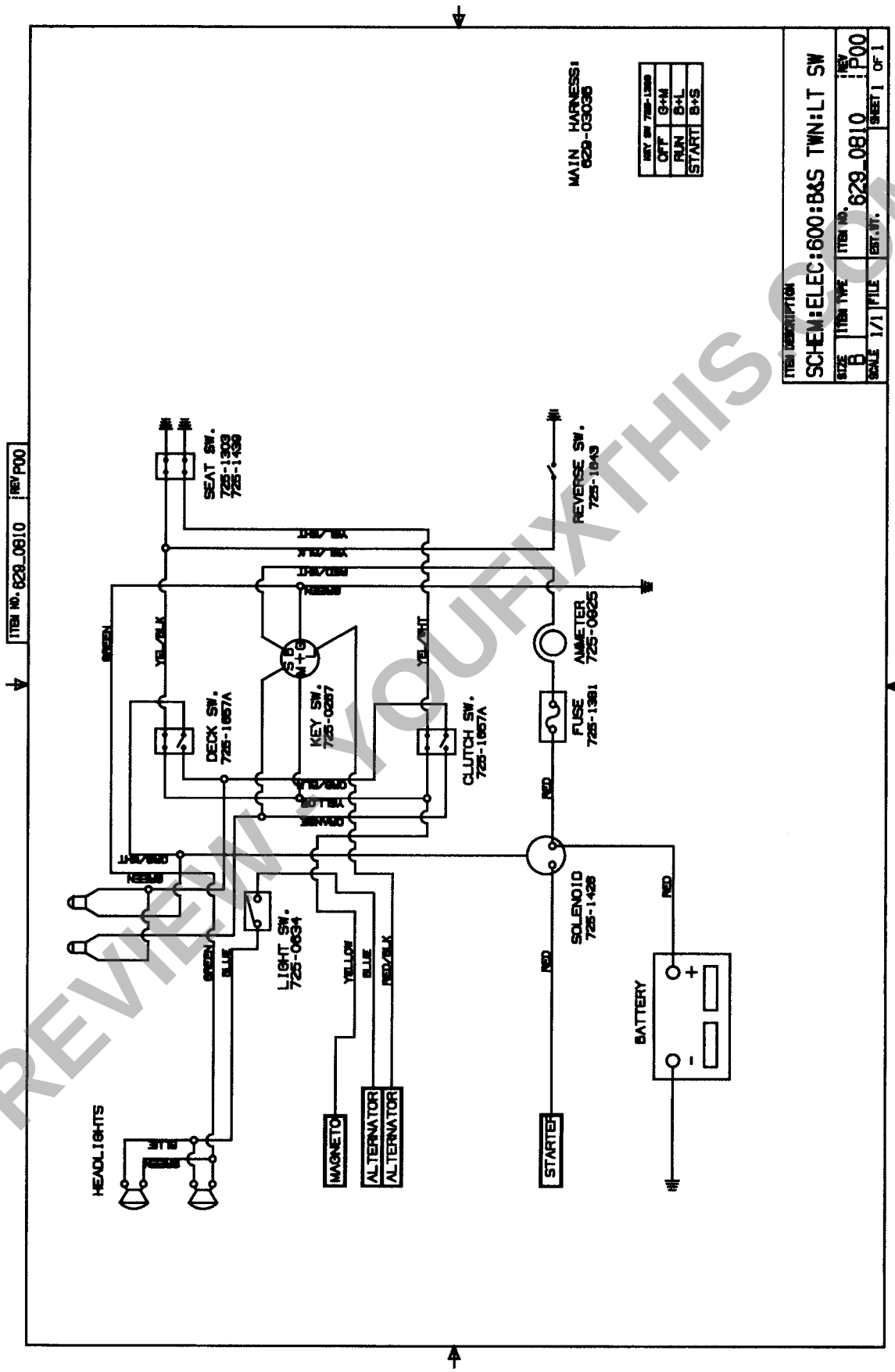

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Disassembly of the IHT

1. Remove the hydrostatic fill port using a 1/4" allen wrench. See Figure 6-53.

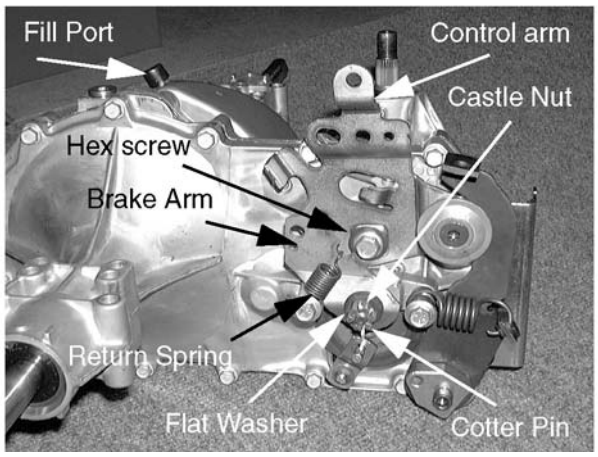

Figure 6-53.

2. Rotate the hydrostatic transaxle 180 degrees and drain the hydrostatic fluid into a suitable drain pan.

3. Remove the cotter pin securing the castle nut, washer, and brake actuation arm to the square head bolt using a pair of needle nose pliers.

4. Remove the castle nut and washer using a 9/16" wrench.

5. Remove the brake return spring from the brake actuation arm.

6. Remove the brake actuation arm.

7. Remove the hex cap screw securing the control arm to the trunnion shaft using a 1/2" wrench.

8. Remove the allen head screw securing the adjusting puck, neutral control arm, and large spacer to the housing using a 1/4" allen wrench. See Figure 6-54.

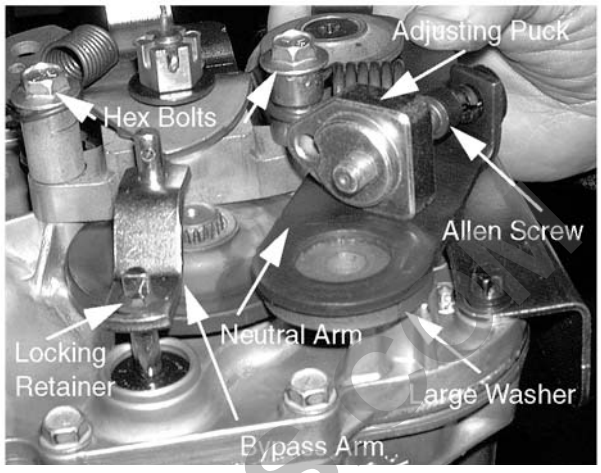

Figure 6-54.

NOTE

This step removes the stress being applied to the brake assembly

9. Remove the neutral control arm and large washer.

10. Remove both of the hex bolts securing the brake assembly to the IHT case using a 7/16" socket. See Figure 6-55.

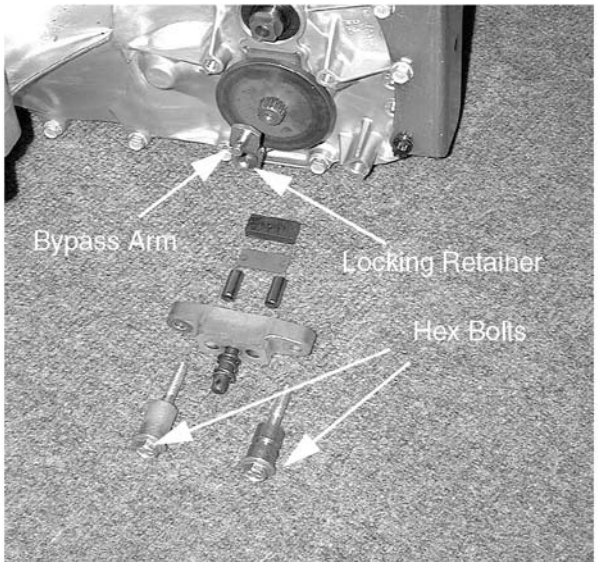

Figure 6-55.

11. Remove the locking retainer securing the bypass arm using a small flat-blade screwdriver.

12. Place the hydrostatic transaxle in a vice with the outer perimeter hex flange screws facing up. See Figure 6-56.

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Table 6-1. **310-0500 and 310-0750 Integrated Hydrostatic Transaxle Troubleshooting Chart**

WARNING

THE VEHICLE SHOULD BE ON LEVEL GROUND AND THE ENGINE DISABLED BEFORE PERFORMING ANY ADJUSTMENT

SYMPTOMS	PROBABLE CAUSE
Vehicle will not attain normal maximum speed	The engine is not operating at the correct speed The control arm or linkage is damaged or loose The transaxle drive belt is worn or loose The brake is not fully released The bypass valve is stuck partially open A charge check valve is held open Water in the oil (cloudy or milky appearance)
Vehicle will not move when the vehicle control handle is moved	The control linkage is damaged or not connected The transaxle drive belt is broken or loose The input pulley is loose or damaged The brake is not fully released The transmission is low on fluid The bypass valve is stuck or not released
Vehicle is sluggish or noisy under load (operates fine on level surface)	The transaxle drive belt is worn or loose The brake is not fully released The bypass valve is stuck partially open A charge check valve is held partially open The transmission is low on fluid Water in the oil (cloudy or milky appearance)
Oil is leaking from the breather cap during normal operation	The cooling fan is loose or damaged The cooling fins are obstructed by grass clippings or dirt The oil level exceeds the recommended mark The vehicle is exceeding its maximum load rating The brake is stuck or not fully released The breather cap is not properly installed or has been damaged

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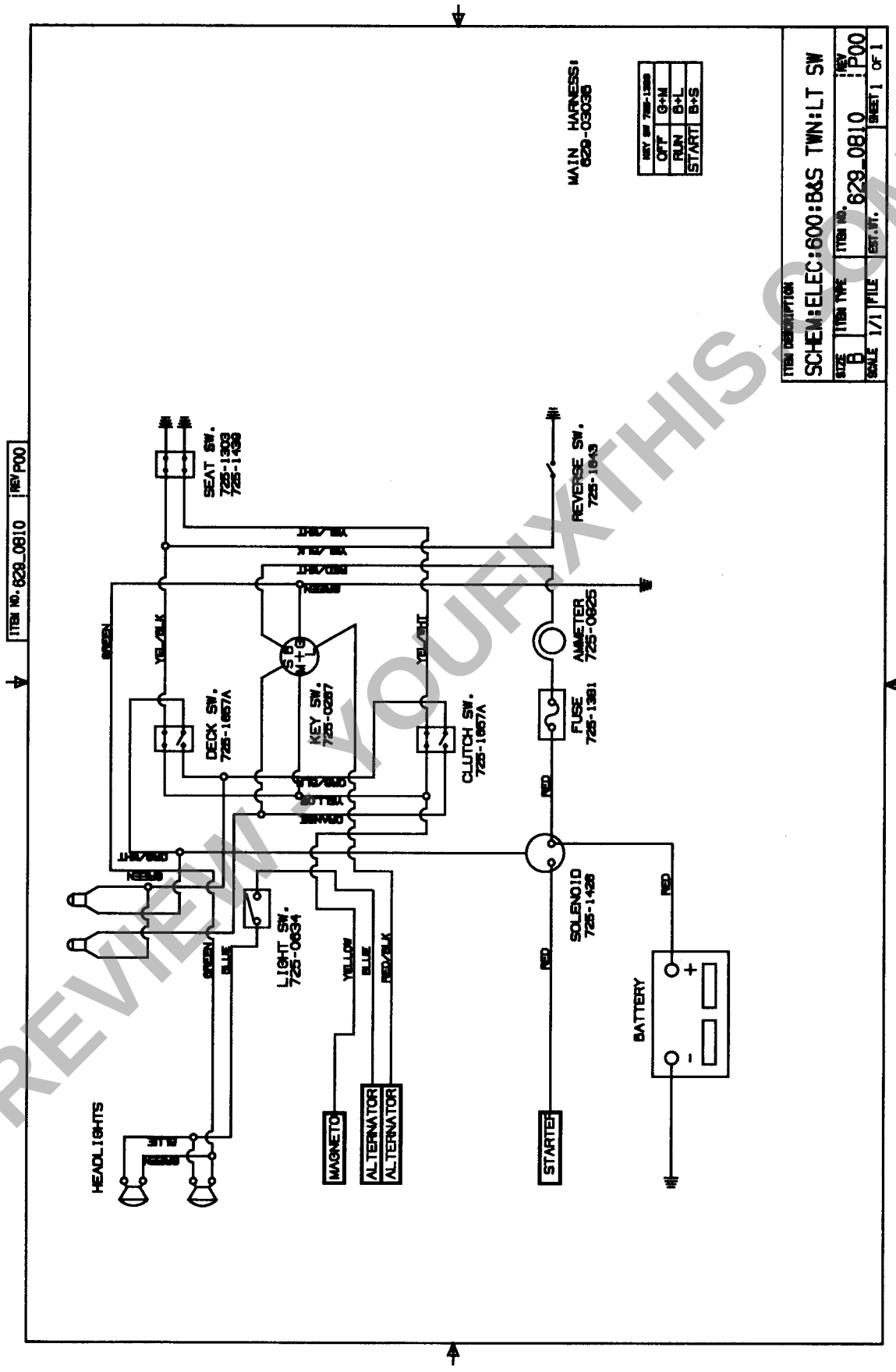

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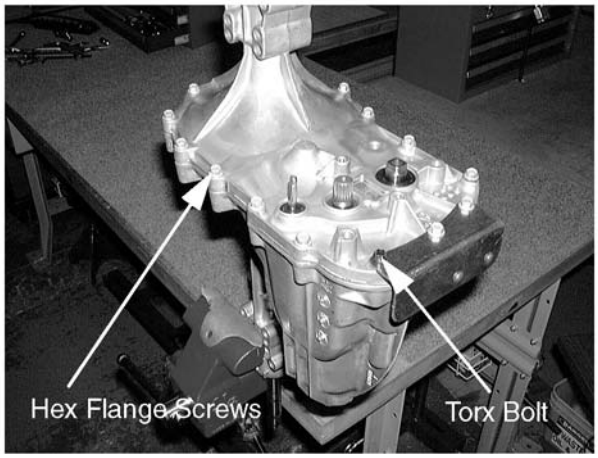

Figure 6-56.

13. Remove the male torx bolt from the front mounting bracket using a 5/16" 12 point socket.

14. Remove all fourteen perimeter hex bolts securing the two IHT case halves together using a 3/8" socket.

15. Separate the housings from one another using the rear break points and a flat blade screwdriver. See Figure 6-57.

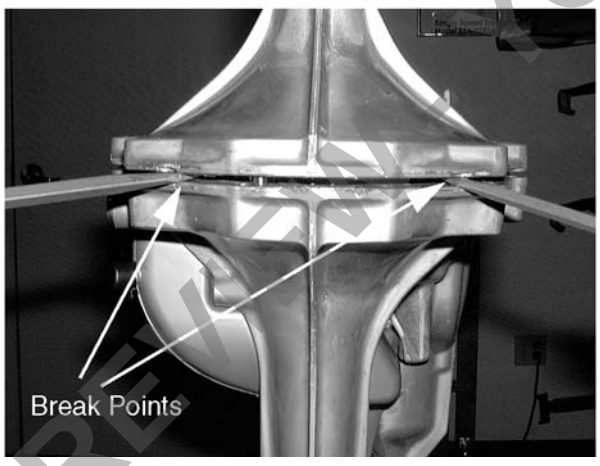

Figure 6-57.

16. Grasp the right axle and the front of the right case half and remove them from the left IHT case assembly. See Figure 6-58.



Figure 6-58.

17. Remove the 60T bull gear. See Figure 6-59.

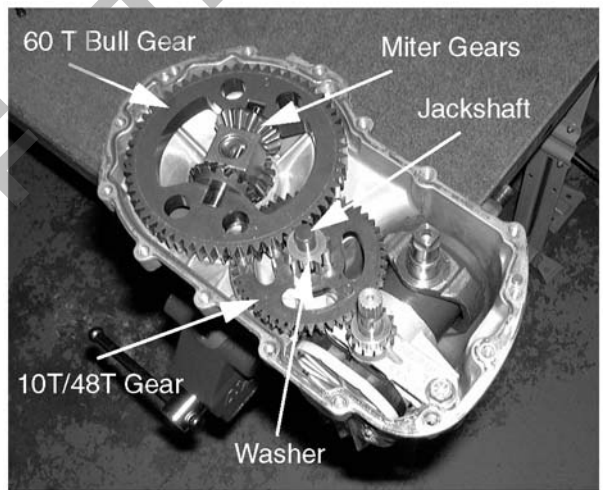

Figure 6-59.

18. Remove the miter gears as an assembly.

19. Separate and inspect all the components for damage or wear. See Figure 6-60.

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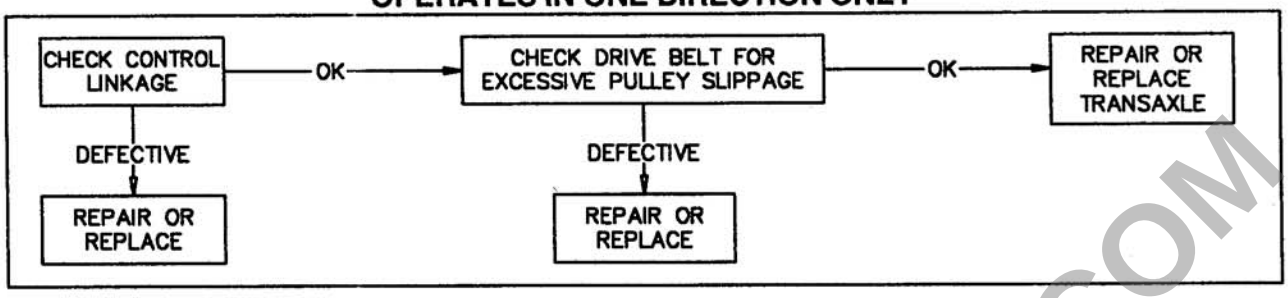
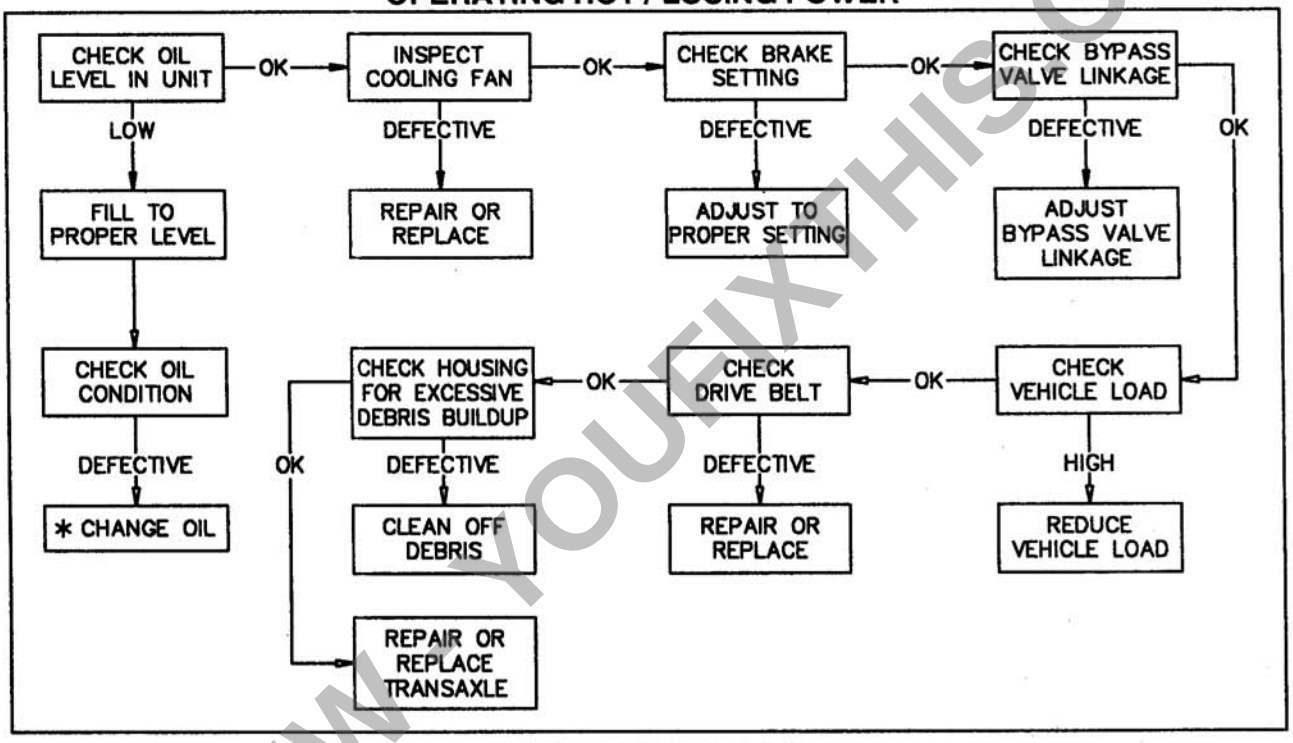
TROUBLESHOOTING DIAGRAM 310-0500/0750 IHT

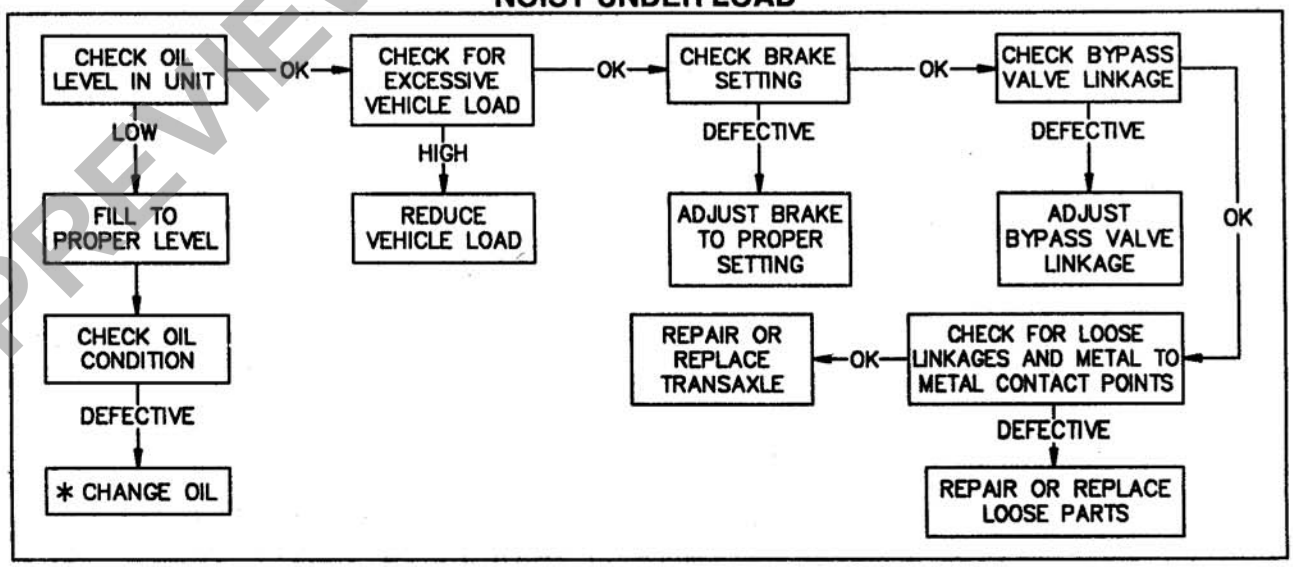
OPERATES IN ONE DIRECTION ONLY



OPERATING HOT / LOSING POWER



NOISY UNDER LOAD



* WILL REQUIRE TRANSAXLE REMOVAL

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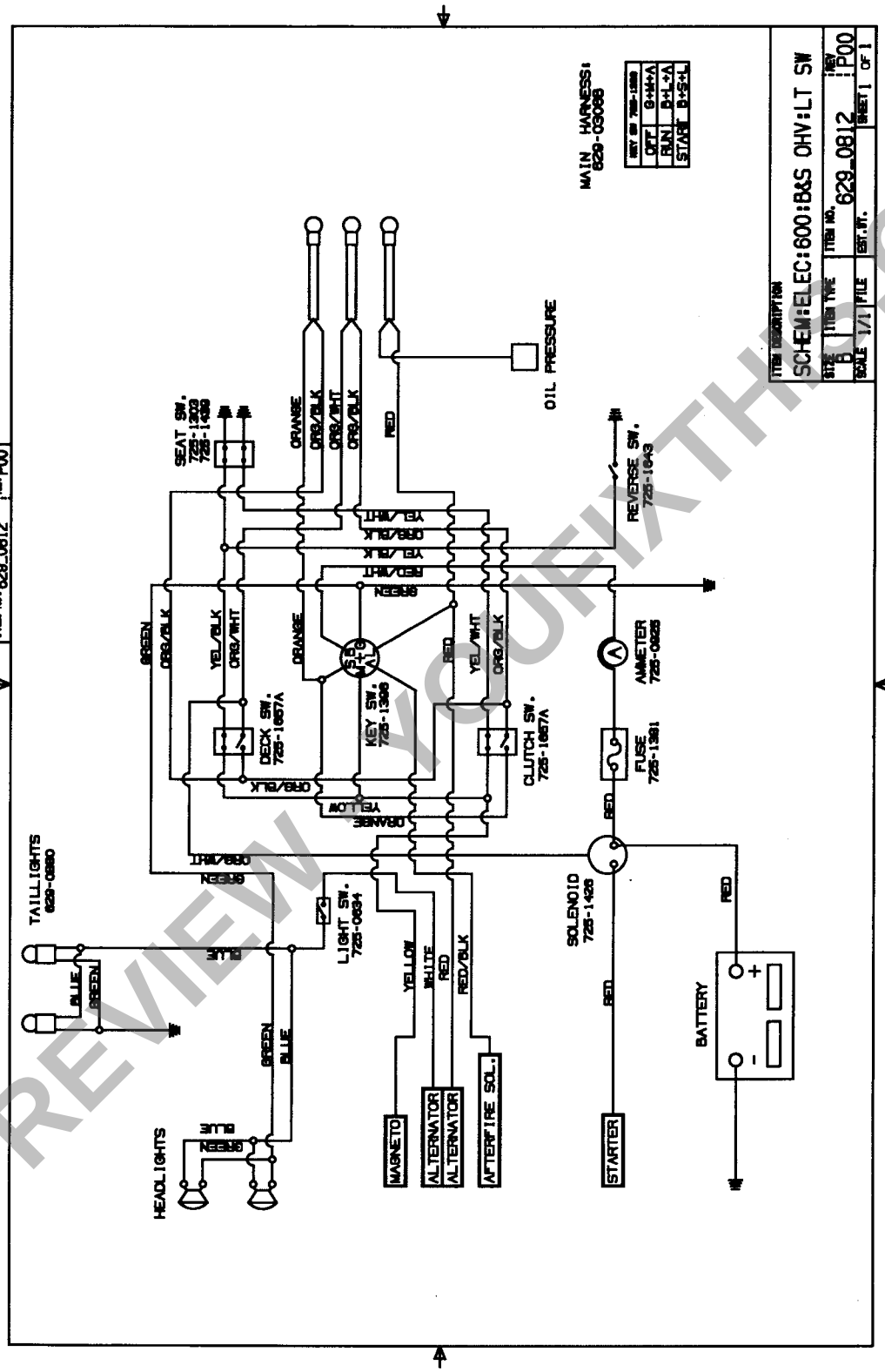

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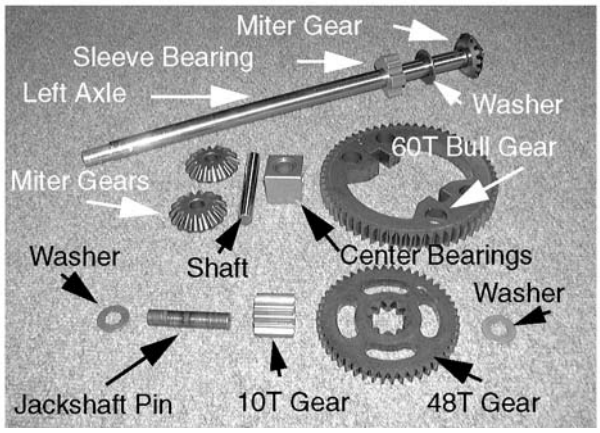

Figure 6-60.

20. Remove the jack-shaft assembly.

21. Separate and inspect all components for damage or wear.

22. Slowly remove the left axle assembly and inspect it for damage or wear.

23. Inspect the outer seal for damage or wear. See Figure 6-61.

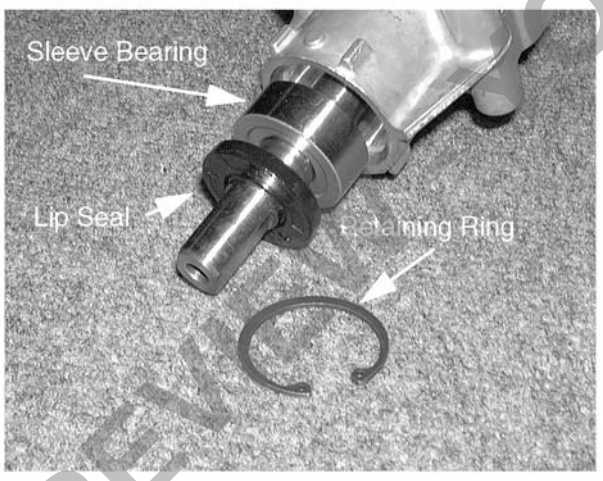

Figure 6-61.

NOTE

It is recommended that the seal is replaced.

24. Remove the retaining ring, lip seal, and spacer from the input shaft using a pair of retaining ring pliers and a flat blade screwdriver. See Figure 6-62.

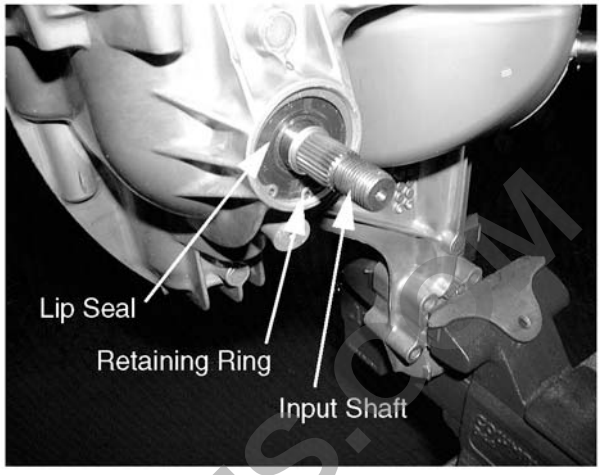

Figure 6-62.

25. Remove the input shaft assembly and inspect it for damage or wear. See Figure 6-63.

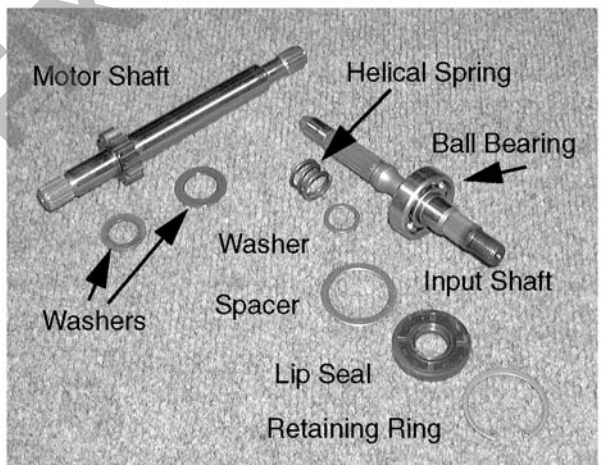

Figure 6-63.

NOTE

Make certain the small washer and helical spring on the input shaft are on the input shaft prior to installation.

26. Slowly insert a smooth scraper between the pump block assembly and the upper face of the center section. See Figure 6-64.

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TROUBLESHOOTING CHART 310-0500/0750 IHT

WARNING!!!
THE VEHICLE SHOULD BE ON LEVEL GROUND AND
THE ENGINE DISABLED BEFORE PERFORMING ANY ADJUSTMENTS

SYMPTOM - OPERATES IN ONE DIRECTION ONLY

POSSIBLE CAUSE	CORRECTIVE ACTION
-Inspect control linkage	-Repair or replace
-Inspect drive belt & pulleys	-Repair or replace

SYMPTOM - NOISY

POSSIBLE CAUSE	CORRECTIVE ACTION
-Check oil level & condition	-Fill to proper level or change oil
-Check for excessive loading	-Reduce vehicle loading
-Check brake setting	-Adjust brake to proper setting
-Check for loose parts	-Repair or replace loose parts
-Check bypass valve linkage operation	-Repair or replace linkage

SYMPTOM - LOW POWER

POSSIBLE CAUSE	CORRECTIVE ACTION
-Check engine RPM	-Adjust to correct setting
-Check drive belt & pulleys	-Repair or replace
-Check oil level & condition	-Fill to proper level or change oil
-Check for excessive loading	-Reduce vehicle loading
-Check brake setting	-Adjust brake to proper setting
-Check for loose parts	-Repair or replace loose parts
-Check bypass valve linkage operation	-Repair or replace linkage

SYMPTOM - OPERATING HOT

POSSIBLE CAUSE	CORRECTIVE ACTION
-Check for debris buildup	-Clean off debris
-Check oil level & condition	-Fill to proper level or change oil
-Check for excessive loading	-Reduce vehicle loading
-Check brake setting	-Adjust brake to proper setting

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TABLE OF CONTENTS

WORK SAFETY . . . . . **Section 1**

GENERAL INFORMATION . . . . . **Section 2**

Safety Precautions 2-1
Batteries And Charging Systems 2-2

ELECTRICAL . . . . . **Section 3**

Safety Interlock Systems 3-1
Safety Interlock Systems - Changes for 1991 3-1
Electric Start System 3-3
Recoil Start System 3-6
Safety Interlock Systems Wiring Diagrams 3-10
Troubleshooting Safety Interlock Systems 3-23
Evaluating Electric Clutches 3-56

BELTS AND DRIVE SYSTEM . . . . . **Section 4**

General 4-1
Proper Storage of Belts 4-3
Causes of V-Belt Problems 4-3
V-Belt Problems with Rotary Tillers, Self-Propelled Mowers and Riding Mowers 4-4
Belt Wear Due to Normal Life 4-5
Pulley Alignment 4-6
Idlers 4-6
Maintenance Of Variable Speed Pulleys 4-9
Four Wheel Steering 4-10
Disassembly Of Four Wheel Steering 4-13
Brake Adjustment for 600 and 700 Series 4-15

HYDROSTATIC . . . . . **Section 5**

TRANSAXLES . . . . . **Section 6**

General 6-1
Transaxle Changes For 1990, 1991, 1992 and 1997 Models 6-3
Disassembly/Assembly of Transaxle 6-5
Hydrostatic Transaxle 6-13
Integrated Hydrostatic Transaxle 6-17

LAWN TRACTORS . . . . . **Section 7**

300 and 400 Series 7-1
Rear Engine Riding Mowers 500 Series 7-6
Transmatic LT 600A 7-9
Hydrostatic Drive 700 Series 7-35

YARD BUG . . . . . **Section 8**

Deck Leveling 8-1
Brake Adjustment 8-3
Blade Brake/PTO Adjustment 8-5
Speed Control Pedal Adjustment 8-6
Steering Adjustment 8-9
Removal and Installation of Deck Belt 8-11
Removal and Installation of Mowing Deck Assembly 8-12
Removal and Replacement of the Drive Belts 8-14
Transmission Removal and Installation 8-16
Transmission Disassembly 8-18
Transmission Reassembly 8-20
Electrical 8-23

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WORK SAFELY—FOLLOW THESE RULES

This symbol is used to call your attention to instructions concerning your personal safety. Be sure to observe and follow these instructions.

1. To prevent accidental starting, always pull the high tension wire(s) off the spark plug(s) before servicing and/or adjusting the machine.

2. To prevent injury, do not allow children or bystanders around the machine while it is being adjusted and/or serviced.

3. Do not wear rings, wrist watches or loose fitting clothing when working on machinery; they could catch on moving parts causing serious injury. Wear sturdy, rough-soled work shoes. Never adjust and/or service a machine in bare feet, sandals or sneakers.

4. Always wear safety glasses when using a hammer, chisel or other tools that may cause chips to fly.

5. Be sure to reinstall safety devices, guards or shields after adjusting and/or servicing the machine.

6. When operating a power washer to clean a machine before servicing, be careful at all times to avoid injury. Maintain proper footing and balance at all times. Never direct the spray at people or animals, as high pressure spray can cause serious injury.

7. If a portable heater is used to heat the service area, the following precautions must be observed

   a. Do not use portable heaters in presence of volatile materials such as gasoline or paint, as fire or explosion may result.

   b. To avoid being burned, do not touch the heater during operation.

   c. Portable heaters consume oxygen and combustion fumes can be hazardous. Heater should be used only in a well-ventilated area. Keep a window or door partially open to provide ventilation.

   d. Keep the heater at least four feet from combustible materials.

   e. Never use gasoline as fuel.

8. Handle gasoline with care—it is highly flammable.

   a. Use approved gasoline container.

   b. Never remove the fuel tank cap or fill the fuel tank when the engine is running, is hot or indoors. Also, do not smoke when working around flammable fuel.

   c. Avoid fires—be sure container or funnel does not touch the battery. Do not overfill the fuel tank. Wipe up spilled gasoline.

   d. Replace fuel tank cap securely.

9. Never use trouble lights or electric powered tools that have cut and/or damaged cords or plugs. Be sure all electric tools are properly grounded.

10. Never run an engine in a confined area such as a garage or storage building any longer than is necessary for immediate moving of the machine out of or into the area. **EXHAUST GASES ARE TOXIC. OPENING DOORS AND WINDOWS MAY NOT PROVIDE ADEQUATE VENTILATION.**

11. After servicing, be sure all tools, parts or servicing equipment are removed from the machine.

12. Electrical storage batteries give off highly inflammable hydrogen gas when charging and continue to do so for some time after receiving a steady charge. Do not under any circumstances allow an electric spark or an open flame near the battery. Always disconnect a battery cable before working on the electrical system.

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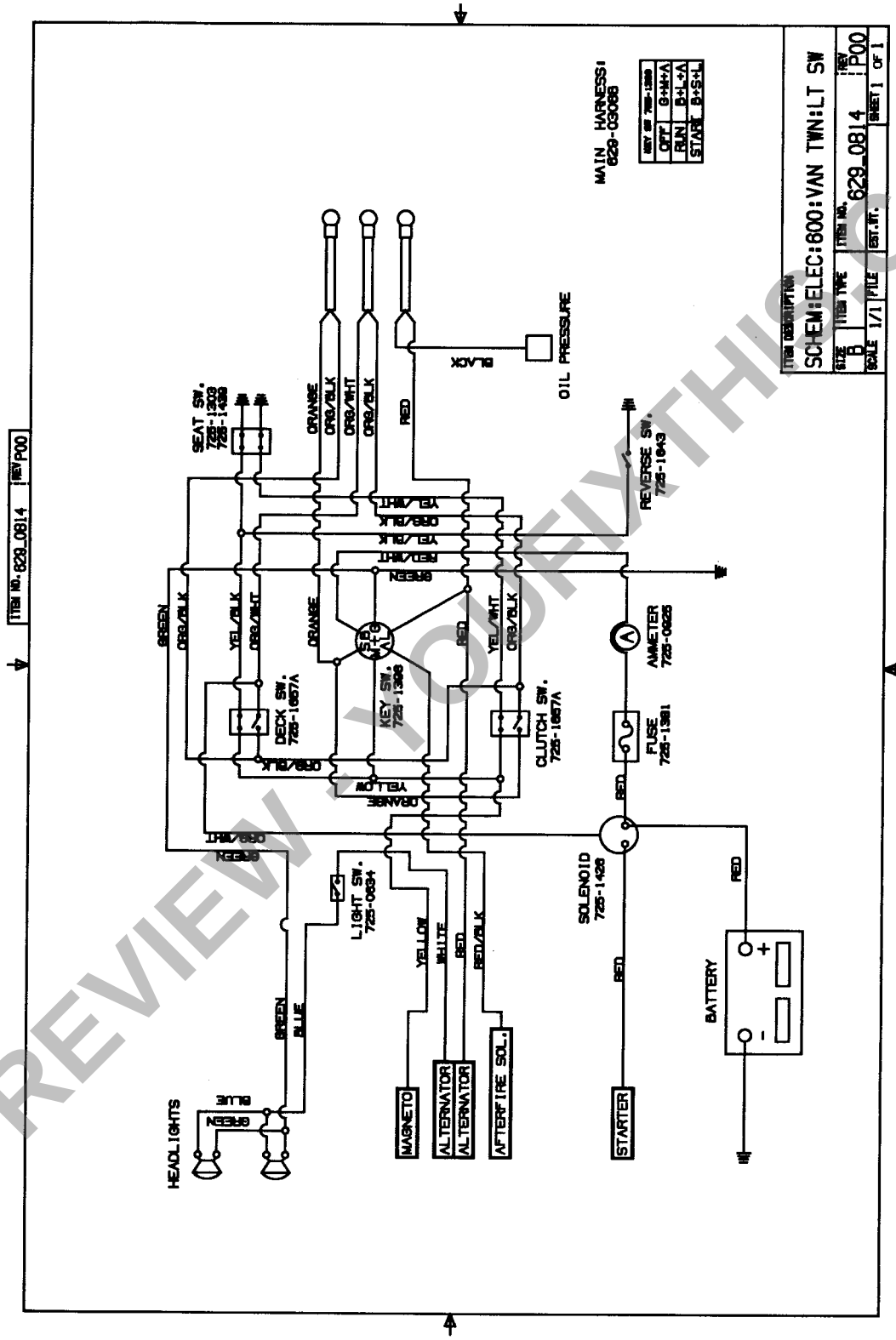

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6-1.2 Also featured are high speed needle bearings on the input shaft and four brass bushings which provide added support for the axles. Clutch collar and bevel gears have three paws for easier shifting and less backlash.

6-1.3 The transaxle is lubricated and sealed at the factory, and does not require checking. If disassembled for any reason, lubricate with 10 ounces of Shell Durina Grease, part number 737-0148.

6-1.4 Basically all single speed transaxles are the same. There were some changes in 1991 and 1992 to improve the performance and durability.

6-1.5 The purpose of this notice is to provide the owner of a lawn tractor with information which may enable him to get the most efficient and satisfactory services from his mowing equipment. Note the following:

1. Some rules must be followed to secure the maximum service life from this unit. The shift lever should never be forced. Shifting should be done slowly. The clutch pedal should be fully depressed each time the mower is changed from reverse to forward or forward to reverse. Shifting from forward to reverse must never be done without declutching. If the unit will not go into gear, the clutch pedal should again be fully depressed and the shift lever slowly moved to the desired position. After the shift lever has been moved to the desired position, it must not be held there forcefully. The results of disregarding these rules can mean an inoperative transmission, sometimes in less than half an hour.

2. Abusive use can cause the yoke of the detent shaft to bend. This bent part, riding inside the clutch collar and rubbing the sides of the center groove, builds up excessive heat, scores the clutch collar and builds up metal on the yoke. When enough metal is built up on this yoke, one of several things occurs. The builtup metal seizes the clutch, and the transmission apparently freezes up. The built-up metal seizes the clutch collar and snaps the detent shaft assembly where the yoke is swaged in place. The built-up metal expands so rapidly that the clutch collar is split into two parts. If the yoke is bent on one movement of the lever, on the next movement it may seize so rapidly the detent shaft assembly will snap. This can occur with no metal build-up. In all cases, the scored clutch collar, the built-up metal on the yoke and a bent yoke indicate abusive use.

3. Often it is noted that the transmission will not remain in forward position. This is again the result of abuse rather than use. Operating without proper declutching wears away the inner part of the large bevel gear and because a large radius assumes the place of the necessary flat surface there, the clutch collar tends to slip back out of position. The condition occurs most often on the forward gear because it is used most often.

4. When repairs are necessary to correct the result of improper operation, it should be noted that the transmission contains 10 ounces of Shell Durina Grease, part number 737-0148. We suggest it or an equivalent when repairs are made in the field.

5. Transmissions operated in the proper manner will give a maximum of service with a minimum of maintenance. The manner of operation determines the life of the unit.

6-2. TRANSAXLE CHANGES FOR 1990, 1991, 1992 AND 1997 MODELS.

6-2.1 1990 changes were as follows:

1. In 1989 MTD used the single speed transaxle 717-1050. In 1990 the transaxle axle length was changed by 1/2 inch on each side. Older model transaxles will not fit on the 1990 600 Series tractors. The new transaxle is a 717-0542.

2. The 1990 transaxle part numbers are as follows:

   a. 300 series—717-0775

   b. 400 series—717-1237

   c. 500 series—717-0775V

   d. 600 series—717-0542

6-2.2 1991 changes were as follows:

1. The material used for the brake yoke prior to 1991 was powder metal. This has been changed to cast aluminum. Also, the brake adjustment castle nut and cotter pin have been changed to a hex lock nut and anti-rotation bracket. See Figure 6-3.

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B. Piston seat

C. Piston

See Figure 6-143.

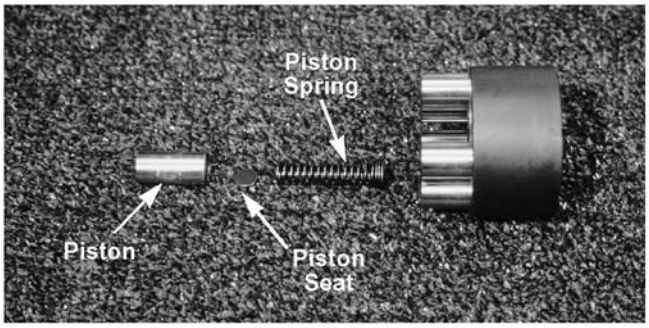

Figure 6-143

22. Inspect the center section motor face and inspect each of these parts / areas:

    A. Center section

    B. Bypass plate (bread)

    C. Motor shaft

    D. Center section motor face

    See Figure 6-144.

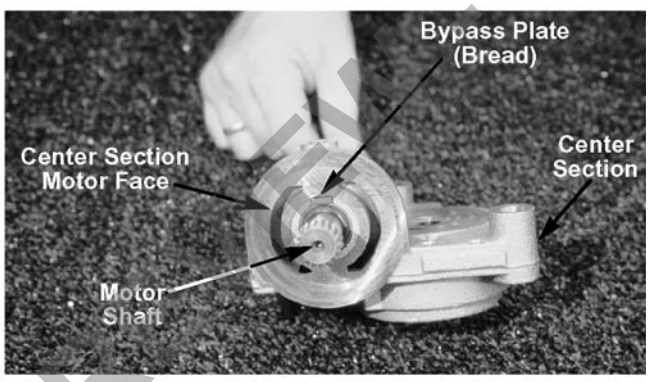

Figure 6-144

23. Once the motor shaft is removed from the center section you can inspect each of these areas for excessive wear or damage:

    A. Motor shaft seal (always replace with a new seal)

    B. Two washers

    C. Snap ring

    D. Motor shaft (splines, gear teeth) See Figure 6-145.

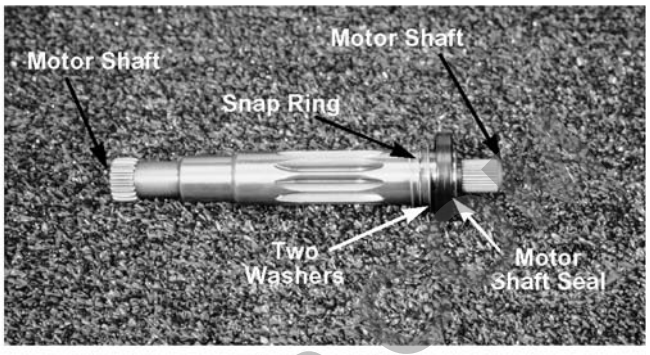

Figure 6-145

24. Inspect the center section pump and identify and inspect each of these parts/ areas:

    A. Center section

    B. Bypass actuator bore

    C. Input shaft bore

    D. Center section pump face

    F. Pump face kidney (each kidney port has a passage through the center section to the motor face kidneys See Figure 6-146.

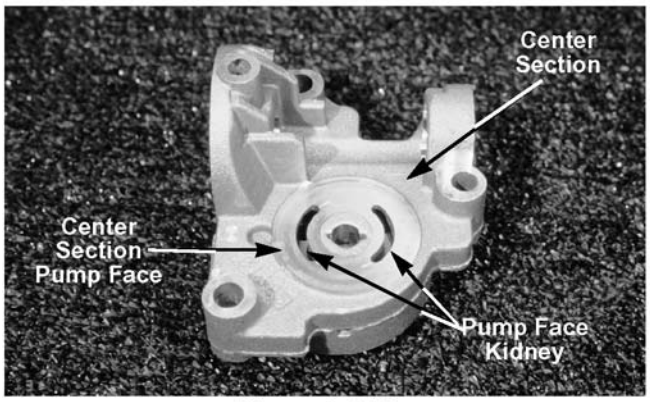

Figure 6-146

25. Here we have another view of the center section motor face and inspect each of these parts/ areas:

    A. Center section

    B. Bypass plate (bread)

    C. Center section motor face

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SPEED CONTROL PEDAL ADJUSTMENT

INITIAL SPEED CONTROL PEDAL ADJUSTMENT WITH NEW BELTS:

NOTE

This section is performed with new belts **ONLY**.

1. Lock the parking brake and turn the ignition key **"OFF"**.
2. Pivot the hood up and remove the spark plug wire from the spark plug.
3. Lower the hood.
4. From the right side of the rider, locate the variable drive cable under the front housing.
5. Follow the variable drive cable forward to the front channel assembly.
6. Locate and loosen the variable drive cable adjustment jam nuts using two 1/2" wrenches. See Figures 8-15 and 8-16.

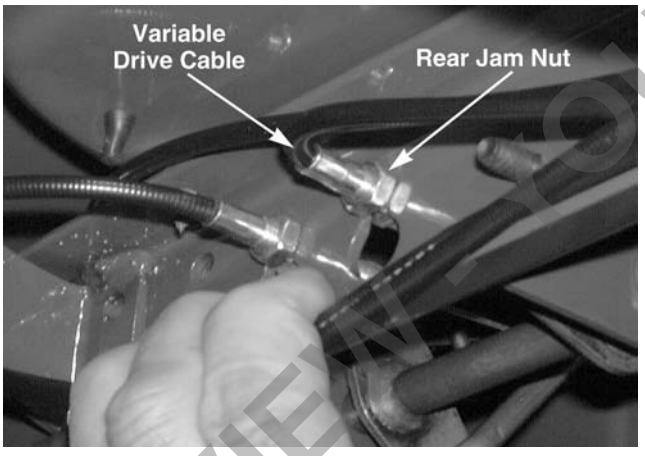

Figure 8-15.

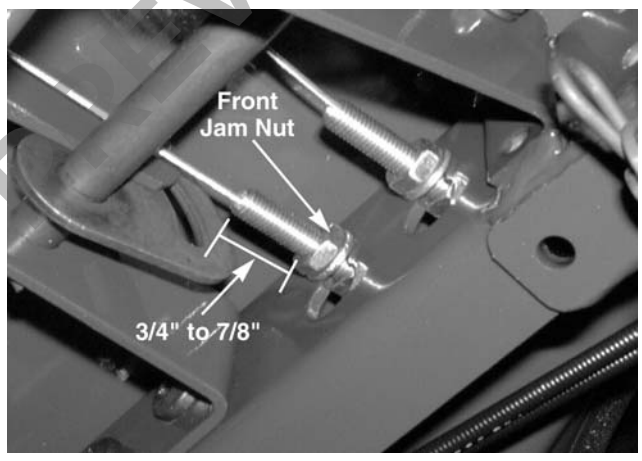

Figure 8-16.

7. By hand, loosen the rear jam nut (closest to the deck) until it bottoms out on the threaded cable end. See Figure 8-15.
8. By hand, tighten the front jam nut until the threaded cable end is exposed 3/4" to 7/8" past the front face of the front jam nut. See Figure 8-16.
9. By hand, tighten the rear jam nut (clockwise) until it is snug up against the rear of the front channel assembly. See Figure 8-15.
10. Tighten both jam nuts using two 1/2" wrenches.
11. Release the parking brake.
12. Apply 10 pounds of force to the variable pedal assembly with a fish scale. See Figure 8-17.



Figure 8-17.

13. From the back of the rider, locate the oval frame extrusion directly behind the engine.
14. Looking down through the oval extrusion, locate the head of the weld pin (belt keeper) on the idler bracket assembly.
15. With a partner applying 10 pounds of force to the variable pedal assembly, measure the distance between the edge of the weld pin head and the right inside edge of the oval extrusion. The measurement will be between 1.60" and 1.65". See Figure 8-18.

IF ADDITIONAL SPEED CONTROL ADJUSTMENT IS NEEDED, PERFORM THE FOLLOWING STEPS:

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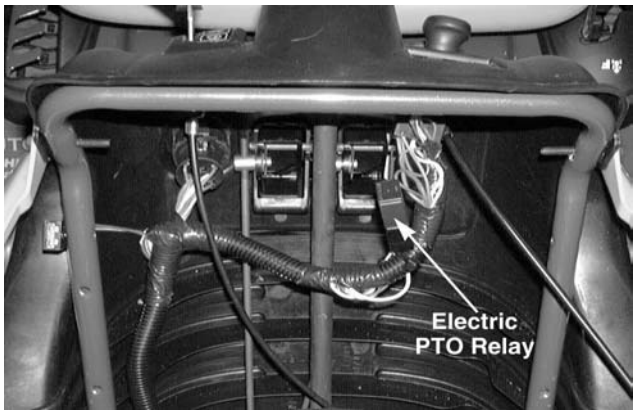

Figure 9-90

2. Remove the PTO relay from the wiring harness connector. See Figure 9-91.

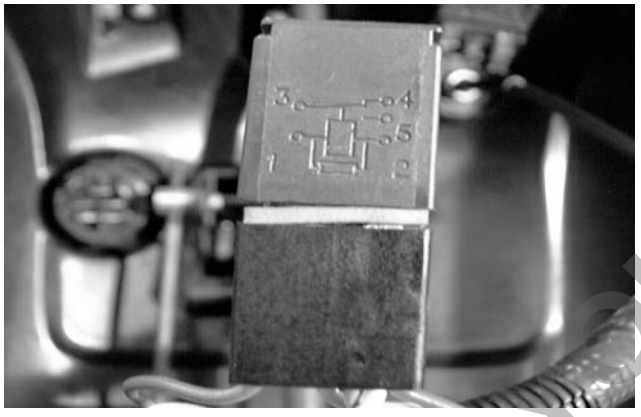

Figure 9-91

NOTE

The relay circuitry is on the front of the relay.

3. Place the relay on a flat surface and identify the corresponding male terminals. See Figure 9-92.

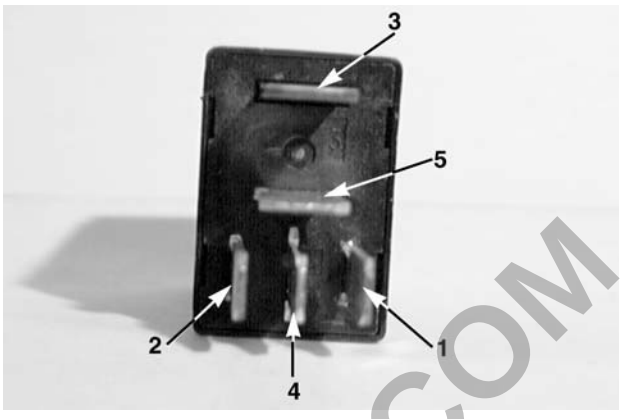

Figure 9-92

NOTE

The male terminals are labeled at the base of the relay.

4. Using an ohm meter, place the test probes on terminals 1 and 2.
–Depending on the temperature, the ohms reading should be approximately 82 ohms. See Figure 9-93.



Figure 9-93

5. Place the test probes on terminals 3 and 4.
–There will be **CONTINUITY**. See Figure 9-94.

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To begin a repair on any mower the first thing to determine is, does it have the original type belts installed on it? If it does not, that is the place to start your repair. The belts must be to the manufacturers specifications. The results of the wrong belt on a deck can also cause poor cutting quality because the belt could be slipping on the blade spindle pulley and this can cause too slow of a blade speed. Grass in the spring has a high moisture content and sometimes it is just too wet. This too can affect the quality of cut. Grass should be relatively dry when cutting and a moderate ground speed be selected. Use the transmission to select the speed. Do not change the throttle control from the full throttle position. For further information on individual decks, check the Technical Service Handbook #770-8640L.

CUTTING DECKS

12-1.1 Following is a list of cutting problems, which may be encountered with twin-blade mowers, and possible solutions.

1. Uncut strip of grass. Only the tips of the blades cut so they must be sharp clear to the end. Sharpen the blades. Dull blades tear the grass rather than cut it.

2. Engine speed too slow. The engine should be operated at full throttle regulated by O.P.E.I. on mowers where blade is fastened directly to crankshaft. On riding mowers the cutting blade shaft is driven through the use of a belt and pulleys, or a gear box, and may not rotate at the same speed as the engine.

3. Ground speed too fast. Use the transmission to select a slower ground speed.

4. Blades not even with each other.

   a. There should be no more than 3/16 inch difference between the blades. Check for a bent blade or spindles; if not bent, the deck may be warped and should be replaced.

   b. Check the blade alignment by measuring from the ground (or flat surface) to tip of blade, rotate blade and check each end. See Figure 12-1.

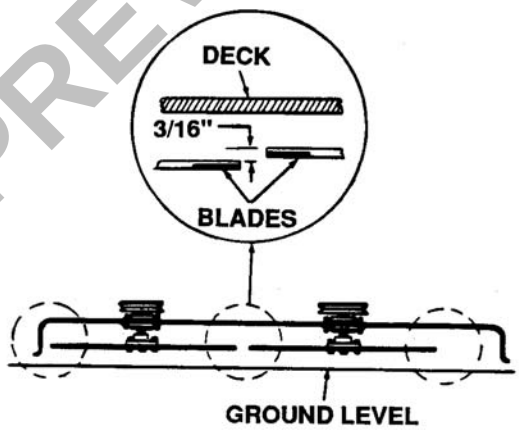
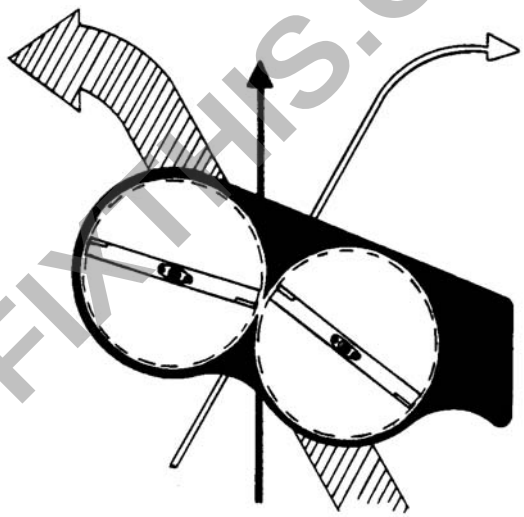


Figure 12-1. Blade Alignment

5. Turning to the right leaves small uncut strips of grass at end of lawn. To prevent this, make left hand turns when mowing or go back and trim when finished. See Figure 12-2.



SHOWS LH TURN AND APPROXIMATE OVERLAP
SHOWS STRAIGHT MOWING AND APPROXIMATE OVERLAP
SHOWS RH TURN AND APPROXIMATE UNCUT STRIP

Figure 12-2. Turning Procedure

6. Short blade. Blades are sometimes manufactured short or sharpened too much on twin-blade units, replace.

7. Uneven cut.

   a. Air pressure should be equal on both front and rear tires.

   b. The deck wheels should be set evenly so the pitch of the cutting deck from side to side will not be affected.

   c. Deck links should move freely and not bind against the frame of the tractor or other component parts. Links must also be the correct length.

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