

Design Requirements for Structures or Pedestals to Support Line-Rupter Switches

Line-Rupter Switch supporting structures (or pedestals) are to be designed to support dead weight and to minimize deflections from bending moments. Structures (or pedestals) should limit deflections as follows:

- (a) The deflection under static wind load should not exceed one inch.
- (b) The total of the rotational deflections of the switch-operator (or geared-operating-handle) support and the outboard-bearing support in resisting the switch-operator locked-rotor torque (or the geared-operating-handle maximum output torque) of 21,500 inch-pounds should not exceed 5.0 degrees.

M_{wt} and M_{wl} (see page 2) are the wind moments in the transverse and longitudinal directions, respectively, at each Line-Rupter Switch pole-unit. F_{wt} and F_{wl} are the wind forces in the transverse and longitudinal directions, respectively, at each Line-Rupter Switch pole-unit. For individual pole-units mounted on independent pedestals of height "B," the maximum bending moment at the foundation may be found as follows:

Transverse: $M_{wt} + (F_{wt} \times B)$ (Bending moment from wind acting on pedestal)

Longitudinal: $M_{wl} + (F_{wl} \times B)$ (Bending moment from wind acting on pedestal)

The weight of the bus plus any associated ice load exerts a vertical force on the Line-Rupter Switch terminal pads. This vertical force must not exceed 400 pounds on the terminal pads at either end.

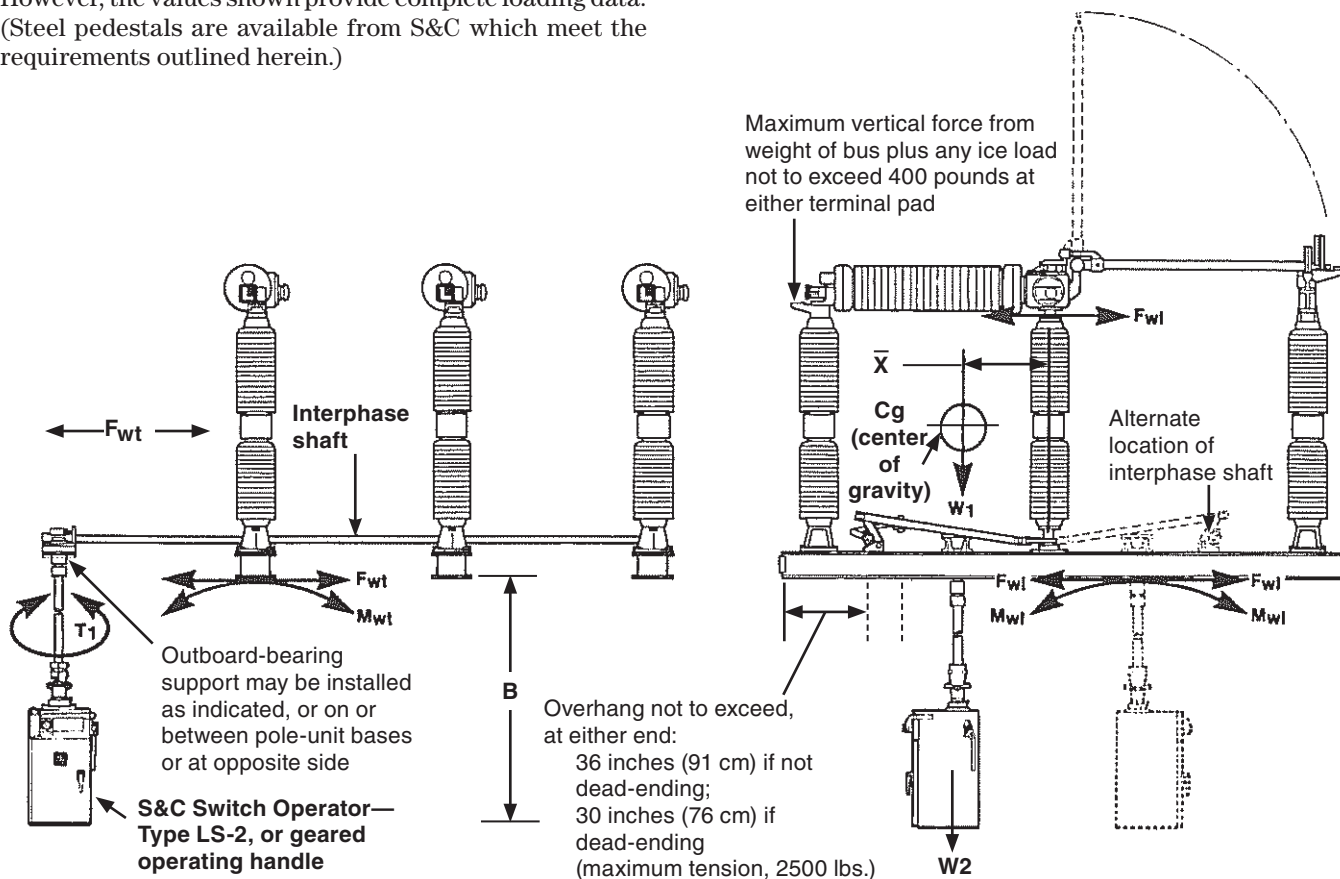


S&C Line-Rupter™ Switch

Upright Mounting

In these loading diagrams, no attempt has been made to indicate a specific arrangement of the supporting structure, since there are many ways in which it can be executed. However, the values shown provide complete loading data. (Steel pedestals are available from S&C which meet the requirements outlined herein.)

For further information on arrangement of the components for a specific installation, refer to the applicable Erection Drawing (ED) supplied by S&C.



Legend:

- B** = Height of mounting pedestal or supporting structure
- F_{wl}** = Static wind force, longitudinal
- F_{wt}** = Static wind force, transverse
- M_{wl}** = Static wind bending moment, longitudinal
- M_{wt}** = Static wind bending moment, transverse
- T₁** = Switch-operator locked-rotor torque
- W₁** = Weight of one Line-Rupter Switch pole-unit
- W₂** = Weight of switch operator
- X̄** = Horizontal distance from centerline of center (rotating) insulator stack to center of gravity

Loading Data^①

Rating, kV	F _{wl} , Lbs.②	F _{wt} , Lbs.②	M _{wl} , In-Lbs.②	M _{wt} , In-Lbs.②	T ₁ , In-Lbs.③	W ₁ , Lbs.② (kg)	W ₂ , Lbs. (kg)	X̄, Inches (mm)
115	200	850	9 250	27 500	21 500	1185 (538)	350 (159)	3¼ (83)
138	230	895	11 850	33 750	21 500	1270 (576)	350 (159)	1½ (29)
161	250	965	14 090	38 550	21 500	1370 (621)	350 (159)	-3⅛ (83)
230	300	1190	19 730	57 950	21 500	1690 (767)	350 (159)	2¾ (70)

① Values shown are for Line-Rupter Switches equipped with station post insulators. Wind force is based on 100-mph (161-kph) wind velocity.

② Per Line-Rupter Switch pole-unit.

③ This is the maximum torque that can be delivered by the geared operating handle or a 125 Vdc LS-2 Switch Operator under extreme ice conditions; the maximum torque output of a 48 Vdc LS-2 operator is 18,000 in.-lbs.