# BATWING®
# ROTARY CUTTER

**BW20.51Q**
**BW20.61Q**
**BW20.71Q**
**BW13.71Q**
**BW13.71QREV**

**BW20.51**
**BW20.61**
**BW20.71**
**BW13.71**

OPERATOR'S MANUAL

MAN1282
(Rev 07/18/2023)

WOODS®

**TO THE DEALER:**

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

**The dealer must complete the online Product Registration form at the Woods Dealer Website** which certifies that all Dealer Checklist items have been completed. Dealers can register all Woods product at dealer.WoodsEquipment.com under Product Registration.

**Failure to register the product does not diminish customer's warranty rights.**

**TO THE OWNER:**

Read this manual before operating your Woods 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 adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer. To obtain complete warranty details, visit WoodsEquipment.com/warranty. You may also request a hard copy by calling 1-800-319-6637 or mail your request to: Woods Equipment Company, Attn: Warranty Dept. 2606 South Illinois Route 2, Oregon, IL 61061. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

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

Use only genuine Woods 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 **NOTICE** 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 is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**DANGER** Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

**WARNING** Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

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

**IMPORTANT or *NOTICE*** Is used to address practices not related to physical injury.

**NOTE** Indicates helpful information.

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**¡LEA EL INSTRUCTIVO!**

**Si no lee Ingles, pida ayuda a alguien que si lo lee para que le traduzca las medidas de seguridad.**

**This Operator's Manual should be regarded as part of the machine. Suppliers of both new and second-hand machines must make sure that this manual is provided with the machine.**

# SPECIFICATIONS

| | BW20.51<br>BW20.51Q | BW20.61<br>BW20.61Q | BW20.71<br>BW20.71Q | BW13.71 | BW13.71QREV |
|---|---|---|---|---|---|
| Cutting Height (Varies with tire selection) | 2" - 15" | | | | |
| Cutting Width | 240" (20') | | | 162" (13.5') | |
| Overall Width | 249" | | | 171" | |
| Transport Width | 123" | | | 99" | |
| Tractor HP | 70 - 200 | 70 - 300 | 70 - 300 | 70 - 300 | 70 - 300 |
| Blade Spindle | 3 | | | 2 | |
| Blade Overlap | 6" | | | | |
| Number of Blades | 6 | | | 4 | |
| Blade Rotation | Left Spindle: CW; Right Spindle & Center: CCW | | | RT & CTR: CCW | RT: CCW, CTR: CW |
| Input Driveline | Cat 5 Heavy | | | | |
| CV | Cat 6 | | | | |
| Side Frame Thickness | 1/4" | | | | |
| Weight (approximate lbs. with 8 large aircraft tires, single chain shielding, and CV drive) | 6435 | 6354 | 7740 | 7860 | 7860 |
| Wheel Size | 15" Rims, 24" Aircraft, 29" Aircraft, 21" Solid | | | | |
| Torsion Protection | Slip Clutch | | | | |
| Blade Speed 540 / 1000 | 15,450 / 16,300 | | | | 16,300 |

# GENERAL INFORMATION

**⚠ WARNING**

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

The purpose of this manual is to assist you in operating and maintaining your cutter. 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.

Throughout this manual, references are made to right and left directions. These are determined by standing behind the equipment facing the direction of forward travel. Blade rotation is clockwise (left wing) and counterclockwise (right wing and center section) as viewed from the top of the cutter.

**NOTICE:**
If you would like to receive a free Spanish language translation of the Safety Rules section of this manual, plus a set of Spanish language safety decals, please contact your local Woods dealer.

**AVISO:**
Si desea recibir una traducción al español gratuita de la sección de Reglas de seguridad de este manual y un juego de etiquetas de seguridad en español, por favor comuníquese con su concesionario local de Woods.

**BE SAFE!**

**BE ALERT!**

**BE ALIVE!**

**BE TRAINED**
**Before Operating Mowers!**

ASSOCIATION OF EQUIPMENT MANUFACTURERS

*Safety Training*
*Does Make a Difference.*

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# Watch a Mower Safety Video Online

The AEM (Association of Equipment Manufacturers) offers a safety training video, *Industrial and Agricultural Mower Safety Practices*. The 22-minute video can be viewed online for free at TheAEMStore,

https://youtu.be/uEWXsDqhDq0

It reinforces the proper procedures to follow while operating your mowing equipment. The video does not replace the information contained in the Operator's Manual, so please review this manual thoroughly before operating your new mowing equipment.

**Also, available from the Association of Equipment Manufacturers:**

A large variety of training materials (ideal for groups) are available for a nominal charge from AEM. Following is a partial list:

- **Training Package for Rotary Mowers/Cutters-English**
  Contains: DVD & VHS (English)
  Guidebook for Rotary Mowers/Cutters (English)
  AEM Industrial/Agricultural Mower Safety Manual (English)
  AEM Agricultural Tractor Safety Manual (English)

- **Training Package for Rotary Mowers/Cutters-English/Spanish**
  Contains: DVD & VHS (English/Spanish)
  Guidebook for Rotary Mowers/Cutters (English/Spanish)
  AEM Industrial/Agricultural Mower Safety Manual (English/Spanish)
  AEM Agricultural Tractor Safety Manual (English/Spanish)

AEM training packages are available through:

AEM at: *www.aem.org*
or
Universal Lithographers, Inc.
Email: aem@ulilitho.com
800-369-2310 tel
866-541-1668 fax

# 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 an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, 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 operator.

## INSTALLATION

- **Hydraulics must be connected as instructed in this manual. Do not substitute parts, modify, or connect in any other way.**

## TRAINING

- **Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals and safety decals are available from your dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.) 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 hands or other 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 if 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.**

- **Never allow children or untrained persons to operate equipment.**

## PREPARATION

- **Check that all hardware is properly installed. Always tighten to torque chart specifications unless instructed otherwise in this manual.**
- **Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. When connecting equipment or hoses or performing any hydraulic maintenance, purge any air in hydraulic system by operating all hydraulic functions several times. Do this before putting into service or allowing anyone to approach the equipment.**
- **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.**
- **After connecting hoses, check that all control lever positions function as instructed in the Operator's Manual. Do not put into service until control lever and equipment movements are correct.**
- **Set tractor hydraulic relief valve at 2500 psi (170 bars) (17,000 kPa) to prevent injury and equipment damage due to hydraulic system failure.**
- **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 getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**
- **Make sure attachment is properly secured, 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.**

# SAFETY RULES

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

- **Make sure driveline guard tether chains are attached to the tractor and equipment as shown in the pamphlet that accompanies the driveline. Replace if damaged or broken. Check that driveline guards rotate freely on driveline before putting equipment into service.**
- **Connect PTO driveline directly to power unit PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and can result in personal injury or death.**
- **Before starting power unit, check all equipment driveline guards for damage. Replace any damaged guards. Make sure all guards rotate freely on all drivelines. If guards do not rotate freely on drivelines, repair and replace bearings before putting equipment into service.**
- **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 system in "locked up" position at all times.**
- **Remove accumulated debris from this equipment, power unit, and engine to avoid fire hazard.**
- **Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**
- **Make sure shields and guards are properly installed and in good condition. Replace if damaged.**
- **Do not put this equipment into service unless all side skids are properly installed and in good condition. Replace if damaged.**
- **A minimum 20% of tractor and equipment weight must be on the tractor front wheels when attachments are in transport position. Without this weight, front tractor wheels could raise up resulting in loss of steering. The weight may be attained with front wheel weights, ballast in tires, front tractor weights or front loader. Weigh the tractor and equipment. Do not estimate.**
- **Inspect and clear area of stones, branches, or other hard objects that might be thrown, causing injury or damage.**

### TRANSPORTATION

- **When transporting, pay special attention to overhead power lines and make sure the machine has sufficient clearance to pass.**
- **Power unit must be equipped with Roll Over Protection System (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 system in "locked up" position at all times.**
- **Always raise unit and install transport locks before transporting. Leak down or failure of mechanical or hydraulic system can cause equipment to drop.**
- **Always attach safety chain to tractor drawbar when transporting unit.**
- **Always comply with all state and local lighting and marking requirements. Turn on flashing warning lights whenever traveling on a public roadway.**
- **Never allow riders on power unit or attachment.**
- **Do not operate PTO during transport.**
- **Do not operate or transport on steep slopes. Refer to tractor manual for proper ballasting and slope recommendations.**
- **Do not operate or transport equipment while under the influence of alcohol or drugs.**
- **The maximum transport speed for this machine is 20 mph (30 km/h). Regardless of the maximum speed capability of the towing tractor, do not exceed the implement's maximum transport speed. Doing so could result in:**
  - **Loss of control of the implement and tractor**
  - **Reduced or no ability to stop during braking**
  - **Implement tire failure**
  - **Damage to the implement or its components.**
- **Use additional caution and reduce speed when under adverse surface conditions, turning, or on inclines.**
- **Never tow this implement with a motor vehicle.**

# SAFETY RULES

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

### OPERATION

- **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**
- **Stay away from the machinery during a thunderstorm. Do not operate machine during a thunderstorm. If lightning from a thunderstorm strikes during operation, remain in the tractor cab. Do not make contact with the ground or objects outside the machine. Do not leave the cab until the storm has passed.**
- **Never walk, stand, or place yourself or others under a raised wing or in the path of a lowering wing. Hydraulic system leak-down, hydraulic system failures, mechanical failures, or movement of control levers can cause wings to drop unexpectedly and cause severe injury or death.**
- **Full chain shielding must be installed at all times. Thrown objects could injure people or damage property.**
  - **If the machine is not equipped with full chain shielding, operation must be stopped.**
  - **This shielding is designed to reduce the risk of thrown objects. The mower deck and protective devices cannot prevent all objects from escaping the blade enclosure in every mowing condition. It is possible for objects to ricochet and escape, traveling as much as 300 feet (92m).**
- **Never direct discharge toward people, animals, or property.**
- **Do not operate or transport equipment while under the influence of alcohol or drugs.**
- **Operate only in daylight or good artificial light.**
- **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.**
- **Never allow riders on power unit or attachment.**
- **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 system in "locked up" position at all times.**
- **Always sit in power unit 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 power unit engine.**
- **Operate tractor PTO at 540 RPM (1000 RPM on Q Series cutters). Do not exceed.**
- **Raise or lower wings slowly to prevent personal injury or damage to cutter.**
- **Look down and to the rear and make sure area is clear before operating in reverse.**
- **Do not operate or transport on steep slopes.**
- **Do not stop, start, or change directions suddenly on slopes.**
- **Watch for hidden hazards on the terrain during operation.**
- **Do not handle blades with bare hands. Careless or improper handling may result in serious injury.**
- **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 an authorized dealer.**
- **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**
- **Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.**
- **To prevent contamination during maintenance and storage, clean and then cover hose ends, fittings, and hydraulic ports with tape.**
- **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**
- **Make certain all movement of equipment has stopped before approaching for service.**
- **Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, set parking brake, remove key, inspect, and repair any damage before resuming operation.**
- **Continuous operation while the clutch is slipping could cause heat build-up resulting in fire. Adjust slip clutch pressure by tightening springs to the dimension shown in the "Owner Service" section. If clutch is set to minimum spring length, replace the friction disks as shown.**

# SAFETY RULES

## ⚠ ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! ⚠

### MAINTENANCE

- **Before cleaning, servicing, adjusting, repairing or unplugging, stop tractor engine, place all controls in neutral, set park brake, remove ignition key, and wait for all moving parts to stop.**
- **Before dismounting power unit or performing any service or maintenance, follow these steps: disengage power to equipment, lower the 3-point hitch and all raised components to the ground, operate valve levers to release any hydraulic pressure, set parking brake, stop engine, remove key, and unfasten seat belt.**
- **Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.**
- **Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.**
- **To prevent contamination during maintenance and storage, clean and then cover hose ends, fittings, and hydraulic ports with tape.**
- **Do not allow bystanders 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 an authorized dealer.**
- **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**
- **Make certain all movement of equipment components has stopped before approaching for service.**
- **Frequently check blades. They should be sharp, free of nicks and cracks, and securely fastened.**
- **Do not handle blades with bare hands. Wear gloves. Careless or improper handling may result in injury.**
- **Your dealer can supply genuine replacement blades. Substitute blades may not meet original equipment specifications and may be dangerous.**
- **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 putting unit into service.**
- **Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)**
- **Make sure shields and guards are properly installed and in good condition. Replace if damaged.**
- **Never perform cleaning, service or maintenance with engine running.**
- **Do not disconnect hydraulic lines until machine is securely blocked or placed in lowest position and system pressure is released by operating valve levers.**
- **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.**
- **Explosive separation of tire and rim parts can cause serious injury or death. Release all air pressure before loosening bolts on wheel.**

### STORAGE

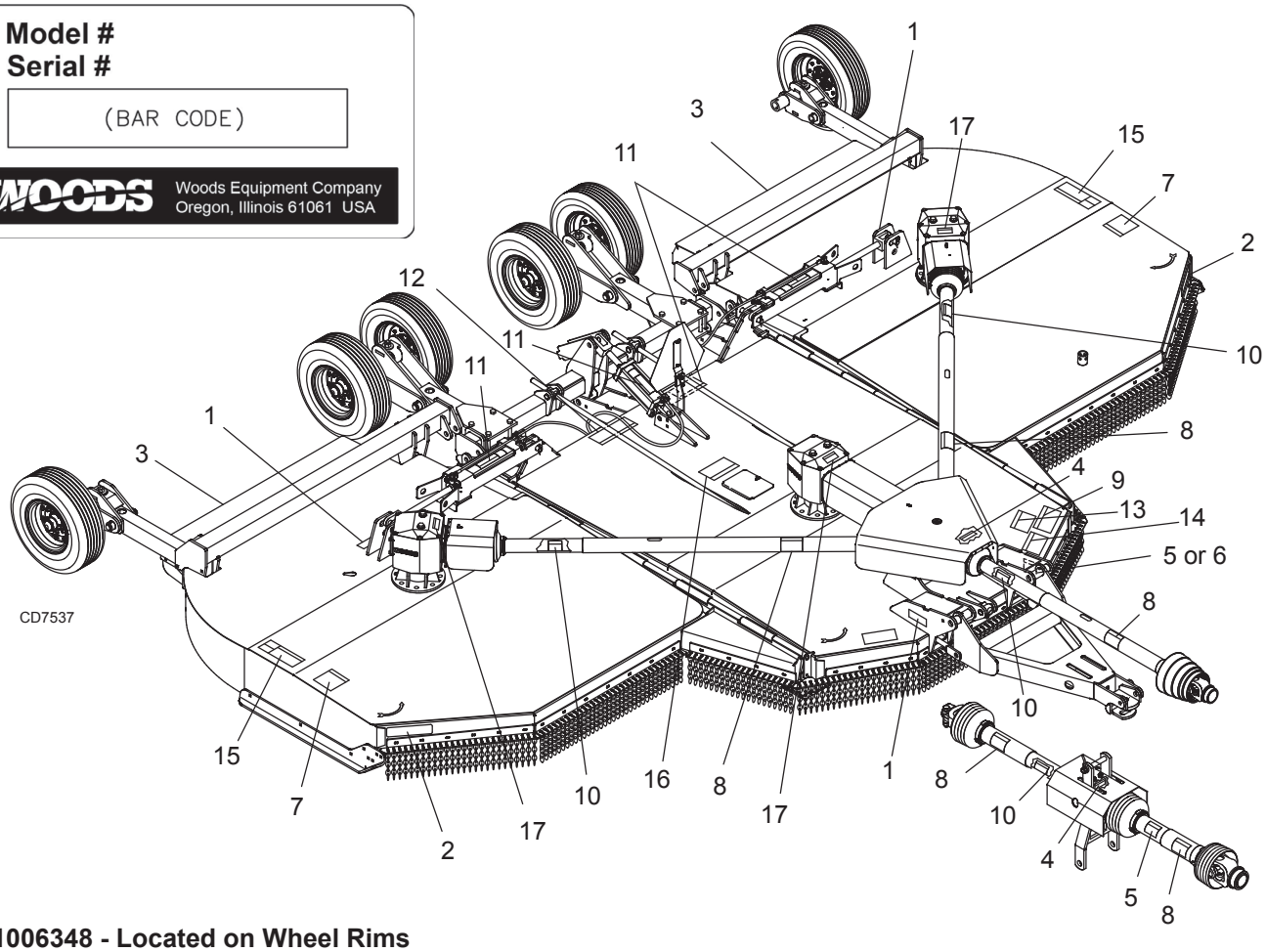
- **Before disconnecting and storing, follow these instructions:**
  - **Store on level, solid ground.**
  - **Disconnect driveline and secure up off the ground.**
  - **Lower wings to ground.**
  - **Raise cutter center section and pin transport bar in raised position.**
  - **Attach parking jack and raise tongue weight off tractor drawbar.**
  - **Place wedge blocks at front and rear of wheels on center section and each wing to prevent wheel rotation.**
  - **Securely block all four corners of center section and each wing with jackstands.**
  - **Remove hydraulic hoses after tractor is turned off and all system pressure is released by operating valve levers several times.**
  - **Remove safety tow chain.**
  - **Remove retainer pin and high strength drawbar pin.**
- **Keep children, bystanders, and animals away from equipment and the storage area.**

# SAFETY & INSTRUCTIONAL DECALS

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

**Replace Immediately If Damaged!**

**1 - Serial Number Plate**


**PN 1006348 - Located on Wheel Rims**

**WARNING** — EXPLOSION HAZARD

RELEASE ALL AIR PRESSURE BEFORE LOOSENING BOLTS.
FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR DEATH.
MAX. SPEED: 20 MPH, MAX. WEIGHT: 4000 LBS., MAX. AIR PRESSURE: 40 PSI.
1006348

### BE CAREFUL!

Keep safety decals clean and visible.

Use a clean, damp cloth to clean safety decals.

Avoid spraying too close to decals when using a pressure washer; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off.

Replacement safety decals can be ordered free from your Woods dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

**2 - FRONT AMBER REFLECTOR (PN 1002940)**

**3 - REAR RED REFLECTOR (PN 57123)**

**4 - PN 18869**

**DANGER**

**SHIELD MISSING**
**DO NOT OPERATE - PUT SHIELD ON**
18869

**17 - PN 1004114**

**DANGER**

**If shaft connection is visible, shield is missing. Replace shield before operating equipment.**
1004114

# SAFETY & INSTRUCTIONAL DECALS

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

### Replace Immediately If Damaged!

**5 - PN 15922**

**WARNING**

DO NOT EXCEED PTO SPEED OF

1000

- PTO speeds higher than 1000 RPM can cause equipment failure and personal injury.
- Tractor PTO master shield, PTO drive shaft guarding and PIC guards are to be kept in place.

15922

OR

**6 - PN 18866**

**WARNING**

DO NOT EXCEED PTO SPEED OF

540

- PTO speeds higher than 540 RPM can cause equipment failure and personal injury.
- Tractor PTO master shield, PTO drive shaft guarding and PIC guards are to be kept in place.

18866

**7 - PN 15503**

**DANGER**

ROTATING BLADES AND THROWN OBJECTS

- Do not put hands or feet under or into mower when engine is running.
- Before mowing, clear area of objects that may be thrown by blade.
- Keep bystanders away.
- Keep guards in place and in good condition.

BLADE CONTACT OR THROWN OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH.

15503

**8 - PN 18864**

**DANGER**

*ROTATING DRIVELINE*
CONTACT CAN CAUSE DEATH
*KEEP AWAY!*
DO NOT OPERATE WITHOUT -

- All driveline guards, tractor and equipment shields in place.
- Drivelines securely attached at both ends.
- Driveline guards that turn freely on driveline.
- Read the operator's manual.
- Do not use PTO adapters.

18864

**9 - PN 18865**

**WARNING**

FALLING OFF CAN RESULT IN BEING RUNOVER.

- Tractor must be equipped with ROPS (or ROPSCAB) and seat belt. Keep foldable ROPS systems in "locked up" position at all times.
- Buckle Up! Keep seat belt securely fastened.
- Never allow riders on mower or tractor.

RAISED EQUIPMENT CAN DROP AND CRUSH.

- Before working underneath, follow all instructions and safety rules in operator's manual and securely block up all corners of equipment with jack stands.
- Securely blocking prevents equipment dropping from hydraulic leakdown, hydraulic system failures or mechanical component failures.

FALLING OFF OR FAILING TO BLOCK SECURELY CAN RESULT IN SERIOUS INJURY OR DEATH.

18865

**PN 611520**


**PN 611521**


**11 - PN W19924**

W19924

**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.

# SAFETY & INSTRUCTIONAL DECALS

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

**Replace Immediately If Damaged!**

**12 - PN 1004991**


**10 - PN 33347**


**13 - PN 1003751**


**14 - PN 18877**


**15 - PN 18964**


**16 - PN 15502**

# OPERATION

The designed and tested safety of this machine depends on it being operated within the limitations as explained in this manual. Be familiar with and follow all safety rules in the manual, on the cutter and on the tractor.

The safe operation of this cutter is the responsibility of the operator, who must be properly trained. The operator should be familiar with the equipment and all safety practices before starting operation. Read the safety information on page 7 through page 13.

Recommended tractor ground speed for most conditions is from 1 to 6 mph.

Always operate tractor PTO at 540 RPM, or at 1,000 RPM for Q models.

## ⚠ DANGER

- **Look down and to the rear and make sure area is clear before operating in reverse.**
- **Full chain shielding must be installed at all times. Thrown objects could injure people or damage property.**
  - **If the machine is not equipped with full chain shielding, operation must be stopped.**
  - **This shielding is designed to reduce the risk of thrown objects. The mower deck and protective devices cannot prevent all objects from escaping the blade enclosure in every mowing condition. It is possible for objects to ricochet and escape, traveling as much as 300 feet (92m).**

## ⚠ WARNING

- **Never allow children or untrained persons to operate equipment.**
- **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**
- **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**

## ⚠ CAUTION

- **Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.**
- **Stay away from the machinery during a thunderstorm. If lightning from a thunderstorm strikes during operation, remain in the tractor cab. Do not make contact with the ground or objects outside the machine. Do not leave the cab until the storm has passed**
- **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; and respirator or filter mask where appropriate.**

## CONNECTING CUTTER TO TRACTOR

### *NOTICE*

- **For tractors with a 1-3/8" diameter PTO shaft, the horizontal distance from the end of the tractor PTO shaft to the center of drawbar pin should be 14" for 540 RPM cutter and 16" for the 1000 RPM cutters. Tractors with 1-3/4 20-spline PTO shaft should be set to 20". This will minimize joint knock and damage to drive components.**

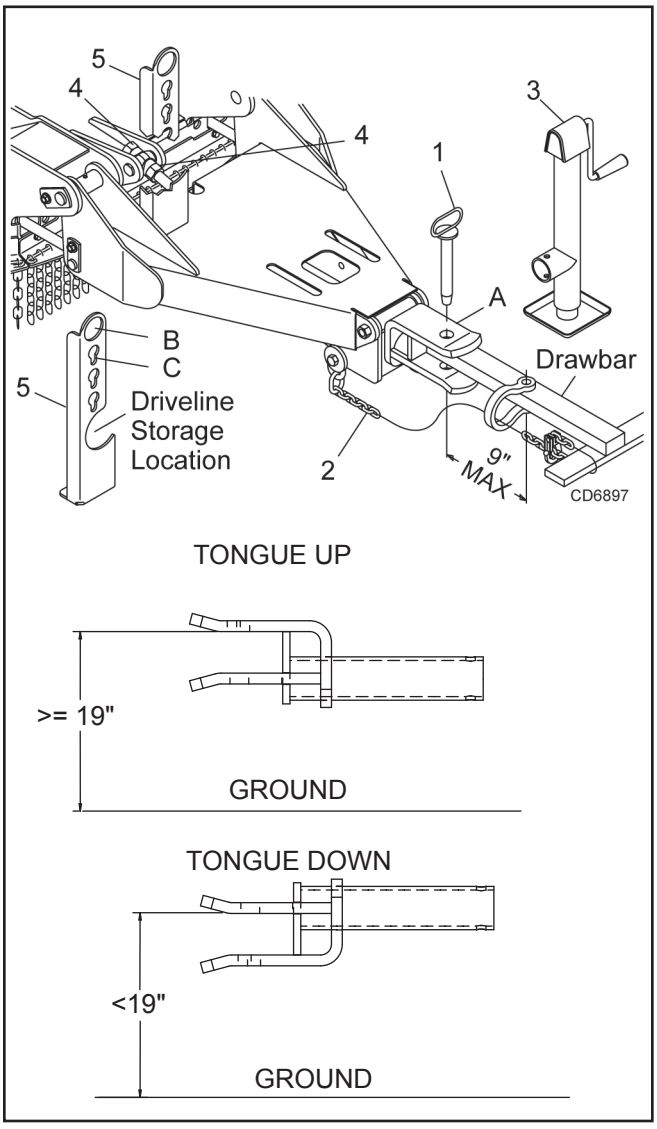



**Figure 1.** Cutter to Tractor Connection

1. Check tongue clevis to make sure it is adjusted to match your tractor PTO speed.
2. Position tongue clevis (A) up or down based on tractor drawbar height.
3. Attach cutter using a 1-1/8" clevis pin (1) and clip.
4. Attach safety tow chain (2) to drawbar support. Leave enough slack for turning.
5. Connect cutter driveline to tractor PTO shaft, making sure the spring-activated lock pin slides freely and is seated in tractor PTO splined groove.
6. Remove parking jack (3) from the tongue and attach it to the storage post on the front of the left wing.
7. Adjust nuts (4) so tongue clevis (A) is parallel with the tractor drawbar.
8. Remove parking jack (3) from the tongue and attach it to the storage post on the front of the left wing.

   **NOTE:** Place driveline in storage position on the hose holder (5) when not in use.

## Hydraulic Connection

1. Inspect hydraulic hoses to ensure they are in good condition.
2. Clean the fittings before connecting them to the tractor hydraulic ports.
3. Route the hose through the hose holder at the hitch and be sure the hose can slide freely in the holder. Do not allow hose slack to drag on the ground or become caught on tractor protrusions.
4. Attach the hydraulic hose to the tractor.
5. Raise unit with center lift cylinder and extend wing cylinders. Stop tractor and remove transport lock pins from wing stops and transport stop as shown in Figure 2 and Figure 3, page 18.
6. From the operator position, start tractor and raise and lower deck several times to purge trapped air from the hydraulic cylinder.

## Interference Check

1. Be sure that tractor 3-point lift links do not interfere with hydraulic hoses, cutter driveline, or cutter frame.
2. Check for straight-ahead operation and at full turning angles. If there is any interference, remove the lower lift links.
3. Contact between tractor lift links and cutter parts can cause damage, especially when turning.

## CV Driveline Turning Limits

### *NOTICE*

- **You must not exceed a turning angle of 80 degrees at the head of the Constant Velocity driveline or damage will occur.**

1. To check for potential excessive turn angle, disconnect the driveline from tractor.
2. Start engine and turn as far right or left as possible.
3. Shut engine off and try to connect CV driveline to tractor. If it cannot be connected, the turn angle is too severe.
4. Restart engine and straighten angle slightly, shut off engine and try to connect CV driveline to tractor.
5. Repeat the process until the driveline can be connected. The point at which the driveline can be connected is the maximum turn that should be made.

## Cutting Height Adjustment

### *NOTICE*

- **Avoid ground contact with blades. Striking ground with blades produces one of the most damaging shock loads a cutter can encounter. If this occurs repeatedly, the cutter, driveline, and gearboxes will be damaged.**

Cutting height range is from 2" to 15". A hydraulic cylinder is used for cutting height adjustment.

When selecting a cutting height, you should consider the area of operation. If the ground is rolling and has mounds the blades could contact, set the cutting height accordingly. The cutting height (blade edge) is approximately 1" above the bottom of the side skid.

#### Cutting Height (Normal Mowing) - Center Section

1. Position the cutter on a hard level surface and select an approximate cutting height, Example 6".
2. Raise wings and lock them in the UP position.
3. Use the hydraulic cylinder to raise or lower the center section to obtain a distance of 5" from bottom edge of skid shoe to the ground.
4. Place jackstands under the four corners of the center section. See illustration on page 21. Lower center section to relieve pressure on attitude rod nuts.
5. Loosen outer jam nut on the attitude rods.
6. Adjust inner nuts in or out until the rear of the cutter is approximately 1/2" higher than the front. See Figure 1A. It's used as a starting point for adjusting the attitude rod, based on different tongue height and wheel options.

7. Raise cutter, remove jackstands and check deck height. Tighten jam nuts against sleeve.

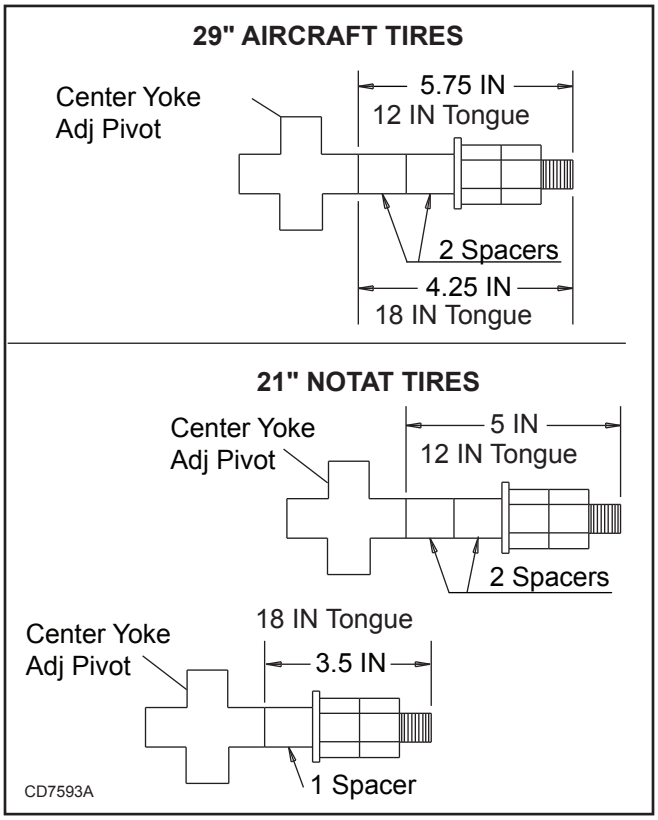



**Figure 1A.** Attitude Rod Adjustment

**Cutting Height (Normal Mowing) - Wings**

1. Lower wings to normal mowing position.
2. Loosen the jam nut on the adjustable link (turn buckle).
3. Lengthening the link will raise the wing, shortening the link will lower the wing. The rear edge of the wing should be parallel to the ground.
4. Make sure jam nuts are tightened once wing is leveled.

When using the cutter to shred, the rear of the cutter deck should be approximately 1/2" to 1" lower than the front.

## TRACTOR OPERATION

### ⚠ WARNING

- **Power unit must be equipped with Roll Over Protection System (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 system in "locked up" position at all times.**

Use care when operating around tree limbs and other low objects. Avoid being knocked off tractor and being injured.

The cutter is operated with tractor controls. Engage the PTO at a low RPM to prevent excessive loads on the cutter drive system. Increase throttle to recommended PTO operating RPM.

Be sure operator is familiar with all controls and can stop tractor and cutter quickly in an emergency. The operator should give complete, undivided attention to operating tractor and cutter.

## CUTTER OPERATION

### ⚠ WARNING

- **Look down and to the rear and make sure area is clear before operating in reverse.**
- **Do not operate or transport on steep slopes.**
- **Do not stop, start, or change directions suddenly on slopes.**
- **Use extreme care and reduce ground speed on slopes and rough terrain.**
- **Watch for hidden hazards on the terrain during operation.**

### ⚠ CAUTION

- **Stop power unit and equipment immediately upon striking an obstruction. Turn off engine, remove key, inspect, and repair any damage before resuming operation.**

When beginning operation of the cutter, make sure that all persons are in a safe location.

Power for operating the cutter is supplied by the tractor PTO. Operate PTO at 540 (1000 RPM for "Q" models).

Know how to stop the tractor and cutter quickly in an emergency.

To stop cutter when operating under normal conditions, reduce tractor RPM to idle and disengage PTO to reduce freewheeling on cutting elements.

Engage PTO at a low engine RPM to minimize stress on the drive system and gearbox.

With PTO engaged, raise PTO speed to 540 or 1000 RPM depending on model and maintain throughout cutting operation.

Gearbox protection is provided by a slip clutch with replacement fiber disc. The slip clutch is designed to slip when excessive torsional loads occur.

Move slowly into material. Adjust tractor ground speed to provide a clean cut without lugging the tractor engine.

Use a slow ground speed for better shredding.

Proper ground speed will depend on the terrain and the material's height, type, and density.

Normally, ground speed will range from 2 to 5 mph. Tall, dense material should be cut at a low speed; thin, medium-height material can be cut at a faster ground speed.

Always operate tractor PTO at proper RPM (540 or 1000 depending on model) to maintain blade speed and to produce a clean cut.

Under certain conditions tractor tires may roll down some grass and prevent cutting at the same height as the surrounding area. When this occurs, reduce your ground speed but maintain PTO at 540 or 1000 RPM. The lower ground speed will permit grass to rebound partially.

## Mowing Tips

Maximum recommended ground speed for cutting or shredding is 6 miles per hour. Adjust tractor ground speed by using higher or lower gears to provide a clean cut without lugging tractor engine.

Tall material should be cut twice. Cut material higher the first pass. Cut at desired height at 90 degrees the second pass.

Remember, sharp blades produce cleaner cuts and use less power.

Before entering an area, analyze it to determine the best procedure. Consider the height and type of material to be cut and the terrain type (hilly, level or rough, etc.).

## Shredding

The cutter may be used to shred various crops including green manure, straw, stubble, asparagus residue, corn stalks and similar crops in preparation for tilling. It may also be used to shred pruning in orchards, groves and vineyards.

Each shredding operation may require a different set-up. Start with front edge of cutter high. Adjust up or down as necessary with attitude rod. Experiment until you obtain the results you want.

When shredding attitude is set, check that the distance from the bottom rear edge of the wing to the ground matches the bottom edge of the rear center section to the ground.

## TRANSPORTING

**⚠ WARNING**

- **Always raise unit and install transport locks before transporting. Leak down or failure of mechanical or hydraulic system can cause equipment to drop.**
- **Always attach safety chain to tractor drawbar when transporting unit.**
- **Never exceed 20 mph (30 km/h) during transport.**
- **Never allow riders on power unit or attachment.**
- **Do not operate PTO during transport.**
- **Do not operate or transport on steep slopes. Refer to tractor manual for proper ballasting and slope recommendations.**
- **Do not operate or transport equipment while under the influence of alcohol or drugs.**
- **Watch for hidden hazards on the terrain during operation.**
- **Stop power unit and equipment immediately upon striking an obstruction. Turn off the engine, remove key, inspect, and repair any damage before resuming operation.**
- **Never allow children or untrained persons to operate equipment.**
- **Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.**
- **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**
- **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head. Wear a respirator or filter mask where appropriate.**
- **When transporting, pay special attention to overhead power lines and make sure the machine has sufficient clearance to pass.**

**⚠ CAUTION**

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

## Lock-Up

Always transport with wings and center frame in the raised, locked position.

### Wing Lock-Up

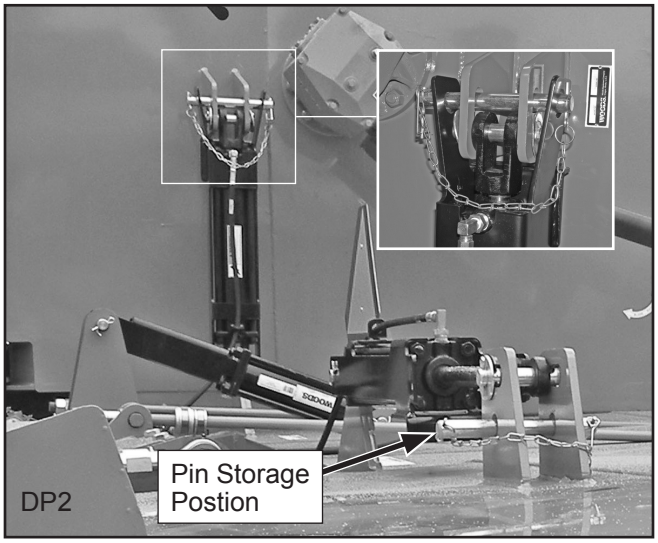



**Figure 2.** Transport Lock-Up
Wing and Center Section Shown

1. Remove safety pin and lock-up pin from storage position.
2. Raise wing and align wing transport lock with slotted holes in the cylinder lugs.
3. Insert lock-up pin above cylinder pin and secure with klik pin
4. Repeat steps 1 to 3 for opposite wing.
5. Relieve hydraulic pressure from wing cylinders and lower wing against wing transport lock.

### Center Section Lock-Up

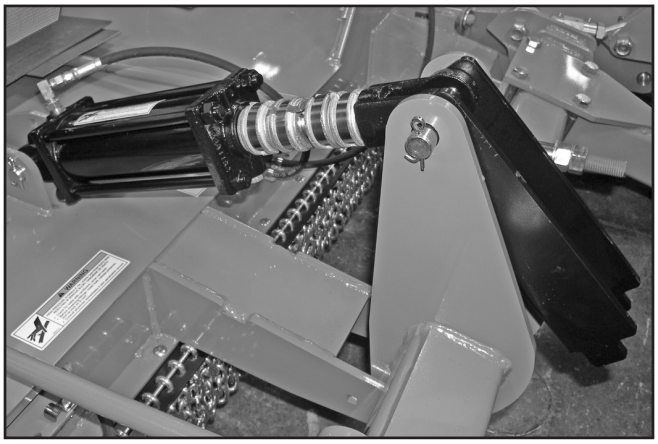


**Figure 3.** Transport Lock In Operation Position

1. Raise cutter with hydraulic cylinder to maximum height.
2. Rotate transport lock into position over cylinder rod (Figure 2).
3. Lower cutter against transport lock.
4. To lower cutter for operation, extend hydraulic cylinder to raise cutter. Rotate transport lock back away from cylinder rod (Figure 3).
5. Lower cutter to cutting height. Use cylinder stops (stroke control kit) to set desired cutting height.

## STORAGE

Follow these steps when storing your cutter:

1. Clean cutter before storing. See page 26 for cleaning instructions. Store on level, solid ground.
2. Disconnect driveline and secure up off the ground.
3. Lower wings to ground.
4. Raise cutter center section and pin transport bar in raised position.
5. Attach parking jack and raise tongue weight off tractor drawbar.
6. Place wedge blocks at front and rear of wheels on center section and each wing to prevent wheel rotation.
7. Securely block all four corners of center section and each wing with jack stands.
8. Remove hydraulic hoses after tractor is turned off and all system pressure is released by operating valve levers several times.
9. Remove safety tow chain from tractor.
10. Remove retainer pin and high strength drawbar pin.
11. Keep children, bystanders, and animals away from equipment and the storage area.

## PRE-OPERATION CHECKLIST

**(OWNER'S RESPONSIBILITY)**

_____ Review and follow all safety rules and safety decal instructions on page 7 through page 13.

_____ Check that all safety decals are installed and in good condition. Replace if damaged or illegible.

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

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

_____ Check all lubrication points and grease as instructed in 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 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.

_____ Check that all hardware is properly installed and secured.

_____ Check cutting height and attitude adjustment.

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

_____ Check that blades are sharp and secure and cutting edge is positioned to lead with correct rotation.

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

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

_____ 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.

_____ Inspect area to be cut and remove stones, branches, or other hard objects that might be thrown and cause injury or damage.

_____ Inspect chain shielding and replace any damaged or missing links.

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

_____ Check the tire pressure for pneumatic tires. The maximum pressure allowed is 40 psi.

# OWNER SERVICE

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

## ⚠ WARNING

- **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**
- **Before working underneath, disconnect driveline from tractor, lower wings to ground, raise cutter, and pin transport bar in raised position. Attach parking jack and lower to ground. Securely block all four corners of center section and each wing with jack stands. Blocking up prevents the cutter from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.**
- **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 cleaning, servicing, adjusting, repairing or unplugging, stop tractor engine, place all controls in neutral, set park brake, remove ignition key, and wait for all moving parts to stop.**
- **Never perform cleaning, service or maintenance with engine running.**

## ⚠ CAUTION

- **If you do not understand any part of this manual and need assistance, see your dealer.**
- **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; and respirator or filter mask where appropriate.**

## BLOCKING METHOD

To minimize the potential hazards of working underneath the cutter, follow these procedures:

## ⚠ WARNING

- **Before performing any service or maintenance, lower equipment to ground or block securely, turn off engine, remove key, and disconnect driveline from tractor PTO.**
- **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 position jackstands under wheels, axles, or wheel supports. Components can rotate and cause cutter to fall.

1. Jackstands with a load rating of 1000 lbs. or more are the only approved blocking device for this cutter. Install jackstands (shown by **X**s in Figure 4) under the cutter before working underneath unit.
2. Consider the overall stability of the blocked unit. Just placing jackstands underneath will not ensure your safety.

   The working surface must be level and solid to support the weight on the jackstands. Make sure jackstands are stable, both top and bottom. Make sure cutter is approximately level.
3. With full cutter weight lowered onto jackstands, test blocking stability before working underneath.
4. If cutter is attached to tractor when blocking, set the brakes, remove key, and block cutter before working underneath.
5. Securely block rear tractor wheels, in front and behind. Tighten tractor lower 3-point arm anti-sway mechanism to prevent side-to-side movement.

| | | |
|---|---|---|
| 1 | Driveline U-joint | 10 Hours |
| 2 | Telescoping shaft | 10 Hours |
| 4 | CV body assembly (10 pumps minimum) | 10 Hours |
| 5 | Driveline shield | 10 Hours |
| 6 | Splined yoke | 10 Hours |
| 7 | Gearbox (above lower line on dipstick) | Daily |
| 8 | Tongue pivot | 40 Hours |
| 9 | Wheel yoke pivot | 40 Hours |
| 10 | Gearbox (bottom of side hole) | Daily |
| 11 | Tailwheel spindle | 20 Hours |
| 12 | Turnbuckle | 40 Hours |
| 13 | Blade pin | 40 Hours |

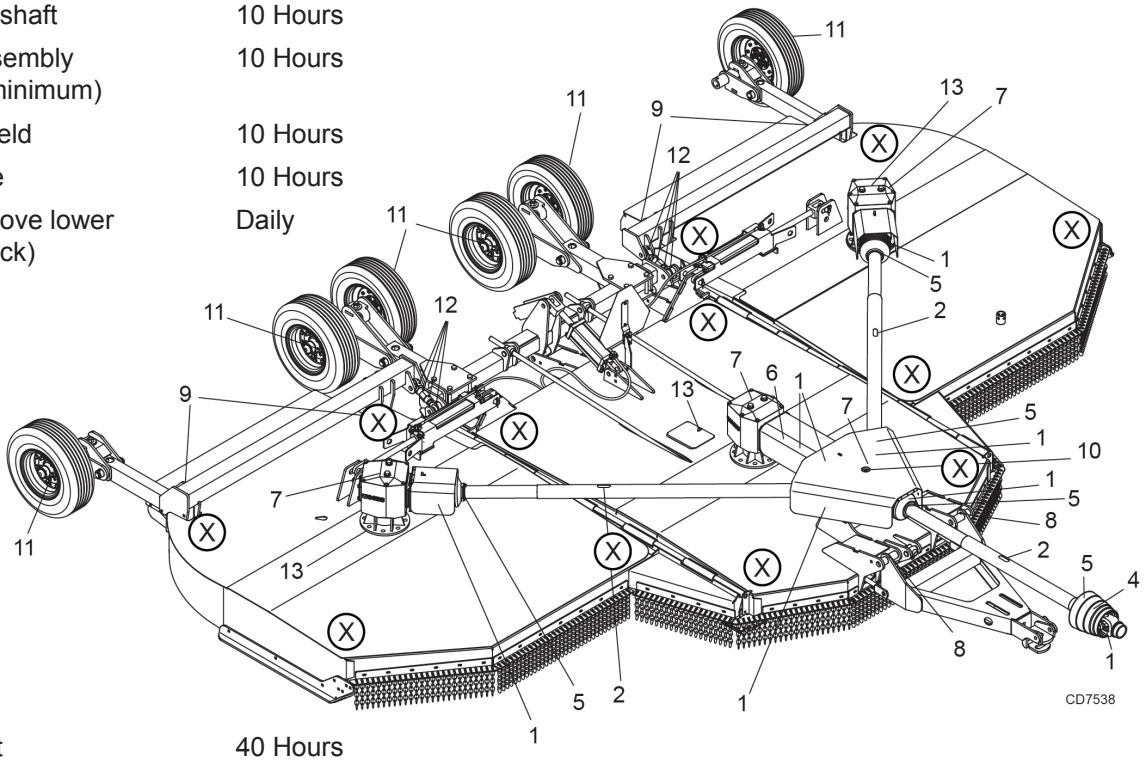



**Figure 4.** Jackstand Placement and Lubrication Points

## LUBRICATION

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

See Figure 4 for lubrication points and frequency or lubrication based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication.

Use a lithium grease of #2 consistency with a MOLY (molybdenum disulfide) additive for all locations unless otherwise noted. Be sure to clean fittings thoroughly before attaching grease gun. One good pump of most guns is sufficient when the lubrication schedule is followed.

### Gearbox Lubrication

For gearbox, use a high quality gear oil with a viscosity index of 80W or 90W and an API service rating of GL–4 or –5 in gearboxes.

**Splitter Gearbox:** Fill gearbox until oil runs out the side plug on gearbox.

**Wing Gearbox:** Fill gearbox until oil is just above lower line on dipstick. Check gearbox daily for evidence of leakage, and contact your dealer if leakage occurs. Use sealant on vent plug threads during installation. Check vent plug periodically and clean if it does not relieve pressure.

### Driveline Lubrication

1. Lubricate the driveline slip joint every eight operating hours. Failure to maintain proper lubrication could result in damage to U-joints, gearbox, and driveline.
2. Lower cutter to ground, disconnect driveline from tractor PTO shaft, and slide halves apart but do not disconnect from each other.
3. Apply a bead of grease completely around male half where it meets female half. Slide drive halves over each other several times to distribute grease.

## Seasonal Lubrication

In addition to the daily recommended lubrication, a more extensive application is recommended seasonally.

1. Fill CV double yokes with 20 pumps of grease with the joints in a straight line.
2. Articulate CV body to maximum angle several times to ensure full coverage of joints.
3. Place joints in the straight position and a add 10 additional pumps of grease to both joints.
4. Wipe telescoping drive clean of all old grease and contaminants.
5. Add a thin layer of new grease over telescoping drive.

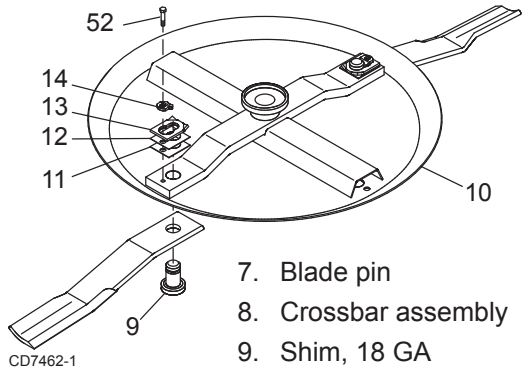
## BLADES

### ⚠ WARNING

- **Your dealer can supply genuine replacement blades. Substitute blades may not meet original equipment specifications and may be dangerous.**
- **Before working underneath, read manual instructions, securely block up, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.**

## Blade Removal

**(Figure 5)**




7. Blade pin
8. Crossbar assembly
9. Shim, 18 GA
10. Shim, 20 GA
11. Keyhole plate
12. Blade lock clip
50. 1/2 NC x 1-1/4 HHCS GR5

**Figure 5.** Blade Assembly

1. Disconnect driveline from tractor PTO.
2. Raise cutter and block securely (see Figure 4).
3. Align crossbar (8) with blade access hole in the cutter frame. Remove cap screw (50), blade pin lock clip (12, keyhole plate (11), and shims (9 & 10). Carefully drive blade pin (7) out of crossbar.
4. Rotate crossbar and repeat for opposite blade.

### *NOTICE*

- **If blade pin (7) is seized in crossbar and extreme force will be needed to remove it, support crossbar from below to prevent gearbox damage.**

## Blade Installation

**(Figure 5)**

### ⚠ WARNING

- **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 servicing, adjusting, repairing, or unplugging, stop tractor engine, place all controls in neutral, set park brake, remove ignition key, and wait for all moving parts to stop.**
- **Never perform cleaning, service, or maintenance with engine running.**
- **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**
- **Before working underneath, disconnect driveline from tractor, lower wings to ground, raise cutter, and pin transport bar in raised position. Attach parking jack and lower to ground. Securely block all four corners of center section and each wing with jack stands. Blocking up prevents the cutter from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.**
- **If you do not understand any part of this manual and need assistance, see your dealer.**
- **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. Wear a respirator or filter mask where appropriate.**

### *NOTICE*

Crossbar rotation has clockwise rotation on left gearbox and counterclockwise rotation on the right and center gearboxes when looking down on cutter. Be sure to install blade cutting edge to lead in correct rotation.

**NOTE:** Always replace or sharpen both blades at the same time.

1. Inspect blade pin (7) for nicks or gouges, and if you find any, replace the blade pin.
2. Insert blade pin through the blade. Blade should swivel on blade pin; if it doesn't, determine the cause and correct.
3. Align crossbar (8) with blade access hole in cutter frame. Apply a liberal coating of Never-Seez® or equivalent to blade pin and crossbar hole. Make sure blade offset is down away from cutter.
4. Insert blade pin (7) through blade. Push blade pin through crossbar.
5. Install shims (9 & 10) over blade pin.

   **NOTE:** Only use enough shims to allow keyhole plate (11) to slide into blade pin groove.
6. Install blade clip (12) over keyhole plate and into blade pin groove.
7. Secure into position with cap screw (50). Torque cap screw to 85 lbs-ft.
8. Repeat steps for opposite side.

   **NOTE:** Blade should be snug but should swivel on pin without having to exert excessive force. Blade should not move more than a 1/4 inch up or down at the tip. Keep any spacers not used in the installation as replacements or for future installation.

## Blade Sharpening

1. Sharpen both blades at the same time to maintain balance. Follow original sharpening pattern.
2. Do not sharpen blade to a razor edge—leave at least a 1/16" blunt edge.
3. Do not sharpen back side of blade.

***NOTICE:*** When sharpening blades, grind the same amount on each side to maintain balance. Replace blades in pairs. Unbalanced blades will cause excessive vibration, which can damage gearbox bearings. Vibration may also cause structural cracks to cutter.

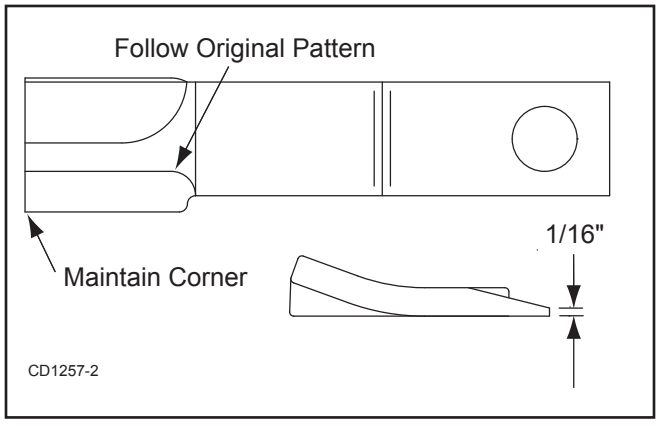



**Figure 6.** Blade Sharpening

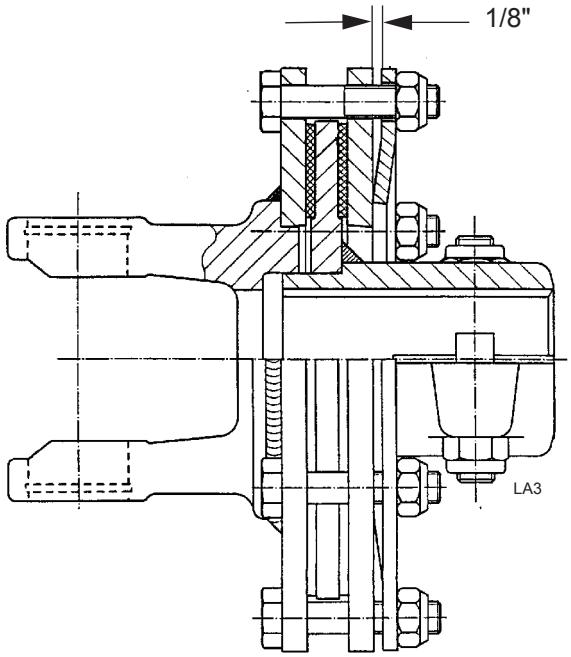
## 2-PLATE SLIP CLUTCH ADJUSTMENT

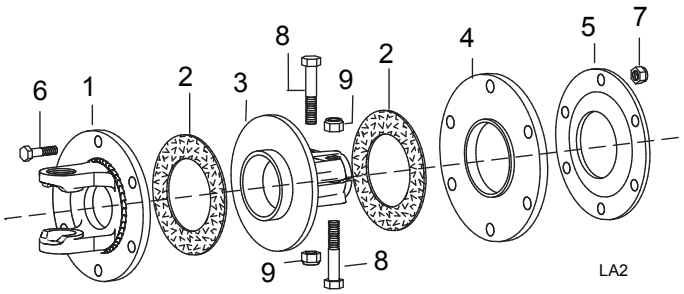
**(Figure 7)**

The slip clutch is designed to slip so that the gearbox and driveline are protected if the cutter strikes an obstruction.

A new slip clutch or one that has been in storage over the winter may seize. Before operating the cutter, make sure it will slip by performing the following operation:

1. Turn off tractor engine and remove key.
2. Remove driveline from tractor PTO.
3. Loosen six 10 mm cap screws (6) to remove all tension from Belleville spring plate (5).
4. Hold clutch hub (3) solid and turn shaft to make sure clutch slips.
5. If clutch does not slip freely, disassemble and clean the thrust plate faces (4), flange yoke (1), and clutch hub (3).
6. Reassemble clutch.
7. Tighten Belleville spring (5) until it is against the thrust plate (4) of the clutch, and then back off each of the six nuts by 2 full revolutions. The gap between Belleville spring and thrust plate should be 1/8" as shown in Figure 7.
8. If a clutch continues to slip when the spring is compressed to 1/8" gap, check friction discs (2) for excessive wear. Discs are 1/8" when new. Replace discs after 1/16" wear. Minimum disc thickness is 1/16".




1. Flange yoke
2. Friction disc
3. Hub 1-3/8 round bore
4. Thrust plate
5. Belleville spring plate
6. 10 mm x 1.5P x 50 mm Cap screw
7. 10 mm x 1.5P Hex nut
8. 12 mm x 1.5P x 65 mm Cap screw
9. 12 mm x 1.5P Hex nut

**Figure 7.** 2-Plate Slip Clutch Assembly

## 4-PLATE SLIP CLUTCH ADJUSTMENT

**(Figure 8)**

The slip clutch is designed to slip so that the gearbox and driveline are protected if the cutter strikes an obstruction.

A new slip clutch or one that has been in storage over the winter may seize. Before operating the cutter, make sure slip clutch will slip by performing the following operation:

1. Turn off tractor engine and remove key.
2. Tighten four nuts (12) to remove pressure from the clutch plates (2). Repeat for all three clutches.
3. Start tractor at low throttle and slowly engage PTO and allow clutches to slip for 5 seconds. Disengage PTO and turn off tractor engine.
4. If clutches slip freely, completely loosen nuts (12).
5. If clutch does not slip freely, disassemble and clean plates (4, 6, & 7), flange yoke (1), and clutch hub (3).
6. Reassemble clutch.
7. Tighten Belleville spring (5) with nuts (11) until it is against the thrust plate (4) of the clutch. Back off each of the four nuts (11) until gap between Belleville spring and thrust plate is .236" as shown in Figure 8.
8. If a clutch continues to slip when the spring is compressed to .236" gap, check friction discs (2) for excessive wear. Discs are 1/8" when new. Replace discs after 1/16" wear. Minimum disc thickness is 1/16".

**NOTE:** When storing cutter for long periods of time, relieve the pressure on the clutch discs by tightening the four nuts (12) on each clutch. Completely loosen nuts (12) to return to service.

## SHIELDING REPAIR

**⚠ DANGER**

- **Full chain shielding must be installed at all times. Thrown objects could injure people or damage property.**
  - **If the machine is not equipped with full chain shielding, operation must be stopped.**
  - **This shielding is designed to reduce the risk of thrown objects. The mower deck and protective devices cannot prevent all objects from escaping the blade enclosure in every mowing condition. It is possible for objects to ricochet and escape, traveling as much as 300 feet (92m).**

**Repairing Chain Shielding**

1. Inspect chain shielding each day of operation and replace any broken or missing chains as required.
2. Replace any missing hardware.

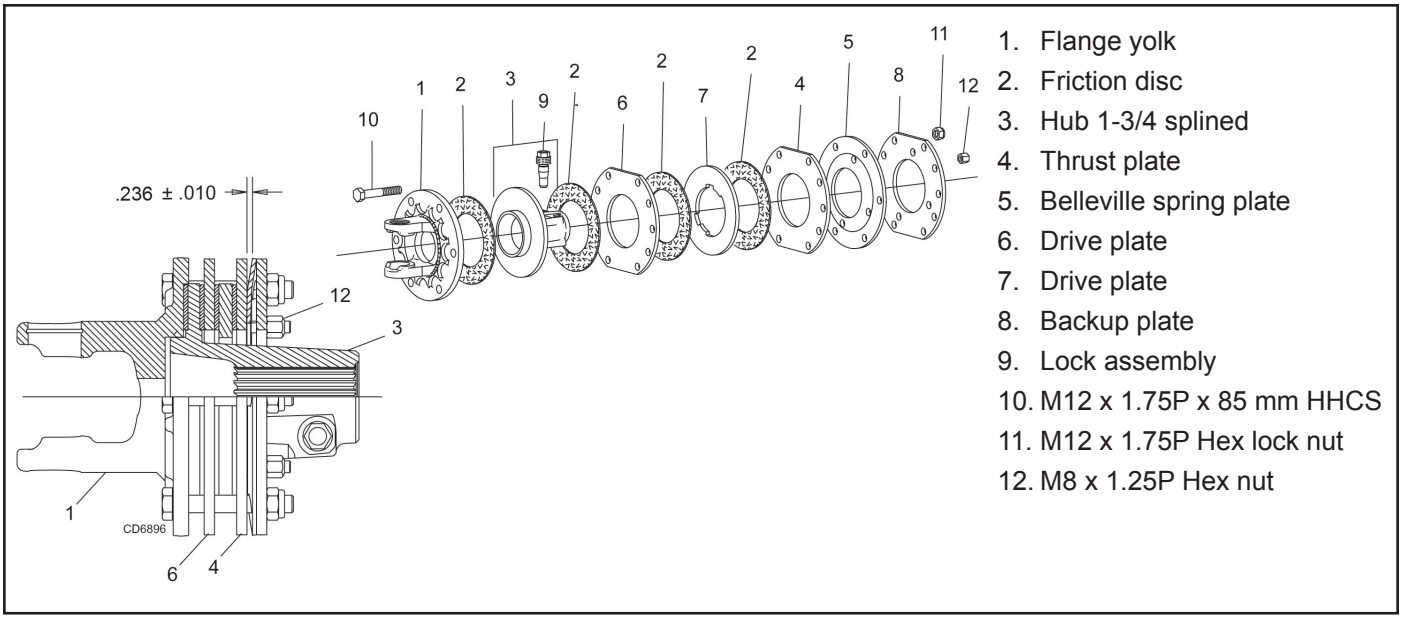



**Figure 8.** 4-Plate Slip Clutch Assembly

## SERVICING TIRES SAFELY

**⚠ WARNING**

- **Explosive separation of tire and rim parts can cause serious injury or death. Release all air pressure before loosening bolts.**

### Used Aircraft Tires (Figure 9)

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure and result in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and an extension hose long enough to allow you to stand to the side — not in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.

Never remove split rim assembly hardware (A) with the tire inflated.


**Figure 9.** Split Rim Tire Servicing

## CLEANING

**⚠ WARNING**

- **Never perform cleaning, servicing, or maintenance with engine running.**
- **Before cleaning, servicing, adjusting, repairing, or unplugging: stop tractor engine, place all controls in neutral, set park brake, remove ignition key, and wait for all moving parts to stop.**

### After Each Use

- **Remove large debris such as clumps of dirt, grass, crop residue, etc. from machine.**
- **Inspect machine and replace worn or damaged parts.**
- **Replace any safety decals that are missing or not readable.**
- **Do not climb on machine or ladder to clean. Clean machine with wings in lowered position.**

### Periodically or Before Extended Storage

- **Clean large debris such as clumps of dirt, grass, crop residue, etc. from machine.**
- **Remove the remainder using a low-pressure water spray.**

1. Be careful when spraying near scratched or torn safety decals or near edges of decals as water spray can peel decal off surface.
2. Be careful when spraying near chipped or scratched paint as water spray can lift paint.
3. If a pressure washer is used, follow the advice of the pressure washer manufacturer.

- **Inspect machine and replace worn or damaged parts.**
- **Sand down scratches and the edges of areas of missing paint and coat with Woods spray paint of matching color (purchase from your Woods dealer).**
- **Replace any safety decals that are missing or not readable (supplied free by your Woods dealer). See Safety & Instructional Decals section for location drawing.**

# TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| Does not cut | Dull blades | Sharpen blades. |
| | Worn or broken blades | Replace blades. (Replace in pairs only.) |
| | Incorrect PTO speed | Set at rated PTO speed. |
| | Ground speed too fast | Reduce ground speed. |
| | Drive not functioning (blades do not turn when PTO is running) | Check drive shaft connection. Check gearbox. |
| | Gearbox malfunction | Repair gearbox. |
| | Excessive clutch slippage | Adjust clutch. |
| | Incorrect blade direction | Check to be sure blade edge is correct for direction of rotation. |
| Streaks or ragged cut | Broken or worn blades | Replace or sharpen blades. |
| | Attitude incorrect | Level machine. |
| | Ground speed too fast | Reduce ground speed. |
| | Excessive cutting height | Lower cutting height. (**Note:** Set height so blades do not frequently hit ground.) |
| | Excessive lush and tall vegetation | Recut at 90° to first pass. |
| Excessive side skid wear | Running with skids continuously on ground | Raise cutting height or adjust. |
| Excessive clutch slippage | Clutch out of adjustment | Adjust clutch. |
| | Clutch discs worn; wear stops contacting opposite plate | Replace discs. |
| | Blades hitting ground | Raise cutting height. |
| Vibration | Broken blade | Replace blades in pairs. |
| | Bearing failure | Check gearbox shafts for side play. |
| | Hitch length incorrect | Reset hitch length. |
| | Universal drive | Adjust pedestal bearing height to be parallel to ground. |
| Blades hitting deck | Bent blades or crossbar | Replace bent blades or crossbar. |
| Unit will not raise | Low oil | Add hydraulic oil. |
| Unit doesn't cut level | Wing section cuts lower than center | Lengthen turnbuckle connecting center yoke to wing wheel yoke. |
| | Wing section cuts higher than center | Shorten turnbuckle connecting center yoke to wing wheel yoke. |

# DEALER SERVICE

The information in this section is written for dealer service personnel. The repair described here requires special skills and tools. If your shop is not properly equipped or your mechanics are not properly trained in this type of repair, you may be time and money ahead to replace complete assemblies.

## ⚠ WARNING

- **Before working underneath, read manual instructions, securely block up, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failure, or mechanical component failure.**
- **Keep all persons away from operator control area while performing adjustments, service, or maintenance.**

## ⚠ CAUTION

- **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

## GEARBOX MAINTENANCE

**NOTE:** Read this entire section before starting any repair. Many steps are dependent on each other.

**1.** Fill gearbox with SAE 80W or 90W gear lube. Proper oil level is between lowest ring and end of dipstick.

**NOTE:** Repair to this gearbox is limited to replacing bearings, seals, and gaskets. Replacing gears, shafts, and a housing is not cost effective. Purchasing a complete gearbox is more economical.

**2.** Inspect gearbox for leakage and bad bearings. Leakage is a very serious problem and must be corrected immediately.

**NOTE:** Bearing failure is indicated by excessive noise and side-to-side or end-play in gear shafts.

### Seal Replacement

**(Figure 10)**

Recommended sealant for gearbox repair is Permatex® Aviation 3D Form-A-Gasket or equivalent.

Leakage can occur at the vertical or horizontal gaskets and shaft seals.

Leakage at the horizontal gasket or seal can be repaired without removing the gearbox from the cutter.

#### Seal Installation

**NOTE:** Proper seal installation is important. An improperly installed seal will leak.

**1.** Clean area in housing where seal outer diameter (OD) seats. Apply a thin coat of Permatex.

**2.** Inspect area of shaft where seal seats. Remove any burrs or nicks with an emery cloth.

**3.** Lubricate gear shaft and seal lips.

**4.** Place seal squarely on housing, spring-loaded lip toward housing. Select a piece of pipe or tubing with an OD that will sit on the outside edge of the seal but will clear the housing. Tubing with an OD that is too small will bow seal cage and ruin seal.

**5.** Carefully press seal into housing, avoiding distortion to the metal seal cage.

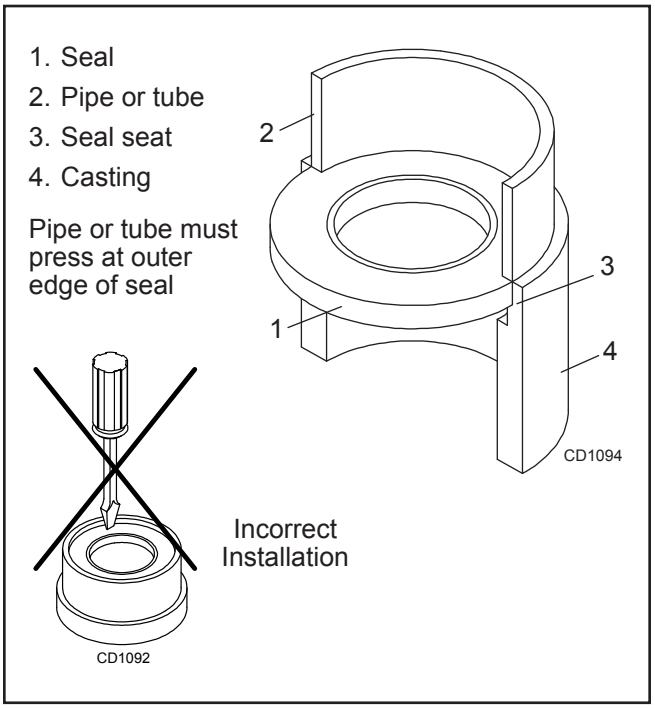



**Figure 10.** Seal Installation

**Vertical Shaft Seal Replacement**
**(Figure 11)**

1. Disconnect and remove the rear driveline from the gearbox.
2. Remove vent plug (24) and siphon gear lube from housing through this opening.
3. Remove crossbar (see page 33).
4. Remove protective seal (8) and vertical shaft seal (18). Replace seal (18) with new seal.

   Vertical seal should be recessed in housing. Horizontal seal (19) should be pressed flush with outside of housing.

   **NOTE:** Distortion to seal cage or damage to seal lip will cause seal to leak.
5. Fill gearbox with SAE 80W or 90W gear lube until it runs out the level plug.
6. Remove and replace any seal damaged in installation.

**Horizontal Shaft Seal Replacement**
**(Figure 11)**

1. Disconnect and remove the rear driveline from the gearbox.
2. Remove vent plug (24) and siphon gear lube from housing through this opening.
3. If the leak occurred at either end of horizontal shaft, remove oil cap (20) and/or oil seal (19). Replace with new one.
4. Fill gearbox with SAE 80W or 90W gear lube to proper level.

## GEARBOX REPAIR

### Removal from Cutter

**(Figure 11)**

**NOTE:** Gearbox is heavy: do not attempt to move without mechanical assistance.

1. Disconnect and remove the rear driveline from the gearbox.
2. Remove cotter pin and nut from vertical shaft and remove crossbar (see page 33).
3. Remove the six bolts that attach gearbox to cutter and remove gearbox.

### Disassembly

**(Figure 11)**

1. Remove top cover (22) from gearbox and pour out gear oil.
2. Remove oil cap (20) (to be replaced).
3. Remove snap ring (10) and shim (13) from input shaft (3).
4. Support gearbox in hand press and push on input shaft (3) to remove bearing (7).
5. Remove six cap screws (23) and top cover (22) from housing. Remove gear (1) from inside housing.
6. Remove oil seal (19) from front of housing (to be replaced).
7. Remove snap ring (10) and shim (13) from front of housing (2).
8. Remove input bearing (7) by using a punch and hammer from outside of housing.
9. Support housing in vise in a horizontal position.
10. The castle nut (15), cotter pin (25), and hub are already removed with the stump jumper/crossbar. Remove the protective seal (8), and oil seal (18).
11. Remove cotter pin (9), castle nut (14), and shim (17) from output shaft (4).
12. Remove output shaft (4) by using a punch and hammer and tap on top to drive down. Remove gear (5) and shim (16) from inside housing.
13. Remove bottom bearing (26) by using a punch and hammer from the top, outside the housing.
14. Support housing upside down (top cover surface) and remove bottom bearing (6) by using a punch and hammer from the bottom side of the housing.
15. Inspect gears for broken teeth and wear. Some wear is normal and will show on loaded side. Forged gear surfaces are rough when new. Check that wear pattern is smooth.
16. Inspect vertical and horizontal shafts for grooves, nicks, or bumps in the areas where the seals seat. Resurface any damage with emery cloth.
17. Inspect housing and caps for cracks or other damage.

### Assembly

**(Figure 11)**

1. Clean housing, paying specific attention to areas where gaskets will be installed.
2. Wash housing and all components thoroughly. Select a clean area for gearbox assembly. Replace all seals, bearings, and gaskets. All parts must be clean and lightly oiled before reassembling.
3. Insert both output bearings (6) in the housing, using a round tube of the correct diameter and a hand press.
4. Slide output shaft (4) through both bearings (6) until it rests against top bearing (6).
5. Slide shim (16) over output shaft (4).
6. Press gear (5) onto output shaft (4) and secure with shim (17), castle nut (14), and cotter pin (9).

7. Apply grease to lower seal lips (18) and press seal (18) over output shaft (4), using a tube of the correct diameter. Be sure not to damage the seal lip.
8. Press in housing so that seal is recessed. Press protective seal (8) until seated flush with housing. Verify that the seal (8) is seated correctly.
9. Press bearing (7) into the housing, using a round tube of the correct diameter and a hand press. Secure with shim (13) and snap ring (10).
10. Secure snap ring (11) on input shaft (3) if not already secure.
11. Place gear (1) through top of housing and align gear (1) and gear (5) so that gear teeth are a match.
12. While holding gear (1) in place, slide input shaft (3) through gear (1) and bearing (7). Align splines on shaft (3) and gear (1).
13. Slide shim (12) over input shaft (3) and press bearing (7) onto input shaft (3), using a round tube of the correct diameter and a hand press.
14. Slide shim (13) over input shaft (3) and secure with snap ring (10).
15. Check input shaft end float by moving the input shaft (3) by hand. If end float is higher than 0.012", insert shim between input shaft (3) and rear bearing (7). Repeat until end float is less than 0.012". Check rotational torque by hand. The torque should be less than 2.2 lbs-inch.
16. Check that the gear backlash is between 0.006" and 0.016". You should not have to adjust the backlash.
17. Press in input oil seal (19), using tube of correct diameter. Be careful not to damage seal lip.
18. Press oil cap (20) on to cover the rear of housing, using a tube of the correct diameter.
19. Place top cover (22) on top of housing and secure with six cap screw (23).
20. Check gearbox housing for leaks by plugging all holes except one. Apply 4 psi compressed air and immerse the gearbox in water to verify that there are no leaks.
21. Remove gearbox from water and dry off with compressed air. Add SAE 80W or 90W EP oil to proper level. Tighten all plugs.

## Reinstallation

**NOTE:** Gearbox is heavy: do not attempt to move without mechanical assistance.

1. Set gearbox on cutter and fasten with bolts and nuts. Torque bolts to 300 lbs-ft.
2. Attach crossbar (Crossbar Installation, page 34).

1. Crown gear
2. Gearbox housing
3. Input shaft
4. Output shaft
5. Gear, pinion
6. Bearing
7. Input bearing
8. Protective seal
9. Cotter pin
10. Snap ring
11. Snap ring
12. Shim, 45.3 x 2.5
13. Shim, 70.3 x 84.7
14. Nut
15. Castle nut
16. Shim, 50.3 x 70.3
17. Shim
18. Oil seal (Vertical Shaft)
19. Oil seal (Horizontal Shaft)
20. Cap
22. Top cover
23. Cap screw 8 mm x 16 (8.8)
24. Vent plug
25. Cotter pin
26. Bearing

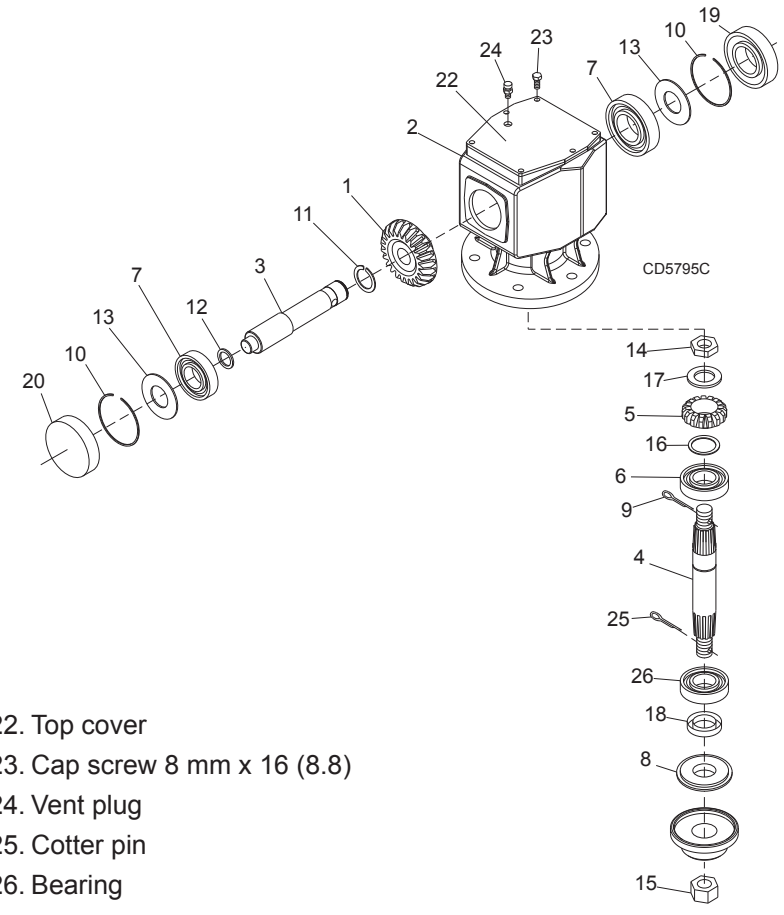



**Figure 11.** Gearbox

## SPLITTER GEARBOX REPAIR

**(Figure 12)**

### Removal from Cutter

1. Disconnect and remove all drivelines from gearbox.
2. Remove the four cap screw and lock washers that secure gearbox to cutter, and remove gearbox.

   **NOTE:** Gearbox is heavy: do not attempt to move it without mechanical assistance.

### Disassembly

#### Center Shaft

1. Remove plug from side of gearbox and pour out the gear oil.
2. Remove seal (6, to be replaced) from the front and rear of the center shaft (5).
3. Remove front cap (4) and gaskets (8, 9, 10) from the front and rear of the center shaft (5).
4. Support gearbox in a hand press and push on the rear of the center shaft.
5. Remove bearing cones (7), and gear (18) from center shaft (5).
6. Remove bearing cups (7) from housing and cap using a punch and hammer.

#### Side Shaft

7. Remove seal (12, to be replaced) from the output shaft (13).
8. Remove 8 cap screws (3) and side shaft assembly.
9. Remove cotter pin (21), bearing adjustment nut (20), and gear (19).
10. Support side shaft assembly in hand press. Press shaft (13) through the cap (11) from the threaded end of the shaft.
11. Repeat steps 10 through 12 for opposite side shaft.

#### Inspect Components

12. Inspect gears for broken teeth and wear. Some wear is normal and will show on the loaded side of the teeth. Forged gear surfaces are rough when new. Check that wear pattern is smooth.
13. Inspect shafts for grooves, nicks, or bumps in the areas where seals seat. Resurface any damage with emery cloth or replace shaft. from gearbox.
14. Inspect housing and caps for cracks or other damage.

### Assembly

1. Clean housing, pay specific attention to areas where gaskets are installed.
2. Wash housing and all components thoroughly.
3. Select a clean work area to assemble gearbox.
4. Replace all seals, bearings, and gaskets.
5. All parts must be clean and lightly oiled before assembly.

#### Side Shaft

6. Insert bearing cups (7) in hub cap (11) using a round tube of the same size diameter and a hand press.
7. Press bearing cone (7) on to output shaft (13), slide output shaft (13) through hub cap (11) and press bearing cone (7) on to output shaft (13).
8. Slide gear (19) over output shaft (13) and secure with nut (20) and cotter pin (21).
9. Check end play of shaft by moving it in and out. If end play is more than 0.012", tighten nut (20). Repeat process until end play is less than 0.012".
10. Check rotational torque. Torque should be less than 2.2 lbs-inch gear.
11. Place seal (12) over shaft and press into housing using a tube of the same diameter. Seal should be flush with housing when properly installed.
12. Repeat steps 6 through 10 for opposite side shaft.

#### Center Shaft

13. Insert bearing cups (7) in housing and front cap (4) using a round tube of the same size diameter and a hand press.
14. Press spacer (14), gear (18), shims (15, 16, 17) and bearing cones (7) on to input shaft (5).
15. Slide input shaft (5) through housing and install gaskets (8, 9, 10) and cap (4).
16. Check end play of shaft by moving it in and out. If end play is more than 0.012", remove a gasket (8, 9, or 10). Repeat process until end play is less than 0.012".
17. Check rotational torque. Torque should be less than 2.2 lbs-inch gear.
18. Check gear backlash, backlash should be between 0.006" and 0.016". Adjust the backlash by adding or removing shims (15, 16, 17) from the input shaft (5).
19. Place seal (6) over shaft and press into housing using a tube of the same diameter. Seal should be flush with housing when properly installed. Repeat process for opposite end shaft.

## Check Gearbox

1. Check gearbox for leaks by: plugging all holes except one, applying 4 psi of compressed air, and immersing gearbox in water. Verify gearbox does not leak.

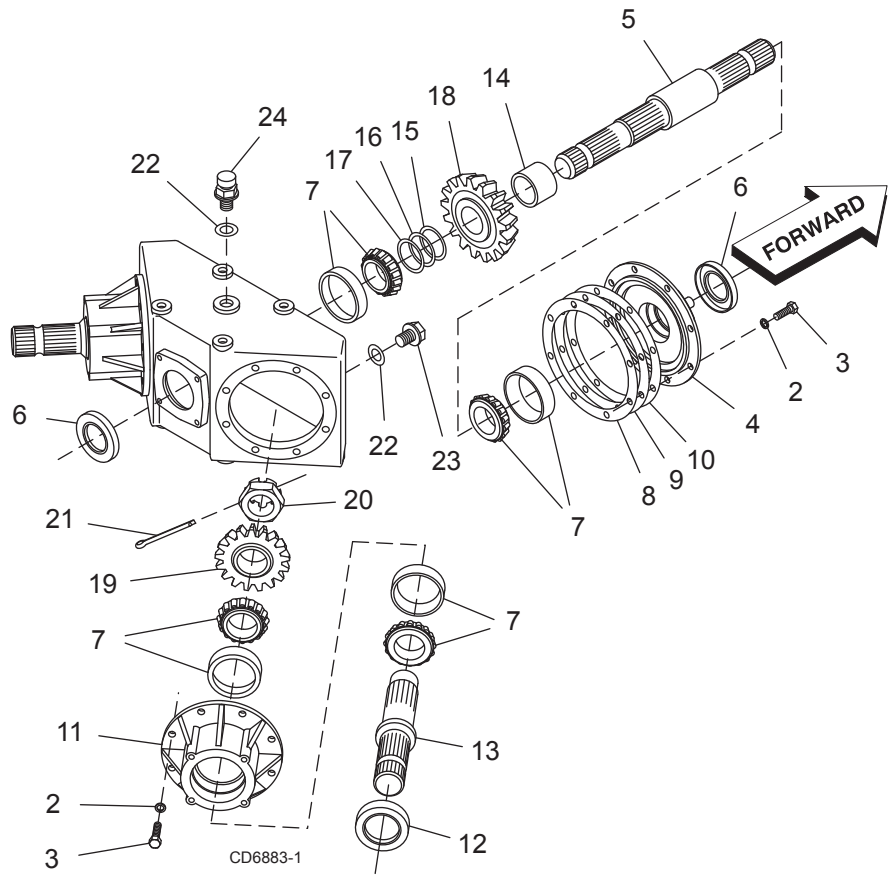
   **NOTE:** Excessive air pressure will damage seals.

2. Remove gearbox from water and dry off.
3. Remove upper plug on right side of housing. Add SAE 80W or 90W EP oil until it runs out side level hole. Replace plug.
4. Install breather (24) in top cover.

## Gearbox Installation

**NOTE:** Gearbox is heavy: do not attempt to move it without mechanical assistance.

1. Place gearbox on cutter and secure into position using four cap screws and lock washers.
2. Torque hardware to 300 lbs-ft.
3. Attach all drivelines to gearbox.
4. Install all shields.




2. 10 mm Lock washer
3. M10 x 1.5P x 30 HHCS
4. Input cap
5. Input shaft
6. Input oil seal
7. Bearing assembly (cup & cone)
8. Gasket .15 mm
9. Gasket .25 mm
10. Gasket .40 mm
11. Hub cap
12. Oil seal
13. Output shaft
14. Spacer
15. Shim .30 mm
16. Shim .40 mm
17. Shim .50 mm
18. Center gear
19. Wing gear
20. Bearing adjustment nut
21. 1/8 x 2-1/2 Cotter pin
22. Sealing washer
23. M18 x 1.5P Level plug
24. M18 x 1.5P Breather plug

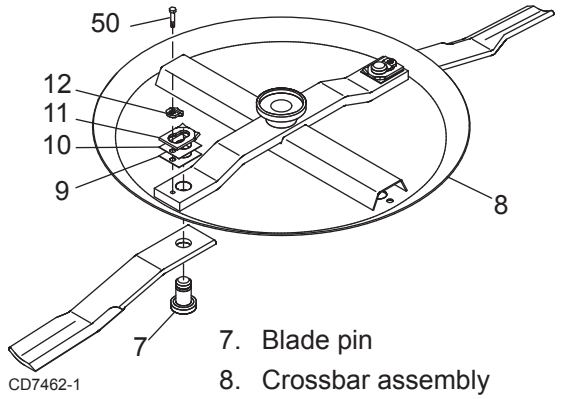
**Figure 12.** Splitter Gearbox Assembly

## CROSSBAR REMOVAL

1. It is necessary to gain access to bottom side of cutter for crossbar removal. See Blocking Method page 20.

   **NOTE:** You will need to use either the puller screw (Item 6, Figure 14) or a small hydraulic jack to remove the crossbar.

2. Remove blades from crossbar as shown in Figure 13.

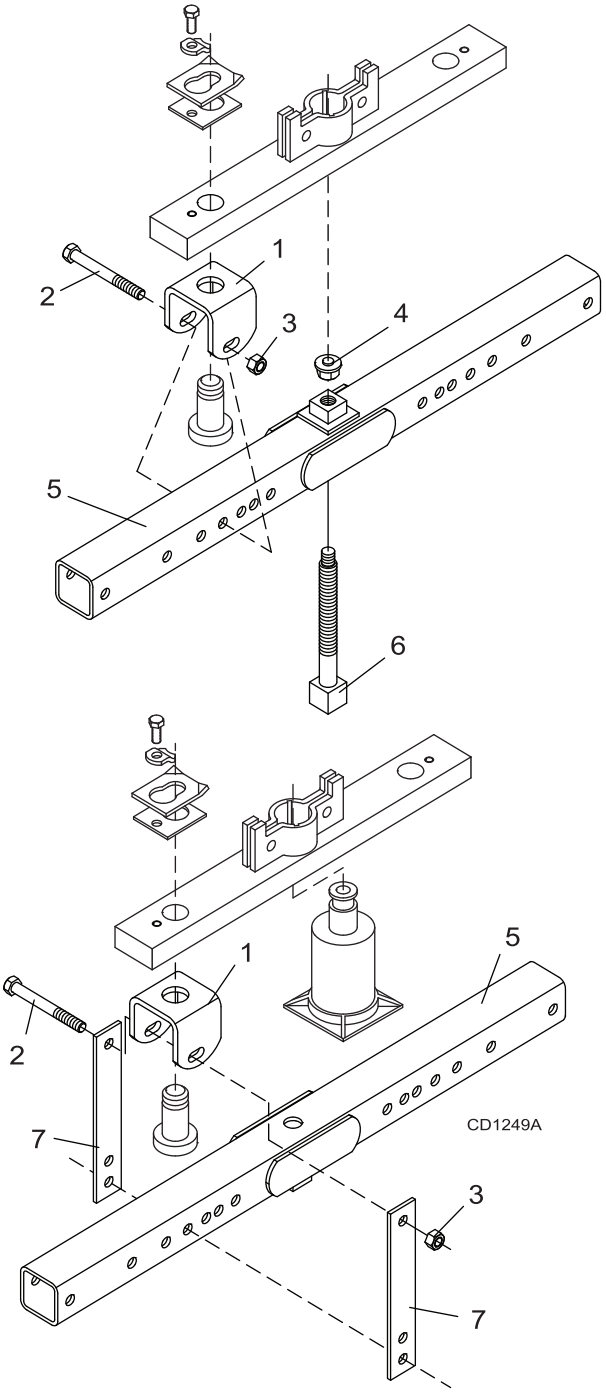



7. Blade pin
8. Crossbar assembly
9. Shim, 18 ga
10. Shim, 20 ga
11. Keyhole plate
12. Blade lock clip
50. 1/2 NC x 1-1/4 HHCS GR5

**Figure 13.** Blade Removal

3. Remove cotter pin from bottom of crossbar and remove nut and washer.
4. Refer to Figure 14. Attach a clevis (1) to each end of crossbar, using blade pins, spacers, keyhole plates, and blade pin clips.
5. Position tube assembly (5) with threaded nut (4) toward crossbar for puller screw removal or down for hydraulic jack removal.
6. For removal with puller screw, attach tube (5) to each clevis with bolts (2) and nuts (3). Place pad (4) in nut and thread puller screw (6) into nut from bottom. Tighten until pad is solid against gearbox shaft. For best results, strike head of puller screw with a hammer while tightening with a wrench.
7. For removal with a jack, attach tube to each clevis with puller links (7), bolts (2), and nuts (3). Place jack on tube with end of jack pressing against gearbox shaft. Slowly apply force with jack

   **NOTE:** Hydraulic jack will not operate if tipped more than 90°. Use care to prevent bending crossbar during removal.




1. Crossbar puller clevis
2. 5/8 NC x 4-1/2 HHCS
3. 5/8 NC Hex nut
4. Crossbar puller pad
5. Crossbar puller tube
6. Crossbar puller screw
7. Crossbar puller link

**Figure 14.** Crossbar Removal

## CROSSBAR INSTALLATION

1. Using emery cloth (220 or finer), remove surface rust, Loctite® and foreign material from hub, splined gearbox vertical shaft, and crossbar assembly.
2. Slide crossbar assembly (8) onto splined shaft. Install nut (69) and align a slot with hole in splined shaft.

   For .51 models, torque nut to 450 lbs-ft. For .61 and .71 models, torque nut to 800 lbs-ft.
3. Install cotter pin (70) through slot in nut and bend ends over.

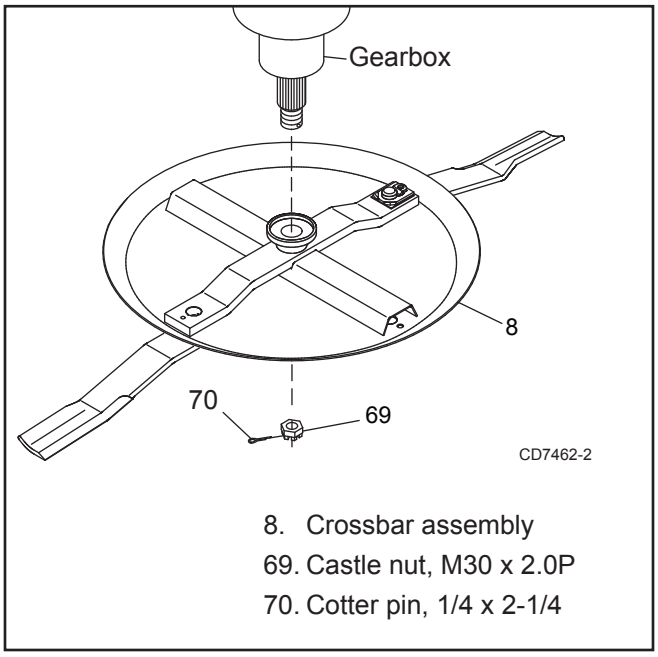



**Figure 15.** Crossbar Assembly Installation

## UNIVERSAL JOINT REPAIR

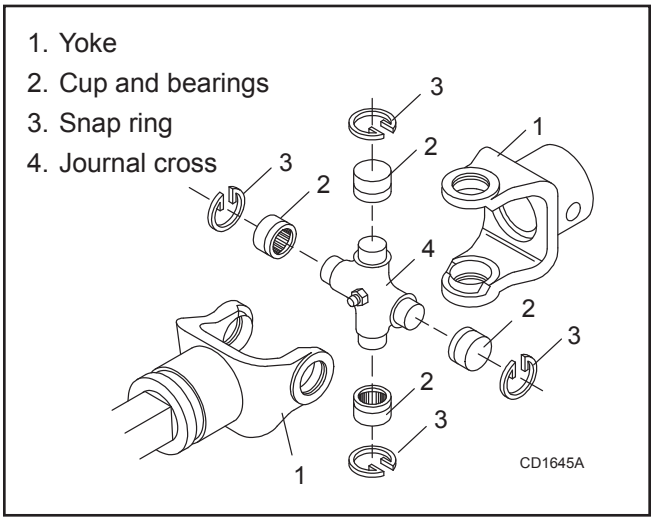



**Figure 16.** U-Joint Exploded View

### U-Joint Disassembly

1. Remove external snap rings from yokes in four locations as shown in Figure 17.

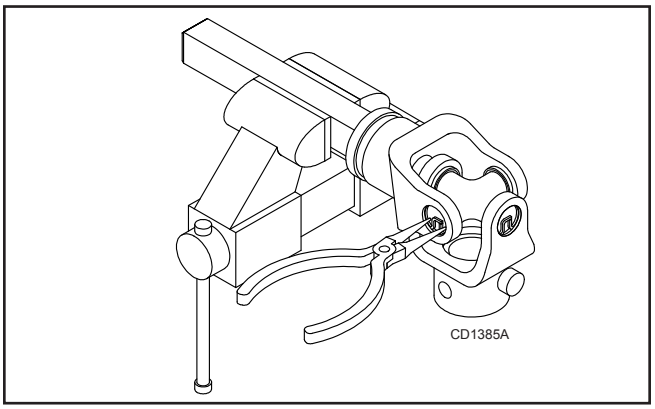



**Figure 17.**

2. With snap rings removed, support drive in vise, hold yoke in hand and tap on yoke to drive cup up out of yoke. See Figure 18.

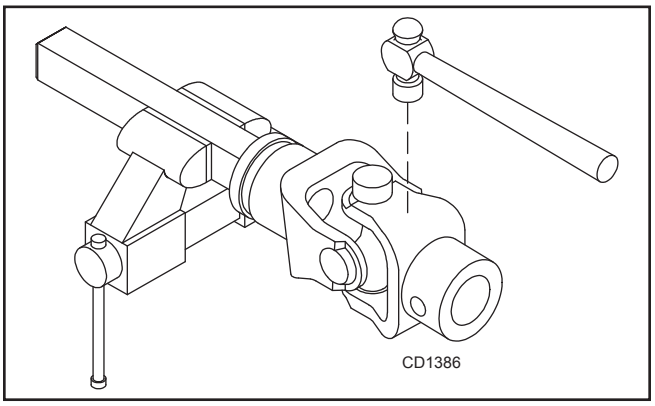



**Figure 18.**

3. Clamp cup in vise as shown in Figure 19 and tap on yoke to completely remove cup from yoke. Repeat Step 2 & Step 3 for opposite cup.

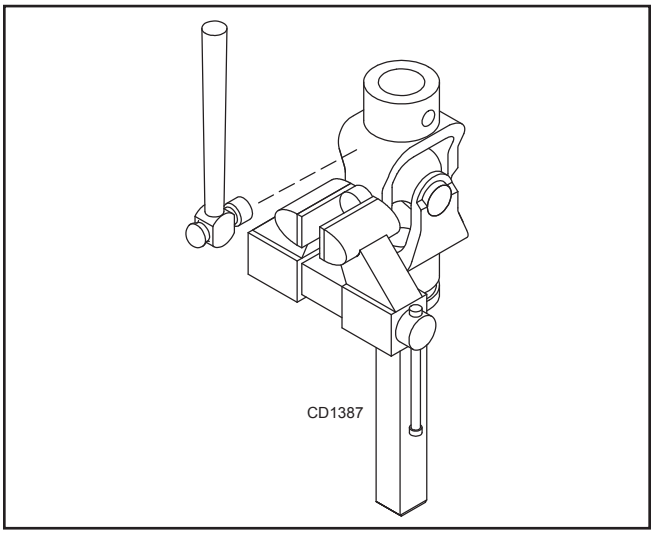



**Figure 19.**

4. Place universal cross in vise as shown in Figure 20 and tap on yoke to remove cup. Repeat Step 3 for final removal. Drive remaining cup out with a drift and hammer.

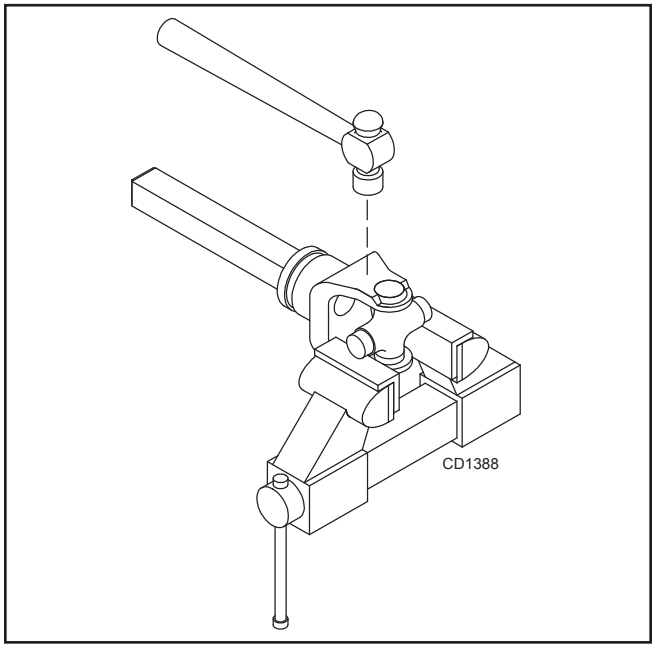



**Figure 20.**

## U-Joint Assembly

1. Place seals securely on bearing cups. Insert cup into yoke from outside and press in with hand pressure as far as possible. Insert journal cross into bearing cup with grease fitting away from shaft. Be careful not to disturb needle bearings. Insert another bearing cup directly across from first cup and press in as far as possible with hand pressure.
2. Trap cups in vise and apply pressure. Be sure journal cross is started into bearings and continue pressure with vise, squeezing in as far as possible. Tapping the yoke will help.
3. Seat cups by placing a drift or socket (slightly smaller than the cup) on cup and rap with a hammer. Install snap ring and repeat on opposite cup.
4. Repeat Step 1 and Step 2 to install remaining cups in remaining yoke.
5. Move both yokes in all directions to check for free movement. If movement is restricted, rap on yokes sharply with a hammer to relieve any tension. Repeat until both yokes move in all directions without restriction.

## SERVICING TIRES SAFELY

**Used Aircraft Tires**
**(Figure 21)**

**⚠ WARNING**

- **Explosive separation of tire and rim parts can cause serious injury or death. Release all air pressure before loosening bolts.**

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure and result in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and an extension hose long enough to allow you to stand to the side — not in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.

Never remove split rim assembly hardware (A) with the tire inflated.


**Figure 21.** Split Rim Tire Servicing

# ASSEMBLY

## DEALER SET-UP INSTRUCTIONS

Assembly of this cutter is the responsibility of the WOODS dealer. It should be delivered to the owner completely assembled, lubricated and adjusted for normal cutting conditions.

The cutter is shipped partially assembled. Assembly will be easier if components are aligned and loosely assembled before tightening hardware. Recommended torque values for hardware are located on page 80.

Select a suitable working area. A smooth hard surface, such as concrete, will make assembly much quicker. Open parts boxes and lay out parts and hardware to make location easy. Refer to illustrations, accompanying text, parts lists and exploded view drawings.

Complete the checklist on page 39 when assembly is complete and cutter is delivered to the customer.

### ⚠ WARNING

- **Before working underneath, carefully read Operator's Manual instructions, disconnect driveline, raise mower, securely block up all corners with jackstands, and check stability. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failures, or mechanical component failures.**
- **Do not disconnect hydraulic lines until machine is securely blocked or placed in lowest position and system pressure is released by operating valve levers.**

### ⚠ CAUTION

- **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

### Install Wheel

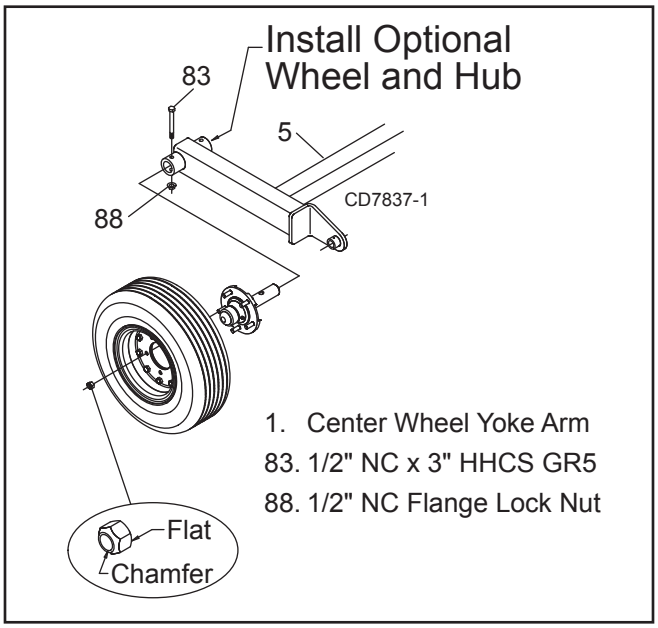



**Figure 22.** Center Section Wheel and Hub Installation

### Winch Kit Installation

*See Parts page 77 for parts list and diagram.*

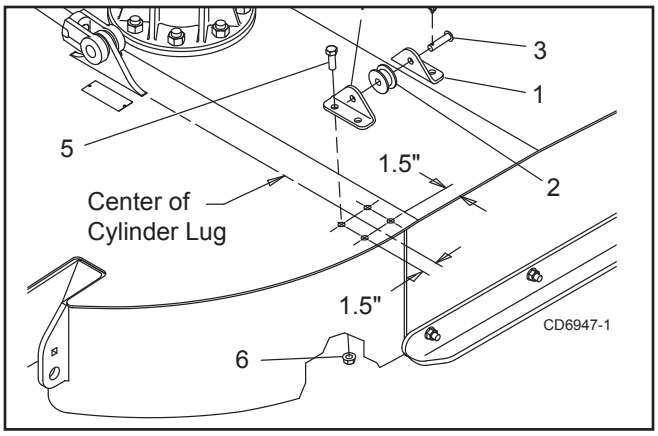



**Figure 23.** Roller Assembly Installation

1. Locate and drill one 9/16" hole in each wing using dimensions shown in Figure 23. Assemble items 1, 2, 3 and 4. Use assembly to locate and drill remaining holes.
2. Secure idler brackets (1) and rollers (2) to deck with bolts (5) and nuts (6).
3. Remove cylinder pin: Place channel (10) over cylinder and cylinder lug. Place wing lock-up bracket over channel and insert pin (8), washers (7), and cotter pins (9). NOTE: Washers (7) are used as spacers and are placed between lock-up bracket and channel (10) as needed.

4. Repeat step to install second channel (10) on opposite wing.
5. Attach winch assembly to channels (10) using bolts (5) and lock nuts (6).
6. Move SMV sign and hardware to channel as shown in the winch kit instructions.
7. Tighten all hardware.

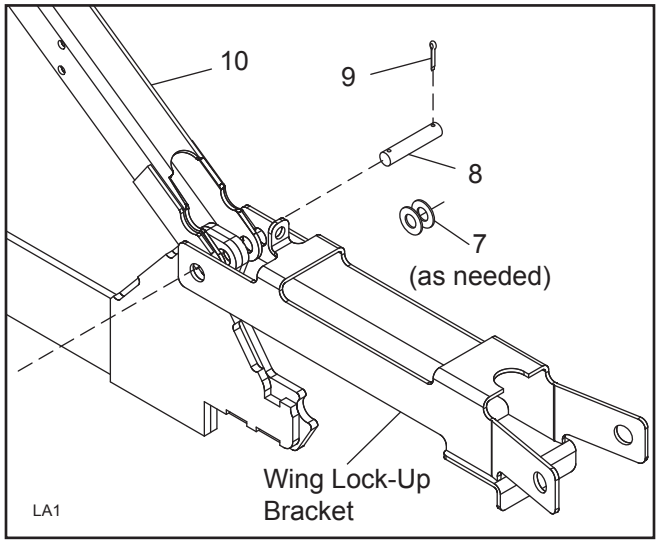
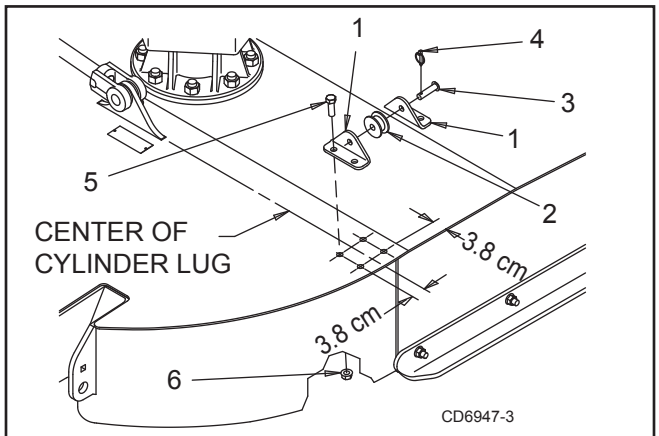



**Figure 24.** Winch Channel Installation

## Winch Kit Operation

**(Figure 25)**

1. Move cutter so that wing is on the upward slope of a ditch to aid in wing lift with the winch.
2. Unwind cable and remove roller (2).
3. Place cable around roller (2) and reinstall using pin (3) and klik pin (4).
4. Attach cable hook into large hole in which assembly bracket and raise wing.
5. Install transport lock pin before moving unit.




2. 6696 Chain idler casting
3. 409 Clevis pin, 1/2 x 2
4. 22411 Klik pin, 3/16 x 1

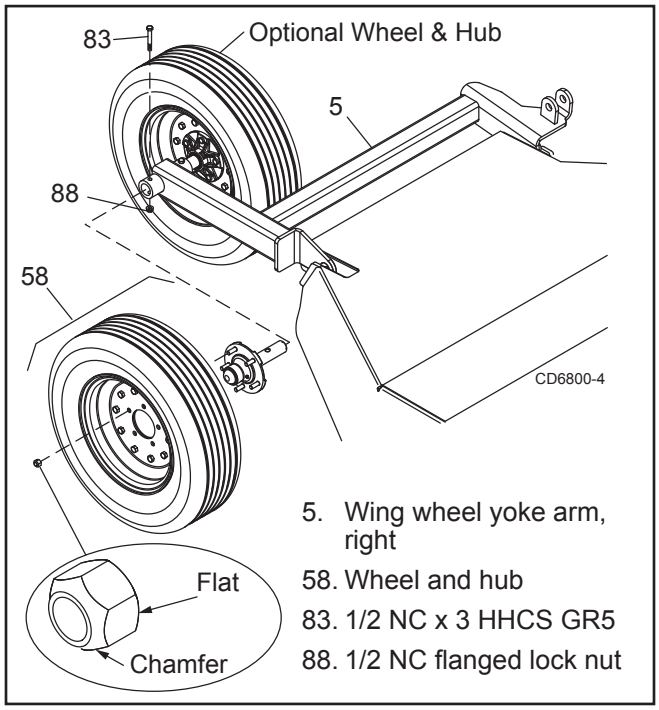
**Figure 25.** Winch Kit Operation

## Install Wing Wheel

**(Figure 26)**

1. Insert wheel hub into wing wheel yoke arms (5) and align holes.
2. Secure into position using cap screw (83) and flanged lock nut (88).
3. Attach wheel to hub using five lug nuts. Install the chamfered side of the lug nut toward the inside for steel rim for pneumatic tires and rims. Tighten to 85 lbs-ft. Check that tire air pressure is a maximum of 40 psi.

   **NOTE:** Install the flat side of the nut toward the inside for solid tires and aircraft tires (shown).
4. Install optional dual wheel and hub to inside of wheel yoke arm.




5. Wing wheel yoke arm, right
58. Wheel and hub
83. 1/2 NC x 3 HHCS GR5
88. 1/2 NC flanged lock nut

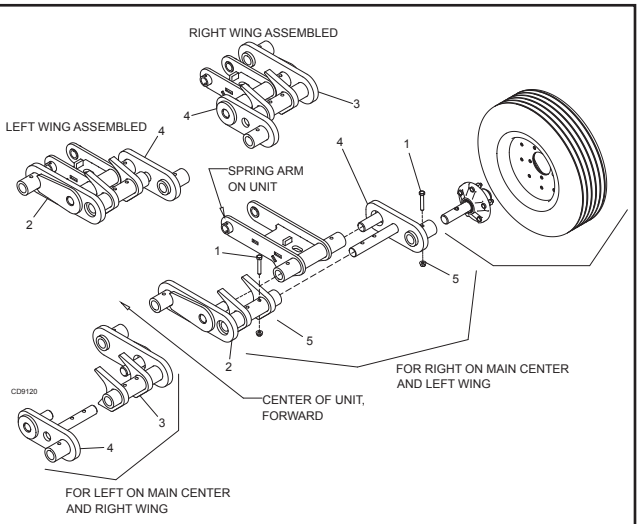
**Figure 26.** Wing Wheel - Right

## Install Tandem Accessory (Optional)

*See Parts page 75 for parts list and diagram.*

1. Raise unit and support with jack stands per diagram on page 21 to take pressure off of tires.
2. Remove wheel assembly from right spring arm hub assembly from center frame.
3. Remove axle hub from right spring arm.
4. Install drive type grease fitting in four holes in spring arm.
5. Install tandem arm 617144 as shown.
6. Install tandem arm 617176 as shown, sliding both axles into receiving tubes. Fasten with screw 3489 and nuts 1045624 provided.

7. Install axle/hub 1017050 and secure with screw 3489 and nut 1045624, reused or purchased separately as needed.
8. Install wheel assembly.
9. Repeat for left spring arm of center frame, using 617145 in place of 617144, installed from the center.
10. Repeat for wings if purchased, noting orientation of parts to locate wheels in the correct position. Outer wheel should be forward of inner wheel on both wings.



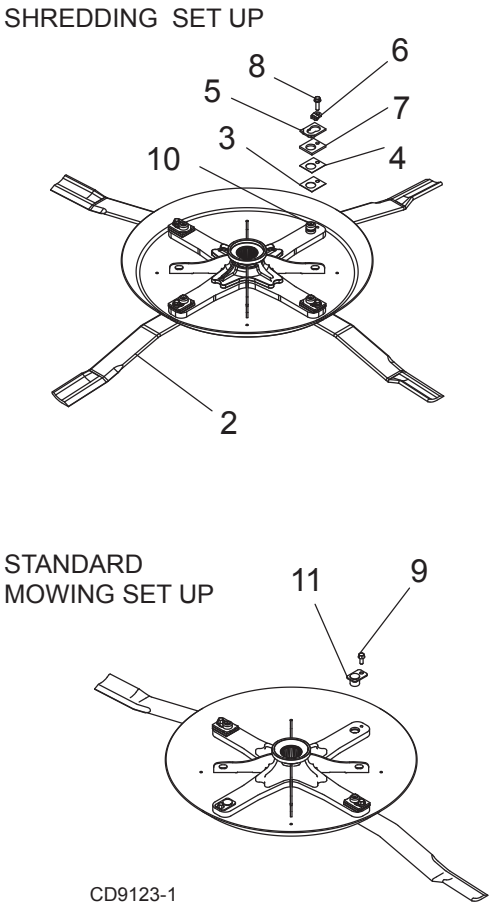

| | | |
|---|---|---|
| 1. | 3489 | HHCS 1/2 NC x 3 GR5 ZP |
| 2. | 617144 | WA, Tandem Arm, RT, BW20 |
| 3. | 617145 | WA, Tandem Arm, LT, BW20 |
| 4. | 617146 | WA, Tandem Arm, BW20 |
| 5. | 1045624 | Nut, HFN 1/2 NC, Dri-Loc Patch |

**Figure 27.** Tandem Axle Kit

## Install Shred Kit (Optional - BW20.61, BW20.71)

*See Parts page 74 for parts list and diagram.*

1. Install supplied shred kit blades as shown, using shims to obtain no more than .25" movement at blade tip. Stack shims as shown in Figure 28.
   - To return to brush cutting, remove one opposing set of blades and hardware from each crossbar.
   - To protect unused hole for following season: coat tab pin 1045820 with Never-Seez™, insert into hole, and secure with screw 1031225.
   - For lower horsepower shredding, order 3 sets of flat double edge blade kits 19162K**T.**




| | | |
|---|---|---|
| 2. | 8825KT | Kit, Blade, 8825 STD |
| 3. | 10520 | 18 GA 1-1/2 blade pin shim |
| 4. | 13946 | 20 GA 1-1/2 blade pin shim |
| 5. | 32603 | Keyhole plate special |
| 6. | 32604 | Blade pin lock clip spec |
| 7. | 1028824 | Spacer, 5/16 thick blade pin |
| 8. | 1028902 | HFS 1/2 NC x 1-3/4 GR8 |
| 9. | 1031225 | HFS .50 NC x 1.25 GR5 |
| 10. | 1045034 | Pin, blade, drl, 2.39 |

**Figure 28.** Shredding Kits

# DEALER CHECKLISTS

## DEALER PRE-DELIVERY CHECKLIST

**(DEALER'S RESPONSIBILITY)**

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

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

### *NOTICE*

- **Gearboxes are not filled at the factory. Prior to delivery, make sure each gearbox is filled between lowest ring and end of dipstick with 80 or 90W API GL-4 or GL-5 gear lube.**

_____ 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 all bolts to be sure they are properly torqued.

_____ Check wheel bolts for proper torque.

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

_____ Check that blades have been properly installed.

_____ Check and grease all lubrication points as identified in lubrication information on page 21.

_____ Check the level of gearbox fluids before delivery. Service, if required, as specified in the lubrication information on page 21.

## DELIVERY CHECKLIST

**(DEALER'S RESPONSIBILITY)**

_____ Show customer how to make adjustments and select proper PTO speed.

_____ 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 how to determine the turning limits of the CV PTO driveline.

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

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

_____ 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.

_____ Explain to customer that when transporting the cutter, the wing and center sections should be raised and their respective transport bars installed and pinned in place.

_____ 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.

_____ Explain to customer the potential crushing hazards of going underneath raised equipment. Instruct that before going underneath to disconnect the driveline, securely block up all corners with jack stands and to follow all instructions in the BLOCKING METHOD, page 20 of the operator's manual. Explain that blocking up prevents equipment dropping from hydraulic leak down, hydraulic system failures or mechanical component failures.

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

_____ 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.

# NOTES

WOODS®

**PARTS INDEX**

# BATWING® Rotary Cutter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| Chain Shielding (Wing Section) | 53 | | | |
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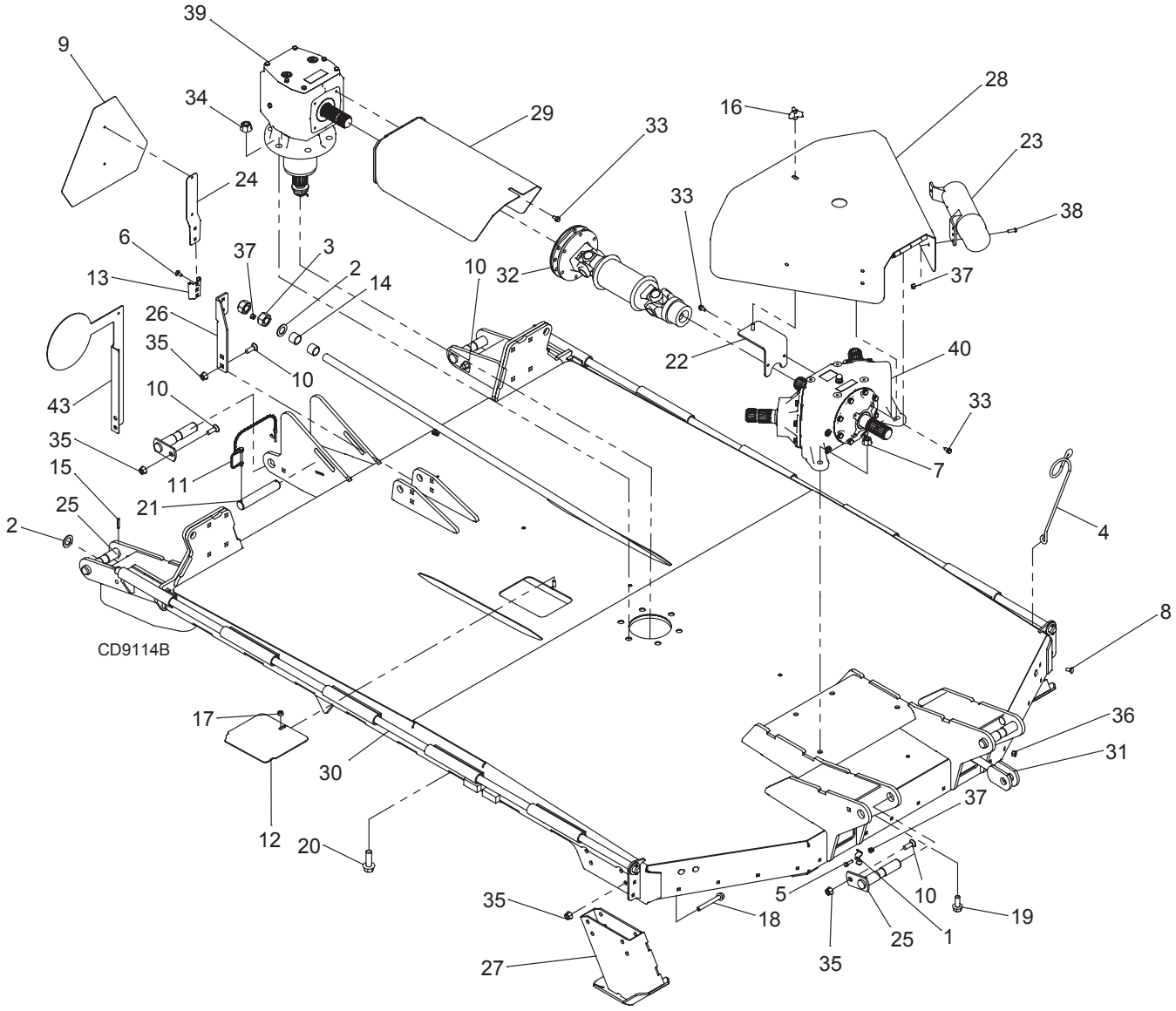
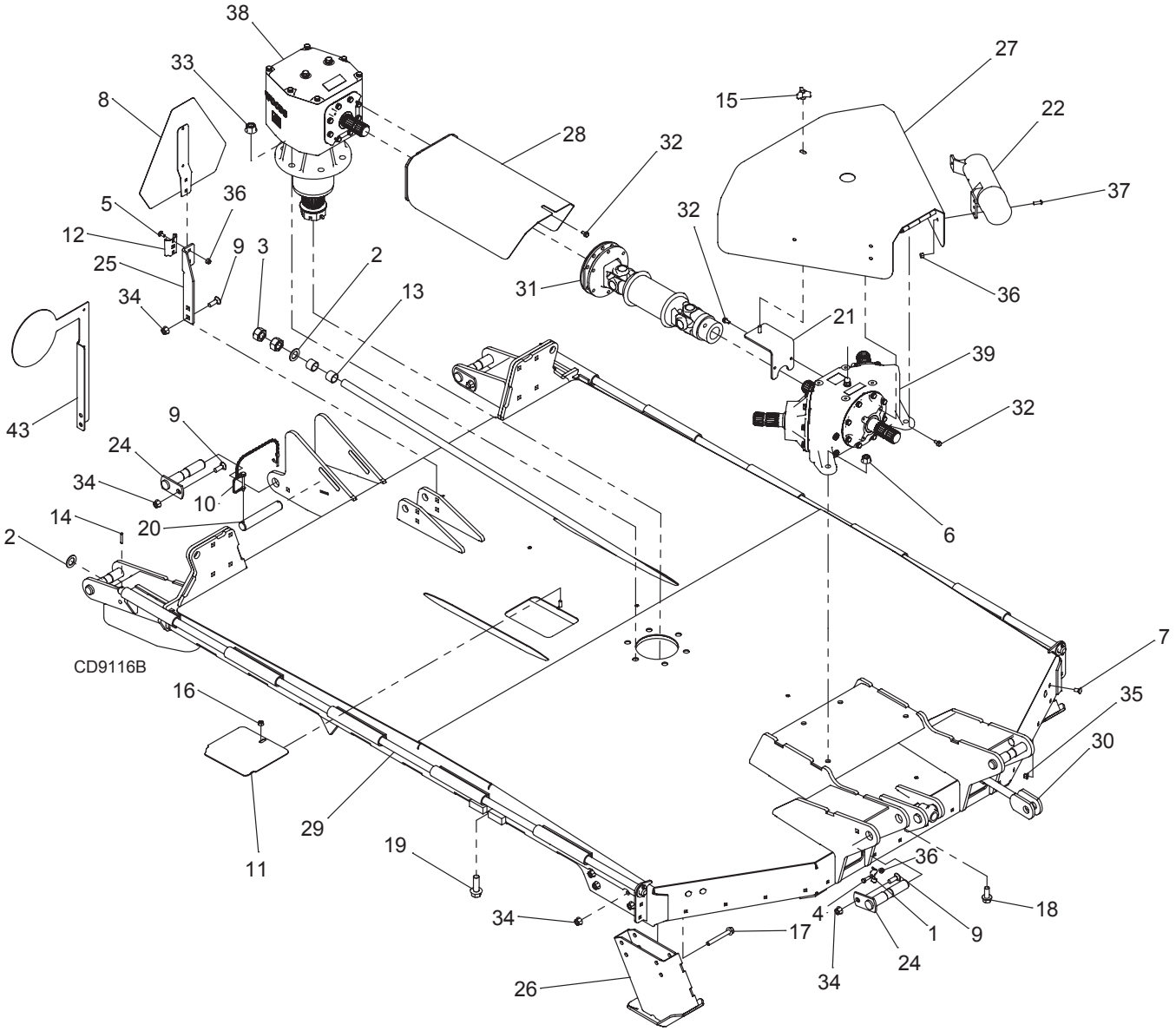
# CENTER FRAME ASSEMBLY
# BW20.51 / BW20.51Q



# CENTER FRAME ASSEMBLY
# BW20.51 / BW20.51Q

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 258 | 4 | Feedline clamp - 1/2 |
| 2 | 1863 | 6 | 1 SAE flat washer |
| 3 | 3132 | 4 | Hex nut 1 NC ZP |
| 4 | 3443 | 1 | Hydraulic hose holder |
| 5 | 14562 | 4 | HHCS 5/16 NC x 1 GR5 |
| 6 | 16148 | 2 | Carriage bolt 5/16 NC x 3/4 ZP |
| 7 | 19025 | 4 | HFN Nut 5/8 NC Dri-Loc patch |
| 8 | 24597 | 4 | Carriage bolt 3/8 NC x 3/4 |
| 9 | 24611 | 1 | SMV slow moving vehicle sign |
| 10 | 29893 | 7 | Carriage bolt 1/2 NC x 1-1/2 HT |
| 11 | 57050RP | 1 | Bent link .14 x 9.00 x 7.84 |
| 12 | 62484 | 1 | SMV emblem socket |
| 13 | 65130 | 4 | Pipe 1 sch 40 x 1.00 |
| 14 | 66016 | 4 | Spirol pin 1/4 x 1-1/2 |
| 15 | 66840 | 1 | 3-prong knob 3/8 NC |
| 16 | 66885 | 1 | Spiralock flange nut 3/8 NC |
| 17 | 578478 | 8 | HFS screw 1/2 NC x 4.0 GR5 |
| 18 | 603843 | 4 | HFS screw 5/8 NC x 1.5 GR8 |
| 19 | 603845 | 6 | HFS screw 3/4 NC x 2.25 GR5 |
| 20 | 617192RP | 1 | WA, shield support |
| 21 | 1003828 | 1 | Manual tube |
| 22 | 1004251 | 1 | SMV bracket |
| 23 | 1017055 | 5 | Flag pin 1.25 x 6.5 |
| 24 | 1017143RP | 1 | Lug bent .25 x 2.25 x 11.0 |
| 25 | 1027035RP | 2 | WA, skid BW240 |
| 26 | 1027110RP | 1 | WA, splitter shield BW240 |
| 27 | 1027115RP | 1 | WA, center gearbox shield BW240 |
| 28 | 1027123RP | 2 | Hinge pin 1.0 x 98.0 |
| 29 | 1027125RP | 2 | WA, attitude rod |
| 30 | 1027297 | 1 | Drv 2JT FXD - 1340 1.75 - 20 12.6 |
| 31 | 1041071 | 10 | HFS screw M8 - 1.25 x 16 CL8.8 patch |
| 32 | 1045611 | 6 | HFN nut 3/4 NC Dri-Loc patch |
| 33 | 1045624 | 15 | HFN nut 1/2 NC Dri-Loc patch |
| 34 | 1045628 | 4 | HFN nut 3/8 NC Dri-Loc patch |
| 35 | 1045655 | 9 | HFN nut 5/16 NC Dri-Loc patch |
| 36 | 1046050 | 3 | Screw BTN HD 5/16 NC x 1.0 |
| 37 | 617167RP | 1 | Gearbox with decal 540 (see **pages 56 and 57**) **-OR-** |
| 37 | 617168RP | 1 | Gearbox with decal 1000 (see **pages 56 and 57**) |
| 38 | 1034939 | 1 | Splitter gearbox 540 (see **pages 54 and 55**) **-OR-** |
| 38 | 1034940 | 1 | Splitter gearbox 1000 (see **pages 54 and 55**) |
| 43 | 632851RP | 1 | Bracket, w/ Decals SMV SIS BW20 |
| | HHCS | | Hex head cap screw |

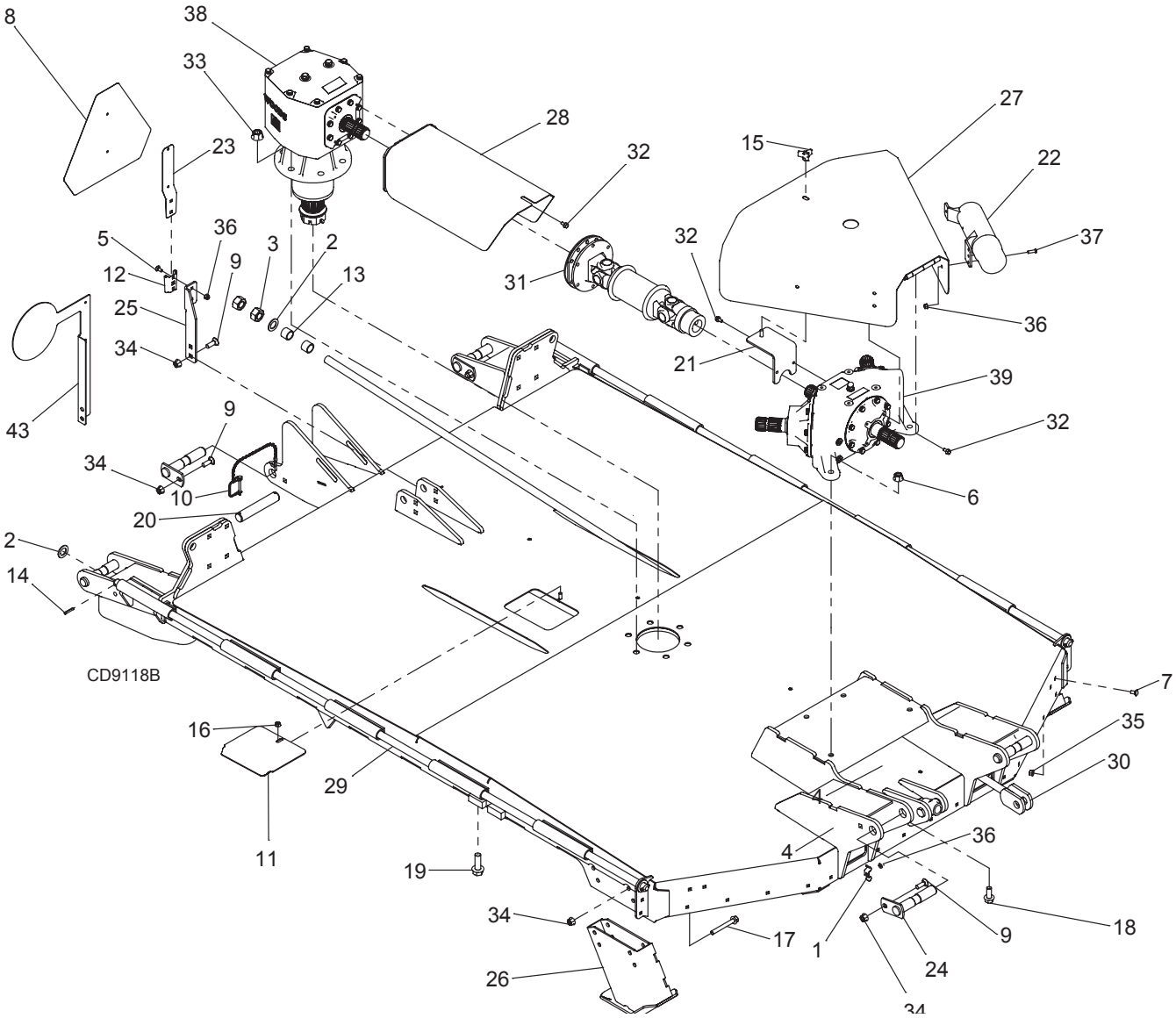
# CENTER FRAME ASSEMBLY
# BW20.61 / BW20.61Q



# CENTER FRAME ASSEMBLY
# BW20.61 / BW20.61Q

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 258 | 4 | Feedline clamp - 1/2 |
| 2 | 1863 | 6 | 1 SAE flat washer |
| 3 | 3132 | 4 | Hex nut 1 NC ZP |
| 4 | 14562 | 4 | HHCS 5/16 x 1 GR5 |
| 5 | 16148 | 2 | Carriage bolt 5/16 NC x 3/4 ZP |
| 6 | 19025 | 4 | HFN nut 5/8 NC Dri-Loc patch |
| 7 | 24597 | 4 | Carriage bolt 3/8 NC x 3/4 |
| 8 | 24611 | 1 | SMV slow moving vehicle sign |
| 9 | 29893 | 7 | Carriage bolt 1/2 NC x 1-1/2 HT |
| 10 | 57050RP | 1 | Bent link .14 x 9.00 x 7.84 |
| 11 | 62484 | 1 | SMV emblem socket |
| 12 | 65130 | 4 | Pipe 1 sch 40 x 1.00 |
| 13 | 66016 | 4 | 1/4 x 1-1/2 spirol pin |
| 14 | 66840 | 1 | 3-prong knob 3/8 NC |
| 15 | 66885 | 1 | Spiralock flange nut 3/8 NC |
| 16 | 578478 | 8 | HFS screw 1/2 NC x 4.0 GR5 |
| 17 | 603843 | 4 | HFS screw 5/8 NC x 1.5 GR8 |
| 18 | 603845 | 6 | HFS screw 3/4 NC x 2.25 GR5 |
| 19 | 617192RP | 1 | WA, shield support |
| 20 | 1003828 | 1 | Manual tube |
| 21 | 1004251 | 1 | SMV bracket |
| 22 | 1017055 | 5 | Flag pin 1.25 x 6.5 |
| 23 | 1017143RP | 1 | Bent lug .25 x 2.25 x 11.0 |
| 24 | 1027035RP | 2 | WA, skid BW240 |
| 25 | 1027110RP | 1 | WA, splitter shield BW240 |
| 26 | 1027115RP | 1 | WA, center gearbox shield BW240 |
| 27 | 1027123RP | 2 | Hinge pin 1.0 x 98.0 |
| 28 | 1027125RP | 2 | WA, attitude rod |
| 29 | 1027297 | 1 | Drv 2JT FXD - 1340 1.75 - 20 12.6 |
| 30 | 1041071 | 10 | HFS screw M8 - 1.25 x 16 CL8.8 Patch |
| 31 | 1045611 | 6 | HFN nut 3/4 NC Dri-Loc patch |
| 32 | 1045624 | 15 | HFN nut 1/2 NC Dri-Loc patch |
| 33 | 1045628 | 4 | HFN nut 3/8 NC Dri-Loc patch |
| 34 | 1045655 | 9 | HFN nut 5/16 NC Dri-Loc patch |
| 35 | 1046050 | 3 | Screw BTN HD 5/16 NC x 1.0 |
| 36 | 603873RP | 1 | Gearbox with decal 540 (see **pages 58 and 59**) **-OR-** |
| 36 | 603874RP | 1 | Gearbox with decal 1000 (see **pages 58 and 59**) |
| 37 | 1034939 | 1 | Splitter gearbox 540 (see **page 54 and 55**) **-OR-** |
| 37 | 1034940 | 1 | Splitter gearbox 1000 (see **page 54 and 55**) |
| 43 | 632851RP | 1 | Bracket, w/ Decals SMV SIS BW20 |
| | HHCS | | Hex head cap screw |

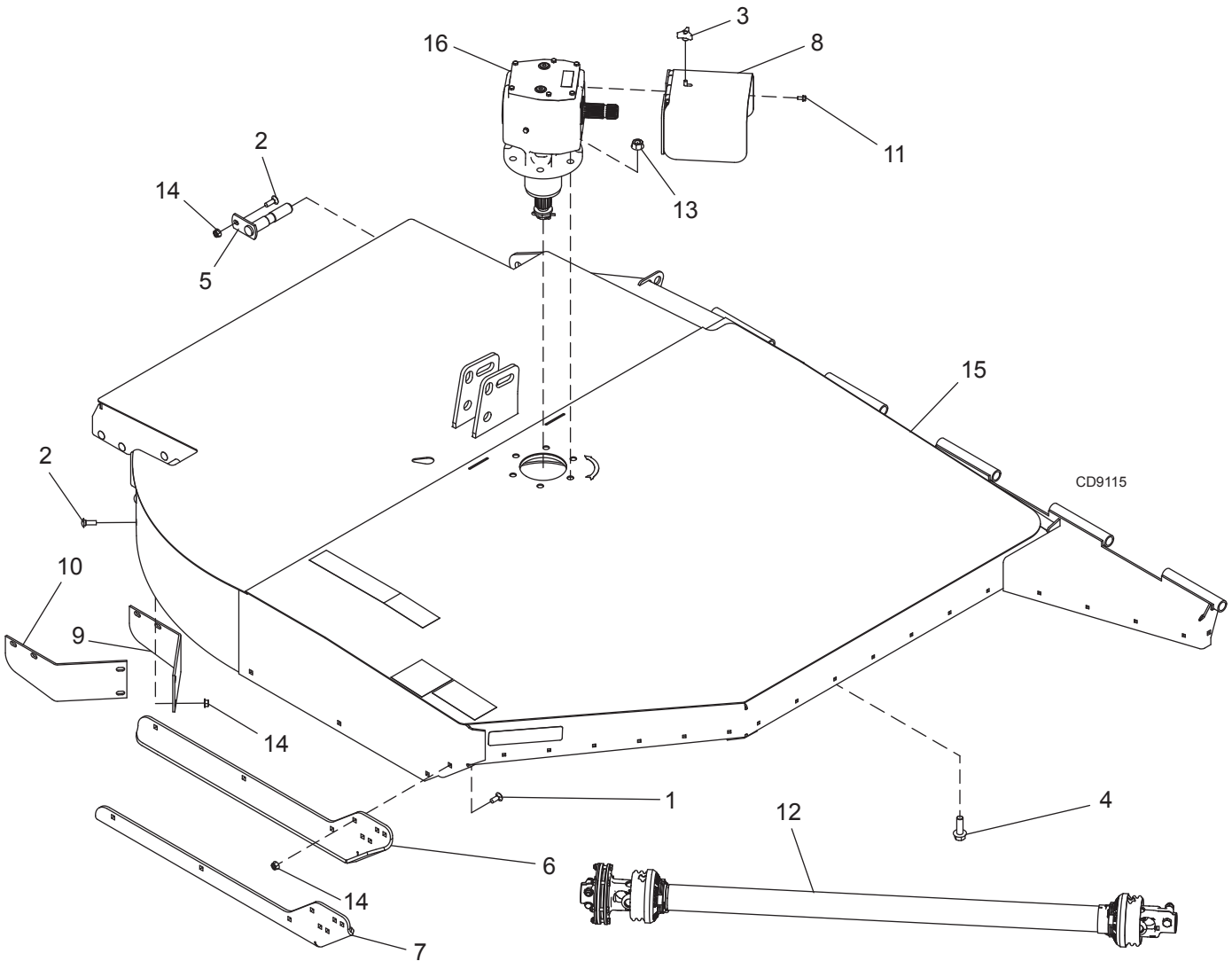
# CENTER FRAME ASSEMBLY
# BW20.71 / BW20.71Q / BW13.71 / BW13.71Q / BW13.71QREV



# CENTER FRAME ASSEMBLY
# BW20.71 / BW20.71Q / BW13.71 / BW13.71Q / BW13.71QREV

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 258 | 4 | Feedline clamp - 1/2 |
| 2 | 1863 | 6 | 1 SAE flat washer |
| 3 | 3132 | 4 | Hex nut 1 NC ZP |
| 4 | 14562 | 4 | HHCS 5/16 NC x 1 GR5 |
| 5 | 16148 | 2 | Carriage bolt 5/16 NC x 3/4 ZP |
| 6 | 19025 | 4 | HFN nut 5/8 NC Dri-Loc patch |
| 7 | 24597 | 4 | Carriage bolt 3/8 NC x 3/4 |
| 8 | 24611 | 1 | SMV slow moving vehicle sign |
| 9 | 29893 | 7 | Carriage bolt 1/2 NC x 1-1/2 HT |
| 10 | 57050RP | 1 | Bent link .14 x 9.00 x 7.84 |
| 11 | 62484 | 1 | SMV emblem socket |
| 12 | 65130 | 4 | Pipe 1 sch 40 x 1.00 |
| 13 | 66016 | 4 | 1/4 x 1-1/2 spirol pin |
| 14 | 66840 | 1 | 3-prong knob 3/8 NC |
| 15 | 66885 | 1 | Spiralock flange nut 3/8 NC |
| 16 | 578478 | 8 | HFS screw 1/2 NC x 4.0 GR5 |
| 17 | 603843 | 4 | HFS screw 5/8 NC x 1.5 GR8 |
| 18 | 603845 | 6 | HFS screw 3/4 NC x 2.25 GR5 |
| 19 | 617192RP | 1 | WA, shield support |
| 20 | 1003828 | 1 | Manual tube |
| 21 | 1004251 | 1 | SMV bracket |
| 22 | 1017055 | 5 | Flag pin 1.25 x 6.5 |
| 23 | 1017143RP | 1 | Lug bent .25 x 2.25 x 11.0 |
| 24 | 1027035RP | 2 | WA, skid BW240 |
| 25 | 1027110RP | 1 | WA, splitter shield BW240 |
| 26 | 1027115RP | 1 | WA, center gearbox shield BW240 |
| 27 | 1027123RP | 2 | Hinge pin 1.0 x 98.0 |
| 28 | 1027125RP | 2 | WA, attitude rod |
| 29 | 1027299 | 1 | Drv 2JT FXD-2400 1.75 - 20 10.6 (see **page 68**) |
| 30 | 1041071 | 12 | HFS screw M8 - 1.25 x 16 CL8.8 patch |
| 31 | 1045611 | 6 | HFN nut 3/4 NC Dri-Loc patch |
| 32 | 1045624 | 15 | HFN nut 1/2 NC Dri-Loc patch |
| 33 | 1045628 | 4 | HFN nut 3/8 NC Dri-Loc patch |
| 34 | 1045655 | 9 | HFN nut 5/16 NC Dri-Loc patch |
| 35 | 1046050 | 3 | Screw BTN HD 5/16 NC x 1.0 |
| 36 | 603873RP | 1 | Gearbox with decal 540 (see **pages 58 and 59**) **-OR-** |
| 36 | 603874RP | 1 | Gearbox with decal 1000 (see **pages 58 and 59**) **-OR-** |
| 37 | 1034939 | 1 | Splitter gearbox 540 (see **pages 54 and 55**) **-OR-** |
| 37 | 1034940 | 1 | Splitter gearbox 1000 (see **pages 54 and 55**) |
| 43 | 632851RP | 1 | Bracket, w/ Decals SMV SIS BW20 |

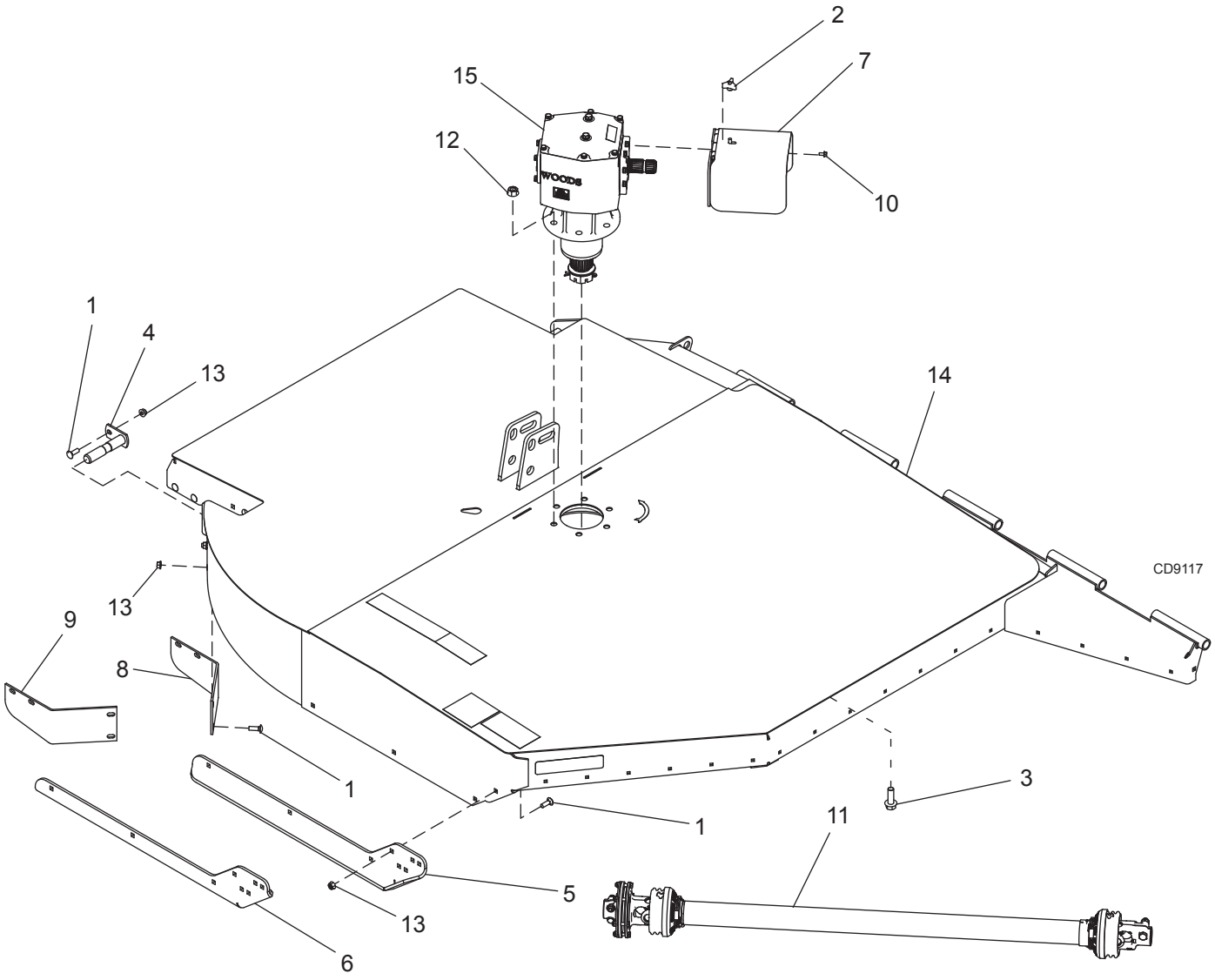
# WING FRAME ASSEMBLY
# BW20.51 / BW20.51Q




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 2615 | 4 | Carriage bolt 1/2 NC x 1-1/4 GR5 |
| 2 | 29893 | 6 | Carriage bolt 1/2 NC x 1-1/2 HT |
| 3 | 66840 | 1 | 3-prong knob 3/8 NC |
| 4 | 603845 | 6 | HFS screw 3/4 NC x 2.25 GR5 |
| 5 | 1017055 | 2 | Flag pin 1.25 x 6.5 |
| 6 | 1027098RP | 1 | Right wing skid BW240 |
| 7 | 1027099RP | 1 | Left wing skid BW240 |
| 8 | 1027120RP | 1 | WA, wing gearbox shield BW240 |
| 9 | 1027246RP | 1 | Right wing angle |
| 10 | 1027247RP | 1 | Left wing angle |

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 11 | 1041071 | 4 | HFS screw M8 - 1.25 x 16 CL8.8 patch |
| 12 | 1045591 | 1 | Complete drive assembly 2400, 61.4 x 84.3 CL (see **page 70**) |
| 13 | 1045611 | 6 | HFN nut 3/4 NC Dri-Loc patch |
| 14 | 1045624 | 10 | HFN nut 1/2 NC Dri-Loc patch |
| 15 | 620926 | 1 | BW20.51 right wing repair assembly with decals |
| 15 | 620927 | 1 | BW20.51 left wing repair assembly with decals |
| 16 | 617169RP | 1 | Right wing gearbox with decal (see **page 57**) |
| 16 | 617170RP | 1 | Left wing gearbox with decal (see **page 57**) |

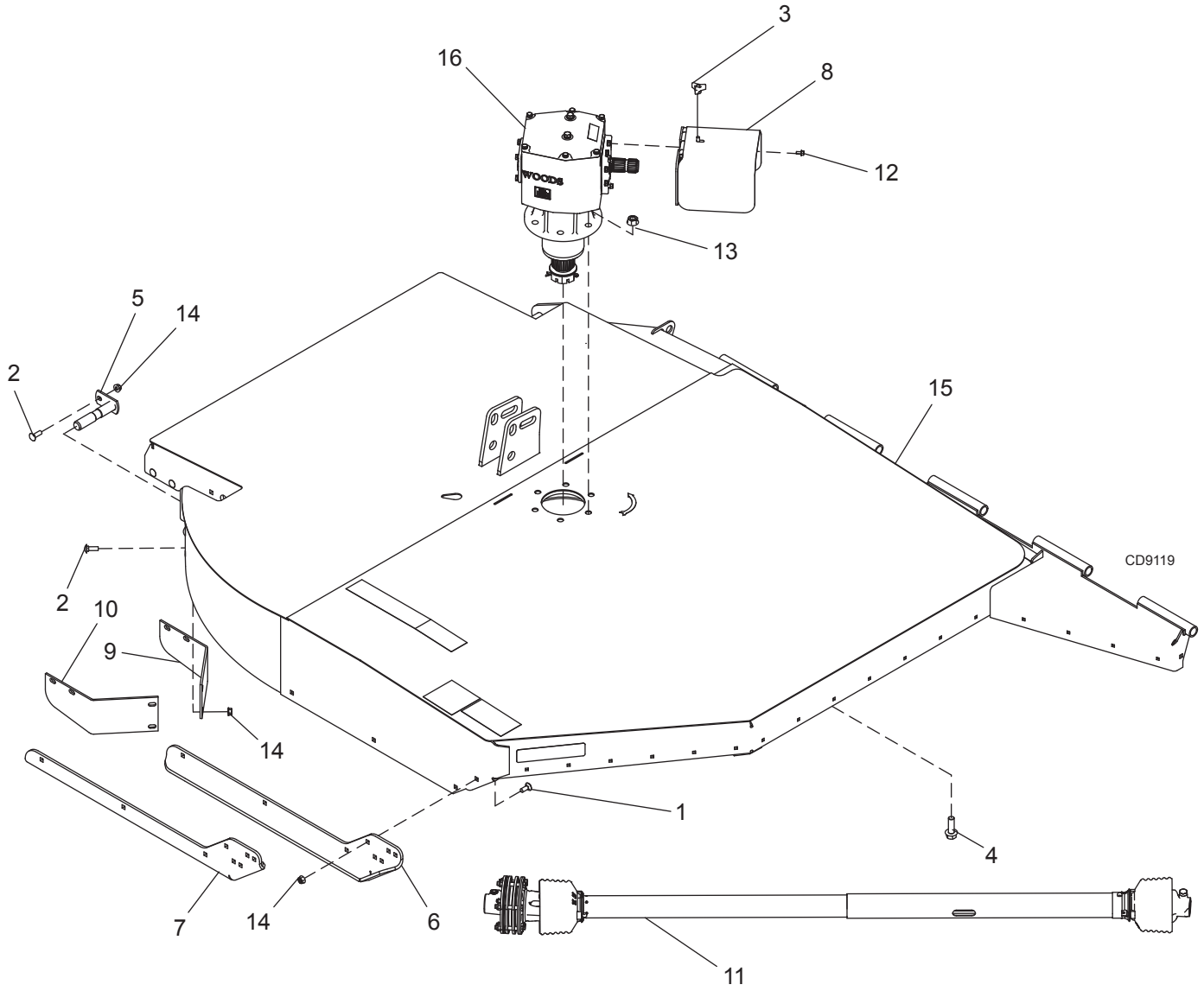
# WING FRAME ASSEMBLY
# BW20.61 / BW20.61Q




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 29893 | 10 | Carriage bolt 1/2 NC x 1-1/2 HT |
| 2 | 66840 | 1 | 3-prong knob 3/8 NC |
| 3 | 603845 | 6 | HFS screw 3/4 NC x 2.25 GR5 |
| 4 | 1017055 | 2 | Flag pin 1.25 x 6.5 |
| 5 | 1027098RP | 1 | Right wing skid BW240 |
| 6 | 1027099RP | 1 | Left wing skid BW240 |
| 7 | 1027120RP | 1 | WA, wing gearbox shield BW240 |
| 8 | 1027246RP | 1 | Right wing angle |
| 9 | 1027247RP | 1 | Left wing angle |
| 10 | 1041071 | 4 | Screw, HFS, M8 - 1.25 x 16 CL8.8 patch |

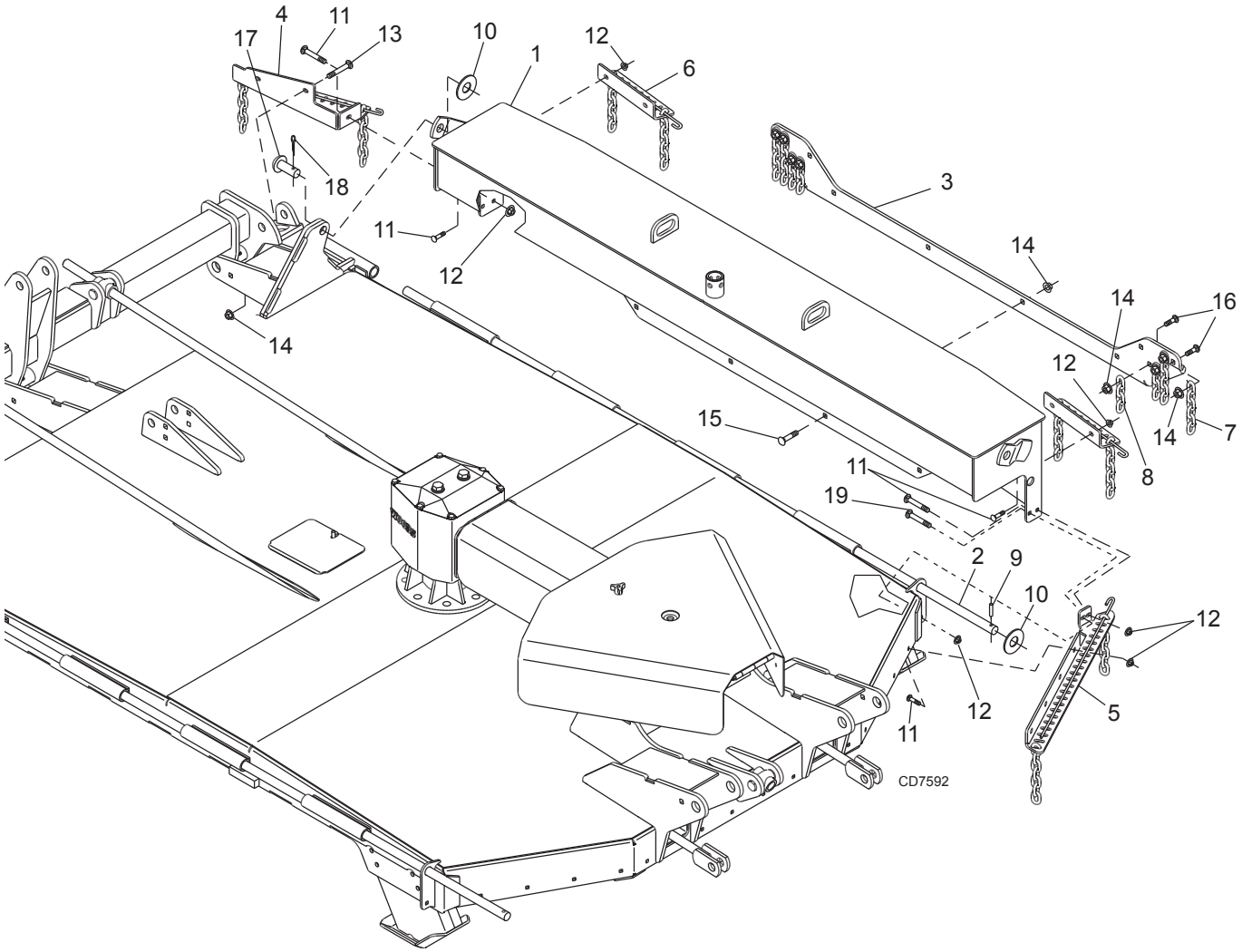
| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 11 | 1045591 | 1 | Complete drive assembly - 2400 61.4 x 84.3 CL (see **page 48**) |
| 12 | 1045611 | 6 | HFN nut 3/4 NC Dri-Loc patch |
| 13 | 1045624 | 10 | HFN nut 1/2 NC, Dri-Loc patch |
| 14 | 620928 | 1 | Right wing assembly with decals, BW20.61 |
| 14 | 620929 | 1 | Left wing assembly with decals, BW20.61 |
| 15 | 603876RP | 1 | Right wing gearbox with decal (see **page 54**) |
| 15 | 603875RP | 1 | Left wing gearbox with decal (see **page 54**) |

# WING FRAME ASSEMBLY
# BW20.71 / BW20.71Q / BW13.71 / BW13.71Q / BW13.71QREV



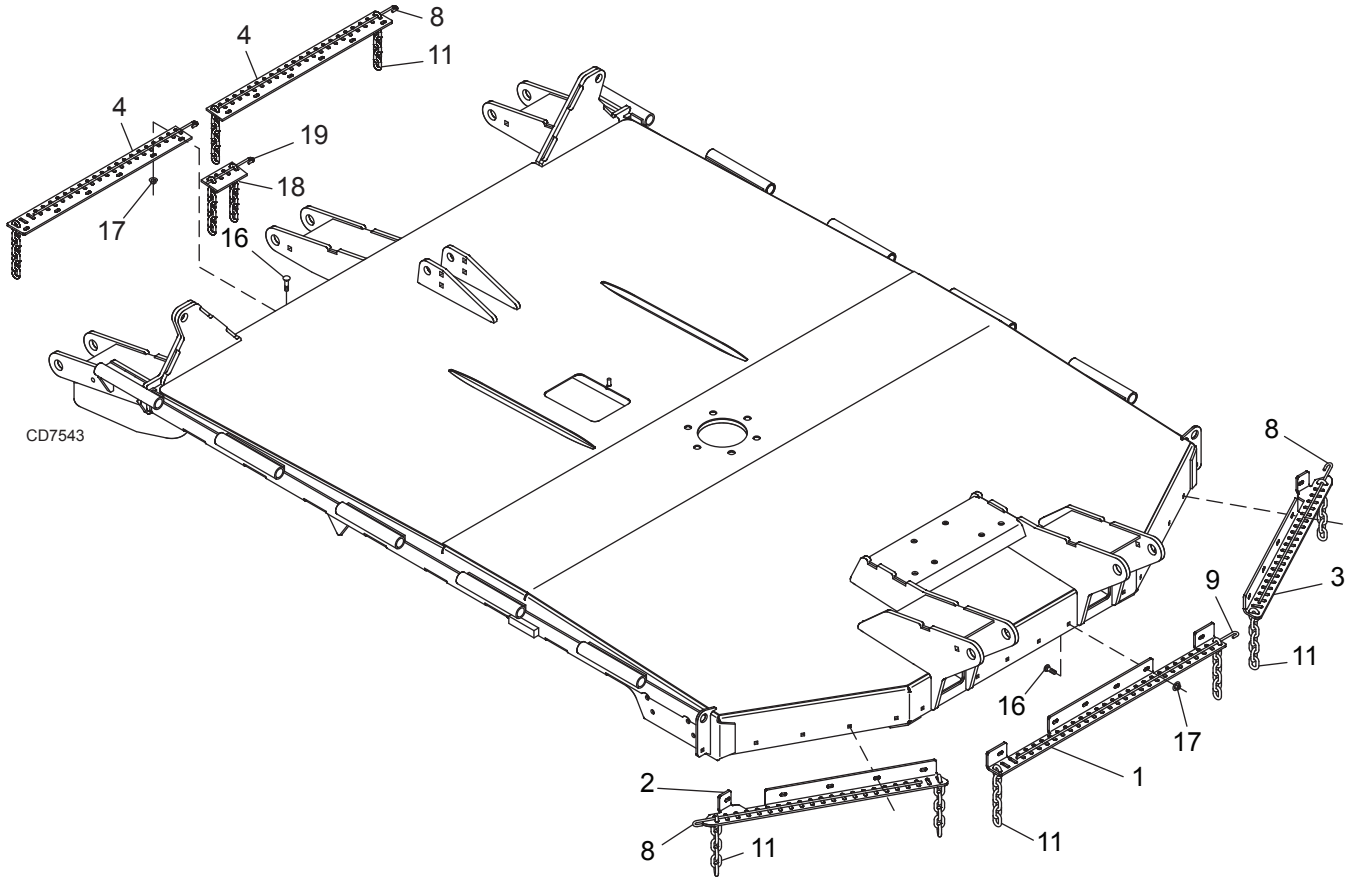

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 2615 | 4 | Carriage bolt 1/2 NC x 1-1/4 GR5 |
| 2 | 29893 | 6 | Carriage bolt 1/2 NC x 1-1/2 HT |
| 3 | 66840 | 1 | 3-prong knob 3/8 NC |
| 4 | 603845 | 6 | HFS screw 3/4 NC x 2.25 GR5 |
| 5 | 1017055 | 2 | Flag pin 1.25 x 6.5 |
| 6 | 1027098RP | 1 | Right wing skid BW240 |
| 7 | 1027099RP | 1 | Left wing skid BW240 |
| 8 | 1027120RP | 1 | WA, wing gearbox shield BW240 |
| 9 | 1027246RP | 1 | Right wing angle |
| 10 | 1027247RP | 1 | Left wing angle |
| 11 | 1027298 | 1 | Complete drive assembly - 2500 59.5 x 8532 (see **page 70**) |
| 12 | 1041071 | 4 | HFS screw M8 - 1.25 x 16 CL8.8 patch |
| 13 | 1045611 | 6 | HFN nut 3/4 NC Dri-Loc patch |
| 14 | 1045624 | 10 | HFN nut 1/2 NC Dri-Loc patch |
| 15 | 620930 | 1 | Right wing assembly with decals, BW20.71 |
| 15 | 620931 | 1 | Left wing assembly with decals, BW20.71 |
| 15 | 620932 | 1 | Right wing assembly with decals, BW20.71R |
| 15 | 620933 | 1 | Left wing assembly with decals, BW20.71R |
| 16 | 603876RP | 1 | Right wing gearbox with decal (see **page 54**) |
| 16 | 603875RP | 1 | Left wing gearbox with decal (see **page 54**) |

# COUNTERWEIGHT BOX ASSEMBLY
# BW13.71 / BW13.71Q / BW13.71QREV




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1027190 | 1 | Weight box 1300 lbs |
| 2 | 1027123RP | 1 | Hinge pin, 1 x 98 |
| 3 | 1027198RP | 1 | Skid shoe, weight box |
| 4 | 1027197 | 1 | Rear chain shield bracket, left weight box (shown) **-OR-** |
| 4 | 1027196 | 1 | Rear chain shield bracket, right weight box **-OR-** |
| 4 | 1029893RP | 1 | Rear double chain shield bracket, left weight box **-OR-** |
| 4 | 1029892 | 1 | Rear double chain shield bracket, right weight box |
| 5 | 1027203RP | 1 | Front chain shield bracket, left weight box **-OR-** |
| 5 | 1027204 | 1 | Front chain shield bracket, right weight box **-OR-** |
| 5 | 1027064 | 1 | Front double chain shield bracket, left weight box **-OR-** |
| 5 | 1027065 | 1 | Front double chain shield bracket, right weight box |
| 6 | 1027135RP | 2 | Bracket, Chain weight box **-OR-** |
| 6 | 1029894RP | 2 | Bracket, double chain weight box |
| 7 | 5498 | 4 | 5/16 Chain - 6 link **-OR-** |
| 7 | 1016953 | 4 | 5/16 Chain - 11 link |
| 8 | 4069 | 4 | 5/16 Chain - 4 link **-OR-** |
| 8 | 5496 | 4 | 5/16 Chain - 7 link |
| 9 | 66016 | 2 | Spring pin, 1/4 x 1-1/2 |
| 10 | 1863 * | 2 | 1" flat washer |
| 11 | 6697 * | 9 | Carriage bolt, 3/8 NC x 1 GR5 |
| 12 | 14350 * | 10 | 3/8 NC flanged hex lock nut |
| 13 | W301109 | 3 | Carriage bolt, 1/2 NC x 1-1/4 GR5 |
| 14 | 11900 * | 17 | 1/2 NC flanged hex lock nut |
| 15 | 29893 * | 6 | Carriage bolt, 1/2 NC x 1-1/2 GR5 |
| 16 | 10284 * | 8 | Carriage bolt, 1/2 NC x 2 GR5 |
| 17 | 46605 | 1 | Clevis pin, 1 x 2.26 |
| 18 | 1285 * | 1 | Cotter pin, 1/4 x 1-1/2 |
| 19 | W301104 * | 1 | Carriage bolt, 3/8 NC x 1-1/2 GR5 |
| | * | | Standard hardware, obtain locally |

# CHAIN SHIELDING - CENTER SECTION




## SINGLE ROW

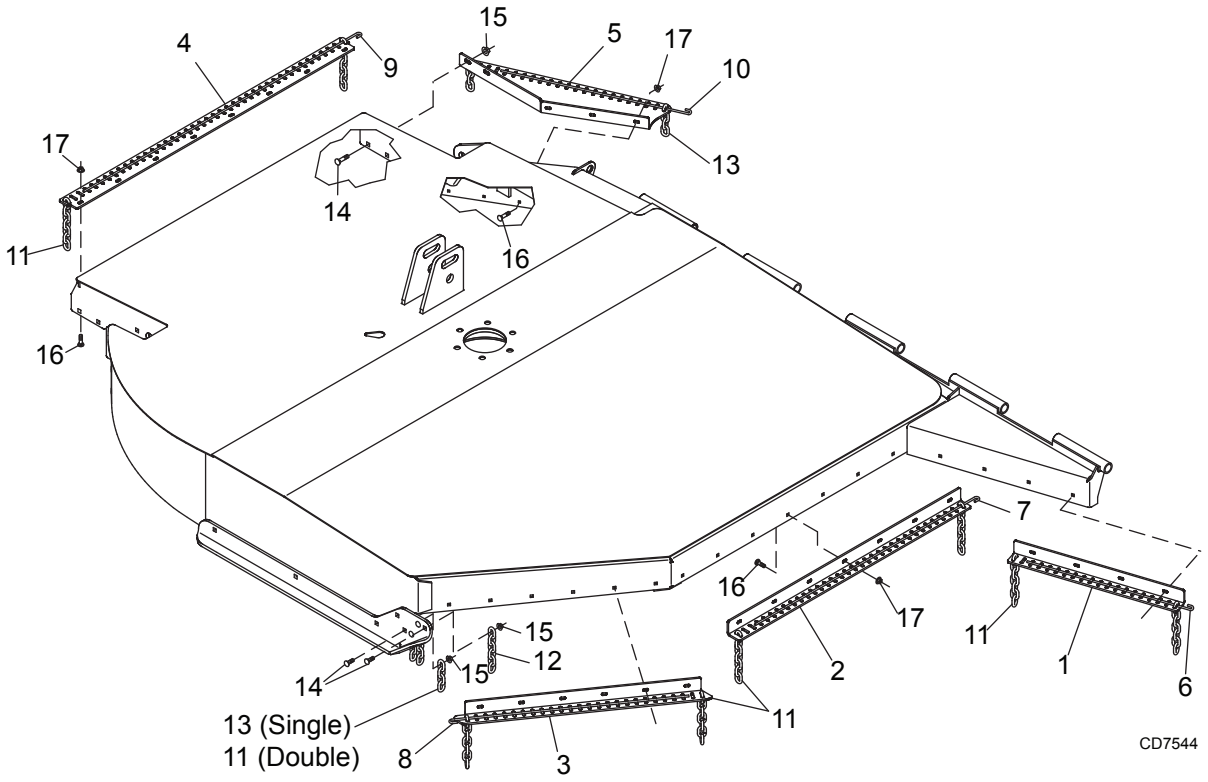
| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1027131RP | 1 | Front center chain plate |
| 2 | 1027132RP | 1 | Front right chain plate |
| 3 | 1027133RP | 1 | Front left chain plate |
| 4 | 1027141RP | 2 | Rear chain plate |
| 8 | 1003644 | 4 | Pin, 22 to 24 chains |
| 9 | 1003646 | 1 | Pin, 28 to 30 chains |
| 11 | 5496 | 123 | 5/16 chain - 7 link |
| 16 | 6697 | * | 3/8 NC x 1 carriage bolt GR5 |
| 17 | 14350 | * | 3/8 NC flanged lock nut |
| 18 | 1027189RP | 1 | Rear chain plate, center short |
| 19 | 1007852 | 1 | Pin, 7 to 9 chains |

## DOUBLE ROW

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1029881RP | 1 | Front center chain plate |
| 2 | 1029882RP | 1 | Front right chain plate |
| 3 | 1029883RP | 1 | Front left chain plate |
| 4 | 1029888RP | 2 | Rear chain plate |
| 8 | 1003644 | 8 | Pin, 22 to 24 chains |
| 9 | 1003646 | 2 | Pin, 28 to 30 chains |
| 11 | 5496 | 220 | 5/16 chain - 7 link |
| 16 | 6697 | * | 3/8 NC x 1 carriage bolt GR5 |
| 17 | 14350 | * | 3/8 NC flanged lock nut |
| 18 | 1027291RP | 1 | Rear chain plate, center short |
| 19 | 1007852 | 2 | Pin, 7 to 9 chains |

- Standard hardware, obtain locally

# CHAIN SHIELDING - WING SECTION




## SINGLE ROW

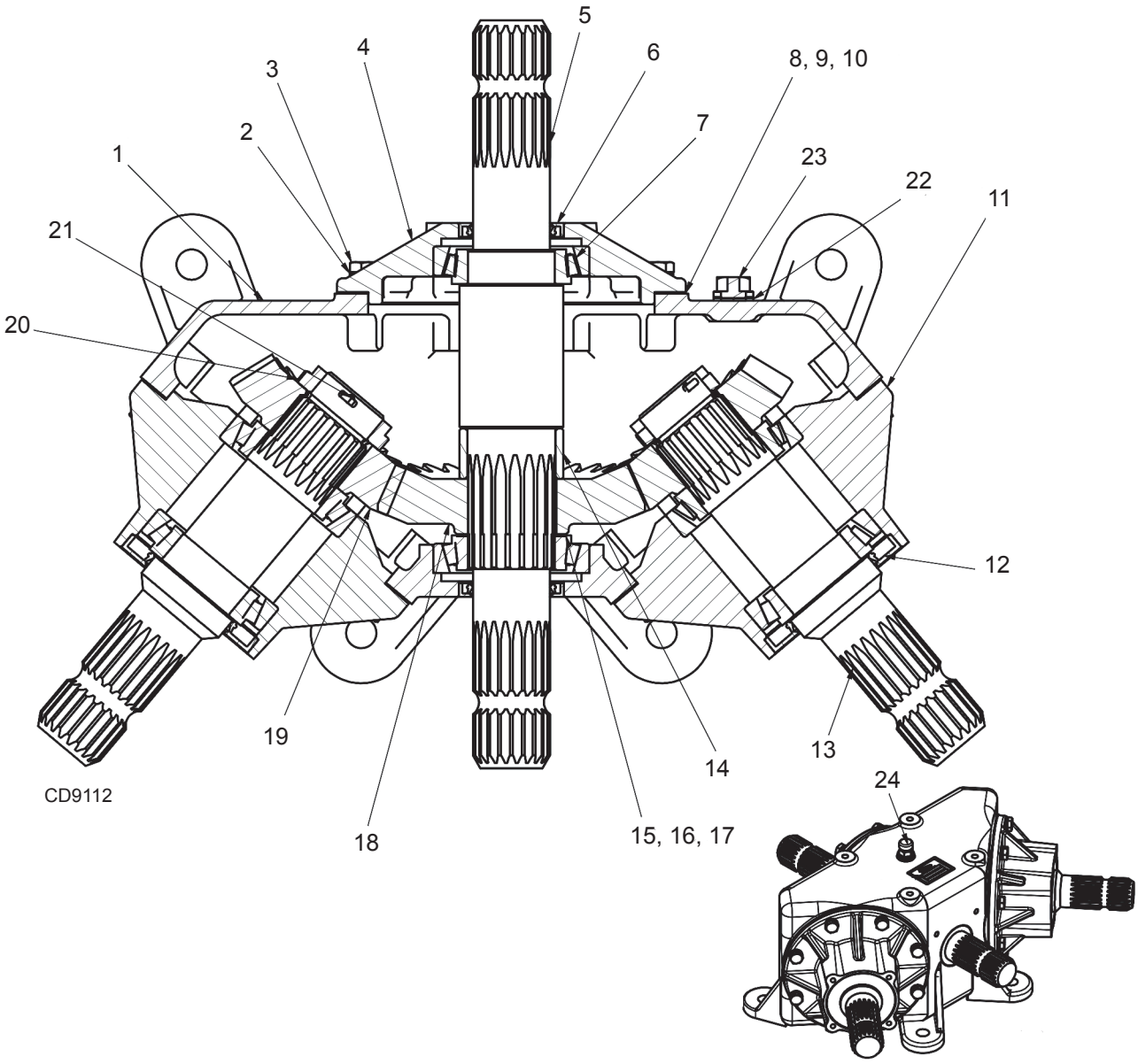
| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1027134RP | 1 | Front wing chain plate, inner |
| 2 | 1027140RP | 1 | Front wing chain plate, center |
| 3 | 1027136RP | 1 | Front right wing chain plate, outer **- OR -** |
| 3 | 1027137RP | 1 | Front left wing chain plate, outer |
| 4 | 1027142RP | 1 | Rear wing chain plate |
| 5 | 1027138RP | 1 | Rear right wing chain plate, inner **- OR -** |
| 5 | 1027139RP | 1 | Rear left wing chain plate, inner |
| 6 | 1003643 | 1 | Pin, 19 to 21 chains |
| 7 | 1007851 | 1 | Pin, 34 to 36 chains |
| 8 | 1003645 | 1 | Pin, 25 to 27 chains |
| 9 | 1007854 | 1 | Pin, 40 to 42 chains |
| 10 | 1003644 | 1 | Pin, 22 to 24 chains |
| 11 | 5496 | 124 | 5/16 chain - 7 link |
| 12 | 5498 | 2 | 5/16 chain - 6 link |
| 13 | 4069 | 25 | 5/16 chain - 4 link |
| 14 | 29893 | * | 1/2 NC x 1-1/2 carriage bolt GR5 |
| 15 | 11900 | * | 1/2 NC flanged lock nut |
| 16 | 6697 | * | 3/8 NC x 1 carriage bolt GR5 |
| 17 | 14350 | * | 3/8 NC flanged lock nut |

## DOUBLE ROW

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1029885RP | 1 | Front wing chain plate, inner |
| 2 | 1029884RP | 1 | Front wing chain plate, center |
| 3 | 1029886RP | 1 | Front right wing chain plate, outer **- OR -** |
| 3 | 1029887RP | 1 | Front left wing chain plate, outer |
| 4 | 1029889RP | 1 | Rear wing chain plate |
| 5 | 1029890RP | 1 | Rear right wing chain plate, inner **- OR -** |
| 5 | 1029891RP | 1 | Rear left wing chain plate, inner |
| 6 | 1003643 | 2 | Pin, 19 to 21 chains |
| 7 | 1007851 | 2 | Pin, 34 to 36 chains |
| 8 | 1003645 | 2 | Pin, 25 to 27 chains |
| 9 | 1007854 | 2 | Pin, 40 to 42 chains |
| 10 | 1003644 | 2 | Pin, 22 to 24 chains |
| 11 | 5496 | 217 | 5/16 chain - 7 link |
| 12 | 1016953 | 2 | 5/16 chain - 11 link |
| 13 | 4069 | 38 | 5/16 chain - 4 link |
| 14 | 29893 | * | 1/2 NC x 1-1/2 carriage bolt GR5 |
| 15 | 11900 | * | 1/2 NC flanged lock nut |
| 16 | 6697 | * | 3/8 NC x 1 carriage bolt GR5 |
| 17 | 14350 | * | 3/8 NC flanged lock nut |

* Standard hardware, obtain locally

# SPLITTER GEARBOX ASSEMBLY

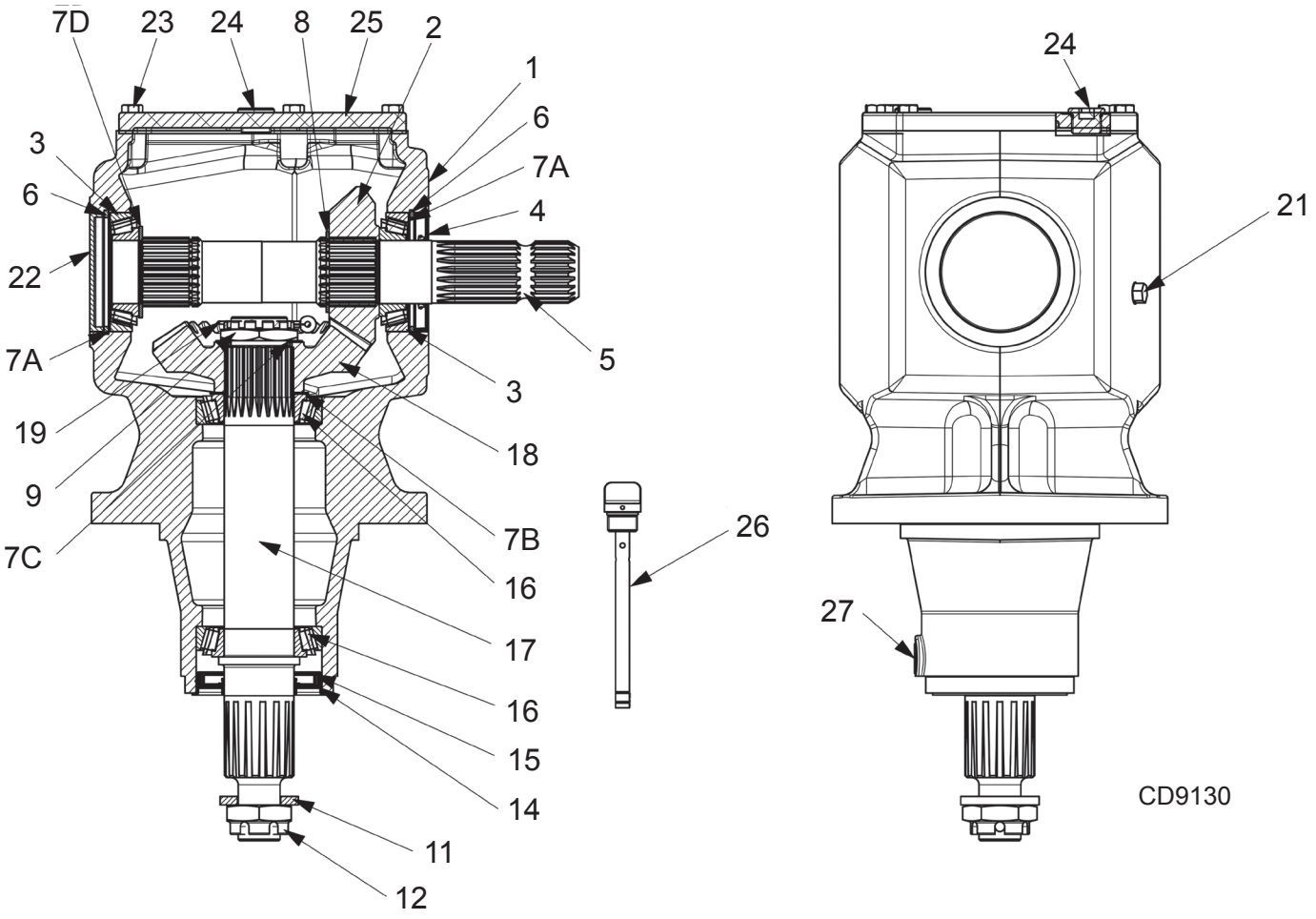


# SPLITTER GEARBOX ASSEMBLY PARTS LIST

| REF | PART 540 RPM | PART 1000 RPM | QTY | DESCRIPTION |
|---|---|---|---|---|
| 1 | 1034939 | 1034940 | - | Complete splitter gearbox |
| 2 | 21542 | 21542 | 24 | 10 mm lock washer |
| 3 | W307201 | W307201 | 24 | M10 x 1.5P x 30 HHCS |
| 4 | 1034937 | 1034937 | 1 | Input cap |
| 5 | 1034938 | 1034938 | 1 | Input shaft |
| 6 | 1019589 | 1019589 | 2 | Input oil seal |
| 7 | 1019587 | 1019587 | 6 | Bearing assembly 50 x 90 |
| 8 | 1019592 | 1019592 | AR | Gasket .15 mm |
| 9 | 1019593 | 1019593 | AR | Gasket .25 mm |
| 10 | 1019594 | 1019594 | AR | Gasket .45 mm |
| 11 | 1019612 | 1019612 | 2 | Hub cap |
| 12 | 1019590 | 1019590 | 2 | Oil seal |
| 13 | 1019576 | 1019576 | 2 | Output shaft |
| 14 | 1019603 | 1019603 | 1 | Spacer |
| 15 | 1019609 | 1019609 | | Shim .30 mm |
| 16 | 1019608 | 1019608 | | Shim .40 mm |
| 17 | 1019610 | 1019610 | | Shim .50 mm |
| 18 | 1027170 | 1027184 | 1 | Gear |
| 19 | 1027184 | 1027170 | 2 | Gear |
| 20 | 1019605 | 1019605 | 2 | Bearing adjustment nut |
| 21 | NS | NS | 2 | 1/8 x 2-1/2 cotter pin |
| 22 | 1009081 | 1009081 | 2 | Sealing washer |
| 23 | 1019601 | 1019601 | 1 | M18 x 1.5 level plug |
| 24 | 1019600RP | 1019600RP | 1 | M18 x 1.5 breather plug |

AR As required
NS Not serviced

# WING & CENTER GEARBOX ASSEMBLY
# BW20.51 / BW20.51Q



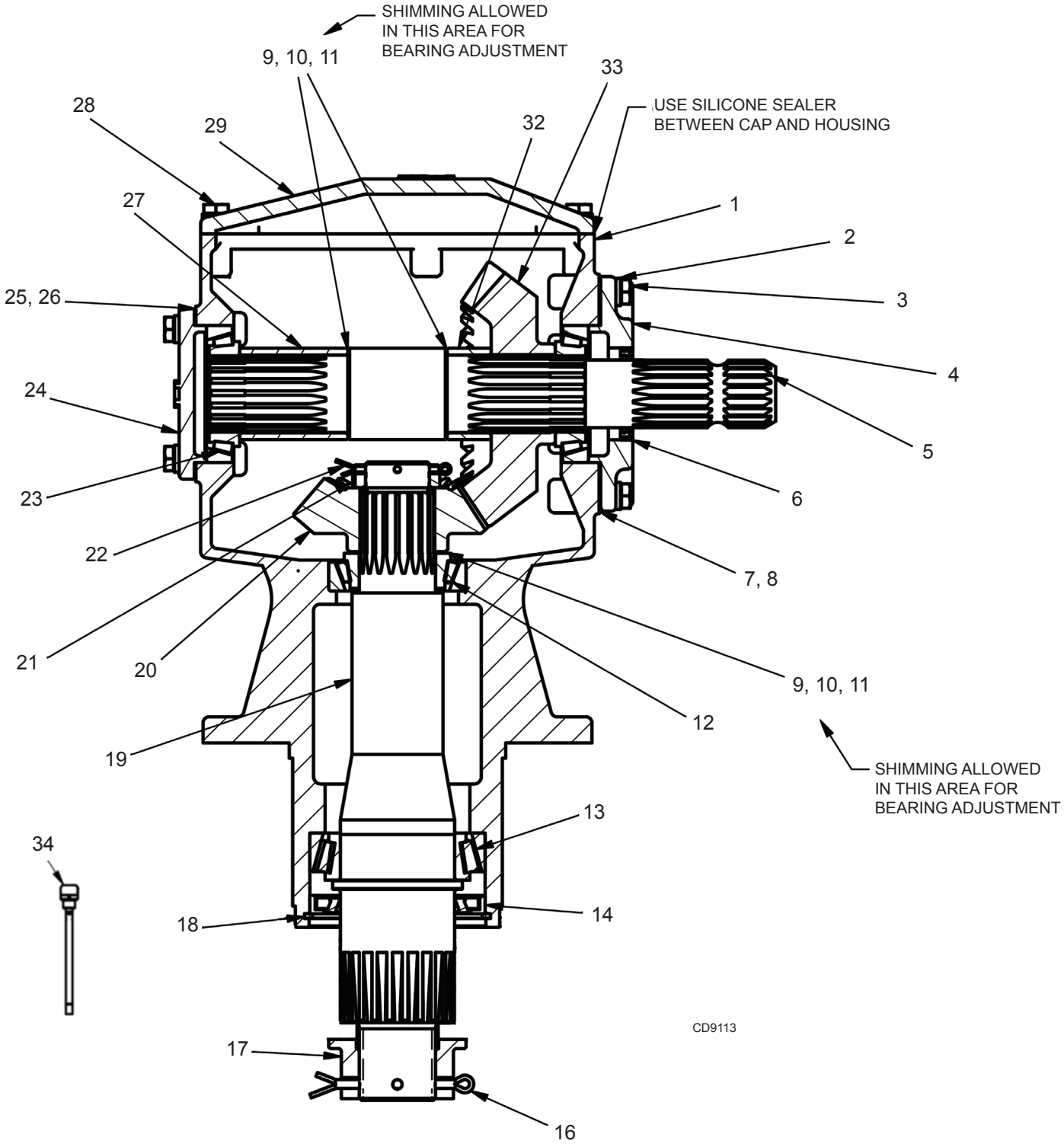
# WING & CENTER GEARBOX ASSEMBLY
# BW20.51 / BW20.51Q

| REF | QTY | LEFT WING | RIGHT WING | CENTER 540 ONLY | CENTER 1000 ONLY | DESCRIPTION |
|---|---|---|---|---|---|---|
| | | 617170RP | 617169RP | 617167RP | 617168RP | Complete gearbox |
| 1 | 1 | NS | NS | NS | NS | Housing |
| 2 | 1 | 603867 | 603867* | 57316 | 57316 | Gear, crown |
| 3 | 2 | 39411 | 39411 | 39411 | 39411 | Bearing |
| 4 | 1 | 57318 | 57318 | 57318 | 57318 | Oil seal 45 x 85 x 10 |
| 5 | 1 | 57319 | 57319 | 57319 | 57319 | Input shaft |
| 6 | 2 | 57320 | 57320 | 57320 | 57320 | Snap ring 85 UNI7437 |
| 7 | 1 | 57471 | 57471 | 57471 | 57471 | Shim kit (includes 7A - 7D) |
| 7A | | | | | | Shim 70.3 x 84.7 |
| 7B | | | | | | Shim 50.3 x 70.3 |
| 7C | | | | | | Shim 40.3 x 61.7 x 1 |
| 7D | | | | | | Shim 45.3 x 65.3 x 2.5 |
| 8 | 1 | 57321 | 57321 | 57321 | 57321 | Snap ring 50 UNI7435 |
| 9 | 1 | 57329 | 57329 | 57329 | 57329 | Castle nut M40 x 1.5P |
| 11 | 1 | 1024670 | 1024670 | 1024670 | 1024670 | Washer, 1.22 x 2.205 x .236 |
| 12 | 1 | W39323 | W39323 | W39323 | W39323 | Castle nut M30 x 2.0P |
| 14 | 1 | 57338 | 57338 | 57338 | 57338 | Protective seal |
| 15 | 1 | 1045873 | 1045873 | 1045873 | 1045873 | Oil seal 50 x 90 x 10 |
| 16 | 2 | 39263 | 39263 | 39263 | 39263 | Bearing cup & cone |
| 17 | 1 | 57356 | 57356 | 57356 | 57356 | Output shaft |
| 18 | 1 | 603867 | 603867 | 57358 | 57358 | Gear pinion |
| 19 | 1 | NS | NS | NS | NS | Cotter pin 3/16 x 2 |
| 21 | 1 | NS | NS | NS | NS | Plug |
| 22 | 1 | 57371 | 57371 | 57371 | 57371 | Cap |
| 23 | 6 | NS | NS | NS | NS | M8 x 16 GR8.8 HHCS |
| 24 | 2 | NS | NS | NS | NS | Plug |
| 25 | 1 | 1045878 | 1045878 | 1045878 | 1045878 | Top cover |
| 26 | 1 | 1045872 | 1045872 | 1045872 | 1045872 | Dipstick |
| 27 | 1 | 1045877 | 1045877 | 1045877 | 1045877 | Magnetic drain plug |
| 28 | 1 | 1005512 | 1005512 | 1005512 | 1005512 | Gearbox repair kit (contains items 3, 4, 6, 7, 8, 14, 15, 16, 20) |

* Crown gear placed on opposite end of input shaft for right wing

NS Not Serviced

# WING & CENTER GEARBOX ASSEMBLY
# BW20.61 / BW20.61Q & BW20.71 / BW20.71Q



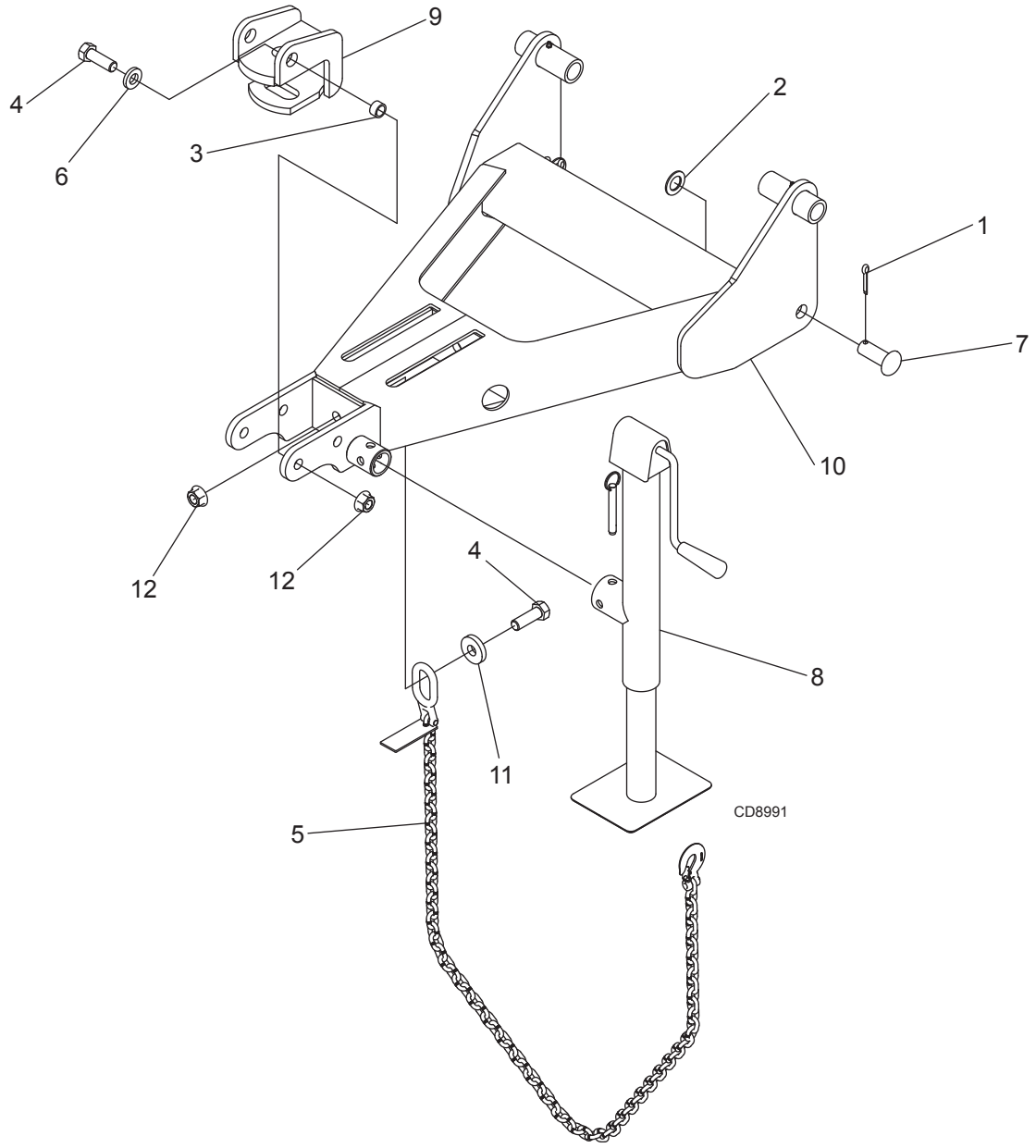
# WING & CENTER GEARBOX ASSEMBLY
# BW20.61 / BW20.61Q / BW20.71 / BW20.71Q

| REF | QTY | LEFT WING | RIGHT WING | CENTER 540 ONLY | CENTER 1000 ONLY | DESCRIPTION |
|---|---|---|---|---|---|---|
| | | 603875RP | 603876RP | 603873RP | 603874RP | Complete gearbox |
| 1 | 1 | NS | NS | NS | NS | Housing |
| 2 | 18 | 21542 | 21542 | 21542 | 21542 | M10 lock washer |
| 3 | 12 | W307201 | W307201 | W307201 | W307201 | M10 x 1.5 x 30 cap screw |
| 4 | 1 | 1019614 | 1019614 | 1019614 | 1019614 | Input cap |
| 5 | 1 | 1019577 | 1019577 | 1019577 | 1019577 | Input shaft |
| 6 | 1 | 1019589 | 1019589 | 1019589 | 1019589 | Oil seal |
| 7 | | 1019595 | 1019595 | 1019595 | 1019595 | Input cap gasket (0.20) |
| 8 | | 1019596 | 1019596 | 1019596 | 1019596 | Input cap gasket (0.40) |
| 9 | | 1019609 | 1019609 | 1019609 | 1019609 | Shim (0.30) |
| 10 | | 1019608 | 1019608 | 1019608 | 1019608 | Shim (0.40) |
| 11 | | 1019610 | 1019610 | 1019610 | 1019610 | Shim (0.50) |
| 12 | 1 | 614303 | 614303 | 614303 | 614303 | 32210 bearing assembly |
| 13 | 1 | 614294 | 614294 | 614294 | 614294 | 33015 bearing assembly |
| 14 | 1 | 614295 | 614295 | 614295 | 614295 | ø75 x ø115 x 12 metal insert oil seal |
| 16 | 1 | NS | NS | NS | NS | Cotter pin - 5 x 90 |
| 17 | 1 | 614298 | 614298 | 614298 | 614298 | M50 x 4 - 6H slotted flange nut |
| 18 | 1 | 614299 | 614299 | 614299 | 614299 | ø115 bore retaining ring |
| 19 | 1 | 614301 | 614301 | 614301 | 614301 | Output shaft |
| 20 | 1 | 1011758 | 1011758 | 1019585 | 1019586 | Tooth pinion - output |
| 21 | 1 | 1019605 | 1019605 | 1019605 | 1019605 | Bearing adjust nut |
| 22 | 1 | NS | NS | NS | NS | Cotter pin M4 x 60 |
| 23 | 2 | 1019587 | 1019587 | 1019587 | 1019587 | 30210 bearing assembly |
| 24 | 1 | 1019615 | 1019615 | 1019615 | 1019615 | Blank adjusting cap |
| 25 | | 1019598 | 1019598 | 1019598 | 1019598 | Black cap gasket (0.20) |
| 26 | | 1019599 | 1019599 | 1019599 | 1019599 | Blank cap gasket (0.40) |
| 27 | 1 | 1019604 | 1019604 | 1019604 | 1019604 | Bearing spacer |
| 28 | 6 | NS | NS | NS | NS | M10 x 1.5 x 25 cap screw |
| 29 | 1 | 1019616 | 1019616 | 1019616 | 1019616 | Inspection cover |
| 30 | 2 | 1019601 | 1019601 | 1019601 | 1019601 | Level drain plug M18 x 1.5 |
| 31 | 2 | 1009081 | 1009081 | 1009081 | 1009081 | Sealing washer |
| 32 | 1 | 1019603 | 1019603 | 1019603 | 1019603 | Input shaft spacer |
| 33 | 1 | 1011758 | 1011758* | 1019586 | 1019585 | Tooth gear - input |
| 34 | 1 | 614302 | 614302 | 614302 | 614302 | M8 x 15 dip stick TS FF breather asy |

* Crown gear placed on opposite end of input shaft for right wing

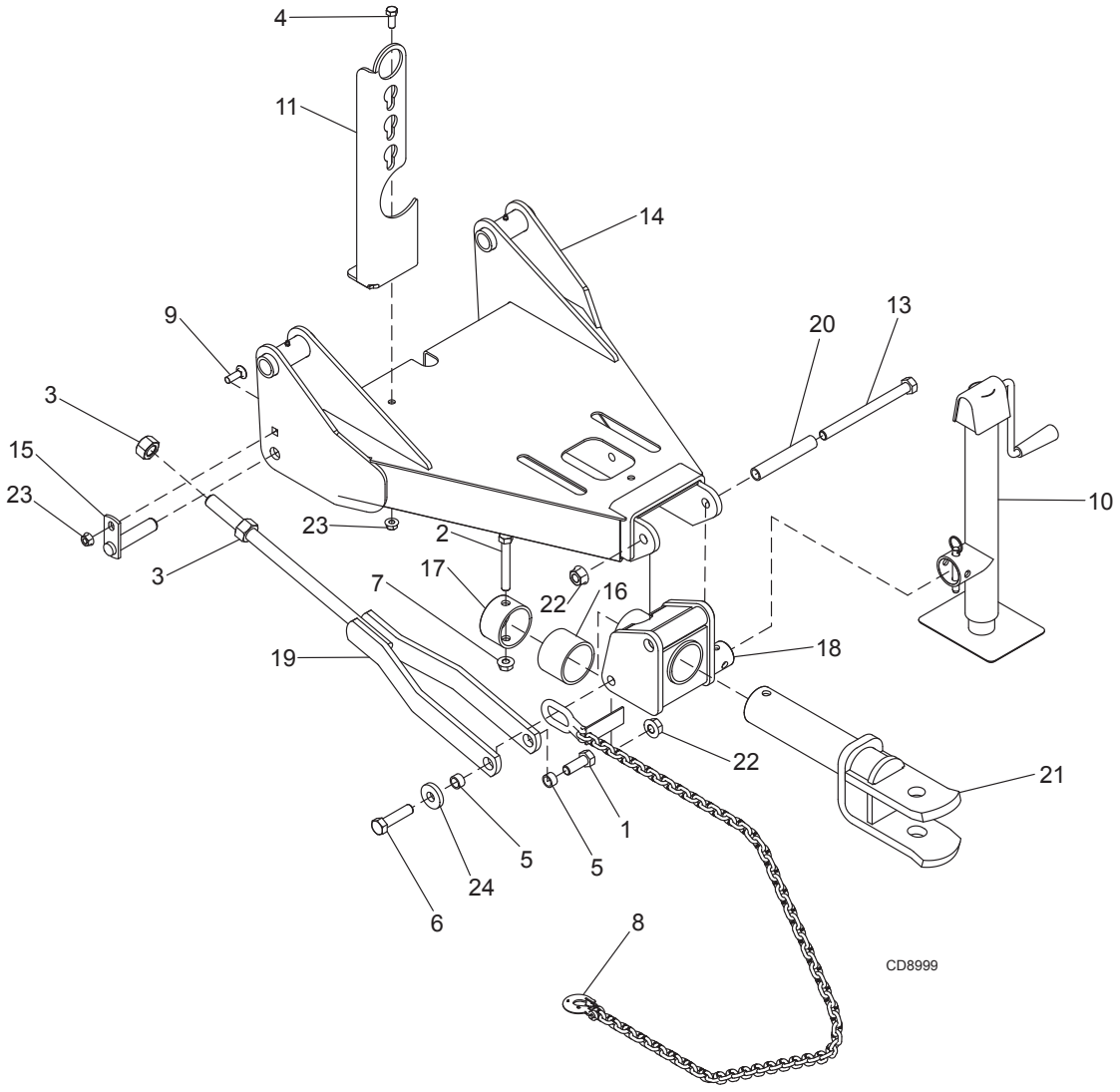
NS Not Serviced

# TONGUE ASSEMBLY
# BW20.51 / BW20.51Q




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1285 | 2 | 1/4 x 1-1/2 cotter pin |
| 2 | 1863 | 2 | 1 SAE flat washer |
| 3 | 13087 | 2 | Sleeve 3/4 x 1 x 9/16 HT |
| 4 | 13759 | 3 | HHCS 3/4 NC x 2-1/4 GR5 ZP |
| 5 | 19407 | 1 | Safety chain assembly, 10,000 lb. |
| 6 | 28873 | 2 | 3/4 ID 1-1/2 OD 1/4 thick washer |
| 7 | 46605 | 2 | Pin CLV 1.00 x 2.26 |
| 8 | 52232 | 1 | Swivel parking jack |
| 9 | 1005595RP | 1 | Hitch, BW180 CATG 2 clevis |
| 10 | 1027100RP | 1 | WA, tongue, BW240 |
| 11 | W8424 | 1 | 3/4 ID 2 OD 3/8 thick washer |
| 12 | W302207 | 3 | Flange head lock nut 3/4 NC |

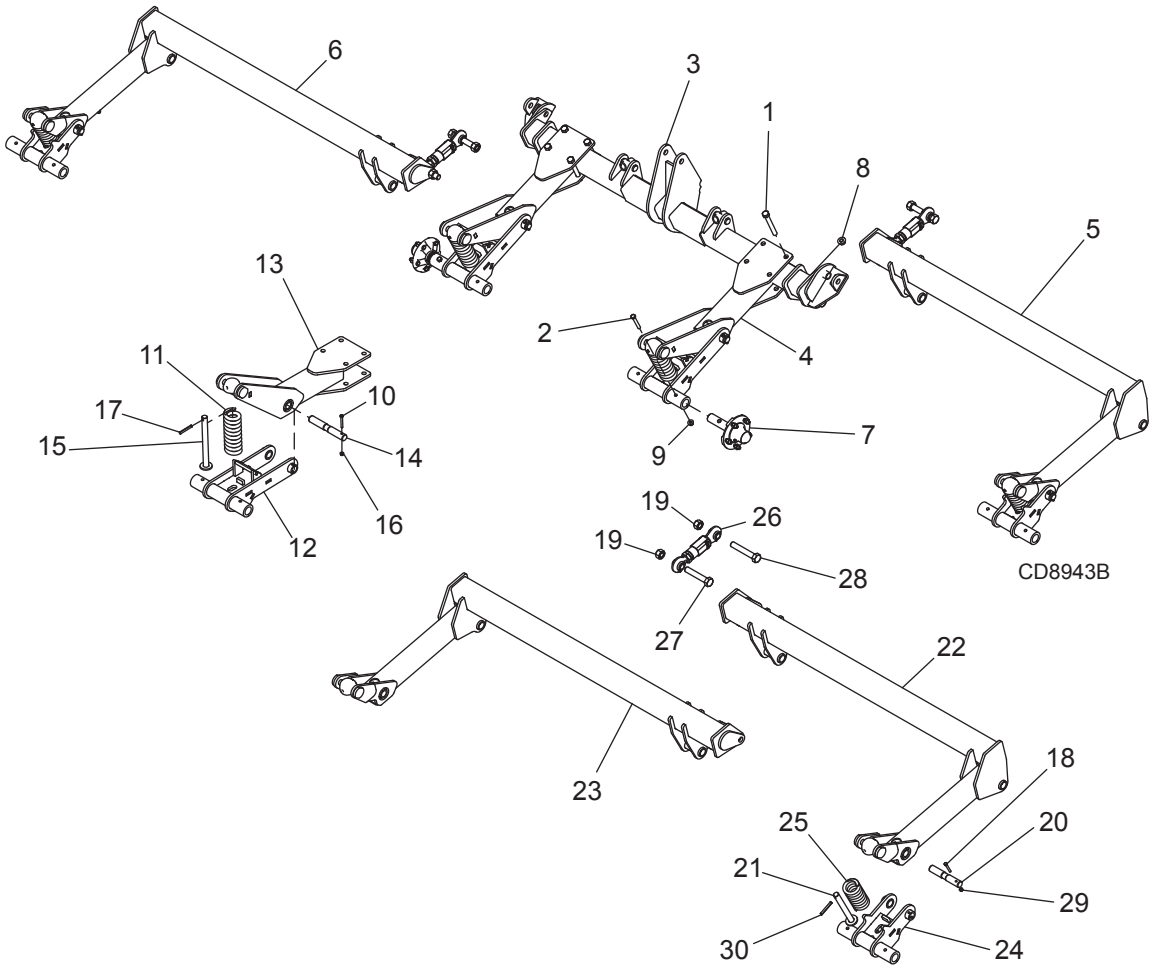
# TONGUE ASSEMBLY
# BW20.61 / BW20.61Q / BW20.71 / BW20.71Q / BW13.71 / BW13.71Q




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 735 | 1 | HHCS 3/4 NC x 2 GR5 |
| 2 | 3097 | 1 | HHCS 5/8 NC x 4 - 1/2 GR5 ZP |
| 3 | 3132 | 2 | Hex nut 1 NC ZP |
| 4 | 6100 | 2 | HHCS 1/2 NC x 1 - 1/4 GR5 ZP |
| 5 | 13087 | 2 | Sleeve 3/4 x 1 x 9/16 HT |
| 6 | 14334 | 1 | HHCS 3/4 NC x 3 GR5 |
| 7 | 19025 | 1 | HFN nut 5/8 NC, Dri-Loc patch |
| 8 | 19407 | 1 | Safety chain assembly 10,000 lb. |
| 9 | 29893 | 2 | Carriage bolt 1/2 NC x 1-1/2 HT |
| 10 | 52232 | 1 | Swivel parking jack |
| 11 | 52442RP | 1 | Swivel parking jack |
| 12 | 65130 | 2 | Pipe 1 SCH 40 x 1.00 |

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 13 | W301014 | 1 | Bolt mach 3/4 NC x 9 |
| 14 | 611434RP | 1 | WA, tongue BW20 |
| 15 | 1017045 | 1 | Flag pin 1.00 x 4.25 |
| 16 | 1017217RP | 1 | Sleeve 3.06 x 3.50 x 1.25 |
| 17 | 1017218RP | 1 | Sleeve, DR 3.06 x 3.50 x 2.00 |
| 18 | 1017220RP | 1 | WA, tongue level hitch |
| 19 | 1017230RP | 1 | WA, tongue level link |
| 20 | 1017232 | 1 | Sleeve .760 x 1.00 x 6.06 |
| 21 | 1017240RP | 1 | WA, tongue clevis |
| 22 | 1045611 | 3 | HFN nut 3/4 NC, Dri-Loc patch |
| 23 | 1045624 | 4 | HFN nut 1/2 NC, Dri-Loc patch |
| 24 | W8424 | 1 | 3/4 ID 2 OD 3/8 thick washer |

# SPRING ARM ASSEMBLY




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 2377 | 8 | HHCS 3/4 NC 6 GR5 |
| 2 | 1637 | 4 | HHCS 1/2 NC x 3-1/2 GR5 ZP |
| 3 | 609567RP | 1 | WA, center yoke BW20 |
| 4 | 611427RP | 2 | Center spring arm assembly |
| 5 | 611428RP | 1 | Right wing spring arm assembly |
| 6 | 611429RP | 1 | Left wing spring arm assembly |
| 7 | 1017050 | 5 | 5-bolt wheel hub |
| 8 | 1029037 | 8 | Spiralock flange HFN 3/4 NC |
| 9 | 1045624 | 4 | HFN nut 1/2 NC, Dri-Loc patch |

## ITEM 4 BREAKDOWN

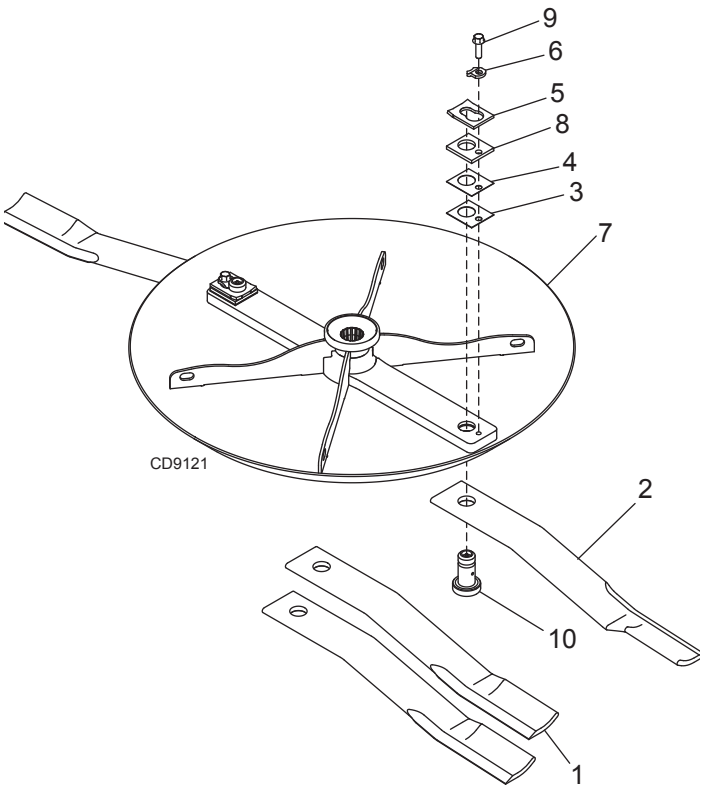
| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 10 | 10509 | 1 | HHCS 5/16 NC x 2-1/2 GR5 |
| 11 | 19710RP | 1 | SPR/CMP 3.25 .69 9.52200 |
| 12 | 610650RP | 1 | WA, lower spring arm, ctr |
| 13 | 611403RP | 1 | WA, wheel yoke arm, spring |
| 14 | 1017149 | 1 | Bar DR 1.25 x 8.85 |
| 15 | 610634RP | 1 | WA, pin 1.00 x 10.88 |
| 16 | 1045655 | 1 | HFN nut 5/16 NC, Dri-Loc patch |
| 17 | 1046049 | 1 | Spirol pin 3/8 x 3 hvy |

## ITEMS 5 & 6 BREAKDOWN

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 18 | 10509 | 2 | HHCS 5/16 NC x 2-1/2 GR5 |
| 19 | 34279 | 4 | Lock nut 1 NC |
| 20 | 52087 | 2 | Bar DR 1.25 x 6.64 x 7.56 |
| 21 | 610635RP | 2 | WA, Pin 1.00 x 8.38 |
| 22 | 609568RP | 1 | WA, right yoke BW20 |
| 23 | 609569RP | 1 | WA, left yoke BW20 |
| 24 | 610665RP | 2 | WA, wing spring arm |
| 25 | 1032100RP | 2 | Compression spring 3.25 x .56 x 7.25 x 1113 |
| 26 | 1039950 | 2 | Trunnion adjustable link |
| 27 | 1044811 | 2 | HHCS 1 NC x 5.5 GR8 pltd |
| 28 | 1044973 | 2 | HHCS 1 NC x 6 GR8 pltd |
| 29 | 1045655 | 2 | HFN 5/16 nut NC, Dri-Loc patch |
| 30 | 1046049 | 2 | Spirol pin 3/8 x 3 hvy |

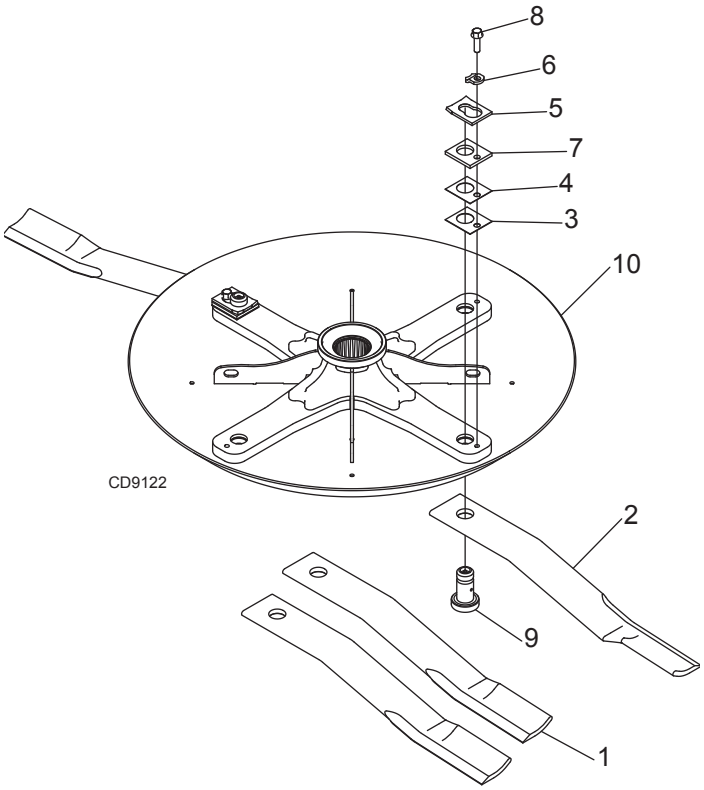
HHCS Hex head cap screw

# CROSSBAR ASSEMBLY
# BW20.51 / BW20.51Q



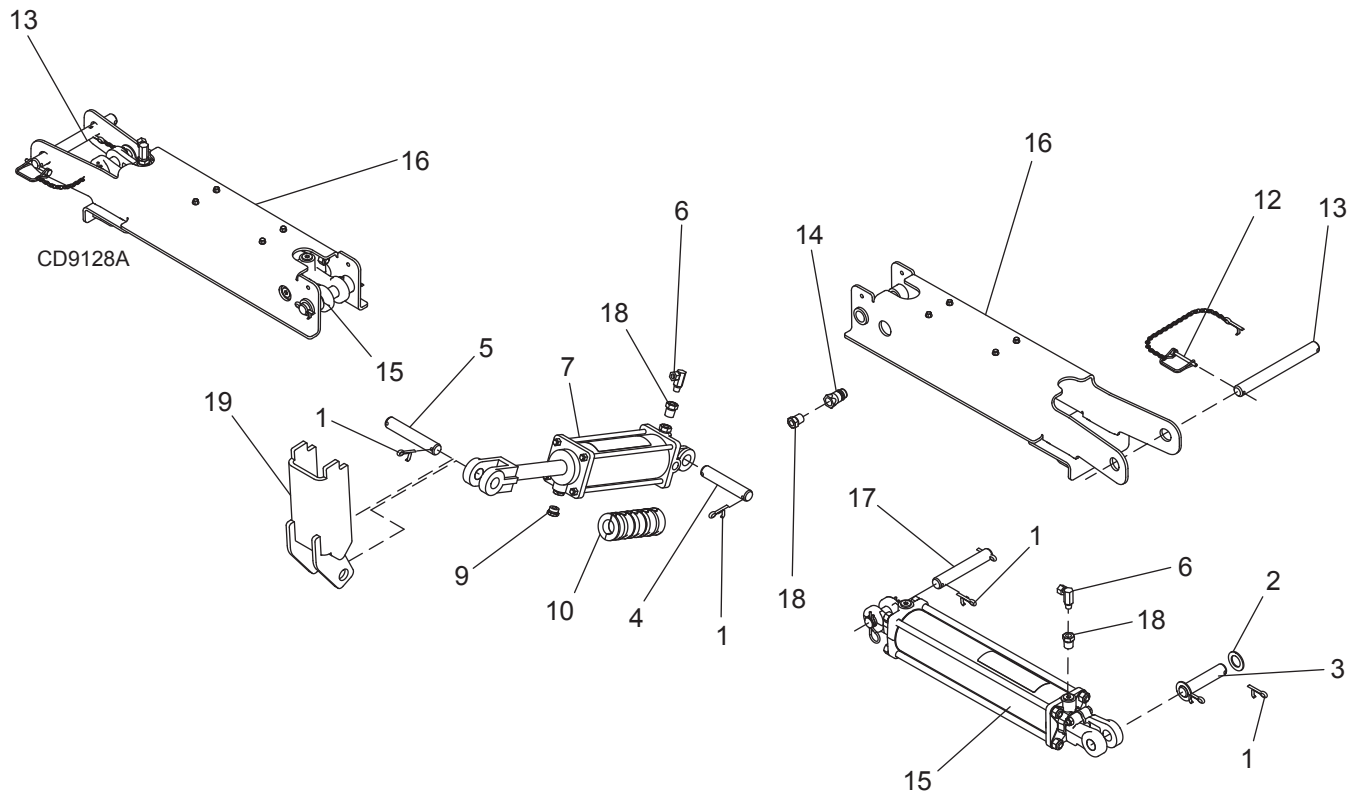

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 8820KT | 1 | 8820 STD left wing blade kit |
| 2 | 8825KT | 1 | 8825 STD center & right wing blade kit |
| 3 | 10520RP | 2 | 18 GA 1-1/2 blade pin shim |
| 4 | 13946RP | 2 | 20 GA 1-1/2 blade pin shim |
| 5 | 32603 | 2 | Keyhole plate special |
| 6 | 32604RP | 2 | Blade pin lock clip spec |
| 7 | 617159RP | 1 | WSA, crossbar BW12.51 |
| 8 | 1028824RP | 2 | Spacer, 5/16 thick blade pin |
| 9 | 1028902 | 2 | HFS 1/2 NC x 1-3/4 GR8 |
| 10 | 1045034RP | 2 | Blade pin drl 2.39 |

# CROSSBAR ASSEMBLY
# BW20.61 / BW20.61Q / BW20.71 / BW20.71Q / BW13.71 / BW13.71Q



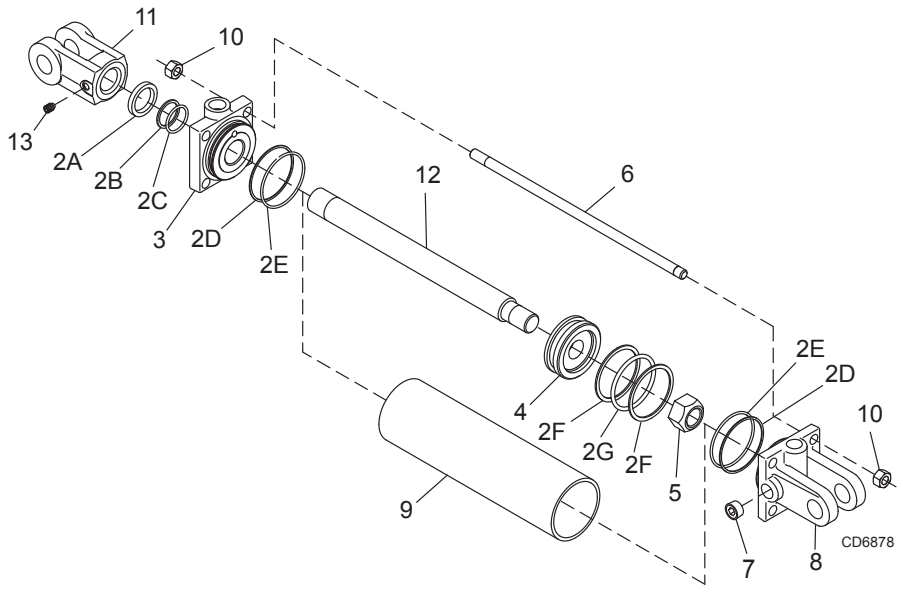

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 8820KT | 1 | 8820 STD left wing blade kit |
| 2 | 8825KT | 1 | 8825 STD center and right wing blade kit |
| 3 | 10520RP | 2 | 18 GA 1-1/2 blade pin shim |
| 4 | 13946RP | 2 | 20 GA 1-1/2 blade pin shim |
| 5 | 32603 | 2 | Keyhole plate special |
| 6 | 32604RP | 2 | Blade pin lock clip spec |
| 7 | 1028824RP | 2 | 5/16 thick blade pin spacer |
| 8 | 1028902 | 2 | HFS 1/2 NC x 1-3/4 GR8 |
| 9 | 1045034RP | 2 | Blade pin drl 2.39 |
| 10 | 617130RP | 1 | WA, crossbar BW20.61/71 |

# CYLINDER ASSEMBLY




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1285 | 12 | 1/4 x 1-1/2 cotter pin |
| 2 | 1863 | 4 | 1 SAE flat washer |
| 3 | 8345 | 2 | Headless pin 1.00 x 4.08 |
| 4 | 8346 | 1 | Headless pin 1.00 x 4.58 |
| 5 | 8347 | 1 | Headless pin 1.00 x 5.08 |
| 6 | 10290 | 3 | 1/4 x 1/4 90 elbow 1/16 restrictor |
| 7 | 10475 | 1 | 3-1/2 x 8 hydraulic cylinder with breather - lincludes 11975 & W11893 (see **page 65** for parts breakdown) |
| 8 | 11817 | 1 | Hose .25 ID x .25 NPT x 230 |
| 9 | 11975 | 1 | 1/2 NPT vent plug |
| 10 | 24098A | 1 | 1-1/4 cylinder stoke control set |
| 11 | 52201 | 2 | Hose .25 ID x .25 NPT x 264 |
| 12 | 52204 | 2 | Chain & cotter lynch pin assembly |
| 13 | 52329 | 2 | Headless pin 1.00 x 8.41 |
| 14 | 66511 | 3 | Male coupler ISO 1/2 NPT |
| 15 | 52234 | 2 | 3.5 x 1.25 x 16.0 NPT 8 cylinder |
| 16 | 617226RP | 2 | Wing cylinder lockup assembly |
| 17 | W8348 | 2 | Headless pin 1.00 x 5.58 |
| 18 | W11893 | 6 | Adapter 1/4 NPTF 1/2 NPTM |
| 19 | 1004814 | 1 | Transport Lock-up |

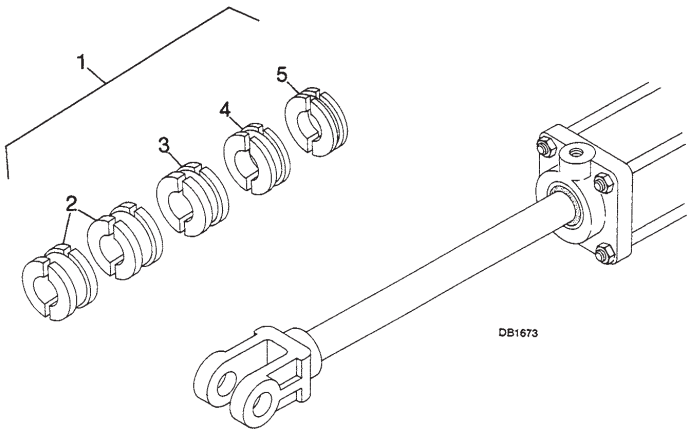
# HYDRAULIC CYLINDER - CENTER LIFT




| REF | 3-1/2 x 8 PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 10475 | | Complete cylinder |
| 2 | 23540 | 1 | Seal repair kit (includes items 2A - 2G) |
| 2A | † | 1 | Wiper seal |
| 2B | † | 1 | Rod seal |
| 2C | † | 1 | Rod o-ring |
| 2D | † | 2 | Cap seal |
| 2E | † | 2 | Cap o-ring |
| 2F | † | 2 | Piston seal |
| 2G | † | 1 | Piston o-ring |
| 3 | N/S | 1 | Cylinder housing - rod end |
| 4 | N/S | 1 | Piston |
| 5 | N/S | 1 | Jam nut |

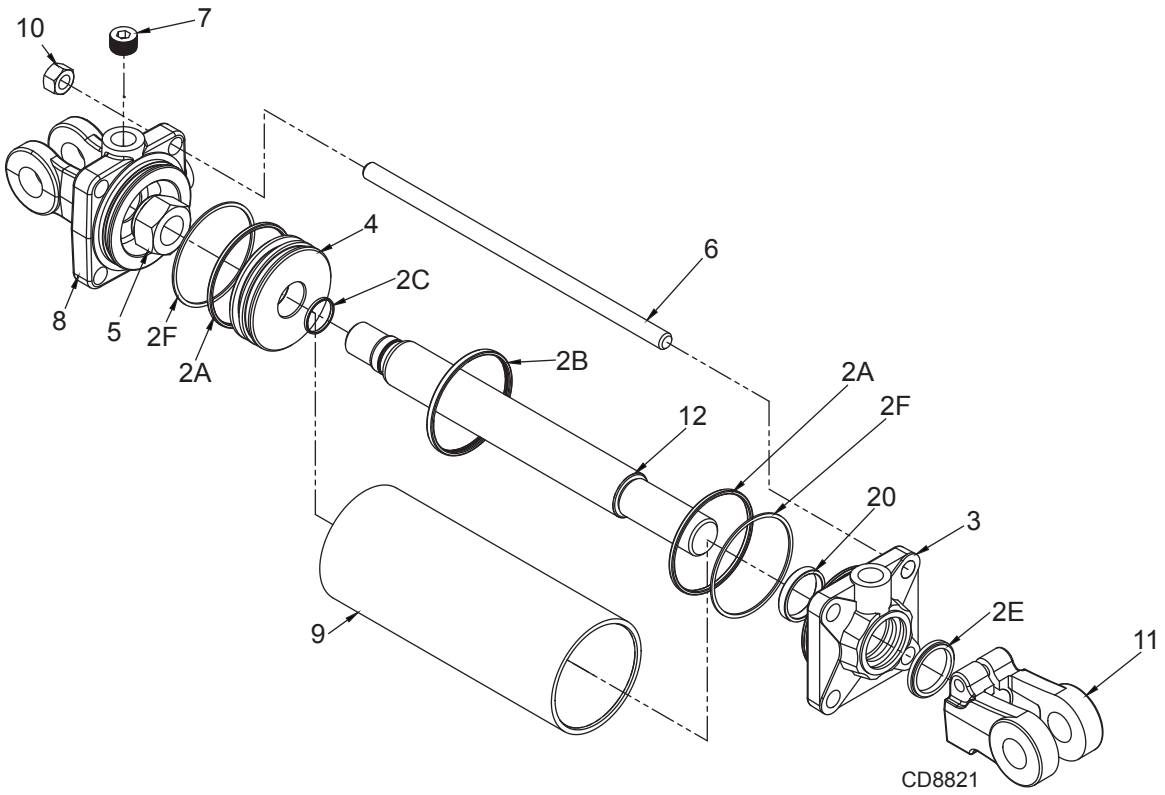
| REF | 3-1/2 x 8 PART | QTY | DESCRIPTION |
|---|---|---|---|
| 6 | N/S | 4 | Cylinder tie rod |
| 7 | * | 3 | 1/2 Pipe plug |
| 8 | N/S | 1 | Cylinder housing - butt end |
| 9 | N/S | 2 | Cylinder barrel |
| 10 | N/S | 8 | Tie rod nut |
| 11 | N/S | 1 | Cylinder clevis |
| 12 | N/S | 1 | Cylinder rod |
| 13 | * | 1 | Dog point set screw 3/8 x 3/4 |
| | † | | Included in seal kit |
| | * | | Standard hardware, obtain locally |
| | N/S | | Not serviced |

# HYDRAULIC CYLINDER STROKE CONTROL KIT




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 24098 | 1 | Stroke control set for 1-1/4" cylinder rod (contains items 2 - 5) |
| 2 | – – – – | 2 | 1-1/2" Segment |
| 3 | – – – – | 1 | 1-1/4" Segment |
| 4 | – – – – | 1 | 1" Segment |
| 5 | – – – – | 1 | 3/4" Segment |

# HYDRAULIC CYLINDERS - WING



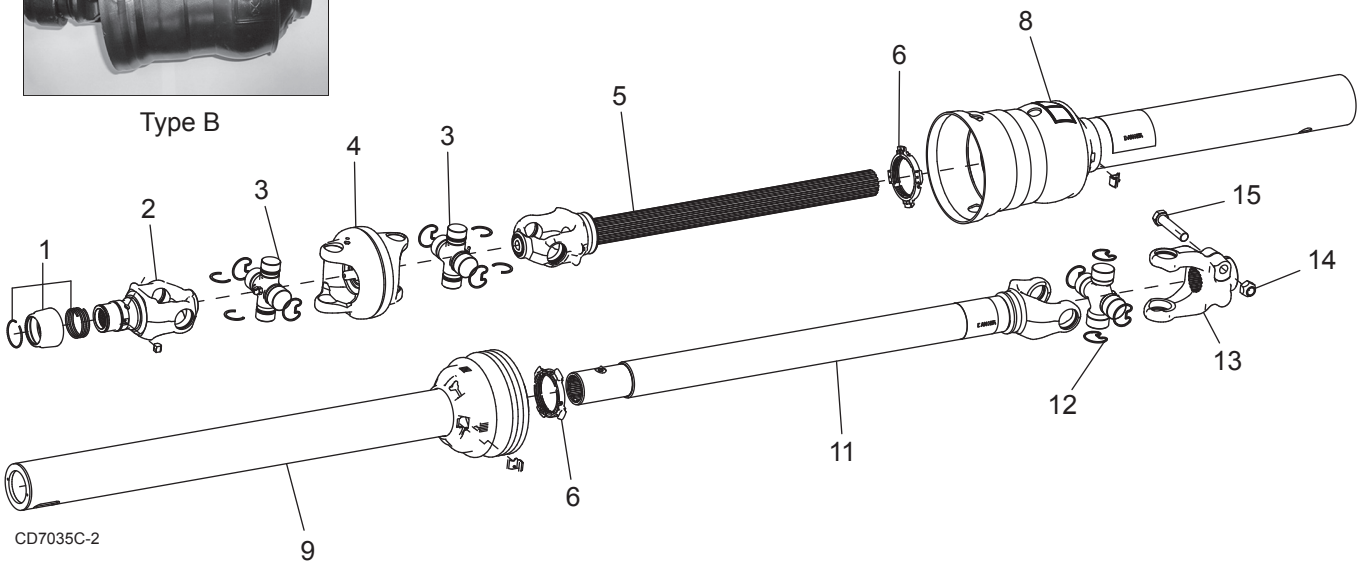

**3.5X1.25ø ROD**

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 52234 | | Complete cylinder |
| 2 | 600250 | 1 | Seal kit (includes items 2A-2F) |
| 2A | † | 2 | Cap o-ring |
| 2B | † | 1 | Piston seal |
| 2C | † | 1 | Rod o-ring |
| 2D | † | 1 | Cap seal |
| 2E | † | 1 | Wiper seal |
| 2F | † | 2 | Backup seal |
| 3 | N/S | 1 | Cylinder housing rod end |
| 4 | N/S | 1 | Piston |
| 5 | N/S | 1 | Jam nut |
| 6 | N/S | 4 | Cylinder tie rod |
| 7 | * | 3 | 1/2 pipe plug |
| 8 | N/S | 1 | Cylinder housing butt end |
| 9 | N/S | 1 | Cylinder barrel |
| 10 | N/S | 8 | Tie rod nut |
| 11 | N/S | 1 | Cylinder clevis |
| 12 | N/S | 1 | Cylinder rod |

| | |
|---|---|
| † | Included in seal kit |
| * | Standard hardware; obtain locally |
| N/S | Not Serviced |

# 540 RPM & 1000 RPM FRONT CV DRIVE

Type B

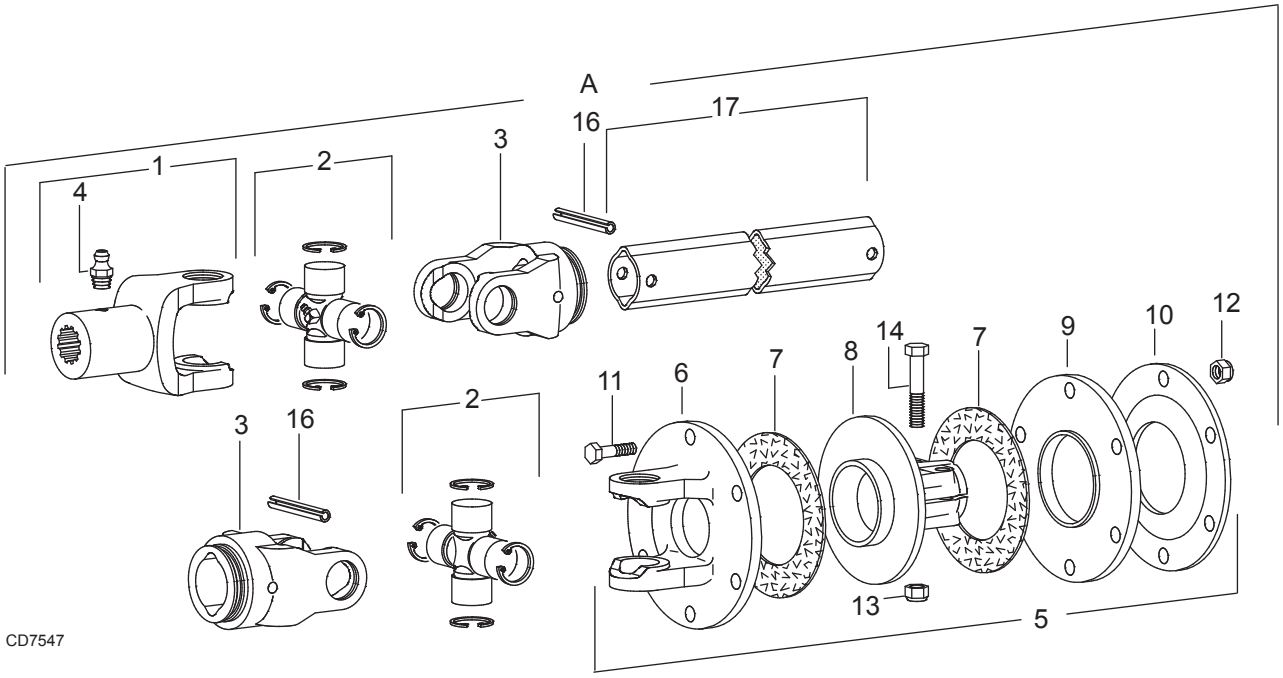



| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| **A** | 1021103RP | 1 | Complete CV drive (**540 RPM**) |
| **B** | 1021104RP | 1 | Complete CV drive (**1000 RPM**) |
| **C** | 1021105RP | 1 | Complete CV drive (**1000 RPM, 1-3/4"**) |
| 1 | 19851 | 1 | Slide lock repair kit |
| 1C | 19837 | 1 | Slide lock repair kit (**1000 RPM, 1-3/4"**) |
| 2A | 1033103 | 1 | Yoke QD CV 1.375 - 6 (**540 RPM**) |
| 2B | 1033104 | 1 | Yoke QD CV 1.375 - 21 (**1000 RPM**) |
| 2C | 1033105 | 1 | Yoke QD CV 1.75 - 20 (**1000 RPM, 1-3/4"**) |
| 3 | 1033107 | 2 | CV u-joint repair kit Cat 6 55E |
| 4 | 1033106 | 1 | CV body with fitting |
| 5A | 1033113 | 1 | Yoke and shaft CV splined 25.9 (**540 RPM**) |
| 5B | 1033111 | 1 | Yoke and shaft - CV splined 26.6 (**1000 RPM**) |
| 5C | 1033116 | 1 | Yoke and shaft CVSP lines 30.9 (**1000 RPM**) |
| 6 | 1009065 | 2 | Drive shield bearing kit |
| 7 | 18864 † | 1 | Decal, danger rotating driveline (see **page 12**) |
| 8A | 1021314 | 1 | CV shield outer (**540 RPM**) |
| 8B | 1021318 | 1 | CV shield outer (**1000 RPM**) |
| 8C | 1023155 | 1 | CV shield outer (**1000 RPM, 1-3/4"**) |

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 9A | 1021315 | 1 | CV shield inner (**540 RPM**) |
| 9B | 1021319 | 1 | CV shield inner (**1000 RPM**) |
| 9C | 1023156 | 1 | CV shield Inner (**1000 RPM, 1-3/4"**) |
| 10 | 33347 † | 1 | Decal, danger guard missing (see **page 13**) |
| 11A | 1021316 | 1 | Yoke 55R x 36.4 x 1.69 - 20 (**540 RPM**) |
| 11B | 1021320 | 1 | Yoke 55R x 38.4 x 1.69 - 20 (**1000 RPM**) |
| 11C | 1023157 | 1 | Yoke, tube & sleeve 55R x 39.8 x 1.69-20 (**1000 RPM, 1-3/4"**) |
| 12 | 58765 | 1 | U-Joint cross and bearing kit |
| 13 | 1023058 | 1 | Yoke, 55R x 5.06 x SP 1.75 - 20 |
| 14 | 6239 * | 1 | 5/8 NC lock nut |
| 15 | 34473 * | 1 | 5/8 NC x 3 HHCS GR5 |

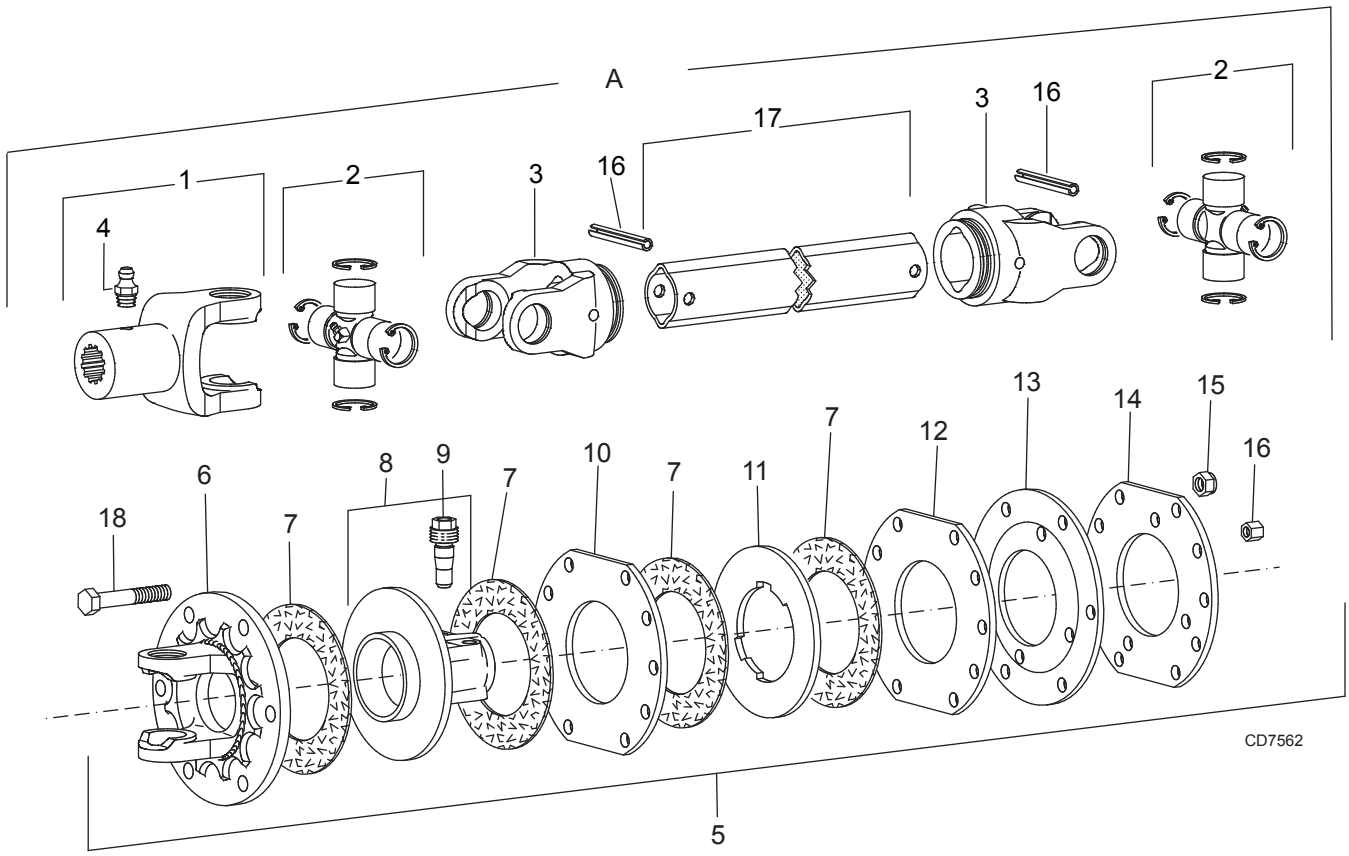
| | |
|---|---|
| † | Not shown |
| HHCS | Hex Head Cap Screw |
| * | Standard hardware; obtain locally |

# CENTER DECK DRIVE ASSEMBLY
# BW20.51 / BW20.51Q / BW20.61 / BW20.61Q



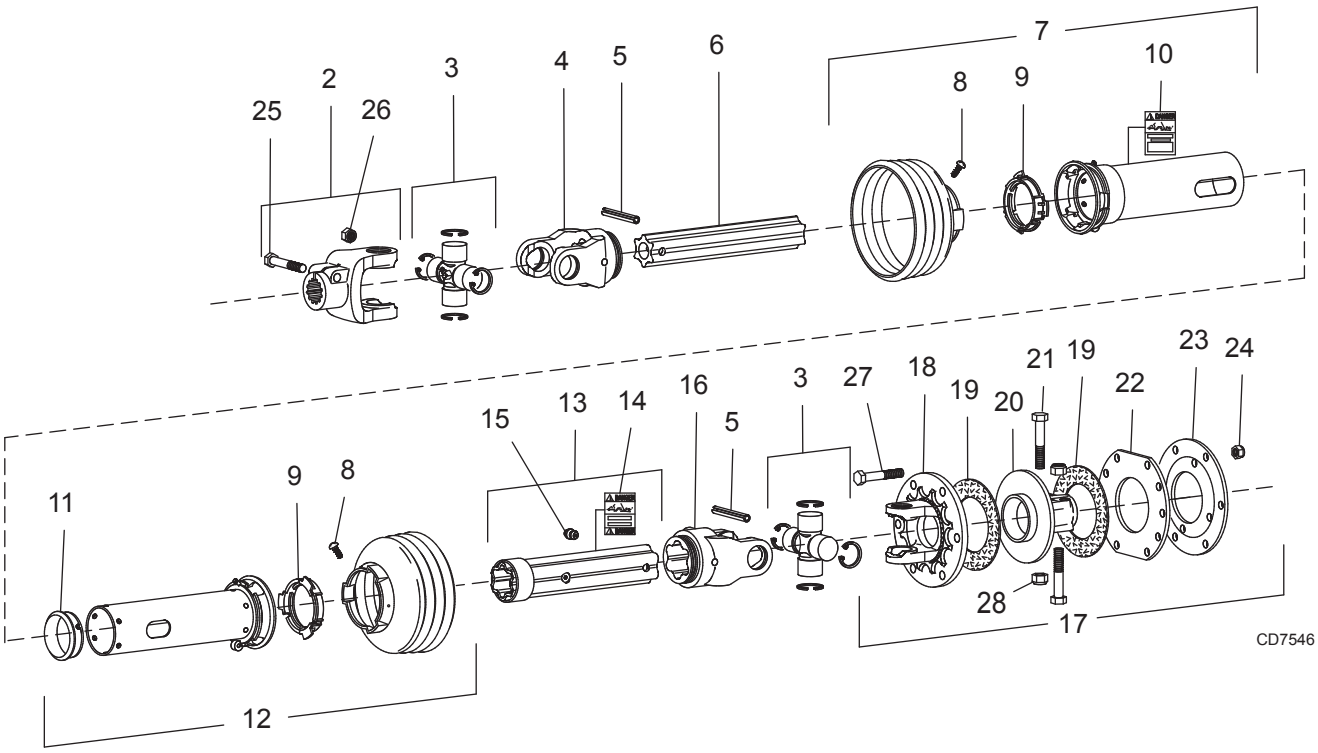

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| A | 1027297 | 1 | Complete center drive assembly |
| 1 | 1004961 | 1 | Yoke, 1-3/4, 20 spline |
| 2 | 110 | 2 | Cross & bearing kit |
| 3 | 40576 | 1 | Inboard yoke |
| 4 | 1005521 | 1 | Grease fitting |
| 5 | 57416 | 1 | Friction clutch 1340 1-3/4, 20 spline |
| 6 | 57438 | 1 | Flange yoke |
| 7 | 57432 | 2 | Friction disc |
| 8 | 57440 | 1 | Hub, 1-3/4, 20 spline |
| 9 | 57434 | 1 | Thrust plate |
| 10 | 57439 | 1 | Belleville spring plate |
| 11 | W57259 | 6 | M10 x 1.5P x 55 mm HHCS 8.8 |
| 12 | 57260 | 6 | M10 x 1.5P hex lock nut |
| 13 | W57261 | 2 | M12 x 1.75P hex lock nut |
| 14 | 57262 | 2 | M12 x 1.75P x 65 mm cap screw 8.8 |
| 15 | 1005508 | | Clutch repair kit |
| 16 | 40764 | 2 | Spring pin 10 x 60 |
| 17 | 1019110 | 1 | Outer profile |
| | HHCS | | Hex Head Cap Screw |

# CENTER DECK DRIVE ASSEMBLY
# BW20.71 / BW20.71Q / BW13.71 / BW13.71Q / BW13.71QREV




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| A | 1027299 | 1 | Complete center drive assembly |
| 1 | 1019107 | 1 | Yoke, 1-3/4, 20 spline |
| 2 | W38352 | 2 | Cross & bearing kit |
| 3 | 38353 | 1 | Inboard yoke |
| 4 | 1005521 | 1 | Grease fitting |
| 5 | 1016484 | 1 | Friction clutch 2400 1-3/4, 20 spline |
| 6 | 1016489 | 1 | Flange yoke |
| 7 | 57432 | 4 | Friction disc |
| 8 | 1016490 | 1 | Hub, 1-3/4, 20 spline clutch |
| 9 | 1016498 | 1 | Lock assembly |
| 10 | 57443 | 1 | Drive plate |
| 11 | 1016491 | 1 | Clutch drive plate |
| 12 | 1016494 | 1 | Thrust plate |
| 13 | 1016492 | 1 | Belleville spring |
| 14 | 1016493 | 1 | Backup plate |
| 15 | W57261 | 6 | M12 x 1.75P hex lock nut w/ nylon insert |
| 16 | 1016495 | 4 | M8 x 1.25P hex nut GR10 |
| 17 | 1019110 | 1 | Outer profile |
| 18 | 1016496 | 6 | M12 x 1.75P x 85 mm HHCS CL8.8 |
| | HHCS | | Hex Head Cap Screw |

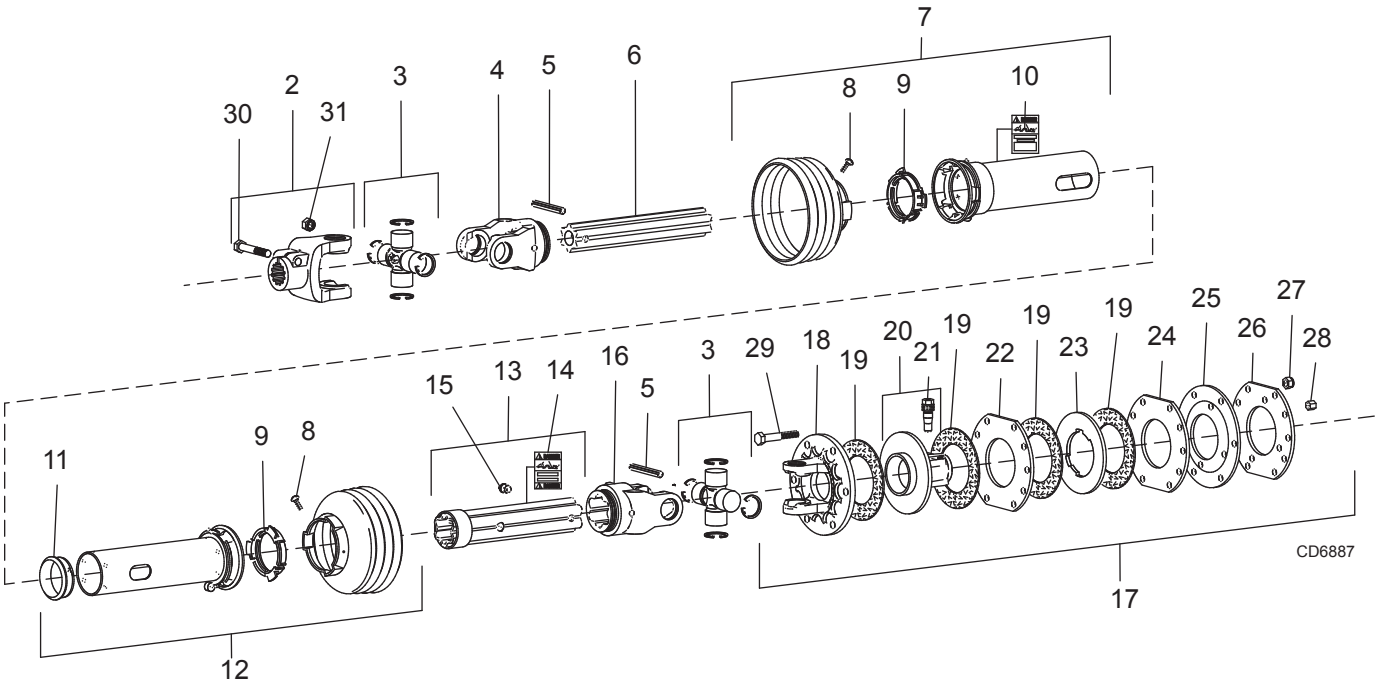
# WING DRIVE ASSEMBLY
# BW20.51 / BW20.51Q / BW20.61 / BW20.61Q




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1045591 | | Complete wing drive assembly |
| 2 | 1019111 | 1 | Yoke 1-3/4 20 special |
| 3 | 1045581 | 2 | Cross and bearing kit 2400 |
| 4 | 90317352 | 1 | Inboard yoke S4 |
| 5 | 40764 | 2 | Spring pin 10 x 80 |
| 6 | 1045594 | 1 | Inner profile S4L |
| 7 | 1045592 | 1 | Outer shield |
| 8 | 40778 | 2 | Screw (package of 10) |
| 9 | 40766 | 1 | Bearing ring |
| 10 | 18864 | 1 | Decal, danger rotating driveline |
| 11 | 1041679 | 1 | Support bearing |
| 12 | 1045593 | 1 | Inner shield |
| 13 | 1045595 | 1 | Profile and sleeve |
| 14 | 33347 | 1 | Decal, Danger Guard Missing |
| 15 | 40779 | 1 | Grease fitting |

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 16 | 44677 | 1 | Inboard yoke S5 |
| 17 | 1019114 | 1 | Clutch (includes 18 thru 24, 27,28) |
| 18 | 1027217 | 1 | Flange yoke |
| 19 | 57432 | 2 | Friction disc |
| 20 | 57440 | 1 | Hub 1-3/4 20 |
| 21 | 57262 | 2 | M12 x 1.75P x 65 mm HHCS 8.8 |
| 22 | 57434 | 1 | Thrust plate |
| 23 | 57439 | 1 | Belleville spring plate |
| 24 | 57260 | 6 | M10 x 1.5P hex lock nut |
| 25 | W307309 | 2 | M12 x 1.75P x 60 mm HHCS 8.8 |
| 26 | 58549 | 2 | M12 x 1.75P hex lock nut |
| 27 | W57259 | 6 | M10 x 1.5P x 55 mm HHCS 8.8 |
| 28 | W57261 | 2 | M12 x 1.75P hex lock nut |
| | HHCS | | Hex Head Cap Screw |

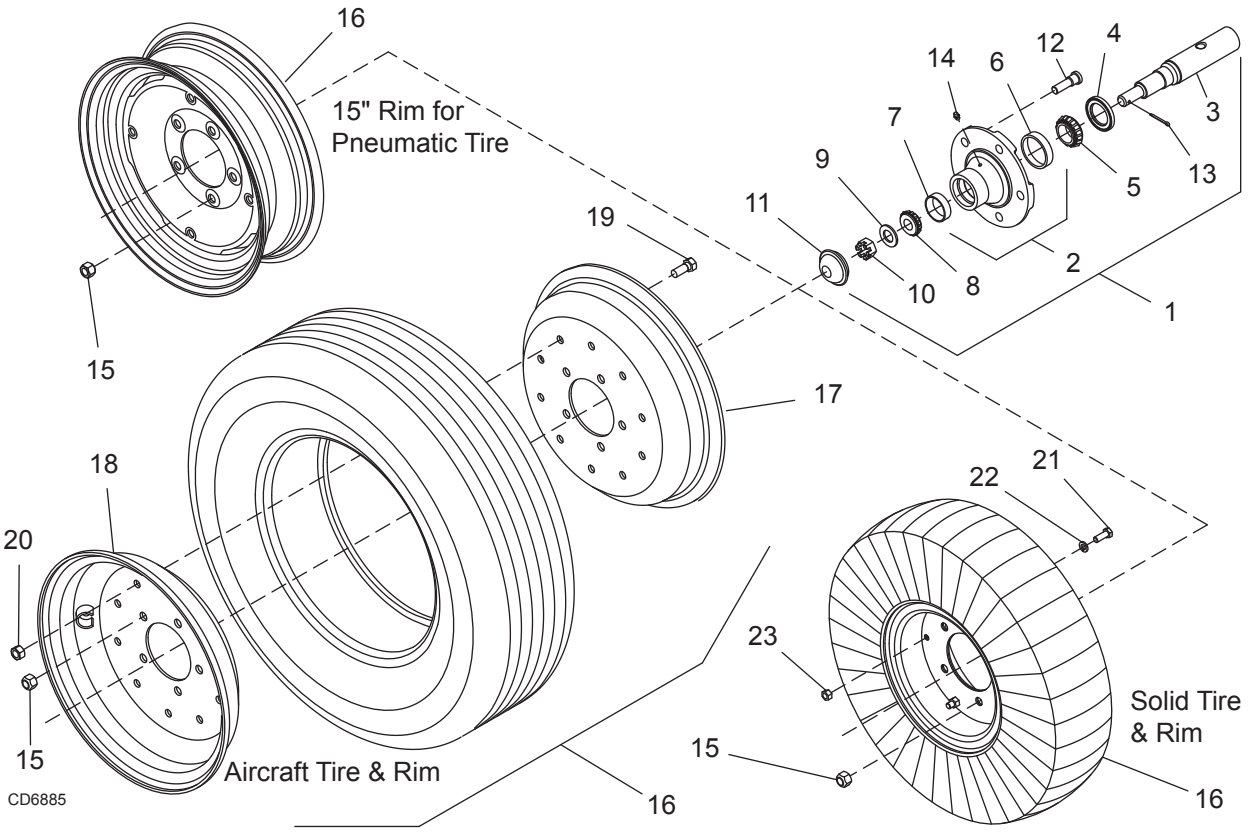
# WING DRIVE ASSEMBLY
# BW20.71 / BW20.71Q / BW13.71 / BW13.71Q / BW13.71QREV




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1027298 | -- | Complete wing drive assembly |
| 2 | 1004957 | 1 | Yoke, 1-3/4, 20 spline (includes items 30, 31) |
| 3 | W40566 | 2 | Cross & bearing kit |
| 4 | 40750 | 1 | Inboard yoke |
| 5 | 40765 | 2 | Spring pin 10 x 90 |
| 6 | 1029842 | 1 | Inner profile |
| 7 | 1019117 | 1 | Outer guard half (includes items 8, 9, 10) |
| 8 | 40778 | 2 | Screw |
| 9 | 40766 | 2 | Bearing ring SC25 |
| 10 | 18864 | 1 | Decal, danger rotating driveline |
| 11 | 40767 | 1 | Support bearing |
| 12 | 1019118 | 1 | Inner guard half (includes items 8, 9, 11) |
| 13 | 1029843 | 1 | Outer profile & sleeve |
| 14 | 33347 | 1 | Decal, danger guard missing |
| 15 | 40779 | 1 | Grease fitting |
| 16 | 40751 | 1 | Inboard yoke |
| 17 | 1019109 | 1 | Friction clutch 2500 1-3/4, 20 spline (includes items 18 through 29) |

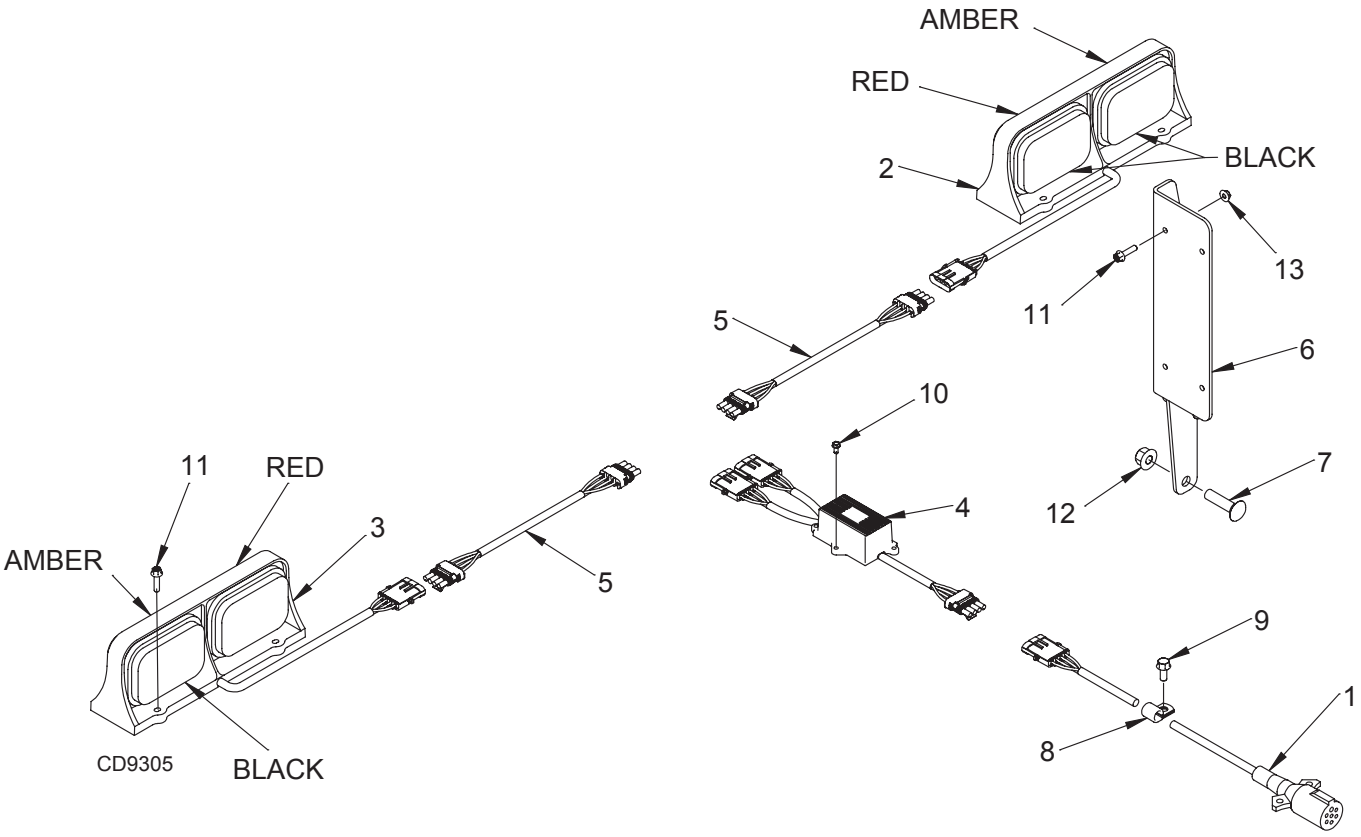
| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 18 | 57441 | 1 | Flange yoke |
| 19 | 57432 | 4 | Friction disc |
| 20 | 1016490 | 1 | Hub, 1-3/4, 20 spline (includes item 21) |
| 21 | 1016498 | 1 | Lock assembly |
| 22 | 57443 | 1 | Drive plate |
| 23 | 1016491 | 1 | Drive plate |
| 24 | 1016494 | 1 | Thrust plate |
| 25 | 1016492 | 1 | Belleville spring |
| 26 | 1016493 | 1 | Backup plate |
| 27 | W57261 | 6 | M12 x 1.75 hex lock nut w/ nylon insert |
| 28 | 1016495 | 4 | M8 x 1.25 hex nut GR10 |
| 29 | 1016496 | 6 | M12 x 1.75 x 85 mm HHCS PC 8.8 |
| 30 | 1001042 | 1 | M16 x 2.0 x 90 mm HHCS PC 8.8 |
| 31 | 1005522 | 1 | M16 x 2.0 hex lock nut |
| | HHCS | | Hex Head Cap Screw |

# 5-BOLT WHEEL & TIRE ASSEMBLY



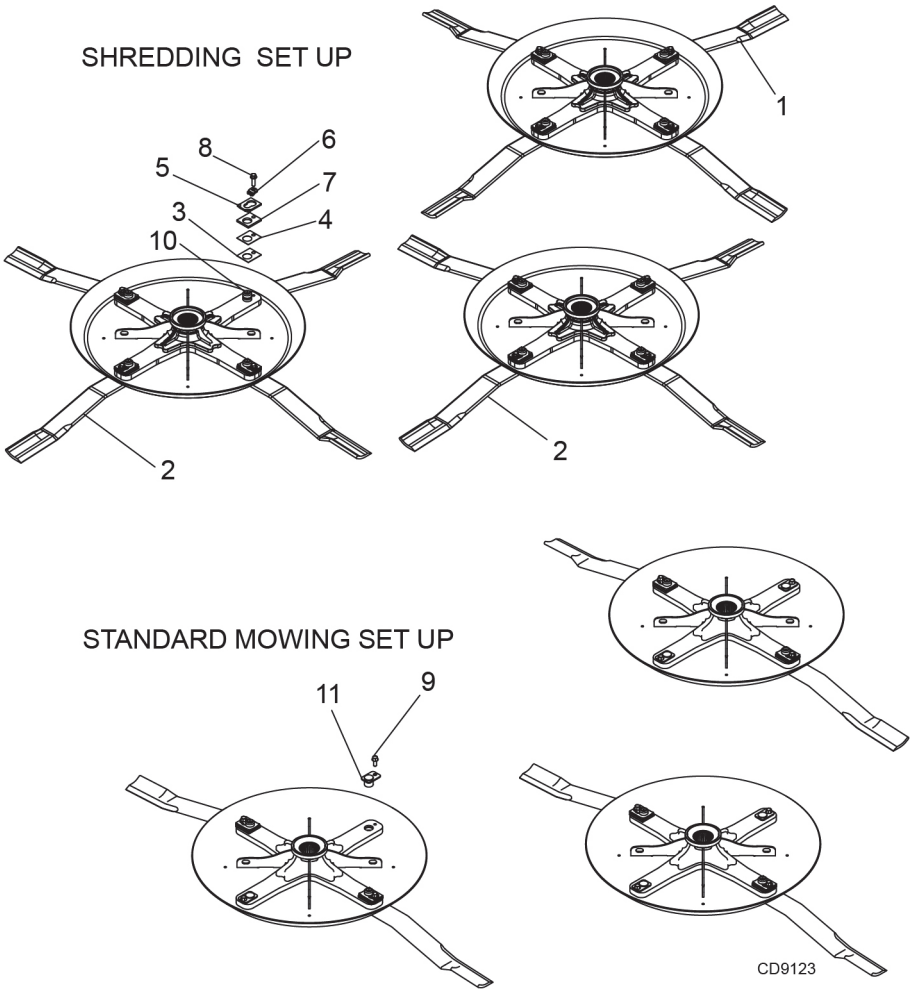

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1017050 | 1 | Heavy hub assembly (includes items 1 through 15) |
| 2 | 1017034 | 1 | Heavy wheel hub with cups (includes items 6, 7, 14) |
| 3 | 1017033 | 1 | Axle |
| 4 | 1017027 | 1 | Seal |
| 5 | 1017028 | 1 | Bearing cone |
| 6 | 1017036 | 1 | Bearing cup |
| 7 | 1017037 | 1 | Bearing cup |
| 8 | 1017029 | 1 | Bearing cone |
| 9 | 1017031 | 1 | Washer |
| 10 | 1017032 | 1 | Castle nut |
| 11 | 1017035 | 1 | Hub cap |
| 12 | 1017038 | 5 | Stud |
| 13 | 1017069 | 1 | Cotter pin |
| 14 | 1017067 | 1 | Grease fitting |
| 15 | 35317 | 5 | Nut, lug 1/2 NF |
| 16 | 1017088 | 1 | 15" rim for pneumatic tire - 5 bolt **-OR-** |
| 16 | 1017040 | 1 | 6.00 x 9 solid tire, rim & hardware - 5 bolt **-OR-** |
| 16 | 1039976 | 1 | 25 x 8 - 14 severe duty ag tire, rim & hardware - 5 bolt **-OR-** |
| 16 | 1039976F | 1 | 25 x 8 - 14 severe duty ag tire, rim & hardware, foam filled - 5 bolt |
| 16 | 1017030 | 1 | 29 x 9 x 15 aircraft tire, rim & hardware - 5 bolt |
| 17 | 1017026 | 1 | 15.0 x 6.0 rim half (for 29" aircraft wheel only) |
| 18 | 1017025 | 1 | 15.0 x 6.0 rim half w/ valve hole (for 29" aircraft wheel only) |
| 19 | 6100 * | | 1/2 NC x 1-1/4 HHCS GR5 |
| 20 | 765 * | | 1/2 NC lock nut |
| 21 | 19887 * | | 3/8 NC x 1 HHCS GR8 |
| 22 | 838 * | | 3/8 standard lock washer |
| 23 | 835 * | | 3/8 NC Hex nut |
| - | 1015833 | 1 | 29 x 9 x 15 inner tube (for 29" aircraft wheel only) |
| - | 1017042 | 2 | Rim half for 6 x 9 solid tire |
| | * | | Standard hardware, obtain locally |

# LIGHT KIT ASSEMBLY




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1036887 | 1 | WIRE HARNESS, 16 FT MAIN |
| 2 | 1040275 | 1 | LED AG COMBO LAMP LH |
| 3 | 1040276 | 1 | LED AG COMBO LAMP RH |
| 4 | 1040277 | 1 | AG ENHANCER MODULE |
| 5 | 1045073 | 1 | HARNESS, WIRE, 3 FT REAR, 2 PCS |
| 6 | 632852 | 1 | BRACKET, BW13 LIGHT |
| 7 | * | 2 | BOLT CRG 1/2 NC X 2 |
| 8 | 78059 | 5 | CLAMP .50 DIA STEEL CUSHION |
| 9 | * | 5 | BOLT, HEX FLNG 5/16 NC X .75 GR5 |
| 10 | * | 2 | SCREW #10NC SELF-TAPPING YD |
| 11 | * | 8 | SCREW, HFS-6 LOBE, 1/4 NCX1.0 GR5, PATCH |
| 12 | * | 2 | NUT, HFN 1/2 NC, CTR LOCK |
| 13 | * | 4 | NUT, HEX FLNG 1/4 NC SRTD |
| | * | | Standard hardware, obtain locally |
| | HHCS | | Hex Head Cap Screw |

# SHREDDER KIT (OPTIONAL)
# BW20.61 / BW20.61Q & BW20.71 / BW20.71Q ONLY

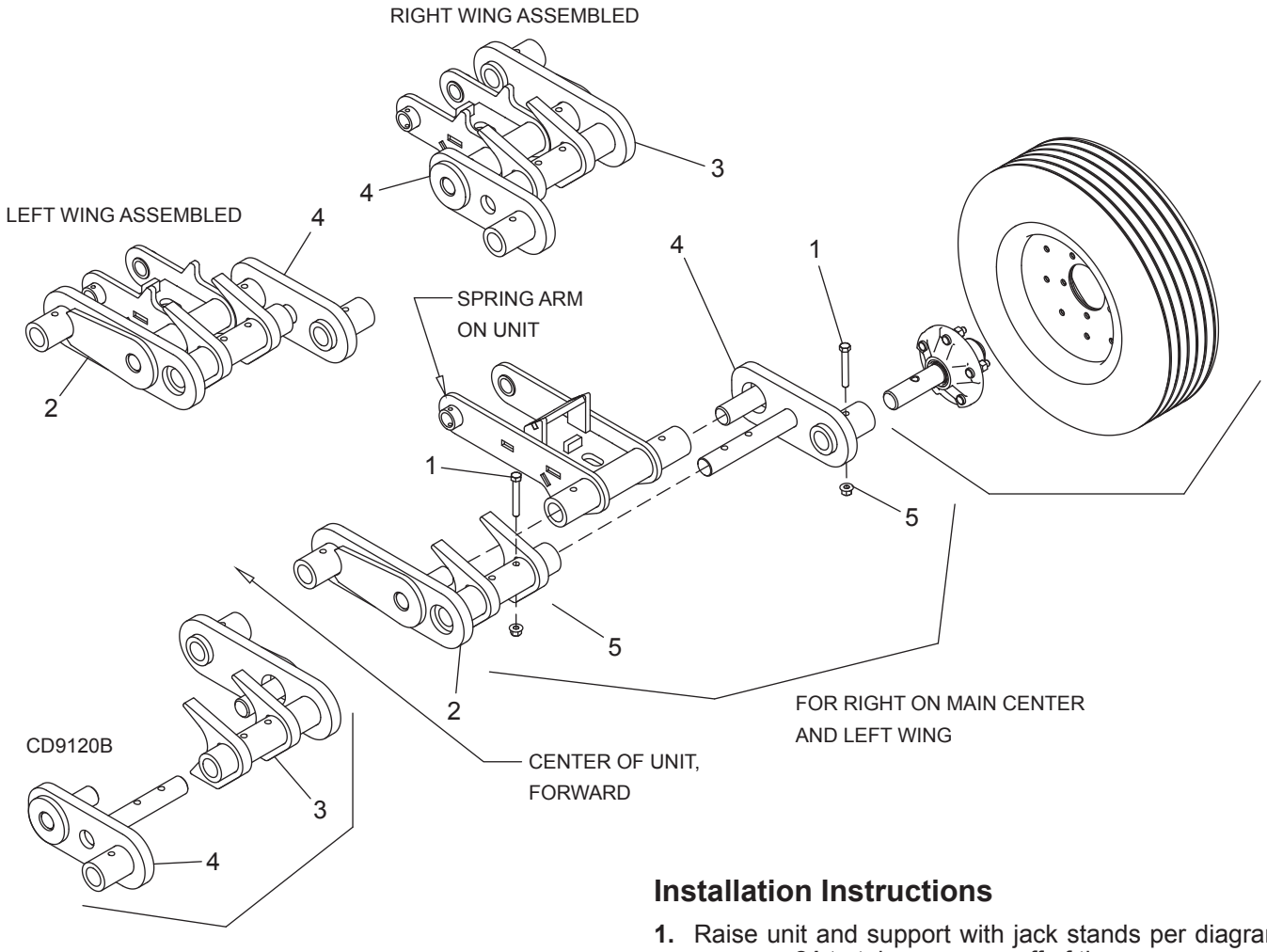



| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 8820KT | 1 | 8820 STD blade kit |
| 2 | 8825KT | 2 | 8825 STD blade kit |
| 3 | 10520RP | 6 | 18 GA 1-1/2 blade pin shim |
| 4 | 13946RP | 6 | 20 GA 1-1/2 blade pin shim |
| 5 | 32603 | 6 | Keyhole plate special |
| 6 | 32604RP | 6 | Blade pin lock clip spec |
| 7 | 1028824RP | 6 | 5/16 thick blade pin spacer |
| 8 | 1028902 | 6 | HFS 1/2 NC x 1-3/4 GR8 |
| 9 | 1031225 | 6 | HFS .50 NC x 1.25 GR5 |
| 10 | 1045034RP | 6 | Blade pin drl 2.39 |
| 11 | 1045820 | 6 | WA, pin 1.50 x 1.13 |

## Installation Instructions

- Install supplied shred kit blades as shown, using shims to obtain no more than .25" movement at blade tip. Stack shims as shown on **page 22**.
- To return to brush cutting, remove one opposing set of blades and hardware from each crossbar.
- To protect unused hole for following season: coat tab pin 1045820 with Never-Seez™, insert into hole, and secure with screw 1031225.
- For lower horsepower shredding, order 3 sets of flat double edge blade kits 19162KT.

# TANDEM ACCESSORY (OPTIONAL)

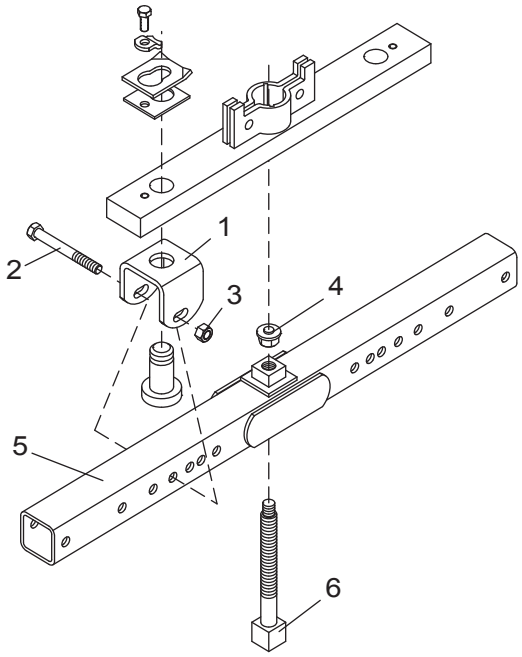


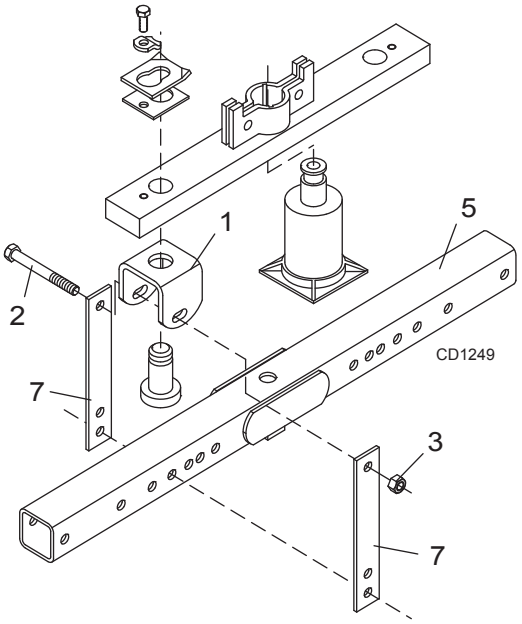

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 1637 | 8 | HHCS 1/2 NC x 3-1/2 GR5 ZP |
| 2 | 617144RP | 1 | WA, right tandem arm, BW20 |
| 3 | 617145RP | 1 | WA, left tandem arm, BW20 |
| 4 | 617146RP | 2 | WA, tandem arm, BW20 |
| 5 | 1045624 | 8 | HFN nut 1/2 NC, Dri-Loc patch |
| | HHCS | | Hex head cap screw |
| | • | | Standard hardware; obtain locally |

## Installation Instructions

1. Raise unit and support with jack stands per diagram on **page 21** to take pressure off of tires.
2. Remove wheel assembly from right spring arm hub assembly from center frame.
3. Remove axle hub from right spring arm.
4. Install drive type grease fitting in fitting in four holes in spring arm.
5. Install tandem arm 617144 as shown.
6. Install tandem arm 617146 as shown, sliding both axles into receiving tubes. Fasten with screw 1637 and nuts 1045624 provided.
7. Install axle/hub 1017050 and secure with screw 3489 and nut 1045624, reused or purchased separately as needed.
8. Install wheel assembly.
9. Repeat for left spring arm of center frame, using 617145 in place of 617144, installed from the center.
10. Repeat for wings if purchased, noting orientation of parts to locate wheels in the correct position. Outer wheel should be forward of inner wheel on both wings.

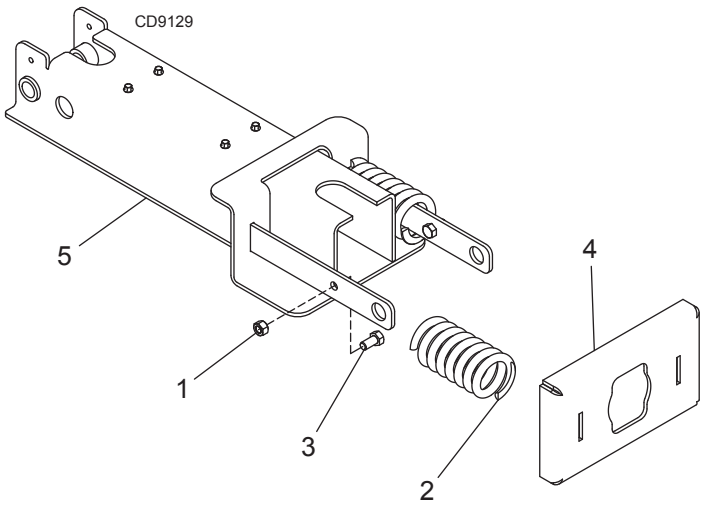
## CROSSBAR PULLER (OPTIONAL)



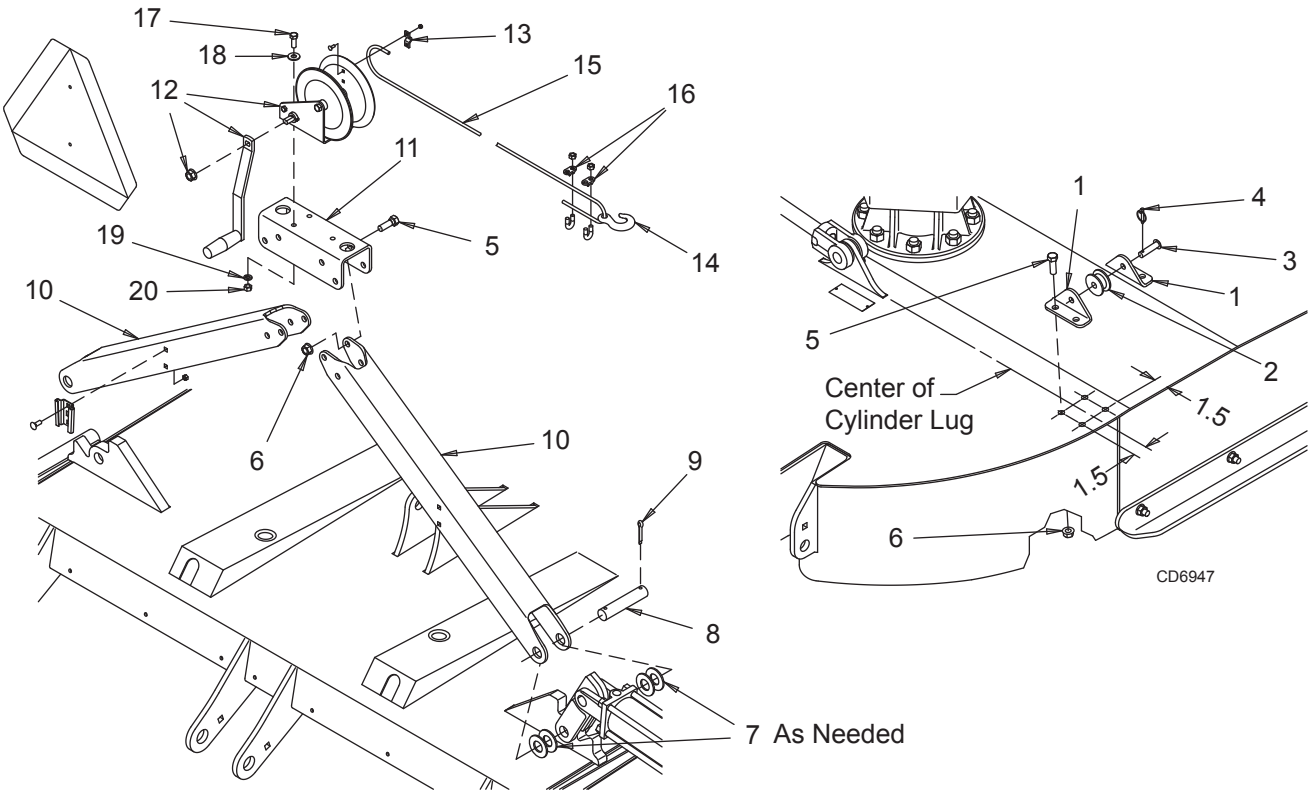

| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| A | 8811 | 1 | Crossbar puller, complete |
| 1 | 19914RP | 2 | Crossbar puller clevis |
| 2 | 3097 * | 4 | 5/8 NC x 4-1/2 HHCS GR5 |
| 3 | 230 * | 4 | 5/8 NC hex nut |
| 4 | 24879RP | 1 | Crossbar puller pad assembly |
| 5 | 24876 | 1 | Crossbar puller tube assembly |
| 6 | 24881 | 1 | Crossbar puller screw assembly |
| 7 | 24885RP | 4 | Crossbar puller link |
| | * | | Standard hardware, obtain locally |

## WING PUSHOFF (OPTIONAL)




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| 1 | 765 | 2 | Lock nut 1/2 NC ZP |
| 2 | 13316 | 2 | Compression spring 3.00 .50 6.2 |
| 3 | 25475 | 2 | HHCS 1/2 NC x 1 GR5 ZP ful thd |
| 4 | 609589RP | 1 | Wing push off lock channel |
| 5 | 611459RP | 1 | Wing push off assembly |
| | HHCS | | Hex head cap screw |
| | * | | Standard hardware, obtain locally |

# WINCH KIT (OPTIONAL)




| REF | PART | QTY | DESCRIPTION |
|---|---|---|---|
| A | 1019456 | - | Winch kit, complete |
| 1 | 52478 | 4 | Idler bracket |
| 2 | 6696 | 2 | Chain idler casting |
| 3 | 409 | 2 | Clevis pin, 1/2 x 2 |
| 4 | 22411 | 2 | Klik pin, 3/16 x 1 |
| 5 | 3379 * | - | HHCS, 1/2 NC x 1-1/2 GR5 |
| 6 | 11900 * | - | Lock nut, 1/2 NC flanged |
| 7 | 1863 * | - | Washer, 1" SAE flat |
| 8 | 1008325 | 2 | Headless pin, 1 x 4 drilled |
| 9 | 1266 * | - | Cotter pin, 3/16 x 1-1/2 |
| 10 | 1027150 | 2 | Channel. .25 x 2.56 x 2.75 x 38.48 |
| 11 | 1027199 | 1 | Channel, 3.12 x 3.25 x 10.00 |
| 12 | 12612 | 1 | Gear winch 5.1 to 1 |
| 13 | 12642 | 1 | Winch cable clamp kit |
| 14 | 11790 | 1 | C-Hook, 1/4 cable |
| 15 | 52479 | 1 | Cable, 1/4" x 24-ft |
| 16 | 11789 | 2 | Clip, 1/4 cable |
| 17 | 839 * | - | HHCS, 3/8 NC x 1 GR5 |
| 18 | 565 * | - | Washer, 3/8 flat |
| 19 | 838 * | - | Washer, 3/8 lock |
| 20 | 835 * | - | Hex nut, 3/8 NC plated |

• Standard hardware; obtain locally

## Winch Kit Operation

1. Move cutter so wing is on the upward slope of a ditch to aid wing lift with the winch.
2. Unwind cable and remove roller (2).
3. Place cable around roller (2) and reinstall using pin (3) and klik pin (4).
4. Attach cable hook into large hole in winch assembly bracket (11) and raise wing.
5. Install transport lock pin before moving unit.

# NOTES

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# BOLT TORQUE CHART

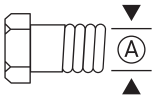
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

Fasteners must always be replaced with the same grade as specified in the manual parts list.

Always use the proper tool for tightening hardware: SAE for SAE hardware and Metric for metric hardware. Make sure fastener threads are clean and you start thread engagement properly.

All torque values are given to specifications used on hardware defined by SAE J1701 MAR 99 & J1701M JUL 96.

## SAE SERIES TORQUE CHART




SAE Bolt Head Identification

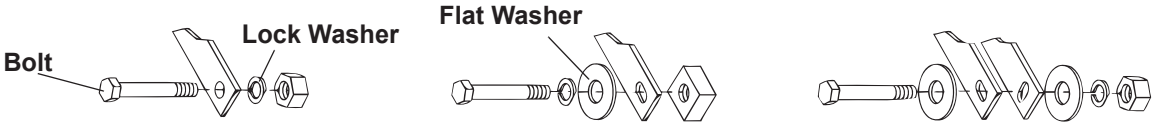
SAE Grade 2
(No Dashes)

SAE Grade 5
(3 Radial Dashes)

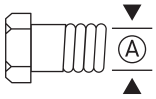
SAE Grade 8
(6 Radial Dashes)

| Ⓐ Diameter (Inches) | Wrench Size | Marking on Head | | | | | |
|---|---|---|---|---|---|---|---|
| | | SAE 2 | | SAE 5 | | SAE 8 | |
| | | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | N-m |
| 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" | 467 | 634 | 722 | 979 | 1020 | 1383 |

## TYPICAL WASHER INSTALLATIONS




## METRIC SERIES TORQUE CHART




Metric Bolt Head Identification


Metric
Grade 8.8

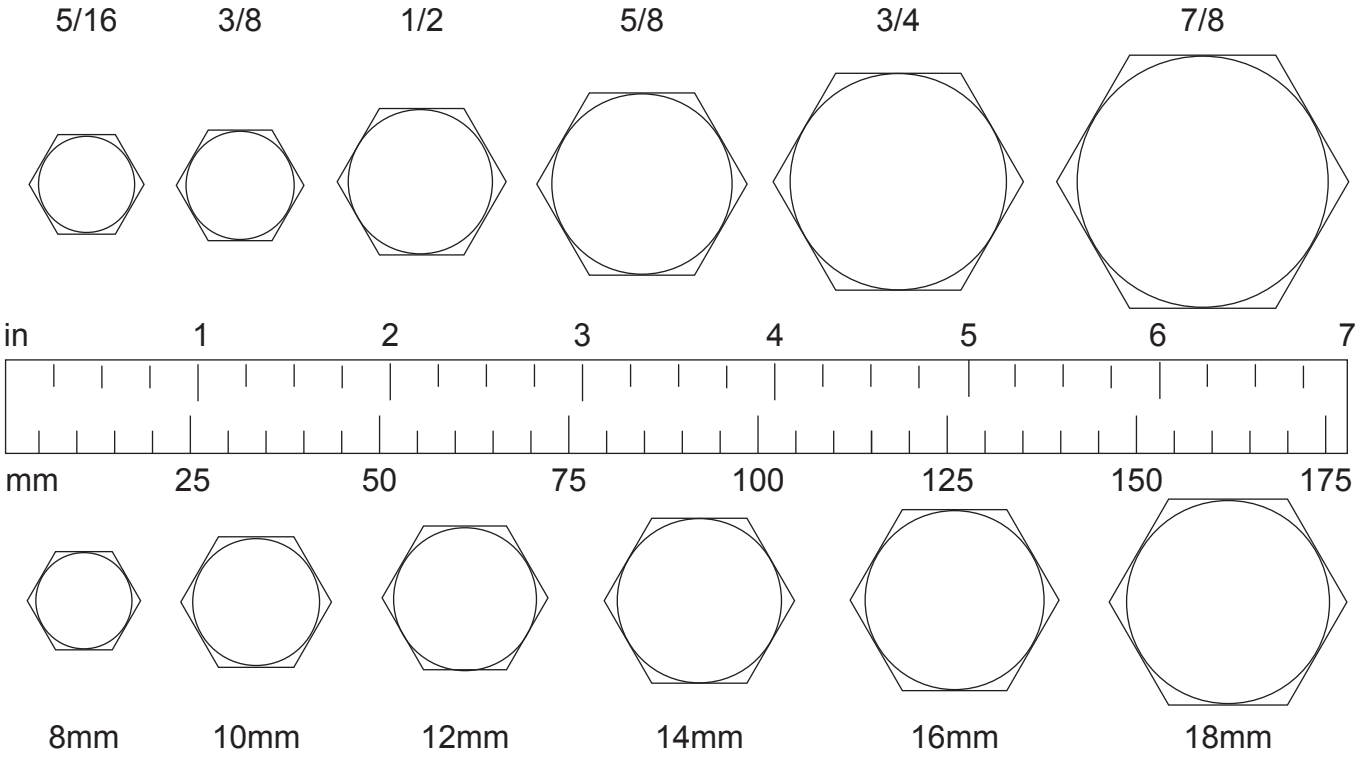

Metric
Grade 10.9

| Ⓐ Diameter & Thread Pitch (Millimeters) | Wrench Size | Coarse Thread | | | | Fine Thread | | | | Ⓐ Diameter & Thread Pitch (Millimeters) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Marking on Head | | | | Marking on Head | | | | |
| | | Metric 8.8 | | Metric 10.9 | | Metric 8.8 | | Metric 10.9 | | |
| | | N-m | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | |
| 6 x 1.0 | 10 mm | 8 | 6 | 11 | 8 | 8 | 6 | 11 | 8 | 6 x 1.0 |
| 8 x 1.25 | 13 mm | 20 | 15 | 27 | 20 | 21 | 16 | 29 | 22 | 8 x 1.0 |
| 10 x 1.5 | 16 mm | 39 | 29 | 54 | 40 | 41 | 30 | 57 | 42 | 10 x 1.25 |
| 12 x 1.75 | 18 mm | 68 | 50 | 94 | 70 | 75 | 55 | 103 | 76 | 12 x 1.25 |
| 14 x 2.0 | 21 mm | 109 | 80 | 151 | 111 | 118 | 87 | 163 | 120 | 14 x 1.5 |
| 16 x 2.0 | 24 mm | 169 | 125 | 234 | 173 | 181 | 133 | 250 | 184 | 16 x 1.5 |
| 18 x 2.5 | 27 mm | 234 | 172 | 323 | 239 | 263 | 194 | 363 | 268 | 18 x 1.5 |
| 20 x 2.5 | 30 mm | 330 | 244 | 457 | 337 | 367 | 270 | 507 | 374 | 20 x 1.5 |
| 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 |

# BOLT SIZE CHART

**NOTICE: Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.**

## SAE BOLT THREAD SIZES




## METRIC BOLT THREAD SIZES

# ABBREVIATIONS

AG . . . . . Agriculture
ASABE . . . . . American Society of Agricultural & Biological Engineers (formerly ASAE)
ASAE . . American Society of Agricultural Engineers
ATF . . . . . Automatic Transmission Fluid
BSPP . . . . . .British Standard Pipe Parallel
BSPTM . . . . . British Standard Pipe Tapered Male
CV . . . . . Constant Velocity
CCW . . . . . Counter-Clockwise
CW . . . . . .Clockwise
F . . . . . Female
FT . . . . . Full Thread
GA . . . . . .Gauge
GR (5, etc.) . . . . . Grade (5, etc.)
HHCS . . . . . .Hex Head Cap Screw
HT . . . . . Heat-Treated
JIC . . . . . Joint Industry Council 37° Degree Flare
LH . . . . . Left Hand
LT . . . . . Left
m . . . . . Meter
mm . . . . . Millimeter
M . . . . . .Male
MPa . . . . . Mega Pascal
N . . . . . Newton
NC . . . . . .National Coarse
NF . . . . . National Fine
NPSM . . . . . National Pipe Straight Mechanical
NPT . . . . . National Pipe Tapered
NPT SWF . . National Pipe Tapered Swivel Female
ORBM . . . . . .O-Ring Boss - Male
P . . . . . Pitch
PBY . . . . . Power-Beyond
psi . . . . . Pounds per Square Inch
PTO . . . . . Power Take Off
QD . . . . . .Quick Disconnect
RH . . . . . Right Hand
ROPS . . . . . Roll-Over Protective Structure
RPM . . . . . .Revolutions Per Minute
RT . . . . . Right
SAE . . . . . .Society of Automotive Engineers
UNC . . . . . Unified Coarse
UNF . . . . . .Unified Fine
UNS . . . . . Unified Special

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