



Drop Forged Chain

FOR DRAG CONVEYORS



INSTALLATION AND MAINTENANCE GUIDE

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⚠ DANGER




Exposed moving parts will cause severe injury or death.

Lockout power before removing cover or inspection door.

⚠ WARNING

Moving parts can crush and cut.

Lockout power before removing guard or servicing.

Do NOT operate with guard removed

CUSTOMER SAFETY RESPONSIBILITIES

4B appreciates your business and is pleased you have chosen our products to meet your needs.

Please read in its entirety and understand the literature accompanying the product before you place the product into service. Please read the safety precautions carefully before operating the product. With each product you purchase from 4B, there are some basic but important safety considerations you must follow to be sure your purchase is permitted to perform its design function and operate properly and safely, giving you many years of reliable service. Please read and understand the Customer Safety Responsibilities listed below. Failure to follow this safety directive and the Operation Manuals and other material furnished or referenced, may result in serious injury or death.

SAFETY NOTICE TO OUR CUSTOMERS

- A. In order to maximize efficiency and safety, selecting the right equipment for each operation is vital. The proper installation of the equipment, and regular maintenance and inspection is equally important in continuing the proper operation and safety of the product. The proper installation and maintenance of all our products is the responsibility of the user unless you have asked 4B to perform these tasks.
- B. All installation and must be in accordance with local and national codes and other standards applicable to your industry. Failure to install correctly can result in the product or machine failing to operate as intended, and can defeat its design function.
- C. Periodic inspection by a qualified person will help assure your 4B product is performing properly. 4B recommends a documented inspection at least annually and more frequently under high use conditions.
- D. Please see the last page of this manual for all warranty information regarding this product.

CUSTOMER SAFETY RESPONSIBILITIES

1. READ ALL LITERATURE PROVIDED WITH YOUR PRODUCT

Please read all user, instruction and safety manuals to ensure that you understand your product operation and are able to safely and effectively use this product. If the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

2. YOU BEST UNDERSTAND YOUR NEEDS

Every customer and operation is unique, and only you best know the specific needs and capabilities of your operation. Please call the 24-hour hotline at 309-698-5611 for assistance with any questions about the performance of products purchased from 4B. 4B is happy to discuss product performance with you at any time.

3. SELECT A QUALIFIED AND COMPETENT INSTALLER

Correct installation of the product is important for safety and performance. It is critical for the safety of your operation and those who may perform work on your operation that you select a qualified and competent installer to undertake the installation. The product must be installed properly to perform its designed functions. The installer should be qualified, trained, and competent to perform the installation in accordance with local and national codes, all relevant OSHA Regulations, as well as any of your own standards and preventive maintenance requirements, and other product installation information supplied with the product. You should be prepared to provide the installer with all necessary installation information to assist in the installation.

4. ESTABLISH AND FOLLOW A REGULAR MAINTENANCE AND INSPECTION SCHEDULE FOR YOUR 4B PRODUCTS

You should develop a proper maintenance and inspection program to confirm that your system is in good working order at all times. You will be in the best position to determine the appropriate frequency for inspection. Many different factors known to the user will assist you in deciding the frequency of inspection. These factors may include but are not limited to weather conditions; construction work at the facility; hours of operation; animal or insect infestation; and the real-world experience of knowing how your employees perform their jobs. The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

5. RETAIN AND REFER TO THE OPERATION MANUAL FOR 4B'S SUGGESTED MAINTENANCE AND INSPECTION RECOMMENDATIONS

As all operations are different, please understand that your specific operation may require additional adjustments in the maintenance and inspection process essential to permit the monitoring device to perform its intended function. Retain the Operation Manual and other important maintenance and service documents provided by 4B and have them readily available for people servicing your 4B equipment. Should you have any questions, please call the free 24-hour hotline number (309-698-5611).

6. SERVICE REQUEST

If you have questions or comments about the operation of your unit or require the unit to be serviced please contact the 4B location who supplied the product or send your request via fax (309-698-5615) or call us via our 24-hour hotline number in the USA (309-698-5611). Please have available product part numbers, serial numbers, and approximate date of installation. In order to assist you, after the product has been placed into service, complete the online product registration section which is accessed via our website www.go4b.com/usa.

WARNING

- Rotating machinery can cause serious injury or death.
- Always lockout and tagout the machine prior to installation and maintenance.
- Ensure that all overload protection systems such as shear pins, overload couplings, and electrical overload devices are installed and correctly set.

CHAIN OVERVIEW

4B Drop forged conveyor chain is a reliable solution for a diverse range of conveying applications in industries such as power generation, wood pellet production, hazardous waste incineration, mineral processing, mining, cement, pulp and paper, grain handling, and food processing.

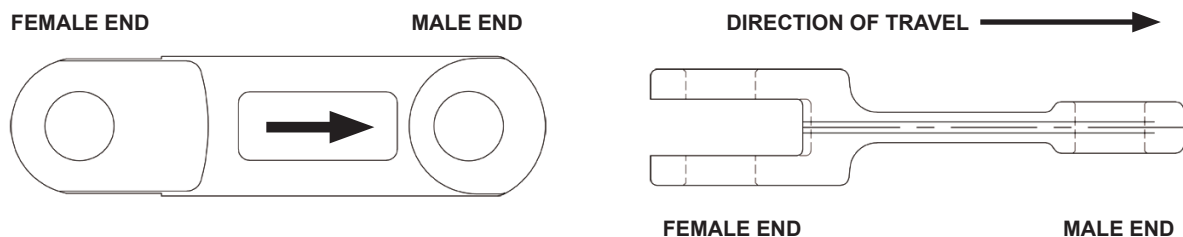
It is commonly utilized in drag and en-masse conveyors for moving material horizontally or on an incline up to 90 degrees; using a skeletal chain and flight assembly that is drawn along the bottom section of an enclosed housing.

The flights are either welded or bolted onto the chain links. The links are made of heat treated forged steel with typical internal core hardness of 40 HRC and surface hardness of 57-62 HRC. Its exceptional combination of internal ductility, external hardness, and high strength-to-weight ratio makes drop forged chain a durable, dependable, versatile, and severe duty conveying medium.

CHAIN INSTALLATION

The information below is for guidance only. You **MUST** follow the equipment manufacturer's safety, installation, and maintenance instructions that were provided with the conveyor.

1. Chain replacement should always be combined with the replacement of the sprockets to assure proper meshing and harmonious action between the chain and sprockets.
2. Ensure that all return rails are in-line at the joints.
3. Ensure that the sprockets are centered on the head and tail sections.
4. Ensure that the sprockets are in alignment with each other.
5. Ensure that all set screws and sprocket assembly bolts are properly tightened.
6. Ensure that the chain is installed in the correct direction. The male end of the link always leads the female end. A direction arrow is normally stamped on the chain link.



7. Connect chain strands with connecting pins provided. Never re-use circlips, roll pins or lock nuts.
8. Adjust the take-up to tighten the chain as necessary. Twin strand chain systems must be matched for equal chain tension. Chain conveyors may have different tensioning systems. Contact your Conveyor Manufacturer for more details.
9. A rule of thumb for checking tension is to lift the chain away from the return rail at the mid-point of each chain strand. A typical amount of lift is 1% of the chain strand center distance; i.e. on a 50 foot chain strand the lift would be 6 inches.
10. Never over tension the chain. Excessive noise and/or vibration indicate an over-tensioned chain which results in accelerated chain and sprocket wear. Bear in mind that the take-up controls the chain tension on the return strand. The conveying strand is naturally in tension.

11. Run the conveyor empty and listen for unusual snapping, snagging, or popping noises. The chain should operate smoothly.
12. Inspect the chain regularly, especially during the start-up period. Contact your Conveyor Manufacturer for more details.

CHAIN MAINTENANCE

The information below is for guidance only. You **MUST** follow the equipment manufacturer’s safety, installation, and maintenance instructions that were provided with the conveyor. Consult your Conveyor Manufacturer for more details.

1. Check for chain elongation by measuring the length of a used strand (10 pitches minimum) and comparing it to the equivalent length of a new strand. Measurements must be taken while chain is in tension. Chain replacement is recommended at 2% elongation.
2. Check for chain link wear by measuring the height of the link. Chain replacement is recommended when the original height has worn by 20%.
3. Inspect chain for damaged flights.
4. Inspect connecting pins for damaged or missing retainers.
5. Inspect sprockets for damaged or worn teeth.
6. Inspect groove depth of idler/trailer wheel. Replace if groove is too shallow to maintain chain engaged to idler wheel.
7. Inspect sprockets for material build-up in pockets. Replace or repair sprocket cleaner if necessary.
8. Inspect shaft keys and re-torque hub setscrews and sprocket assembly bolts.
9. Inspect chain rails for damage and wear.
10. Damaged links, pins, retainers and flights **MUST** be replaced; otherwise it may result in further damage to chain, sprockets and conveyor system.

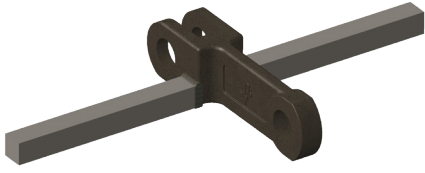
STANDARD PIN OPTIONS



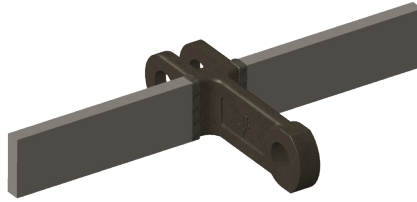
NOTE

Clamps and roll pins must **NOT** be re-used. Install only once and discard after use.

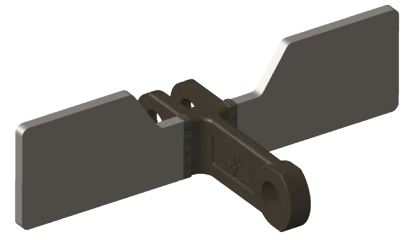
COMMON WELDED FLIGHT ATTACHMENTS



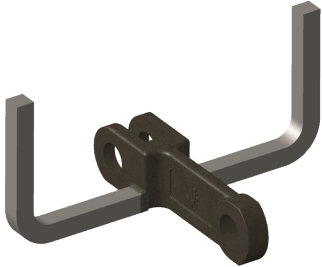
Square Bar Flight



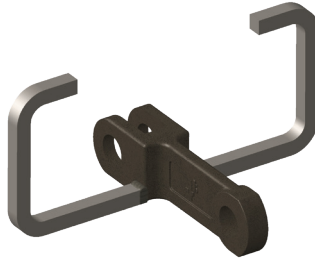
Flat Bar Flight



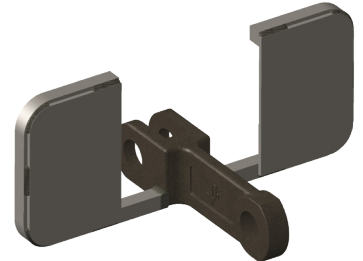
Paddle Flight



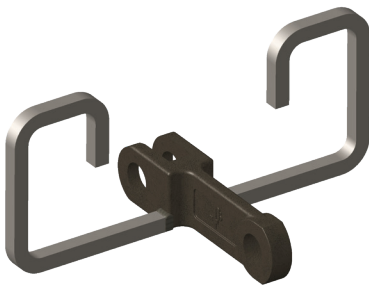
U Flight



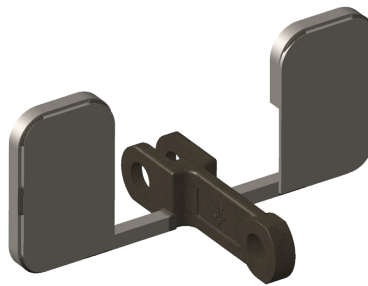
Closed U Flight



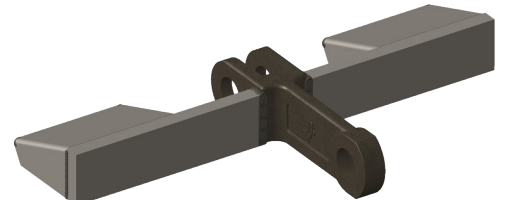
Closed U Flight
With Filler Plates



OO Flight



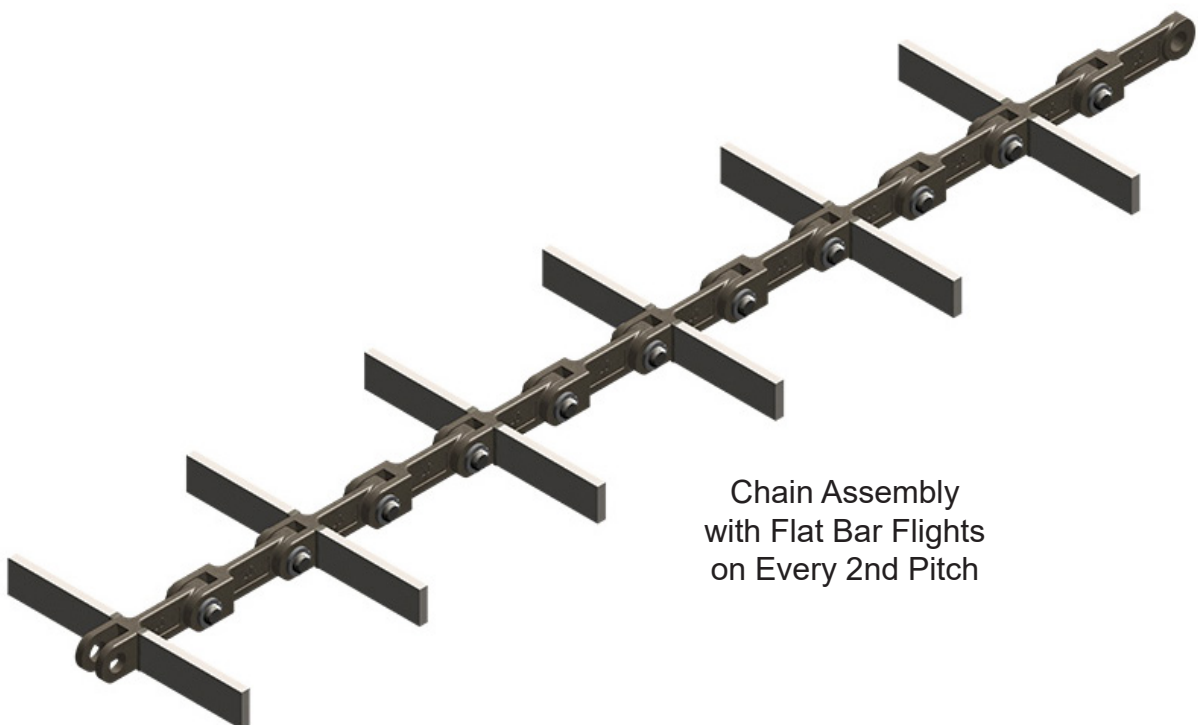
OO Flight
With Filler Plates



Return Cups

NOTE

Custom flights are available, based on customer specifications.



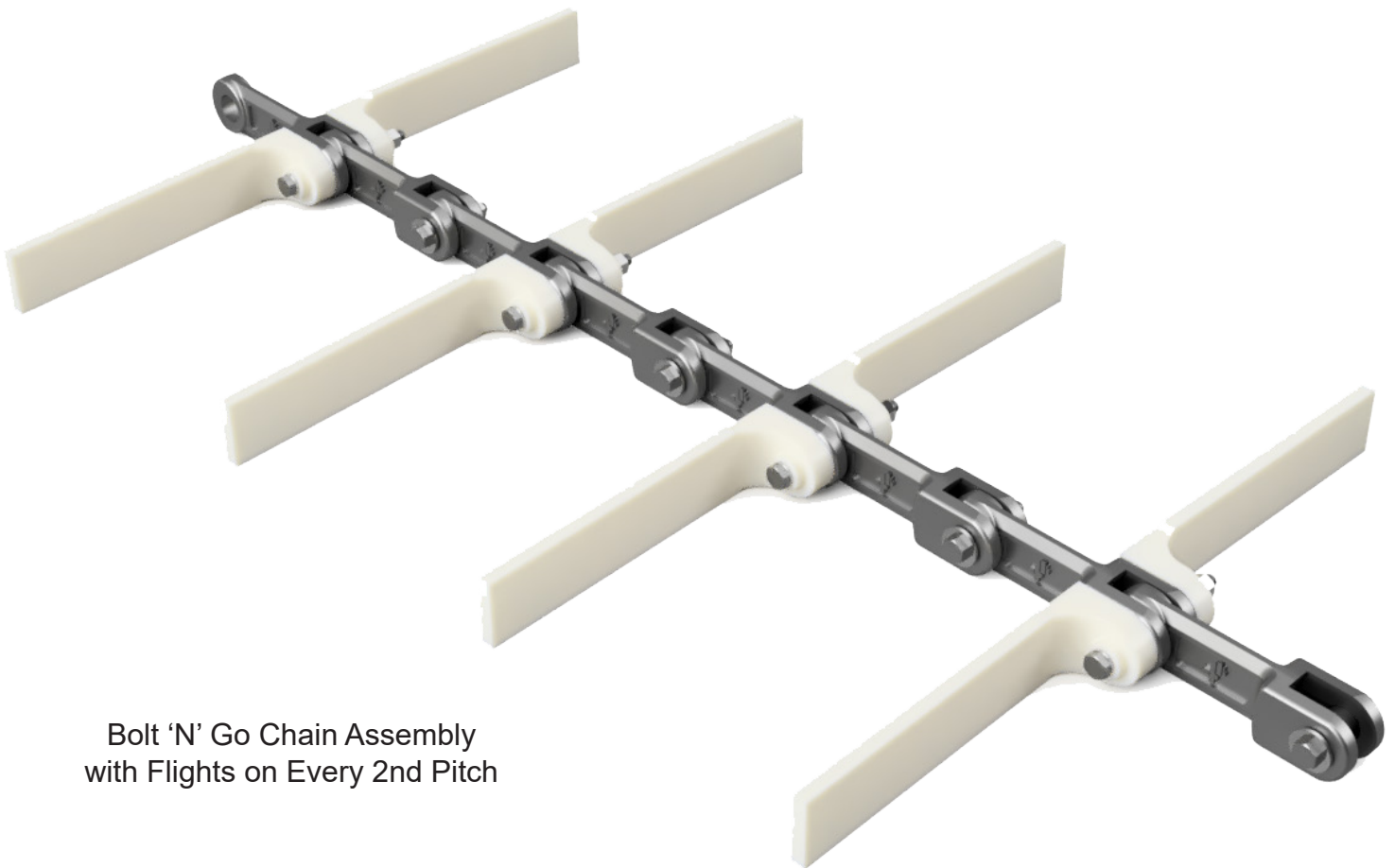
Chain Assembly
with Flat Bar Flights
on Every 2nd Pitch

BOLT 'N' GO CHAIN OVERVIEW

Bolt N Go is the greatest solution for drag conveyors in the Feed and Grain industry. The chain is constructed with high strength, light weight, drop forged links and hollow pins. The paddles are made from flexible, resilient, and wear resistant nylon material. They attach to the links with hex bolts, washers and lock nuts. This unique chain construction brings valuable benefits to feed and grain operations, such as:

- Nylon paddles can be changed out without removing the tension from the chain
- Nylon paddles eliminate the need for HOT WORK PERMITS since there are no steel attachments
- Nylon paddles can bend past obstructions and return to shape
- Nylon paddles provide superior wear resistance than UHMW paddles
- Every link is an easily accessible assembly and disassembly point
- Lightweight construction draws less amps than traditional chains

Chain breakdowns are inevitable and there is no time for downtime so get back up and running faster than ever with Bolt N Go chain!



Bolt 'N' Go Chain Assembly
with Flights on Every 2nd Pitch

BOLT 'N' GO INSTALLATION

The table below lists all of the hardware required to assemble Bolt 'N' Go chain in 102NA, 142NA, and 142HA sizes. Torque ranges for the bolts are also provided to ensure proper clamping force.

#	102NA LINK	142NA LINK	142HA LINK
1	4B102BNA	4B142BNA	4B142BHA
2	Nylon Flight	Nylon Flight	Nylon Flight
3	1/4 x 1-3/4 Hex Bolt (Gr. 8) - No Flight	M10 x 65 Hex Bolt (Gr. 10.9) - No Flight	M10 x 85 Hex Bolt (Gr. 10.9) - No Flight
	1/4 x 3-1/2 Hex Bolt (Gr. 8) - Flight	M10 x 120 Hex Bolt (Gr. 10.9) - Flight	M10 x 140 Hex Bolt (Gr. 10.9) - Flight
4	Small Flat Washer (2) - No Flight	Small Flat Washer (2) - No Flight	Small Flat Washer (2) - No Flight
5	Fender Washer (2)	Fender Washer (2)	Fender Washer (2)
6	Wedge Lock Washer (2)	Wedge Lock Washer (2)	Wedge Lock Washer (2)
7	Nylon Insert Lock Nut	Nylon Insert Lock Nut	Nylon Insert Lock Nut
8	Hollow Pin	Hollow Pin	Hollow Pin
---	Torque Bolt to 5 to 6 ft-lb.	Torque Bolt to 20 to 25 ft-lb.	Torque Bolt to 20 to 25 ft-lb.

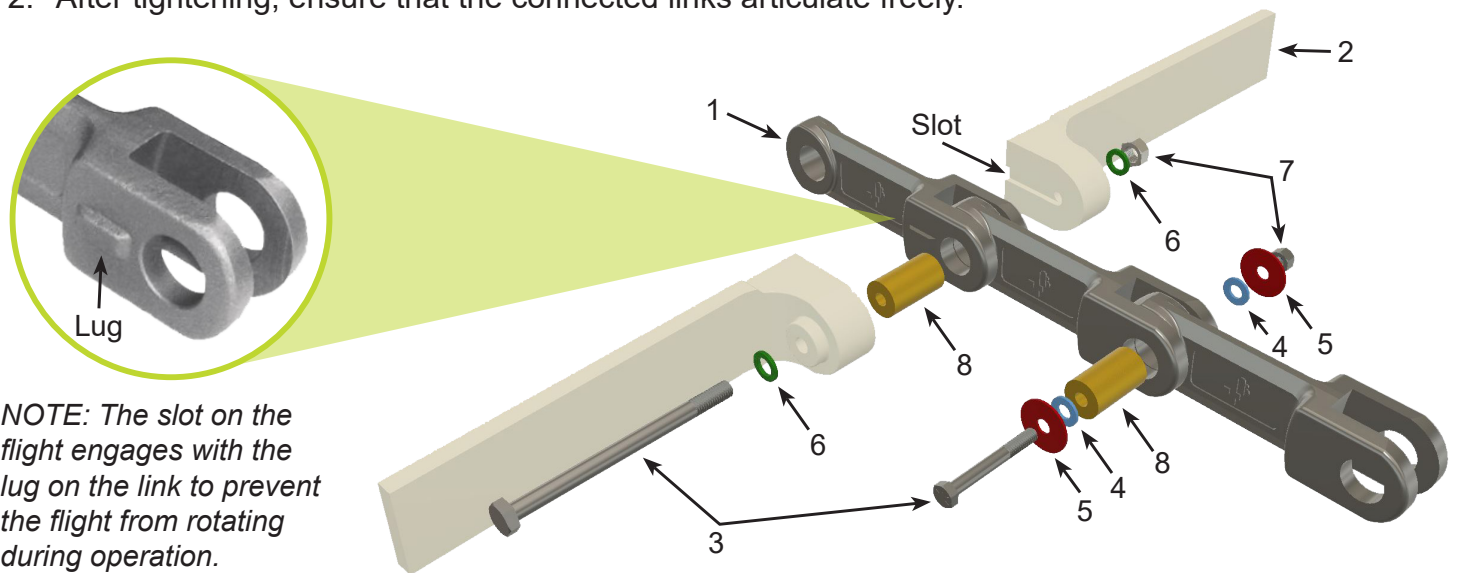
The diagram below illustrates the assembly for both flighted and non-flighted links. Note that the hollow pin (#8) keeps the chain tensioned when adding or removing flights.

FLIGHTED LINKS -

1. Align flight slot to engage with the link lug to prevent rotation.
2. Bolt (3) → Wedge Lock (6) → Flight (2) → Hollow Pin (8) → Flight (2) → Wedge Lock (6) → Lock Nut (7)
3. After tightening, ensure that the connected links articulate freely.

NON-FLIGHTED LINKS -

1. Bolt (3) → Fender (5) → Flat Washer (4) → Hollow Pin (8) → Flat Washer (4) → Fender (5) → Lock Nut (7)
2. After tightening, ensure that the connected links articulate freely.



BOLT 'N' GO MAINTENANCE

1. After installation, run the conveyor without product for several revolutions. Check that the chain and flights are secure.
2. If no issues are found, run the conveyor with material for 3 hours. Check the chain and flights again to make sure they are secure.
3. Periodically inspect the chain, flights and bolt torque settings.

SPROCKET OVERVIEW

Forged chain sprockets are typically of segmental construction consisting of four segments bolted onto a solid or split B or C-type hub. The segmental construction facilitates the replacement of worn tooth segments by allowing the hub to remain mounted to the shaft.

Sprocket segments are generally made from carbon steel, case hardened to 450-550 BHN, or AR400-500 steel. They are also available in grade 420 stainless steel for corrosive applications. Sprocket hubs are typically made from mild steel or 304 stainless steel.

The engagement method with drop forged chain is quite different from traditional chains. The spine of the chain links engage between sprocket segments as shown in Image A. As such, it is critical that the channel between segments remain clear for the chain to engage. For this reason, sprocket cleaners are normally incorporated onto the return rail to strip away any product build up within this area.

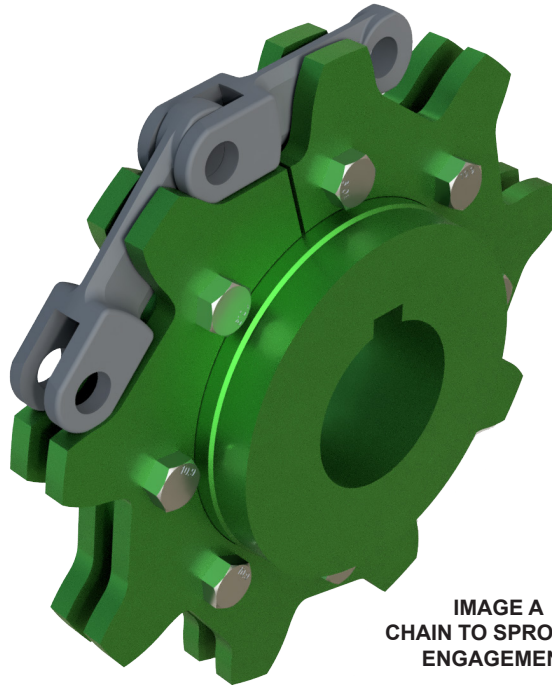


IMAGE A
CHAIN TO SPROCKET
ENGAGEMENT

SPROCKET INSTALLATION

Ensure that the drive sprocket is installed in the correct direction. A direction arrow is normally stamped on the sprocket to indicate proper chain travel (Image B).

Some drive sprockets have symmetrical teeth and are wear reversible, so direction is not a factor during installation (Image C). NOTE: Although the sprocket maybe wear reversible, the direction of travel for the chain is not.

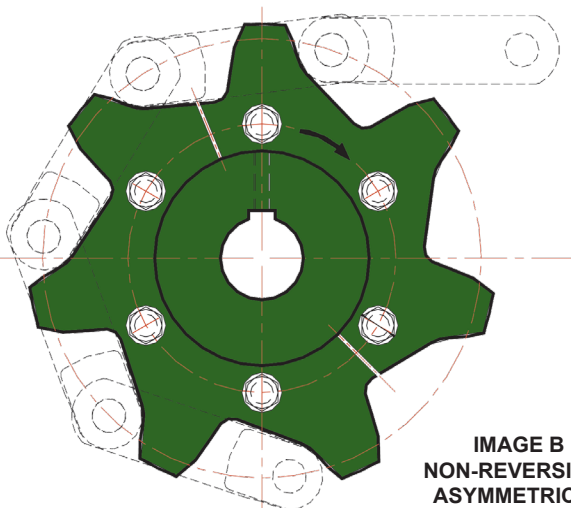


IMAGE B
NON-REVERSIBLE
ASYMMETRICAL

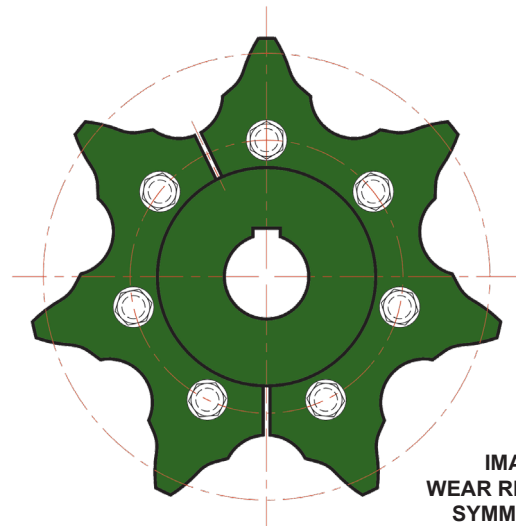


IMAGE C
WEAR REVERSIBLE
SYMMETRICAL

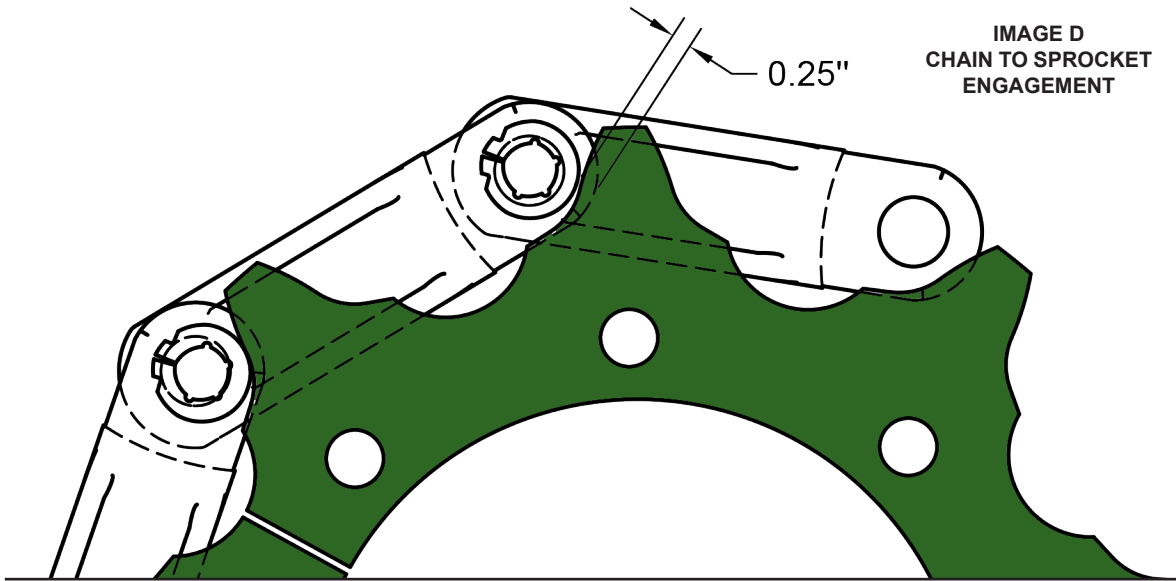
SPROCKET MAINTENANCE

Sprockets are fabricated and hardened at a slightly lower hardness compared to the chain to minimize wear. Sprocket replacement is recommended when the teeth are worn 1/4" below original surface engagement with the chain, as illustrated in Image D.

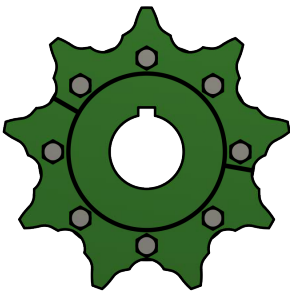
Operating the chain on worn sprockets creates an improper pitch diameter, which can result in damage to the chain, circlips, and lead to chain separation. This condition will also shock load the chain and cause "hooking", resulting in higher stress loads on the chain due to improper sprocket engagement.

Although sprockets are critical to proper conveyor operation, they often get overlooked during routine maintenance. Typically, sprocket tooth segments should be replaced 1 or 2 times throughout the life cycle of the chain.

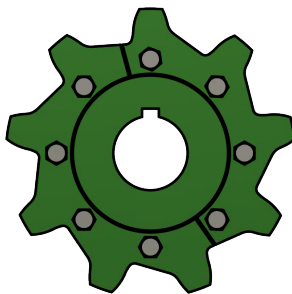
Always install new chain with new sprocket segments.



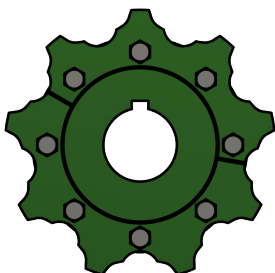
COMMON SPROCKET TYPES



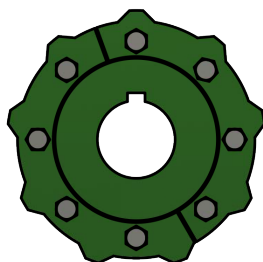
Wear Reversible
Symmetrical
Drive



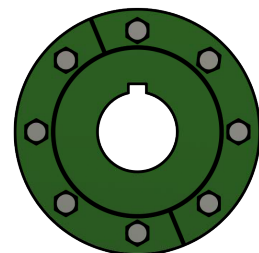
Non-Reversible
Asymmetrical
Drive



Self Cleaning
Trailer



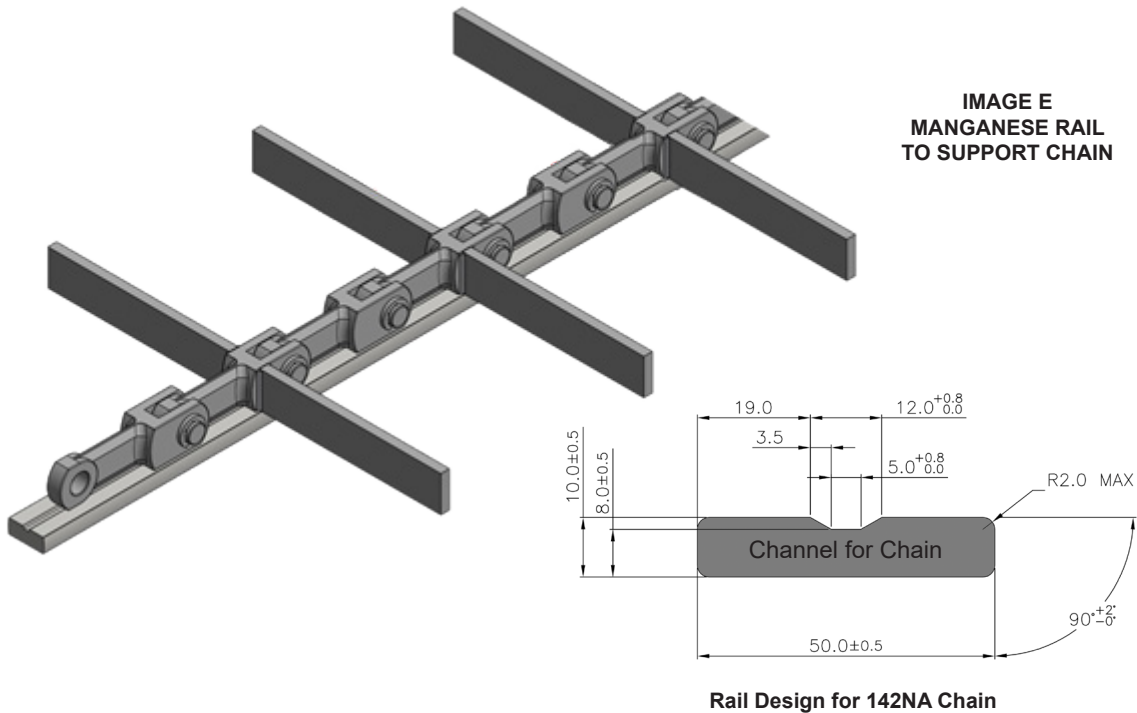
Star Trailer



Smooth Trailer

ADDITIONAL RECOMMENDATIONS

1. Sprocket cleaners and chain wipers help maintain the sprocket clear of buildup for the chain to engage.
2. Conveyor inlet screens ensure that particle size does not exceed conveyor design parameters and help prevent tramp material from entering the conveyor.
3. Conveyor inlet magnets help prevent the introduction of tramp material.
4. Central rails made from Hadfield manganese steel will maximize chain life and help prevent fatigue on welded flights (Image E).
5. Wear bushings, AR steel flights, and hard weld coatings are available for extremely abrasive applications.
6. For installation assistance or any application questions, call 4B.



PRODUCT WARRANTY

1. EXCLUSIVE WRITTEN LIMITED WARRANTY

ALL PRODUCTS SOLD ARE WARRANTED BY THE COMPANY 4B COMPONENTS LIMITED AND 4B BRAIME COMPONENTS LIMITED HEREIN AFTER REFERRED TO AS 4B TO THE ORIGINAL PURCHASER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE (1) YEAR AFTER DATE OF PURCHASE FROM 4B. ANY PRODUCT DETERMINED BY 4B AT ITS SOLE DISCRETION TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO A 4B BRANCH OR AUTHORIZED SERVICE LOCATION, AS 4B DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT 4B'S OPTION.

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4. LIMITATION OF DAMAGES

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