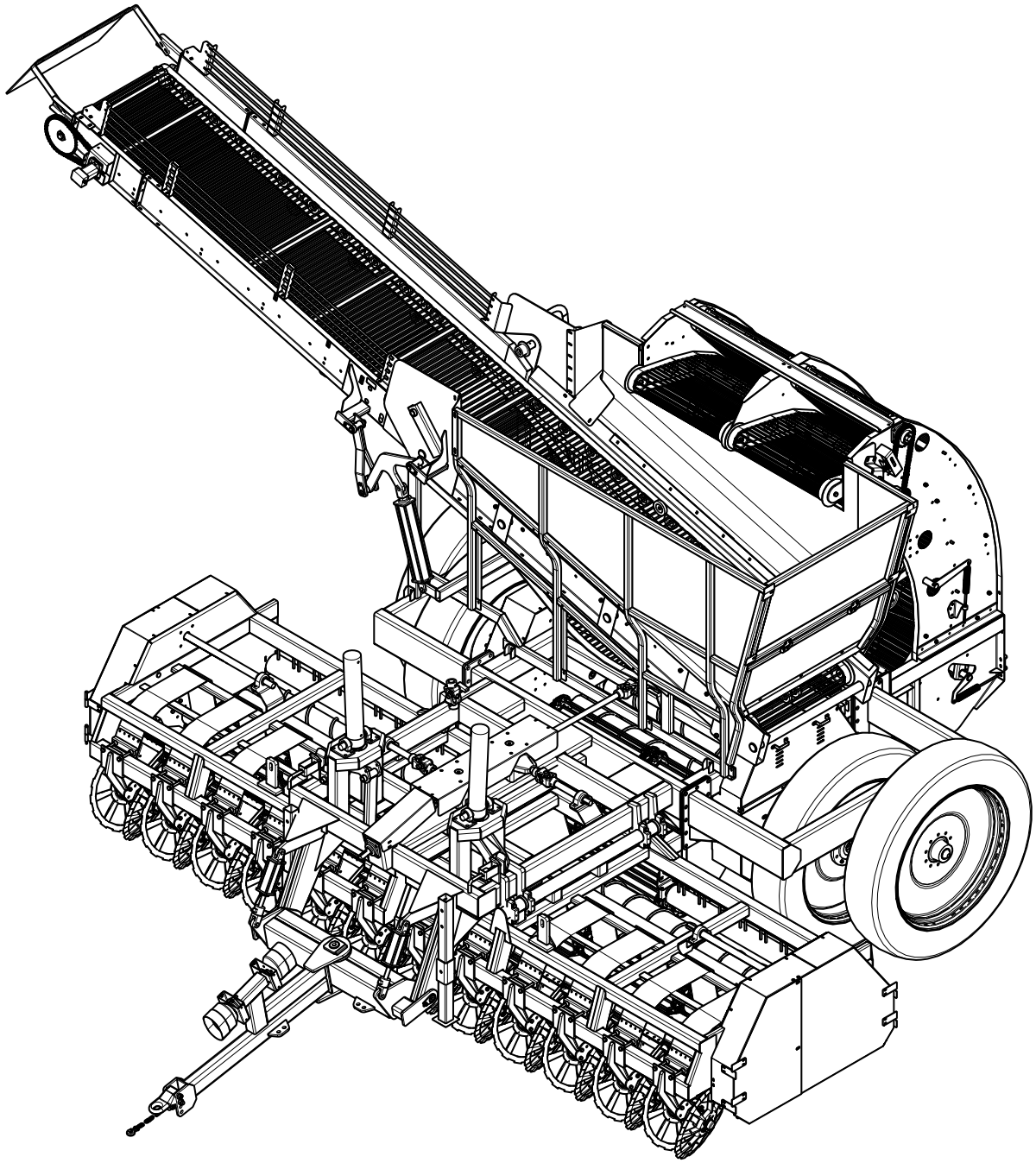
STANDARD Alloway

2011

FOLDING BEET HARVESTER



OPERATOR'S MANUAL

PN - 700-5-0007 (2011)

Rev : A (09/18/2011)

TO THE DEALER:

Assembly and proper installation of this product is the responsibility of the Alloway dealer. Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Operator's Manual are completed before releasing equipment to the owner.

The dealer must complete the Warranty Registration included in this manual. Both dealer and customer must sign the registration which certifies that all Dealer Check List items have been completed. The dealer is to return the prepaid postage portion to Alloway, give one copy to the customer, and retain one copy.

Note: Warranty credit is subject to this form being completed and returned.

TO THE OWNER:

Read this manual before operating your Alloway equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all the adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

For service, your authorized Alloway dealer has trained mechanics, genuine Alloway service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Alloway service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Model:_____ **Date of Purchase** _____

Serial Number: (see Safety Decal section for location) _____

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION, WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.

This Safety-Alert Symbol indicates a hazard and means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

WARNING Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed

CAUTION Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

IMPORTANT Indicates that failure to observe can cause damage to equipment.

NOTE Indicates helpful information.

TABLE OF CONTENTS

GENERAL INFORMATION

The purpose of this manual is to assist you in operating and maintaining your Beat Harvester. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance. These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

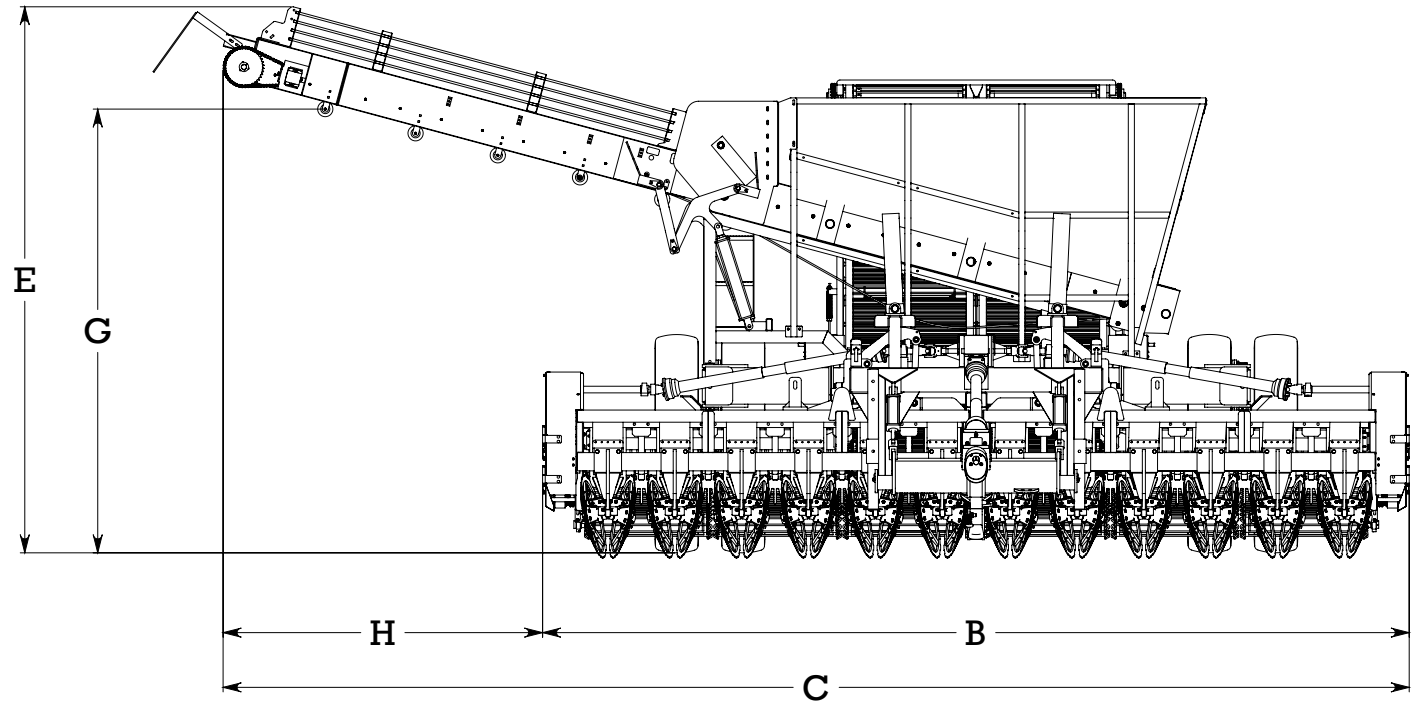
The illustrations and data used in this manual were current at the time of printing, but due to possible inline production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

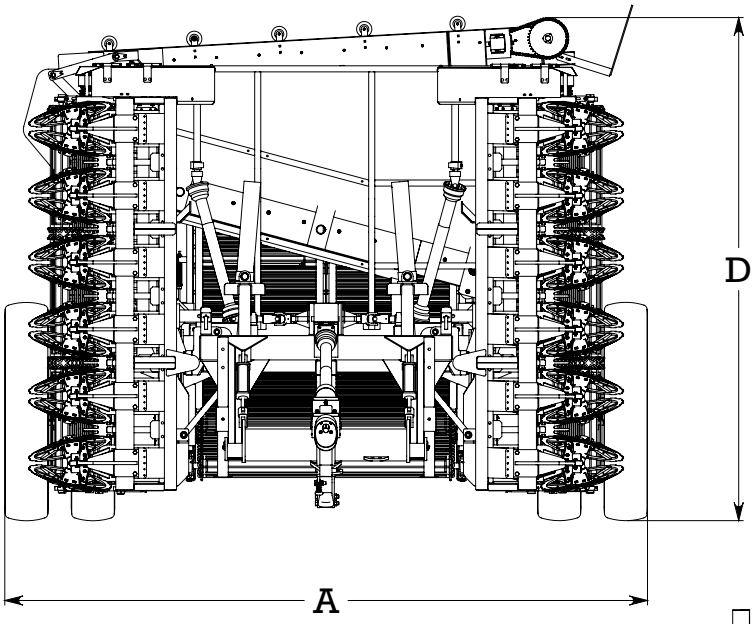
WARNING

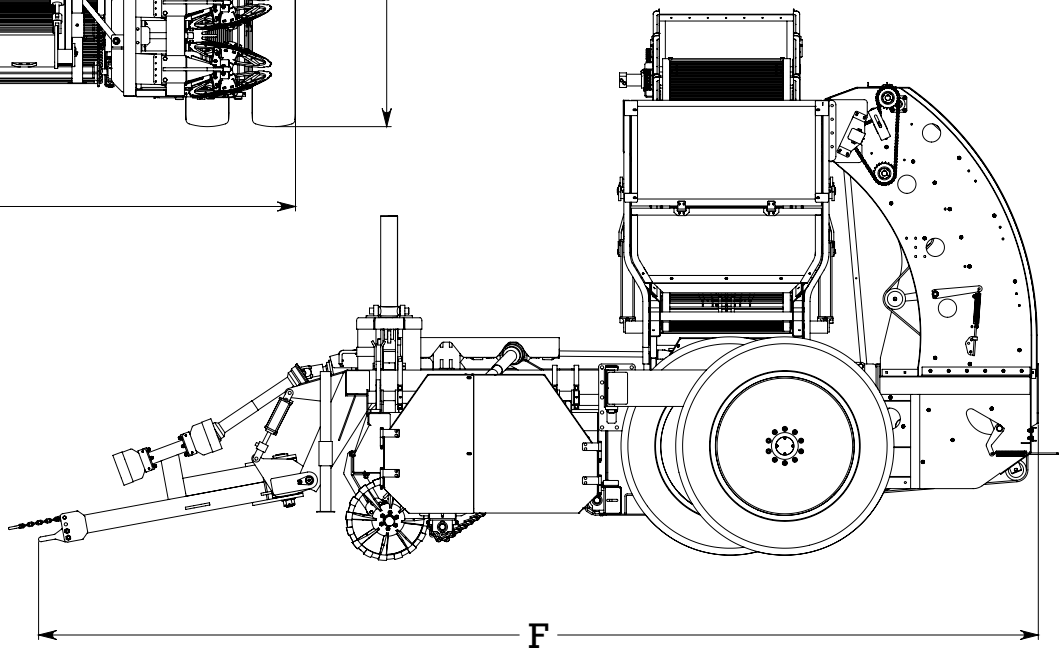
- **Some illustrations in this manual show the Beet Harvester with safety shields removed to provide a better view. The Beet Harvester should never be operated with any safety shielding removed.**

Throughout this manual, references are made to right and left direction. These are determined by standing behind the equipment facing the direction of forward travel.

SPECIFICATIONS







SPECIFICATIONS

Model	12 Row 22
A. Transport Width	17 ft 8 in (5.38 m)
B. Operation Width	23 ft 9 in (7.24 m)
C. Overall Width	32 ft 6 in (9.91 m)
D. Transport Height	13 ft 10 in (4.22 m)
E. Operation Height	15 ft 0 in (4.57 m)
F. Overall Length	27 ft 6 in (8.38 m)
G. Truck Height Clearance	12 ft 2 in (3.71 m)
H. Truck Width Clearance	8 ft 9 in (2.67 m)
Gearbox	250 HP
Belt Elevator Chain	Dual 42 in (107 cm)
1/2” Elevator Chain Rods	56 мм Pitch
Tank Capacity	3-1/2 Tons
Tractor PTO Speed	1000 RPM
Belt System	4B Power Band
Elevator Drive	Hydraulic
Grab Roll Bed	Rock Protected
Grab Rolls Adjustable	3 Full Length - Wing 5 Full Length - Center
Grab Roll Option	2 Stub Rollers - 1 Per Wing
Grab Roll Composition	Steel
Digger Struts	Fixed or Flexible
Tongue Weight (Drawbar)	10,000 lbs (4,500 kg)
Weight Empty	35,000 lbs (15,900 kg)
Wheel Struts	2 Walking Tandem Struts 2 Stabilizer Struts
Main Wheels	4
Tire Type	380 / 90R46 Traction
Tire Pressure	35 psi (241 kPa)
Tire Ply Rating	149A8
Tire Load Capacity	7,150 lbs (3,240 kg)
Stabilizer Wheels	2
Tire Type	9.5L - 15 Implement
Tire Pressure	44 psi (303 kPa)
Tire Ply Rating	8
Tire Load Capacity	2,470 lbs (1,120 kg)

CHECK LISTS

PRE-DELIVERY CHECK LIST
(DEALER'S RESPONSIBILITY)

Inspect the equipment thoroughly after assembly to ensure it is set up properly before delivering it to the customer.

The following check lists are a reminder of points to inspect. Check off each item as it is found satisfactory or after proper adjustment is made.

—— Check that all safety decals are installed and in good condition. Replace if damaged.

—— Check that shields and guards are properly installed and in good condition. Replace if damaged.

—— Check that PTO shaft is properly installed.

—— Properly attach implement to tractor and make all necessary adjustments.

—— Check all bolts to be sure they are tight.

—— Check wheel bolts for proper torque.

—— Check that all cotter pins and safety pins are properly installed. Replace if damaged.

—— Check and grease all lubrication points as identified in "Service, lubrication information."

—— Check the level of gearbox fluids before delivery. Service, if required, as specified in the "Service, lubrication information."

—— Check that tractor hydraulic reservoir has been serviced and that hydraulic system and all functions have been operated through full cylinder stroke to purge air from system.

—— After pressurizing and operating all harvester functions, stop tractor and make sure there are no leaks in the hydraulic system. Follow all safety rules when checking for leaks.

DELIVERY CHECK LIST
(DEALER'S RESPONSIBILITY)

—— Show customer how to make adjustments andselect proper PTO speed.

—— Show customer how to make adjustments.

—— Instruct customer how to lubricate and explain importance of lubrication.

—— Point out the safety decals. Explain their meaning and the need to keep them in place and in good condition. Emphasize the increased safety hazards when instructions are not followed.

—— Present Operator's Manual and request that customer and all operators read it before operating equipment. Point out the manual safety rules, explain their meanings and emphasize the increased safety hazards that exist when safety rules are not followed.

—— Show customer how to make sure driveline is properly installed and that spring-activated locking pin or collar slides freely and is seated in groove on tractor PTO shaft.

—— Show customer the safe, proper procedures to be used when mounting, dismounting, and storing equipment.

—— Explain to customer that when equipment is transported on a road or highway, safety devices should be used to give adequate warning to operators of other vehicles.

—— Explain to customer that when equipment is transported on a road or highway, a Slow Moving Vehicle (SMV) sign should be used to provide adequate warning to operators of other vehicles.

—— Explain to customer that when towing on a public road to comply with all state and local lighting/ marking laws and to use a safety tow chain.

—— Make customer aware of optional equipment available so that customer can make proper choices as required.

—— Point out all guards and shields. Explain their importance and the safety hazards that exist when not kept in place and in good condition.

SAFETY RULES
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said *"The best safety device is an informed, careful operator." We* ask you to be that kind of an operator.

The designed and tested safety of this equipment depends on it being operated within the limitations as explained in this manual.

TRAINING

■ **Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals are available from dealer or, in the United States. Failure to follow instructions or safety rules can result in serious injury or death.**

■ **If you do not understand any part of this manual and need assistance, see your dealer.**

■ **Know your controls and how to stop engine and attachment quickly in an emergency.**

■ **Operators must be instructed in and be capable of the safe operation of the equipment, its** attachments **and all controls. Do not allow anyone to operate this equipment without proper instructions.**

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Make sure that all operating and service personnel know that in the event hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury, or gangrene, serious injury or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Do not allow children or untrained persons to operate equipment.**

PREPARATION

■ **Check that all hardware is tight and properly installed. Always tighten to torque chart specifications.**

■ **Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. Before operating or allowing anyone to approach the equipment, purge any air in the system by operating all hydraulic functions several times after connecting equipment, connecting hoses, or doing any hydraulic maintenance.**

■ **Make sure all hydraulic hoses, fittings and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.**

■ **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing and head.**

■ **Ensure implement is properly attached, adjusted and in good operating condition.**

■ **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**

■ **Before starting tractor, check all equipment driveline guards for damage and make sure they rotate freely on all drivelines. Replace any damaged guards. If guards do not rotate freely on drivelines, repair and replace bearings before operating.**

(Safety Rules continued on next page)

SAFETY RULES
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

(Safety Rules continued from previous page)

- **Power unit must be equipped with ROPS or ROPS CAB and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in "locked up" position at all times.**

- **Connect PTO driveline directly to tractor PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and result in personal injury or death.**

- **Remove accumulated debris from this equipment, tractor and engine to avoid fire hazard.**

- **Ensure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**

- **Ensure shields and guards are properly installed and in good condition. Replace if damaged.**

- **A minimum 20% of tractor and equipment weight must be on tractor front wheels with attachments in transport position. Without this weight, tractor could tip over causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires or front tractor weights. When attaining the minimum 20% weight on the front wheels, you must not exceed the Roll Over Protection Structure (ROPS) weight certification. Weigh the tractor and equipment. Do not estimate.**

- **Make sure hydraulic hoses and cylinders are fully purged of air before operating. Keep all persons away and fill the system by raising and lowering all functions several times. Air in the system can allow components to fall unexpectedly.**

OPERATIONAL SAFETY

- **Do not allow other people in the area when operating, attaching, removing, assembling or servicing equipment.**

- **Keep bystanders away from equipment.**

- **Never go underneath equipment lowered to the ground or raised, unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements, or have work done by a qualified dealer.**

- **Do not operate equipment while under the influence of alcohol or drugs.**

- **Operate only in daylight or good artificial light.**

- **Avoid contact with electrical wires.**

- **Keep hands, feet, hair and clothing away from equipment while engine is running. Stay clear of all moving parts.**

- **Always comply with all state and local lighting and marking requirements.**

- **No riders are allowed on equipment.**

- **Power unit must be equipped with ROPS or ROPS CAB and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in "locked up" position at all times.**

- **Always sit in tractor seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake and ensure all other controls are disengaged before starting tractor engine.**

- **Operate tractor PTO at RPM speed stated in "Specifications" section.**

- **Do not operate tractor PTO during transport.**

- **Look down and to the rear and make sure area is clear before operating in reverse.**

- **Do not operate on steep slopes.**

(Safety Rules continued on next page)

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■ **Do not operate tractor PTO during transport.**

■ **Look down and to the rear and make sure area is clear before operating in reverse.**

■ **Do not operate on steep slopes.**

■ **Do not stop, start or change directions suddenly on slopes.**

■ **Watch for hidden hazards on the terrain during operation.**

■ **Stop tractor and implement immediately upon striking an obstruction. Turn off engine, remove key, inspect and repair any damage before resuming operation.**

■ **Truck boom lock must be engaged when truck boom is in operating position. Do not operate unloader conveyor unless boom lock is engaged and in good repair. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.**

■ **Always connect safety chain from implement to towing vehicle when transporting.**

■ **AVOID INJURY OR DEATH FROM POWER LINES:**

- **Stay away from power lines.**
- **Electrocution can occur without direct contact.**
- **Check clearances before raising implement.**
- **Do not leave the operator's seat if any part of the tractor or implement contacts electric lines.**

■ **Before dismounting tractor, disengage tractor PTO power to implement, lower front lift cylinders so that lifter wheels are on the ground. Operate valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt.**

■ **Before performing any service or maintenance, disengage power to implement, lower front lift cylinders so that lifter wheels are on the ground, lower truck boom, lower 3-point hitch. Operate valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt. Disconnect driveline from tractor PTO. Chock (block) front and rear of implement wheels.**

■ **Before working underneath a raised implement, read and follow all operator's manual instructions and safety rules. Implement must be attached to tractor, lift cylinder locks must be installed, and lift cylinders lowered against locks. Hydraulic system leak down, hydraulic system failures, or movement of control levers can cause equipment to drop unexpectedly and cause severe injury or death.**

(Safety Rules continued on next page)

SAFETY RULES
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

(Safety Rules continued from previous page)

MAINTENANCE SAFETY

- **Service and maintenance work not covered in OWNER SERVICE must be done by a qualified dealership. Special skills, tools and safety procedures may be required. Failure to follow these instructions can result in serious injury or death.**

- **Before dismounting tractor, disengage tractor PTO power to implement, lower front lift cylinders so that lifter wheels are on the ground. Operate valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt.**

- **Before performing any service or maintenance, disengage power to implement, lower front lift cylinders so that lifter wheels are on the ground, lower truck boom, lower 3-point hitch. Operate valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt. Disconnect driveline from tractor PTO. Chock (block) front and rear of implement wheels.**

- **Before working underneath a raised implement, read and follow all operator's manual instructions and safety rules. Implement must be attached to tractor, lift cylinder locks must be installed, and lift cylinders lowered against locks. Hydraulic system leak down, hydraulic system failures, or movement of control levers can cause equipment to drop unexpectedly and cause severe injury or death.**

- **Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.**

- **Before performing any maintenance on the beet harvester. Do not work in or under the holding tank with the tank bottom in the raised (unload) position. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.**

- **Before performing any maintenance on the beet harvester, the truck boom must be fully lowered into the transport position. Do not work on harvester with truck boom in any intermediate position. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.**

- **Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.**

- **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing and head.**

- **Do not allow other people in the area when operating, attaching, removing, assembling or servicing equipment.**

- **Never go underneath equipment lowered to the ground or raised, unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements, or have work done by a qualified dealer.**

- **Ensure implement is properly attached, adjusted and in good operating condition.**

- **Never perform service or maintenance with engine running.**

- **Make sure hydraulic hoses and cylinders are fully purged of air before operating. Keep all persons away and fill the system by raising and lowering all functions several times. Air in the system can allow components to fall unexpectedly.**

- **Keep all persons away from operator control area while performing adjustments, service or maintenance.**

(Safety Rules continued on next page)

(Safety Rules continued from previous page)

- **Make certain all movement of implement components has stopped before approaching for service.**

- **Tighten all bolts, nuts and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before operating.**

- **Ensure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**

- **Ensure shields and guards are properly installed and in good condition. Replace if damaged.**

- **Do not disconnect hydraulic lines until engine is stopped, tractor is properly secured, equipment and all components are lowered to the ground, and system pressure is released by operating all valve control levers.**

STORAGE

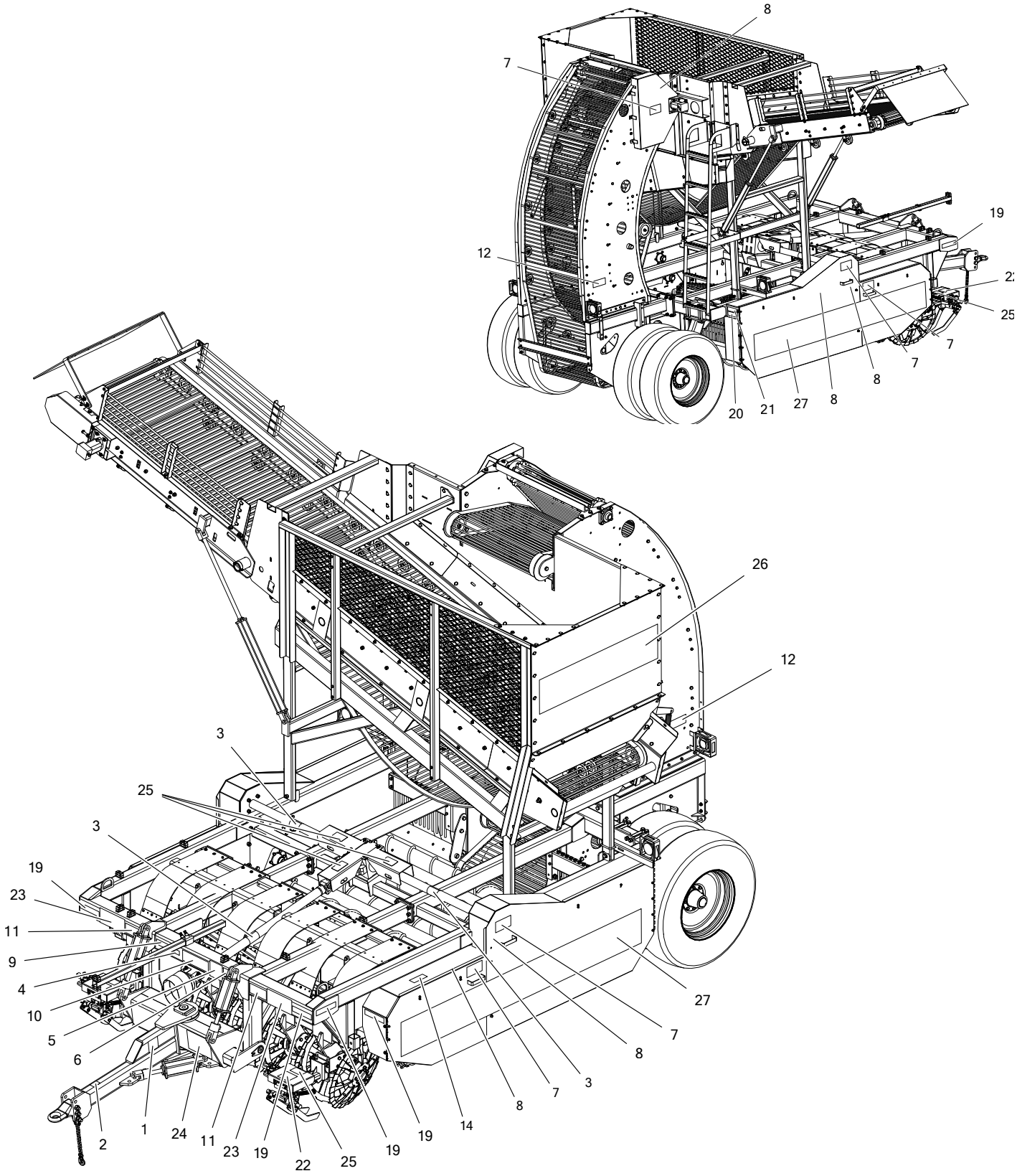
- **For storage, disengage tractor PTO power to harvester, lower front lift cylinders so that lifter wheels are on the ground, lower truck boom, lower 3-point hitch. Operate tractor valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt. Remove driveline from tractor PTO. Chock (block) front and rear of harvester wheels.**

- **Keep children and bystanders away from storage area.**

SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!



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SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!

(Safety Decals continued from previous page)

1. 506-3-0196 Rotating Driveline Warning

2. 700-3-0519 PTO Speed Warning

4. 200-3-1366 Serial Number Tag

3. 903-17456 Driveline Safety Sign

5. 700-3-0494 Fall Hazard Warning

(Safety Decals continued on next page)

SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!

(Safety Decals continued from previous page)

⚠ WARNING

TO AVOID SERIOUS INJURY OR DEATH:

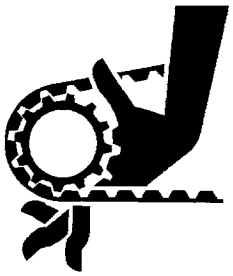
- Read Operator's Manual before operating, servicing or repairing equipment. Follow all safety rules and instructions. (Manuals are available from dealer or, in the United States and Canada, call 1-800-319-6637.)
- Keep all guards in place, properly secured and in good condition. Replace if damaged.
- Operate from tractor seat only.
- Do not allow any other persons in the area when operating.
- Before dismounting tractor:
  - Disengage PTO.
  - Lower equipment and all raised components.
  - Stop engine, remove key and engage brake.
  - Operate hydraulic valve levers to release any pressure.
  - Allow no children or untrained persons to operate the equipment.

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.

PN 700-3-0493

6. 700-3-0493 Read Manual Warning

⚠ WARNING



ROTATING DRIVE HAZARDS

- Before opening drive guard:
  - Disengage PTO drive,
  - Lower equipment to ground,
  - Stop engine, remove key and engage brake,
  - Operate valve levers to release any hydraulic pressure,
  - Wait for all rotation to stop,
  - Disconnect driveline from tractor PTO.
- Before starting tractor:
  - Close drive cover and secure,
  - Keep guard in good condition.

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.

PN 700-3-0495

7. 700-3-0495 Rotating Drive Hazard

⚠ DANGER

SHIELD MISSING

DO NOT OPERATE - PUT SHIELD ON

18869-B

8. 506-3-0194 Shield Missing Warning

19924-B

⚠ WARNING

HIGH-PRESSURE HYDRAULIC OIL LEAKS CAN PENETRATE SKIN RESULTING IN SERIOUS INJURY, GANGRENE OR DEATH.

- Check for leaks with cardboard; never use hand.
- Before loosening fittings: lower load, release pressure, and be sure oil is cool.
- Consult physician immediately if skin penetration occurs.

9. 506-3-0195 Hydraulic Pressure Warning

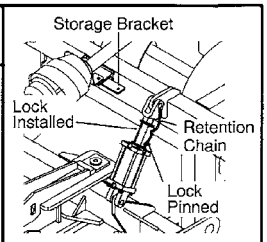
PN 700-3-0498

⚠ WARNING

RAISED EQUIPMENT CAN DROP AND CRUSH.

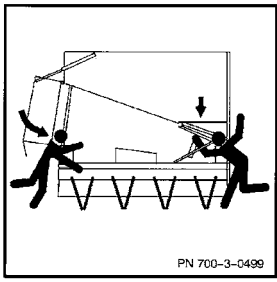
- Install both cylinder locks before transporting or working underneath raised harvester.
- Locks must be installed correctly, kept in good condition, and stored on harvester.
- Read and follow manual instructions.

FAILURE TO FOLLOW INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.



CYLINDER LOCKS

10. 700-3-0498 Cylinder Lock Warning



PN 700-3-0499

⚠ WARNING

RAISED EQUIPMENT CAN DROP AND CRUSH.

- Truck boom and holding tank must be lowered before leaving tractor, or before servicing or storing harvester.
- Lowering components prevents crushing from hydraulic leak down, hydraulic system failures, movement of control levers or mechanical component failures.

FAILURE TO FOLLOW INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.

11. 700-3-0499 Raised Equipment Warning

⚠ WARNING

PN 700-3-0497

KEEP AWAY FROM ELEVATOR CHAIN

- Never use service access holes while equipment is running.
- Before servicing elevator chain, tractor must be shut off and PTO shaft disconnected from tractor.

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.

12. 700-3-0497 Elevator Chain Warning

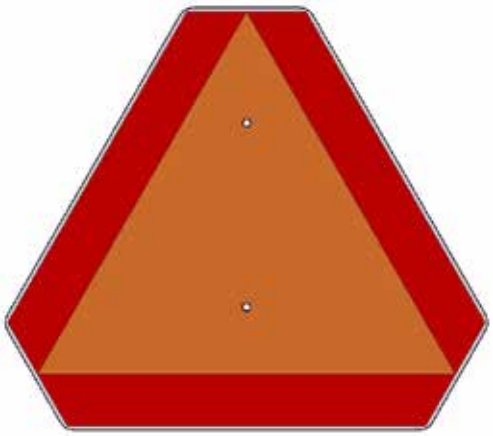
(Safety Decals continued on next page)

SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!

(Safety Decals continued from previous page)



13. 500-3-1696 SMV Sign

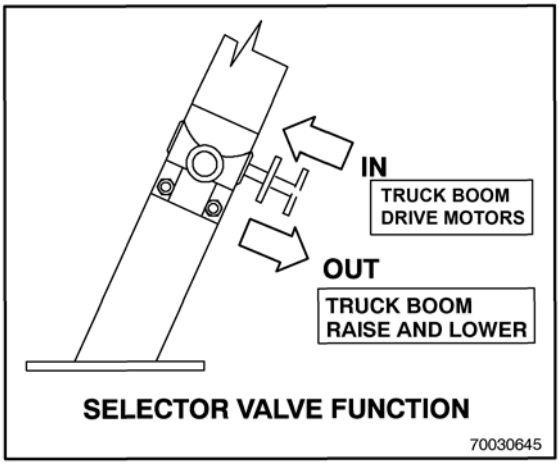
BOOM LOCK MUST BE ENGAGED WHEN TRUCK BOOM IS RAISED TO OPERATING POSITION:

1. Read manual and follow all instructions and safety rules.
2. Lock pin must be in lowered position.
3. Hydraulically raise truck boom.
4. Boom lock must fully rotate into engaged position as shown.
5. Check and do not operate unless boom lock is fully engaged and in good repair.

BOOM LOCK MUST BE RELEASED BEFORE TRUCK BOOM CAN BE LOWERED:

1. Read manual and follow all instructions and safety rules.
2. Hydraulically raise truck boom to full up position to remove boom weight from boom lock.
3. Stand behind truck boom and raise lock pin handle to raised position as shown.
4. Hydraulically lower truck boom to transport position.
5. The lock pin will automatically reset to the lowered position as the truck boom is lowered. If lock pin does not reset, have unit repaired before operating.

15. 700-3-0644 Boom Lock Warning



16. 700-3-0645 Selector Valve Function

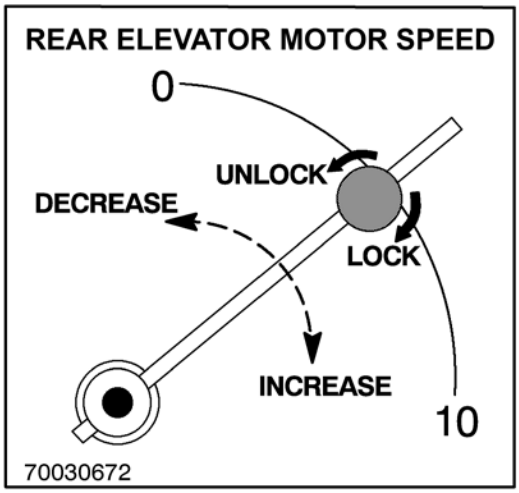
WARNING

MANUAL CONTAINER AND MANUAL ARE MISSING

- REPLACE AND READ BEFORE OPERATING.
- KEEP MANUAL CONTAINER AND MANUAL MOUNTED IN THIS LOCATION. (Available from dealer or call 1-800-319-6637.)

FAILURE TO FOLLOW MANUAL INSTRUCTIONS AND SAFETY RULES CAN RESULT IN SERIOUS INJURY OR DEATH. 506-3-0192

14. 506-3-0192 Manual Container Warning



17. 700-3-0672 Rear Elevator Motor Speed

18. 700-3-1390 Electrocution Hazard

(Safety Decals continued on next page)

SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately If Damaged!

(Safety Decals continued from previous page)

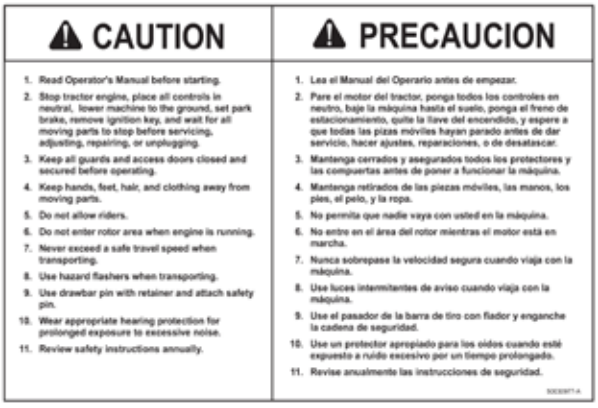
19. 200-3-4004 Amber Reflector 9 x 2

20. 200-3-4034 Orange Fluorescent Reflector 9 x 2

21. 200-3-4005 Red Reflector 9 x 2

22. 505-3-0315 High - Pressure Fluid Hazard

23. 902-15101 Alloway Standard Logo



24. 500-3-0977 Caution Manual Warning

25. 100-3-1367 Safety Guard

26. 507-3-0432 Alloway Standard Circular Large w/ Short Striping

27. 902-15100 Alloway Standard Circular Large w/ Long Striping

OPERATION

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said *"The best safety device is an informed, careful operator."* We ask you to be that kind of an operator.

WARNING

- **Operators must be instructed in and be capable of the safe operation of the equipment, its attachments and all controls. Do not allow anyone to operate this equipment without proper instructions.**
- **Do not allow children or untrained persons to operate equipment.**

CAUTION

- **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing.**

WARNING

- **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**
- **Before starting tractor, check all equipment driveline guards for damage and make sure they rotate freely on all drive- lines. Replace any damaged guards. If guards do not rotate freely on drivelines, repair and replace bearings before operating.**
- **A minimum 20% of tractor and equipment weight must be on tractor front wheels with attachments in transport position. Without this weight, tractor could tip over causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires or front tractor weights. When attaining the minimum 20% weight on the front wheels, you must not exceed the Roll Over Protection Structure (ROPS) weight certification. Weigh the tractor and equipment. Do not estimate.**

WARNING

- **Ensure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**
- **Ensure shields and guards are properly installed and in good condition. Replace if damaged.**
- **Do not allow other people in the area when operating, attaching, removing, assembling or servicing equipment.**
- **Keep bystanders away from equipment.**
- **Never go underneath equipment lowered to the ground or raised, unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements, or have work done by a qualified dealer.**

CAUTION

- **Operate only in daylight or good artificial light.**
- **Avoid contact with electrical wires.**

WARNING

- **Keep hands, feet, hair and clothing away from equipment while engine is running. Stay clear of all moving parts.**
- **Always comply with all state and local lighting and marking requirements.**
- **No riders are allowed on equipment.**
- **Power unit must be equipped with ROPS or ROPS CAB and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS systems in "locked up" position at all times.**

PRE-OPERATION CHECK LIST
(OWNER'S RESPONSIBILITY)

To assure safe and efficient operation it is essential, that each machine operator read and understand the operating procedures and related safety requirements outlined in this manual.

Complete the Pre-Operation Checklist before initial operation, after the first hour of field operation, and before each shift thereafter.

—— Review and follow all safety rules and safety decal instructions on pages 4 through 11.

—— Check that all safety decals are installed and in good condition. Replace if damaged.

—— Check that all shields and guards are properly installed and in good condition. Replace if damaged.

—— Check that all hardware and cotter pins are properly installed and secured.

—— Check alignment and spacing of digger wheels.

—— Check alignment of grab rolls and remove any obstructions.

—— Check that elevator chains, rollers and tensioners move freely and without obstruction

—— Check tractor and harvester tire pressures Service as necessary.

—— Check that boom lock is in good repair. Do not operate unless boom lock is fully engaged when truck boom is raised.

—— Check that equipment is properly and securely attached to tractor.

—— Make sure driveline spring-activated locking collar slides freely and is seated firmly in tractor PTO spline groove.

—— Before starting tractor, check all equipment driveline guards for damage and make sure they rotate freely on all drivelines. Replace any damaged guards. If guards do not rotate freely on drivelines, repair and replace bearings before operating.

—— Do not allow riders.

—— Check and keep all bystanders away from equipment working area.

—— Check all lubrication points and grease as instructed in "Service, lubrication information". Make sure the PTO slip joint is lubricated and that the gearbox fluid levels are correct.

—— Set tractor PTO at correct rpm for your equipment.

—— Check that all hydraulic connections are correct and all hydraulic control movements function as described in the Operator's Manual.

—— Check that all hydraulic hoses and fittings are in good condition and not leaking before starting tractor. Check that hoses are not twisted, bent sharply, kinked, frayed or pulled tight. Replace any damaged hoses immediately.

—— Raise and lower equipment to make sure air is purged from hydraulic cylinders and hoses.

—— Make sure tractor 3-point lift links do not interfere with hydraulic hoses or driveline throughout full turning range.

—— Make sure tractor ROPS or ROPS CAB and seat belt are in good condition. Keep seat belt securely fastened during operation.

—— Before starting engine, operator must be in tractor seat with seat belt fastened. Place transmission in neutral or park, engage brake and disengage tractor PTO.

HARVESTER COMPONENTS

The harvester consists of several components which will be referred to throughout this manual. They are as follows:

1. Center frame: This is the base structure to which all components of the harvester are attached.

2. Wing frame: This is the structure to which the lifter struts of the harvester are attached.

3. Hitch: Located on the front of the harvester, it is used to attach the harvester to a tractor. Hydraulic cylinders connect the Hitch to the Main Frame and are used to control the working depth and harvester steering.

4. Lifter struts: Lifter struts are attached to the wings of the harvester to align with each row of beets. A pair of lifter wheels is attached to each strut to remove the beets from the soil.

5. Paddle shaft: Shaft and paddle assemblies rotate through each lifter wheel assembly directing all materials from between the lifter wheels onto the grab roll bed.

6. Front Barrier: Structure attached to the front of the wings to keep beets from falling out.

7. Rear Barrier: Located on the back of the wings to keep beets from falling out the back while allowing easy access to the inside of the wing.

8. Wing Grab Rolls: Pairs of counter-rotating cleaning rolls to remove soil and debris from the beets while moving beets to the center frame.

9. Center Frame Grab Rolls: Pairs of counter-rotating cleaning rolls to remove soil and debris from the beets while moving beets to the vertical

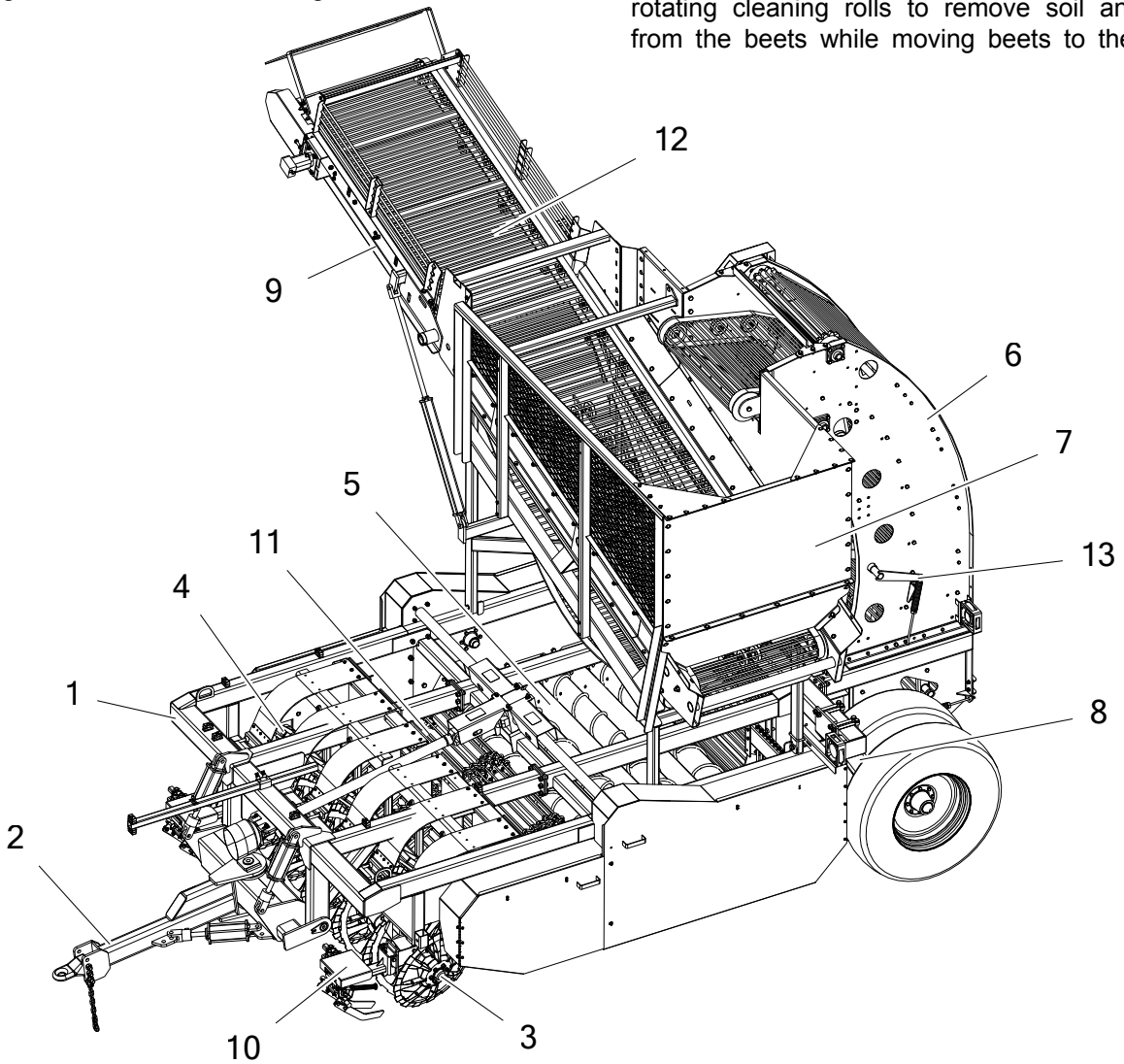


Figure 1. Beet Harvester Components

elevator.

10. Wing Chain Bed: Chain that carries beets from lifter wheels to the wing grab roll bed.

11. Center Frame Chain Bed: Chain that carries beets from the wing grab roll bed to the center frame grab roll bed.

12. Trunion Hydraulic Cylinder: The main cylinder to lift the wings up.

13. Walking Tandem Wheels: Mounted on the sides of the center frame, designed to offer a smooth ride while increasing carrying weight.

14. Stabilizer Wheels: Located on the front of each wing to keep the wings from dipping.

15. Holding tank: Beet holding area. Beets are dropped into the tank until truck arrives.

16. Truck boom: The foldable conveyor extension on the top right of the harvester used to convey beets to the truck.

17. Vertical elevator: Structure comprised of four powered belted chains moving the beets vertically from the grab rolls to the top of the holding tank.

18. Row Finder: Keeps the Harvestor digger wheels centered on the beets.

EQUIPMENT MATCHING

Harvester	Minimum HP
8 ROW 30”	240 HP
12 ROW 22”	250 HP
12 ROW 30”	290 HP
16 ROW 22”	300 HP

Use the above guidelines to select a tractor with adequate power and weight to operate the harvester.

Use tractor manufacturer ASAE HP ratings for tractor matching.

TRACTOR BALLAST

The tractor should be equipped with manufacturer’s maximum allowable front end ballast for operational and transport stability.

TIRE REQUIREMENTS

The loaded beet harvester will transfer 4000 to 6000 lbs. of static weight to the tractor drawbar. Tractor tires must be of adequate capacity to carry the additional load.

See your tractor operator’s manual for selecting tires of the proper capacity and the correct air pressure required.

Dual tractor wheels set to the correct row spacing may be used to increase load capacity.

Tractor tire spacing must be adjusted to match the harvester row spacing.

PTO

WARNING

- **Connect PTO driveline directly to tractor PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and result in personal injury or death.**

Tractor must be equipped with a 1000 rpm PTO shaft. The harvester may be equipped with either a 1-3/8”-21 or 1-3/4”-20 spline driveline to match the tractor output shaft without using adapters.

The harvester may be equipped with optional CV driveline.

HITCH REQUIREMENTS

The drawbar length must be adjusted to a minimum of 16” to 18” between the end of the tractor PTO shaft and the center of the hitch pin.

IMPORTANT

- **Fasten support chains so that they support the drawbar equally.**
- **Raise the three-point hitch only high enough to support the drawbar. Do not bend the drawbar or hitch components.**

HYDRAULIC SYSTEM

Each outlet requires a minimum flow of 12-16 GPM at 2000 psi.

On certain tractors using a pressure/flow compensated system, a load sensing line may be required for proper hydraulic system operation. Consult your tractor dealer for the specific requirements of your tractor hydraulic system.

If *not* equiped with Hydraulic Manifold

The tractor must be equipped with a minimum of seven operator controlled remote outlets and one power-beyond circuit or eight operator controlled remote outlets if a power-beyond is not available.

- Tractor remote valve (1) supplies hydraulic power for the depth control/transport cylinders on the hitch.
- Tractor remote valve (2) supplies hydraulic power to the Boom lift/lower cylinders.
- Tractor remote valve (3) supplies hydraulic power to the Wing lift/lower cylinders.
- Tractor remote valve (4) supplies hydraulic power to the Hydraulic drive motors on Boom Unload Conveyor.
- Tractor remote valve (5) supplies hydraulic power to the Hydraulic drive motors on Rear Elevator.
- Tractor remote valve (6) supplies hydraulic power to the row finder override.
- Tractor remote valve (7) or power-beyond circuit supplies hydraulic power for row finder.
- Tractor remote valve (8) supplies hydraulic power to the Wing Stabilizer lift/lower cylinders.

If equiped with Hydraulic Manifold

The tractor must be equipped with a minimum of three operator controlled remote outlets and one power-beyond circuit or four operator controlled remote outlets on a closed center or pressure/flow compensated hydraulic system.

- Tractor remote valve (1) supplies hydraulic power to the row finder override.
- Tractor remote valve (3) supplies hydraulic power to the Wing lift/lower cylinders.
- Tractor remote valve (4) supplies hydraulic power to the Hydraulic drive motors on Boom Unload Conveyor and Rear Elevator.
- Tractor remote valve (4) or power-beyond circuit supplies hydraulic power for hydraulic Manifold Block.

ELECTRICAL SYSTEM

The tractor must be equipped with a SAE J560a 7-pin electrical connector. This will provide power for turn signals, warning flashers, and operating power for the optional rear steering selector switch.

The harvester is equipped with warning flashers and turn signals located on each corner. Warning lights must be functional whenever the harvester is transported on public highways.

See your tractor operator's manual for instructions on warning light and turn signal operation.

If warning lights and turn signals do not function correctly, see your Alloway dealer.

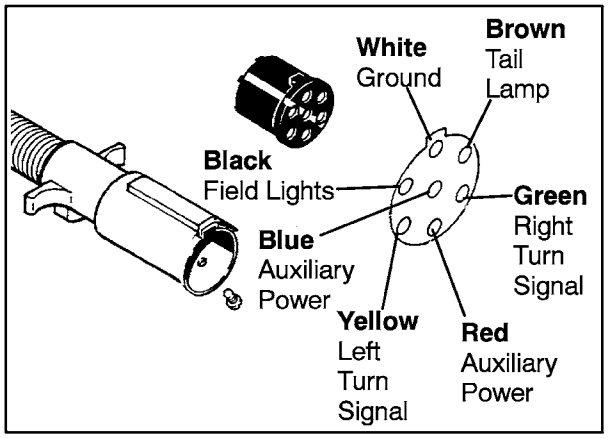


Figure 3. 7-Pin Electrical Connector

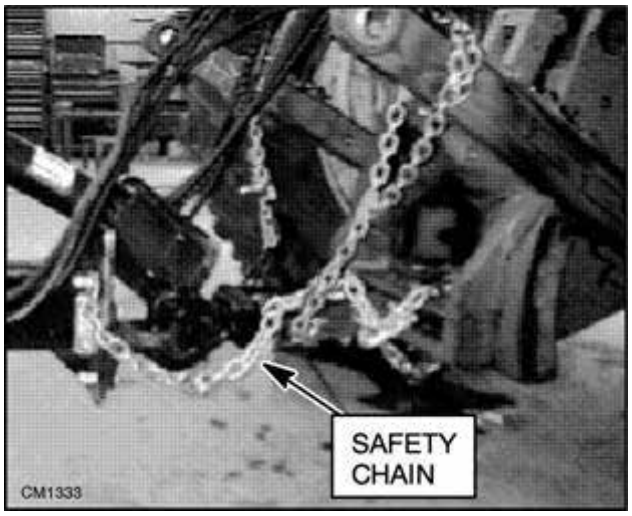


Figure 4. Lock Pin & Safety Chain

ATTACHING TRACTOR TO THE HARVESTER

Make sure there are no bystanders between tractor and harvester.

Carefully back up, until the Pin on the tractor is directly in line with the harvester clevis ring.

Stop engine, set parking brake, wait for all moving parts to stop and remove ignition key before dismounting.

Clean the hydraulic couplers and fittings to avoid oil contamination.

Connect the hydraulic hoses which control the front hitch cylinders to the tractor. Connect these hoses so that moving the control lever forward lowers the harvester (raises the hitch tongue) and moving the control lever rearward raises the harvester (lowers the hitch tongue).

Attach the safety chain to the drawbar support of the tractor. Attach Hydraulic Lines. Insert the 7-pin male harvester electrical cable into the tractor female connector.

The unloader conveyer motor is operated by tractor remote valve. Connect the hoses originating at the harvester so that moving lever forward causes the boom conveyor motor to run forward.

The Rear Elevator conveyer motor is operated by tractor remote valve. Connect the hoses originating at the harvester so that moving lever forward causes the beets to run into the tank.

Check the harvester PTO shaft for smooth telescoping action. Attach the harvester PTO shaft to the tractor PTO shaft. Make sure the locking collar is fully engaged in the lock groove of the tractor PTO.

Hydraulically raise front of the harvester, stop engine, set park brake, wait for all moving parts to stop and remove ignition key before dismounting.

Install transport locks on depth control cylinders.

UNHOOKING THE TRACTOR FROM THE HARVESTER

Locate the harvester on a hard level surface. Make sure area is free of bystanders.

Lower machine with the tractor hydraulics from tractor seat, until machine is resting in a level and stable position on the lifter wheels. Planks or blocking of a suitable size may be used to prevent the harvester from sinking into the soil or damaging the floor surface.

Move boom locks out of cradled position and fully lower the truck boom. Stop the engine, set parking brake, remove ignition key and wait for all moving parts to stop before dismounting the tractor. Block the rear wheels of the harvester to prevent the harvester from rolling. Disconnect PTO shaft from tractor. Disconnect the safety tow chain. Disconnect the electrical cable from the tractor and store in a safe and secure position on the hitch. Remove Pin from hitch.

Lower the hitch to the full extension of the lift cylinders. Stop the engine, release hydraulic pressure in all remotes, set parking brake, remove ignition key and wait for all moving parts to stop before dismounting the tractor.

Disconnect all hydraulic lines and the rear steering electrical connector.

FIELD OPERATION

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said *"The best safety device is an informed, careful operator."* We ask you to be that kind of an operator.

The Alloway harvester will give best performance only if it is properly set for individual field conditions. These setting requirements may change with changes in soil moisture, density and beet varieties. The following explains the operation and adjustment of the machine. Check with your dealer or Alloway for special conditions.

RAISING AND LOWERING THE HARVESTER

The harvester lift cylinders are attached to the harvester tongue and are used to raise the front of the harvester out of the ground. The lift cylinders are connected to tractor hydraulic outlet.

Harvester hydraulic connections should be made so that moving tractor control lever forward lowers the harvester and moving lever rearward raises the harvester.

Transport locks are included and must be installed whenever the harvester is attached to the tractor when not involved in digging operations.

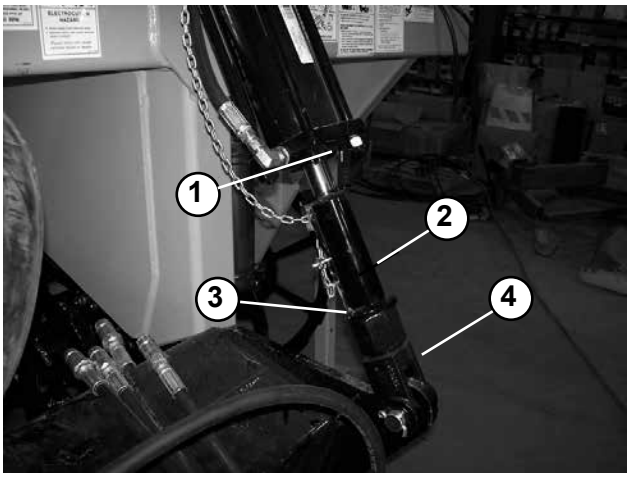
DEPTH STOPS AND TRANSPORT LOCKS

Digging depth is controlled with two hydraulic lift cylinders on the hitch. Adjustable stops are provided on these cylinders which are used to set and retain the desired machine working depth. These stops must be adjusted so both cylinders have the same stop length.

Adjust cylinder depth stops by turning stop nut. Lengthening stop will raise harvester out of the ground for shallower operation. Shortening the stop will lower the harvester into the ground for deeper operation.

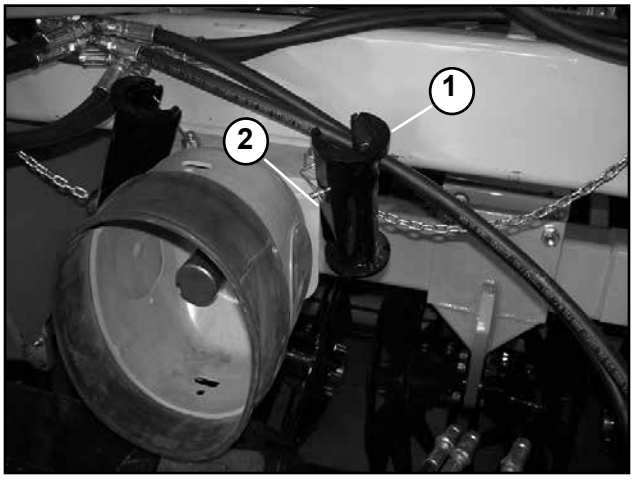
Transport locks are included and must be installed whenever the harvester is attached to the tractor when not involved in digging operations.

To install transport locks, depth stops must be adjusted equally. Raise harvester completely. Set tractor park brake, turn off tractor engine, remove key and exit tractor cab. Working from beside the lift cylinders, remove transport lock from storage bracket and install transport lock over cylinder rod. Install lock pin in transport lock to hold lock in place on cylinder rod. Install transport lock for both lift cylinders



1. Front Lift Cylinder
2. Transport Lock
3. Lock Pin
4. Adjustable Depth Stop

Figure 9. Transport Locks Installed



1. Transport Lock
2. Lock Pin

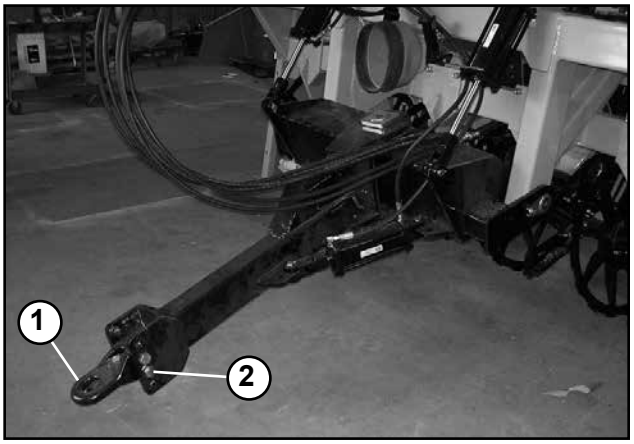
Figure 10. Transport Lock Storage Position

Transport locks should be attached to the storage brackets whenever locks are removed for digging operation. Replace any lost or damaged transport lock component immediately. Recommended operating depth is between 2” and 3” measured from cleared undisturbed soil to the bottom of the cut trench behind the harvester.

IMPORTANT

- **When operating in rocky conditions, the lift circuit should be placed in “float” position to allow the harvester to raise over rocks without lifting the tractor.**

Additional leveling adjustment is possible by moving the hitch ring attached to the harvester tongue.



1. Adjustable Hitch Ring 2. Hitch Adjustment Bolts

Figure 13. Hitch Ring Adjustment

Adjust Chain Bed spacing between lifter wheels and Chain Bed by adjusting Pivot Bracket with adjusting bolt. Try to keep a minimum distance of approximately 1/2” between lifter wheels and Chain Bed.

1. A 2. B

Figure 13. Chain Bed Adjustment

Cleaning capacity of the harvester can be affected by raising or lowering the adjustable grab roll bed. The front of the side sheet may be lowered (This allows beets more time on grabroll bed for better cleaning). The front of the side may be raised if less cleaning is needed.

1. A 2. B

Figure 13. Grab Roll Bed Adjustment

RAISE TRUCK BOOM TO OPERATING POSITION

The truck boom must be raised from the lowered transport position and locked in the raised operating position before operating the truck boom conveyor. The truck boom is raised into position with single acting cylinders and is lowered to rest on boom locks during operation.

WARNING

- **Truck boom lock must be engaged when truck boom is in operating position. Do not operate unloader conveyor unless boom lock is engaged and in good repair. Hydraulic system leak down, hydraulic sys tem failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.**

IMPORTANT

- **Operate unloader conveyer only with truck boom fully raised and with boom lock engaged. Hydraulic pressure on boom cyl inders must be relieved and hydraulic selector valve moved to the "in" position (row finder override function). Make sure all people and equipment are clear of the boom area.**

Move the hydraulic selector valve to the "out" position to activate the truck boom circuit.
Using tractor remote lever #3, move lever rearward to retract the boom cylinders. Raise the truck boom completely until the boom locks drop into place as shown in Figure 14. Move control lever #3 forward to lower the boom to rest on the boom locks.

Stop the engine, set parking brake, remove ignition key and wait for all moving parts to stop before dismounting the tractor. Move the hydraulic selector valve to the "in" position to activate the harvester truck boom hydraulic motors.

LOWER TRUCK BOOM TO TRANSPORT POSITION

Make sure all people and equipment are clear of the boom area.

The hydraulic selector valve must be in the "out" position to activate the truck boom circuit.

Using tractor remote lever #3, move lever rearward to retract the boom cylinders. This will raise the truck boom completely and remove the boom weight from the boom locks.

Stop the engine, set parking brake, remove ignition key and wait for all moving parts to stop before dismounting the tractor.

Stand behind truck boom and pull the lock pin handle to position the lock pin in raised position as shown in Figure 15. This releases the boom lock so the truck boom can be lowered. Move tractor control lever forward and fully lower the truck boom.

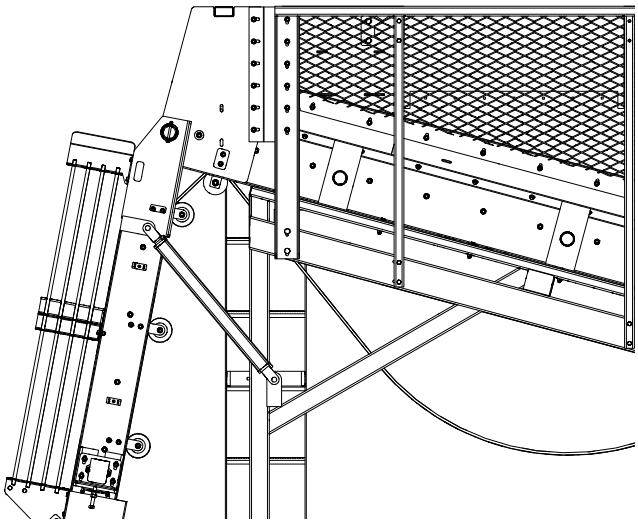


Figure 16. Truck Boom in Lowered Transport Position

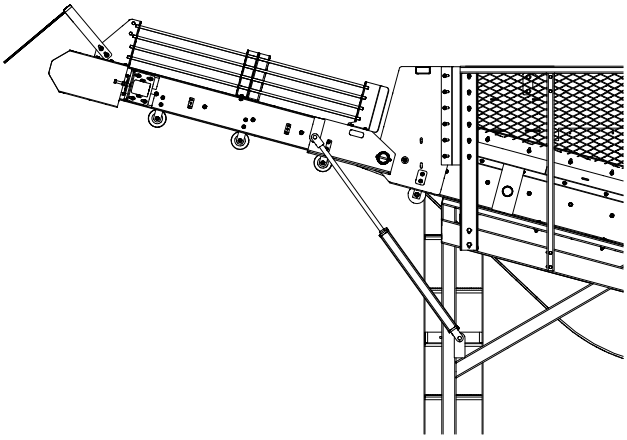


Figure 17. Truck Boom in Extended Field Position

TRUCK BOOM MOTOR SPEED, ADJUST

Adjust truck boom motor speed using the tractor remote. Start tractor and activate truck boom motor. Observe truck boom unloading speed.

ROW FINDER

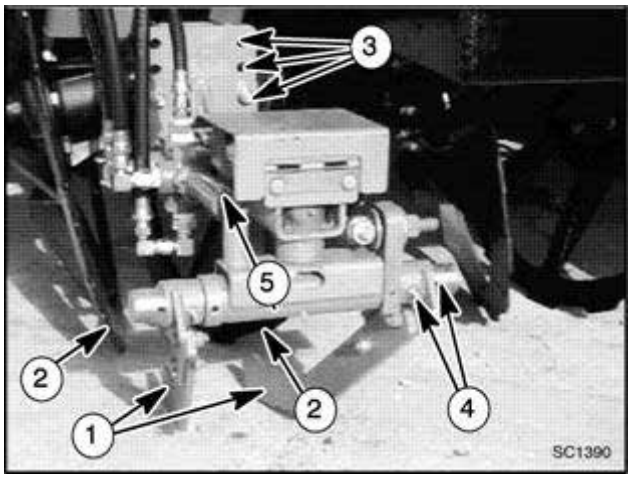
Automatic steering by the row finder requires constant hydraulic potential at the automatic steering valve. Hydraulic power for the row finder is provided by the tractor power-beyond kit or tractor remote #4 set for continuous operation.

Make sure the row finder assembly is level and the feeler arms are aligned with the center of the lifter wheels on the finder row.

With the harvester set at operating depth, adjust the row finder feeler arms to run as lightly on the soil as possible. Adjust the width of the feeler arms to the approximate diameter of the beets at ground level. Adjust the length of the valve control rod to center the feeler arms on the lifter wheel strut. Adjust the auxiliary centering springs to the same position as the centering spring in the row finder valve spool. It is generally more productive to adjust the row finder on level ground in the land and not on the head land.

IMPORTANT

- **Before backing up, raise harvester completely. The row finder may be damaged if it is allowed to contact the ground while backing.**



1. Feeler Arms
2. Lifter Wheels
3. Row Finder Height Adjustment
4. Feeler Arm with Adjustment
5. Steering Control Rod

Figure 18. Row Finder

ROW FINDER OVERRIDE

A row finder override control is powered by tractor control valve. This provides manual control of the steering system and can be used to override the row finder.

To operate the row finder override control: activate tractor control lever rearward to move the harvester left, and forward to move the harvester right.

PTO ENGAGEMENT

Set the tractor throttle to idle before engaging or disengaging the PTO.

WARNING

- **Connect PTO driveline directly to tractor PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and result in personal injury or death.**

GRAB ROLLS

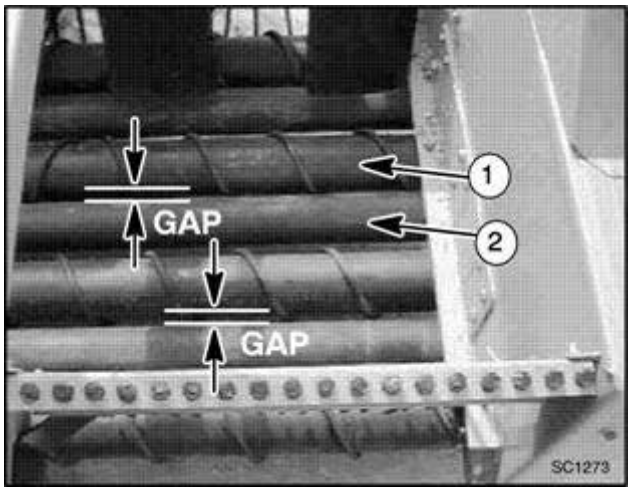
The grab roll bed is a series of counter-rotating roll pairs which help to clean the beets and move them to the elevator. The gap between roll pairs is adjustable for different cleaning requirements.

The grab roll bed is equipped with a system of cushions to help absorb shocks and permit small stones or other debris to pass between the grab rolls.

It is important to have an even space on the left and right sides of the harvester between the pairs of grab rolls; however, the individual pairs can have different gaps to accommodate conditions. For instance a wide gap may be helpful on the first pair of rollers to get rid of a lot of soil, and a narrow gap on the last pair may save tails. Spiral rolls are fixed in the grab roll bed. In 7-roll harvesters, the rear spiral roll has no paired smooth roll. Optional fixed-position rear stub rolls are available.

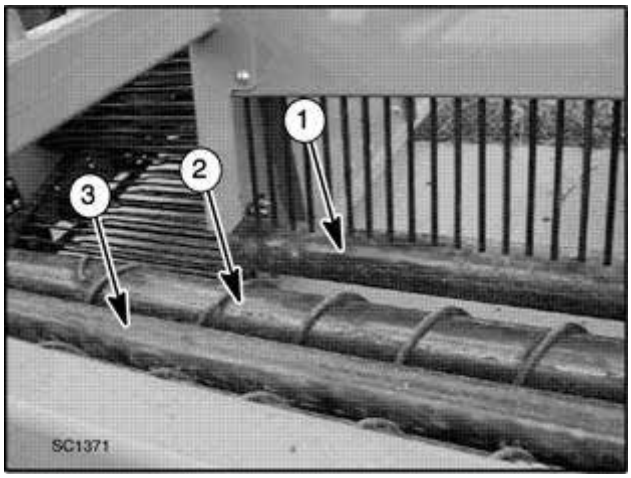
GRAB ROLL BED RODS

The grab roll rods are located at the rear of the roll bed, and may be removed for access to the bed.



1. Spiral Roll (Fixed)
2. Smooth Roll (Adjustable)

Figure 21. Grab Roll Gap



1. Stub Roll (Optional)
2. Rear Spiral Roll
3. Smooth Roll

Figure 22. Stub Roll (Optional)

LIFTER WHEELS

The pinch point width should be uniform across all rows of the harvester. The pinch point width can be adjusted by adding or removing pairs of spacers at each lifter wheel.

Raise harvester and install transport locks (see Blocking Method, page 32).

To remove or add spacers, loosen lifter wheel nuts and remove the bolt retaining each spacer (one bolt per spacer). Install or remove spacers as required to set the desired width and re-tighten the wheel nuts to 100 lb—ft.(without wheel cushions). With wheel cushions, tighten wheel nuts to compress wheel spring assemblies 1/4” from their free height.

Spacers must be installed as pairs. Multiple spacer pairs may be used at each wheel to increase the pinch point width.

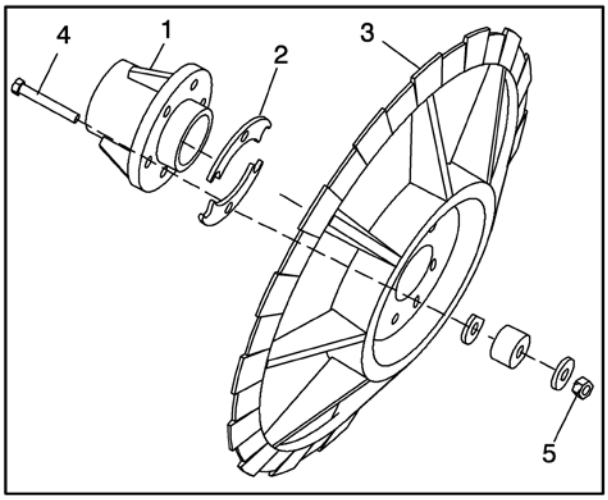
It is not necessary to remove the lifter wheels when adding or removing spacers.

WHEEL SCRAPERS

Wheel scraper blades are adjustable for digging conditions. To adjust scraper blades, loosen retaining bolts and slide scraper blades to place the scraper closer to the wheel or away from the wheel. Retighten scraper retaining bolts.

WHEEL FILLERS

Under certain digging conditions, beets may fall through the spokes of the lifter wheels during operation. This condition may require the installation of filler spokes on the lifter wheels. To install fillers, remove two wheel nuts (opposite from each other) and install wheel filler. Retighten wheel retaining nuts.



1. Hub
2. Spacer (Installed in pairs)
3. Lifter Wheel
4. Wheel Bolt
5. Wheel Nut

Figure 23. Install Lifter Wheel Spacers

FLEXING LIFTER STRUTS (Optional)

Flex struts are available for the lifter wheel struts for operation in rocky conditions.

Flex cushions on the lifter wheels will reduce damage to the lifter wheels in rocky conditions.

When operating in rocky conditions, the lift circuit should be run in “float” to allow the harvester to raise over rocks without lifting the tractor.

IMPORTANT

- **When operating in rocky conditions, the lift circuit should be placed in “float” position to allow the harvester to raise over rocks without lifting the tractor.**

PADDLE SHAFT

The paddle shaft provides a set of rotating paddles between each set of lifter wheels. Beets are moved onto the chain bed by the rotating paddles. The height of the paddle shaft may be raised or lowered to obtain the correct clearance for the harvesting conditions. With flex struts installed, the paddle shaft must be placed in the uppermost position to maintain adequate clearance between the paddle shaft and the lifter wheels. Keep front and rear paddle deflectors in place and in good condition; replace if damaged or missing.

VERTICAL ELEVATOR

A dual chain elevator moves the beets from the grab roll bed to the holding tank. A combination of straight and offset rods is used in the elevator to provide a pocket for carrying beets. All machines are equipped with 1:1 speeds for the vertical elevator chains. If scrubbing action is desired, the speed of the outside chain can be increased by replacing the 40 tooth “driven” sprocket with a 34 tooth sprocket. This will give a scrub ratio of approximately 15% between the two vertical elevator chains.

As the elevator fills with beets, spring loaded tensioner arms allow the chains to operate correctly. Tension adjustment springs for the outer chain are located on the both sides of the elevator. Tension adjustment spring for the inner chain is located on the right side of the elevator.

The vertical elevator is driven from the self contained hydraulic system or by 4th remote on tractor (optional). To speed up rear elevator use flow control. For more speed and power increase flow.

TRANSPORTING

Fully lower the elevator boom as instructed in “Truck Boom Lower”.

Raise the machine and insert the transport locks on the hitch lift cylinders.

Transport locks must be installed whenever the harvester is transported.

Replace any lost or damaged transport lock component immediately.

Do not transport the harvester with beets in the holding tank.

Make sure reflectors, lights and the SMV sign are clean and clearly visible to other traffic.

Do not allow riders.

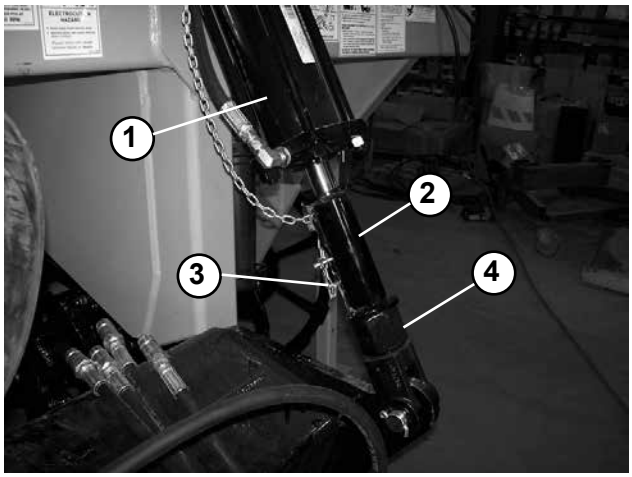
Use hazard flashers on the tractor and harvester when transporting.

Never exceed safe travel speed, slow down when making turns and traveling on rough roads or shoulders.

Only use a tractor of the recommended size and weight for transporting.

Lock foot brake pedals for even application during road travel.

Do not exceed 10 mph transport speed.



1. Lift Cylinder
2. Transport Lock
3. Lock Pin
4. Adjustable Depth Stop

Figure 24. Transport Locks Installed

FIELD OPERATION

STORAGE

WARNING

- **For storage, disengage tractor PTO power to harvester, lower front lift cylinders so that lifter wheels are on the ground, lower truck boom, lower 3-point hitch. Operate tractor valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt. Remove driveline from tractor PTO. Chock (block) front and rear of harvester wheels.**

CAUTION

- **Keep children and bystanders away from storage area.**

After the season's use, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of the next season.

To insure a long, trouble free life, this procedure should be followed when preparing the unit for storage.

Clear the area of bystanders.

Thoroughly wash the machine using a pressure washer to remove all dirt, mud, debris or residue.

Check the rotating components for damage or entangled material. Repair or replace damaged parts. Remove any entangled material.

Inspect all hydraulic hoses, fittings, lines and couplers. Tighten any loose fittings. Replace any hose that is cut, nicked or abraded or is separating from the crimped end of the fitting.

Change the oil in the gearbox.

Lubricate all grease fittings. Make sure that all grease cavities have been filled with grease to remove any water residue from the washings.

Touch up all paint nicks and scratches to prevent rusting.

Move to storage area.

Select an area that is dry, level and free of debris. Unhook from tractor.

Place PTO shaft on hitch to keep PTO off the ground.

Store the machine in an area away from human activity.

Do not allow children to play on or around the stored machine.

OWNER SERVICE

Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said *"The best safety device is an informed, careful operator."* We ask you to be that kind of an operator.

The information in this section is written for operators who possess basic mechanical skills. Should you need help, your dealer has trained service technicians available. For your protection, read and follow all safety information in this manual.

WARNING

- **Before dismounting tractor, disengage tractor PTO power to implement, lower front lift cylinders so that lifter wheels are on the ground. Operate valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt.**
- **Before performing any service or maintenance, disengage power to implement, lower front lift cylinders so that lifter wheels are on the ground, lower truck boom, lower 3-point hitch. Operate valve control levers to release any hydraulic pressure. Stop engine, set parking brake, remove key and unfasten seat belt. Disconnect driveline from tractor PTO. Chock (block) front and rear of implement wheels.**
- **Before working underneath a raised implement, read and follow all operator's manual instructions and safety rules. Implement must be attached to tractor, lift cylinder locks must be installed, and lift cylinders lowered against locks. Hydraulic system leak down, hydraulic system failures, or movement of control levers can cause equipment to drop unexpectedly and cause severe injury or death.**

WARNING

- **Never perform service or maintenance with engine running.**
- **Do not disconnect hydraulic lines until engine is stopped, tractor is properly secured, equipment and all components are lowered to the ground, and system pressure is released by operating all valve control levers.**
- **Keep all persons away from operator control area while performing adjustments, service or maintenance.**

CAUTION

- **Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing and head.**

WARNING

- **Never go underneath equipment lowered to the ground or raised, unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death. Follow Operator's Manual instructions for working underneath and blocking requirements, or have work done by a qualified dealer.**

BLOCKING METHOD FOR LIFTER WHEELS AND ROW FINDER SERVICE

The only approved blocking devices for this harvester are the cylinder transport locks supplied with the unit. The harvester must be located on a hard level surface and the transport locks properly installed. Do not use a transport lock or retaining pin which is bent or damaged. Replace any damaged or lost transport lock component immediately.

Do not work underneath harvester unless it is properly attached to the tractor and blocked securely. When properly attached, the unit will be anchored to minimize front-to-rear movement.

Before blocking, ensure harvester is securely attached to tractor. Truck boom must be fully lowered into transport position. Do not work on harvester with truck boom in any intermediate position. Raise harvester completely, set park brake, shut off engine, remove key, and chock tractor wheels. Without going under the harvester, carefully install transport locks and retaining pins. Start tractor and lower harvester onto transport locks. Cylinder depth stops must be set equally before installing transport locks. Disconnect PTO driveline before performing any maintenance on the harvester.

TRUCK BOOM SERVICE

WARNING

- **Before performing any maintenance on the beet harvester, the truck boom must be fully lowered into the transport position. Do not work on harvester with truck boom in any intermediate position. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.**

- **Truck boom lock must be engaged when truck boom is in operating position. Do not operate unloader conveyor unless boom lock is engaged and in good repair. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.**

Before working on truck boom or any components on the right side of the harvester, the truck boom must be fully lowered into transport position. Do not work on harvester with truck boom in any intermediate position.

LUBRICATION

Figure 26 (Page 30) shows the lubrication points. The accompanying chart gives the frequency of lubrication in operating hours, based on normal conditions. Severe or unusual conditions may require more frequent lubrication.

Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

Use SAE multi-purpose high temperature grease, or SAE multi-purpose lithium based grease.

Use a lithium grease of No. 2 consistency with a MOLY (molybdenum disulfide) additive for all locations. Be sure to clean fittings thoroughly before attaching grease gun. When applied according to the lubrication chart, one good pump of most guns is sufficient. Do not over grease. Grease the telescoping driveline. Daily lubrication of the PTO slip joint is necessary or damage to U-joints, gearboxes, tractor PTO and/or harvester driveline can result.Close and secure all removeable covers and guards before operating harvester.

Owner Service *Continued*

Lubrication Service Record

NOTE: See prior pages for details.
Copy this page to continue service record.

✔ = CHECK **C** = CHANGE
L = LUBRICATE **R** = REPACK

Date:	Serviced By:	10 Hours or Daily		20 Hours			40 Hours			Annually			
		L PTO Driveline	✔ Gearbox Oil Level	L PTO Driveline (Telescope Section)	L Rotor Splined Couplers	L Wheel Mounting Tube Bearings	L Rotor End Bearing	L U-Joint	L Overrunning Clutch	C Gearbox Oil	R Wheel Bearings	L Ratchets	L Center Hanger Bearings

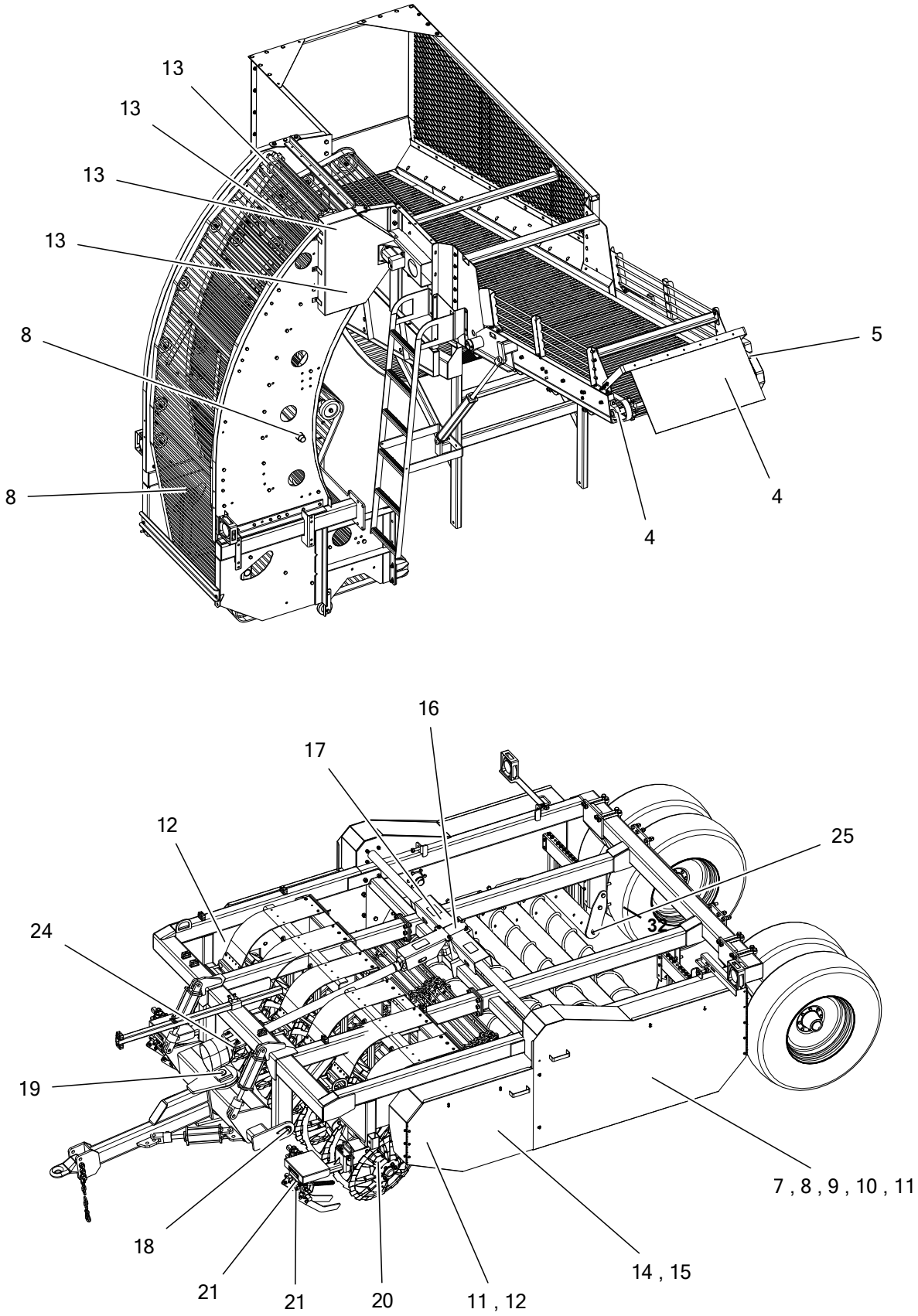


Figure 26. Lubrication Locations

LUBRICATION CHART

ITEM NO.	DESCRIPTION	FREQUENCY	NUMBER
1	U-Joint	24 hrs	2(std) or 3(CV)
2	Slip-Joint	24 hrs	1
3	Cv-Joint (Optional)	24 hrs	1
4	Cross Shaft	24 hrs	2
5	Motor Primary Shaft Bearing	24 hrs	1
6	Elevator Tensioner Pivots	8 hrs	2
7	Grab Roll Bearing	24 hrs	16
8	Cushion Pivot	8 hrs	6
9	Grab Roll Idler Pivots	Yearly	4
10	Grab Roll Drive Bearing	24 hrs	2
11	Paddle Shaft Primary Drive	24 hrs	4
12	Paddle Shaft Bearings	24 hrs	2 or 3
13	Elevator Upper Shafts	24 hrs	4
14	Chain Bed Shaft Bearings	24 hrs	1
15	Idler Pulley Hubs	24 hrs	2
16	Main Gearbox: Check Lube Level	24 hrs	1
17	Main Gearbox Output U-Joints	24 hrs	2
18	Hitch Lift Pivots	8 hrs	2
19	Hitch Steering Pivots	8 hrs	2
20	Lifter Wheel Bearing	24 hrs	1 (each wheel)
21	Row Finder Pivot Shafts	8 hrs	2
22	Rear Steering Pivot Shaft (Optional)	8 hrs	2
23	Rear Steering Level Adjuster (Optional)	8 hrs	4
24	PTO Carrier Bearing	24 hrs	1
25	Short Grab Roll Bearing	24 hrs	2

DAILY SERVICE

Inspect all drive belts for slippage, damage or accumulation of foreign materials. Adjust and clean as necessary.

Inspect all drive chains and adjust as necessary.

Inspect paddle shaft for loose or missing paddles and hardware.

Inspect grab roll bed for alignment, spacing, and roll damage. Check that grab roll shock cushions are in good condition.

Inspect the elevator and unloader structures for missing or damaged rollers. Inspect unloader chain slide bars on the tank bottom for damage or wear; replace if necessary.

Inspect hydraulic system for leaking or damaged components. Replace or repair leaking fittings immediately.

Inspect all conveyor chains for loose or missing cross rods. Check the splices on each belted chain, tighten chain as necessary.

Inspect lifter wheels and struts for alignment, loose or missing components, and proper setting.

Check tractor and harvester tire pressure. Service as necessary.

YEARLY SERVICE

Inspect PTO driveline components for wear or damage and repair as necessary.

Inspect all gearboxes for leaks or damage, and repair.
Drain and replace all gearbox lubricant and clean breathers.

Repack lifter wheel bearings and replace any worn or damaged components.

Inspect chain bed for damaged or bent chain and replace if necessary.

Inspect paddle shaft bearings, paddles, and deflectors. Replace as necessary.

Inspect grab rolls for proper alignment, bent rolls, or damaged flighting and replace if necessary. Inspect grab roll drive belts, sheaves and tighteners; repair any damaged components.

Inspect transport cylinder locks; replace any worn or damaged component.

Repack carrier wheel bearings and replace any damaged components.

MAINTENANCE

Before performing any maintenance or inspections on the harvester, shut off the tractor, set the parking brake, release all hydraulic system pressure with the tractor hydraulic controls and remove the key from the tractor.

GRAB ROLL DRIVE BELT ADJUSTMENT (Figure 28)

Open grab roll side door. Tighten the tension spring adjustment bolt so as to show approximately 1/8" gap between each of the spring coils.

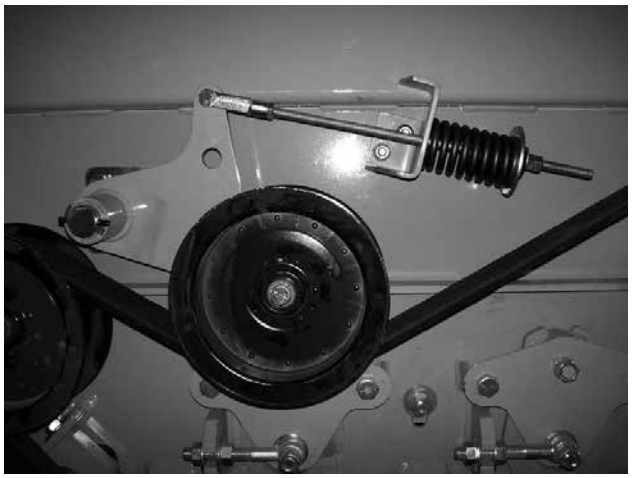


Figure 28. Grab Roll Drive

BELT REPLACEMENT (NEW BELT)

To remove belt, loosen the idler spring.

Install belt over grab roll sheaves as shown in Figure 29.

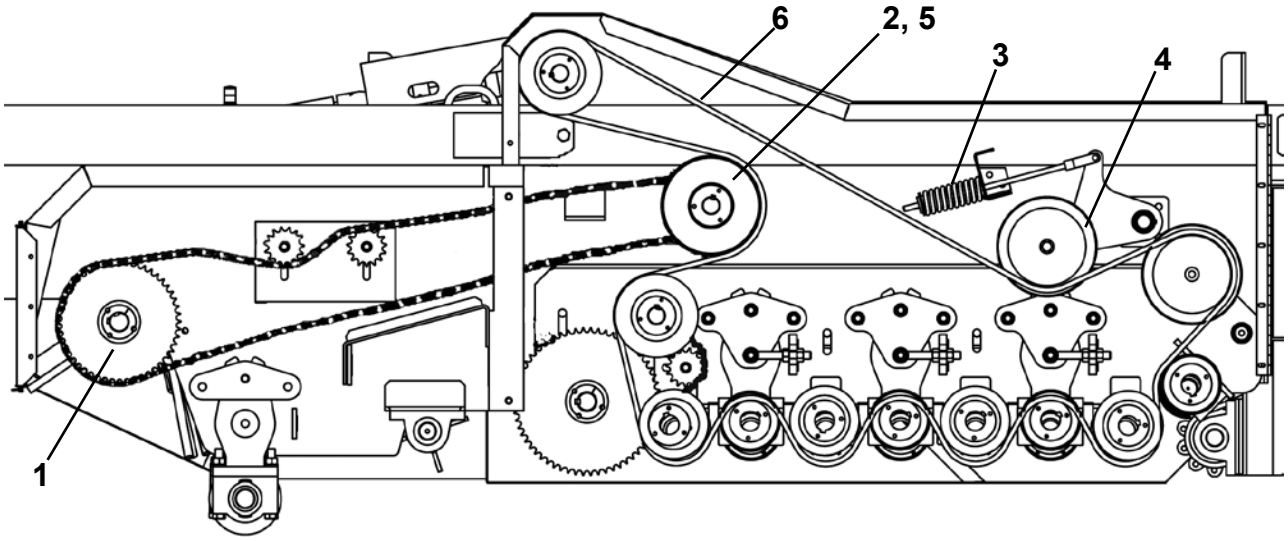
Route belt around drive sheaves and idlers as shown in Figure 31. Do not pry belt over sheaves as damage to the belt may result.

Tighten idler spring until belt does not slip under full load operation.Close and secure grab roll side door.

PADDLE SHAFT, ELEVATOR AND UNLOADER DRIVE CHAINS

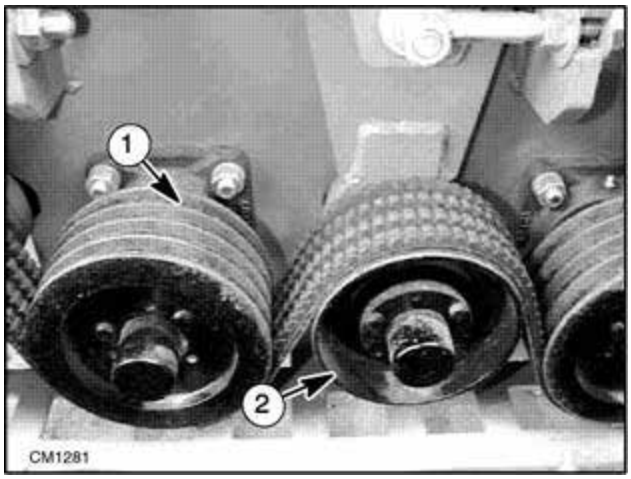
Adjust drive chains by moving idler sprocket untilchain has 3/8" slack in the long side of the chain. Elevator inner and outer chains are set at the factory to run at the same speed. In some conditions scrubbing action may be needed. By running the inner and outer chains at different speeds, beets are "rolled" up the elevator for additional cleaning.

A 34-tooth top sprocket (driven) is available to increase the outer elevator speed and provide a 15% scrubbing ratio between elevator chains.



1. Paddle Shaft Primary Drive
2. Grab Roll Drive Sheaves
3. Idler Spring
4. Belt Idler
5. Paddle Shaft Drive Sprocket
6. Grab Roll Drive Belt

Figure 29. Grab Roll Drive



1. Grab Roll Drive Sheave, Grooved (Fixed Position Spiral Roll)
2. Grab Roll Drive Sheave, Flat (Adjustable Postion Smooth Roll)

Figure 30. Belt Routing

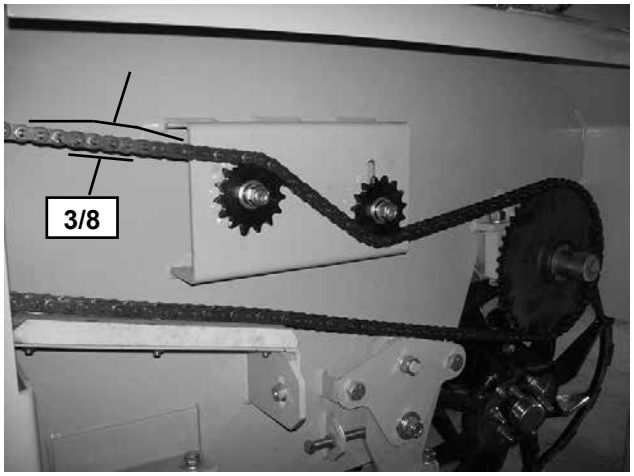


Figure 32. Drive Chain Adjustment

ELEVATOR SPEED ADJUSTMENT (Figure 33)

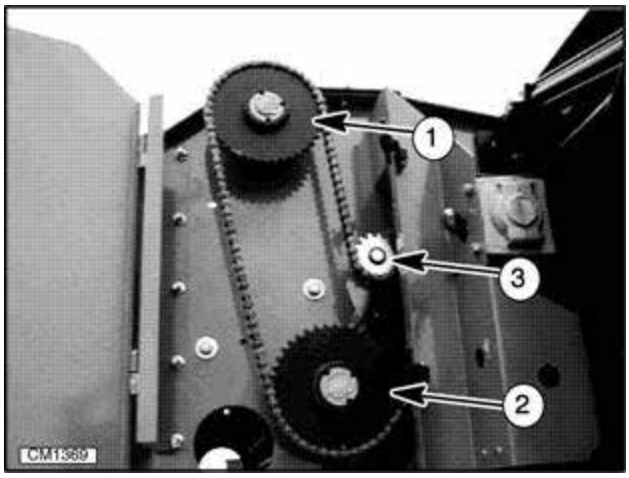
Working from the holding tank, remove shield and drive chain at top of elevator.

Remove outer elevator chain drive sprocket.

Install appropriate replacement drive sprocket (40-tooth standard or 34-tooth optional scrubber sprocket.)

Add or remove chain links to fit new sprockets Install drive chain and adjust.

Close and fasten drive shield.



1. Outer Elevator, “Driven” Sprocket, (40T Std, 34T Opt)
2. Inner Elevator, “Driven” Sprocket (40T)
3. Idler

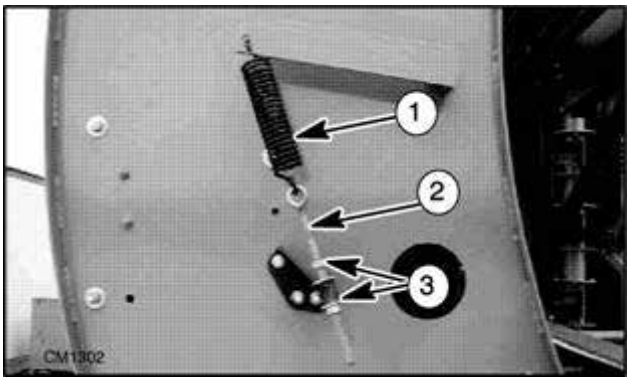
Figure 33. Elevator Upper Drive

ELEVATOR CHAIN ADJUSTMENT

Inspect all elevator drive sprockets and rollers for damage or missing components. Missing or damaged rollers will cause chain tension to be incorrect.

Replace any missing or damaged roller.

With the elevator empty of beets and free from accumulated dirt, adjust elevator tightener springs (both sides) so that they have 1/8” gap between coils.



1. Tension Spring
2. Adjustment Eyebolt
3. Jam Nuta

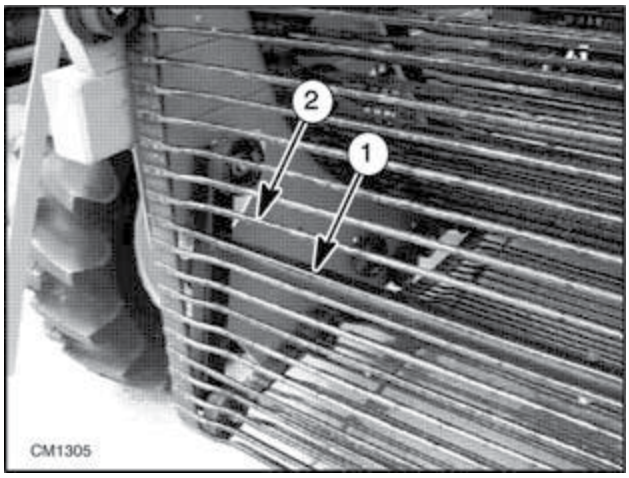
Figure 34. Elevator Tensioner

ELEVATOR CHAIN CROSS ROD REPLACEMENT

Elevator chains have a combination of straight and offset rods which are spaced for maximum performance. Truck boom conveyer has all straight rods. Do not operate the harvester with loose, bent or missing cross rods. Replace rods with the type removed. Install offset rods with the offset away from the beets as shown in Figure 35.

Remove rivets attaching rod to belt. Use caution to avoid damaging the belt.

Attach replacement rod to belt using bolts and threaded back-plate. Make sure offset portion of rod is away from the beets.

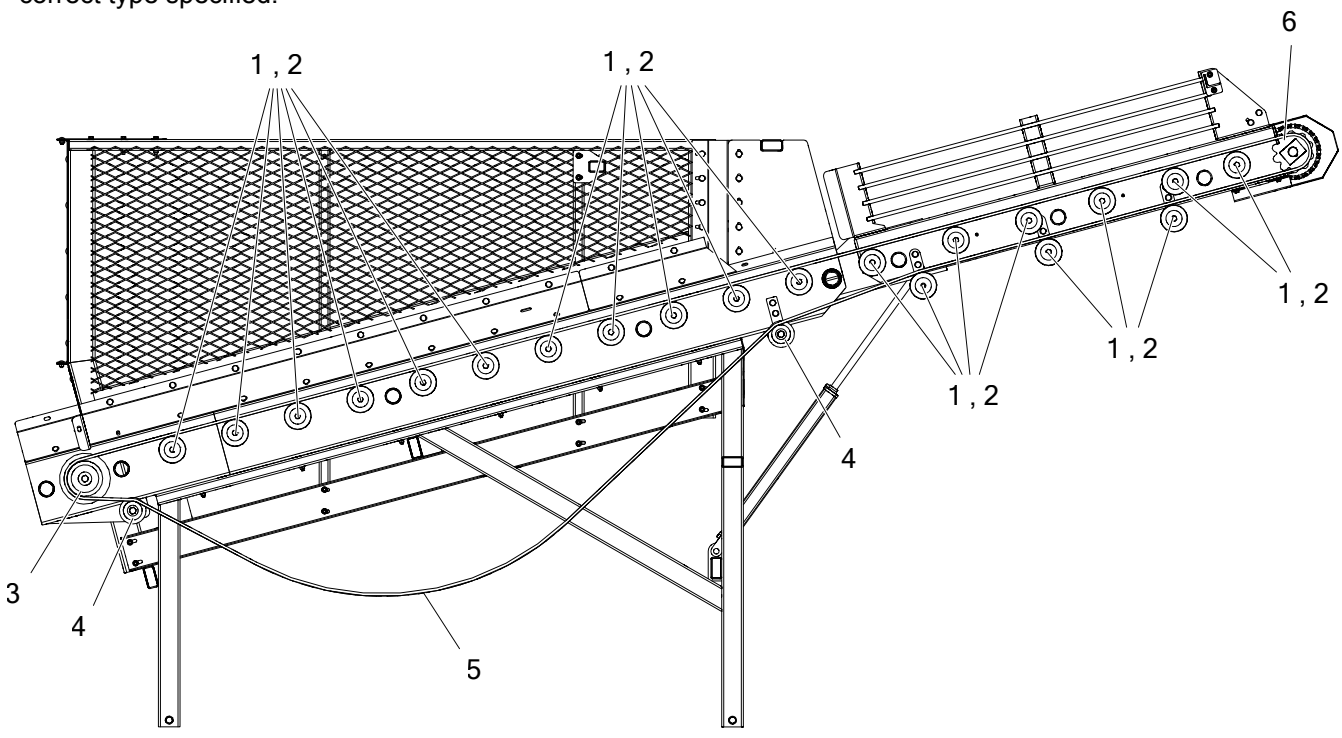


1. Straight Rod (1)
2. Offset Rod (5)

Figure 35. Elevator Cross Rods

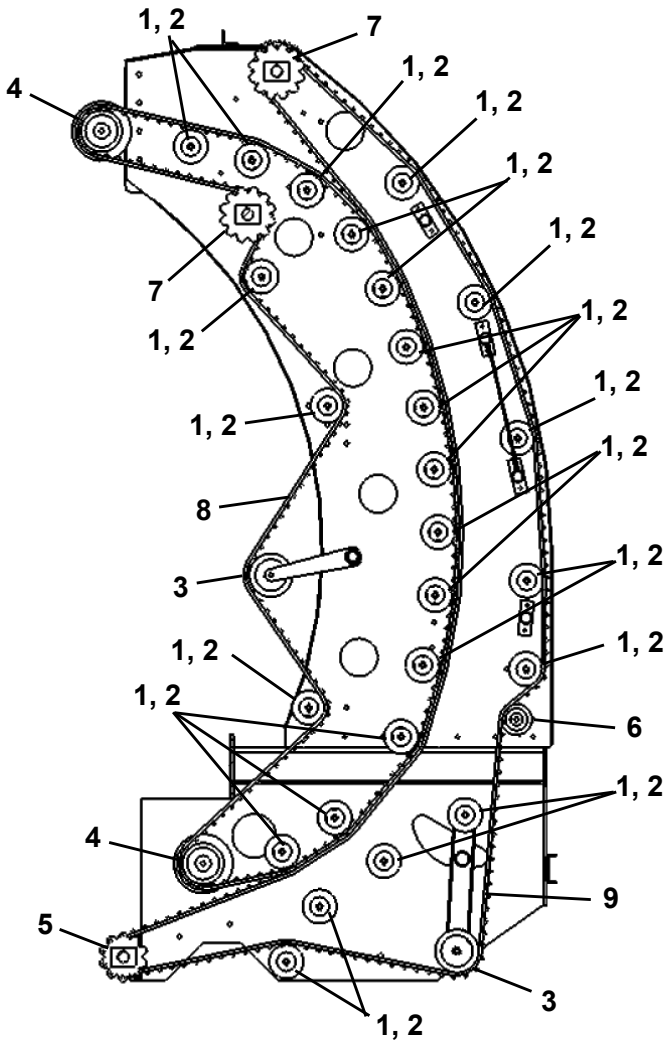
ELEVATOR CHAIN ROUTING AND ROLLER LOCATION (Figure 36 & Figure 37)

Roller location and elevator chain routing must be correct to provide proper tension during operation. Replace any damaged or missing rollers using the correct type specified.



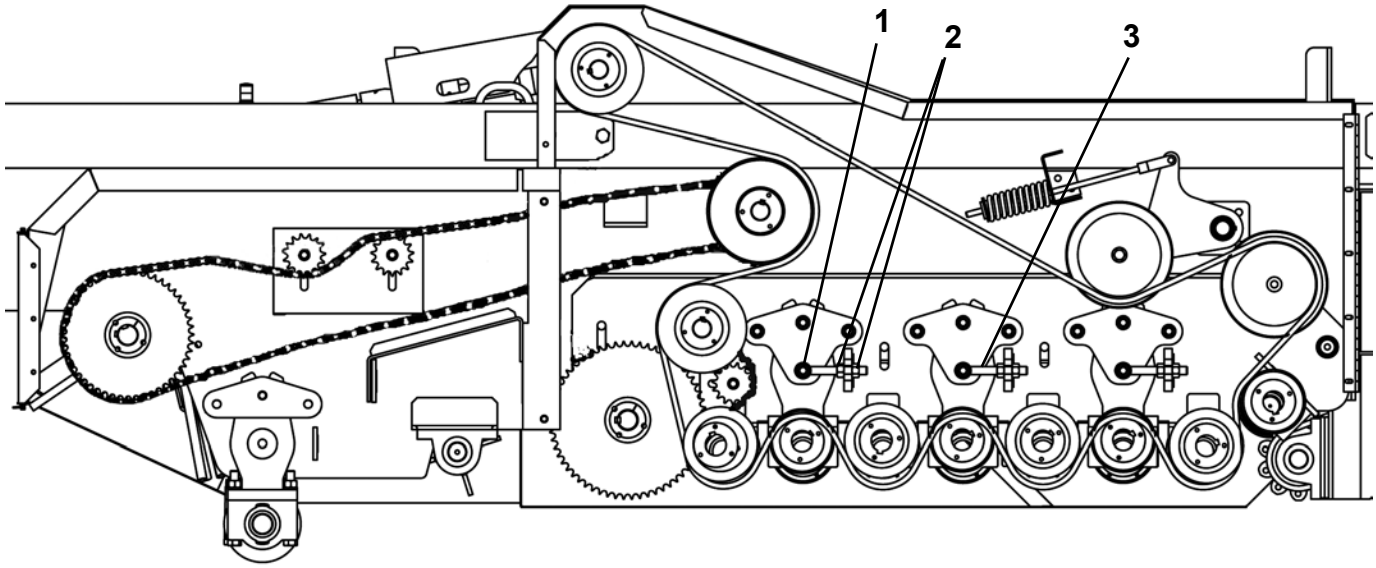
1. 5” Smooth Roller
2. Standoff
3. 6.5” Flanged Roller
4. 3.5” Flanged Roller
5. 10 Tooth, 50mm, 1-3/4” Sprocket
6. Unloader Conveyer (Belted Chain)

Figure 36. Roller Components (Boom - Tank Bottom)



1. 5” Roller
2. Standoff
3. 7” Smooth Sprocket
4. 6” Nose Roller
5. 10 Tooth, 50mm, 1-3/4” Sprocket
6. 5” Flanged Roller
7. 12 Tooth, 50mm, 1-3/4” Sprocket
8. Inner Chain (Belted)
9. Outer Chain (Belted)

Figure 37. Roller Components (Elevator)



1. Pivot Bolts
2. Jam Nuts
3. Eye-Bolts

Figure 38. Grab Roll Adjustment

HOLDING TANK CHAIN GLIDES

Replaceable glides in the tank bottom provide wear surfaces for the unloader conveyer chain.

Remove worn or damaged glides and install replacement glides using new hardware.

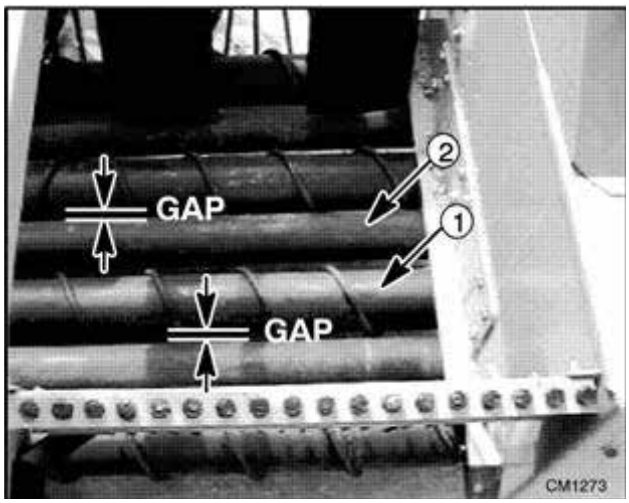
BED CHAIN ADJUSTMENT

To adjust bed chain open front door (both sides). Loosen center bolt in Pivot Bracket. Loosen Adjusting Bolt, adjust Bed Chain to allow 1/2" gap between Bed Chain and lifter wheels. Retighten Hardware.

GRAB ROLL ADJUSTMENT (Figure 38 and Figure 39)

Before working on any components on the right side of the harvester, the truck boom must be fully lowered into transport position with hydraulic pressure relieved or locked in unload position with boom locks installed. Do not work on harvester with truck boom in any intermediate position.

It is important to have an even space on the left and right sides of the harvester between the pairs of grab rolls; however, the individual pairs can have different gaps to accommodate conditions. For instance a wide gap may be helpful on the first pair of rolls to get rid of a lot of soil, and a narrow gap on the last pair may save tails. Spiral rolls are fixed in the grab roll bed.



1. Smooth Roll (Adjustable) 2. Spiral Roll (Fixed)

Figure 39. Grab Roll Gap

Open grab roll drive shields and secure. Loosen the 3/4" nut at the pivot point of the pivot arm bearing holder.

Loosen both 3/4" nuts on the eyebolt and move the smooth roll bearing housing to adjust the gap between the paired rollers. Adjust both sides of each roll pair to the same gap. When all roll pairs are adjusted to the desired gap, tighten all bolts to specifications in Bolt Torque Chart.

Check grab roll drive belt tension and adjust if necessary. (See Grab Roll Drive Belt.)

LIFTER STRUT ADJUSTMENT

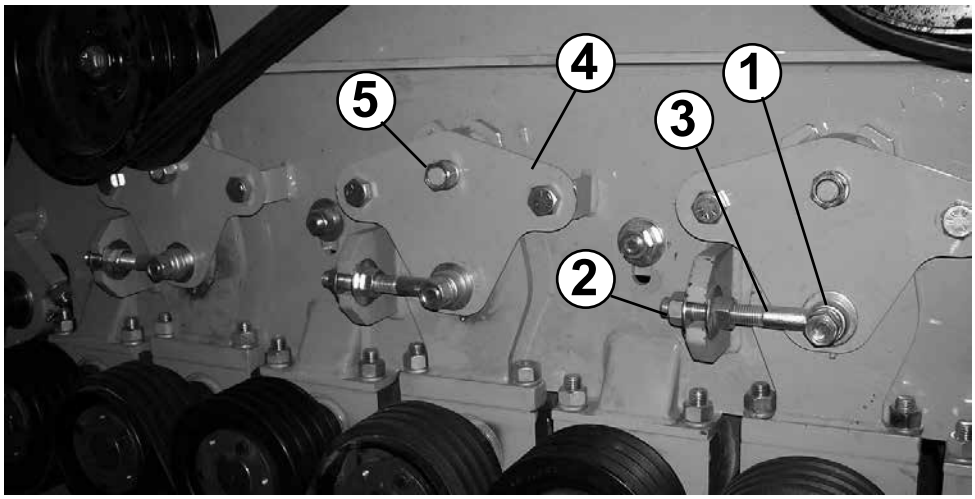
Lifter struts should be adjusted to match the row spacing of the beets being harvested. When struts are moved, paddles must be adjusted to prevent contact between paddles and lifter wheels.

Raise harvester and install transport locks (See Blocking Method).

Loosen strut mounting bolts. Slide strut to new location and tighten evenly. When moving strut, it may be necessary to loosen paddle support on paddle shaft to allow strut to be moved.

Measure to confirm correct row spacing and tighten to specifications in Bolt Torque Chart, page 13 (standard struts). Tighten optional flex strut cushion bolts to 100 lbs./ft.

Adjust paddles and paddle shaft (see Paddle Shaft Adjustment, page 42).



1. Pivot Bolts
2. Jam Nuts
3. Eye-Bolts
4. Tie Bar
5. Cushion Retaining Bolts

Figure 40. Grab Roll Cushions

LIFTER WHEEL FILLERS

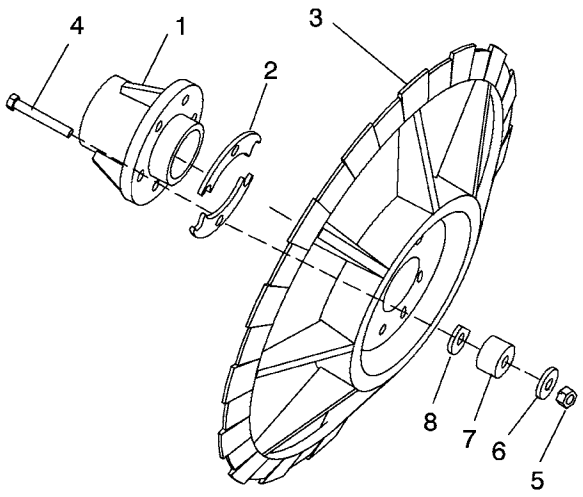
Harvesting small beets may require the use of optional fillers to prevent beets from being lost through lifter wheel spokes.

Raise harvester and install transport locks.

Remove two opposite wheel nuts from each lifter wheel.

Attach wheel fillers to the lifter wheel with a filler rod between each wheel spoke.

Re-install wheel nuts and tighten to specifications in Bolt Torque Chart.



1. Hub
2. Spacer
3. Lifter Wheel
4. Wheel Bolt
5. Wheel Nut
6. Washer
7. Wheel Cushion *
8. Notched Spacer *

* - Optional

Рис 41. Install LIfter Wheel Spacers

PADDLE SHAFT ADJUSTMENT

The paddle shaft may be adjusted to provide proper movement of beets onto the chain bed. Paddle assemblies are adjustable side-to-side to maintain an equal gap between lifter wheels. The paddle shaft may be adjusted vertically to move paddles closer to the lifter wheels. The paddle assemblies must be adjusted after any movement of lifter wheels or struts. When using flex struts, paddle shaft must be raised to the uppermost position so that wheels cannot contact paddle shaft when strut is moved rearward by contact with a rock.

Raise harvester and install transport locks (see Blocking Method, page 28). Loosen paddle assemblies on paddle shaft and adjust so that each paddle is centered between the lifter wheels.

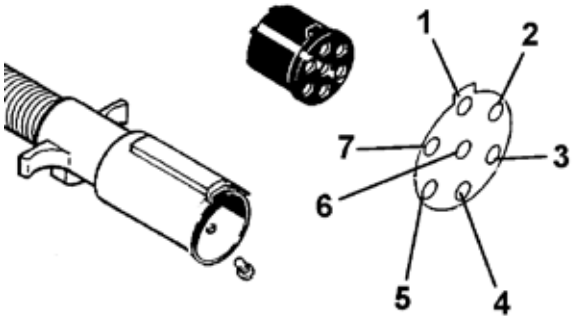
Tighten paddle assembly bolts to specifications in Bolt Torque Chart, page 15.

Loosen paddle shaft bearing housings and lift or lower shaft to provide 2-1/2" clearance between paddle shaft and lifter wheels. With flex struts installed, paddle shaft must be placed in the uppermost position. Clearance must be at least 2-1/2" to allow for strut movement.

Tighten paddle shaft bearing housings to specifications in Bolt Torque Chart, page 15.

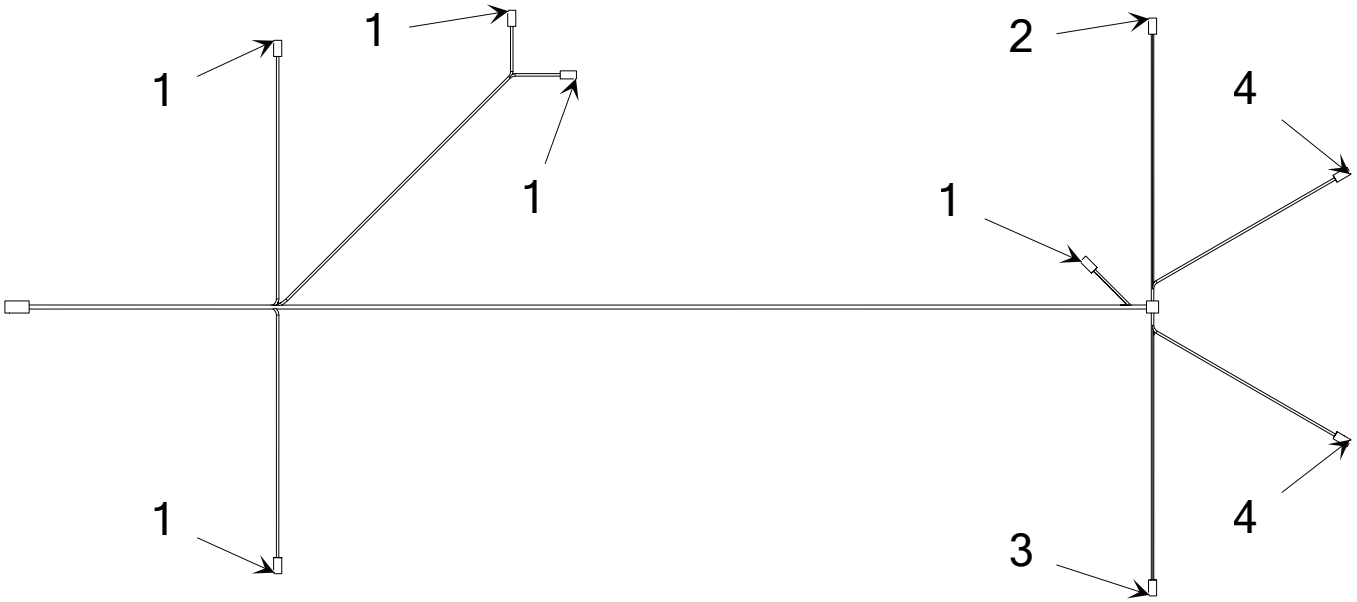
ELECTRICAL SYSTEM

The harvester is equipped with a SAE J560a 7-pin electrical connector. This provides power for turn signals, warning flashers, row finder override, boom fold selector switch, and optional rear steering switch.



1. White - Ground
2. Brown - Tail Lamp
3. Green - Right Turn Signal
4. Red - Auxiliary Power
5. Yellow - Left Turn Signal
6. Blue - Auxiliary Power
7. Black - Field Lights

Figure 45. 7-Pin Electrical Connector



1. White / Black - Field Light
2. White / Green - Right Warning Flasher
3. White / Yellow - Left Warning Flasher
4. White / Brown - Rear Tail Light

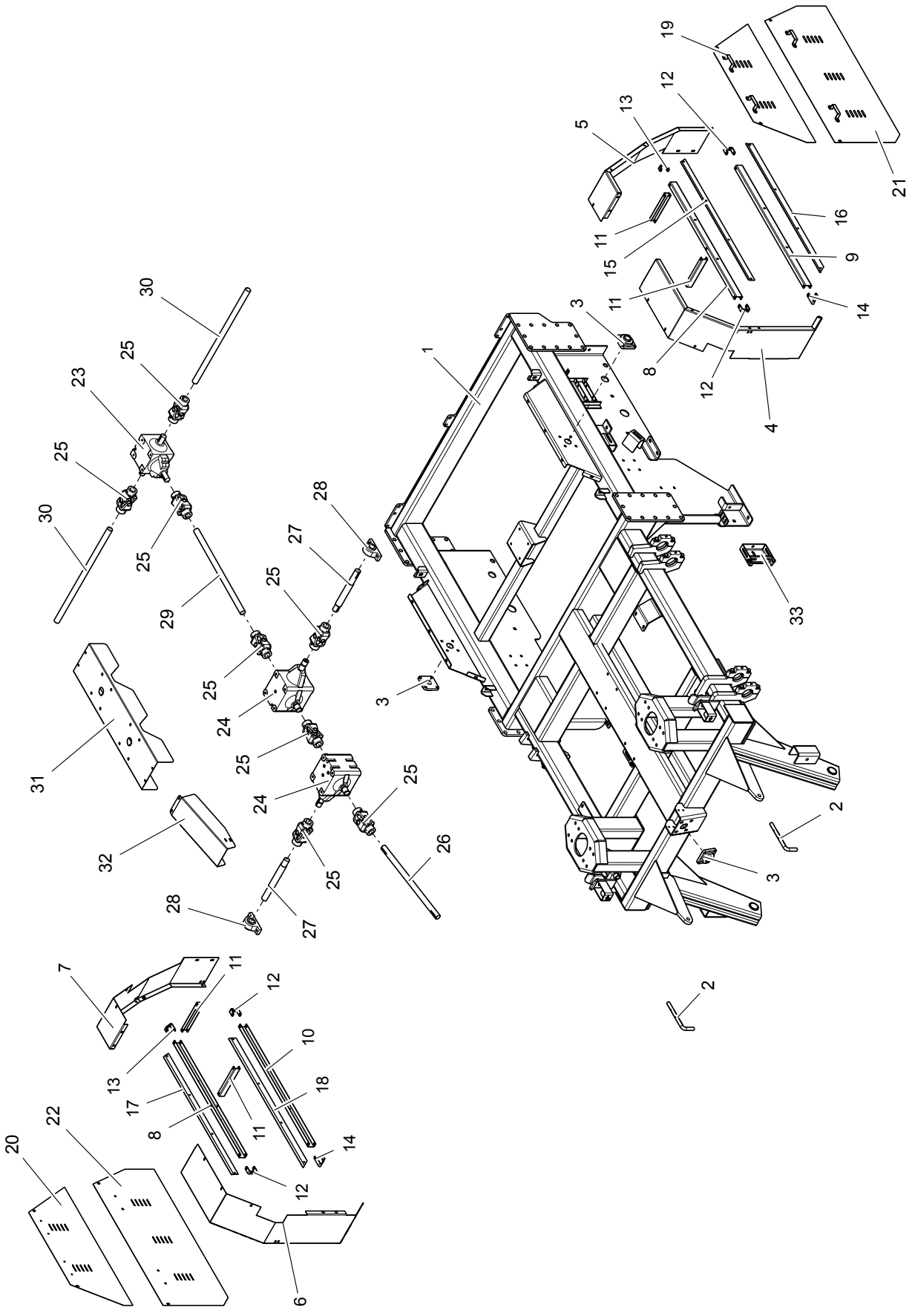
Figure 46. Harvester Wire Harness

STANDARD alloway

PARTS INDEX

FOLDING BEET HARVESTER

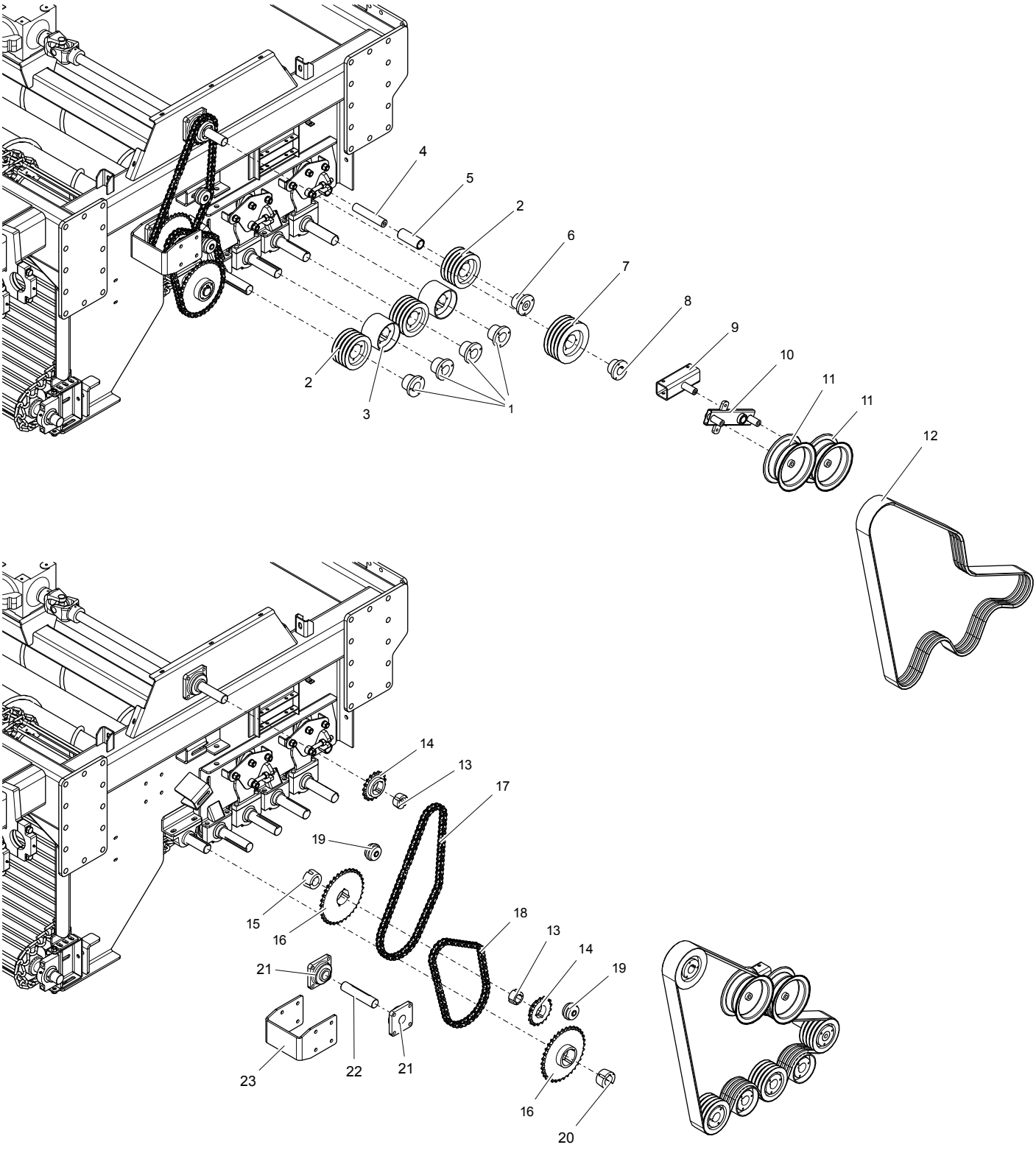
CENTER FRAME COMPONENTS



CENTER FRAME COMPONENTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0873	FRAME	1
2	700-3-2484	HINGE PIN	2
3	901-01185	4-BOLT FLANGE BEARING, 1-3/4”	3
4	700-2-0986	FRONT INNER SHIELD (LH)	1
5	700-2-0985	FRONT INNER SHIELD (RH)	1
6	700-2-0988	BACK INNER SHIELD (LH)	1
7	700-2-0989	BACK INNER SHIELD (RH)	1
8	700-3-2518	MIDDLE SUPPORT	2
9	700-3-2514	SUPPORT STRAP	1
10	700-3-2616	BOTTOM SUPPORT	1
11	700-3-2525	MIDDLE SUPPORT	4
12	700-3-2520	DOOR STOP	4
13	700-3-2521	DOOR STOP	2
14	700-3-2522	DOOR STOP	2
15	700-3-2510	MIDDLE SUPPORT	1
16	700-3-2513	BOTTOM SUPPORT	1
17	700-3-2614	MIDDLE SUPPORT	1
18	700-3-2615	BOTTOM SUPPORT	1
19	700-3-2545	TOP DOOR (LH)	1
20	700-3-2612	TOP DOOR (RH)	1
21	700-3-2508	BOTTOM DOOR (LH)	1
22	700-3-2611	BOTTOM DOOR (RH)	1
23	903-15520	GEARBOX	1
24	903-15581	GEARBOX	2
25	903-05034	U-JOINT	8
26	700-3-2383	FRONT DRIVE SHAFT	1
27	700-3-2608	WING DRIVE SHAFT	2
28	901-01272	PILLOW BLOCK BEARING, 1-3/4”	2
29	700-3-2403	REAR DRIVE SHAFT	1
30	700-3-1432	SIDE DRIVE SHAFT	2
31	700-3-2636	GEARBOX COVER	1
32	700-3-2637	FRONT SHAFT COVER	1
33	700-2-0879	CHAIN BED ADJUSTMENT BRACKET	2

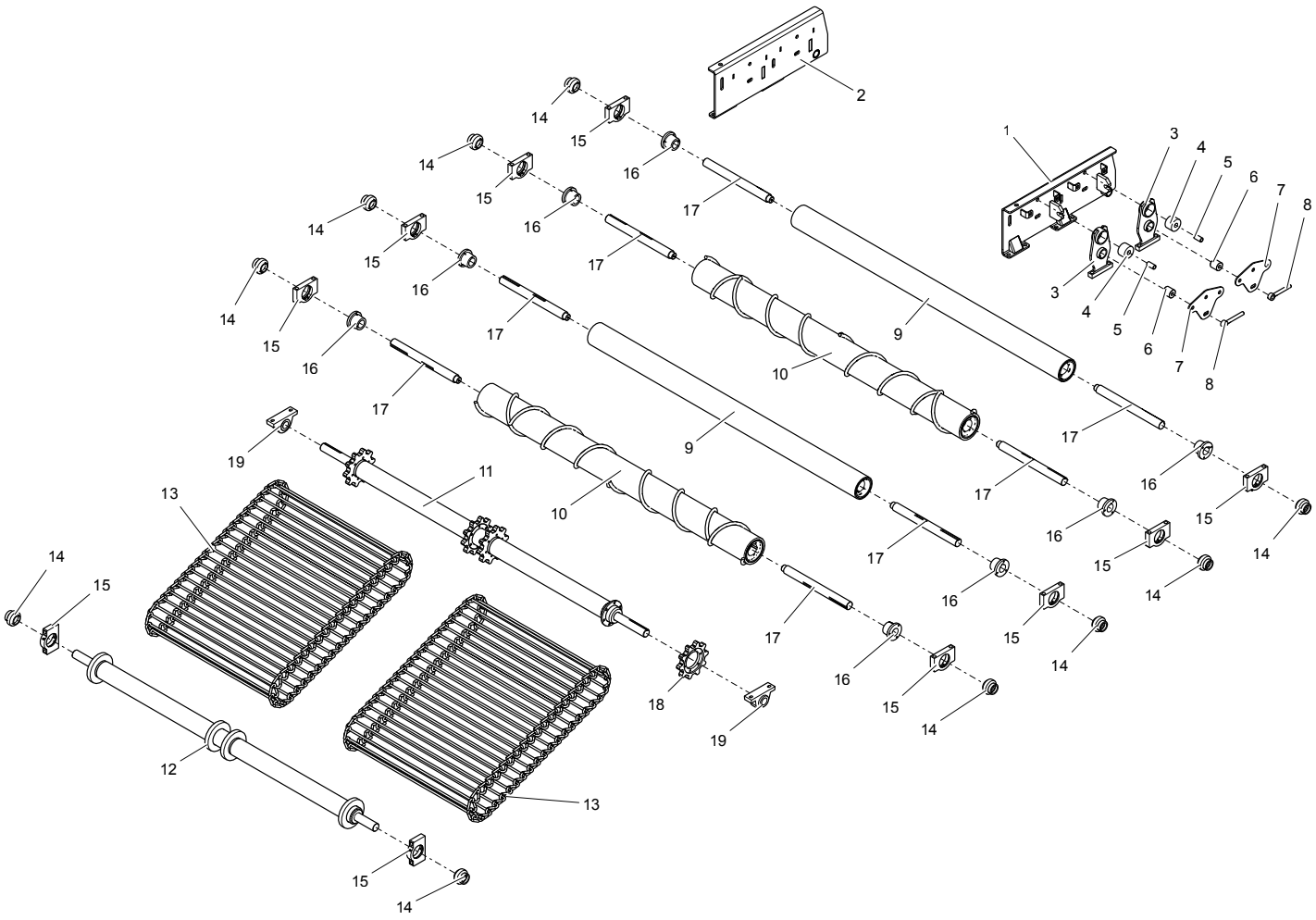
CENTER FRAME DRIVE COMPONENTS



CENTER FRAME DRIVE COMPONENTS

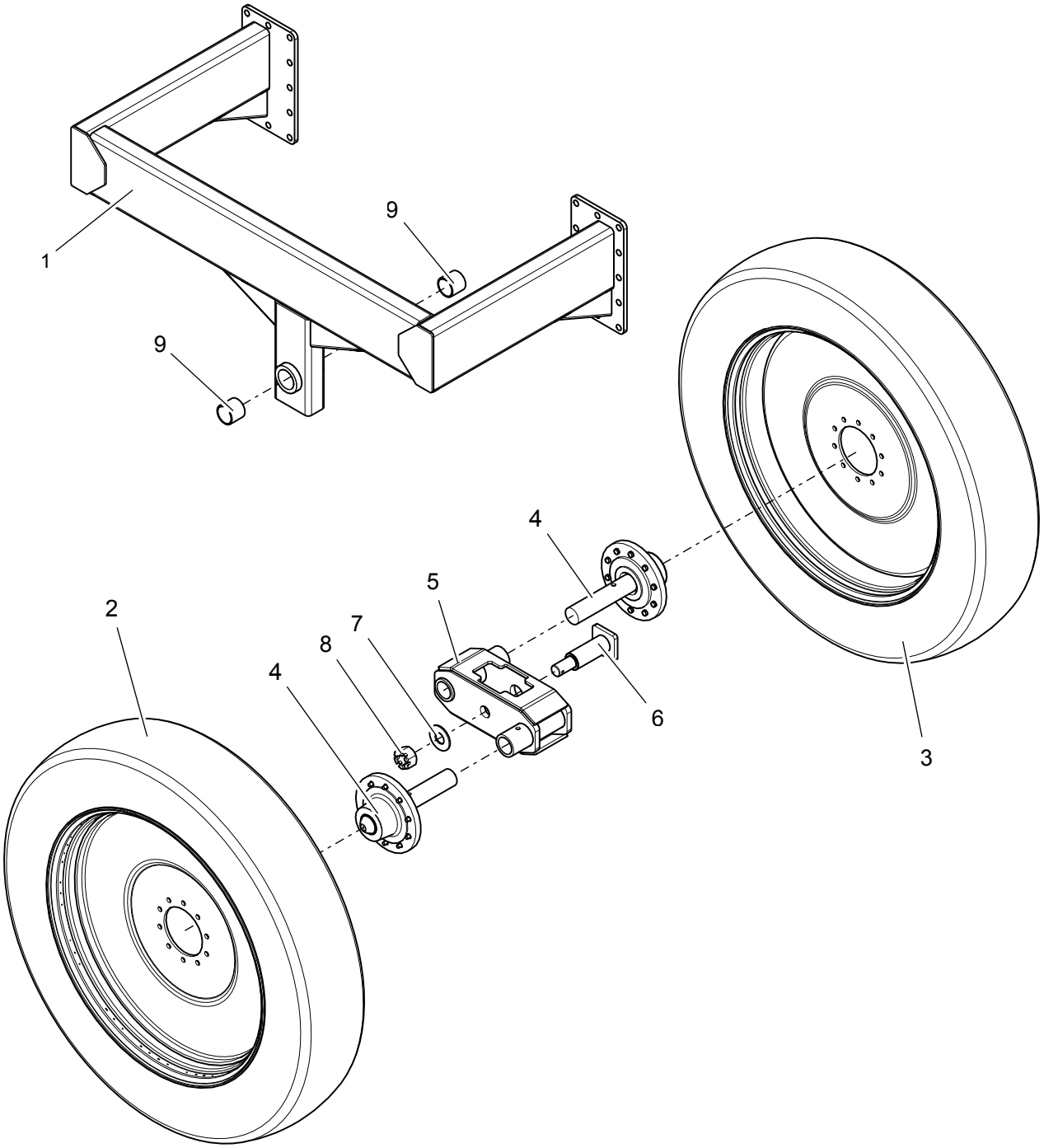
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	903-08452	Q1 HUB, 1-15/16”	16
2	903-08431	GROOVED PULLEY	6
3	700-2-0267	SMOOTH PULLEY	4
4	700-3-2411	PIVOT SHAFT	2
5	700-3-2412	PIVOT BUSHING	2
6	903-08473	IDLER BUSHING	2
7	903-08400	PULLEY	2
8	903-08416	SK HUB, 1-3/4”	2
9	700-2-0991	PIVOT BASE	2
10	700-2-0931	PIVOT ARM	2
11	500-3-1249	FLANGED PULLEY	2
12	903-01448	BELT, 4B150	2
13	903-08412	TAPER LOCK BUSHING, 1-3/4” (2012)	4
14	903-11098	SPROCKET - 80BTL17 (2012)	4
15	903-08471	TAPER LOCK BUSHING, 1-3/4” (2517)	2
16	903-11104	SPROCKET - 80BT34H (2517)	4
17	903-03180	GRAB ROLL DRIVE CHAIN	2
18	903-03179	PRIMARY DRIVE CHAIN	2
19	903-11101	IDLER SPROCKET	4
20	903-08449	TAPER LOCK BUSHING, 1-15/16” (2517)	2
21	901-01185	4-BOLT FLANGE BEARING, 1-3/4”	4
22	700-3-2340	IDLER PULLEY SHAFT	2
23	700-3-2339	IDLER BEARING PLATE	2

CENTER FRAME CHAIN BED & GRAB ROLL COMPONENTS



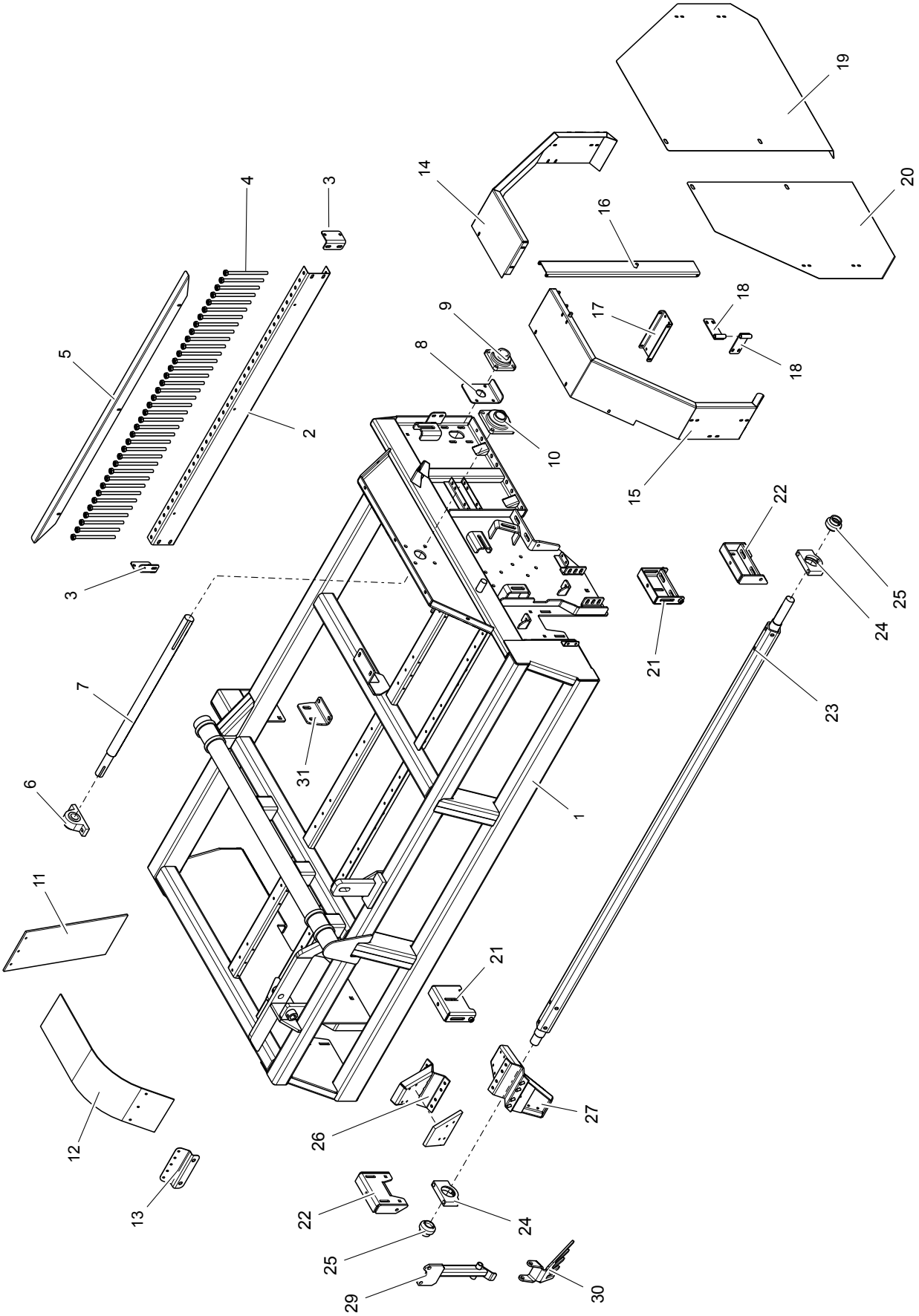
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0915	GRAB ROLLER ADJUSTMENT PLATE (LH)	1
2	700-2-0917	GRAB ROLLER ADJUSTMENT PLATE (RH)	1
3	700-2-0375	SWING ARM	4
4	700-3-0557	RUBBER SLEEVE	4
5	700-3-0609	PIVOT BUSHING	4
6	700-3-0458	KNURLED BUSHING	4
7	700-3-0753	TIE STRAP	4
8	900-03463	EYE BOLT, 3/4” NC x 6”	4
9	700-2-0942	SMOOTH GRAB ROLLER	2
10	700-2-0940	SPIRAL GRAB ROLLER	2
11	700-2-0944	CHAIN BED DRIVE TUBE	1
12	700-2-0913	CHAIN BED IDLER TUBE	1
13	903-03181	HOOK CHAIN (42”)	2
14	901-01280	INSERT BEARING, 1-15/16”	10
15	700-2-0377	BEARING BOCK	10
16	903-08452	Q1 HUB, 1-15/16”	16
17	700-3-0913	DRIVE SHAFT	8
18	700-3-0809	CHAIN BED SPROCKET	4
19	901-01272	PILLOW BLOCK BEARING, 1-3/4”	4

STRUT COMPONENTS



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0919	REAR STRUT (LH)	1
	700-2-0924	REAR STRUT (RH)	
2	700-2-0963	WHEEL / TIRE ASSY (LH)	1
3	700-2-0964	WHEEL / TIRE ASSY (RH)	1
4	700-2-0553	WHEEL SPINDLE	2
5	700-2-0885	SPINDLE HOLDER	1
6	700-2-0922	TANKDEM AXLE PIVOT PIN	1
7	900-11048	FLAT WASHER, 2”	1
8	900-06239	SLOTTED NUT, 2”	1
9	901-01344	SPLIT BUSHING	2

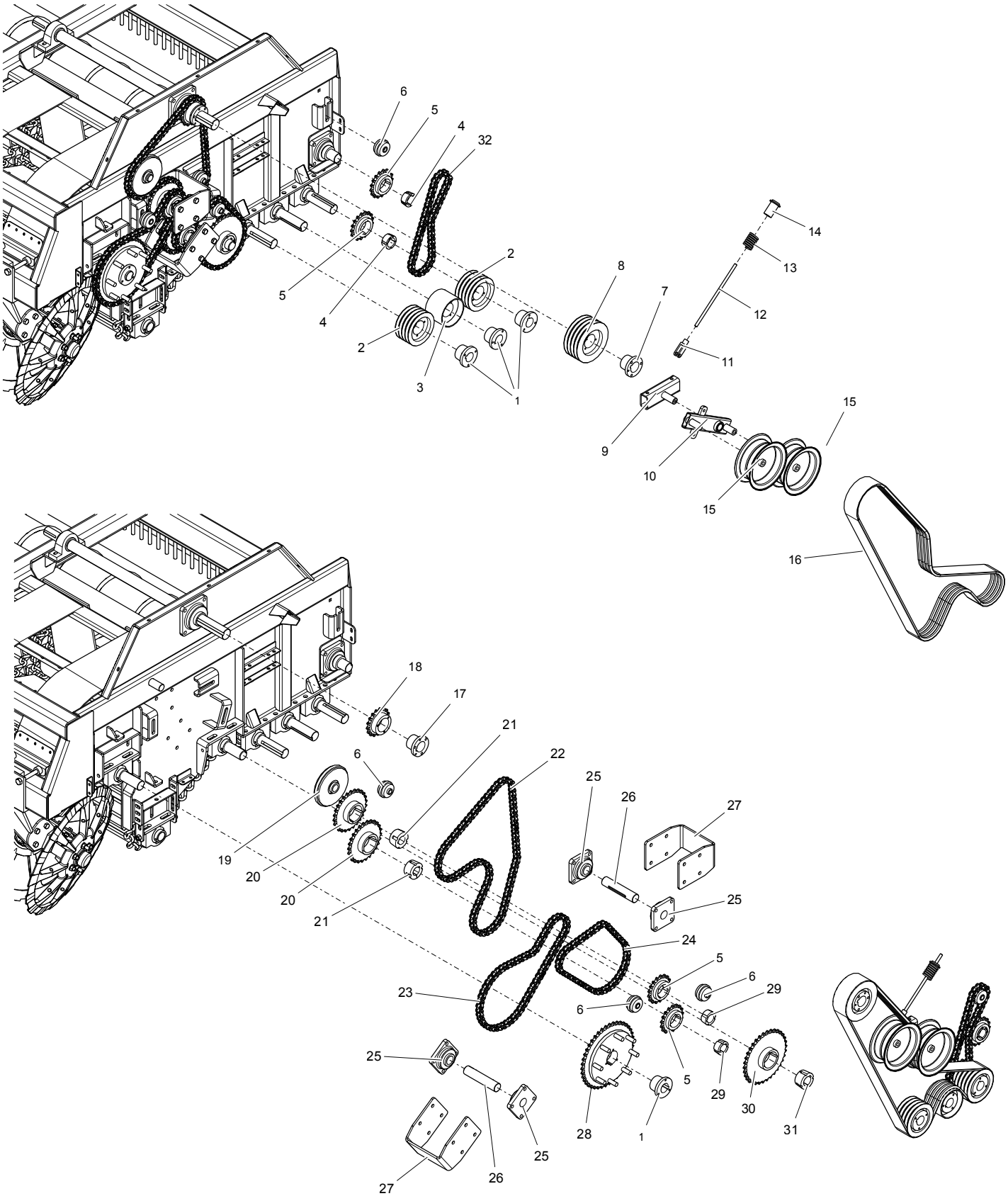
WING FRAME COMPONENTS



WING FRAME COMPONENTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0934	WING FRAME (LH)	1
	700-2-0878	WING FRAME (RH)	
2	700-3-1996	REAR BARRIER CLIP	1
3	700-3-2418	REAR BARRIER SUPPORT BRACKET	2
4	700-2-0918	REAR BARRIER ROD	37
5	700-3-2424	REAR BARRIER CAP	1
6	901-01272	PILLOW BLOCK BEARING (1-3/4”)	1
7	700-3-2369	WING DRIVE SHAFT	1
8	700-3-2493	BEARING PRESSURE PLATE	1
9	901-01282	BEARING (1-15/16”)	1
10	901-01311	BEARING (2-3/16”)	1
11	700-3-0317	PADDLE DEFLECTOR	6
12	700-3-1762	PADDLE COVER	6
13	700-3-0807	PADDLE COVER MOUNT	6
14	700-3-2492	REAR SHIELD WRAP (LH)	1
	700-3-2573	REAR SHIELD WRAP (RH)	
15	700-2-0959	FRONT SHIELD WRAP (RH)	1
	700-2-0976	FRONT SHIELD WRAP (LH)	
16	700-2-0960	DOOR CHANNEL	1
17	700-3-2497	BOTTOM DOOR CHANNEL	1
18	700-2-0956	DOOR HINGE	8
19	700-3-2503	REAR DOOR (LH)	1
	700-3-2575	REAR DOOR (RH)	
20	700-3-2502	FRONT DOOR (LH)	1
	700-3-2574	FRONT DOOR (RH)	
21	700-2-0879	CHAIN BED ADJUSTMENT BRACKET	2
22	700-2-0938	PADDLE SHAFT ADJUSTMENT BRACKET	2
23	700-2-0566	PADDLE SHAFT	1
24	700-2-0377	BEARING BLOCK	2
25	901-01280	INSERT BEARING (1-15/16”)	2
26	700-2-0069	SINGLE PADDLE HALF	6
27	700-2-0070	DUAL PADDLE HALF	6
28	700-3-1207	RUBBER PADDLE FLAPS	18
29	700-2-0929	FRONT BARRIER HOLDER	5
30	700-3-1483	FRNT BARRIER	5
31	700-3-2417	REAR GRAB ROLL ADJUSTMENT BRACKET	1

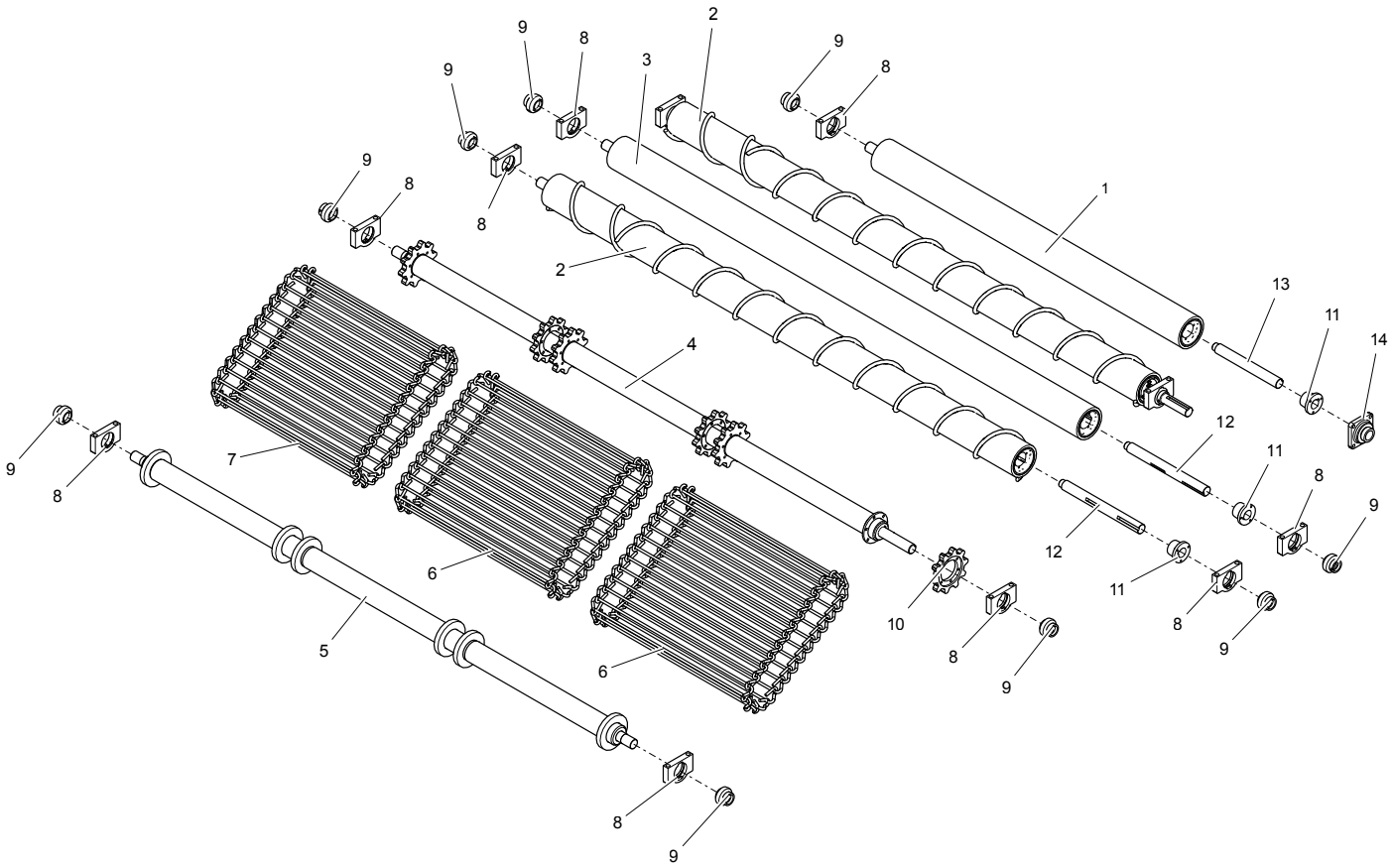
WING DRIVE COMPONENTS



WING DRIVE COMPONENTS

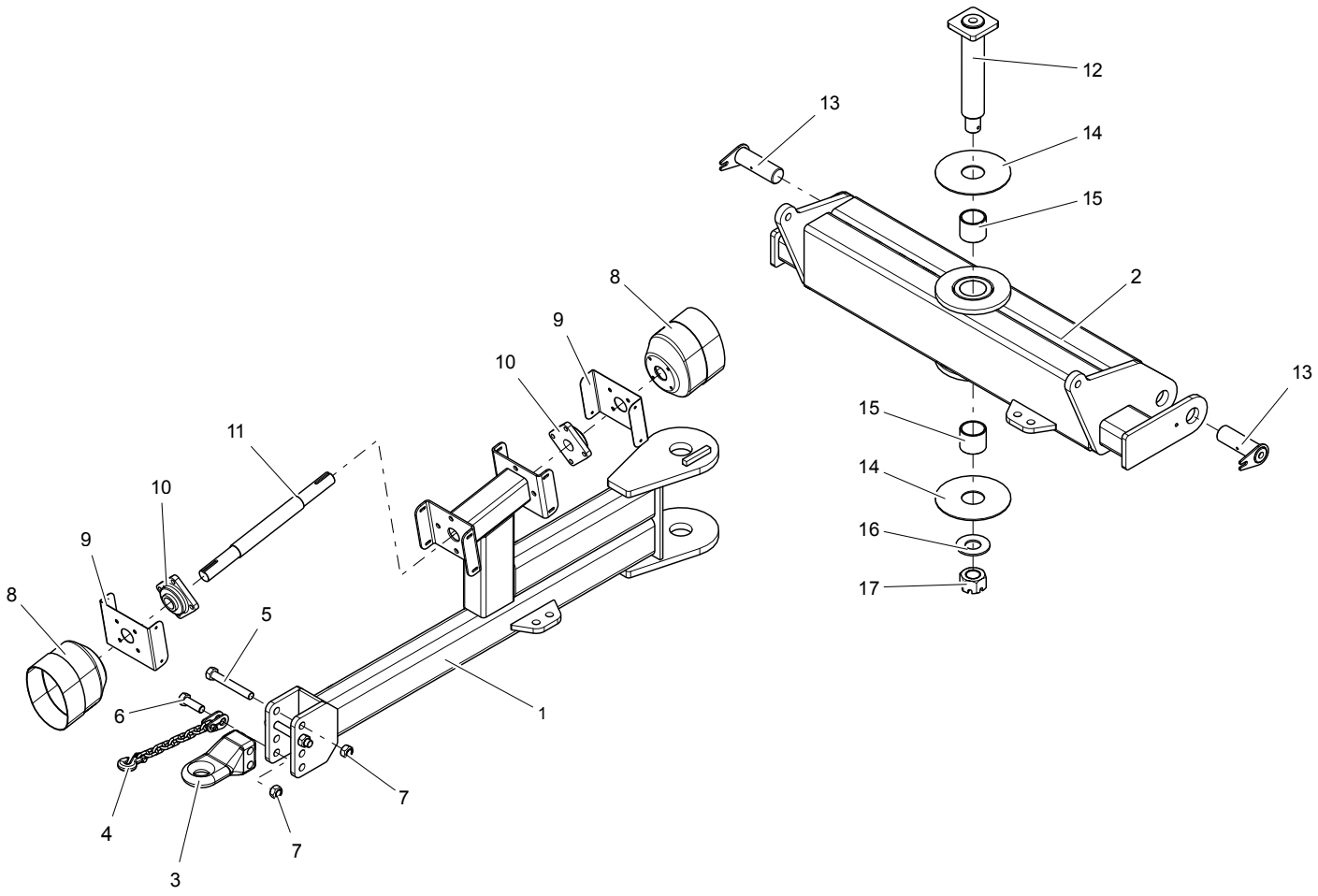
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	903-08452	Q1 HUB (1-15/16”)	8
2	903-08431	GROOVED PULLY	2
3	700-2-0267	6” FLAT PULLEY	1
4	903-08450	TAPERED HUB - 1-15/16” (2012)	2
5	903-11098	SPROCKET - H80BT17 (2012)	4
6	903-11101	IDLER SPROCKET	4
7	903-08476	SK BUSHING (2-3/16”)	1
8	903-08400	DRIVE SHAFT PULLEY	1
9	700-2-0721	TENSIONER PIVOT BASE	1
10	700-2-0931	TENSIONER PIVOT ARM	1
11	900-42053	CLEVIS	1
12	700-3-2596	THREADED ROD	1
13	905-14005	SPRING	1
14	500-2-0580	SPRING SUPPORT	1
15	500-3-1249	FLANGED PULLEY	2
16	903-01449	BELT - 4B136	1
17	903-08475	Q1 HUB (2-3/16”)	1
18	903-11109	SPROCKET - 80Q17 (Q1)	1
19	903-11102	8” IDLEMASTER	1
20	903-11103	SPROCKET - 80BT25H (2517)	2
21	903-08471	TAPER LOCK BUSHING - 1-3/4” (2517)	2
22	903-03176	PRIMARY DRIVE CHAIN (#80-1)	1
23	903-03175	PADDLE SHAFT DRIVE CHAIN (#80-1)	1
24	903-03177	CHAIN BED DRIVE CHAIN (#80-1)	1
25	901-01185	4-BOLT FLANGE BEARING (1-3/4”)	4
26	700-3-2340	IDLER PULLEY SHAFT	2
27	700-3-2339	IDLER BEARING MOUNT	2
28	903-11105	TORQUE LIMITER	1
29	903-08412	TAPER LOCK BUSHING - 1-3/4” (2012)	2
30	903-11104	SPROCKET - 80BT34H (2517)	1
31	903-08449	TAPER LOCK BUSHING - 1-15/16” (2517)	1
32	903-03174	REAR GRAB ROLL DRIVE CHAIN	1

WING CHAIN BED & GRAB ROLL COMPONENTS



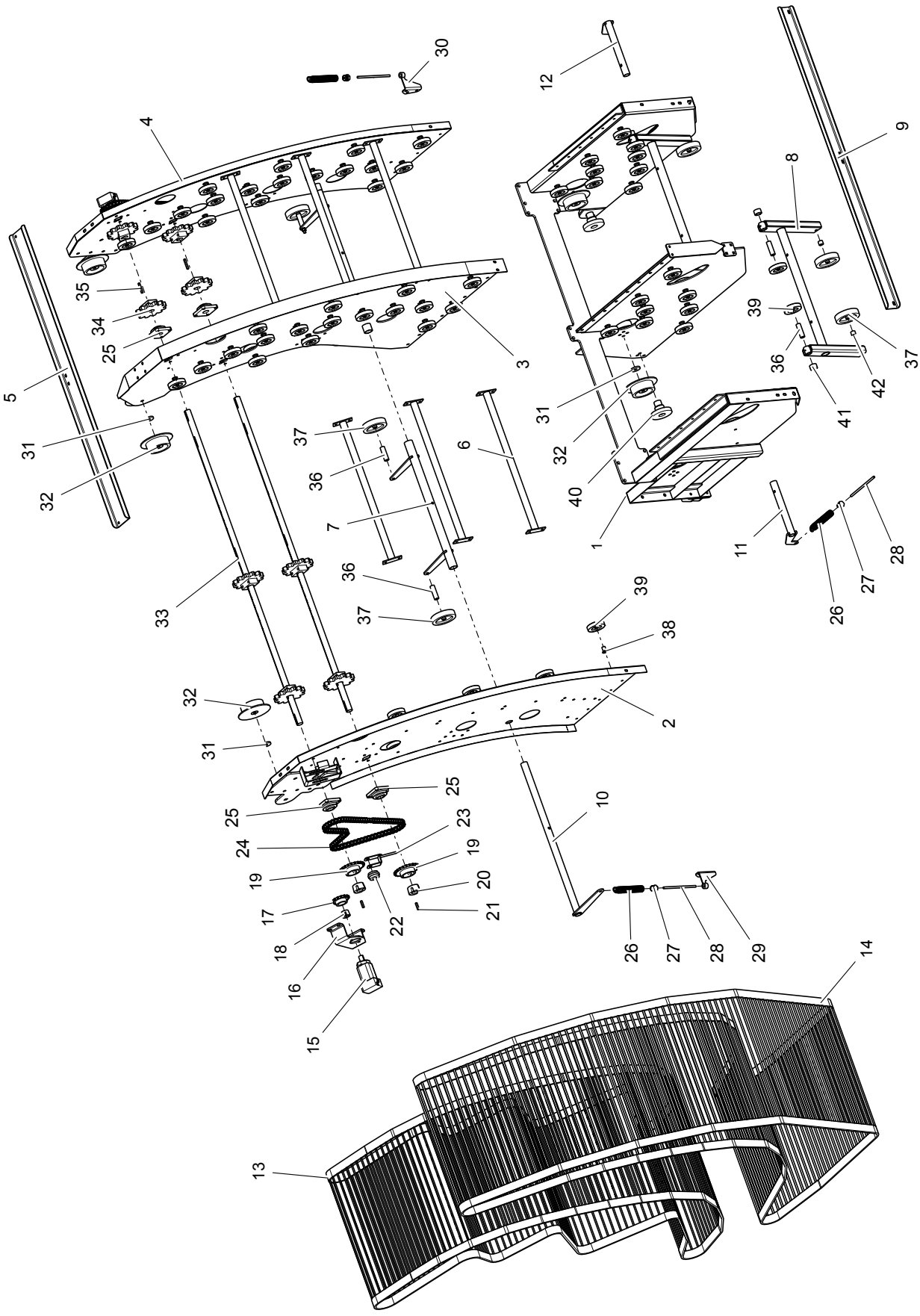
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0926	SHORT SMOOTH GRAB ROLL	1
2	700-2-0939	SPIRAL GRAB ROLL (LH)	2
	700-2-0608	SPIRAL GRAB ROLL (RH)	
3	700-2-0900	SMOOTH GRAB ROLL	1
4	700-2-0803	CHAIN BED DRIVE TUBE	1
5	700-2-0904	CHAIN BED IDLER TUBE	1
6	903-03172	CHAIN BED (42”)	2
7	903-03173	CHAIN BED (39”)	1
8	700-2-0377	BEARING BLOCK	11
9	901-01280	INSERT BEARING (1-15/16”)	1
10	700-3-0809	CHAIN BED SPROCKET	6
11	903-08452	Q1 HUB (1-15/16”)	4
12	700-3-0913	GRAB ROLL DRIVE SHAFT	3
13	700-3-2415	SHORT GRAB ROLL DRIVE SHAFT	1
14	901-01282	BEARING (1-15/16”)	1

HITCH COMPONENTS



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0912	FRONT HITCH	1
2	700-2-0546	INNER HITCH	1
3	505-3-0831	CAT - 3 HITCH	1
4	905-07123	SAFETY TOW CHAIN (21,000 LB)	1
5	900-02930	HEX HEAD BOLT, 1”-8 x 7”	2
6	900-01519	HEX HEAD BOLT, 1”-8 x 3”	1
7	900-06514	TOP LOCK NUT, 1”-8	3
8	903-18007	PTO BELL	2
9	500-3-2164	GUARD BRACKET	2
10	901-01185	4-BOLT FLANGE BEARING (1-3/4”)	2
11	700-3-2357	PTO TRANSFER SHAFT	1
12	700-2-0340	POLE PIN	1
13	700-2-0019	HITCH MOUNT PIN	2
14	700-3-0741	THRUST WASHER	2
15	901-01344	SPLIT BUSHING	2
16	900-11048	FLAT WASHER, 2”	1
17	900-06239	SLOTTED NUT, 2”-4 1/2	1
-	700-2-0545	COMPLETE HITCH ASSY	-

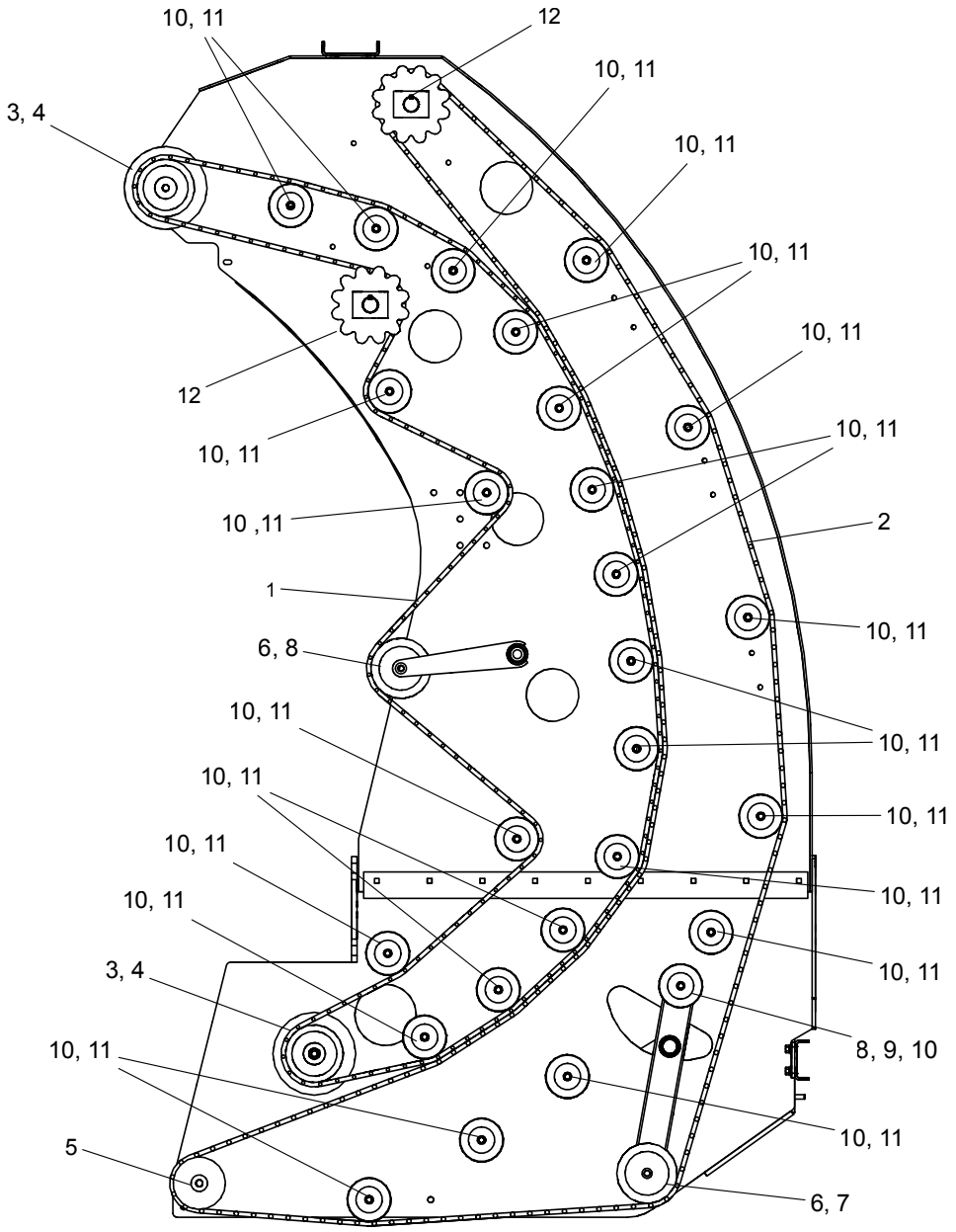
ELEVATOR COMPONENTS



ELEVATOR COMPONENTS

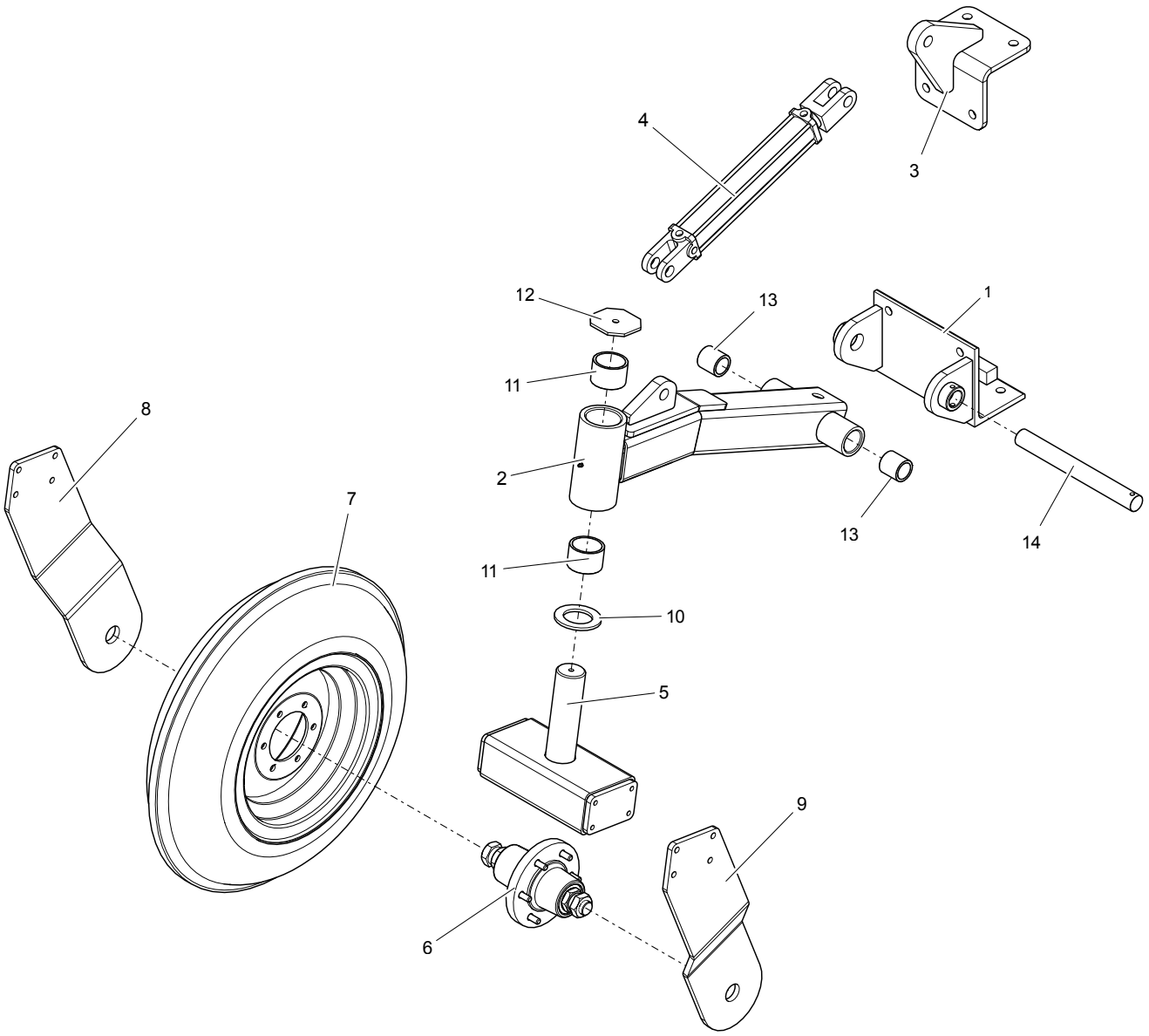
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0909	LOWER ELEVATOR MOUNT *INCLUDES #9*	1
2	700-2-0887	UPPER ELEVATOR SIDE (LH)	1
3	700-2-0948	UPPER ELEVATOR SIDE (CENTER)	1
4	700-2-0888	UPPER ELEVATOR SIDE (RH)	1
5	700-3-2468	TOP CHANNEL	1
6	700-2-0023	SPREADER BAR	6
7	700-2-0949	UPPER INSIDE TENSION ARM	2
8	700-2-0028	LOWER INSIDE TENSION ARM	2
9	700-3-2467	BACK CHANNEL	1
10	700-2-0950	UPPER OUTSIDE TENSION ARM	2
11	700-2-0381	LOWER OUTSIDE TENSION ARM (LH)	1
12	700-2-0844	LOWER OUTSIDE TENSION ARM (RH)	1
13	903-03170	INSIDE BELTED CHAIN	1
14	903-03169	OUTSIDE BELTED CHAIN	1
15	904-05223	HYDRAULIC DRIVE MOTOR	2
16	700-3-2471	HYDRAULIC MOTOR MOUNT	2
17	903-11107	MOTOR SPROCKET (1615)	2
18	903-08474	TAPER-LOCK BUSHING (1615)	2
19	903-11108	DRIVE SPROCKET (2517)	4
20	903-08471	TAPER-LOCK BUSHING (2517)	4
21	100-3-3333	DRIVE SPROCKET KEY	4
22	903-11101	IDLER SPROCKET	2
23	700-2-0947	IDLER TENSIONER BRACKET	2
24	903-03178	HYDRAULIC MOTOR DRIVE CHAIN	2
-	903-03168	#80-1 CONNECTING LINK	1
-	903-03167	#80-1 HALF LINK	-
25	901-01185	BEARING, 4-BOLT FLANGE	6
26	700-3-1253	TENSIONER SPRING	4
27	700-3-1252	SPRING PLUG	4
28	700-3-1255	TENSIONER ROD	4
29	700-2-0972	TENSIONER BRACKET (LH)	1
30	700-2-0030	TENSIONER BRACKET (RH)	1
31	500-3-1463	WASHER	8
32	903-08437	FLANGED ROLLER (6.5”)	8
33	700-3-2470	DRIVE SHAFT	2
34	903-11067	DRIVE SHAFT SPROCKET	8
35	120-3-0192	DRIVE SHAFT SPROCKET KEY	8
36	700-3-0417	SLEEVE	8
37	903-08425	ROLLER (7”)	8
38	903-08424	SPACER	100
39	903-08433	ROLLER (5”)	104
40	903-08435	ROLLER (6”)	4
41	700-3-0547	LOWER TENSIONER SPACER	4
42	700-3-1805	SPACER TUBE	4

ROLLER COMPONENTS (ELEVATOR)



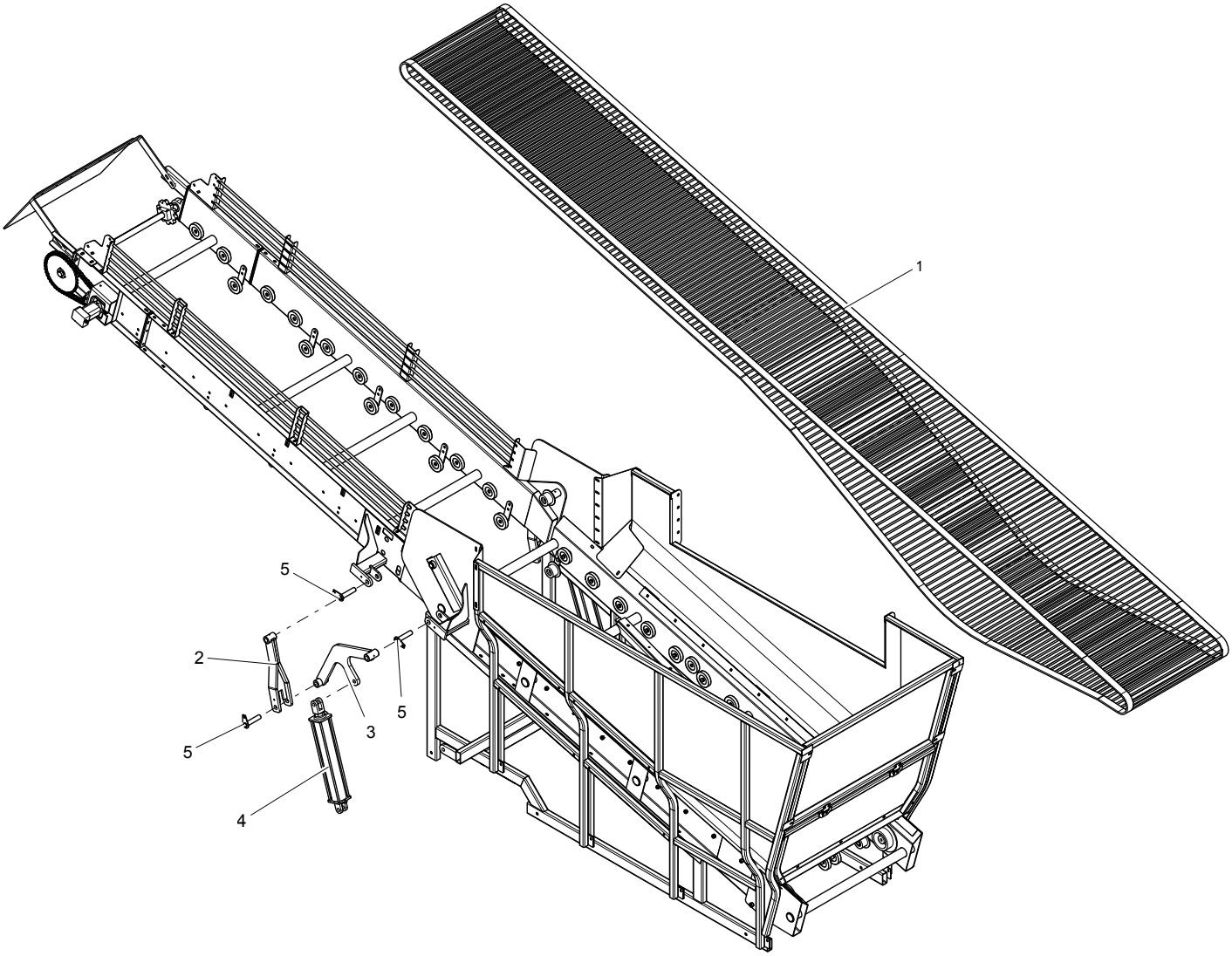
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	903-03170	INSIDE BELTED CHAIN	2
2	903-03169	OUTSIDE BELTED CHAIN	2
-	903-03135	BELTED CHAIN REPAIR SPLICE	-
-	903-03134	4’ CHAIN EXTENSION	-
3	903-08437	FLANGED ROLLER (6.5”)	8
4	500-3-1463	WASHER	8
5	903-08435	ROLLER (6”)	4
6	903-08425	ROLLER (7”)	8
7	700-3-1805	SPACER TUBE	4
8	700-3-0417	SLEEVE	8
9	700-3-0547	LOWER TENSIONER SPACER	4
10	903-08433	ROLLER (5”)	104
11	903-08424	SPACER	100
12	903-11067	DRIVE SHAFT SPROCKET	8

STABILIZER WHEEL COMPONENTS



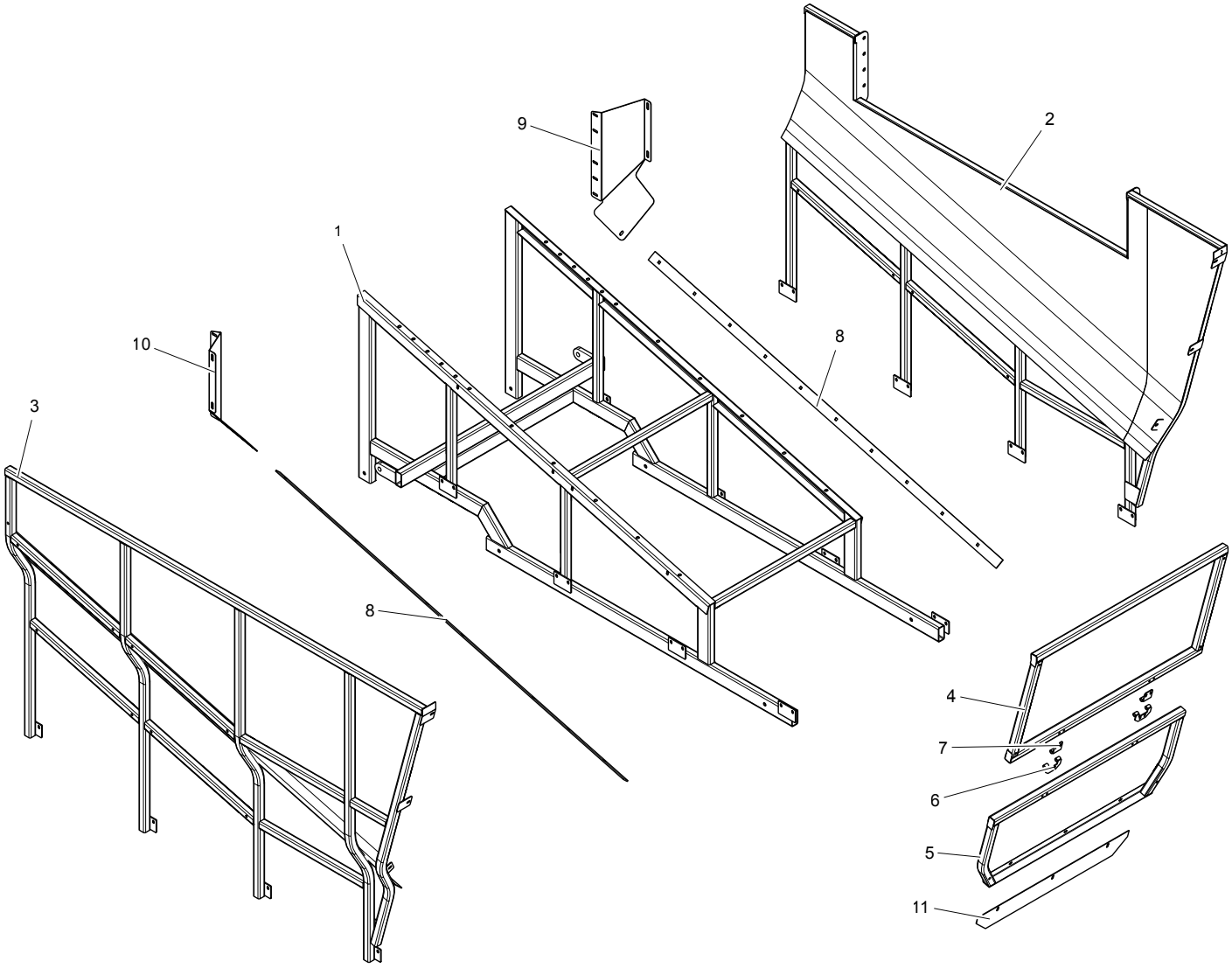
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0983	FRONT STABILIZER MOUNT	1
2	700-2-0982	STABILIZER ARM	1
3	700-2-0984	UPPER CYLINDER MOUNT	1
4	905-21453	CYLINDER, 2” X 12”	1
5	200-2-0689	CASTER PIVOT	1
6	200-2-0928	SPINDLE	1
7	200-2-0988	TIRE / WHEEL ASSY	1
8	200-3-2621	SIDE PLATE (LH)	1
9	200-3-2622	SIDE PLATE (RH)	1
10	200-3-1233	OILITE WASHER	1
11	200-3-1766	CASTER PIVOT BUSHING	2
12	200-3-1219	TUBE CAP	1
13	901-01146	BRONZE BUSHING	2
14	700-3-2600	PIVOT	1

TANK COMPONENTS



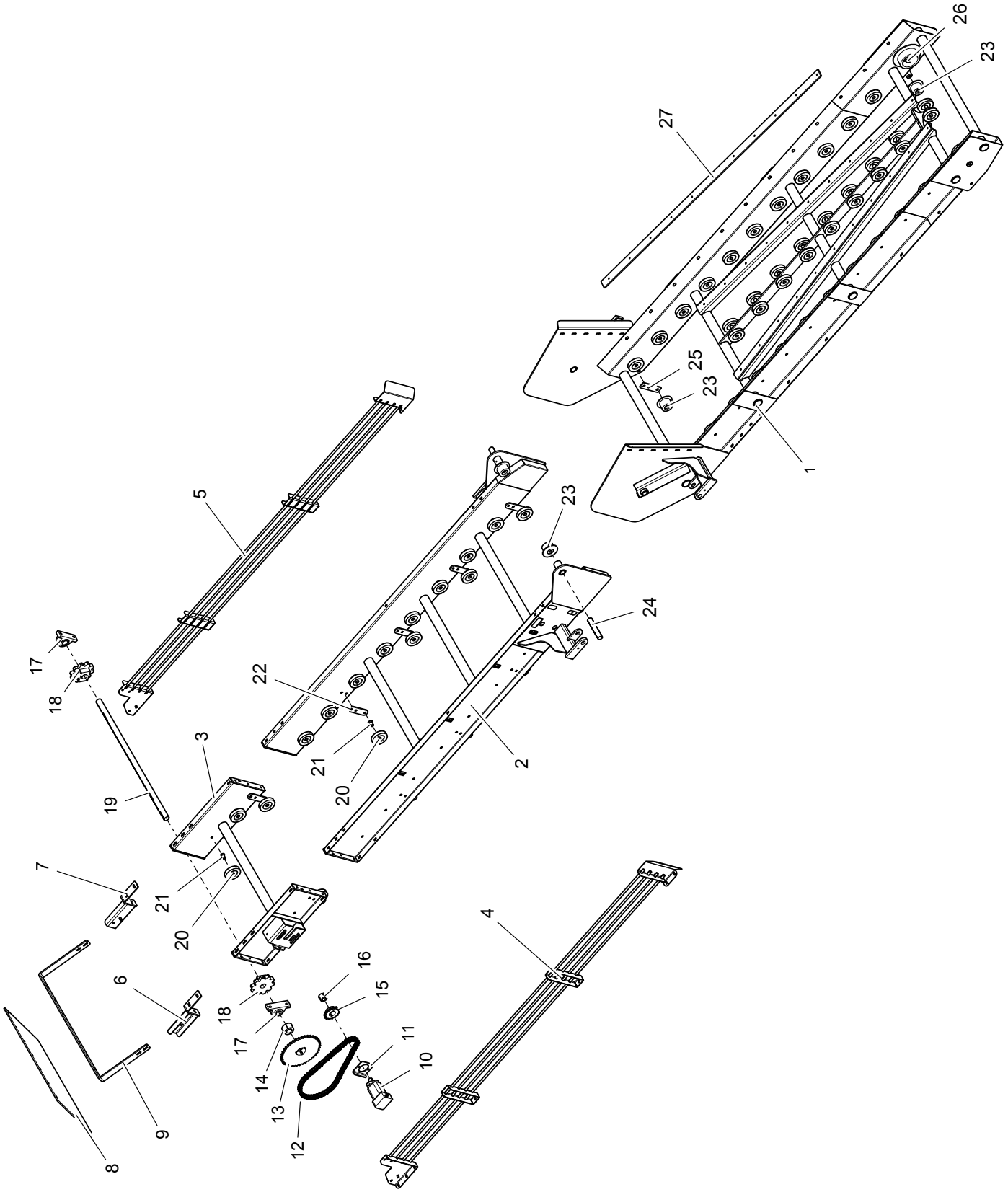
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	903-03182	CONVEYOR BELTED CHAIN	1
2	700-2-0968	BOOM PIVOT BAR	2
3	700-2-0967	PUSH ARM	2
4	905-21417	CYLINDER, 4” X 24”	2
5	500-2-0684	PIN, 1-1/4”	6

TANK FRAME COMPONENTS



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0966	UNDERCARRIAGE FRAME	1
2	700-2-0974	HOPPER BACK	1
3	700-2-0971	HOPPER FRONT	1
4	700-2-0977	TANK GATE	1
5	700-2-0980	HINGED GATE	1
6	700-2-0979	LOWER HINGE HALF	2
7	700-2-0978	UPPER HINGE HALF	2
8	700-3-2592	MESH HOLDER STRIP	2
9	700-3-2594	BACK TANK SUPPORT GUSSET	1
10	700-3-2595	FRONT TANK SUPPORT GUSSET	1
11	700-3-2593	ADJUSTABLE SLIDE GATE	1

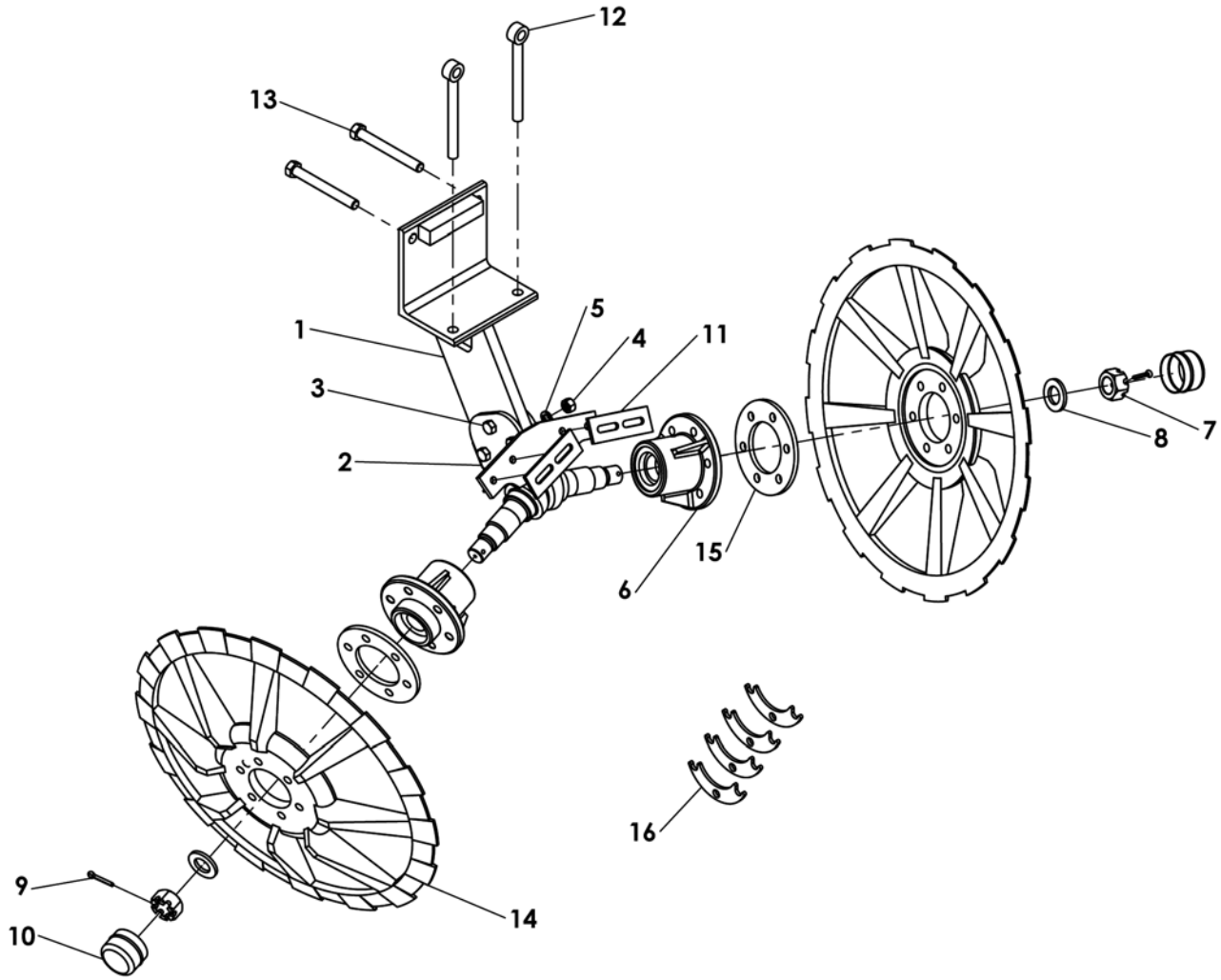
TANK CONVEYOR COMPONENTS



TANK CONVEYOR COMPONENTS

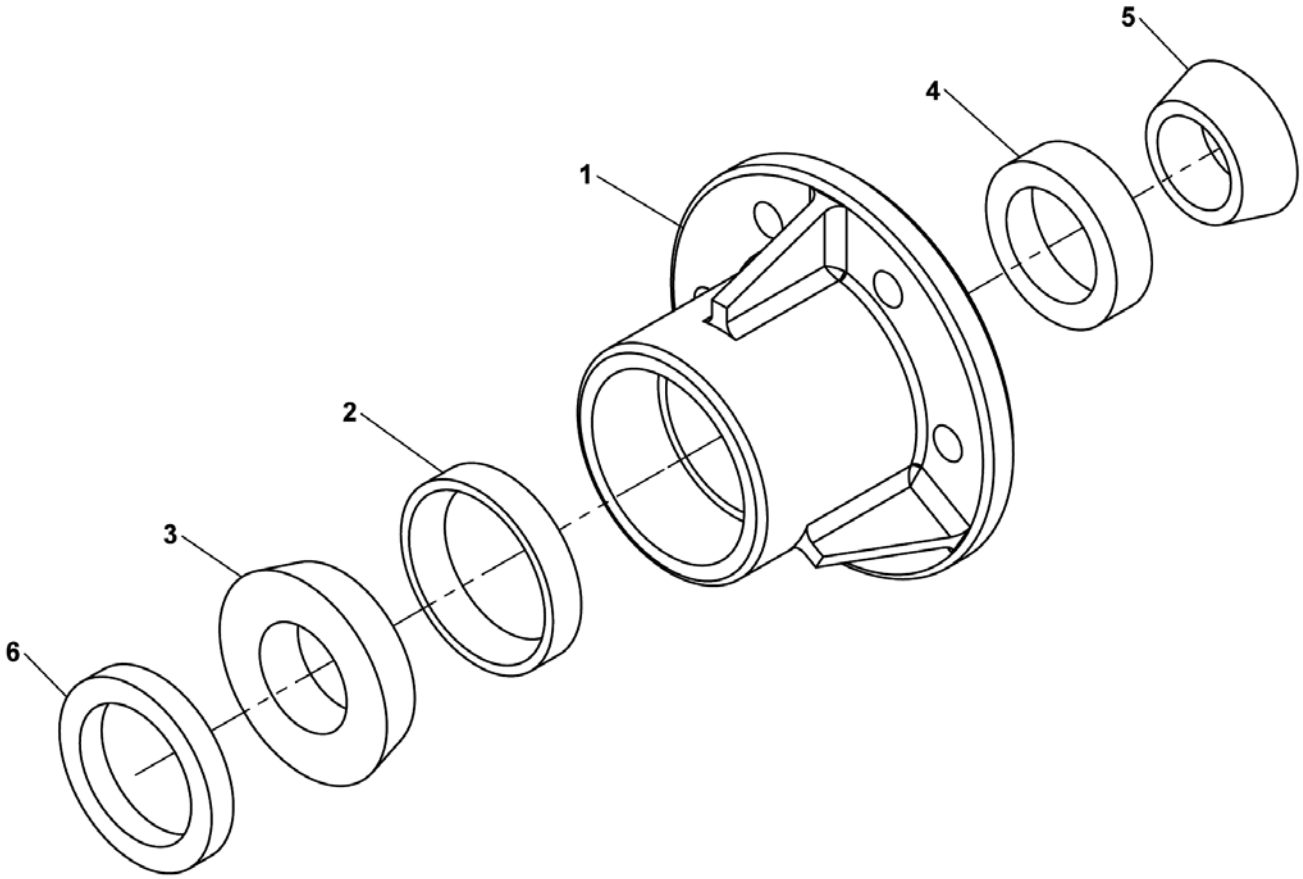
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0955	LOWER FRAME	1
2	700-2-2073	BOOM	1
3	700-2-0869	BOOM EXTENSION	1
4	700-2-0832	SIDE RAIL (LH)	1
5	700-2-0833	SIDE RAIL (RH)	1
6	700-2-0992	BOOM STOP (RH)	1
7	700-2-0993	BOOM STOP (LH)	1
8	700-3-1220	RUBBER FLAP	1
9	700-3-1860	DEFLECTOR BAR	1
10	904-05223	DRIVE MOTOR	1
11	700-3-0894	MOTOR MOUNT	1
12	903-03183	BOOM DRIVE CHAIN	1
13	903-11110	SPROCKET - 80BTL40H (2517)	1
14	903-08471	TAPER LOCK BUSHING, 1-3/4” (2517)	1
15	903-11107	SPROCKET - 80BTL15 (1615)	1
16	903-08474	TAPER LOCK BUSHING, 1-1/4” (1615)	1
17	901-01272	PILLOW BLOCK BEARING, 1-3/4”	2
18	903-11068	BELTED CHAIN SPROCKET	2
19	700-3-0086	DRIVE SHAFT	1
20	903-08433	5” ROLLER	70
21	903-08424	SPACER	68
22	700-3-0230	ROLLER DROP STRAP	10
23	903-08426	3.5” FLANGED ROLLER	6
24	700-3-2117	PIVOT PIN	2
25	700-3-1861	ROLLER DROP STRAP	2
26	903-08437	6.5” FLANGED ROLLER	2
27	700-3-1728	TANK SLIDE	2

DIGGER STRUT COMPONENTS



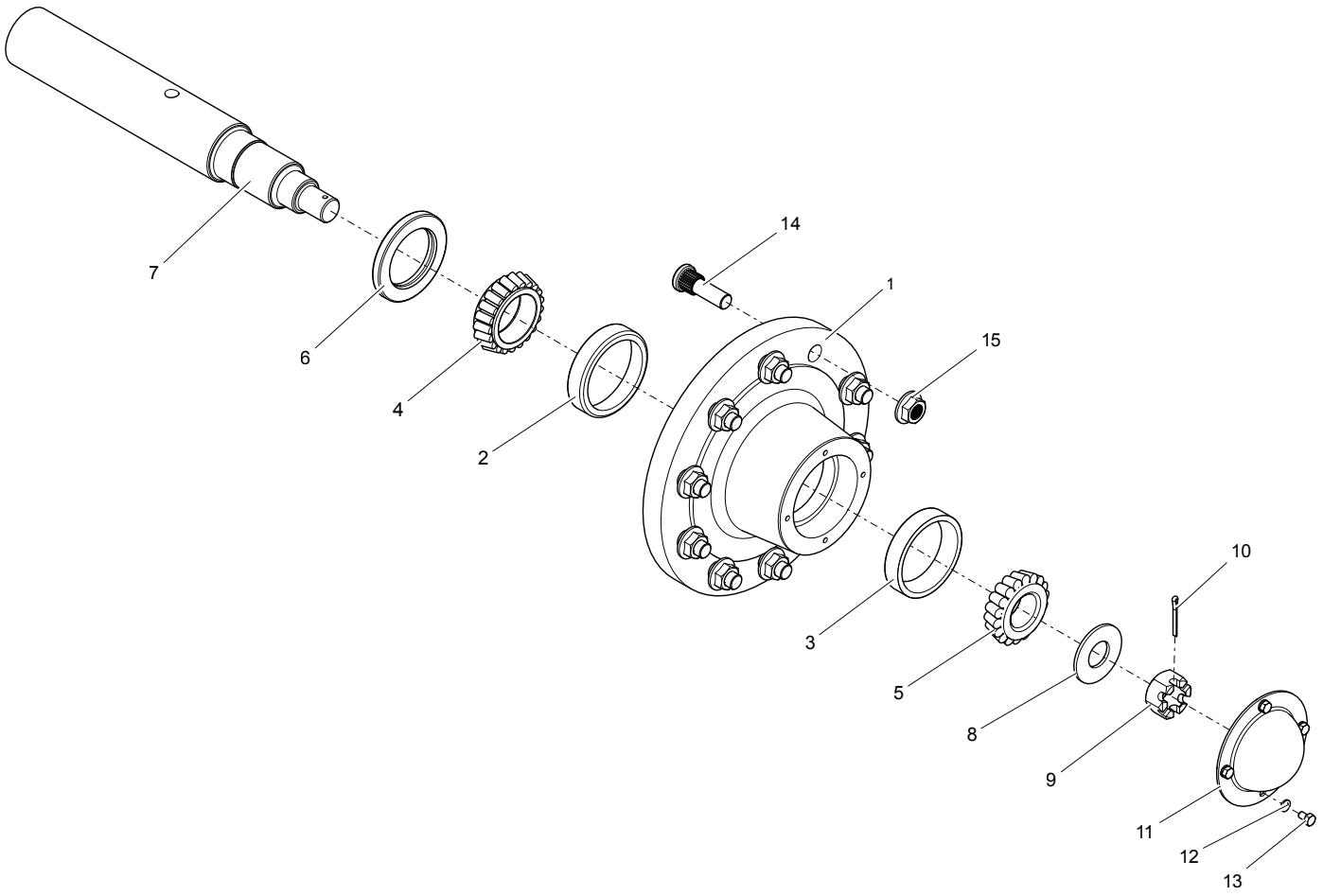
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0407	STRUT WELD - DIGGER	1
2	700-2-0511	SPINDLE WELD	1
3	900-01353	5/8 NC X 3 HEX BOLT GRADE 5	3
4	900-06013	NUT HEX 5/8 UNC	3
5	900-11015	WASHER, LOCK, 5/8	3
6	700-2-0410	HUB ASSY - DIGGER STRUT	2
7	900-06068	1-3/8 - 12 SLOTTED HEX NUT	2
8	120-3-0003	WASHER - 1.41 OD X 2.5 OD X .25	2
9	900-23064	COTTER PIN - 1/4 X 2	2
10	905-09129	DUST CAP- 3 OD X 2.25 DP	2
11	700-3-1056	SCRAPER BLADE - DIGGER STRUTS	2
12	900-03462	EYE BOLT 3/4 X 8	2
13	900-01425	HEX BOLT - 3/4NC X 6-1/2 GR5 ZP	2
14	700-3-0303	LIFTER WHEEL - 28 CASTING	2
15	700-3-1475	WHEEL SPACER - 3/8”	2

DIGGER STRUT HUB COMPONENTS



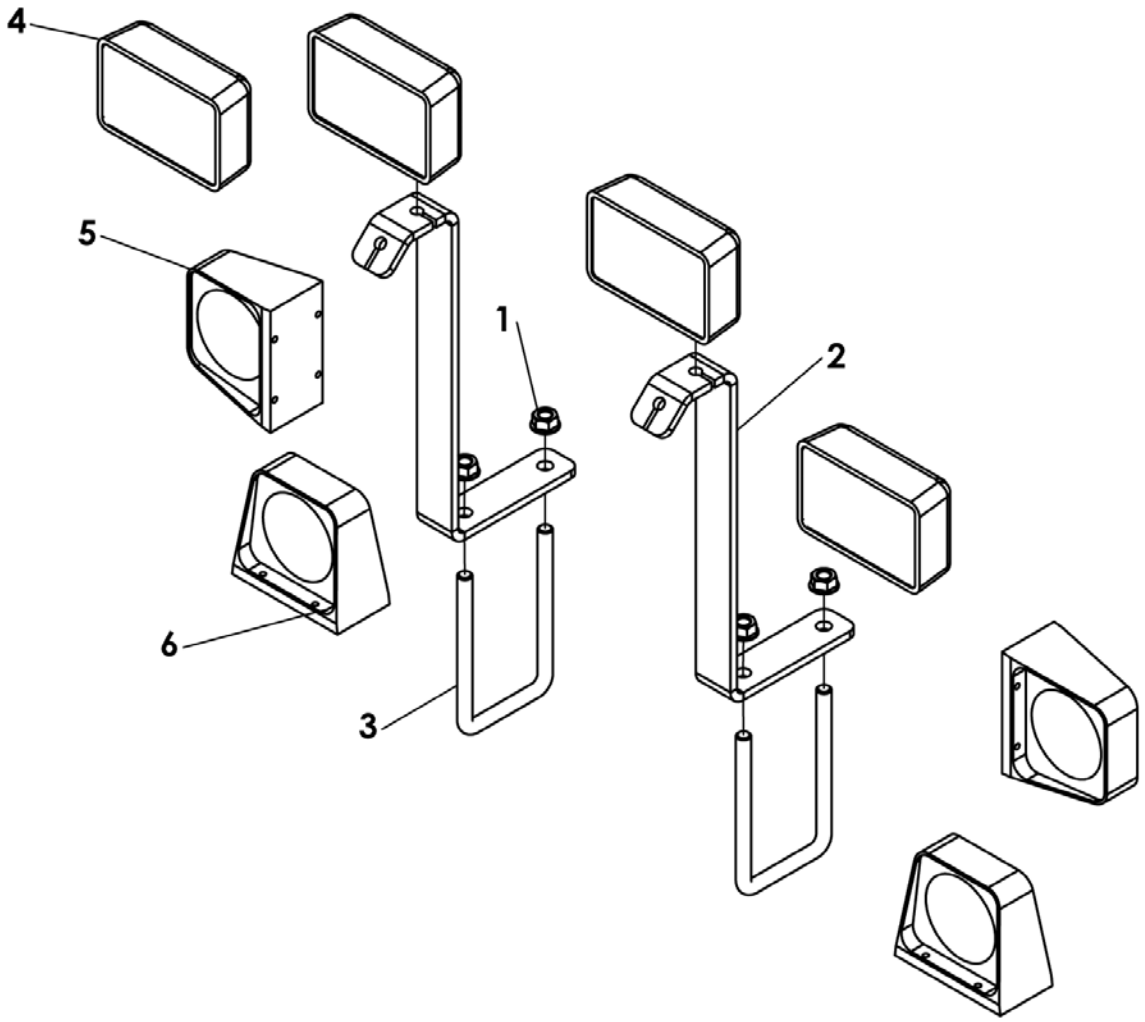
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-3-0275	HUB - MACHINED (DIGGER)	1
2	901-01319	BEARING CUP #362A	1
3	901-01320	BEARING CONE #368A	1
4	901-01321	BEARING CUP #26823	1
5	901-01322	BEARING CONE #26884	1
6	901-09214	SEAL - NATIONAL #415302	1
	700-2-0410	HUB ASSY - DIGGER STRUT	

WHEEL HUB COMPONENTS



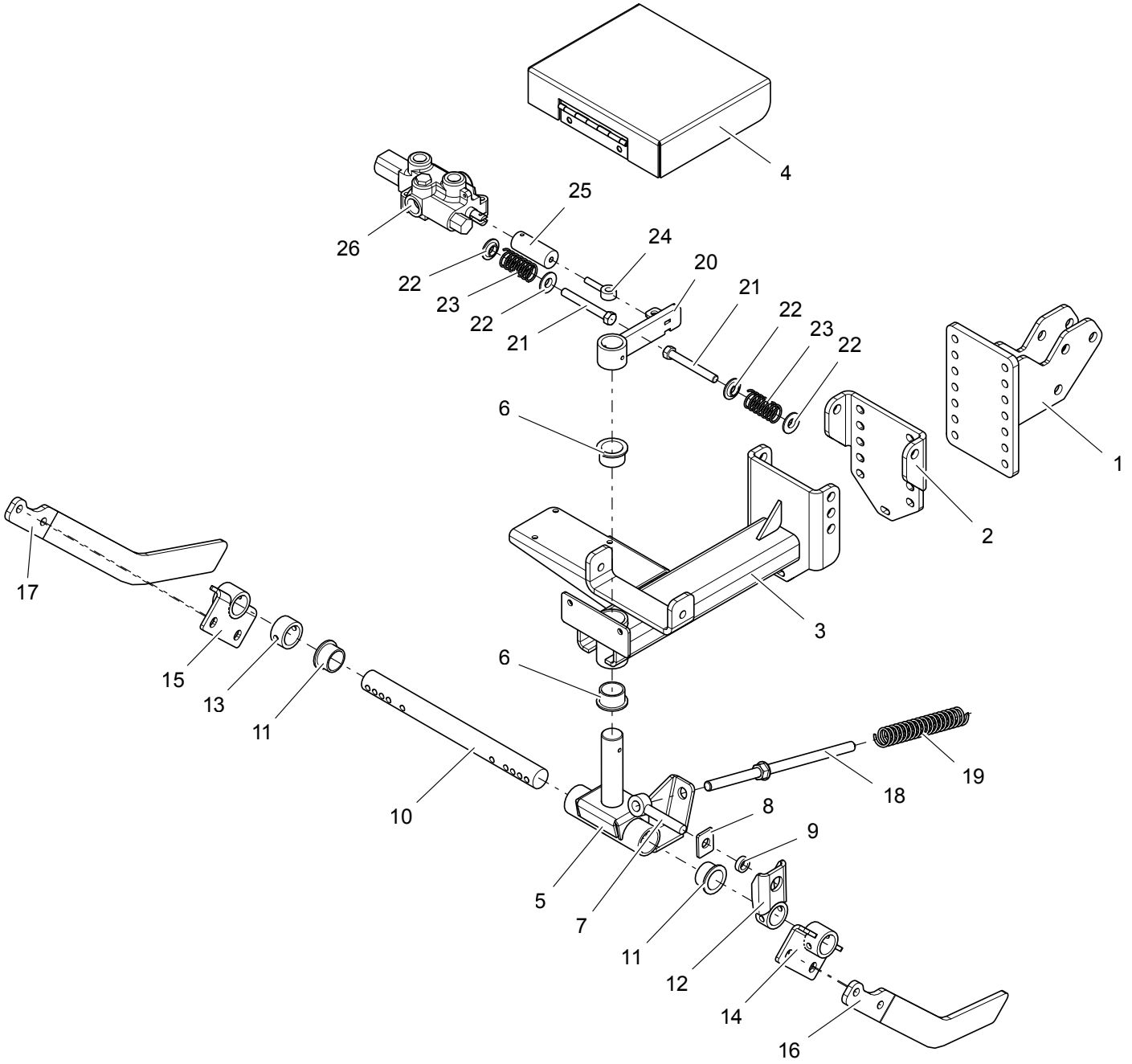
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	905-09187	HUB - 10 BOLT x 11.25 BC x 8.69 PILOT	1
2	901-01413	BEARING CUP #39520	1
3	901-01414	BEARING CUP #453A	1
4	901-01411	BEARING CONE #39585	1
5	901-01412	BEARING CONE #460	1
6	901-09240	GREASE SEAL #415088	1
7	700-3-1259	SPINDLE	1
8	900-11042	FLAT WASHER, 1-1/4”	1
9	900-06066	SLOTTED NUT, 1-1/4” NF	1
10	900-23045	COTTER PIN, 3/16” x 2”	1
11	905-09183	DUST CAP	1
12	900-11010	LOCK WASHER, 5/16”	4
13	900-02342	BOLT, 5/16” NC x 1/2”	4
14	905-09188	WHEEL STUD, 3/4” NF	10
15	905-09185	WHEEL NUT, 3/4” NF	10
-	905-09160	HUB W/ CUPS & STUDS	-
-	700-2-1021	HUB W/ CUPS, BEARINGS, STUDS, & SEAL	-
-	700-2-0553	HUB & SPINDLE (COMPLETE KIT)	-

LIGHT KIT COMPONENTS



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	900-06145	NUT, FLANGE, 5/8” NC GR8	4
2	500-3-1720	BRACKET, FIELD LIGHT	2
3	200-3-0017	U-BOLT 5/8 x 4 x 7.25” LONG	2
4	500-3-1721	LIGHT, FIELD	4
5	904-01154	AMBER LAMP	2
6	904-01155	RED LAMP	2
	700-3-1496	HARVESTOR WIRE HARNESS	1
	500-1-0109	FIELD LIGHT BRACKET KIT	
	700-2-0521	LIGHT KIT, HARV 622/822/630	

ROWFINDER COMPONENTS



ROWFINDER COMPONENTS

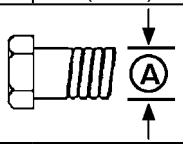
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	700-2-0425	ADJUSTMENT PLATE	1
2	700-3-2186	INNER PIVOT BRACKET	1
3	700-2-0852	PIVOT MOUNT	1
4	700-2-0862	TOP COVER	1
5	700-2-0851	PIVOT WELD	1
6	700-3-0383	OILITE BUSHING	2
7	900-03465	EYE BOLT	1
8	700-3-2187	EYE BOLT WASHER	1
9	700-3-2183	DOWN PRESSURE BUSHING	1
10	700-3-2170	PIVOT SHAFT	1
11	700-3-0383	OILITE BUSHING	2
12	700-2-0853	SPRING TENSIONER	1
13	700-3-2182	DOWN PRESSURE BAR	1
14	700-2-0855	FINGER MOUNT (LH)	1
15	700-2-0854	FINDER MOUNT (RH)	1
16	700-3-2189	FINGER (RH)	1
17	700-3-2188	FINGER (LH)	1
18	700-2-0856	TENSION SPRING HOLDER	1
19	905-14007	TENSION SPRING	1
20	700-2-0850	STEERING PADDLE	1
21	900-01245	BOLT, 1/2 NC x 4	2
22	700-3-2185	SPRING RETAINER	4
23	905-14022	COMPRESSION SPRING	2
24	903-05044	ROD END EYE BOLT	1
25	700-3-2167	TIE ROD CONNECTING SHAFT	1
26	905-03258	PRINCE VALVE - 4 WAY	1

BOLT TORQUE CHART

SAE Series Torque Chart

Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application. Fasteners must always be replaced with the same grade as specified in the manual parts list.

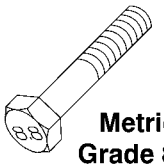
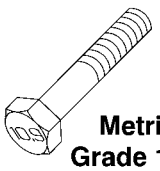
Make sure fastener threads are clean and you properly start thread engagement.

SAE Bolt Head Identification		 **SAE Grade 2 (No Dashes)**		 **SAE Grade 5 (3 Radial Dashes)**		 **SAE Grade 8 (6 Radial Dashes)**	
Ⓐ Diameter (Inches)	Wrench Size	MARKING ON HEAD					
		SAE 2		**SAE 5**		**SAE 8**	
		ft./lb.	(Nm)	ft./lb.	(Nm)	ft./lb.	(Nm)
1/4”	7/16’	6	(8)	10	(13)	14	(18)
5/16’	1/2”	12	(17)	19	(26)	27	(37)
3/8”	9/16”	23	(31)	35	(47)	49	(67)
7/16”	5/8”	36	(48)	55	(75)	78	(106)
1/2”	3/4”	55	(75)	85	(115)	120	(163)
9/16”	13/16”	78	(106)	121	(164)	171	(232)
5/8”	15/16”	110	(149)	170	(230)	240	(325)
3/4”	1-1/8”	192	(261)	297	(403)	420	(569)
7/8”	1-5/16”	306	(416)	474	(642)	669	(907)
1”	1-1/2”	350	(475)	680	(925)	1020	(1383)
1-1/8”	1-11/16”	450	(610)	885	(1200)	 Bolt Diameter	
1-1/4”	1-7/8”	600	(815)	1255	(1700)		
1-3/8”	2-1/16”	675	(915)	1620	(2200)		
1-1/2”	2-1/4’	920	(1250)	2200	(2900)		

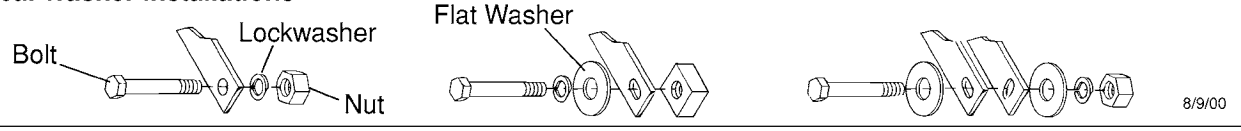
Metric Series Torque Chart

Use only metric tools on metric hardware. Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application. Fasteners must always be replaced with the same grade.

Make sure fastener threads are clean and you properly start thread engagement.

Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	**COARSE THREAD**				**FINE THREAD**				Ⓐ Diameter & Thread Pitch (Millimeters)	**Metric Bolt Head Identification**
		MARKING ON HEAD				MARKING ON HEAD					
		Metric 8.8		**Metric 10.9**		**Metric 8.8**		**Metric 10.9**			
		Nm	ft./lb.	Nm	ft./lb.	Nm	ft./lb.	Nm	ft./lb.		
6x1.0	10 mm	8	6	11	8	8	6	11	8	6x1.0	 **Metric Grade 8.8**
8x1.25	13 mm	20	15	27	20	21	16	29	22	8x1.0	
10x1.5	16 mm	39	29	54	40	41	30	57	42	10x1.25	
12x1.75	18 mm	68	50	94	70	75	55	103	76	12x1.25	
14x2.0	21 mm	109	80	151	111	118	87	163	120	14x1.5	
16x2.0	24 mm	169	125	234	173	181	133	250	184	16x1.5	 **Metric Grade 10.9**
18x2.5	27 mm	234	172	323	239	263	194	363	268	18x1.5	
20 x 2.5	30 mm	330	244	457	337	367	270	507	374	20x1.5	
22 x 2.5	34 mm	451	332	623	460	495	365	684	505	22 x 1.5	
24 x 3.0	36 mm	571	421	790	583	623	459	861	635	24 x 2.0	
30 x 3.0	46 mm	1175	867	1626	1199	1258	928	1740	1283	30 x 2.0	

Typical Washer Installations



ABBREVIATIONS

AG ..... Agriculture
ASAE ..... American Socity of Agricutural Engineers
ATF ..... Automatic Transmission Fluid
BSPP ..... British Standard Pipe Parallel
BSPTM ..... British Standard Pipe Tapered Male
CV ..... Constant Velocity
CCW ..... Counter-Clockwise
CW ..... Clockwise
DIA ..... Diameter
EP ..... Extreme Pressure
F ..... Female
FB ..... Female O-Ring Boss
FJ ..... Female Boss
FJX ..... Female Swivel JIC
FP ..... Female Pipe
ft./lb ..... Foot Pound
GA ..... Gauge
GR (5, etc.) ..... Grade (5, etc.)
HHCS ..... Hex Head Cap Screw
HT ..... Heat Treated
in ..... Inch
JIC ..... Joint Industry Counicl 37° Flare
kg ..... Kilogram
km/h ..... Kilometers Per Hour
lb ..... Pound
LH ..... Left Hand
LT ..... Left
in ..... Inches
m ..... Meter
mm ..... Millimeter
M ..... Male
MB ..... Male O-Ring Boss
MJ ..... Male JIC
MJX ..... Male Swivel JIC
MP ..... Male Pipe
MPa ..... Mega Pascal
MPH ..... Miles Per Hour
N ..... Newton
NC ..... National Course
NF ..... National Fine
NPSM ..... National Pipe Straight Mechanical
NPT ..... National Pipe Tapered
NPT SWF ..... National Pipe Tapered Swivel Female
Nm ..... Newton Meter
OSHA ... Occupational Safety and Health Administration
P ..... Pitch
PBY ..... Power Beyond
psi ..... Pounds per Square Inch
PTO ..... Power Take Off
QD ..... Quick Disconnect
RH ..... Right Hand
ROPS ..... Roll Over Protection Structure
RPM ..... Revolutions Per Minute
RT ..... Right
SAE ..... Society of Automotive Engineers
SMV ..... Slow Moving Vehicle
UNC ..... Unified Coarse
UNF ..... Unified Fine
UNS ..... Unified Special
ZP ..... Zinc Plate

INDEX

WARRANTY

Please enter information below and SAVE FOR FUTURE REFERENCE.

Date Purchased: _____ **From (Dealer):** _____

Model Number: _____ **Serial Number:** _____

ALLOWAY warrants each new ALLOWAY product to be free from defects in material and workmanship. This warranty is applicable only for the normal service life expectancy of the machine or components, not to exceed twelve consecutive months from the date of delivery of the new ALLOWAY product to the original purchaser.

Genuine ALLOWAY replacement parts and components will be warranted for 90 days from date of purchase, or the remainder of the original equipment warranty period, whichever is longer.

Under no circumstances will it cover any merchandise or components thereof, which, in the opinion of the company, has been subjected to negligent handling, misuse, alteration, an accident, or if repairs have been made with parts other than those obtainable through ALLOWAY.

The company in no way warrants engines, batteries, tires or other trade accessories since these items are warranted separately by their respective manufacturers.

Our obligation under this warranty shall be limited to repairing or replacing, free of charge to the original purchaser, any part that in our judgement shall show evidence of such defect, provided further that such part shall be returned within thirty (30) days from date of failure to ALLOWAY, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid.

This warranty shall not be interpreted to render us liable for injury or damages of any kind or nature to person or property. This warranty does not extend to loss of crops, loss because of delay in harvesting, or any expense or loss incurred for labor, supplies, substitute machinery, rental or for any other reason.

Except as set forth above, ALLOWAY SHALL HAVE NO OBLIGATION OR LIABILITY OF ANY KIND ON ACCOUNT OF ANY OF ITS EQUIPMENT AND SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES. ALLOWAY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND, SPECIFICALLY, ALLOWAY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOME STATES OR PROVINCES DO NOT PERMIT LIMITATIONS OR EXCLUSIONS OF IMPLIED WARRANTIES OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE LIMITATIONS OR EXCLUSIONS IN THIS WARRANTY MAY NOT APPLY.

This warranty is subject to any existing conditions of supply which may directly affect our ability to obtain materials or manufacture replacement parts.

ALLOWAY reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligations to owners of units previously sold.

No one is authorized to alter, modify, or enlarge this warranty nor the exclusions, limitations and reservations.

WARRANTY

ALLOWAY STANDARD, d/b/a ALLOWAY, warrants this product to be free from defect in material and workmanship for a period of ninety (90) days from the date of delivery of the product to the original purchaser.

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of ALLOWAY, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not cover normal wear or tear, or normal maintenance items.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

ALLOWAY'S' obligation under this Warranty is limited to, at ALLOWAY'S option, the repair or replacement, free of charge, of the product If ALLOWAY, in its sole discretion, deems it, to be defective or in noncompliance with this Warranty. The product must be returned to ALLOWAY with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid. ALLOWAY shall complete such repair or replacement within a reasonable time after ALLOWAY receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. ALLOWAY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALLOWAY SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY AND/OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

ALLOWAY shall not be liable for any incidental or consequential losses, damages or expenses, arising directly or indirectly from the product, whether such claim is based upon breach of contract, breach, of warranty, negligence, strict liability in tort or any other legal theory. Without limiting the generality of the foregoing, Alloway specifically disclaims any damages relating to (i) lost profits, business, revenues or goodwill; (ii) loss of crops; (iii) loss because of delay in harvesting; (iv) any expense or loss incurred for labor, supplies, substitute machinery or rental; or (v) any other type of damage to property or economic loss.

This Warranty is subject to any existing conditions of supply, which may directly affect ALLOWAYS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, service person, salesperson, or employee of any company, including without limitation, ALLOWAY, Its authorized dealers, distributors, and service centers, IS authorized to alter, modify, or enlarge this Warranty.

Answers to any questions regarding warranty service and locations may be obtained by contacting:

STANDARD alloway

PART NUMBER

700-5-0007

Alloway Standard Inc.

4230 14th Ave NW.
Fargo, ND 58102

Tele : 877-275-8714

Fax : 701-356-4985

Rev : A (09/18/2011)