## 2. DESCRIPTION OF THE I-SERIES

The I-series is a revolutionary new tractor platform introduced in the 2007 season. This platform combines a traditional lawn tractor with zero-turning capabilities. This is accomplished by using EZT transaxles from Hydro-Gear with an innovative steering system. See Figure 1.1.



**Figure 1.1**

The Steering gear box operates the control linkages for the transmissions while turning the front wheels. This gives the I-series zero-turning capabilities while using a traditional steering wheel.

The I-series will come with a 46” or 50” deck options and in keeping with the rest of the Cub Cadet line it will be powered by Kohler engines.

These tractors will also have the same Rev-Tec mow in reverse feature as the rest of the Cub Cadet lawn tractors.

## 3. MODEL AND SERIAL NUMBERS

The model and serial number tag can be found under the seat. See Figure 1.2.




**Figure 1.2**

The serial number is located to the right of the model number as shown above. See Figure 1.2.

The model number is 17AF9BKH710. The break down of what the number mean is as follows:

17.....residential zero turn mower

...A.....sales level

.....F.....engine code

.....9.....frame

.....B.....drive system

.....K.....hood style

.....H.....deck (H = 46” K = 50”)

.....710....customer number

The serial number is 1J056G10005. The serial number reads as follows:

1.....engineering level

..J.....month of production (J = October)

.....05.....day of the month

.....6.....last digit of the year

.....G.....plant it was built in

.....1.....assembly line number

.....0005.....number of unit built

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

youfixthis.com

5. Remove the two screws and two nuts that fasten the seat box cover. See Figure 2.10.

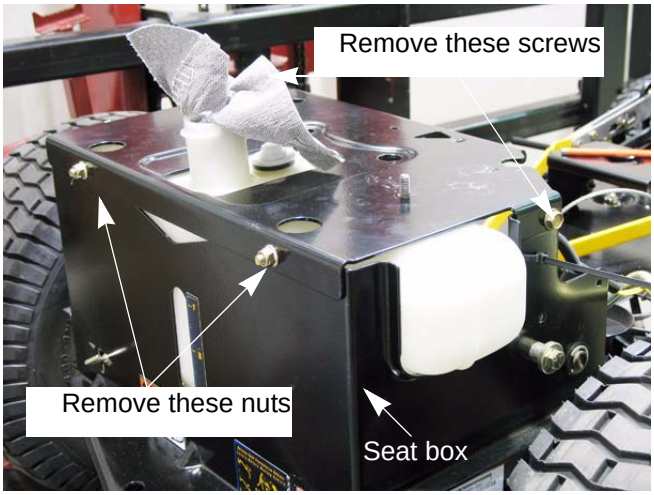



**Figure 2.10**

6. Remove the seat box cover.
7. Clamp the fuel line. See Figure 2.11.

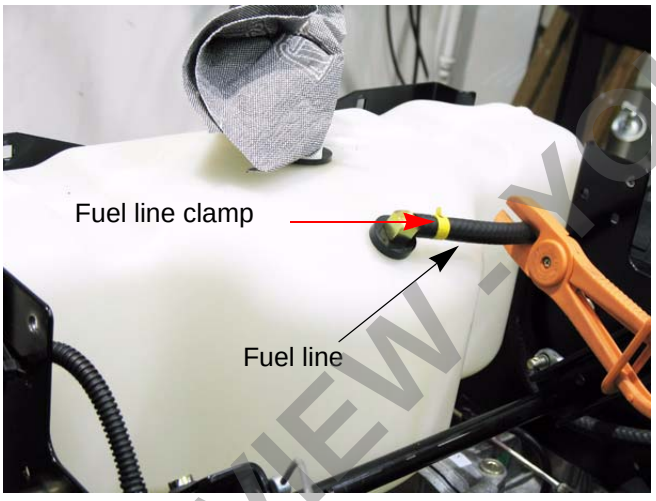



**Figure 2.11**

8. Remove the fuel line clamp and slide the fuel line off.

   **NOTE:** The fuel tank has a barbed fitting. Anytime a fuel line is removed from a barbed fitting it should be replaced because of the damage caused to the fuel line liner.

9. Lift the fuel tank out of the seat box.
10. Install the fuel tank by following the above steps in reverse order.
11. Test run the tractor and check for leaks before returning to service.

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com
youfixthis.com

### Dash Removal

The dash for the I-series is easy to remove. There are a few repair procedures that require the dash to be removed. The steps to remove it are as follows:

1. Remove the steering wheel by:

   1a. Remove the center cover. See Figure 4.4.




**Figure 4.4**

   1b. Remove the bolt with a 1/2" wrench. See Figure 4.5.




**Figure 4.5**

**NOTE:** There is no puller needed for the steering wheel. Once the bolt is removed it will lift off of the steering shaft.

**NOTE:** When replacing the steering wheel, lock the steering gear box in neutral as described in chapter 6 STEERING. This will make it easier to center the steering wheel.

2. Remove the dash by:

   2a. Disconnect the key switch, module, PTO switch and the hour meter. See Figure 4.6.

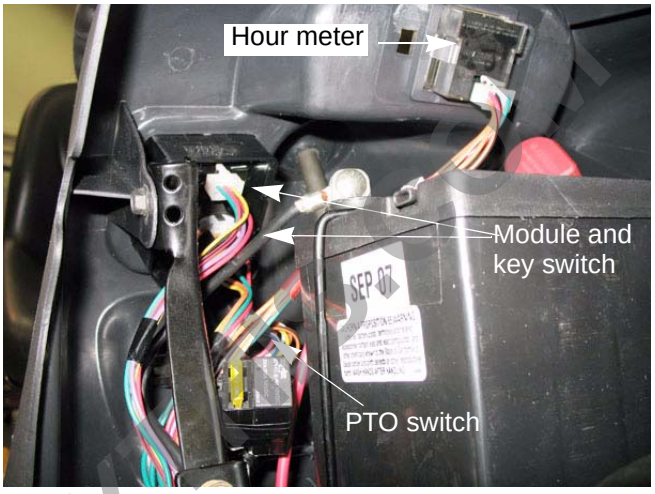



**Figure 4.6**

   2b. Disconnect the parking brake by removing the hair pin clip and sliding the rod out of the lever. See Figure 4.7.

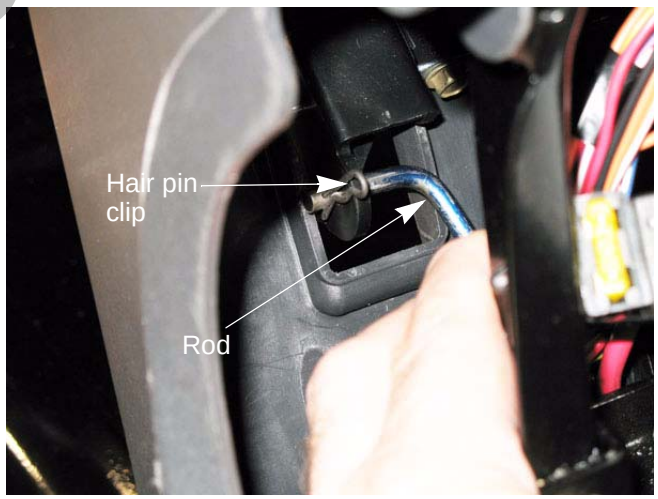



**Figure 4.7**

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

youfixthis.com

# CHAPTER 6: STEERING

## Introduction

The steering on the I-series tractor works in two phases. First it will steer like any other tractor by turning the front wheels. Second and more importantly, the steering linkage will control the two hydro transmission to make the tractor turn at a sharper radius until the tractor reaches a zero point turning radius.

The steering gear box is attached to the front wheels by drag links. When the steering wheel is turned, the gear box will turn the wheels. When the angle of the wheels reaches around a 55° angle from straight ahead, the gear box will start to slow the transmission on the inside of the turn and continue turning the front wheels. When the inside wheel reaches an angle of 90° the rear wheel on that side will stop driving. Turning the wheel past that point will make the inside rear wheel go in reverse The front wheels can reach a 108° angle and with the transmission on the side of the turn going in reverse the tractor will be in a zero turn.

Because the steering gear box is linked to the transmissions, the transmission adjustments and the wheel alignment must be addressed together. A transmission that is out of adjustment can make the steering look out of adjustment just as a front end that is out of adjustment will affect the adjustment of the transmissions.

## Neutral and Transmission Links Adjustment

Because the steering gear box is linked to the transmissions, it is important to make sure the transmission is adjusted for neutral first. The transmission links will self adjust when the neutral adjustment and wheel alignment are done. To establish neutral:

1. Lock Steering Gear Box in Neutral Position:

   1a. Reaching in from the left side of the engine, remove the 1/4”-20 plug screw from the steering gear box centering port using a 3/8” wrench. See Figure 6.1.




**Figure 6.1**

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

youfixthis.com

9. Tighten the return to neutral bolt. See Figure 6.17.




**Figure 6.17**

10. Remove the tool.
11. Reassemble the tractor by following the steps just described in reverse order.
12. Test drive the tractor in a safe area before returning it to service.

**Steering gear box removal**

For the first two years of production there will be no service parts for the steering gear box. The purpose of this is to have any failed gear box returned to the engineers for examination. For warranty, any gear box failure is to be repaired by replacing the gear box without opening it. To replace the gear box:

1. Remove the dash and fender by following the steps described in chapter 4 BODY/CHASSIS.
2. Disconnect the transmission linkage:

   2a. Remove the cotter pin, washer and clevis pin in the linkage. See Figure 3.18.

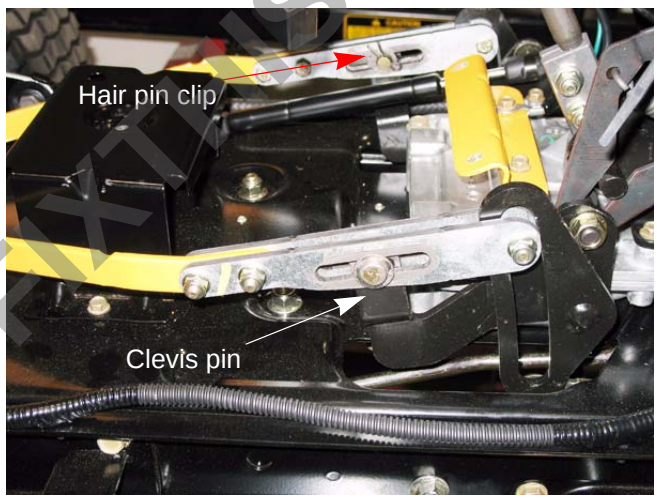



**Figure 3.18**

   2b. Remove the nut and bolt attaching the transmission linkage to the levers on the steering gear box. See Figure 6.19.

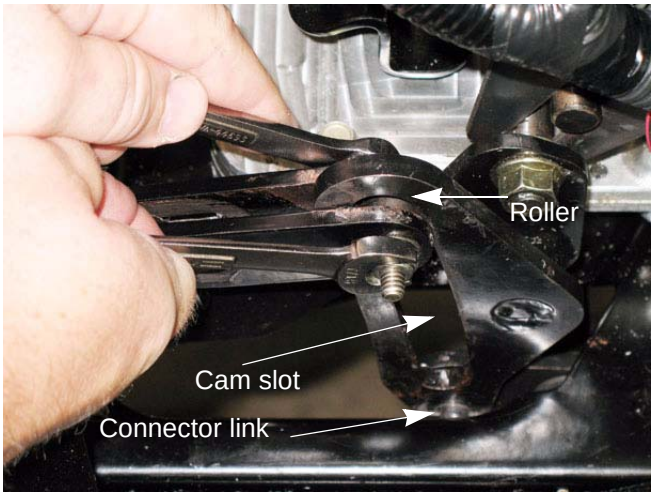



**Figure 6.19**

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com
youfixthis.com

- **Heat and Vibration:** Heat and vibration are hard on most mechanical devices. The same is true of electronics.
- **Moisture:** Moisture causes a nasty combination of corrosion and shorts. Corroded connections and wires create resistance that results in low voltage and ground issue. Many electronic components are “potted” or encased in a sealant that protects them from moisture. They are still vulnerable to bad inputs caused by corroded external connections and damaged switches.
- **Improper Tools:** Some test lights can overload electronic circuits.

**Electrical environment: AC Vs. DC**

Most modern outdoor power equipment that has an electrical system complex enough to require diagnosis will be equipped with an alternator that produces alternating current (AC). In most systems, this current is immediately rectified to direct current (DC), and regulated to a nominal 12 Volts. The presence of AC is very limited. The primary concern of this section is 12 Volt DC systems, though much of the theory and techniques apply equally well to other DC systems.

**1. Voltage:** Pressure

- Voltage is the “pressure” that electricity has. It is the amount of force pushing electrons through a circuit.
- The unit of measurement for this pressure is volts.
- The capital letter “V” is used to represent volts.
- Most (not all) outdoor power equipment operates on a nominal 12 volts. In practice, system voltage may run as high as 13.5V or 14V.

**2. Amperes:** Flow

- Current is the “flow” of electricity. It is the amount of electrons flowing in circuit.
- The flow of current is measured in Amperes or Amps for short.
- The capital letter “I” is used to represent Amps.

**3. Ohms:** Resistance

- Resistance is the opposition to current flow. It is a restriction that slows down the flow of current.
- Resistance is measured in Ohm’s.
- The greek letter omega “Ω”, or the letter ”R” for Resistance is used to represent Ohm’s.
- Resistance creates heat. A circuit with too much electrical load, or too much resistance for the load placed on it will get hot.

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

youfixthis.com

- Some charging systems do not work if the system voltage falls below 6V. It takes a certain amount of voltage to excite the fields in the alternator.
- Some solid-state components will not work if the system voltage falls below a given threshold.
- Some solid-state components can be damaged by the jump-starting that accompanies operation with a dead battery.
- Many electric PTO clutches will fail to work dependably if battery needs to be replaced. Even though the charging system produces enough out-put to drive the clutch, it is overtaxed driving the clutch and forcing a charge into a damaged battery.
- Continued operation with a weak battery overtaxes the charging system.

3. Charging the battery:

**NOTE:** It is best to remove batteries from equipment for charging to minimize corrosion from out-gassing during charging.

**CAUTION:** When disconnecting or removing the battery, disconnect the ground cable first. When reconnecting or installing a battery, connect the ground cable last. These steps will minimize the chance of shorting-out the battery posts with a tool.

3a. Batteries on most modern outdoor power equipment are 12 volts so set the charger to 12 volts.

3b. Set the charge rate to 2 amps.

**CAUTION:** Never charge an outdoor power equipment battery at a rate higher than 2 amps. Damage to the battery will result.

**CAUTION:** Never attempt to charge or jump a frozen battery.

3c. Charge the battery until it is fully charged. Most battery chargers have an amp gauge to show the charging rate. When the gauge is at zero, stop charging the battery.

4. Checking battery condition: There are three things to do when testing a battery:

- Visual inspection
- Electrolyte test
- Operational test

4a. Visual inspection

- Inspect the battery and battery connections for corrosion. Clean if necessary. Neutralize acid with baking soda, and protect the terminals once they are cleaned.

**NOTE:** Battery cable corrosion is the most common type of increased resistance circuit failures.

- Inspect the battery case for signs of damage and missing vent caps. Battery cases that bow out in the middle indicate that the battery froze or over heated and should be replaced.

5. Check the electrolyte level if the caps can be removed. Fill as needed with distilled water. After initial charging, do not add electrolyte to the battery.

6. Hydrometer test (non-sealed batteries only) See Figure 7.33.

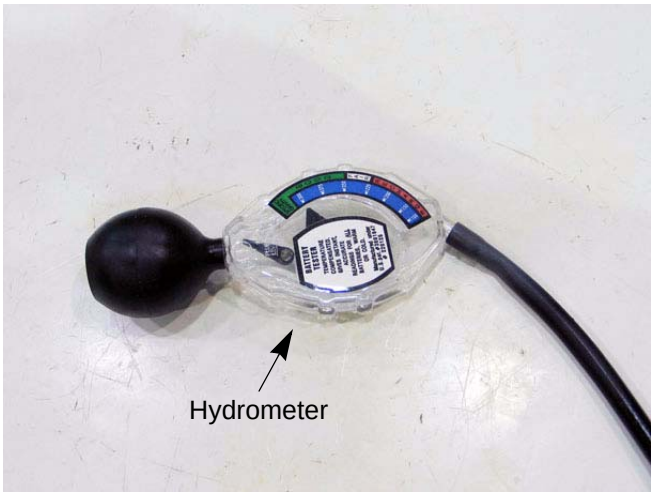



**Figure 7.33**

**CAUTION:** Always wear eye protection and acid resistant gloves when working with electrolyte. Use baking soda to neutralize any spilled acid.

6a. Give the battery at least ten minutes for the electrolyte to stabilize after charging the battery or adding water to the cells.

6b. Measure the temperature of the electrolyte in the middle cells of the battery.



PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com
youfixthis.com

10. Applying this principle to the positive side of the system: See Figure 7.43.

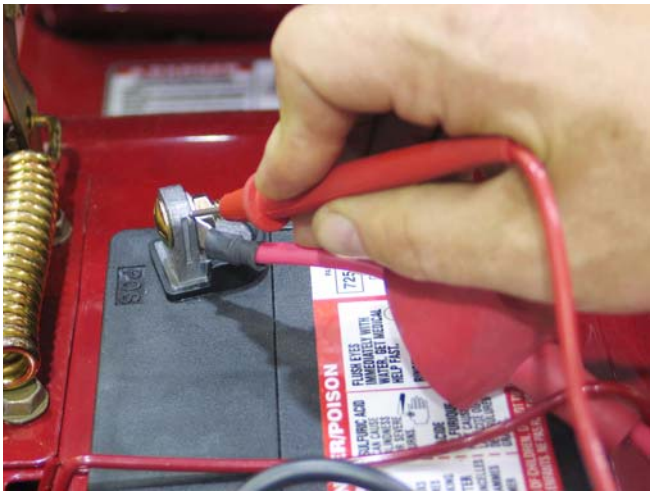


**Figure 7.43**

**IMPORTANT:** Ultimately, all positive current will find its way from the positive post of the battery to the negative post.

10a. To check hot-side voltage drop: set-up a multi meter to measure 12V DC.

10b. Make a good electrical connection between the red (+) probe and the positive post on the battery.

10c. Make a good electrical connection between the black (-) probe and the suspect point of the circuit.

10d. Power-up the circuit in question.

10e. The voltage that shows-up on the meter is the power that is not following the intended path back to the negative battery post.

10f. Voltage drop on a good circuit should be less than 0.1 volts. A voltage drop reading on the meter of greater than 0.2 volts indicates a fairly substantial problem that demands attention.

- As an example, if the tractor had a slow-turning starter, the ground-side voltage drop measured below 0.1 volts, and there was not a parasitic load on the engine (e.g. PTO clutch that is not fully disengaged), it would be logical for the technician to check voltage drop to the starter. See Figure 7.44.




**Figure 7.44**

- With the starter motor engaged, the voltage drop reading here is nearly 0.6 volts, indicating a serious problem in the heavy-gauge circuit between the starter and the battery.

10g. Checking voltage-drop at various points along the circuit can help pin-point the problem.

- Check voltage-drop at the output lug on the starter solenoid:
- If there is a significant difference, the problem lies between the lug on the solenoid and the lug on the starter.
- If there is little change, the problem lies further up-stream.
- Check voltage drop at the input lug on the solenoid. If there is significant difference between the reading here and the reading at the output lug (greater than 0.10 volt), then the contacts inside the solenoid may be burned. If there is little change, the problem lies further up-stream, between the battery and the solenoid.
- Results may be cross-checked by testing voltage drop across the two posts of the starter solenoid while cranking the starter motor.

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

youfixthis.com

### Deck Gauge Wheel Adjustment

The cutting decks are of a “floating” design. This means that they are suspended above the ground. The gauge wheels occasionally touch the ground. They are designed to bump the deck up and over irregularities. This prevents scalping damage to the turf and to the deck.

Adjust the gauge wheels as follows:

1. Place the tractor on a smooth, flat surface and move the deck to the desired mowing height using the deck lift lever.
2. Check gauge wheels distance from the flat surface below. If the gauge wheels contact the ground, they must be raised. If the gauge wheels are higher than 1/2" above the ground, they should be lowered.
3. Remove the shoulder bolt securing one of the front ball wheels to the front index bracket.
4. Reposition the ball wheel to align with the one of four index holes that places the wheel 1/4" to 1/2" above the ground. See Figure 8.13.

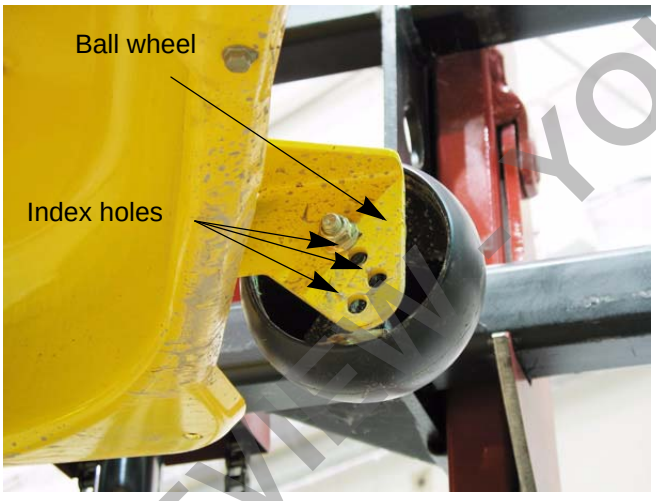



**Figure 8.13**

5. Secure the ball wheel to the index bracket with the shoulder bolt. Note the index hole used and secure the other ball wheel in the same position.

### Deck Rear Roller Adjustment

The rear rollers on the mower deck are not designed to carry the weight of the deck. The rear rollers should be adjusted to approximately 1/4" to 1/2" above the ground when the deck is moved to the desired cutting height.

To adjust the rear roller:

1. Place the tractor on a smooth, flat surface, move the deck to the desired cutting height.
2. Check the height of the rear rollers.

46" Deck ONLY

**NOTE:** The 46" deck roller assembly index bracket has three adjustment positions using either the bottom two holes, middle two holes, or top two holes.

A Support the roller assembly and remove the two self tapping screws from both the left and right roller index brackets. See Figure 8.14.

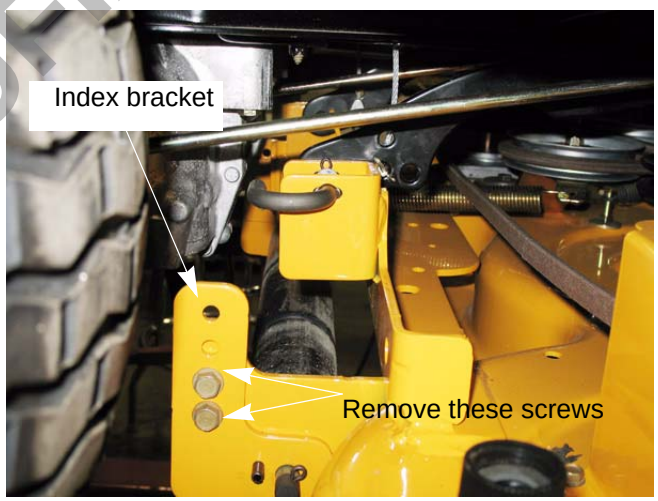



**Figure 8.14**

B Position the roller assembly so that the rollers are approximately 1/4" to 1/2" above the flat surface below. Align the nearest two index bracket holes with holes in the deck mounting brackets.

C Secure the roller assembly with the four self tapping screws.

**NOTE:** The self tapping screws should be in the corresponding holes of both the left and right roller index brackets.

PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com
youfixthis.com

**NOTE: Any servicing dealer attempting a warranty repair must have prior approval before conducting maintenance of a Hydro-Gear® product unless the servicing dealer is a current Authorized Hydro-Gear Service Center.**

## EXTERNAL MAINTENANCE

Regular external maintenance of the EZT® should include the following:

1. **Check the vehicle operator's manual for the recommended load ratings. Insure that the current application does not exceed load rating.**
2. Check oil level in accordance with Figure 4 Page 9.
3. Inspect the vehicle drive belt, idler pulley(s), and idler spring(s). Insure that no belt slippage can occur. Slippage can cause low input speed to the transmission.
4. Inspect the vehicle control linkage to the directional control arm on the transaxle. Also insure that the control arm is securely fastened to the trunnion arm of the transaxle.
5. Inspect the bypass mechanism on the transaxle and the vehicle linkage to insure that both actuate and release fully.

## SERVICE AND MAINTENANCE PROCEDURES

Some of the service procedures presented on the following pages can be performed while the EZT is mounted on the vehicle. Any repair procedures as mentioned in the repair section of this manual must be performed after the unit has been removed from the vehicle.

## FLUIDS

The fluids used in Hydro-Gear products have been carefully selected, and only equivalent, or better products should be substituted.

Typically, an engine oil with a minimum rating of 55 SUS (9.0 cSt) at 212° F (100° C) and an API classification of SL is recommended. A 20W50 engine oil has been selected for use by the factory and is recommended for normal operating procedures.

### FLUID VOLUME AND LEVEL

Fluid volume information is provided in Table 4.

Certain situations may require additional fluid to be added or even replaced. Refer to Page 4 and Figure 4 for the proper fill port location.

Fill the EZT so the oil level is .75"-1.50" (19-38 mm) below the oil fill port.

Recheck the fluid level once the unit has been operated for approximately 1 minute.

Purging will be required. Refer to the purging procedures on Page 10.

PREVIEW : YOUFIXTHIS.COM



Download full manual at youfixthis.com
youfixthis.com

locate.

**(Swashplate/Pump Block)**

11. **(See Figure 15)** Install the pump thrust bearing (35) in the trunnion machined swashplate (19). NOTE: Place the thin race of the bearing towards the swashplate. The thick race must face the pistons.

12. **(See Figure 13)** Place the pump block assembly (4), pistons down, on top of the thrust bearing in the swashplate (19).

13. Coat the pump running surface with clean motor oil.

14. *Care must be taken to prevent the scaring or scratching of the center section sealing face during this step.* Insert the shaft of the swashplate/pump block assembly (Figure 21) into the housing while simultaneously compressing the pistons in the block. NOTE: To assist in the installation of these components, insert the assembly until 3/4 of the pump block is covered by the center section. Then slightly press the shaft end toward the center section while pushing the shaft into its bore.

15. Install the input shaft and bypass rod. See page 20.

16. Install the axle shaft, reduction gears and expansion plate, if removed. Refer to page 18.

17. Install the side housing and brake. See page 17.

18. Fill the transaxle with new oil. See page 9.

19. Install the bypass arm and control arm. See page 15.

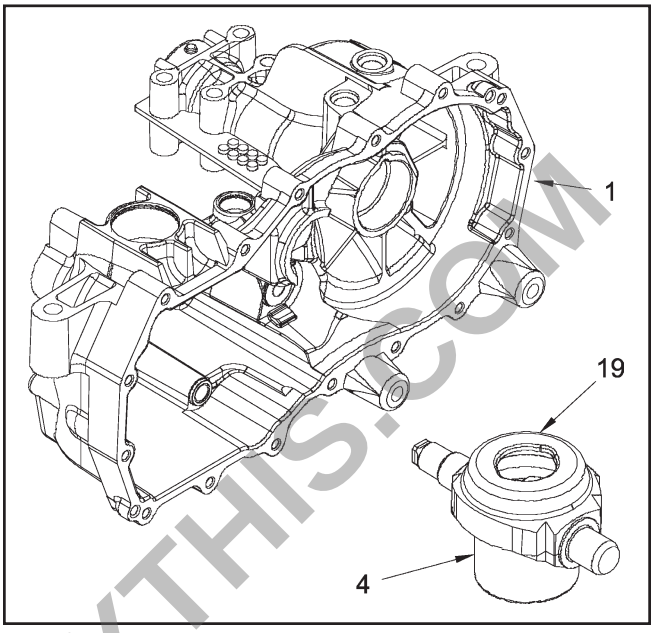



**Figure 12.**

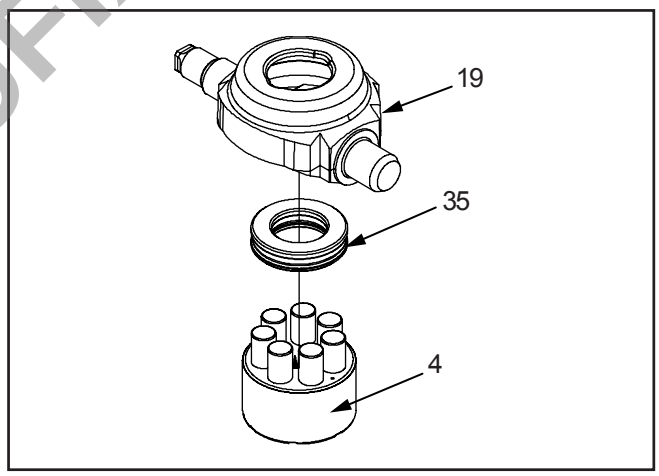



**Figure 13.**

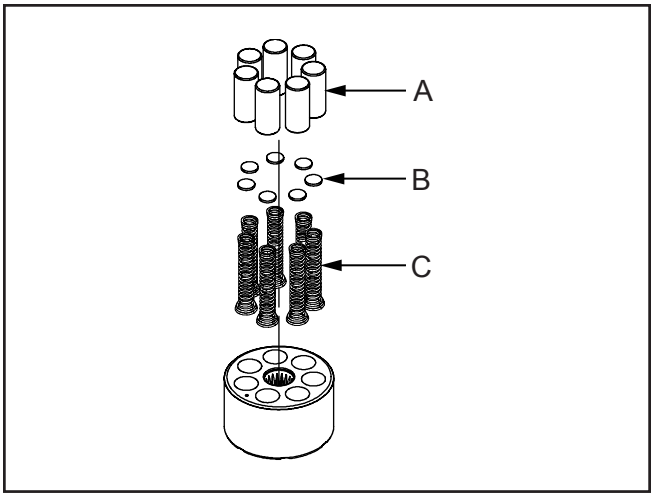



**Figure 14.**

PREVIEW - YOUFIXTHIS.COM


Download full manual at youfixthis.com
youfixthis.com

# Table of Contents


1. INTRODUCTION ..... 1
2. ENGINE RELATED PARTS ..... 3
3. BRAKES ..... 7
4. BODY/CHASSIS ..... 13
5. DRIVE SYSTEM ..... 17
6. STEERING ..... 22
7. ELECTRICAL SYSTEM ..... 36
8. CUTTING DECKS AND LIFT SHAFT ..... 67
9. MAINTENANCE INTERVALS ..... 78
10. HYDROGEAR APPENDIX ..... 83


PREVIEW - YOUFIXTHIS.COM



Download full manual at youfixthis.com

youfixthis.com

# PREVIEW ONLY

You're viewing 12 of 124 pages

## The full manual includes:

- All 124 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

**Cub Cadet I Series, I Series Riding Tractors, 17AF9BKH710 Shop Manual**

**Scan or click anywhere**
youfixthis.com

*Click anywhere on this page to get the full manual*