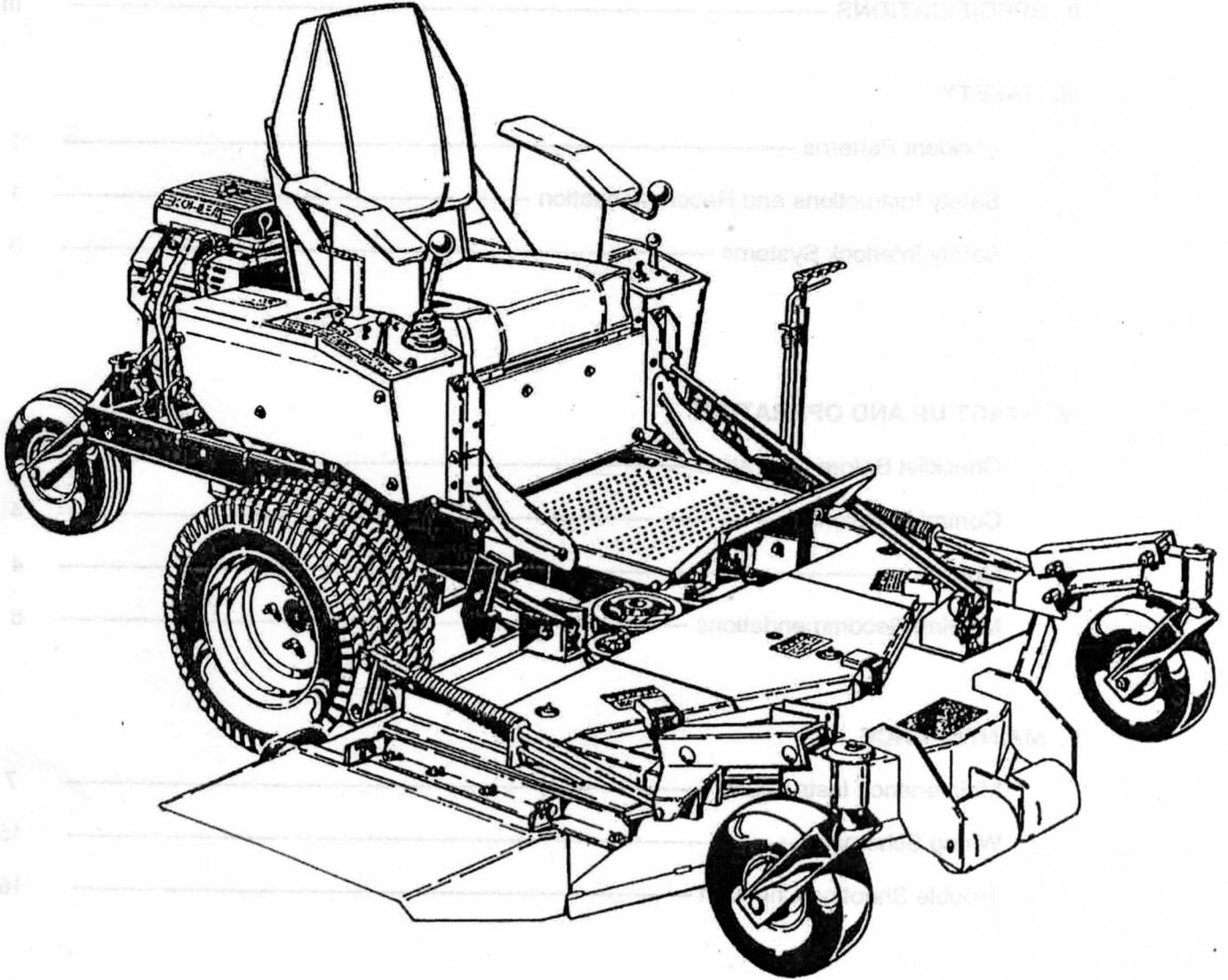


Safety Instructions & Operators Manual

COMMERCIAL CLIPPER

2203F & 2503F

Zero Turn Radius Mower



Congratulations for buying a Commercial Clipper product. Your Commercial Clipper Zero Turning Radius Riding Mower was designed and built to provide long and trouble free service. Keep in mind that it, like any other mechanical device can be potentially dangerous if used improperly, and hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the equipment. Study this manual and pay special attention to the important Safety Precautions on pages 1-3. Following these instructions will help you continue to enjoy the trouble-free performance expected of the Commercial Clipper product.

COUNTRY CLIPPER LIMITED WARRANTY.

COMMERCIAL CLIPPER MODEL

For one (1) year from the date of the original purchaser's purchase of a **COMMERICAL CLIPPER** zero turn radius mower, for commercial, or non-residential use (or for 90 days if used for rental purposes), **COUNTRY CLIPPER**, through any **COUNTRY CLIPPER** dealer, will replace, free of charge, any parts, found upon examination by the factory at Corydon, Iowa, to be defective in material or workmanship or both.

Items such as belts, hoses and other wear items are covered for 60 days from the purchase date for defects in material or workmanship; blades are not covered by any warranty. This warranty does not apply to Engines and their components, Hydraulic Transmissions, Gear Reduction Final Drives or Batteries, as these items are warranted separately by their manufacturer. This warranty does not apply to parts that have been damaged by accident, alteration, abuse, improper lubrication, normal wear or other causes beyond our control, nor does this warranty apply to any liability for consequential damages.

All transportation costs incurred by the purchaser in submitting parts to a **COUNTRY CLIPPER** dealer for replacement under this warranty must be paid by the purchaser.

There is no other express warranty for this product.

All implied warranties, including those of merchantability and fitness for a particular purpose are, unless specifically required by the law of the jurisdiction, hereby excluded.

Where implied warranties are required by law, including those of merchantability and fitness for a particular purpose, they are, where allowed by the law of the state, limited to one (1) year from purchase date for the original purchaser's use. Liability for consequential damages, under any and all warranties, both express and implied, are hereby excluded unless specifically required by the statutory law of the jurisdiction.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

WARNING: THE USE OF REPLACEMENT PARTS OTHER THAN GENUINE *COMMERICAL CLIPPER* PARTS MAY IMPAIR THE SAFETY OF *COMMERICAL CLIPPER* PRODUCTS AND WILL VOID ANY LIABILITY AND WARRANTY BY *COUNTRY CLIPPER* ASSOCIATED WITH THE USE OF SUCH PARTS.

IMPORTANT: Please fill out the attached *COMMERICAL CLIPPER* Product Registration sheet immediately and mail to:

***COUNTRY CLIPPER*, Corydon, IA 50060, USA**

TRACTOR SPECIFICATIONS

	w/ 48" DECK	w/ 60" DECK	
Length			
All Models -----	96"	101"	
Width			
All Models -----	49"	61"	
Height			
All Models (To top of seat back)-----	45 1/2"	45 1/2"	
Weight			
All Models ----- Approx.	Approx. 850 lbs.	950 lbs	
Fuel Tank			
All Models -----	Approx. 5 gallons		
Hydrostats			
All Models -----	(2) Hydro-Gear BDU-10L		
Engine			
Model 2203F -----	22 h.p. twin Kohler Command		
Model 2503F -----	25 h.p. twin Kohler Command		
Engine to Hydrostat belt (Kevlar)			
All Models -----	(SPECIAL) A-83		
Tires	Front	Drive	Rear
All Models	4.10-3.50 x 4	20-10.0 x 10	13-6.00 x 5

DECK SPECIFICATIONS

	48"	60"
ITEM	48"	60"
Cutting width	48"	60"
Cutting height	-----1.00" to 5"-----	
Blades	(3)-17"	(3)-21"
Overall width including chute	57 1/2"	69 1/2"
Material thickness	12 GA.	12 GA.
Reinforcement plate	10 GA.	10 GA.
Spindle bearings	25mm	25mm

NOTE: Tractors should be matched to decks to insure sufficient power is available for the intended usage.

WE SHARE YOUR DESIRE TO PROTECT YOURSELF, YOUR FAMILY, YOUR FRIENDS AND NEIGHBORS FROM ACCIDENTAL INJURY. OBSERVING AND ENFORCING THE FOLLOWING GUIDELINES WILL HELP TO INSURE THE SAFETY OF EVERYONE.

PLEASE BE CAREFUL!

SAFETY

ACCIDENT PATTERNS TO AVOID

- I. CONTACT WITH THE ROTATING BLADE**
--This accident usually happens when the operator is clearing the discharge chute of grass, (especially when the grass is wet), or when the operator adjusts the machine without turning it off and waiting for the blades to completely stop.
- II. PROPELLED OBJECTS** --Sticks, rocks, wires, and other objects can be propelled out through the discharge chute or from under the mower housing. Bystanders are particularly vulnerable.
- III. GRASS CATCHER OR GUARD** --The mower shall not be operated without either the entire grass catcher or guard in place.
- IV. OVERTURNING** --This happens when riding mowers are used on steep slopes, embankments or hills. The operator in these cases can come in contact with the blades or sustain injuries during a fall.

SAFETY INSTRUCTIONS AND RECOMMENDATIONS

- 1. PEOPLE WHO OPERATE, SERVICE, OR ARE OTHERWISE ASSOCIATED** with the Zero Turning Radius Mower should be trained in its proper use and warned of its dangers. Before operating, adjusting, or servicing the Zero Turning Radius Mower they should read and understand this entire manual and the owner's engine manual.
- 2. AVOID CONTACT WITH MOVING PARTS.** Keep hands and feet from under mowing deck and away from blades at all times. Turn engine (motor) off if you must unclog the chute.

- 3. AVOID HILLS AND SLOPES.** Use extreme caution when mowing up or down slopes. **NEVER** mow across the face of a slope. If a slope must be ascended, drive up the slope; back down when descending. Reduce speed and use caution to start, stop and maneuver. To prevent loss of control on a slope avoid sharp turns, sudden changes in direction, and sudden stops and starts.
- 4. DISENGAGE POWER TO MOWER BEFORE BACKING UP.** Do not mow in reverse unless **ABSOLUTELY** necessary and then only after turning around and observing the entire area behind the mower. Go slowly. Most "running over victim" accidents occur in reverse.
- 5. BEGINNING OPERATORS SHOULD LEARN HOW TO STEER** the Zero Turning Radius Mower before attempting to mow. Start with slow engine speed and drive without the blades engaged in open area until comfortable with the machine.
- 6. KNOW HOW TO STOP QUICKLY.** Know the location and operation of every control, especially how to brake and how to disengage the mower blades.
- 7. DO NOT MOVE THE JOYSTICK CONTROL** from forward position to reverse position rapidly. The speed and/or direction of travel is affected instantly by movement of the Joystick Control.
- 8. DO NOT ALLOW CHILDREN TO OPERATE MOWER.** Do not allow others who have not had instruction to operate mower.

9. **ALWAYS TURN ENGINE OFF AND REMOVE KEY** before leaving mower to prevent children and inexperienced operators from starting the engine. Never leave the mower unattended with engine running. Always wait for all moving parts and all sounds to stop before leaving operator's seat. Always set the parking brake on an unattended mower.
10. **WEAR STURDY, ROUGH-SOLED WORK SHOES AND CLOSE-FITTING SLACKS** and shirts. Never operate mower in bare feet, sandals or sneakers.
11. **NEVER CARRY PASSENGERS.**
12. **KNOW THE AREA YOU ARE TO MOW.** Watch for hidden dangers such as rocks, roots, sticks, holes, bumps, and drop-offs, etc. Before mowing, pick up all debris in area to be mowed. Sharp and hard objects can be propelled at a high speed and can act like shrapnel. Walk through tall grass **BEFORE MOWING** to make sure there are no hidden dangers. Mow higher than desired in tall grass to expose any hidden objects and/or obstacles, clean the area, and then mow to the desired height.
13. **NEVER REFUEL A MOWER INDOORS.** Allow the engine time to cool before refueling. Unseen vapors may be ignited by a spark. Always clean up spilled gasoline. Never run the engine indoors in a garage or any other closed building. Allow engine to cool before storing in any enclosure. The engine exhaust and gasoline fumes are dangerous.
14. **NEVER REMOVE THE FUEL CAP** or add gasoline to a running or hot engine or an engine that has not been allowed to cool for several minutes after running. Always make sure the gas cap is in place.
15. **DO NOT SMOKE AROUND THE MOWER** or the gasoline storage container. Gasoline fumes can easily ignite.
16. **KEEP GASOLINE IN A WELL-VENTILATED AREA** away from your living quarters and in tightly-capped safety cans. Never store mower with gasoline in the tank inside a building where fumes may reach open flame or spark.
17. **DISENGAGE BLADE, STOP ENGINE AND REMOVE IGNITION KEY** before any servicing. Be sure all moving parts and sounds have stopped. Let engine cool and disconnect the spark plugs so the engine cannot start by accident. **A SLIGHT ROTATION OF THE BLADES COULD START THE ENGINE.**
18. **KEEP ALL NUTS, BOLTS, AND SCREWS TIGHT** to be sure equipment is in safe working condition, especially blade mounting bolts.
19. **VEHICLE SHOULD BE STOPPED AND INSPECTED FOR DAMAGE** after striking a foreign object and the damage should be repaired before restarting and operating the equipment. Stop immediately and check for damage or loose parts if mower should start vibrating.
20. **DISENGAGE BLADES BEFORE DRIVING ACROSS WALKS** or projecting objects.
21. **KEEP SAFETY DEVICES AND GUARDS IN PLACE.** If any of the safety switches become inoperable, have them repaired immediately.
22. **DO NOT STEP OR STAND ON THE MOWER HOUSING.** Step or stand only on the foot deck.
23. **WATCH OUT FOR TRAFFIC** near roadways and when crossing roads.
24. **THIS MACHINE IS NOT MEANT FOR HIGHWAY OR STREET USE.** It is not a recreational vehicle and it should not be operated as such.
25. **DO NOT USE MOWER WHEN GRASS IS WET OR SLIPPERY.**
26. **MOW ONLY DURING DAYLIGHT.**
27. **ALWAYS DISENGAGE THE MOWER BLADE CLUTCH** when transporting
28. **NEVER OPERATE WITHOUT ANTI-BUCK CYLINDER** properly **ATTACHED**

SAFETY INTERLOCK SYSTEM

DO NOT OPERATE MOWER IF SAFETY SWITCHES ARE NOT OPERATING PROPERLY

Your Zero Turning Radius Mower is equipped with switches interlocked for your safety.

1. The mower blades must be disengaged before the engine will start.
2. The Joystick Control Lever must be in neutral "DOWN" position before the engine will start.
3. The engine will stop if the mower blade clutch is engaged when the operator leaves the driver's seat.
4. The engine will stop if the Joystick Control Lever is not in the neutral "DOWN" position when the operator leaves the driver's seat.
5. The engine will stop if the brake is "SET" and the Joystick Control Lever is moved to the "UP" position.
6. The engine will stop if the brake is "SET" and the mower blade clutch is engaged.
3. Do not mix oil with gasoline.
4. Do not use white, high test or premium gasoline. Do not use de-icers, carburetor cleaners, or other such additives.
5. Check the crankcase oil level. Make sure the engine is off. The mower should be parked on a level area. Do not overfill. (See your engine manual for more detailed instructions.)
6. Check the hydrostatic transmission oil level. (See "Maintenance" section of this manual.)
7. Check battery fluid level.
8. Inspect V-belts.
9. Check tire pressure:
All Models
Deck tires Drive tires Rear tires
10" 16 psi 20" 16 psi 13" 16 psi
10. Make sure underside of mower deck is free of grass.
11. Make sure mower blades are sharp and secured tightly.
12. Clean the air intake screen on the engine if necessary.
13. Perform any other maintenance as it becomes necessary. (See the "Maintenance" section of this manual.)

START UP AND OPERATION

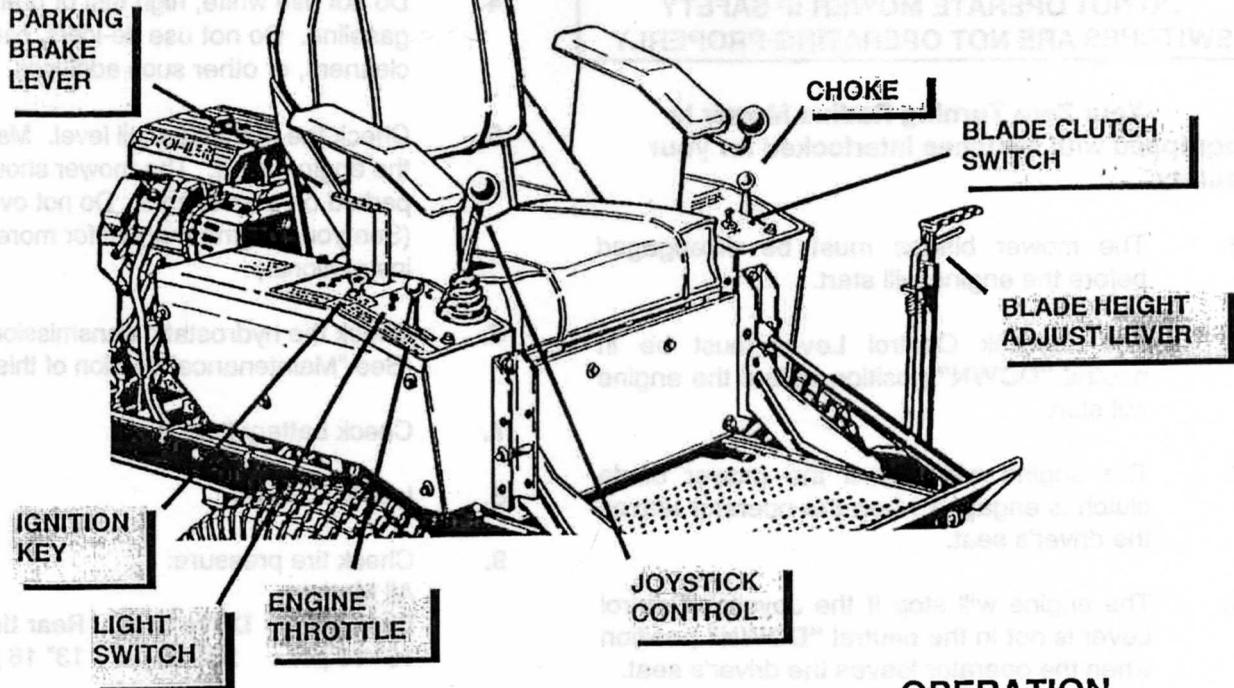
CHECKLIST BEFORE OPERATION

 **WARNING** 

HANDLE GASOLINE WITH CARE--IT IS HIGHLY FLAMMABLE. DO NOT SMOKE. ENGINE SHOULD BE OFF AND COOL. USE APPROVED GAS CONTAINER. NEVER FILL TANK INDOORS. WIPE UP ANY SPILLS. REPLACE CAP TIGHTLY

1. Make sure fuel tank is full. Use regular unleaded gasoline (see engine owner's manual for more details).
2. Make sure dirt and foreign matter is kept out of gas tank. Use a clean funnel and gas can.

CONTROL LOCATIONS



OPERATION



WARNING



AVOID INHALING EXHAUST FUMES-- CARBON MONOXIDE GAS IS COLORLESS AND ODORLESS, AND CAN CAUSE UNCONSCIOUSNESS, AND IS POTENTIALLY LETHAL. DO NOT RUN LAWN MOWER IN GARAGE OR OTHER CONFINED AREA.

IMPORTANT: If the operator is inexperienced with the Joystick zero turning radius control he/she should follow these recommendations: Disengage the mower blades. Go very slowly until thoroughly familiar with the machine. Keep away from fences, buildings, and other obstructions. While becoming familiar with the machine, move the Joystick Control smoothly and slowly. Practice until operation is smooth and efficient.

1. **MOVE JOYSTICK CONTROL TO neutral "DOWN" position** by centering it and pushing down.
2. **SET PARKING BRAKE.** Pull rearward to set.
3. **DISENGAGE MOWER BLADE CLUTCH** by moving clutch switch to "OFF" (right) position.
4. **SET ENGINE CHOKE CONTROL** for cold starts to full position.
5. **SET ENGINE THROTTLE TO 1/2 throttle.**
6. **TURN IGNITION KEY to "START"** position and release to "RUN" as soon as engine starts. **Note:** Prolonged cranking will damage starter motor and shorten the battery life.
7. **ADJUST ENGINE THROTTLE AND CHOKE** for desired engine smoothness and speed. **Note:** When mowing, always run engine at full throttle.



CAUTION



AVOID HILLS AND SLOPES. USE EXTREME CAUTION WHEN MOWING UP OR DOWN SLOPES. NEVER MOW ACROSS THE FACE OF A SLOPE. IF A SLOPE MUST BE ASCENDED, DRIVE UP THE SLOPE; BACK DOWN WHEN DESCENDING.

8. **RELEASE PARKING BRAKE.** Push brake lever forward to release.

9. **TO DRIVE:** Move the Joystick control to the "UP" position. Move the Joystick Control forward to move forward. Increasing forward movement of the Joystick Control will increase the speed of travel. To reverse the direction, pull the Joystick Control slightly back. To turn, move the Joystick Control toward the direction you want to turn. To turn on a zero radius axis, go slowly and move the Joystick Control Lever to the side you wish to turn and slightly to the rearward at the same time.

10. **BRAKING:** To brake mower, gently move Joystick Control in the opposite direction you are traveling. If the parking brake is engaged with the Joystick Control in the "UP" position the engine will stop.

11. **CUTTING HEIGHT ADJUSTMENT:** Disengage Cut Height Adjust Lever Catch. Adjust "HIGHER" by moving the lever rearwards. Adjust "LOWER" by pushing the lever forward. Engage the Cut Height Lever Catch by releasing. **NOTE:** To achieve a 1" to 3" cutting range, the bar connecting the deck lift handle and the rear of the deck must be in the first hole. To achieve a 3" to 5" range, the bar connecting the deck lift handle and the rear of the deck must be in the second hole.

12. **ENGAGE MOWER BLADE CLUTCH** by pulling up on the blade clutch switch lever then moving the lever to "ON" (left) position. The engine will not start if the blade clutch is engaged. If the operator is not in the seat, the engine will stop if the clutch is engaged.



CAUTION



FOR SMOOTH, SAFE OPERATION, MOVE THE JOYSTICK CONTROL LEVER IN A GENTLE, SLOW MOTION. NEVER PULL OR PUSH THE JOYSTICK CONTROL LEVER RAPIDLY, ESPECIALLY ON SLOPES.

13. **TO STOP:**

A. Move Joystick Control to neutral position and then to the "DOWN" position.

B. Set the parking brake.

C. Disengage the mower blade clutch by moving the clutch to the "OFF" (right) position.

D. Slow engine speed with throttle to slowest position.

E. Turn ignition key to "OFF" (left) position.

F. Remove the key and wait for all movement and all sound to cease before dismounting

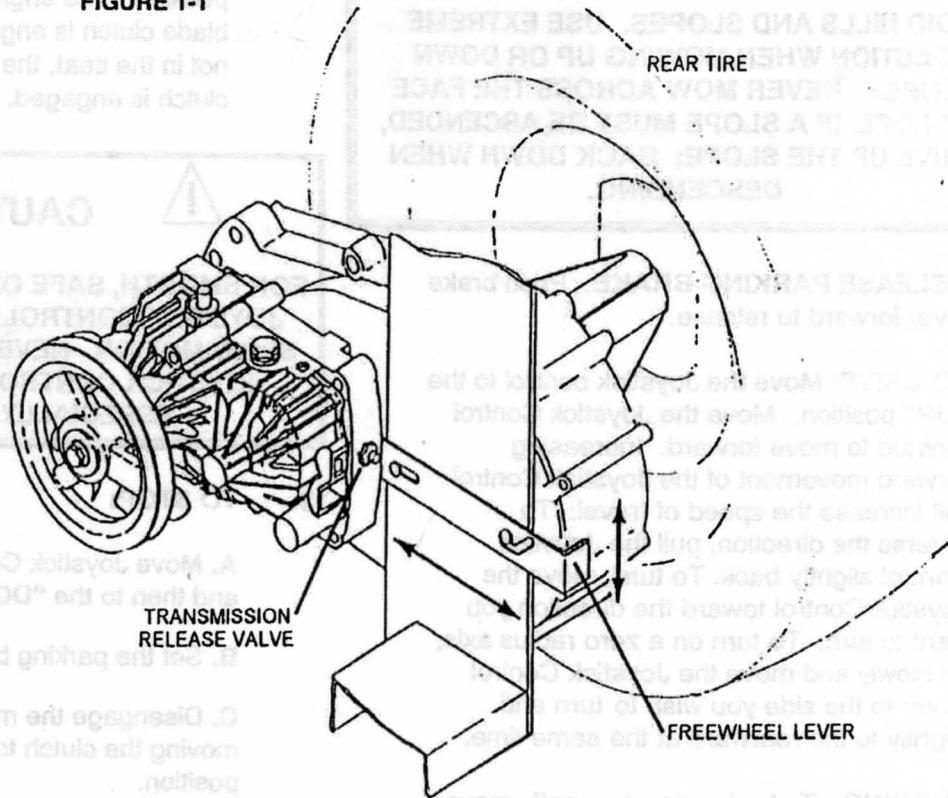


CAUTION



WHEN LEAVING THE MOWER UNATTENDED, ALWAYS REMOVE THE KEY AND SET THE PARKING BRAKE, EVEN IF JUST FOR A FEW MOMENTS. HELP PROTECT CHILDREN AND OTHER UNAUTHORIZED PERSONS FROM ACCIDENTS.

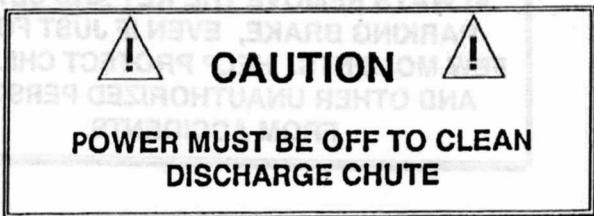
FIGURE 1-1



14. **UNLOCK TRANSMISSION:** The freewheel levers are located on each side of the mower below the seat mount (flip up the foot deck to access them). Lift the levers slightly, push them to the rear and down to release the transmissions for free wheeling. To engage the transmissions lift the levers slightly, pull them forward and then down. **NOTE:** The tractor should never be pulled at more than 2 miles per hour or for any appreciable distance. See Figure 1-1.

MOWING RECOMMENDATIONS

1. Keep mower blades sharp.
2. Make sure deck and discharge chute are clean.
3. When mowing tall grass, make two passes, mowing off 1/2 of the desired cut on the first pass, and then the desired height the second pass. Check for hidden dangers first.
4. Go slowly for trimming.
5. Always cut grass with the engine at full throttle speed. This "ENGINE" speed allows the cutting blades to operate at optimum cutting speed. Control "GROUND" speed with the Joystick Control lever.
6. Vary ground speed to suit conditions (i.e.: go slower in tall thick grass, on hills, wet conditions, etc.).



MAINTENANCE

 <h2 style="margin: 0;">CAUTION</h2> <p style="margin: 0;">BEFORE PERFORMING ANY MAINTENANCE, TURN OFF ENGINE REMOVE KEY AND DISCONNECT SPARK PLUGS. USE EXTREME CARE WHEN WORKING ON MACHINERY. DO NOT WEAR WATCH OR JEWELRY. DO NOT WEAR LOOSE FITTING CLOTHES, AND OBSERVE ALL COMMON SAFETY PRACTICES WITH TOOLS.</p> 

MAINTENANCE SCHEDULE

<i>SERVICE</i>	<i>WHEN</i> _____
Check drive belts -----	every 50 hours (20 hrs break-in)
Check crankcase oil level -----	before each use
Clean grass from Hydrostat fans and cooling fans-----	before each use
Check air intake screen -----	after each use
Clean grass under deck -----	after each use
Check tire pressure -----	every 10 hours
Check battery fluid -----	every 10 hours
Sharpen mower blades -----	every 10 hours
Clean air filter element -----	every 10 hours
Check hydrostatic transmission fluid -----	every 25 hours
Grease driveline (3 fittings)-----	every 50 hours
Grease Deck Pivot Tube-----	every 50 hours
Check adjustment of P.T.O. Clutch -----	every 50 hours (or if blades do not stop within 7 seconds from switch disengagement)
Change engine crankcase oil -----	every 50 hours (5 hrs break-in)
Change engine oil filter -----	every 100 hours
Change hydrostat oil filter (part #H-2026)-----	every 250 hours (50 hrs break-in)
Change oil in deck gearbox -----	annually or every 500 hours
Replace air filter element-----	annually or 500 hours
Check spark plugs -----	annually or 500 hours
Service battery -----	annually or 500 hours

Perform these maintenance procedures more frequently under extremely dusty, dirty conditions.
 Replace decals when illegible. Write parts dept. for free replacement

MAINTENANCE INSTRUCTIONS

1. ENGINE:

For complete maintenance and operating information of the engine, please refer to the maintenance instructions furnished by the engine manufacturer and included in your Zero Turning Radius Mower information packet.

NOTE: Air intake screen must be kept clean. If plugged, engine may be seriously damaged by over heating.

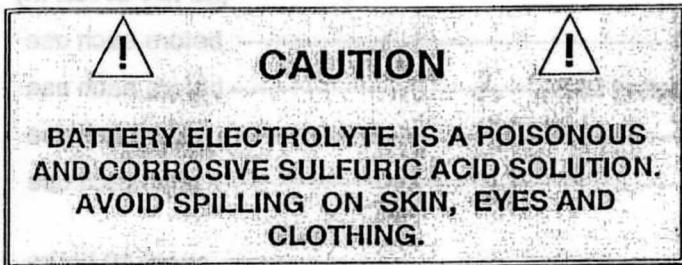
3. TIRES:

Correct tire pressure is essential for efficient operation of the mower. Check tire pressure periodically. Inflate tires to the pressure listed below:

Tire Pressure: Front tires Drive tires Rear tires.
All Models----- 10" 16 psi 20" 16 psi 13" 16 psi

Lug nuts or lug bolts should be checked regularly for tightness.

4. MOWER BLADES:



2. BATTERY:

Keep the electrolyte level above the plates in each cell by adding distilled water as it becomes necessary. Add water just before operating the mower to mix the water with the solution. Be careful not to overfill the battery -- the electrolyte solution is corrosive and can cause damage to surrounding metal parts if it should spill. Keep your battery at 1.260 specific gravity charge. When servicing the battery make sure to reconnect cables exactly as they were prior to removal.

Keep the battery clean. Remove the corrosion around the battery terminals by applying a solution of one part baking soda to four parts water. Coat all exposed terminal surfaces with a light layer of grease or petroleum jelly to prevent corrosion.

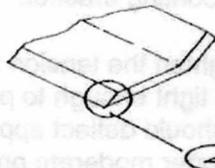
NOTE: At temperatures below 32 degrees F (0 deg C) the full charge state must be maintained to prevent cell electrolyte from freezing and causing permanent battery damage.



Check sharpness of mower blades after every 10 hours of operation. To sharpen blades, proceed as follows:

- A. Remove bolt, lock washer, and large flat washer mounting blade on shaft. Remove blade.
- B. Blades should be discarded when worn excessively. See Figure 1-2.
- C. Sharpen blade with a hand file, electric grinder or blade sharpener. Wear gloves and eye protection when sharpening. Grind blade at original 25 deg. bevel.
- D. Check balance of blade by positioning the blade on a nail or blade balance pedestal. Grind the blade on the end that is heavier until both sides balance.
- E. Install blade, flat washer, lock washer and bolt. Make sure to tighten bolt to 60 ft. lbs.

New Blade



25 Degrees



When notch starts
discard blade

DANGEROUS !



5. V-BELTS:

The main hydro drive belt should be checked after first 20 hours and every 50 hours thereafter. Replace any belts found to be in poor condition. The deck belt is equipped with a spring loaded belt tightener and does not require tightening adjustments. The hydrostatic transmission belt is adjusted manually (see page 10 for tensioning instructions.)

6. LUBRICATION:

A. Engine: Follow engine manufacturer's recommendation.

B. Deck Spindles: Lubricate with 3 "shots" only, every 100 hours.

C. Hydrostatic transmission & Filter.

D. P.T.O. Shaft: Grease every 50 hours.

E. Deck Lift Rod Wldt.: Grease every 50 hours.

F. Deck Gearbox: See page 14

Checking and Replenishing Oil IN HYDROSTATIC TRANSMISSION

7. Check the oil level in hydrostatic transmission oil reservoir after every 25 hours of usage. Do not remove the reservoir cap to check the oil level as this allows dirt to enter the transmission. Replenish as needed with 20W-50 Mobil Super H.D.

If oil is needed: See figure 1-3

- a. Wipe area of oil reservoir cap clean of any dirt or debris.
- b. Remove oil reservoir cap.
- c. Fill to line marked on reservoir.
- d. Do not over fill.

e. When checking oil level be very careful to keep the reservoir clean and to fill only with clean oil.

8. Change the oil in the reservoir and hydrostat transmission oil filter after the first 100 hours of use. Then every 500 hours after that. Remove the filter and be sure all oil has drained from the reservoir. Replace with new filter and 20w-50 Mobil Super H.D.

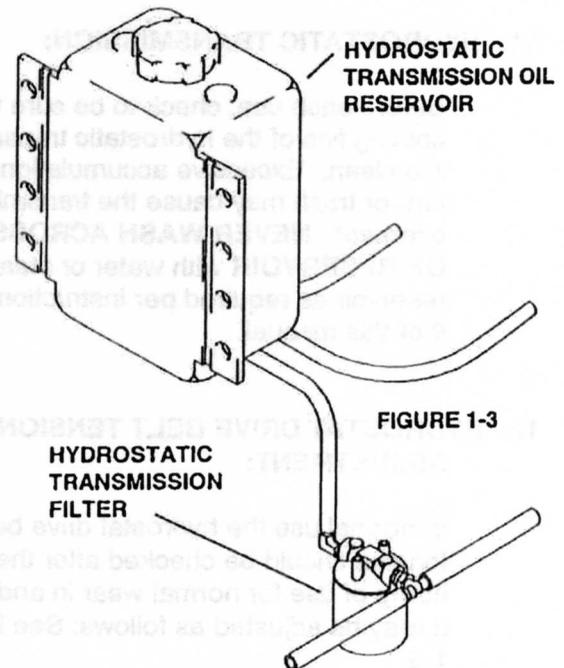
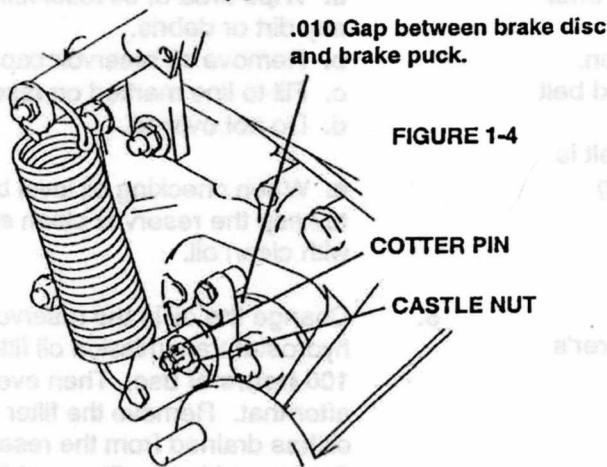


FIGURE 1-3

9. PARKING BRAKE ADJUSTMENT:

With the brake handle in the release position. Remove the cotter pin from the castle nut. Insert a 0.010 to 0.020 feeler gauge between the brake disc and the brake puck. Tighten the castle nut with the feeler gauge inserted until the gauge fits snugly between the disc and puck. The gap should not be so tight that the feeler gauge cannot be reinserted after removal. Back the castle nut to the closest pin hole and reinsert the cotter pin. Repeat for other side. See figure 1-4.



11. HYDROSTATIC TRANSMISSION:

Before each use, check to be sure that the cooling fins of the hydrostatic transmissions are clean. Excessive accumulation of oil, dirt, or trash may cause the transmission to overheat. **NEVER WASH ACROSS TOP OF RESERVOIR** with water or steam. Fill reservoir as required per instructions page 9 of this manual.

12. HYDROSTAT DRIVE BELT TENSION ADJUSTMENT:

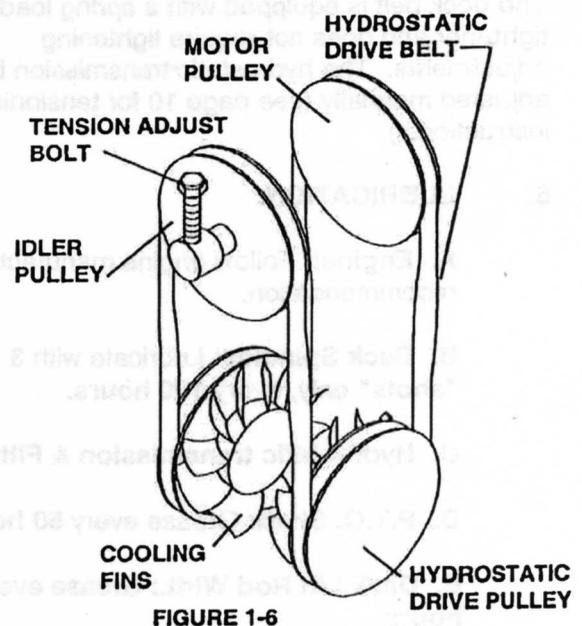
In normal use the hydrostat drive belt tension should be checked after the first 20 hours of use for normal wear in and stretch. It may be adjusted as follows: See Figure 1-6.

a. Loosen the idler pulley locking nut until the idler pulley can be just moved relative to the mounting bracket.

b. Tighten the tension adjust bolt until the belt is tight enough to prevent belt slippage. Belt should deflect approximately 3/8" to 5/8" under moderate pressure. Do not over tighten.

c. Retighten the slide locking nut.

d. Retighten the tension adjust bolt 1/4 turn to set the lockwasher and prevent loosening of the tension adjust bolt. See Figure 1-6.



13. SCALPER ROLLER BOLTS:

Scalper roller bolts should be tightened until the spacer bushing will not turn relative to the scalper bracket to prevent undue wear on the end of the spacer bushing and the scalper bracket. The proper torque is from 17 to 20 ft. lb.

14. JOYSTICK CONTROL LEVER NEUTRAL ADJUSTMENT:

With the engine running, if the machine travels in either direction when the Joystick Control Lever is in the neutral "DOWN" position, stop the engine, elevate the rear wheels clear of the ground and adjust as follows:

- A. Remove the right hand fender skirt exposing the Joystick Control assembly.
- B. Start the engine.
- C. Run engine at fast idle with control lever in the "DOWN" position.
- D. Loosen the nuts on the upper linkage assembly on the linkage that corresponds with the wheel that is turning. NOTE: One nut is left hand threaded.
- E. Adjust by turning the upper linkage rod "IN" or "OUT" until the drive wheel stops turning.
- F. Retighten the nut on upper linkage assembly and check to make sure the drive wheel is still not turning.
- G. Repeat steps B through F for other side.
- H. Replace fender skirt. Shut off engine before removing from blocks.

15. JOYSTICK CONTROL LEVER DETENT ADJUSTMENT:

If the Joystick Control Lever does not lock in the "UP" position, turn the detent adjustment screw clockwise until a desirable locking action is obtained. If the Joystick Control Lever is hard to slide up and down, turn the detent adjustment screw counter-clockwise until a desirable sliding action is obtained.

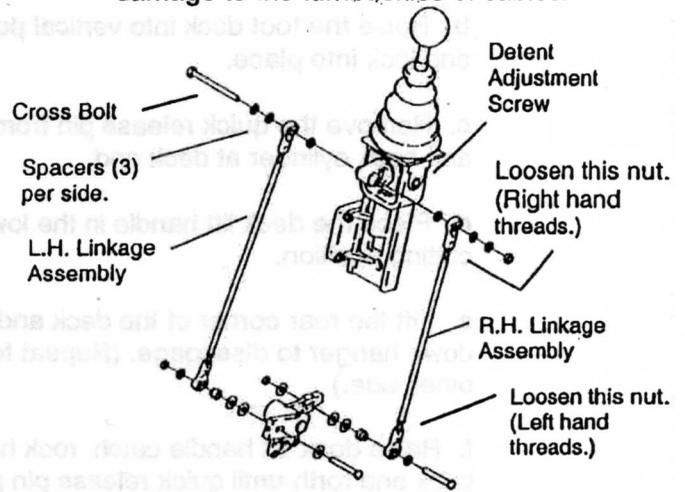
16. JOYSTICK CONTROL LEVER SENSITIVITY ADJUSTMENT:

To change the sideways turning response adjust as follows:

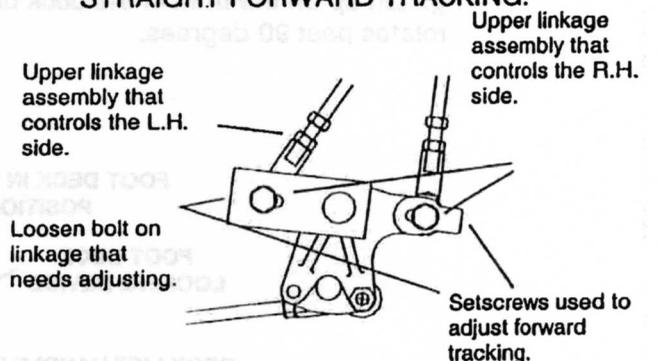
- A. Remove the right hand fender skirt exposing Joystick Control Lever assembly.
- B. Remove the cross bolt, nut, and spacers.
- C. Reassemble spacers as desired. (2) spacers between the turnbuckle

and joystick pivot shaft quicken the response, (1) slows the response.

NOTE: It is important that there is a spacer on each side of the turnbuckles to prevent damage to the turnbuckles or cables.



17. JOYSTICK ADJUSTMENT FOR STRAIGHT FORWARD TRACKING:



In a large open area, actuate the joystick control lever into the full forward position. If the mower veers to the right, then the right hydrostat needs to be sped up. If it veers to the left, then the left hydrostat needs to be sped up. After determining which hydrostat needs to be sped up, stop the machine, shut off the engine. Slightly loosen the bolt at the lower end of the upper linkage assembly on the side that is slower, and using a 1/8" allen wrench, turn the set screw 1/4 of a turn. It may take several test drives to get the joystick control lever exactly straight forward. Once the joystick control lever has been adjusted to your liking, completely tighten the bolt on the control linkage assembly that was loosened earlier. Recheck to make sure neutral adjust has not been affected, if it has see step #16.

18. TILTING THE DECK: See Figure 1-9.

- a. Set the parking brake.
- b. Raise the foot deck into vertical position and lock into place.
- c. Remove the quick release pin from the anti-buck cylinder at deck end.
- d. Place the deck lift handle in the lowest cutting position.
- e. Lift the rear corner of the deck and pivot down hanger to disengage. (Repeat for other side.)
- f. Raise deck lift handle catch, rock handle back and forth until quick release pin pulls free with little effort.
- g. Lift up on the front of the deck until deck rotates past 90 degrees.

19. LOWER AND REATTACH THE DECK: See Figure 1-9.

- a. Rotate the deck back to horizontal the position.
- b. Stand on front of deck and align deck lift bar with deck lift handle, rock handle back and forth until quick release pin slips through. **NOTE** the orientation of the holes in the bar. The first hole is for low cutting 1" to 3", the second hole is for high cutting 3" to 5".
- c. Lift the rear corner of the deck until the down hanger engages the push bar. (Repeat for other side.)
- d. Reattach the anti-buck cylinder.
- f. Unlatch foot deck locking device and lower the foot deck back to horizontal position.

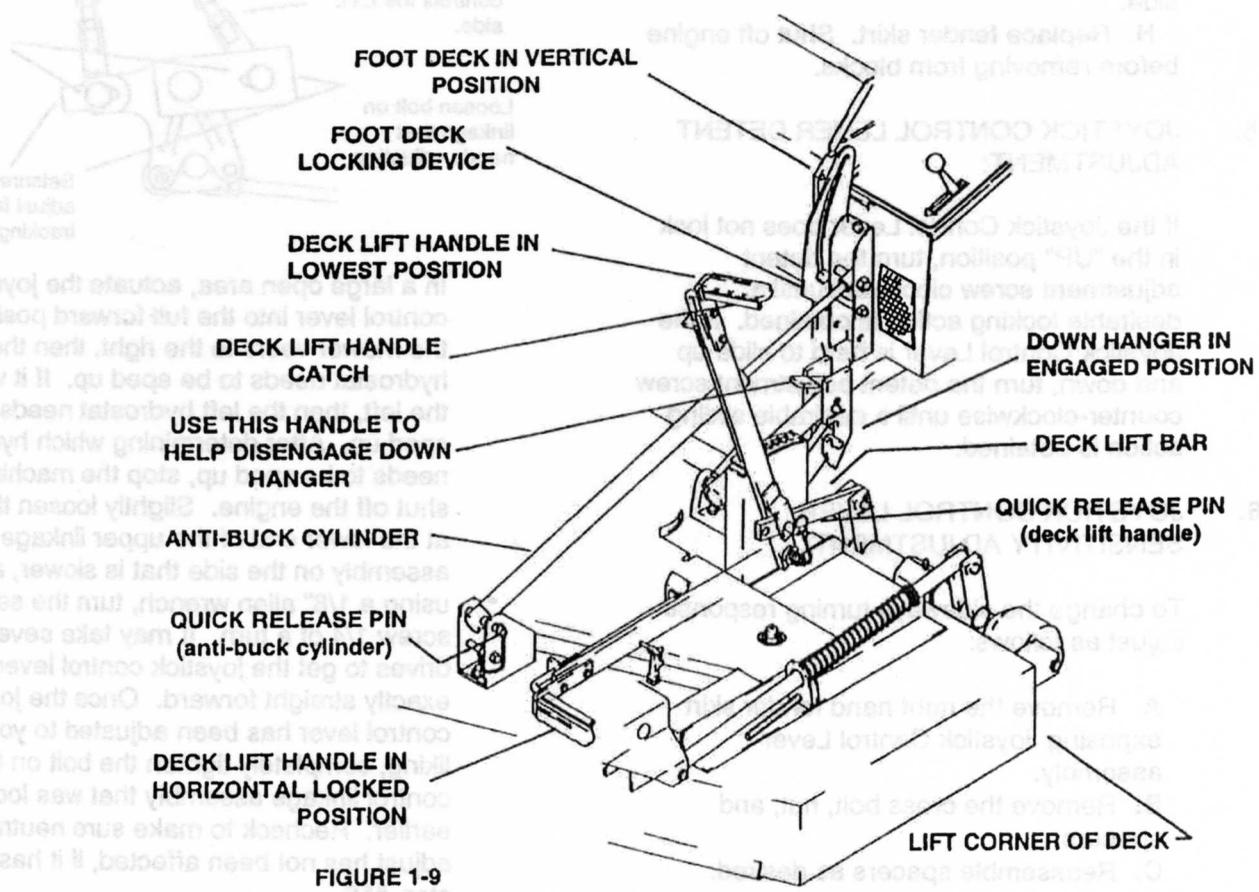


FIGURE 1-9


CAUTION


BEFORE PERFORMING ANY MAINTENANCE, TURN OFF ENGINE REMOVE KEY AND DISCONNECT SPARK PLUGS. USE EXTREME CARE WHEN WORKING ON MACHINERY. DO NOT WEAR WATCH OR JEWELRY. DO NOT WEAR LOOSE FITTING CLOTHES, AND OBSERVE ALL COMMON SAFETY PRACTICES WITH TOOLS.

20. LEVELING THE DECK:

The deck comes from the manufacturer pre leveled. If the deck does appear to be cutting unlevel follow this procedure.

- a. Set all tire pressure to correct specifications. (See Page 3.)
- b. Place machine on a level slab of concrete.
- c. Move blades by hand so all the blades are pointed in the same direction. **See Figure 1-11.** Measure from the blade tip (beveled edge) to the ground, all three blades. If there is more than a 3/16" difference from one side to the other, the deck should be leveled.

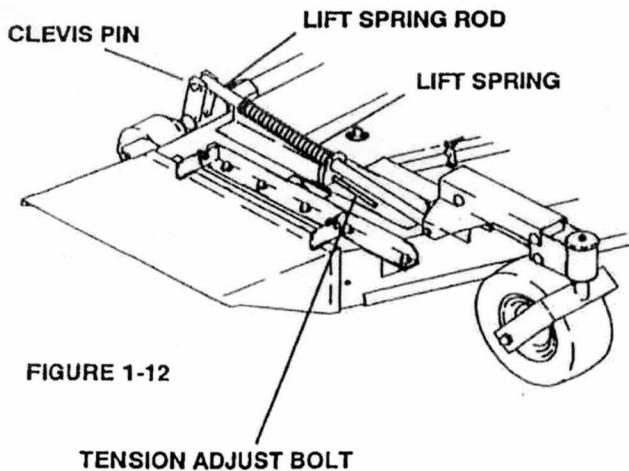


FIGURE 1-12

- d. Remove the clevis pin from the rear of the lift spring rod, on the high side. The lift spring rod is two parts one threaded into the other. Turn the lift spring rod counter-clockwise 2 turns. Reassemble clevis pin and re-measure. Repeat as required to achieve a difference of no more than 3/16" from one side to the other.
See Figure 1-12.

- e. If the deck is level side to side but high or low at the center blade, both lift spring rods must be adjusted equal amounts. Shortening the lift spring rods will bring the center blade up and lengthening the lift spring rod will let the center blade down.

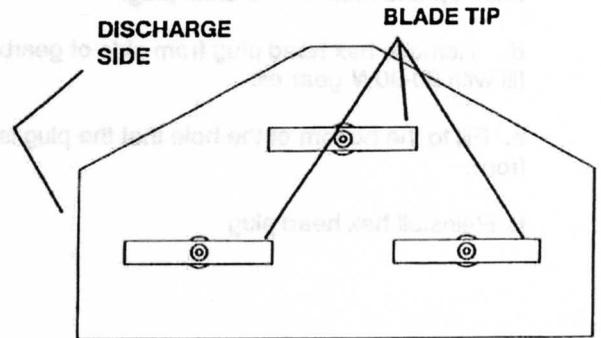
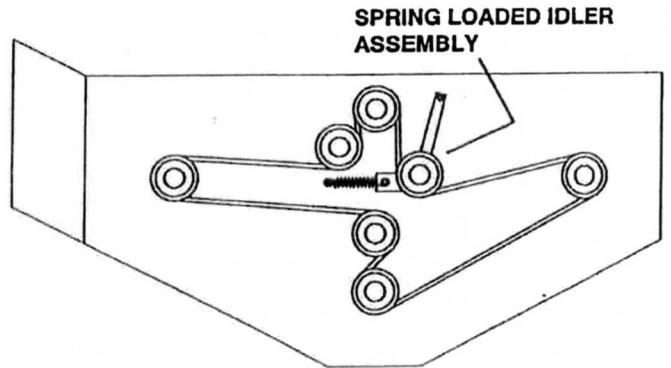


FIGURE 1-11



DECK SPINDLE BELT DIAGRAM (TOP VIEW)

21. CHECKING DECK DRIVE GEARBOX FLUID LEVEL:

The fluid level only needs to be checked if oily residue is found on the gearbox housing.

- a. Rotate deck in to the upright position. (See deck servicing for procedure.)
- b. Remove the hex head plug at the low end of the gearbox housing. (Plug closest to the drive shaft.) The fluid level should be level with the bottom of the threaded hole.

22. CHANGING FLUID IN DECK DRIVE GEARBOX

- a. Rotate the deck into the upright position and remove drain plug from bottom of gearbox.
- b. Lower deck to drain fluid.
- c. When the fluid is drained from gearbox raise deck back up and reinsert the drain plug.
- d. Remove hex head plug from side of gearbox and fill with 80-90W gear oil.
- e. Fill to the bottom of the hole that the plug is removed from.
- f. Reinstall hex head plug

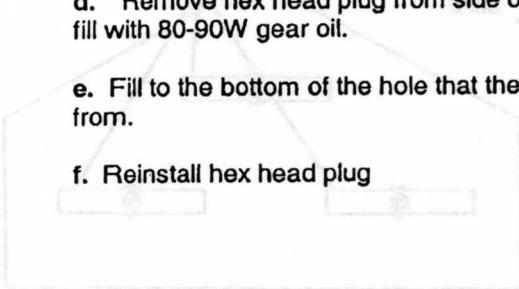
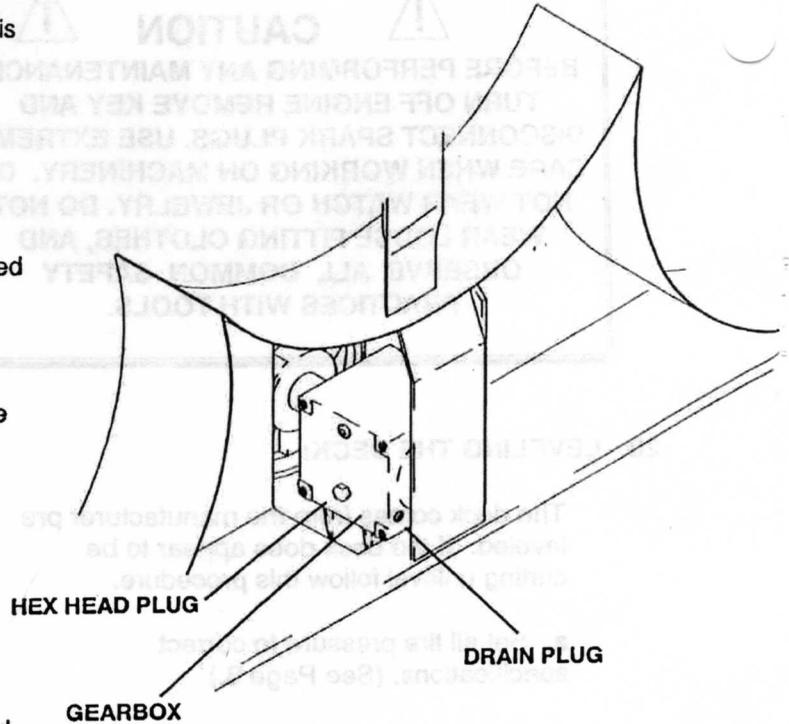
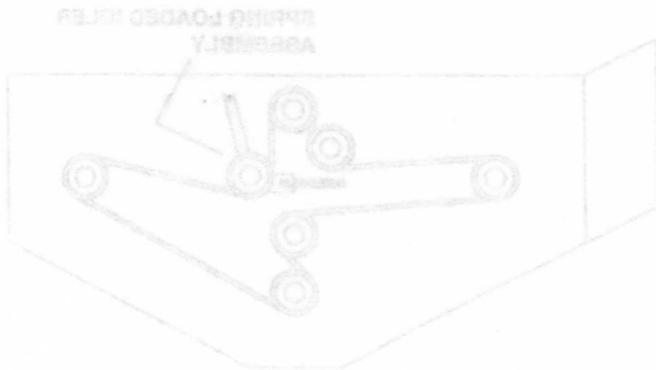
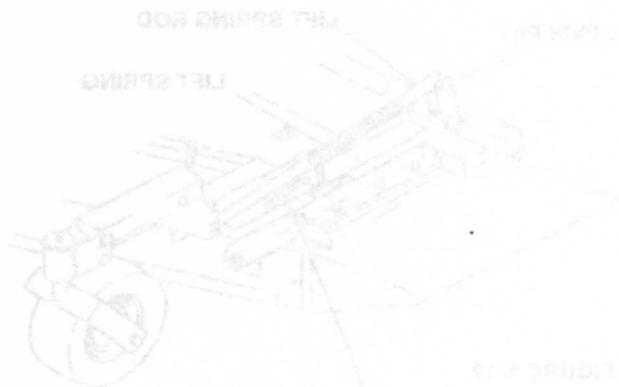


FIGURE 1-11



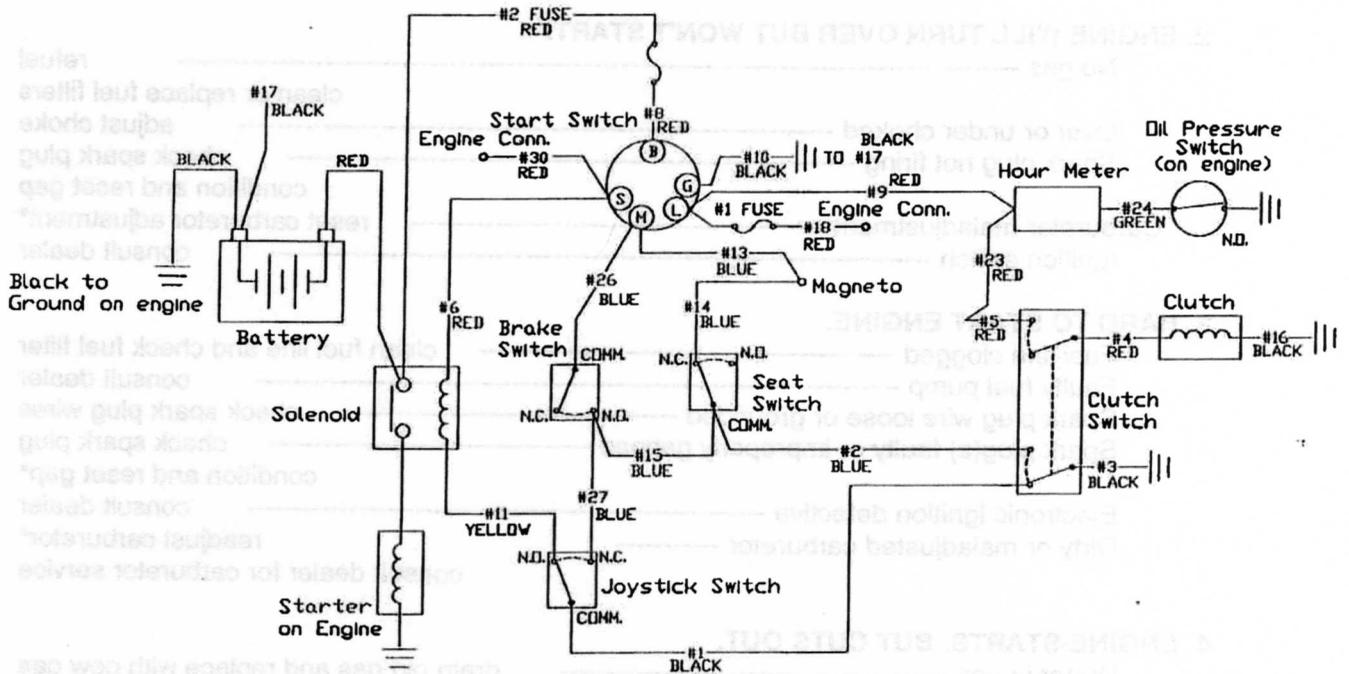
DECK SPINDLE BELT DIAGRAM (TOP VIEW)



DECK SPINDLE BELT DIAGRAM (SIDE VIEW)

WIRING SCHEMATIC:
22 & 25 h.p. MODELS

SCHEMATIC



Black Wires = Ground
Red Wires = Power
Blue Wires = Kill Circuit
Yellow Wires = Start Circuit
Green Wires = Signal Circuit

START SWITCH	
POSITION	CIRCUIT "MAKE"
OFF	G+M
ON	B+L
START	B+L+S

TROUBLE SHOOTING CHECK LIST

1. ENGINE WON'T TURN OVER.

- Mower blades engaged ----- disengage blades
- Drive not in neutral ----- move Joystick Control to neutral "Down" position
- Blown fuse ----- replace fuse
- Dead battery ----- charge or replace
- Solenoid ----- consult dealer
- Ignition switch ----- consult dealer
- Starter ----- consult dealer

2. ENGINE WILL TURN OVER BUT WON'T START.

- No gas ----- refuel
- Over or under choked ----- clean or replace fuel filters
- Spark plug not firing ----- adjust choke
- Carburetor maladjustment ----- check spark plug condition and reset gap
- Ignition switch ----- reset carburetor adjustment*
- consult dealer

3. HARD TO START ENGINE.

- Fuel line clogged ----- clean fuel line and check fuel filter
- Faulty fuel pump ----- consult dealer
- Spark plug wire loose or grounded ----- check spark plug wires
- Spark plug(s) faulty or improperly gapped ----- check spark plug condition and reset gap*
- Electronic ignition defective ----- consult dealer
- Dirty or maladjusted carburetor ----- readjust carburetor*
- consult dealer for carburetor service

4. ENGINE STARTS, BUT CUTS OUT.

- Water in gas ----- drain old gas and replace with new gas
- clean carburetor bowl
- Clogged fuel line ----- check fuel filter
- clean fuel line
- Vent in fuel cap plugged ----- check vent
- Faulty fuel pump ----- consult dealer
- Maladjusted carburetor ----- readjust carburetor
- Engine dies when raising Joystick ----- parking brake set
- release brake

5. ENGINE KNOCKS.

- Low oil level ----- check and add oil
- Ignition timing off ----- consult dealer
- Fuel octane too low ----- drain and replace with higher octane gas
- Over heated engine ----- shut off engine and allow to cool

* See engine manual for engine adjustments

6. ENGINE SOMETIMES SKIPS AT HIGHER SPEEDS

- Incorrect Ignition Timing ----- consult dealer
- Carburetor maladjusted ----- readjust carburetor
- Faulty spark plugs ----- check spark plug
clean and reset gap
- Bouncing off seat safety switch ----- slow down on rough terrain

7. ENGINE OVERHEATED

- Air intake screen or fins clogged ----- clean intake screen
and fins
- Fuel mixture too lean ----- readjust carburetor
- Oil level too low or too high ----- adjust oil level
- Improper ignition timing ----- consult dealer
- Running engine too slow ----- run engine faster

8. ENGINE IDLES POORLY

- Carburetor maladjustment ----- readjust carburetor
- Improper spark plug gap ----- check and re-gap plug

9. ENGINE BACKFIRES

- Carburetor maladjustment ----- readjust carburetor

10. ENGINE RUNS BUT MOWER WON'T MOVE FORWARD

- Drive belt loose or broken ----- re-tension or replace
- Shift linkage disconnected ----- reconnect
- Transmission shift arm disconnected ----- reconnect
- Transmission oil low ----- add oil
- Transmission locks in unlock position ----- put in lock position
- Air in Transmission ----- bleed air
- Hydrostat Oil Filter Plugged ----- replace filter
- Not enough tension on drive belt ----- check
- Bad Transmission ----- consult dealer
- Gear Mating Transmission/Gearbox disconnected ----- consult dealer

11. MOWER LOSES POWER OR TRANSMISSION OVERHEATS

- Hydro. trans. oil too low or too high ----- adjust oil as needed
- Transmission damage ----- consult dealer
- Transmission blowing oil out cap ----- overfilled or water
contaminated

12. ENGINE STALLS WHEN BLADES ARE ENGAGED

- Operator not on seat ----- sit on seat
- Faulty interlock system ----- consult dealer
- Bad blade spindle bearing ----- consult dealer
- Deck drive belt not properly routed ----- reroute
- Blades blocked by foreign material ----- clean under deck

* See engine manual for engine adjustments