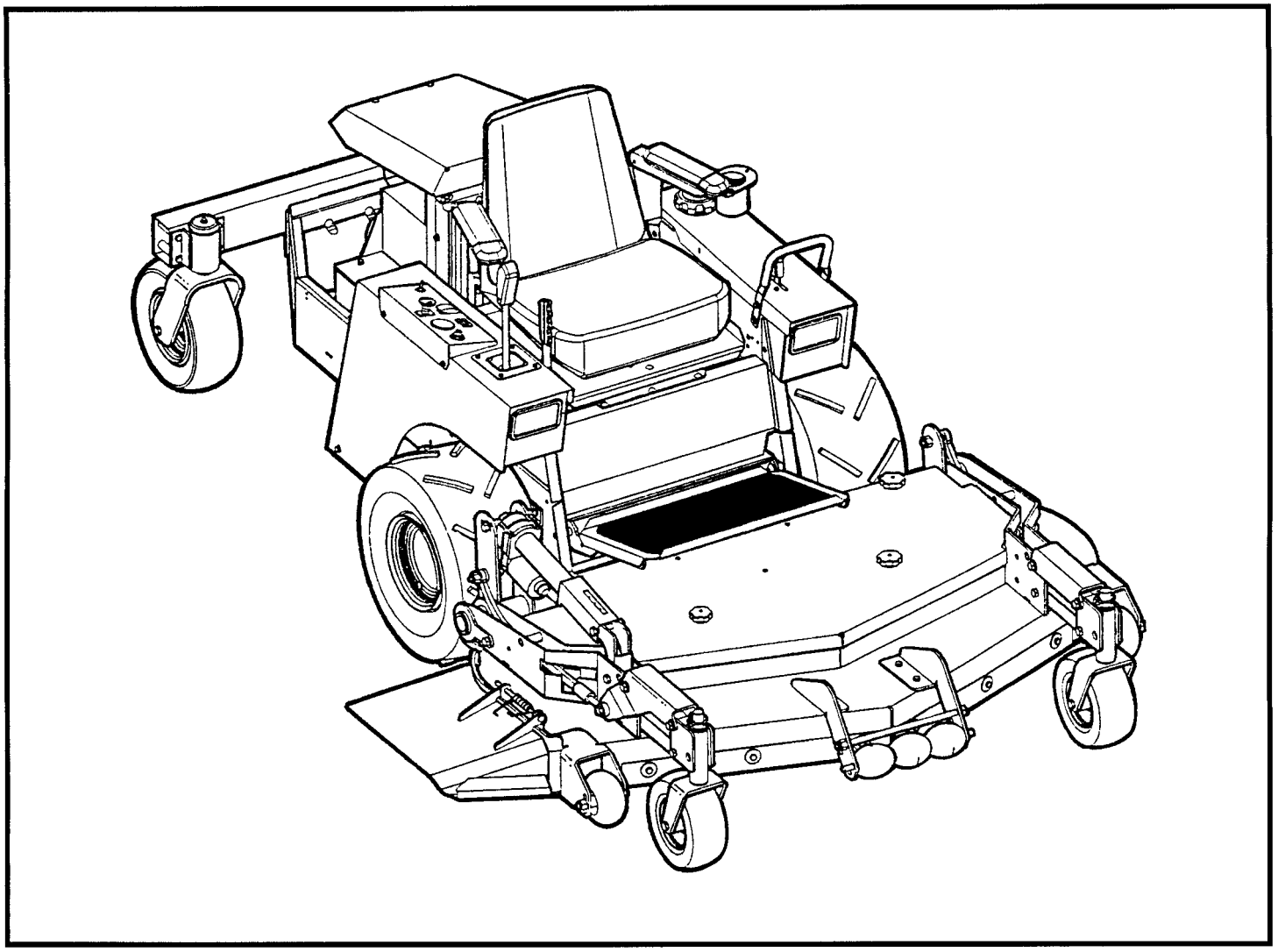
# SNAPPER®

# OUT FRONT Z-RIDER



# SERVICE MANUAL

SNAPPER® McDonough, GA., 30253 U.S.A.

# SERVICE MANUAL

## for
## SNAPPER OUT FRONT Z-RIDERS

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# Section I
# GENERAL INFORMATION

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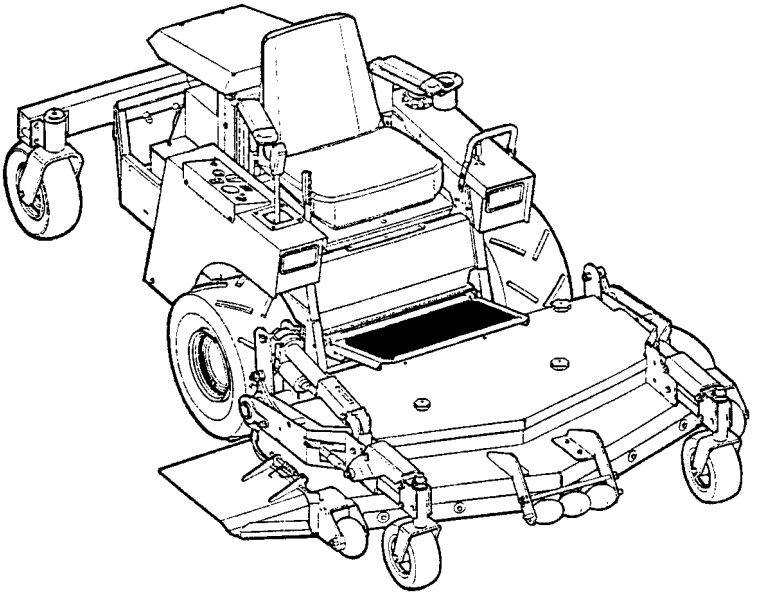
# Section I - GENERAL INFORMATION

## 1.1 MASTER PROFILES FOR MODELS BUILT FROM 1996 THRU 1999

### OUT FRONT Z-RIDER - '96

| POWER UNITS | MOWER DECKS |
|---|---|
| **ZF2200K - 82371** | **ZF6100M (61" Deck) - 82385**<br>**ZF5200M (52" Deck) - 82459** |
| **Literature Pack - 5-4286**<br>Operator Manual - 3-5899<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06106 | |



### OUT FRONT Z-RIDER - '97

| POWER UNITS | MOWER DECKS |
|---|---|
| **1) ZF2200K - 82371**<br>**1) ZF2500K - 82517** | **ZF5200M (52" Deck) - 82459**<br>**ZF6100M (61" Deck) - 82385** |
| **1) Literature Pack - 5-7724**<br>Operator Manual - 4-6480<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06106 | |

### OUT FRONT Z-RIDER (Diesel) - '97

| POWER UNITS | MOWER DECKS |
|---|---|
| **1) ZF2100DKU - 82512** | **ZF5200M (52" Deck) - 82459**<br>**ZF6100M (61" Deck) - 82385** |
| **1) Literature Pack - 5-4629**<br>Operator Manual - 4-5182<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06113 | |

### OUT FRONT Z-RIDER - '98

| POWER UNITS | MOWER DECKS |
|---|---|
| **1) ZF2500KH - 84343** | **1) ZF5200M (52" Deck) - 84344**<br>**2) ZF6100M (61" Deck) - 84345**<br>**3) ZF7301M (73" Deck) - 84278** |
| **1) Literature Pack - 5-7724**<br>Operator Manual - 4-6480<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06106 | **1) Literature Pack - None**<br>**2) Literature Pack - None**<br>**3) Literature Pack - 5-8002**<br>Operator/Dealer Set-Up - 4-7174<br>Parts Manual - 4-7173<br>Parts Manual - 06125 |

### OUT FRONT Z-RIDER (Diesel) - '98

| POWER UNITS | MOWER DECKS |
|---|---|
| **1) ZF2500DKH - 84342**<br>**2) ZF2300GKU - 84271** | **ZF5200M (52" Deck - 82459**<br>**ZF6100M (61" Deck - 82385** |
| **1) Literature Pack - 5-4629**<br>Operator Manual - 5-5182<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06113<br>**2) Literature Pack - 5-6429**<br>Operator Manual - 4-5182<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06113 | |

### OUT FRONT Z-RIDER - '99

| POWER UNITS | MOWER DECKS |
|---|---|
| **1) ZF2500KH - 84409** | **1) ZF5200M (52" Deck) - 84434**<br>**2) ZF6100M (61" Deck) - 84435**<br>**3) ZF7301M (73" Deck) - 84441** |
| **1) Literature Pack - 5-7724**<br>Operator Manual - 4-6480<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06106 | **1) Literature Pack - None**<br>**2) Literature Pack - None**<br>**3) Literature Pack - 5-8002**<br>Operator/Dealer Set-Up - 4-7174<br>Parts Manual - 4-7173<br>Parts Manual - 06125 |

### OUT FRONT Z-RIDER (Diesel) - '99

| POWER UNITS | MOWER DECKS |
|---|---|
| **1) ZF2100DKU - 84410**<br>**1) ZF2300GKU - 84411**<br>**2) EZF2100DKU - 84350** | **ZF5200M (52" Deck) - 84434**<br>**ZF6100M (61" Deck) - 84435**<br>**EZF6100M (61" Deck) - 84351** |
| **1) Literature Pack - 5-4629**<br>Operator Manual - 4-5182<br>Dealer Set-Up - 3-5892<br>Parts Manual - 06106<br>**2) Literature Pack - 5-8677**<br>Operator Manual - 7-3065<br>Dealer Set-Up - 7-3067<br>Parts Manual -06113 | |

**NOTE**

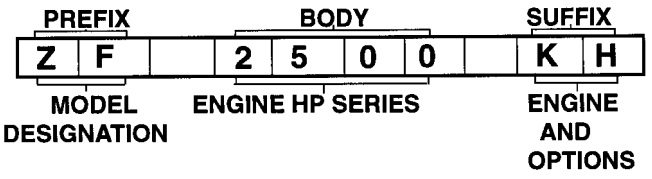
Model Number Explanations are graphically shown on Page 1.3. Please learn this identification system. It will help in many ways.

# Section I - GENERAL INFORMATION

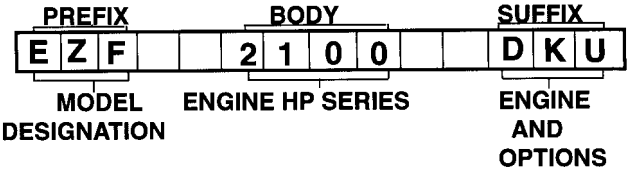
## 1.2 MODEL NUMBER EXPLANATIONS

### POWER UNITS

**EXAMPLE 1**




**EXAMPLE 2**

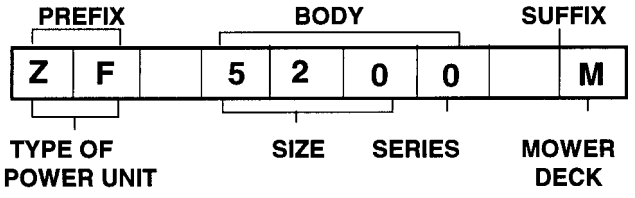



### EXPLANATION

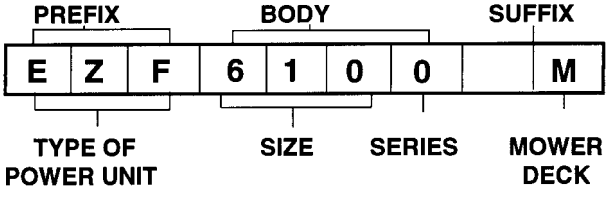
| PREFIX | BODY | SUFFIX |
|---|---|---|
| *E - European Market<br>Z - Zero Turning - Hydro<br>**F - Front Mounted Mower | 21 - 21 HP<br>23 - 23 HP<br>25 - 25 HP | KH - Kohler Engine<br>DKU - Kubota Diesel Engine<br>GKU - Kubota Gas Engine |
| | 00 - Series Designation | |

### MOWER UNITS

**EXAMPLE 1**




**EXAMPLE 2**




### EXPLANATION

| PREFIX | BODY | SUFFIX |
|---|---|---|
| *E - European Market<br>Z - Zero Turning - Hydro Drive<br>F - Front Mounted Mower | 52 - 52" Mower Cutting Width<br>61 - 61" Mower Cutting Width<br>73 - 73" Mower Cutting Width | M - Mower Deck |
| | 00 - Series Designation<br>01 - Series Designation | |

•When Used, It Is Always First Letter of Model Number
••Appears After First or Second Letter Of Model Number

# Section I - GENERAL INFORMATION

## INTRODUCTION

### 1.3 HOW TO USE THIS MANUAL

This manual contains the Service and Maintenance information required to properly inspect, service and repair the OUT FRONT Z-RIDER Power Units and their compatible Mower Units (ZF5200M, ZF6100M & ZF7301M).

The manual is divided into sections for quick, easy reference. Carefully read all procedures described for servicing a particular component BEFORE repairs are started, to avoid needless disassembly.

> **NOTE**
> References to the RIGHT and LEFT sides are determined by facing forward while sitting in the Operator's Seat.

### 1.4 WARNINGS & CAUTIONS

Details of standard workshop safety procedures are not included in this manual. WARNINGS & CAUTIONS occur where procedures, if improperly performed, could cause personal injury, and/or damage to the unit or its components. These WARNINGS & CAUTIONS do not cover all conceivable ways hazardous consequences could be created by improperly following the instructions or by the incorrect use of service tools.

### 1.5 SERIAL NUMBER LOCATION

The Unit Serial Number is located on the inside of the rear of the right hand fender.

### 1.6 TOOL REQUIREMENTS

The normal complement of U.S. Standard tools found in most repair shops are all that will normally be needed to repair **SNAPPER OUT FRONT Z-RIDERS**. Special tools and meters are mentioned where needed in the manual. Refer to the specified Parts Manual for special tools available through **SNAPPER** Dealers.

> **NOTE**
> Throughout the following sections of this manual, you may find the abbreviations **ZF** or **OFZ** being used in lieu of **OUT FRONT Z-RIDER**. These are acronyms of common usage to describe various models of the machine.

### 1.7 SPECIFICATIONS - GENERAL

**A.** ENGINE SPECIFICATIONS
Refer to the Engine Manufacturer's Manuals.

**B.** HYDRO TRANSAXLE SPECIFICATIONS
The Power Units covered in this manual will have the following Hydro Transaxle Combinations:
1. Eaton 771A (R.H.), 771B (L.H.)
2. Refer to the Hydro Transaxle Manufacturer's Shop Manuals for repair procedures.

**C.** TIRE SPECIFICATIONS
The Power Units covered in this manual are furnished with tires having four (4) different parts numbers. Traction Tire Pressures are to be maintained at 12 PSI while Caster Tires are to be kept at 25 PSI.

### 1.8 SPECIFICATIONS - TORQUE VALUES

Standard Torque Specifications and Capscrew Markings Chart. The values given here are based on the use of clean and dry threads. Reduce torque by 10 percent when threads are lubricated with engine oil and by 20 percent if new plated capscrews are used.

**CAPSCREW HEAD MARKINGS**

**Manufacturer's Marks may vary. Three-line markings on heads shown below - for example, indicate SAE Grade 5.**

SAE 1 or 2 | SAE 5 | SAE 6 or 7 | SAE 8

| CAPSCREW BODY SIZE Inches - Thread | SAE 1 or 2 Torque Ft - Lb | SAE 5 Torque Ft - Lb | SAE 6 or 7 Torque Ft - Lb | SAE 8 Torque Ft - Lb |
|---|---|---|---|---|
| 1/4 - 20 | 5 | 8 | 10 | 12 |
| - 28 | 6 | 10 | | 14 |
| 5/16 - 18 | 11 | 17 | 19 | 24 |
| - 24 | 13 | 19 | | 27 |
| 3/8 - 16 | 18 | 31 | 34 | 44 |
| - 24 | 20 | 35 | | 49 |
| 7/16 - 14 | 28 | 49 | 55 | 70 |
| - 20 | 30 | 55 | | 78 |
| 1/2 - 13 | 39 | 75 | 85 | 105 |
| - 20 | 41 | 85 | | 120 |
| 9/16 - 12 | 51 | 110 | 120 | 155 |
| - 18 | 55 | 120 | | 170 |
| 5/8 - 11 | 83 | 150 | 167 | 210 |
| - 18 | 95 | 170 | | 240 |
| 3/4 - 10 | 105 | 270 | 280 | 375 |
| - 16 | 115 | 295 | | 420 |

### 1.9 WORKSHOP SAFETY HINTS

**A.** DO NOT run engine in an enclosed area - exhaust fumes are hazardous to your health.

**B.** DO NOT smoke, light a fire or create any sparks near gasoline or diesel fuel - both are flammable, gasoline in particular.

**C.** DO NOT use gasoline as a solvent. Fumes are dangerous. Always use non-flammable solvents.

**D.** DO NOT store gasoline in an area where sparks or flames are present such as near water heaters or furnaces - gasoline fumes are extremely explosive.

**E.** ALWAYS disconnect the spark plug wires and secure the ends away from the plug BEFORE inspecting, servicing or repairing the unit or attachments. Precautions prevent accidents such as unintentional start-ups!

F. ALWAYS make adjustments and do repairs in a well-lit and well-ventilated area.

G. ALWAYS wear protective safety goggles when using pressurized air to clean the machine or parts.

H. DO NOT use a jack to support the **OUT FRONT Z-RIDER** in a raised position. Use a chain hoist, "jack stands" or other stable supports that will hold up BOTH sides of the frame at the same time. This approach is especially important when raising and supporting the rear end of the unit. When lifting the rear of the unit (with deck attached), the mower deck caster wheels may pivot - therefore, both sides of the rear frame MUST be securely supported. Be sure to chock (block) the front caster wheels.

**WARNING**

If welding repairs are to be made on the **OUT FRONT Z-RIDER**, observe the following precautionary steps before welding:

**A.** ALWAYS disconnect or remove the battery.
**B.** ALWAYS attach grounding lead a minimum of 2 FEET (24") from area to be welded. *(Make certain welder ground is not located at a seal or bearing).*
**C.** ALWAYS shut-off fuel supply valves.
**D.** ALWAYS make sure that fuel tank caps are tightened securely.
**E.** ALWAYS drape fuel tanks with wet towels.
**F.** ALWAYS keep a fire extinguisher and other fire fighting apparatus close by.
**G.** ALWAYS practice SAFETY when welding!

**NOTE**

Read the Operator's and Engine Owner's Manuals and instructions BEFORE operating equipment.

# NOTES

# Section II
# TROUBLESHOOTING

## CONTENTS

# Section II - TROUBLESHOOTING
## ENGINE

| PROBLEM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| **Starter Will Not Crank Engine.** | Battery dead. | Service Battery. |
| | Blown Fuse. | Replace Fuse. (Fuse Panel under instrument panel). |
| | Electrical connections loose or corroded. | Clean and check connections for good contact. |
| | Defective Ignition Switch. | Replace Ignition Switch. |
| | Broken or frayed wire in Ignition Wiring. | Inspect Wiring. Repair any Wiring problem. |
| | Worn or defective Starter Gear. | Replace Starter Gear. |
| **Engine Will Not Start.** | Blade Engagement Switch in the "ON" position. | Move Blade Engagement Switch to "OFF". |
| | Park Brake not set. | Set Park Brake. |
| | Fuel Tank empty. | (Gas Engine). Fill Fuel Tank with fresh fuel.<br>(Diesel Engine). Fill Fuel Tank with fresh Diesel Fuel. |
| | Fuel Filter clogged. | (Gas Engine). Replace Fuel Filter.<br>(Diesel Engine). Remove and clean Fuel Filter of debris. |
| | Fuel Cock in the "OFF" position. | Move Fuel Cock Lever to the "ON" position. |
| | Engine needs choking. | Move Choke Control to "CHOKE" position. |
| | Spark Plug Wire disconnected. | Place Spark Plug Wire onto Spark Plug. |
| | Battery weak or dead. | Service Battery. |
| | Faulty Parking Brake, Blade or Ignition Switch. | Repair or replace faulty component. |
| **Engine Stalls After Running.** | Operator not in Seat. | Sit in Operator's Seat. |
| | Choke Control in the "CHOKE" position. | Move Choke Control to "OFF" position. |
| | Fuel Tank empty. | Fill with Fuel to proper level. |
| | Fuel Injection Nozzle clogged with carbon. | (Diesel Engine). Clean or replace Fuel Injection Nozzle. |
| | Insufficient lubrication. | Check engine oil lubrication system. |
| | Fuel Filter clogged. | (Gas Engine). Replace Fuel Filter.<br>(Diesel Engine). Remove and clean Fuel Filter of debris. |
| | Engine Air Pre-Cleaner and/Air Cleaner dirty. | Clean free of all debris. |
| | Spark Plug defective or gap set improperly. | Service Spark Plug. |
| | Water, debris or stale fuel in Fuel System. | Drain and clean Fuel System. |
| **Engine Loses Power.** | Excessive load on Engine. | Lessen load. |
| | Engine Air Pre-Cleaner or Air Cleaner dirty. | Clean or replace Filters. |
| | Engine Oil Level low. | Fill with Engine Oil to proper level. |
| | Engine Cooling Fins & Air Intake Screen excessively dirty. | Clean Cooling Fins, Air Intake Screen of all debris. |
| | Fuel Injection Nozzle clogged with carbon. | (Diesel Engine). Clean or replace Fuel Injection Nozzle. |
| | Spark Plug faulty. | Service Spark Plug. |
| | Water, debris or stale fuel in Fuel System. | Drain and clean Fuel System. |
| **Engine Backfires When Turned to "STOP".** | Throttle Control set to "FAST" position. | Set Throttle Control to "SLOW" and allow Engine to idle. Then, turn Key to "OFF". |
| **Excessive Vibration.** | Damaged or bent Mower Blade(s). | Service Mower Blade(s). |
| | Loose Blade components. | Service and tighten loose parts. |
| | Loose or missing Air Lift (if equipped). | Replace Air Lifts. Tighten to proper torque. |
| | Frayed or damaged Belts. | Replace Belts. |
| | Loose or damaged Pulleys. | Inspect and tighten/replace. |

(Troubleshooting Continued on Next Page)

# Section II - TROUBLESHOOTING

## ENGINE

| PROBLEM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| **Engine Overheats. (Water-Cooled Engines)** | Insufficient Engine lubrication. | Check Engine Oil Lubrication System. |
| | Fan Belt broken or out of adjustment. | Replace Fan Belt or adjust to proper tension. |
| | Insufficient Coolant Level. | Check Coolant Level and replenish supply. |
| | Thermostat defective. | Replace Thermostat of correct heat range. |
| | Radiator Screen or Radiation Cooling Fins clogged. | Clean all debris from Radiator Screen and Fins. |
| | Water Pump, Fan & Radiator Cap defective. | Replace Cooling System parts that are defective. |
| | Incorrect Fuel Injection Timing. | Adjust Fuel Injection Timing until correct. |
| | Excessive concentration of antifreeze. | Change Coolant (water/antifreeze) mixture ratio. |
| | Cooling System clogged with debris. | Drain and flush Cooling System. |

## HYDRO TRANSAXLE (Traction Drive)

| PROBLEM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| **Tractor Will Not Move.** | Joystick in the Neutral "N" position. | Place Joystick in desired speed position. |
| | Motion Control Levers in the Neutral "N" position. | Move Control Levers to desired speed. |
| | Roll Release Lever is in "ROLL" position. | Move Roll Release Lever to the engage position. |
| | Low Transmission Hydraulic Oil level. | Bring Hydraulic Oil to proper level. |
| | Parking Brake engaged. | Move Parking Brake to disengaged position. |
| **Loss of Traction.** | Traction Drive Belt requires replacement. | Replace Traction Drive Belt. (See MAINTENANCE PARTS, Pg. 2.4). |

## MOWER UNIT

| PROBLEM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| **Blade(s) Not Cutting** | Blade Engagement Switch in the "OFF" position. | Move Blade Switch to the "ON" position. |
| | Clutch Belt slipping. | Replace Clutch Belt. (See MAINTENANCE PARTS, Pg. 2.4). |
| **NOTE See Section VIII for Detailed "Corrective Action" in Solving Cutting Problems.** | Mower Belt slipping. | Replace Mower Belt. |
| | Electric Clutch not functioning. | Adjust or replace Electric Clutch. |
| | Check Gearbox for damage. | Repair or replace Gearbox. |
| | Power Transfer Shaft disconnected or damaged. | Connect Power Transfer Shaft or repair damage. |
| **Cutting Grass Improperly. (See Section VIII).** | Uneven Tire Pressure. | Bring to proper pressure. |
| | Cutting Height too low or high. | Adjust Cutting Height. |
| | Engine speed too slow. | Move Throttle Control to "FAST" position. |
| | Forward speed too fast. | Move Motion Control Levers to a slower speed. |
| | Terraced cut, side-to-side. | Adjust side-to-side level. |
| | Excessive Deck pitch, front to rear. | Adjust front to rear level. |
| | Cutting Blade(s) dull or damaged. | Sharpen Cutting Edges or replace Blade(s). |
| | Blade Belt slipping. | Replace Blade Belt. (See MAINTENANCE PARTS on Pg. 2.4). |
| | Check Electric Clutch. | Adjust to proper specifications. |
| | Check Clutch Belt. | Replace Clutch Belt. (See MAINTENANCE PARTS on Pg. 2.4). |
| | Check Gearbox for damage. | Repair or replace Gearbox. |
| **Poor Grass Discharge. (See Section VIII).** | Engine speed too slow. | Move Throttle Control to "FAST" position. |
| | Forward speed too fast. | Move Motion Control Levers to a slower speed. |
| | Grass is wet. | Mow when grass is dry. |
| | Excessively worn or damaged Blade(s). | Service Mower Blade(s). |
| | Buildup of grass clippings and debris under Deck. | Clean Deck. |
| | Improper Blade(s) installed on Deck. | Install proper SNAPPER Blade(s). |
| | Blade(s) installed improperly on Deck. | Install Blade(s) properly. |

# Section II - TROUBLESHOOTING

## MOWER UNIT (Continued from Page 2.3)

| PROBLEM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| **Deck Will Not Lift Properly.** | Loose or disconnected Electrical Harness.<br>Electric Screw Jack malfunctioning.<br>Key Switch is in "OFF" position. | Connect Electrical Harness<br>Repair/replace Electric Screw Jack.<br>Turn Key Switch to "ON" position. |
| **Oil Leaking.** | Loose or missing Hydraulic Reservoir Cap.<br>Leaking Hose Fittings, Clamps or Reservoir. | Check oil level and replace Reservoir Cap.<br>Verify Fittings and Hose Clamps are tight. |

## BATTERY

| PROBLEM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| **Battery Will Not Charge.** | Poor Cable connections.<br>Bad Battery Cell(s).<br>Faulty Alternator.<br>Blown Fuse. | Clean Cables and Battery Terminals.<br>Replace with new Battery.<br>Repair or replace Alternator.<br>Replace Fuse. |

## MAINTENANCE PARTS

| REPLACEMENT PARTS | | POWER UNITS | | | | | MOWER UNITS | |
|---|---|---|---|---|---|---|---|---|
| ITEM | PART No. | ZF2200K | ZF2500K | ZF2500KH | ZF2100DKU | ZF2300GKU | ZF5200M | ZF6100M |
| Battery | 3-5610 | • | • | • | • | • | | |
| Oil Filter, Hydro | 4-5184 | • | • | • | • | • | | |
| Fuel Filter | 4-4777 | (Order from KOHLER) | | | | | | |
| Mower Blades | 2-9246<br>1-7081<br>2-9251 | | | | | | • (3) Hi Lift | • (3) Low Lift<br>• (3) Hi Lift |
| Belt, Mower Deck | 4-2776<br>3-5542 | | | | | | • | • |
| Belt, Upper Drive Shaft to Hydro Pump | 3-5544 | • (2) | • (2) | • (2) | • (2) | • (2) | | |
| Belt, Deck Drive Shaft to Electric Clutch | 3-5543<br>4-1830 | • (2) | • (2) | • (2) | • (2) | • (2) | | |

**NOTE: For those parts not listed above, consult SNAPPER Parts Manual No. 06106 (REV 2, 11/97).**

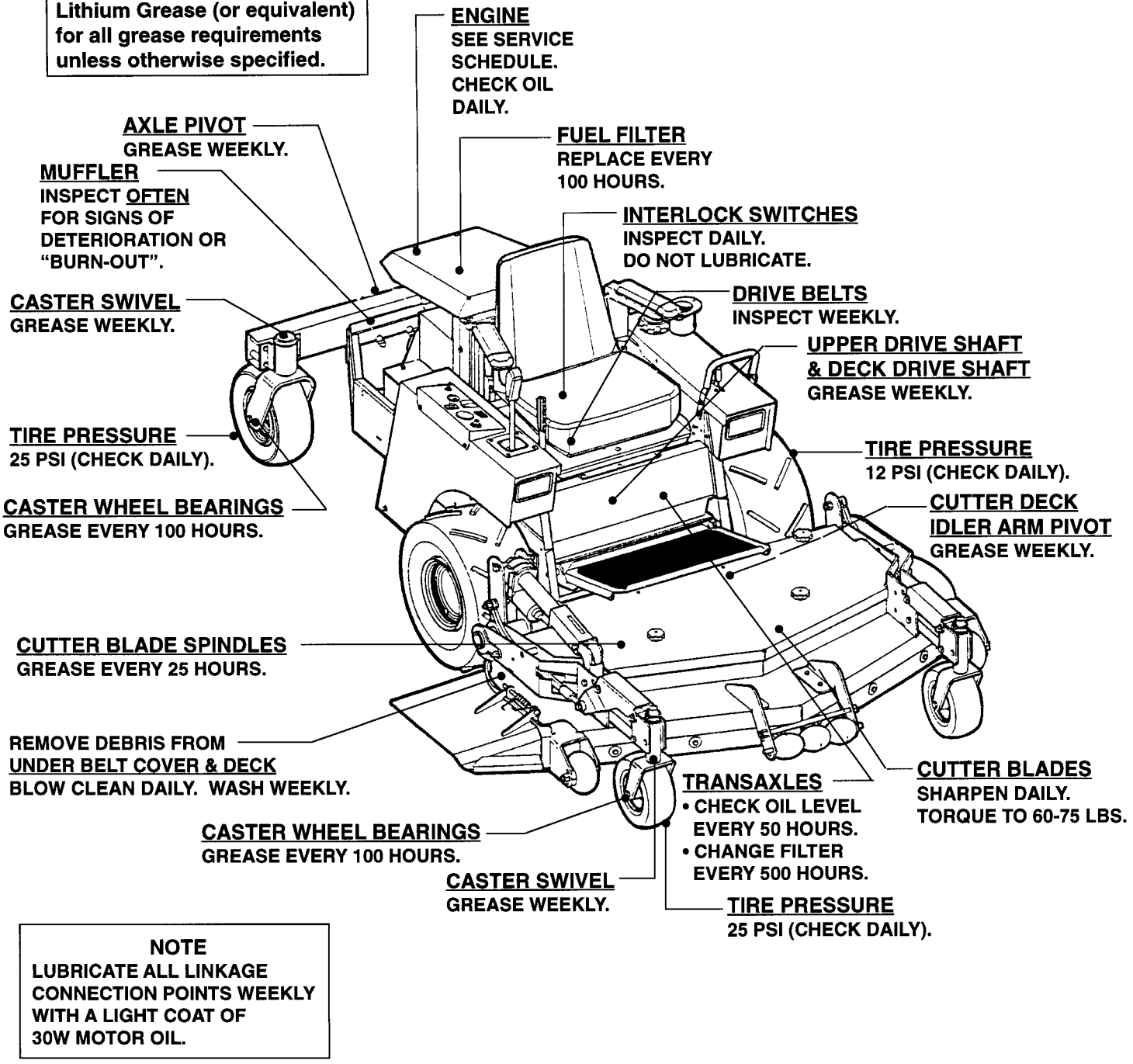
# Section II - TROUBLESHOOTING

## SERVICE & LUBRICATION CHART

**NOTE:**

The Power Unit illustrated below is indicative of all models of the SNAPPER OUT FRONT Z-RIDER. It is shown with a representative 52" or 61" Mower Unit attached and is intended to give a general overview of the various components. Use common sense when servicing - if a sliding surface shows signs of wear, it needs lubrication. If a component is equipped with a grease fitting, it requires grease, etc.

**NOTE**
**Use Kendall NLG1 No.2 Lithium Grease (or equivalent) for all grease requirements unless otherwise specified.**




**NOTE**
**LUBRICATE ALL LINKAGE CONNECTION POINTS WEEKLY WITH A LIGHT COAT OF 30W MOTOR OIL.**

# Section II - TROUBLESHOOTING

## SERVICE SCHEDULE

| ITEM | SERVICE PERFORMED | EACH USE | 5 HRS | 25 HRS | 50 HRS | 75 HRS | 100 HRS | EACH SEASON |
|---|---|---|---|---|---|---|---|---|
| **Engine Oil** | Check Oil Level | X | | | | | | |
| | Initial Oil Change | | X Gas Eng. | | X | | | |
| | Periodic Oil Change | | | | X Gas Eng. | X* Diesel | | |
| | Change Oil Filter | | | | X Gas Eng. | | X Diesel | |
| **Air Pre-Cleaner** | Clean Sponge Element | | | X** Gas Eng. | | | | |
| **Air Cleaner** | Clean or Replace | | | X** Gas Eng. | | | | X Diesel |
| **Fuel Filter** | Replace | | | | | | X | |
| **Engine Cooling System** | Clean Shroud & Fins | | | | | | X** Kohler | |
| **Engine Cooling System** | Clean Radiator Screen & Fins | | | | | | X** Kubota | |
| **Engine Cooling System** | Check Coolant Level | | | | | | | See Engine Manual |
| **Battery** | Check Electrolyte | | | | | | X | X |
| | Charge Battery | | | | | | | X*** |
| | Testing Battery | | | | | | | X |
| **Tires** | Check Air Pressure | X | | | X | | | X |
| **Drive Belts** | Check For Wear, Damage & Replacement | X | | | | | | |
| **Mower Deck** | Clean Outside & Underside of Debris Accumulation | X | | | | | | |
| **Lubrication Points** | Grease or Oil | | | X | | | | X |
| **Hydrostatic Trans.Oil** | Check Oil Level | | | | X | | | X |
| **Hydrostatic Trans. Filter** | Replace Filter | | | First Change at 200 Hours. Thereafter every 500 Hours. | | | | |

• Change oil every 25 hours when operating under heavy load or high temperatures.
** Clean more often under dusty conditions or when air debris is present.
*** Charge battery every one or two months as specified by Engine Owner's Manual.

# Section III
# ELECTRICAL

## CONTENTS

# Section III - ELECTRICAL SYSTEM

## INTRODUCTION

The Electrical Systems of the OUT FRONT Z-RIDERS consist of three circuits which are the Ignition, Charging and Starting Circuits. This section covers the Starting Circuit only. Refer to the Engine Manuals for information concerning the Ignition and Charging Circuits - these are Internal Engine Circuits.

### 3.1 STARTING CIRCUIT (Principle of Operation)

The Safety Interlock System is an electrical loop containing three Interlock Switches; Seat, Park Brake and PTO Control Switch. Activation of the Park Brake will manually lock the Steering Control. The three Interlock Switches MUST be closed at the same time before the Engine can be started. If any of the three are open, the Circuit will not be grounded and the Starting Solenoid cannot be activated.

After the Engine has been started, the PTO Switch can be closed and the Park Brake released to free the Steering Control. The Key Switch must remain open (in RUN position) and the operator must remain in the seat to keep the Seat Switch closed. The Interlock System will "kill" the Engine if the operator vacates the seat UNLESS the PTO Switch (Mower Blade) has been turned OFF, the Steering Control placed in NEUTRAL and the Parking Brake set.

### 3.2 WIRING HARNESSES

Shown in Figures 3.1 & 3.2 are the Battery Cables and Wiring Harnesses for the OUT FRONT Z-RIDER. These apply to all models. See "Cable & Plug Connection Chart" on Pages 3.3 & 3.4 for connection locations. Wiring Schematics are shown on Pages 3.4, 3.5 and 3.6.

**BATTERY CABLES & WIRING HARNESSES**

**Models EZF2100DKU, ZF2100DKU & ZF2300GKU (Kubota Engines)**

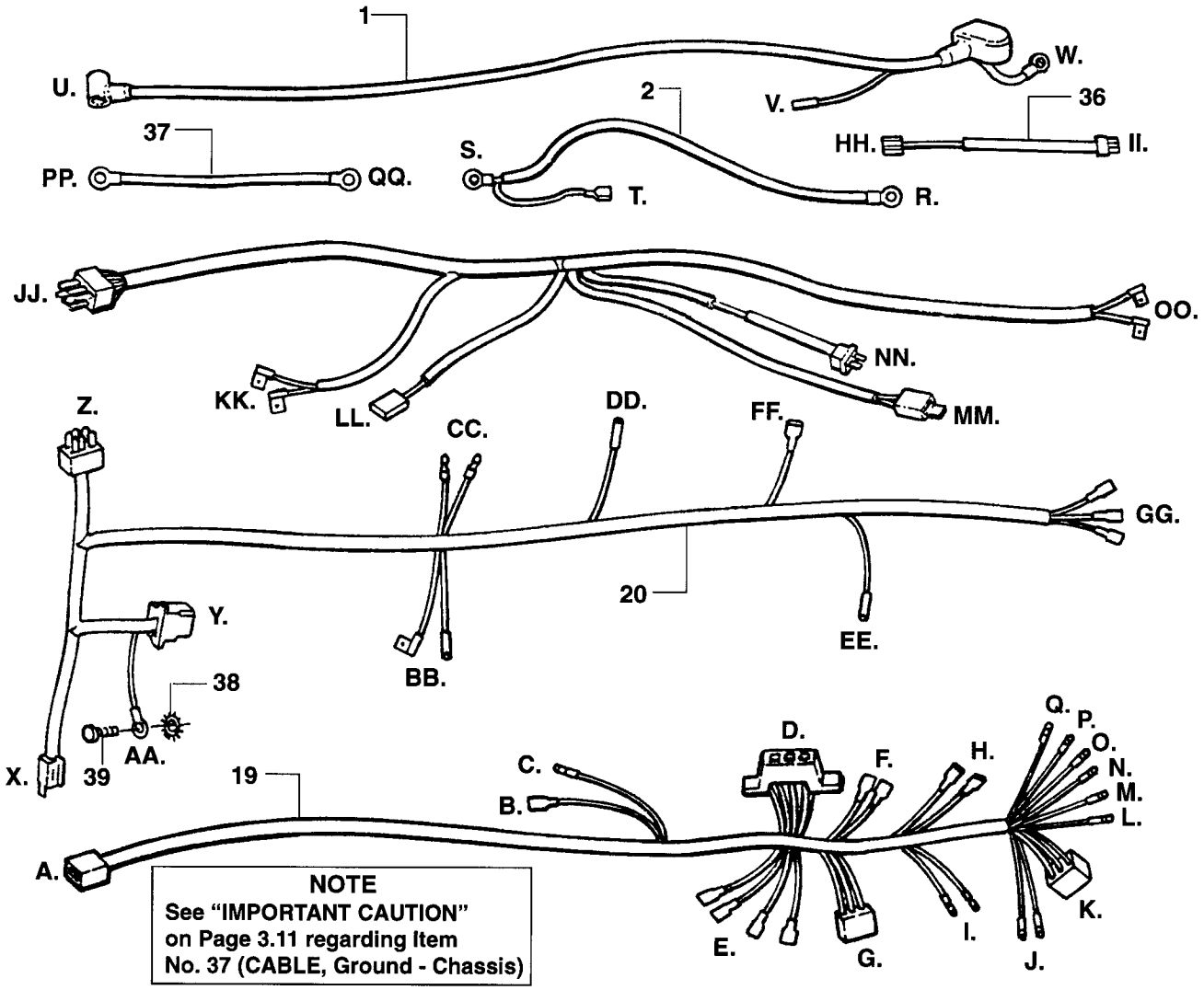



FIGURE 3.1

# Section III - ELECTRICAL SYSTEM

## CABLE & PLUG CONNECTION CHART (Kubota Engines)

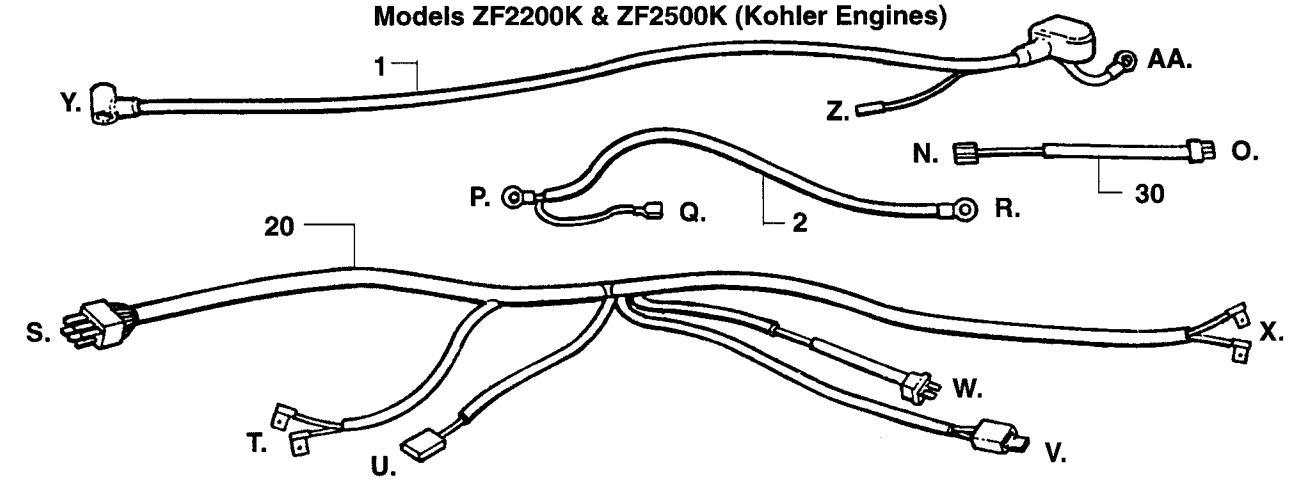
REFER TO FIGURE 3.1

| ITEM | PART No. | DESCRIPTION |
|---|---|---|
| 1 | 4-5312 | CABLE, Battery - Positive |
| 2 | 4-5311 | CABLE, Battery - Negative |
| 19 | 4-5200 | HARNESS, Control Panel (Model ZF2100DKU) |
| -- | 4-7240 | HARNESS, Control Panel (Model ZF2300GKU) |
| 20 | 4-5201 | HARNESS, D722B-I/D 722EB-1 Kubota Engine |
| -- | 4-5334 | HARNESS, WG750ELP-1 Kubota Engine |
| 30 | 4-5334 | HARNESS, Front |
| 36 | 4-2834 | HARNESS, Deck Lift |
| 37 | 4-5310 | CABLE, Ground-Chassis (Model ZF2100DKU) |
| -- | 5-8364 | CABLE, Ground-Chassis (Model ZF2300GKU) |

| PLUG | CONNECTS TO: | PLUG | CONNECTS TO: | PLUG | CONNECTS TO: |
|---|---|---|---|---|---|
| A. | Engine Harness | O. | Terminal "30" (5A) | CC. | Alternator |
| B. | Battery | P. | Terminal "17" (2A) | DD. | Oil Pressure Sender |
| C. | Battery | Q. | Terminal "19" (1A) | EE. | Glow Plug |
| D. | Fuses | R. | Ground (Engine Base) | FF. | Water Temp Sender |
| E. | Deck Lift | S. | Battery Terminal (Neg.) | GG. | Electric Solenoid |
| F. | Light Switch | T. | Control Panel Harness | HH. | Electric Screwjack |
| G. | PTO Switch | U. | Starter Solenoid | II. | Front Harness |
| H. | Hour Meter | V. | Control Panel Harness | JJ. | Control Panel Harness |
| I. | Amp Meter | W. | Battery Terminal (Pos.) | KK. | Right Head Light |
| J. | Buzzer | X. | PTO | LL. | Park Brake Switch |
| K. | Front Harness | Y. | Regulator | MM. | Seat Switch |
| L. | Terminal "50" (10A) | Z. | Main Harness | NN. | Deck Lift Harness |
| M. | Terminal "ACC" (8A) | AA. | Ground (Chassis) | OO. | Left Head Light |
| N. | Terminal "ACC" (4A) | BB. | Starter Solenoid | PP. | Ground (Engine) |
| | | | | QQ. | Ground (Frame) |

**BATTERY CABLES & WIRING HARNESSES**

**Models ZF2200K & ZF2500K (Kohler Engines)**




See Page 3.4 for "CABLE & PLUG CONNECTION CHART" (Kohler Engines)

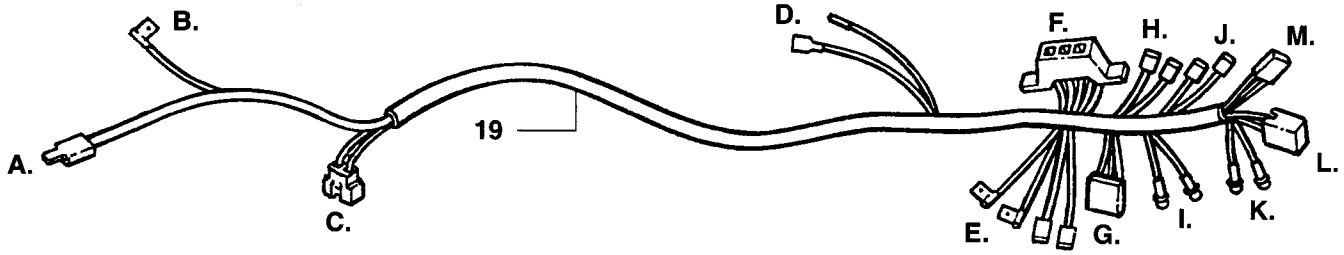



FIGURE 3.2

# Section III - ELECTRICAL SYSTEM

## CABLE & PLUG CONNECTION CHART (Kohler Engines)

| | ITEM | PART No. | DESCRIPTION |
|---|---|---|---|
| REFER TO FIGURE 3.2 | 1 | 3-5607 | CABLE, Battery - Positive |
| | 2 | 3-5609 | CABLE, Battery - Negative |
| | 19 | 3-5606 | HARNESS, Control Panel |
| | 20 | 3-5614 | HARNESS, Front |
| | 30 | 4-2834 | HARNESS, Deck Lift |

| PLUG | CONNECTS TO: | PLUG | CONNECTS TO: |
|---|---|---|---|
| A. | Electric Clutch | O. | Front Harness |
| B. | Starter Solenoid | P. | Battery Terminal (Neg.) |
| C. | Engine | Q. | Control Panel Harness (Green Wire) |
| D. | Battery | R. | Ground (Engine Base) |
| E. | Deck Lift Switch | S. | Control Panel Harness |
| F. | Fuse Box (Mounted Under Console Panel) | T. | Right Head Light |
| G. | PTO Switch | U. | Park Brake Switch |
| H. | Light Switch | V. | Seat Switch |
| I. | Amp Meter | W. | Deck Lift Harness |
| J. | Hour Meter | X. | Left Head Light |
| K. | Buzzer | Y. | Starter Solenoid |
| L. | Front Harness | Z. | Control Panel Harness (Black Wire) |
| M. | Ignition Switch | AA. | Battery Terminal (Pos.) |
| N. | Electric Screwjack | | |

## WIRING SCHEMATIC

### MODELS ZF2200K & ZF2500K (Kohler Engines)

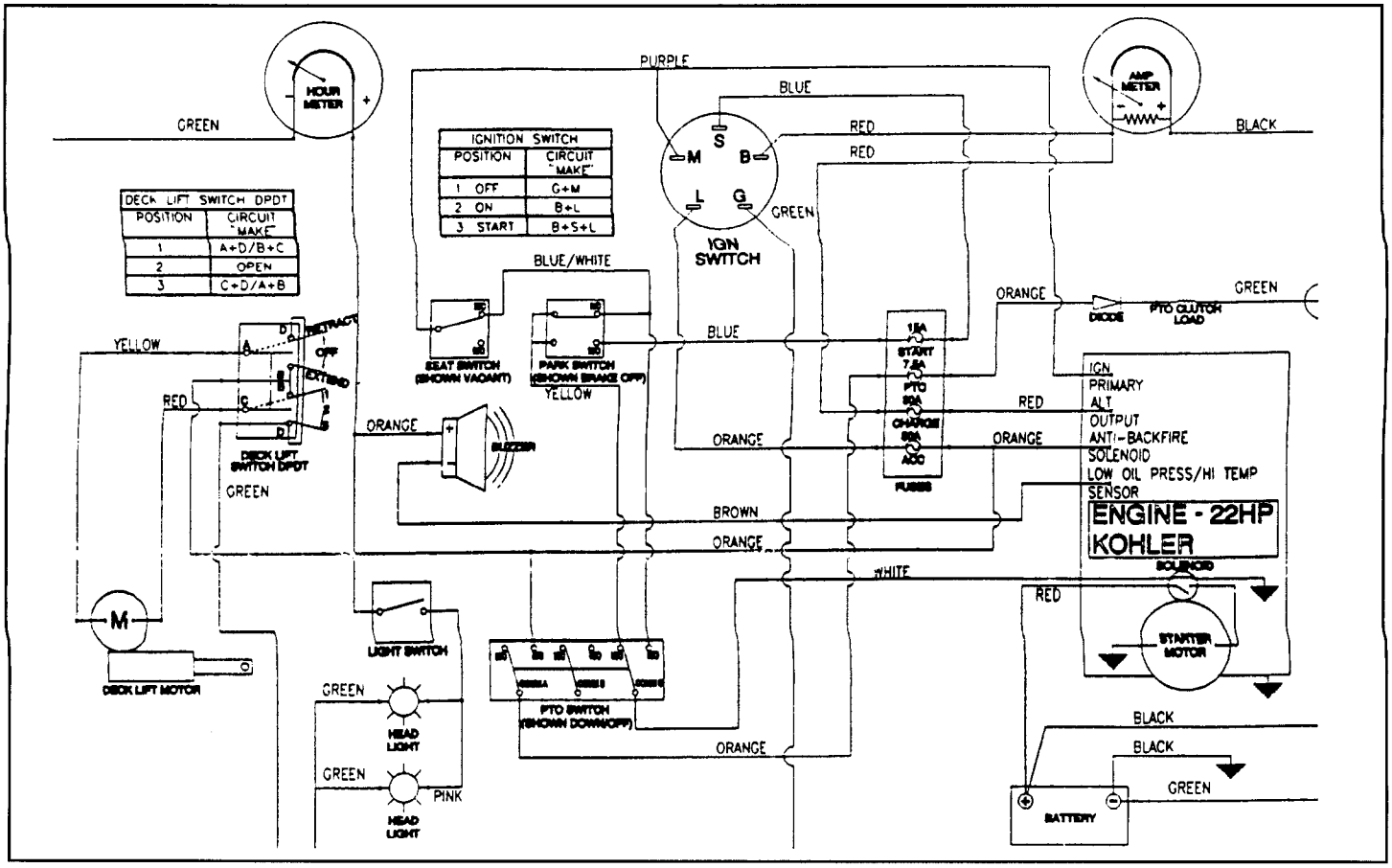



FIGURE 3.3

# Section III - ELECTRICAL SYSTEM

## WIRING SCHEMATIC

### Model ZF2300GKU (Kubota Gasoline Engine)

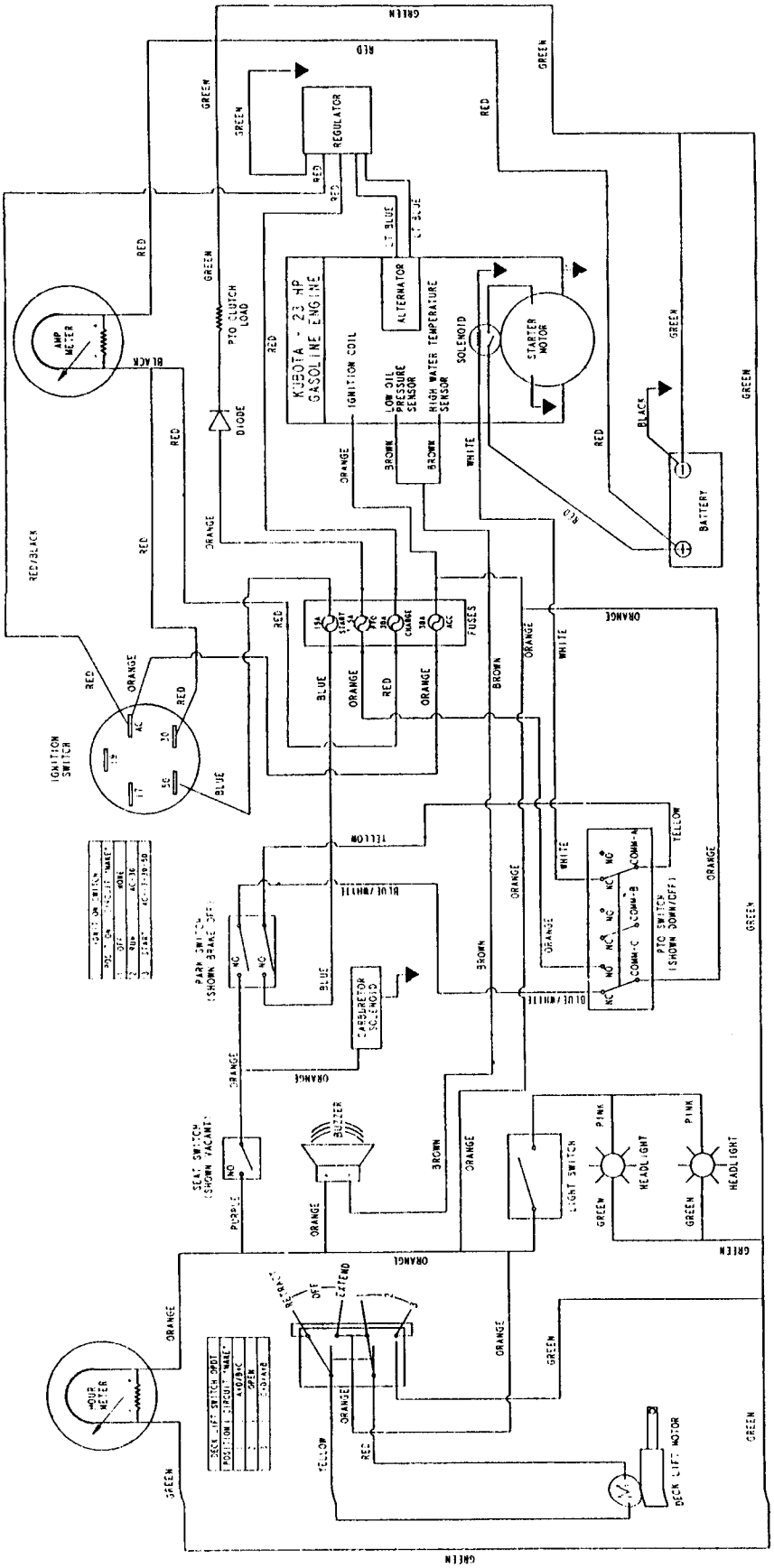



FIGURE 3.4

# Section III - ELECTRICAL SYSTEM

## WIRING SCHEMATIC

**Models EZF2100DKU & ZF2100DKU (Kubota Diesel Engines)**

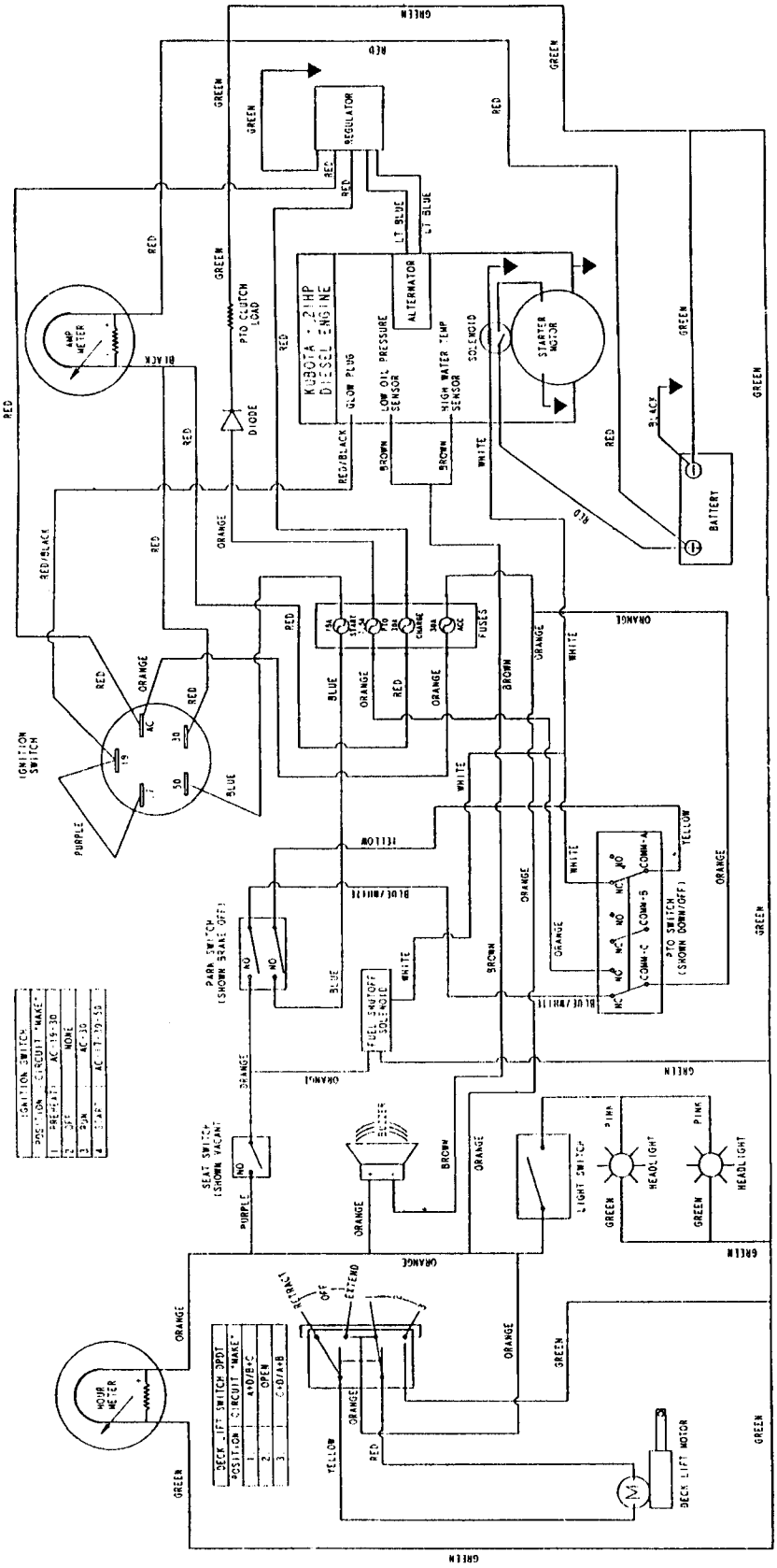



**FIGURE 3.5**

# Section III - ELECTRICAL SYSTEM

## 3.3 BATTERY

### A. BATTERY REMOVAL

1. Remove Battery Spring & Bracket.
2. Slide Terminal Cover away from Positive Terminal.
3. Observe and note Cable positions on Battery. See Figure 3.6.
4. Disconnect Cables from Battery Terminals, disconnecting BLACK (Negative) Cable first, then disconnect RED (Positive) Cable last. Retain Mounting Bolts and Nuts.

### B. BATTERY INSTALLATION

1. Position Battery into Battery Compartment.
2. Connect Cables to Battery Terminals. Connect RED (Positive) Cable first. Connect BLACK (Negative) Cable last.
3. Reinstall Battery Bracket, Spring and Terminal Cover. Refer to Figure 3.6.

**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.**

### C. BATTERY SERVICE

1. Remove Battery.
2. Place Battery in a well-ventilated area on a level surface.
3. Using distilled water, refill Cells as required to cover Cell Plates.
4. With Cell Caps removed, connect Battery Charger to Battery Terminals. RED to Positive (+) Terminals and BLACK to Negative (-) Terminal. See Figure 3.7.

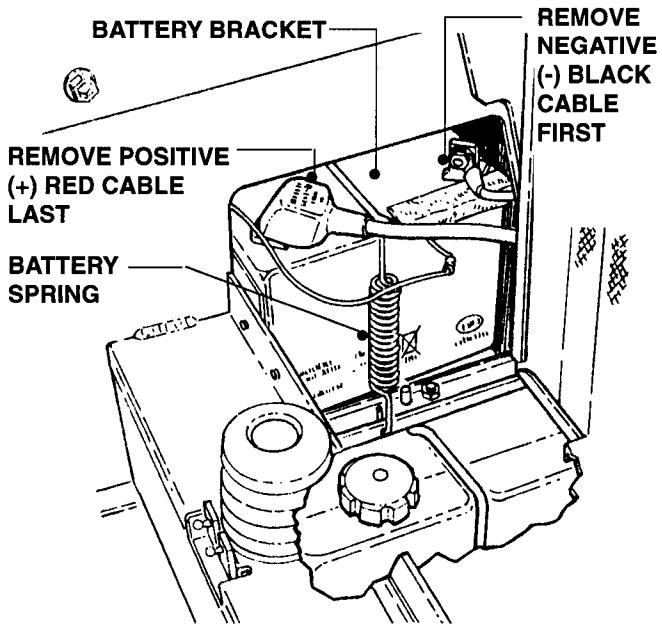



FIGURE 3.6

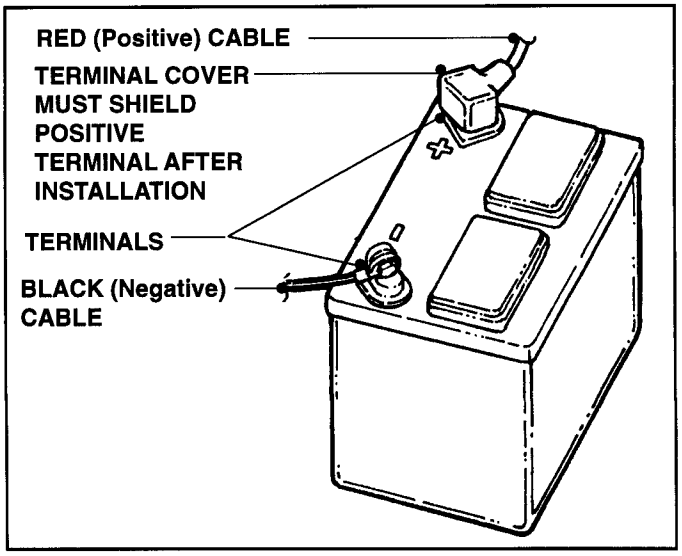



FIGURE 3.7

5. Slow charge Battery at 1 amp for 10 hours. An alternative fast charge should be no more than 2.5 amps for four hours.
6. If Battery will not accept charge, or is partially charged after 10 hours of charging at 1 amp, replace with new Battery. See "Battery Condition Chart" on following page.

**WARNING**

**The electrolyte (acid) produces a highly explosive gas. Keep all sparks, flame and fire away from area when charging Battery or when handling electrolyte or Battery. Electrolyte (acid) is a highly corrosive liquid. Wear eye protection. Wash affected areas immediately after having eye or skin contact with electrolyte (acid). Battery acid is corrosive. Rinse empty acid containers with water and mutilate before discarding. If acid is spilled on Battery, bench or clothing, etc., flush with clear water and neutralize with baking soda.**

### D. BATTERY TESTING

There are two types of Battery Tests - Unloaded and Loaded. The Unloaded Test is the procedure that will be discussed. An Unloaded Test is made on a Battery without discharging current. To perform Unloaded Testing, check charge condition using either a hydrometer or voltmeter.

1. Using a voltmeter, voltage readings appear instantly to show the state of charge. Remember to hook the Positive Lead to the Battery's Positive Terminal, and the Negative Lead to the Negative Terminal.

(Continued on Following Page)

| BATTERY CONDITION CHART | | | |
|---|---|---|---|
| State of Charge | Syringe Hydrometer | Digital Voltmeter | Five Ball Hydrometer |
| 100% Charged W/Sulfate Stop | 1.280 | 12.80v | Five Balls Floating |
| 100% Charged | 1.265 | 12.60v | Four Balls Floating |
| 75% Charged | 1.210 | 12.40v | Three Balls Floating |
| 50% Charged | 1.160 | 12.10v | Two Balls Floating |
| 25% Charged | 1.120 | 11.90v | One Ball Floating |
| 0% Charged | Less Than 1.100 | Less Than 11.80v | Zero Balls Floating |

2. A Hydrometer measures the specific gravity of each cell. The specific gravity tells the degree of charge, generally a specific gravity of about 1.265 to 1.280 indicates full charge. A reading of 1.230 to 1.260 indicates the Battery should be charged before testing. The charge above shows the charge level as measured by Syringe Float Hydrometer, Digital Voltmeter and Five Ball Hydrometer.

### E. NEW BATTERY PREPARATION

1. Removed Battery from carton.
2. Place Battery in a well-ventilated area on a level non-concrete surface.
3. Remove Battery Cell Caps. Fill Cells as required with Electrolyte to proper level. Fill to 3/16" above Cell Plates. Filling Battery with Electrolyte will bring the Battery to 80% charged state.

**IMPORTANT!**

3/16" above Cell Plates is the recommended level. However, do not try to measure this dimension. Never place anything in Battery other than specified Electrolyte.

**WARNING**

**DO NOT OVERFILL!**

4. With Cell Caps removed, connect Battery Charger to Battery Terminals; RED to Positive (+) and BLACK to Negative (-) Terminal.

**WARNING**

**Never attempt to service or charge the Battery while it is installed in the machine. Never use "BOOST" chargers on the Battery.**

5. Slow charge the Battery at 1 amp for 2 hours to bring the Battery to full charge.
6. After charging, check level of Electrolyte and add as needed to bring level to 3/16" above Cell Plates.
7. Reinstall Cell Caps.
8. Install Battery into Power Unit.
9. Connect Positive (+) Cable (RED) first, then Wiring Harness to the Positive Terminal (+) on Battery using bolt and nut provided. 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.

**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.**

# Section III - ELECTRICAL SYSTEM

## 3.4 INTERLOCK SYSTEM ANALYSIS

### A. KEY SWITCH TEST (DIESEL ENGINES)

1. Slide the Protective Rubber Boot away from the Switch Terminals.
2. Disconnect wires from the Switch Terminals. See Figure 3.8.
3. Hold the Switch in the PREHEAT Position and, using an Ohmmeter, connect Terminals AC and 19 - it should show continuity. Now, connect Terminals AC and 30 - there should be continuity.
4. Place the Switch in the OFF Position. There should be no continuity.
5. Hold the Switch in the START Position after connecting the Ohmmeter to Terminals AC and 17 - there should be continuity. Now, connect Terminals AC and 30 - there should be continuity. Terminals AC and 50 should show continuity, also.
6. Turn Key to RUN Position. Connect Ohmmeter to Terminals AC and 30. There should be continuity.
7. Reconnect Harness Wires to Switch Terminals after completing test. Replace Rubber Boot.

| IGNITION SWITCH (DIESEL) | |
|---|---|
| POSITION | CIRCUIT "MAKE" |
| 1. PREHEAT | AC - 19 - 30 |
| 2. OFF | NONE |
| 3. RUN | AC - 30 |
| 4. START | AC - 17 - 30 - 50 |

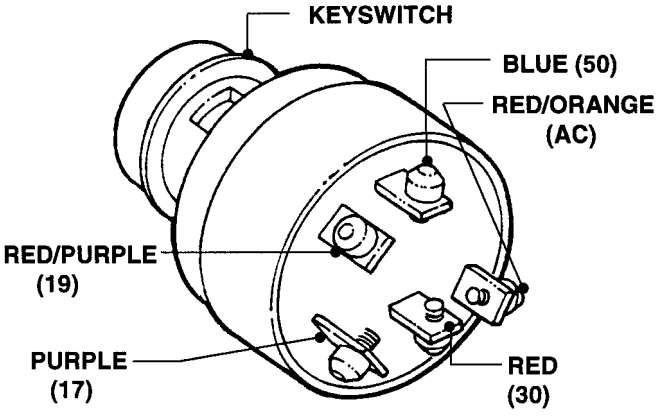



FIGURE 3.8

### B. KEY SWITCH TEST (GAS ENGINES)

1. Slide the Protective Rubber Boot away from the Switch Terminals.
2. Disconnect Wires from the Switch Terminals. See Figure 3.9.
3. Place the Switch in the OFF Position. There should be no continuity.
4. Hold the Switch in the START Position after connecting the Ohmmeter to Terminals AC and 17 - there should be continuity. Now, connect Terminals AC and 30 - there should be continuity. Terminals AC and 50 should show continuity, also.
5. Reconnect Harness Wires to Switch Terminals after completing test. Replace Rubber Boot.

| IGNITION SWITCH (GAS) | |
|---|---|
| POSITION | CIRCUIT "MAKE" |
| 1. OFF | NONE |
| 2. RUN | AC - 30 |
| 3. START | AC - 17 - 30 - 50 |

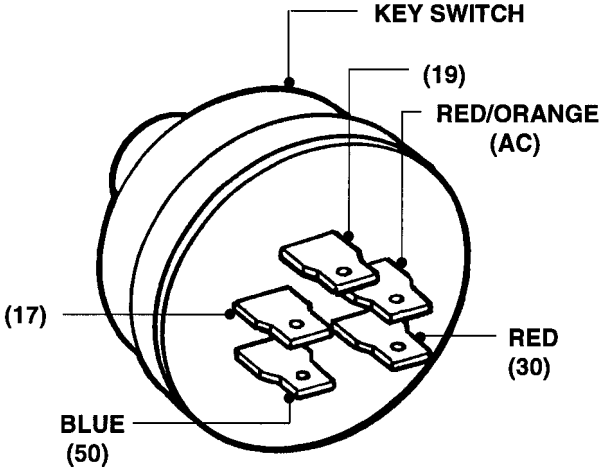



FIGURE 3.9

# Section III - ELECTRICAL SYSTEM

### C. PTO SWITCH TEST

1. Disconnect Wire Connectors from the Switch Terminals. See Figure 3.10.
2. Push Knob down to OFF position and connect Tester Leads to the Switch Terminals as follows:
   - **a)** #3 and #7
   - **b)** #6 and #7 — the Light should NOT come on.
   - **c)** #1 and #4
3. Pull Knob up to ON position and connect Tester Leads to the Switch Terminals as follows:
   - **a)** #1 and #4
   - **b)** #2 and #5 — the Light SHOULD come on.
   - **c)** #3 and #6

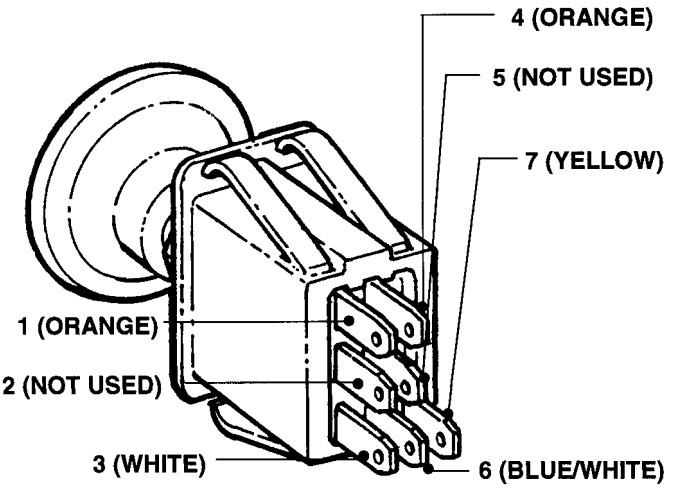



**FIGURE 3.10**

### D. PARK BRAKE SWITCH TEST

1. Disconnect the Wires from the four Switch Terminals. See Figure 3.11.
2. Attach a Continuity Light to the two Terminals marked NC. Turn the Light Switch on - the bulb should light. Depress the Switch Button and the bulb should go out.
3. Next, attach the Light to the two UNMARKED Terminals. Turn the Light Switch ON and depress the Switch Button - the bulb should light ONLY when the Button is depressed.

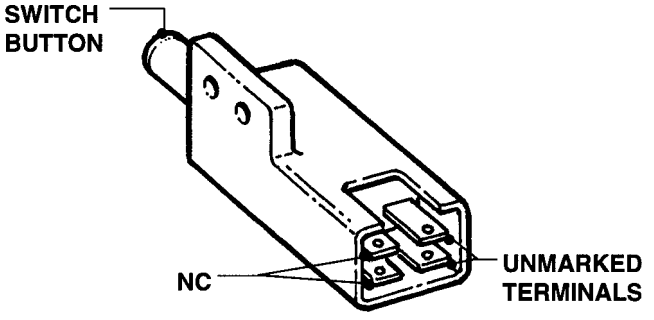



**FIGURE 3.11**

### E. SEAT SWITCH TEST

1. Disconnect Seat Switch Plug from Seat Switch. See Figure 3.12.
2. Attach Continuity Light Wires to the Terminals.
3. Have a helper to depress the Seat Switch by pushing in on the Seat area directly above the Switch. When the Switch is depressed (making the circuit), the Light should come on.
4. Reconnect Wires to the proper Terminals.

**IMPORTANT!**

The Seat Switch Plug is equipped with a Grounding Plunger which will ground the Magneto unless fully depressed. Make certain you have a firm connection when attaching Plug to Seat Switch.

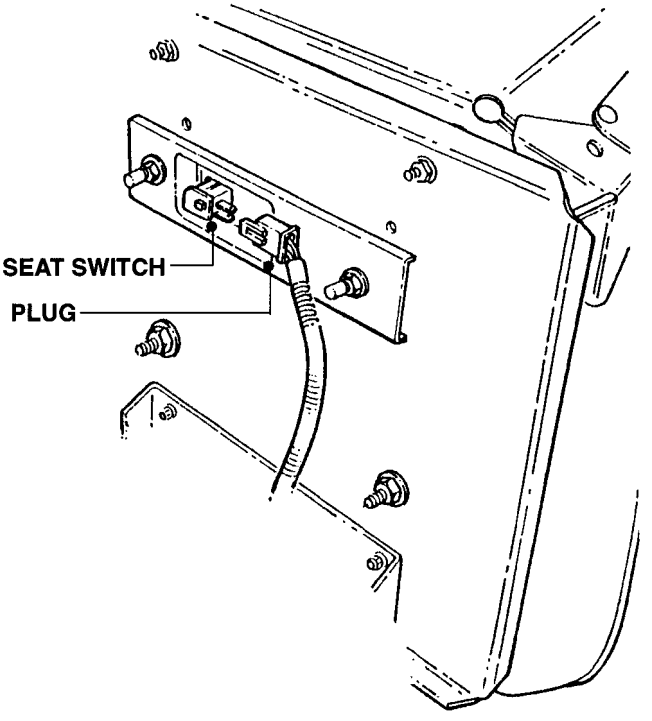



**FIGURE 3.12**

# Section III - ELECTRICAL SYSTEM

### 3.5 DECK LIFT SWITCH TEST

**A.** The self-centering Deck Lift Switch has three positions:
Position 1 - UP
Position 2 - NEUTRAL (Self-Centering)
Position 3 - DOWN

**B.** Test the Switch using an Ohmmeter as follows:

1. Disconnect wires from the Switch Terminals. See Figure 3.13.
2. Push Switch to UP Position and, while holding in place, connect Terminals A and D - it should shown continuity. Connect Terminals B and C - they also should show continuity.
3. Release Switch, allowing it to assume the NEUTRAL Position. Test. There should be no continuity.
4. Move Switch to DOWN Position and hold in place. Connect Terminals C and D - there should be continuity. Connect Terminals A and B - there should be continuity.

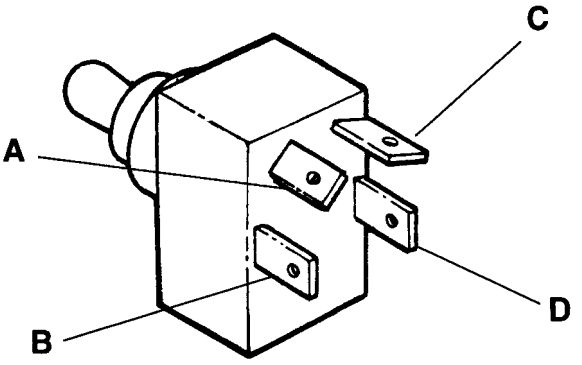



**FIGURE 3.13**

# IMPORTANT

# CAUTION

## (Kubota Engines Only)

If the Chassis Ground Cable (Item No. 37, Figure 3.1) has been removed or loosened for any reason, make certain that it is properly attached and securely grounded to the lower chassis (frame) before starting Engine!

If this Cable is not properly grounded, the circuit will seek ground through the Engine. This circumstance can result in the burn-out of the Main Bearings in less than 40 hours of operation.

# NOTES

# OEM ENGINE SERVICE MANUAL

## KOHLER

**COMMAND ENGINES - 18, 20, 22 & 25 HP Horizontal Crankshaft**
**Form No: TP - 2428A**
**Issue Date: 4/92**
**Revised: 4/94**
**Contact: Kohler Sales & Service 1-800-544-2444**

# Section IV
# ENGINE & FUEL SYSTEM

## (Kohler 22 & 25 HP ENGINES)

### CONTENTS

# Section IV - ENGINE & FUEL SYSTEM

## INTRODUCTION

This Section covers only those SNAPPER OUT FRONT Z-RIDERS powered by Kohler Twin Cylinder, Air-Cooled, 22 and 25 HP Gasoline Engines. See Section V for information covering service of Kubota gasoline and diesel engines.

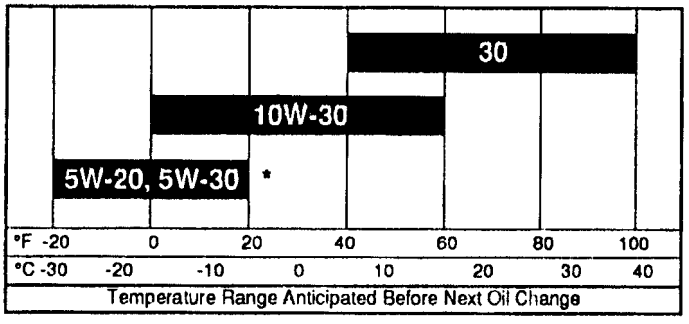
The following information covers the maintenance, removal and installation of these engines. Refer to the Manufacturer's Service/Repair Manuals for information covering Engine Repair.

### 4.1 ENGINE MAINTENANCE (KOHLER)

#### A. ENGINE OIL

1. Change Engine Oil on a regular schedule. Use only those oils classified for Service SF, SE, SD or SC. These oils will keep the engine cleaner and will help retard the formation of gum and varnish deposits. DO NOT use oil additives!
2. Refer to the following chart for recommended grades to use with temperature range anticipated before next oil change.

**RECOMMENDED SAE VISCOSITY GRADES**




* If not available, a synthetic oil may be used having 5W-20 or 5W-30 viscosity.

#### B. SPARK PLUGS

1. Spark Plugs should be cleaned or replaced (if necessary) and gap reset to .040 (1.02mm) every 100 hours of operation or every 6 months, whichever comes first.
2. To clean, remove Spark Plug from Engine, scrape or wire brush and wash with a commercial solvent. DO NOT blast clean.

**NOTE**

Sparking can occur if Wire Terminal does not fit firmly on Spark Plug. Compress Terminals if necessary.

#### C. MUFFLER

1. When servicing Engine, inspect Muffler for signs of damage or deterioration. Replace as required.
2. Make sure that Muffler Guard (if applicable) is always in place and secure before allowing mower to leave shop.

**CAUTION**

**Worn out Mufflers are more than just a noise nuisance and should be replaced immediately. Continued use could result in fire or explosion!**

#### D. AIR CLEANER

(Consult Engine Manual for Part Number of Filter Element).

1. Inspect Filter during every Engine Service or every 25 operating hours (more often if mower is used under extremely dirty or dusty conditions). See Figure 4.1.

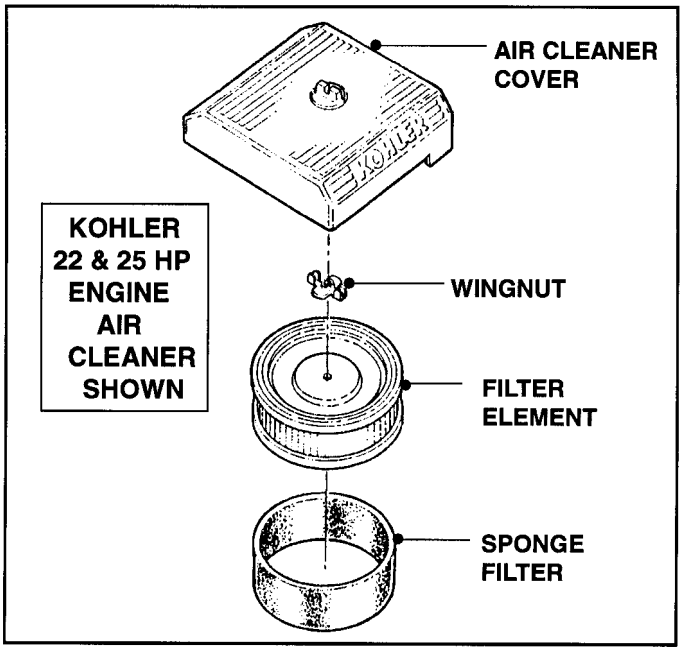



**FIGURE 4.1**

1. Clean Sponge Filter per Manufacturer's instructions.
2. Replace Filter Element as required.
3. Always clean Cover inside and out, and clean Base before reassembly.

#### E. FUEL FILTER

**WARNING**

**Gasoline is flammable and must be handled with care. DO NOT allow open flame, matches or smoking in area. Wipe up any spills. Use approved (RED) fuel container.**

1. Both the 22 and 25 HP Kohler Engines use a 15 Micron Inline Fuel Filter which is initially furnished as an OEM Item. Replacement filters are SNAPPER Part No. 4-4777.
2. Check the Inline Fuel Filter at frequent intervals and replace before it becomes clogged with sediment.
3. Make certain that the replacement filter is correctly installed with the gas flow going to the Engine.
4. Check other Fuel System Components frequently and replace any parts that are worn or cracked.

# Section IV - ENGINE & FUEL SYSTEM

## 4.2 ENGINE REMOVAL (KOHLER)

**A.** Disconnect the Battery. Remove NEGATIVE (-) BLACK Cable first and POSITIVE (+) RED Cable last. Secure Cables away from the Battery. See Figure 4.2.

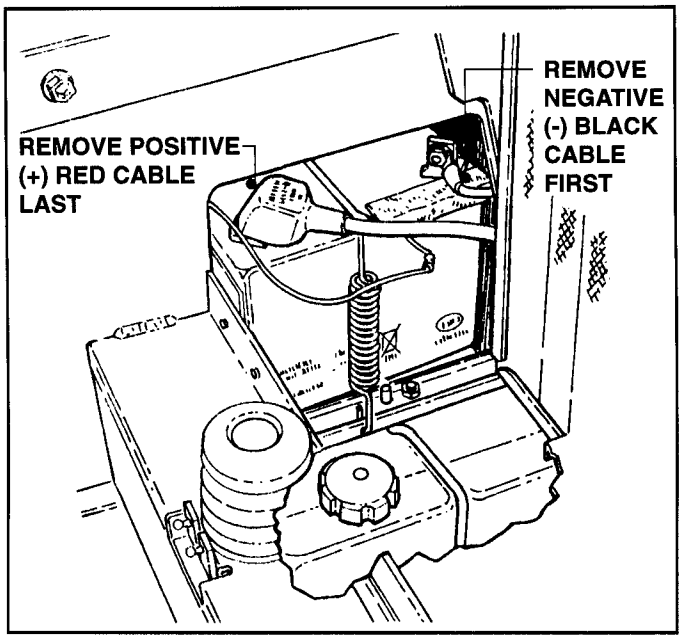



**FIGURE 4.2**

**B.** Disconnect Engine Pigtail from Wiring Harness. See Figure 4.3.

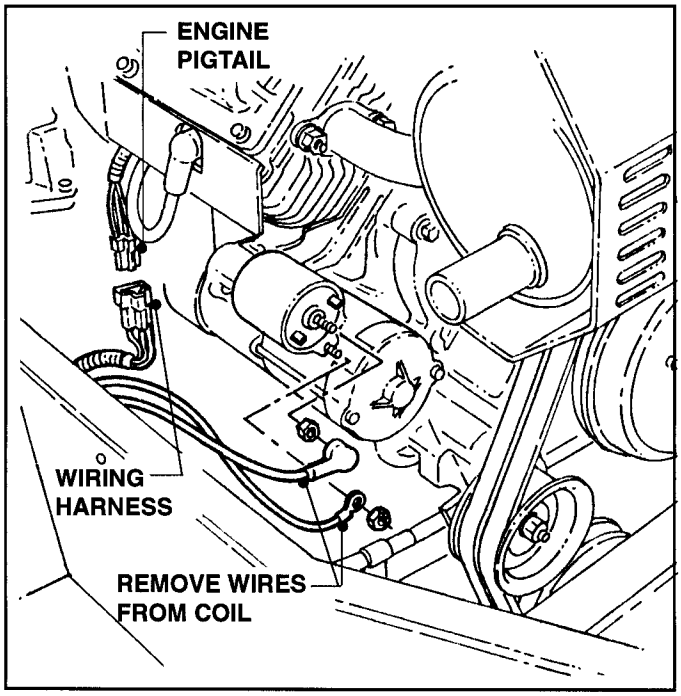



**FIGURE 4.3**

**C.** Remove Wires from Coil. Refer to Figure 4.3.

**D.** Disconnect Electric Clutch Pigtail from Wiring Harness and remove Fasteners from Cable Clamps. See Figure 4.4.

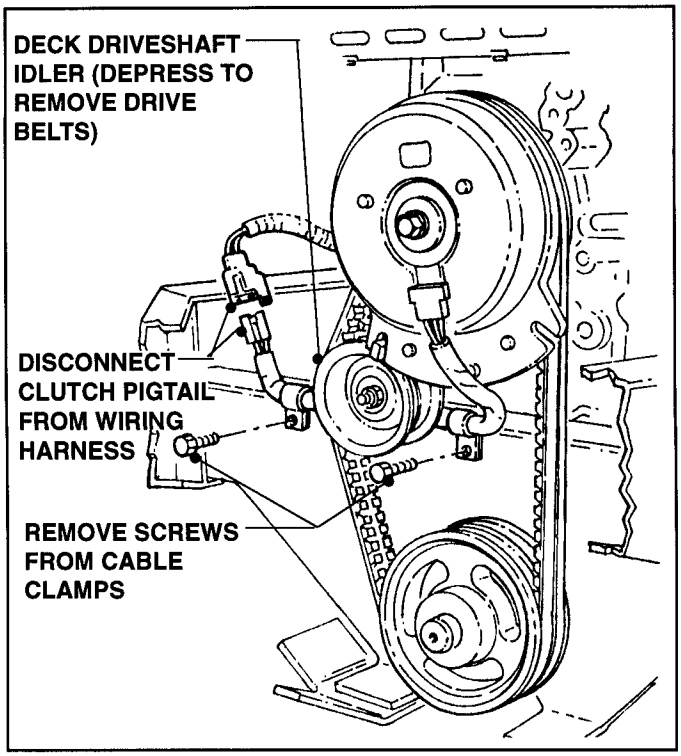



**FIGURE 4.4**

**E.** Depress Deck Driveshaft Idler and remove Drive Belts. Refer to Figure 4.4.

**F.** Squeeze Fuel Line Clamp and remove Fuel Line from Engine. Plug open end of Line. See Figure 4.5.

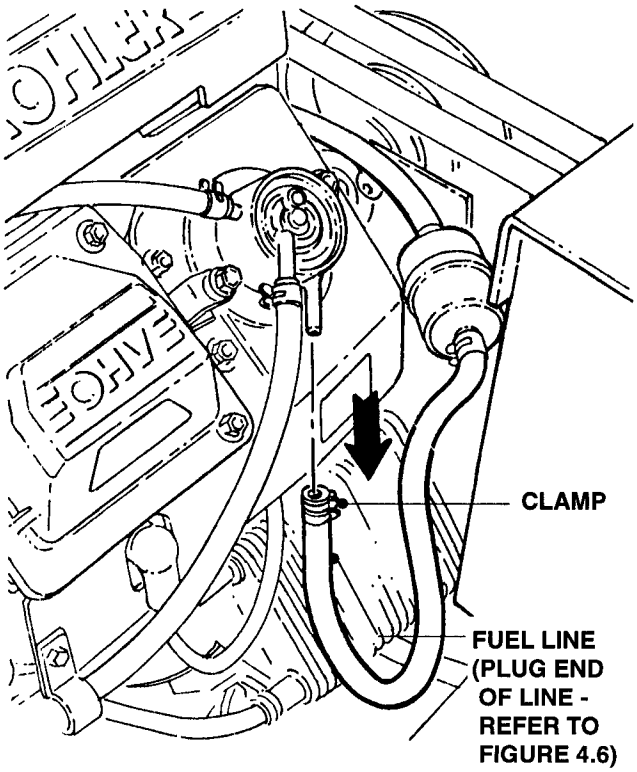



**FIGURE 4.5**

**G.** Separate Left Main Fuel Line from front of Engine by bending Hose Clamps away from Line. See Figure 4.6.

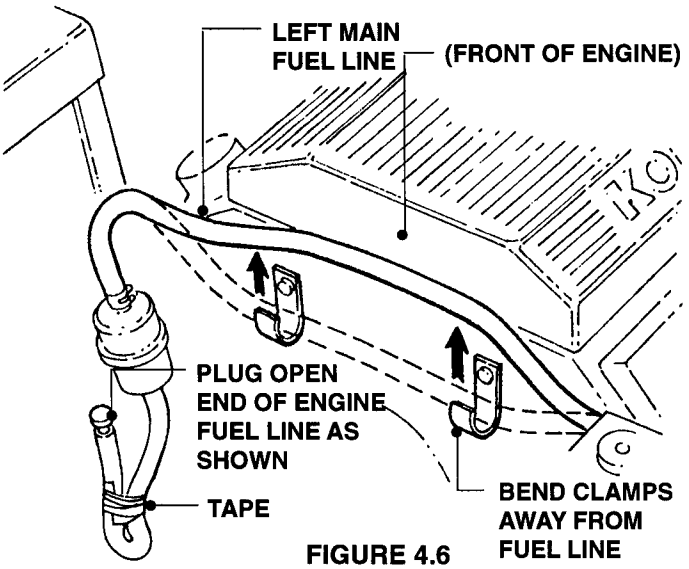



FIGURE 4.6

**H.** Disconnect Choke and Throttle Cables from Engine. Store both Cables out of the way.

**J.** Separate Upper Drive Shaft from Engine as follows:

1. Loosen the two (2) Sq. Hd. Set Screws. See Figure 4.7.

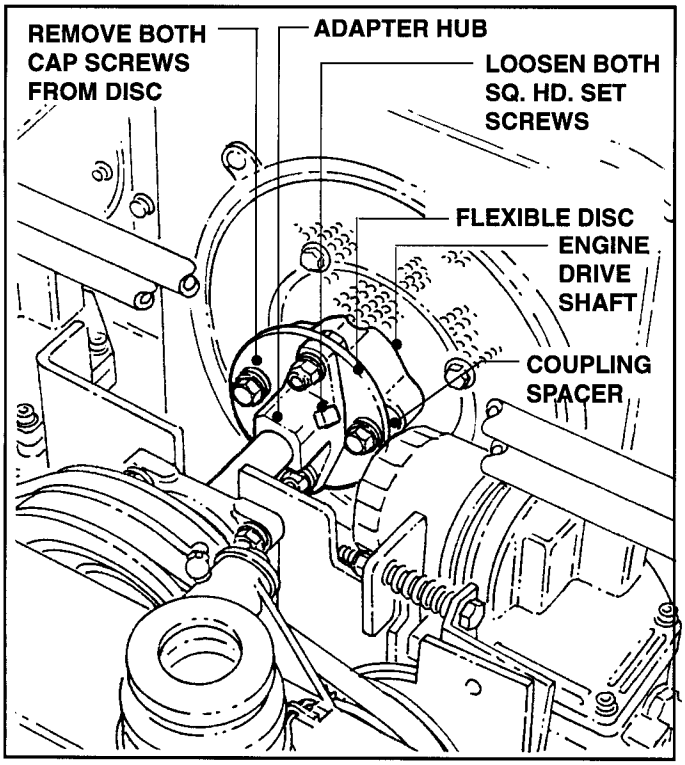



FIGURE 4.7

2. Remove the two (2) Hex Hd. Cap Screws, Lock Washers and Flat Washers which secure the Flexible Disc to the Engine Driveshaft.

3. Slide Adapter Hub/Flexible Disc Assembly away from Engine. Place Coupling Spacers and Washers aside for reassembly. Refer to Figure 4.7.

> **NOTE**
> At this point of disassembly, check Flexible Disc for damage. If replacement is required, see Step 4.5 "FLEXIBLE DISC REMOVAL".

**K.** Remove the four (4) Engine Mounting Nuts and Hex Hd. Capscrews. Store Ground Wire out of the way. See Figure 4.8.

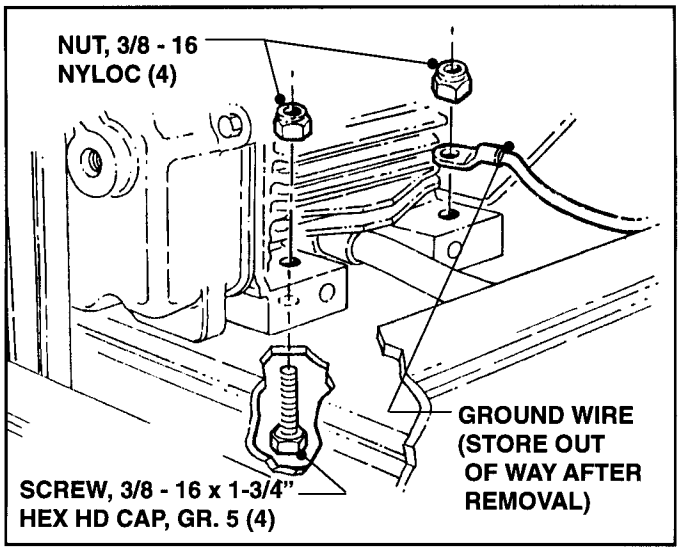



FIGURE 4.8

**L.** Attach suitable lifting device to lift Ears on Engine. Remove Engine from Frame.

> **NOTE**
> In order to accommodate certain lifting devices, it may be necessary to remove Air Filter before attaching lift to Engine.

### 4.3 ENGINE PART NUMBERS

**A.** Engine, 22 HP (Kohler No. CH22S PS-66536)

**B.** Engine, 25 HP (Kohler No. CH25S PS-68577) (Refer to SNAPPER Parts Manual No. 06106 (REV. 2, 11/97) for Parts Numbers of Engine Components).

### 4.4 ENGINE INSTALLATION

**A.** If installing a new or replacement Engine, the Engine should be fitted with all usable components taken from the one removed.

**B.** Install a new Fuel Filter (KOHLER Part No. 4-4777) and inspect Fuel Lines for damage. Replace as required.

(Continued on Following Page)

**C.** Install a new Filter Element in the Air Cleaner.
**D.** Install new Oil Filter.
**E.** Reinstall Engine to Frame in reverse order of removal.

### 4.5 FLEXIBLE DISC REMOVAL

**A.** Loosen both Set Screws on the Adapter Hub. See Figure 4.9.

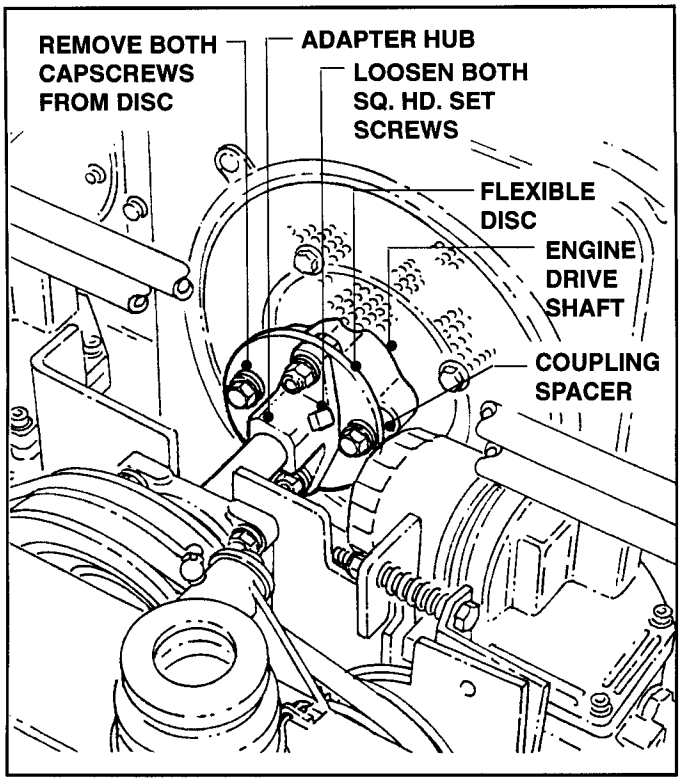



**FIGURE 4.9**

**B.** Remove the two (2) Hex Hd. Cap Screws, Lock Washers and Flat Washers which secure the Flexible Disc to the Engine Driveshaft.
**C.** Slide Adapter Hub/Flexible Disc Assembly away from Engine. Place Coupling Spacers and Washers aside for reassembly. Refer to Figure 4.10.

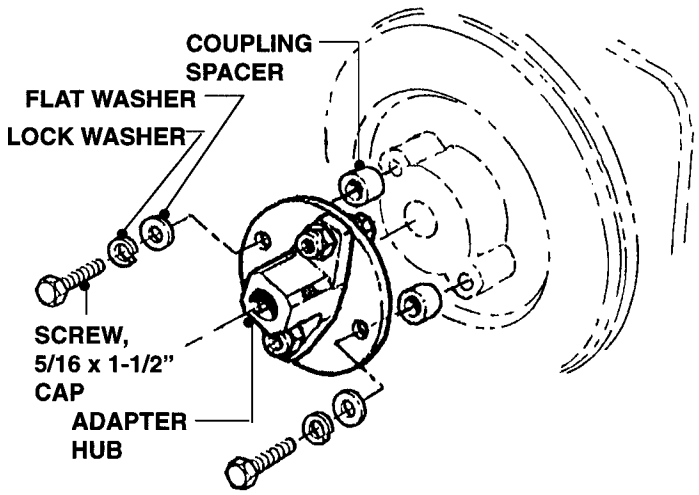



**FIGURE 4.10**

**NOTE**
At this point of disassembly, check Flexible Disc for damage. If replacement is required, see Step 4.6 "FLEXIBLE DISC REPLACEMENT".

### 4.6 FLEXIBLE DISC REPLACEMENT

**A.** Loosely attach NEW Flexible Disc to Engine Drive Shaft with two (2) Coupling Spacers, 5/16 x 1-1/2" Hex Hd. Cap Screws, Lock Washers and Flat Washers. Refer to Figures 4.9 and 4.10.
**B.** Remove Adapter Hub from the old Flexible Disc and loosely attach it to the NEW Disc as shown in Figure 4.11.

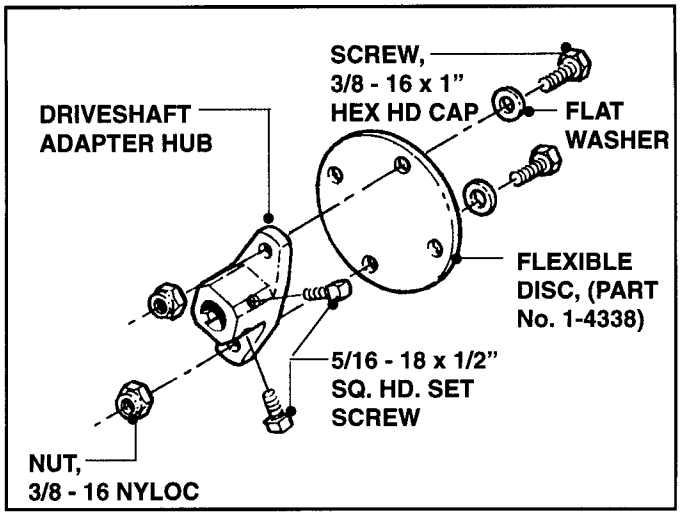



**FIGURE 4.11**

**NOTE**
At this point - for Drive Alignment Purposes - perform the following steps.
1. Loosen Set Screws on Flange Bearing Lock Collar. See Figure 4.12, Pg. 4.6.
2. Loosen the three (3) 5/16 - 18 Hex Nyloc Flange Bearing Mounting Nuts until Bearing will move freely.
3. Loosen the two (2) 5/16 - 18 x 5/8" Skt. Hd. Set Screws on the Dual V-Drive Pulley.

**C.** Slide Upper Drive Shaft into Adapter Hub. Secure loosely with the two (2) Sq. Hd. Set Screws found on the Hub.
**D.** Align Dual V- Drive Pulley with both Transaxle Fan (Input) Pulleys.
**E.** Install both V-Belts. Make any necessary alignment adjustments at this time.
**F.** Tighten Flexible Disc to Engine Drive Shaft.
**G.** Tighten Adapter Hub to Flexible Disc.

(Continued on Following Page)

H. Tighten the two (2) Sq. Hd. Set Screws on the Adapter Hub. (This will secure the Upper Drive Shaft to its Drive Axis).
J. Tighten the Flange Bearing Mounting Nuts.
K. Tighten the two (2) Skt. Hd. Set Screws on the Dual V-Drive Pulley.

**NOTE**
Check Belt Alignment again. If necessary, make required adjustments until both Belts run true in the Pulleys.

**IMPORTANT!**
**Early production units of the OFZ used Socket Head Set Screws to secure the Driven and Drive Pulleys. These should be replaced with Square Head Set Screws (consult Parts Man. No. 06106 (REV. 2, 11/97).**

**Also, the one-piece Flange Bearing shown below, Part No. 5-4655, should be replaced with the 4-piece Flange Bearing. See "Detail" below.**

## UPPER DRIVESHAFT ASSEMBLY

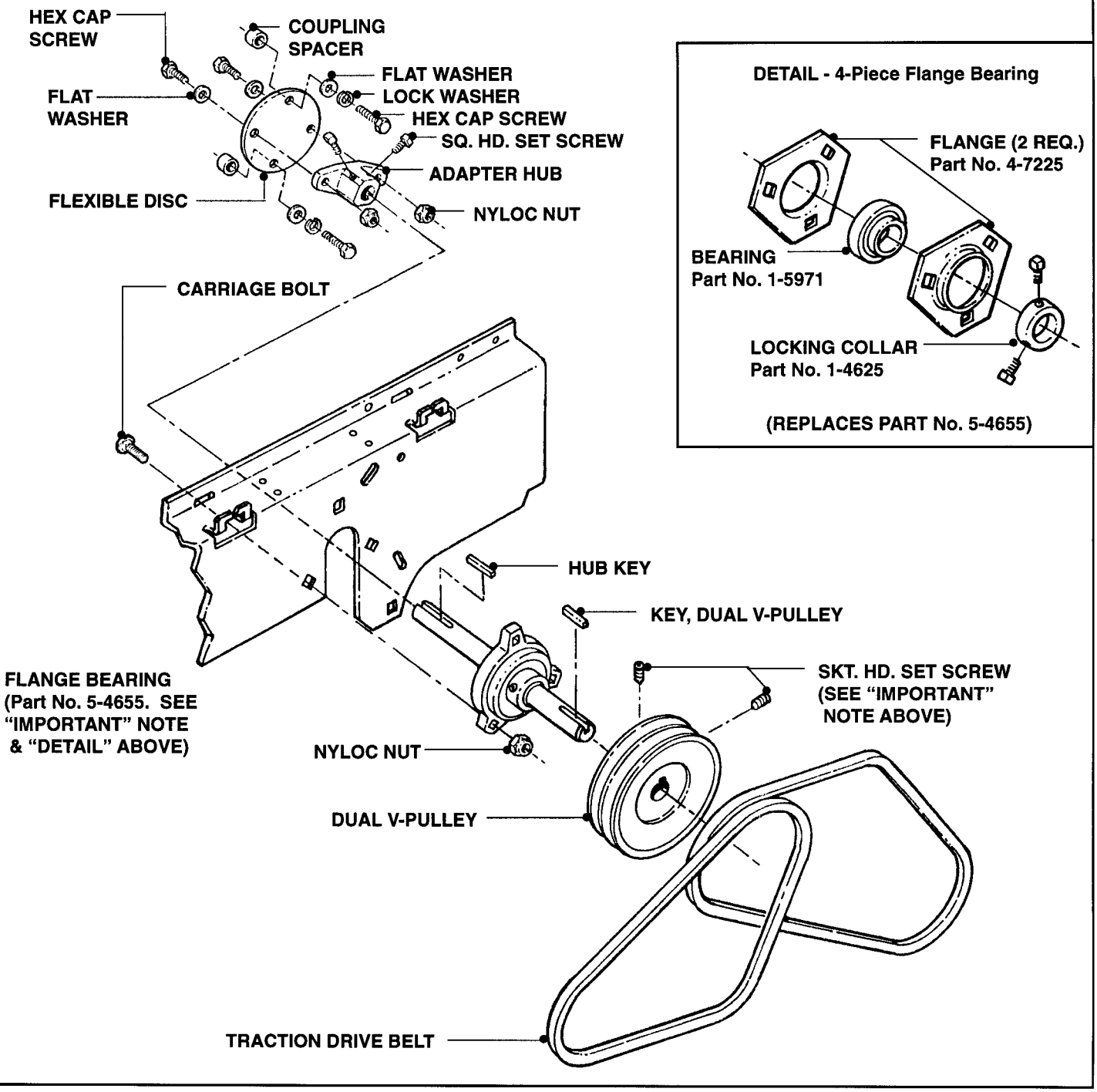



FIGURE 4.12

# Section IV - ENGINE & FUEL SYSTEM

### 4.7 FUEL SYSTEM

The Fuel System of the SNAPPER OUT FRONT Z-RIDERS consist of a Fuel Tank, Fuel Filter, Hoses, Clamps and Fuel Tank Support Bracket - all of which mount to the Upper Chassis. Components of the Fuel System are shown in Figure 4.13.

**IMPORTANT!**

The Fuel System should be inspected at each service period. Check for cracks or leaks in the Tank(s); Valve leakage and Fuel Hose integrity. Replace any item that appears worn or is damaged. Replace Fuel Filter on a regular basis.

### 4.8 FUEL TANK REPLACEMENT

**A.** Remove L.H. Fender as an assembly (refer to Section VII, "L.H. FENDER REMOVAL".

**B.** Remove the Hose Clamp and Fuel Hose from the Tank Fuel Outlet.

**C.** Lift and remove Tank from the Tank Support Bracket.

**D.** Install new Tank in reverse order of removal.

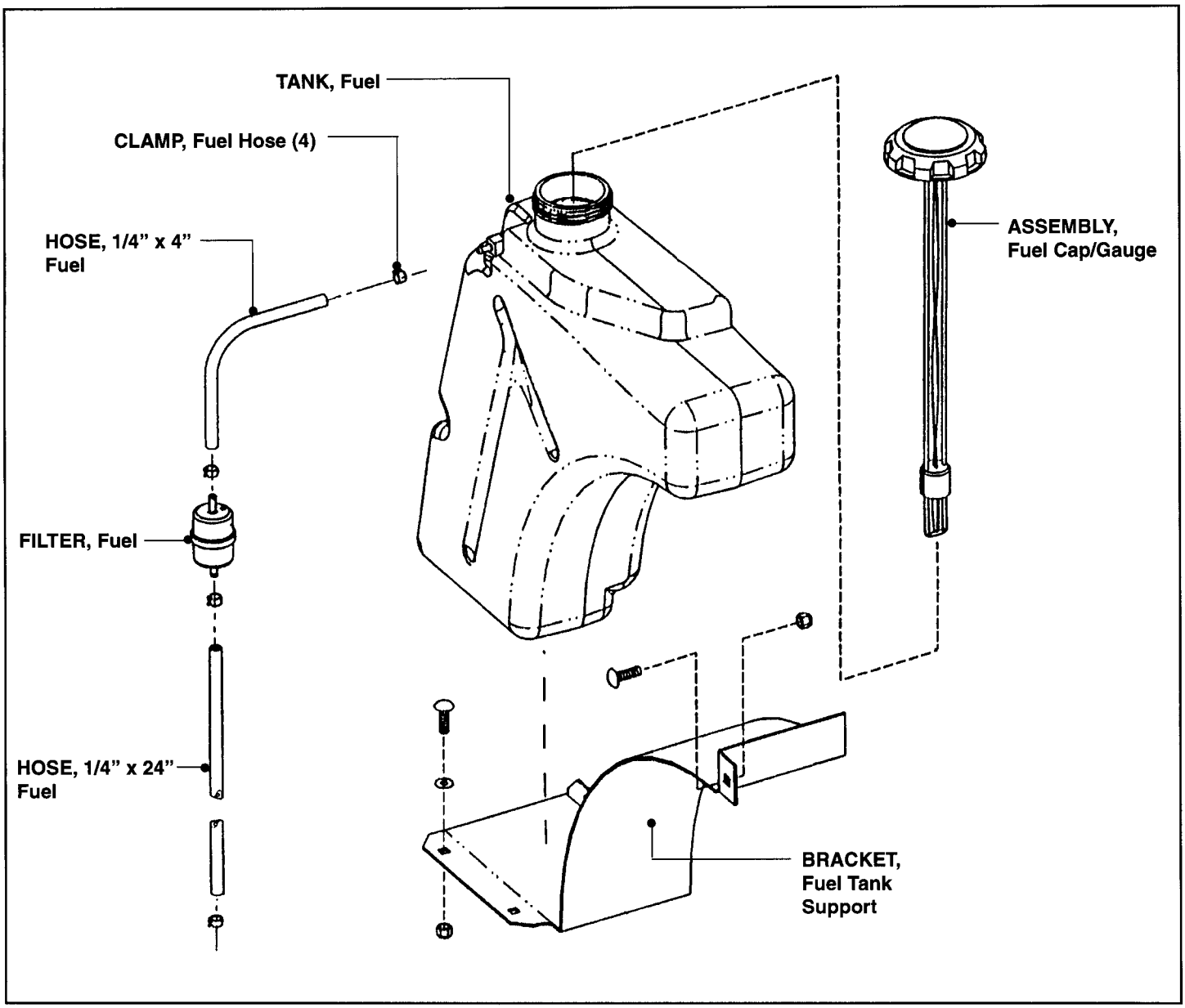



**FIGURE 4.13**

# NOTES

# OEM ENGINE SERVICE MANUALS

**Kubota**

**DIESEL ENGINE - 22 HP WATER-COOLED**
**Title: WORKSHOP MANUAL, DIESEL ENGINE - 68mm STROKE SERIES**
**Contains: 68mm STROKE SERIES - WSM, 01160 - WSM, 01161 - WSM, 01162**
**Contact: Kubota Factory Representative (See Yellow Pages)**

**GASOLINE ENGINE - 23 HP WATER-COOLED OHV**
**Title: WORKSHOP MANUAL, GASOLINE ENGINE - WG750 - B**
**Contains: W6750 - B - WSM, 00641 - WSM, 60203 - 0**
**Contact: Kubota Factory Representative (See Yellow Pages)**

# Section V

# ENGINE & FUEL SYSTEM

## (Kubota 22 HP Diesel & 23 HP Gasoline Engines)

### CONTENTS

# Section V - ENGINE & FUEL SYSTEM

## 5.1 ENGINE MAINTENANCE (KUBOTA 22 HP DIESEL ENGINE)

### A. ENGINE OIL

1. Change Engine Oil on a regular schedule.

**NOTE**

Use only those oils classified for API Service CC or CD which are suitable for the temperature range anticipated before next oil change.

Above 77° F (25° C).....SAE 30 or 10W-30
32° F to 77° (0° to 25° C)...SAE 20 or 10W-30
Below 32° F (0° C).....SAE 10W or 10W-30

Oil Capacity of the Kubota 22 HP Diesel Engine is 4 U.S. qts. (3.2 Liters/2.81 Imp. qts.).

2. Change Oil Filter after first 50 hours of operation and at each oil change thereafter. See Figure 5.1.

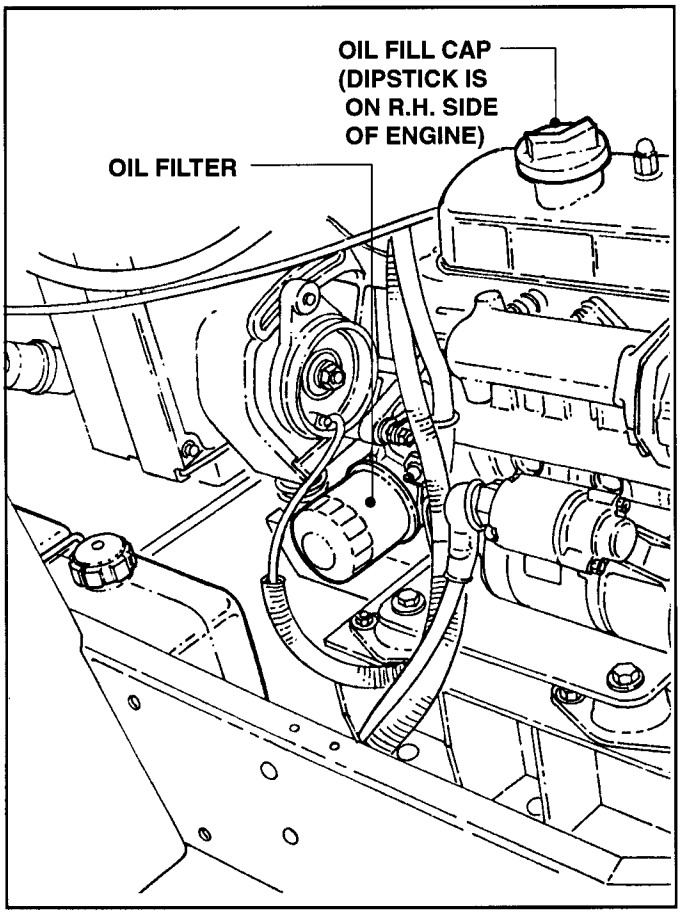



**FIGURE 5.1**

### B. CLEANING/REPLACING FUEL FILTER

Engine must be cold before removing Fuel Filter. Proceed as follows:

1. Close Fuel Filter Cock. See Figure 5.2.
2. Remove Fuel Bowl Retaining Ring.
3. Remove Fuel Bowl. Clean Bowl thoroughly with kerosene.
4. Remove Filter element, large and small O-rings and Spring.
5. Submerge Filter Element in kerosene and move it about vigorously to rinse away debris. Remove Filter from kerosene and stand it on a clean cloth.
6. Reassemble Fuel Filter in reverse order.

**NOTE**

Replace Fuel Filter if it cannot be properly cleaned.

7. Bleed the Fuel System (C. BLEEDING FUEL SYSTEM).

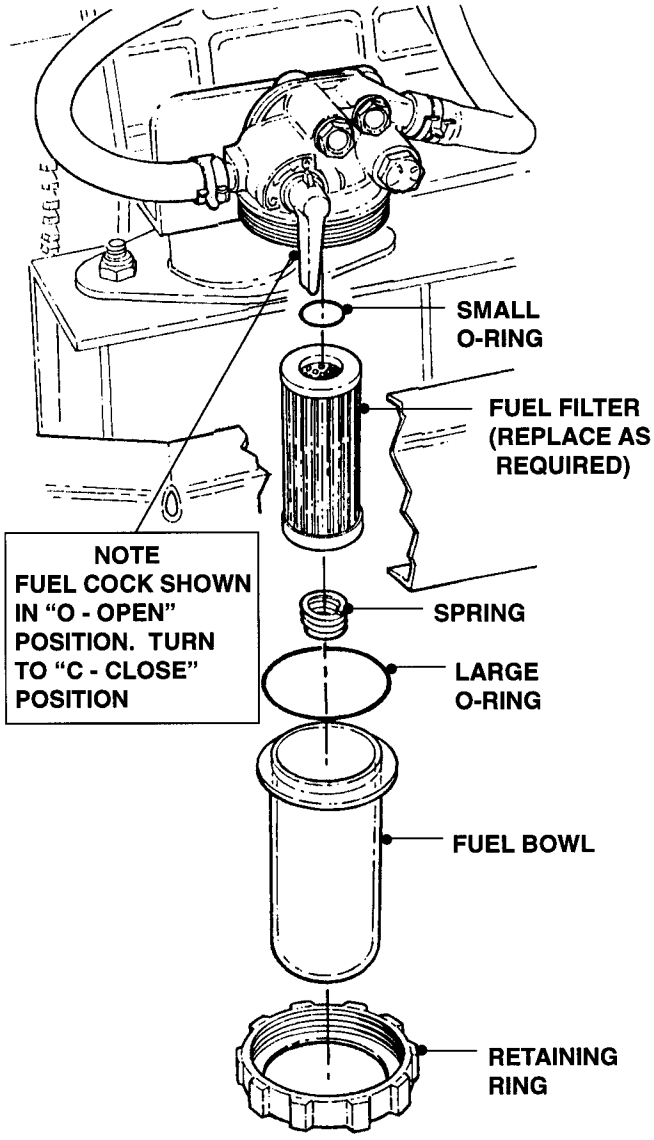



**FIGURE 5.2**

# Section V - ENGINE & FUEL SYSTEM

### C. BLEEDING FUEL SYSTEM

1. Make sure that Fuel Filter Cock is closed.
2. Remove Fuel Cap and fill Fuel Tank to the fullest extent. Replace Fuel Cap.
3. Open Fuel Filter Cock. See Figure 5.3.
4. Loosen the Air Vent Plug a few turns. Allow air bubbles to be released. Close Air Vent Plug when a steady flow of fuel appears.

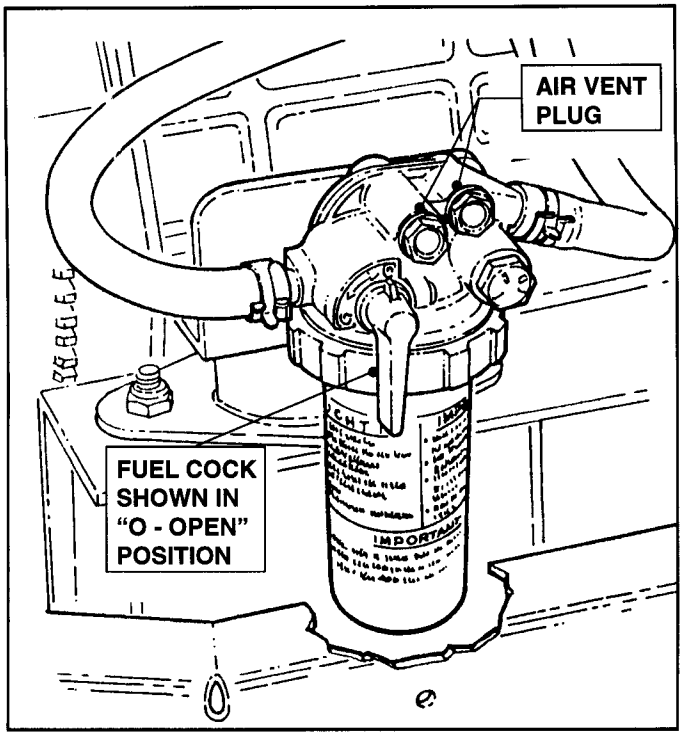



**FIGURE 5.3**

5. Loosen the Air Vent Plug on top of the Fuel Injection Pump. See Figure 5.4.

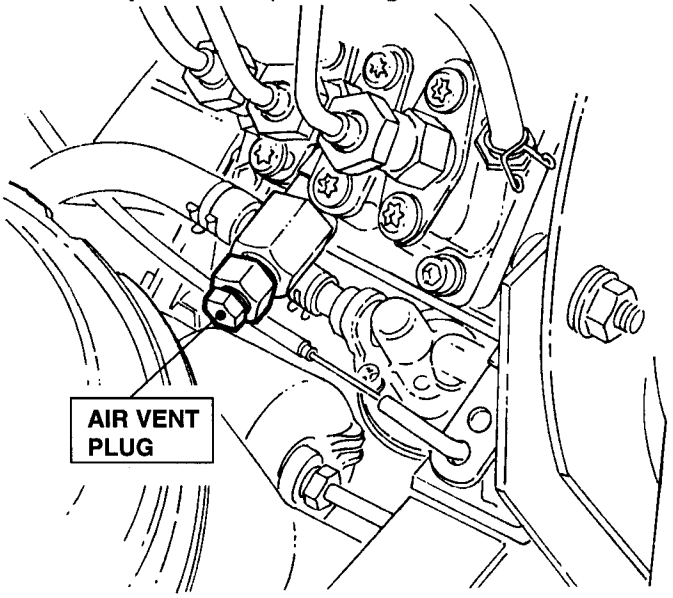



**FIGURE 5.4**

6. Allow air bubbles to be released. Retighten Plug when bubbles stop. Refer to Figure 5.4.

**NOTE**

Keep Air Vent Plug on Fuel Injection Pump tight except when bleeding Fuel System. Otherwise, Engine may not operate.

### D. CHECK FUEL LINES/CONNECTIONS

1. Check all Fuel Lines for any cuts, breaks or other damage. Replace as required.
2. Check Clamped connections for air or fuel leaks. Replace Clamps or Fuel Hose as required.
3. Check Fuel Tank and Fuel Cap for leaks. Replace items as required.

### E. AIR CLEANER SERVICE

The Air Cleaner should be disassembled, thoroughly cleaned and fitted with a new (or cleaned) Air Filter Element at least once a year - more often under extremely dry or dusty conditions. The Air Filter Element is cleaned as follows:

1. Remove Filter Cannister Cover. See Figure 5.5.
(Continued on Page 5.4).

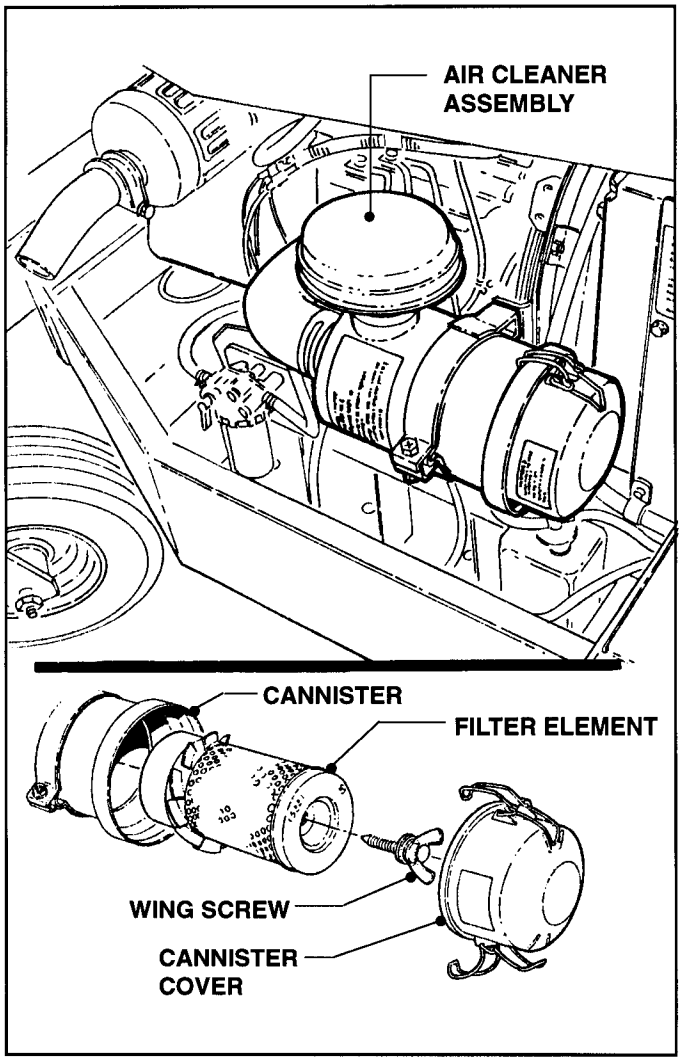



**FIGURE 5.5**

(Continued from Page 5.3)

2. Remove Wing Screw and Filter Element (refer to Figure 5.5).
3. Place Filter Element on flat surface, finned-end down, and direct compressed air into the inside of the Element. Do not let the Air Nozzle get against the Filter.

**NOTE**
Nozzle Air Pressure must not exceed 100 PSI.

4. After cleaning or replacing Filter Element, reassemble the Air Cleaner Assembly.

### F. CHECKING FAN BELT TENSION

1. Apply a force of 22 lbs. (30.4 N•m, 10 kgf.) to the center of the Fan Belt between the Fan Pulley and the Alternator Pulley.
2. Belt deflection at this point should be 0.78 inches (10mm).
3. To adjust Fan Belt tension, loosen Tensioning Screw at top of Alternator. See Figure 5.6. Move Alternator "IN" or "OUT" until Belt tension is correct. Retighten Tensioning Screws.

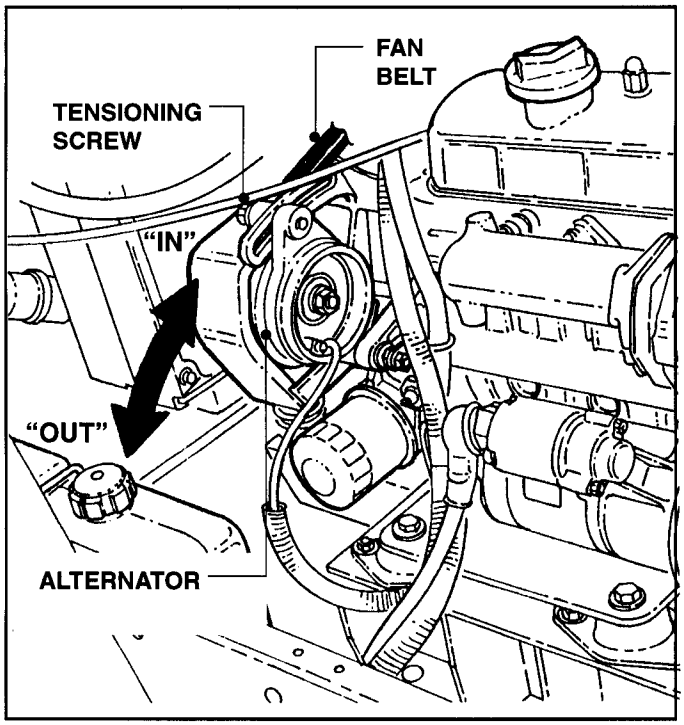



FIGURE 5.6

**NOTE**
If replacement of Fan Belt is required, see "FAN BELT REMOVAL/REPLACEMENT" on Page 5.8.

### G. MUFFLER

1. When servicing Engine, inspect Muffler for signs of damage or deterioration. Replace as required.
2. Make sure that Muffler Guard (if applicable) is always in place and secure before allowing mower to leave shop.

**CAUTION**
***Worn out Mufflers are more than just a noise nuisance, and should be replaced immediately. Continued use could result in fire or explosion!***

### H. CHECKING COOLING SYSTEM

Since a correctly-operating Fan is an integral part of the Engine Cooling System, make certain that the Fan Belt is in good condition and properly adjusted before proceeding with Cooling System Checks.

1. **COLD ENGINE ONLY** - Check Engine Coolant (antifreeze/water) and add Coolant in the Reserve Tank as needed to bring level up to the FULL mark. See Figure 5.7.

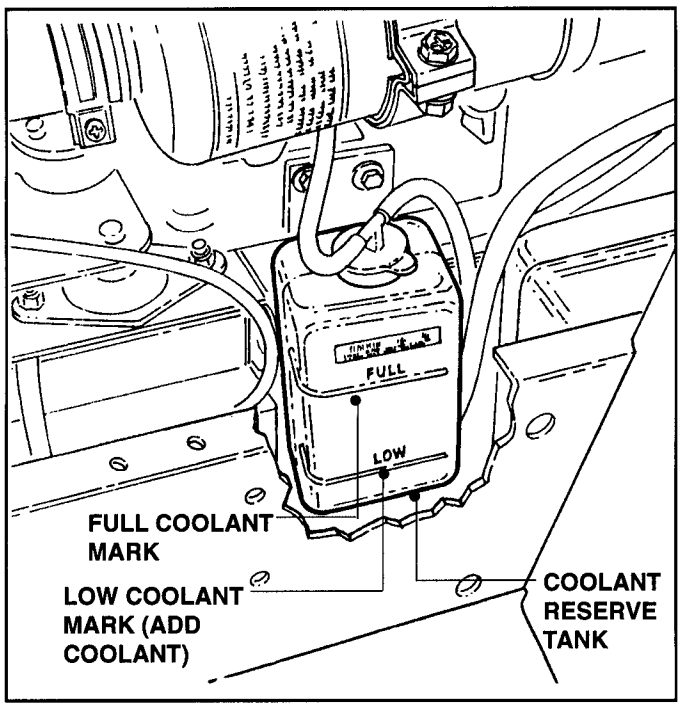



FIGURE 5.7

2. When adding Coolant, first mix the antifreeze and water, then pour the mixture into the Radiator.
(Refer to STANDARD SAE J814c & SAE J1034 for mixing antifreeze and water). See Chart below.

| COOLANT RATIO | | | | |
|---|---|---|---|---|
| Vol % Antifreeze | Freezing Point °C | Freezing Point °F | Boiling Point °C | Boiling Point °F |
| 40 | -24 | -12 | 106 | 222 |
| 50 | -37 | -34 | 108 | 226 |
| 60 | -52 | -62 | 111 | 232 |
| 70 | -64 | -84 | 114 | 236 |

**⚠ WARNING ⚠**

***DO NOT remove cap from radiator when Engine and Coolant are hot. Coolant is pressurized. Severe burns could result.***

3. The Cooling System should be cleaned each 500 hrs. of service or, as follows:
   a. Winter Service (before adding antifreeze).
   b. Summer Service (switching from antifreeze mixture to water only).

**NOTE**

When cleaning the Cooling System, the use of Kubota Detergent No. 20 (or equivalent) is recommended for effectively washing away any rust buildup.

4. Check all Hoses for condition and leaks. Tighten or replace items as required.

## 5.2 ENGINE REMOVAL (KUBOTA 22 HP DIESEL ENGINE)

### A. DISCONNECT ELECTRICAL COMPONENTS (See 1 thru 10 as follows)

1. Battery (Black Neg. (-) Wire first, Red Pos. (+) Wire last).
2. Remove Drive Belts from Electric Clutch, then disconnect Electric Clutch Pigtail from Main Harness. Remove Wire Clamps. See Figure 5.8.

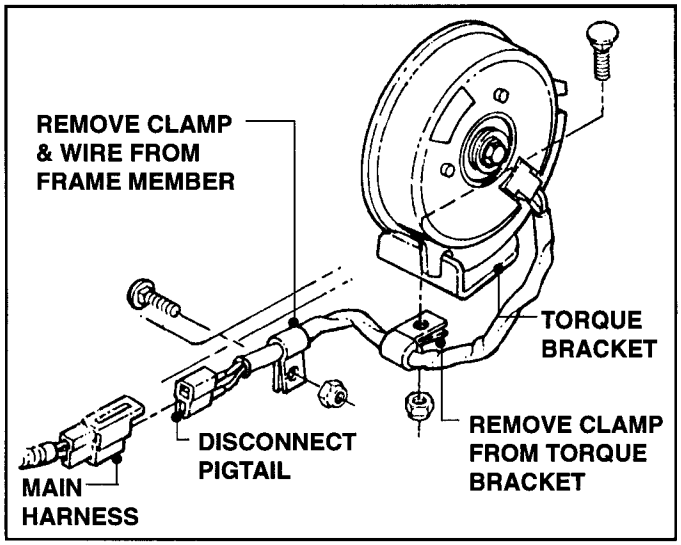



**FIGURE 5.8**

3. Disconnect the three (34) Wires from the Starter Solenoid (L.H. Side).
4. Disconnect Spade Connectors from Heat Sensor and Oil Sensor Plugs.
5. Separate the Wire Loom (close to the Alternator) and find the two (2) Spade Connections to the Alternator. Disconnect.
6. Separate the Plastic Loom attached to the Radiator Support and disconnect the three (3) Spade Connections to the Solenoid mounted on the R.H. Side of Engine.
7. Remove Red/Black Wire from GLO-PLUG STRIP. See Figure 5.9.

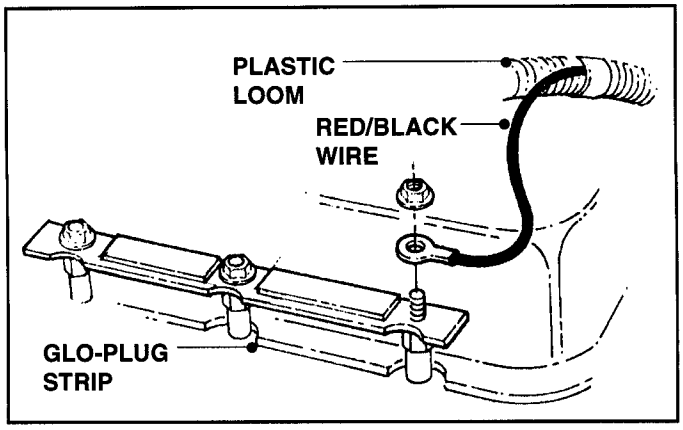



**FIGURE 5.9**

8. Remove Wire Loom and Wires from L.H. Side of Engine. Coil and store out of way.
9. Disconnect Ground Cables from rear of Solenoid Mounting Bracket (R.H. Side). Store out of way.
10. Check to see if any other wiring would hamper Engine removal. If so, disconnect wiring and store out of way.

### B. DISCONNECT MECHANICAL COMPONENTS (See 1 thru 10 as follows)

1. Disconnect Throttle Control from Engine. Loosen or remove Cable Retaining Clamps and store Throttle Cable out of way.
2. Tilt Seat forward and remove V-Belts from Upper Drive Shaft Pulley.
3. Loosen Nuts on Upper Drive Shaft Bearing.
4. Working from left side of unit, separate the Upper Drive Shaft from the Engine. Push Drive Shaft forward to clear Engine.
5. Remove the four (4) 3/8 - 16 x 2-1/2" Hex Cap Screws, 3/8 - 16 Nyloc Nuts, 3/8" Flat Washers and Snubbing Washers which secure the Engine to the Isolator Mounts.
6. Disconnect Fuel Feed Line from Fuel Filter. Plug Line.
7. Disconnect Fuel Return Line from R.H. top rear of Engine Block. Plug Line.
8. Remove Fuel Return Line from Clamps located on Radiator Brace and L.H. Side of Radiator.

9. Check Engine and Radiator to make sure that all Wires, Hoses, etc. which would interfere with Engine removal have been disconnected.
10. Attach Chain Hooks to Lift Eyes on Engine/Radiator Assembly and slowly lift up and away from Frame.

### 5.3 ENGINE INSTALLATION (KUBOTA 22 HP DIESEL ENGINE)

**A.** Repair or replace Engine and install in reverse order of removal.

**IMPORTANT!**
**CAUTION**

***When installing a new or repaired Kubota Engine on the OFZ, make certain that the Chassis Ground Cable is securely grounded to the Lower Chassis (Frame). This is important! If the Cable is not grounded, the Circuit will seek a ground through the Engine. This circumstance can burn out the Main Bearings of the Engine in less than 40 hours of operation.***

**B.** If making repairs to the Engine removed, consult the Charts shown below for the correct Torque Values applicable to Kubota Engines.

## TORQUE VALUES CHART - SPECIAL USE NUTS, BOLTS & SCREWS

| ITEM | SIZE & PITCH | FT. - LBS. | N•M | KGF•M |
|---|---|---|---|---|
| * Head Cover Cap Nuts | M6 x 1.0 | 2.9 to 4.3 | 3.9 to 5.9 | 0.4 to 0.6 |
| * (**) Head Bolts | M8 x 1.25 | 28.9 to 32.5 | 39.2 to 44.1 | 4.0 to 4.5 |
| * Bearing Case Bolts 1 | M6 x 1.0 | 9.4 to 11.6 | 12.7 to 15.7 | 1.3 to 1.6 |
| * Bearing Case Bolts 2 | M7 x 1.0 | 19.5 to 22.4 | 26.5 to 30.4 | 2.7 to 3.1 |
| * Flywheel Bolts | M10 x 1.25 | 39.8 to 43.4 | 53.9 to 58.8 | 5.5 to 6.0 |
| * Connecting Rod Bolts | M7 x 0.75 | 19.5 to 22.4 | 26.5 5o 30.4 | 2.7 to 3.1 |
| * Idle Gear Shaft Bolts | M6 x 1.0 | 7.23 to 8.32 | 9.81 to 11.28 | 1.00 to 1.15 |
| * Fan Drive Pulley Bolt | M12 x 1.5 | 72.3 to 79.6 | 98.1 to 107.9 | 10.0 to 11.0 |
| * Glow Plugs | M8 x 1.0 | 5.8 to 10.8 | 7.8 to 14.7 | 0.8 to 1.5 |
| * Nozzle Holder Assembly | M20 x 1.5 | 36.2 to 50.6 | 49.0 to 68.6 | 5.0 to 7.0 |
| * Oil Switch Taper Screw | PT 1/8 | 10.8 to 14.5 | 14.7 to 19.6 | 1.5 to 2.0 |
| * Injection Pipe Retaining Nuts | M12 x 1.5 | 18.1 to 25.3 | 24.5 to 34.3 | 2.5 to 3.5 |
| * Oil Drain Plug | M12 x 1.25 | 23.9 to 27.5 | 32.4 to 37.3 | 3.3 to 3.8 |

*** Before installation, apply oil to threads.**
*** (**) Consult Kubota WORKSHOP MANUAL for tightening sequence of Head Bolts.**

## TORQUE VALUES CHART - GENERAL PURPOSE NUTS, BOLTS & SCREWS

| SIZE | FT. LBS. | N•M | KGF•M | FT. LBS. | N•M | KGF•M |
|---|---|---|---|---|---|---|
| M6 | 5.8 to 6.9 | 7.9 to 9.3 | 0.80 to 0.95 | 7.23 to 8.32 | 9.8 to 11.3 | 1.00 to 1.15 |
| M8 | 13.0 to 15.2 | 17.7 to 20.6 | 1.8 to 2.1 | 17.4 to 20.3 | 23.5 to 27.5 | 2.4 to 2.8 |
| M10 | 28.9 to 33.3 | 39.2 to 45.1 | 4.0 to 4.6 | 35.4 to 41.2 | 48.1 to 55.9 | 4.9 to 5.7 |
| M12 | 46.3 to 53.5 | 62.8 to 72.6 | 6.4 to 7.4 | 57.1 to 66.5 | 77.5 to 90.2 | 7.9 to 9.2 |
| | No Grade or Grade 4 | | | Grade 7 | | |
| | Standard Screw and Bolt SS41, S20C | | | Special Screw and Bolt S43C, S48C (Refined) | | |

# Section V - ENGINE & FUEL SYSTEM

## 5.4 ENGINE MAINTENANCE (KUBOTA 23 HP GASOLINE ENGINE

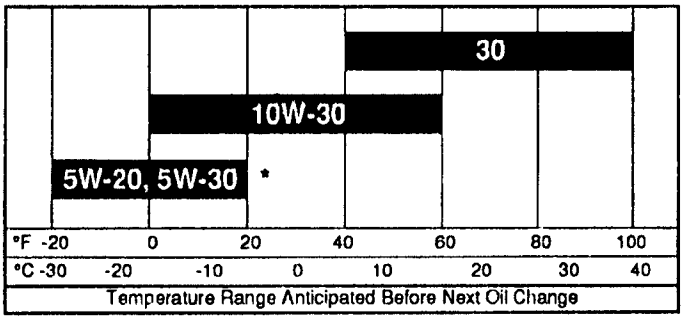
**NOTE**

Maintenance of the Kubota 23 HP Gasoline Engine is primarily the same as that of the Diesel Engine (Refer to 5.1 thru 5.3 for procedures).
Listed below are those items found on the Gasoline Engine which require different service than the Diesel.

### A. ENGINE OIL

1. Change Engine Oil on a regular schedule. Use only those oils classified for Service SF, SE, SD or SC. These oils will keep the Engine cleaner and will help retard the formation of gum and varnish deposits. DO NOT use oil additives!
2. Refer to the following Chart for recommended Grades to use with temperature range anticipated before next oil change.

**RECOMMENDED SAE VISCOSITY GRADES**




* If not available, a synthetic oil may be used having 5W-20 or 5W-30 viscosity.

### B. OIL FILTER

1. Change Oil Filter after first 50 hours of operation and at each oil change thereafter.

### C. SPARK PLUGS

1. Spark Plugs should be cleaned or replaced (if necessary) and Gap reset to .039 to .043 (1.0 to 1.1 mm) every 100 hours of operation or every 6 months, whichever comes first.
2. To clean, remove Spark Plug from Engine, scrape or wire brush and wash with a commercial solvent. DO NOT blast clean.

**NOTE**

Sparking can occur if Wire Terminal does not fit firmly on Spark Plug. Compress Terminals if necessary.

### D. MUFFLER

1. When servicing Engine, inspect Muffler for signs of damage or deterioration. Replace as required.
2. Make sure that Muffler Guard (if applicable) is always in place and secure before allowing mower to leave the shop.

**CAUTION**

***Worn out Mufflers are more than just a noise nuisance, and should be replaced immediately. Continued use could result in fire or explosion!***

### E. AIR CLEANER

(Consult Engine Manual for Part Number of Filter Element).

Inspect Filter during every Engine service or every 25 operating hours (or more often if mower is used under extremely dirty or dusty conditions). See Figure 5.10.

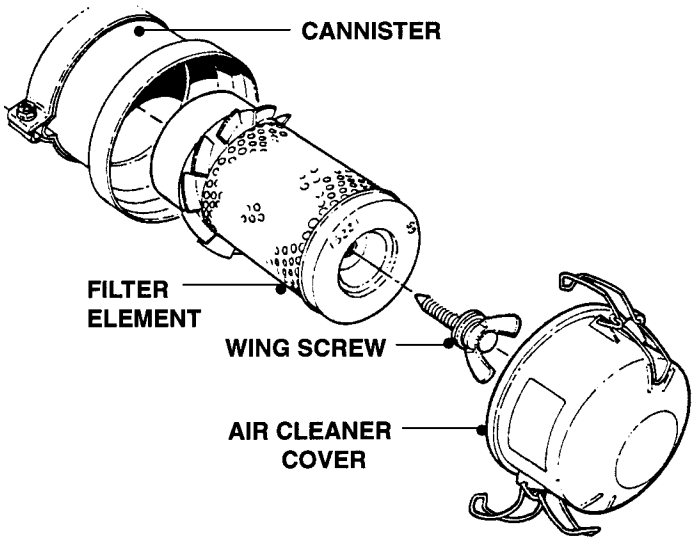



**FIGURE 5.10**

1. Remove Filter Element from Cannister.
2. To clean the Element, direct a flow of compressed air to the inside of the Element until all debris has been removed (do not exceed 100 psi).
3. Replace Filter Element as required.
4. Always clean Cover inside and out, and clean Cannister before reassembly.

**WARNING**

***Gasoline is flammable and must be handled with care. DO NOT allow open flame, matches or smoking in area. Wipe up any spills. Use approved (RED) fuel container.***

1. Check the Inline Fuel Filter at frequent intervals and replace before it becomes clogged with sediment. Replacement Filters are SNAPPER Part No. 4-6364.

2. Make certain that the replacement Filter is correctly installed with the gas flow going to the Engine.
3. Check other Fuel System Components frequently and replace any parts that are leaking or showing worn spots or cracks.

**G. CHECKING FAN BELT TENSION**
(See Page 5.4, refer to Figure 5.6).

**H. CHECKING COOLING SYSTEM**
(See Pages 5.4 & 5.5, refer to Figure 5.7).

## 5.2 ENGINE REMOVAL (KUBOTA 23 HP GASOLINE ENGINE)

(See Pages 5.5 & 5.6, refer to Figure 5.8).

**NOTE**
Although the Gasoline and Diesel Engines are different, the instructions for their removal are practically the same. Use standard procedures to remove and disconnect those items required for Engine removal.

## 5.3 ENGINE (FAN) BELT REMOVAL: GASOLINE & DIESEL ENGINES

1. Remove Radiator Screen.
2. Remove Nut and Bolt that secure the top portion of Alternator Cover. Rotate Cover to the side. See Figure 5.11.

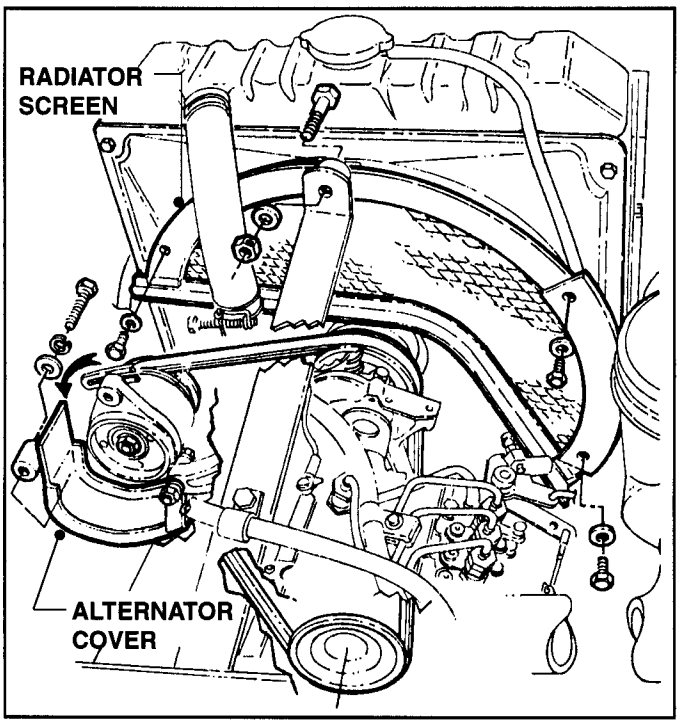



FIGURE 5.11

3. Remove the Nuts and Bolts that secure the Metal Couplings to the Rubber Flex Coupling. Remove Rubber Flex Coupling to allow space to remove and install Belt. See Figure 5.12.
4. Remove Belt from around Pulleys and Fan. Pull Belt through where Rubber Flex Coupling was located.
5. Install new Belt in reverse order.

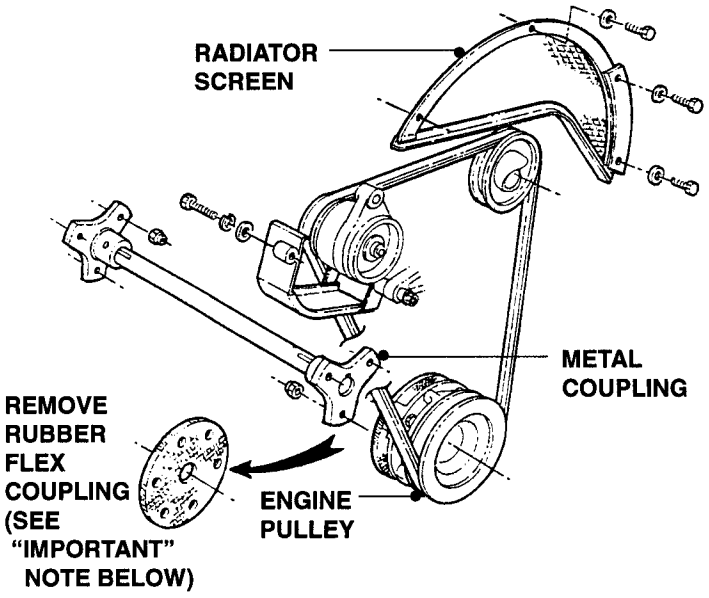



FIGURE 5.12

**IMPORTANT!**
For those OFZ's equipped with Kubota Diesel Engines, the existing Drive Shaft Coupling should be replaced with SNAPPER #6-3164 UNIVERSAL JOINT/COUPLING KIT. Refer to SNAPPER Instruction No. 7-3582 (I.R. 3/31/00) for installation procedures. See Figure 5.13 below.

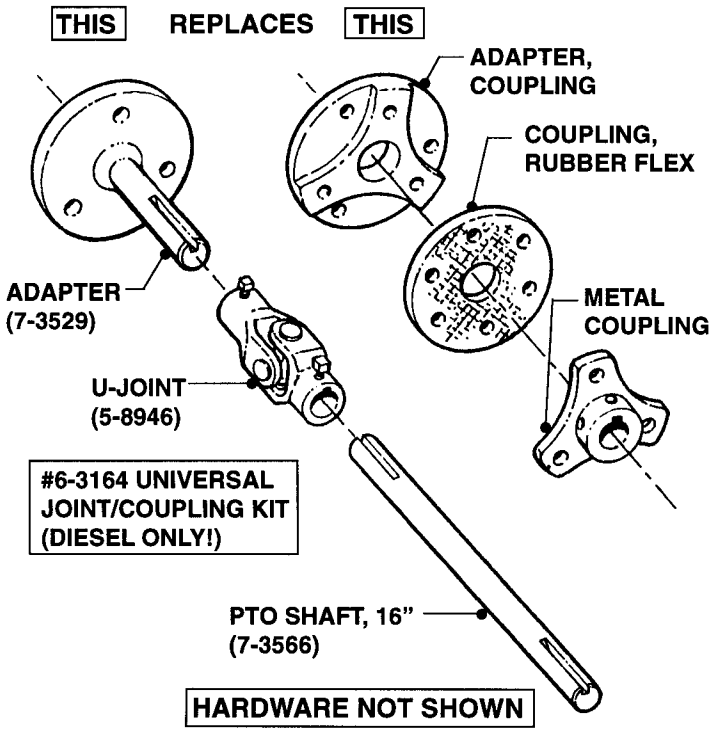



FIGURE 5.13

# Section V - ENGINE & FUEL SYSTEM

## 5.4 FUEL SYSTEM

The Fuel System of the SNAPPER OUT FRONT Z-RIDERS consist of a Fuel Tank, Fuel Filter, Hoses, Clamps and Fuel Tank Support Bracket - all of which mount to the Upper Chassis. Components of the Fuel System are shown in Figure 5.14.

**IMPORTANT**

The Fuel System should be inspected at each service period. Check for cracks or leaks in the Tank; Valve leakage and Fuel Hose integrity. Replace any item that appears worn or is damaged. Replace Fuel Filter on a regular basis.

## 5.5 FUEL TANK REPLACEMENT

**A.** Replace L.H. Fender as an assembly (refer to Section VII, "L.H. FENDER REMOVAL").

**B.** Remove the Hose Clamps, Harness Clips and Hoses from the Tank Fuel Outlets.

**C.** Lift and remove Tank from the Tank Support Bracket.

**D.** Install new Tank in reverse order of removal.

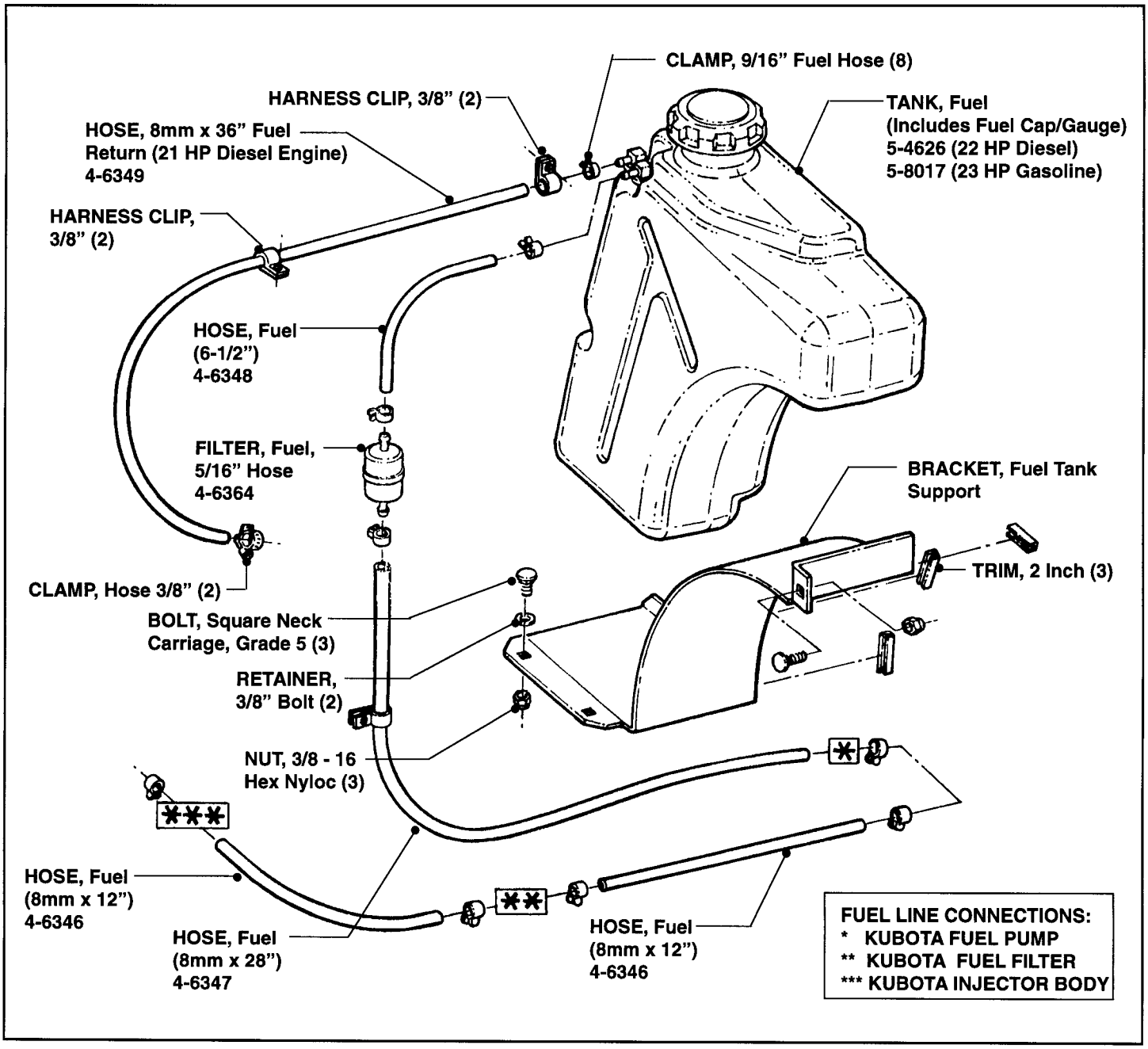



FIGURE 5.14

# NOTES

# Section VI
# TANDEM HYDRO DRIVE SYSTEM

## CONTENTS



*** IMPORTANT CHANGE NOTICE! ***

Some OUT FRONT Z-RIDERS are equipped with Kubota DIESEL ENGINES. These Models should have their existing flexible disc drive shaft couplings replaced with the #6-3164 UNIVERSAL JOINT/COUPLING KIT. Refer to SNAPPER INSTRUCTION No. 7-3582 (I.R. 3/31/00).

# Section VI - TANDEM HYDRO DRIVE SYSTEM

## INTRODUCTION

The 700 Series Hydro Transaxle Assemblies used on the SNAPPER OUT FRONT Z-RIDERs are normally designed for rugged use and maximum endurance. If properly maintained, cleaned and cared for, these units should normally last for the working life of the Power Unit. However, due to accidents and sometimes operator's negligence, the repair shop will have to replace one or both Transaxle Units.

The following information covers basic troubleshooting, removal and replacement of the Hydro Transaxle Assemblies.

### 6.1 TROUBLESHOOTING - HYDRO TRANSAXLE

If either of the Hydro Transaxles are operating erratically or not at all, SNAPPER recommends that the following Troubleshooting checks be made before replacing the Unit(s).

**A. CONTROLS - JOYSTICK**

1. Check position of Roll-Release Levers. Make certain they are in "Operating Position". See Figure 6.1.

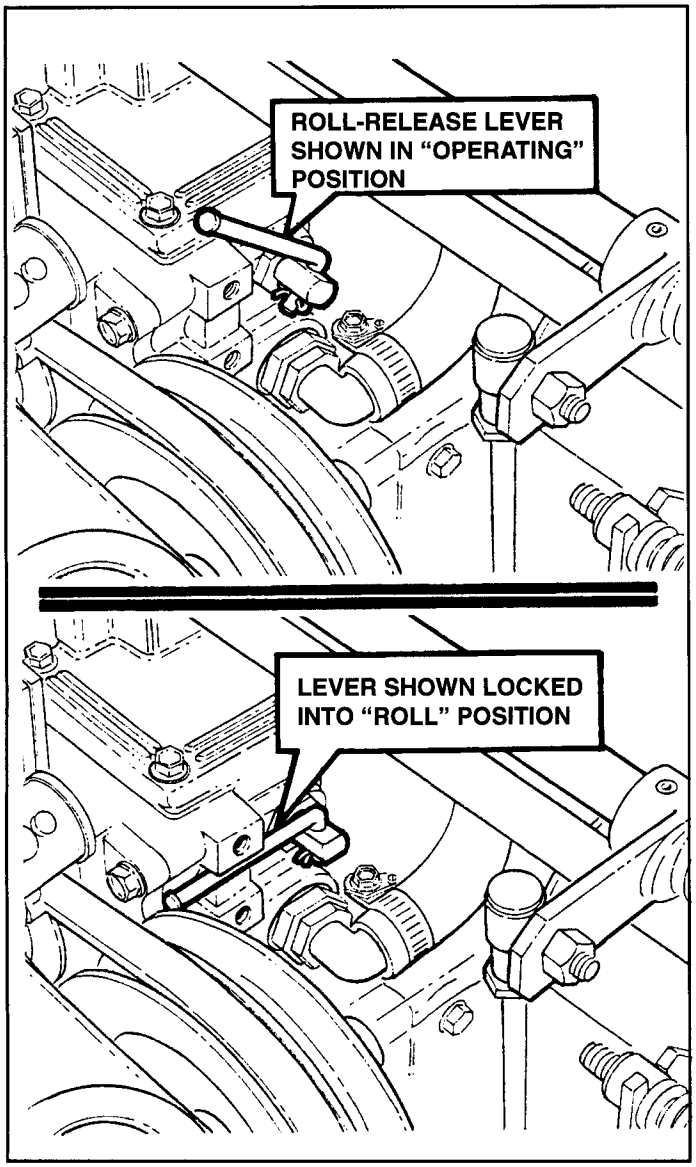



**FIGURE 6.1**

2. Check the Neutral Position as follows:
   - **a)** Start Engine and release Parking Brake.
   - **b)** Move Joystick forward to begin movement of Unit.
   - **c)** Move Joystick to center or neutral position to stop machine. If machine does not come to a complete stop, or has any movement when Joystick has been moved to neutral position, adjustments are required.
3. **NEUTRAL POSITION ADJUSTMENTS**
   - **a)** Stop Engine.
   - **b)** Raise Rear Wheels off ground high enough to rotate freely.
   - **c)** Disconnect Brake Rod from Parking Brake. See Figure 6.2.

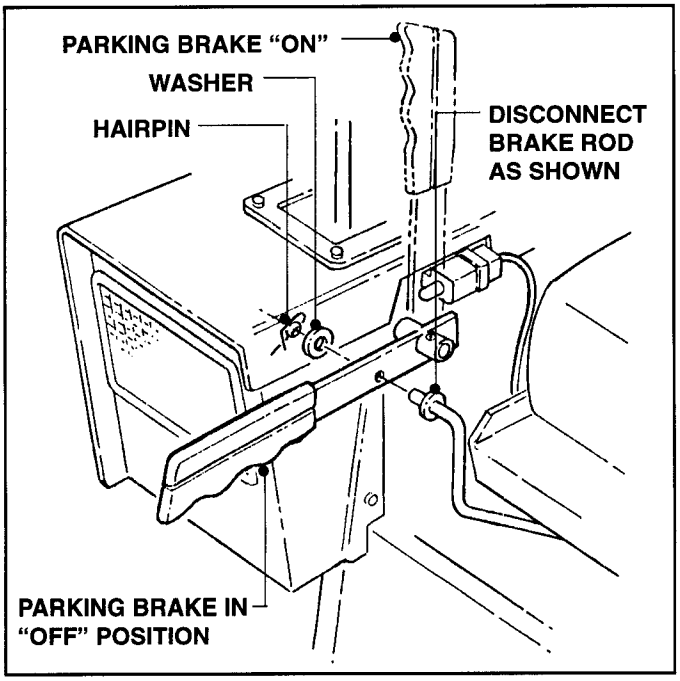



**FIGURE 6.2**

   - **d)** Pull Parking Brake Lever up to "ON" position.

**IMPORTANT**

Engaging Parking Brake while Brake Rod is disconnected, locks Joystick in Neutral position.

**e)** Start Engine. Neither wheel should rotate or have any movement.

**f)** If wheel(s) are rotating, disconnect Transmission Control Rods from Cross Shaft and turn Adjusting Bolts, located on Pump(s), clockwise, or counterclockwise, until rotation stops. See Figure 6.3.

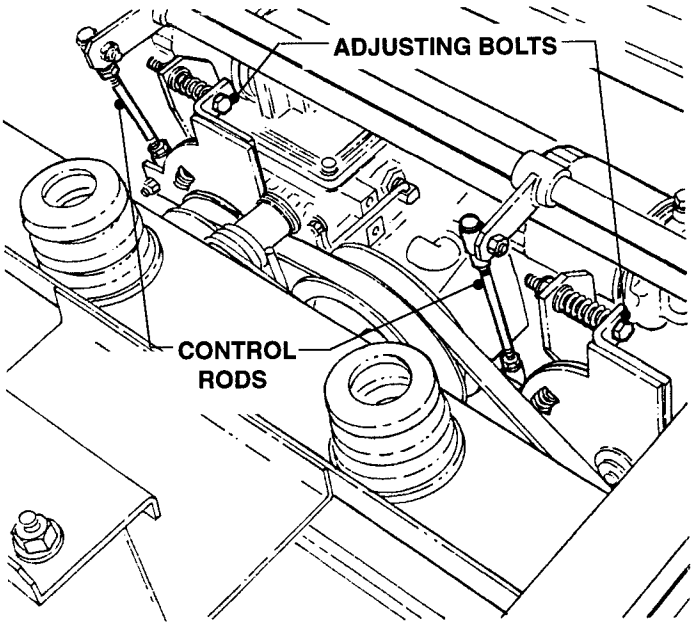



**FIGURE 6.3**

**g)** With wheels in neutral, and not rotating, stop engine and adjust Control Rods until they fit into the Cross Shaft Arms with no wheel creep.

**h)** Reconnect Park Brake Rod.

**4. BALL JOINT LINK ADJUSTMENTS (JOYSTICK CONTROL)**

**a)** Remove the R.H. Fender (Refer to Section VI, Page 7.10).

**b)** Set Park Brake to lock Joystick in position then adjust Ball Joint Links to fit locked position.

**NOTE**
Other than the Ball Joint Link Assemblies, the Joystick Control has no adjustments.

**5. PARKING BRAKE ADJUSTMENT (Both Drive Wheels/Brakes Jointly)**

**a)** Disconnect Parking Brake Rod from Park Brake Lever. See Figure 6.4, Page 6.4.

**b)** Rotate Rod clockwise one (1) turn to tighten Brake or counterclockwise to loosen Brake tension.

**NOTE**
DO NOT OVERTIGHTEN BRAKE ROD! Damage to Parking Brake components could result.

**6. TESTING PARKING BRAKE ADJUSTMENT**

**a)** Engage Parking Brake.

**b)** Try to roll each Drive Wheel to insure there is no movement (Parking Brake should hold both Drive Wheels in place).

**c)** If one Wheel can be moved, then adjustment can be performed on the individual Drive Wheels. See 7., INDIVIDUAL DRIVE WHEEL/BRAKE ADJUSTMENT.

**7. INDIVIDUAL DRIVE WHEEL/BRAKE ADJUSTMENT**

**a)** Rotate nut 1/2 turn clockwise to tighten Brake. (See "Inset", Figure 6.4, Page 6.4).

**b)** Recheck Drive Wheel for adjustment. If Wheel does not move, adjustment is complete.

**NOTE**
DO NOT OVERTIGHTEN HYDROSTATIC BRAKE RODS! Damage to Parking Brake components could result.

**B. HYDRAULIC RESERVOIR(S) & HOSES**

1. Check for leaks at connections.
2. Check Hoses for kinks, cracks or deterioration.

**C. HYDRAULIC FLUID**

1. Check for proper fluid level (1-1/2" to 2") below top of filler neck.
2. Check fluid type (SAE 20W-20, SAE 30 or SAE 40 Motor Oil).
3. Check Oil Filter (Part No. 4-2715 Oil Filter).

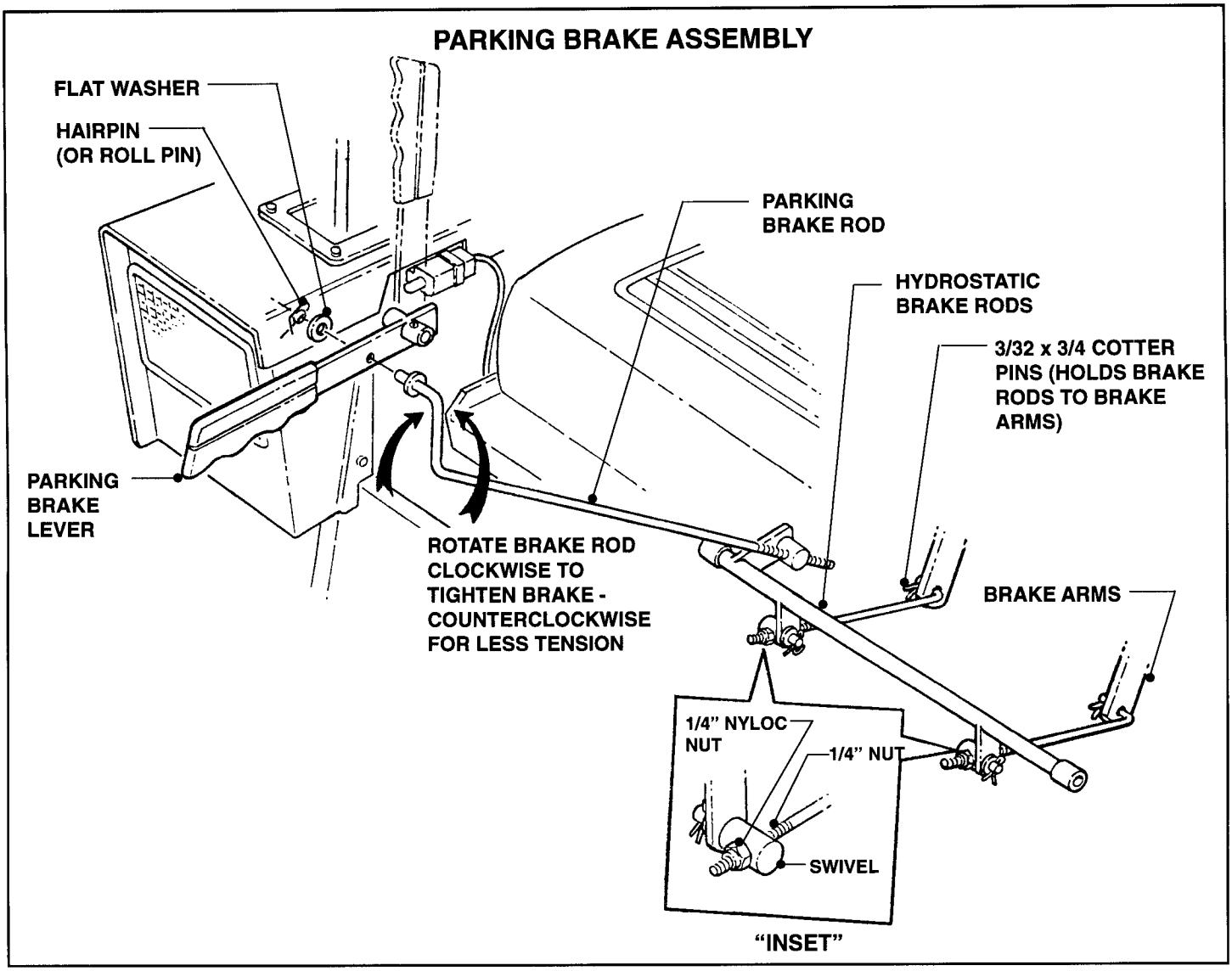



FIGURE 6.4

### 6.2 CONCLUSION (TROUBLESHOOTING - HYDRO TRANSAXLE)

Having made the checks, tests and adjustments found on the previous two (2) pages, and finding no remedy for a malfunctioning unit, replace the Hydro Transaxle as follows:

### 6.3 REMOVAL - HYDRO TRANSAXLE ASSEMBLY

**A.** Disconnect the Battery. Remove NEGATIVE (-) BLACK Cable first and POSITIVE (+) RED Cable last. Secure Cables away from the Battery. See Figure 6.5.

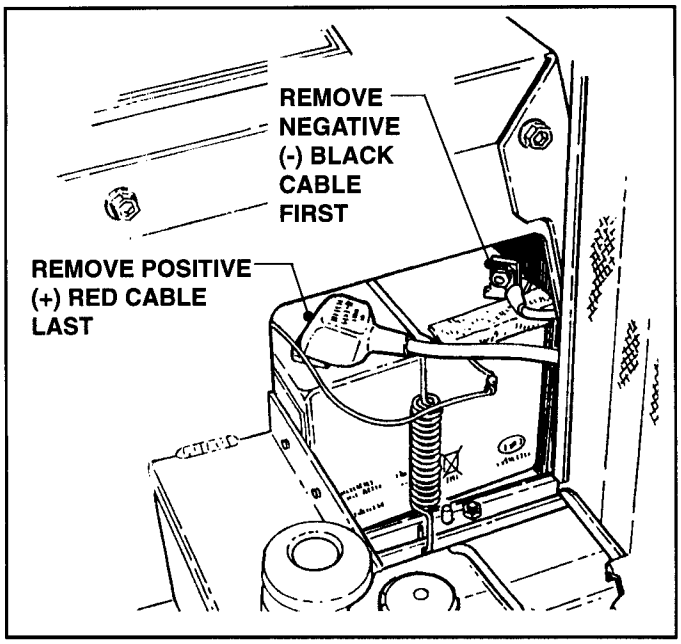



FIGURE 6.5

**B.** Remove the 1/4 - 28 Nyloc Nut from the Control Rod on the Neutral Return Cam. Disconnect Rod from Cam. See Figure 6.6.

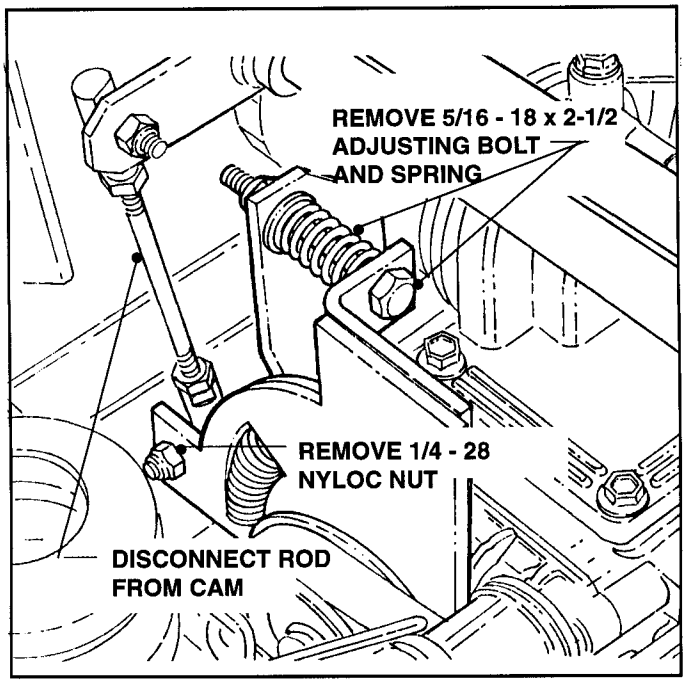



**FIGURE 6.6**

**C.** Remove the 5/16 - 18 x 2-1/2" Neutral Return Adjusting Bolt and Spring. Refer to Figure 6.6.

**D.** Depress Idler Pulley and remove Traction Belt from Input Pulley. See Figure 6.7.

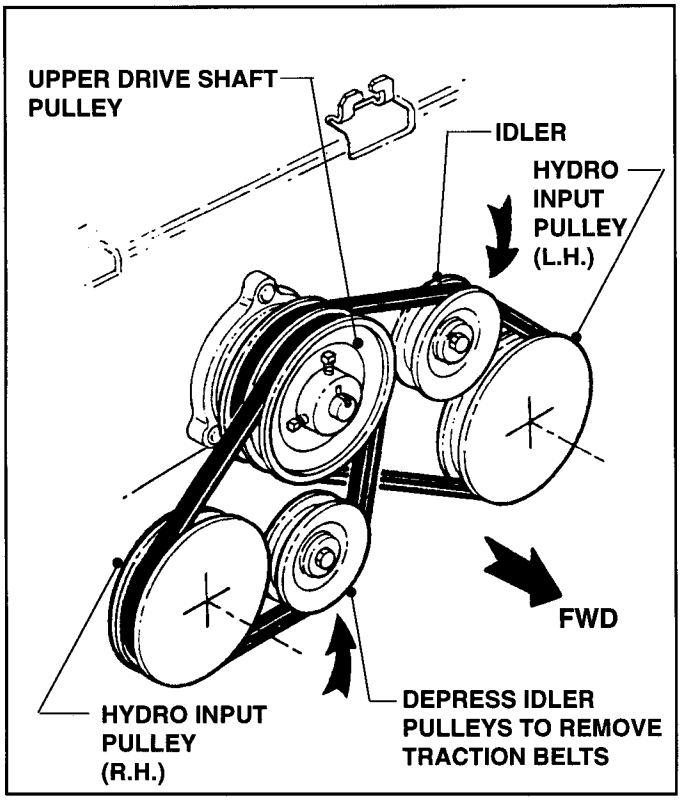



**FIGURE 6.7**

**E.** Place rear of Unit up on jackstands. Chock front Wheels.

**F.** Remove Rear Wheel from Transaxle to be removed.

**G.** Disconnect the Hydrostatic Brake Rod be removing the 3/32 x 3/4 Cotter Pin from the Brake Arm. Refer to Figure 6.4 on Page 6.4.

> **NOTE**
> For additional working space, disconnect the Deck Driveshaft and move it out of the way. See Figure 6.8.

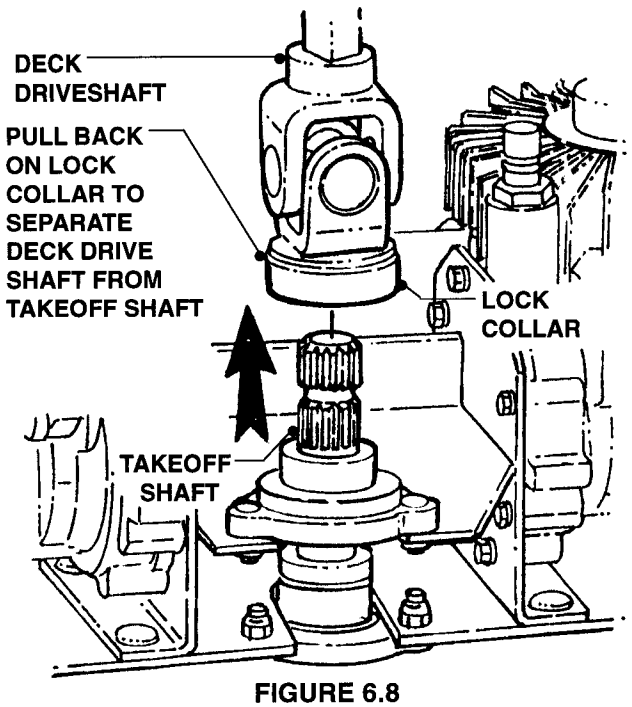



**FIGURE 6.8**

**H.** Place a five (5) gallon container beneath Hydraulic Hose connection of Transaxle being removed. Using cutters or a sharp utility knife, cut Hose located at bottom of Transaxle.

1. Allow oil to drain from system.
2. Cut Upper Hose.
3. Remove the 13/16" Hose Clamps from the Hose Stubs.
4. Split the Hose Stubs with a sharp knife and remove.
5. Remove the sections of cut Hose from the Hydraulic Reservoir in a like manner. Save Clamps to install new Hoses.

**J.** Remove the eight (8) 1/4 - 20 x 5/8 Hex Flange Lock Screws from inside the Bearing Mount Weldment. See Figure 6.9 on following page.

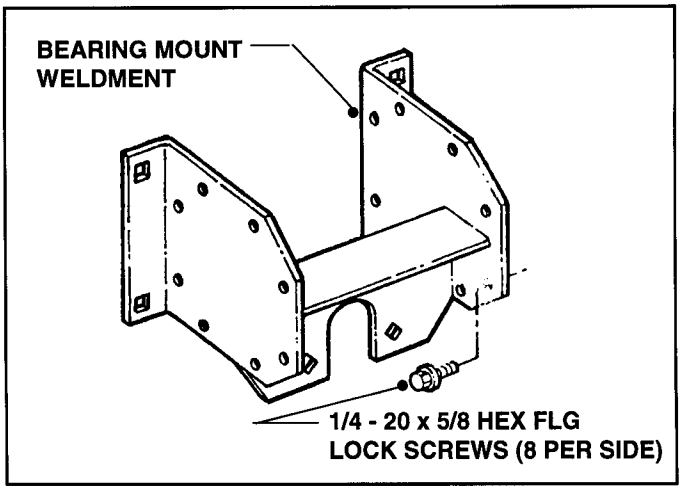



**FIGURE 6.9**

**K.** While supporting the Transaxle Assembly in a safe manner, separate it from the Unit by removing the 3/16 - 16 Hex Locknuts, Flat Washers and 3/8 - 16 x 4-3/4" Bolts and Transaxle Spacers. See Figure 6.10. Transaxle Assembly is now ready for repair or replacement.

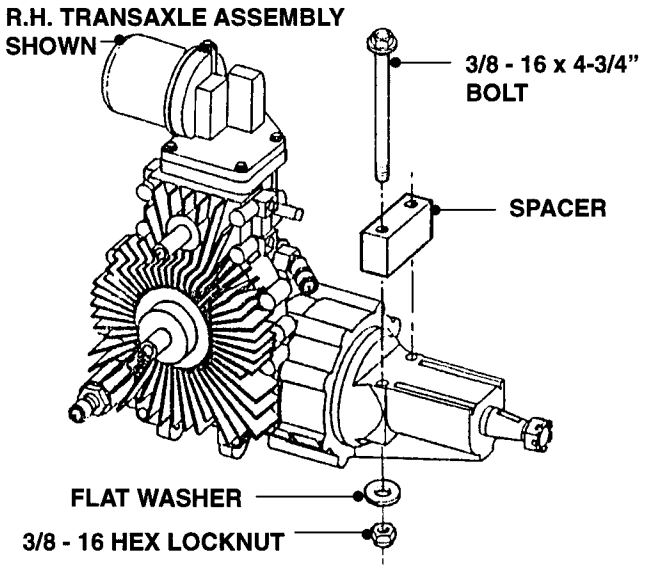



**FIGURE 6.10**

### 5.4 REPLACEMENT-HYDRO TRANSAXLE ASSEMBLY

**A.** Remove the following parts from the Hydro Transaxle Assembly which is to be replaced. See Figure 6.11 on following page.

1. **Transmission Pulley**
   - **a)** Loosen the two (2) 5/16 - 18 x 5/16 Sq. Hd. Set Screws.
   - **b)** Remove the Transmission Pulley and Cooling Fan as an assembly.
   - **c)** Remove the #605 Woodruff Key.

**NOTE**

The R.H. and L.H. Transmission Pulleys are different. The Mounting Face of the R.H. Pulley has an extended Boss to compensate fro the Offset Drive Belt configuration of the Upper Drive Shaft Pulley.

2. **Neutral Return Cam & Neutral Adjustment Plate**
   - **a)** Remove the 1/4 - 20 x 1-1/4 Hex Hd Cap Screw, 1/4 Lock Washer & 1/4 I.D. x 1" O.D. Flat Washer.
   - **b)** Remove the Neutral Return Cam and #404 Woodruff Key.
   - **c)** Remove the Neutral Adjustment Plate and the 1" External Retaining Ring.
3. **Roll Release Rod**
   - **a)** Remove 1/16 x 1/2 Cotter Pin.
   - **b)** Remove Roll Release Rod.
4. **Hydraulic Fittings (Removal)**
   - **a)** Loosen Inner Nut of Upper Fitting (45°).
   - **b)** Remove Fitting from Pump.

**NOTE**

Upper Fitting (45°) - Note Angle of installed position BEFORE REMOVING! Fitting must be installed at SAME ANGLE in new Transaxle.

   - **c)** Remove Lower Fitting (Straight).

**B.** Install new and removed parts to replacement Hydro Transaxle Assembly before installation.

1. New Oil Filter (SNAPPER Part No. 4-2715, Eaton Part No. 103144).
2. Upper & Lower Hydraulic Fittings.
   - **a)** Lubricate NEW O-Ring with Petroleum Jelly. Place O-Ring on Lower (Straight) Fitting and install. Do not overtighten.
   - **b)** Place a NEW lubricated O-Ring on Upper Fitting and install at same angle of position as it was when removed. Tighten until snug.
   - **c)** Tighten Inner Nut to seal O-Ring.
3. Insert Roll Release Rod into Shaft and secure with Cotter Pin.
4. Install Neutral Adjustment Plate and secure with 1" External Retaining Ring.
5. Install Neutral Return Cam and #404 Woodruff Key. Secure with Flat Washer, Lockwasher and Screw.
6. Install Transmission Pulley/Cooling Fan Assembly and loosely tighten the two (2) Set Screws (Pulley will have its final tightening when Traction Belt(s) are aligned).

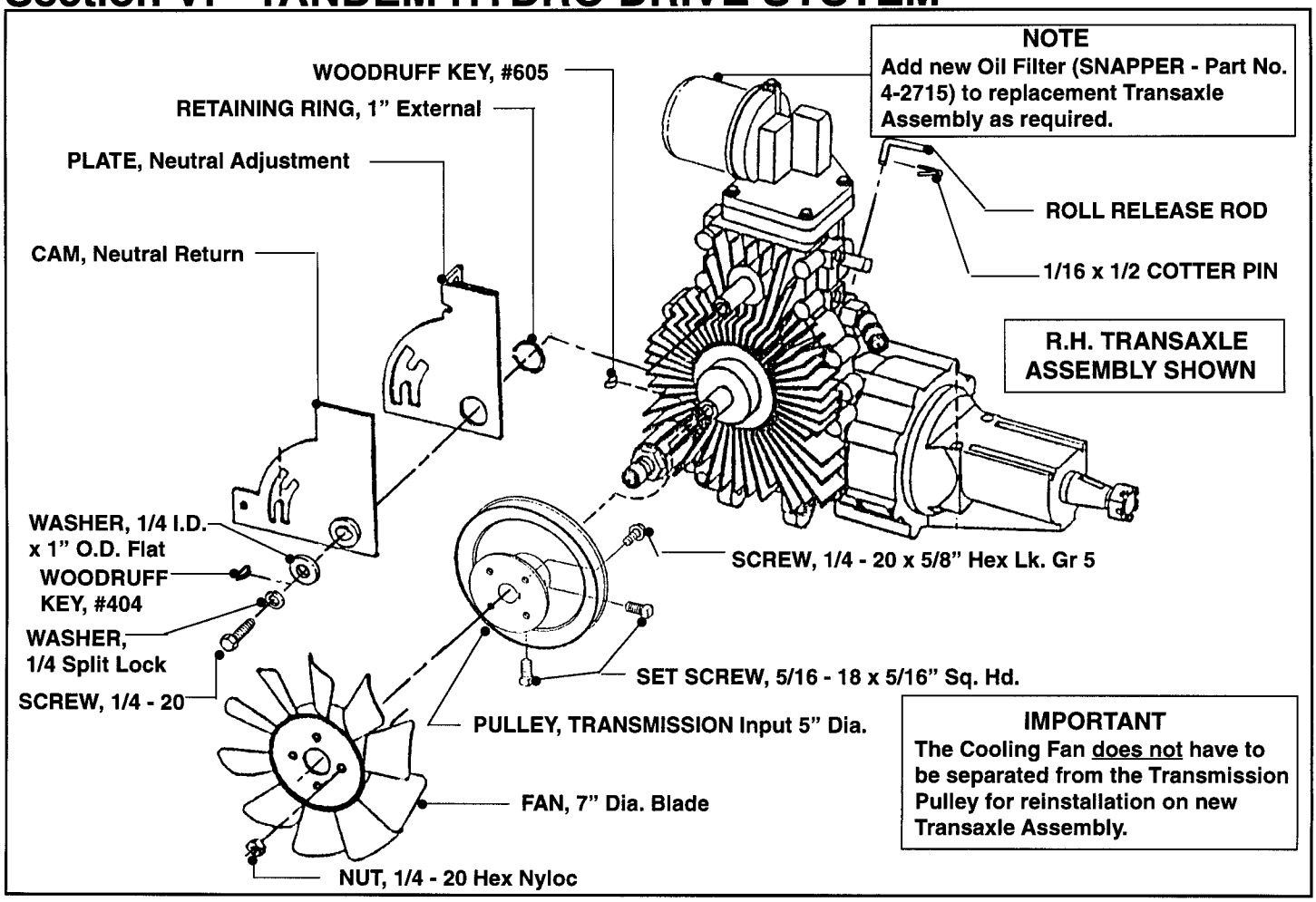



**FIGURE 6.11**

**C.** While supporting the new Hydro Transaxle Assembly, align Mounting Holes with their mating holes in the Power Unit Frame.
   1. Place the Spacer between the Hydro Transaxle and mounting surface of Frame. Insert the two (2) 3/8 - 16 x 4-3/4" Bolts thru the holes in top of the Frame, Spacer and Transaxle. Secure Bolts with Flat Washers and Locknuts. Torque to 31 Ft. Lbs. (42.16 N•m).
   2. Secure the Hydro Transaxle to the Bearing Mount Weldment with the eight (8) 1/4 - 20 x 5/8 Hex Flange Lock Screws. Torque to 8 Ft. Lbs. (10.88 N•m).

**D.** Attach new Hydraulic Hoses to Transaxle.

**E.** Reattach Power Transfer Shaft to PTO.

**F.** Depress Idler Pulley and place Traction Belt(s) over Input Pulley. Move the Input Pulley on its Shaft until the Belt is aligned with Traction Pulley. Tighten the two (2) 5/16 - 18 x 5/16 Sq. Hd. Set Screws.

**G.** Install the 5/16 - 18 x 2-1/2 Neutral Return Adjusting Bolt and Spring into the Neutral Adjusting Plate and Driveshaft Bracket.

**H.** Reconnect the Hydrostatic Brake Rod to the Brake Arm.

**J.** Reconnect Control Rod to Neutral Cam.

**K.** Reinstall Rear Wheel.

**L.** Fill Hydraulic Reservoir(s).

**M.** Reconnect Battery (Refer to Figure 6.5.).

# NOTES

# Section VII
# CASTER WHEEL/REAR AXLE, CHASSIS & BODY COMPONENTS

## CONTENTS

# Section VII - CASTER WHEEL/REAR AXLE, CHASSIS & BODY COMPONENTS

## INTRODUCTION

Besides those instructions which detail the removal of parts, this section also gives information about partial disassembly in order to more easily access the Z-RIDER's internal mechanisms. Take a moment to review this section. It will save you time when making adjustments or repairs.

### 7.1 CASTER WHEEL ASSEMBLY (All Models)

Components of the Caster Wheel Assembly are shown in Figure 7.1.

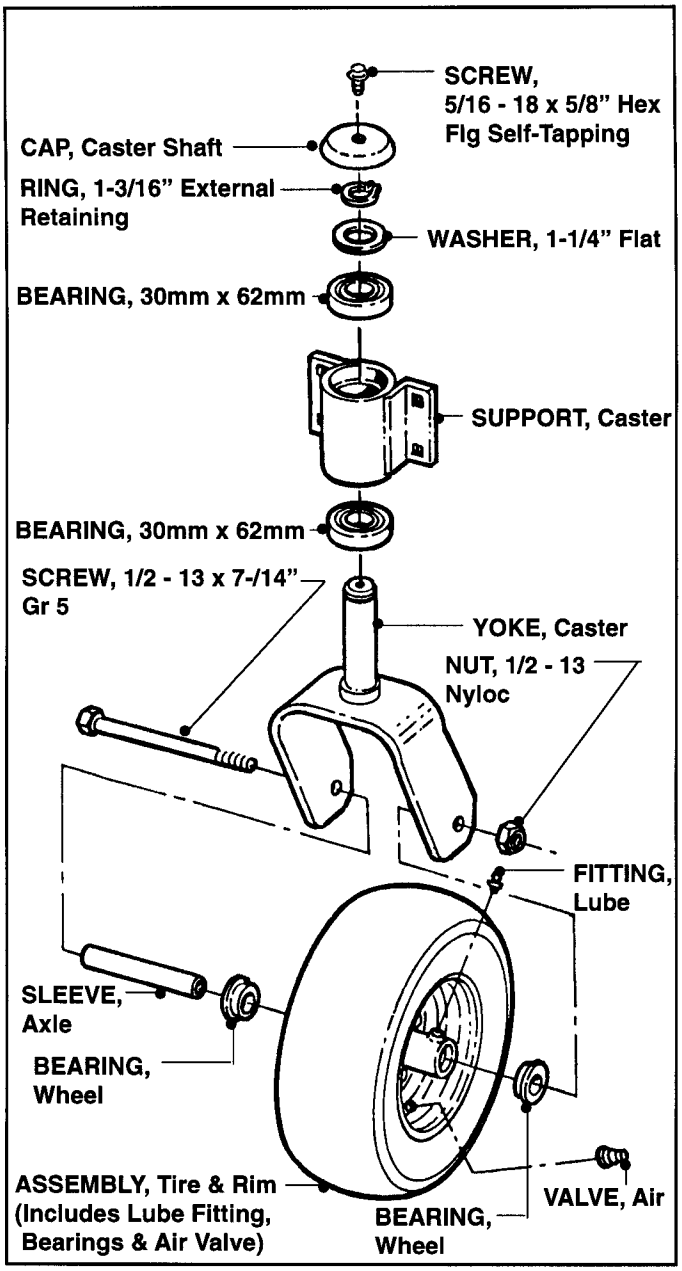



FIGURE 7.1

#### A. REPLACEMENT OF CASTER SUPPORT BEARINGS

1. Raise and support rear of Power Unit.
2. Remove 5/16 - 18 x 5/8" Hex Flg. Screw.
3. Remove Caster Shaft Cap.
4. While supporting Wheel Assembly from underneath, remove the 1-3/16" External Retaining Ring from top of Caster Yoke.
5. Remove 1-1/4" Flat Washer.
6. Lower the assembled Caster Yoke and Wheel out of the Caster Support.
7. Drive old Bearings out with a Drift Pin.
8. Inspect Bearings surfaces in Caster Support. Remove any burrs or nicks with emery cloth. Clean insides thoroughly with an approved solvent, then wipe dry. Lubricate lightly with GP grease.
9. Lightly grease new Bearings, then press into Caster Support until they bottom-out.
10. Reinstall Caster Wheel in reverse order of removal.

#### B. REPLACEMENT OF CASTER WHEEL BEARINGS

1. Remove 1/2 - 13 x 7-1/4" Screw and 1/2 - 13 Nyloc Nut from Caster Wheel. Refer to Figure 7.1.
2. Remove Caster Wheel.
3. Remove Axle Sleeve and Wheel Bearings.
4. Clean, inspect and perform any required maintenance on Bearing surfaces of Wheel.
5. Lightly grease, then install new Bearings.
6. Reinstall Axle Sleeve.
7. Reinstall Caster Wheel to Yoke.
8. Lubricate Caster Wheel with Kendall NLGI No. 2 Lithium Grease or equivalent.
9. Check Tire pressure - it should be 12 psi.

#### C. REPLACEMENT OF OTHER COMPONENTS

Items such as the Tire & Rim Assembly, Caster Yoke, Spacer Tubes and Retaining Hardware may be replaced with new parts during any reassembly sequence. Consult Parts Manual No. 06106 (Rev.2, 11/97), & No. 06113 (Rev. 3, 1/14/00) for replacement numbers. Refer to Figure 7.1.

### 7.2 CASTER WHEEL/REAR AXLE ASSEMBLY (Models EZF2100DKU, ZF2100DKU & ZF2300GKU)

Components of the Caster Wheel/Rear Axle Assembly are shown in Figure 7.2 on Page 7.3.

#### A. REMOVAL: CASTER WHEEL/AXLE ASSEMBLY

1. Raise and support rear of Power Unit.
2. Remove 5/16 - 18 x 5/8" Hex Flg. Screw from end of Caster Shaft Cap on Pivot.
3. Remove Caster Shaft Cap.
4. Remove 1-3/16 External Retaining Ring.

(Continued on Following Page)

5. Remove two (2) 1-1/4" I.D. x 1-7/8" O.D. Flat Washers.
6. Using an assistant, remove the Assembly by pulling it to the rear and off the Rear Axle Pivot.

**CAUTION**
**When the Caster Wheel/Axle Assembly is free of the Pivot, it will tend to roll over. Be careful when removing!**

7. Reverse above steps to install Caster Wheel/ Axle Assembly.

**B. REPLACEMENT OF AXLE PIVOT BEARINGS**

Before attempting to remove/replace Axle Pivot Bearings, either remove both Caster Wheel Assemblies (or) secure the Rear Axle Weldment - with Casters attached - in a vise to prevent movement while servicing.

1. Remove existing Bearings by driving them to the outside with a Drift Pin. (The Bearing Bosses have a machined seating surface. Bearings cannot be removed by driving them inward). See Figure 7.2.
2. Inspect insides of both Bearing Boss surfaces for any dirt or damage. Use emery cloth to eliminate any burrs. Clean insides thoroughly with an approved solvent, wipe dry, then lubricate with GP grease.
3. Press new Bearings (Part No. 3-5602) into Bosses until they bottom-out.
4. Lubricate Pivot Shaft and reinstall Axle Assembly.

**C. REPLACEMENT OF AXLE PIVOT**

1. Remove Caster Wheel/Axle Assembly (refer to A., Steps 1 thru 6).
2. Remove the four (4) 3/8 - 16 Hex Nuts, 3/8" Flat Washers and 3/8 - 16 x 1-1/2 Carriage Bolts from the Axle Pivot and Power Unit Frame. Refer to Figure 7.2.
3. Install new/repaired Axle Pivot to Lower Chassis by inserting the four (4) 3/8 - 16 x 1-1/2 Carriage Bolts from the inside, attaching the Axle Stop Bracket, Axle Pivot, Washers and Nuts. Tighten securely.
4. Reinstall Caster Wheel/Axle Assemblies.

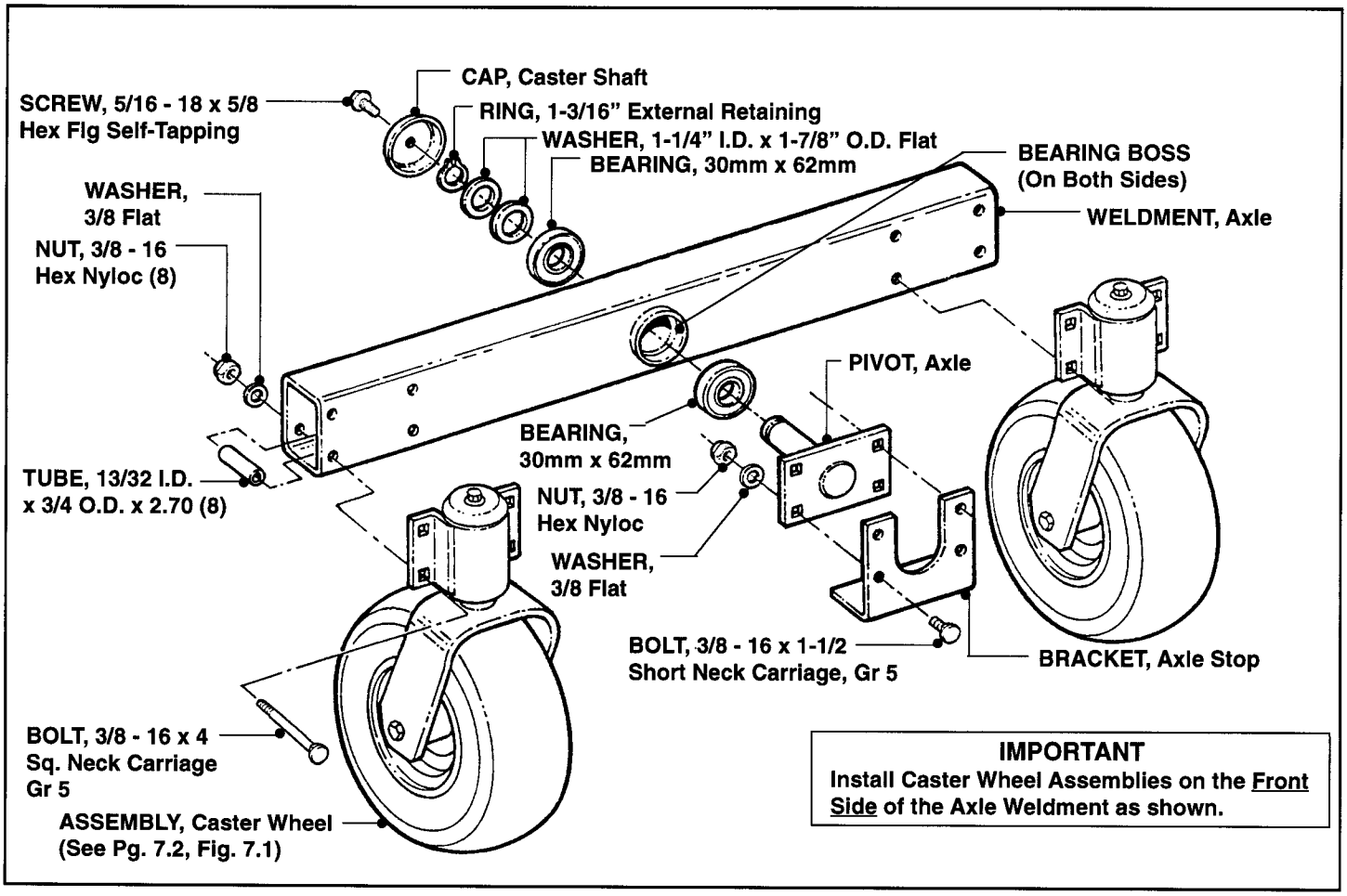



**FIGURE 7.2**

# Section VII - CASTER WHEEL/REAR AXLE, CHASSIS & BODY COMPONENTS

## 7.3 SEAT & SEAT SUPPORT ASSEMBLIES

Shown below in Figure 7.3 are the Seat Assembly Components for all models of the OUT FRONT Z-RIDER.

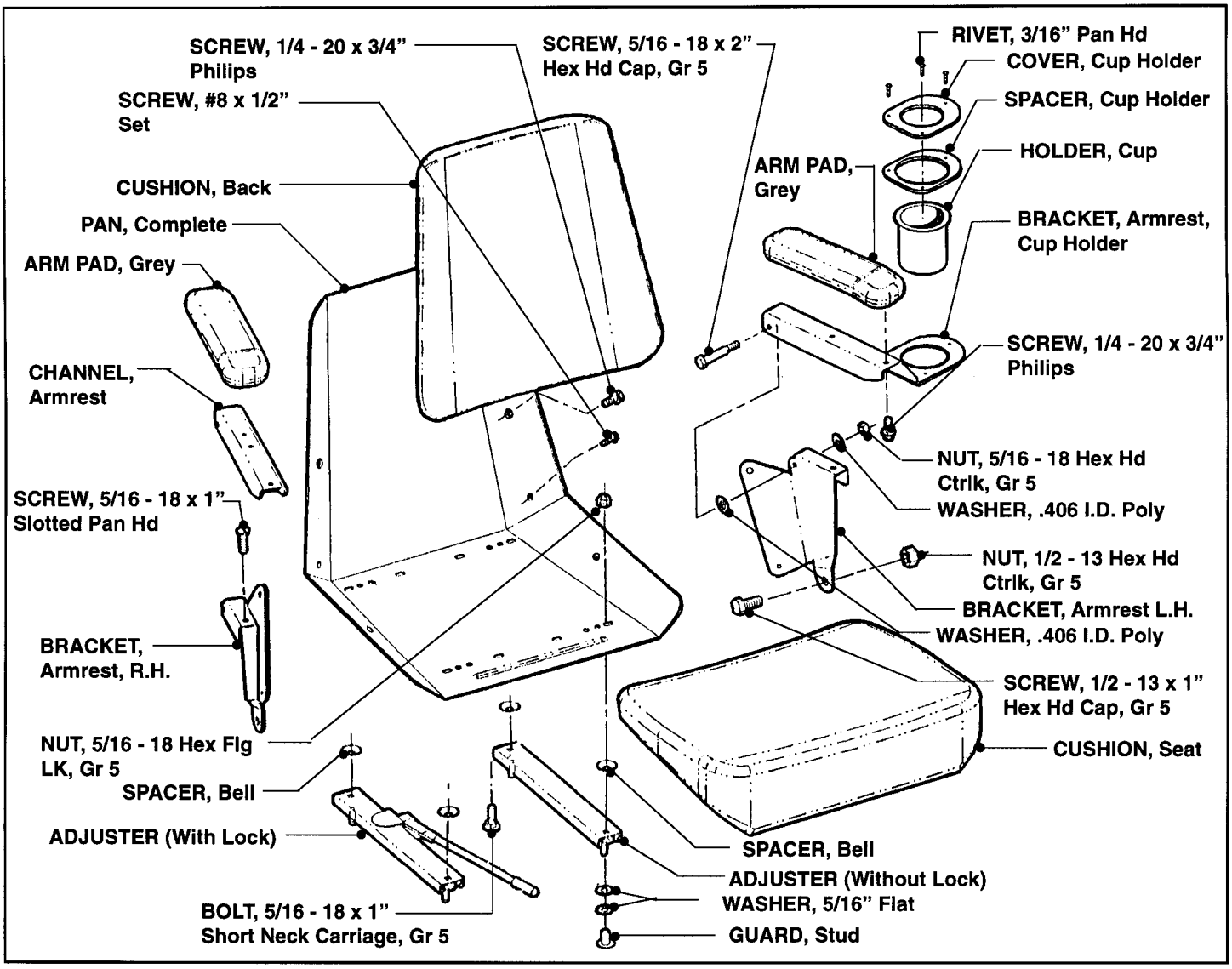



FIGURE 7.3

### A. REMOVING SEAT & SEAT SUPPORT ASSEMBLIES

1. Tilt Seat Assembly forward, then disconnect Wiring Harness from Switch. See Figure 7.4.
2. Remove 5/16 - 18 Flanged Lock Nut and Wiring Harness Clamp.
3. Remove Hairpin from Seat Pivot Rod, then remove Rod.
4. Remove the assembled Seat and Seat Support from Unit (refer to Figures 7.4 & 7.5).

### B. SEPARATING SEAT & SEAT SUPPORT

(Assemblies do not have to be removed from Unit in order to separate them.

1. Disconnect Wiring Harness from Switch. Refer to Figure 7.4.
2. Remove Flanged Lock Nut and Wiring Harness Clamp.

(Continued on Page 7.5)

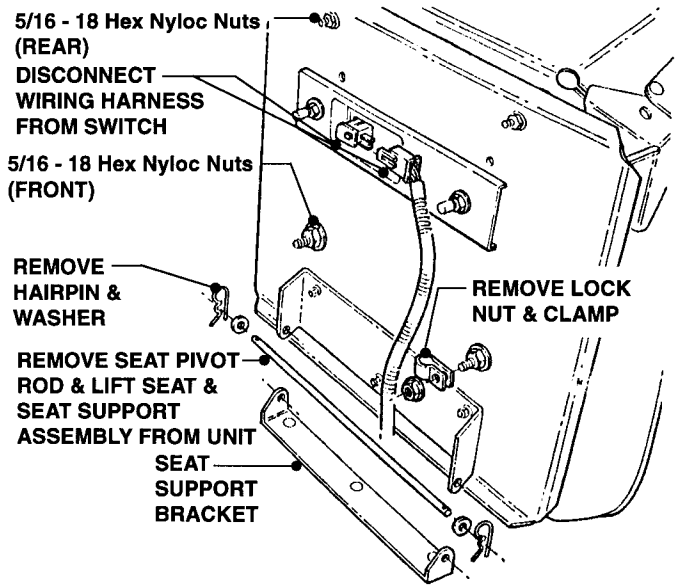



FIGURE 7.4

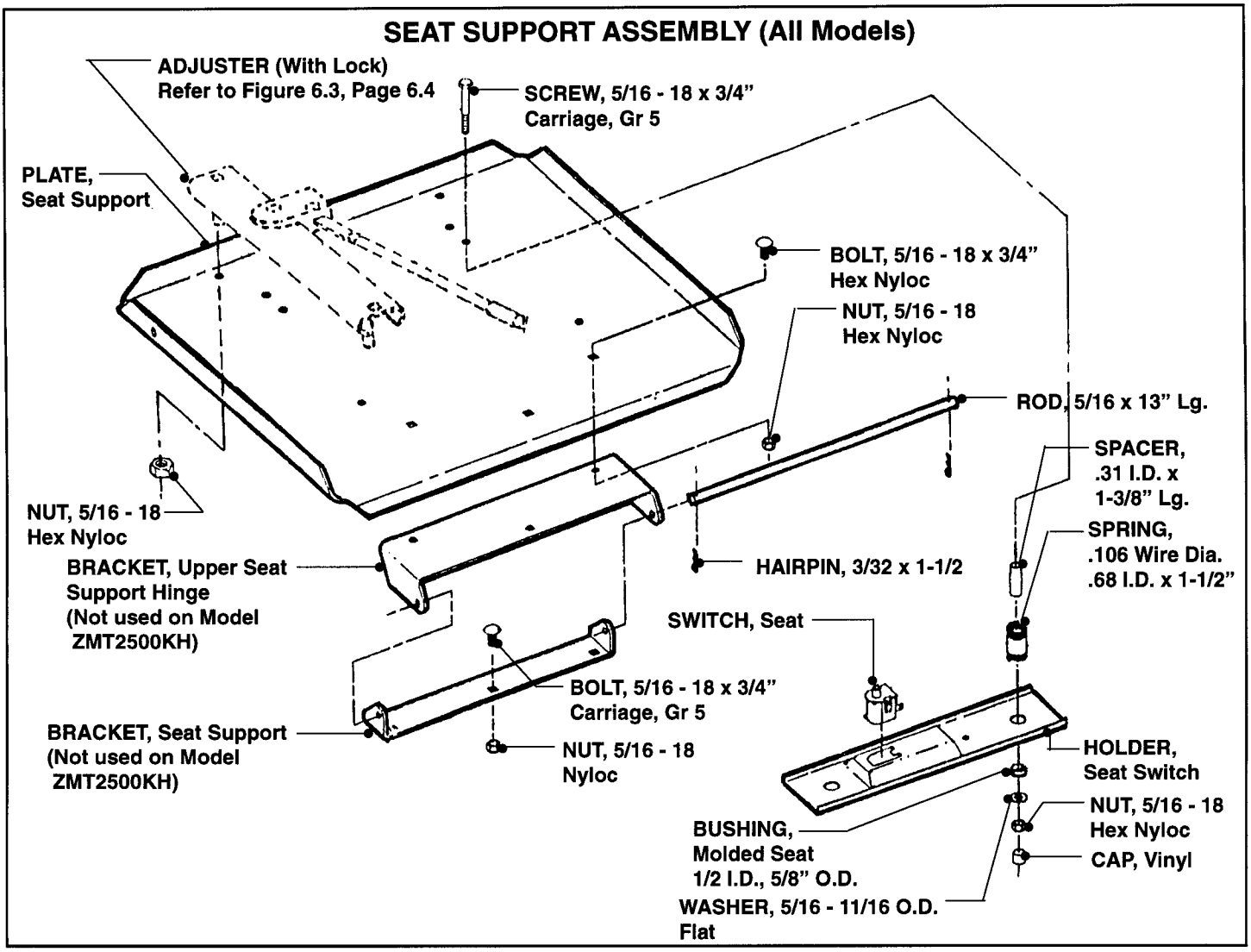



**FIGURE 7.5**

(Continued from Page 7.4, B. SEPARATING SEAT & SEAT SUPPORT)

3. Remove the two (2) front 5/16 - 18 Hex Nyloc Nuts first (refer to Figure 7.4).
4. Next, while holding Seat Assembly, remove the two (2) 5/16 - 18 Hex Nyloc Nuts from the rear of the Support Plate.
5. Remove Seat Assembly from Seat Support. If Seat Pan requires replacement, it must be ordered as Part No. 5-4117, SEAT ASSEMBLY. See SNAPPER PARTS MANUALS No. 06106 & No. 06113.

### C. SEAT SWITCH REPLACEMENT

(Seat Assembly must be separated from Seat Support before Switch can be replaced. See "B. SEPARATING SEAT & SEAT SUPPORT").

1. Remove Vinyl Caps from ends of Screws.
2. Remove the two (2) 5/16 - 18 Hex Nyloc Nuts.
3. Remove the two (2) 5/16 - 11/16" O.D. Flat Washers.
4. Remove Seat Switch Holder from Studs. Refer to Figures 7.4 & 7.5.

> **NOTE**
> Make sure not to misplace the Spacers, Springs or Molded Seat Bushings when removing/installing the Seat Switch Holder.

5. Remove Seat Switch.
6. Install new Seat Switch (Part No. 1-7590).
7. Reinstall components in reverse order.

### D. REPLACING COMPONENTS OF THE SEAT & SEAT SUPPORT ASSEMBLIES

Figures 7.3, 7.4 & 7.5 show all components of the Seat & Seat Support Assemblies. Replacement of any parts is a straightforward Removal/Installation operation. Consult the Parts Manual for required Part Numbers.

(Continued from previous page - CHASSIS & BODY COMPONENTS)

## 7.4 CHASSIS & BODY COMPONENTS

### A. FOOTREST ASSEMBLY

All models of the OUT FRONT Z-RIDER are equipped with identical Footrest Assemblies (refer to SNAPPER Parts Manuals No. 06106 & No. 06113). If damaged, the Footrest should be replaced with a new part. Removal and replacement are straightforward.

### B. UPPER CHASSIS & SEAT LATCH ASSEMBLY

The same Chassis & Seat Latch Assembly (Part No.'s) are used on all models of the OUT FRONT Z-RIDER. However, the Kubota-powered (Diesel & Gasoline) have additional Cover Guards not found on the Kohler-powered Units. They are as follows:

| Part No. | Description | Model |
|---|---|---|
| 4-5292 | GUARD, Driveshaft | ZF2100DKU |
| 7-1986 | GUARD, Driveshaft | ZF2300GKU |
| 7-1992 | COVER, Cable | (All Kubota) |
| 7-2276 | SHIELD, Drive | (European) |

### C. LOWER CHASSIS (FRAME)

The different models of the OUT FRONT Z-RIDER are equipped with the following Frames:

| POWER MODEL No. | FRAME PART No. | PARTS MANUAL REFERENCE |
|---|---|---|
| ZF2200K<br>ZF2500K | 4-2589<br>" | No. 06106<br>Pages 12 & 13 |
| EZF2100DKU<br>ZF2100DKU<br>ZF2300GKU | 4-4840<br>"<br>" | No. 06113<br>Pages 14 & 15 |

### D. R.H. FENDER REMOVAL (Fender Remains Assembled)

This removal is for access to the following items:

1. Park Brake Lock
2. Joystick Control Assembly
3. Ball Joint Link Assemblies

1. Disconnect the Battery. Remove NEGATIVE (-) BLACK Cable first and POSITIVE (+) RED Cable last. Secure Cables away from the Battery. See Figure 7.6.

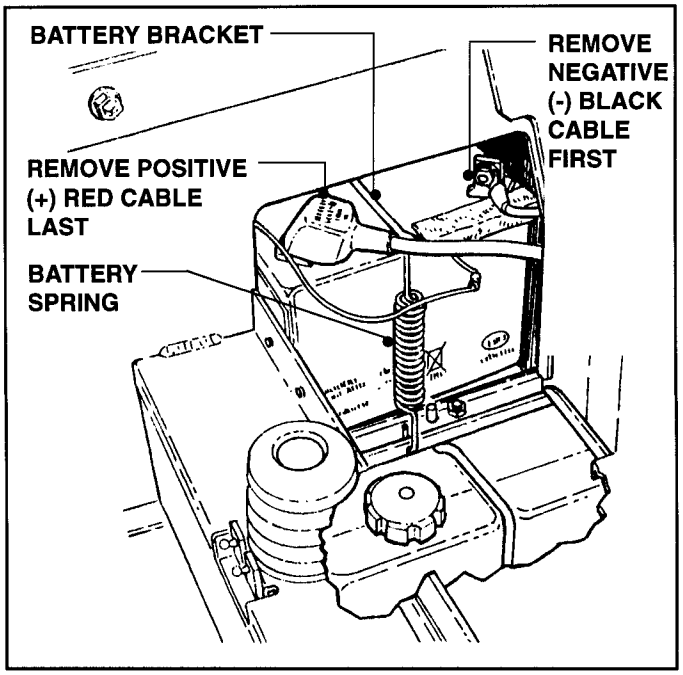



FIGURE 7.6

2. Remove the two (2) Screws from the Control Panel.
3. Lift up on outer side of Panel and disengage the Fender Panel.
4. Lower Panel into opening. See Figure 7.7.

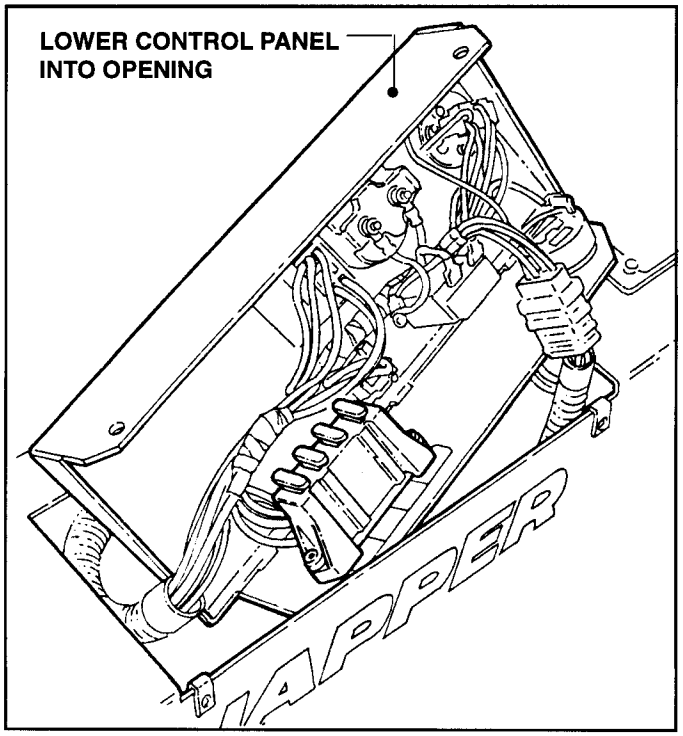



FIGURE 7.7

**CAUTION**

**If Battery has not been disconnected, Control Panel Wires will be "HOT". AVOID GROUNDING!**

5. Remove Screws from Fender at locations shown in Figure 7.8.

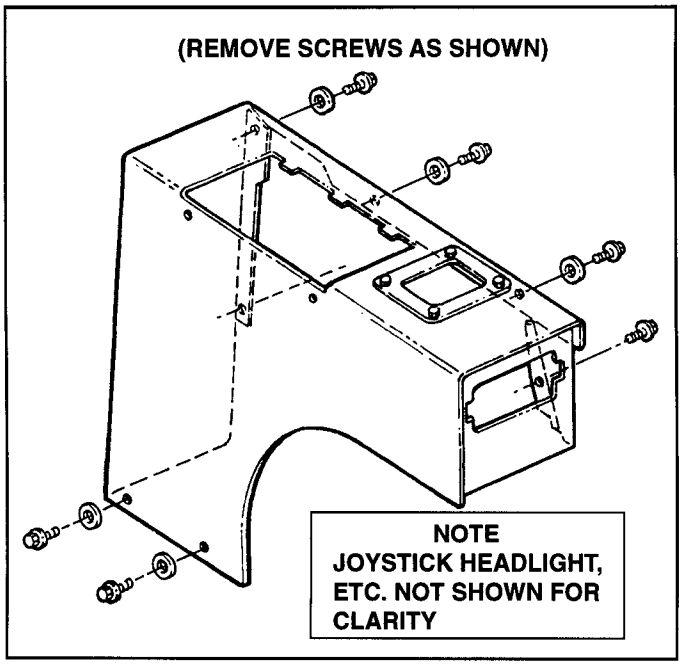



**FIGURE 7.8**

6. Gently tap inward on Headlight Lens to free Assembly from Bezel.
7. Push Headlight inside Fender. Lay Lens and Bezel aside for later reassembly.
8. Remove assembled Fender by lifting it up and slightly forward.

### E. L.H. FENDER REMOVAL
**(Fender Remains Assembled)**

This removal is for access to the following items:

1. Fuel Tank.
2. Throttle Control Assembly (Diesel & Gasoline).
3. Choke Control Assembly (Gasoline Only).

1. Remove Handle. See Figure 7.9.
2. Remove Screws from Fender at locations shown.
3. Gently tap inward on Headlight to Free Assembly from Bezel.
4. Push Headlight inside Fender. Lay Lens and Bezel aside for later reassembly.
5. Disconnect Choke and Throttle Cables from Engine, OR remove Choke and Throttle Control Assemblies per Steps 6 thru 8.
6. Remove the Handles from the Choke and Throttle Controls.
7. Remove the four (4) Screws which secure the Choke and Throttle Controls to the Fender.
8. Lower Control Assemblies into Fender Well.
9. Remove Fuel Cap.

**WARNING**

**Place a clean piece of cloth over Filler Spout of Fuel Tank until Fender has been removed, then replace Fuel Cap.**

10. Remove assembled Fender by lifting it up and slightly forward.
11. Replace Fuel Cap.

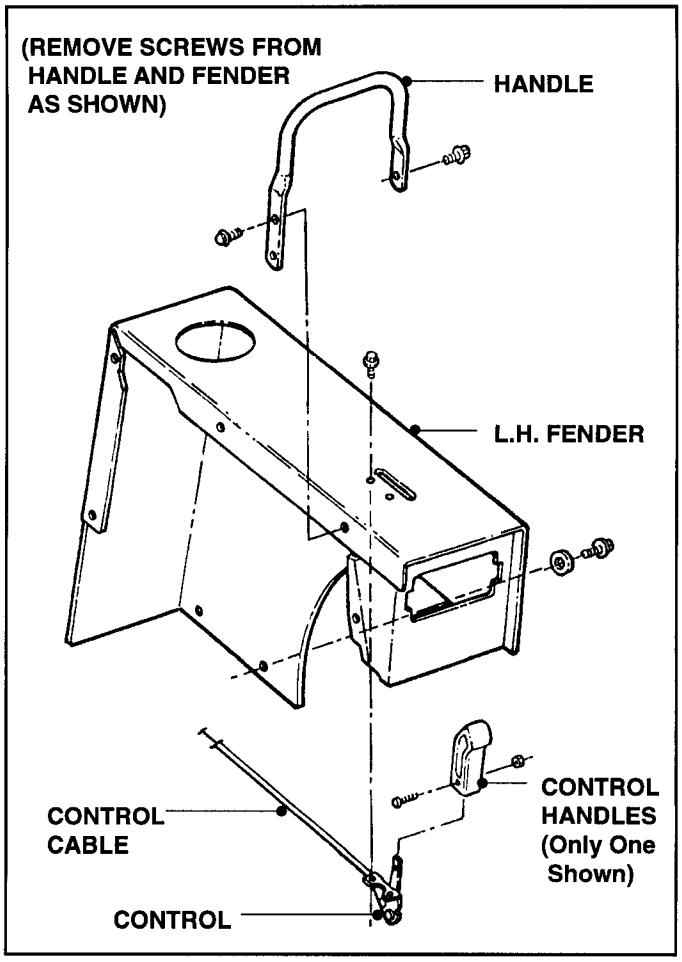



**FIGURE 7.9**

# NOTES

# Section VIII
# 52" & 61" MOWER DECK ASSEMBLIES

## CONTENTS

# Section VIII - 52" & 61" MOWER DECK ASSEMBLIES

**INTRODUCTION**

This Section will begin by repeating that portion of TROUBLESHOOTING (Sect. II, Pg. 2.3) which deals with mowing problems. In doing so, it will elaborate on the "corrective action" measures taken to solve those problems by giving step-by-step instructions for the adjustment, disassembly, repair or replacement of those components causing the problems.

**8.1 PROBLEM - BLADE(S) NOT CUTTING**

Move unit to a level, well-ventilated area.

*Check the obvious first!*

Check Blades. Visually inspect the Deck Drive Belts and Mower Drive Belt for any sign of wear or other damage. Also, check the Power Transfer Shaft for damage and proper connection.

With Engine "OFF" and Spark Plug Wires disconnected, have an assistant to disengage the spring-loaded Deck Idler Pulley while you turn each Spindle Pulley by hand. Blades should turn freely as you turn the individual Pulleys. If not, there is a problem within the Cutter Housing Assembly. (Refer to Sect. IX, CUTTER HOUSING/BLADE ASSEMBLY).

After having made the visual check and finding no apparent problems, release the Deck Idler Pulley. attach the Spark Plug Wires, set the Park Brake and start the Engine.

After Engine has warmed-up, pull the Blade Switch Knob out into the "ON" position to engage Mower Blades. If Mower Blades *DO ENGAGE*, proceed to Step 8.2 PROBLEM - CUTTING GRASS IMPROPERLY.

If Mower Blades *DO NOT ENGAGE*, continue as follows, one step-at-a-time, until problem is solved.

**A. FUSE CHECK**

1. Turn Engine "OFF".
2. Remove Screws from Control Panel, located on top of R.H. Fender.
3. Lift Control Panel upward to expose Fuse Panel underneath.

> **CAUTION**
> **Avoid accidental grounding of wires! Without the Battery being disconnected, the Wiring System will be "HOT"!**

4. Check the 7.5 Amp PTO Fuse. Replace as required. See Figure 8.1.

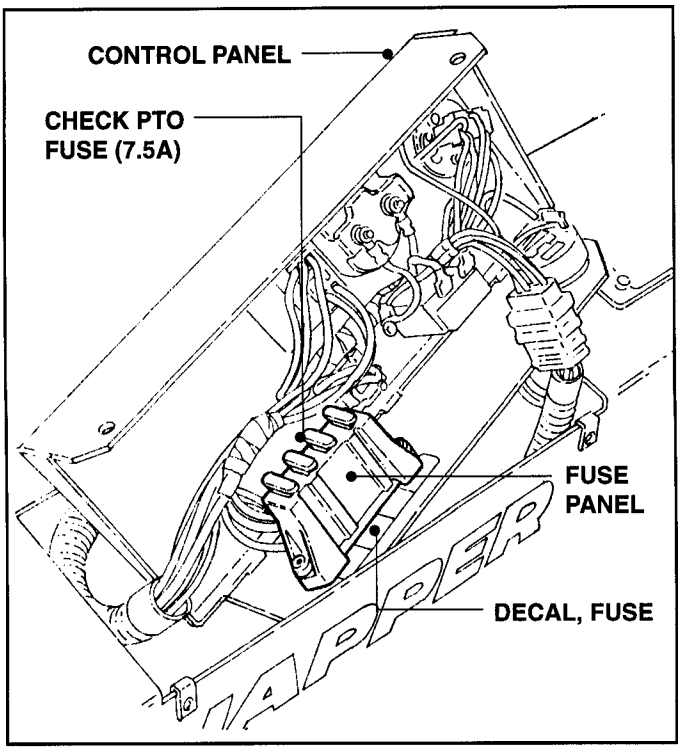



**FIGURE 8.1**

**B. PTO SWITCH TEST**
**(See Section III - Electrical)**

**C. DECK DRIVE BELTS (ADJUSTMENT)**

If the Deck Drive Belts are slipping, adjust Belt tension as follows:

1. Using a suitable pry bar, disengage the Torsion Spring from the Idler Arm Weldment. See Figure 8.2.

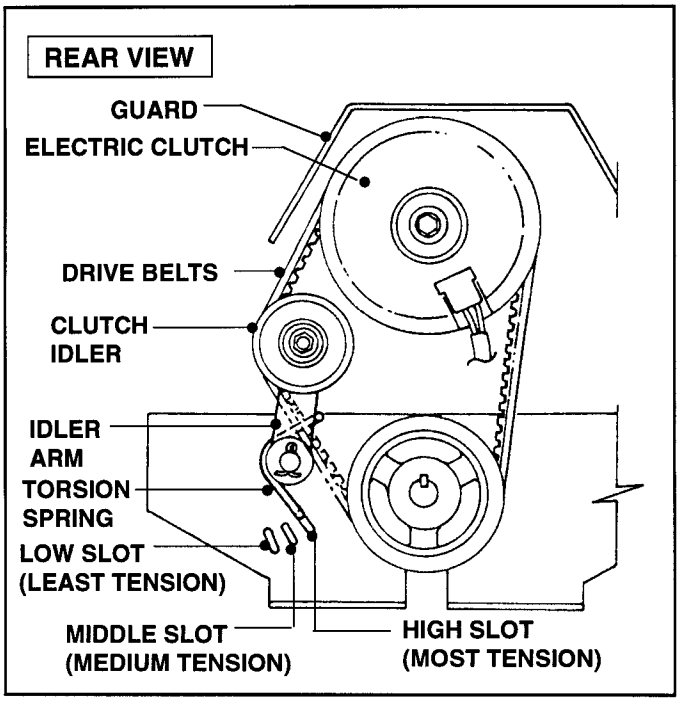



**FIGURE 8.2**

2. Remove lower end of Torsion Spring from its slot location and place in a higher slot to increase Belt tension (a lower slot will decrease Belt tension).
3. Reattach Torsion Spring to Idler Arm Weldment. Refer to Figure 8.2.

**D. DECK DRIVE BELTS (REPLACEMENT)**

If the Deck Drive Belts which drive the Power Transfer Shaft require replacement, proceed as follows:

1. Depress Clutch Idler and remove both Deck Drive Belts. See Figure 8.3.
2. Install new Belts (Refer to "E. PART No.s - DECK DRIVE BELTS" below).

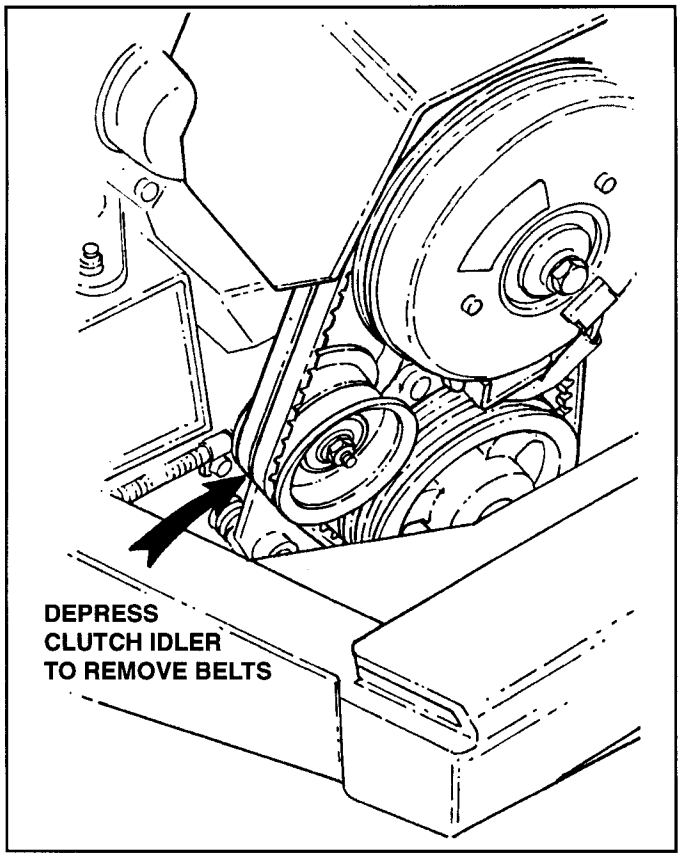



**FIGURE 8.3**

**E. PART No.s - DECK DRIVE BELTS**

1. Models ZF2200K, ZF2500K & ZF2500KH
   3-5543 Belt, Deck Drive (HA 36.5 Effective Lgth.)
2. Models EZF2100DKU, ZF2100DKU & ZF2300GKU
   4-1830 Belt, Deck Drive (HA37.25 Effective Lgth. - Sold as a Pair)

**F. MOWER DRIVE BELT**

Replace Mower Drive Belt as follows:

1. Lower Deck to lowest setting.
2. Lift up on Footrest until it locks in the "UP" position.
3. Remove four (4) Knobs that secure the Deck Cover. See Figure 8.4.
4. Remove Cover for access to Deck Belt.

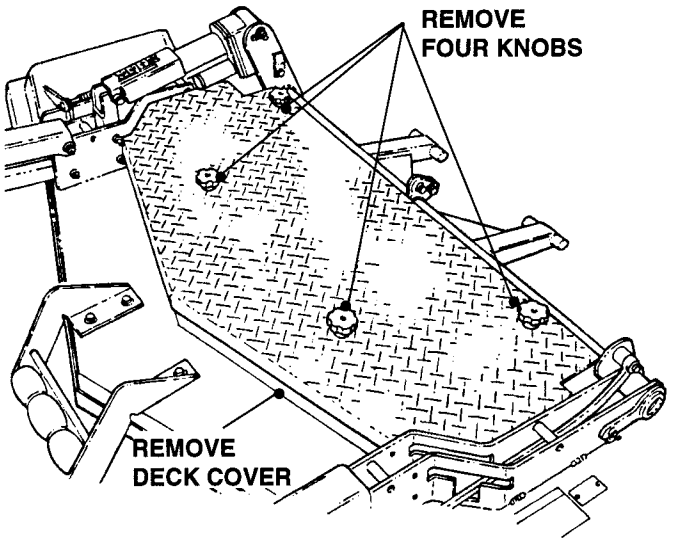



**FIGURE 8.4**

5. Remove old Belt.
6. Route new Belt around Blade Pulleys and Idler Pulley in the same position as old Belt was removed. It may be necessary to use a pry bar to pull Idler Pulley back to install Belt. See Figure 8.5.
7. Reinstall Deck Cover and Knobs.

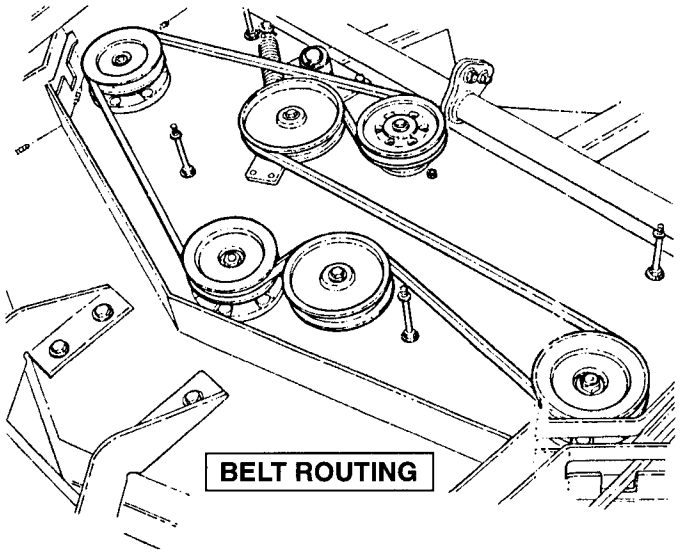



**FIGURE 8.5**

**G. PART No.s - MOWER DRIVE BELT**

| | |
|---|---|
| 4-2776 | BELT, 52" HB (122") |
| 3-5542 | BELT, 61" HB (134-1/2") |

# Section VIII - 52" & 61" MOWER DECK ASSEMBLIES

**H. ELECTRIC CLUTCH TEST**
(See Section III, ELECTRICAL).

**J. GEARBOX**
Check Right Angle Gearbox for damage as follows:

1. Check for any severe oil leaks around PTO Input Shaft and Deck Belt Drive Shaft (See "IMPORTANT NOTE" below).
2. If leaks are found, they are probably due to a ruptured Oil Seal.
3. Replace ruptured Seal(s) per Step K., "GEAR BOX SEAL REPLACEMENT".

**K. GEARBOX SEAL REPLACEMENT**
Earlier Models of the ZF5200M & ZF6100M Mower Units used a different casting for the Right Angle Gearbox Housing than the later models which were introduced in 1999. Both Housings are interchangeable.

**IMPORTANT NOTE!**
Customers and Operators should be advised that when cutting long grasses (fescue, etc.), they should frequently stop the Unit and clean any debris away from the Power Transfer Shaft and the Right Angle Gearbox Input Shaft. Failure to do so could result in excessive oil leakage due to the Oil Seal being knocked loose from the Gearbox.

1. **PART No.s** **RIGHT ANGLE GEARBOXES**
   5-8342 Right Angle Gearbox ('99)
2. Remove Gearbox from Mower Deck.
3. Remove Deck Drive Pulley and Spacer.
4. Remove damaged Seal(s) and replace as illustrated in Figure 8.6.

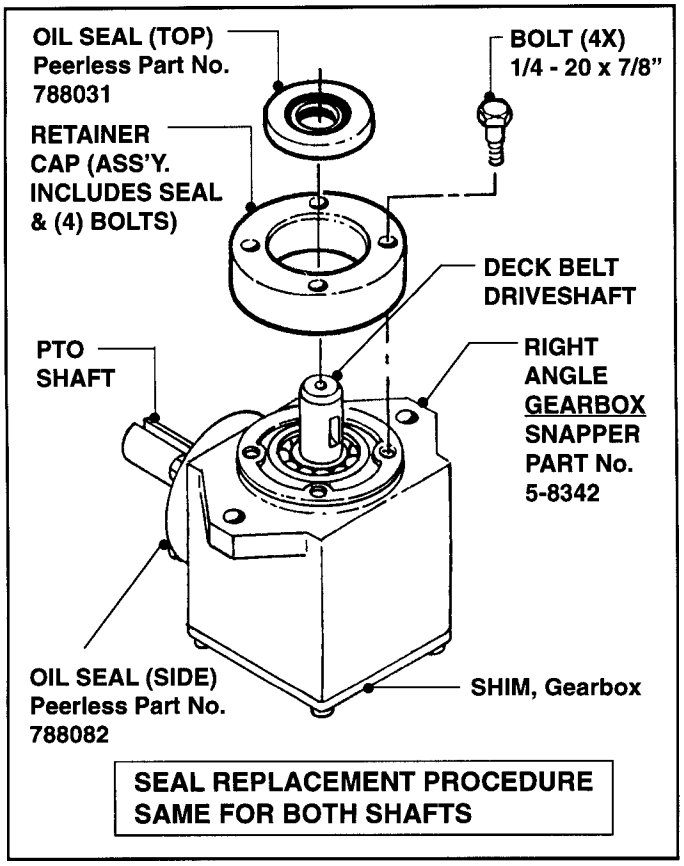



**FIGURE 8.6**

5. If Gearbox requires additional oil, see "L. GEARBOX LUBRICATION".

**L. GEARBOX LUBRICATION**
(Gearbox must be removed from Mower Deck for lubrication).

1. Place Gearbox upside-down from its normally-installed position with the Flanges resting on blocks.
2. Remove the four (4) #10 - 24 x 1/2" Screws and the Cover. See Figure 8.7.

**NOTE**
At this point, the Gearbox may be thoroughly inspected for internal wear or damage. To do so, turn Gearbox back over (onto a container) and allow any oil to drain completely. Inspect and make any repairs. Place Gearbox back onto the blocks.

3. Inspect Gasket. Replace as required.
4. Use 80W90 GEAR OIL (6 oz.) to bring a drained Gearbox to proper "FULL" level.

# Section VIII - 52" & 61" MOWER DECK ASSEMBLIES

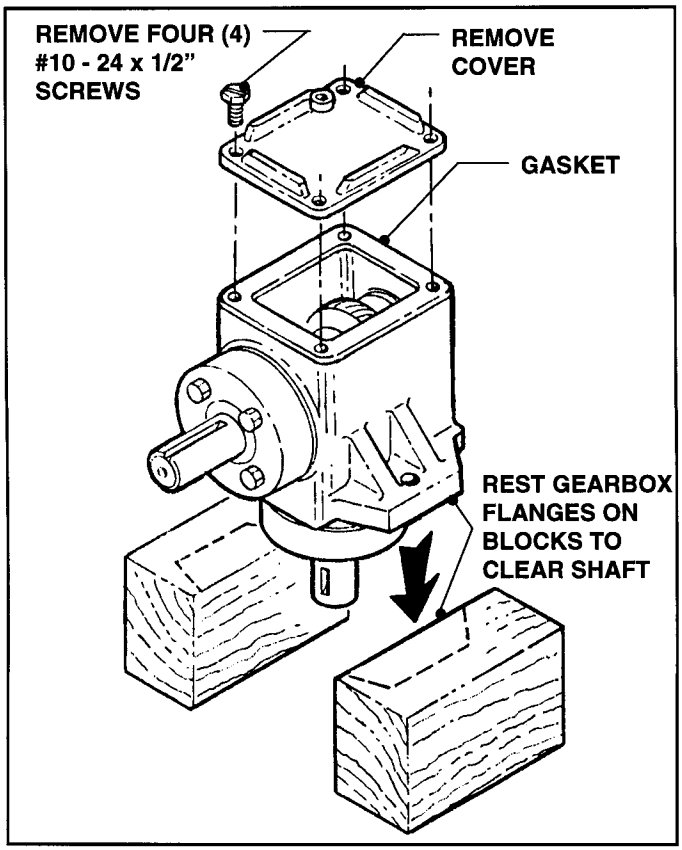



FIGURE 8.7

5. Attach Cover, turn Gearbox over to its operating position and check for any leakage.

**8.2 PROBLEM - CUTTING GRASS IMPROPERLY**

As previously stated in this section, you should "Check the obvious first"! In this case, visually inspect the tires for obvious pressure differences. Check the number of Spacers above and below each Cutter Spindle to see if each corresponds with the selected cutting height.

Start Engine and allow it to warm. Move Throttle Control to "FAST" position and ascertain if there are any Engine problems (Engine skip; misfire; choking down' etc.) which could cause improper cutting. Measure side-to-side level of Deck, and also, front-to-rear pitch.

**A. MOWER DECK ADJUSTMENT (LEVELNESS) SIDE-TO-SIDE and FRONT-TO-REAR**

Before making Deck leveling adjustments, check tires and add or release air as needed to bring pressure to 12 PSI in drive tires (Turf Type Tires), 5 PSI (All Terrain Type Tires) and 25 PSI in rear Caster Tires. Pressure in Front Deck Caster Wheels should be 25 PSI.

If tires are properly inflated and mowing is still uneven, adjust Deck levelness as follows:

1. Place Mower on a smooth, level surface.
2. Raise Deck to highest cutting position.
3. Place 2 x 4 blocks under front edge of Deck beside Caster Wheels. Blocks should be on both sides of Deck. Make Deck relatively level by positioning blocks. Both Caster Wheels must be off the ground.
4. Loosen Leveling Bracket at center Rear Deck support. See Figure 8.8. This allows the Lift Arm to settle down into Hitch Brackets.

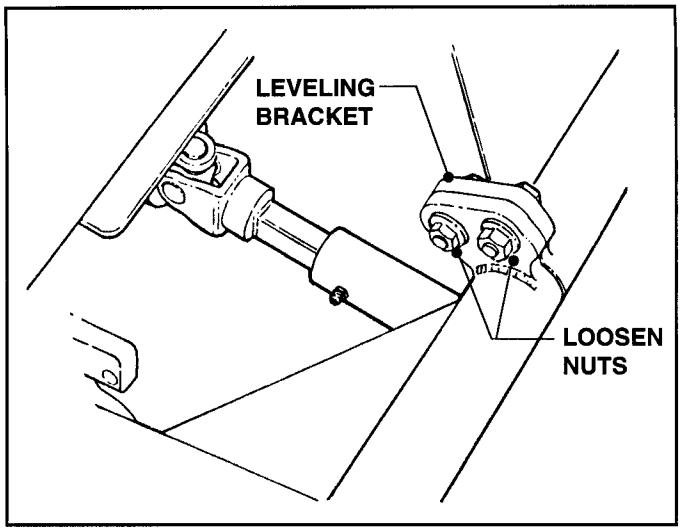



FIGURE 8.8

5. Retighten Leveling Bracket Bolts.
6. Remove both Bolts (one from each side) from the front portion of the Link Weldment. See Figure 8.9. The Front Caster Wheel will then drop to the ground.

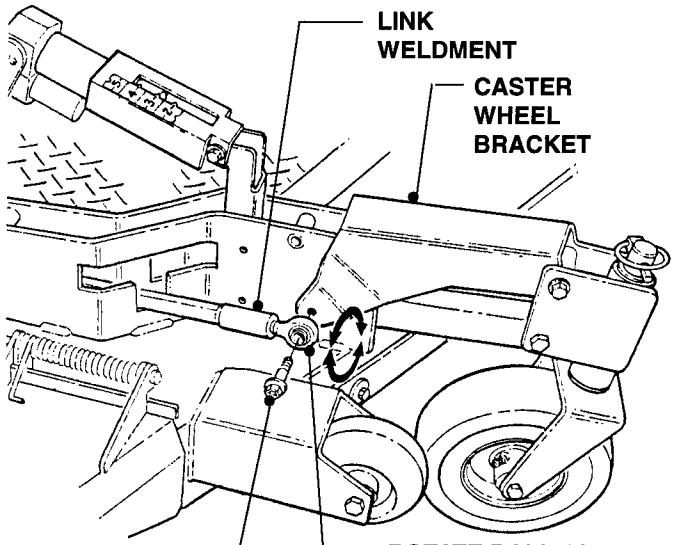



FIGURE 8.9

7. Turn Ball Joint in or out until Ball Joint Anchor Hole aligns with Mounting Hole. Reinstall Bolt and tighten securely. Use same procedure on other Caster Wheel. (Refer to Figure 8.9).
8. Remove blocks from under front of Deck.

**B. SIDE-TO-SIDE LEVEL**

Check Blade Tips by rotating Blades until Tips are pointing to the side of the Deck. Check the measurement of outside Blade Tips to the ground on both Blades. The measurement of each outside Blade Tip should be within 1/8" of each other.

**C. FRONT-TO-REAR LEVEL**

Check Blade Tips by rotating Blades until Tips are pointing to the front and rear of Deck. Check the Blade Tip measurements of each Blade. Front-to-rear measurement should be 1/4" to 3/8" higher in the rear. See Figure 8.10.

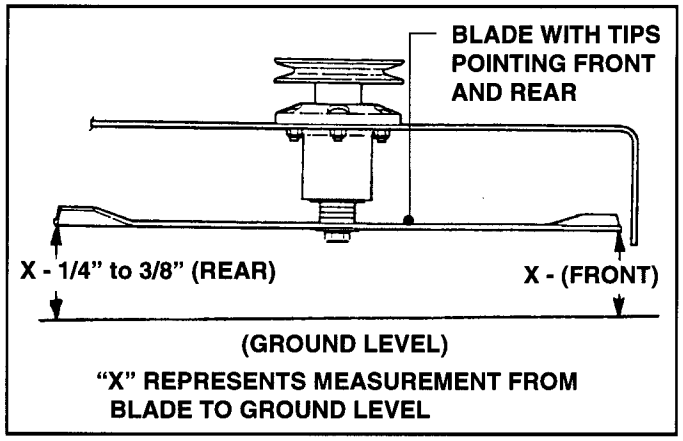



**FIGURE 8.10**

### 8.3 CUTTING HEIGHT ADJUSTMENT

**A.** The cutting height can be adjusted with the Switch located on the Right Side Console. Move Switch "UP" to raise Deck or move Switch "DOWN" to lower the Deck. See Figure 8.11.

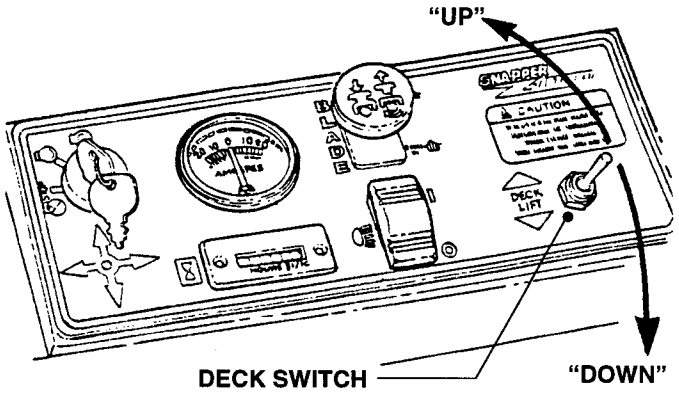



**FIGURE 8.11**

**B.** When Deck is at desired cutting height, release Switch and observe Height of Cut Decal located on the upper right top side of the Deck. See Figure 8.12.

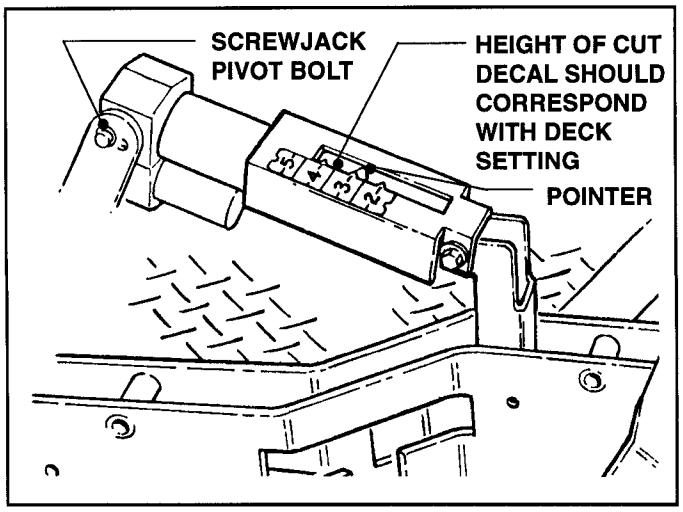



**FIGURE 8.12**

**NOTE**

The Engine does not have to be running to adjust cutting height, but Key Switch must be in the "ON" position.

**C.** Check to make certain that Blade-to-Ground distance is the same as indicated on Height-of-Cut Decal. If not, loosen the Screwjack Pivot Bolt and adjust Pointer to correct reading on Decal. Refer to Figure 8.12.

### 8.4 DECK REMOVAL

**⚠ WARNING ⚠**

**Before attempting any adjustments, maintenance, service, or repairs, stop Engine and Blade. Always remove Key from Ignition Switch, remove Spark Plug Wire(s) and secure Wire(s) away from Spark Plug(s).**

Move Power Unit/Mower Deck to an area where the Mower Deck is to be disconnected. Turn Engine "OFF", but leave Keyswitch in the "ON" position. Engage Parking Brake.

**A.** The rear of Deck must be raised up or both Jack Stands moved down to the lowest **position and both Locking Pins inserted. See Figure 8.13 on following page.**

**NOTE**

Jack Stands are located on the left and right rear sides of the Mower Deck.

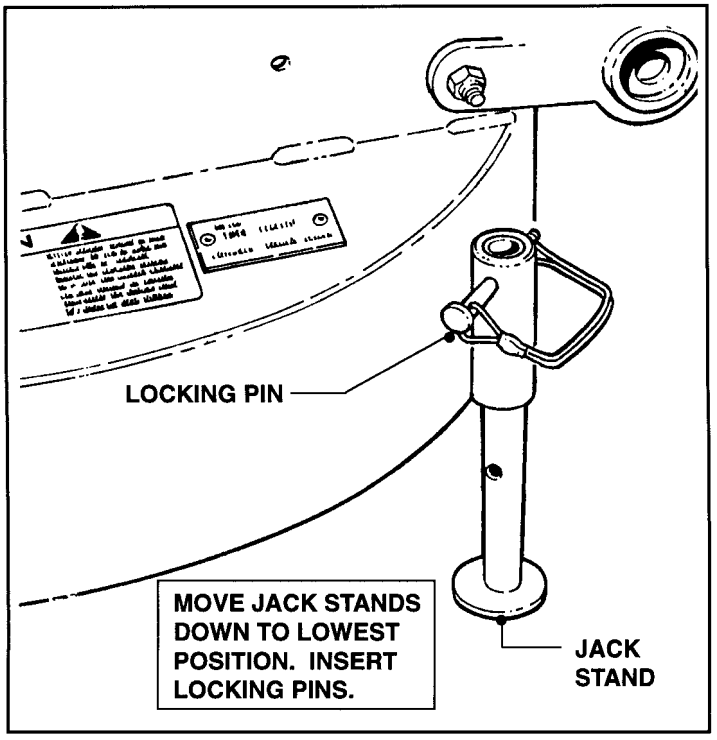



FIGURE 8.13

**B.** Using the Deck Lift Switch, lower the Deck until it rests on the Jack Stands.

**C.** The Hitch Latch Pins are shown in the latched position. The latched position locks the Deck Lift Arm into position. See Figure 8.14.

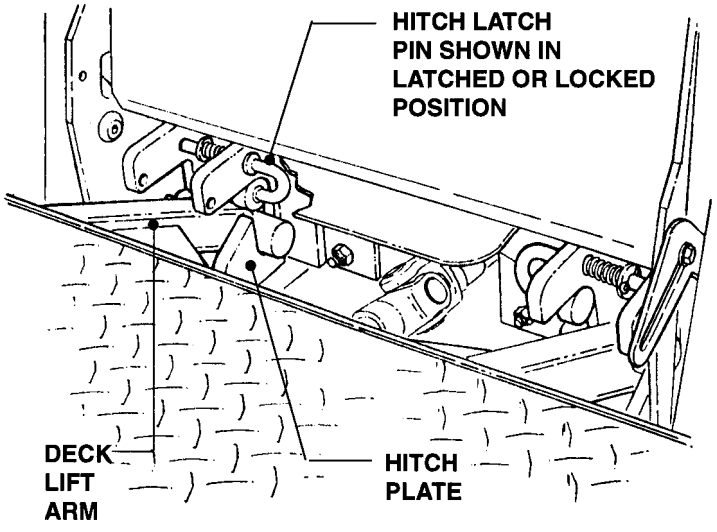



FIGURE 8.14

**D.** Rotate spring-loaded Hitch Latch Pins (located on both Hitch Plates) to the unlatched position. See Figure 8.15.

**NOTE**
**DECK LIFT ARM SHOWN REMOVED FOR CLARITY. DECK WOULD NOT BE REMOVED AT THIS TIME IN DECK REMOVAL PROCEDURE.**

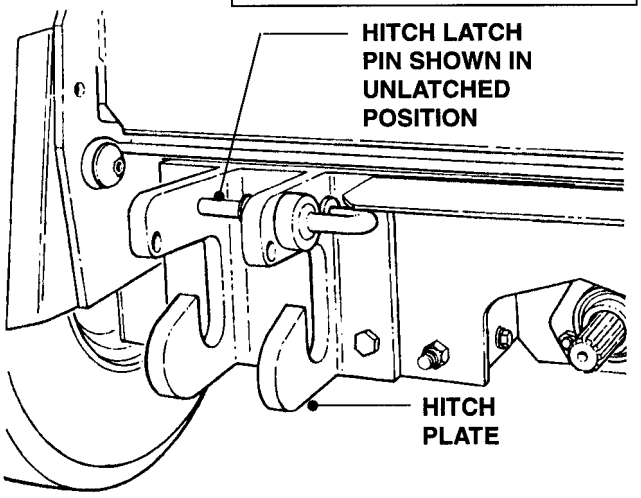



FIGURE 8.15

**E.** Move Deck Lift Switch as if to lower Deck and the Lift Arm will move up in the Hitch Plates. The Lift Arm needs to be high enough to clear the Hitch Plates when Power Unit is driven backward away from Mower Deck. Refer to Figure 8.15.

**F.** Turn Switch Key to "OFF" position.

**G.** Pull Lock Collar back and slide Power Transfer Shaft away from Power Take Off (PTO) Shaft. See Figure 8.16.

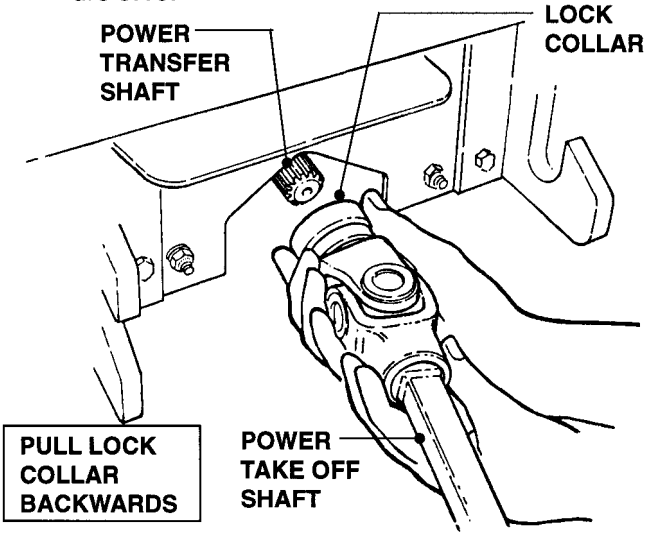



FIGURE 8.16

**H.** Disconnect Wiring Harness from Mower Deck.

**J.** Start Power Unit. Disengage Parking Brake. Carefully move Power Unit backward away from Mower Deck.

# Section VIII - 52" & 61" MOWER DECK ASSEMBLIES

## 8.5 DECK COMPONENTS REPAIR (52" & 61" DECKS)

The 52" & 61" Decks found on the SNAPPER OUT FRONT Z-RIDERS have interchangeable components with the following exceptions (see Chart below):

| PART No.s | DECK MODEL | DESCRIPTION |
|---|---|---|
| 4-2898 | ZF5200M | DECK, 52" |
| 4-2651 | ZF6100M | DECK, 61" |
| 4-2776 | ZF5200M | BELT, 52" HB (122") |
| 3-5542 | ZF6100M | BELT, 61" HB (134-1/2") |
| 4-6728 | ZF5200M | COVER, 52" DECK |
| 4-6729 | ZF6100M | COVER, 61" DECK |
| 1-0008 | ZF5200M | KEY, #6 WOODRUFF |
| 9-1826 | ZF6100M | KEY, 5/32 x 5/8" WOODRUFF |
| 4-2903 | ZF5200M | DEFLECTOR, CHUTE (52") |
| 4-2656 | ZF6100M | DEFLECTOR, CHUTE (61") |
| 4-2914 | ZF5200M | BAFFLE, FRONT (52") |
| 3-6445 | ZF6100M | BAFFLE, FRONT (61") |
| 4-2901 | ZF5200M | LINK, WLDMNT, L.H. (52") |
| 4-2661 | ZF6100M | LINK, WLDMNT, L.H. (61") |
| 4-2900 | ZF5200M | LINK, WLDMNT, L.H. (52") |
| 4-2662 | ZF6100M | LINK, WLDMNT, R.H. (61") |
| 4-2867 | ZF5200M | PULLEY, CAST 5 3/4" O.D.(52") |
| 3-5788 | ZF6100M | PULLEY, CAST 5.45 O.D. (61") |

**NOTE**

The geometry of the Belting arrangement found on the 52" & 61" Decks is such that the Mower Belt maintains 80 lbs. detent pressure at all times. Improper lubrication, neglect of apparent problems and constant abuse of the Mower Deck will result in its being sent to your repair shop with one or more of the following problems:

**A. PROBLEM - EXCESSIVE BELT WEAR**

1. Remove Mower Belt.
2. Check Idler Pulley for correct operation:
   - **a)** Does it spin freely when turned by hand?
   - **b)** Does it "wobble" when turned?
   - **c)** Is it difficult to turn?
3. If the Idler Pulley spins freely, it is O.K. If it wobbles, or is difficult to turn, it must be replaced. See Figure 8.17.

**IMPORTANT!**

USE ONLY GENUINE SNAPPER PARTS WHEN REPLACING ITEMS ON THE ZF5200M & ZF6100M MOWER DECKS. DO NOT SUBSTITUTE AN AFTERMARKET PART FOR ANY ITEM FOUND ON EITHER DECK!

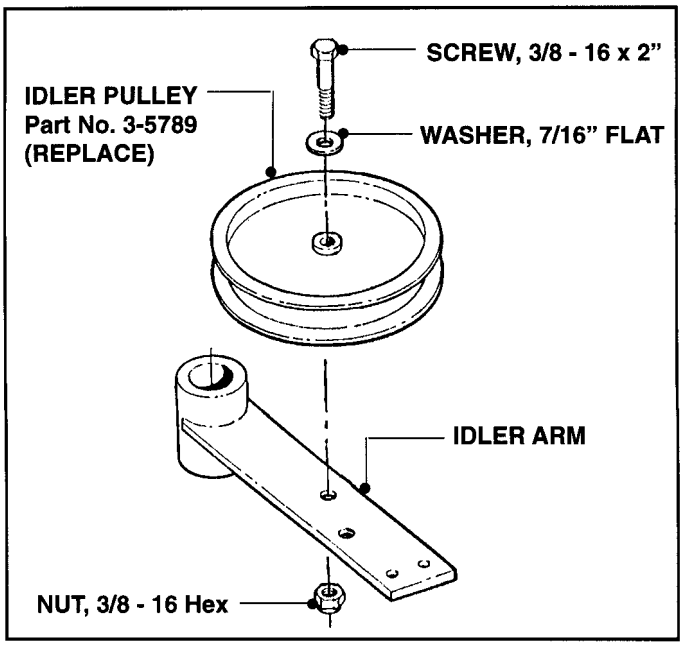



**FIGURE 8.17**

4. Check Idler Arm to make certain that it pivots easily.
5. If it does not, lubricate Pivot area through Grease Fitting, located at rear of Idler Arm. See Figure 8.18.

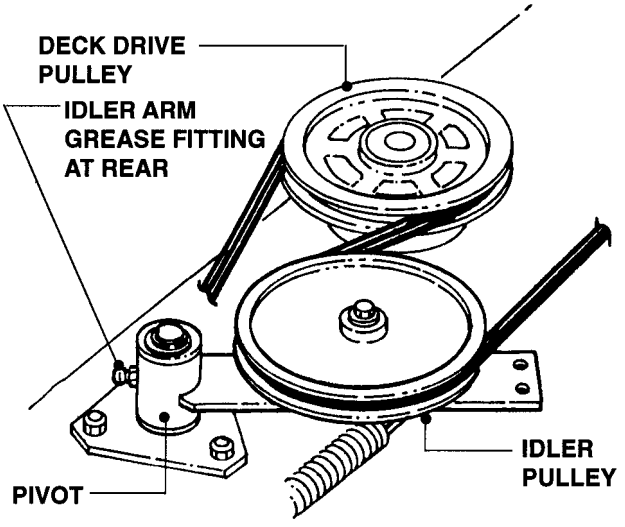



**FIGURE 8.18**

6. If the Idler Arm is still difficult to pivot, remove it from the Pivot and check the Bushings and Pivot Shaft for damage. See Figure 8.19. Replace parts as required.

**NOTE**

The Idler Arm may "Freeze--Up" on the Pivot Shaft due to lack of lubrication.

# Section VIII - 52" & 61" MOWER DECK ASSEMBLIES

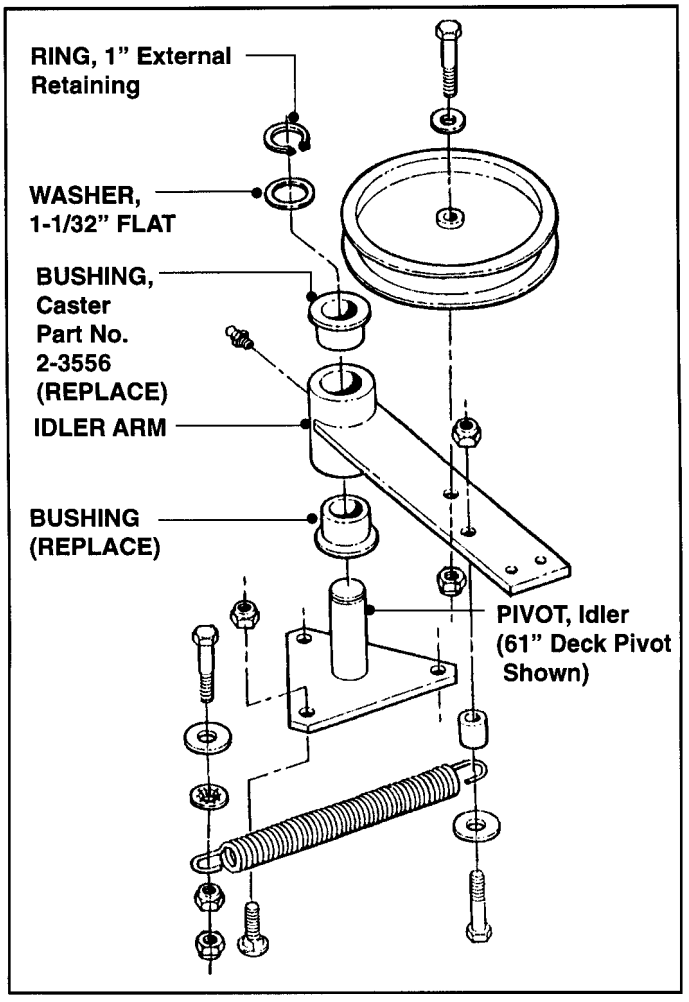



FIGURE 8.19

**NOTE**
Refer to SNAPPER PARTS MANUALS No. 06113 (Rev. 3, 1/14/00) & No. 06106 (Rev. 2, 11/97) for further assistance.

7. Check the front Idler Pulley for "free-turning" also. Replace parts as required. See Figure 8.20.

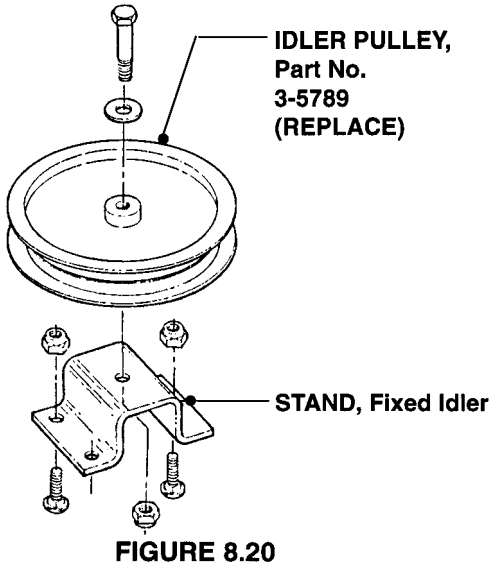



FIGURE 8.20

8. Check the Cutter Housing Assemblies. If they turn freely when spun by hand, they are O.K. If not, see Section IX, CUTTER HOUSING ASSEMBLIES, for repair information.

**B. FRONT BAFFLE (52" & 61" Decks)**

The Front Baffle may be used as a LIP BAFFLE or DUST BAFFLE by simply reversing its position on the Deck.

1. **LIP BAFFLE (Lip Turned Outward)**
   Best position of Baffle for use in lush grass during summer or fall. See Figure 8.21.
2. **DUST BAFFLE (Lip Turned Inward)**
   When in this position, the Baffle helps prevent dusting conditions during arid times of year. Also, it helps pull dust into Mower Deck and out Discharge Chute.

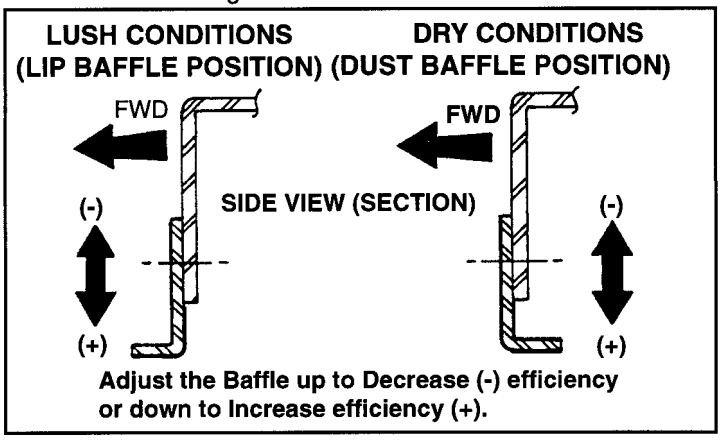



FIGURE 8.21

**8.6 DECK WELDMENT REPAIR (52" & 61" DECKS)**

If a Deck develops a broken weld or is punctured due to an accident while mowing or during transport, repair Deck as follows:

**A. WELDING DECKS**

When making welding repairs, the use of an Electric Stick Welder is recommended. Although the welding job is easier when using either 6010 or 0613 welding rods, the job can be completed faster by using the larger 7018 rods. In either case, always set the welder "Heat" at the appropriate number for each rod.

1. Thoroughly clean area to be welded. Use a grinder to dress parts to be joined.
2. Making sure that the parts are properly aligned, clamp or otherwise secure them in position.
3. Tack-weld the area as required to prevent warping. Check alignment frequently.
4. Weld area closed.
5. Grind and sand welded area.
6. Prime and paint.

(Continued on following page)

**NOTE**

When welding Deck components fabricated from thinner metals, the use of a Wire Welder is recommended. Use .035 Wire for most jobs.

**B. STRAIGHTENING BENT DECKS**

If a Deck becomes bent during operation or transport, it can usually be restored to near-original condition by a mechanic who is familiar with metalworking. Observe the following when straightening Decks.

1. Avoid using a torch to "relieve" the damaged area for straightening. This will cause the heated area to lose temper.

**NOTE**

Because of the strength and thickness (#7 GA) of the steel used in making the 52" & 61" Deck Weldments, most damage is generally confined to the Blade Baffles on the underside of the Deck or the Discharge Chute.

2. If straightening a bent Blade Baffle, it is best to remove all Deck components and lay the Deck Weldment upside-down on a firm, level surface.
   - **a)** Using shop hammers of varying weights with appropriately-sized dollys, "work-out" the bent areas of the Blade Baffle until its inner circumference matches that of an undamaged Baffle.
   - **b)** The circumference may be checked with a cardboard pattern taken from an undamaged Baffle.
   - **c)** Any welding of the Blade Baffles or Discharge Chute should be done with the Wire Welder.
   - **d)** After work has been completed on the Deck, turn it back over - right-side-up - and check to make sure that all of the Deck Skirt is in contact with the level work surface.
3. If the Deck Skirt is not level with a proven level surface, straighten the Deck Weldment until the Skirt is in full contact with surface.

**NOTE**

To avoid repainting after straightening a Deck, the paint can *sometimes* be preserved by coating the affected area with GP grease before beginning the straightening process. Wipe of excess grease after completing job.

# Section IX
# CUTTER ASSEMBLIES

## CONTENTS

# Section IX - CUTTER HOUSING ASSEMBLIES

## INTRODUCTION

Whenever a unit is brought in for service, the Mower Blade and Cutter Housing Assemblies should be checked for wear or damage. If the Blades require attention, they must be removed from the Spindle for repair/replacement. On the other hand, it is not necessary to remove the Cutter Housing from the Mower Deck in order to overhaul the Deck Spindle Assembly.

### 9.1 CUTTING BLADE SERVICE

**A.** When performing Service on a Mower Unit, be sure to check the Cutting Blades for damage or signs of excessive wear. See Figure 9.1 for Blade wear limits.

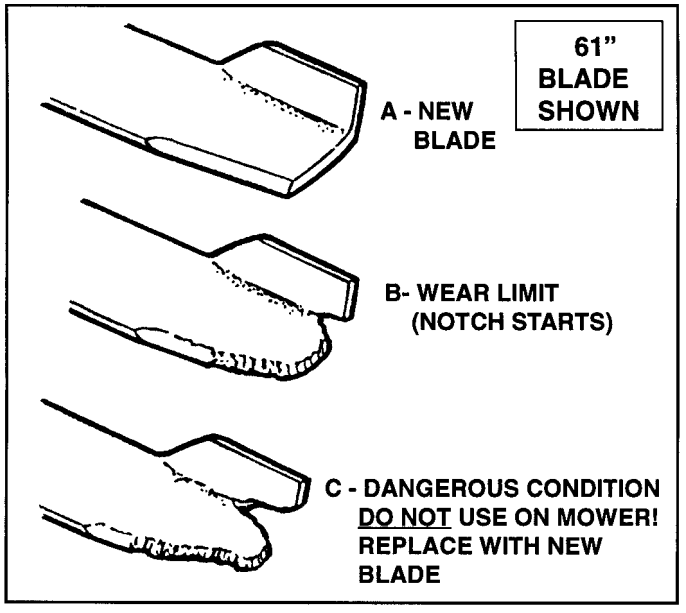



**FIGURE 9.1**

**B.** PART No.'s - CUTTING BLADES

| | |
|---|---|
| 2-9245 | BLADE, 18" (52" DECK) |
| 1-7081 | BLADE, 21" (61" DECK) (Low Lift) |
| 2-9251 | BLADE, 21" (61" DECK) (High Lift) |

**WARNING**

**Never allow a customer to take a mower out of your repair shop with a Cutting Blade worn to the extent shown in Illustration "C" of Figure 9.1, without warning that customer of the danger that a tip could fly off and cause either personal injury or property damage.**

### 9.2 BLADE REMOVAL AND SHARPENING

**A.** With Engine OFF, remove Key and disconnect Spark Plug Wires from Spark Plugs. Secure wires away from plugs.

1. Remove Floor Pan (If Deck is left attached) when removing Center Blade.
2. Either remove Mower Deck or elevate front of Unit high enough to allow for Blade Removal underneath Deck.
3. Remove Spindle Covers (if required).
4. Remove Mower Drive Belt.

**CAUTION**

Avoid cutting yourself on a sharp Blade! Wear gloves to protect your hands while handling the Blade.

**B.** Remove Blade.

**C.** Clean and inspect each Blade for excessive wear and damage. Refer to Figure 9.1.

**D.** Should Blades be in acceptable condition, sharpen at 25 to 30 degrees. DO NOT sharpen beyond existing cutting edge. See Figure 9.2.

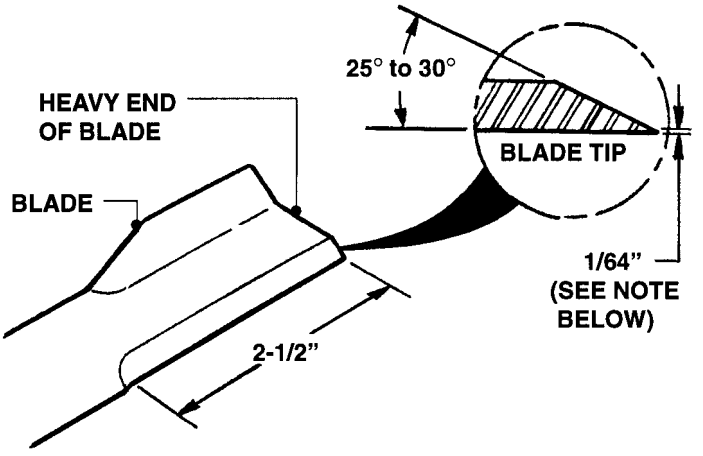



**FIGURE 9.2**

**NOTE**

When sharpening Blades, leave 1/64" untouched. Razor sharp Blades dull quicker and damage easier. Commercial Balancers are available and should be used in accordance with manufacturer's instructions.

**E.** Balance each Blade after sharpening by grinding metal from the heavy end of the Blade.

**WARNING**

**The use of aftermarket or "Universal" Blades may adversely affect mower performance and/or safety.**

### 9.3 BLADE INSTALLATION

**A.** Insert Blade Mounting Bolt through Bevel Washer and into Blade. Place Blade Spacers over Bolt. Make certain each Blade is installed with the same amount of Spacers as removed. See Figure 9.3.

**B.** Install Blade Mounting Bolt with Spacers and Blade into Spindle.

**C.** Install an equal amount of Blade Spacers on top of each Blade Mounting Bolt.

(Continued on Following Page)

# Section IX - CUTTER HOUSING ASSEMBLIES

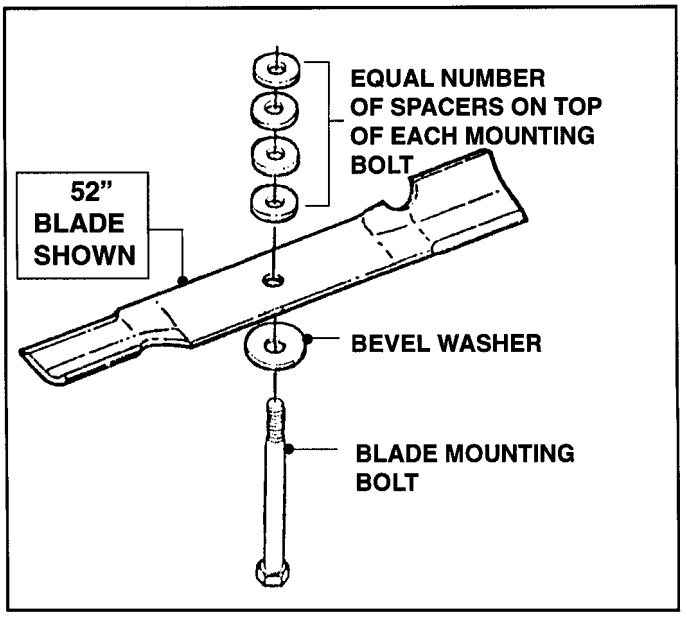



FIGURE 9.3

**D.** Install Spindle Washer and Nut on Blade Mounting Bolt.

**E.** Torque each Blade Mounting Bolt and Nut to 70 to 80 ft. lbs. of torque (95 to 109 N•m).

### 9.4 CUTTER HOUSING ASSEMBLY - 52" & 61" DECKS

The Cutter Housing Assembly can be replaced as an assembly or rebuilt using individual replacement parts. The following procedures are outlined separately and can be performed with the Mower Unit attached to the Power Unit.

### 9.5 CUTTER HOUSING ASSEMBLY REPLACEMENT

**A.** Either remove Mower Deck or elevate front of Unit high enough to allow for Blade removal from underneath Deck.

**B.** Remove Mower Drive Belt.

**C.** Remove Spindle Nut, any Spacers and Spindle Washer from top of Spindle. See Figure 9.4.

**D.** Remove Blade Bolt, Beveled Washer, Blade and any Blade Spacers. Refer to Figure 9.3.

**E.** Remove the six (6) 3/8 - 16 Hex Flange Lock Nuts securing the Cutter Housing to the Deck and remove Cutter Assembly.

**F.** Reverse above steps to install replacement Cutter Assembly.

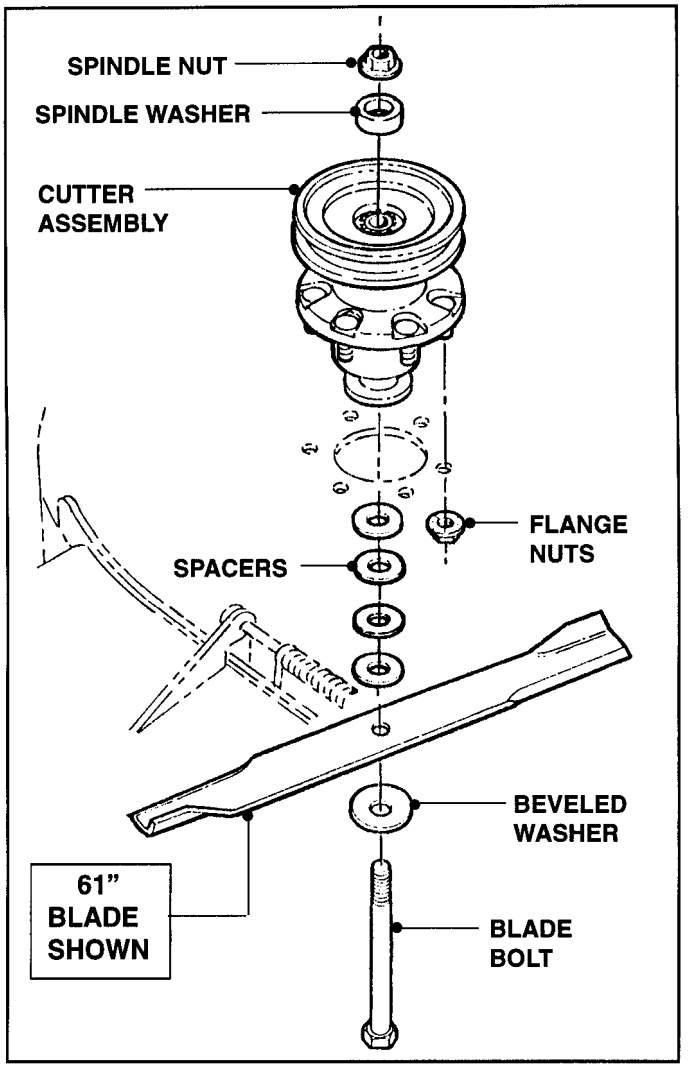



FIGURE 9.4

### 9.6 CUTTER HOUSING ASSEMBLY REBUILD/ OVERHAUL

**A.** Remove Cutter Housing Assembly as described in "Cutter Housing Assembly Replacement".

> **NOTE**
> Cutter Housing Assembly may be overhauled without removal from Mower Deck. Remove Blade (see 9.2 BLADE REMOVAL, etc.), then proceed with Item B as follows:

**B.** Remove Spindle Washer. See Fig. 9.5 on Pg. 9.4.

**C.** Remove Pulley and Snap Ring.

**D.** Using a soft-faced mallet, tap the top of the Spindle downward until the Spindle, Lower Bearing and Spacer are free of the Cutter Housing.

**E.** Remove Upper Bearing.

**F.** Clean and inspect all components for damage or wear. Replace components as required.

**G.** Install components in reverse order.

**H.** Torque Blade Bolt and Spindle Nut to 70 to 80 ft. lbs. of torque (95 to 109 N•m).

**J.** Fill Cutter Housing Assembly with grease.

# Section IX - CUTTER HOUSING ASSEMBLIES

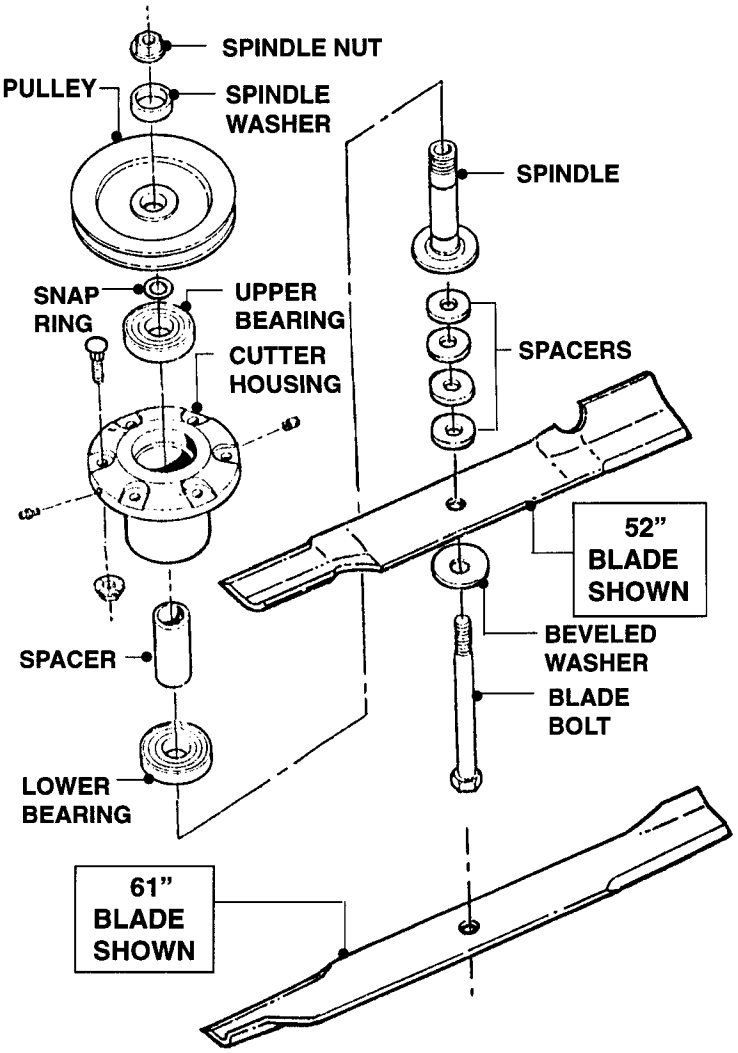



FIGURE 9.5

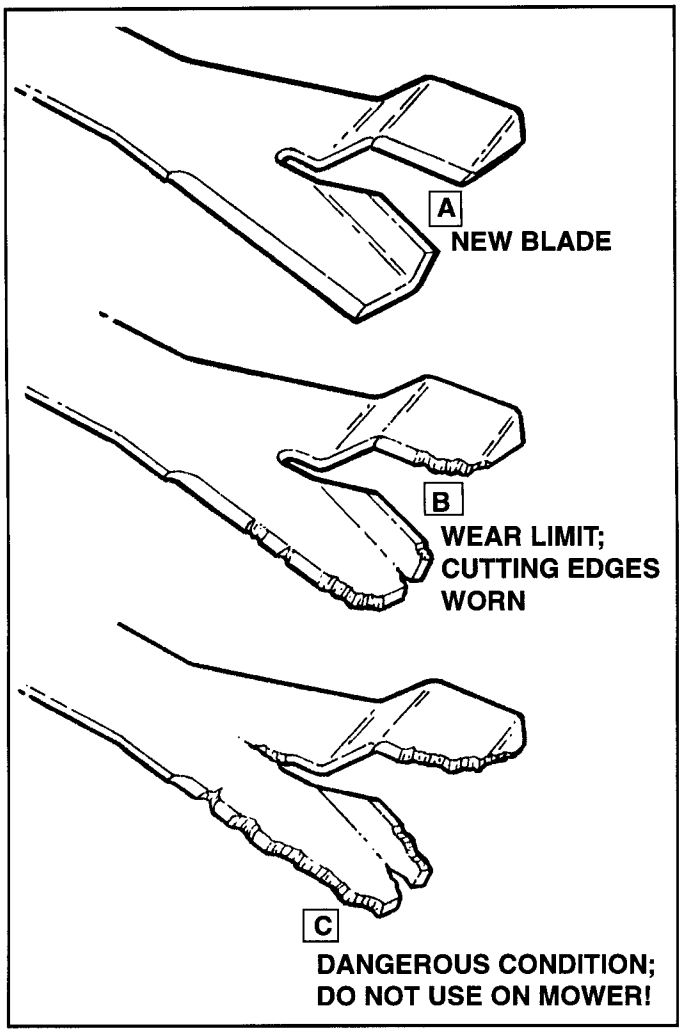



FIGURE 9.6

### 9.7 SPECIAL RECYCLING BLADE (NINJA) WEAR LIMIT

**A.** The special Recycling Blade (NINJA) is used on those mowers set up for mulching. This blade MUST be inspected for wear and damage each time one of these mowers is brought in for repair.

**B.** Consult the Blade Drawings shown in Figure 9.6 to determine if a blade can be sharpened and safely reused, or if it must be replaced with a new part. Consult the SNAPPER "ACCESSORIES" Manual for Part No.

**C.** Refer to 9.8, BLADE REMOVAL AND SHARPENING (NINJA).

### 9.8 BLADE REMOVAL AND SHARPENING (NINJA)

**A.** Remove Blade(s).

**CAUTION**

**Wear heavy gloves to avoid cutting yourself when handling blades!**

**B.** Clean and inspect Blades for excessive wear or damage. Refer to Figure 9.6.

**C.** Sharpen both cutting edges on each end of the Blade at an angle of 22 to 28 degrees. The cutting surface should extend inward about 4-1/2" from the tip of the lower cutting edge and as far as practical from the tip of the upper cutting edge. See Figure 9.7 on Page 9.5.

**NOTE**

Regardless of the location of the Blade Spacers, **when the blade is removed, all** Spacers should be placed at the bottom of the Spindle when replacing the Blade. This arrangement will provide a "low-as-possible" cut.

# Section IX - CUTTER HOUSING ASSEMBLIES

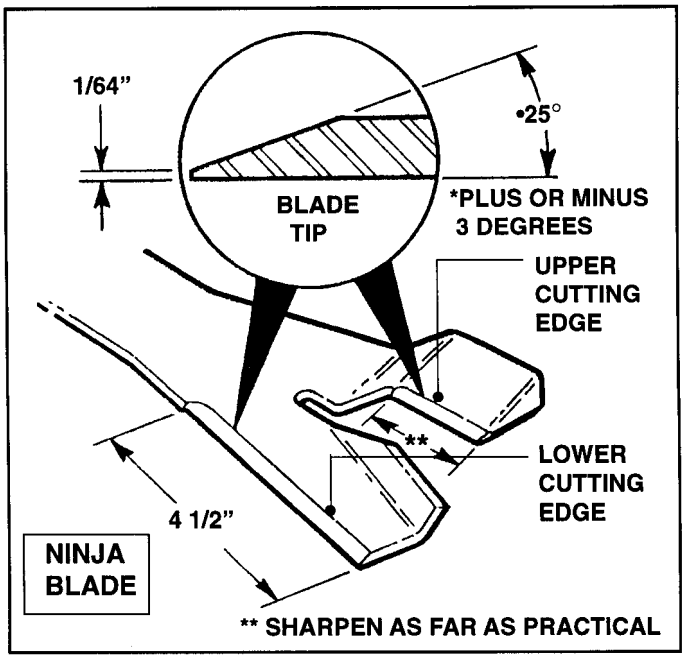



FIGURE 9.7

**9.9 BLADE INSTALLATION (NINJA)**

- **A.** Place the Blade Mounting Bolt through Bevel Washer and Blade.
- **B.** Install all Spacers on top of Blade. See Figure 9.8.
- **C.** Install Blade Mounting Bolt with Blade and Spacers into Spindle.
- **D.** Install the Blade Mounting Nut on each Blade Mounting Bolt.
- **E.** Torque each Blade Mounting Bolt and Nut to 60 to 75 ft. lbs. of torque (81 to 102 N•m).

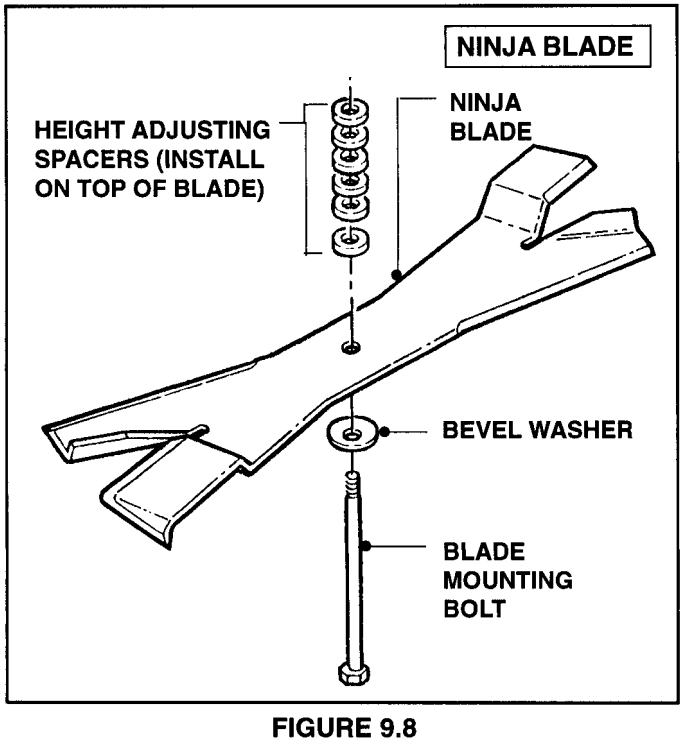



FIGURE 9.8

**NOTE**

Make certain that all Spacers are installed on top of Blade and under the Spindle.

**9.10 MOWER DRIVE BELT REPLACEMENT**

Inspect Mower Drive Belt. Replace Belt if it shows signs of excessive wear, damage and/or is broken.

**A. BELT REMOVAL**

1. Remove Power Unit Foot Rest.
2. Remove old Belt.

**B. PART No.'s - MOWER DRIVE BELT**

| | |
|---|---|
| 4-2776 | BELT, 52" HB DRIVE (122") |
| 3-5542 | BELT, 61" HB DRIVE (134 1/2") |

**C. BELT REPLACEMENT**

1. Route Belt around Blade Pulleys and Idler Pulley in same direction as old Belt was removed. It may be necessary to use a pry bar to pull Idler Pulley back to install Belt. See Figure 9.9.

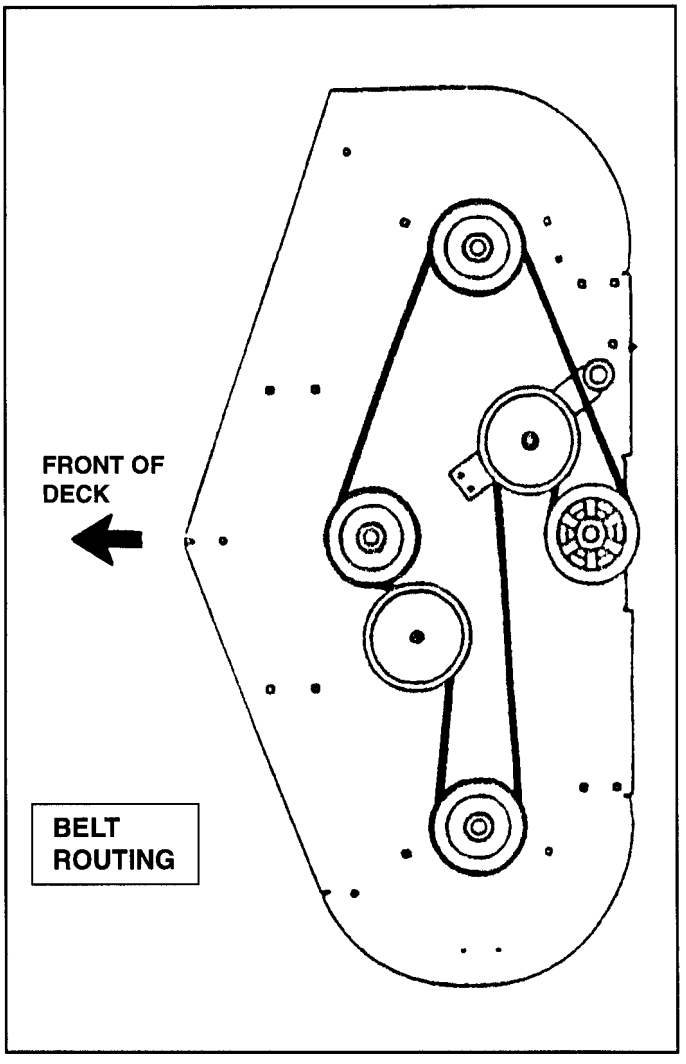
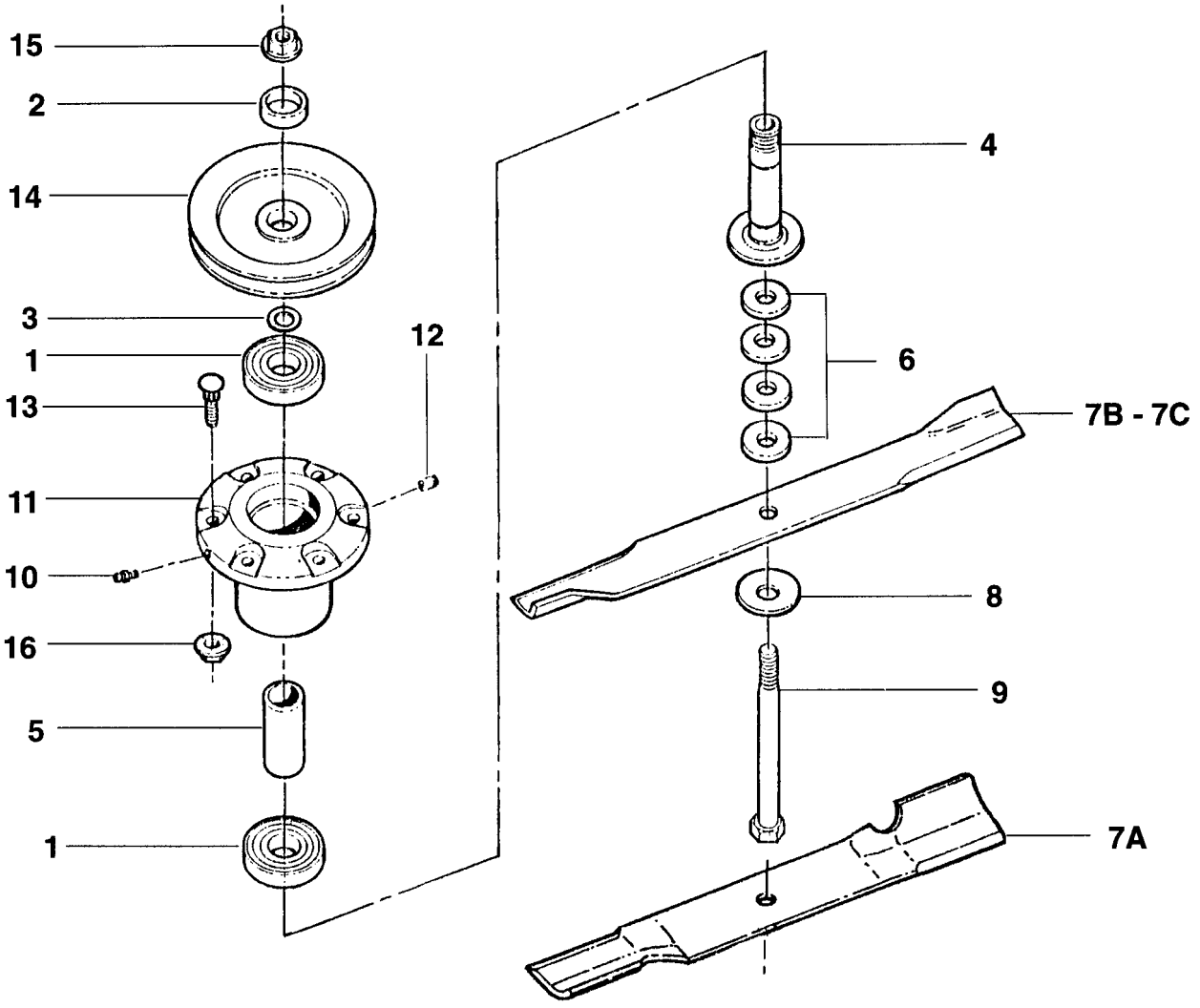



FIGURE 9.9

# Section IX - CUTTER HOUSING ASSEMBLIES

## PARTS SHEET

## (CUTTER HOUSING ASSEMBLY - 52" & 61" DECKS)




| ITEM | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 2-9422 | BEARING, Sealed (2) |
| 2 | 2-9270 | WASHER, Spindle |
| 3 | 2-9274 | SNAP-RING, Spindle Shaft |
| 4 | 2-9253 | SHAFT, Spindle |
| 5 | 2-9254 | SPACER, Bearing |
| 6 | 2-9271 | SPACER, Blade (4) |
| 7A | 2-9245 | BLADE, 18" (52" Deck) |
| 7B | 1-7081 | BLADE, 21" (61" Deck) (Low Lift) |
| 7C | 2-9251 | BLADE, 21" (61" Deck) (High Lift) |
| 8 | 1-6440 | WASHER, Beveled |
| 9 | 2-9256 | BOLT, 5/8 - 18 x 7-1/2" Hex Head Cap, Grade 5 |
| 10 | 2-9275 | FITTING, Lube |
| 11 | 2-9252 R/B 5-8237 | HOUSING, Cutter |
| 12 | 2-9384 | VENT, Spindle |
| 13 | 2-9302 | BOLT, 3/8 - 16 x 1-1/4" Rib Necked (6) |
| 14 | 2-9249 | PULLEY, 5-3/4" O.D. (52" Deck) |
| 15 | 9-1736 | NUT, 5/8 - 18 Hex Flange, Grade 5 |
| 16 | 9-1299 | NUT, 3/8 - 16 Hex Nyloc (6) |

# NOTES

*Service Manual for*

# SNAPPER®

# *OUT FRONT Z-RIDER*

**⚠ WARNING:** The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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



**MANUAL No. 07225 (I.R. 4/00)**

**PRINTED IN U.S.A.**