Record your vibrating feeder serial and order number in the space provided below. You will find the serial number plate located on the support frame or side plate.

Please include these numbers when requesting service or ordering replacement parts.

CALIFORNIA
Proposition 65 Warning
Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

Copyright KPI-JCI
2014
Models Covered:

- 30 x 12
- 36 x 14
- 36 x 16
- 36 x 20
- 42 x 18
- 42 x 20
- 50 x 16
- 50 x 18
- 50 x 20
- 50 x 20 LP
- 50 x 24
- 62 x 20
- 60 x 24
This manual contains operating instructions and lubrication-maintenance information. Application of this information should maximize the performance and life of your equipment and minimize down time.

Safe and efficient operation requires that anyone who will be operating or maintaining this equipment read and understand the safety, operation, maintenance and troubleshooting information contained in the operator’s manual.

Continuing improvement and advancement of KPI-JCI products may cause changes to your equipment which may not be reflected in this publication.

KPI-JCI reserves the right to make changes or add improvements to its products at any time, without incurring any obligation to make such changes on previously manufactured equipment.

Although care has been taken to assure the accuracy of this publication, KPI-JCI does not assume any liability for loss, damage or injury caused by errors or omissions.
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## About This Manual

### Purpose

The purpose of this manual is to help you get the best value from your equipment. It can do so by helping you decide what work must be done, even if you decide to have it done by a dealer service department or a repair shop. It also provides information and procedures for routine maintenance and servicing.

### Using the Manual

Procedures, once described in the text, are not normally repeated. When it is necessary to refer to another chapter, the reference will be given as page number.

Even though this manual has been prepared with extreme care, KPI-JCI can not accept responsibility for errors in, or omissions from the information given.

### Special Notations

Within this manual procedures or situations that require special attention are indicated with the words, **DANGER**, **WARNING**, **CAUTION** and **IMPORTANT**.

**DANGER, WARNING** and **CAUTION** are used to indicate procedures or situations where personal safety is involved.

**IMPORTANT** is used to indicate special procedures or situations which, if not observed, could result in damage to the equipment or affect the operation of the machine.
Serial Number Plate

Modifications are a continuing process in the manufacture of this equipment. Since replacement parts, manuals, and lists are compiled specifically for each unit, the serial numbers are essential to correctly identify the component required.

The serial number plate will show the serial number, job order number, and model number.

**Vibrating Feeder Serial Number**

The serial number for the vibrating feeder is stamped on a plate which is located on the feeder side plate.

The serial number is the number that should be referred to when ordering parts or requesting service.
# Buying Replacement Parts

<table>
<thead>
<tr>
<th>Authorized Dealer Parts Department</th>
<th>Purchased Components</th>
<th>Serial Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>An authorized dealer parts department is the best source for parts, particularly parts which are unique to this equipment. If you do not know who the authorized dealer is in your area contact KPI-JCI. Dealerships are located throughout the United States and some parts of the world.</td>
<td>Replacement parts for components purchased by KPI-JCI such as gear reducers, electric motors and engines are available through your authorized dealer. However, items like engine parts are typically not stocked by the dealer or KPI-JCI.</td>
<td>Since replacement parts manuals and lists are compiled specifically for each unit, the serial numbers are essential to correctly identify the component required.</td>
</tr>
</tbody>
</table>
Maintenance Techniques and Tools

Tools

Although a minimal number of tools are needed for operation and maintenance, a good selection of basic tools is required.

The following is a list of recommended tools for servicing and maintaining the vertical shaft impactor.

- Tool box
- 3/4" drive socket set (socket to 2") with ratchet and extension and breaker bar
- 1/2" drive socket set
- Box end open wrench set 3/8" to 1"
- Allen wrench set 1/8" to 1"
- Punch and chisel set
- 3 pound sledge
- Pry bar set (dog leg)
- Line bar set
- 1 set of Phillips screwdrivers
- 1 set of standard screwdrivers
- 2 - 8" Vise grip curved
- 18" pipe wrench
- 18" crescent wrench opening to 1-3/4"
- Scraper
- Spanner wrench (p/n 257017)

These items can be purchased from KPI-JCI as a kit. Order part number 289470 for the vertical shaft impactor tool kit.

Waste Oil and Fluids

Waste oil and fluids drained from the engine and hydraulic system during normal maintenance and repair can present a disposal problem.

To avoid pouring them on the ground or into the sewage system, pour the used fluids into large containers, seal them and take them to an authorized disposal or recycling center.

Fasteners

All threaded fasteners should be clean and straight, with undamaged threads and undamaged corners on the hex heads.

It is a good habit to replace all damaged fasteners when performing maintenance, never reuse a damaged fastener.

Special locknuts with nylon inserts can only be used once. If they are removed, they lose their locking ability and must be replaced.

Rusted nuts and bolts should be treated with a penetrating fluid to ease removal and prevent breakage. Badly rusted fasteners may have to be chiseled, sawed or torched off.

Flat washers and lockwashers, when removed from an assembly, should always be replaced exactly as removed. When replacing nuts and bolts, be sure to use the correct grade. Never use a different grade of bolt than the original equipment.
**Lubricants and Fluids**

**Bearings**

Vibrating feeder bearings are lubricated with an NLGI 2 multipurpose, extreme pressure synthetic grease.

**Gear Box**

The vibrating feeder gear box is filled with a high performance gear oil having extreme pressure characteristics and load carrying properties.

For ambient temperatures below +40°F (4.5 degrees C) an ISO viscosity grade 150 should be used.

For ambient temperatures above +40°F (4.5 degrees C) an ISO viscosity grade 220 should be used.
Storage

When the machine will not be used for a period of a few months, use the following procedure for storage to minimize corrosion and deterioration.

**General Storage Guidelines**

- Remove all dirt and debris from all areas in and around the machine.
- Lubricate all points as specified in the maintenance and lubrication section of this manual.
- Bearings must be rotated and lubricated every 30 days (they are in storage) to prevent them from drying out.
- Loosen and remove v-belts to prevent them from stretching.
- Clean the outside of the machine and repaint any areas where needed.
- Attach a tag to the plant indicating what storage procedures have been done.
- To help prevent corrosion, the fuel and hydraulic tanks should be filled to their proper level.

**Electric Motor Storage Guidelines**

The following guidelines should be followed when storing equipment with an electric motor.

- Loosen and remove v-belts from the electric motor to reduce the load on the bearing.
- Fill the bearing cavities with grease to prevent condensation.
- Rotate and lubricate the bearing every 30 days it is in storage to prevent them from drying out.
- If storing for longer than six months, follow the Extended Period Storage in the next column for bearings.

**Extended Period Storage (6 months or more)**

If the machine will be stored for a period of six months or more follow the guidelines below.

These guidelines should be completed once every three months to lubricate the bearings and/or to purge condensation and to prevent the bearings from drying out.

- Lubricate bearings
- Rotate the shaft two revolutions.
- Replace breather cap.

To help prevent corrosion, the fuel and hydraulic tanks should be filled to their proper level.
Introduction to the Vibrating Feeder

Feeder orientation is determined by standing at the front of the vibrating feeder looking toward the direction of travel. References to the feed end and material flow is shown below.

Feed End  Material flow  Discharge End
Introduction to the Vibrating Feeder

**Vibrating Feeder**

The vibrating feeder is typically used to feed primary crushers from a feed hopper. The vibrating feeder does the combined function of controlling the feed to the crusher and removing fines from the feed material.

The mechanically produced vibration moves the rock along at a controlled speed and shakes the fines between spaced grizzly bars. The vibrator mechanism creates the vibration by combining the centrifugal forces produced by two counter-rotating unbalanced shafts to produce an upward and forward motion in a constant direction. The force vibrates the feeder in a straight line path.

Vibration is induced by an eccentricity cut into the shaft. The eccentricity produces a three-way motion - horizontal, vertical, and elliptical. Feed material is moved forward and upward in an elliptical path. The resulting turning motion of the material provides high capacity and excellent scalping action as the material is turned to expose all sides to the grizzly openings. Fines are shook loose by this motion and drop through the grizzly to be bypassed.

KPI-JCI offers four grizzly deck designs or a solid pan deck on our vibrating feeders. This allows you to choose the model that best suits your needs and provides you with maximum production rates. All grizzly designs feature adjustable, tapered grizzly bars. The solid pan deck is constructed of 3/4” solid plate with an optional 3/4” liners.
The following is a brief description of the vibrating feeder’s basic parts and their function.

**Vibrating Mechanism**

The vibrating mechanism produces the force to vibrate the feeder. This mechanism has two parallel unbalanced shafts mounted on spherical roller bearings. A v-belt sheave drives one shaft which, in turn, drives the second shaft through timing gears.

**Pan Assembly**

The pan assembly is the framework of the feeder. The wear plates, grizzly bars, support springs, and vibrating mechanism bolt to the pan assembly. The pan assembly is a non-wearing part if wear plates are replaced when needed.

**Vibrator Drive**

Standard v-belts drive the vibrator mechanism through grooved sheaves. A pivoted motor base maintains the correct belt tension under varying feed loads.
**Introduction to the Vibrating Feeder**

**Grizzly Bars**

The grizzly bars, fabricated from mild steel with a heat-treated alloy steel wear surface, form a scalping deck which removes fines from the feed material. The spacing of the bars adjusts to give a 2-1/2” to 6” nominal opening range between the bars. Capscrews with spacer plate hold the bars in place on the support channels. A plate deck is available for the grizzly section if needed.

**Support Springs**

Coil springs support the vibrating feeder. The springs absorb the shocks of falling rocks hitting the feeder and isolate the vibration from the supports. Cast-iron retainers bolted to the pan assembly and supporting structure hold the springs and position the feeders.
## Specifications

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Solid pan Length</th>
<th>Grizzly length</th>
<th>Speed</th>
<th>HP</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>30&quot; x 12'</td>
<td>2' 5&quot;</td>
<td>12'</td>
<td>1' 3&quot;</td>
<td>8'</td>
<td>4'</td>
<td>1000</td>
<td>20</td>
<td>4300</td>
</tr>
<tr>
<td>36&quot; x 14'</td>
<td>2' 11&quot;</td>
<td>14'</td>
<td>1' 6&quot;</td>
<td>9'</td>
<td>4' 6&quot;</td>
<td>950</td>
<td>30</td>
<td>6000</td>
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<tr>
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<td>2' 11&quot;</td>
<td>16'</td>
<td>1' 6&quot;</td>
<td>11' 6&quot;</td>
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<td>950</td>
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<td>3' 5&quot;</td>
<td>20'</td>
<td>1' 6&quot;</td>
<td>12'</td>
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<td>6'</td>
<td>750</td>
<td>60</td>
<td>25000</td>
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Safety First!

This symbol is used to bring attention to safety precautions and instructions.

Warning decals have also been placed on the equipment to provide instructions and to identify specific hazards which, if not heeded, could cause bodily injury or death to you or other persons.

KPI-JCI cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the equipment are therefore not all inclusive.

If an operation is not performed as specifically recommended by KPI-JCI you must satisfy yourself that it is safe for you and others. You should also ensure that the equipment will not be damaged or made unsafe by the method of operation you choose.

The following signal words may be used in this manual to designate a degree or level of hazard and are defined as follows.

- **DANGER** is used for imminently hazardous situations which, if not avoided, WILL result in death or hazardous injury.

- **WARNING** is used for potentially hazardous situations which, if not avoided, could result in death or serious injury.

- **CAUTION** with the safety symbol is used for potentially hazardous situations which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

- **NOTICE** is used for specific practices that are critical to the operation or maintenance of the equipment.
Safety

Safety symbols are used with signal words to further demonstrate a safety hazard. The table below illustrates the safety symbols found on decals.

Safety Precautions

The safe operation and maintenance of the plant is the responsibility of the owner/employer and the operator/employee.

The owner/employer must ensure that anyone who operates, maintains, services, transports or works around the machine is familiar with operation, maintenance and safety procedures and information outlined in this manual.

Operator/Employee’s Responsibility

It is the operator’s responsibility to read, understand and follow all operation, service and safety information presented in this manual and on the machine.

Untrained operators and maintenance personnel are a hazard to themselves and others and are not qualified to operate or service the plant.

Never modify the plant in any way. Unauthorized modifications can affect the function and/or safe operation and life of the plant.

<table>
<thead>
<tr>
<th>Safety Symbol</th>
<th>Safety Meaning</th>
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<tr>
<td>Fall Hazard.</td>
<td>Do not stand or sit on frame while in operation. Wear proper safety rigging and gear before climbing on the equipment.</td>
</tr>
<tr>
<td>High Pressure Hazard.</td>
<td>The machine’s hydraulic system poses a high pressure fluid hazard. Wear proper protective equipment (PPE) when working on the machine. Follow the steps to relieve hydraulic pressure and lockout/tagout machine before servicing.</td>
</tr>
<tr>
<td>Impact Hazard.</td>
<td>The machine uses counterbalance valves. Wear proper PPE. Follow the steps to relieve pressure and lockout/tagout machine before servicing.</td>
</tr>
<tr>
<td>Magnetic Field Hazard.</td>
<td>Pacemaker users should use caution around the magnet.</td>
</tr>
<tr>
<td>Nip Point Hazard.</td>
<td>The head and tail pulley areas on conveyors pose a nip point hazard. Make sure machine is locked out/tagged out before servicing.</td>
</tr>
<tr>
<td>Flammable Material Hazard.</td>
<td>Diesel fuel and hydraulic oil pose a flammable material hazard. Do not smoke near machine.</td>
</tr>
<tr>
<td>Respiratory Hazard.</td>
<td>Machine operation causes dust. Wear a face mask when operating the machine.</td>
</tr>
<tr>
<td>Flying Debris Hazard.</td>
<td>Crusher operation causes debris and poses a risk of eye injury. Wear approved eye protection when the crusher is operating.</td>
</tr>
<tr>
<td>Falling Objects Hazard.</td>
<td>Loading the machine causes debris to fall and poses a head injury. Wear an approved hard hat when the machine is operating.</td>
</tr>
<tr>
<td>High Voltage Hazard.</td>
<td>The electrical components on this machine pose burns or shock risk. Make sure machine is locked out/tagged out before servicing.</td>
</tr>
</tbody>
</table>

Owner/Operator’s Responsibility

It is the owner/operator’s responsibility to insure everyone operating the equipment is familiar with safe operation and maintenance of the plant. Do not risk injury or death by ignoring safety practices or failing to instruct.

It is the owner’s responsibility to give the operator/employee instruction before allowing them to operate, service, transport or work around the plant. This instruction should be reviewed at least annually.
The following section presents material on specific safety items. Although specific safety guidelines are given, each situation can have its own peculiarities which can not always be covered by specific rules.

**General Safety**

1. Read and understand the Operator’s Manual before operating, servicing or working around this machine.
2. Have a first aid kit available and know how to use it.
3. Have a fire extinguisher available and know how to use it.
4. Wear necessary protective gear, including but not limited to:
   - Hard hat
   - Protective shoes with slip resistant soles
   - Eye protection
   - Protective gloves
   - Hearing protection
   - Respirator or filter mask
5. Check and secure all guards before operating. Repair or replace any damaged or missing guards or guarding devices.
6. Repair or replace any damaged handrails, ladders, or walkways.
7. Place all controls in neutral, stop engine, remove ignition key, follow lockout/tagout procedure and wait for all motion to stop before lubricating, adjusting, or servicing.
8. Clear area of people before starting the plant.
9. Review safety practices annually.

**Assembly Safety**

1. Assemble in an area with sufficient space to handle the largest component and access to all sides of the machine.
2. Use only cranes, jacks and tools with sufficient capacity.
3. Do not allow spectators in the assembly area.

**Operating Safety**

1. Read and understand the Operator’s Manual before operating, servicing or working around this machine.
2. Keep hands, feet, hair and clothing away from moving parts.
3. Follow lockout/tagout procedure and wait for all motion to stop before lubricating, adjusting or servicing.
4. Clear the area of people before starting the plant.
5. Place the plant so that it is visible from the operator’s station.
6. Never operate the plant if it has been damaged.
7. Keep all hydraulic lines, fittings and couplers free from leaks before operating.
8. Review safety practices annually.
9. Do not stand or sit on catwalk, underscreen frame, or rails while plant is in operation.
10. Safe working load of the platform is 300 lbs. (136 kg).
Safety

Operating Safety Area

1. Keep away from receiving hopper and loading area.
2. Keep away from discharge end.
3. Always be aware of the location of other personnel and keep them away from hazard areas.
4. Keep away from power lines when relocating or transporting the plant.

Maintenance Safety

1. It is the owner/operator’s responsibility to provide a safe method of access to certain service areas such as head pulley bearings and hub.

   Do not use the conveyor belt as a walkway to access these areas.

2. Read and understand the Operator’s Manual before lubricating, servicing or working around this machine.

3. Follow lockout/tagout procedure and wait for all motion to stop before lubricating, adjusting or servicing.

4. Follow good shop practices.

5. Make sure all guards are in place and properly secured when maintenance work is completed.
6. Never wear poor fitting, baggy or frayed clothing when working around or on any of the drive system components.
7. Relieve pressure from the hydraulic circuit before servicing or maintaining system.
8. Keep hands, feet, hair and clothing away from moving or rotating parts.
9. Clear the area of bystanders when carrying out any maintenance or adjustment.

Magnet Safety

1. Magnetic field can be harmful to pacemaker wearers. Pacemaker wearers shall maintain a minimum safe distance of 16.5’ (5 meters) from the magnet.
2. Strong magnetic field can produce sudden interaction with metallic objects. Use caution when handling objects near magnet.
Safety

Hydraulic Safety

1. Always place all controls in neutral before servicing hydraulic system.

2. Replace any worn, cut, abraded, flattened or crimped hoses or steel lines.

3. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements.

   The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

4. Wear proper hand and eye protection when searching for a hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.

5. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.

Transport Safety

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways.

2. Make sure that all the lights and reflectors that are required by the local highway and transportation authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

3. Do not allow anyone to ride on the plant during transport.

4. Do not exceed 55 mph when transporting the machine. Reduce speed on rough roads and surfaces.

5. The machine is not grounded. Electrocution can occur without direct contact. Stay away from overhead power lines.
Lockout Procedures

Lockout procedures are a principal means of controlling energy hazards. A lockout procedure is a set of safe work practices and rules that make it impossible for a worker to come into contact with an uncontrolled energy source.

The first step in designing a lockout procedure is to identify all sources of energy that affect the work.

Second, action must be taken to neutralize, redirect or stop the energy from performing its normal function before workers enter the area to make adjustments or perform maintenance.

The third step is to verify that a zero energy state has been achieved. This means that there is no energy available to cause a hazard.

The final step is to physically prevent the accidental re-energizing of the system until the work is completed and every worker is in a safe place.

This last step often involves placing padlocks on equipment controls, which is the origin of the "lockout" term. For example, five workers might be involved in a maintenance procedure.

Each of them might have a color-coded lock. All five locks could be placed on an electrical switch, preventing the power from being turned back on until all of the workers have removed their locks.

Zero Energy State

Achieving a zero energy state is often more complex than the simple example given above. Energy sources are not always obvious. Equipment is often initially powered by electricity. But this “main” energy source may be converted into other forms of energy as part of the operation of the machine. For example, a device might use electricity to power a pump, creating hydraulic pressure to operate the device. The hydraulic pressure remains stored in the system even when the electricity is turned off. Gravity and momentum can be stored in a stationary machine by springs or counterweights. The term zero energy state means that all of these energy sources have been controlled.

Lockout Policy

Every workplace where workers could come into contact with energy sources should have written safe work procedures that implement a lock-out policy.

In some cases, job hazard analysis will be required. Training programs need to be designed. Responsibility for specific lock-out procedures must be assigned to individuals by the employer.

The exact procedures involved in implementing a lock-out will depend on the circumstances of the individual workplace. These general principles apply in every situation.

CAUTION

Failure to follow correct lockout/tagout procedures could result in death or serious injury.
Anyone who will be operating and/or maintaining the machine must read and clearly understand all safety, operating and maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until this manual has been read and clearly understood.

A sign-off sheet has been provided for your record keeping to show that all personnel who will be working with this equipment have read and understand the information in this manual and that they have been instructed in the operation of this equipment.

This manual should be reviewed at least annually.

The following personnel have reviewed and have been trained in the proper operation and maintenance of the machine.

<table>
<thead>
<tr>
<th>Date of review and training completion</th>
<th>Trainee Signature</th>
<th>Trainer Signature</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
Decal Placement

The following illustrations are shown to help identify decals when they require replacement. Make sure machine surface is clean and free from grease and oil before applying new decal.

**CAUTION**

Safety decals are provided for your personal safety. If they should become damaged, they must be replaced.

- 139083 WARNING
  - Loading Area
  - Keep Away

- 46-60146
  - Rock Eater
  - Dragon decal

- 220762
  - KPI-JCI logo
  - Rectangle

- 114933
  - CAUTION

- 139014
  - 24 hour parts & service decal

- 174848
  - Built in USA decal with eagle and American flag

- 221578
  - Black PIONEER logo

- 254815
  - Built in USA decal with eagle and American flag

Vibrating Feeder

- 139006
  - Left Panel
  - This assembly must be empty and clear of all material before lifting.

- 139006
  - Left Panel
  - This assembly must be empty and clear of all material before lifting.
Decal Placement

- **114933**: CAUTION
- **213616**: WARNING
- **220762**: KPI-JCI logo - rectangle
- **139083**: WARNING
- **139006**: CAUTION
- **221578**: Built in USA decal with eagle and American flag
- **46-60146**: Rock Eater Dragon decal
Feeders are where typical plant operation begins. Probably no other single factor in the design or construction of an aggregate processing plant cost so little and pays so much in dividends as proper feeding. Proper feeding maximizes plant operation and often determines the efficiency of the entire plant.

Material from gravel pits or quarries is almost always delivered to processing plants in batches. Delivery may be by trucks, front-end loaders, or bulldozers, or less frequently by shovels, draglines or dredges. The economy of material from the delivery equipment usually requires rapid dumping of material from the delivering equipment at the plant so that loads of a few yards to several tons will be unloaded quite suddenly.

Except for operations involving dredges, loads of pit-run material are usually dumped into a hopper or pocket at the plant. The plant feed hopper is usually designed to have a capacity two to three times the maximum size load being delivered to accommodate the intermittent loads being dumped.

Aggregate processing equipment and plants operate best when fed material at a uniform rate. The plant feeder hopper usually has a mechanical device regulating the hopper discharge and draws material from the hopper at a relatively uniform rate. This machine is a feeder, and the unit which handles pit-run material from the feed hopper is commonly called the primary feeder since it is the first mechanical unit to handle the raw material from the pit or quarry.

Feeders have the following functions:

- To form an impact resistant bottom to the feed hopper and absorb the impact of the loads of material which may be dropped into the hopper by the hauling or excavating machines.
- To withdraw material from the hopper or pocket at a relatively uniform rate and at a rate suitable for the designed capacity of the plant components which follow it.

While engineers involved with the feeder and plant designed may refer to impact as a force measured in foot-pounds, operators and sales people often describe the impact as resulting from a certain weight of load dumped from a height measured in feet above the feeder. For example, they may describe the impact on the feeder as that of a ten ton load dropped fifteen feet.

Impact is also influenced, to some degree, by the size of the pieces of material in the dumped load. When a load with considerable fine material is dumped, the fines dumped on the feeder tend to cushion the fall of the remaining material. On the other hand, when a load consisting almost entirely of boulders or extremely coarse rock (for example, rip-rap) is dumped, the impact on the feeder is increased. A plant operator concerned with feeder maintenance costs will protect his primary feeder from the most severe impact conditions by operating the feeder so that the primary feed hopper is rarely empty and leave material on the feeder to cushion it from the loads being dumped.

Secondary feeder handling the discharge of crushers or the undersize of screen will rarely be subjected to severe impact loads since the crushed or screen undersize material is usually a mixture of relatively...
small sizes. However, these feeders may have to support considerable weight if the collecting hopper or pocket over the feeder is deep.

Feeders withdraw material from their hoppers, pockets, or bins by reciprocating motions, vibrating motions, or by the movements of a continuous belt of rubber or metal pans. The amount of material discharged or the capacity of the feeder is a function of several factors of which the most common are:

- Width of the feeder inside the hopper skirt boards.
- Height of the feeder discharge opening.
- Speed of the feeder’s motion.
- Weight per cubic foot of the material.
- Percentage of voids in the material.

The first three factors define a volume of material being discharged by the feeder and usually expressed in cubic feet of material in a period of time, such as per minute or more commonly per hour. The last two factors convert the calculated volume to weight and is usually expressed in tons.

**Vibrating Feeders**

Vibrating feeders are currently the most widely used feeder. These feeders have high capacity and are relatively low maintenance feeders. These feeders are equipped with either a grizzly bar or solid pan section.

Vibrating feeders are designed to feed and scalp pit-run or quarried rock ahead of primary jaw or impact crushers. The solid pan deck of the feeder forms the bottom of the feed hopper and the vibrating motion of the unit moves the material out of the feed hopper into the primary crusher at a uniform rate. Vibrating feeders are available with grizzly bars for scalping or pan decks. The purpose of the grizzly section is to allow that portion of the material in the pit-run which does not require crushing to fall through the grizzly into a collecting hopper beneath it and bypass the crusher. The bypassed material joins the crushed product on the undercrusher conveyor. The grizzly bars have adjustable spacing to vary the bypass size. Pan decks are used when removal of fines is not necessary.

**Advantages of vibrating feeders are:**

- They require minimal headroom.
- They offer a combination of feeding and primary scalping in one unit which under some conditions eliminates the need for a separate scalping screen ahead of the crusher.
- Their solid bottoms minimize underfeeder spill.
Site Selection and Preparation

**Site Selection**

Selecting a site without anticipating problems could lead to unsatisfactory operation and plant relocation could be required. When selecting a suitable site for operation the following factors should be taken into consideration:

1. **Ground stability.** If the ground is too soft or unstable, proper leveling and loading may be impossible.

2. **Ample room.** Leave plenty of room around the feeder to facilitate access of loading equipment, assembly of feeder components and service personnel.

3. **Proper drainage.** Proper drainage is important to allow for runoff of normal rainfall.

4. **Wind direction.** You may also want to consider prevailing wind direction and its effect on the operator or loading personnel.

**Foundation**

Do not locate the foundation on sand, unstable soil, or anywhere that flooding might occur. Locate the foundation on level, solid rock, or a compacted aggregate base only.

Where fill of any kind has been used, the foundation must extend through the fill to a solid subsurface. The subsurface must be of adequate load bearing ability to support the combined weight of the feeder and its supporting structure.

When constructing the foundation, consider these other factors:

1. Allow adequate space beside the feeder for walkways and service platforms. Observe all federal, state, and local regulations when designing and constructing walkways or service platforms.

2. Allow about ten feet of space on one side of the feeder for shaft removal.

3. Allow space above the feeder so it can be raised when spring replacement is necessary.

4. Allow adequate space for access to the v-belt drive. Be sure the drive will not be blocked by walls, structures, or other objects.

**NOTICE**

The portable plant may include other equipment. Operation and maintenance manuals have been provided for this equipment. Refer to these manuals for equipment installation and start-up procedures.

**Support Structure Guidelines**

The support structure is a steel or concrete structure located between the feeder and its foundation. The feeder base is mounted on top of this structure.

Use the following guidelines when designing and installing a support structure.

1. The support structure must be firmly anchored to a solid foundation. It must be strong enough to carry the weight of the feeder and its material load.

2. The support structure must be capable of withstanding the forces present during normal feeder operation and the additional forces which occur during startup and shutdown. The structure must be sufficiently braced to minimize vibration and swaying.

3. Check side-to-side and end-to-end levelness.
Set-up

**Portable Plant Set-up**
*(portable feeders only)*

1. Carefully move the portable plant to a suitable site.

2. Using jacks or hydraulic rams, raise the plant chassis so the tires are off the ground. Install blocking and cribbing under the plant support legs.

3. Install walkways and service platforms as required.

4. Remove all shipping brackets and chains. Save brackets and chains for future use.

5. Remove any items shipped inside the feeder.

6. Check that the portable plant frame and feeder are level.

7. Complete the preoperation and operation checks.

**Check Levelness**

1. Check the top and bottom edge of the feeder for levelness. The feeder must be level side-to-side and end-to-end.

2. If the feeder corner is low on one side, recheck the support structure for levelness. Be sure that the foundation has not settled.
Motor and V-belt Installation

Use the following guidelines when installing the v-belt drive. Complete all steps that apply.

1. If required, install the motor mounting bracket to the feeder base or other supporting structure. If the motor is customer supplied, be sure that it is the correct speed and horsepower.

   When installing the motor, the motor must be installed 90 degrees from line of action. Refer to the diagram to the right.

2. Install v-belts and adjust tension. The motor mount assembly has a belt tensioning mechanism which allows for the vibration of the feeder and keeps the belt at the proper tension.

3. Install v-belt drive guard.

WARNING

V-belt drive must be properly guarded to prevent injuries caused by moving parts. Always replace v-belt drive guard after making any inspections, adjustments or repair.

The feeder passes through a critical speed range when starting and stopping. Using a motor that is too small will cause the feeder to vibrate excessively because not enough torque is available to pull the feeder through the critical speed range.
Set-up

**Electrical Connection**

Use the following guidelines when wiring the motor and installing its electrical components. Complete all steps that apply.

1. Be sure to provide an adequate electrical ground.
2. Be sure the wire size is adequate.
3. Be sure all connections are tight.
4. Provide a loop at the motor connection to allow for motor movement during future v-belt tension adjustments.
5. Use full voltage starter and install it in a proper enclosure that is appropriate for the operating conditions.
6. If a variable frequency drive is used, refer to the drive operation manual for operation and adjustment.

**WARNING**

Failure to properly install and connect electrical components may result in a dangerous electrical shock hazard. Allow only licensed electricians to install and connect electrical components. Be sure that all connections are in accordance with the National Electrical Code and any applicable local codes.

**NOTICE**

Starter must be equipped with overload protection that is appropriate for the rated full load amps of the motor.

**Direction of Rotation**

Jog the motor and check that the feeder sheave rotates in the correct direction. The driven sheave should rotate counterclockwise.
**Feeder Support Structure Assembly**

If your feeder is part of a support structure, use the following procedure to construct the support structure.

Have all assembly drawings available before beginning any support structure assembly. If you do not have the assembly drawings please contact KPI-JCI, Inc. Refer to IB-5008 Field Assembly Procedures for additional information regarding support structure assembly.

1. **If adequate lifting equipment is available, the structure may be assembled on the ground on its side and then lifted into place as a complete unit or it may be constructed from the bottom upward.**

2. Bolt each of the pieces loosely in place. Place washers on both sides of the bolt.

   Do not tighten bolts until the complete assembly is bolted loosely together. This will allow for lateral adjustment.

   A very limited amount of grinding or redrilling may be required to fit pieces together. All structures are pre-assembled at the factory to ensure all pieces fit correctly.

   If pieces are not fitting properly, check to make sure assembly surface is level and that no twisting has occurred.

3. **When assembling the structure from the ground up, bolt the tower legs to the foundation.**

   Check to make sure each tower leg is level and that they are all at the same height.

   **For a skid base assembly the same procedure applies.**

4. **Loosely bolt cross braces to tower structure.**

5. **Assemble the access stairway assembly. Bolt loosely.**

6. **Loosely bolt the handrail assembly to the top of the component.**

7. **Tighten bolts to correct torque value (see Appendix B).**

   It is very important not to overtighten. If using impact wrenches, make sure they are correctly calibrated and set.

8. **Check to make sure all pieces are properly oriented after the assembly has been bolted loosely in place.**

   **Check to be sure no pieces are upside down or in the incorrect position.** Refer to the assembly drawings.
Startup and Shutdown

Initial Operation

The feeder should be run empty initially to ensure everything is operating properly and there are no misaligned or binding parts. Operate a new feeder empty for two hours.

CAUTION

Before starting the feeder, be sure all tools and foreign objects have been removed and everyone is clear.

Daily Start-up

Use the following guidelines when starting the feeder for daily use.

1. Perform all maintenance and inspection procedures as outlined in Chapter 8.

2. Start the feeder and allow it to reach normal operating speed. Operate the feeder for a few minutes without material and listen for unusual noises or other signs of trouble.

3. Start material feed and check that the material quickly and evenly flows across the full width of the feeder surface.

4. Feed material at a steady rate. Avoid surge loads.

5. Do not overload the feeder by feeding too much material at one time. This will create a material bed that is too deep. Reduced feeder efficiency, material spillage and plugging may result. Damage to bearings and feeder structure may also occur.

The feeder passes through a critical speed range when starting and stopping. Using a motor that is too small will cause the feeder to vibrate excessively because not enough torque is available to pull the feeder through the critical speed range.

Material flowing to left side.

Material flowing to right side.

Material evenly distributed.

NOTICE

If unusual noises or other problems are noticed, stop the feeder, lockout power and make repairs as required.
Startup

Observing Feeder Operation

1. As the feeder operates, be aware of any sudden changes in the sound, movement, or material flow that might indicate trouble.

2. Listen for the sound of loose parts.

3. Listen for whining or howling sounds that might indicate under-greased bearings and potential bearing failure.

4. Always stop the feeder if any abnormal noises are heard, or if any obvious changes in operation is observed. Identify the problem and make repairs as necessary.

5. Check if material is spilling over the sides of the feeder or from around chutes and hoppers. Reduce feed rate or make repairs as required.

Daily Shut-down

1. Stop the material feed and allow the feeder to operate until all quarry material is discharged. Be sure no quarry material remains on any of the feeder surfaces.

2. Stop the feeder.

3. Lockout power and tag controls for the feeder and all related equipment (conveyors, etc.).

4. Perform all scheduled inspection and maintenance procedures.
Preoperation/Operation Checklist

Check each component of the vibrating feeder to ensure that it is in operational condition. This check should include, but not be limited to the following.

### PRE-OPERATIONAL CHECKS

<table>
<thead>
<tr>
<th>OK</th>
<th>Adjust</th>
</tr>
</thead>
</table>

#### 1. Sheet Metal/Appearance/Paint

#### 2. Lubrication
   - a. Grease bearing
   - b. Gear box
   - c. Hydrostatic drive (if equipped)

#### 3. V-belt Drive
   - a. Sheaves aligned
   - b. V-belt tensioned properly
   - d. Motor rotates proper direction (sheave counter clockwise)

#### 4. General
   - a. Operator’s manual on unit
   - b. Decals in place and readable
   - c. Safety guards in place
   - d. All bolts are tight
   - e. Feeder is level

### OPERATIONAL CHECKS

<table>
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<th>Adjust</th>
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</thead>
</table>

#### 1. Unit vibration

#### 2. Feeder
   - Shaft RPM__________

#### 3. Feeder not hitting stationary objects

#### 4. Feed material evenly distributed

#### 5. Material does not backup in chute

#### 6. Bearing temp 4 hours__________
   - Bearing temp 8 hours__________

### After first day of operation

1. Retighten bolts holding vibrator mechanism to pan assembly torque to 900 ft/lb.

2. Check tightness of spring retainer bolts.

3. Check tightness of pan liner bolts.

4. Check all wear plates.
Maintenance and Lubrication

The following section contains instructions for maintaining and lubricating the vibrating feeder.

Maintenance intervals shown are for normal operating conditions. If the feeder is operated under severe or adverse conditions maintenance may need to be performed more often. Failure to perform regular maintenance may result in feeder plant failure or damage.

---

**WARNING**

Never attempt to service or adjust this machine until all motion has stopped and power has been disconnected and locked out.

---

### Notes

<table>
<thead>
<tr>
<th>Interval</th>
<th>Ref. No.</th>
<th>Item</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>10 hours</td>
<td>1</td>
<td>V-belt Tension</td>
<td>Check for wear and proper tightness.</td>
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<tr>
<td></td>
<td>--</td>
<td>Bearing Housings</td>
<td>Add 1 oz. lubricant to each bearing housing.</td>
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<tr>
<td></td>
<td>--</td>
<td>Gear Box Lubricant</td>
<td>Check level. Add as needed.</td>
</tr>
<tr>
<td>50 hours</td>
<td>4</td>
<td>Support Springs</td>
<td>Check feeder for level and replace springs as needed.</td>
</tr>
<tr>
<td></td>
<td>--</td>
<td>Wear Plates/Grizzly Bars</td>
<td>Check for wear and replace as needed.</td>
</tr>
<tr>
<td>200 hours</td>
<td>3</td>
<td>Vibrator Mechanism</td>
<td>Drain, flush, and refill gear case.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Motor Mount Bearings</td>
<td>Lubricate bearings on both sides.</td>
</tr>
<tr>
<td>As needed</td>
<td>2</td>
<td>Electric Motor</td>
<td>Lubricate motor bearings.</td>
</tr>
</tbody>
</table>

**Note:** Quantities of grease have been specified by the term “pumps”, this refers to one pump from a standard 13 oz. grease gun delivering 20-25 pumps per oz.
**General Inspection**
(10 hours)

A walkaround inspection should be made on a daily basis. By taking a few minutes each day to inspect the feeder, you can spot potential problems and take care of them before they become serious.

Generally you should check the following items:

1. Make sure all guards are in place and functional.
   Repair or replace any damaged or missing guards or guarding devices.
2. Repair or replace any damaged handrails, ladders or walkways.
3. Loose nuts, bolts and set screws.
4. Clear away built-up dirt and debris.

---

**V-belt Drive**
(10 hours)

Check the v-belt drive for proper tension. Replace v-belts that show signs of obvious damage, such as ruptures or cuts. See Appendix C for information on measuring v-belt tension.

Keep v-belts clean and free from oil, grease and other lubricants that may cause slippage or premature wear.

Check sheaves for proper alignment. If v-belts show excessive wear on one side or are turning over in their grooves, check for sheave misalignment.

Remove any built-up dirt or other material from around the v-belt drive and motor.

Be sure that the v-belt drive is securely installed after inspection and maintenance.
**Vibrating Feeder Bearings**  
*(10 hours)*

There are four grease fittings for the vibrating feeder bearings. They should receive 25 pumps each.

Mobilith SHC 220 is a multipurpose, extreme pressure grease recommended for heavy-duty industrial applications.

**Vibrating Feeder Gear Box**  
*(10 hours)*

Use the site glass on the vibrating feeder gear box to check the oil level. Add oil as needed.

Check the gear box lubricant level often by viewing the site glass. Lubricant should be added until it is halfway up on site glass.
**Motor Mount Bearings**  
(50 hours)

Lubricate the motor mount bearings with two pumps of NLGI 2 grease.

**Support Springs**  
(50 hours)

The support springs should be checked to make sure they are supporting the feeder evenly. Springs should never “bottom out” completely, even during operation. Replace any springs which are sagging.
Vibrating Feeder Gear Box (200 hours)

Drain the oil in the gear box. Flush and refill with Mobil 600 XP industrial gear oil. Amount of gear oil needed to fill gear box will vary according to feeder size. Check the gear box lubricant level often by viewing the site glass. Lubricant should be added until it is halfway up on site glass.
**Electric Motors**
(As needed)

Lubrication information for the WEG electric motor can be found in the bottom left hand corner of the nameplate. A table of lubrication intervals is provided below; however, frame size, speed, lubrication interval should be verified on the nameplate before lubricating. W E G recommends to lubricate bearings with Polyrex Em Grease.

**Motors without Grease Nipples**

Motors up to frame 324/6T are normally fitted without grease nipples. Regrease using the following procedure.

1. Carefully disassemble the motor.

2. Drain all the grease out of the motor.

3. Clean the bearing with kerosene or diesel.

4. Regrease the bearing immediately.

**Motors with Grease Nipples**

Clean the area around the grease nipple. Lubricate the bearing with half the total grease and run the motor for one minute at full speed. Turn off the motor and apply the rest of the grease.

### Electric Motor Lubrication Intervals

<table>
<thead>
<tr>
<th>Frame</th>
<th>Grease oz/g</th>
<th>1800 rpm</th>
<th>1500 rpm</th>
<th>1200 rpm</th>
<th>1000 rpm</th>
<th>900 rpm</th>
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<tr>
<td>254T/256T</td>
<td>.45/13</td>
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<td>284T/286T</td>
<td>.63/18</td>
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<td>20000</td>
<td>20000</td>
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<tr>
<td>324T/326T</td>
<td>.74/21</td>
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<td>20000</td>
<td>20000</td>
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<td>20000</td>
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<tr>
<td>364T/365T</td>
<td>.95/27</td>
<td>9700</td>
<td>11600</td>
<td>14200</td>
<td>16400</td>
<td>17300</td>
</tr>
</tbody>
</table>

#### Ball Bearings (hours)

<table>
<thead>
<tr>
<th>Frame</th>
<th>Grease oz/g</th>
<th>1800 rpm</th>
<th>1500 rpm</th>
<th>1200 rpm</th>
<th>1000 rpm</th>
<th>900 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>324T/325T</td>
<td>.74/21</td>
<td>20000</td>
<td>20000</td>
<td>20000</td>
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<td>14200</td>
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<td>17300</td>
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<td>404T/405T</td>
<td>1.19/34</td>
<td>6000</td>
<td>7600</td>
<td>9500</td>
<td>11600</td>
<td>13800</td>
</tr>
<tr>
<td>444T/445T</td>
<td>1.58/45</td>
<td>4700</td>
<td>6000</td>
<td>7600</td>
<td>9800</td>
<td>12200</td>
</tr>
<tr>
<td>447T</td>
<td>1.58/45</td>
<td>4700</td>
<td>6000</td>
<td>7600</td>
<td>9800</td>
<td>12200</td>
</tr>
<tr>
<td>504T/505T</td>
<td>1.58/45</td>
<td>4700</td>
<td>6000</td>
<td>7600</td>
<td>9800</td>
<td>12200</td>
</tr>
</tbody>
</table>

#### Cylindrical Roller Bearings (hours)
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Symptom</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor efficiency</td>
<td>1. Incorrect speed.</td>
<td>1. Check and adjust as required.</td>
</tr>
<tr>
<td></td>
<td>2. Material feed not properly distributed.</td>
<td>2. Adjust feed method to distribute material evenly.</td>
</tr>
<tr>
<td></td>
<td>3. Incorrect timing.</td>
<td>3. Check timing and adjust.</td>
</tr>
<tr>
<td></td>
<td>4. V-belts slipping.</td>
<td>4. Check for worn v-belts. Check for grease or oil on v-belts or sheaves. If dirty, clean. Check v-belt tension. Check sheaves for alignment.</td>
</tr>
<tr>
<td>Feeder surface has uneven wear or material flows to one side.</td>
<td>1. Material feed not properly distributed.</td>
<td>1. Adjust feed method to distribute material evenly.</td>
</tr>
<tr>
<td></td>
<td>2. Feeder not level.</td>
<td>2. Make sure feeder is level.</td>
</tr>
<tr>
<td></td>
<td>3. Material buildup on feeder pan.</td>
<td>3. Remove buildup and reduce feed rate.</td>
</tr>
<tr>
<td></td>
<td>4. Springs broken or sagging.</td>
<td>4. Replace.</td>
</tr>
<tr>
<td>“Unusual” noises</td>
<td>1. Feeder hitting other objects.</td>
<td>1. Remove obstruction and make repairs as required.</td>
</tr>
<tr>
<td></td>
<td>2. Grizzly bars loose.</td>
<td>2. Tighten.</td>
</tr>
<tr>
<td></td>
<td>3. Bearings worn or damaged.</td>
<td>3. Repair or replace bearings.</td>
</tr>
<tr>
<td>Support spring breakage</td>
<td>1. Feeder not level.</td>
<td>1. Make sure feeder is level.</td>
</tr>
<tr>
<td></td>
<td>2. Overloading.</td>
<td>2. Reduce feed rate.</td>
</tr>
<tr>
<td></td>
<td>3. Material buildup on feeder pan grizzly section.</td>
<td>3. Remove buildup.</td>
</tr>
<tr>
<td>Oil discharge from breather.</td>
<td>1. Rotation of eccentric shaft incorrect.</td>
<td>1. Correct rotation.</td>
</tr>
<tr>
<td></td>
<td>2. Oil reservoir filled too high.</td>
<td>2. Fill or empty oil.</td>
</tr>
<tr>
<td></td>
<td>2. Bearing worn out.</td>
<td>2. Replace bearing.</td>
</tr>
<tr>
<td></td>
<td>3. Seal worn.</td>
<td>3. Replace seal.</td>
</tr>
<tr>
<td>Cracked side plates</td>
<td>1. Feeder hitting other objects.</td>
<td>1. Remove any obstructions.</td>
</tr>
<tr>
<td></td>
<td>2. Feeder not level.</td>
<td>2. Make sure feeder is level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Check for sagging or broken springs, replace as needed.</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Symptom</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feeder will not start</strong></td>
<td>1. No power.</td>
<td>1. Check electrical and motor connections.</td>
</tr>
<tr>
<td></td>
<td>3. V-belts slipping.</td>
<td>3. Check for worn v-belts. Check for grease or oil on v-belts and sheaves.</td>
</tr>
<tr>
<td></td>
<td>parameters incorrect.</td>
<td></td>
</tr>
<tr>
<td><strong>Motor overheats or fails</strong></td>
<td>1. Motor overloaded.</td>
<td>1. Check for excessive friction in motor or v-belt drive.</td>
</tr>
<tr>
<td></td>
<td>2. Incorrect voltage and/or</td>
<td>2. Check motor for the following: single phasing, unbalanced voltage,</td>
</tr>
<tr>
<td></td>
<td>wiring.</td>
<td>excessive voltage, bad ground, incorrect connections.</td>
</tr>
<tr>
<td></td>
<td>3. Motor ventilation openings.</td>
<td>3. If necessary, use compressed air to blow out dirt from the motor.</td>
</tr>
<tr>
<td></td>
<td>4. V-belt drive misaligned.</td>
<td>4. Check alignment and adjust as required.</td>
</tr>
<tr>
<td></td>
<td>5. V-belt tension too tight.</td>
<td>5. Check tension, adjust as required.</td>
</tr>
<tr>
<td></td>
<td>lubrication.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Motor defective.</td>
<td>7. Repair or replace.</td>
</tr>
<tr>
<td><strong>High bearing temperature in</strong></td>
<td>1. Under-lubrication/over-</td>
<td>1. Lubricate bearings according to specifications.</td>
</tr>
<tr>
<td><strong>excess of 180 degrees F.</strong></td>
<td>lubrication.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Incorrect grease.</td>
<td>2. Use correct grease.</td>
</tr>
<tr>
<td></td>
<td>3. Speed (RPM) too high.</td>
<td>3. Check speed and adjust.</td>
</tr>
<tr>
<td></td>
<td>5. Bearing misaligned.</td>
<td>5. Realign bearing.</td>
</tr>
<tr>
<td></td>
<td>7. Excess bearing load.</td>
<td>7. Reduce belt tension.</td>
</tr>
</tbody>
</table>
Appendix A: Belt Tension Instructions

Use the following procedure to use the Gates sonic belt tester to measure belt tension.

1. Attach the sensor and turn the power on.

2. Press the blue MASS button and enter belt unit weight in grams/meter.

3. Press the blue WIDTH button and enter the width in millimeters.

4. Measure the belt span. Press the blue SPAN button and enter span length in millimeters.

5. Press the gray MEASURE button. The green light below the number pad will begin flashing to indicate measurement is in progress.

6. Pluck or tap the belt to make it vibrate. In some cases, it may be necessary to tap the belt with the handle of a screwdriver to achieve sufficient vibration for measurement.

7. Hold the sensor approximately 3/8" from the belt. Do not touch the belt with the sensor.

The green light will turn off after a signal is received and remain off for approximately 1-2 seconds during calculation. The measured belt tension is then displayed.

The red light will display if there is no reading or a measurement error.

---


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Appendix A: Belt Tension Instructions

Belt Tension Gauge Instructions

Use the following procedure to measure v-belt tension.

1. Lockout/tagout all power.

2. Measure the belt span length of the drive (see drawing).

3. Set the large O-ring on the body of the tension gauge at the dimension equal to 1/64” for every inch of span length.

For example:

32” belt span

1/64 x 32 = 1/2”

4. Set the O-ring on the plunger at zero (0) against the body of the tension gauge.

5. Press the v-belt tension gauge perpendicular to the belt at the midpoint of the belt span.

Deflect the belt until the bottom of the large O-ring is even with the top of the next belt, or the bottom of a straight edge laid across the top of the other belt(s) on the drive. Release pressure and read pounds of force used at O-ring on plunger.

6. Compare the force required in step 5 with the ranges in the table on the next page.

Tighten or loosen belts as needed to bring them within the recommended ranges.

NOTICE

The proper tension for v-belt drive is the lowest tension at which the belt(s) will not slip under peak load conditions.

NOTICE

For new belts, tighten to the initial installation deflection force shown in the table on the next page. Check tension frequently during the first 24 hours of operation. Subsequent retensioning should fall between the minimum and maximum forces shown in the table.
### Appendix A: Belt Tension Instructions

<table>
<thead>
<tr>
<th>V-belt Type</th>
<th>Small Sheave Dia. Range (in.)</th>
<th>Recommended Deflection Force (lbs.)</th>
<th>Initial Installation</th>
<th>Retensioning</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>B</td>
<td>- 4.6</td>
<td>7.3</td>
<td>6.4</td>
<td>4.9</td>
</tr>
<tr>
<td></td>
<td>4.7 - 5.6</td>
<td>8.7</td>
<td>7.5</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>5.7 - 7.0</td>
<td>9.3</td>
<td>8.1</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td>7.1 -</td>
<td>10.0</td>
<td>8.8</td>
<td>6.8</td>
</tr>
<tr>
<td>BX</td>
<td>- 4.6</td>
<td>10.0</td>
<td>8.7</td>
<td>6.7</td>
</tr>
<tr>
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<td>4.7 - 5.6</td>
<td>11.0</td>
<td>9.5</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>5.7 - 7.0</td>
<td>11.5</td>
<td>9.9</td>
<td>7.6</td>
</tr>
<tr>
<td></td>
<td>7.1 -</td>
<td>12.0</td>
<td>10.1</td>
<td>7.8</td>
</tr>
<tr>
<td>3V</td>
<td>2.65 - 3.35</td>
<td>4.6</td>
<td>4.0</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>3.65 - 4.50</td>
<td>5.5</td>
<td>4.8</td>
<td>3.7</td>
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<tr>
<td></td>
<td>4.75 - 6.0</td>
<td>6.4</td>
<td>5.6</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>6.5 - 10.6</td>
<td>7.3</td>
<td>6.4</td>
<td>4.9</td>
</tr>
<tr>
<td>3VX</td>
<td>2.2 - 2.5</td>
<td>4.8</td>
<td>4.2</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>2.65 - 4.75</td>
<td>5.7</td>
<td>4.9</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>5.0 - 6.5</td>
<td>7.2</td>
<td>6.2</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>6.9 -</td>
<td>8.7</td>
<td>7.5</td>
<td>5.8</td>
</tr>
<tr>
<td>5V</td>
<td>7.1 - 10.3</td>
<td>16.5</td>
<td>14.3</td>
<td>11.0</td>
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<tr>
<td></td>
<td>10.9 - 11.8</td>
<td>19.5</td>
<td>16.9</td>
<td>13.0</td>
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<tr>
<td></td>
<td>12.5 - 16.0</td>
<td>21.0</td>
<td>18.2</td>
<td>14.0</td>
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<tr>
<td>5VX</td>
<td>- 5.5</td>
<td>15.0</td>
<td>13.0</td>
<td>10.0</td>
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<td></td>
<td>5.9 - 8.0</td>
<td>19.0</td>
<td>16.9</td>
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<td>8.5 - 10.9</td>
<td>21.0</td>
<td>18.2</td>
<td>14.0</td>
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<td></td>
<td>11.8 -</td>
<td>22.0</td>
<td>19.5</td>
<td>15.0</td>
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<tr>
<td>8V</td>
<td>12.5 - 16.0</td>
<td>39.0</td>
<td>33.8</td>
<td>26.0</td>
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<tr>
<td></td>
<td>17.0 - 20.0</td>
<td>45.0</td>
<td>39.0</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>21.2 - 24.4</td>
<td>51.0</td>
<td>44.2</td>
<td>34.0</td>
</tr>
</tbody>
</table>
Bolts must be tightened to the proper torque as listed in the table below and on the next page. These values represent a torque value at 75% of proof load. The torque values are given for both grade 5 and grade 8 fasteners with unified coarse threads (UNC) and unified fine threads (UNF) along with standard hex nut and prevailing torque locknut. Both imperial and metric units are listed (ft.lbs. and n-m).

### Bolt Torque Chart - UNC

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 - 20</td>
<td>6 (9)</td>
<td>5 (7)</td>
<td>9 (12)</td>
<td>7 (10)</td>
</tr>
<tr>
<td>5/16 - 18</td>
<td>13 (18)</td>
<td>10 (14)</td>
<td>18 (25)</td>
<td>15 (20)</td>
</tr>
<tr>
<td>3/8 - 16</td>
<td>23 (31)</td>
<td>18 (25)</td>
<td>33 (44)</td>
<td>26 (35)</td>
</tr>
<tr>
<td>7/16 - 14</td>
<td>37 (50)</td>
<td>30 (40)</td>
<td>52 (71)</td>
<td>42 (57)</td>
</tr>
<tr>
<td>1/2 - 13</td>
<td>56 (76)</td>
<td>45 (61)</td>
<td>80 (108)</td>
<td>64 (86)</td>
</tr>
<tr>
<td>9/16 - 12</td>
<td>81 (110)</td>
<td>65 (88)</td>
<td>115 (156)</td>
<td>92 (124)</td>
</tr>
<tr>
<td>5/8 - 11</td>
<td>112 (152)</td>
<td>90 (122)</td>
<td>158 (215)</td>
<td>127 (172)</td>
</tr>
<tr>
<td>3/4 - 10</td>
<td>199 (270)</td>
<td>159 (216)</td>
<td>281 (381)</td>
<td>225 (305)</td>
</tr>
<tr>
<td>7/8 - 9</td>
<td>321 (435)</td>
<td>256 (348)</td>
<td>453 (614)</td>
<td>362 (491)</td>
</tr>
<tr>
<td>1 - 8</td>
<td>481 (652)</td>
<td>385 (521)</td>
<td>679 (921)</td>
<td>543 (737)</td>
</tr>
<tr>
<td>1-1/8 - 7</td>
<td>600 (813)</td>
<td>480 (651)</td>
<td>963 (1305)</td>
<td>770 (1044)</td>
</tr>
<tr>
<td>1-1/4 - 7</td>
<td>846 (1147)</td>
<td>677 (918)</td>
<td>1358 (1842)</td>
<td>1087 (1473)</td>
</tr>
<tr>
<td>1-3/8 - 6</td>
<td>1109 (1504)</td>
<td>888 (1203)</td>
<td>1781 (2414)</td>
<td>1424 (1931)</td>
</tr>
<tr>
<td>1-1/2 - 6</td>
<td>1473 (1997)</td>
<td>1178 (1597)</td>
<td>2363 (3204)</td>
<td>1891 (2564)</td>
</tr>
<tr>
<td>2-1/2 - 4</td>
<td>5000 (6779)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Appendix B: Prevailing Torque Locknut

#### Bolt Torque Chart - UNF

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 - 28</td>
<td>7 (10)</td>
<td>6 (8)</td>
<td>10 (14)</td>
<td>8 (11)</td>
</tr>
<tr>
<td>5/16-24</td>
<td>14 (20)</td>
<td>12 (16)</td>
<td>20 (28)</td>
<td>16 (22)</td>
</tr>
<tr>
<td>3/8-24</td>
<td>26 (35)</td>
<td>21 (28)</td>
<td>37 (50)</td>
<td>30 (40)</td>
</tr>
<tr>
<td>7/16-20</td>
<td>41 (56)</td>
<td>33 (45)</td>
<td>58 (79)</td>
<td>47 (63)</td>
</tr>
<tr>
<td>1/2 - 20</td>
<td>63 (86)</td>
<td>51 (69)</td>
<td>90 (122)</td>
<td>72 (97)</td>
</tr>
<tr>
<td>9/16 - 18</td>
<td>91 (123)</td>
<td>72 (98)</td>
<td>128 (174)</td>
<td>102 (139)</td>
</tr>
<tr>
<td>5/8-18</td>
<td>127 (172)</td>
<td>102 (138)</td>
<td>179 (243)</td>
<td>143 (195)</td>
</tr>
<tr>
<td>3/4-16</td>
<td>222 (301)</td>
<td>178 (241)</td>
<td>314 (425)</td>
<td>251 (340)</td>
</tr>
<tr>
<td>7/8-14</td>
<td>354 (480)</td>
<td>283 (384)</td>
<td>500 (678)</td>
<td>400 (542)</td>
</tr>
<tr>
<td>1 - 12</td>
<td>526 (713)</td>
<td>421 (571)</td>
<td>743 (1008)</td>
<td>595 (806)</td>
</tr>
<tr>
<td>1-1/8 - 12</td>
<td>673 (912)</td>
<td>538 (729)</td>
<td>1079 (1463)</td>
<td>864 (1171)</td>
</tr>
<tr>
<td>1-1/4 - 12</td>
<td>937 (1270)</td>
<td>750 (1016)</td>
<td>1504 (2039)</td>
<td>1203 (1631)</td>
</tr>
<tr>
<td>1-3/8 - 12</td>
<td>1263 (1712)</td>
<td>1010 (1370)</td>
<td>2027 (2748)</td>
<td>1622 (2198)</td>
</tr>
<tr>
<td>1-1/2 - 12</td>
<td>1657 (2246)</td>
<td>1325 (1797)</td>
<td>2659 (3605)</td>
<td>2127 (2884)</td>
</tr>
</tbody>
</table>

#### Metric Bolt Torque Chart

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Standard Hex (N-M)</th>
<th>Prevailing Torque (N-M)</th>
<th>Standard Hex (N-M)</th>
<th>Prevailing Torque (N-M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
<td>15</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>19</td>
<td>25</td>
<td>22</td>
<td>29</td>
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<tr>
<td>8</td>
<td>27</td>
<td>36</td>
<td>32</td>
<td>43</td>
</tr>
<tr>
<td>10</td>
<td>54</td>
<td>72</td>
<td>63</td>
<td>84</td>
</tr>
<tr>
<td>12</td>
<td>94</td>
<td>125</td>
<td>110</td>
<td>147</td>
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<td>14</td>
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<td>365</td>
</tr>
<tr>
<td>18</td>
<td>323</td>
<td>430</td>
<td>377</td>
<td>503</td>
</tr>
<tr>
<td>20</td>
<td>458</td>
<td>610</td>
<td>535</td>
<td>713</td>
</tr>
<tr>
<td>22</td>
<td>622</td>
<td>830</td>
<td>727</td>
<td>970</td>
</tr>
<tr>
<td>24</td>
<td>791</td>
<td>1055</td>
<td>925</td>
<td>1233</td>
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<tr>
<td>27</td>
<td>1157</td>
<td>1543</td>
<td>1352</td>
<td>1803</td>
</tr>
<tr>
<td>30</td>
<td>1572</td>
<td>2095</td>
<td>1837</td>
<td>2450</td>
</tr>
<tr>
<td>33</td>
<td>2138</td>
<td>2851</td>
<td>2500</td>
<td>3332</td>
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<tr>
<td>36</td>
<td>2746</td>
<td>3662</td>
<td>3210</td>
<td>4279</td>
</tr>
</tbody>
</table>
Assembly Marking

An assembly marking system is typically used on support structures, chutes, conveyors and other parts of the structure.

Assembly Mark Numbers

When assembly is required, drawings are included that show the finished assembly with associated assembly mark numbers.

Assembly mark numbers indicate three things. The first three digits represent the last three digits of the machine’s serial number. The next two digits represent the last two digits of the associated drawing number. The final two digits represent the individual piece number.

Example:

Last three digits of serial number

Individual piece number

542-23-02

Last two digits of drawing number

On conveyors, one sheet will include information such as number of capscrews, washers, and prevailing torque locknuts used per conveyor section, torque chart and other pertinent assembly information.

Serial numbers are not shown on the drawings because drawings can be used on different projects.

The bill of material shown on the drawing will not correspond to the assembly mark numbers due to manufacturing processes.
Appendix C: Assembly Marking

Assembly Drawings

A set of 11” x 17” (unless otherwise specified) drawings will be sent to the dealer who is responsible to forward the drawings to the customer for field erection.

The exact quantity of each drawing will depend on the complexity of the project. At least two sets are sent to the customer and one set for the dealer.

These drawings are sent in advance to allow adequate time to prepare the structure for field erection. Also, the foundation layout and loadings will be sent when Engineering has fully completed all layouts.

Along with the assembly drawings, one copy of IB-0277 Field Assembly Procedures will be sent.

One set of assembly drawings and one copy of IB-0277 Field Assembly Procedures will also be sent when the equipment is shipped from KPI-JCI.

Assembly Marking

Assembly marks on individual pieces are located approximately at the position indicated on the drawings. The drawing will also include a “mark number table” with mark number, description of piece and color code.

A secondary method of assembly mark numbering uses a handwritten tag to identify parts (used for internal handling at KPI-JCI). This tag, containing the corresponding assembly mark number, is inserted into a bolt hole with a twist tie. The assembly mark number tag should be located close to the assembly mark number decal. This tag may or may not be included on parts received.
## PRE-OPERATIONAL CHECKS

1. **Sheet Metal/Appearance/Paint**
   - [ ] Ok
   - [ ] Adjust

2. **Lubrication**
   - a. All Fittings Greased
     - [ ] Ok
   - b. Timing Gear Reservoir to proper level
     - [ ] Ok
   - c. Hydrostatic Drive (if equipped)
     - [ ] Ok

3. **V-belt Drive**
   - a. Sheaves Aligned
     - [ ] Ok
   - b. V-belt Tensioned Properly
     - [ ] Ok
   - c. Motor Rotates Proper Direction (sheave counter clockwise)
     - [ ] Ok

4. **General**
   - a. Operator’s Manual on Unit
     - [ ] Ok
   - b. Decals in Place & Readable
     - [ ] Ok
   - c. Safety Guards on
     - [ ] Ok
   - d. All bolts are Tight
     - [ ] Ok
   - e. Feeder is Level
     - [ ] Ok

## OPERATIONAL CHECKS

1. **Shaft RPM**
   - [ ] Ok
   - [ ] Adjust

2. **Bearing Temp. 4 Hrs.**
   - [ ] Ok
   - [ ] Adjust

3. **Bearing Temp. 8 Hrs.**
   - [ ] Ok
   - [ ] Adjust

After First Day of Operation

1. **Retighten bolts holding vibrator mechanism to pan assembly torque to 900 ft/lb**
   - [ ] Ok
   - [ ] Adjust

2. **Check tightness of spring retainer bolts**
   - [ ] Ok
   - [ ] Adjust

3. **Check tightness of pan liner bolts**
   - [ ] Ok
   - [ ] Adjust

4. **Check all wear items**
   - [ ] Ok
   - [ ] Adjust

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☐ The safe operation of this product was explained and a complete operator’s manual was with the product.

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If Adjustments are made please note change:

________________________________________

Date Inspection Completed

________________________________________

Inspector’s Signature
KOLBERG-PIONEER, INC.
700 W 21st Street, Yankton, SD 57078 USA

SERVICE
800-532-9311 - 605-665-9311; Fax 800-514-6115 - 605-665-9348

PARTS
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