

## Troubleshoot circuit and fix fault

### Does this solve the problem?

- 1] Yes
- 2] No
- 3] I don't know

- **Explanation**

Measure continuity across switch (S10) terminals 21-22 (NC) while activating the switch. If the signal does not open and close with the switch, the switch is bad and should be replaced.

Measure continuity across vibration ball switch cable (W502), check all wire terminations for looseness or corrosion and address any issues found. Check digital input 500 on TOI U01. If no faults are found in the circuit, including the switch, cable and terminations, it is possible that the TOI is faulty.

Relevant spare parts	
Description	Item No.
Switch Assembly GC-SUIZ-AD	<a href="#">60106337</a>
TOI-II INTF. w. EXT. w. POC. (DIP1-ADR2)	<a href="#">60015648</a>

## Identify cause of vibration in nacelle, fix and replace vibration ball in holder

### Does this solve the problem?

- 1] Yes
- 2] No
- 3] I don't know

- **Explanation**

There can either be a minor cause for this alarm i.e. Service personnel have handled the vibration ball recently and it has fallen off its holder, a problem in the vibration ball circuit, bad thyristor or TAC 40 trigger board causing this alarm etc. or a very serious cause i.e. damaged blade, gearbox, generator etc.

If the vibration ball coming out of its holder cannot be attributed to service personnel, circuit or fault during grid connection, then it is likely a very serious component issue that has caused the ball to come loose. Do not reset the turbine until you are absolutely sure there is no damage to the turbine or the cause of the alarm has been identified and remedied.

Check the alarm log for pitch, gear, yaw, generator, tower (TAC 84 Lateral and Downwind) or blade (TAC84 Edgewise) vibration alarms recently. Any alarms regarding these main components/systems could be an indication of the source of the vibration.

If the alarm occurred during start-up, while connecting to the grid, the cause could be a faulty thyristor or TAC 40 trigger board. Evidence of this should be visible in the alarm log, along with the vibration error. Investigate any other alarms occurring in conjunction with this alarm.

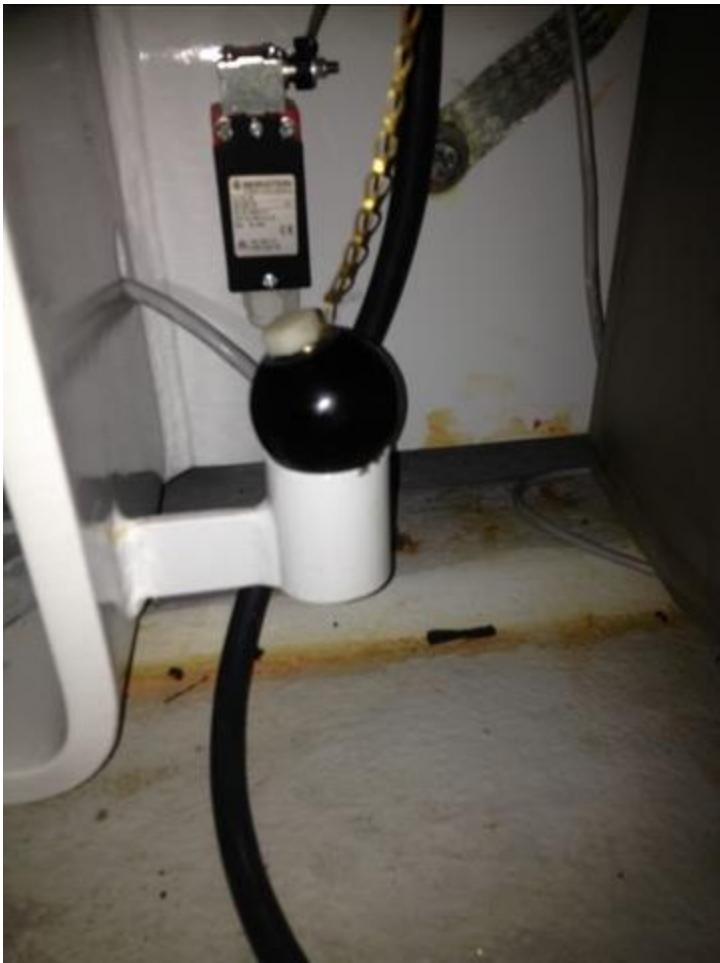
Upon approaching the tower, investigate the rotor assembly. Inspect each individual blade for abnormalities; also inspect a large area around the tower base for debris from the blades. Ensure that the blades and hub are not damaged before entering the turbine. If the rotor is freewheeling, listen for abnormal noise.

Upon entering the turbine and into the nacelle, inspect for signs of debris or oil and inspect the yaw ring, brake disk, yaw brake calipers, yaw gear pinions etc. for any damage or debris.

Upon entering the nacelle, perform an overall visual assessment of the drivetrain and machinery frame, look for obvious damage, movement or any abnormalities. Next, make a closer inspection of the main bearing, rotor bolts, main shaft, shrink disk, gearbox, gear stays and bushings/bolts, HSS coupling, generator, generator feet- essentially the entire drive train. Inspect the rear machinery frame bolts to the front machinery frame **PRIOR** to entering the rear of the nacelle. If any abnormalities are found, contact the site manager and if needed the local Engineering department for instructions on how to proceed.

Finally, inspect the vibration ball. If the ball is not in its holder, continue to investigate the drivetrain.





If nothing can be found, replace the vibration ball into its holder. If the HSS shaft brake has been applied, release the brake momentarily to allow the rotor to slowly freewheel. Listen for any abnormal noise from the drivetrain, rotor/main shaft connection or any other part of the nacelle. Closely inspect any area emitting any abnormal noise. With all safety precautions in place and the HSS lock engaged, an internal visual inspection should be performed on the gearbox to rule out any gearbox damage.

Yaw the turbine momentarily and listen for any abnormal sound from the yaw ring, yaw brakes, yaw motors/gears and the yaw bearing.

If a cause for the alarm cannot be identified, or attributed to service personnel, contact the site manager and local Engineering department for instruction on how to proceed.

