

CONSTRUCTION GUIDELINE

PAGE: 1 of 7

SUPERSEDING: new

EFFECTIVE DATE: January 25, 2008

SEPARABLE CONNECTOR (T-BODY), 150 kV BIL, DEADBREAK**1. Scope**

This construction guideline identifies the material required to install a 600 A (or 900 A), 150 kV BIL, deadbreak, separable connector (T-body) on the end of a piece of primary cable.

The material list includes all the parts necessary to complete an installation. Optional connector accessories and replacement parts are also identified. The material list has been organized to be cable specific.

600 A assemblies use all-aluminum compression connectors. 900 A assemblies require all-copper compression connectors.

The material needed to trifurcate 3/C type cable and seal the exposed tape shield from the trifurcation point to the T-body metallic shield adapter/jacket sealing kit is outside the scope of this guideline. Refer to NSP-110 for this information.

Paper-insulated-lead-covered (PILC) cable and sector cable are outside the scope of this guideline.

Cable preparation work procedures and connector installation procedures are outside the scope of this guideline.

For cable technical data, refer to E6-1.0/NGE-70.

For general cable preparation procedures, refer to U5-2.81/NSP-290.

For cutback lengths and connector assembly and installation procedures, refer to the specific instructions that were provided with the connector.

For connector continuous, fault closing, and short-time current ratings and overload capability, refer to IEEE 386.

Deadbreak connectors are a subcategory of separable connectors, which is a subcategory of dead front cable accessories.

2. Application

A separable connector (T-body) is a fully insulated and shielded system for terminating and electrically connecting an insulated power cable to electrical apparatus, other power cables, or both, so designed that the electrical connection can be readily established or broken by engaging or separating the connector at the operating interface.

The separable connectors described in this construction guideline may be used on the following three-phase, 60 Hz systems:

- 13.8 kV, 3-wire, delta, where load consists of network type transformers with delta-connected primary and grounded wye-connected secondary
- 26.4 kV, 4-wire, solidly-grounded, wye-connected

STANDARDS COORDINATOR

John Shipek

STANDARDS SUPERVISOR

John Barnett

UNIT DIRECTOR

Richard Kent

2. Application, continued

The Seattle neighborhood of First Hill is a network constructed with a mix of 125 kV BIL and 150 kV BIL material and equipment. New installations should incorporate 125 kV BIL connectors, where possible.

Refer to Construction Guideline U5-17.05/NSP-304 for the preferred separable connector system rated 125 kV BIL.

Basic T-body is not equipped with a capacitive test point. Test points are provided by utilizing insulated plugs with test point caps, Stock Number 687270.

This guideline may be used by engineers to design connector systems and create bills of material or by field crews when performing actual installations.

Only qualified electrical workers shall install and operate separable connector systems.

3. Separable Connector Technical Description

voltage class	35 kV
common names	T-Body
	600 amp elbow
	hammerhead
	BLR
SCL Material Standard	6863.25
manufacturers	various
maximum voltage rating (ph-g)	21.1 kV RMS, grounded WYE systems
BIL	150 kV crest
continuous current rating	
with all-aluminum compression connector	600 A RMS
with all-copper compression connector	900 A RMS
short-time current rating	25 kA RMS, symmetrical
IEEE 386 interface	Figure 13

4. General Examples

Example 4.1: T-body installed on one phase of a 3/C, tape shielded type cable. Note: for this type of cable, a jacket seal/metallic shield adapter kit and an 8 inch length of heat shrinkable tubing, Stock Number 737455, is required to seal the elbow, the adapter kit leads, and the tubing installed over the jacketless cable. The cold shrink tube supplied with the seal kit is too short in this application and is not used.



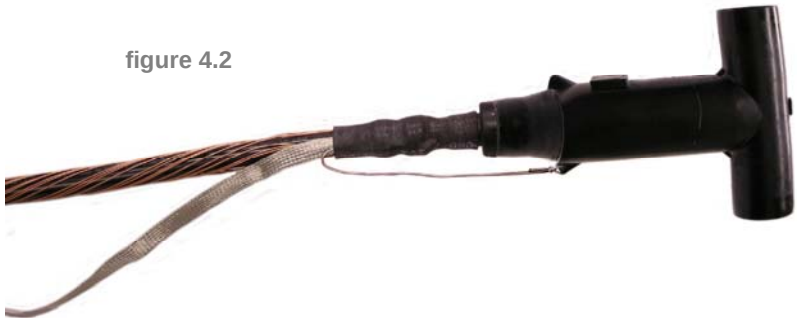
figure 4.1

4. General Examples

Example 4.2: T-body installed on bare, round wire, concentric neutral cable. Note: for this type of cable, a jacket seal/metallic shield adapter kit is required.



figure 4.2



Example 4.3: T-body installed on jacketed, round wire, concentric neutral cable. Note: for this type of cable, a jacket seal/metallic shield adapter kit is required.



figure 4.3



Example 4.4: T-body installed on flat strap shielded type cable. Note: for this type of cable, a jacket seal/metallic shield adapter kit is required.

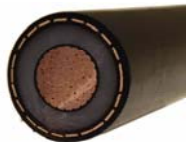


figure 4.4



Example 4.5: T-body installed on drain wire shielded type cable. Note: for this type of cable, a jacket seal/metallic shield adapter kit is required. Drain wire shielded type cable is no longer purchased. Example is provided for comparison only.



figure 4.5



CONSTRUCTION GUIDELINE

Separable Connector (T-Body), 150 kV BIL, Deadbreak

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5. Material List, Table 5.1

Stock Number	Rated Circuit Voltage, kV		Size, AWG/kcmil	Shape	Shield Type	required	required	required	required - select one		Table 5.1 Notes
	Type					T-Body (only) Stock No.	Cable Adapter Stock No.	Additional Part Stock No.	600 A Comp. Conn. Stock No.	900 A Comp. Conn. Stock No.	
1	2	3	4	5	6	7	8	9	10	11	12
613212	5	1/C	#6	compressed	tape						c
613222	5	1/C	350	compressed	tape						
601025	5	1/C	500	class B	DW						
613522	15	3/C	#1	compressed	tape						
613523	15	3/C	#1	compressed	tape						
613520	15	3/C	2/0	compressed	tape						
613521	15	3/C	3/0	compressed	tape						
613526	15	3/C	3/0	compressed	tape						
613530	15	3/C	350	compact	tape						
613531	15	3/C	500	sector	tape						b
010128	15	3/C	500	compact	tape						
613532	15	3/C	500	compact	tape						
623640	15	1/C	500	compact	tape						
012735	15	3-1/C	500	compressed	FS						
613533	15	3/C	750	sector	tape						b
613534	15	3/C	750	compact	tape						
623670	15	3-1/C	1000	compressed	FS						
623650	27	3-1/C+2N	#8	compressed	tape						c
602027	28	1/C	#1	class B	RW/CN	687060	687019	012662	686375	686913	a
613540	28	3/C+3G	#1	compressed	Tape	687060	687019	012662	686375	686913	a d
602025	28	1/C+1N	1/0	solid	RW/CN	687060	687019	012662	687375	686913	a
012098	28	1/C+1N	1/0	solid	RW/CN	687060	687019	012662	686375	686913	a
602044	28	1/C	350	class B	RW/CN	687060	687020	686512	686351	na	a
012099	28	1/C	350	compact	FS	687060	687020	686512	686366	686916	a
613613	28	1/C	350	compact	DW	687060	687020	686512	686366	686916	a
613543	28	3/C+3G	350	compact	tape	687060	687020	686512	686366	686916	a d
012100	28	1/C	500	compact	FS	687060	687025	686512	686362	686917	a
613615	28	1/C	500	compact	DW	687060	687025	686512	686362	686917	a
613645	28	1/C	500	compressed	FS	687060	687025	686512	686362	686917	a
602119	28	1/C	750	compact	DW	687060	687028	686512	686349	686919	a
613618	28	1/C	750	compact	DW	687060	687028	686512	686349	686919	a
974050	28	3/C	750	sector	tape	na	na	na	na	na	b
012101	28	1/C	750	compact	FS	687060	687035	686512	686349	686919	a
012102	28	1/C	1000	compact	FS	687060	687035	686512	686398	686920	a
613619	28	1/C	1000	compact	DW	687060	687035	686512	686398	686920	a
613655	28	1/C	1000	compressed	FS	687060	687035	686512	010136	012128	a
none	35	1/C	350	compressed	tape	687060	na	686512	686351	na	a
623660	35	1/C	750	compact	DW	687060	687030	686512	686349	686919	a
623655	35	1/C	1000	compact	tape	687060	na	686512	686398	686920	a

5. Material List, continued**Table 5.1 Legend:**

na Not a stock item or not available from any source

Table 5.1 Notes:

For 600 A assemblies, select all-aluminum compression connector from column 10. For 900 A assemblies, select all-copper compression connector from column 11.

If a cable adapter requires excessive force to install, halt the procedure and obtain a better fitting adapter. Contact Standards if an error in Table 5.1 is discovered. Cable adapters should be neither loose fitting nor excessively snug.

- a. Required additional part consists of a jacket seal/metallic shield adapter kit that provides cable jacket-to-accessory sealing and grounding.
- b. Separable connectors are not commercially available for sector cable. Connections must be hand taped.
- c. Cable adapters are not commercially available for conductor smaller than #1 AWG.
- d. The material needed to trifurcate 3/C type cable and seal the exposed tape shield from the trifurcation point to the T-body metallic shield adapter/jacket sealing kit is outside the scope of this guideline. Refer to NSP-110 for this information. An 8 inch length of heat shrinkable tubing, Stock Number 737455 is required to seal the tubing over the jacketless cable. The cold shrink tube supplied with the seal kit is too short in this application and not used.

The following figures are provided for general identification.

T-Body, 150 kV BIL (body,
instructions)

Stock No. **687060**

figure 5.1



**Cable adapter, 750 kcmil,
150 kV BIL**

Stock No. **687028**

figure 5.2



5. Material List, continued

Jacket sealing/shield adapter kit standard fault duty (cold shrink tube, mastic seal strips, 5/8-inch by 3/4-inch diameter constant force spring, preformed ground/bleeder wire, Scotch No. 13 semi-con tape, and instruction sheet).

Stock No. **012662**

figure 5.3



Jacket sealing/shield adapter kit high fault duty (cold shrink tube, mastic seal strips, 3/4-inch by 1-1/2-inch diameter constant force spring, U-shaped (double tail) braid, Scotch No. 13 semi-con tape, and instruction sheet).

Stock No. **686512**

figure 5.4



Compression connector, all-aluminum, for 350 kcmil compressed

Stock No. **686351**

figure 5.5



Compression connector, all-copper, for 500 kcmil compact

Stock No. **686917**

figure 5.6



Heat shrinkable tubing, heavy wall, sealant coated, minimum expanded ID 2 inches

Stock No. **737455**

figure 5.7



6. Connector Accessories (Optional)

Refer to Material 6863.27 for a complete list of connecting plugs, insulating plugs, and caps that may be used with this separable connector.

Insulated plug with test point capStock No. **687270**

figure 6

**7. Replacement Parts**

Stock Number	Description, in.
686514	Constant force spring, 5/8 x 0.75 OD relaxed
686516	Constant force spring, 5/8 x 1.00 OD relaxed
012127	Constant force spring, 5/8 x 1.50 OD relaxed

**8. Tools**

Information relating to tool type, die number, and number of crimps is provided with the connector.

9. References

386-2006; "Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600 V"; IEEE

6863.25; "Separable Connector, Deadbreak, Dielectric Components, 150 kV BIL"; *Material Standards*; SCL

6863.27; "Accessories, Separable Connector, 600 A, 150 kV BIL, Deadbreak"; *Material Standards*; SCL

B100-02024; *Components Master Catalog, 5 kV-35 kV Electrical Distribution Systems, Specifiers Guide*; Cooper Power Systems

E6-1.0/NGE-70; "Properties of Medium Voltage Cables"; *Construction Guidelines*; SCL

NSP-110; "Trifurcation of Three Conductor Polyethylene Cable, 13 & 28 kV With and Without Neutral/Ground Wires"; *Construction Guidelines*; SCL

PG-CA-0506; *Cable Accessories for 5 kV-35 kV Distribution Systems, Product Selection Guide*; Elastimold
Richards Product Catalog; Richards Manufacturing Company

Shipek, John; SCL Standards Engineer, subject matter expert and originator of U5-17.10/NSP-305 (john.shipek@seattle.gov)

U5-2.81/NSP-290; "Primary Cable Preparation, General"; *Construction Guidelines*; SCL

U5-17.05/NSP-304; "Separable Connector (T-Body), 125 kV BIL, Deadbreak"; *Construction Guidelines*; SCL