Push-Pull Standard

Control Cable Assembly

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

**Bristow®** – Economical construction for applications that do not require tight bend radii.

**Utility** – Adds a binder wire for structural integrity and a tighter minimum bend radius than other controls.

**Low Friction EXT** – Have the same advantages as Utility with an added plastic covered innermember which provides improved efficiency.

**Low Friction** – 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. Provides long life in the most demanding applications.

**Common Applications:** Implement control, throttle control, PTO/4WD activation, valve actuation, remote battery disconnect, remote electrical disconnect, transmission shift, hydrostatic drives, latches

- Made of tough/durable materials
- Environmentally protected with long-lasting seals
- Temperature rated for use from -65°F to 310°F

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

Bristow & Utility = .002
Low Friction EXT & Low Friction = .001

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

**Material:**

- Stainless steel or plated carbon steel
- Plastic coated carbon steel conduit and innermember
- Plastic seals

**Suggested End Fittings:**
- Full range

### Comparison Chart

<table>
<thead>
<tr>
<th>Part</th>
<th>Temperature</th>
<th>Bend Radius</th>
<th>Strength Integrity</th>
<th>Economy</th>
<th>Efficiency</th>
<th>Service Life</th>
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<tbody>
<tr>
<td>Bristow</td>
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</table>

Arrows indicate relative position within the family of products
<table>
<thead>
<tr>
<th></th>
<th>A Dimension Grooved Swivel (in)</th>
<th>Minimum Travel Push-Pull (in)</th>
<th>Working Input Load (lbs)</th>
<th>Maximum Input Overload (lbs)</th>
<th>A Dimension Threaded Swivel (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(control at mid travel)</td>
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<td>Push-Pull</td>
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<td>(control at mid travel)</td>
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<td><strong>VLD</strong></td>
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<td>Very Light Duty</td>
<td>3.69</td>
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<td>80/120</td>
<td>120/180</td>
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**Push-Pull Standard Specifications (for Ordering Code see back cover)**

- **Very Light Duty (VLD)**: Minimum travel 1”, input load 80/120 lbs, maximum overload 120/180 lbs.
- **Light Duty (LD)**: Minimum travel 1”, input load 150/230 lbs, maximum overload 230/350 lbs.
- **Medium Duty (MD)**: Minimum travel 1”, input load 250/400 lbs, maximum overload 400/600 lbs.
- **Heavy Duty (HD)**: Minimum travel 1”, input load 700/1000 lbs, maximum overload 1000/1500 lbs.

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**Diagram Notes:**

- 16° Minimum Conical Swivel
- Mid Travel: A ± .12
- Full T.H.D.: L
- .20 Radius
- .50 Root Dia
- .17 Wide

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**Cablecraft® Min Bend Radius:**

- 2” minimum bend radius for VLD
- 3” minimum bend radius for LD
- 5” minimum bend radius for MD
- 6” minimum bend radius for HD

**Bristow® Min Bend Radius:**

- 5” minimum bend radius for VLD
- 7” minimum bend radius for LD
- 9” minimum bend radius for MD
- 11” minimum bend radius for HD

**Backlash Factor:**

- .00015 per degree of bend for VLD
- .00020 per degree of bend for LD
- .00025 per degree of bend for MD
- .00030 per degree of bend for HD

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**Thread Sizes:**

- 3/8-24 UNF-2A
- 7/8-14 UNF-2A
- #10-32 UNF-2A
- 5/16-24 UNF-2A
- 1/4-28 UNF-2A
Follow the steps below to determine your “ordering code” or part number. An example of a typical ordering code is 173-VTG-3-144.

173 - VTG - 3 - 144

**Step 1:** Determine cable materials depending on usage and conditions.

- **Utility:** “The Rugged Gray Cable” is the industry-standard and is designed for a long life under rugged conditions (173, 174, 175).
- **Low Friction EXT:** “The Green Cable” is the proper cable to use when superior efficiency is required. The extruded nylon cover over the innermember works very smoothly with the polyliner (313, 314, 315).
- **Low Friction:** The proper cable to use when superior efficiency is required. The bonded PTFE cover over the inner operating member works very smoothly with the plastic liner (183, 184, 185).

**Step 2:** Determine the “duty” (size) of the cable by the diameter and threads of the end rods.

- **V** = 10-32 UNF (Very light duty)
- **L** = 1/4-28 UNF (Light duty)
- **M** = 5/16-24 UNF (Medium duty)
- **H** = 3/8-24 UNF (Heavy duty)

**Step 3:** Determine the type of conduit end fittings (conduit caps) for left end and right end.

- **T** = Threaded
- **G** = Grooved
- **TT, GG or TG** combinations

**Step 4:** Determine the travel of the end rod. 1” through 6” in one inch increments.

**Step 5:** Determine the overall length of the cable in one inch increments.
Push-Pull Standard Order Code

Cablecraft® Ordering Codes

Control Type
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
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

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 +/-.25 (inches)

Suffix Letters for Additional Features
Use Only For Optional Feature Requests
- N End Rod Jam Nuts (2 each)
- W Extra Shake-proof 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 Rod Conversions
- V M5 x .8
- L M6 x 1.0
- M M8 x 1.25
- H M10 x 1.5

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Warning: Since the manufacturer is unable to determine all applications in which a part may be placed, it is the user’s responsibility to determine the suitability of the part for its intended use. This is especially true where safety is a factor. Incorrect application or installation may result in property damage, bodily injury, or death. For technical assistance, call 260-749-5105.