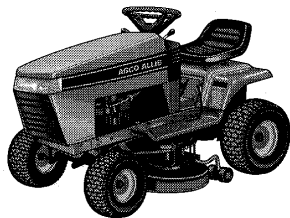


512 SERIES

Hydro &
5-Speed



AGCO ALLIS

This manual covers the following Manufacturer's Numbers:

512 Hydro: Mfg. No. 1692164

512 Gear: Mfg. No. 1692166

36" Mower: Mfg. No. 1691420

Contents

SAFETY RULES	2
DECALS	5
MOWER INSTALLATION & REMOVAL	7
OPERATION	11
CONTROLS	11
SAFETY INTERLOCK SYSTEM	12
PUSHING THE TRACTOR BY HAND	13
RECOMMENDED FUEL	13
STARTING THE ENGINE	14
SELECTING GROUND SPEED & ENGINE SPEED	14
STARTING & STOPPING	14
BEFORE LEAVING OPERATOR'S POSITION	15
CLUTCH/BRAKE PEDAL OPERATION	15
MOWING PATTERN & TIPS	16
NORMAL CARE	17
DETERMINING OPERATION TIME	17
NORMAL CARE SCHEDULE	17
RAISING HOOD & SEAT DECK	17
ADJUSTING SEAT	17
CHECKING/ADDING GASOLINE	19
LUBRICATING THE TRACTOR	19
LUBRICATING THE MOWER	22
CHECKING THE FUEL FILTER	23
CHECKING BATTERY FLUID	23
CLEANING THE BATTERY & CABLES	24
CHECKING TIRE PRESSURE	25
CHECKING TRANSMISSION FLUID LEVEL (Hydro)	25
TRACTOR NORMAL STORAGE	26
TRACTOR OFF-SEASON STORAGE	26
STARTING AFTER STORAGE	27
SHARPENING & BALANCING THE BLADES	27
MOWER OFF-SEASON STORAGE	29

TROUBLESHOOTING & REPAIR	30
CONTENT OF SECTION	30
TROUBLESHOOTING PROCEDURES	30
BATTERY REPLACEMENT	34
JUMP STARTING	34
TRACTOR DRIVE BELT REPLACEMENT (Hydro)	37
TRACTOR DRIVE BELT REPLACEMENT (Gear)	38
MOWER BELT REPLACEMENT	41
ADJUSTMENTS	43
TRACTOR BRAKE ADJUSTMENTS (Hydro)	43
TRACTOR BRAKE ADJUSTMENTS (Gear)	45
BRAKE/CLUTCH ROD (Gear)	47
ENGINE PULLEY BELT STOP	47
NEUTRAL ADJUSTMENTS (Hydro)	48
MOWER ADJUSTMENTS	49
Mower Drive Belt Tension	49
Arbor Belt Stops	50
Idler Pulley Belt Guide	50
PTO Pulley Belt Stops	51
Levelling The Mower	52
Blade Brake Adjustment	53
SMALL LIFT LEVER	54
LARGE LIFT LEVER	55
SPECIFICATIONS	56
COMMON REPLACEMENT PARTS	57
OPTIONAL ATTACHMENTS	58
PARTS MANUAL AVAILABLE	59

NOTE

In this manual, "left" and "right" are referred to as seen from operating position.

Safety Rules



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of vehicle, severe personal injury or death to you, yourself or bystanders, or damage to property or equipment. This cutting machine is capable of amputating hands and feet and throwing objects. The triangle  in text signifies important cautions or warnings which must be followed.

IMPORTANT - Safe operation practices for riding mowers.

I. General operation

1. Read, understand, and follow all instructions in the manual and on the machine before starting.
2. Only allow responsible adults, who are familiar with the instructions, to operate the machine.
3. Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade.
4. Be sure the area is clear of other people before mowing. Stop tractor if anyone enters the area.
5. Never carry passengers.
6. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while backing.
7. Be aware of the mower discharge direction and do not point it at anyone. **Do not operate the mower** without either the entire grass catcher or the guard in place.
8. Slow down before turning.
9. Never leave a running tractor unattended. Always turn off blades, set parking brake, stop engine, and remove keys before dismounting.
10. Turn off blades when not mowing.
11. Stop engine before removing grass catcher or unclogging chute.
12. Mow only in daylight or good artificial light.
13. Do not operate the tractor while under the influence of alcohol or drugs.

14. Watch for traffic when operating near or crossing roadways.
15. Use extra care when loading or unloading the tractor into a trailer or truck.

II. Slope operation

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not mow it.

DO

- Refer to page 14 for recommendations for wheel weights or counterweights to improve stability.
- Mow up and down slopes, not across.
- Remove obstacles such as rocks, tree limbs, etc.
- Watch for holes, ruts, or bumps. Uneven terrain could overturn the machine. *Tall grass can hide obstacles.*
- Use slow speed. Choose a low gear so that you will not have to stop or shift while on the slope.
- Use extra care with grass catchers or other attachments. These can change the stability of the machine.
- Keep all movement on the slopes *slow* and *gradual*. Do not make sudden changes in speed or direction.
- Avoid starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly *straight* down the slope.

Safety Rules

DO NOT

- *Do not* turn on slopes unless necessary, and then, turn slowly and gradually downhill, if possible.
- *Do not* mow near drop-offs, ditches, or embankments. The mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
- *Do not* mow on wet grass. Reduced traction could cause sliding.
- *Do not* try to stabilize the machine by putting your foot on the ground.
- *Do not* use grass catcher on steep slopes.

III. Children

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the mowing activity. Never assume that children will remain where you last saw them.

1. Keep children out of the mowing area and under the watchful care of another responsible adult.
2. Be alert and turn machine off if children enter the area.
3. Before and when backing, look behind and *down* for small children.
4. Never carry children. They may fall off and be seriously injured or interfere with safe machine operation.
5. Never allow children to operate the machine.
6. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

IV. Service

1. Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
 - a) Use only an approved container.
 - b) Never remove gas cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.

- c) Never refuel the machine indoors.
 - d) Never store the machine or fuel container inside where there is an open flame, such as in a water heater.
2. Never run a machine inside a closed area.
 3. Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
 4. Never tamper with safety devices. Check their proper operation regularly.
 5. Keep machine free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage. Allow machine to cool before storing.
 6. Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
 7. Never make adjustments or repairs with the engine running.
 8. Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
 9. Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.
 10. Check brake operation frequently. Adjust and service as required.



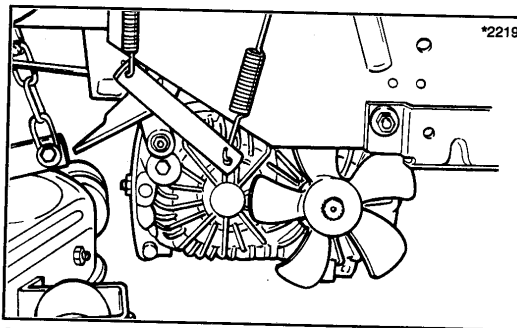
WARNING

Never operate on slopes greater than 30 percent (16.7) which is a rise of three feet in a travel distance of ten feet. When operating on slopes that are greater than 15 percent (8.5) but less than 30 percent, use front counterweights and rear wheel weights. In addition to front and rear weights, use extra caution when operating on slopes with rear-mounted grass catcher.

Safety Rules

WARNING

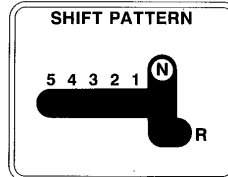
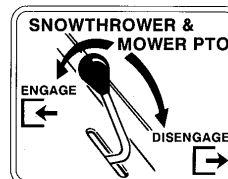
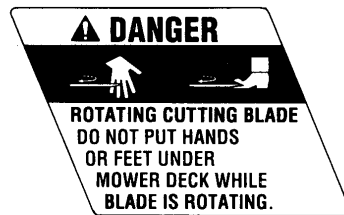
Never place hands near the hydro pump cooling fan when the tractor is running. Cooling fan is located on left-hand side of hydro pump inside the rear frame.



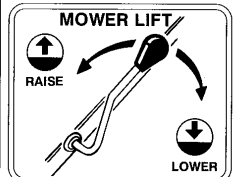
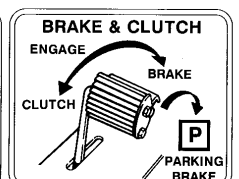
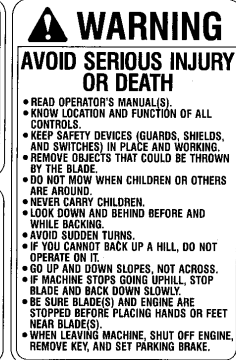
Cooling Fan Location (Shown with left-hand rear tire removed.)

Decals

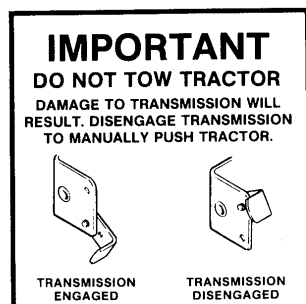
ALL WARNING, CAUTION, and instructional messages on your tractor and mower should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important. The safety messages on this page are on your tractor and mower.



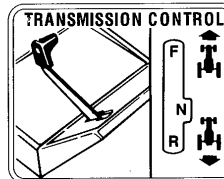
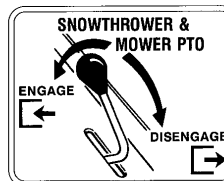
Gear Models



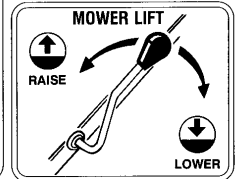
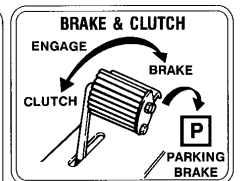
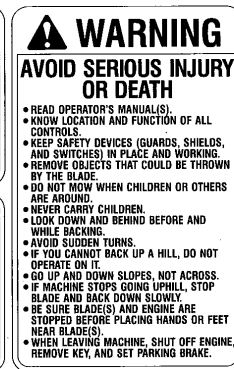
Decals



Hydro Models



Hydro Models



Mower Installation & Removal

WARNING

Engage the parking brake, disengage the PTO, stop the engine and remove the key before attempting to install or remove the mower.

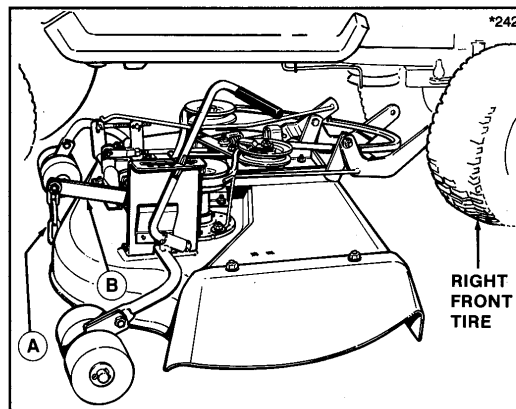


Figure 1. Installing 36" Mower
A. Lift Chain
B. Lift Arm
C. Mower Hitch Arms

NOTE: The lift chain (A, figure 1) should be connected to the rear hole in lift arm (B) unless optional large lift arm (B, figure 8) is used to raise mower. With large lift lever, connect chain in forward hole.

1. Place your tractor on a hard level surface, with the mower on the right side of the tractor.
2. Turn the front wheels of the tractor full left.
3. Place the mower in lowest cutting position and slide it under the tractor, aligning arms (C, figure 1) with tractor hitch (A, figure 2).

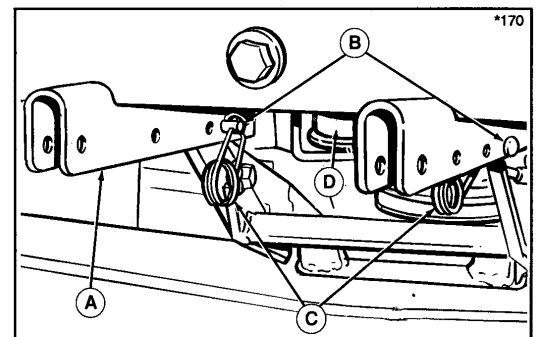


Figure 2. Mower Hitch Arms
A. Hitch
B. Pins
C. Safety Clips
D. Drive Belt

Mower Installation & Removal

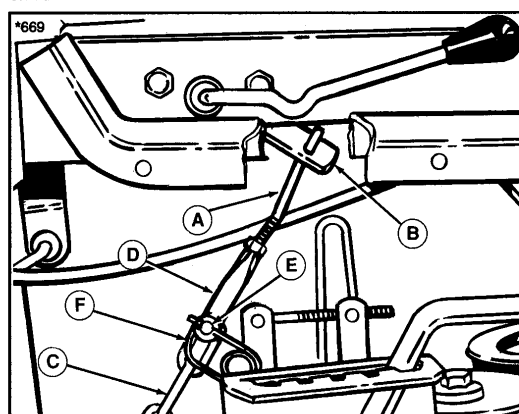


Figure 3. Lift Assembly

- | | |
|--------------|-----------|
| A. Lift Link | D. Clevis |
| B. Lift Arm | E. Pin |
| C. Chain | F. Clip |

4. Insert the link (A, figure 3) into lift arm (B) then pivot back and down. Secure chain (C) to clevis (D) with pin (E) and clip (F). Use on three links of chain.
5. Lift up front of mower and insert pins (B, figure 2) to attach mower hitch arms to tractor hitch (A). (You can insert a pry bar under front edge of deck to raise.) Connect the clips (C) into the pins.

8

6. Slip the mower drive belt (E, figure 4) onto the PTO pulley (C). Loosen belt stops as necessary. The left-hand belt stop (A) is shown in figure 5. The right-hand belt stop (A) is shown in figure 6. Make sure the belt stop is routed between belt stop fingers as shown in figure 6.
7. Make sure the belt is properly installed on the mower pulleys. The belt pattern is shown in figure 4.

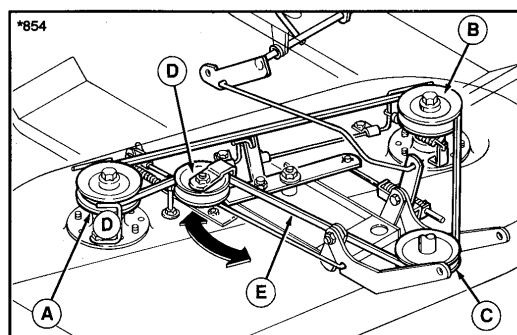


Figure 4. Mower Belt Pattern

- | | |
|--------------------------|----------------------|
| A. V-Pulley, Right Arbor | D. Flat Idler Pulley |
| B. V-Pulley, Left Arbor | E. Belt |
| C. Engine PTO Pulley | |

Mower Installation & Removal

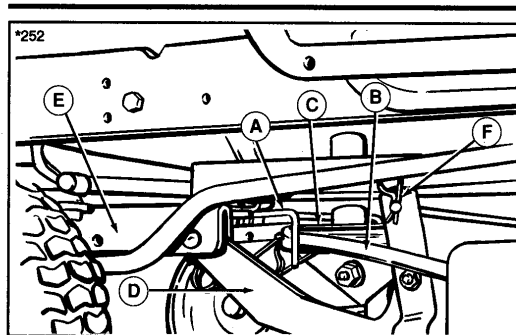


Figure 5. Left-Hand Belt Stop
A. Belt Stop
B. Belt
C. PTO Pulley
D. Mower Hitch Arm
E. Tractor Hitch
F. Spring Clip

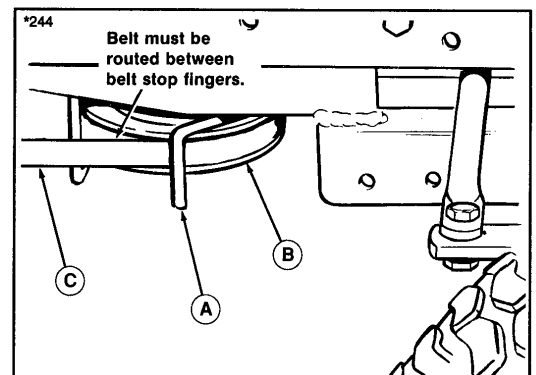


Figure 6. Right-Hand Belt Stop
A. Belt Stop
B. PTO Pulley
C. Belt

Continued

Mower Installation & Removal

8. Insert one end of the PTO rod (B, figure 7) in the mower PTO arm (A) and the other end in the tractor PTO arm (C) in hole marked "MOW". The rod must be inserted into the holes from the right-hand side as shown. Refer to figure 7 to make sure you connected correct end of rod to front. Install the spring clips (D).
9. If installing mower for the first time, or if new belt was installed, perform the mower adjustments in the Adjustment section.
10. Reverse the procedure to remove the mower.

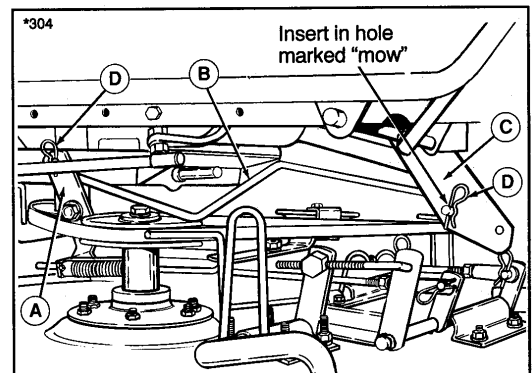


Figure 7. Installing PTO Rod
A. Mower PTO Arm
B. PTO Rod
C. Tractor PTO Arm
D. Spring Clip

Operation CONTROLS

Refer to figure 8 for an explanation of tractor and mower controls.

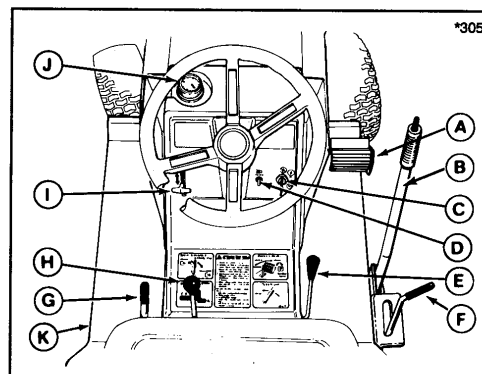


Figure 8. Tractor & Mower Controls

Ref.	Name	Function
A	Clutch-Brake	Disengages tractor clutch when pressed down at least halfway. Applies brake when fully depressed. Engages parking brake when latched over footrest.
B	Optional Lift Lever	Lifts and holds attachments in transport position (only required with attachment other than mower). (Optional)
C	Ignition Switch	Operates with key to start, run, or stop engine.
D	Light Switch	Switches headlights on or off.
E	Lift Lever	Lifts and holds mower in transport position.
F	Mower Height Control Lever	Adjusts mower cutting height.
G	PTO (Power Take Off) Lever	Engages and disengages power to attachment. Pull back to disengage.
H	Ground Speed Control Lever	Controls ground speed and forward/reverse motion. On hydro model, move left and forward (down) to go forward. Pull up to go rearward. On gear model, select forward speed 1-5 or reverse.
I	Engine Speed Control	Position from SLOW to FAST to control engine speed. Also position for engine CHOKE.
J	Gas Gauge/Cap	Shows amount of gasoline in the tank and serves as tank cap.
K	Seat Deck Release	Pull down on latch underneath left footrest while raising seat deck.

Operation

SAFETY INTERLOCK SYSTEM

Your tractor is equipped with a seat switch safety system that will automatically shut the engine off when the operator leaves the seat with the PTO engaged or the transmission lever in gear. The tractor engine will continue to run when the operator leaves the seat if the PTO is disengaged and the transmission is in neutral.

Check the seat switch (A, figure 9) every fall and spring with the following three tests. Make sure the wiring harness (B) is securely plugged into the switch.

Test 1 — Engine should NOT crank if:

- A. Seat not occupied or;
- B. Transmission lever out of neutral, or;
- C. PTO switch engaged.

Test 2 — Engine should crank if:

- A. Seat is occupied, and;
- B. Transmission lever in neutral, and;
- C. PTO disengaged.

Test 3 — Engine should shut off if:

- A. Operator rises off seat with transmission lever in gear, or;
- B. Operator rises off seat with PTO engaged.

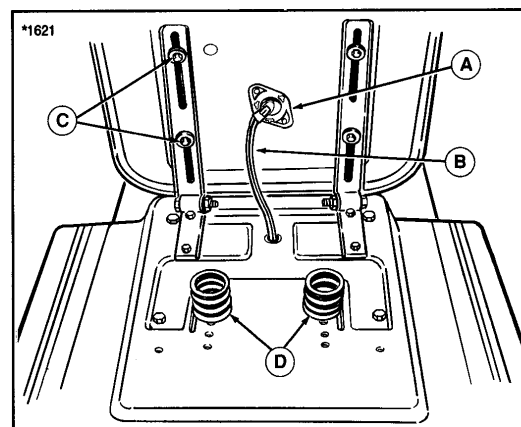


Figure 9. Seat Switch

A. Seat Switch

B. Wiring Harness

C. Capscrews

D. Seat Springs

WARNING

If the tractor does not pass the test, do not operate tractor. See your authorized dealer. Under no circumstance should you attempt to defeat the purpose of the safety system.

PUSHING THE TRACTOR BY HAND (Hydro Models)

To push the tractor by hand, the hydro release lever (A, figure 10) must be in the "PUSH" position. Rotate the lever upwards and engage lever capscrew in wrapper hole. To drive tractor, rotate lever downward, making sure that bottom of lever is several inches away from plunger (B).

BEFORE OPERATING

1. Refer to Normal Care Chart and perform any needed care.
2. Clear the work area of any objects which may be caught in or thrown by the attachment.

RECOMMENDED FUEL

Refer to your engine manual for specific fuel and oil recommendations. Never use gasoline containing methanol, gasoline containing more than 10% ethanol, gasoline additives (except gas stabilizer for winter storage), premium gasoline, or white gas because engine/fuel system damage could result.

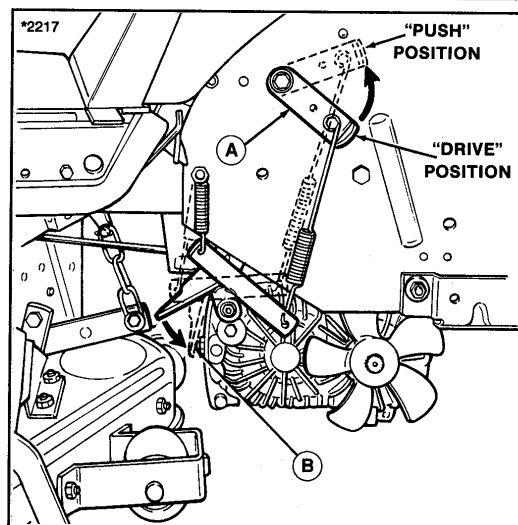


Figure 10.
A. Hydro Release Lever
B. Plunger

Operation

STARTING THE ENGINE

1. Seat yourself on tractor seat in operating position. Set the parking brake.
2. Set engine speed control to CHOKE. A warm engine may not require choking.
3. Lift the PTO lever as far as it will go to the rear to disengage the attachment.
4. Set ground speed control lever in NEUTRAL.
5. Insert the key into the ignition switch and turn it to START. When engine starts, release the key.
6. Move the engine speed control to SLOW. Warm up the engine by running it for at least a minute before engaging the PTO lever or driving the tractor.

SELECTING GROUND SPEED & ENGINE SPEED

On hydro models, ground speed is infinitely variable according to how far the control lever is pushed forward or reverse. Run engine at full throttle and use control lever to select ground speed. On gear models, most mowing is done in third or fourth gear with engine speed between 3/4 and full speed. If the terrain is rough, hilly, or sloping, use first or second gear. If the grass is wet or over three inches (76 mm) high, use full engine speed (with low gear) so the mower will have enough power to cut the grass. Shift gears only with tractor stopped and clutch-brake pedal fully depressed.



WARNING

Slope Operation

Never operate on slopes greater than 30 percent (16.7°) which is a rise of three feet vertically in 10 feet horizontally. When operating on slopes that are greater than 15 percent (8.5°) but less than 30 percent use rear wheel weights (see your dealer). Select slow ground speed before driving onto slope. Mow UP and DOWN the slope, never across the face, use caution when changing directions and DO NOT START OR STOP.

STARTING & STOPPING

1. Start the engine.
2. Set engine control for 1/3 to 1/2 speed. Select the gear best suited for conditions.
3. Release the parking brake by depressing clutch-brake pedal and unlatching pedal from the foot rest.
4. Make sure the path in desired direction of movement is clear.
5. If you are ready to mow, engage the mower PTO with moderately fast motion. Engaging PTO too slowly may cause belt wear.
6. Slowly release the clutch-brake pedal to engage clutch and start tractor into motion.
7. Adjust engine speed control to desired speed. Between 3/4 and full speed is recommended for mowing.

8. For a gradual stop on gear models, press the pedal down only far enough to disengage the clutch (refer to figure 11). For a more rapid stop, press pedal down farther to apply the brake. See "Before Leaving Operator's Position" (next page). For a gradual stop on hydro models, move the transmission control lever into NEUTRAL position. For a more rapid stop, depress the clutch-brake pedal. If you stop by depressing the pedal, move control lever to NEUTRAL before releasing pedal.

BEFORE LEAVING THE OPERATOR'S POSITION:

1. Stop tractor motion and engage parking brake.
2. Disengage the PTO and lower the attachment.
3. Set engine speed control to SLOW. Stopping a hot engine too fast may cause engine damage. Let engine idle for about a minute.
4. Turn key to OFF and remove it.

WARNING

Before leaving the operator's position for any reason, engage the parking brake, disengage the PTO, stop the engine and remove the key.

WARNING

To reduce fire hazard, keep the engine, tractor and mower free of grass, leaves and excess grease.

CLUTCH/BRAKE PEDAL OPERATION

Refer to figure 11. Depressing pedal from position A to B disengages transmission drive. Depressing pedal further from position B to C will also apply tractor brake. Parking brake is applied at position C when pedal is latched over foot rest as shown in figure 11.

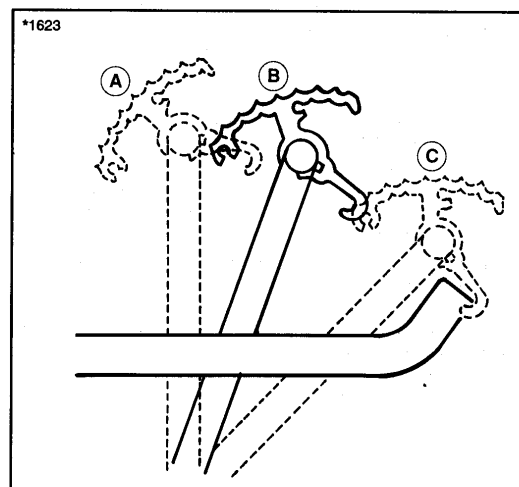


Figure 11. Brake/Clutch Pedal

Operation

MOWING PATTERN & TIPS

For the first use of the mower choose a smooth level area. Cut long straight strips overlapping slightly.

The size and type of area to be mowed determine the best mowing pattern to use. Obstructions such as trees, fences and buildings must also be considered. Where possible, make one or two passes in a clockwise direction around the outside of the area to keep cut grass off fences and walks. The remainder of the mower should be done in a counterclockwise direction so the clippings are dispersed on the cut area.

Where possible, keep the left side of the mower toward trees, posts, or other obstacles on the first pass around the obstacles to keep hand trimming to a minimum.

On moderate size, frequently mowed lawns where grass is light and dry, it is sometimes practical to mow in a clockwise direction so clippings are thrown toward the center of the lawn and concentrated for pickup and removal.

Most lawns should be mowed to keep the grass approximately two to three inches (50 to 76 mm) high. Best results are obtained by cutting often and not to short. To help keep a green lawn, never mow more than one third off the height of the grass, or a maximum of one inch (25 mm), in one mowing. For extremely tall grass, set the cutting height at maximum for the first pass, and then reset to the desired height and mow again.

On thick, or springy grass or soft ground, the mower rollers sink into the ground giving too low a cut. Adjust the cutting height as necessary. For best appearance, grass should be cut in the afternoon or early evening (in daylight) where it is free of external moisture.

Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.

Normal Care

DETERMINING OPERATING TIME

Determining operating time is easily accomplished if the tractor is equipped with an optional hourmeter. If not, multiply the time it takes to do one job by the number of times you've done the job.

NORMAL CARE SCHEDULE

A schedule for normal care is provided in Table 1. If your tractor is not equipped with an optional hourmeter, you will need to keep a record of operating time.

RAISING HOOD & SEAT DECK

To raise the hood, grasp both sides of the hood (A, figure 12) near the dash and pull outward. Pivot the hood up and forward. To open the seat deck, pull down the latch (B) under the foot rest and tilt seat deck back.

ADJUSTING THE SEAT

Raise the seat deck. While holding the seat, loosen the four capscrews (C, figure 9) that secure seat to seat deck. Position the seat as desired then tighten the capscrews.

Seat springs (D, figure 9) can be adjusted for operator comfort. Move springs forward for lighter operator and toward the rear for heavier operator.

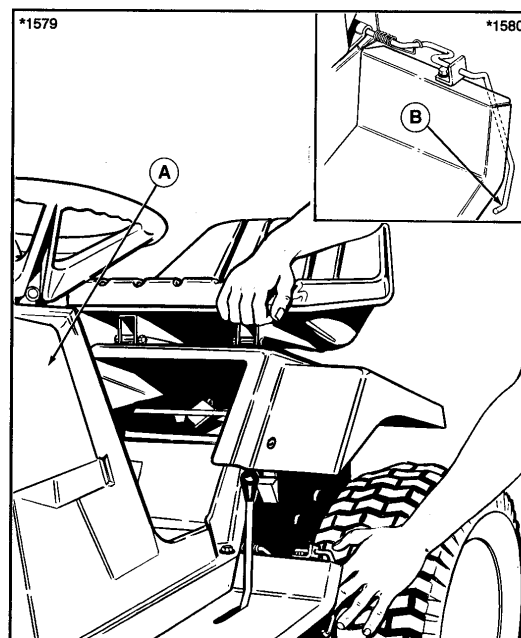


Figure 12. Operating the Seat Deck

A. Hood

B. Latch

Normal Care

	See	Before First Use	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Spring & Fall
Safety Items							
Check safety interlock system.	pg. 12	●					●
Check tractor brake adjustment.	pg. 43/45	●					●
Check mower blade brake adjustment.	pg. 53	●					●
Normal Care Items							
Check rider & mower for loose hardware.		●	●	●			
Check engine oil level.	Eng. Mn.	●	●	●			●
Check engine air filter.	" "				**●		●
Change engine oil and filter.*	" "				**Every 50 hrs.		●
Lubricate rider & mower.	pg. 19/22				●		●
Check tire pressure.	pg. 25				●		●
Check battery fluid level.	pg. 23				**●		
Check transmission fluid (hydro).	pg. 25	●			●		●
Change transmission fluid (hydro).	Dealer	Every 400 hrs. or for hydro pump service only.					
Check fuel filter.	pg. 23					●	
Clean battery & cables.	pg. 24					●	
Clean/sharpen blades.	pg. 27				●		
Inspect spark plug.	Eng.Mn.					●	
Check belt tension.	See Troubleshooting & Adjustment Sections					●	●

* Change original engine oil after first 5 hours of operation.

** More often in hot (over 85° F, 30° C) weather or dusty operating conditions.

Table 1. Schedule of Normal Care - Tractor & Mower.

CHECKING/ADDING GASOLINE

CAUTION

Never use gasoline containing METHANOL, gasohol containing more than 10% ethanol, gasoline additives, premium gasoline, or white gas because engine/fuel system damage could result.

Check the gas gauge/cap to be sure there is enough gasoline to complete the job. To add gasoline, remove the gas gauge/cap. Refer to your engine manual for gasoline recommendations. Install and hand tighten the gas gauge/cap.

LUBRICATING THE TRACTOR

Lubricate the tractor as shown in figures 13 thru 17. When a grease gun is shown, wipe the fitting clean, apply two or three shots of lithium base automotive grease, and wipe off excess grease. When an oil can is shown, wipe the area clean, apply a few drops of oil (SAE 30), then wipe up drips or spills.

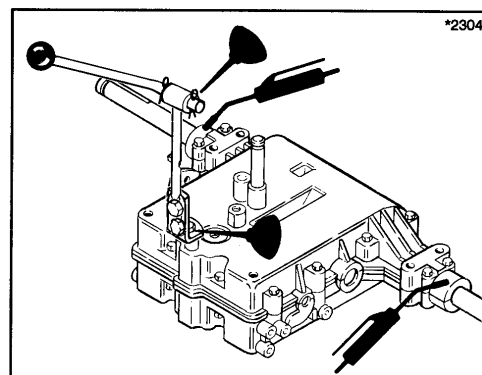


Figure 13. Shift Lever Lubrication (Gear Model)

Normal Care

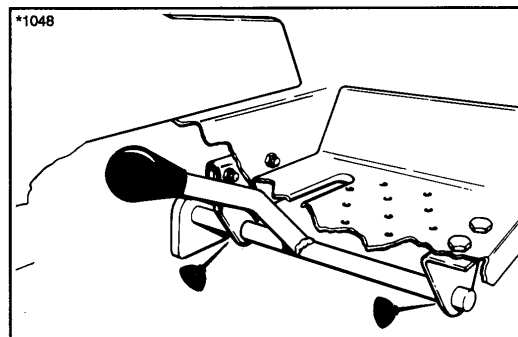


Figure 14. PTO Lever Lubrication

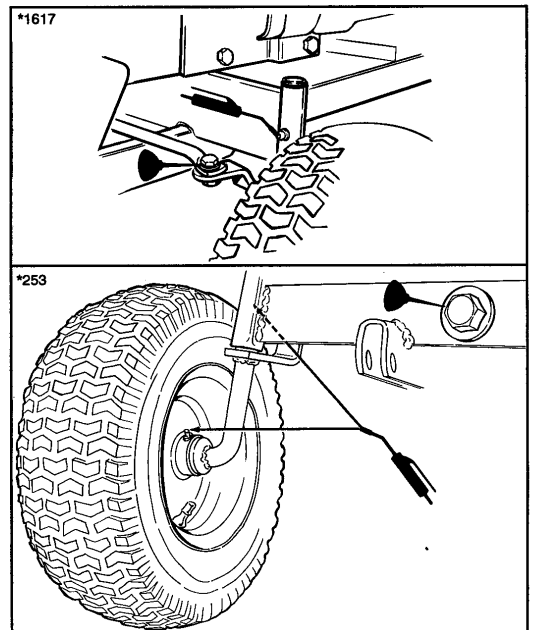


Figure 15. Front Axle Lubrication
(Two grease fittings on each side)

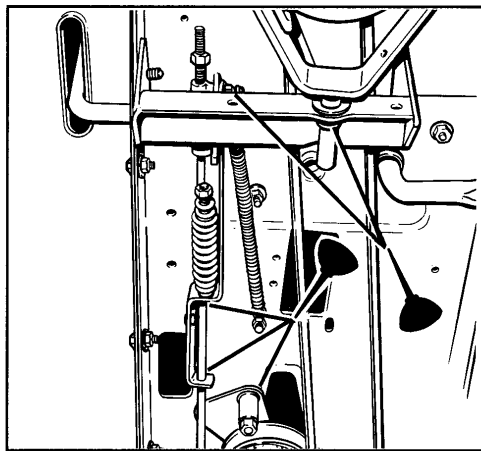


Figure 16. Clutch & Brake Rod Lubrication (Gear Model)

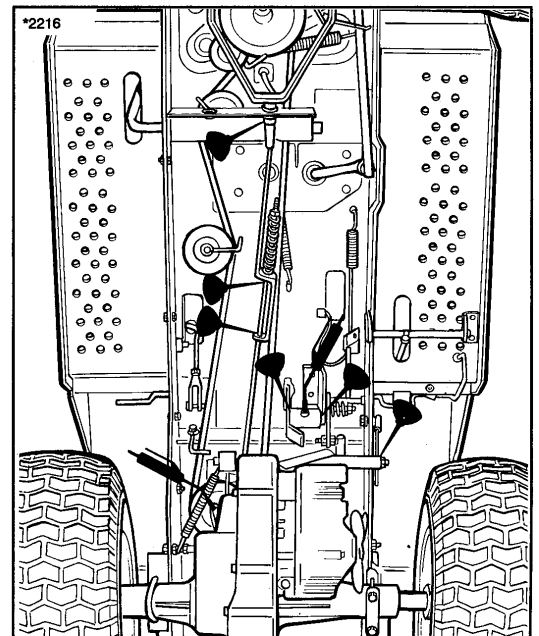


Figure 17. Clutch & Brake Rod Lubrication (Hydro Model)

Normal Care

LUBRICATING THE MOWER

Lubricate the mower as shown in figure 18 thru 20. Also lubricate the grease fittings on the mower idler pulley and arbors (underneath deck). Use an oil can with medium weight (SAE 30) oil. Brush and wipe dirt and grass from the area before applying oil. Wipe up drips and spills. Keep oil off belts and pulleys.

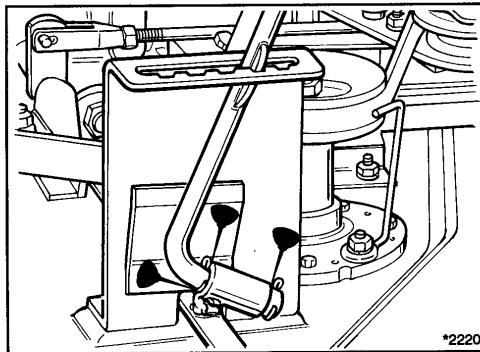


Figure 18. Lubricate Height Control Lever & Point Where Roller Bar Contacts Bracket.

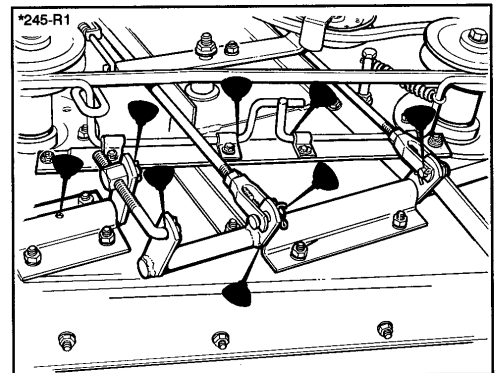


Figure 19. Lubricate Brake Lever, Clevises, & Levelling Rod.

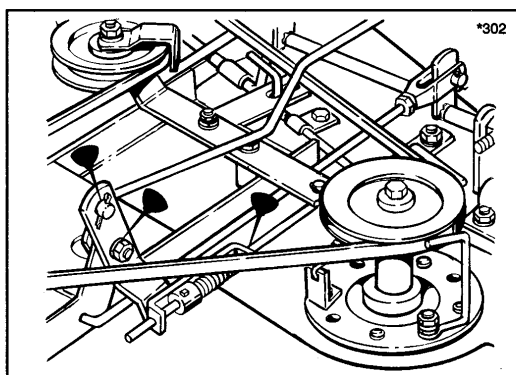


Figure 20. Lubricate Hitch, PTO Rod and PTO Arm.

CHECKING THE FUEL FILTER

WARNING

Do not remove fuel filter when engine is hot, as spilled gasoline may ignite. Do not spread hose clamps further than necessary. Insure clamps grip hoses firmly over filter after installation.

The fuel filter is located in fuel line between fuel tank and carburetor. If filter is dirty or clogged, replace as follows. Place a container below filter to catch spilled gasoline.

1. Using a pliers, open and slide hose clamps from fuel filter.
2. Remove hoses from filter.
3. Install new filter in proper flow direction in fuel line. Secure by reclamping with hose clamps. See warning at beginning of procedure.

CHECKING BATTERY FLUID

1. Raise the seat.
2. Remove filler caps, one at a time.
3. Fluid must be even with split ring full mark (figure 21). If not, add distilled water.
4. Reinstall filler caps.

Normal Care

CLEANING THE BATTERY & CABLES

WARNING

Be careful when handling the battery. Avoid spilling electrolyte. Keep flames and sparks away from the battery.

WARNING

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.

1. Disconnect the cables from the battery, negative cable first (figure 21).
2. Remove the battery clamp, then remove the battery.
3. Scrub the battery, cables, and battery compartment with baking soda and water.
4. Clean the battery terminals and cable clamps with a wire brush.
5. Reinstall battery and clamp (figure 21).
6. Connect cables, positive cable first.
7. Coat cable clamps and terminals with grease or petroleum jelly.

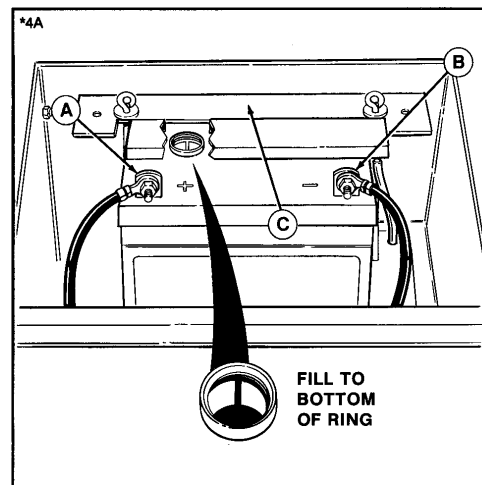


Figure 21. Battery
A. Positive Terminal
B. Negative Terminal

C. Battery Clamp

CHECKING TIRE PRESSURE

Check air pressure of all four tires. Front tires should be 12 to 15 psi. Rear tires should be 6 to 8 psi. A gauge with one-pound markings will be necessary for an accurate check .

CHECK TRANSMISSION FLUID LEVEL (Hydro Model)

Hydrostatic Fluid Level

1. Allow tractor to cool after operation. Fluid must be cool for an accurate check.
2. The fluid level is visible in the reservoir (figure 22) without removing cap. The level should be between the two lines. If not, go to step 3.
3. Raise the seat deck.
4. Before removing reservoir cap, clear all grass and debris from battery compartment and area around the hydro reservoir.
5. Remove the reservoir cap. If diaphragm does not come out with cap, remove it. Add 30W premium grade oil as required. If oil is black or milky, see your dealer to determine cause.
6. Check the level again after operating the tractor a few times. If level is consistently low, see your dealer to check for leaks.

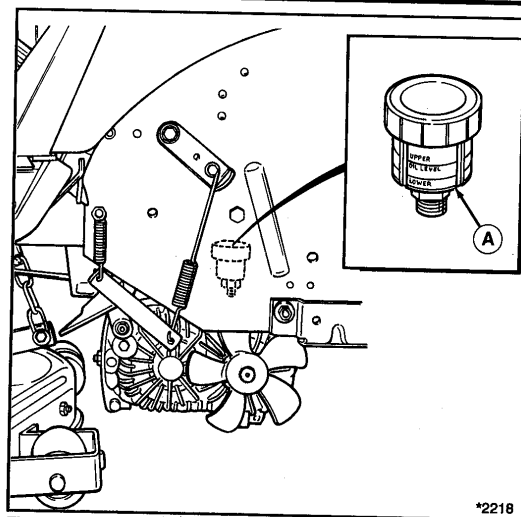


Figure 22. Hydrostatic Reservoir
A. Reservoir

*2218

Normal Care

Transaxle

The transaxle and hydro pump are a sealed unit (refer to figure 23). The transaxle is packed with grease and does not require any further lubrication unless a service overhaul is performed. Apply two shots of grease every 100 hours to fitting on input shaft of hydro pump.

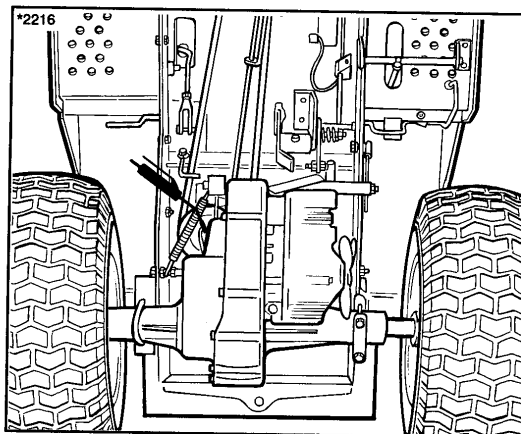


Figure 23. Transaxle Grease Fitting

TRACTOR NORMAL STORAGE

Clean all grass and dirt from the mower. To protect your tractor, store it in an enclosed dry area. Do not store it in an enclosure where fumes from the fuel tank could reach an open flame. Clean the seat with a vinyl cleaner.

To store your tractor in a cold area between winter snow removal jobs, we suggest that you fill the fuel tank at the completion of each job to prevent water condensation in the fuel tank. Wait for engine to cool before filling tank.

TRACTOR OFF-SEASON STORAGE

When the tractor is to be stored for two months or longer, take precautions as follows:

WARNING

Gasoline is highly flammable. Keep open flame or spark away from gasoline and fuel tank. Never store tractor where gasoline fumes may reach an open flame or spark.

1. To empty or prepare fuel tank:
 - a. Run tractor engine until it stops from lack of fuel, or;
 - b. Use a gasoline stabilizer. This additive, available from your dealer, prevents formation of gum and varnish for up to one year. With the additive, fuel may remain in your tank for long periods.
2. Change engine oil while the engine is still warm. Record the type and weight of oil put in crankcase.

Normal Care

3. Remove spark plugs. Pour one ounce (30 ml) of SAE 30 oil into engine through spark plug holes. Crank engine a few times to distribute oil and then reinstall the spark plugs.
4. Lubricate the tractor and mower (figure 13-20).
5. Check battery fluid level (page 21). Battery life will be extended if it is removed and stored in a cool, dry place, fully charged.
6. Clean tractor thoroughly. Coat all exposed bare metal parts with a good quality paint (obtainable from your dealer) or a light film of grease or oil.

STARTING AFTER STORAGE

1. Replace battery, if removed. Be sure terminals and clamps are clean (figure 21).
2. Remove the spark plug and wipe dry. Crank engine a few times to blow excess oil out of plug hole. Reinstall the plug.
3. Fill fuel tank with fresh gasoline (unless a fuel stabilizer was used).
4. Clean engine fins and air filter. (See engine manual.)
5. Check fluid levels and tire pressure. (See Normal Care Chart.)
6. Start the engine outdoors. Do not run engine at high speeds immediately after starting.

SHARPENING & BALANCING THE BLADES

1. Remove the mower from the tractor.
2. Position the mower as in figure 24. Secure the mower so its will not fall or slide.



WARNING

Do not handle the mower blades with bare hands. Avoid touching the cutting edge. Careless or improper handling of blades may result in serious injury.

3. Remove any dirt or foreign matter from inside the mower deck and blade.
4. To remove the blade for sharpening, use a wooden block to hold blade while removing the capscrew (figure 24).
5. Use a file to sharpen blade to fine edge. Remove all nicks and dents in blade edge. If blade is severely damaged, it should be replaced.
6. Check and balance blade. Use a balancing machine or the fixture shown in figure 25. Center the blade on a nail lubricated with a drop of oil. A balanced blade will remain level. File material off heavier end of blade until it is balanced.

Normal Care

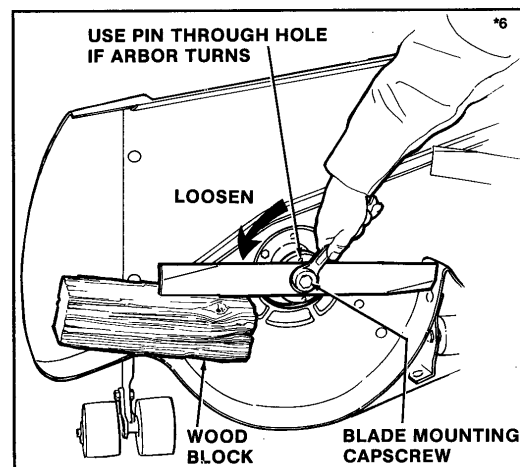


Figure 24. Removing Blade

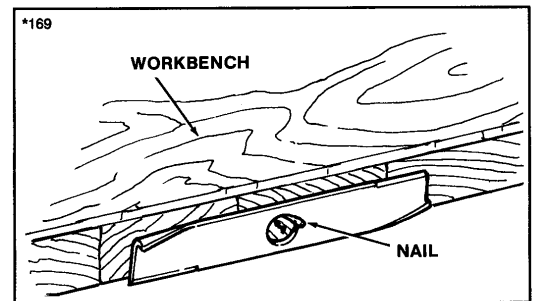


Figure 25. Balancing Blade

Normal Care

7. Reinstall each blade with the tabs pointing up toward deck and secure with a capscrew, cup washer, and spline washer. Be sure all splines are aligned and washer is flush against blade. Use a wooden block to prevent blade rotation and torque capscrew to 50-70 ft. lbs. (68-76 N.m.) (figure 26).

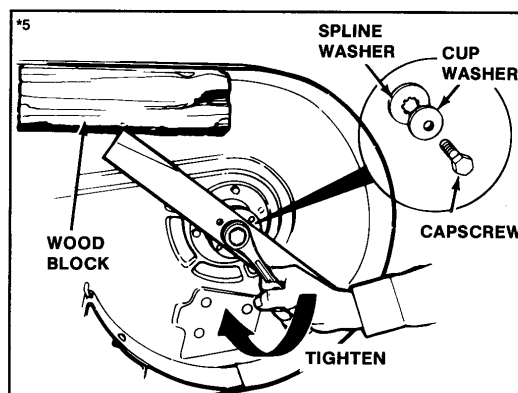


Figure 26. Installing Blade

WARNING

Blade mounting capscrews must be installed with the cup washer and spline washer and then securely tightened. Torque blade mounting capscrews to 50-70 ft. lbs. (68-76 N.m.)

MOWER OFF-SEASON STORAGE

To protect your mower, store it in an enclosed dry area. To prepare the mower for off-season storage, perform the following.

1. Remove mower from tractor if tractor is to be used without mower. (See Mower Installation and Removal section).
2. Clean top and underside of mower to remove all grass and dirt.
3. Coat all bare metal surfaces with a good quality paint (available from your dealer) or a light coat of oil to prevent rusting.
4. Lubricate mower (figure 18-20).
5. Check, sharpen and balance the mower blades (figure 24-25).
6. The belt should be stored in a cool, dark place away from sunlight or any heat source.

Troubleshooting & Repair

CONTENT OF SECTION

This section of the manual provides troubleshooting and repair instructions for the more common and easily corrected problems. For other problems, it is recommended that you contact your dealer.



WARNING

To avoid serious injury, perform maintenance on the tractor or mower only when the engine is stopped and the parking brake engaged. Always remove the ignition key and disconnect spark plug wire and fasten away from the plug before beginning the maintenance to prevent accidental starting of the engine.

TROUBLESHOOTING PROCEDURES

Troubleshooting procedures are provided in Table 2. To use these procedures, first locate the problem description that best describes the trouble that you have encountered. Check the possible causes one at a time in the order that they are listed.

1. Engine will not start.

- A. Ground speed control lever not in neutral start position. Shift into NEUTRAL.
- B. PTO clutch lever not disengaged. Disengage fully.
- C. Operator not seated. Operator must be in seat on models equipped with seat switch.
- D. Out of fuel. Refill fuel tank.
- E. Engine flooded. Move control out of choke & attempt to start.
- F. Circuit breaker tripped. Wait one minute for automatic reset. Replace if defective (see your dealer).
- G. Battery terminals require cleaning. See Normal Care section.
- H. Battery discharged or dead. Recharge or replace.
- I. Wiring loose or broken. Visually check wiring & replace broken or frayed wires. Tighten loose connections.
- J. Solenoid or starter motor faulty. Repair or replace.
- K. Safety interlock switch faulty. Replace if needed. (See your dealer.)
- L. Spark plug faulty, fouled, or incorrectly gapped. Clean & gap or replace.
- M. Water in fuel tank. Drain fuel & refill with fresh fuel.
- N. Old stale gas. Drain fuel & replace with fresh fuel.

Table 2. Troubleshooting.

Troubleshooting & Repair

- 2. Engine starts hard or runs poorly.**
 - A. Fuel mixture too rich. Move control out of choke. If problem still exists, clean air filter.
 - B. Carburetor adjusted incorrectly. See your engine manual.
 - C. Spark plug faulty, fouled, or incorrectly gapped. Clean and gap or replace.
- 3. Engine knocks.**
 - A. Low oil level. Check/add oil as required.
 - B. Using wrong grade oil. See Engine Manual.
- 4. Excessive oil consumption.**
 - A. Engine running too hot. Clean engine fins, blower screen and air cleaner. See Normal Care section.
 - B. Using wrong weight of oil. See Engine Manual.
 - C. Too much oil in crankcase. Drain excessive oil.
- 5. Engine exhaust is black or smoky.**
 - A. Dirty air filter. Clean air filter.
 - B. Choke not fully open. Move control out of choke and be sure choke opens fully. If problem still exists, check carburetor adjustment.
- 6. Engine runs, but tractor will not drive or lacks power.**
 - A. Ground speed control lever in NEUTRAL. Shift into forward or reverse gate.
 - B. Drive belt slips. (See problem and cause below.)
 - C. Check hydro transmission oil (hydro models).
- 7. Drive belt slips.**
 - A. Clutch or belt tension is out of adjustment. See Adjustment section.
 - B. Pulleys or belt greasy or oily. Clean as required.
 - C. Belt stretched or worn. Replace with correct belt.
 - D. Clutch rod binding in guide. Oil clutch rod. See Tractor Lubrication.

Troubleshooting & Repair

8. Brake will not hold.

- A. Brake is incorrectly adjusted. See Adjustment section.
- B. Brake pads worn & require replacement. See your dealer.

9. Tractor handles poorly.

- A. Steering linkage is loose. Check and tighten any loose connections.
- B. Improper tire inflation. Check and correct.
- C. Wheels are spinning and slipping. Use weights to provide additional stability and traction.
- D. Moving too fast on slopes. Reduce speed.

10. Main tractor drive belt does not stop when clutch-brake pedal is depressed.

- A. Belt stop out of adjustment. See Adjustments section.
- B. Belt tension out of adjustment. See Adjustments section.

TROUBLESHOOTING (MOWER)

- 1. Mower will not raise.**
 - A. Lift chain not attached or broken. Attach or repair.
- 2. Uneven cut.**
 - A. Mower not leveled properly. See leveling adjustment in Mower Adjustment section.
 - B. Tractor tires not inflated equally or properly.
- 3. Mower cut is rough looking.**
 - A. Engine speed too slow. Set for three-fourths to full speed.
 - B. Tractor ground speed too fast. Use lower gear.
 - C. Blades dull & require sharpening. See Normal Care section.
 - D. Mower drive belt slipping. Belt oily or worn. Clean or replace belt as necessary. Readjust belt tension.
- 4. Engine stalls easily with mower engaged.**
 - A. Tractor ground speed too fast. Use lower gear.
 - B. Engine speed too slow. Set for three-fourths to full speed.
 - C. Cutting height set too low when mowing tall grass. Cut tall grass at maximum cutting height during first pass.
 - D. Discharge chute jamming with cut grass. Cut grass with discharge pointing toward previously cut area.
- 5. Excessive mower vibration.**
 - A. Blade mounting screws are loose. Torque to 55 ft. lbs. (74 N.m). See Normal Care section.
 - B. Mower blades, arbors, or pulleys are bent. Check and replace as necessary.
 - C. Mower blades are out of balance. Remove, sharpen, and balance blades (see Normal Care section).
- 6. Excessive belt breakage.**
 - A. Belt tension too tight. Readjust belt tension.
 - B. Bent or rough pulleys. Repair or replace.
 - C. Using incorrect belt. See your dealer.
- 7. Mower drive belt slips or fails to drive.**
 - A. Mower drive belt out of adjustment. See Adjustment section.
 - B. Mower drive belt broken. Replace belt.

Troubleshooting & Repair

BATTERY REPLACEMENT

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. It may, as an example, mean that the charging system is not working properly or that the battery has lost its charge during storage. First, "Clean Battery & Cables" and "Check Battery Fluid Level" as described on page 24. Have the battery recharged if necessary. If there is any doubt about the cause of the problem, see your dealer. If you must replace the battery, remove and install the battery as described in "Clean Battery & Cables".

JUMP STARTING WITH AUXILIARY (BOOSTER) BATTERY

Jump starting is not recommended. First, check the battery as described in "Battery Replacement" above. If jump starting must be done, follow these instructions and refer to figure 27. Both booster and discharged batteries should be treated carefully when using jumper cables. Follow exactly procedures one through five, being careful not to cause sparks.



WARNING

For your personal safety use extreme care when jump starting. Never expose battery to open flame or electric spark - battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.

1. Set parking brake and place transmission in "NEUTRAL". Turn off lights and other electrical loads.
2. Remove vent caps from both the booster and the discharged batteries. Lay a cloth over the open vent wells on each battery. These two actions help reduce the explosion hazard always present in either battery when connecting a "live" battery to a "dead" battery.
3. Attach one end of one jumper cable to the positive terminal of the booster battery (identified by a red color, "+" or "P" on the battery case, post or clamp) and the other end of same cable to positive terminal of discharged battery. DO NOT permit vehicles to touch each other, as this could establish a ground connection.

Troubleshooting & Repair

4. Attach one end of the remaining cable to the negative terminal (black color, "-" or "N") of the booster battery, and the other end to a bare metal surface on the frame of your tractor **AWAY FROM** the battery compartment (do not connect directly to negative post of dead battery). Take care that clamps from one cable do not inadvertently touch the clamps on the other cable. Do not lean over the battery when making this connection.

5. The tractor with the discharged battery should now start. Reverse the jump starting procedure exactly to remove the jumper cables. Then reinstall the vent caps and throw the cloths away as they may have corrosive acid on them.

 WARNING

Any procedure other than the above could result in: (1) personal injury caused by electrolyte squirting out of the battery vents, (2) personal injury or property damage due to battery explosion, (3) damage to the charging system of the booster vehicle or the immobilized vehicle.

Do not attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents of the battery. If ice can be seen or if the electrolyte fluid cannot be seen, do not attempt to start with jumper cables as long as the battery remains frozen.

Troubleshooting & Repair

*1582

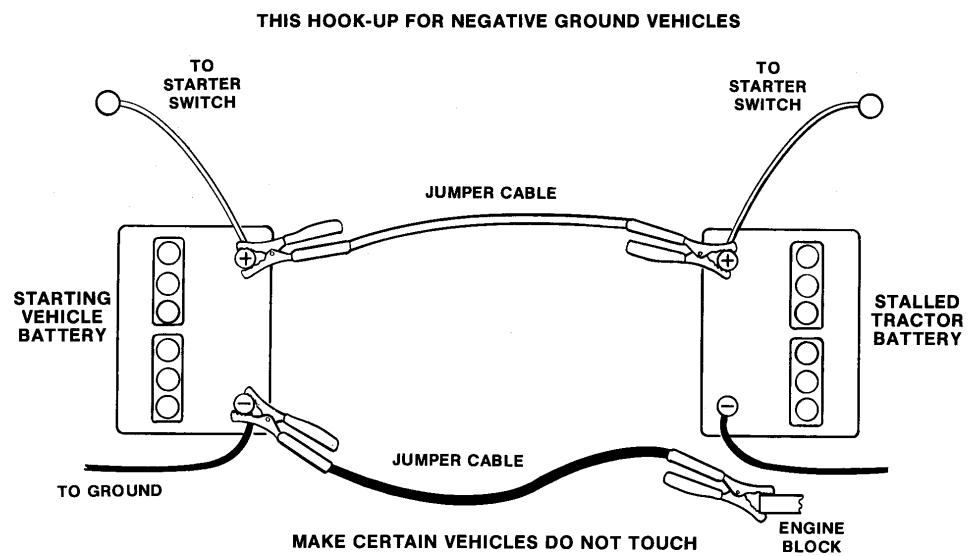


Figure 27.

TRACTOR DRIVE BELT REPLACEMENT

Hydro Model



CAUTION

To avoid damaging belt, do not pry over pulleys.

1. Remove the mower from the tractor.
2. With the clutch disengaged, remove the idler pulley spring (I).
3. Loosen the PTO pulley belt stops (G, figure 28).
4. Remove the tractor belt from the engine pulley (A) and allow to rest on top of the PTO pulley.
5. Loosen the belt stop on the idler pulley (B) and remove the belt.
6. Loosen the capscrew securing belt stop (J) and remove belt from idler pulley (D).
7. Loosen the belt stop (F, figure 29) and remove the belt from the transmission pulley (E).
8. Remove the belt from PTO pulley (F) and tractor.

- | | |
|------------------------|------------------------------|
| A. Engine Pulley | F. PTO Pulley |
| B. Pulley, Flat | G. PTO Pulley Belt Stops |
| C. Idler Pulley | H. Belt Stops, Engine Pulley |
| D. Idler Pulley, Flat | I. Idler Pulley Spring |
| E. Transmission Pulley | J. Idler Pulley Belt Stop |

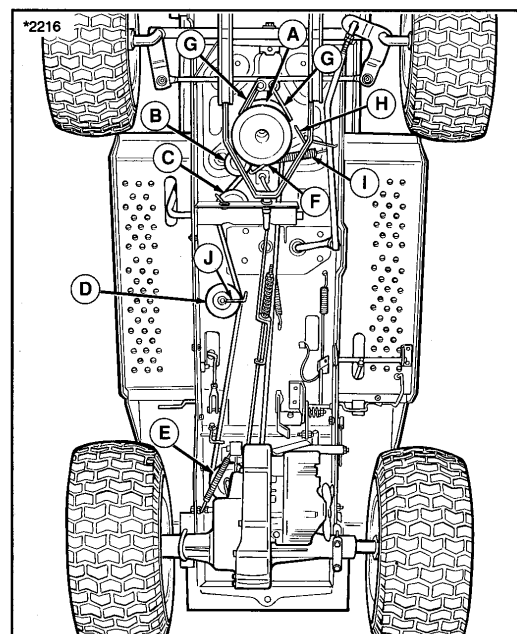


Figure 28. Hydro Tractor (seen from underneath).

Troubleshooting & Repair

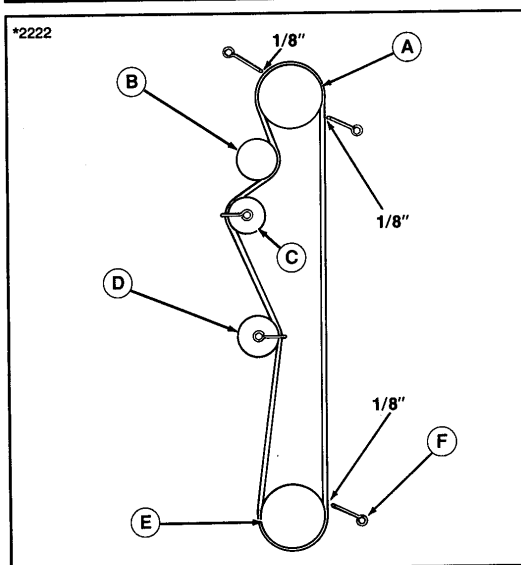


Figure 29. Belt Diagram

A. Engine Pulley
B. Idler Pulley
C. Idler Pulley

D. Idler Pulley, Middle
E. Transmission Pulley
F. Belt Stop

9. Install the new belt by reversing the procedure. Be sure the V side of the belt is against all the pulleys except the flat idler pulleys (B and D, figure 28 and 29). The belt diagram is shown in figure 29.

10. Reinstall belt over idler pulley belt stop (J) and tighten capscrew. Make sure pulley can rotate freely after installation.

11. Reinstall idler pulley spring.

12. Perform "Tractor Brake Adjustment" and all belt stop adjustments. Make sure belt stop (F, figure 29) is positioned 1/8" from transmission pulley (in the forward position).

TRACTOR DRIVE BELT REPLACEMENT

Gear Model



To avoid damaging belt do not pry belt over pulleys.

1. Set the parking brake.
2. Remove the mower from tractor.
3. Remove the two capscrews (A, figure 30), lockwashers, and nuts securing the gear shift lever (B) to transmission bracket (C).
4. Open the seat deck and remove capscrew (D), flat washer, spacer and nut securing gear shift (B) to frame (E).

Troubleshooting & Repair

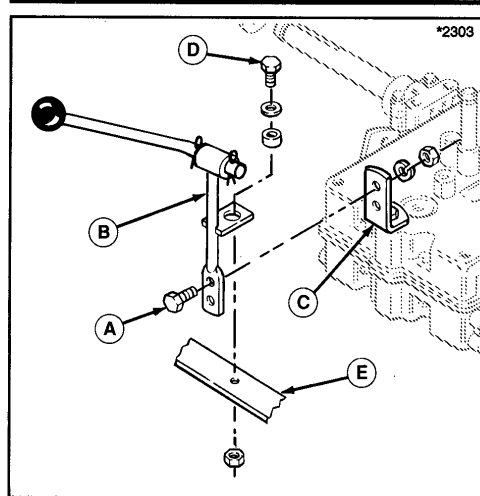


Figure 30.
A. Capscrew
B. Gear Shift Lever
C. Trans. Bracket

D. Capscrew
E. Frame

5. Loosen the belt guide (A, figure 31) from the idler pulley (B).

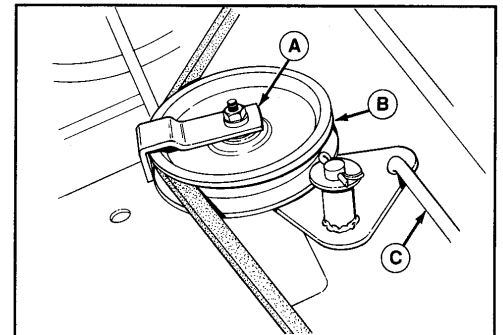


Figure 31.
A. Belt Guide
B. Idler Pulley
C. Clutch Rod

Troubleshooting & Repair

6. Loosen nut securing rear idler pulley (A, figure 32) and slide pulley forward to release belt tension. Belt guide (B) will be loose.
7. Loosen belt stops (C) on transmission drive pulley (D).
8. Remove belt from rear idler pulley and transmission drive pulley. Slip the belt over pulleys and between transmission gear shift brackets.
9. Remove belt from idler pulley (E).
10. Loosen the belt stops (F) from engine pulley (G).
11. Remove the belt from the engine pulley (G).
12. Install the belt in reverse order of removal procedure. The belt pattern is shown in figure 32.
13. Reinstall the gear shift lever to frame and transmission.
14. Tighten the belt guide on the idler pulley so that it is perpendicular to the frame. The belt should not touch the guide when the tractor is engaged. Tighten belt stops on drive pulley and engine pulley so that there is 1/8" clearance between belt and belt stop. Belt stop on rear idler pulley self-indexing when nut is tightened.
15. To adjust rear idler pulley position, refer to "Clutch Rod Adjustment", page 47.

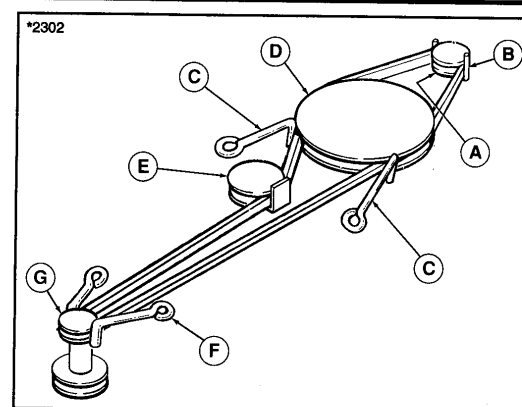


Figure 32.

A. Rear Idler Pulley
B. Belt Guide
C. Belt Stop
D. Trans. Drive Pulley

E. Idler Pulley
F. Belt Stop
G. Engine Pulley

MOWER BELT REPLACEMENT



CAUTION

To avoid damaging belt do not pry belt off pulleys.

1. Remove mower from the tractor.
2. Loosen the belt guide (C, figure 33) on the idler pulley.
3. Move idler arm (B) toward rear of mower deck to release blade brakes.
4. While holding brake released, remove belt from right and left arbor pulleys.
5. Install the new belt on the pulleys as shown in figure 29.
6. Reinstall the mower on the tractor (see Mower Installation & Removal). Check mower drive belt tension as outlined in the Adjustment section. Run the mower under no load conditions for about 5 minutes. Recheck belt tension and blade brake adjustment after 1 hour of operation.
7. Reposition the belt guide on the idler pulley (figure 33). Before tightening the nut (D), position the belt guide so it is 1/4 inch (6 mm) behind the idler arm (B) when viewed from above (figure 33). Hold the belt guide when tightening nut.

NOTE

Each time after changing the mower belt tension, perform the remaining mower adjustments: Right-Arbor Belt Stop, Idler Pulley Belt Guide, PTO Pulley Belt Stops, and Blade Brake.

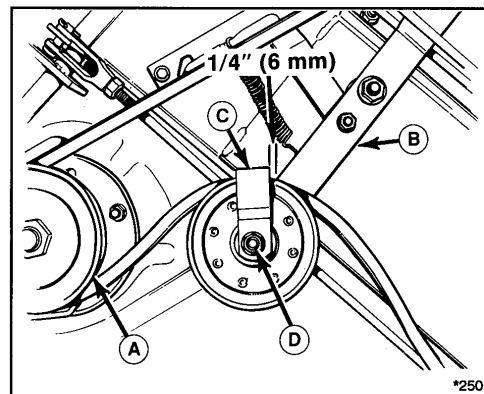


Figure 33. Mower Belt Replacement

- A. Arbor Pulley
- B. Idler Arm
- C. Belt Guide
- D. Nut

Troubleshooting & Repair

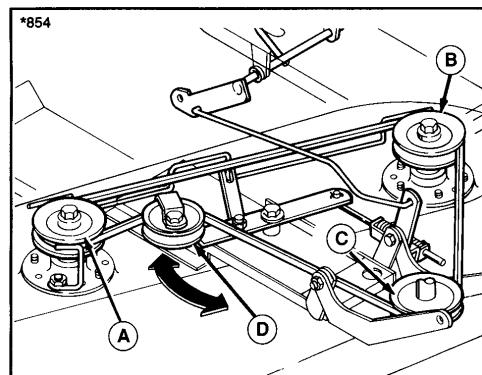


Figure 34. Mower Belt Pattern
A. V-Pulley, Right Arbor
B. V-Pulley, Left Arbor
C. Engine PTO Pulley
D. Flat Idler Pulley

Adjustments



WARNING

To avoid serious injury, perform adjustment only with engine stopped, key removed, and tractor on level ground.

TRACTOR BRAKE ADJUSTMENTS (Hydro Model)

1. With clutch/brake pedal released, rotate the brake cam (A, figure 35) forward until it stops. There should be 3/16" gap between transaxle housing (B) and rear point of brake cam.
2. If adjustment is required, remove cotter pin and turn adjusting nut (C) until proper 3/16" clearance is achieved. Turning the nut in will decrease clearance and turning the nut out will increase clearance. Reinstall cotter pin after adjustment.
3. Depress the clutch/brake pedal and latch parking brake over footrest. When compressed, the brake spring (A, figure 36) should be 3-3/8", measured between the rod guide (B) and adjusting nut (C).
4. If adjustment is required, turn adjusting nut (C) until proper 3-3/8" spring length is achieved.

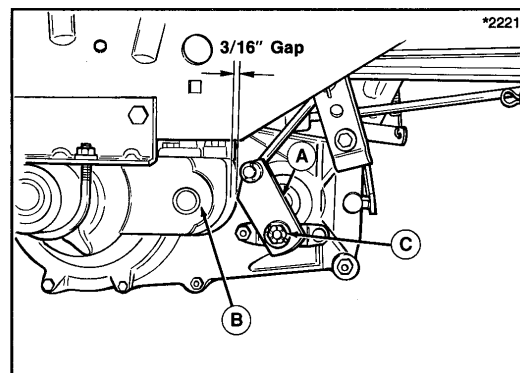


Figure 35. Brake Adjustment (Hydro Model)

- A. Brake Cam
B. Transaxle Housing
C. Adjusting Nut

Adjustments

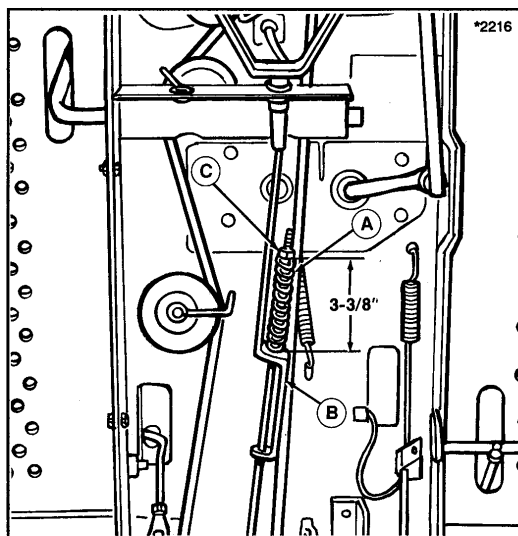


Figure 36. Brake Spring Adjustment (Hydro Model)
A. Brake Spring
B. Rod Guide
C. Adjusting Nut

TRACTOR BRAKE ADJUSTMENTS (Gear Model)

1. Adjust parking brake as follows:

- a. Place the transmission in gear and release the parking brake. Move the brake rod (I, figure 38) back and forth to be sure there is no tension on the brake pads.
- b. Push the cam lever (A, figure 37) forward (toward front of tractor) to take out any slack. The gap between lever (A) and stop (B) should be $\frac{1}{8}$ inch (0.3 mm). Use a feeler gauge to measure. If not $\frac{1}{8}$ inch, perform step "c".
- c. Loosen or tighten the adjustment nut (C) to achieve correct dimension. Some models are equipped with two nuts. If so, loosen the outer nut, adjust the inner nut as necessary, then tighten the outer nut.

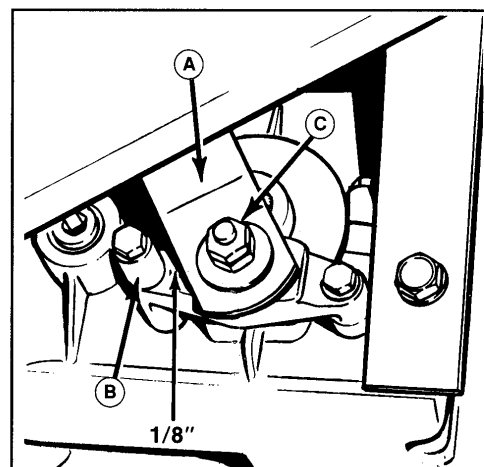


Figure 37. Parking Brake Adjustment (Gear Model)

A. Brake Cam Lever

B. Stop

C. Adjustment Nut

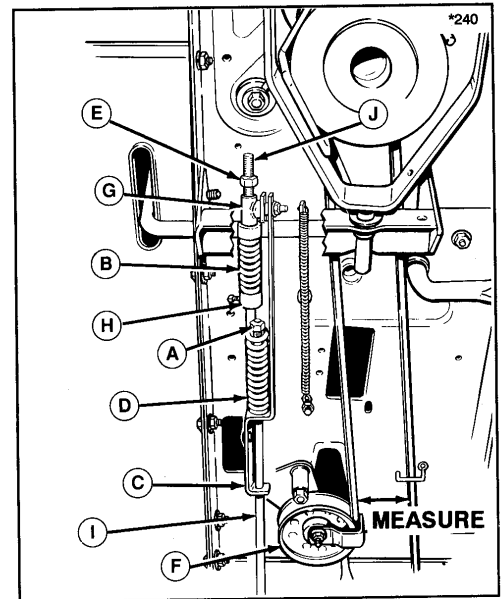
Adjustments

2. Adjust the brake rod as follows:

- a. Make sure the brake cam lever is properly adjusted on the disc brake. See step 1.
- b. Fully depress clutch pedal and lock parking brake.
- c. Adjust the brake rod nut (A, figure 38) until spring (D) is compressed to $2\frac{11}{32}$ " length.

Figure 38. Brake-Clutch Adjustment (Gear Model)

- | | |
|--------------------|---------------------|
| A. Nut | F. Idler Pulley |
| B. Spring | G. Clutch Rod Guide |
| C. Brake Rod Guide | H. Set Collar |
| D. Spring | I. Brake Rod |
| E. Nut | J. Clutch Rod |



CLUTCH ROD (Gear)

Adjust the clutch rod as follows:

1. Make sure clutch pedal is released and parking brake is not locked.
2. Apply 15-20 ft. lbs. to force idler pulley (F, figure 38) to firmly seat transmission drive belt. Measure the distance between the belt strands (from inside to inside). Distance should be between 2 3/4" and 3 3/8".

3. To adjust distance between belt strands, loosen rear idler pulley. Move rear pulley rearward to increase distance and move pulley forward to decrease distance.

Note: For smooth operation, the drive system is designed to allow some belt slippage at transmission drive pulley when clutch pedal is released. In the following adjustment, less belt slippage can be obtained by slightly reducing the 2 7/16" dimension.

4. Make sure spring (B, figure 38) is seated against spacer over rod guide (G) and set collar (H) is against spring. Apply 15-20 lbs. pressure on idler pulley (F) to position belt in pulley. Push set collar (H) against spring (B) to compress spring to 2 7/16" ($\pm 1/16$ ") and tighten setscrew. Release idler pulley and check dimension. If adjustment is required, apply parking brake, loosen setscrew, reposition set collar, and tighten set collar. Release parking brake and recheck dimension until 2 7/16" dimension is achieved.
5. Measure distance between rod guide (G) and nut (E). Distance should be 5/8". Turn nut as required to correct distance.

ENGINE PULLEY BELT STOP

Adjust drive pulley belt stop as follows:

There should be 1/8 inch (3 mm) between each belt stop and the belt when the tractor clutch is engaged (pedal up). See figure 39.

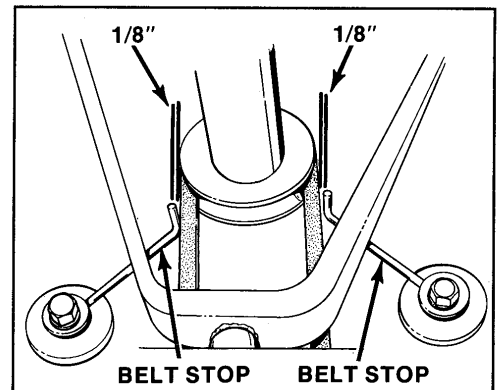


Figure 39. Drive Pulley Belt Stops

Adjustments

NEUTRAL ADJUSTMENT (Hydro Model)

If the tractor creeps forward or back with transmission in neutral notch, adjust as follows.

1. Raise rear of tractor off ground with suitable hoist or floor jack. Install jackstands underneath transaxle and block front wheels.
2. Raise the seat deck. The control lever quadrant (A, figure 40) is mounted with slotted holes so it can be adjusted. Loosen the two self-tapping screws (C) and move the quadrant so the screws are centered in the quadrant slots. Then tighten the two screws.
3. Place speed control lever in neutral position. Start engine and run at maximum RPM.
4. Loosen jam nut (B, figure 41) and adjust control link length by rotating nut (A, figure 41) in either direction until wheels stop rotating. Snug jam nut (B) finger-tight.
5. Check for neutral from forward and reverse with speed control lever. Repeat steps 3 and 4 if needed.
6. Hold the adjustment nut (B) and tighten outer jam nut (A) securely.
7. Remove unit from jackstands or jack.

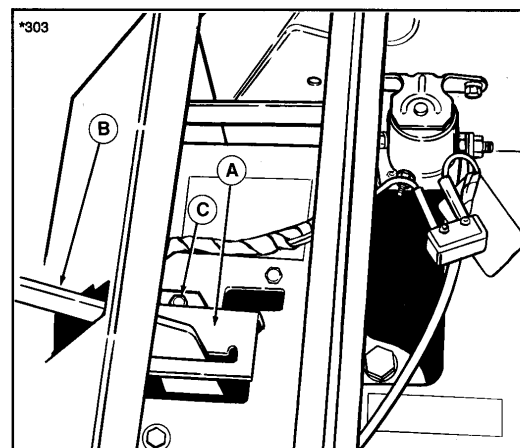


Figure 40. Control Lever Quadrant
A. Quadrant
B. Transmission Engagement Lever
C. Taptite Screw

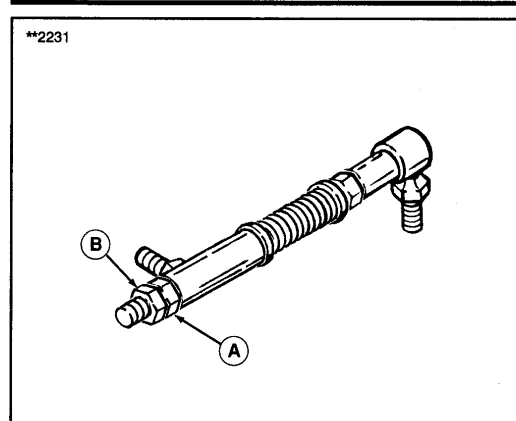


Figure 41. Hydro Control Linkage
A. Adjustment Nut
B. Jam Nut

MOWER ADJUSTMENTS

Mower Drive Belt Tension

Using the mower lift lever, lower the mower. Using the height control lever, place the mower in highest cutting position. Place the PTO lever in engaged position. The gap between the rod guide (A, figure 42) and the set collar (B) should measure $\frac{3}{8}$ to $\frac{1}{2}$ inch (10 to 13 mm). If not, disengage the PTO. Loosen the setscrew (C). Move the rod forward to increase the gap or back to decrease the gap then tighten the setscrew. Engage the PTO and recheck the adjustment. Readjust if necessary.

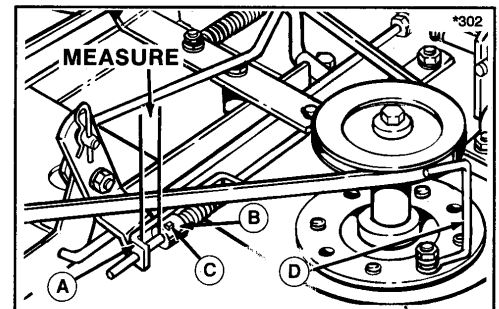


Figure 42. Drive Belt Tension

A. Rod Guide
B. Set Collar

C. Setscrew
D. Belt Stop

Adjustments

Arbor Belt Stops

The arbor belt stops are item D in figure 34 and item B in figure 43. There should be 1/8 inch (3 mm) clearance between the belt stops and belt when the PTO lever is engaged. If not, loosen the nut, move the belt stop and retighten the nut.

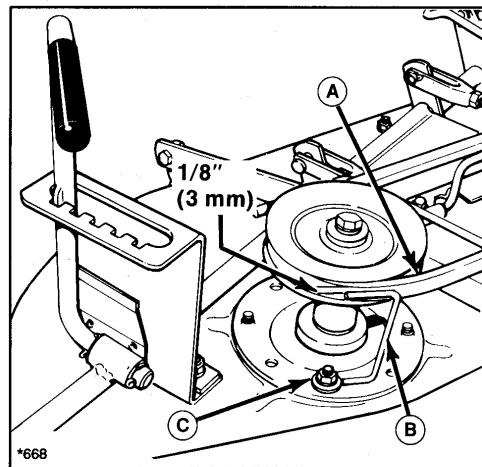


Figure 43. Right Arbor Belt Stop

A. Belt
B. Belt Stop

C. Nut

Idler Pulley Belt Guide

The idler pulley belt guide is correctly adjusted when its edge is 1/4 inch (6 mm) from the rear edge of the idler arm (figure 44). If not, loosen the nut (C) and move the belt guide. Tighten the nut and recheck the measurement.

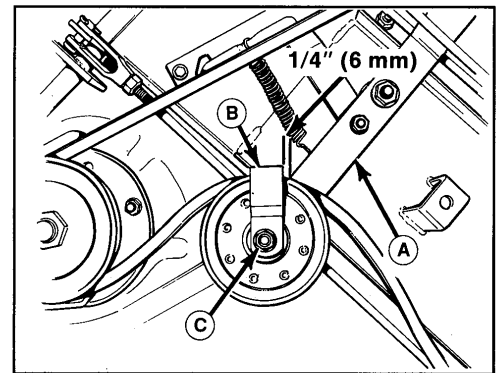


Figure 44. Idler Pulley Belt Guide

A. PTO Idler Arm
B. Belt Guide
C. Nut

PTO Pulley Belt Stops

There are two belt stops at the PTO pulley; one on the left (figure 45) and one on the right (figure 46). With the PTO lever engaged, measure the distance between the belt stop and belt. There should be 1/16 inch (1.5 mm) clearance between each belt stop and the belt. To adjust a belt stop, loosen its mounting capscrew, move the belt stop, and retighten the capscrew. Recheck the measurement.

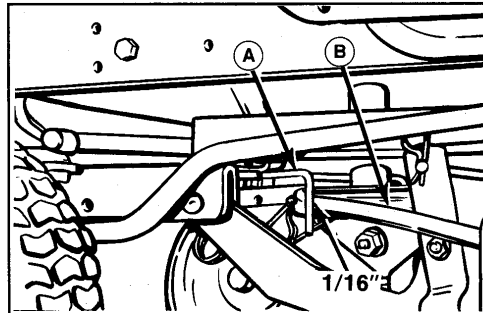


Figure 45. Left PTO Pulley Belt Stop
A. Belt Stop
B. Belt

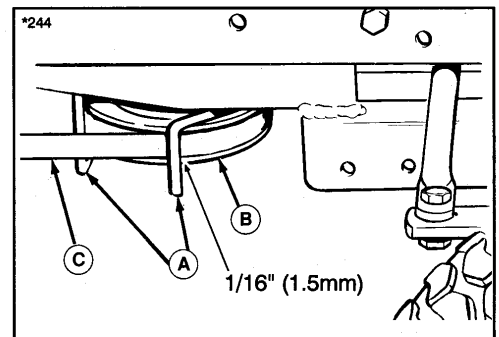


Figure 46. Right PTO Pulley Belt Stop
A. Belt Stop
B. PTO Pulley
C. Belt

Adjustments

LEVELLING THE MOWER

If the cut is uneven, the mower may need levelling. Unequal or improper tire pressure may also cause an uneven cut. To level the mower, proceed as follows:



WARNING

To prevent accidental starting, remove the ignition key and then remove the spark plug wire and fasten it away from the spark plug.

1. With the mower installed, place the tractor on a smooth level surface, such as a concrete floor. Turn the front wheels straight forward.
2. Check for bent blades, and replace if necessary.
3. Disengage the PTO. Arrange the mower blades so that they are both pointing from side-to-side, perpendicular to the tractor. Engage the PTO.
4. Measure the distance between the outside tips of each blade and the ground. If there is more than 1/8 inch (3 mm) difference between the measurements on each side, proceed to step 5. If there is 1/8 inch (3 mm) or less difference proceed to step 6.

5. Remove the cotter pin (E, figure 47) which secures the mower levelling rod (D). Shorten the rod (D) to raise the left side of the mower or lengthen the rod to lower the left side of the mower. Put the levelling rod back in its hole and recheck the measurements. If the mower is level, install the cotter pin (E).
6. Disengage mower PTO to arrange the blades so they are facing front to back, parallel with the tractor. Engage mower PTO again.
7. Measure the distance to the ground from the front tip of the left blade and the rear tip of the right blade. The measurements should be equal. If they are not, proceed as follows.

NOTE

One full turn of clevis will equal about 1/8 inch.

8. Remove the cotter pins and clevis pins (B) from the hitch clevises (C). Loosen the two nuts (A). Turn each clevis an equal number of turns in the same direction. Shorten the hitch rods to raise the front of the mower or lengthen the hitch rods to lower the front of the mower.
9. Reinstall the pins through the clevises (C) and rear suspension arm (F) and recheck the measurements. When the mower is level, reinstall the cotter pins and tighten nuts (A) against clevises (C).

Adjustments

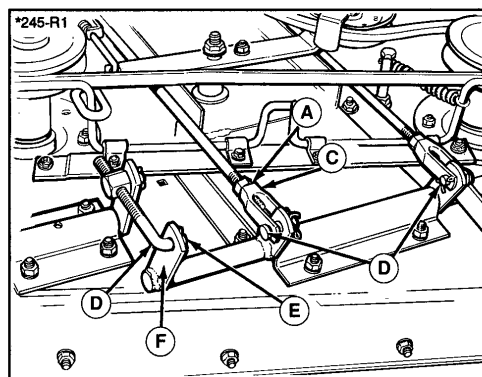


Figure 47. Levelling Mower

- | | |
|-------------------|------------------------|
| A. Jam Nuts | D. Mower Levelling Rod |
| B. Clevis Pins | E. Cotter Pin |
| C. Hitch Clevises | F. Suspension Arm |

Blade Brake Adjustment

Inspect the mower deck with the mower attached and PTO rod released. The blade brake rods (A & B, figure 48) should firmly contact the belt (C) at the rear of the right and left arbor pulleys. There should be a slight clearance between the two brake rods

in the center. The right brake rod (B) should be slightly closer ($1/16'' - 1/8''$) to belt than the left hand brake rod (A) with the PTO rod released.

To adjust blade brake rods, loosen the mounting brackets (D) and adjust rods for clearance. Retighten bracket bolts and check again. Engage the PTO and be sure that brake rods are at least $1/8''$ from belts.

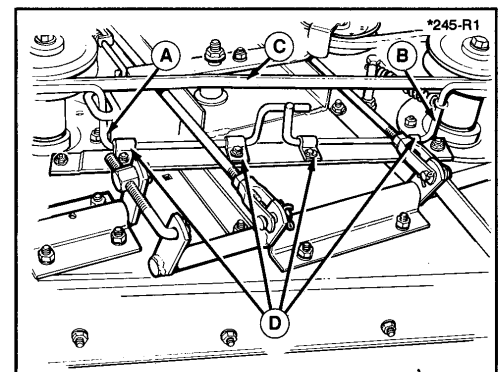


Figure 48.

- | | |
|-------------------|----------------------|
| A. L.H. Brake Rod | C. Belt |
| B. R.H. Brake Rod | D. Mounting Brackets |

Adjustments

SMALL LIFT LEVER ADJUSTMENT

NOTE

Use this procedure if small lift lever (E, figure 8, page 11) is used. If optional large lift lever (B, figure 8) is used, refer to next procedure.

1. Place the mower in low cut position. Using the lift lever, raise the mower.
2. Measure the distance between top of upstop bracket and top of footrest (figure 49). The measurement should be 3-3/8 inches.
3. To adjust, disconnect clevis (E) from chain. Loosen nut (A) and turn clevis to raise or lower mower. Reconnect chain to check measurement. When correct, tighten nut against clevis.

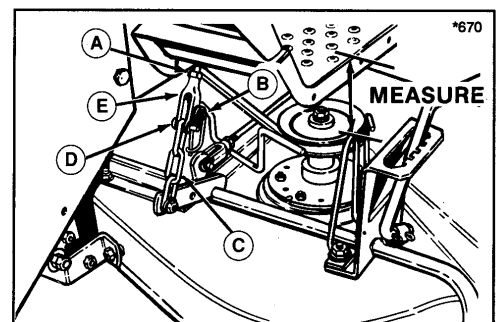


Figure 49. Lift Assembly - Small Lift Lever

A. Nut
B. Clip
C. Chain
D. Pin
E. Clevis

LARGE LIFT LEVER

NOTE

Use this procedure if optional large lift lever (B, figure 8, page 11) is used. If small lift lever (E, figure 8) is used, see previous procedure.

1. Place the mower in low cut position. Using the lift lever, raise the mower.
2. Measure the distance from bottom edge of lever bracket to mower deck (figure 50).

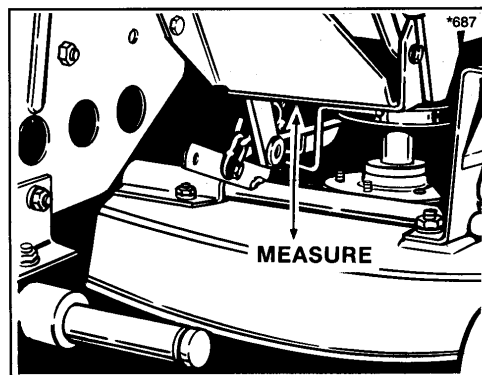


Figure 50. Measurement - Large Lift Lever

3. The measurement should be 5 inches.

4. To adjust, disconnect trunnion (C, figure 51) from lift chain. Loosen the nut and turn trunnion to raise or lower mower. Tighten nut when measurement is correct.

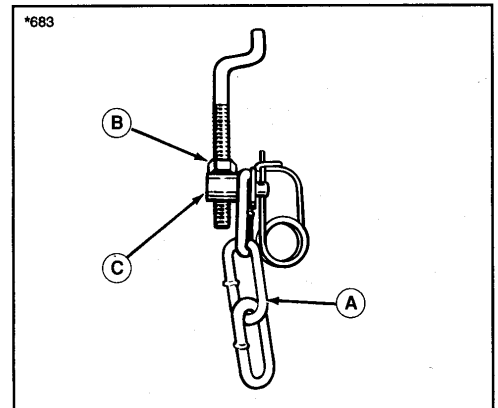


Figure 51. Lift Assembly - Large Lift Lever

- A. Chain
B. Nut
C. Trunnion

Specifications

BASIC ENGINE

Make: Briggs & Stratton - 4 cycle air cooled
Model & Type: See engine I.D. plate
Horsepower: 12.5 HP @ 3600 rpm (Eng. Mfg's. Rating)
Cylinder: 1 horizontal
Bore & Stroke: 12.5 HP: 3.44 x 3.06 inches (87 x 78 mm)
Displacement: 12.5 HP: 28.4 cu. in. (465 cc)
Crankshaft: Vertical, syncrobalanced
Battery: 12 volt 39 amp. hour
Governor: Mechanical full throttle - no load setting
@ 3400 $\pm$ 100 rpm; idle speed @ 1750 $\pm$ 200 rpm
Crankcase Capacity: See engine manual
Ignition: Electronic
Charging: Unregulated 3-amp DC charging circuit
Air Cleaner: Oil foam with reuseable polyurethane element
Fuel Tank: 2.2 gallons (8.3 liters) of "regular" grade leaded or unleaded gasoline.
Starter: 12 volt electric gear drive

TRANSMISSION (Hydro)

Type: Belt drive to hydrostatic transmission
Differential: Gear reduction unit with bevel gears
Ground speeds @ 3400 rpm:
Forward - 0-4.8 mph
Reverse - 0-2.6 mph

TRANSMISSION (Gear)

Type: Spur gear trans. w/5 speed forward & 1 reverse
Differential: Bevel gear type
Ground speeds @ 3400 rpm:
1st gear - .9 mph (1.5 km/h)
2nd gear - 1.8 mph (2.9 km/h)
3rd gear - 2.6 mph (4.2 km/h)
4th gear - 3.7 mph (5.0 km/h)
5th gear - 4.0 mph (6.4 km/h)
Reverse - 1.9 mph (3.4 km/h)

DIMENSIONS & WEIGHT

Height (at steering wheel): 39 in. (99 cm)
Width: 33.75 in. (88 cm)
Length: 65.25 in. (166 cm)
Clearance - Front Axle: 9 in. (228 mm)
Clearance - Transmission: 6 in. (152.4 mm)
Wheel Base: 45.5 in. (1156 mm)
Turning Radius: 24 in. (610 mm) to inside of rear wheel
Front Tires: 15 x 6.00 x 6 Pneumatic
Rear Tires: 18 x 8.50 x 8 Pneumatic

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Common Replacement Parts

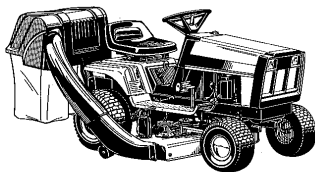
Listed below are part numbers for the more common replacement parts. Use the order form at the back of the manual to order a complete, illustrated parts manual. Only genuine replacement parts will assure optimum performance and safety. Do not attempt repairs or maintenance unless proper procedures and safety precautions are followed. For assistance in any area, see your dealer.

QTY PER UNIT	DESCRIPTION	PART NUMBER
1	Drive Belt - Engine to Hydro Transmission	1656960
1	Drive Belt - Engine to Gear Transmission	1708114
1	Drive Belt - Mower	108505
1	Keys - Ignition (2 keys with Ring)	122203
2	Headlight Bulb	1677371
2	Blade - Mower (Standard)	1657589
3	Cotter Pin - Levelling Clevises & Rod	918447
1	Spring Clip - Mower PTO Rod	106787
1	Cotter Pin - Mower PTO Rod	918448
2	Hitch Pin - Mower	156306
2	Safety Clips - for Hitch Pins	176012
1	Battery - 340 Cold Cranking Amps	1685215
1	Fuel Filter	173206
1	Interlock Switch - PTO	1701580
1	Interlock Switch - Transmission	1665586
1	Interlock Switch - Seat	1700636

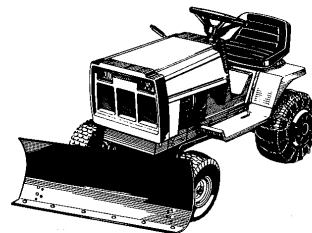
DESCRIPTION	PART NUMBER
Simplicity Engine Oil:	
• SAE5W-30 Cold Weather Engine Oil	* 1685576
• SAE 30W - 32° and above	* 1685659
Multi-Purpose Hydraulic/ Transmission Oil	* 1685516
* Case of 12 qts. See your dealer to buy individual quarts.	

Grease Gun Kit	1685510
8 Oz. Tube - for above	103077
Touch-Up Paint	
Deep Orange Spray Paint, 13 Oz. Can	1685611
Deep Orange Paint, 1 Qt.	1685612
Deep Orange, 1/2 Oz. Touch-up Dauber	1685615
Gloss Black Spray Paint, 13 Oz. Can	1685639
Gloss Black Paint, 1 Qt.	1685641
Pneumatic Tire Seal - Stops Leaks. Available in following amounts:	
11 Oz. Tube	1685523
Case of 24-11 Oz. Tubes	1685525
12 Pac - 11 Oz. Tubes	1685537
Hourmeter Kit	1685535
Designer Seat Cover	1685540

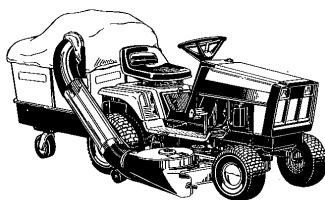
Optional Attachments & Accessories



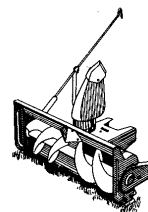
DELUXE TWIN CATCHER - For the best lawn appearance.



42" DOZER BLADE - For snow removal and light dozing of dirt, gravel, etc.



TURBO COLLECTION SYSTEMS - Collect grass clippings, thatch, and leaves with powerful turbo collector. Can be used with 6.5 bu. twin bag collector (shown above), 10 bu. dump cart, or QuadBagger™



36" SNOWTHROWER - Efficient single stage operation to handle the heaviest of snows.



36" MULCHER/SHREDDER KIT - Finely chops grass clippings into tiny particles. Helps to fertilize your lawn and eliminates the need to bag or rake grass and leaves.

36" MULCHER/SHREDDER KIT - Includes discharge baffle and shredder blades.

TIRE CHAINS for traction.

HOURLY METER to record operating time.

FRONT WEIGHT to improve steering and stability with rear mounted attachment.

REAR WHEEL WEIGHTS to improve traction and stability.

DUMP CART for vacuum collector and hauling chores.

SNOW CAB to shield operator from blowing snow and wind.

NOTE: Some attachments require accessories. See your dealer or the attachment operator's manual.

Parts Manual Available

AGCO Allis Parts Manuals are fully illustrated. All of the assemblies are shown in exploded views which show the relationship of the parts and how they go together. Important assembly notes and special torque values are included in the illustrations. For standard hardware, a torque specification chart is included.

To order, enclose this form with a check or money order made out to AGCO Allis. Address the envelope to:

AGCO Allis Lawn & Garden Equipment
Attn: Cashier
500 N. Spring Street
P.O. Box 997
Port Washington, WI 530740997

***Extend Equipment Life -
Use Only Genuine
AGCO Allis Repair Parts***

- ☐ I would like a Parts Manual (TP-1206) for my 512 Series (5-Speed or Hydro) lawn tractor and mower. Enclosed is a check or money order for \$5.50.
- ☐ I would like a Parts Manual (TP-1176) for my 512 Series Attachments and Accessories. Enclosed is check or money order for \$5.50.
- ☒ Please include \$1.50 for shipping and handling.

Print clearly. This will be your mailing label.
Allow four to six weeks for delivery.

Name _____

Street or RFD _____

City, State, Zip _____

Tractor Mfg. No. _____

Notes _____

Notes

Notes _____

Notes

Notes _____



**DEUTZ
ALLIS**

LAWN & GARDEN EQUIPMENT

500 N. Spring St. P.O. Box 997 Port Washington, WI USA 53074-0997

FORM 1708890
PRINTED IN U.S.A.
©1992 5/92