BrakeTech SBC-1300 Spring-Applied Brake Caliper

Professional Maintenance Manual - Rotor Braking System

Component Type: Spring-applied hydraulic brake caliper

EAN: 50311982

Compatible Turbine Model: AeroVolt AV4000 High-Speed Wind Turbine

Dimensions: 280mm × 240mm

Weight: 9200g

Sensor Interfaces: sensor_B, sensor_T, sensor_R

Stock Location: Italy/Torino

Component Overview

The BrakeTech SBC-1300 is a heavy-duty spring-applied, hydraulically released brake caliper used to halt the turbine rotor during maintenance, overspeed events, or emergency stops.

It applies immense clamping force through hardened steel pads onto the turbine disc. The caliper uses redundant hydraulic releases and preload springs,

ensuring default engagement during pressure loss. It is integrated with Sensor_B (brake status), Sensor_T (temperature), and Sensor_R (release pressure feedback).

Symptoms of Brake System Degradation

- Delayed or ineffective braking in SCADA logs

- Elevated brake temperatures during standard operation

- Visible pad wear or oil leakage around caliper base

- Abnormal noise or rotor drag during idle state

Brake Fault Codes and Service Instructions

SBC-007

Description: Sensor_B reports brake engaged but rotor speed remains >5 RPM.

Resolution: Check pad wear or oil contamination. Confirm hydraulic release valve integrity and spring tension.

SBC-021

Description: Sensor_R pressure below 80 bar while in release mode.

Resolution: Recharge hydraulic accumulator. Inspect for line blockage or degraded fluid viscosity.

SBC-039

Description: Brake temperature exceeds 95°C during braking cycle.

Resolution: Allow cooldown. Check friction material and rotor disc for glazing. Replace if warped.

SBC-044

Description: Pad wear sensor triggered - thickness <3 mm.

Resolution: Replace pads immediately. Inspect caliper piston travel distance and reset wear indicator.

SBC-066

Description: Hydraulic release response delay >1.5s.

Resolution: Bleed hydraulic line and inspect solenoid valve function. Replace if sluggish.

SBC-082

Description: Caliper does not return to full open position.

Resolution: Inspect spring assembly for binding. Lubricate guide pins and test manual release.

SBC-097

Description: Sensor_T drift between paired calipers >12°C.

Resolution: Recalibrate Sensor_Ts. If discrepancy persists, replace affected sensor. Verify thermal coupling.

Maintenance Frequency and Brake Lifecycle

Inspect every 2,000 turbine hours or after every emergency stop. Replace brake caliper after 12,000 hours or 3 pad replacements.

Caliper Removal and Safety Replacement Steps

1. Park turbine, engage rotor lock, and confirm SCADA brake command is disengaged.

2. Deactivate hydraulic pressure supply and drain residual line pressure safely.

3. Access brake caliper zone at main shaft rear. Use platform lift or nacelle access hatch.

4. Inspect for oil leaks, burn marks, or scoring on brake disc. Document any visible anomalies.

5. Disconnect sensor wiring for B, T, and R with ESD protection. Label connectors clearly.

6. Unbolt caliper from its mount using heavy-duty tools. Use hoist or pulley system to support caliper weight.

7. Inspect spring pack, return guides, and pistons for corrosion or misalignment. Replace if damaged.

8. Mount new SBC-1300 caliper in exact orientation. Torque bolts to 85 Nm using cross pattern.

9. Reconnect hydraulic line and perform leak test at 120 bar. Reattach sensor wiring and shield cable ends.

10. Initiate SCADA brake release test. Confirm full retraction and zero drag on brake disc.

11. Perform emergency brake test at low rotor RPM. Verify response time <1.2s and full stop within specs.

12. Check pad contact area for uniform wear. Log disc temperature with Sensor_T.

13. Log all actions, torque values, and pressure readings. Photograph installation site and serial plate.

14. Clear brake fault codes in SCADA and monitor first 3 hours of rotor activity for anomalies.