

Replacement Parts Bulletin

For Line Backer™ Circuit Switchers

Do you have Line Backer™ circuit switchers on your system?

Have they given you problems? Do they still?

Don't know where to turn for help?

If you answered yes to any of these questions then Southern States has the solutions that you are looking for. We provide a full range of parts for retrofits/upgrades/refurbishments of existing Line Backers™ as well as field service support, if desired, during the installation of these parts and the adjustment of your Line Backer™.

In 1997, Southern States licensed the horizontal circuit switcher design from Siemens and can provide new components, utilizing the latest technology, which will upgrade your existing Line Backer™ into a modern, fully functional, reliable circuit switcher. While solutions offered by other manufacturers involve extensive rework of the installation, often including replacement of the existing support structure and its foundations, Southern States parts are physically interchangeable with your existing equipment allowing you to reuse what does not need replacement. Line Backers™ manufactured before November, 1983 have none of the design improvements detailed in the following pages, making them strong candidates for a complete upgrade or outright replacement with new horizontal circuit switchers, reusing the support structure and foundations of the existing Line Backer™.

So, if your system has one or more Westinghouse, Siemens, or Siemens-Allis type MFB, CP, CPS, or CPS-VB Line Backer™ circuit switchers contact Southern States and let us put our parts and service support to work for you.

As with all Southern States products, the furnished parts come with our standard 5-year warranty.



PRODUCT HISTORY

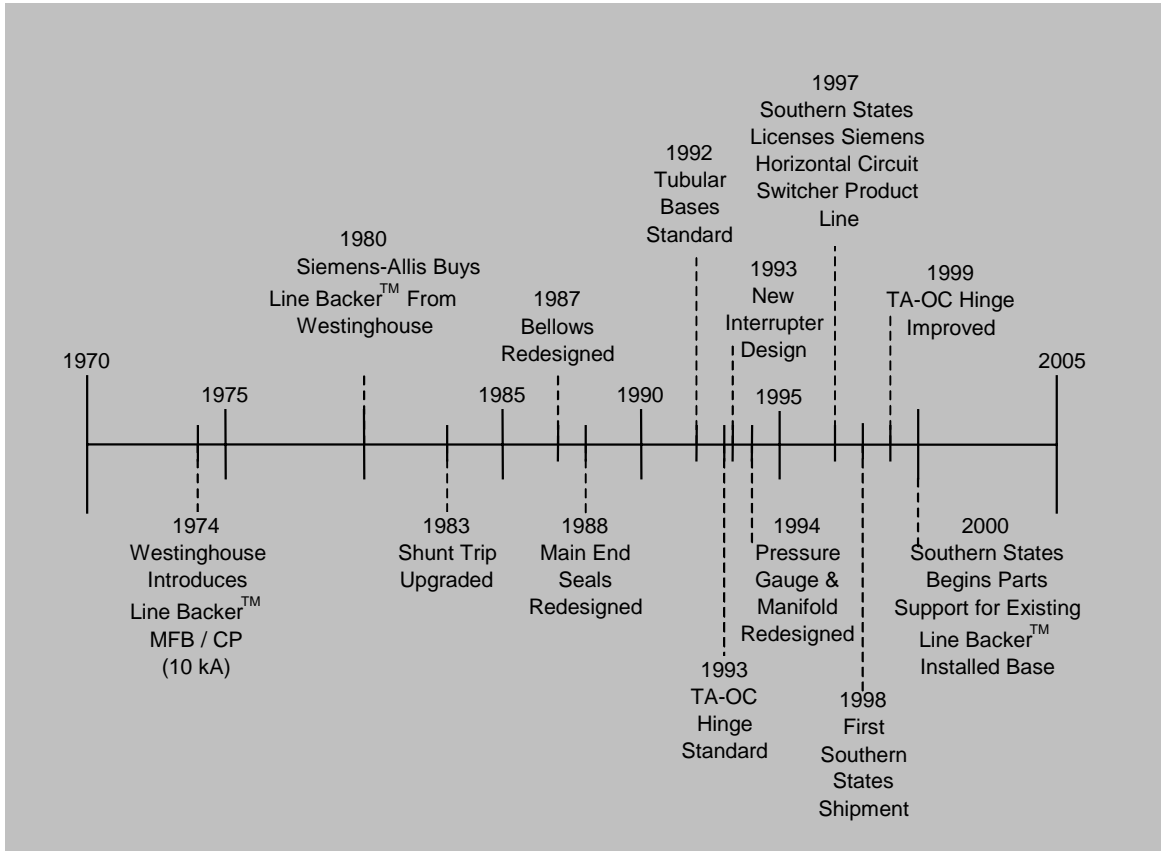


Figure 1 – Horizontal Circuit Switcher Timeline

Manufacturer	TYPE	
	Horizontal Non-Blade	Horizontal w/ Blade
Westinghouse	CP	MFB
Siemens-Allis	CP	MFB
Siemens	CP, CPS	MFB, CPS-VB
Southern States	CSH	CSH-B

Westinghouse introduced the MFB and CP Line Backer™ line of circuit switchers to the market in 1974. In 1980, Siemens-Allis purchased the Line Backer™ product line from Westinghouse, continuing to offer the MFB and CP. They later introduced the CPS and CPS-VB circuit switchers with higher interrupting ratings. Product quality problems drove Siemens to make major design changes, which resulted in a totally re-engineered product by the mid-90's.

Southern States enters the circuit switcher market in 1998

In 1997, Southern States recognized the market potential for a high quality horizontal circuit switcher and decided to purchase the license to the Siemens design. In 1998, after focusing on various design and manufacturing improvements, Southern States introduced the CSH and CSH-B circuit switchers. These products share a physical resemblance to the original Line Backer™, but that is where the similarity ends.

The information contained herein explains upgrade and replacement opportunities for utilities that own Line Backers™ or any other manufacturer's horizontal circuit switcher.

SHUNT TRIPS

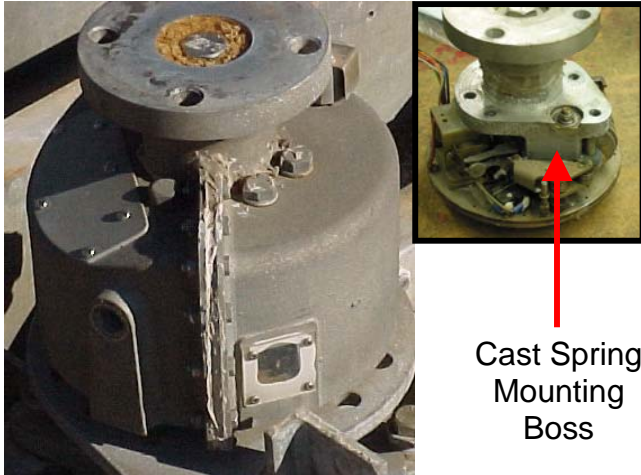


Figure 2 – Pre-November 1983 Shunt Trip Design



Figure 3 – Current Shunt Trip Design

Identified Problems:

- Over time the seals for the two-piece casting (Figure 2) allowed moisture to enter the shunt trip resulting in component corrosion and electrical shorts. This led to nuisance operations or the disabling of the desired high speed tripping capability of the interrupter.
- The pre-November 1983 shunt trip design utilized a cast spring mounting boss (Figure 2). Multiple operations and corrosion caused by exposure to moisture can cause a fatigue crack in the boss that propagates throughout the casting, disabling the shunt trip.

Recommended Actions:

- Replace your existing shunt trip with the current design (see Figure 3) that is a bolt-for-bolt replacement.

Note:

If your circuit switcher has the original shunt trip design and you have not done any other upgrades then your circuit switcher is susceptible to all of the potential issues mentioned in this service bulletin.

Replacement Parts:

Part Description	Part Number
Shunt Trip Assembly – 125 VDC	08125854
Shunt Trip Coil Only – 125 VDC	08125836
Shunt Trip Assembly – 48 VDC	08125855
Shunt Trip Coil Only – 48 VDC	08125837

INTERRUPTER / DRIVER



Figure 4 – Old style gauges and manifold



Figure 5 – New style gauge and manifold

Identified Problems:

- Leaking from the bellows, flat gasket seals, gauge, rupture disk, or the epoxy that seals the manifold and its components to each other and to the interrupter may cause insufficient SF₆ gas pressure, resulting in the inability to clear system faults.
- Mechanical failure can occur inside the interrupter disabling its fault protection capability.
- The UV rays of the sun cause fading of the old style pressure gauge face making it impossible to verify the SF₆ level inside the interrupter (see Figure 4).

What Interrupter Do I Have?

The best way to determine what interrupter is on your circuit switcher is from the data on the nameplate of each circuit switcher base. A visual inspection of the pressure gauge can also identify your interrupter. Interrupters with a black pressure gauge (see Figure 4) are the oldest and have the most problems. Interrupters with the newest gauge (see Figure 5) have all of the design improvements.

Recommended Actions:

Upgrade your interrupter/driver with a bolt-for-bolt replacement that increases the performance and reliability of your circuit switcher.

- As a bolt-for-bolt replacement, the new interrupter/driver will have the same pad height and physical length as the existing unit allowing you to increase your fault interrupting capability without replacing the entire circuit switcher.
- The internal parts of the interrupter have been fully upgraded, increasing mechanical performance and reliability.
- Flat gaskets have been replaced by compression o-rings as the main end seals.
- The new gauge and manifold uses compression o-rings instead of epoxy to provide a significantly better gas seal.

Replacement Parts:

Part Description	Part Number
Interrupter / Driver – 350 kV BIL	08126562
Interrupter / Driver – 550 kV BIL	08126260
Interrupter / Driver – 550 kV BIL with Bypass Switch provision	08126388

Part Description	Part Number
Interrupter / Driver – 650 / 750 kV BIL	08126261
Interrupter / Driver – 650 / 750 kV BIL with Bypass Switch provision	08126468
Interrupter / Driver – 900 kV BIL	08126262

HINGE / BLADE



Figure 6 – “Dog leg” style hinge

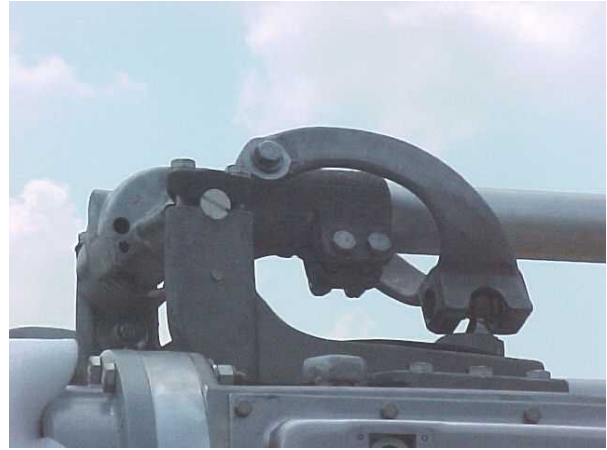


Figure 7 – TA-OC style hinge

Identified Problems:

- A geometric dead spot exists in the “dog leg” style hinge (see Figure 6). If the blade stops in the dead spot or seizes in any position, one or more hinge components may fail. The potential for failure is magnified because the aluminum pivot is vulnerable to oxidation which causes the hinge to seize, resulting in a component failure.

How Do I Determine If My Hinge Has Problems?

All MFB, CP, CPS, and CPS-VB units manufactured before January 1993 have a “dog leg” style hinge. All units manufactured after January 1993 have a TA-OC style hinge (see Figure 7).

- If your blade jumps or bounces as it closes then a problem definitely exists.
- All “dog leg” style hinges on circuit switchers have a geometric dead spot so an upgrade is advisable.

Recommended Actions:

Upgrade to a TA-OC style hinge that has 30+ years of demonstrated reliable performance in the field. Since 1999, the TA-OC style hinge’s cross sectional area has been increased for improved performance under iced conditions. Due to the differences in hinge configuration an upgrade must also include a new blade, as the “dog leg” style hinge’s blade is too short to work with the TA-OC style hinge.

Replacement Parts:

Part Description	Part Number
Hinge Assembly – 38 kV	08125927
Hinge Assembly – 48.3 kV	08125927
Hinge Assembly – 72.5 kV	08125927
Hinge Assembly – 121 kV	08125928
Hinge Assembly – 145 kV	08125929
Hinge Assembly – 169 kV	08125930
Hinge Assembly – 242 kV	08125931

Part Description	Part Number
Blade Assembly – 38 kV	08127394
Blade Assembly – 48.3 kV	08126886
Blade Assembly – 72.5 kV	08124622
Blade Assembly – 121 kV	08124621
Blade Assembly – 145 kV	08124620
Blade Assembly – 169 kV	08124619
Blade Assembly – 242 kV	08124618

MOTOR OPERATOR

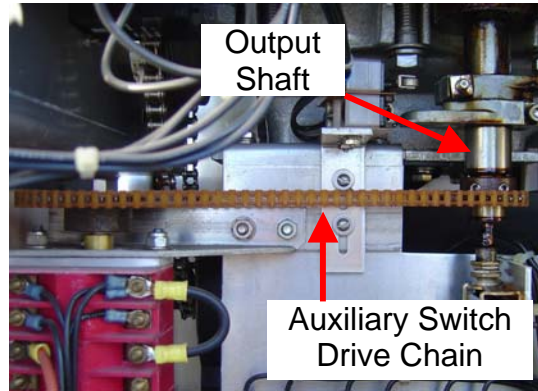


Figure 8 – Shows the output shaft and the nylon auxiliary switch drive chain for the auxiliary contacts

Identified Problems:

- If you have a three-door CM-4, CM-4A, or CM-4AL motor operator then under normal operating conditions grease can seep down the output shaft and into the reversing contactor, potentially causing an uncommanded operation of the circuit switcher. Two-door motor operators do not have this problem because their reversing contactor is located in a different location.
- The nylon auxiliary chain furnished in older CM-4, CM-4A, and CM-4AL motor operators will degrade and break, preventing the auxiliary contacts from changing state and making it impossible to determine, from a remote location, if the circuit switcher is closed or open.

How Do I Determine If My Motor Operator Has a Problem?

- Check to see if you have a nylon auxiliary switch drive chain. If so, inspect your auxiliary switch drive chain to determine if it is brittle or has any “stripped” bushings.
- Next inspect for the presence of liquefied grease on the motor operator drive shaft.

Recommended Actions:

- If you have a nylon drive chain an immediate replacement with our stainless steel drive chain is strongly recommended regardless of condition.
- Replacement of your motor operator with the CM-4AE motor operator is recommended if you are experiencing grease leakage.

Replacement Parts:

Part Description	Part Number
Auxiliary Switch Chain	01980794
Auxiliary Switch Chain Connecting Link	01980795
Electric Motor	
- 48 VDC	01470077
- 125 VDC	01470076
Dynamic Brake Resistor	
- 48 VDC	01490776
- 125 VDC	01490774
Reversing Contactor	
- 48 VDC	01490751
- 125 VDC	01490752

BOLT-FOR-BOLT



Figure 9 – Shows a competitor’s circuit switcher being removed from its support structure.



Figure 10 – Shows the Southern States CSH-B circuit switcher that replaced the competitor’s unit and reused the existing structure and foundations

Would you like to upgrade your existing circuit switcher without having to replace the support structure and its foundations?

Southern States can upgrade any installation’s fault interrupting capability to a full 20 kA by custom engineering our type CSH and CSH-B horizontal circuit switchers to adapt to virtually any support structure and phase spacing regardless of original manufacturer. Reusing the existing support structure and foundations will save on the first cost and total installed cost of your circuit switcher upgrade by reducing outage time and installation time.

If you have existing type MFB, CP, CPS, or CPS-VB Line Backers™ Southern States can replace your entire circuit switcher with a CSH or CSH-B that will have physical dimensions identical to your existing unit for a true bolt-for-bolt replacement. There will be no required reworking of the bus or relocating of conductors.

PARTS, SERVICE, AND SUPPORT

For Service or Support fill out the appropriate information below and
fax to Southern States

COMPANY NAME: _____

CONTACT PERSON: _____

E-mail address: _____

Phone: _____

Fax: _____

Date of transmittal: _____

Type Circuit Switcher: _____

kV Rating: _____

Blade BIL Rating: _____

Interrupter BIL Rating: _____

Continuous Current Rating: _____

Fault Interrupting Rating: _____

S.O. #: _____

Manufacture Date: _____

Type Circuit Switcher: _____

kV Rating: _____

Blade BIL Rating: _____

Interrupter BIL Rating: _____

Continuous Current Rating: _____

Fault Interrupting Rating: _____

S.O. #: _____

Manufacture Date: _____

Additional notes: _____



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