



Fertilizer Site Maintenance Guide

Instructions Manual

PNEG-2311

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All information, illustrations, photos and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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1. Instructions



Make sure to observe all site safety precautions and wear the required safety equipment prior to performing any maintenance or service to equipment. Follow all site lock out/tag out procedures.

Chain Conveyors

General Maintenance

A good maintenance program involves thorough general housekeeping, adequate periodic re-lubrication, and timely adjustment of take-ups to maintain proper chain tension.

Periodic Inspection

At regularly scheduled intervals, while observing all safety precautions, observe the conveyor as it operates.

Inspect for:

1. Loose or missing hardware, in particular:
 - a. Flight mounting fasteners.
 - b. Return roller mounting screws and set collars.
 - c. Set screws that lock return roller locating set collars to the roller shafts. If the rollers slip sideways on their shafts, the chain will bear directly on the shafts instead of the rollers. Wear and extensive damage will occur very rapidly.
 - d. Check and tighten all sprocket set screws.
2. Noisy bearings, motor or reducer.
3. Overheated bearings, motor or reducer.
4. Structural damage.
5. Rust or corrosion.
6. Damaged wiring, including exposed conductors and connections.
7. Periodically shut off and lock out all power to the conveyor. Check the CHOKE/CHAIN BREAK switch to see that it actuates and restores smoothly.
8. Check chain and flights for damage due to foreign object caught in conveyor. Replace damaged poly-flights with new. Straighten bar flights which have been bent. If bars have been bent more than two times, the chain section should be replaced. **DO NOT ATTEMPT TO REWELD BARS ONTO THE CHAIN.** Special preheating procedures must be followed or the heat treated chain side bars can become brittle and cause chain failure. Consult InterSystems on this procedure.
9. Make sure that all guards are in place and that all warning labels are in place and legible. Replace any missing warning signs **IMMEDIATELY**.

Lubrication

Reducer

Refer to the documentation furnished with the reducer. The user must interpret the data there in light of the severity of duty in each application. If there is any doubt, contact the manufacturer or a local supplier of the reducer for specific recommendations.

Motor

Many motors have sealed and permanently lubricated bearings; with these, no re-lubrication is possible or desirable. If bearings of this type become noisy or overheat, they must be replaced. Motors having bearings which can be re-lubricated are usually larger integral horsepower sizes. Special pressure lubricating equipment may be required. Refer to the documentation furnished with the motor.

Mounted Bearings

Mounted bearings require periodic re-lubrication at appropriate intervals. The amount and frequency depends in large extent upon the severity of the operating environment and the duty cycle. Inject each mounted bearing with an NLGI #2 grease, Lubri-Plate "Multi-Lube A" for example. Inject only enough lubricant so that a slight bead can be seen to form around the seal. The appearance of the bead indicates that the bearing has been filled adequately and helps purge and exclude contaminants from the bearing cavity.

General Housekeeping

At frequent and regular intervals, remove the accumulated dirt from the motor and reducer to prevent overheating. Fan cooled motors depend upon unobstructed air flow over the housing for effective cooling.

Reducer gear cases must also be free of dirt for effective radiation of heat. Most reducers have a pressure vent which allows escape of vapors which may build-up internally. If dirt blocks a vent, internal pressure can rupture seals. Leaking lubricant can contaminate product and will result in reducer failure and equipment downtime. Some manufacturers have refused to honor warranties in such cases.

Keep the area around the CHOKE/CHAIN BREAK limit switch clear of accumulations of dirt and debris which might prevent the switch from functioning as intended.

1. Instructions

Enclosed Belt Conveyors

At regularly scheduled intervals, while observing all safety precautions, observe the conveyor as it operates.

Inspect for:

1. Belt sag to ensure that it does not exceed the recommended 2% belt sag.
2. Flippers on tail pulley are adjusted so they barely touch the bottom of the conveyor length.
3. Skirtboard wear and proper adjustment.
4. Bottom liner for excessive wear from belt or other foreign material.
5. Wear on head pulley lagging.
6. Loose or missing hardware.
7. Noisy bearings, motor or reducer.
8. Overheated bearings, motor or reducer.
9. Structural damage.
10. Rust or corrosion.
11. Damaged wiring, including exposed conductors and connections.
12. Periodically shut off and lock out all power to the conveyor. Check the plug switch and belt break/slip switch to see that they are functioning properly.
13. Belt damage due to foreign object caught in conveyor.
14. Make sure that all guards are in place and that all warning labels are in place and legible. Replace any missing warning signs IMMEDIATELY.

Bucket Elevators

At frequent and regular intervals, while observing all safety precautions, perform these housekeeping chores and inspections:

1. Remove accumulated dirt from the motor, reducer housings and bearings.
 - a. Motors depend upon unobstructed airflow over their housings for effective cooling.
 - b. Reducer gear cases must also be free of dirt for effective heat radiation. Most reducers have a pressure vent to permit escape of vapors, which may build-up internally. If dirt blocks a vent, internal pressure can rupture seals. Leaking lubricant will contaminate the product being handled by the elevator and reducer failure and subsequent equipment downtime will definitely result if the leak is not discovered in time and repairs made. Original equipment manufacturers will refuse to honor warranties if a motor or reducer fails because dirt accumulation leads to overheating or lubricant failure.
 - c. While cleaning the reducer, check the reducer's lubricant level and condition. If the level is low, find and correct the leak. If the lubricant is dirty or shows signs of overheating, schedule a change of lubricant as soon as possible.
 - d. Listen carefully for a noisy motor, reducer, bearings or a rubbing belt. Any of these sounds can be a forewarning of overheating and fire or explosion. Correct any problem discovered immediately.
2. Periodically remove the drop-down clean out door from each end of the boot. Clean the boot of all accumulated dirt and material to prevent vermin infestation and corrosion.
 - a. If the boot has a screw take-up, clean the take-up screws and nuts. Apply a protective coating of rust-inhibiting lubricant. Future take-up adjustment will be much easier. (OR)
 - b. If the boot has a Posi-Guide gravity take-up, clean the polyethylene guide sleeves and the stainless steel guide shafts of accumulated dirt to ensure that the pulley and weight box assembly move up and down freely. The guide sleeves and shaft DO NOT require any lubrication. In fact, any lubricant applied would merely attract dirt, preventing smooth operation of the take-up.
3. Examine the head lining. Extreme wear patterns can sometimes distort the discharge and if not corrected, wear completely through the head. Spouting may also wear through.
4. Check to make sure the pressure relief vents, if installed, on the head and/or legging are unobstructed. In order to provide relief, they must be free to blow out.
5. Inspect all ladders and platforms. Tighten any loose fasteners. Note any defective field welds and schedule immediate repair. Also schedule replacement for any damaged ladder sections, platform structural members or floor grates. While inspecting platforms and ladders, be sure to examine guying cable brackets and/or bracing. Note any defects and schedule immediate repair.
6. Examine guying. Tighten any clamp fasteners, which are loose. If a cable is excessively slack, adjust turnbuckles to restore tension.
7. Check the belt take-up in the boot section. If the pulley has been adjusted to its lowest (maximum) limit, it will be necessary to shorten the belt by removing one or two rows of buckets and re-splice the belt.
8. It is also advisable to check the condition of all infeed and discharge spouting associated with the elevator for damage and wear.
9. When all specific inspections have been carried out, stand back and generally observe the elevator and any associated equipment. Look and listen for any problem not covered in the preceding list.
10. Make sure that all guards are in place and that all warning labels are in place and legible. Replace any missing warning signs IMMEDIATELY.

1. Instructions

Distributors

At frequent and regular intervals, while observing all safety precautions, perform these housekeeping chores and inspections:

1. Remove accumulated dirt from the motor, reducer housings and bearings.
 - a. Motors depend upon unobstructed airflow over their housings for effective cooling.
 - b. Reducer gear cases must also be free of dirt for effective heat radiation. Most reducers have a pressure vent to permit escape of vapors, which may build-up internally. If dirt blocks a vent, internal pressure can rupture seals. Leaking lubricant will contaminate the product being handled by the distributor and reducer failure and subsequent equipment downtime will definitely result if the leak is not discovered in time and repairs made. Original equipment manufacturers will refuse to honor warranties if a motor or reducer fails because dirt accumulation leads to overheating or lubricant failure.
 - c. Check the reducer's lubricant level and condition on a regular basis. If the level is low, find and correct the leak. If the lubricant is dirty or shows signs of overheating, schedule a change of lubricant as soon as possible.
 - d. Listen carefully for a noisy motor, reducer, or bearings. Any of these sounds can be a forewarning of overheating and fire or explosion. Correct any problem discovered immediately.
2. Periodically remove the inspection door from the distributor and clean the interior of all accumulated dirt and material.
3. Examine the distributor lining. Extreme wear patterns can sometimes distort the discharge and if not corrected, wear completely through the distributor. Spouting may also wear through.
4. Inspect all flanges and spouting. Tighten any loose fasteners. Note any damage to the distributor and support structure and schedule immediate repair. Also, schedule replacement for any damaged spouting, platform structural members, or floor grates. While inspecting platforms and ladders, be sure to examine mounting brackets and/or bracing. Note any defects and schedule immediate repair.
5. Check the condition of all inlet and discharge spouting associated with the distributor for damage and wear.
6. Make sure that all guards are in place and that all warning labels are in place and legible. Replace any missing warning signs IMMEDIATELY.

Open Belt Conveyor

At regularly scheduled intervals, while observing all safety precautions, observe the conveyor as it operates.

Inspect for:

1. Belt sag to insure that it does not exceed the recommended 2% belt sag.
2. Flippers on tail pulley are adjusted so they barely touch the bottom of the conveyor length.
3. Wear on head pulley lagging.
4. Loose or missing hardware.
5. Noisy bearings, motor or reducer.
6. Overheated bearings, motor or reducer.
7. Structural damage.
8. Rust or corrosion.
9. Damaged wiring, including exposed conductors and connections.
10. Periodically shut off and lock out all power to the conveyor. Check the shaft speed sensor to see that they are functioning properly.
11. Check belt for damage due to foreign object caught in conveyor.
12. Make sure that all guards are in place and that all warning labels are in place and legible.

Horizontal Mixer

General Maintenance

1. Before physical inspection or maintenance is performed on the machinery, **THE POWER MUST BE DISCONNECTED AND LOCKED OUT FROM THE MACHINE**. This should prevent accidental start-up during plant maintenance procedures.
2. The V-belt drive, if applicable, should be checked at least once a month for proper tension and belt condition.
3. The chain drive of the mixer should be checked at least monthly for proper tension. If the mixer is supplied with a chain drive, clean the chain regularly with a brush and solvent. Proper lubrication of the chain will increase the life of the chain drive.
4. All bearings and motors must be inspected and lubricated regularly. See manufacture's specifications and schedules for more details. Do not over lubricate the bearings since this could damage the bearing seals.
5. The machine may need to be cleaned regularly depending on the characteristics of the product. Before cleaning, **DISCONNECT POWER AND LOCK OUT**. Remove covers where applicable for easy access. When complete, replace and properly secure covers.
6. Unusual noises coming from the machine should be investigated immediately.
7. Packing gland seals need to be inspected every two weeks. Inspection is required because the packing material will eventually wear down. Neglect of the seals can cause undue dusting and leaking of the product from the seal area and wear on the shaft. Do not over tighten the packing in the seal, this will cause wear on the shaft. If you notice the shaft getting too hot, you may have to loosen the seals. It is not usual for the shaft to be too warm for the hand to touch. If the seal is supplied with the air purge option, you should check the air supply. You should have 3-5 PSI of dry, filtered air supplied to the seal.
8. If your machine is equipped with a chain drive and an oil fluid coupling, the flexible gear couplings on each side of the oil fluid coupling **need** to be greased **regularly**. See manufacture's specifications and schedules for more details.

Conditioner

At regularly scheduled intervals, while observing all safety precautions, clean the interior of the conditioner, removing any product build-up. Make sure to follow all proper lock out/tag out procedures.

2-Way and 3-Way Valves

At regularly scheduled intervals, while observing all safety precautions, clean the interior of the valves, removing any product build-up. Make sure to follow all proper lock out/tag out procedures.

Salem Gates

At regularly scheduled intervals, while observing all safety precautions, clean the interior of the valves, removing any product build-up. Make sure to follow all proper lock out/tag out procedures.

Off Season Preventative Maintenance

Receiving Equipment

1. Exercise the equipment.
 - a. Run chain conveyors once a week for 15 minutes to prevent the chain from seizing up.
 - b. Run belt conveyors once a week for 15 minutes.
 - c. Move the tripper car or plow.
 - d. Run bucket elevator once a week for 15 minutes.

Blend Tower

1. Empty the overhead bins.
2. Clean out any product build-up in the overhead bins.
3. Clean out any dust or product build-up in the distributor.
4. Exercise the equipment.
 - a. Run chain conveyors once a week for 15 minutes to prevent the chain from seizing up.
 - b. Run bucket elevator once a week for 15 minutes.
 - c. Operate all salem gates and valves every two weeks.
 - d. Run mixers for 15 minutes every two weeks.

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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