Push-Pull Standard

Control Cable Assembly

Push-Pull Industrial

Tuthill Controls offers a full range of push-pull controls that provide a means of transmitting linear motion from one location to another. They offer ease of installation as well as superior performance.

The Bristow® Type control is an economical construction for applications which do not require tight bend radii, and are temperature rated for use from a low of -65°F to a peak of +230°F.

Arrows indicate relative position within the family of products

COMPARISON CHART

	Temp	Bend Radius	Strength Integrity	Economy	Efficiency	Service Life
Bristow	↓	↓	↓	↑	↓	↓
Utility	→	↑	↑	→	↓	→
LF-EXT	→	↑	↑	→	→	↑
LF	↑	↑	↑	↓	↑	→

The Utility Style adds a binder wire for structural integrity and a tighter minimum bend radius than other controls.

Low Friction EXT controls have the same advantages as utility with an added plastic covered innermember which provides improved efficiency.

Low Friction controls provide the standard of excellence for industrial controls. Features include a binder wire for structural integrity, tight minimum bend radius, and PTFE covered innermember for the ultimate in efficient, smooth operation. Temperature rated for use from a low of -65°F to a peak of +310°F, they will provide long life in the most demanding applications.

Description:

Push-Pull Standard
Industrial Control
Cable Assembly

Applications:

- Implement control
- Throttle control
- PTO/4WD activation
- Valve actuation
- Remote battery disconnect
- Remote electrical disconnect
- Transmission shift
- Hydrostatic drives
- Latches

Features:

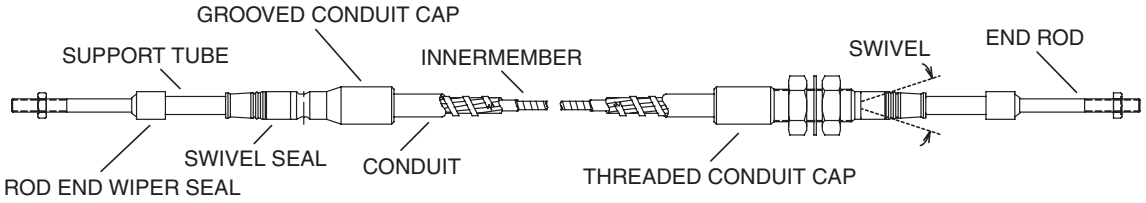
- Wide temperature range
  -65°F — 230°F (Bristow)
  -65°F — 230°F (Utility)
  -65°F — 230°F (Low Friction EXT)
  -65°F — 310°F (Low Friction)
- Tough/durable materials
- Long lasting seals
- Environmentally protected

TUTHILL Controls Group®

Linking Motion & Control... The Tuthill Solution

Push-Pull Standard Description

The Cablecraft® Time Proven Design — The design of today's Cablecraft control has evolved from over 54 years experience in meeting a wide variety of industrial, ordnance, marine and aircraft applications. Combined with careful selection of materials and fabrication methods, this design provides users the most versatile, highest quality control available today.



End Rod and Support Tube — All standard Cablecraft controls may be ordered with either type 300 stainless steel or protectively plated carbon steel end rods and support tubes. Choose the material to best meet your requirements.

End Rod Seals — Rod wiper seals have been carefully designed to prevent entry of moisture and contamination into the support tube and to provide a bearing surface for smooth motion of the end rod. Two types of rod wiper seals are available (see seal options in ordering code), capable of meeting a wide range of environmental conditions.

Improved Model 5 Floating Wiper Seal — All Utility, Low Friction, Low Friction EXT and Bristow® controls are equipped with the new improved molded plastic Model 5 seal unless otherwise specified. Extensive testing and field experience have proven the ability of this seal to protect the control in contaminated environments. Security tabs hold the seals in position and an internal support tube bushing improves end rod alignment.

Model 6 Floating Wiper Seal System — The Model 6 seal system is offered as an option on all Cablecraft Push-Pull control cables. It is designed to provide a tighter fit with the surface of the rod end and an internal o-ring is added at the swivel joint of the support tube for additional protection. The Model 6 seal system provides additional sealing for use in extreme environmental conditions. Because this seal produces additional load friction to a push-pull control cable, it is recommended for applications which can tolerate extra friction.

Swivel — The swivel joint between support tube and end cap is designed to allow 8 degrees minimum swivel from the control centerline.

Swivel Seal — Protection of the swivel joint from entry of moisture and contamination is provided by a molded seal. On LD and larger sizes, mounting nuts for threaded type conduit fittings may be removed without removing the swivel seal.

Conduit Caps — All standard Cablecraft controls have plated steel conduit fittings. Special controls designed for marine and aircraft applications are available with stainless steel or brass fittings.

Conduit — Four types of conduit construction are available to meet various requirements — Low Friction, Low Friction EXT, Utility and Bristow. See “Cablecraft Control Selection” data and individual specification pages for construction and performance information. These standard conduits are covered with a tough plastic casing for protection against corrosion and abrasion. Color coding of the casings allows easy identification of the control type:

Low Friction - Green
Low Friction EXT - Green
Utility - Gray
Bristow - Black

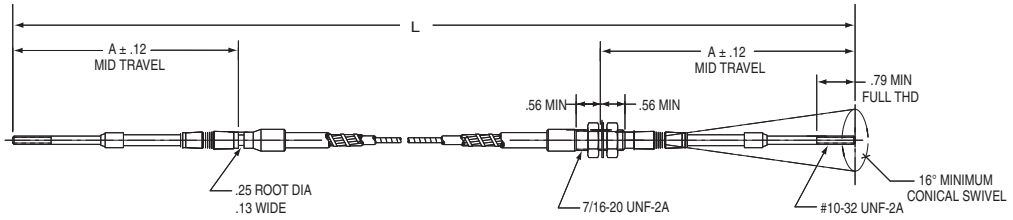
Inner Operating Member — The inner operating member for all standard Cablecraft controls is made of flexible 1 X 19 strand, armored with a swaged steel jacket for efficient operation and compression strength. Stainless steel inner operating member is available for added protection in corrosive environments. In Low Friction controls, a coating of PTFE provides superior efficiency and reduces “stick-slip” during operation. Note: VLD Bristow is a solid wire, Low Friction EXT is plastic covered, Utility is uncovered.

Lubrication — All standard Cablecraft controls are lubricated during construction with carefully selected compounds to provide optimum performance. No further service is necessary or recommended.

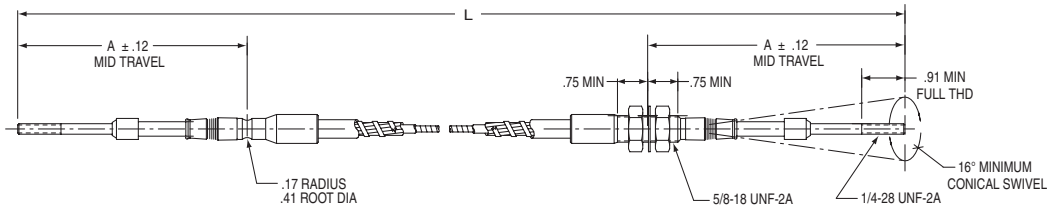
Installation — Mechanical stops should be implemented at or below the travel desired (ie. 1″, 2″, 3″, 4″, 5″, or 6″) on the equipment on which the cable assembly is being installed. Internal damage may result if end rod is allowed to bottom inside conduit cap.

Push-Pull Standard Specifications

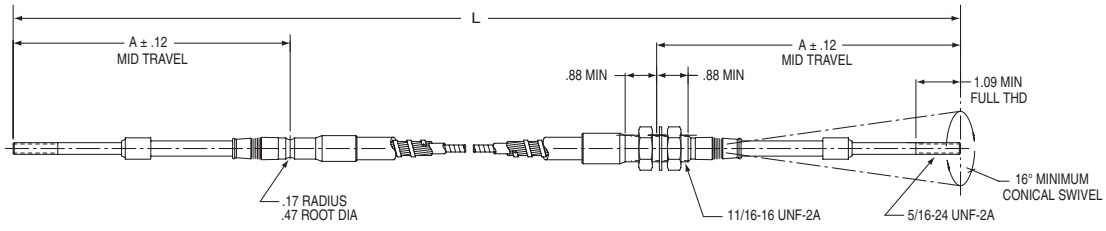
	A Dimension Grooved Swivel (in) (control at mid travel)	Minimum Travel Push-Pull (in)	Working Input Load (lbs) Push-Pull	Maximum Input Overload (lbs)	A Dimension Threaded Swivel (in) (control at mid travel)
VLD	3.69	1″	80/120	120/180	4.38
Very Light Duty	5.19	2″	80/120	120/180	5.87
	6.69	3″	70/120	110/180	7.38
Cablecraft® Min Bend Radius 2″	8.19	4″	60/120	90/180	8.87
Bristow® Min Bend Radius 5″	9.69	5″	45/120	70/180	10.38
Backlash Factor .00015 Per Deg. of Bend	11.19	6″	30/120	45/180	11.87



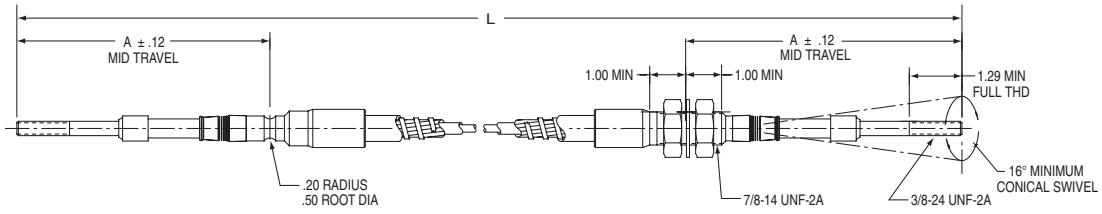
LD	4.00	1″	150/230	230/350	4.62
Light Duty	5.50	2″	150/230	230/350	6.12
	7.00	3″	125/230	190/350	7.62
Cablecraft® Min Bend Radius 3″	8.50	4″	100/230	150/350	9.12
Bristow® Min Bend Radius 7″	10.00	5″	75/230	110/350	10.62
Backlash Factor .00020 Per Deg. of Bend	11.50	6″	50/230	75/350	12.12



MD	4.38	1″	250/400	400/600	5.06
Medium Duty	5.87	2″	250/400	400/600	6.56
	7.38	3″	210/400	300/600	8.06
Cablecraft® Min Bend Radius 5″	8.87	4″	170/400	250/600	9.56
Bristow® Min Bend Radius 9″	10.38	5″	130/400	200/600	11.06
Backlash Factor .00025 Per Deg. of Bend	11.87	6″	100/400	150/600	12.56



HD	5.19	1″	700/1000	1000/1500	5.69
Heavy Duty	6.69	2″	700/1000	1000/1500	7.19
	8.19	3″	600/1000	900/1500	8.69
	9.69	4″	500/1000	750/1500	10.19
Cablecraft® Min Bend Radius 6″	11.19	5″	400/1000	600/1500	11.69
Backlash Factor .00030 Per Deg. of Bend	12.69	6″	30/1000	450/1500	13.19



Efficiency Factor

- Input Force = (Output Load x Total Degrees of Bend x Efficiency Factor) + Output Load

For Bristow & Utility Efficiency

- Factor = .002

For Low Friction EXT & Low Friction

- EXT Efficiency Factor = .001

Note: Efficiency will be slightly reduced in applications when output load is substantially less than rated loads.

All line art dimensions are represented in inches

Push-Pull Standard Order Code

Material

- Stainless Steel or Plated Carbon Steel
- Plastic Coated Carbon Steel Conduit and Innermember
- Plastic Seals

Suggested End Fittings

- Full Range

Cablecraft® Ordering Codes

314 - 6 - L - TT - 3 - 144 - (AP)

Control Type

Utility	
173	with Stainless Steel End Rods
174	with Stainless Steel Support Tubes, End Rods, and Innermember Armor
175	All Exposed Fittings/Parts are Stainless Steel plus Stainless Innermember Armor
Low Friction	
183	with Stainless Steel End Rods
184	with Stainless Steel Support Tubes and End Rods
185	All Exposed Fittings/Parts are Stainless Steel
Low Friction-EXT	
313	with Stainless Steel End Rods
314	with Stainless Steel Support Tubes, and End Rods
315	All Exposed Fittings/Parts are Stainless Steel
Bristow®	
773	with Stainless Steel End Rods
774	with Stainless Steel Support Tubes, End Rods and Innermember Armor

Seal Options

6	(Use this number only if requesting optional Model 6 wiper seal, optional on all controls)

Cable Size

Letter	End Rod Thread
V	10-32 UNF
L	1/4-28 UNF
M	5/16-24 UNF
H	3/8-24 UNF

End Fitting Combinations (Options: GG, TG, TT)

T	Threaded Swivel
G	Grooved Swivel

Cable Travel: 1, 2, 3, 4, 5, 6 (inches)

Length (inches)

Suffix Letters for Additional Features

(Use only if requesting optional features)

N	End Rod Jam Nuts (2 each)
W	Extra Shakeproof Washers on Conduit Ends
A	Combination of N and W
P	Stamp with Customer Part Number
S	Stamp with Cablecraft and Customer Part Number
M	Metric End Rods (Call for more information)

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• Please refer to the cautions/warnings and appropriate installation usage information in the Technical/Application Data sheet
• For application assistance/technical questions, please contact us at the appropriate location listed below or through our website at www.tuthillcontrols.com

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