The governor drive shaft may be rotated in either direction. However, the governor relief valve assembly must, when viewing the governor from the nameplate end, be on the left if the governor is rotated clockwise (when viewed from above). The relief valve assembly must be on the right for counterclockwise rotation of the drive.

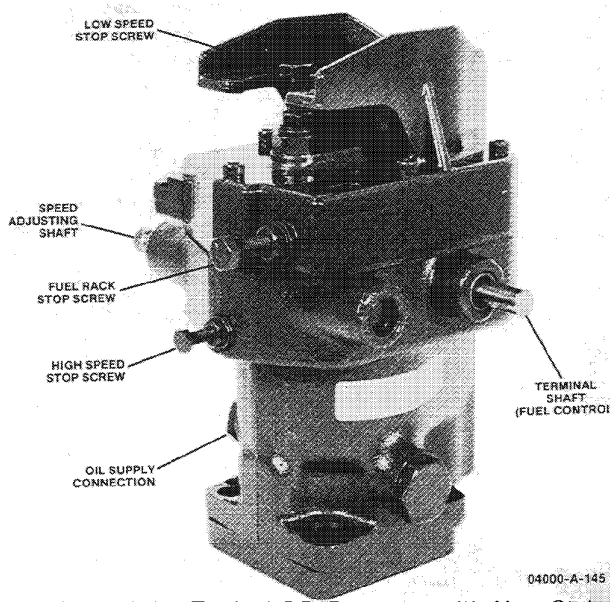

Figure 1-1. Typical SG Governor with New Style Cover

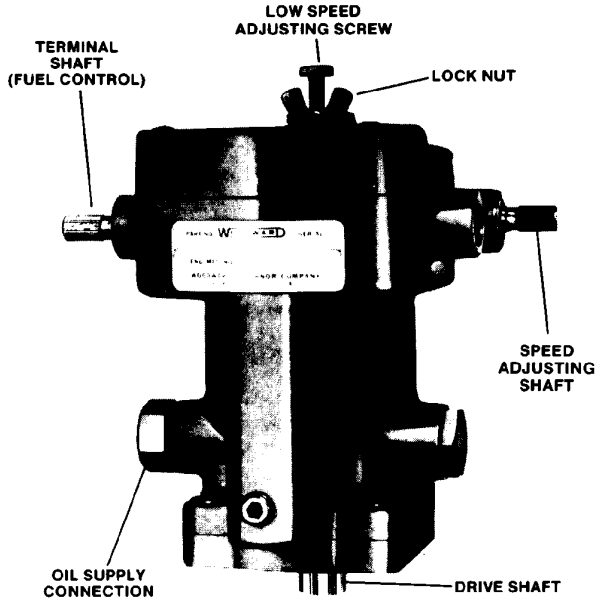

Figure 1-2. Early Type SG Governor

Speed Adjustment

The speed adjusting shaft is used to set the governor for the desired running speed. Low speed and high speed stop screws are provided to limit the speed range of variable speed governors. If the engine is to be operated at one speed setting, the stop screws may be used to lock the position of the speed adjusting shaft.

The terminal shaft may extend on either or both sides of the governor. Shutdown of the engine can be accomplished by turning the speed adjusting shaft below the idle speed setting position.

Speed Droop Adjustment

Speed droop adjustment is provided inside the governor. The droop setting required to gain stability varies with each installation; in most instances it must be set to increase unit speed two or three percent over the terminal shaft rotation used from rated power output at rated speed to zero power output. The range of adjustment is from one-half of one percent to approximately seven percent over the full 36° available travel of the governor terminal shaft.

Auxiliary Features (Optional)

Speed Adjusting Motor

The SG governor can be fitted with a speed adjusting motor to enable the switchboard operator to match the frequency of an alternator with that of other units or a system before synchronizing, and to change load distribution after synchronizing. Two types of motor are available.

The Bodine motor is of the split field, series wound, reversible type (see Figures 3-8and 3-9). It is available in all standard voltages.

The Pittman motor is of the permanent magnet type 12 or 24 Vdc (see Figures 5-3 and 5-5). When motor supply voltage is other than 12 or 24 Vdc, the following control boxes are available for conversion to 24 Vdc:

- 24 Vdc P/N 8272-515
- 110 Vdc P/N 8272-518
- 110 Vdc P/N 8272-516
- 220 Vdc P/N 8272-517

A manual speed adjusting knob with friction clutch assembly is included on units fitted with a speed adjusting motor.

Vibration Attenuating Ballhead Assemblies

A spring-driven oil-damped ballhead assembly (Figure 5-8) may be used in SG governors in place of the standard solid ballhead assembly where it is necessary to overcome undesirable torsional vibrations transmitted from the engine drive to the governor ballhead.

Subcap Assemblies

Different subcap assemblies are available to match the particular needs of the SG governor installation (see Figures 5-7 and 5-12). Figure 5-7 illustrates the subcap used for an installation with a linear output, Figure 5-12 illustrates a rotary output with an internal return spring. Subcaps usually include a fuel-rack stop screw.

Chapter 2.
Principles of Operation

A schematic arrangement of a typical SG governor is shown in Figure 2-1.

As described earlier, the governor uses engine oil as a control medium and does not have an independent sump. The engine oil enters the governor at the relief valve, drops down into the cavity on the suction side of the governor oil pump, and is carried by the pump gears around to the pressure side of the pump. If the supply of pressure oil is greater than is required for governing purposes, the governor pump will build up pressure until the relief valve plunger is pushed to the right against the force of the relief valve plunger spring. The governor pump will then recirculate the oil within the governor.

If pressure oil is used for governing purposes, the pressure will be reduced and the spring will move the relief valve plunger to the left. The recirculating passage is thus blocked so that operating pressure is maintained.

The pilot valve plunger controls the movement of the power piston by directing oil to and from the area beneath the power piston. The power piston, operating through the power piston pin and terminal lever, positions the terminal shaft to which the engine fuel linkage connects.

When the governor is running on-speed, the control land of the pilot valve plunger covers the control port of the ballhead bushing, and the power piston remains stationary.

If the engine load is increased, the governor speed decreases, and speeder spring force—now greater than the lifting effect of the centrifugal force developed by the rotating ballarms—pushes the pilot valve plunger down. Pressure oil is directed to the area under the power piston and pushes the piston up. The power piston and pin rotate the terminal lever and terminal shaft in the direction to increase fuel.

Note that, as the terminal lever rotates in the “increase fuel” direction, the speed droop pin is raised. The right end of the floating lever pivots about the speed adjusting lever pin as the left end of the lever is raised. Raising the left end of the floating lever raises the spring fork and decreases the speeder spring force. Thus, the governor ballhead is enabled to re-center the pilot valve plunger at lower speeds as fuel is increased, a characteristic described as “speed droop”. Closing the control port stops further movement of the power piston simultaneously with return of the engine to the lower speed, a speed determined by the new speeder spring force.

If the engine load is decreased, the governor speed increases and the ballarms lift the pilot valve plunger against the downward force of the speeder spring. The uncovered control port in the ballhead bushing connects the oil under the power piston to sump. The absence of pressure under the power piston allows the external spring force to rotate the terminal shaft and terminal lever in the “decrease fuel” direction.

When moving in the decrease fuel direction, the terminal lever lowers the speed droop pin. The floating lever lowers the spring fork to increase the speeder spring force. The increase in speeder spring force re-centers the pilot valve plunger, and requires an increase in speed to keep it centered. Closing the control port stops further movement of the power piston simultaneously with return of the engine to the higher speed required by the higher spring force.