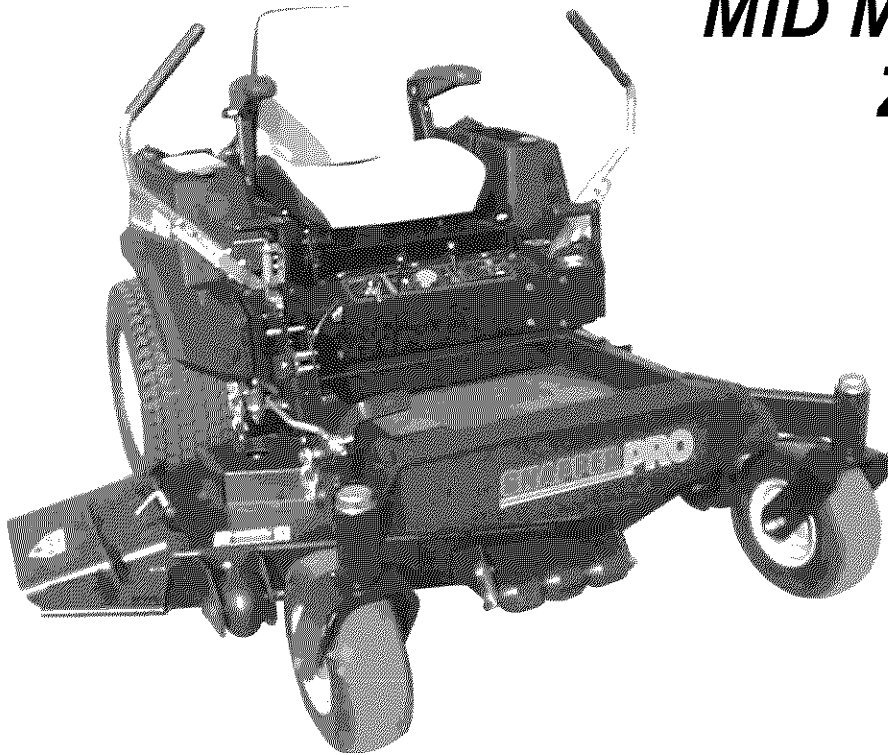


Safety Instructions & Operator's Manual for **SNAPPER**[®]

MID MOUNT Z-RIDER ZERO TURNING HYDRO DRIVE SERIES 2



MODELS

NZM19482KWV
NZM21522KWV
NZM25612KWV
NZM27612KH

MODEL NUMBER EXPLANATION

N **Z** **M** **19** **48** **2** **KWV**

MODEL DESIGNATION

DRIVE SYSTEM TYPE

MOWER ORIENTATION

ENGINE HP *

ENGINE TYPE

SERIES DESIGNATION

MOWER DECK SIZE

POWER UNIT

N – Model Designation	19.0 – Engine Horse Power	48 – 48" Mower Width	2 – Series Designation
Z – Zero Turning – Hydro Drive	21.0 -- Engine Horse Power	52 – 52" Mower Width	KW – Kawasaki Engine
M – Mid Mount Mower	25.0 – Engine Horse Power	61 – 61" Mower Width	KH – Kohler Engine
	27.0 – Engine Horse Power		V – Over Head Valve

Thank you for buying a SNAPPER Product! Before operating your machine, read this manual carefully and pay particular attention to the "IMPORTANT SAFETY INSTRUCTIONS" on Pages 2 - 4. Remember that all power equipment can be dangerous if used improperly. Also keep in mind that SAFETY requires careful use in accordance with the operating instructions and common sense!

NOTE: Specifications are correct at time of printing and are subject to change without notice.

* Actual sustained equipment horsepower will likely be lower due to operating limitations and environmental factors.

SNAPPER McDonough, GA., 30253 U.S.A.

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MANUAL No. 7-4408 (Rev. 1 - 9/3/04)

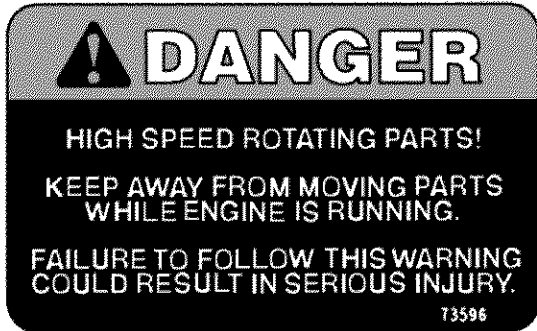
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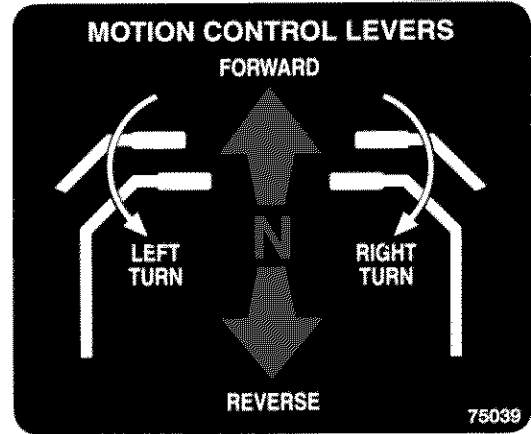
IMPORTANT

NOTICE: Operator Protective Structures are available as optional kits for the Mid-Mount and Out-Front Z-Rider machines. These structures, when installed and used properly can offer additional security to the operator against serious injury in the event of a tip over accident. Operator Protective Structures may be required by local ordinances. Discuss your mowing application and ordinances with your local Snapper Dealer.

Section 2 – SAFETY MESSAGES AND SYMBOLS



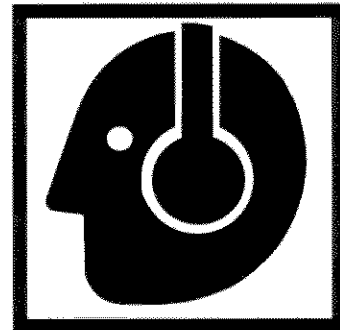
DANGER ! ROTATING PARTS
KEEP AWAY FROM MOVING PARTS



MOTION CONTROL LEVER OPERATION



PARKING BRAKE LEVER OPERATION



WEAR HEARING PROTECTION

TO START:
 MAKE SURE OPERATOR IS SEATED PROPERLY. • PLACE MOTION CONTROL LEVERS IN CENTER/NEUTRAL POSITION. • PULL UP ON BRAKE LEVER TO SET BRAKE. • PUSH BLADE SWITCH DOWN TO MAKE SURE BLADE IS DISENGAGED. • SET CHOKE AND THROTTLE. • TURN KEY TO START ENGINE.

TO OPERATE:
 ADJUST CHOKE AND THROTTLE. • PULL BLADE SWITCH UP TO ENGAGE BLADE. • PUSH PARKING BRAKE LEVER DOWN TO RELEASE BRAKE. • MOVE MOTION CONTROL LEVERS IN THE DIRECTION OF TRAVEL REQUIRED. • INCREASE / DECREASE SPEED WITH AMOUNT OF MOTION CONTROL LEVERS TRAVEL FROM CENTER / NEUTRAL POSITION.

TO STOP:
 MOVE MOTION CONTROL LEVERS TO CENTER / NEUTRAL POSITION. • PUSH BLADE SWITCH DOWN TO DISENGAGE BLADE. • PULL UP ON BRAKE LEVER TO SET BRAKE. • TURN KEY TO OFF POSITION AND REMOVE. • MAKE SURE ALL MOVEMENT HAS STOPPED BEFORE DISMOUNTING.

⚠ WARNING
 TO AVOID SERIOUS INJURY OR DEATH

- READ OPERATOR'S MANUAL AND OTHER INSTRUCTIONAL MATERIALS PROVIDED.
- KNOW LOCATION AND FUNCTION OF ALL CONTROLS.
- THIS MACHINE IS DESIGNED FOR PROFESSIONAL USERS. DO NOT OPERATE UNLESS THOROUGHLY TRAINED AND FAMILIAR WITH ALL CONTROLS AND PROPER USE OF THIS MACHINE.
- NEVER START BLADES UNLESS PROPERLY SEATED ON MACHINE.
- KEEP SAFETY DEVICES (GUARDS, SHIELDS AND SWITCHES) IN PLACE.
- REMOVE OBJECTS THAT COULD BE THROWN BY THE BLADES.
- DO NOT MOVE MOTION CONTROL LEVERS RAPIDLY. AVOID SUDDEN TURNS.
- DO NOT OPERATE BLADES IN REVERSE.
- LOOK DOWN AND BEHIND BEFORE AND DURING REVERSE MOVEMENT.
- DO NOT MOW IN ANY AREA WHERE STABILITY AND TRACTION IS IN DOUBT. DO NOT MOW ON SLOPES STEEPER THAN 15°.
- REDUCE SPEED ON SLOPES. GO FORWARD DOWN SLOPES. GO REVERSE UP SLOPES, NEVER TRAVEL ACROSS SLOPES.
- AVOID UPHILL STARTS. IF MACHINE STOPS GOING UPHILL, STOP BLADES AND BACK DOWN SLOWLY.
- DO NOT MOW WHEN CHILDREN OR OTHERS ARE AROUND. NEVER CARRY CHILDREN DURING OPERATION EVEN WITH BLADES OFF.
- BE SURE ALL MOVING PARTS ARE STATIONARY BEFORE PLACING HANDS AND FEET NEAR BLADES OR SERVICING MACHINE.

WARNING ! AVOID SERIOUS INJURY OR DEATH
STARTING, OPERATION & STOPPING OF MACHINE

Section 3 - OPERATING INSTRUCTIONS

3.1 PRE-START CHECK LIST

Make the following checks and perform the service required before each start-up.

3.1.1. Check tires and add or release air as needed to bring pressure to 12 psi in drive tires. Pressure in front caster wheels should be 25 psi.

3.1.2. Check guards, deflectors and covers to make sure all are in place and securely tightened.

3.1.3. Check engine oil and add oil as needed to bring level up to the FULL mark. Refer to engine owner's manual for oil specifications. See Figure 3.1.

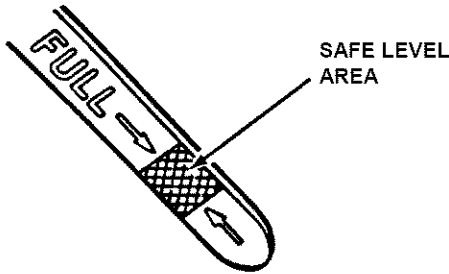


FIGURE 3.1

3.1.4. Check Blade Switch to insure it works freely.

1. Pull the Blade Switch up to the "ON" position to engage or turn "ON" the mower blades.

2. Push Blade Switch down to the "OFF" position to disengage (or turn "OFF") the blades.

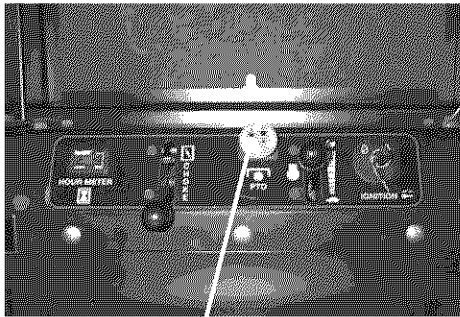


FIGURE 3.2

3.1.5. Clean exterior surfaces of cutting deck, engine and pumps of any accumulation of dirt, grass, oil, etc. Keep engine and pump air intake screens and cooling fins clear at all times.

3.1.6. Add fuel to both tanks of the machine outside where fumes can safely dissipate. Make sure both fuel filler caps are tight. Note the fuel tank selector valve. Refer to engine owner's manual for fuel specifications.

3.1.7. Adjust position of operator's seat. The seat is mounted on slides. Locate latch lever beneath the seat. Move lever towards the left and slide seat to the desired position. Release latch. If equipped, adjust seat suspension for operator weight.

3.1.8. Place mower in desired cutting height setting. Grasp deck lift lever and depress release latch located underneath the lever. Move lever to desired cutting height setting and release latch. Insert stop pin to desired cutting height.

IMPORTANT: There is a foot assist pedal located to the right front side of the footrest. Always use this assist pedal to raise or lower the deck to the desired cutting height. See Figure 3.3.

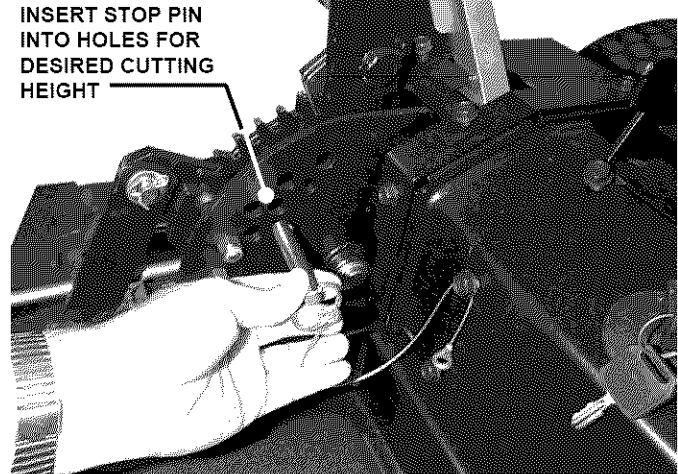
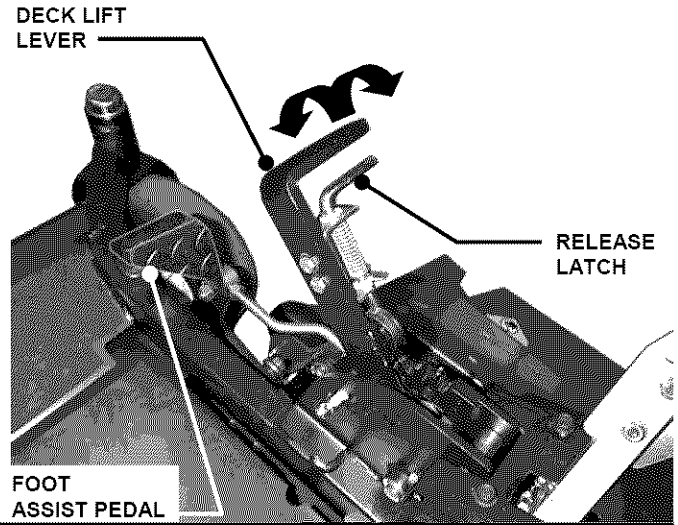


FIGURE 3.3

IMPORTANT: This machine is equipped with hydrostatic drive. The direction of motion and the speed of motion are controlled by the left and right motion control levers. A small movement of these controls can cause the machine to move instantly. **DO NOT** attempt to operate the machine until you read this manual and become familiar with its operation. Practice with the blades "OFF" disengaged, engine speed at a slow setting and in an open area away from obstacles.

	WARNING	
DO NOT allow operation of the machine by untrained personnel.		

Section 3 - OPERATING INSTRUCTIONS

3.3 CUTTING HEIGHT ADJUSTMENT

1. Adjust cutting height, as desired, to any position, using deck lift lever. The release latch should be pulled up when lowering the deck. When raising the deck, the release latch does not have to be pulled up. **IMPORTANT:** There is a foot assist pedal located to the right front side of the footrest. Always use this assist pedal to raise or lower the deck to the desired cutting height. See Figure 3.9 & 3.10.

2. If a specific deck height is desired each time the machine is used, insert the stop pin to desired cutting height. See Figure 3.11.

NOTE: The engine does not have to be running to adjust cutting height.

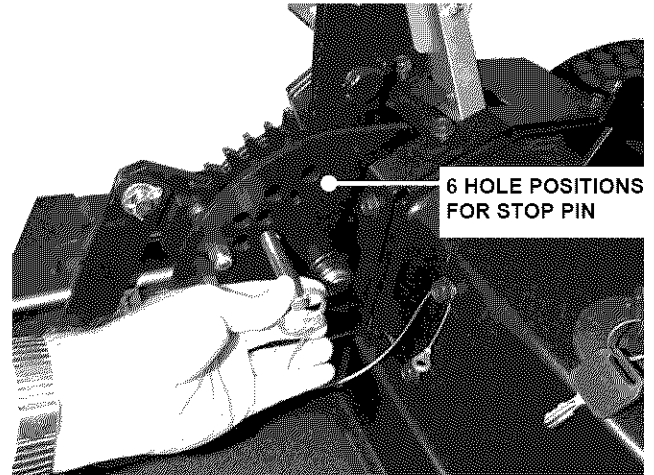


FIGURE 3.11

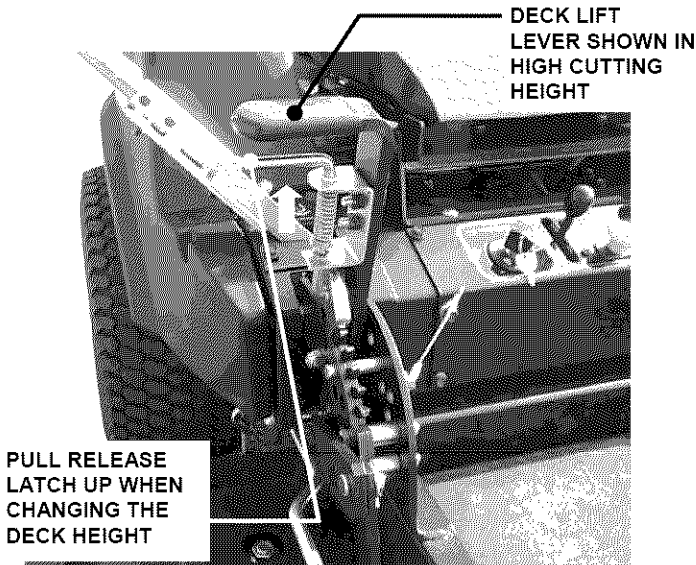


FIGURE 3.9

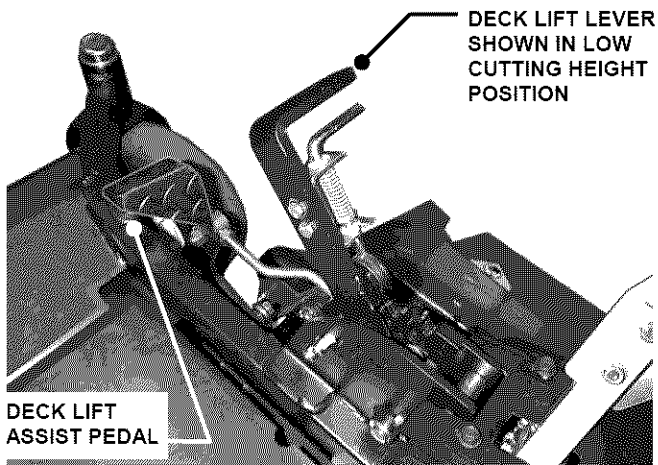


FIGURE 3.10

3.4 OPERATION- MOTION CONTROLS

3.4.1. DRIVING MACHINE

1. Start engine. Release parking brake.

2. Move motion control levers gently and with caution in desired direction. See Figure 3.12.

FORWARD - Move both control levers forward.

REVERSE - Move both control levers rearward.

LEFT TURN - Move left control rearward or move right control lever forward.

RIGHT TURN - Move left control forward or move right control lever rearward.

ZERO RADIUS TURN - Move one control lever forward and move the other control lever rearward simultaneously.

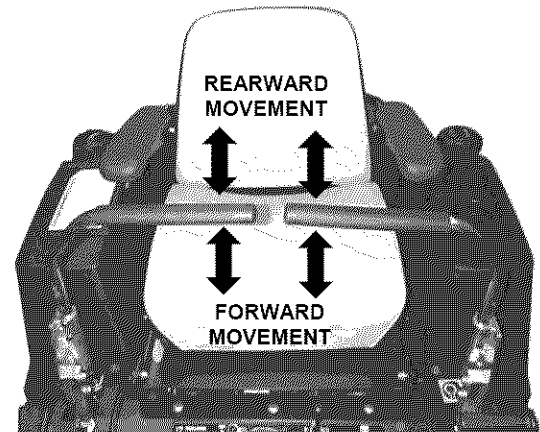


FIGURE 3.12

WARNING
DO NOT make turns at high speed. Slow machine motion. Move motion control lever gently and with caution. DO NOT make sudden changes in speed or direction.

WARNING
Zero-turning the machine at any speed can result in operator disorientation, or in operator being thrown from the machine. Exercise extreme caution when executing a zero-turn.

Section 3 - OPERATING INSTRUCTIONS

3.4.2. STOPPING MACHINE

1. Return motion control lever to the neutral position & the neutral lock position.

IMPORTANT: Operator must use hand assistance to bring both motion control levers to the neutral position & the neutral lock position.

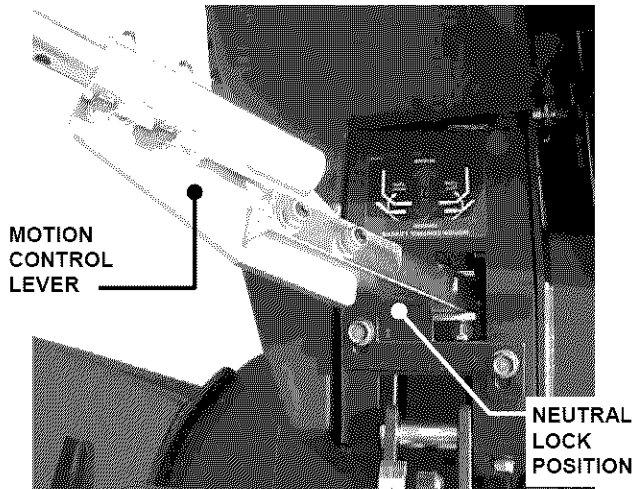


FIGURE 3.13

2. Engage parking brake.
3. Push Blade Switch down to the "OFF" position to disengage or turn "OFF" the blades.
4. Stop engine. Move engine speed control to turtle "SLOW" position. Turn key to stop position.
5. Remove key.

3.5 SAFETY INTERLOCK SYSTEM CHECKS

This machine is equipped with an electrical safety interlock system that is provided for the safety of the operator and others. All safety devices must be in place and functioning properly before operating the machine. Perform the following interlock system checks periodically during the operating season. Contact your authorized Snapper dealer if you have questions.

WARNING
DO NOT operate machine if any safety interlock or safety device is not in place and functioning properly. DO NOT attempt to defeat, modify or remove any safety device.

ENGINE MUST NOT START IF:

1. Motion Control Lever(s) are not in the neutral lock position OR,
2. Parking Brake disengaged and Operator not seated in the Operator's Seat OR,
3. Blade Switch in the "ON" blades engaged position.

ENGINE SHOULD START IF:

1. Blade Switch in the "OFF" blades disengaged position AND,
2. Motion Control Levers are both in the neutral lock position AND,
3. Operator properly seated in the Operator's Seat OR,
4. Parking Brake engaged.

NOTE: The engine can be started with the parking brake disengaged only if conditions in 1, 2 and 3 have been met.

ENGINE MUST BEGIN TO STOP IF:

1. Motion Control Levers are moved from the neutral lock position with Parking Brake engaged OR,
2. Operator rises off of seat with Blade Switch in "ON" blades engaged position OR,
3. Operator rises off of seat with Parking Brake disengaged.

IMPORTANT: Engine and blades will continue to run if Operator becomes reseated prior to engine coming to a complete stop. After coming to a complete stop, the blade switch must be moved to the "OFF" position before engine can be restarted. Engine and blades must come to a complete stop within 7 seconds after the operator rises off the seat or the blade switch is moved to the "OFF" position.

WARNING
DO NOT park the machine on slopes. DO NOT leave machine with engine running. Stop engine. Stop blades. Engage parking brake. Remove key.

Section 4 - MAINTENANCE

WARNING

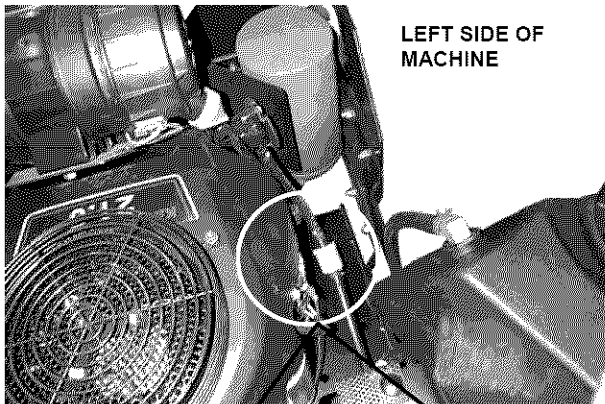
Allow engine to cool for at least ten minutes before performing service or maintenance. **DO NOT** smoke near fuel components when performing service or maintenance. **DO NOT** perform service and maintenance near an open flame. Wipe off any spilled fuel before starting engine. **DO NOT** run engine indoors.

4.5 ANNUALLY (END OF EACH SEASON) (Continued from previous Page)

4.5.2. FUEL FILTER

Service fuel filter as instructed below. Turn key to "OFF" position. Engine **MUST** be stopped and **MUST** be cold before removing filter. Clamp fuel line to prevent fuel spillage or perform filter change when fuel tank and fuel line are empty.

1. Remove fuel line clamps from fuel filter.
2. Remove fuel lines from filter. Discard filter.
3. Install new fuel filter. **IMPORTANT:** Some fuel filters are fuel flow directional. Check for arrow that shows fuel flow direction. Reinstall fuel line clamps. See Figure 4.8.



CLAMP FUEL LINE TO PREVENT SPILLAGE

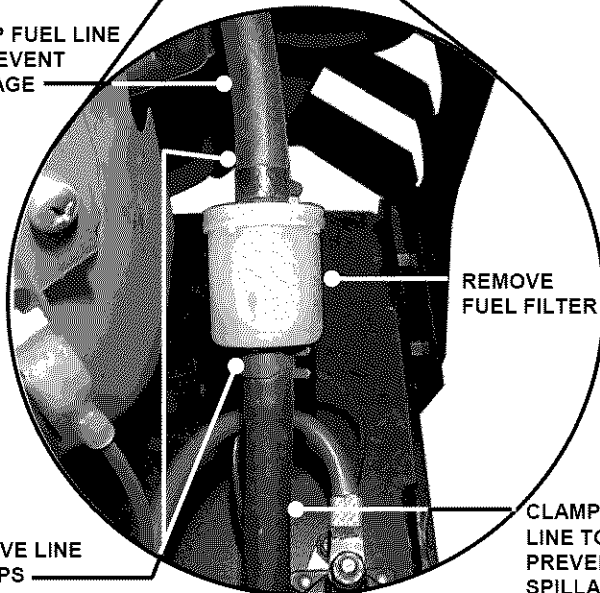
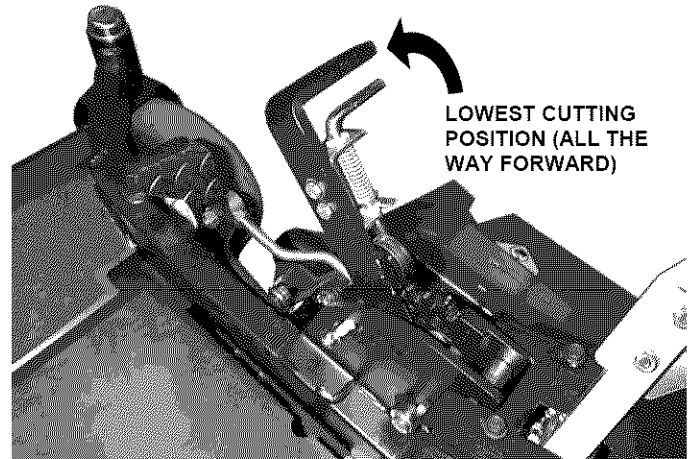


FIGURE 4.8

4.6 DECK REMOVAL

Move power unit/mower deck to an area where the mower deck is to be disconnected. Turn engine "OFF" and remove key from switch. Remove spark plug wire(s) and secure away from spark plug(s). Move motion control levers to the neutral position. Engage parking brake.

1. Move deck lift lever and set the mower deck to the highest cutting position. See Figure 4.9.
2. **IMPORTANT - STORED ENERGY.** Relieve tension on deck lift assist spring by backing off nut on eyebolt. Failure to relieve tension could result in personal injury. See Figure 4.9.
3. Place a wooden block under the front and rear edge of the mower deck.
4. Move deck lift lever and set the mower deck to a lower cutting position until deck rests on wooden blocks. Position the deck to where there is no tension on the deck hanger chains. See Figure 4.9.



POSITION DECK LIFT LEVER IN HIGHEST CUTTING POSITION. PLACE WOODEN BLOCKS UNDER FRONT AND REAR OF DECK. LOWER DECK ONTO BLOCKS

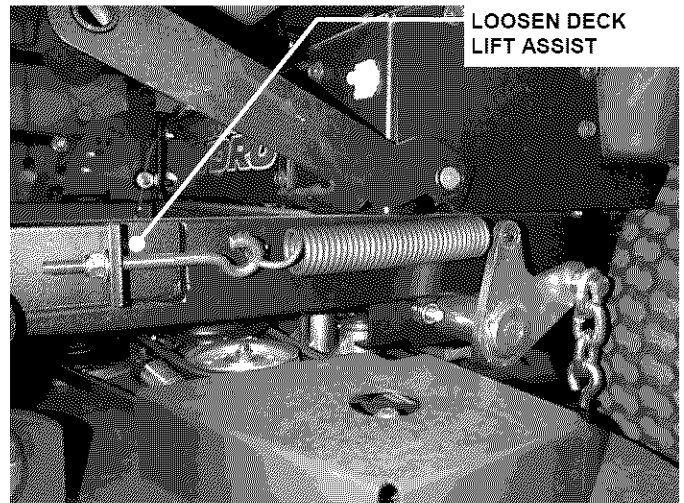


FIGURE 4.9

(Continued On Next Page)

Section 5 - ADJUSTMENTS & REPAIR

5.1 NEUTRAL POSITION ADJUSTMENTS (Continued From Previous Page)

12. With motion control levers remaining in the neutral lock position, See Figure 3.7, hold connecting rod up to the activation assembly and check length of rod. Tie rod end bolt must align with the activation assembly. If bolt is not aligned with the activation assembly, adjust tie rod. Loosen jam nut that secures tie rod. Rotate tie rod in or out to align with hole in activation assembly. Repeat step for other hydro pump. See Figure 5.4.

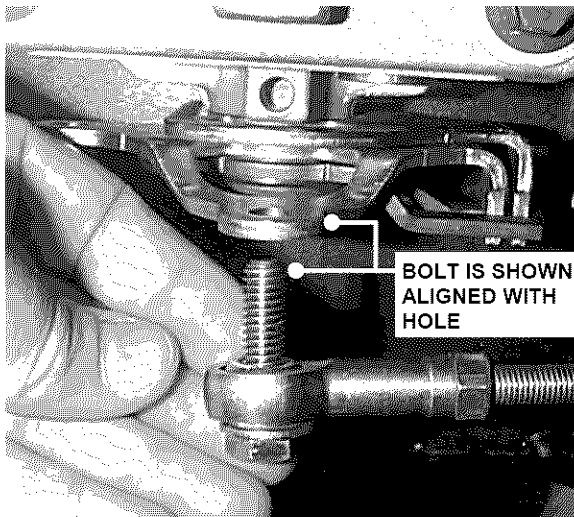
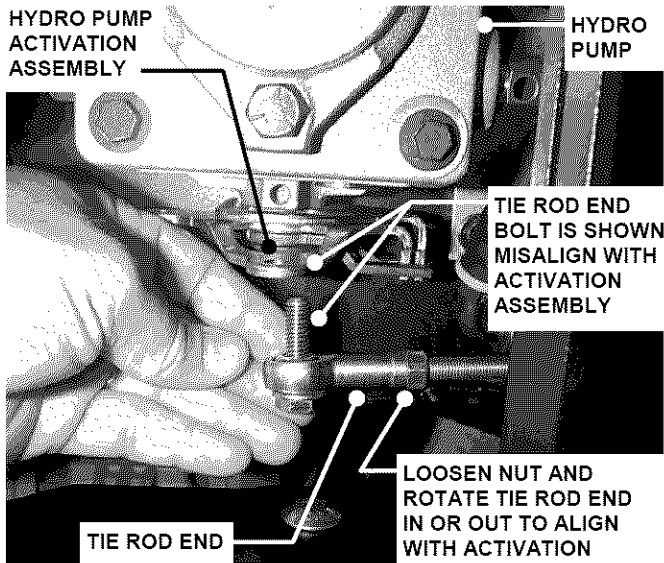


FIGURE 5.4

13. Once tie rod end bolt is aligned with activation assembly insert into hole and reinstall washers and nut that secure bolt to assembly. Tighten securely. Tighten tie rod jam nut securely.

14. Start engine, disengage parking brake, and check rotation of the rear wheels.

15. Reinstall both hydro pump fans. Reinstall washer and bolt. Tighten bolt securely.

16. Reinstall screen and tighten retaining hardware securely.

5.2 MOWER DECK & COMPONENT ADJUSTMENTS

The leveling procedures for the 61 deck differ from the 48 and 52 decks. The 61 deck replaces the two rear eyebolts with slotted brackets, and uses 1 1/4" leveling blocks in place of the 1" blocks. Follow and complete each step carefully.

5.2.1. MOWER DECK ADJUSTMENT (LEVELNESS) SIDE to SIDE and FRONT to REAR

Before making deck leveling adjustments, inflate rear tires to 12 PSI and front tires to 25 PSI. When adjusted correctly, the deck will be level side to side within 1/8", have a low cut setting of approximately 1" (1 1/4" for 61 deck) and the blades pitched approximately 3/16" higher at the rear.

1. Place machine on a smooth level surface.
2. Check side to side level by rotating blades until tips are pointing to the sides of the deck. Check the measurement of outside blade tips to the ground on both blades. The measurement of each of the outside blade tips should be within 1/8" of each other. If measurement of the blade tips is not within 1/8", adjustment should be made.
3. Move deck lift lever and set the mower deck to the highest cutting position.
4. Relieve tension on deck lift assist spring by loosening nut on eyebolt. Refer to Section "Removing Deck".
5. Place 1" blocks (1 1/4" for 61 deck) under the front and rear edge of the mower deck.
6. Move deck lift lever and set the mower deck to the lowest cutting position.
6. Loosen the nuts and bolts that secure both front deck support chains. Adjust chains until tight and retighten bolts and nuts. Torque to 20 to 30 ft. lbs. See Figure 5.5.

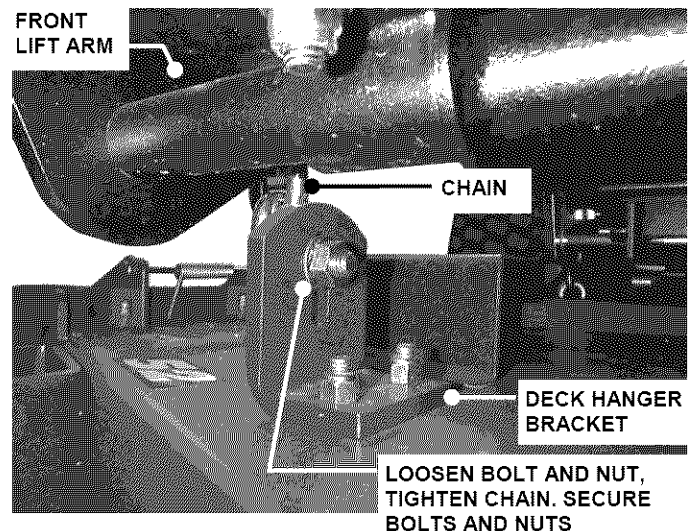


FIGURE 5.5

Section 5 - ADJUSTMENTS & REPAIR



5.10.4. BATTERY TESTING



1. Remove battery. Refer to Section "BATTERY REMOVAL".
2. Using a voltmeter, check the battery's state of charge by comparing the voltmeter reading with the chart below. (Remember to hook the positive (red) lead of the voltmeter to the battery's positive terminal, and the negative lead to the negative terminal.)

Battery Condition Chart	
State of Charge	Digital Voltmeter
100% Charged w/ Sulfate Stop	12.80v
100% Charged	12.60v
75% Charged	12.40v
50% Charged	12.10v
25% Charged	11.90v
0% Charged	Less than 11.80v

5.10.5. NEW BATTERY PREPARATION

1. Remove battery from carton.
2. Place battery in a well ventilated area on a level non-concrete surface.
3. Check date on battery label. See Figure 5.17. If battery is placed into service after the date shown, charge battery. Refer to section "BATTERY CHARGING".
4. After charging (if required), slide battery partially into battery housing.
5. Connect positive (+) cable (red) first, from wiring harness to the positive terminal (+) on battery using bolt and nut provided in hardware bag. Connect negative (-) cable (black) last, to negative terminal (-) on battery using bolt and nut. Apply a small amount of grease over terminals to prevent corrosion.
6. Install battery retainer and positive terminal cover.

	WARNING	
DO NOT attempt to service or charge the battery while it is installed in the machine. DO NOT use "BOOST" chargers on the battery.		

	WARNING	
Shield the positive terminal with terminal cover located on battery harness. This prevents metal from touching the positive terminal, which could cause sparks. Cables must be connected to battery terminals in the proper position. RED (Positive) cable must go to the (+) terminal. BLACK (Negative) cable must go to the (-) terminal.		

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Starter Will Not Crank Engine	1. Battery dead.	1. Service battery.
	2. Blown fuse.	2. Replace fuse.
	3. Electrical connections loose or corroded.	3. Clean and check connections for good contact.
	4. Defective ignition switch.	4. Contact authorized SNAPPER dealer.
Engine Will Not Start	1. Blade engagement switch in the "ON" position.	1. Move blade engagement switch to "OFF".
	2. Park brake not set or Operator not seated.	2. Set park brake and Operator in Operator Seat.
	3. Motion Controls not in Neutral Lock Position.	3. Place Motion Controls in Neutral Lock Position.
	4. Fuel tank empty.	4. Fill fuel tank with fresh fuel.
	5. Engine needs choking.	5. Move choke control to "CHOKE" position.
	6. Spark plug wire disconnected.	6. Place spark plug wire onto spark plug.
	7. Battery weak or dead.	7. Service battery.
	8. Faulty parking brake, blade or ignition switch.	8. Contact authorized SNAPPER dealer.
Engine Stalls After Running	1. Operator not in seat.	1. Sit in operator's seat.
	2. Choke control in the "CHOKE" position.	2. Move choke control to "OFF" position.
	3. Fuel tank empty.	3. Fill with fuel to proper level.
	4. Engine air pre-cleaner and or air cleaner dirty.	4. Clean free of all debris.
	5. Spark plug defective or gap set improperly.	5. Service spark plug.
	6. Fuel filter stopped up.	6. Replace fuel filter.
	7. Water, debris or stale fuel in fuel system.	7. Drain and clean fuel system.
Engine Loses Power	1. Excessive load on engine.	1. Lessen load.
	2. Engine air pre-cleaner or air cleaner dirty.	2. Clean or replace filters.
	3. Engine oil level low.	3. Fill with engine oil to proper level.
	4. Engine cooling fins & air intake screen excessively dirty.	4. Clean cooling fins, air intake screen of all debris.
	5. Spark plug faulty.	5. Service spark plug.
	6. Water, debris or stale fuel in fuel system.	6. Drain and clean fuel system.
Engine Backfires When Turned To "STOP"	1. Throttle control set too "FAST".	1. Set throttle control to "SLOW" and allow engine to idle. Then, turn key to "OFF".
Excessive Vibration	1. Damaged or bent mower blades.	1. Service mower blade(s).
	2. Loose blade components.	2. Service and tighten loose parts.
	3. Worn or damaged components.	3. Inspect all belts and pulleys.
	4. Loose or missing air lift (if equipped).	4. Replace air lifts. Tighten to proper torque.

(Trouble Shooting Continued on Next Page)