

Brown 684 Heavy Duty Cutter

For use with beginning Serial Number:
S705B-1000

ALL WARRANTY WORK **MUST** BE APPROVED
BY BROWN MFG. CORP.
BEFORE WORK BEGINS



Owner / Operator Manual

 **BROWN**
MANUFACTURING CORP.
HEAVY DUTY SINCE 1944

6001 E. Hwy 27 - Ozark, AL 36360
334.795.6603 - Fax: 334.795.3029

www.brownmfgcorp.com

WARNING



Before operating your machine, stop and read this owners manual. Do not attempt to operate the unit until you fully understand the material covered in this manual. Without the knowledge contained in this manual, injury or death can result.

Copyright Information

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Cover Illustrated: Model 684 brush cutter.

Disclaimer

Due to engineering improvements and revision of product specifications, the information contained in this manual is subject to change without notice.

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Warranty Statement

LIMITED WARRANTY

BROWN MANUFACTURING CORP. hereby warrants that Brown's products will be free from defects in material and workmanship under normal use according to the provisions and limitations herein set forth. All parts, specifically EXCLUDING expendable 'wear' parts, that become unserviceable, due to defective material or workmanship, within three months / 90 days from date of the original retail purchase, shall, at Brown's option, be repaired or replaced.

LIMITATIONS

The obligations of Brown for breach of warranty shall be limited to products manufactured by Brown; (1) that are installed, operated, and maintained according to Brown's instruction furnished and/or available to the purchaser upon request; (2) that are installed according to all other applicable Federal, State, and local codes or regulations; and (3) that the purchaser substantiates were defective in material and workmanship notwithstanding that they were properly installed and correctly maintained as set forth and were not abused or misused. The obligation of Brown shall be limited to replacing or repairing the defective product, at the option of Brown. Brown shall not be responsible for any labor or cost of removal or repairing or reinstallation of its products and shall not be liable for transportation costs to and from its plant in Ozark, Alabama. Use of parts for modification or repair of the product or any component part thereof not authorized or manufactured by Brown specifically for such product shall void this warranty. This warranty shall not apply to any damage to or defect in the Brown's products that is directly or indirectly caused by; (1) FORCE MAJEURE, act of GOD, or other accident not related to an inherent product defect; or (2) abuse, misuse, or neglect of the such product, including any damage caused by improper assembly, installation, adjustment, or faulty instruction of the purchaser. **OTHER THAN AS EXPRESSLY SET FORTH HEREIN ABOVE, BROWN MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO ANY OF BROWN'S PRODUCTS, INCLUDED BUT NOT LIMITED TO ANY MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL BROWN BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE SUFFERED BY PURCHASER OR ANY OTHER PERSON OR ENTITY CAUSED IN WHOLE OR IN PART BY ANY OF BROWN'S PRODUCTS.** Any person or entity to whom this warranty extends and who claims breach of warranty against Brown must bring suit thereon within one year from the date of occurrence of such breach of warranty or be forever barred from any and all legal or other remedies for such breach of warranty. Brown is not responsible for and hereby disclaims any undertaking, representation, or warranty made by any dealer, distributor, or other person that is inconsistent with or in any way more expensive than the provisions of this limited warranty. This warranty grants specific legal rights and shall be read in conformity with applicable state law. In some jurisdictions, the applicable law mandates warranty provisions that provide greater rights than those provided for herein. In such case, this limited warranty shall be read to include such mandates provisions; and any provision herein that is prohibited or unenforceable in any such jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceable without invalidating the remaining provisions and without affecting the validity or enforceability of such provisions in any other jurisdiction.

STATEMENT OF POLICY

In accordance with our established policy of constant improvement, we reserve the right to amend these specifications at any time without notice.

WARRANTY BY MANUFACTURER

Dealer/distributor understands and agrees that the manufacturer extends only the following warranty to its customers. In the event dealer/distributor extends any additional warranty such as enlarging the scope or period of warranty or undertaking a warranty of fitness for any particular purpose or obligation not encompassed in manufacturer's warranty, dealer/distributor shall be solely responsible therefore and shall have no recourse against manufacturer with respect thereto.

Owner Registration

WARRANTY NOTES

- All parts returned to Brown Manufacturing Corp. for warranty inspection must be received freight prepaid.
- All Warranty Work must be approved by Brown Mfg. Corp. BEFORE work begins.
- If a warranty claim is approved, replacement or repaired parts will be returned to the customer freight prepaid.
- If a dealer makes any type of approved warranty repair, only parts and labor will be credited by Brown Manufacturing Corp. **No service call or transportation charges are warrantable.**
- No returned parts will be inspected for warranty claims if not received with a Return Authorization Number. **Without a RA#, Brown Manufacturing Corp. cannot and will not be responsible for any returned goods.**
- Drive shaft / slip clutch warranties:** Many factors can cause a slip clutch to fail. Most failures are not caused by the quality of workmanship or of materials used in the component. Therefore, all warranty claims on drive shafts / slip clutches are sent to the manufacturer of the component. All warranties approved by the component manufacturer will be handled and settled by that manufacturer.
- Use of any replacement parts other than original Brown replacement parts will void all warranties.**

⚠WARNING: The use of after-market replacement parts will change the operational conditions of the machine, shorten the life of other components, lead to failure of the machine, and create safety hazards to all persons near the machine. Brown equipment is designed to use original manufacturer replacement parts meeting the exact specifications of the machine and crafted from high-quality materials. After-market replacement parts are neither engineered to meet the machine's exact specifications nor manufactured to the same high standards as original Brown replacement parts.

For Your Records

Model: 684
 Serial No.: _____
 Date Purchased: ___/___/___
 Dealer: _____
 Date Registered: ___/___/___



Owner Registration

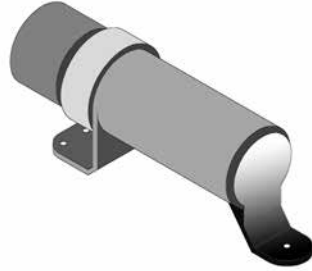
Important: To place the manufacturer's warranty into effect, this card must be mailed within thirty (30) days after receiving equipment.

Name: _____
 Address: _____
 City: _____ State: _____
 Model: 684

Return to:
 Brown Manufacturing Corp.
 6001 E. Hwy 27
 Ozark, AL 36360

Serial No.: _____
 Date Purchased: ___/___/___
 Dealer: _____

IMPORTANT NOTICE: OWNER'S MANUAL STORAGE CONTAINER





- * Brown Manufacturing provides an Owner's Manual storage container on all equipment.
- *This holder is mounted in a convenient location and provides the owner with the proper safety and operation information.
- *Two (2) copies are provided with each unit.
- *One copy is for the **owner** to have at office for review when not operating the equipment.
- *Second copy is to stay with the unit at all times. This will provide the **operator** the information needed for safe and proper operation of the unit.
- *If the Owner's Manual becomes lost or damaged, contact Brown Mfg. or local dealer for replacement.

Please use envelope.

Equipment Safety

Warning: Read this manual before operation.

Operators of the equipment must read and understand this manual. Failure to read this manual and follow these safety and operating instructions could result in serious bodily injury or even death.

 WARNING	
	<p>Before operating your machine, stop and read this owners manual. Do not attempt to operate the unit until you fully understand the material covered in this manual. Without the knowledge contained in this manual, injury or death can result.</p>

Each operator of the equipment should review this manual every six (6) months. You are encouraged to duplicate this manual and to distribute it to each operator of the equipment for their training and reference. Additional copies are available from Brown Manufacturing Corporation.

Equipment Safety

Recognize safety information

This is the safety alert symbol. When you see this symbol on your equipment or in this manual, be alert to the potential for personal injury or injury to others.



Understand signal words

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury



WARNING indicates a hazardous situation which, if not avoided, could result in serious injury or death.



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



NOTICE indicates information considered important but not directly hazard related. (e.g. security, hygiene, equipment or property damage).



Follow safety instructions

- Read owner/operator manual.
- Replace missing or damaged safety decals.
- Safety decals and this manual must be considered a permanent part of your equipment.
- Should ownership of the equipment be transferred, this manual must also be transferred.
- Unauthorized modifications to the equipment are not recommended. This could impair the function, safety, and life of the machine.
- For any part of this manual that you do not understand, contact your dealer or Brown Manufacturing Corporation at (800) 633-8909.
- All implements with moving parts are potentially dangerous. Due to this fact, there is no substitute for a safe, knowledgeable operator. It is important that all persons operating this equipment read, understand, and follow the instructions provided in this manual.





DO NOT OPERATE THIS UNIT IF YOU ARE UNDER THE INFLUENCE OF ALCOHOL, ILLEGAL DRUGS, OR ANY PRESCRIPTION OR OVER THE COUNTER MEDICATIONS THAT COULD CAUSE DROWSINESS, DIZZINESS, DISORIENTATION AND/OR IMPAIR YOUR ABILITY IN ANY WAY TO SAFELY OPERATE THE UNIT.

DO NOT OPERATE THIS UNIT IF YOU SUFFER FROM ANY PHYSICAL CONDITION OR DISABILITY THAT WOULD IMPAIR YOUR ABILITY TO OPERATE IT SAFELY.



Equipment Safety

Safety Decals


The following safety decals should be attached to the equipment at all times. Should any decals become damaged or lost, it is the responsibility of the owner to replace it. Additional decals may be obtained from the dealer or Brown Manufacturing Corporation.

 WARNING	 ADVERTENCIA
	<p>Antes de probar la unidad por primera vez deben remitirse a las instrucciones contenidas en el manual.</p>
<p>Read and understand owner's manual before operating unit.</p>	 ADVERTISSEMENT <p>S'assurer de bien comprendre toutes les consignes du manuel de propriétaire avant d'utiliser la unité.</p>

Part No.: SD-010.

 DANGER	
	<p>THROWN OBJECT HAZARD</p> <p>To prevent serious injury or death from thrown objects:</p> <ul style="list-style-type: none"> • Stay clear when blade is turning. • Operate only with all guards installed and in good condition. • Stop operation if bystanders come within several hundred feet.

Part No.: SD-001A.

 WARNING
<p>To prevent serious injury or death:</p> <ul style="list-style-type: none"> • Operate only at 540 RPM PTO. • Keep guards and shields in place.

SD-007A, Standard models*.

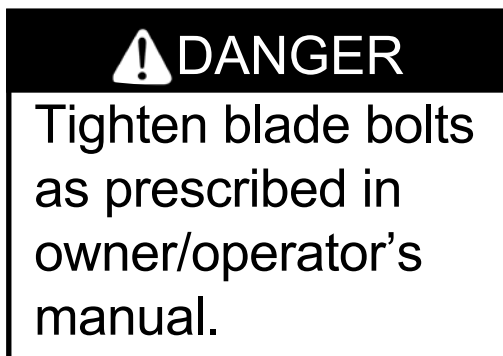
*All Brown 684 Model rotary cutters are equipped for 540 RPM PTOs as standard. Equipping for 1000 RPM PTOs is an option, however; in such a case, use safety decal SD-008A.

Equipment Safety

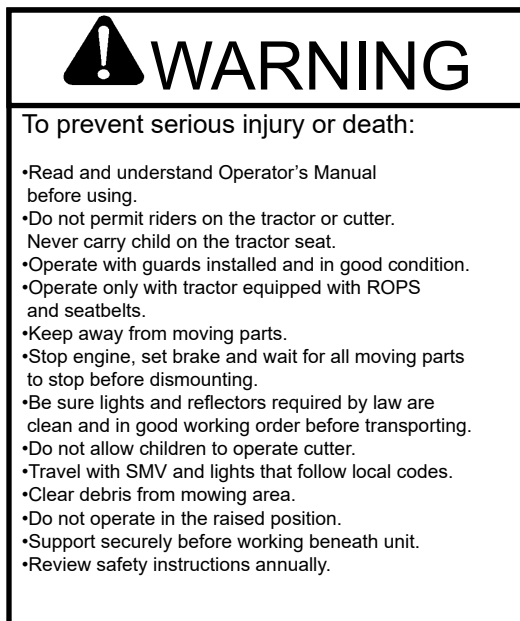
Safety Decals (continued)



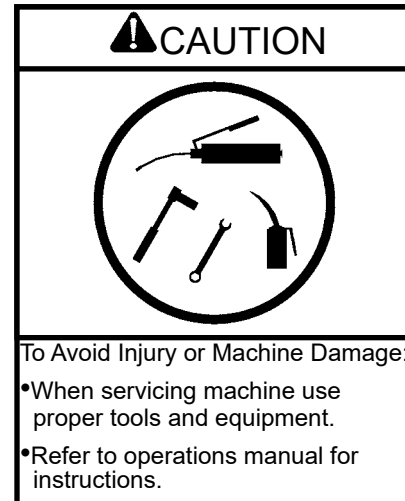
Part No.: DC-3-5-018.



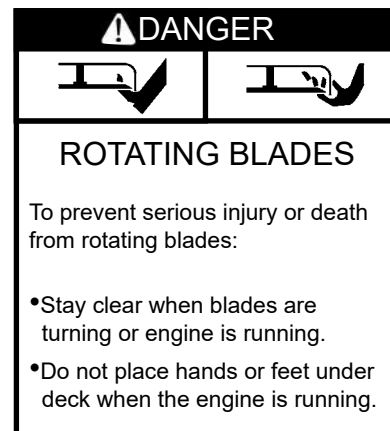
Part NO.: SD-002.



Part No.: SD-009A.



Part No.: SD-SW2.



Part No.: SD-005A.

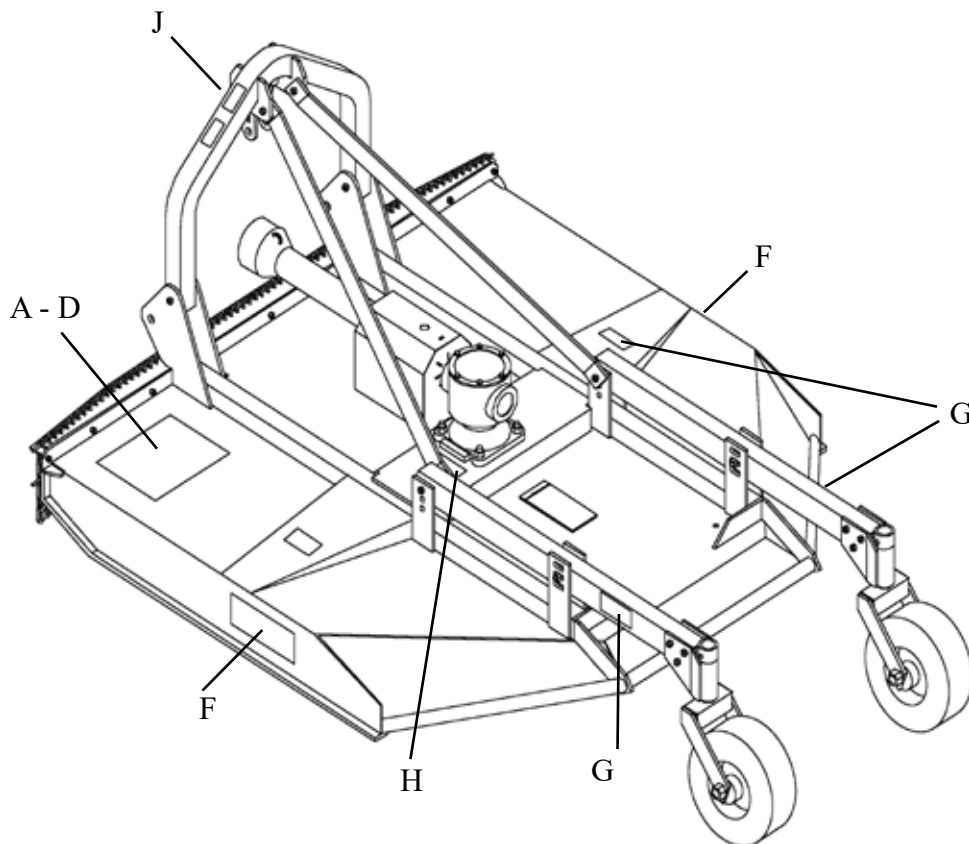


Part No.: SD-006A.

Equipment Safety

Safety Decals (*continued*)

Safety decals must be positioned as illustrated below. Use this diagram to correctly identify missing, damaged, or illegible decals for replacement.

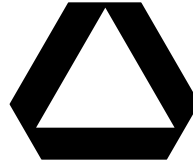


Ref. No.	Part No.	Description
A	SD-009A	Safety Decal: (General safety issues.)
B	SD-002	Safety Decal: Tighten blade bolts.
C	SD-SW2	Safety Decal: When servicing, use proper tools and equipment.
D	SD-010	Safety Decal: Read and understand owners manual.
F	SD-001A	Safety Decal: Thrown object hazard. (2 req.)
G	SD-005A	Safety Decal: Rotating blades. (4 req.)
H	SD-006A	Safety Decal: Rotating driveline. (3 req.)
J	SD-007A SD-008A	Safety Decal: Operate only at 540 RPM. Safety Decal: Operate only at 1000 RPM.
Not pictured	SD-684	Complete safety decal set

Equipment Safety

Warning! Transport with care.

Before transporting to a new location, make certain that the slow-moving vehicle (SMV) emblem is installed and is clearly visible. Use flashing lights and follow local traffic regulations.

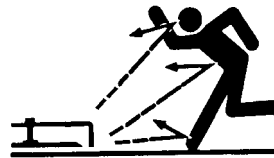


WARNING

Transport with care. Use slow-moving vehicle emblem and flashing light. Follow local traffic regulations.

Danger! Protect bystanders, clear work area of debris.

Do not operate the cutter near people. Debris can be thrown hundreds of feet. Clear work area of foreign objects such as wire, glass, and other debris. Debris thrown by the cutter can cause serious injury or death.



DANGER

Do not operate cutter near bystanders. Clear work area of debris before operating.

Warning! Parking and dismounting.

The rotating parts of this cutter continue to rotate even after the PTO has been disengaged. The operator should remain seated until rotation has stopped. He should then set the brake, turn off the engine, and remove the key. See tractor manual for proper parking procedure.



WARNING

Wait for all rotation to stop before dismounting tractor.


Caution! Avoid fires.

Keep the machine clean of debris, trash, and any other flammable material.



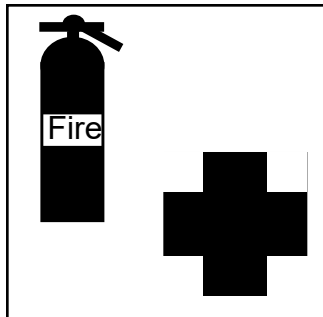
CAUTION

Keep machine clean of debris. Flammable debris on machine poses fire hazard.

 **Warning!**
Fasten Seatbelt!
Before Starting Tractor!
Always Wear Your Seatbelt.



Equipment Safety

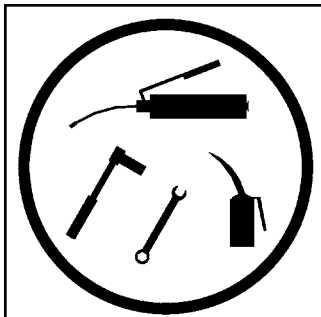


⚠️ WARNING

Prepare for emergencies. Keep fire extinguisher and first aid kit available.

Warning! Prepare for emergencies.

Keep fire extinguisher and first aid kit available. Inspect fire extinguisher and check for charge daily. Check first aid kit for expired contents and keep stocked.

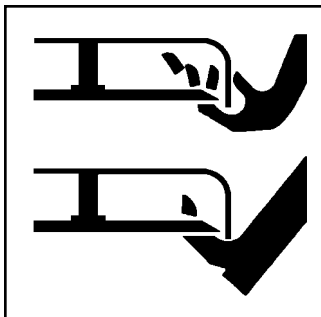


⚠️ WARNING

Check equipment before operation. Tighten all nuts and bolts.

Warning! Check equipment before operating.

Tighten all nuts and bolts before operating. Make certain that equipment is lowered to ground before attempting to make adjustments or perform maintenance. Replace or repair any safety device, bolts, etc., if damaged or worn.

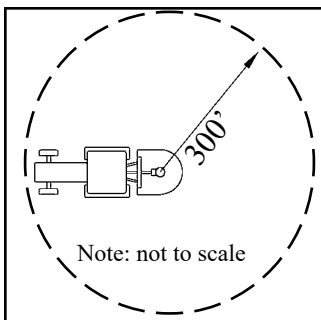


⚠️ DANGER

Rotating blades. Keep hands and feet from under cutter deck.

Danger! Stay clear of rotating blades.

The cutter is designed to cut grass and brush up to four inches in diameter. **Keep hands and feet from under cutter deck!**



⚠️ DANGER

Maintain safety distance of at least 300 ft. Failure to do so may cause serious injury or death.

Danger! Maintain safety distance.

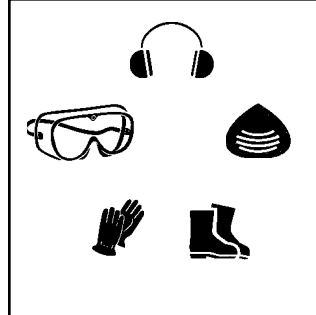
The cutter creates a serious discharge hazard. Always maintain a safety distance of at least 300 ft.

Never operate cutter with bystanders present!

Equipment Safety

Warning! Wear protective clothing.

Wear close-fitting clothing and other protective devices appropriate for the job.

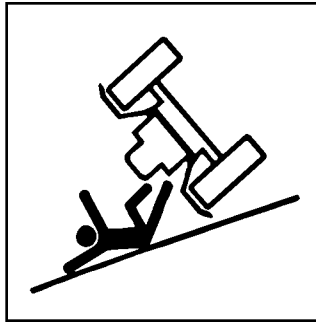


⚠ WARNING

Wear protective clothing.

Warning! Roll-over protection.

Do not operate the cutter on any tractor not equipped with a certified roll-over protective structure (ROPS).

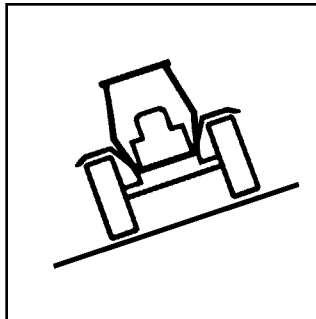


⚠ WARNING

Use only with tractors equipped with a certified roll-over protective structure.

Warning! Slopes and rough terrain.

When operating on slopes or rough terrain, decrease travel speed. Do not operate in an area where the tractor could roll over. **Be sure to fasten safety belt when operating tractor!**

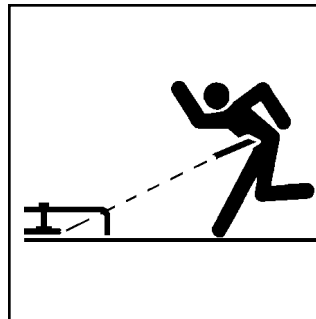


⚠ WARNING

Slow travel speed when operating on slopes or rough terrain.

Danger! Tighten blade bolts.

Blade bolts will stretch with use and must be tightened. Follow maintenance instructions in this manual (see page 21). **If the cutter is operated with loose blade bolts, blades and blade carrier will be damaged. Operation with damaged blades and blade carrier will lead to blade ejection and will cause serious injury or death.**



⚠ DANGER

Tighten blade bolts as prescribed in owners manual. Ejection of blade will cause serious injury or death.

Equipment Safety



Danger! Keep riders off machine.

Riders can be seriously injured or killed by entanglement or by falling.



Danger! Stay clear of rotating drivelines.

Entanglement in driveline can cause serious injury or death. Keep driveline shields in place at all times during operation. Driveline must turn freely inside shields. Driveline shields must be chained to prevent rotation.



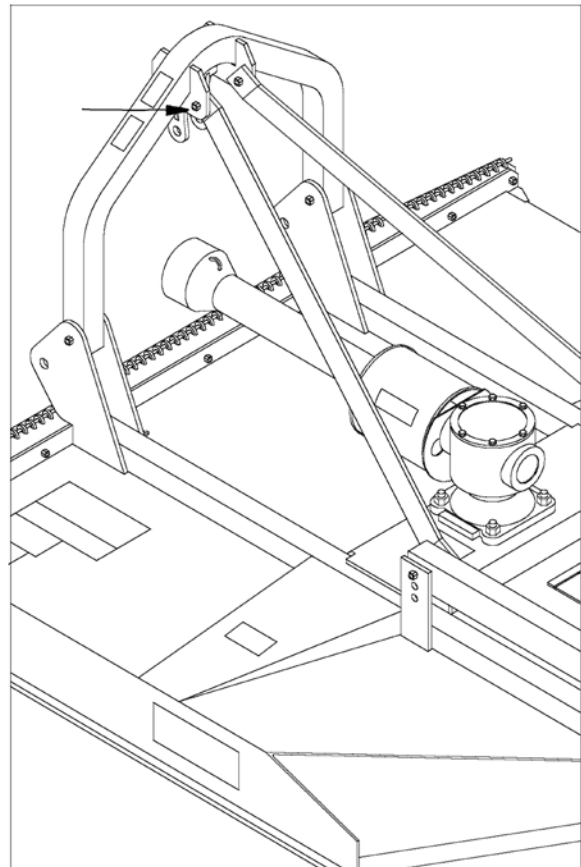
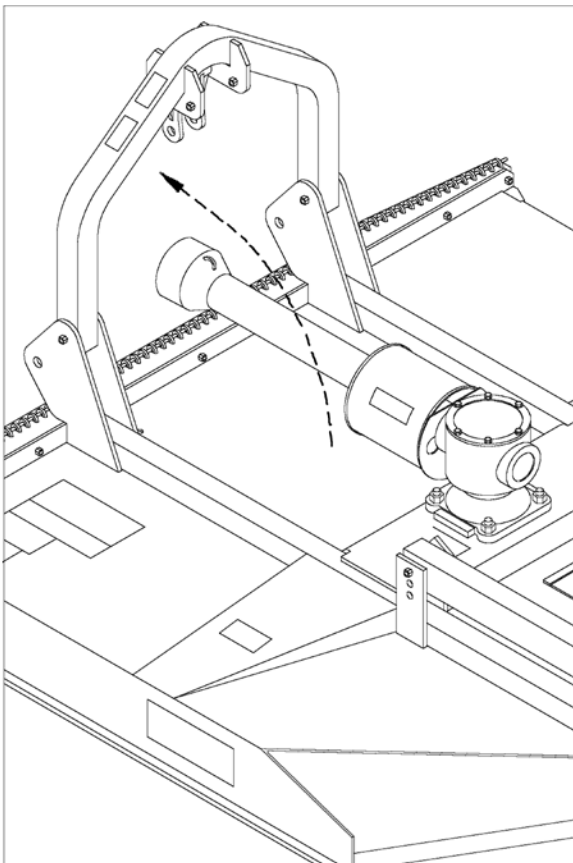
Warning! Hazardous service conditions.

While working under the cutter deck, be aware of safety hazards. Follow safety precautions specified in this manual (see page 20). Failure to exercise caution may lead to serious injury or death.

Assembly

1. Install tailwheel stem into fork holder tube, placing collar over stem and inserting roll key through collar and stem.
2. Raise A-frame from its shipping position to its operational position (almost perpendicular to the cutter deck). Install A-frame braces to the mounting brackets at the top of the A-frame with the provided bolts and tighten securely.
3. Bolt the rear end of the A-frame braces to the mounting brackets near the rear of the machine deck and tighten securely.
4. Tighten all bolts securely.
5. Check the drive shaft for proper length:
 - a. Attach the cutter to the tractor.
 - b. Lift the cutter to the point where the distance from the tractor pto is at the closest distance to the input shaft of the gearbox.
 - c. Measure the distance from PTO of the tractor to the input shaft of the cutter's gearbox.
 - d. Push both halves of the drive shaft together fully. Measure the overall length.
 - e. If the length of the compressed drive shaft is greater than the length between the PTO and input shaft, then the drive shaft must be shortened.

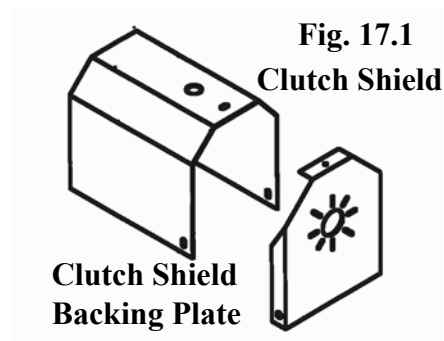
Please note that equal amounts must be removed from each section of the drive shaft.



Assembly

6. Separate the male and female halves of the drive shaft. Apply heavy grease to the telescoping portion of the male drive shaft; recouple the drive shaft.
7. Locate the slip clutch shield, and mounting plate attached to the machine. Remove the mounting bolts, flat washers, and lock washers from the gearbox face plate. Position the clutch shield mounting plate (flat side up) over the input shaft and align it with the threaded holes in the gearbox face plate. Secure with bolts, flat washers, and lock washers previously removed.
8. Remove the clamp cone from the clutch hub assembly, see Fig. 39.1, page 39. Slide the hub onto the input shaft of the gearbox. Align the groove on the input shaft with the bolt hole in the hub. Reinstall the clamp cone and tighten securely. **Check torque of clamp cone after one hour of operation. Failure to do so will result in decreased life of the clutch hub and gearbox shaft splines. Further instructions are on page 39.**

9. Install the clutch shield with the three bolts provided, onto the backing plate.



Warning

The driveline shield and clutch shield must be kept in good operating condition. Failure to maintain safety shields can result in injury or death.

10. Locate vent plug in owners manual storage tube. Remove shipping plug from top center of gearbox. Install vent plug into top port. Failure to install vent plug can and will cause seal failure.

Operation

Before hitching cutter to your tractor, make sure all safety devices are installed on both the cutter and the tractor.



Please follow all safety instructions and procedures.

Attach equipment to tractor.

Be sure the tractor is equipped with the correct category hitchpins, top link, etc.

Be extremely careful when positioning tractor to hitch to the equipment.



Caution! Never allow anyone between the tractor and the equipment during the hitching process.

Be certain that the cutter has been lubricated properly and check oil level in gear box prior to connecting driveline to tractor. Also, do not tighten the top link such that the flex-link toggle is fully extended toward the tractor. The flex-link should be in a relaxed position when on level ground.

Attach the driveline to the tractor. **When attaching driveline to PTO shaft, be certain that the quick-disconnect pin is properly seated.**



Warning! A loose driveline could disconnect and cause personal injury or property damage.

Adjust cutting height.

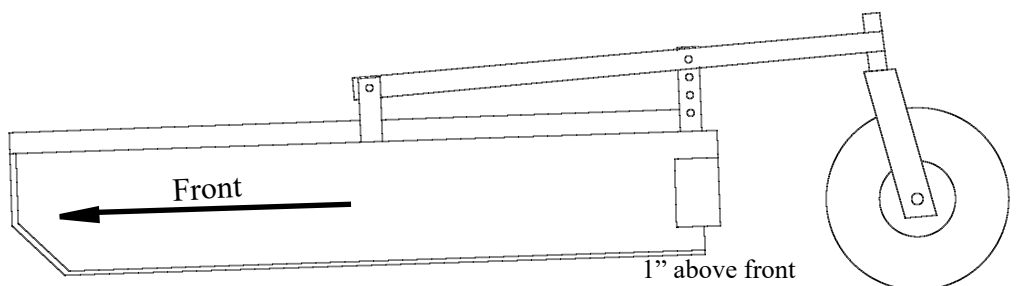


Warning! Be certain that tractor engine is stopped, key is removed, and all rotation of the cutter has ceased before making adjustments.



Caution! Avoid very low cutting heights. Striking the ground with blades causes a damaging shock that can damage both the cutter and the tractor.

Using the tailwheel adjustment and the tractor's lift arms, set the cutter to the desired height; the cutter is designed to operate with a cutting height range between 2" and 12". Note that, on level ground, the front of the cutter should be 1" below the rear (see illustration). Set the tractor's lift stop at the required position to maintain a uniform cut.



Operation

Starting cutter

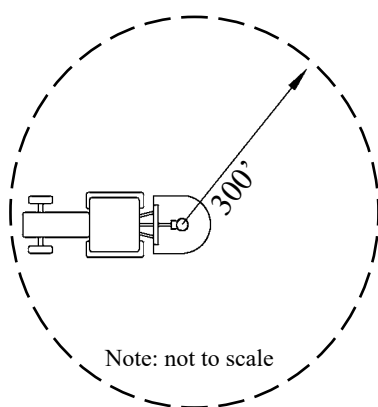
Power for operating the cutter is supplied from the tractor PTO. Refer to your tractor manual for instructions on engaging and disengaging the PTO.

Warning! Do not operate this cutter unless the tractor has a live, or independent, PTO. The momentum created by the blade carrier can push the tractor forward unexpectedly.

Warning! Operate cutter only with the specified PTO RPM. Brown 684 Model cutters are designed to operate at 540 RPM; however, a 1000 RPM design is an option.

Operating speed

Proper operating speed for equipment will depend upon the height, density, and type of the material to be cut. Regardless of chosen ground speed, always operate the PTO at the recommended RPM when cutting.



General Operation

Warning! The cutter creates a very serious discharge hazard. Maintain a safe distance from nearby persons and property. **Do not operate when bystanders are present.**

Warning! Avoid personal injury. Remove all rocks and other debris from work area before cutting.

Observe the following guidelines when operating the cutter:

- Never lower the cutter onto material.
- Avoid tight turns near trees or stationary objects. The deck may be damaged by side impact.

Remember: The safe operation of this equipment is the responsibility of the operator. The operator should be familiar with both the tractor and the equipment. Read and understand all applicable operator manuals and follow all safety practices.

OPERATING INSTRUCTIONS

PLEASE READ AND UNDERSTAND
IF YOU DO NOT UNDERSTAND ANY POINT STATED BELOW
YOU MUST CALL THE FACTORY FOR ASSISTANCE
1-800-633-8909

USE ONLY GENUINE BROWN REPLACEMENT PARTS.

USE OF AFTERMARKET PARTS OR COMPONENTS WILL **VOID** ANY WARRANTY
CONSIDERATION

BLADES This machine was designed to operate **ONLY** with sharp blades. Dull blades will cause multiple types of problems that are **NOT** covered under warranty:

1. Slip clutch failure
2. Extreme wear on blade bolts
3. Blade bar fatigue and cracking or total failure
4. Blade fatigue and cracking or total failure
5. Deck fatigue and cracking
6. Increased amount of discharge or debris
7. Poor cut – increased amount of uncut material
8. Blades must be freely pivoting during operation

BLADE BOLTS Blade bolts **MUST** be kept tight and checked twice daily during operation. Every hour for the first 8 hours of use.

- a. Brown's blade bolts are designed for the extreme conditions and should not be substituted for any reason
- b. 6' Brown blade bolts are **RIGHT** hand thread
- c. Bolts and lock nuts are matched as pairs or sets – do not mix
- d. See maintenance section, page 23 for proper torque specifications
- e. When replacing or repairing blades blue loc-tite should be applied to the blade bolts.

BLADE BAR Proper maintenance of blade bar will insure long life.

- a. Loose blade bolts will impact the bottom of the blade bar, causing the blades to lock into a fixed position.
- b. Loose bolts will cause the elongation of bolt holes
- c. Dull blades will cause the blade bar to crack and fail
- d. Blade bar nut must be checked and kept tight at all time
- e. Loose blade bar can cause output shaft failure, blades striking the bottom of the deck, blade breakage and blade bar cracking
- f. Bar **MUST** be inspected daily for cracking or fatigue

Continued-Next Page

OPERATING INSTRUCTIONS con't

CLUTCH

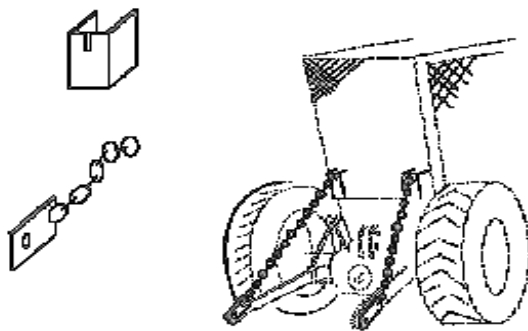
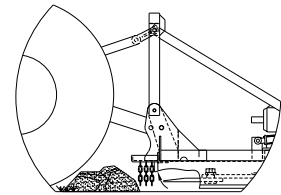
CLUTCH WEAR OR FAILURE is not covered under warranty. Improper operation of the unit will cause the clutch to slip.

- a. When the clutch slips the operator must lift the cutter off the obstruction immediately
- b. Clutch must be allowed to cool after slippage
- c. Excessive ground speed or dull blades will overload the clutch capacity
- d. Proper clutch setting for horse power of tractor
- e. Timely replacement of worn clutch discs
- f. Proper reassembly of slip clutch



WARNING: NEVER ALLOW BLADES TO COME INTO CONTACT WITH ROCKS OR STUMPS.

The blades will be forced to glance over the top of the obstruction, causing a tremendous amount of upwards pressure on the blades, blade bar and output shaft. This pressure can and will cause fatigue, cracking and possible breakage of the components. NEVER lower blades down onto material, the same pressures will be applied to the components causing failure.

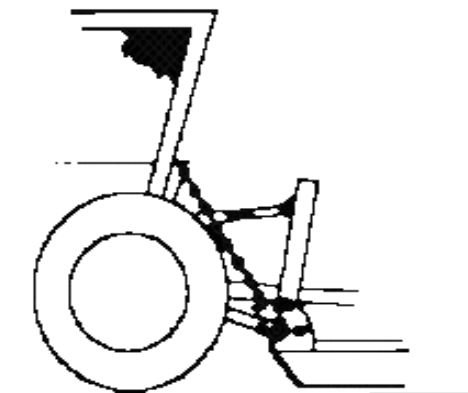


Using Choke Chains (Optional) - Not a factory supplied option.

Choke chains are lengths of chain that attach from the tractor ROPS to the lift pins of the cutter unit. The chains are intended to hold the weight of the unit, insuring that the front of the cutter remains at a fixed altitude above the ground and removing the weight of the unit from the tractor's lift arms.

Choke chains attach to the outside of the cutter unit's lift pins, after the tractor's lift arms have been properly attached to the unit. The chains' hitch plates are then secured in place by the existing spring-clip pins in the unit's lift pins.

The chain system consists of two lengths of suitable chain, each with one end terminating in a hitch plate. A bracket attached to each side of the tractor's ROPS holds the other ends of the choke chains taut in slots milled to the width of a chain link. Choke chain length is adjustable by choosing which chain link is inserted into the retention slots of the ROPS brackets; fine-tuning of the chain lengths may be performed by twisting the chains before securing the chains into their retention slots on the ROPS brackets.



Maintenance

Safety When Working Under Cutter Deck

Never work under the cutter deck until:

- The cutter is sufficiently braced and supported
- The tractor engine is off, brake is set, and key is removed
- PTO has been disengaged
- Driveline is disconnected
- Rear tractor tires have been secured with tire chocks
- The cutter is cooled



Warning! Failure to follow these safety guidelines can result in serious injury or death.

Initial Maintenance



Warning! These maintenance practices must be followed every hour for the first eight hours of operation; the practices must also be performed every hour for the first eight hours following the removal/replacement of any of the components named in this section. Check daily thereafter.

1. Tighten the bolts and tapered shank keeper bolt holding the slip clutch to the input shaft of the gear box.

Caution! Failure to tighten the keeper bolts will shorten the life of the slip clutch hub.

2. Check for debris deposited between the blade bar and the blades. Debris found jamming or locking the blades must be removed to insure that the blade may pivot freely on the blade bolt.



Warning! Failure to maintain freely pivoting blades will cause severe vibration or blade breakage which can result in injury or death.

3. Tighten blade bolts and blade bar nut.



Warning! Failure to tighten blade bolts and blade bar nut can cause blade bolts, blades, or output shafts to break, which can result in injury or death.

4. Check for debris deposited around the output shaft or tail wheel axle.
5. Tighten gearbox mounting bolts.

Caution! Failure to keep the gearbox bolts tightened can cause the blades to strike the bottom of the cutter deck or break the output shaft of the gearbox.

Daily Maintenance

1. Repeat all steps listed under the “Initial Maintenance” section on a daily basis after the initial maintenance has been performed.
2. Lubricate the driveshaft tubes and U-joint.
3. Lubricate the tail wheel hub.
4. Check and maintain the proper amount of lubricant in the gearbox. **The recommended lubricant for the gear box is SAE 85-140 weight gear oil or equivalent.**
5. Check the blades; sharpen or replace as necessary. **When sharpening blades, only sharpen the beveled edge. Also, be certain that paired blades weigh within 1 oz. of each other. When replacing blades, replace both blades of the pair.**

Maintenance

Warning! Use only blades and blade bolts supplied by Brown Manufacturing Corporation.

Warning! If the blades must be sharpened, follow the proper safety procedures listed on page 22 of this manual for working under the cutter deck.

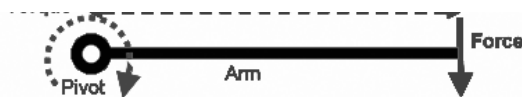
Tightening Blade Bolts and Blade Bar

Tighten blade bolts each hour for the first eight hours of use; tighten daily thereafter. **Repeat hourly inspections each time the blades are removed/replaced.**

Warning! Blade bolts will stretch with use and must be tightened.

1. Disengage PTO; be certain that all rotation has stopped.
2. Lift cutter high enough to place suitable supports under the cutter deck.
3. Turn tractor engine off; remove key; lock transmission and brakes; chock rear wheels.
4. Disconnect driveline.
5. **Tighten blade bolts:** Use an air impact wrench with a 2 3/4" socket with an output of at least 1600 ft/lbs of torque in a right hand direction, all air impacts have two torque measurements, do not use the maximum torque value, this is in left hand rotation, (counterclockwise), use the normal torque value (clockwise). Use the blade bolt access door in the top of the deck. It can be accomplished by hand however it requires at least a 10 foot cheater bar with a minimum force of 160 pounds on the end to develop 1600 ft/lbs. If the bolt turns you will have to hold the head of the bolt with a wrench having a 4" opening. Our bolt wrench part number: TC-165B Wrench.
6. **Tightening Blade Bar:** Remove blade bar cotter pin and tighten nut with a 2-9/16" socket. Torque nut to 2200 ft./lbs.; continue to torque until cotter pin hole aligns with nut. Install a new cotter pin. **Never loosen nut to align cotter pin hole.** Use the disconnected driveline to "foul" the blade bar, by moving the free end of the driveline to the side of the cutter at 90 degrees to rotation. Use an air wrench or torque multiplier to torque the blade bar to the correct value. As you approach 2200 ft/lbs make sure that you align the cotter pin hole up with the castle nut, do not back off on the nut to align the hole. Note: Foot Pounds (ft/lbs) of torque is a means of measuring tightness. 1 pound of force 1 foot from the turn element is 1 foot/lb of torque, any extension use multiplies the force, a 10 foot arm multiplies 10 times the force exerted. $Arm * Force = Ft/Lbs.$

Arm (In Feet)	Force (In Pounds)	Torque (In Ft/Lbs.)
1	1	1
8	200	1600
10	220	2200



Warning! Failure to keep blade bolts tight will cause damage to the blade carrier. If this occurs, refurbish or replace the blade carrier; otherwise, tightening the blade bolt after the blade carrier is damaged can jam the blade, causing the blade to break. This occurrence can cause serious injury or death.

(continued on next page)

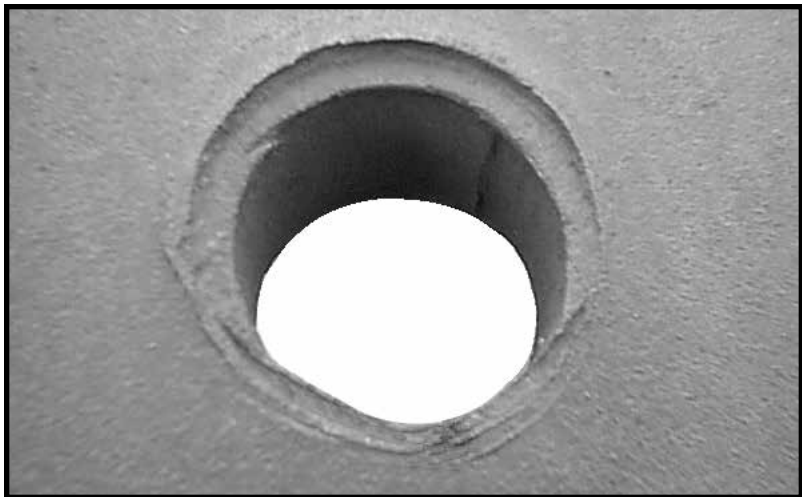
Maintenance

Warning! If blade bolts are allowed to run loose, the obvious danger is for the bolt to come completely loose, allowing the blade, bolt, and nut to be ejected from the cutter.

Tightening Blade Bolts (*continued*)

The second danger is that when the bolt is not sufficiently tight, the blade is allowed excess vertical movement when it strikes an object, be it something it will cut or something into which it should not come in contact. In this situation, the blade is being hammered against the blade carrier and flexed, or bent, up around the edge of the blade carrier at least twelve (12) times per second, generally fifteen (15) times per second. This situation will cause the blade to break from fatigue and to be ejected from the cutter.

The third danger is that, while the second situation is occurring, the blade bolt is also hammering the underside of the blade carrier; the shoulder of the blade bolt beats an indentation around the blade bolt hole into which the bolt shoulder will fit. When this damage occurs, the blade bolt will pull up into the indentation when the bolt is tightened, causing the blade to jam so that it can no longer pivot on the blade bolt. A



jammed blade will break either from fatigue or from catastrophic occurrence and will allow the blade to be ejected. A blade carrier damaged in this manner must be taken out of service immediately. Repair the blade carrier (contact Brown Mfg. Corp. for instructions) and replace the blades and blade bolts before returning the machine to service.

All three of the described occurrences will cause the blades to break and be ejected. An ejected blade can and will cause serious injury or death.

REMEMBER: Blades must pivot freely and blade bolts must be tight!

Proper Gearbox Lubrication

With the cutter sitting level, find and remove the combination vent plug/dip stick from the top of the gearbox. Wipe the dip stick clean and reinsert. Then remove. Oil should touch the dip stick. If not, add oil until it is no higher than 1/2" to 1" on the dip stick. Excess oil in the gearbox will be exhausted through the vent plug/dip stick. Proper replacement oil is 85-140 weight gear oil, our part number is T5-LUBE. **Make certain plug is replaced and tightened securely before operating.**

Maintenance


Sharpening Blades

Blade sharpening procedure:

Cutter blades are manufactured from Ultra-Kor™ Steel. When sharpening this blade using a side grinder keep the grinder moving at all times. DO NOT allow the grinder to stop or rest in one spot, because this will over heat the material and cause it to turn “blue”.

Blades should be sharpened in opposing pairs. For example; Sharpen the bevel up blades, which are directly across from each other, then the bevel down blades (tree cutter).

Take care to remove equal amounts of material from each blade, failure to do so will cause destructive vibration to the cutter and tractor. Opposing pair blades must be kept within 1/10th of a pound of each other to prevent vibration damage.

Tip: The first 1” to 1 ½” of the blade tip is where all of the cutting action takes place. 

NOTE: Failure to keep the blades sharp will cause multiple problems, including:

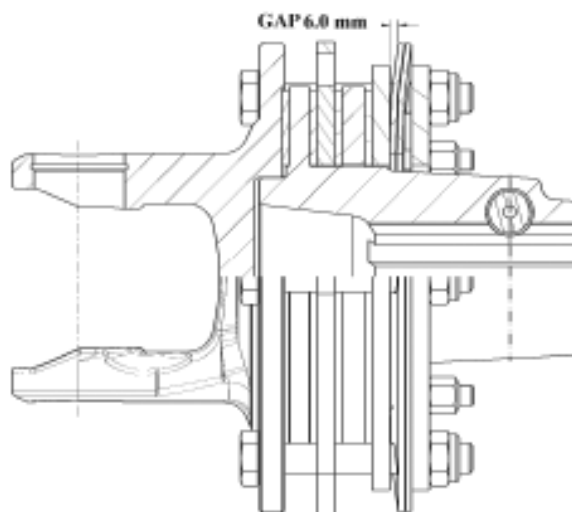
1. Slip clutch failure.
2. Extreme blade bolt wear
3. Blade bar fatigue, cracking and total failure
4. Blade fatigue, cracking and total failure
5. Deck fatigue and cracking
6. Increased amount of discharge or debris
7. Poor cut – increased amount of uncut material

Food for Thought: If your blade was an axe head, would you try to cut a tree with it?

Adjusting the Torque Setting of the Slip Clutch

To re-set the clutch to 1800 Nm, the gap between the Belleville springs (p/n's 236-0642) and the drive plate should be approximately 6.0-mm.

If a higher torque setting is needed, then tighten each bolt a 1/6 of a turn. One revolution of the nut will compress the spring 1.75 mm. Do not set the gap smaller than 5.0-mm. Measurements are approximate since variations in spring force and friction materials may cause some differences in torque values. The clutch can be adjusted with two 19-mm wrenches.



REASONS SLIP CLUTCHES FAIL

* DULL BLADES*

When the blades become dull, the cutting or chipping effect is lost; (dull blades become hammers and will not cut). The dull blades require more torque to hammer into and through the material. The Tree Cutter is not designed to hammer through material. This hammering action will destroy the machine and slip clutch from increased shock load and increased torque required from dull blades. **NEVER** operate the unit with dull or damaged blades.

* GROUND SPEED*

Excessive ground speed increases the torque load to the slip clutch. As more material is fed into the cutting chamber; more torque is required to pass through the slip clutch. NOTE: A good measure for proper ground speed is to watch the tractor tachometer, if the tractor engine loses speed (R.P.M. drop) reduce your ground speed to regain your engine speed. **NEVER** reduce your ground speed by the engine throttle; (select a lower gear to reduce ground speed).

* DECK ADJUSTMENT*

Improper deck adjustment or deck attitude will increase the torque load to the clutch. *See proper deck adjustment in this manual.* The front of the cutter deck should be adjusted 1 inch lower than the rear of the deck, this allows the material to be cut on the front side of the blade arc. If the deck were adjusted with the front higher than the rear, all the material will be cut twice. **NEVER** lower cutter deck down onto material. Keep cutter deck down on the ground at cutting height.

* ENGINE SPEED*

Your tractor engine is designed to operate at a continuous speed to produce a given P.T.O. speed (540 or 1000 R.P.M.). Failure to keep the tractor engine at the proper speed will cause the Tree Cutter to be under powered; thus increasing the torque load to the slip clutch. Refer to tractor owners manual for proper tachometer setting to deliver the proper P.T.O. speed to the cutter. **NEVER** operate your cutter at less than manufactures recommended engine speed for proper P.T.O. output speed. The Tree Cutter is designed to operate at a certain P.T.O. speed (NOT BOTH). Refer to model number or call Brown Mfg. Corp. if you have questions about your Tree Cutter design speed.

SLIP CLUTCH FAILURE IS NOT COVERED UNDER WARRANTY

THE TEN COMMANDMENTS OF OPERATION

1. **NEVER** - Operate this or any other equipment without reading and understanding the owners manual.
2. **NEVER** – Attach this product to a tractor that does not have suitable safety equipment properly installed .
3. **NEVER** – Operate this equipment without all safety equipment properly installed on this equipment.
4. **NEVER** – Start the cutting process without inspecting, walking, flagging or removing all foreign material from job site.
5. **NEVER** – Allow any riders or bystanders within 300 feet of this unit during operation.
6. **NEVER** – Operate this equipment until bolts, fasteners, fittings and oil levels have been checked for operational status.
7. **NEVER** – Allow blades to make contact with rocks or stumps – unit was not designed for this type of operation.
8. **NEVER** – Allow an untrained operator to operate this equipment.
9. **NEVER** – Install any parts that are not genuine Brown replacement parts.
10. **NEVER** – Leave tractor seat until blades have stopped turning and all tractor shut down procedures have been completed.

THESE ARE ONLY A FEW OF THE SAFETY PROCEDURES THAT MUST BE FOLLOWED TO INSURE THE SAFE OPERATION OF THIS EQUIPMENT – MANY OTHER SAFETY RELATED POINTS ARE STATED THROUGHOUT THIS MANUAL



WARNING: FAILURE TO FOLLOW THE TEN COMMANDMENTS CAN AND WILL CAUSE SERIOUS INJURY OR DEATH

IF YOU HAVE ANY SAFETY, MAINTENANCE OR OPERATIONAL QUESTIONS – PLEASE CALL THE FACTORY BEFORE USING THIS EQUIPMENT – 1-800-633-8909

Troubleshooting

Problem	Possible Cause(s)	Possible Solution(s)
Excessive vibration	<ol style="list-style-type: none"> 1. Loose gearbox bolts 2. Loose blade bar and/or blade bolts 3. Blades are not freely swinging 4. Broken, bent, or warped blades 5. Blade bar not seated properly on shaft 	<ol style="list-style-type: none"> 1. Tighten bolts 2. Tighten blade bar nut or blade bolt nuts 3. Clear blade of obstruction 4. Replace set of blades and bolts 5. Remove blade bar; clean hub and shaft; reseal
Excessive clutch slippage	<ol style="list-style-type: none"> 1. Worn clutch linings or plates 2. Oil on lining 3. Glazed friction lining 4. Excessive torque on clutch 5. Dull blades 	<ol style="list-style-type: none"> 1. Repair clutch 2. Replace linings 3. Clean with emory cloth 4. Reduce ground speed, material intake, or tractor size 5. Sharpen or replace blades
Overheating gearbox	<ol style="list-style-type: none"> 1. Insufficient lubricant level 2. Improper lubricant 3. Debris build-up around gearbox 4. Bearing or gears set improperly 	<ol style="list-style-type: none"> 1. Fill to full level 2. Replace with correct lubricant 3. Remove debris 4. Consult dealer
Noisy gearbox	<ol style="list-style-type: none"> 1. Rough gears 2. Worn bearing 	<ol style="list-style-type: none"> 1. Run for a short break-in period or replace gears 2. Replace bearing
Leaking gearbox	<ol style="list-style-type: none"> 1. Damaged oil seal 2. Bent shaft 3. Oil seal installed incorrectly 4. Oil level too high 5. Shaft rough or pitted in oil seal area 6. Shaft bore worn in casting 7. Damaged gasket 8. Loose bolts 	<ol style="list-style-type: none"> 1. Replace seal 2. Replace seal and shaft 3. Replace seal 4. Drain oil to proper level 5. Replace shaft 6. Replace casting or gearbox 7. Replace gasket 8. Tighten bolts.
Short blade life	<ol style="list-style-type: none"> 1. Cutting too low 2. Cutting in sandy or rocky conditions 3. Inadequate blades 	<ol style="list-style-type: none"> 1. Increase cutting height 2. Increase cutting height 3. Replace with Brown blades
Not cutting clean	<ol style="list-style-type: none"> 1. Dull blades 2. Insufficient PTO speed 3. Cutter not level 4. Ground speed too fast 5. Blades are not freely swinging 	<ol style="list-style-type: none"> 1. Sharpen or replace blades 2. Use correct PTO speed 3. Adjust cutter 4. Reduce ground speed 5. Clear blade of obstruction

Specifications

True Cutting Width	84" (7')
Overall Deck Width	93" (7' 9")
Cutting Height	2" to 12"
Deck Construction	1/4" steel plate
A-frame Construction	3 x 3 x 1/4" tubing with Flex Link Category II hitch
Weight	2240 lbs.
Blades	Qty. 2, 5/8" x 6" Ultra-KOR alloy
Blade Bar	1" solid steel plate, 38-1/2" diameter
Drive Shaft	Heavy-duty, fully shielded
Tail Wheel	Qty. 2, 5.00 x 8 laminated solid tires
Gearbox	145 HP
Slip Clutch	Heavy-duty 85/120 HP, 4 disc slip clutch
Horsepower Requirement	70 HP PTO minimum
Maximum Material Size	4"

Standard Features

1/4" steel plate deck

1" solid steel blade carrier, 38-1/2" diameter

Qty. 2, 5/8" x 6" high-tensile blades

Front Chain Guard

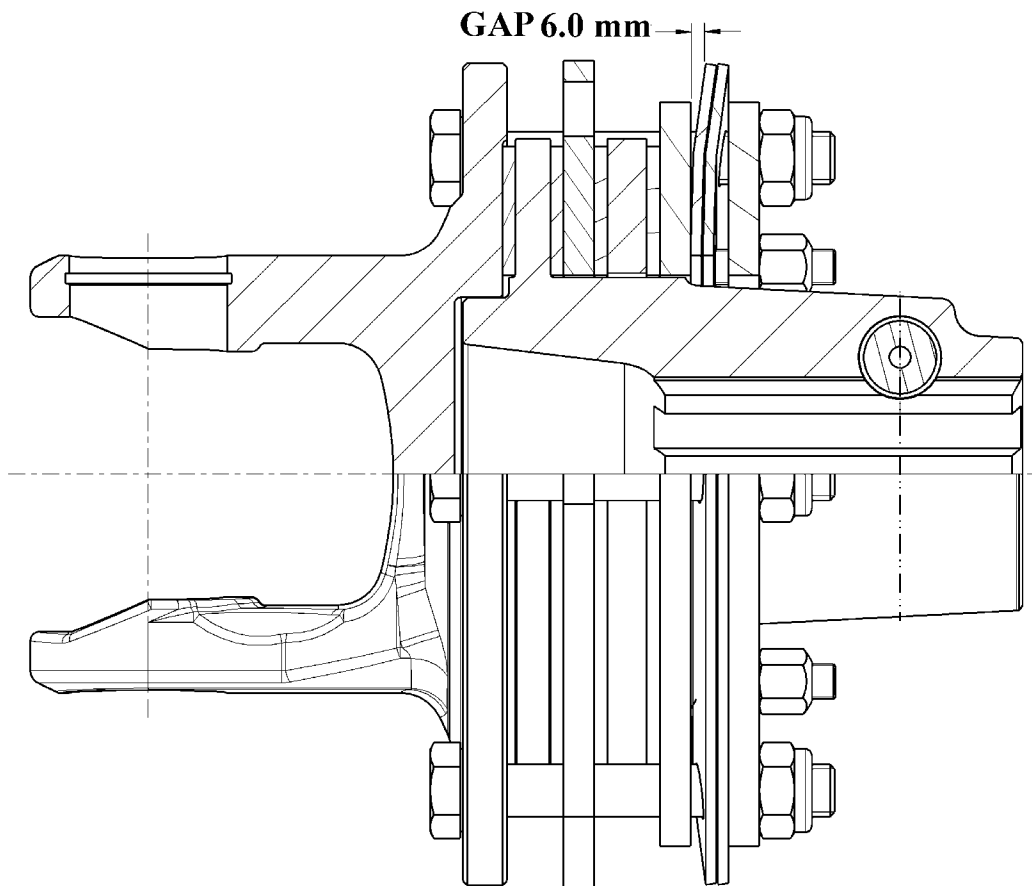
4" diameter maximum material capacity

2" to 12" cutting height

Clutch Adjustment

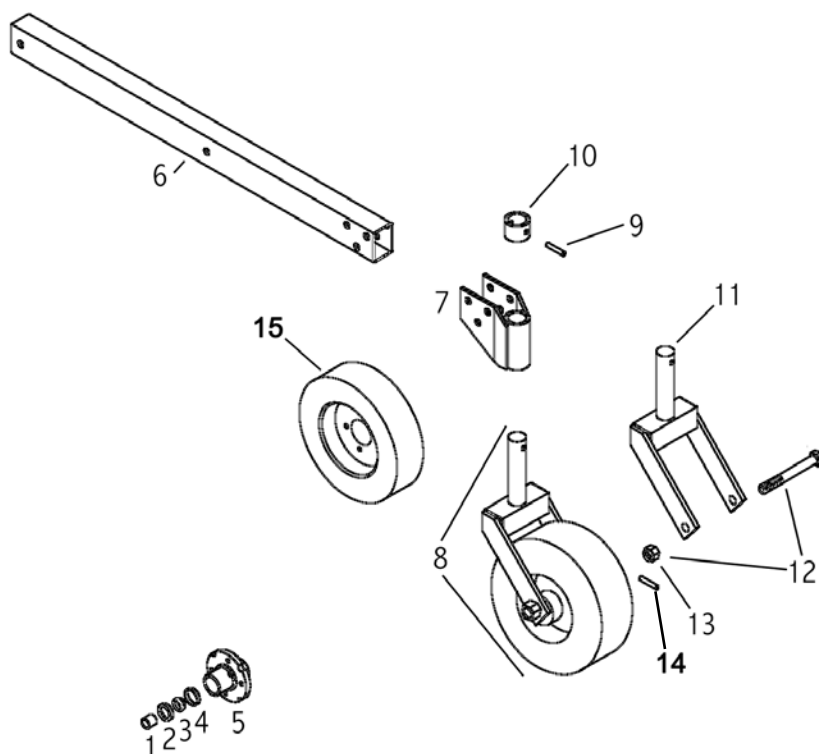
To re-set the clutch to 1800 Nm, the gap between the Belleville springs (p/n's 236-0642) and the driveplate should be approximately 6.0-mm.

If a higher torque setting is needed, then tighten each bolt a 1/6 of a turn. One revolution of the nut will compress the spring 1.75 mm. Do not set the gap smaller than 5.0-mm. Measurements are approximate since variations in spring force and friction materials may cause some differences in torque values. The clutch can be adjusted with two 19-mm wrenches.



Replacement Parts

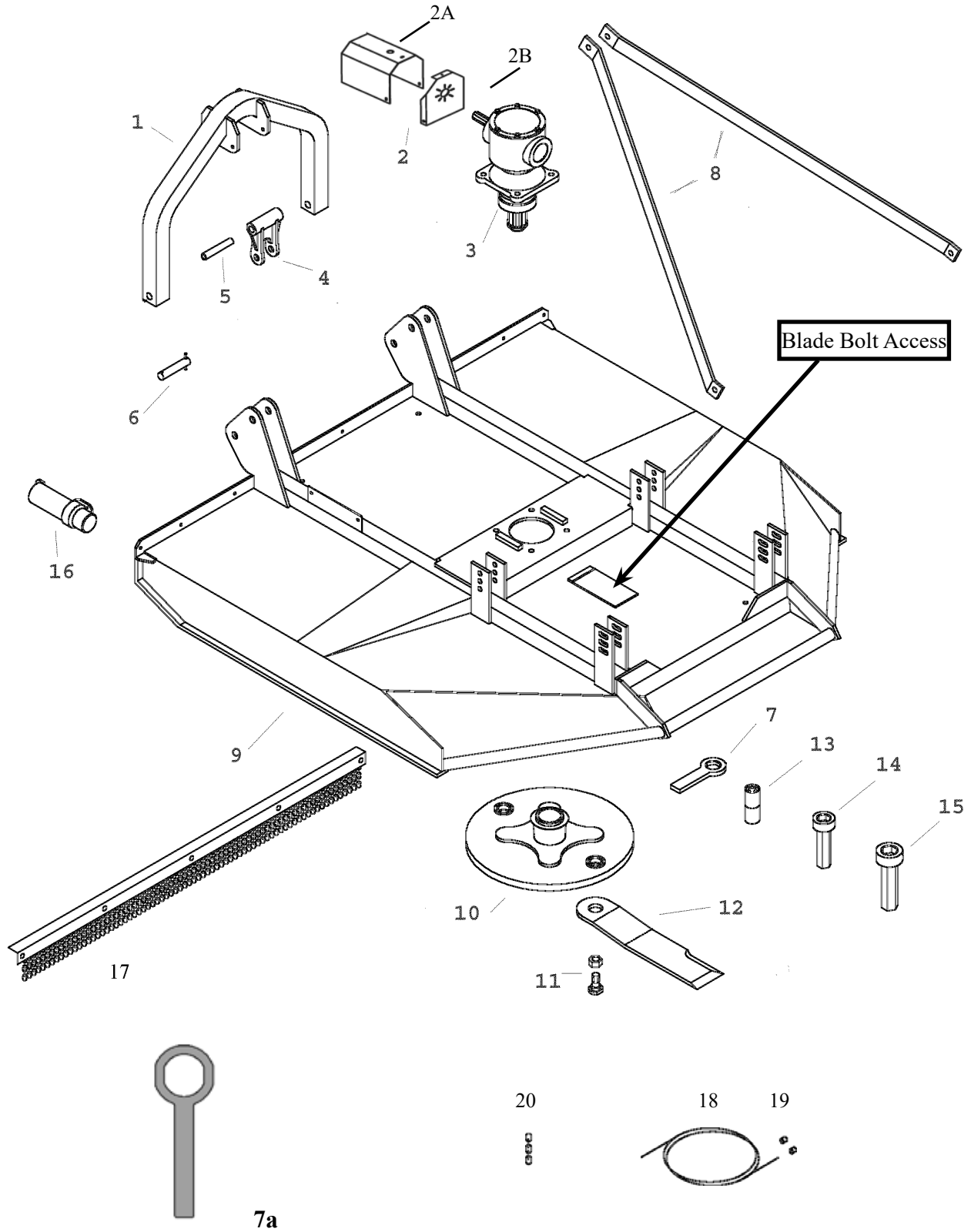
Tailwheel Assembly - 2 Req'd



Ref. No.	Part No.	Qty	Description
1	232-6020	2	Spacer
2	TC-108	2	Seal (2 req.)
3	TC-109	2	Bearing (2 req.)
4	TC-110	2	Cup (2 req.)
NS	232-6040	2	O-ring - Axle Seal (Inside 232-6020)
NS	HC58F16Z	2	Lug Bolts 1/2-20 x 1" HCS Grade 5 Zinc
5	232-6000	1	Complete tail wheel hub assembly
6	684-01	2	Tailwheel arm
7	232-0119	2	Tailwheel Fork Holder
8	6-010	2	Complete tailwheel assembly
9	TC-012	2	Roll pin (1/2" x 2")
10	TC-011	2	Collar
11	6-004A	2	Fork w/ Roll Pin and Collar
12	TC-106	2	Axle
13	TC-114	2	Axle nut
14	TC-115	2	Cotter Pin for Axle Nut
15	TC-113XA	2	Tire and wheel assembly

Replacement Parts

Deck Assembly



Replacement Parts

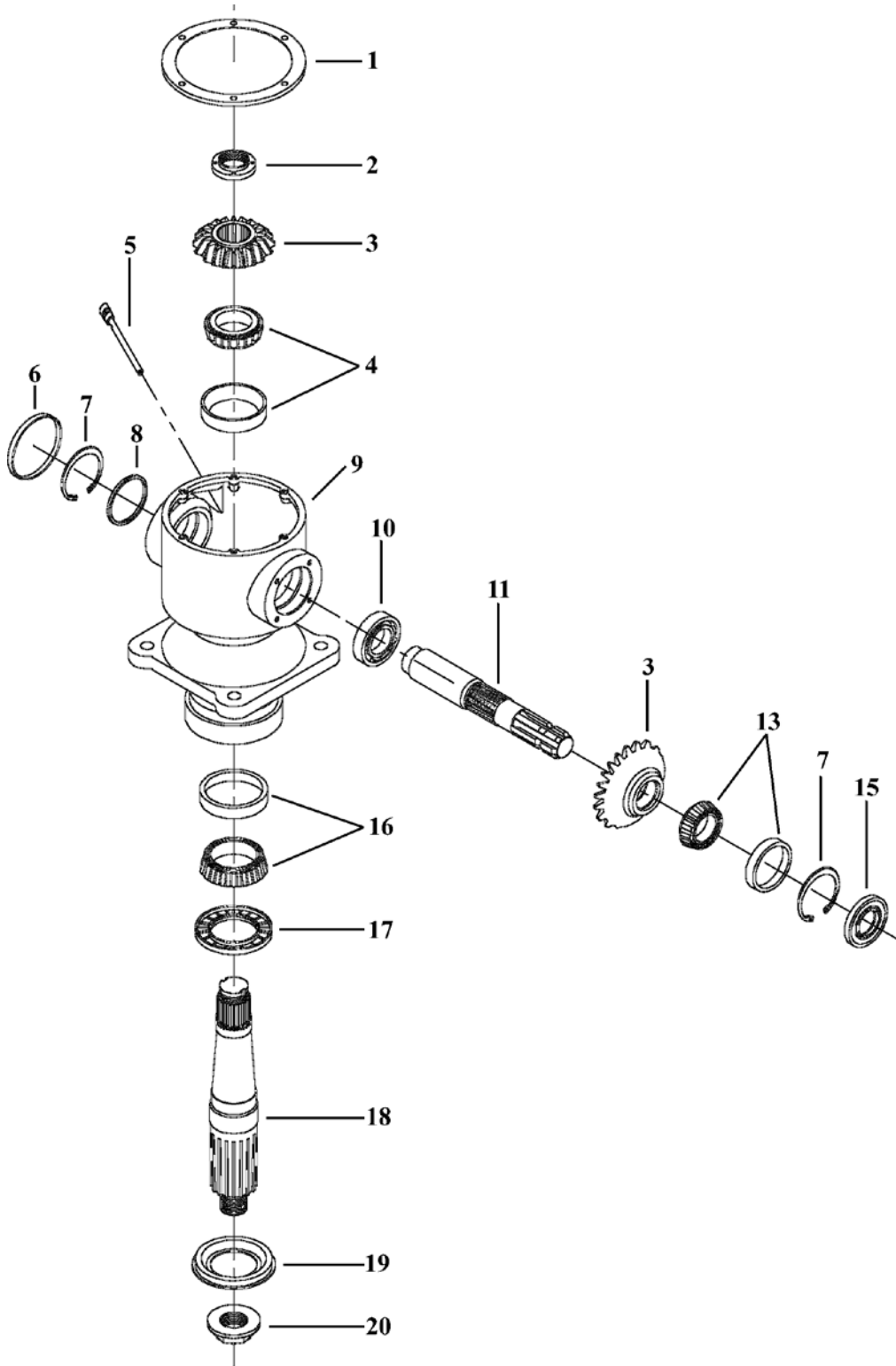
Deck Assembly (*continued*)

Ref. No.	Part No.	Qty	Description
1	BM-51	1	A-frame, tri-bend
2	232-0028	1	Bell shield assembly, complete
2A	700-232-0030	1	Plate, Guard, Driveshaft
2B	700-232-0031	1	Guard, Driveshaft
NP	HC56C12Z	3	Bolt, 3/8-16 x 3/4 HCS GR5, Qty 3
NP	LOC38Z	3	Washer, Lock 3/8 Zinc, Qty 3
3	BM-540	1	145HP gear box - 540 RPM
	BM-1000	1	145HP gear box - 1000 RPM
4	TC2-003	1	A-frame toggle
5	TC2-016	1	A-frame toggle spacer
6	TC-126	2	Category II lift pin with lynch pin
7a	TC-165B Wrench	1	Bolt Head Wrench
7	TC-Wrench	1	Socket Wrench
8	TC2-014	2	A-frame brace
9	M684-003	1	Deck weldment - call factory
10	T5-000S	1	Blade carrier
11	T5-165NB	2	Blade bolt w/nut
12	T5-079NB	2	Blade, Large Hole - 2.75
13	T-2600-001	1	Removal tool - Blade Bar
14	T5-004BS	1	165 Blade bolt socket
15	T5-054AS	1	145/165 Blade bar socket
16	MH-01	1	Manual container
NP	TC-126A	var	7/16" lynch pin
17	684-08	1	Chain guard (front)
18	4-011C	2	5/16" Chain Guard Cable with Stops
19	TC2-012	4	Aluminum Cable Stops
NP	1575	var	Cable Clamp for Field Repair of Chain Guard Cable
20	6-012-8	50	5/16" x 8 Long Link Plated Chain
20	6-012-6	22	5/16" x 6 Long Link Plated Chain

* NP = Not Pictured

Replacement Parts

145 HP Gearbox



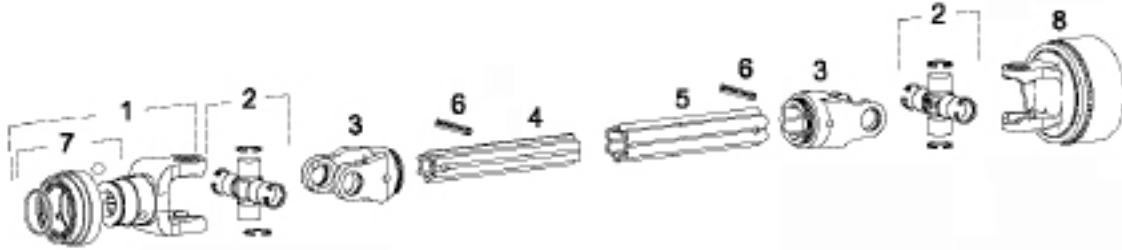
Replacement Parts

145 HP Gearbox (*continued*)

Ref. No.	Part No.	Description
1	T5-035	Cover plate
2	BM-110	Top output shaft nut
3	BM-113	Gear set - 540 RPM
4	BM-111	Bearing set, top output shaft
5	T5-068	Vent plug (w/ dipstick)
6	BM-107	Rear seal plug
7	BM-103	Lock ring (2 req.)
8	BM-108	Shim kit
9	BM-105	Gearbox housing
10	BM-109	Bearing set, rear input shaft
11	BM-102	Input shaft - 1-3/4" x 6 spline
13	T5-060	Bearing set, front input shaft
15	BM-101	Seal, input
16	235-0032	Bearing Set, bottom output shaft
17	T5-065	Seal, output
18	BM-112	Output shaft, tapered
19	T5-048	Output seal guard
20	T5-054A	Nut, flanged, castellated
21	T5-050	Bolt, Hex Head (M10 x 20) for Top Plate
Not Shown	T5-074T-25	Oil plug
22	T5-052	Cotter pin, 5/16" x 3"
Not Shown	T5-LUBE	85-140 gearbox lubricant (1 QT)
Not Shown	TC2-002	Bolt Kit - 3/4" x 3 1/2" NF - Gr 8 Square Head Bolt w/ Flat Washer Gr 8, Nut 3/4"-16 Gr 8, Nylon Lock Nut 3/4"-16 Gr 8 -- 4 Each

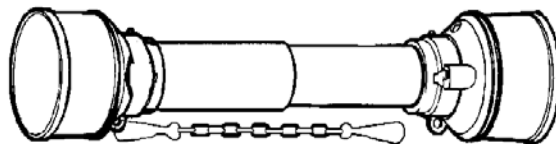
Replacement Parts

Drive Shaft & Slip Clutch



Ref. No.	Part No.	Description
1	T5-W36	Yoke, 1 3/8" x 6 Spline 540 RPM
2	T5-W4	U-Joint Kit (Cross & Bearing)
3	T5-W5	Inboard Yoke, Inner Profile
3A	T5-W7	Outboard Yoke, Outer Profile
4	T5-W36	Yoke with quick-disconnect pin kit, 540 RPM
5	236-0614	Inner Profile Tube
5A	236-0615	Outer Profile Tube
6	236-0612	Spring Pin, 10 x 90
7	T5-W2	ASG Connection Kit
8	236-0601	Friction Clutch 1 3/4" x 6 Spline Metric (540 RPM)
8	236-3005	Friction Clutch 1 3/4" x 20 Spline Metric (1000 RPM)
NP	236-0600	Drive Shaft Complete, 1-3/8"-6 x 1-3/4"-6 spline (540 RPM)
NP	236-3100	Drive Shaft Complete, 1-3/8"-21 x 1-3/4"- 20 spline (1000 RPM)

Driveline Safety Shield



Part No.	Description
236-0610	672,684: Complete shield assembly

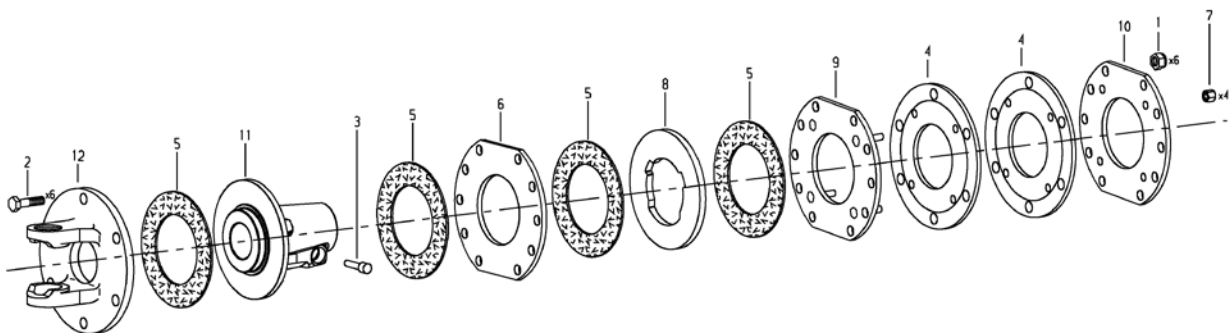
Replacement Parts

Drive Shaft & Slip Clutch (continued)

Slip Clutch Exploded View

Ref. No.	Part No.	Description
1	236-0636	Locknut M12
2	236-0638	Bolt M12 x 85
3	236-0634	Clamp Cone in #11 installation instructions below.
4	236-0642	Belleville Spring
5	236-1703	Friction Disc
6	236-1805	Drive Plate
7	236-0644	Hex Nut M8
8	236-0646	Drive Plate
9	236-0648	Thrust Plate
10	236-0650	Backup Plate
11	236-0652	Hub 1 3/4" x 6 Spline for 540 RPM
11	236-3110	Hub 1 3/4" x 20 Spline for 1000 RPM
12	236-0654	Flange Yoke
Assembly	236-0601	Friction Clutch 1 3/4" x 6 Spline Metric (540 RPM)
Assembly	236-3105	Friction Clutch 1 3/4" x 20 Spline Metric (1000 RPM)

For Clutch Adjustment, see Page 30.



CC Lock Installation Instructions

1. Clean and grease (do not over-grease) the connecting spline shaft. Do not grease or oil the threads of the clamping cone.
2. Slide yoke or clutch onto the connecting shaft. Make sure that the hole for the clamping cone is positioned above the annular groove on the connecting shaft. Start threads of clamping cone by hand, then tighten it to 75 lb-ft (100 N-m) of torque. While tightening, move the yoke or clutch back and forth in axial direction. Check tight and safe fit of yoke or clutch. A 17 mm socket will be needed to tighten the clamping cone.
3. After the first 8-10 hours of operation after installation, the clamping cone must be rechecked for tight and safe fit. The safe fit then needs to be checked at regular intervals during operation. Re-tighten clamping cone as necessary.
4. To disassemble, loosen clamping cone and remove it from the yoke or clutch. If the clamping cone cannot be removed by hand, it can be released from the opposite side by using a hammer and a pin punch.

Note: The clamping cone is serviced only as a complete assembly. Do not attempt to disassemble the clamping cone.

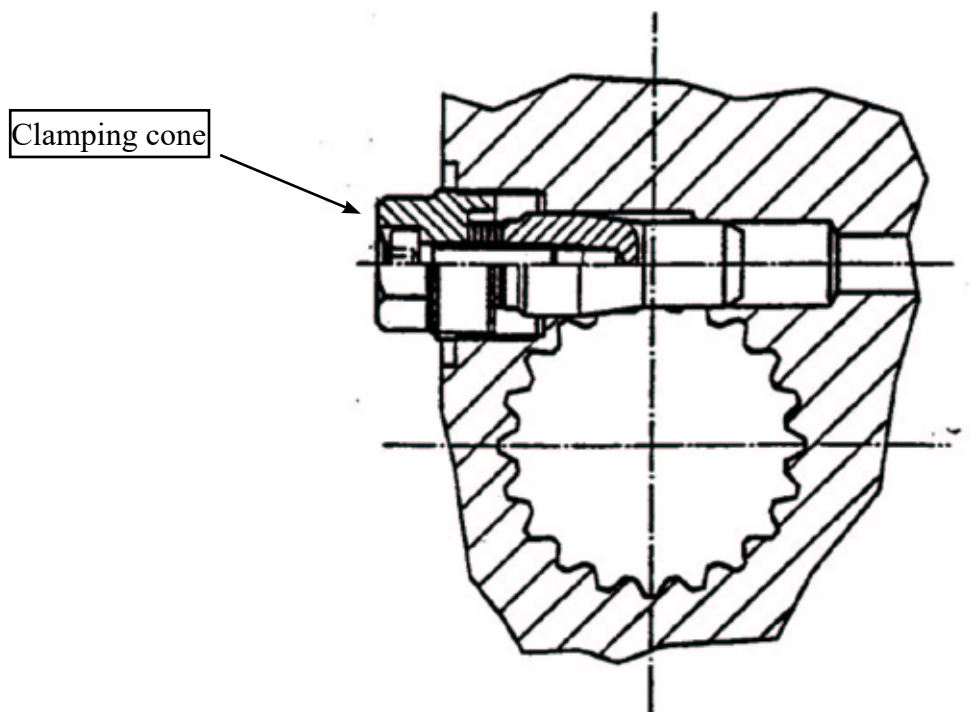


Fig. 39.1

For use with Beginning Serial Number:
S705B-1000

Brown 684
Version 2.7.0
January 2022



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