OVERSPEED TRIP MECHANISM

Figure 1 shows the overspeed trip mechanism which automatically closes the throttle valve, thereby shutting down the turbine, if the speed increases to approximately 10% above normal.

As shown in the illustration, the trip weight "8" is carried in a container "3" which is screwed into a hole drilled perpendicularly to the axis of rotation in an overspeed trip body attached to the shaft. The center of gravity of the weight is slightly offset from the axis of rotation, and normally it is held in place by the compression spring "7" and the retainer "9". If the speed of the turbine increases to the point for which the mechanism is set to operate (approximately 10% above normal) the weight "8", due to its increased centrifugal force, overcomes the compression on the spring "7" and moves outward, striking the trip finger "1". The movement of the trip finger disengages the latch plates "28", thereby allowing the spring "23" to pull the weight "25" toward the right. This movement causes the weight to strike the face of the lever "24" with sufficient force to actuate the throttle valve tripping mechanism, thereby shutting down the turbine.

The mechanism can be tripped by hand by striking the hand trip lever "18", which disengages the latch plates "28" thus closing the throttle valve in the same manner as described. Tripping by hand, however, tests only the trip linkage and does not test the overspeed trip weight and spring adjustment.

When this mechanism has operated, it must be reset by hand. This is accomplished by pushing in on the resetting lever "16" until the latch plates are again engaged. The resetting, of course, cannot be done until the turbine speed has decreased sufficiently to allow the overspeed trip weight "8" to return to its normal position.

The turbine should be overspeeded occasionally to check the speed at which the weight moves out and actuates the trip linkage. This test should be carried out in the following manner:

1. Close the throttle valve until the speed drops below normal. The governing valves will then be wide open. Place blocks under the valve operating lever to hold these valves open.

2. Open the throttle valve slowly, carefully watching the tachometer, and increase the speed to the tripping point. During this test, an operator should stand by, ready to trip the mechanism by hand instantly, if it does not trip automatically at approximately 10% overspeed.

If the weight fails to move out at the correct speed, the unit should be shut down and all parts inspected. Make sure that the weight "8" is not sticking in the container and that the spring is not fouled in any way. The linkage should also be inspected to see that all parts work freely. The overspeed test should again be run, and if the same trouble results, it is evident that the compression of the spring "7" is not correct and should be changed as follows:

1. In order to increase the tripping speed, insert thin liners "5" (.010 to .050 thick) between the spring seat "6" and the container liner "2" so as to increase the spring compression.

2. In order to decrease the tripping speed, remove liners from between the container liner and the spring seat. In case there are no liners, grind the end of the spring squarely, just enough to obtain the desired decrease in compression.

When making these adjustments, it is important to place the liners between the container liner "2" and the spring seat "6" and not between the spring and the collar on the end of the weight "8".

The bracket "12" is so designed that when desired, a low oil pressure trip and/or a solenoid may be mounted on it so that they may operate the trip mechanism by striking the hand trip, lever "18" or the trip lever "33" which is furnished only when a solenoid trip is provided.

In resetting the overspeed trip linkage, the curve segment on the resetting lever "16" contacts the low oil pressure trip rod moving it in, thus resetting the low oil pressure trip. At the same time the lever contacts the resetting segment "26" moving it downward until the latch plates "28" are engaged.

The following list has been compiled to facilitate ordering spare or renewal parts by item number and name, together with the serial number of the turbine.

Item No.	Name of Part
1	Overspeed Trip Finger
2	Overspeed Trip Weight Container Liner
3	Overspeed Trip Weight Container
4	Overspeed Trip Weight Container Lockwasher
5	Overspeed Trip Weight Spring Adjusting Liners
6	Overspeed Trip Weight Spring Seat
7	Overspeed Trip Weight Spring
8	Overspeed Trip Weight
9	Overspeed Trip Weight Retainer
10	Overspeed Trip Body
11	Gasket(1/32 thick)
12	Overspeed Trip Mechanism Bracket
13	Gasket (1/32 thick)
14	Fulcrum Block
15	Resetting Lever Spring
16	Resetting Lever
17	Hand Trip Lever Spring
18	Hand Trip Lever
19	Overspeed Trip Rod Clevis Pin
20	Overspeed Trip Rod Clevis
21	Overspeed Trip Rod
22	Overspeed Trip Rod Spring Seat
23	Overspeed Trip Rod Spring
24	Throttle Valve Trip Lever
25	Overspeed Trip Rod Weight
26	Overspeed Trip Resetting Segment
27	Overspeed Trip Resetting Segment Fulcrum Pin
28	Overspeed Trip Resetting Segment Latch Plates
29	Fulcrum Pin
30	Overspeed Trip Mechanism Support End Cover
31	Hand Trip Lever Shaft Collar
32	Resetting Segment Fulcrum Pin Torsion Spring
33	Trip Lever (when solenoid is used)
34	Hand Trip Lever Shaft Collar
35	Trip Lever Spacer Bushing Shims
36	Trip Lever Spacer Bushing

Overspeed Trip Mechanism

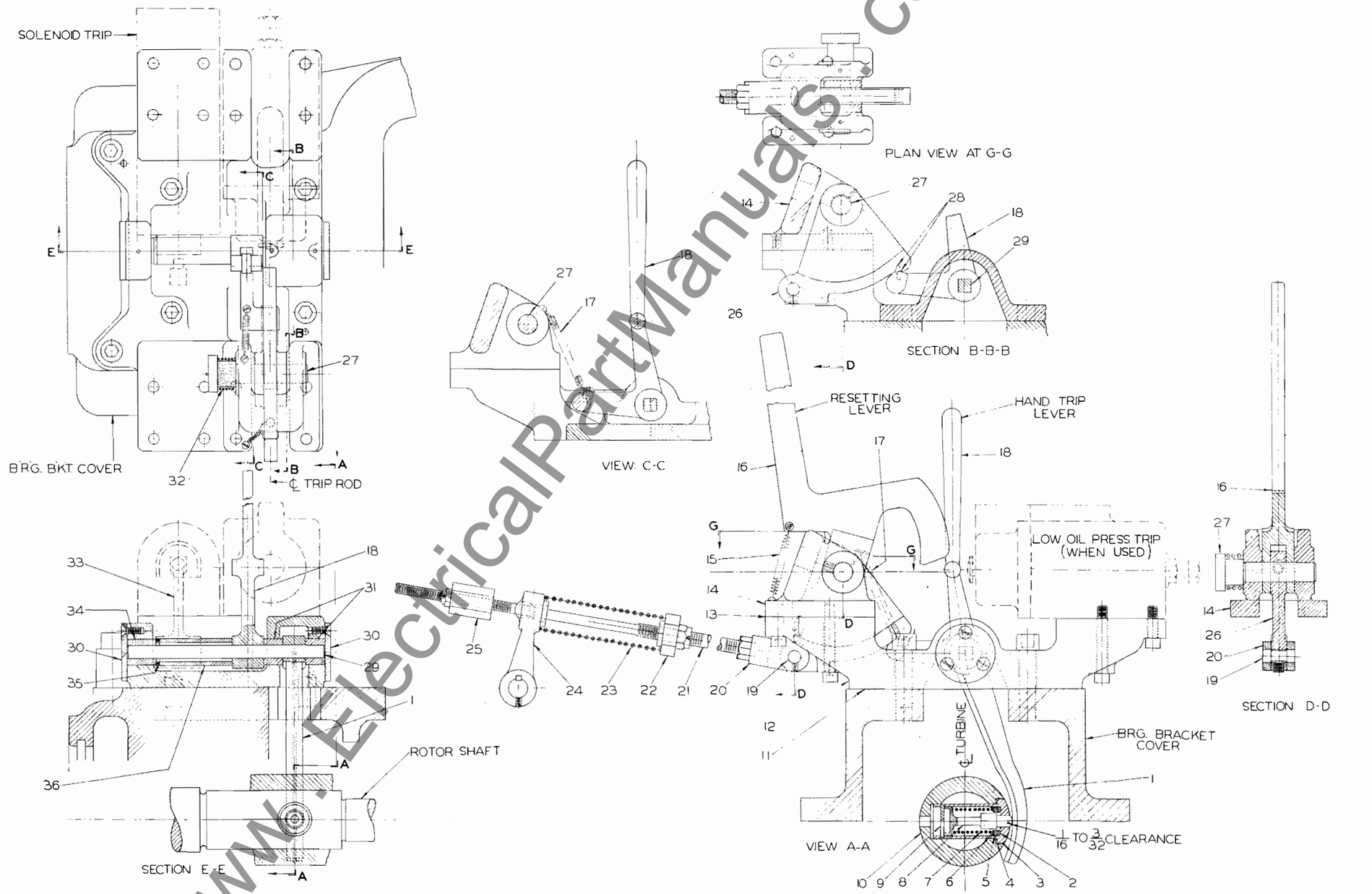

Figure 1