

## DS602 Tub Grinder Horsepower Control Operation Instructions

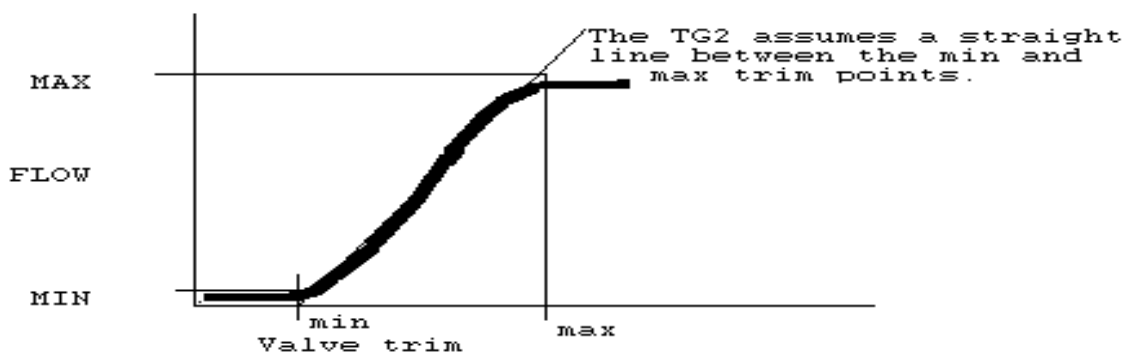
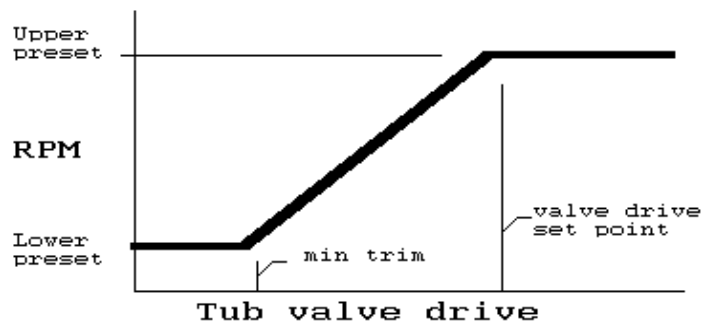
The DS602, is a digital horsepower limiter used to control the tub and conveyor speeds on the Hogzilla Tub Grinder. The DS602 receives a RPM signal from the engine and uses it to regulate the tub speed. Whenever the RPM drops below the preset minimum the Tub automatically reverses to clear out material from the cutter heads. Both the Tub and Conveyor hydraulic valves are driven in open loop mode with independent min and max valve trims. The DS602 is equipped with remote switches to set the Tub & Conveyor direction/speed via the operator's front panel.

**Manual mode** is used to set up and test the system and also function as a back up in the case of a sensor failure. Manual mode does not require that the industrial switches or the RPM sensor to be connected. The speed and direction for the Tub and Conveyor can be set directly from the two front panel knobs. The display will show the engine RPM and the percent of signal drive for the Tub and Conveyor proportional valves. The valve drive display is preceded by a + or - to indicate direction. The manual mode is also used to set the initial Tub and Conveyor speed when operating in the auto mode. The normal procedure is to use the manual mode to *preset* the conveyor and tub speeds to their most typical levels then switch the control to the auto mode. Each time the system is powered up the DS602 will start with the tub and conveyor at the *preset* speeds.

**Automatic mode** is used to implement the horsepower limiting feature. In order for the auto mode to function properly the RPM sensor and the industrial switches must be installed. The DS602 will regulate the Tub speed between the two RPM set points. When the engine RPM drops below the maximum RPM set point, the Tub speed will ramp down in a way that is proportional to the decrease engine RPM. Likewise, as the RPM increases, the tub speed will increase. If the RPM should go below the RPM minimum set point the Tub will reverse for a preset amount of time. This auto-reverse feature is designed to clear out the cutter heads. Once the time out is complete and the RPM is back above the minimum set point the Tub speed will ramp back up in the forward direction.

The **Conveyor speed** is electrically independent of the Tub speed. The conveyor will operate regardless of the engine RPM. In the manual mode the Conveyor speed is set via the panel knob and in the automatic mode the speed and direction is set via the industrial switch on the operator's panel.

There are four **industrial switches** (re: DS602C2) mounted on the operators panel. They allow you to select the forward / off / reverse for both the Tub and the Conveyor. The speed can be changed with the up/down switches. The rate at which the speed is changed is 10% per second. ie. hold the Tub speed switch in the increase direction for 2 seconds and the speed will increase the Tub speed by 20%. If you switch from forward to reverse the DS602 will first ramp the valve down then back up so as not to jerk the hydraulic motors.



## Programming

**SAFETY NOTE:** Before making changes to the program you must first check the tub and conveyor areas to make sure that no personnel are within the operating region. Making changes to the program can result with unexpected movements to the tub and/or conveyor. Use caution and protect against injury to other personnel by keeping everyone clear of the equipment.

Turn the power switch past the man and auto positions over to the **Prog.** position. Using the selector switch to the right of the display you can select the parameter you wish to modify. Each position of the program selector switch will have a display that helps explain the function you will be adjusting. Some selections have only one parameter and other selections have two parameters to change. When there is more than one variable to be changed the active one will flash. If you wish to select the other variable tap (once) the **enter** button and the other variable will begin to flash. You can move back and forth between any two variables by tapping the **enter** button. Use care not to move either of the knobs while tapping the enter button. The controller may interrupt the knob movement as a change to the selected parameter and save your unwanted change.

To **change** or modify any given parameter use the following procedure:

1. Select a parameter using the program selector switch.
2. Tap the enter button to highlight the desired variable on the display. (flashing)
3. Press and hold the enter button while using the lower right knob (Tub speed) to adjust the flashing variable until it reads the value you want.
4. Release the enter button, the value is saved into memory.

Note, When adjusting the min. and max. trims for the Tub and Conveyor valves remember the **hydraulic valves will be active**. Holding the enter button and adjusting the Tub speed knob will directly change the speed of the selected valve, (Tub or Conveyor). This feature allows you can accurately adjust the valve trims by allowing you to immediately observe the result.

The minimum trim is adjusted so that the Tub or Conveyor just starts to move. When adjusting the max. trim there is a tendency to set it too high. This is because the max. trim is set where there is no further increase in Tub or conveyor speed. It's easy to set this parameter too high. Below is a typical curve for a proportional valve;

### Program parameters

The factory presets each of the program values. However some fine tuning in the field may be needed.

- |   |                                |
|---|--------------------------------|
| 1. <b>RPM</b> , pulse per revolution of the engine RPM sensor | 1 - 60 pul/rev                 |
| 2. <b>Tub</b> , min and max valve trim points.                | 1 - 99 % for both min and max. |
| 3. <b>Conveyor</b> , min and max valve trim points.           | 1 - 99 % for both min and max. |
| 4. <b>Ramp</b> , valve ramp control, fwd and rev              | .1 sec. to 5.1 sec.            |
| 5. <b>SP</b> , upper and lower RPM set points                 | 1000 to 2000 rpm               |
| 6. <b>Reverse Time</b> , sets the auto reverse time out       | 0 to 20 sec.                   |

# (the pound symbol) is used to reserve a place on the selector switch for an option.

If no option is available the display will inform the user.

Don't forget to place the power switch back to the auto position and reset the two speed knobs to the desired preset levels.