4-7. GENERAL.

4-7.1 The variable speed pulley can best be described as a torque converter. It is used on some riding mowers, rotary tillers and tractors. The variable speed pulley allows you to vary the ground speed (or the tiller speed) while maintaining a constant engine speed. We use a smaller one on the riders and the larger one on the tractor and rear tine tiller. Coupling the transaxle with the variable drive system you have the ultimate drive train. With this total drive system you can set the speed selector for a given speed, then slow down for a turn (cutting around trees or flower beds), by pushing in on the clutch/brake pedal. Release the pedal and the tractor automatically resumes the set speed. This type of drive system permits no-clutch-on-the-go speed control and enables you to match your ground speed to your mowing conditions without slowing the RPM's of the cutting blade. See Figure 4-8.

![Diagram of Variable Drive System](image)

Figure 4-8. Variable Drive System
4-7.2 The drive principle for the new two speed transmission is similar to the single speed drive system. The variable speed pulley, combined with the two speed transmission, allows 14 ground speeds: 7 low range and 7 high range. Each speed is obtained by the placement of the shift lever and speed control lever. See Figure 4-9.

**NOTE**

On 1989 and 1990 units only, the shim used under the clutch brake pedal assembly is 5/8 inch instead of 1/2 inch as marked for the speed control adjustment.

Figure 4-9. Two Speed Transmission
4-7.3 Riding Mowers have a variable speed pulley that is used with the single speed transmission. This gives you a multispeed drive, and the transmission gives you reverse as well as changing the plane of the drive. Tractors use a variable speed pulley that is between the engine and the four speed transaxle. This gives you a speed variation in each gear. As the variable speed pulley moves away from the engine pulley, the engine V-belt pulls towards the center of the variable speed pulley, pushing the movable sheave up. This forces the transmission V-belt to the outside of the variable speed pulley. A mechanical lock of the control linkage can stop the variable speed pulley at any point. See Figure 4-10.

4-7.4 Tillers use a variable speed pulley that is placed between the engine and the chain cage. By moving the control lever you can vary the tine speed. See Figure 4-11.

4-7.5 Maintenance of Variable Speed Pulleys.

1. **Testing.** The movable sheave must be able to slide easily sideways but cannot be loose. If the movable sheave is too loose it will cock and will not slide when under load.

2. **Repair.** The needle bearings on the riding mower variable speed pulley can be replaced. These are the only parts available for repair. The part number is 741-0404.

3. **Lubrication.** Lubricate the needle or ball bearings once a year with a few drops of engine oil.

   **CAUTION**

   Excessive oiling will get on the V-belts and deteriorate them, or cause slippage.

4. Use a rag to clean dirt and rubber from the V-belt from the groove.

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**Figure 4-10.** Horizontal Variable Speed Drive Pulleys

**Figure 4-11.** Vertical Variable Speed Drive Pulley

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NOTE

Notice the difference between the horizontal (Figure 4-9) and the vertical (Figure 4-11) variable speed drive pulleys.
4-7.6 The shift lever generally has three positions: forward, neutral and reverse, except on the new two speed transmission which has high, low, neutral and reverse. The clutch/brake pedal must be depressed and the lawn tractor must not be moving when shifting gears. Do not force the shift lever. Release the clutch/brake pedal slightly to line up the shifting collar in the transmission. Then try to shift gears.

4-7.7 The speed control lever allows you to regulate the ground speed of the lawn tractor. To select the ground speed, depress clutch pedal. Push speed control lever outward and move backward to slow lawn tractor; move forward to increase speed. When desired speed has been obtained, release lever in that position. Whenever clutch is engaged, unit will automatically go to the preset speed.

4-7.8 The clutch/brake pedal is located on the left side of the lawn tractor. Depressing the clutch/brake pedal part way disengages the clutch. Pressing the pedal all the way down disengages the clutch and engages the disc brake.

4-8. **FOUR WHEEL STEERING.**

48.1 The drive system for the four wheel steer models remain the same as has been previously outlined in Section 4-7.

This is a variable speed pulley principle successfully used on 600 and 700 Series riders and lawn tractors. Coupling this variable drive system with the all new transaxle model 717-1287 adds to the unique maneuverability of the four wheel steering by being able to control just the right ground speeds for comfortable operations. See Figure 4-12.

4-8.2 The four wheel steering lawn tractor is designed for optimum maneuverability. It is important to understand how it operates before using the lawn tractor. If the wheels are pointing straight forward and the steering wheel is turned less than approximately 45 degrees, only the front wheels turn. See Figure 4-13.