

# CALIFORNIA PUSH-PULL, INC.

QUADRASTAT

Cablecraft.

2022 EDITION

## PUSH PULL PULL ONLY CLUTCH & BRAKE CABLES

### CONTROL HEADS

twist lock  
non locking  
micro adjust

### CONTROL LEVERS

### SPOOL VALVE ADAPTORS

### CONTROL CABLES

### ACCESSORIES

clevises  
eye ends  
clamps  
etc.

FLEXIBLE  
SMOOTH OPERATION  
RUGGED  
RELIABLE

100%  
LOAD  
TESTED



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## SPECIALIZING IN REPLACEMENT AND CUSTOM BUILT CABLES

3 COMMERCE CT., STE. 130 • CHICO, CA 95928

530-893-4060 • Fax 530-893-4062

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# Locally Assembled Cable Controls

## with Threaded or Grooved Conduit End Fittings

### Part Number Code

SAMPLE PART NO. 173-MTG-2-90

#### Construction

- 173—Utility with stainless end rods.  
 174—Marine utility with stainless end rods, stainless support tube and stainless armor inner member.  
 183—Low Friction with teflon and nylon wear surfaces and stainless steel end rods.  
 184—Marine Low Friction with teflon and nylon wear surfaces, stainless steel end rods, stainless steel swivel support tubes and stainless steel inner member.

#### Duty (load carrying capacity)

Available in: V (Very light duty), L (Light duty), M (Medium duty), H (Heavy duty). Determine by load or end rod diameter from table A below.

#### Conduit End Fittings

TT (Threaded fittings both ends), GG (Grooved fittings both ends), TG (Threaded fitting one end and Grooved on the other). See table A and diagram B below for dimensions.

#### Length of Travel

1 to 6 inches. Determine from table A and diagram C below.

#### Length Overall (in inches)

### A Duty

#### Load capacities and length of travel

| ALL CABLES        |                   |                         |                                       |                                               |     |     |     |     |                     | THREADED CONDUIT END FITTINGS |                                          |      |       |       |       |                | GROOVED CONDUIT END FITTINGS |      |                                           |      |      |       |       |  |
|-------------------|-------------------|-------------------------|---------------------------------------|-----------------------------------------------|-----|-----|-----|-----|---------------------|-------------------------------|------------------------------------------|------|-------|-------|-------|----------------|------------------------------|------|-------------------------------------------|------|------|-------|-------|--|
| Basic Part Number | Thread "F"        | Min. Bend Radius Inches | Pull Load Capacity All travels Pounds | Push Load Capacity for Travel Shown in pounds |     |     |     |     |                     | Thread "W"                    | Dimension "A" for Travel Shown in inches |      |       |       |       |                | Groove Dimension             |      | Dimension "A" for Travel Shown in inches. |      |      |       |       |  |
|                   |                   |                         |                                       | 1" & 2"                                       | 3"  | 4"  | 5"  | 6"  | 1"                  |                               | 2"                                       | 3"   | 4"    | 5"    | 6"    | Radius inches  | Root Diam. Inches            | 1"   | 2"                                        | 3"   | 4"   | 5"    | 6"    |  |
| V                 | 10-32<br>x 0.89   | 2                       | 120                                   | 80                                            | 70  | 60  | 45  | 30  | 7/16-20<br>x 1.12"  | 4.38                          | 5.87                                     | 7.38 | 8.87  | 10.38 | 11.87 | .13<br>(width) | .25                          | 3.69 | 5.19                                      | 6.69 | 8.19 | 9.69  | 11.13 |  |
| L                 | 1/4-28<br>x 1.00  | 3                       | 230                                   | 150                                           | 125 | 100 | 75  | 50  | 5/8-18<br>x 1.50"   | 4.62                          | 6.12                                     | 7.62 | 9.12  | 10.62 | 12.12 | .17            | .41                          | 4.00 | 5.50                                      | 7.00 | 8.50 | 10.00 | 11.50 |  |
| M                 | 5/16-24<br>x 1.19 | 5                       | 400                                   | 250                                           | 210 | 170 | 130 | 100 | 11/16-16<br>x 1.75" | 5.06                          | 6.56                                     | 8.06 | 9.56  | 11.06 | 12.56 | .17            | .47                          | 4.33 | 5.87                                      | 7.38 | 8.87 | 10.38 | 11.87 |  |
| H                 | 3/8-24<br>x 1.38  | 6                       | 1,000                                 | 700                                           | 600 | 500 | 400 | 300 | 7/8-14<br>x 2.00"   | 5.69                          | 7.19                                     | 8.69 | 10.19 | 11.69 | 13.19 | .20            | .50                          | 5.19 | 6.69                                      | 8.19 | 9.69 | 11.19 | 12.69 |  |

MM conversions: 1 inch = 25.4 mm. 1 mm = .03937 inches. 1 lb = 4536 kg. 1 kg = 2.2046 lbs.

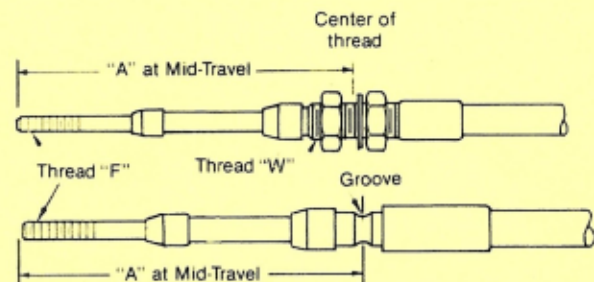
### B Conduit End Fittings

#### Type T

Threaded Conduit End Fitting for bulkhead mounting

#### Type G

Grooved Conduit End Fitting for mounting with U-bolts or clamps.



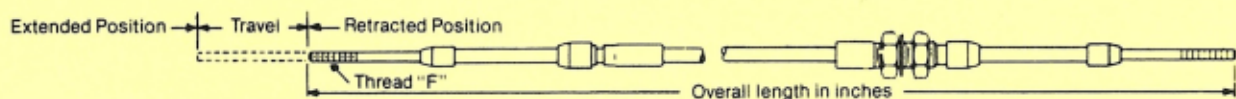
### C Overall length and travel in inches

#### FOR REPLACEMENT CABLES

- Remove old cable.
- Measure length as shown below.
- Measure length of travel. 1" through 6"
- Determine size of thread "F."  
Select basic part number from Table above.

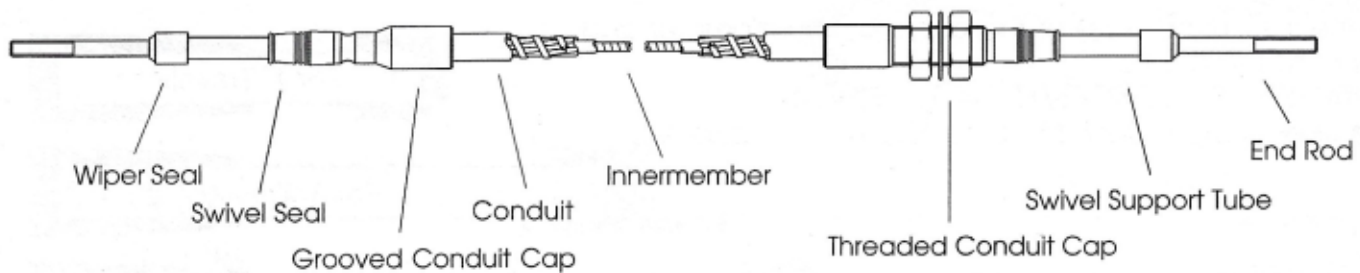
#### FOR NEW CABLES

- Determine overall length.
- Measure travel required. Add 1/4" and then round upward to nearest whole inch.
- Determine loads and select Basic part number from Table A.





## Standard Push-Pull Cable Terminology

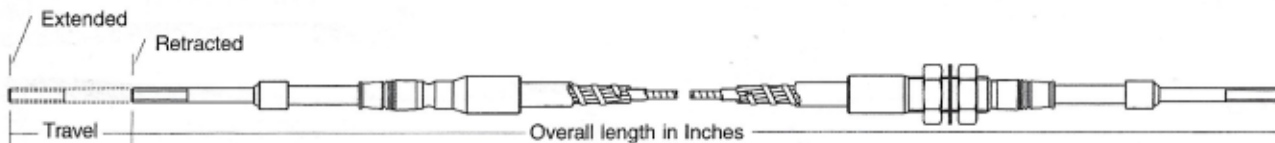


### How to Identify Push-Pull Cables

Your goal is to determine the information required to make up the "ordering code" or part number. An example of a typical ordering code is 173-VTG-3-144.

173 - V IG - 3 - 144

- Step 1: Determine the "**duty**" (size) of the cable by the diameter and threads of the end rods. **V** = 10-32, **L** = 1/4-28, **M** = 5/16-24, **H** = 3/8-24.  
(Very light duty; Light duty; Medium duty; Heavy duty)
- Step 2: 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 3: Determine the **travel** of the end rod. 1" through 6" in one inch increments.



- Step 4: Determine the overall **length** of the cable.
- Step 5: Determine cable materials depending on usage and conditions.  
See details of 173, 174, 175 Utility and 313, 314, 315 Low-Friction EXT.

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 extremely smoothly with the poly liner (313, 314, 315).

(See "Specifications" on page 4 and "Ordering Code" on page 5 to determine part number)



# Visual Comparison Chart for Determining Travel

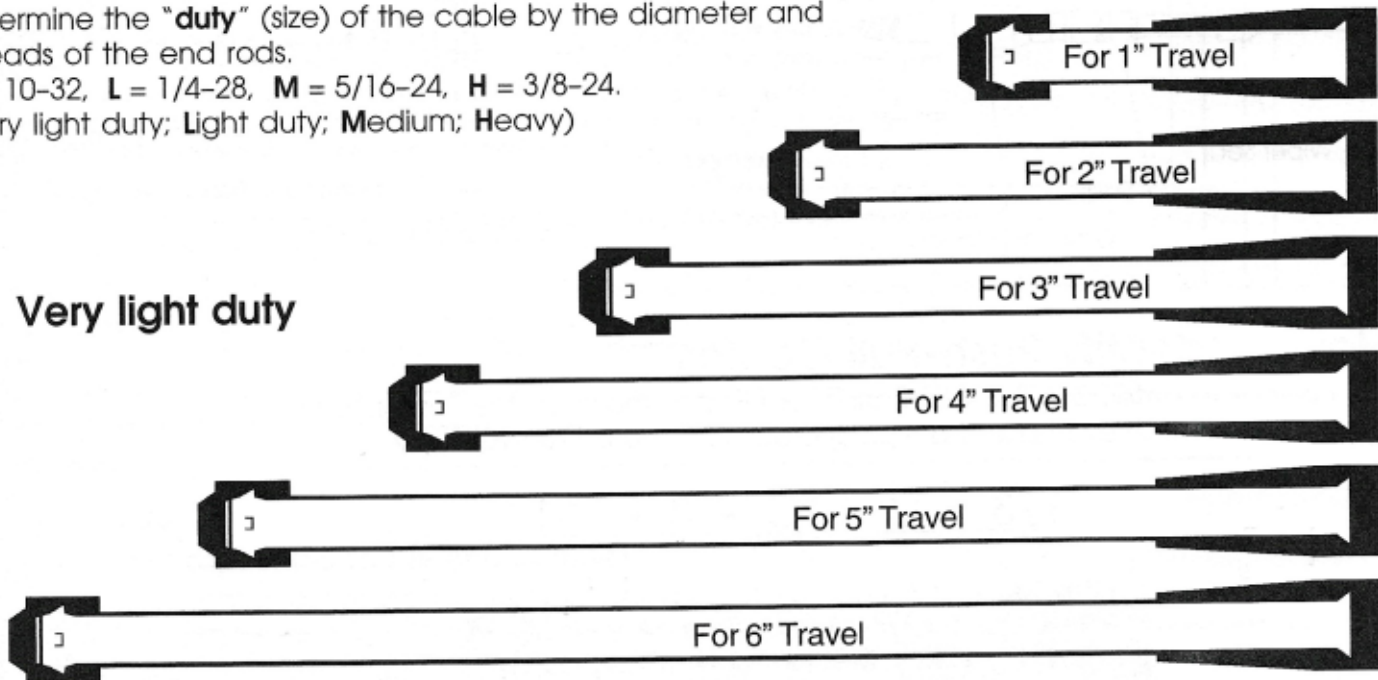
To determine the "travel" on an existing cable, you can compare the length of the support tubes with the illustrations below and on the next page.

Determine the "duty" (size) of the cable by the diameter and threads of the end rods.

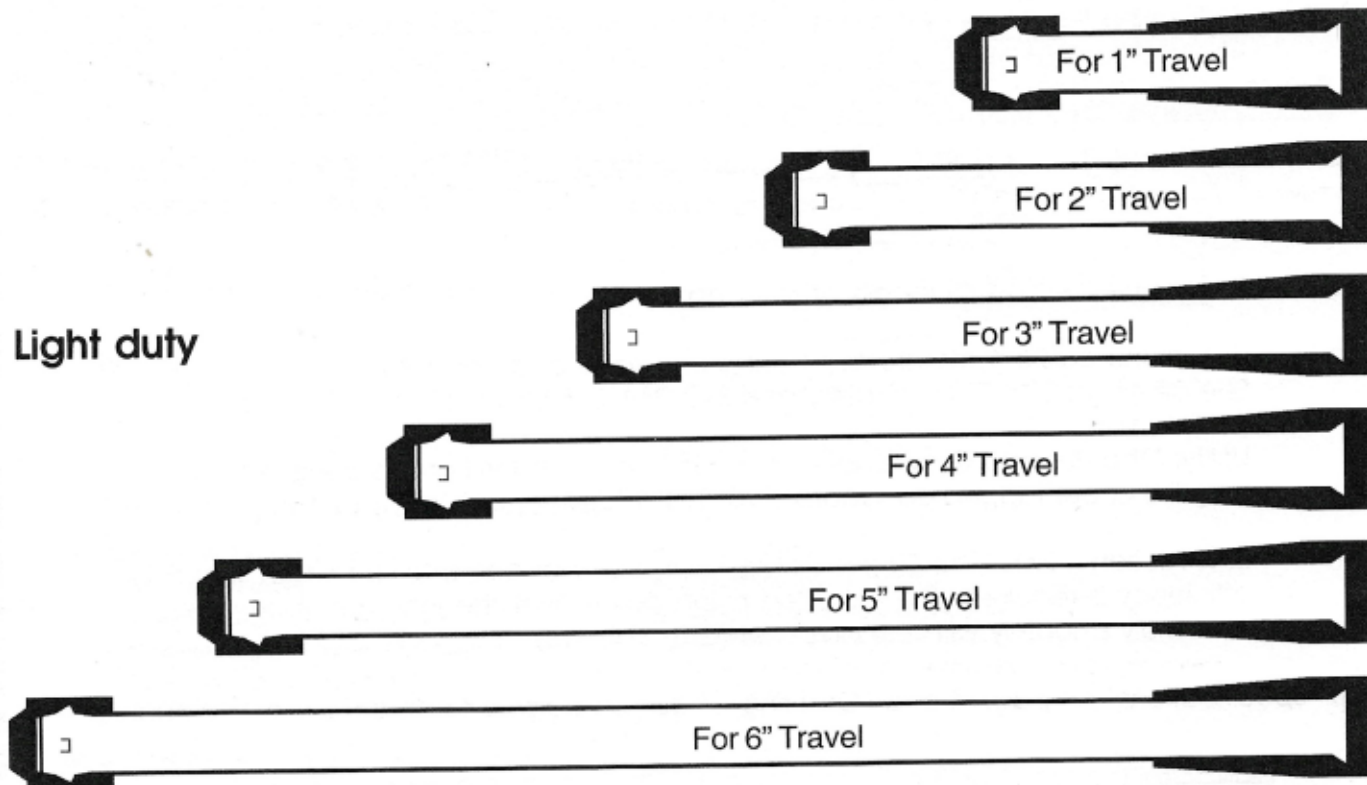
**V** = 10-32, **L** = 1/4-28, **M** = 5/16-24, **H** = 3/8-24.

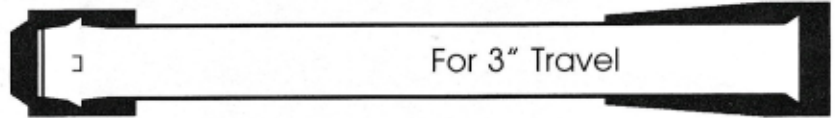
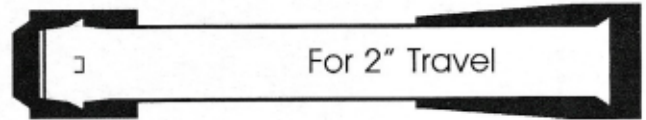
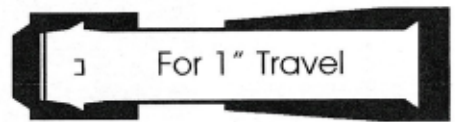
(**Very** light duty; **L**ight duty; **M**edium; **H**eavy)

## Very light duty

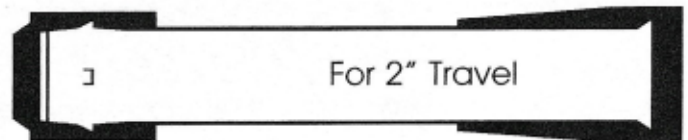
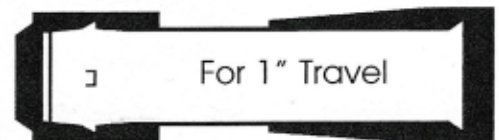
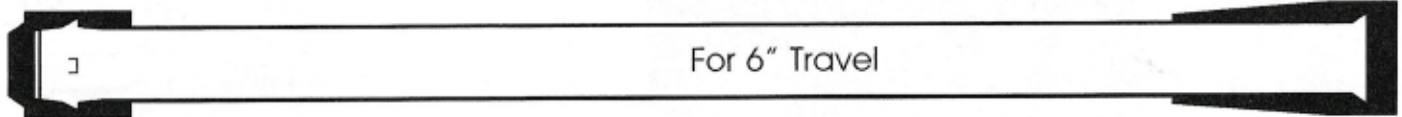
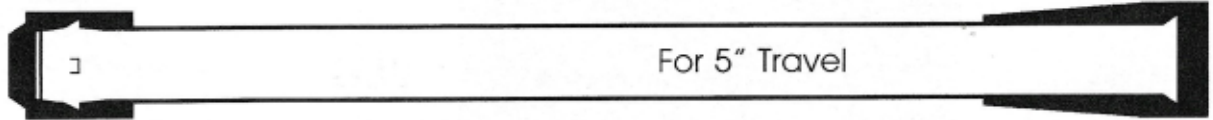
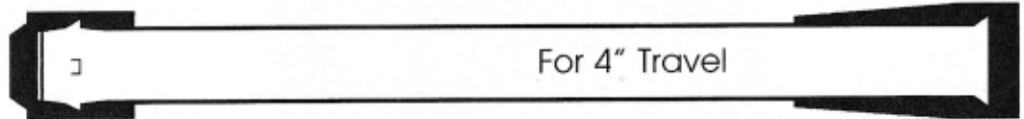


## Light duty

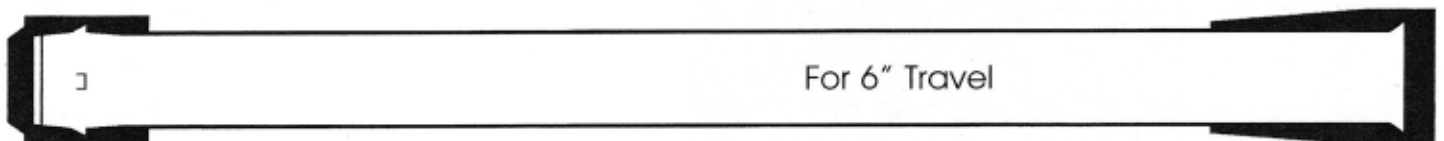
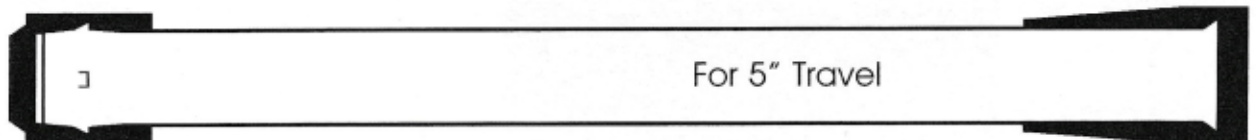
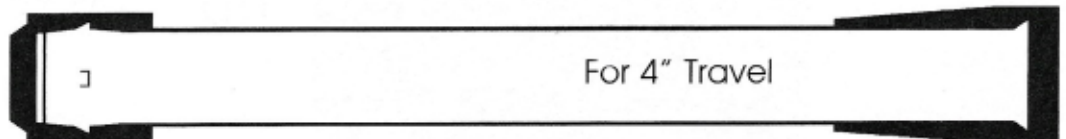
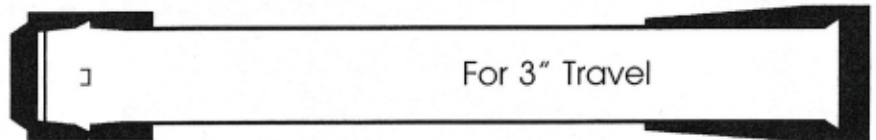




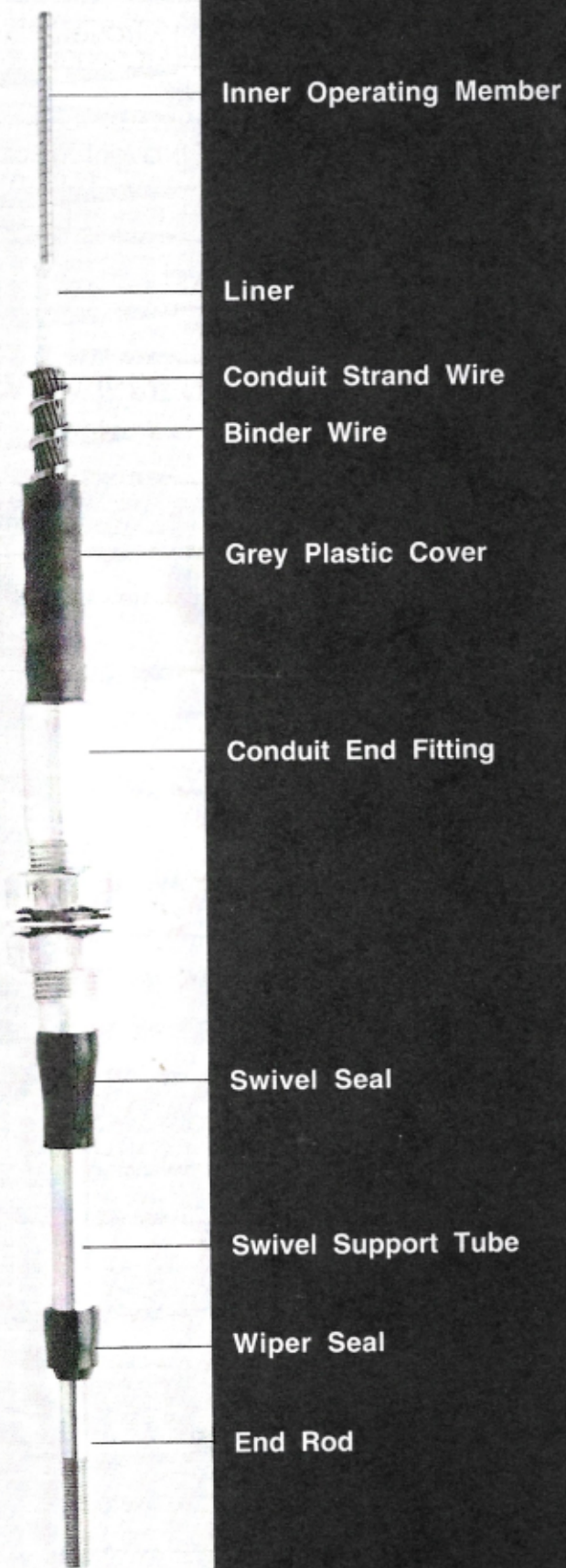
Medium duty



Heavy duty

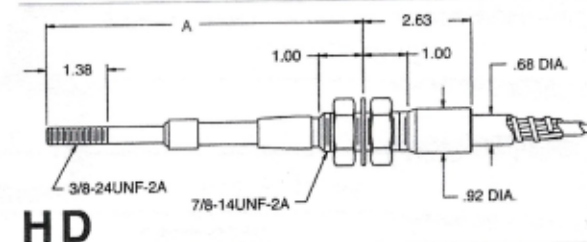
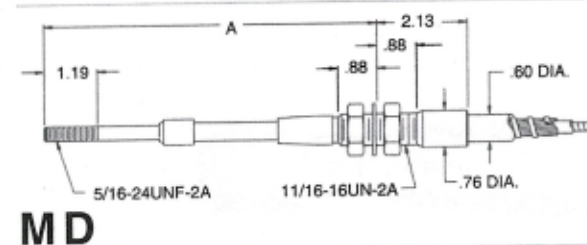
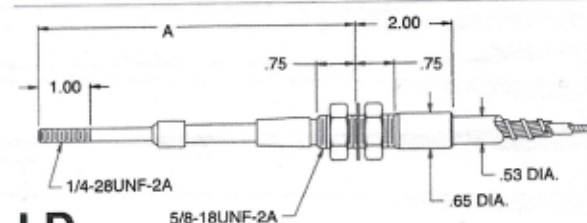
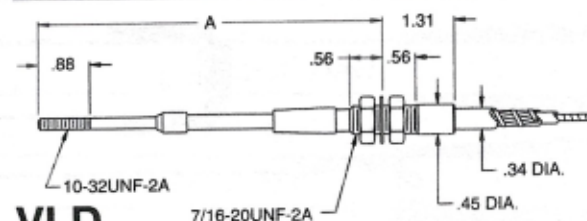






# UTILITY CONTROLS

## THREADED SWIVEL CONDUIT FITTING



- Greater flexibility
- High strength
- Wide temperature capability  
-65° to +230° F.

## DESIGN CRITERIA

| DUTY | MINIMUM BEND RAD. | BACKLASH FACTOR<br>Note (1) | EFFICIENCY FACTOR                     |
|------|-------------------|-----------------------------|---------------------------------------|
| VLD  | 2"                | .00015                      | .002<br>See formula below<br>Note (2) |
| LD   | 3"                | .00020                      |                                       |
| MD   | 5"                | .00025                      |                                       |
| HD   | 6"                | .00030                      |                                       |

(1) Per degree of bend

(2) Input force = output load (lbs) x total degrees of bend x efficiency factor + output load (lbs)

| 'A' DIMENSION<br>THREADED<br>SWIVEL<br>(Control at mid-travel) | MINIMUM<br>TRAVEL | WORKING<br>INPUT<br>LOAD<br>Push/Pull | MAXIMUM<br>INPUT<br>OVERLOAD<br>Push/Pull | 'A' DIMENSION<br>GROOVED<br>SWIVEL<br>(Control at mid-travel) |
|----------------------------------------------------------------|-------------------|---------------------------------------|-------------------------------------------|---------------------------------------------------------------|
|----------------------------------------------------------------|-------------------|---------------------------------------|-------------------------------------------|---------------------------------------------------------------|

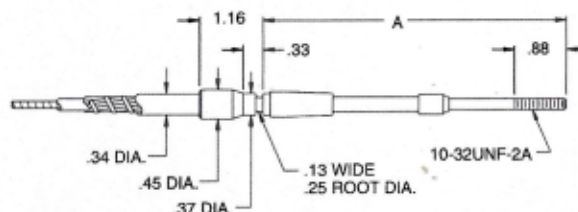
|       |    |        |         |       |
|-------|----|--------|---------|-------|
| 4.38  | 1" | 80/120 | 120/180 | 3.69  |
| 5.87  | 2" | 80/120 | 120/180 | 5.19  |
| 7.38  | 3" | 70/120 | 110/180 | 6.69  |
| 8.87  | 4" | 60/120 | 90/180  | 8.19  |
| 10.38 | 5" | 45/120 | 70/180  | 9.69  |
| 11.87 | 6" | 30/120 | 45/180  | 11.19 |

|       |    |         |         |       |
|-------|----|---------|---------|-------|
| 4.62  | 1" | 150/230 | 230/350 | 4.00  |
| 6.12  | 2" | 150/230 | 230/350 | 5.50  |
| 7.62  | 3" | 125/230 | 190/350 | 7.00  |
| 9.12  | 4" | 100/230 | 150/350 | 8.50  |
| 10.62 | 5" | 75/230  | 110/350 | 10.00 |
| 12.12 | 6" | 50/230  | 75/350  | 11.50 |

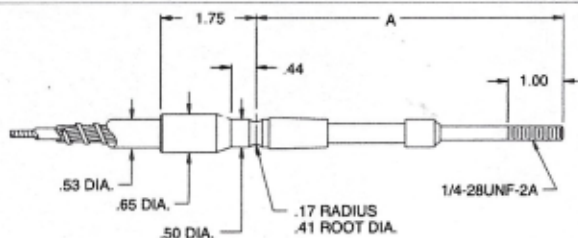
|       |    |         |         |       |
|-------|----|---------|---------|-------|
| 5.06  | 1" | 250/400 | 400/600 | 4.38  |
| 6.56  | 2" | 250/400 | 400/600 | 5.87  |
| 8.06  | 3" | 210/400 | 300/600 | 7.38  |
| 9.56  | 4" | 170/400 | 250/600 | 8.87  |
| 11.06 | 5" | 130/400 | 200/600 | 10.38 |
| 12.56 | 6" | 100/400 | 150/600 | 11.87 |

|       |    |          |           |       |
|-------|----|----------|-----------|-------|
| 5.69  | 1" | 700/1000 | 1000/1500 | 5.19  |
| 7.19  | 2" | 700/1000 | 1000/1500 | 6.69  |
| 8.69  | 3" | 600/1000 | 900/1500  | 8.19  |
| 10.19 | 4" | 500/1000 | 750/1500  | 9.69  |
| 11.69 | 5" | 400/1000 | 600/1500  | 11.19 |
| 13.19 | 6" | 300/1000 | 450/1500  | 12.69 |

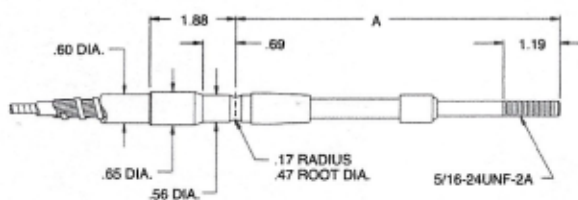
## GROOVED SWIVEL CONDUIT FITTING



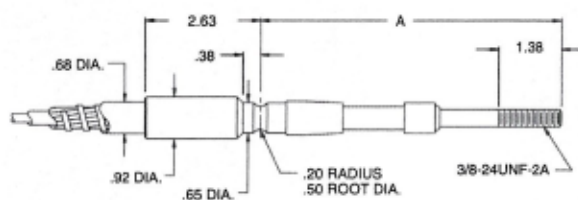
VLD



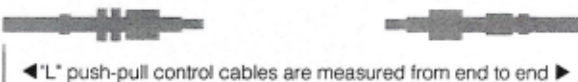
LD



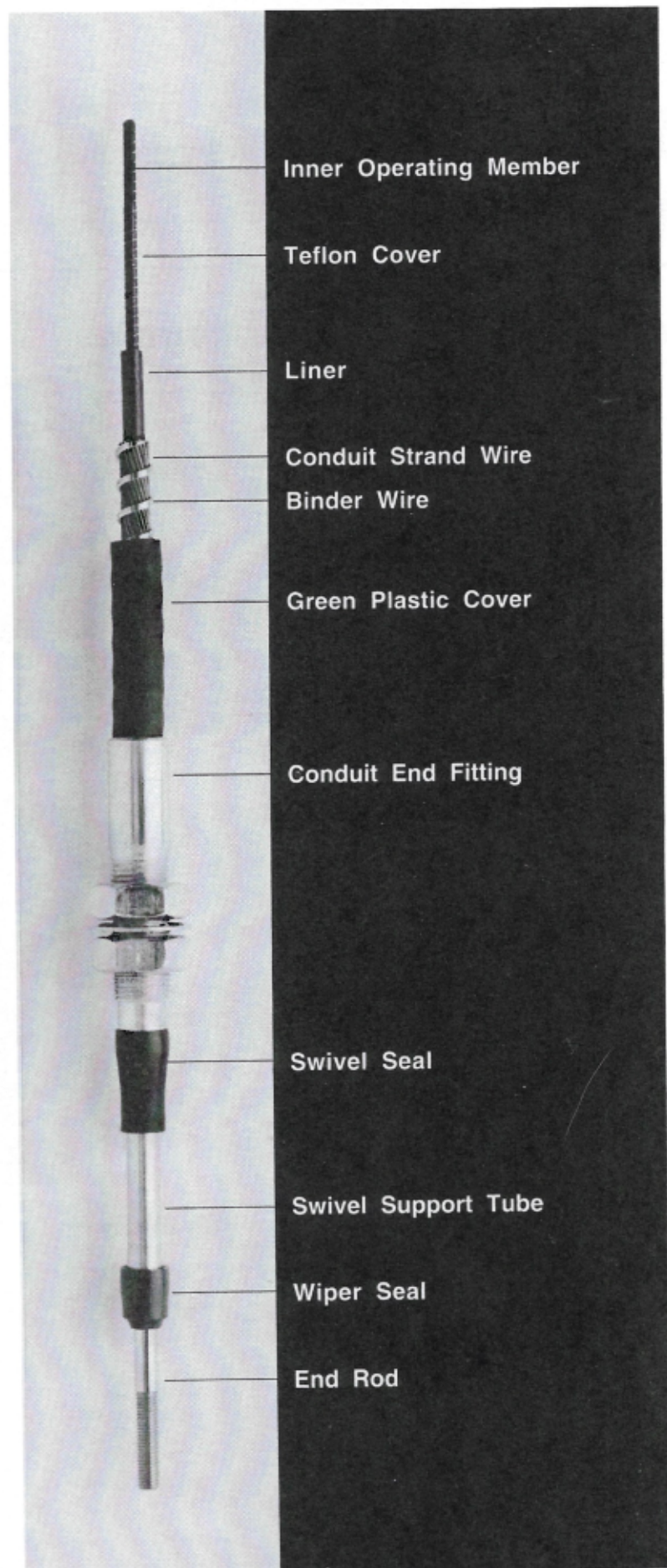
MD



HD

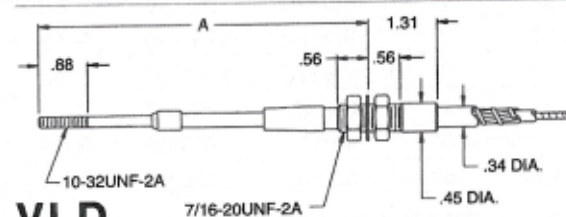




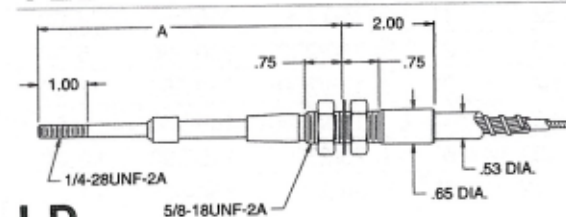


# LOW FRICTION CONTROLS

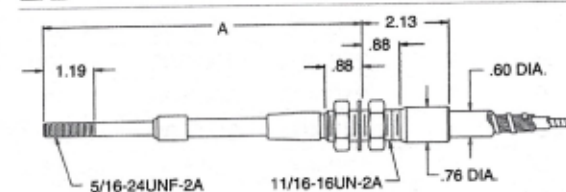
## THREADED SWIVEL CONDUIT FITTING



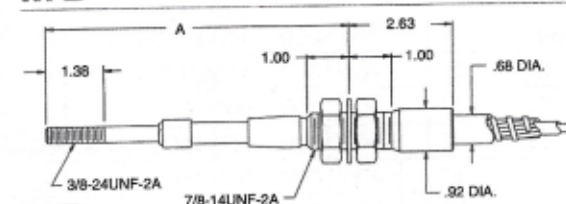
**VLD**



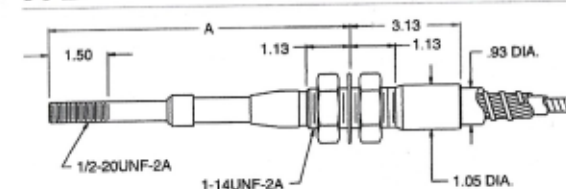
**LD**



**MD**



**HD**



**EHD**

- Superior efficiency
- Greater flexibility
- High strength
- Widest temperature capability  
-65° to +310° F.

# DESIGN CRITERIA

| DUTY | MINIMUM BEND RAD. | BACKLASH FACTOR<br>Note (1) | EFFICIENCY FACTOR             |
|------|-------------------|-----------------------------|-------------------------------|
| VLD  | 2"                | .00015                      | .001                          |
| LD   | 3"                | .00020                      | See formula below<br>Note (2) |
| MD   | 5"                | .00025                      |                               |
| HD   | 6"                | .00030                      |                               |
| EHD  | 8"                | .00035                      |                               |

(1) Per degree of bend

(2) Input force = output load (lbs) x total degrees of bend x efficiency factor + output load (lbs)

| 'A' DIMENSION<br>THREADED<br>SWIVEL<br>(Control at mid-travel) | MINIMUM<br>TRAVEL | WORKING<br>INPUT<br>LOAD<br>Push/Pull | MAXIMUM<br>INPUT<br>OVERLOAD<br>Push/Pull | 'A' DIMENSION<br>GROOVED<br>SWIVEL<br>(Control at mid-travel) |
|----------------------------------------------------------------|-------------------|---------------------------------------|-------------------------------------------|---------------------------------------------------------------|
|----------------------------------------------------------------|-------------------|---------------------------------------|-------------------------------------------|---------------------------------------------------------------|

|       |    |        |         |       |
|-------|----|--------|---------|-------|
| 4.38  | 1" | 80/120 | 120/180 | 3.69  |
| 5.87  | 2" | 80/120 | 120/180 | 5.19  |
| 7.38  | 3" | 70/120 | 110/180 | 6.69  |
| 8.87  | 4" | 60/120 | 90/180  | 8.19  |
| 10.38 | 5" | 45/120 | 70/180  | 9.69  |
| 11.87 | 6" | 30/120 | 45/180  | 11.19 |

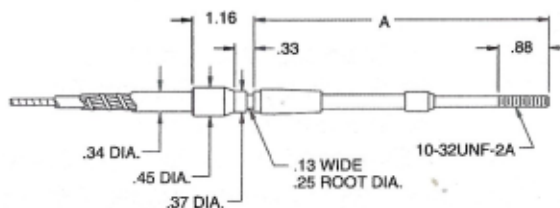
|       |    |         |         |       |
|-------|----|---------|---------|-------|
| 4.62  | 1" | 150/230 | 230/350 | 4.00  |
| 6.12  | 2" | 150/230 | 230/350 | 5.50  |
| 7.62  | 3" | 125/230 | 190/350 | 7.00  |
| 9.12  | 4" | 100/230 | 150/350 | 8.50  |
| 10.62 | 5" | 75/230  | 110/350 | 10.00 |
| 12.12 | 6" | 50/230  | 75/350  | 11.50 |

|       |    |         |         |       |
|-------|----|---------|---------|-------|
| 5.06  | 1" | 250/400 | 400/600 | 4.38  |
| 6.56  | 2" | 250/400 | 400/600 | 5.87  |
| 8.06  | 3" | 210/400 | 300/600 | 7.38  |
| 9.56  | 4" | 170/400 | 250/600 | 8.87  |
| 11.06 | 5" | 130/400 | 200/600 | 10.38 |
| 12.56 | 6" | 100/400 | 150/600 | 11.87 |

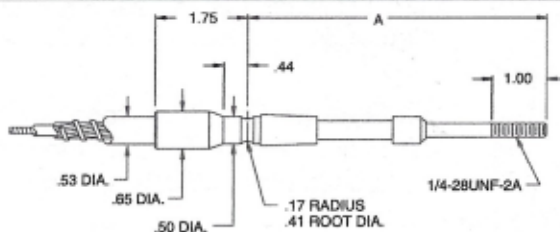
|       |    |          |           |       |
|-------|----|----------|-----------|-------|
| 5.69  | 1" | 700/1000 | 1000/1500 | 5.19  |
| 7.19  | 2" | 700/1000 | 1000/1500 | 6.69  |
| 8.69  | 3" | 600/1000 | 900/1500  | 8.19  |
| 10.19 | 4" | 500/1000 | 750/1500  | 9.69  |
| 11.69 | 5" | 400/1000 | 600/1500  | 11.19 |
| 13.19 | 6" | 300/1000 | 450/1500  | 12.69 |

|       |    |           |           |       |
|-------|----|-----------|-----------|-------|
| 6.12  | 1" | 1200/1500 | 1800/2200 | 5.50  |
| 7.62  | 2" | 1200/1500 | 1800/2200 | 7.00  |
| 9.12  | 3" | 1100/1500 | 1600/2200 | 8.50  |
| 10.62 | 4" | 900/1500  | 1300/2200 | 10.00 |
| 12.12 | 5" | 700/1500  | 1000/2200 | 11.50 |
| 13.62 | 6" | 500/1500  | 750/2200  | 13.00 |

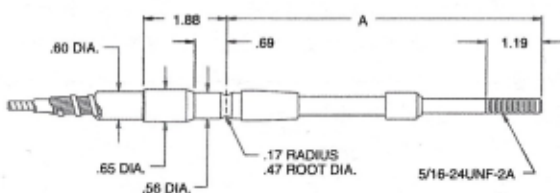
## GROOVED SWIVEL CONDUIT FITTING



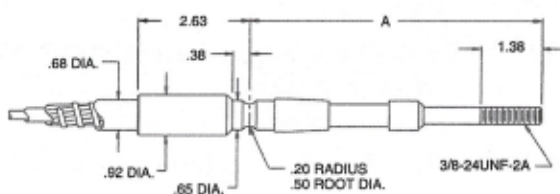
VLD



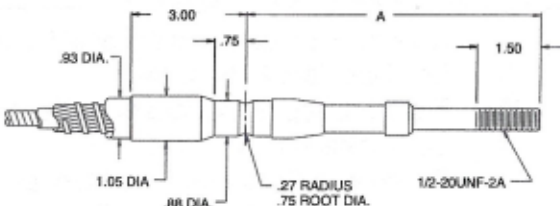
LD



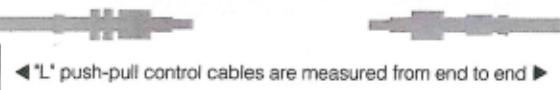
MD



HD



EHD



◀ "L" push-pull control cables are measured from end to end ▶



# Push-Pull Standard Order Code

## Cablecraft® Ordering Codes

|                                                       |                                                                                            |     |   |     |   |   |   |    |   |   |   |     |   |      |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------|-----|---|-----|---|---|---|----|---|---|---|-----|---|------|
|                                                       |                                                                                            | 314 | - | (6) | - | L | - | TT | - | 3 | - | 144 | - | (AP) |
| <b>Control Type</b>                                   | _____                                                                                      |     |   |     |   |   |   |    |   |   |   |     |   |      |
| 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            |     |   |     |   |   |   |    |   |   |   |     |   |      |
| 176                                                   | VLD, LD Black - High heat housing, rated at 340°                                           |     |   |     |   |   |   |    |   |   |   |     |   |      |
| 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                                             |     |   |     |   |   |   |    |   |   |   |     |   |      |
| <b>Seal Options</b>                                   | _____                                                                                      |     |   |     |   |   |   |    |   |   |   |     |   |      |
| 6                                                     | (Use this number only if requesting optional Model 6 wiper seal, optional on all controls) |     |   |     |   |   |   |    |   |   |   |     |   |      |
| <b>Cable Size</b>                                     | _____                                                                                      |     |   |     |   |   |   |    |   |   |   |     |   |      |
| Letter                                                | End Rod Thread                                                                             |     |   |     |   |   |   |    |   |   |   |     |   |      |
| V                                                     | 10-32 UNF                                                                                  |     |   |     |   |   |   |    |   |   |   |     |   |      |
| L                                                     | 1/4-28 UNF                                                                                 |     |   |     |   |   |   |    |   |   |   |     |   |      |
| M                                                     | 5/16-24 UNF                                                                                |     |   |     |   |   |   |    |   |   |   |     |   |      |
| H                                                     | 3/8-24 UNF                                                                                 |     |   |     |   |   |   |    |   |   |   |     |   |      |
| <b>End Fitting Combinations (Options: GG, TG, TT)</b> | _____                                                                                      |     |   |     |   |   |   |    |   |   |   |     |   |      |
| T                                                     | Threaded Swivel                                                                            |     |   |     |   |   |   |    |   |   |   |     |   |      |
| G                                                     | Grooved Swivel                                                                             |     |   |     |   |   |   |    |   |   |   |     |   |      |
| <b>Cable Travel: 1, 2, 3, 4, 5, 6 (inches)</b>        | _____                                                                                      |     |   |     |   |   |   |    |   |   |   |     |   |      |
| <b>Length +/- .25 (inches)</b>                        | _____                                                                                      |     |   |     |   |   |   |    |   |   |   |     |   |      |
| <b>Suffix Letters for Additional Features</b>         | _____                                                                                      |     |   |     |   |   |   |    |   |   |   |     |   |      |
|                                                       | (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 (optional)                                                                 |     |   |     |   |   |   |    |   |   |   |     |   |      |
| V                                                     | M5 x .8                                                                                    |     |   |     |   |   |   |    |   |   |   |     |   |      |
| L                                                     | M6 x 1.0                                                                                   |     |   |     |   |   |   |    |   |   |   |     |   |      |
| M                                                     | M8 x 1.25                                                                                  |     |   |     |   |   |   |    |   |   |   |     |   |      |
| H                                                     | M10 x 1.5                                                                                  |     |   |     |   |   |   |    |   |   |   |     |   |      |

## High Performance Push-Pull Control Cable

**Notes:** (Design Parameters)

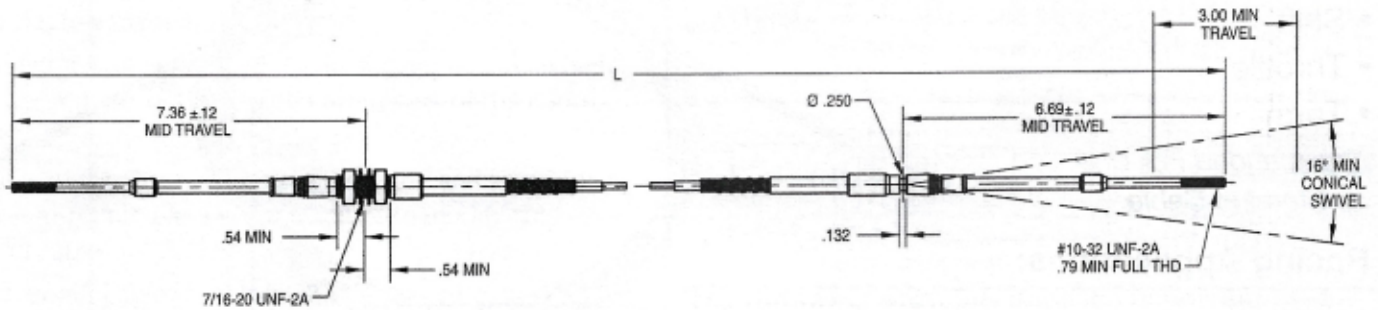
**Travel:** 3" minimum

**Minimum bend radius:** 4.00"

**Operating temperature:**

from -65°F to +350°F

**Slim line grooved conduit cap for marine applications, call for details**



All line art dimensions are represented in inches

### High Performance Cable Ordering Codes

795 - 6 - V - TT - 3 - 144

**Control Type**

\*(All End Rods are Stainless Steel)

**795** All Exposed Fittings/Parts are Stainless Steel – both ends

**796** All Exposed Fittings/Parts are Stainless Steel – one end – Carbon Steel Opposite\*

**Seal Options**

**6** Standard

**Cable Size**

**V** 10-32 UNF End Rods – Very Light Duty

**End Fitting Combinations (TT, TG, GT, GG)**

|     |   |   | stainless<br>end | opposite<br>end |
|-----|---|---|------------------|-----------------|
| 795 | T | T | 796 T            | T               |
|     | T | G | T                | G               |
|     | G | G | G                | T               |
|     |   |   | G                | G               |

**Cable Travel:** 3 (inches)

**Length +/- .25 (inches)**



# Push-Pull Blue Max™

## Marine Applications:

---

- Shift
- Throttle
- Trim

*Not Intended For Use  
as Steering Cable*

## Racing Applications:

---

- Shift
- Fuel Shut Off
- Chute Release
- Throttle

*Not Intended For Use  
as Steering Cable*

## Features:

---

- Travel: 3.00"
- Bulkhead type (threaded)  
conduit caps, stainless steel
- Clamp type (grooved)  
conduit caps, stainless steel
- 10-32 end rod threads
- BB, BC, CC options are all available
- High temperature

## Material:

---

- 1 x 19 Stainless Steel Wrapped  
Innermember
- RHOS Rated
- Stainless Steel
- LDPE Covered (Blue) Conduit
- Binder Wire Conduit Core PTFE



Cablecraft Motion Controls' New Blue Max™ cable line is the high performance control cable to solve your push-pull requirements. This superior control is born of aviation engineering design, with extreme low friction and minimal loss of motion. Offering unparalleled performance with the finest, smoothest feel in the industry.

This outstanding design is excellent for long runs with complicated cable routing while being extremely efficient on shorter runs.

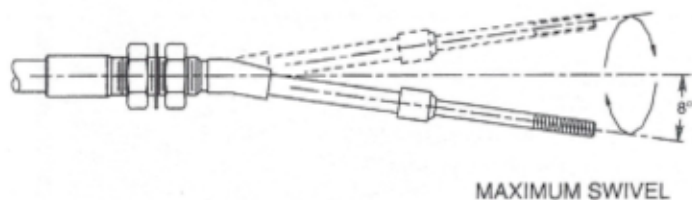
Along with a true 4-inch minimum bend radius, lubed for life, and binder wired PTFE core conduit, the outer jacket is resistant to abrasions, gasoline, diesel, and chemicals.

If you are seeing red over your control problems, make the Blue Max high performance line of cables your next move.

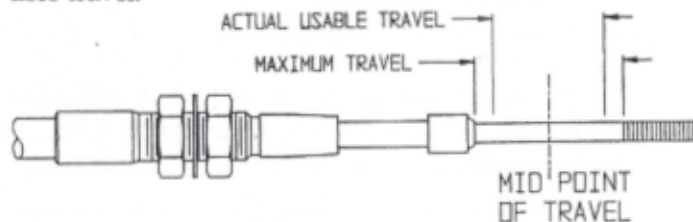
# Control Cable Cautions & Warnings

The following cautions describe application and installation information.

1. Do not install control cables on any application which may exceed any of the design parameters of the control cable.
2. Cablecraft control cables are designed and assembled to be non-repairable. Do not attempt to modify this control cable.
3. Cablecraft cables are designed to be contaminant resistant; not contaminant proof. Protect the cable from contaminants such as gas, oil, diesel fuel, water, dirt and chemicals which may damage the control cable.
4. Protect the control cable from physical damage by paint, kinking, vibration, etc., which may damage the control cable.
5. Control cables have the best load capacity in the **pull** mode. Always install the control cable so it **pulls** the greatest load, and **pushes** the smaller load; and **pulls** the item into the neutral or "off" position.
6. Do not install the control cable with the power on or the engine running. Serious injury or death could result.
7. The swivel angle must be centered within the available swivel angle.



8. The usable stroke must be centered within the available travel:

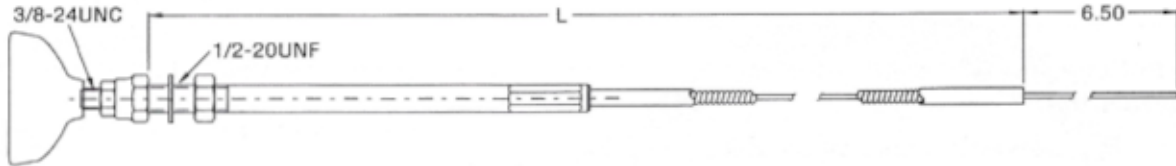


The following warnings describe important push-pull cable operation and maintenance information.

1. Do not adjust the control cable with the power on or the engine running. Serious injury or death could result.
2. A gradual or sudden increase in the no-load friction (cable disconnect at both ends) of a control cable is an indication of a pending or present performance problem. The control cable should be replaced, otherwise serious injury or death may result.
3. A gradual or sudden decrease in the usable stroke, is an indication of a pending or present performance problem. The control cable should be replaced, otherwise serious injury or death may result.
4. Control cables which have moisture inside of them and/or have frozen should be replaced. Do not apply heat to thaw or dry control cables.
5. Cablecraft control cables are lubricated for the life of the control cable. Do not remove the seal or lubricate the control cable.
6. Cablecraft control cables are designed to be non-repairable. Do not attempt to repair this control cable.



## Standard Replacement PTO Control Cable



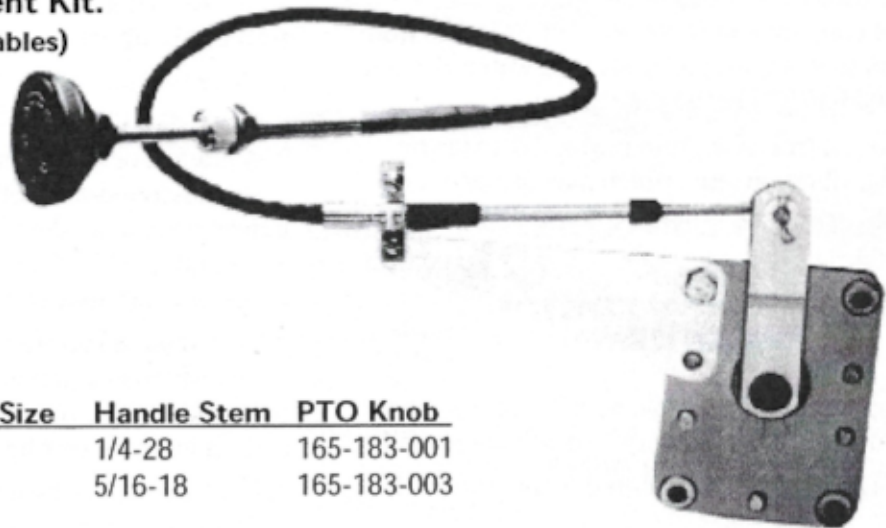
The quality replacement cable for power take-off control that equals or surpasses original equipment standards. Adaptable to mounting brackets of Muncie, Chelsea and similar cable-actuated PTOs.

Part No. 872-507-L  
(Round Wire Construction)  
("L" = Length)

## PTO Cable Attachment Kit.

(For use with non-lock cables)

Attach your custom-built cable to Chelsea or similar PTO units with the same mounting pattern that have a 3 inch hole-center to hole-center lever arm. Cable and handle ordered separately.



| Attachment Kit | Cable Size | Handle Stem | PTO Knob    |
|----------------|------------|-------------|-------------|
| 175-600-004    | VLD        | 1/4-28      | 165-183-001 |
| 175-600-005    | LD         | 5/16-18     | 165-183-003 |

## Optional Knobs for Non-Lock Control Heads

Part numbers shown below are of reinforced black nylon. Specify knob in part number for all non-locking controls. (included in price)

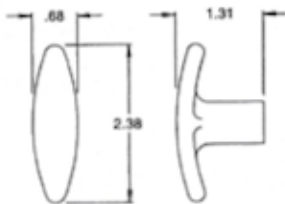
### Part Number

#### Thread Size

| Inscription | 1/4-20 | 1/4-28 | 5/16-18 |
|-------------|--------|--------|---------|
| None        | 005    | 014    | 013     |
| STOP        | 015    | 016    | 017     |
| SHUTOFF     | 002    | 008    | 018     |
| THROTTLE    | 019    | 020    | 021     |
| CHOKE       | 022    | 023    | 024     |
| OPEN        | 025    | 026    | 027     |
| CLOSE       | 028    | 029    | 030     |
| EMER. STOP  | 031    | 032    | 033     |

| Inscription | 1/4-20 | 1/4-28 |
|-------------|--------|--------|
|-------------|--------|--------|

|            |     |     |
|------------|-----|-----|
| None       | 306 | 308 |
| STOP       | 317 | 314 |
| SHUTOFF    | 318 | 319 |
| THROTTLE   | 320 | 321 |
| CHOKE      | 309 | 322 |
| OPEN       | 323 | 324 |
| CLOSE      | 325 | 326 |
| EMER. STOP | 327 | 328 |

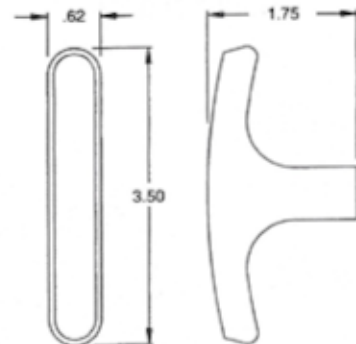


Cast aluminum oversize T-handle  
(not included in price)

### Part Number

#### Thread Size

| Inscription | 1/4-20 | 1/4-28 | 5/16-18 |
|-------------|--------|--------|---------|
| None        | 201    | 202    | 203     |



# Locally Assembled Control Head Cables

Order Knob from Chart Below

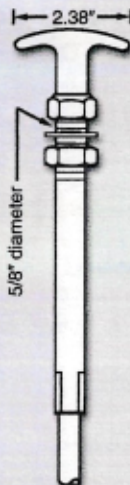
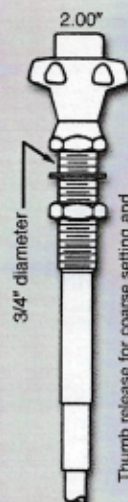
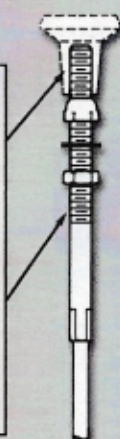
## Knob Thread Diameter

Utility/Low-Friction EXT  
VLD 1/4-28 UNF  
LD 5/16-18 UNC

Commercial  
VLD 1/4-20 UNC

## Mounting Hole Diameter

Utility/Low-Friction EXT  
VLD 7/16 diam.  
LD 5/8 diam.  
Commercial 3/8 diam.



## Utility & Low-Friction EXT

1", 2" and 3" travel  
2" min. bend radius on VLD  
3" min. bend radius on LD  
60 lb. load rating

## How to Order

1. Select the basic part number.
2. Indicate travel per example below.
3. Indicate length in inches.

Part Number Code Example:

56V32 - 3 - 120

Length in inches

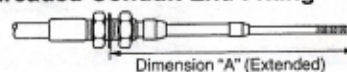
1", 2" or 3" travel

Basic Part Number  
(example is Twist-Lock  
with threaded end fitting  
and stainless steel end rod).  
V-Very Light Duty (VLD)  
L-Light Duty (LD)

|                                                                                                                                                                                   | NON-LOCKING |         | MICRO-ADJUST |         | TWIST-LOCK |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------|--------------|---------|------------|---------|
|                                                                                                                                                                                   | VLD         | LD      | VLD          | LD      | VLD        | LD      |
| Utility                                                                                                                                                                           | 86V32*      | 96L32*  | 26V32*       | 26L32*  | 56V32*     | 56L32*  |
|                                                                                                                                                                                   | 86V42**     | 96L42** | 26V42**      | 26L42** | 56V42**    | 56L42** |
| Low-Friction EXT                                                                                                                                                                  | 81V32*      | 91L32*  | 21V32*       | 21L32*  | 51V32*     | 51L32*  |
|                                                                                                                                                                                   | 81V42**     | 91L42** | 21V42**      | 21L42** | 51V42**    | 51L42** |
| Utility                                                                                                                                                                           | 86V33*      | 96L33*  | 26V33*       | 26L33*  | 56V33*     | 56L33*  |
|                                                                                                                                                                                   | 86V43**     | 96L43** | 26V43**      | 26L43** | 56V43**    | 56L43** |
| Low-Friction EXT                                                                                                                                                                  | 81V33*      | 91L33*  | 21V33*       | 21L33*  | 51V33*     | 51L33*  |
|                                                                                                                                                                                   | 81V43**     | 91L43** | 21V43**      | 21L43** | 51V43**    | 51L43** |
| Commercial<br>VLD Trim-to-length<br>Control Head<br>Cables with<br>stainless steel<br>wire innermember.<br><br>Up to 3" travel<br>5" min. bend radius<br>20 lb. pull load rating. | 79V00       |         | 29V00        |         | 59V00      |         |
|                                                                                                                                                                                   | 79V04       |         | 29V04        |         | 59V04      |         |
|                                                                                                                                                                                   | 79V05       |         | 29V05        |         | 59V05      |         |

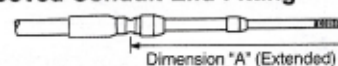
## Output End Options

### Threaded Conduit End Fitting



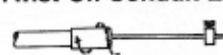
| Travel | VLD  | LD   |
|--------|------|------|
| 1"     | 4.94 | 5.18 |
| 2"     | 6.93 | 7.18 |
| 3"     | 8.94 | 9.18 |

### Grooved Conduit End Fitting



| Travel | VLD  | LD   |
|--------|------|------|
| 1"     | 4.25 | 4.56 |
| 2"     | 6.25 | 6.56 |
| 3"     | 8.25 | 8.56 |

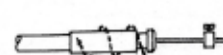
### Twist-On Conduit Ends



3/8" diam.  
No. 161-775-000



3/8-24 UNF  
No. 161-581-000



3/8" diam.  
No. 161-579-000

\*3 = Stainless steel end rod \*\*4 = Stainless steel end rod, support tube and innermember armor

## Optional Knobs for Non-Locking Controls

|               | Utility and Low-Friction EXT |               | Commercial<br>Trim-to-Length |
|---------------|------------------------------|---------------|------------------------------|
|               | VLD                          | LD            |                              |
| Thread Sizes  | 1/4 - 28 UNF                 | 5/16 - 18 UNC | 1/4 - 20 UNC                 |
| 1" Round      | 165-172-308                  | None          | 165-172-306                  |
| 2.4" T-Handle | 165-172-014                  | 165-172-013   | 165-172-005                  |
| 2" Mushroom   | 165-103-001                  | 165-103-006   | 165-103-002                  |
| 2" PTO        | 165-183-001                  | 165-183-003   | 165-183-002                  |

## Friction Lock

To order, add suffix "F" to Micro-Adjust part numbers. For example 16V02F would indicate a Friction Lock with a utility cable and a threaded conduit end fitting.

(Must be attached prior to assembly).





# Control Head Cable Specifications

| <b>Micro Adjust</b> |                     |              |             |            |              |     |
|---------------------|---------------------|--------------|-------------|------------|--------------|-----|
| <b>Twist Lock</b>   |                     |              |             |            |              |     |
| <b>Non Lock</b>     |                     |              |             |            |              |     |
| <b>Non Lock</b>     |                     |              |             |            |              |     |
|                     | Extended Dimensions | Non Lock VLD | Non Lock LD | Twist Lock | Micro Adjust |     |
| <b>VLD</b><br>      | Travel "A"          | 81V32        |             | 51V32      | 21V32DF      | EXT |
|                     | 1" 4.94"            | 81V42        | -----       | 51V42      | 21V42DF      |     |
|                     | 2" 6.94"            | 86V32        |             | 56V32      | 26V32DF      | UTL |
|                     | 3" 8.94"            | 86V42        |             | 56V42      | 26V42DF      |     |
| <b>VLD</b><br>      | Travel "A"          | 81V33        |             | 51V33      | 21V33DF      | EXT |
|                     | 1" 4.25"            | 81V43        | -----       | 51V43      | 21V43DF      |     |
|                     | 2" 6.25"            | 86V33        |             | 56V33      | 26V33DF      | UTL |
|                     | 3" 8.25"            | 86V43        |             | 56V43      | 26V43DF      |     |
| <b>LD</b><br>       | Travel "A"          |              | 91L32       | 51L32      | 21L32DF      | EXT |
|                     | 1" 5.18"            |              | 91L42       | 51L42      | 21L42DF      |     |
|                     | 2" 7.18"            |              | 96L32       | 56L32      | 26L32DF      | UTL |
|                     | 3" 9.18"            |              | 96L42       | 56L42      | 26L43DF      |     |
| <b>LD</b><br>       | Travel "A"          |              | 91L33       | 51L33      | 21L33DF      | EXT |
|                     | 1" 4.56"            |              | 91L43       | 51L43      | 21L43DF      |     |
|                     | 2" 6.56"            |              | 96L33       | 56L33      | 26L33DF      | UTL |
|                     | 3" 8.56"            |              | 96L43       | 56L43      | 26L43DF      |     |
| <b>VLD</b><br>      |                     | CA215        |             | CA217      | CA219        | UTL |
| <b>LD</b><br>       |                     |              | CA216       | CA218      | CA220        | UTL |

# Control Head Cable Order Code

## Cablecraft® Ordering Codes

### Control Head Type

- 2 = Micro Adjust
- 5 = Twist Lock with 2.38" Plastic Handle
- 6 = Twist Lock with 3.5" Metal Handle
- 7 = Non-Locking with 3/8"-24 UNF Mounting
- 8 = Non-Locking with 7/16"-20 UNF Mounting
- 9 = Non-Locking with 5/8"-18 UNF Mounting

### Cable Type

- 1 = Low Friction-EXT
- 6 = Utility

### Cable Size

- V = Very Light Duty
- L = Light Duty

### Stainless Steel Options

- 0 = Carbon Steel Fittings
- 3 = with Stainless Steel End Rod
- 4 = with Stainless Steel End Rod, Support Tube and Innermember Armor

### Output End Fittings

- 2 = Threaded Swivel
- 3 = Grooved Swivel

### Micro Adjust only Cable Options

- D = Disconnect Feature
- F = Friction Lock Accessory

### Seal Options (Use this number only if requesting optional seals)

- 5 = Improved Model 5 Wiper Seal is Standard on Low Friction-EXT & Utility
- 6 = Model 6 Wiper Seal, Optional on All Controls

### Cable Travel — 1"- 3" (For Output Fittings Style 2 & 3 Only)

### Overall Length — (See overall length dimension points indicated on each illustration)

### Knob Option — (For Control Head Types 7, 8 and 9, see page 14 for handle options)

2 - 1 - L - 3 - 2 - DF - (6) - 3 - 120 /

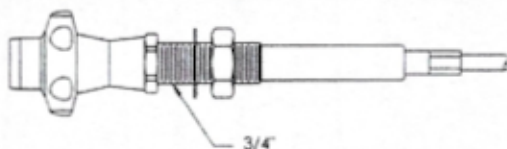


# Control Heads Commercial

Factory assembled, trim-to-length, with stainless steel solid wire innermember. Up to 3" travel, 5" minimum bend radius and 20 lb pull load rating.

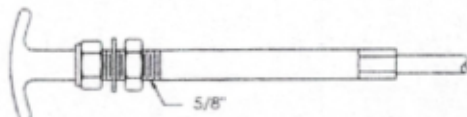
## Micro Adjust

Part No. 29V00-L (without Friction Lock)  
Part No. 29V000F-L (with Friction Lock)



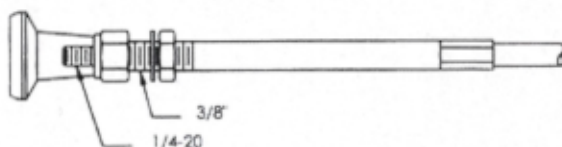
## Twist Lock

Part No. 59V00-L



## Non Lock (shown with 306 knob)

Part No. 79V00-L



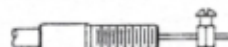
## Twist-On Conduit Ends

(Standard for Control Heads on left)  
Part No. 161-775 (3/8" Dia.)



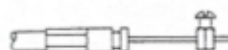
## Optional for Control Heads on left

3/8-24 UNF, Part No. 161-581



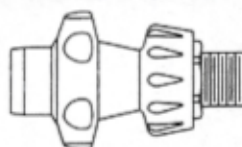
## Optional for Control Heads on left

3/8" Dia., Part No. 161-579



## Friction Lock Kit

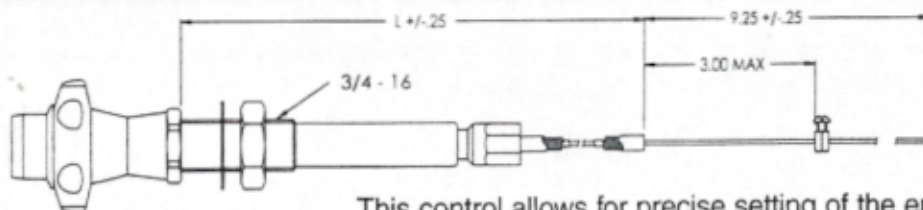
Part No. 165-510-215



For part number 29V00. Includes adjustment ring and compression washer.

## Truck Throttle Control

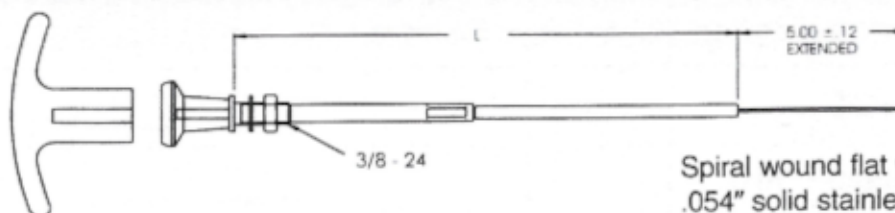
Part No. 286-009-L ("L" = Length)



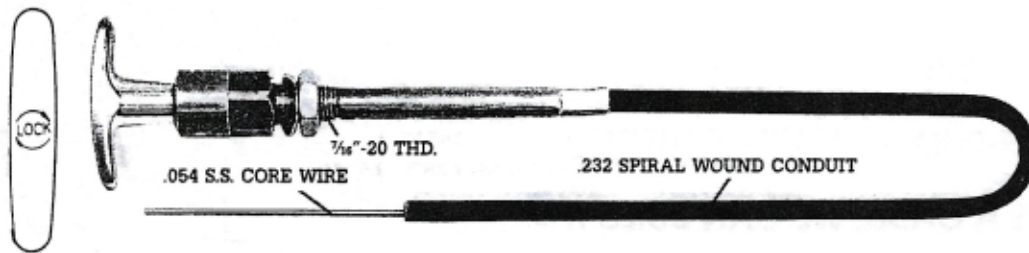
This control allows for precise setting of the engine RPM when the PTO is engaged or as a manual control of the idle position during engine warm up (Friction Lock optional).

## Non-Locking, Non-Rotating Control Head

Part No. 165-437-L Black Knob ("L" = Length), Part No. 165-438-L Black T-Handle ("L" = Length)

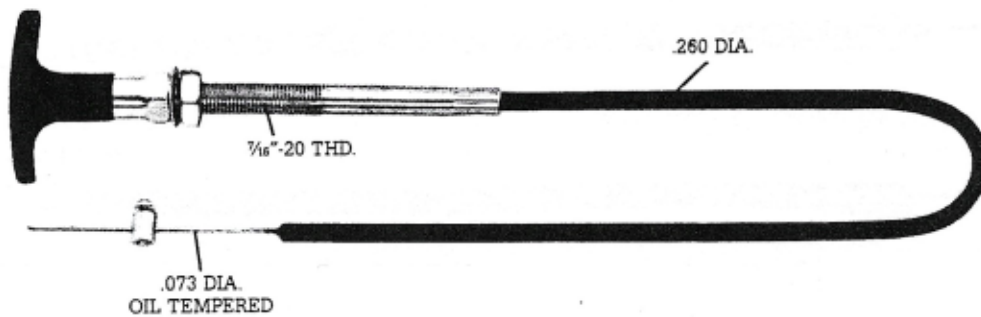


Spiral wound flat wire conduit  
.054" solid stainless innermember



Spiral wound can be cut with side cutting pliers.

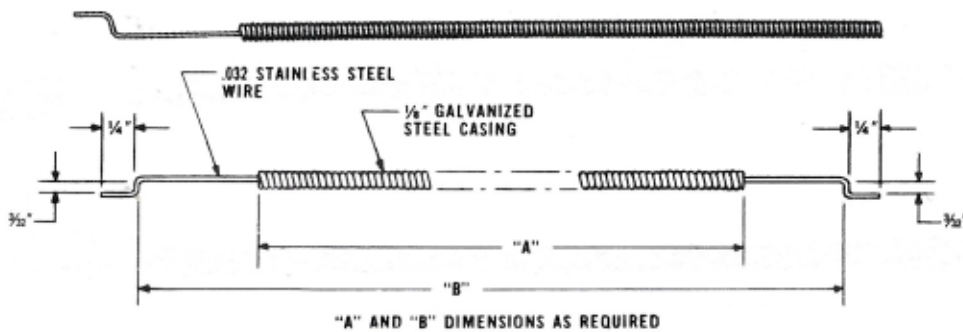
### LIGHT DUTY TWIST LOCK



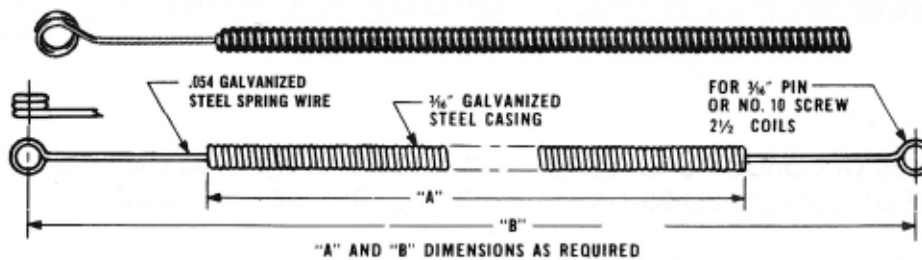
### MEDIUM DUTY TWIST LOCK



### LIGHT DUTY CHOKE CABLE



### Light Load Connector Controls

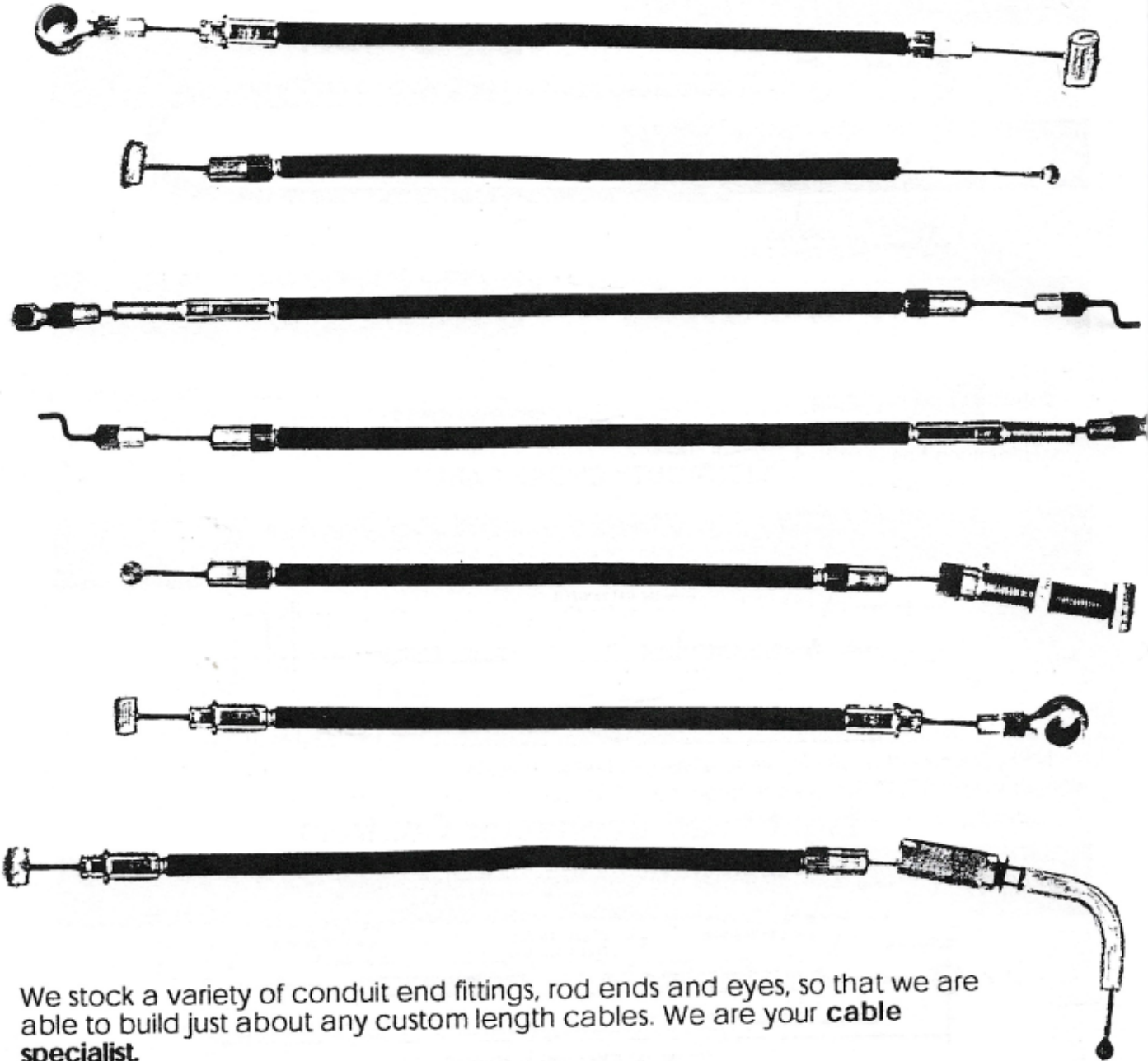




# CUSTOM BUILT CABLES

SPECIALTY CABLES  
A-Z  
PUSH-PULL - BRAKE - CLUTCH

\* IF IT'S A CABLE WE CAN BUILD IT \*



We stock a variety of conduit end fittings, rod ends and eyes, so that we are able to build just about any custom length cables. We are your **cable specialist**.

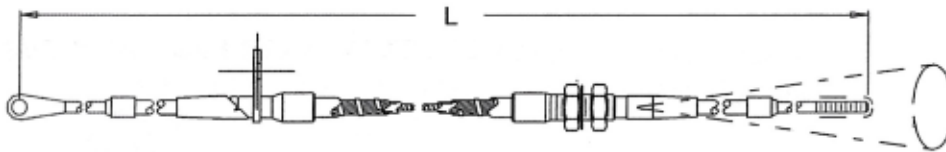
## Automotive shift cables.

Replacements for popular brand shift cables.

Order Code: X=3 for Carbon Steel, X=4 for Stainless Steel; L=Length

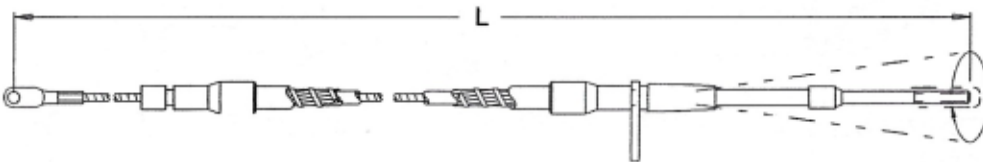
### B&M shift

Part No. CA248-X-L



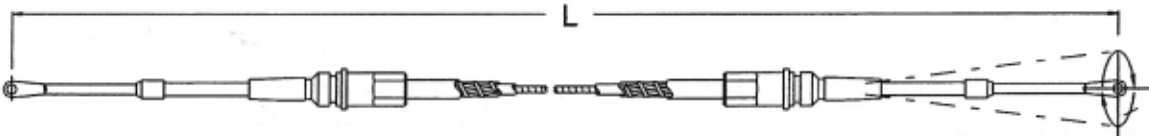
### Dodge Motor Home

Part No. CA249-X-L



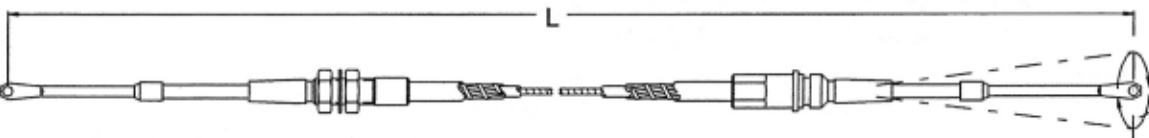
### Hurst Shift

Part No. CA273-X-L



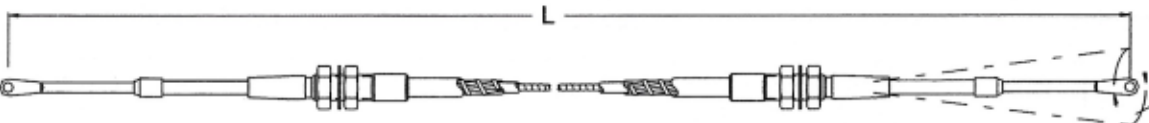
### Hurst Shift

Part No. CA274-X-L



### Hurst Shift

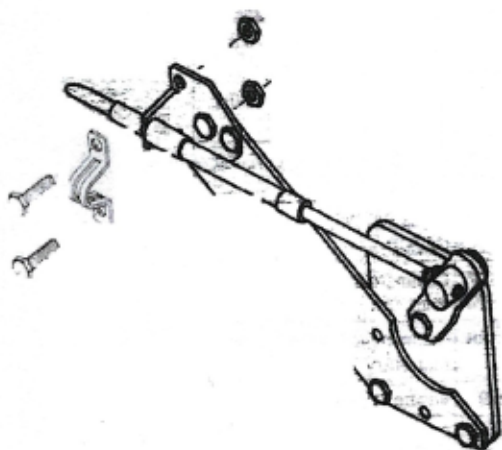
Part No. CA275-X-L





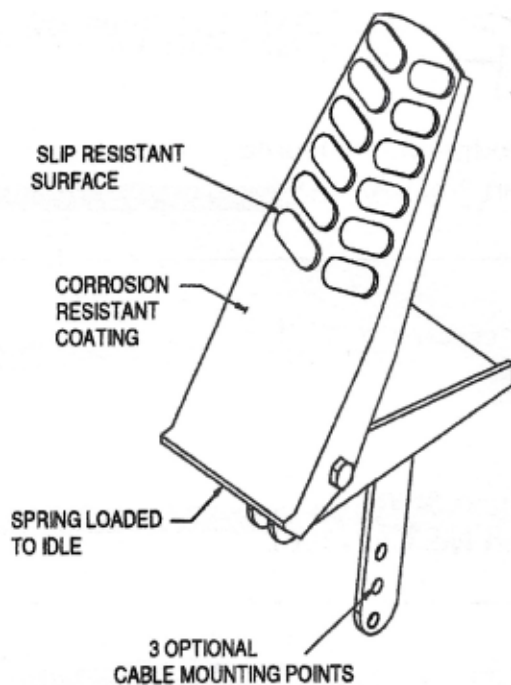
# SPECIAL PURPOSE CONTROLS

## PTO PUMP AND VALVE CONNECTION KITS

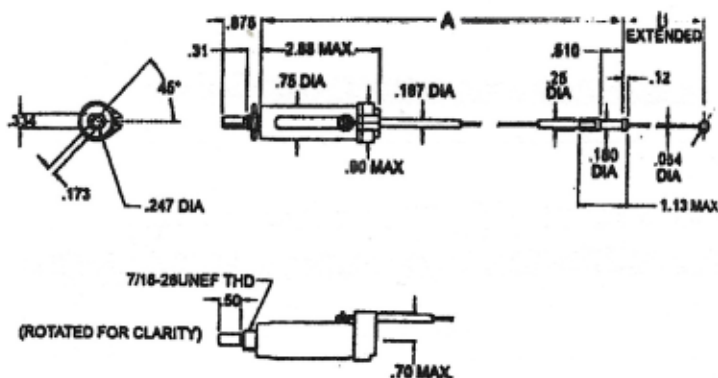


FOR DOUBLE GEAR CHELSEA AND  
SIMILAR P.T.O. PART NO BPT  
FOR SINGLE GEAR PART NO BPTSG

## BRISTOW ACCELERATOR PEDAL



## VENT CONTROL



IDEAL FOR SMALL VEHICLES  
LIGHT LOADS  
WHEN ECONOMY IS IMPORTANT

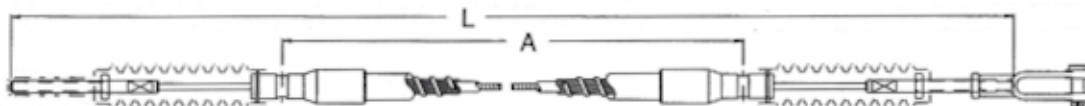
## ROTARY TO LINEAR MOTION CONVERTER

### Throttle/Accelerator Cables (Pull-Only)

Part No. A156-637-L (1/4-28 end rods) Grooved-Grooved

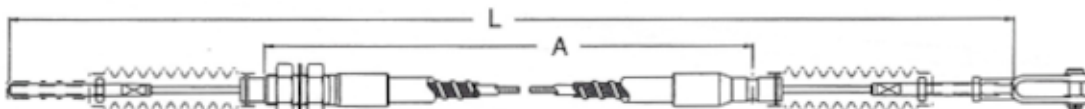
Part No. A156-657-L (10-32 end rods) Grooved-Grooved

"A" dimension fixed in relation to "L" dimension.  
Bellows on both ends.



Part No. A156-638-L (1/4-28 end rods) Threaded-Grooved

Part No. A156-658-L (10-32 end rods) Threaded-Grooved



Part No. A156-679-L (1/4-28 end rods) Threaded-Threaded

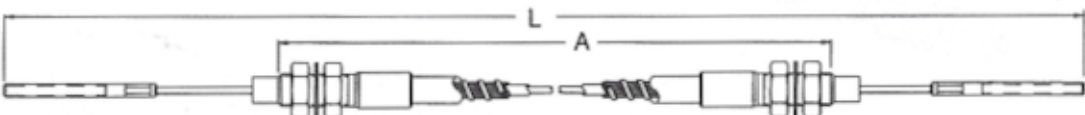
Part No. A156-680-L (10-32 end rods) Threaded-Threaded



Part No. CA305-TT-A-L (1/4-28 end rods) Threaded-Threaded

Part No. CA306-TT-A-L (10-32 end rods) Threaded-Threaded

"A" dimension variable in relation to "L" dimension.  
Bellows optional.



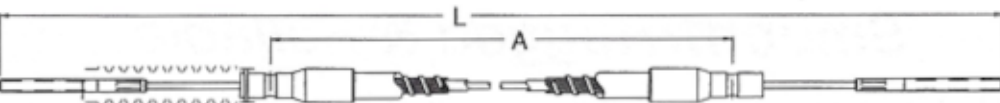
Part No. CA305-TG-A-L (1/4-28 end rods) Threaded-Grooved

Part No. CA306-TG-A-L (10-32 end rods) Threaded-Grooved

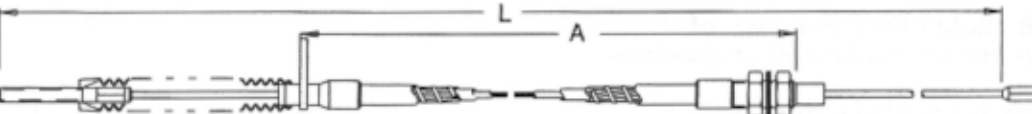


Part No. CA305-GG-A-L (1/4-28 end rods) Grooved-Grooved

Part No. CA306-GG-A-L (10-32 end rods) Grooved-Grooved



Part No. CA307-A-L (1/4-28 end rods) Special

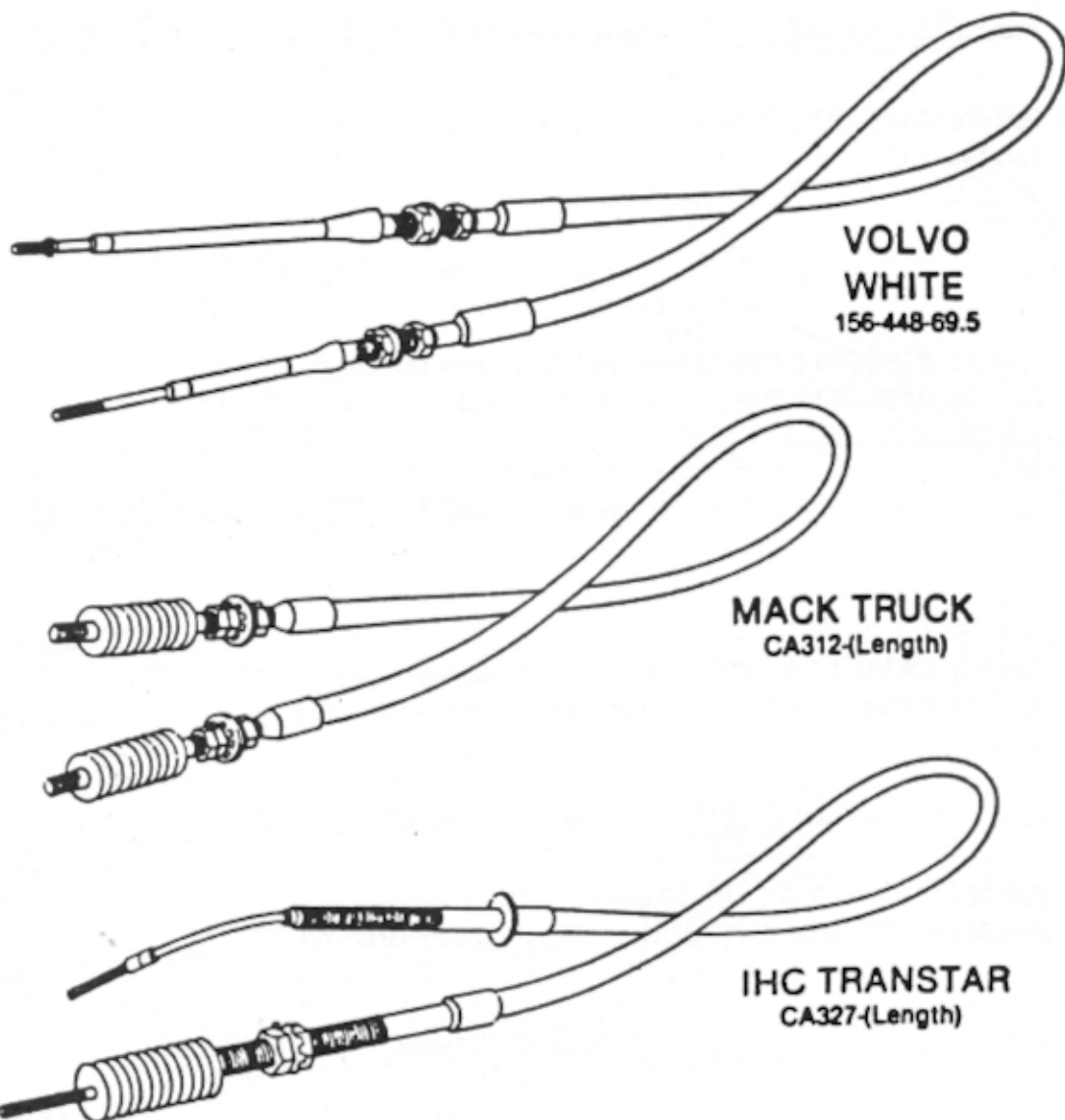




# CLUTCH CONTROL CABLES

**A High Quality  
Replacement for Most  
Cab Over Engine Vehicles**

*The most flexible control cable in the industry*



**VOLVO  
WHITE**  
156-448-69.5

**MACK TRUCK**  
CA312-(Length)

**IHC TRANSTAR**  
CA327-(Length)

## ***Smooth/Rugged & Reliable***

All Cable Assemblers stock components for the immediate assembling of control cables to meet your requirements.

No other clutch cable offers the ease of installation that our added flexibility provides.

Order your cable by overall length or manufacturer's number.

Cable Assemblers will also provide same-day delivery on push-pull, PTO and brake cables.

### Clutch Cables (Pull-Only)

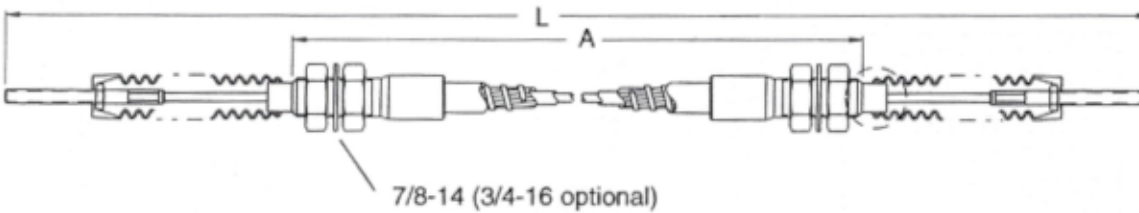
High quality replacements for most cab-over engine vehicles and other similar applications.  
Built to your specifications by your local cable assembler.

Generic clutch replacement cables HD conduit, special clutch inner member.

Part No. CA235-A-L (5/16-24 end rods)

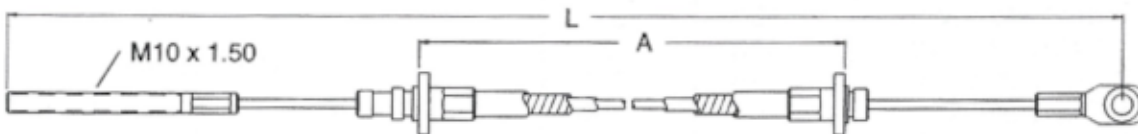
Part No. CA236-A-L (3/8-24 end rods)

Order Code: L=Length overall; A=Conduit length



General Motors style clutch cable. 1500lb brake conduit and innermember.

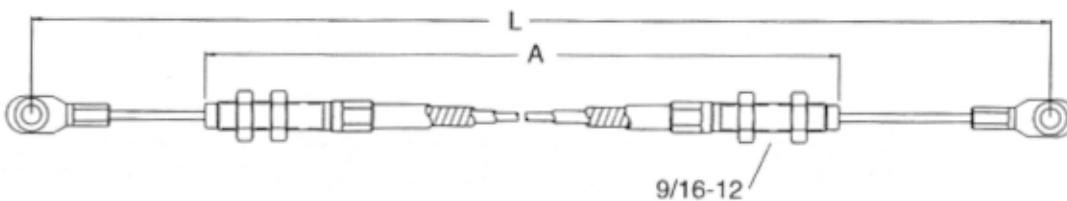
Part No. CA270-XXX (XXX=Dash number, see table below)



| Dash No. | Equivalent<br>G/M Part No. | L     | A     | Conduit | Inner-<br>member |
|----------|----------------------------|-------|-------|---------|------------------|
| -010     | 15520115                   | 76.69 | 47.56 | 47.26   | 69.83            |
| -009     | 15518380                   | 71.65 | 43.31 | 43.01   | 64.79            |
| -008     | 15518379                   | 79.53 | 51.18 | 50.88   | 72.67            |
| -007     | 15518378                   | 74.21 | 44.88 | 44.38   | 67.35            |
| -006     | 15518377                   | 66.93 | 37.60 | 37.30   | 60.07            |
| -005     | 15507983                   | 69.01 | 44.55 | 44.25   | 62.15            |
| -004     | 15507982                   | 52.75 | 26.00 | 25.70   | 45.89            |
| -003     | 15507981                   | 72.91 | 45.27 | 44.97   | 66.05            |
| -002     | 15507980                   | 72.95 | 44.49 | 44.19   | 66.09            |
| -001     | 15507979                   | 68.07 | 40.94 | 40.64   | 61.21            |

General Motors style clutch cable. 1500lb brake conduit and innermember.

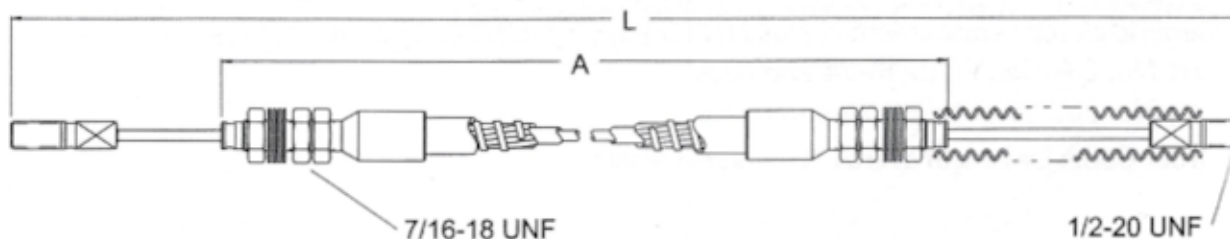
Part No. CA271-A-L (L=Length overall; A=Conduit length)





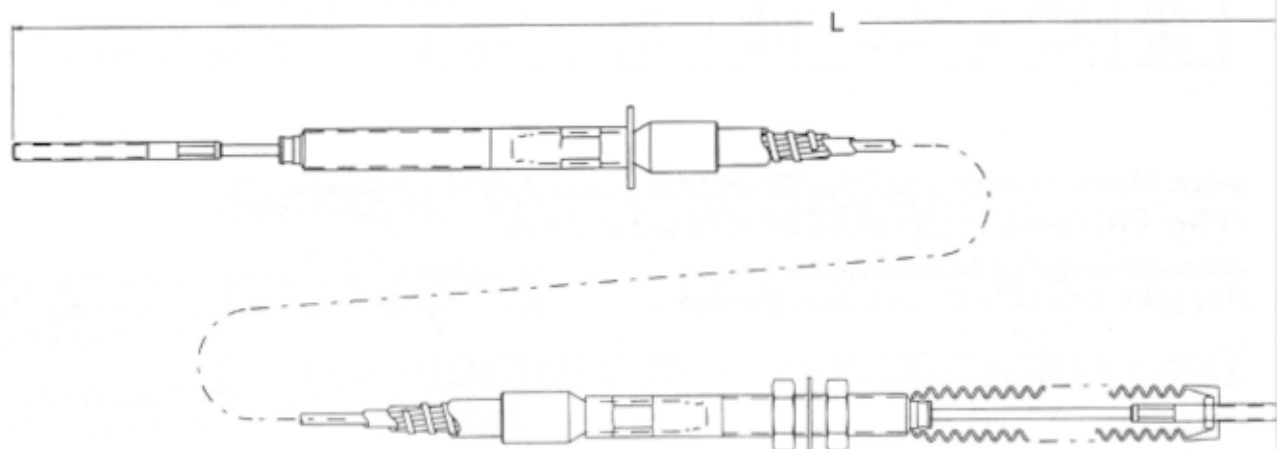
### Clutch Cables (Pull-Only)

Mack Truck® style clutch cable. HD conduit and special clutch innermember.  
Part No. CA312-A-L (A=Conduit length; L=Length overall; see table)



| Part Number       | A     | L     |
|-------------------|-------|-------|
| CA312-34.6-42.0   | 34.6  | 42.0  |
| CA312-55.6-63.0   | 55.6  | 63.0  |
| CA312-79.6-87.0   | 79.6  | 87.0  |
| CA312-85.6-93.0   | 85.6  | 93.0  |
| CA312-91.6-99.0   | 91.6  | 99.0  |
| CA312-102.6-110.0 | 102.6 | 110.0 |
| CA312-127.6-135.0 | 127.6 | 135.0 |
| CA312-25.6-36.0   | 25.6  | 36.0  |
| CA312-34.6-45.0   | 34.6  | 45.0  |
| CA312-43.6-54.0   | 43.6  | 54.0  |
| CA312-55.6-66.0   | 55.6  | 66.0  |
| CA312-67.6-78.0   | 67.6  | 78.0  |
| CA312-79.6-90.0   | 79.6  | 90.0  |
| CA312-85.6-95.0   | 85.6  | 96.0  |
| CA312-91.6-102.0  | 91.6  | 102.0 |
| CA312-103.6-114.0 | 103.6 | 114.0 |
| CA312-118.6-129.0 | 118.6 | 129.0 |
| CA312-29.6-40.0   | 29.6  | 40.0  |
| CA312-95.6-106.0  | 95.6  | 106.0 |
| CA312-107.6-188.0 | 107.6 | 118.0 |

IHC Transtar® style clutch cable. HD conduit and special clutch innermember.  
Part No. CA327-L (L=Length overall)

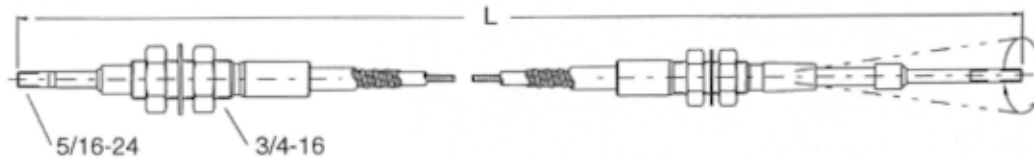


## Remote Valve Control (RCV) Cables

Used to operate hydraulic valves. Ideal for wet-line kits, relocating valves, or vehicle modifications. Mounting kits available for most popular "spool" type valves.

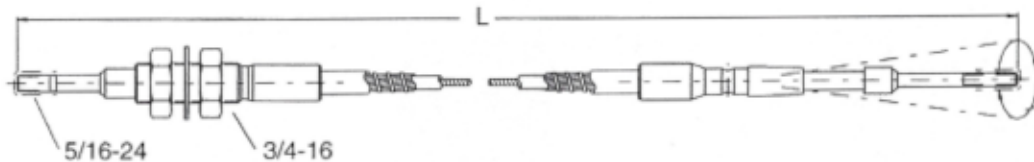
Part No. A17X-334 Utility

Part No. A31X-334 EXT

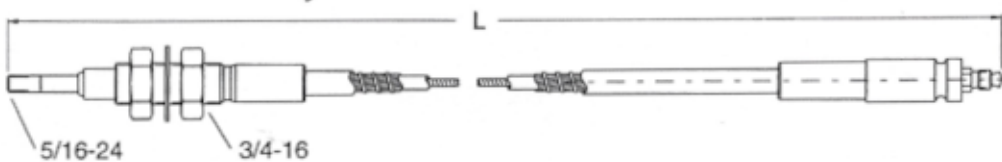


Part No. A17X-335 Utility

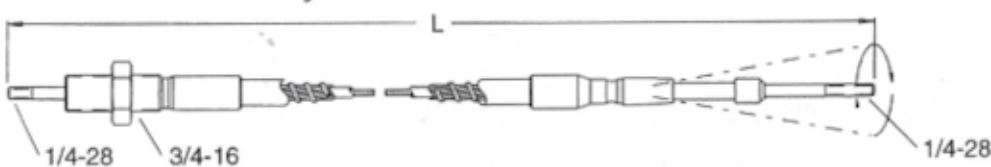
Part No. A31X-335 EXT



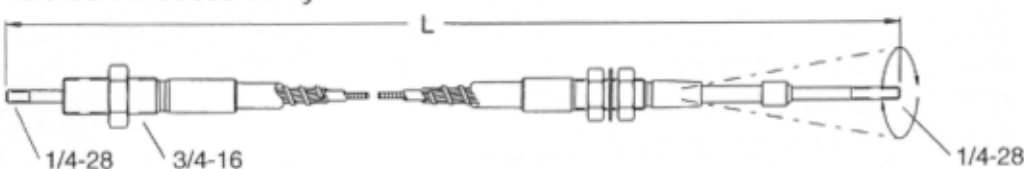
Part No. A17X-342 Utility



Part No. A17X-351 Utility



Part No. A17X-352 Utility

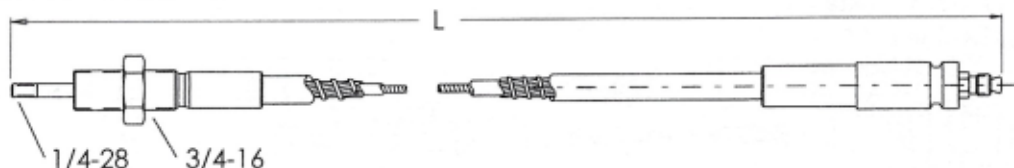




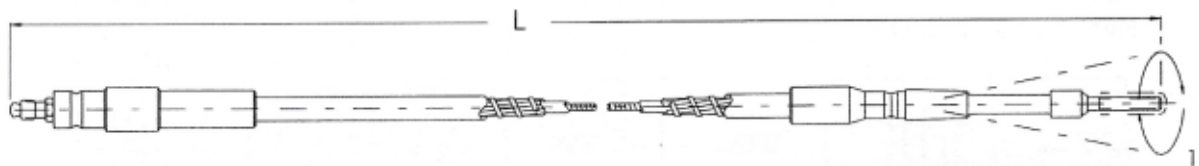
### Remote Valve Control (RVC) Cables (continued)

Part No. CA260 Utility

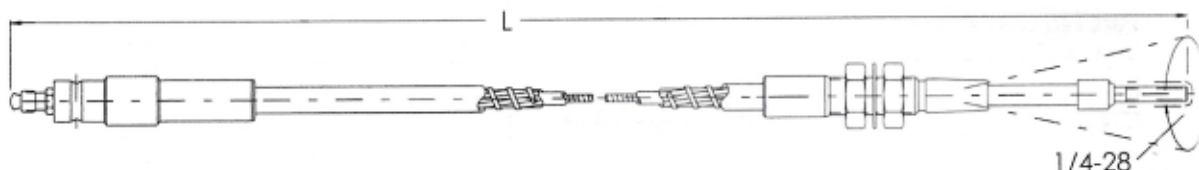
Part No. CA261 EXT



Part No. CA22XG



Part No. CA22XT



### Cable Mounting Kits

Cablecraft mounting kits fit most popular valves.

#### Part Number

#### For Use On:

|             |                                                     |
|-------------|-----------------------------------------------------|
| 185-101-001 | Comm. Shearing 505                                  |
| 185-101-002 | Comm. Shearing D50                                  |
| 185-101-003 | Comm. Shearing A35                                  |
| 185-101-004 | Comm. Shearing A20                                  |
| 185-101-005 | Comm. Shearing VA20                                 |
| 185-101-006 | HUSCO 6000                                          |
| 185-101-007 | HUSCO 7120                                          |
| 185-101-008 | Gresen V20, V31P, V42,<br>CP, CT, CPT, CS, 25P, 5PK |



Kit Includes:  
Adapter Bracket, Clevis,  
Clevis pin, and hardware

## VALVE ADAPTOR KITS

### SPECIFICATIONS

Valve adaptor kits provide a means of attaching the control cable to the valve. The adaptor also provides physical protection to the valve spool and cable end rod.

Adaptors are designated as Internal Clevis, External Clevis or Spring End, depending on the means of attachment to the spool.

#### CABLE

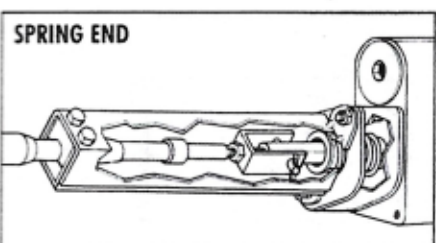
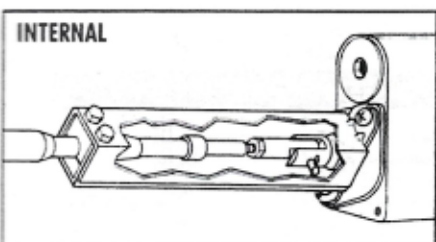
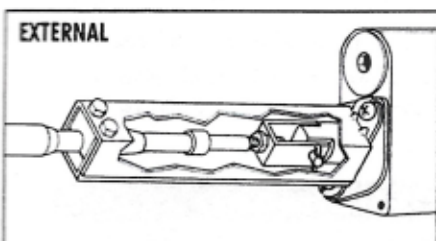
Standard 2 inch Output Stroke Push-Pull,  
Clamp Type Grooved Conduit (Clamp) Cable

#### HARDWARE

Includes Clevis and all Associated Hardware

#### MATERIAL

Housing - Zinc Plated Steel  
Clamps - Zinc Die Cast  
Hardware - Zinc Plated



| MAKE                        | MODEL    | QUADRASTAT<br>PART NUMBER |         | CLEVIS<br>STYLE | LENGTH<br>IN INCHES |           |
|-----------------------------|----------|---------------------------|---------|-----------------|---------------------|-----------|
|                             |          | CABLE SIZE                |         |                 | C4<br>KIT           | C6<br>KIT |
|                             |          | 1/4-28                    | 5/16-24 |                 |                     |           |
| BRAND                       | A0775    | C455                      | -----   | External        | 8.22                | ---       |
|                             | ST2      | C455                      | -----   | External        | 8.22                | ---       |
| COMMER-<br>CIAL<br>INTERTEC | VA-20    | C410                      | C610    | Spring End      | 8.90                | 8.90      |
|                             | VA-20    | C432                      | C632    | External        | 7.70                | 8.05      |
|                             | VA-35    | C419                      | C619    | Spring End      | 8.75                | 8.75      |
|                             | KA-18    | C481                      | C681    | External        | 8.05                | 8.40      |
| CROSS                       | CV       | C403                      | C603    | External        | 7.70                | 8.05      |
|                             | CA       | C402                      | C602    | External        | 7.70                | 8.05      |
|                             | CD       | C402                      | C602    | External        | 7.70                | 8.05      |
|                             | BA       | C482                      | C682    | Spring End      | 8.65                | 8.65      |
| ENERGY                      | CVA200   | C404                      | C604    | Internal        | 8.05                | 8.40      |
|                             | CVP      | C405                      | C605    | Internal        | 8.05                | 8.40      |
|                             | CVSD     | C404                      | C604    | Internal        | 8.05                | 8.40      |
| DANA<br>GRESEN              | V-15 (M) | C411                      | C611    | External        | 7.70                | 8.05      |
|                             | V-15 (F) | C412                      | C612    | Internal        | 7.70                | 8.05      |
|                             | 25P      | C420                      | C620    | Internal        | 7.70                | 8.05      |
|                             | CS       | C406                      | C606    | Internal        | 8.05                | 8.40      |
|                             | V12      | C411                      | C611    | External        | 7.70                | 8.05      |
|                             | V20      | C406                      | C606    | Internal        | 8.05                | 8.40      |
|                             | V20      | C423                      | C623    | Spring End      | 8.79                | 8.79      |
|                             | V42      | C407                      | C607    | Internal        | 8.05                | 8.40      |
| HUSCO<br>PARKER             | V42      | C424                      | C624    | Spring End      | 9.00                | 9.00      |
|                             | 6000     | C408                      | C608    | External        | 7.70                | 8.05      |
| PRINCE                      | VDP11/12 | C409                      | C609    | External        | 7.35                | 7.70      |
|                             | RD5200   | C422                      | C622    | External        | 8.09                | 8.44      |
|                             | RD5300   | C422                      | C622    | External        | 8.09                | 8.44      |
| REXROTH                     | 20T/20P  | C406                      | C606    | Internal        | 7.80                | 8.15      |
|                             | MP-18    | C429                      | C629    | External        | 8.05                | 8.40      |



## QUADRASTAT CORP.

A SUBSIDIARY OF ADAMS RITE MANUFACTURING CO.

260 Santa Fe Street, Pomona, CA 91767

Phone: 909-632-2300 • Fax: 909-632-2369

Website: [www.quadrastat.com](http://www.quadrastat.com) • E-mail: [engineering@quadrastat.com](mailto:engineering@quadrastat.com)

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Adams Rite Manufacturing Co.  
All specifications are subject  
to change without notice.



FORM 504/04

# CONTROL SYSTEMS

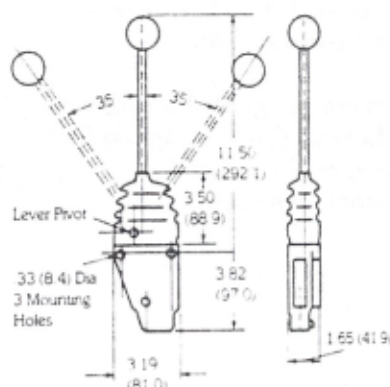
## REMOTE VALVE CONTROL SYSTEM

### Single Axis Remote Valve Control

Weatherproof zinc diecast control can be mounted on interior or exterior of vehicle. Units can be mounted singly or stacked for multi-spool valves.

| PART NO. | DESCRIPTION                      | WEIGHT    |
|----------|----------------------------------|-----------|
| B206301  | Single axis remote valve control | 2.95 lbs. |

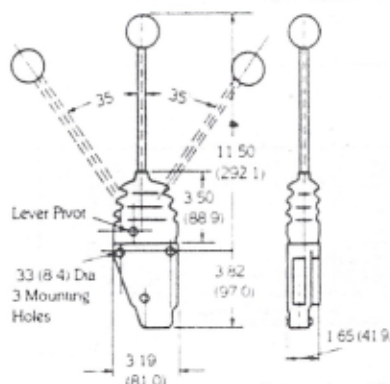
All dimensions shown are nominal.



### Single Axis with Detent Remote Valve Control

Like single axis model with added safety feature of detents.

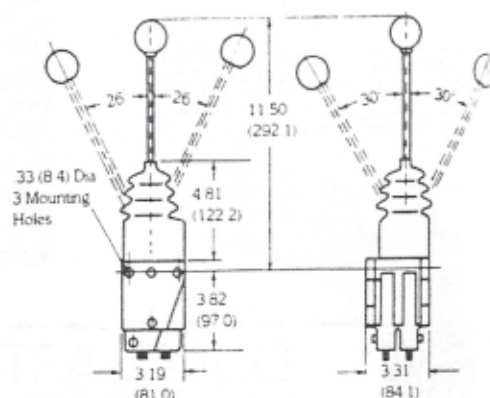
| PART NO.   | DESCRIPTION                                              |
|------------|----------------------------------------------------------|
| B206301001 | Single axis remote valve control w/center detent         |
| B206301002 | Single axis remote valve control w/end detent            |
| B206301003 | Single axis remote valve control w/center and end detent |



### Dual Axis Remote Valve Control

Dual axis controls are used to control two valves simultaneously.

| PART NO. | DESCRIPTION                    |
|----------|--------------------------------|
| B206305  | Dual axis remote valve control |





# MODULAR VALVE CONTROL SYSTEMS

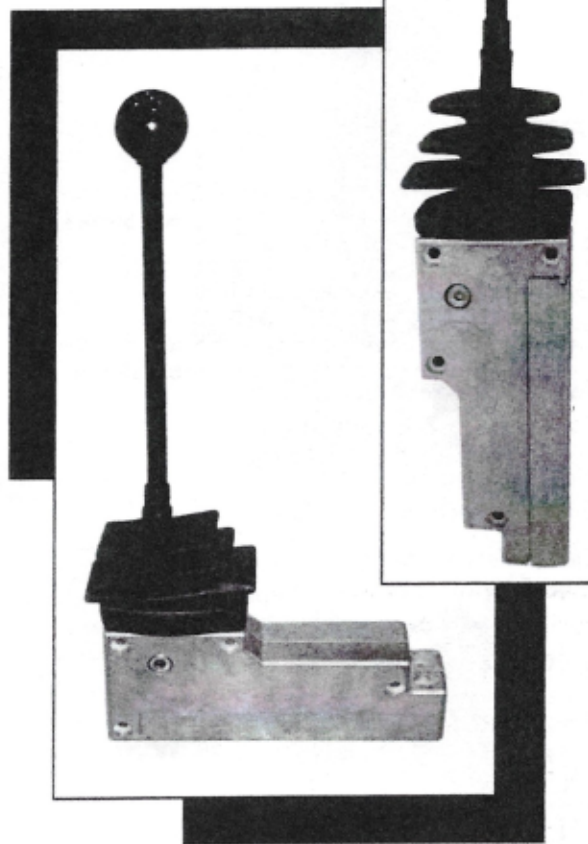
The C80 Series Remote Valve Control provides a Heavy duty Lever for stroking hydraulic spool valves, winch valves or transmission valves.

## STANDARD FEATURES

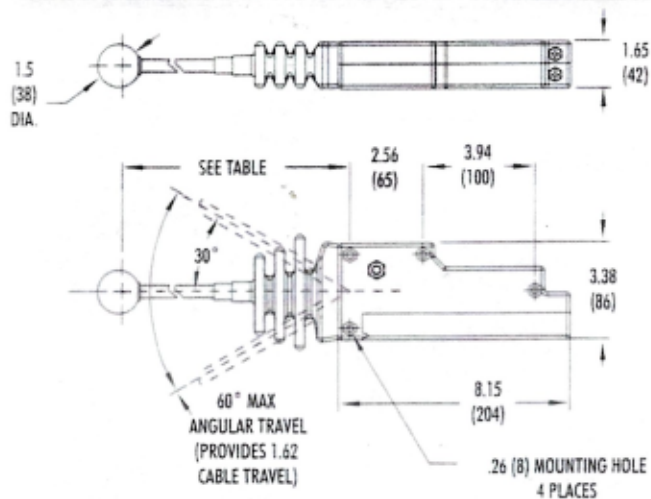
- $\pm 0.81$  inch ( $\pm 20$  mm) Output Stroke
- Maximum Working Load:  
1/4-28 End Rod Cable - 100 lbs (445N)  
5/16-24 End Rod Cable - 200 lbs (890N)
- Pre-Loaded Center Return spring
- Symmetrical Lever Action;  $\pm 30^\circ$  Maximum Lever on Mounting Center Line
- Enclosed assembly, Zinc Die Cast Body
- Uses Standard Configuration, Push-Pull cable - Clamp Type, 2 inch Output Stroke, either 1/4-28 or 5/16-24 End Rod

### CENTERING FORCE LBS. (N)

| 0 Travel      | 1/2 Travel    | Full Travel   |
|---------------|---------------|---------------|
| 11 lbs. (49N) | 13 lbs. (58N) | 15 lbs. (67N) |

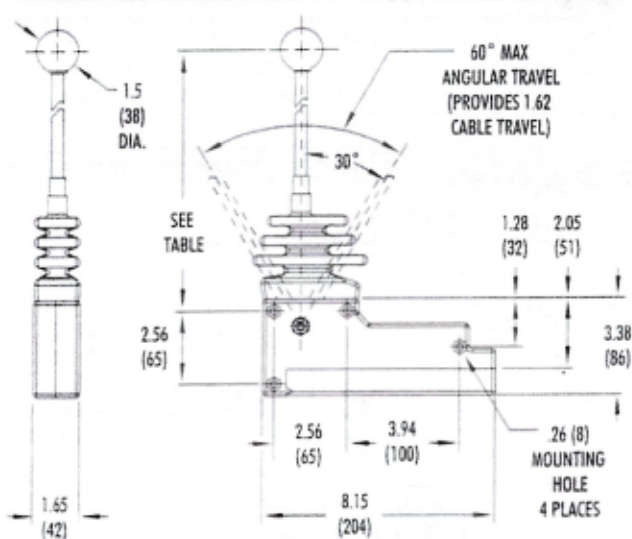


## C85 - IN LINE CONTROL



| LEVER LENGTH | DIMENSION INCHES (mm) | MECHANICAL ADVANTAGE |
|--------------|-----------------------|----------------------|
| 1            | 8.13 (207)            | 5.5:1                |
| 2            | 11.38 (289)           | 7.5:1                |
| 3            | 14.63 (372)           | 9.5:1                |
| G*           | 8.50 (216)            | 5.8:1                |

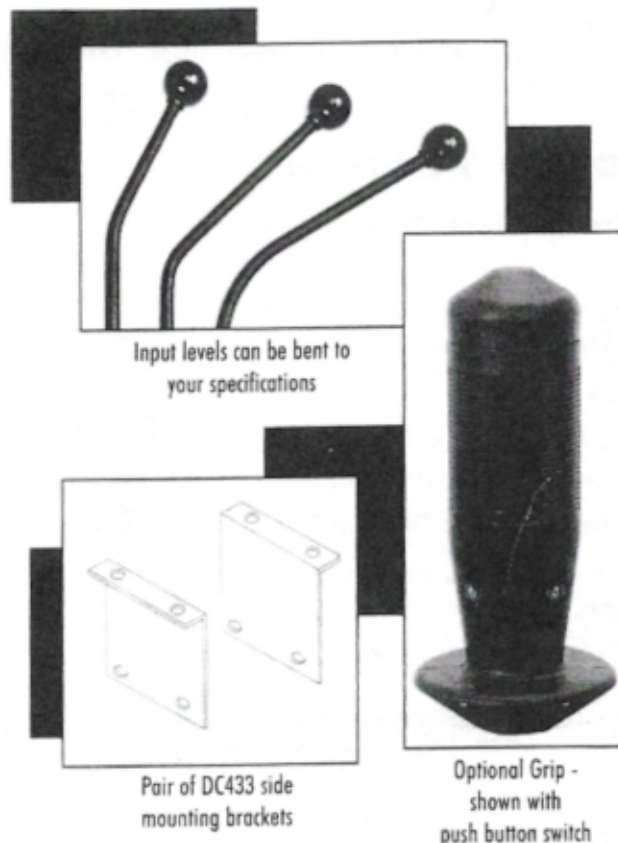
## C84 - RIGHT ANGLE CONTROL



| LEVER LENGTH | DIMENSION INCHES (mm) | MECHANICAL ADVANTAGE |
|--------------|-----------------------|----------------------|
| 1            | 9.15 (232)            | 5.5:1                |
| 2            | 12.40 (315)           | 7.5:1                |
| 3            | 14.65 (398)           | 9.5:1                |
| G*           | 9.60 (244)            | 6.2:1                |

## OPTIONS

- Inline (C85) or Right Angle (C84) Output Stroke
- 3 Standard Lever Lengths
- Grip with Electrical Switches
- Center Position Lock with Pull-Up Knob Release
- Fore and Aft Position Lock with Pull-up Knob Release (C84 only)
- No Centering Spring:  
0 to 1.62 inch (41 mm) Output Stroke
- Biased Return Spring:  
0 to 1.62 inch (41 mm) Output Stroke -  
Pulling Cable (Spring pulls Cable toward zero)
- Bent Input Levers
- Stacked Control Assemblies



## PART NO./ORDERING SYSTEM

**LEVER POSITION**  
4 = 90° to Cable  
5 = In Line with cable

**BASIC SERIES**

**C8 521A 000**

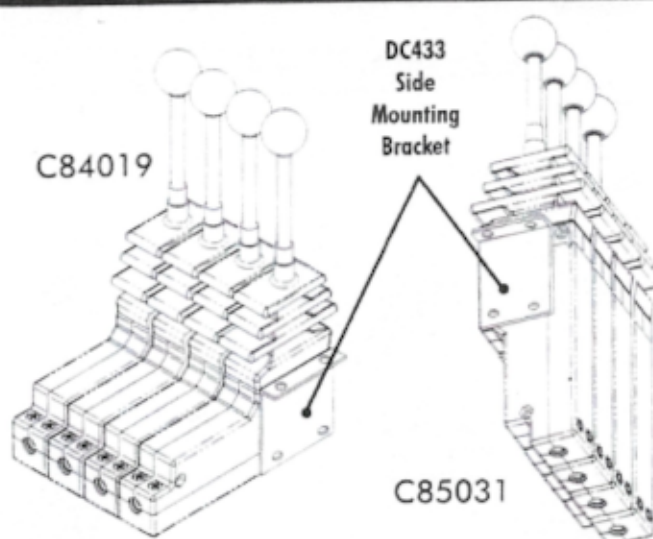
**SPRING PACK**  
1 = None  
2 = Center Return

**SPECIAL DESIGNATIONS**  
Usually 000 unless "G" Grip assembly is specified for lever Length. Refer to page 3 for specific Grip designation. Example: G301 use 301

**CABLE SIZE**  
A = 1/4-28 Threaded Rod End, Type 42C  
B = 5/16-24 Threaded Rod End, Type 62C

**LEVER LENGTH**  
1 } Refer to tables  
2 } on opposite  
3 } page for "A"  
G } Dimension

## MULTILEVER ASSEMBLIES



| STYLE | MULTILEVER PACKAGES |         |         |         |
|-------|---------------------|---------|---------|---------|
|       | 2 Lever             | 3 Lever | 4 Lever | 5 Lever |
| C85   | C85035              | C85030  | C85031  | C85037  |
| C84   | C84020              | C84018  | C84019  | —       |

Levers - Dash 2 for 7.5:1 Advantage, Spring Centered.  
Knob Spacing - 2.00 (50 mm) between Centers,  
0.5 (12.6 mm) gap. Cables - 5/6-24, 2 inch.



## OPTIONS

- Grip - with electrical switches (see page 3)
- 1 inch Stroke Cable for installations having minimal cable bends and appropriately short stroke requirements
- Lock to prevent inadvertent motion of the outputs
- Input motion restrictor
- Bent input levers to place the lever in a convenient position for the vehicle operator



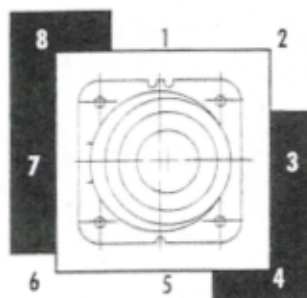
Motion Restrictor Plate



Optional Grip - shown with push button switch

## PERFORMANCE DATA

| Lever Position | Output Motion |      | Geometric Advantage<br>(with 10.9" Lever) |
|----------------|---------------|------|-------------------------------------------|
|                | A             | B    |                                           |
| 1              | PULL          | PUSH | 8.8:1                                     |
| 2              | PULL          | -    | 6.6:1                                     |
| 3              | PULL          | PULL | 8.8:1                                     |
| 4              | -             | PULL | 6.6:1                                     |
| 5              | PUSH          | PULL | 8.8:1                                     |
| 6              | PUSH          | -    | 6.6:1                                     |
| 7              | PUSH          | PUSH | 8.8:1                                     |
| 8              | -             | PUSH | 6.6:1                                     |



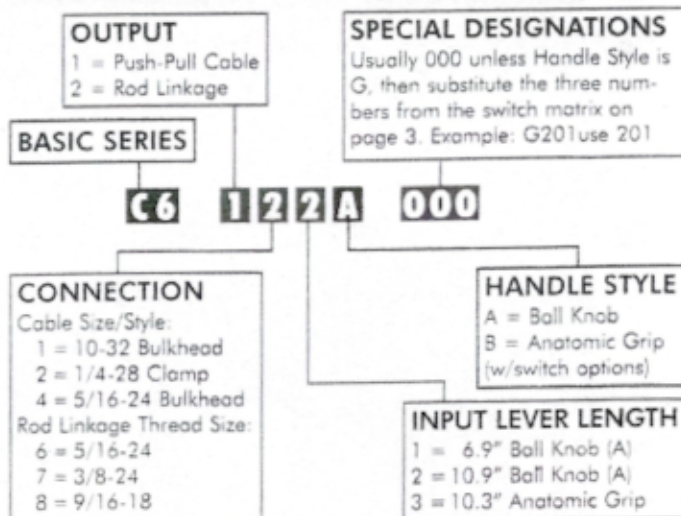
Center Position Lock  
2 or 3 Positions

## SPECIFICATIONS

- OUTPUT STROKE - 0 to  $\pm 0.50$  inches (12.7mm)
- WORKING LOADS - Up to 100lbs. (445N)  
Each Output
- INPUT MOTION - 0 to  $+30^\circ$  All Directions
- MATERIALS:

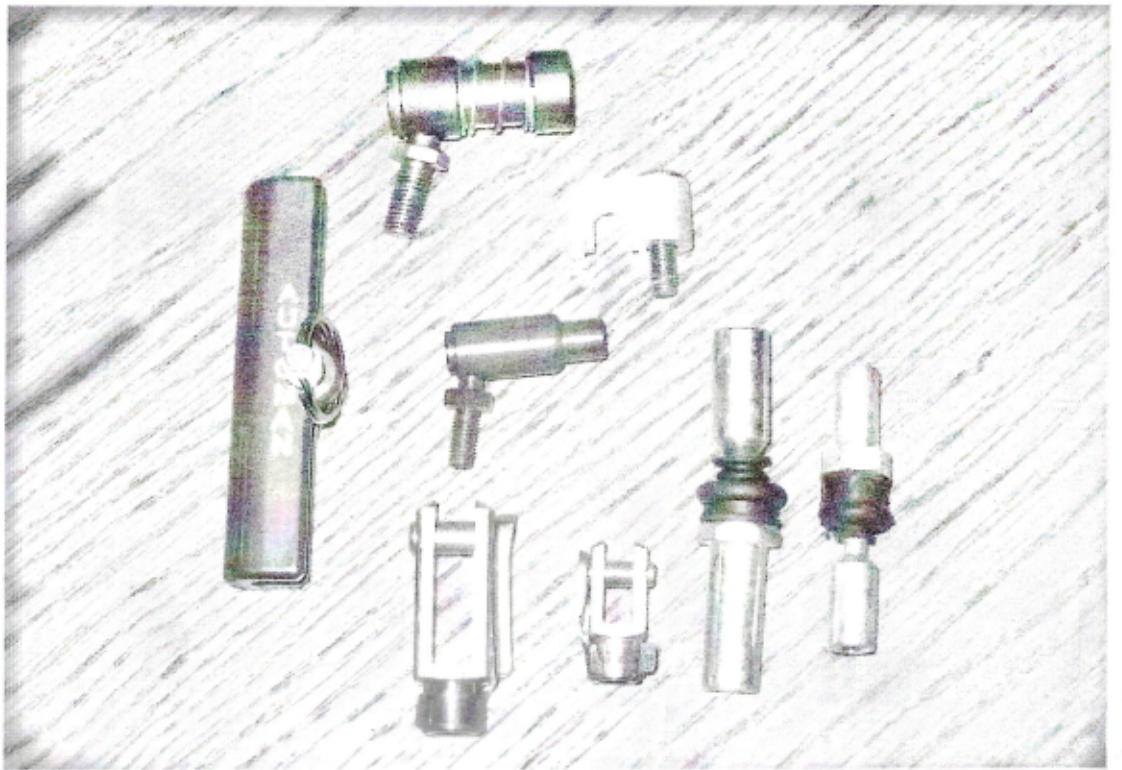
- TOP BOOT - Molded EPDM
- BODY - Nylon 901
- SLIDERS - Steel
- LEVER - Steel

## PART NO./ORDERING SYSTEM

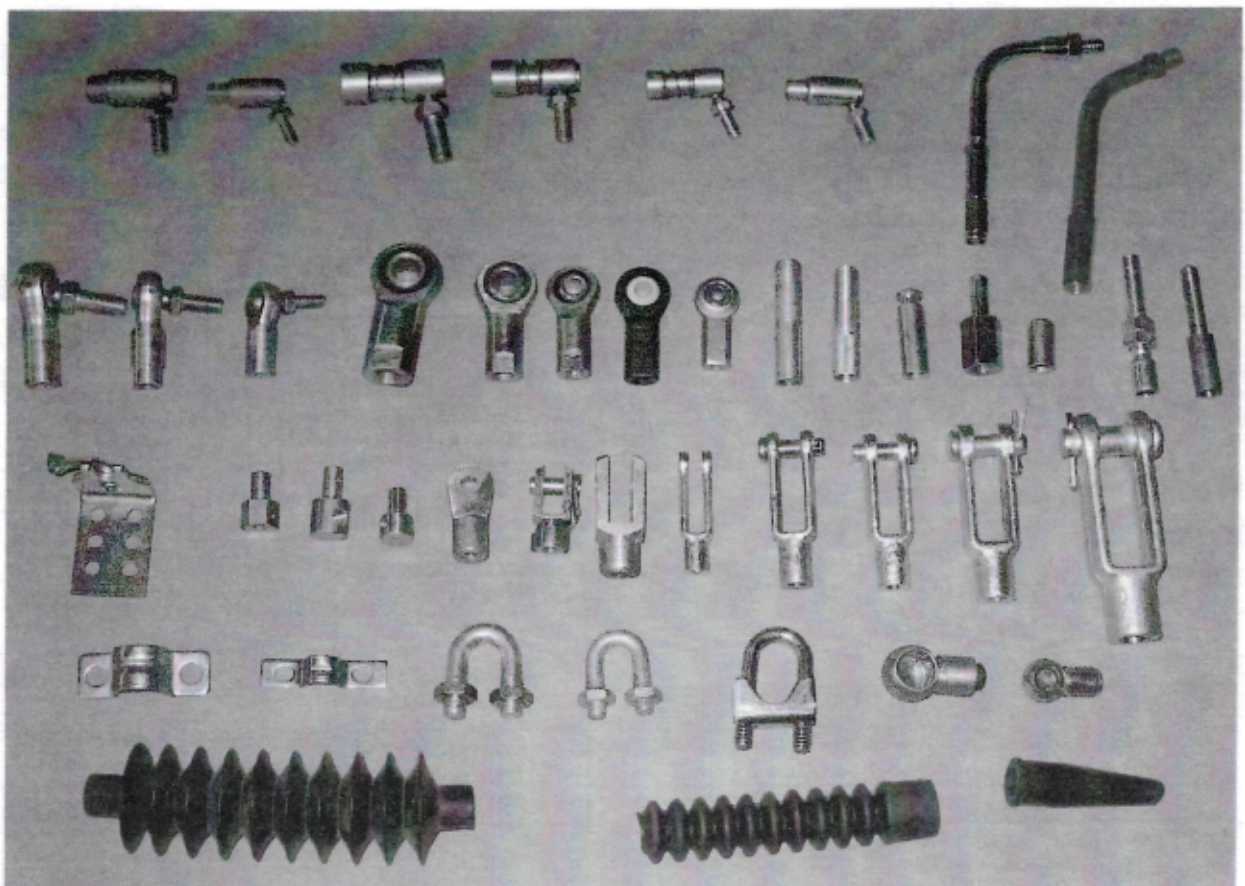




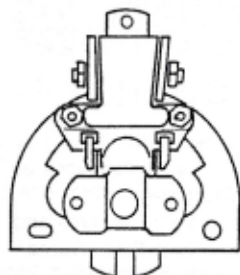
## SPECIALTY HARDWARE



## ACCESSORY HARDWARE



# QUADRASTAT CONTROLS



## SELF-LOCKING

The QUADRASTAT® self-locking Control is a unique control lever that "locks where you leave it."

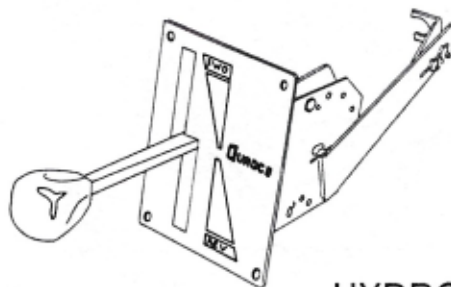
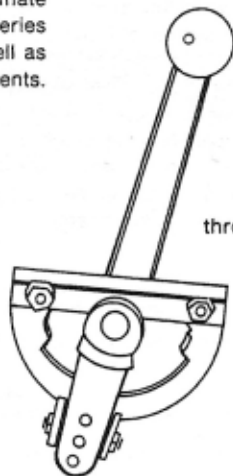
It automatically locks out feedback forces without using ratchets, gates, friction pads, or unlocking knobs. The operator never needs to make any preliminary unlocking

motion to reposition the lever. First used in high performance aircraft, the QUADRASTAT® Control is currently designed and manufactured as an economical anti-feedback device for use in a variety of agricultural and construction equipment applications.

The Q14 Series offers precise control, including backlash adjustment to assure ultimate performance throughout its life. The Q36 Series provides heavier load holding capability as well as the option of position detents.

## THROTTLE

THROTTLE Controls on machinery requiring a constant power setting are one of the most common uses of QUADRASTAT® self-locking Controls. The QUADRASTAT® control is by far the most reliable and economical means of achieving a constant engine throttle setting. The Q14010 and Q14020 Series Controls are particularly compact lever assemblies.



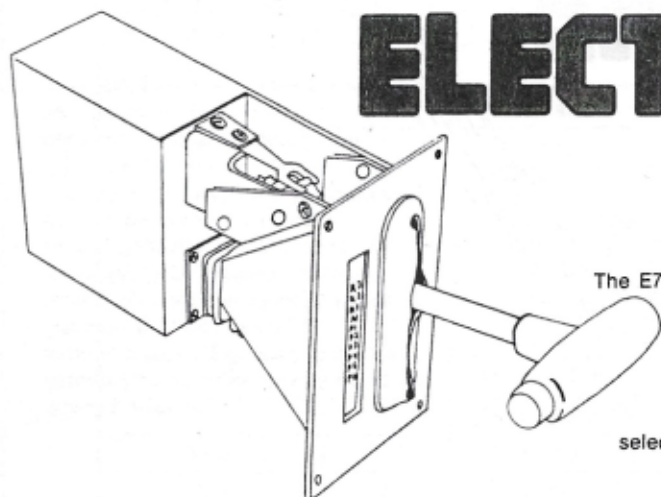
## HYDROSTATIC

The versatility of the QUADRASTAT® control is demonstrated when used in the control of HYDROSTATIC TRANSMISSIONS.

The self-locking, anti-feedback feature provides an ideal means of positioning variable displacement pumps and motors. The locking unit may be fitted with a variety of standard input levers, linear or non-linear outputs, cable supports, bracket/housings, and gate plates, allowing the package to be tailored to meet the needs of each vehicle.

The T50 Series is typically used for a single pump or throttle control. The T60 Series has two

Levers for use either as a combination pump and throttle control or a dual pump (motor) control package.



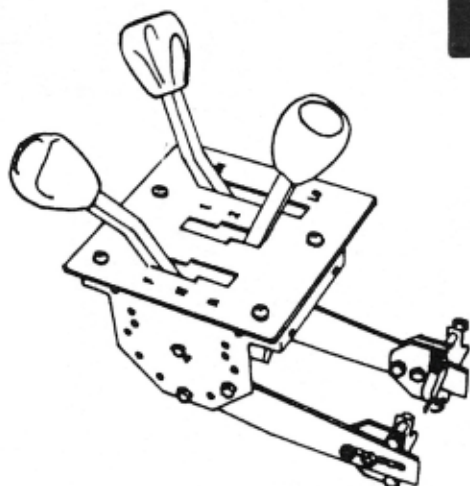
# ELECTRONIC SHIFT CONTROL

The E73 Series Control, designed with both electronic and switch options, meets the demand for an environmentally rugged, reliable, and cost effective Control of solenoid operated Transmissions. Electronic units may be programmed to provide such performance features as automatic torque converter lock-up, down shift inhibiting, automatic shifting, load/range selection, or other needs. Systems with proportional solenoids may be programmed using pulse width modulated outputs.



# TRANSMISSION CONTROLS

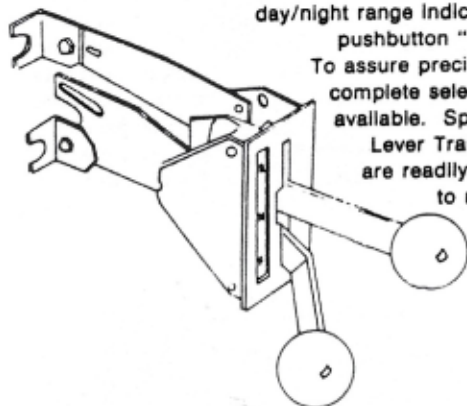
## POWERSHIFT



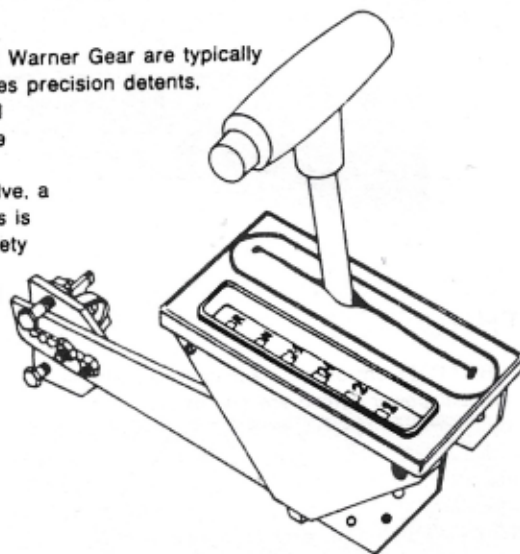
For POWERSHIFT TRANSMISSIONS Quadrastat offers a family of one, two, three and four lever Controls for such functions as Direction, Speed, Hi-Ln Range, and 4 Wheel Disconnect. T13, T25, T29, and T38 Series Controls are available in both standard and special configurations to operate Allison, Clark, Funk, Twin Disc, Warner, and ZF Transmissions. These Controls are ruggedly constructed to meet the demands of the off-highway environment. To complete the installation and insure optimum control, a wide range of Transmission Connector Kits is available.

## AUTOMATIC

AUTOMATIC TRANSMISSIONS manufactured by Allison, Chrysler, Ford, GMC, and Warner Gear are typically controlled by QUADCO® T70 Series Controls. The T73 Series Control features precision detents, positive locking in each range, an illuminated moving red day/night range Indicator, and a convenient and attractive pushbutton "T" handle on the input lever.

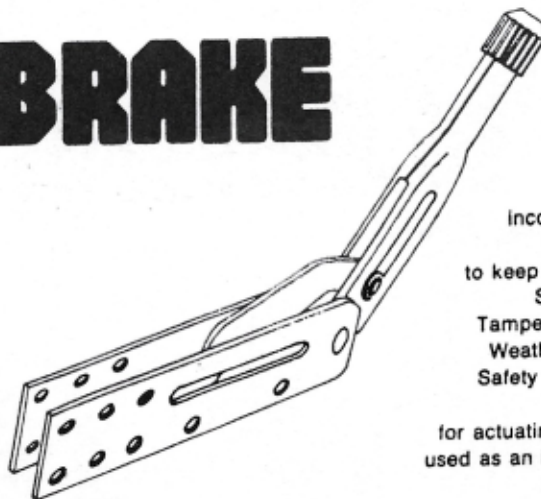


To assure precise actuation of the Transmission Valve, a complete selection of Transmission Connector Kits is available. Special Controls, such as the Dual Safety Lever Transmission - Throttle Control shown, are readily developed by our Engineering Staff to meet specific industry needs.



# PARKING BRAKE LEVERS

The B40 Series overcenter locking lever is specifically designed to meet the requirements of mechanical parking brakes on both Off and On Highway heavy duty vehicles. The levers



are available for either floor or side mounting. All incorporate an adjustment knob in the handle, an easy way to keep the mechanical linkage taut.

Standard accessories include Tamper Resistant Adjusting Knobs, Weather Resistant "ON" Switches, Safety Latches and Security Locks.

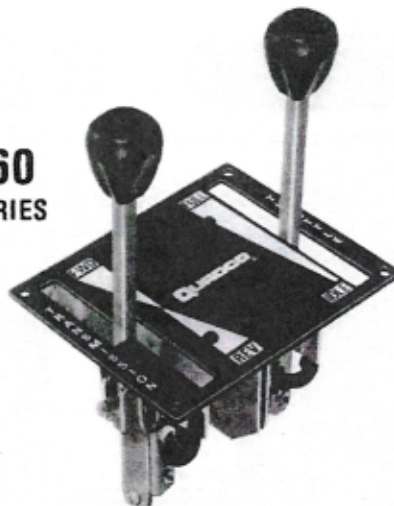
While the lever is normally for actuating parking brakes, it is often used as an inexpensive pull-only throttle or valve control.



**T50  
SERIES**



**T60  
SERIES**



## PART NUMBER SYSTEM and ORDERING PROCEDURE

A COMPLETE PART NUMBER IS COMPOSED OF NINE DIGITS. SINCE EACH CONTROL IS BUILT AT THE FACTORY TO YOUR ORDER, IT IS ESSENTIAL THAT EVERY DIGIT BE SPECIFIED CORRECTLY.

**T6018S012**

**SEVENTH, EIGHT and NINTH digits** are assigned to specific gate plate patterns.

**SIXTH digit** specifies the style and size of the gate plate.

**FIFTH digit** specifies the angle at which the cable leaves the Control Head and whether the cable must "push" or "pull" as the Control lever is moved toward the front of the vehicle.

**FOURTH digit** identifies the type and size push-pull control cable which will be used with the Control Head. It is also used to specify a Neutral Start switch, if available.

Three inch (3") stroke cables are standard. Note that a cable is not included as part of the Control Head assembly.

**FIRST, SECOND and THIRD digits** specify the basic type of Control.

## CONTROL MATRIX

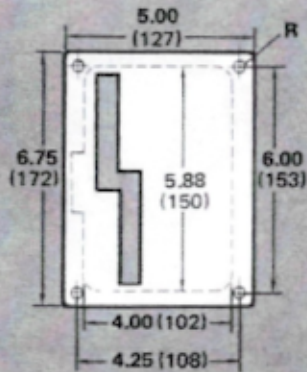
|               | BASIC CONTROL<br>(1st, 2nd, 3rd Digits) | NUMBER<br>LEVERS | CONTROL ACTION    |                   | SELF LOCKING or FRICTION |                   |
|---------------|-----------------------------------------|------------------|-------------------|-------------------|--------------------------|-------------------|
|               |                                         |                  | NUMBER<br>1 LEVER | NUMBER<br>2 LEVER | NUMBER<br>1 LEVER        | NUMBER<br>2 LEVER |
| T50<br>Series | T52                                     | 1                | Linear            | —                 | Self Locking             | —                 |
|               | T53                                     | 1                | Linear            | —                 | Friction                 | —                 |
|               | T54                                     | 1                | Non-Linear        | —                 | Self Locking             | —                 |
|               | T55                                     | 1                | Non-Linear        | —                 | Friction                 | —                 |
| T60<br>Series | T60                                     | 2                | Linear "Z"        | Linear "I"        | Self Locking             | Self Locking      |
|               | T61                                     | 2                | Linear "Z"        | Linear "I"        | Self Locking             | Friction          |
|               | T63                                     | 2                | Linear "Z"        | Linear "I"        | Friction                 | Friction          |
|               | T64                                     | 2                | Non-Linear "Z"    | Linear "I"        | Self Locking             | Self Locking      |
|               | T65                                     | 2                | Non-Linear "Z"    | Linear "I"        | Self Locking             | Friction          |
|               | T66                                     | 2                | Non-Linear "Z"    | Non-Linear "Z"    | Friction                 | Friction          |
|               | T67                                     | 2                | Linear "Z"        | Linear "Z"        | Self Locking             | Self Locking      |
|               | T68                                     | 2                | Non-Linear "Z"    | Non-Linear "Z"    | Self Locking             | Self Locking      |
|               | T69                                     | SPECIALS         |                   |                   |                          |                   |

## SIXTH digit

The Gate Plates are case hardened, painted with black enamel, silk screened and over coated with polyurethane.

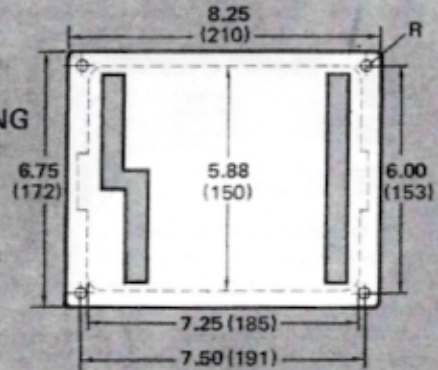
### R Size TOP MOUNTING

PANEL CUTOUT  
DIMENSIONS  
SHOWN BY  
DOTTED LINES  
R TO BE .75



### S Size TOP MOUNTING

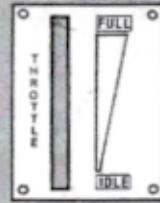
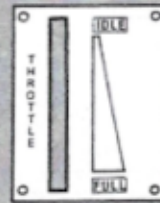
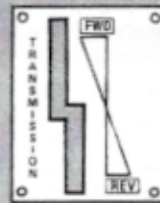
PANEL CUTOUT  
DIMENSIONS  
SHOWN BY  
DOTTED LINES  
R TO BE .75



## SEVENTH, EIGHTH & NINTH digits

### T52 & T53

Gate plates are painted black; different lettering from decal sheet T901 may be applied to the reverse side.



Part Number

001

002

007

003

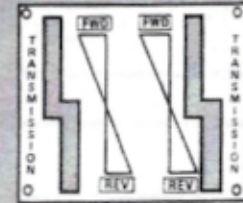
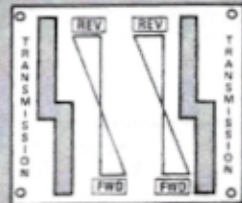
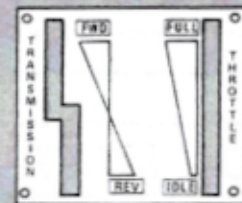
004

009

### T60 & T61 & T63

### T67

Gate plates are painted black; different lettering from decal sheet T901 may be applied to the reverse side.



Part Number

001

002

011

012

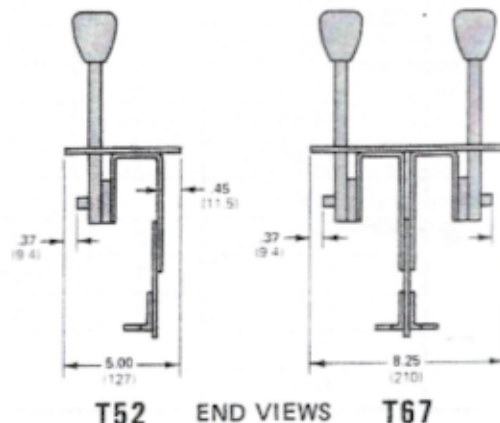
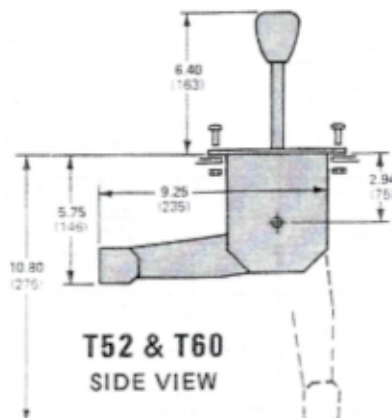
**NOTE:** Control without gate plate is designated by "X000" in the 6th thru 9th digits.

## INSTALLATION

These Controls are designed for surface (TOP) mounting using the gate plate as the mounting plate.

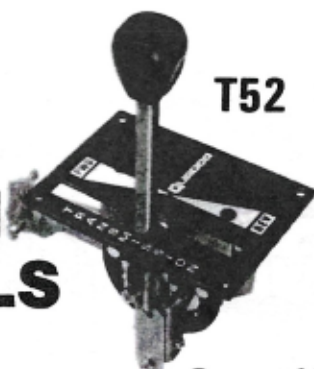
The Control is lowered thru the cutout and secured with four 1/4"-20 black finish, stainless steel screws furnished.

See Top Dimensions under the "SIXTH digit" above.





# LINEAR ACTION CONTROLS



**T52**

## Features:

- INFINITELY POSITIONABLE
- QUADRASTAT® SELF LOCKING OR FRICTION FEEDBACK RESTRAINT DEVICE
- POSITIVE NEUTRAL GATE ("Z")
- LINEAR (1:1) OUTPUT MOTION
- CASE HARDENED GATE PLATE
- INTEGRAL CABLE ANCHOR
- NEUTRAL SWITCH OPTION

## Specifications:

### INPUT:

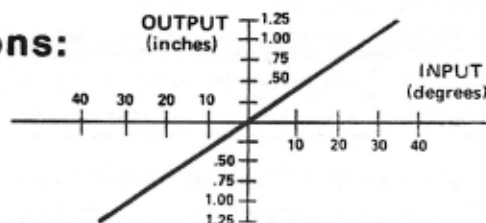
Transmission \_\_\_\_\_  $\pm 36^\circ$   
Throttle \_\_\_\_\_ 0 to  $72^\circ$

### OUTPUT:

Transmission \_\_\_\_\_  $\pm 1.25$  Inches ( $\pm 31.8$  mm)  
Throttle \_\_\_\_\_ 0 to 2.50 inches (63.5 mm)

### FEEDBACK RESTRAINT:

QUADRASTAT® \_\_\_\_\_ 0 to 100 in-lb  
Friction \_\_\_\_\_ 0 to 20 in-lb



### RELATIVE LOST MOTION

(HYSTERESIS):

QUADRASTAT® FRICTION

At Output \_\_\_\_\_  $\pm 0.75^\circ$  \_\_\_\_\_ 0

At Input

Light Loads \_\_\_\_\_  $\pm 0.5^\circ$  \_\_\_\_\_  $\pm 0.2$

Heavy Loads \_\_\_\_\_  $\pm 1.5^\circ$  \_\_\_\_\_  $\pm 0.2$

## FIRST, SECOND & THIRD digits

| BASIC CONTROL OPTIONS<br>(1st, 2nd, 3rd Digits) | NUMBER LEVERS | CONTROL ACTION |                | SELF LOCKING or FRICTION |                |
|-------------------------------------------------|---------------|----------------|----------------|--------------------------|----------------|
|                                                 |               | NUMBER 1 LEVER | NUMBER 2 LEVER | NUMBER 1 LEVER           | NUMBER 2 LEVER |
| T52                                             | 1             | Linear         | —              | Locking                  | —              |
| T53                                             | 1             | Linear         | —              | Friction                 | —              |
| T60                                             | 2             | Linear "Z"     | Linear "I"     | Locking                  | Locking        |
| T61                                             | 2             | Linear "Z"     | Linear "I"     | Locking                  | Friction       |
| T63                                             | 2             | Linear "Z"     | Linear "I"     | Friction                 | Friction       |
| T67                                             | 2             | Linear "Z"     | Linear "Z"     | Locking                  | Locking        |

EXAMPLE:

**T6356S002**

## FOURTH digit

ALWAYS USE 3" STROKE CABLE

| CABLE ROD END         | 1/4" - 28 |     | 5/16" - 24 |     |
|-----------------------|-----------|-----|------------|-----|
| SWITCH                | NO        | YES | NO         | YES |
| CLAMP END FITTINGS    | 1         | 5   | 2          | 6   |
| BULKHEAD END FITTINGS | 3         | 7   | 4          | 8   |

## FIFTH digit

← FRONT OF VEHICLE ←  
(Control Mounted on Right Side of Driver)

| When lever is moved toward front of vehicle<br>CABLE PUSHES | 1 | 2 | 3 | 4 |
|-------------------------------------------------------------|---|---|---|---|
|                                                             |   |   |   |   |
| When lever is moved toward front of vehicle<br>CABLE PULLS  | 5 | 6 | 7 | 8 |
|                                                             |   |   |   |   |

## P.T.O. or Hoist Single Lever Control

### P.T.O. LEVER END DETENT

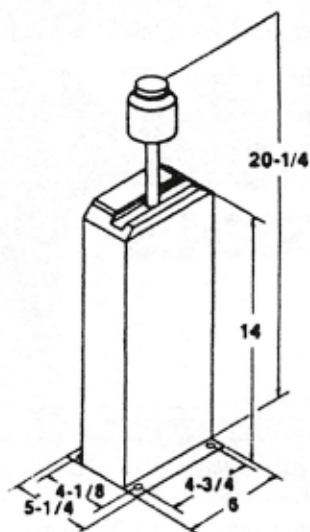
| PART NO | DESCRIPTION                          | WEIGHT    |
|---------|--------------------------------------|-----------|
| BSSPT52 | Single lever for 1/4"-28 thd. cables | 3.85 lbs. |
| BSSPT62 | Single lever for 3/8"-24 thd. cables | 3.85 lbs. |

### HOIST LEVER CENTER DETENT

| PART NO | DESCRIPTION                          | WEIGHT    |
|---------|--------------------------------------|-----------|
| BSSPU52 | Single lever for 1/4"-28 thd. cables | 3.85 lbs. |
| BSSPU62 | Single lever for 3/8"-24 thd. cables | 3.85 lbs. |

### SINGLE LEVER CONSOLE

| PART NO | DESCRIPTION                                                              | WEIGHT    |
|---------|--------------------------------------------------------------------------|-----------|
| BTS     | Black epoxy coated steel console for all B Series single lever controls. | 7.60 lbs. |



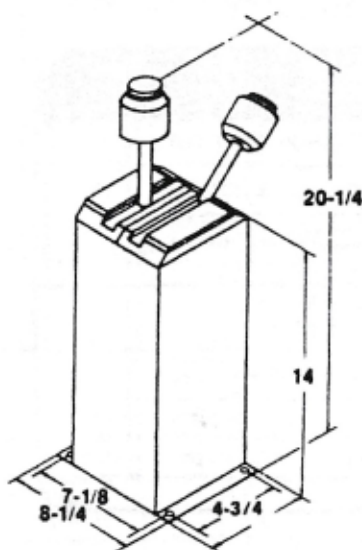
## P.T.O.- Hoist Dual Lever Control

### P.T.O HOIST DUAL LEVER CONTROL

| PART NO | DESCRIPTION                        | WEIGHT   |
|---------|------------------------------------|----------|
| BDS52   | Dual lever for 1/4"-28 thd. cables | 7.5 lbs. |
| BDS62   | Dual lever for 3/8"-24 thd. cables | 7.5 lbs. |

### DUAL LEVER CONSOLE

| PART NO | DESCRIPTION                                                            | WEIGHT  |
|---------|------------------------------------------------------------------------|---------|
| BTD     | Black epoxy coated steel console for all B Series dual lever controls. | 10 lbs. |



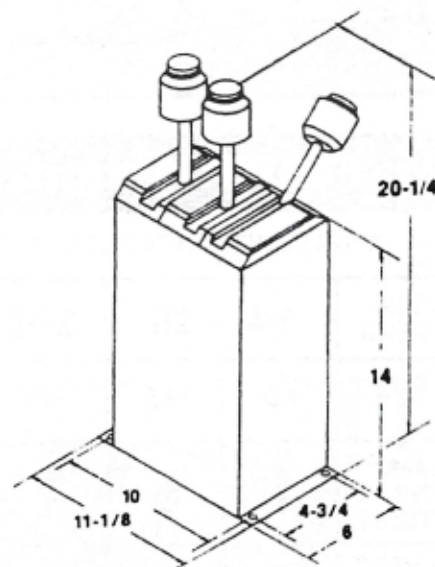
## P.T.O.-Hoist-Hoist Triple Lever Control

### TRIPLE LEVER CONTROL

| PART NO | DESCRIPTION             | WEIGHT    |
|---------|-------------------------|-----------|
| BTTT52  | for 1/4"-28 thd. cables | 11.5 lbs. |
| BTTT62  | for 3/8"-24 thd. cables | 11.5 lbs. |

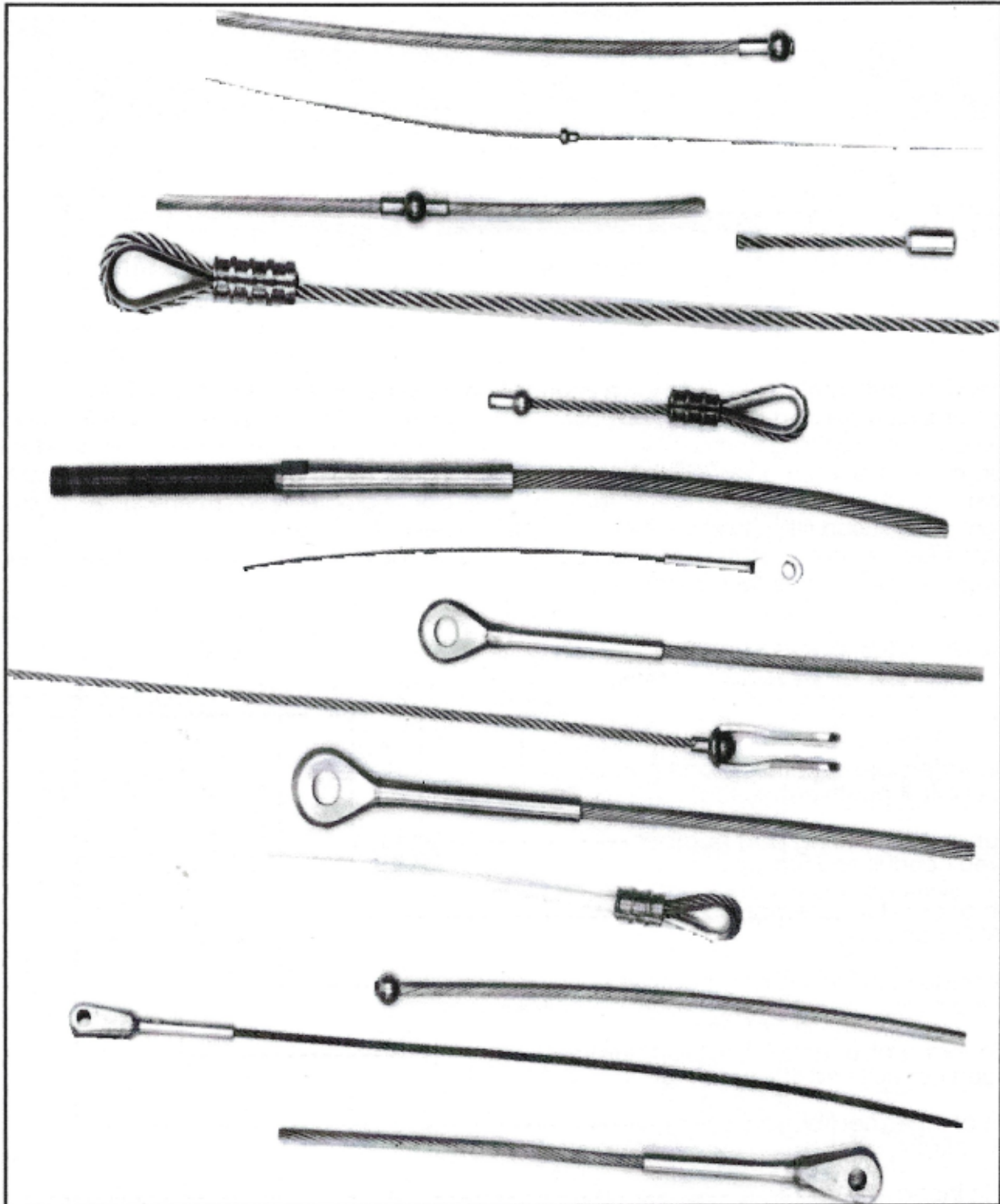
### TRIPLE LEVER CONSOLE

| PART NO | DESCRIPTION                                                              | WEIGHT     |
|---------|--------------------------------------------------------------------------|------------|
| BTT     | Black epoxy coated steel console for all B Series triple lever controls. | 11.45 lbs. |



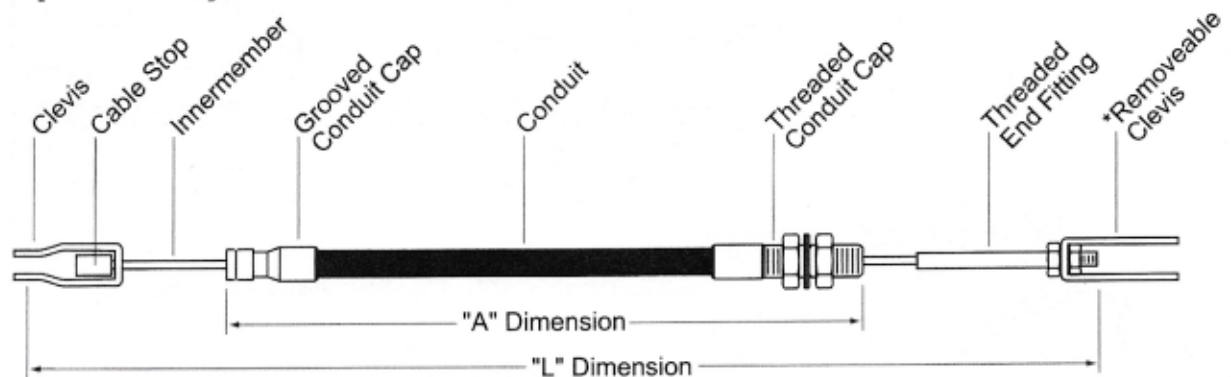


# WIRE ROPE ASSEMBLIES



**A WIDE VARIETY OF CABLE ASSEMBLIES ARE AVAILABLE USING STANDARD OR CUSTOM MACHINED FITTINGS, AND CABLE SIZES FROM 1/16 THRU 3/8 DIAMETER.**

## Preliminary Ordering Procedure For pull-only cable controls



To specify a pull control, the following information must be given in the order listed:

1. Left innermember end fitting part number.
2. Left conduit end fitting part number.
3. Length "A" between conduit fitting reference points in inches.
4. Right conduit end fitting part number.
5. Right innermember end fitting part number.
6. Length "L" of innermember assembly
7. Travel of the innermember in the conduit in inches. (Note dimensions "L" must be sufficiently greater than dimension "A" to allow desired travel).

\*Removable items should be listed separately.

### Sample order code:

CS551 - 072 - 54 - 070 - TE505 - 64 1/2 - 6

Left innermember end fitting part number ---  
(Clevis end fitting with cable stop)

Left conduit end fitting part number ---  
(Grooved conduit end fitting)

Length of conduit assembly ---  
(54") "A" Dimension

Right conduit end fitting part number ---  
(Threaded conduit end fitting)

Right innermember end fitting part number ---  
(Threaded conduit end fitting)

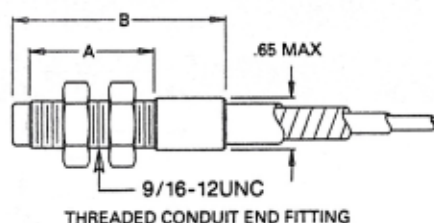
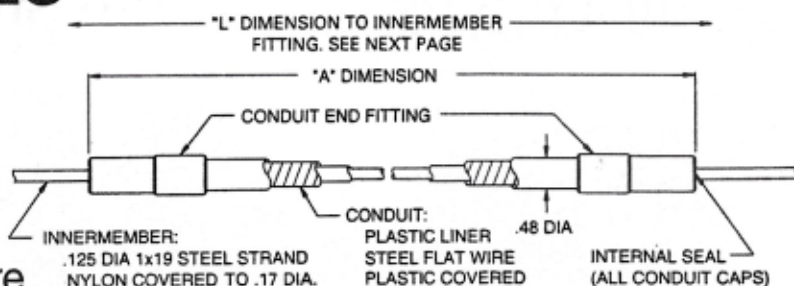
Length of innermember assembly ---  
(64 1/2") "L" Dimension

Travel in inches ---  
(6")

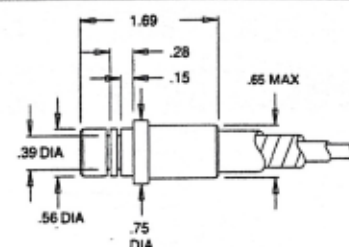


# 1500 POUND SERIES with Lined Conduit

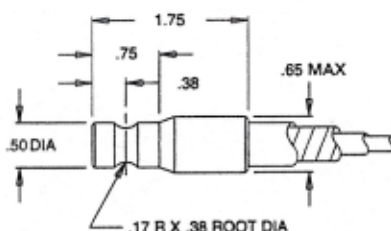
- Ultimate load: 1500 lbs.
- Minimum bend radius: 5"
- See page 7 for ordering procedure



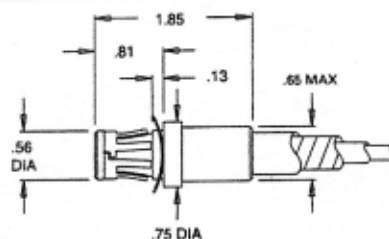
| PART NO. | A   | B   |
|----------|-----|-----|
| 060      | 1.4 | 2.7 |
| 061      | 2.1 | 3.4 |



PART NO. 064

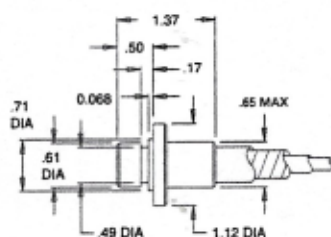


PART NO. 062

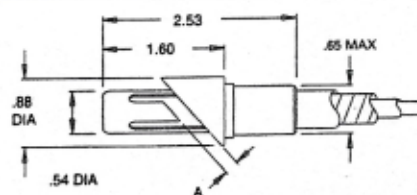


PART NO. 065

For .125 and .187 thick material.

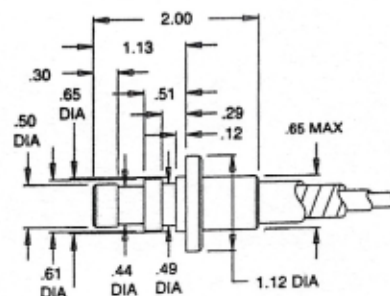


PART NO. 026



PART NO. 066

| PART NO. | A   |
|----------|-----|
| 066      | .13 |
| 067      | .20 |



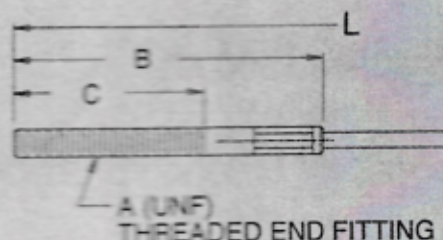
PART NO. 027

## CONDUIT END FITTINGS

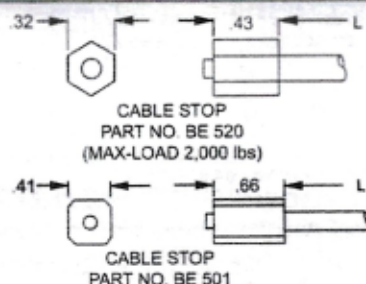
# Pull-Only Brake Cable Specifications

## Threaded End Fitting

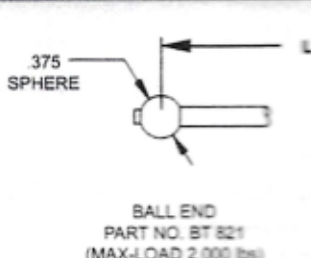
|           | A       | B    | C    |
|-----------|---------|------|------|
| TE504     | 5/16-24 | 3.62 | 2.22 |
| TE504-006 | 5/16-24 | 2.00 | .97  |
| TE504-007 | 5/16-24 | 6.00 | 4.60 |
| TE506     | 3/8-24  | 2.62 | 1.47 |
| TE523-001 | 1/4-28  | 3.62 | 2.47 |



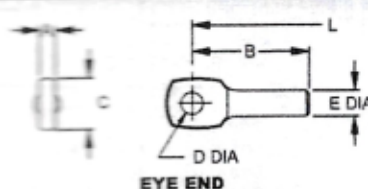
## Cable Stop



## Ball End



## Eye End



| PART NO.    | A    | B    | C   | D    | E    |
|-------------|------|------|-----|------|------|
| 157-047-000 | .235 | 1.81 | .75 | .323 | .375 |
| 000108      | .240 | 1.60 | .75 | .500 | .437 |

## Strap Clevis Part Numbers (For both 1500 and 3000 brake)

### Open Strap Clevis

|           | A | B    | D   | F    | G   | H    |
|-----------|---|------|-----|------|-----|------|
| CS540     | - | 1.62 | .31 | .62  | .43 | .266 |
| CS540-001 | - | 1.62 | .31 | .62  | .51 | .266 |
| CS540-006 | - | 2.50 | .38 | .75  | .57 | .386 |
| CS540-007 | - | 2.50 | .31 | .62  | .51 | .266 |
| CS541     | - | 1.94 | .38 | .75  | .51 | .266 |
| CS541-003 | - | 1.94 | .38 | .75  | .51 | .323 |
| CS541-005 | - | 2.00 | .38 | .75  | .51 | .266 |
| CS541-007 | - | 2.50 | .38 | .75  | .51 | .266 |
| CS541-008 | - | 2.50 | .38 | .75  | .51 | .323 |
| CS542*    | - | 1.08 | .50 | 1.00 | .58 | .323 |

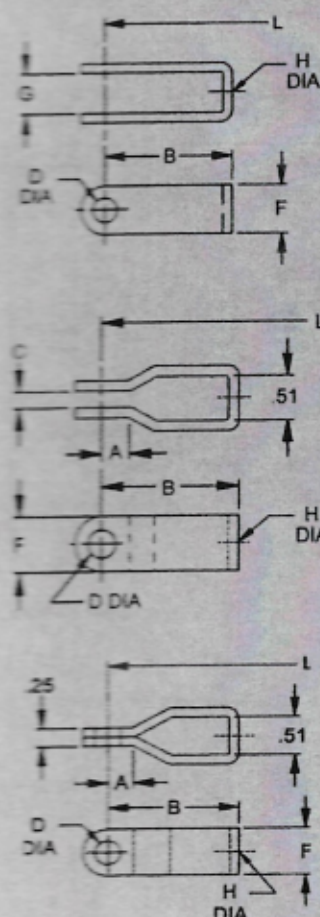
### Step Strap Clevis

|           | A   | B    | C   | D   | F   | H    |
|-----------|-----|------|-----|-----|-----|------|
| CS550     | .31 | 1.56 | .19 | .31 | .62 | .266 |
| CS550-001 | .31 | 1.56 | .19 | .38 | .62 | .266 |
| CS550-002 | .31 | 1.56 | .19 | .31 | .62 | .316 |
| CS550-004 | .31 | 1.56 | .19 | .25 | .62 | .266 |
| CS551     | .38 | 1.75 | .25 | .31 | .62 | .266 |
| CS551-001 | .38 | 1.75 | .25 | .38 | .62 | .266 |
| CS551-002 | .75 | 2.38 | .25 | .31 | .62 | .316 |
| CS551-003 | .38 | 1.50 | .25 | .25 | .62 | .266 |
| CS552     | .31 | 2.38 | .25 | .31 | .75 | .266 |
| CS552-001 | .31 | 2.38 | .25 | .38 | .75 | .266 |
| CS552-003 | .38 | 2.38 | .25 | .43 | .75 | .316 |
| CS552-004 | .38 | 2.38 | .25 | .31 | .75 | .316 |
| CS553     | .50 | 1.88 | .19 | .38 | .75 | .266 |

### Closed Strap Clevis

|       | A    | B    | C | D   | F   | H    |
|-------|------|------|---|-----|-----|------|
| CS562 | .31  | 1.62 | - | .31 | .62 | .316 |
| CS563 | .28  | 1.75 | - | .31 | .62 | .316 |
| CS564 | 1.00 | 2.38 | - | .38 | .75 | .316 |

\*use with 5/16 threaded end rod with nuts only



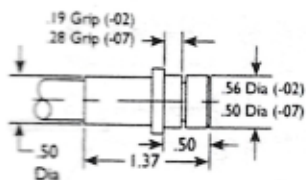


## Retaining Ring Conduit Fitting

.125 Series

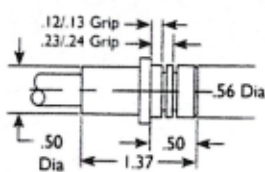
Part #054

Standard Fitting



Part #053

Standard Fitting



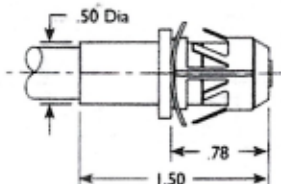
## Snap-In Conduit Fitting

.125 Series

Part #055

.12/.18 Grip

.57/.58 Dia Mounting Hole

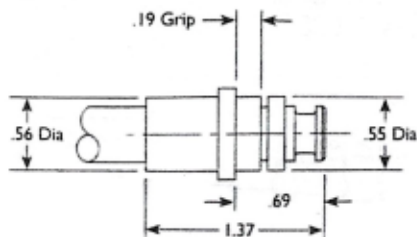


## Retaining Ring / Boot Conduit Fitting

.125 Series

Part #056

Standard Fitting

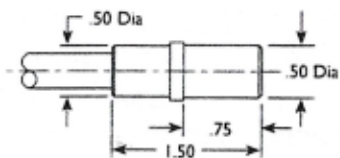


## Clamp Type Conduit Fitting

.125 Series

Part #057

Standard Fitting

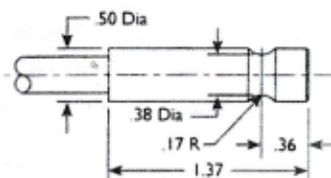


## U-Bolt Conduit Fitting

.125 Series

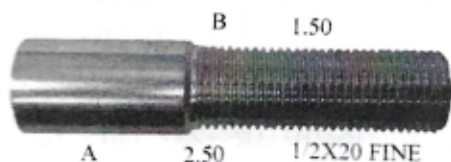
Part #052

Standard Fitting

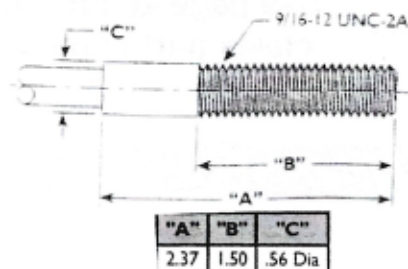


PN#051

C  
56



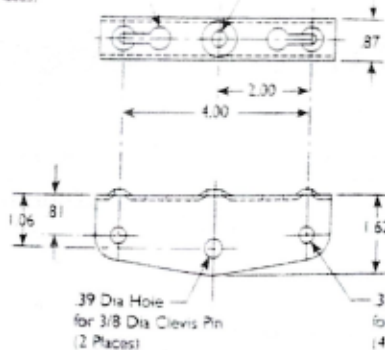
PN#050



## Equalizer

47 Dia. Hole for 3/8 Dia Slug Fitting (2 Places)

36 Dia. Hole for 5/16 Dia Threaded Rod



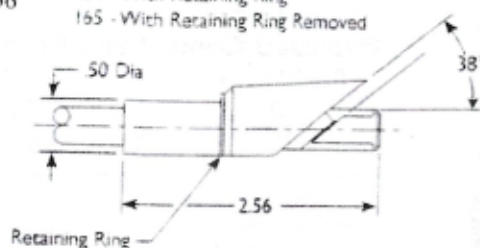
## 38° Conduit Fitting

.125 Series

PN#056

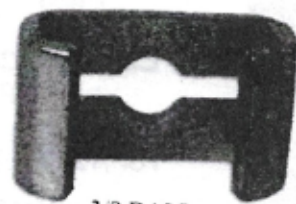
134 - With Retaining Ring

165 - With Retaining Ring Removed



5/16 ROD

Emergency Brake Center Pull

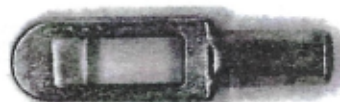


3/8 BALL

Emergency Brake Cable Coupler

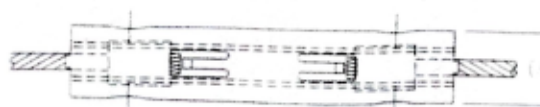
1.75 O.A.L.

.255 I.D.WIDE



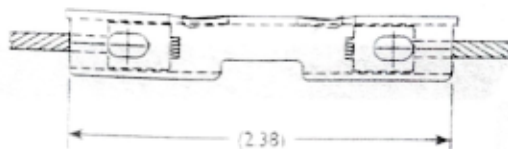
.500 I.D. LONG

SQUARE BRAKE EYE



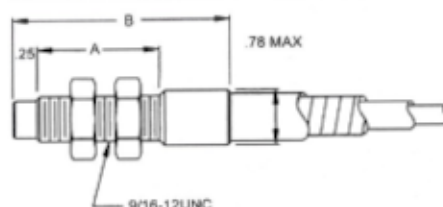
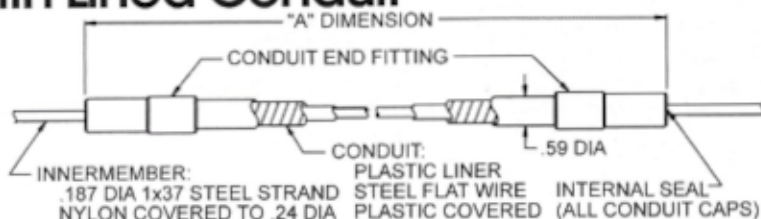
5/16 CYL.

Emergency Brake Cable Coupler



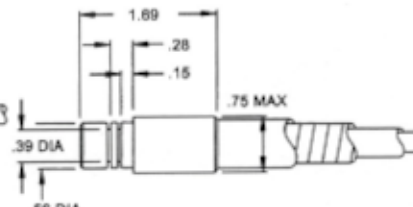
## 3000 Pound Series with Lined Conduit

Ultimate load: 3000 lbs.  
Minimum bend radius: 7"  
See page 11 for ordering procedure.



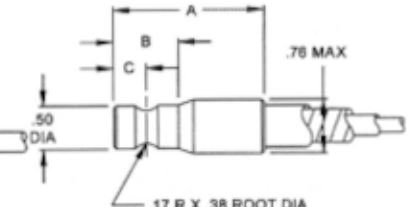
**Threaded Conduit End Fitting**

| Part No. | A   | B   |
|----------|-----|-----|
| 070      | 1.4 | 2.7 |
| 071      | 2.0 | 3.3 |



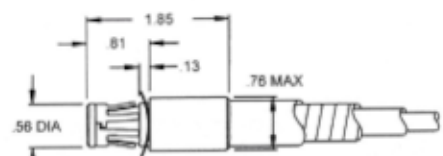
**Grooved Conduit End Fitting**

| Part No. | Use E-Clip  |
|----------|-------------|
| 074      | 175-435-025 |



**Grooved Conduit End Fitting**

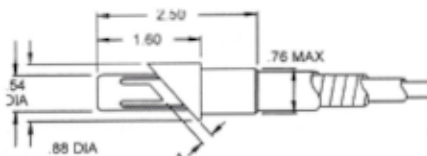
| Part No. | A   | B   | C   |
|----------|-----|-----|-----|
| 072      | 1.4 | 2.7 | .38 |
| 073      | 2.0 | 3.3 | .44 |



**Clip-Lock Conduit End Fitting**

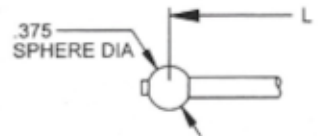
| Part No. |
|----------|
| 075      |

For .125 or .187 thick material.



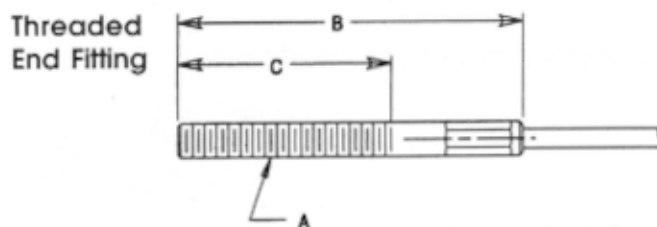
**48° Clip-Lock Conduit End Fitting**

| Part No. | A   |
|----------|-----|
| 076      | .33 |
| 077      | .20 |



**Ball End**

Part No. BT 822  
(Max-load 2,000 lbs.)

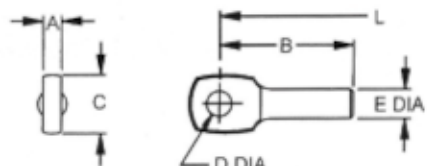


| Part No. | A       | Swaged | C    |
|----------|---------|--------|------|
| TE 505   | 3/8-24  | 2.95   | 2.00 |
| TE 505-1 | 3/8-24  | 1.88   | 1.00 |
| TE 508   | 3/8-24  | 2.62   | 1.50 |
| TE 509-1 | 3/8-24  | 4.95   | 3.75 |
| TE 510-1 | 5/16-24 | 2.50   | 1.50 |
| TE 510-2 | 5/16-24 | 3.62   | 2.24 |
| TE 510-4 | 5/16-24 | 4.00   | 3.00 |
| TE 510-5 | 1/4-28  | 3.62   | 2.50 |
| TE 510-6 | 5/16-24 | 2.12   | 1.00 |
| TE 510-7 | 5/16-24 | 2.88   | 1.50 |
| TE 510-8 | 5/16-24 | 5.60   | 4.47 |
| TE 510-9 | 5/16-24 | 3.00   | 1.91 |
| TE 605   | 3/8-24  | 6.00   | 5.00 |



**Cable Stop**

Part No. BE 502



**Eye End**

| Part No.    | A    | B    | C   | D    | E    |
|-------------|------|------|-----|------|------|
| 157-047-002 | .235 | 1.81 | .75 | .323 | .375 |

See page 28 for strap clevis part numbers.

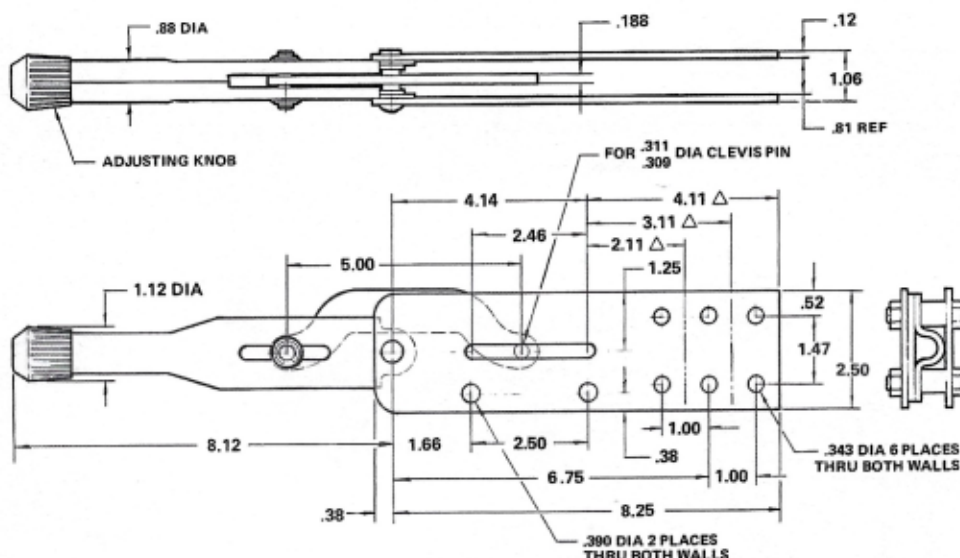


# MOUNTING CONFIGURATIONS

## SIDE MOUNT 165-508-008

2.5 inches (64mm) wide SIDE PLATES; ONE CABLE, with three alternate sets of cable clamp holes. For cowl, instrument panel, seat riser, or frame installation.

Side Mount 165-508-008



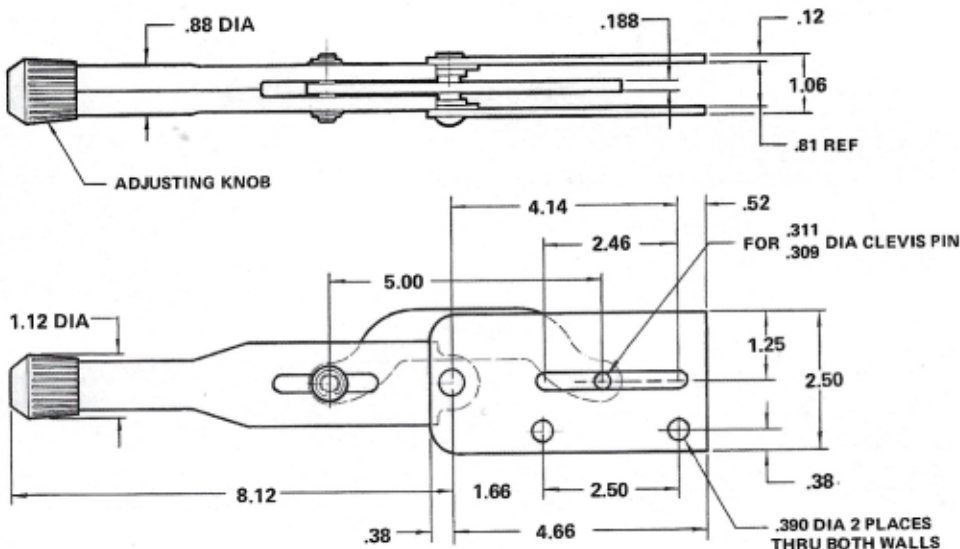
SUPPLIED WITH THE FOLLOWING HARDWARE:

- CLEVIS PIN
- COTTER PIN
- WASHER
- MOUNTING SPACERS (2)
- CABLE CLAMP
- CLAMP BASE
- CLAMP SPACERS (2)

## SIDE MOUNT 165-508-009

2.5 inches (64 mm) wide SIDE PLATES; ONE CABLE. For cowl, instrument panel, seat riser, or frame installation. No cable support.

Side Mount 165-508-009



SUPPLIED WITH THE FOLLOWING HARDWARE:

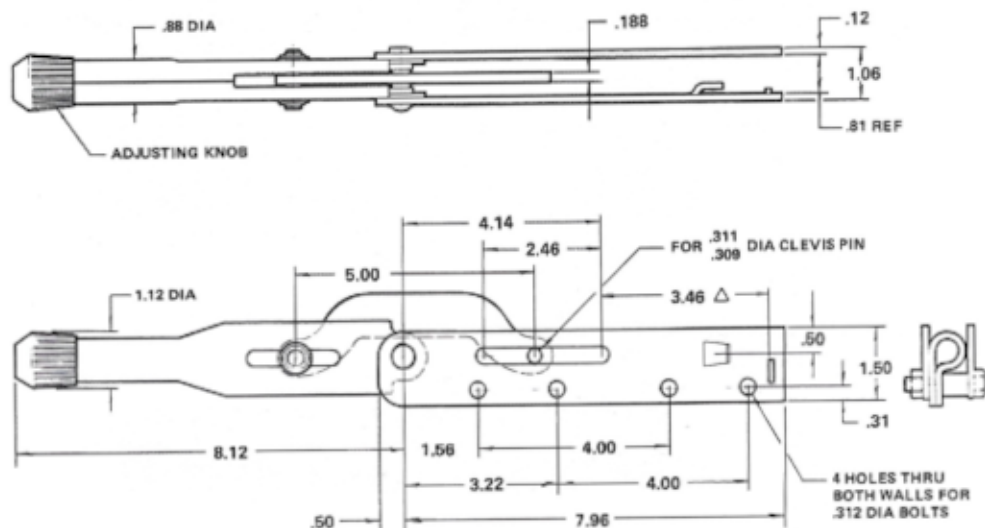
- CLEVIS PIN
- COTTER PIN
- WASHER
- MOUNTING SPACERS (2)

## ADJUSTABLE OVERCENTER-LOCKING BRAKE LEVERS

# MOUNTING CONFIGURATIONS

## SIDE MOUNT 165-508-011

1.5 inches (38mm) wide SIDE PLATES; ONE CABLE. For cowl, instrument panel, seat riser or frame installation.



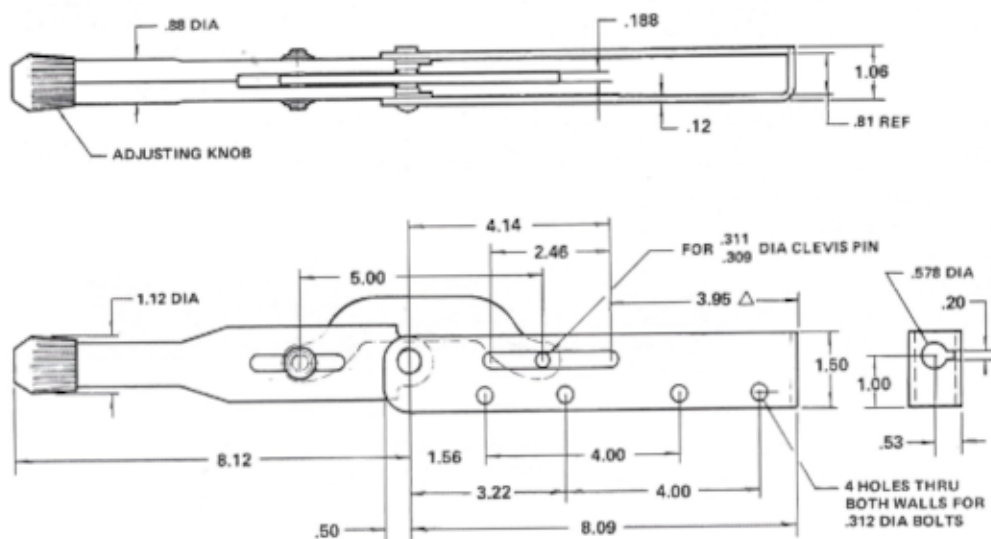
SUPPLIED WITH THE FOLLOWING HARDWARE:

- CLEVIS PIN
- COTTER PIN
- WASHER
- MOUNTING SPACERS (2)
- CABLE CLAMP
- CLAMP SPACER

Side Mount 165-508-0011

## SIDE MOUNT 165-508-028

1.5 inches (38mm) wide SIDE PLATES; ONE CABLE. For cowl, instrument panel, seat riser, or frame installation.



SUPPLIED WITH THE FOLLOWING HARDWARE:

- CLEVIS PIN
- COTTER PIN
- WASHER
- MOUNTING SPACERS (2)

Side Mount 165-508-028

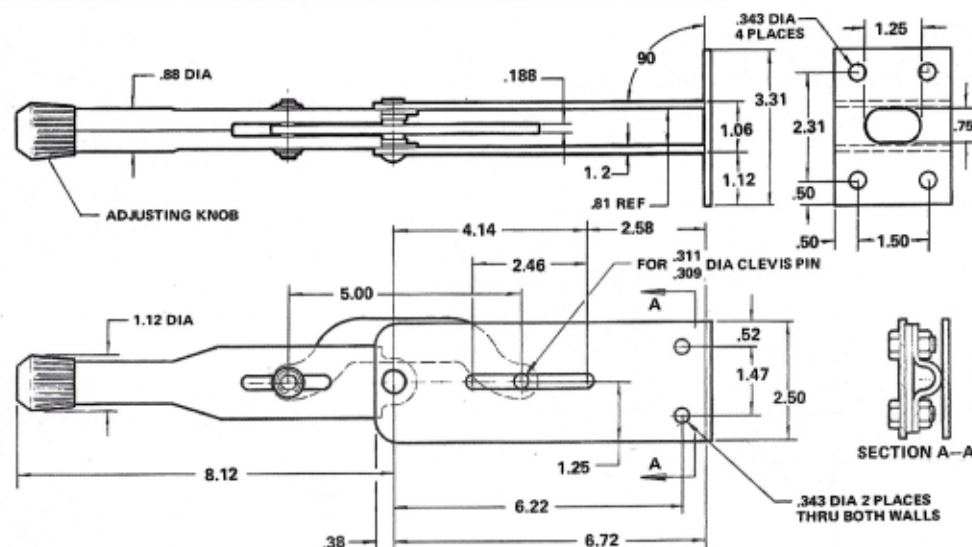


# MOUNTING CONFIGURATIONS

## FLANGE MOUNT-RIGID 165-508-010

2.5 inches (64mm) wide SIDE PLATES; ONE CABLE. For bulkhead, floor or island (doghouse) installation. The rigid frame maintains alignment of clevis pin guide slots for improved life of both the pin and side plates.

Flange Mount-rigid 165-508-010



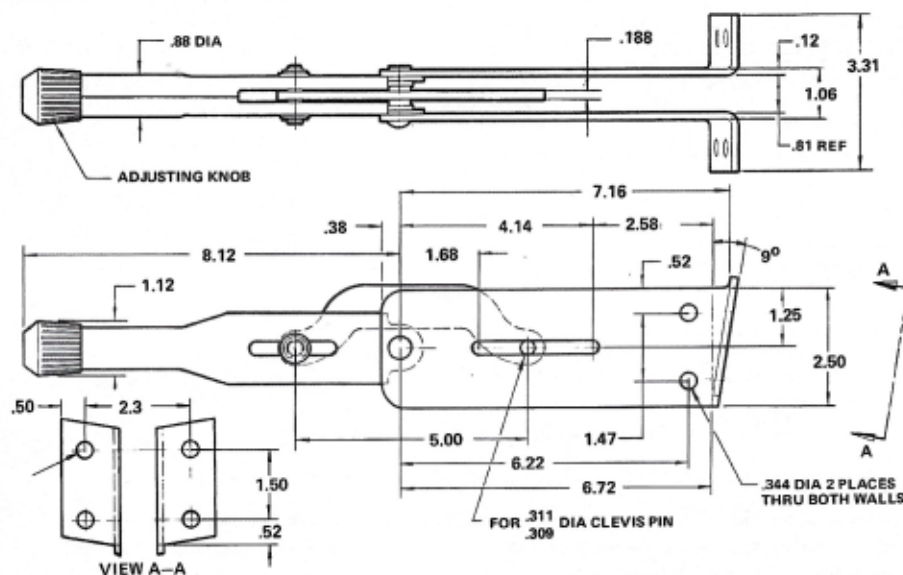
SUPPLIED WITH THE FOLLOWING HARDWARE:

- CLEVIS PIN
- COTTER PIN
- WASHER
- CABLE CLAMP
- CLAMP BASE
- 5/16-24 BOLTS (2)
- 5/16-24 NUTS (2)

## FLANGE MOUNT 165-508-078

2.5 inches (64 mm) wide SIDE PLATES; ONE CABLE. For bulkhead, floor, or island (doghouse) installation. Angle wing flange mounting.

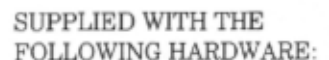
Flange Mount-rigid 165-508-078



SUPPLIED WITH THE FOLLOWING HARDWARE:

- CLEVIS PIN
- COTTER PIN
- WASHER
- CABLE CLAMP
- CLAMP BASE
- 5/16-24 BOLTS (2)
- 5/16-24 NUTS (2)

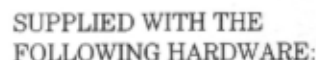
2.5 inches (64mm) wide SIDE PLATES; TWO CABLES. For cowl, instrument panel, seat riser, or frame installation. NOTE: When considering load requirements, the load on the lever assembly will be the sum of the load in each cable.



- CLEVIS PINS (2)
- COTTER PINS (2)
- WASHERS (2)
- MOUNTING SPACERS (2)
- CABLE CLAMPS (2)
- CLAMP SPACER

**Side Mount-dual output 165-508-013**

2.5 inches (64mm) wide SIDE PLATES; TWO CABLES. For bulkhead, floor, or island (doghouse) installation. NOTE: When considering the load requirements, the load on the lever assembly will be the sum of the load in each cable. Wing flange mounting.



- CLEVIS PINS (2)
- COTTER PINS (2)
- WASHERS (2)
- MOUNTING SPACERS (2)
- CABLE CLAMPS (2)
- CLAMP SPACER

Since preassembly of the cables may cause misalignment of the side plates, the following installation procedure is suggested. (1) Slip cable clamp over cable. (2) Attach cable clevis to equalizer bars with clevis pins and hardware provided. (3) Install cable clamp spacer and lightly tighten the 5/16 bolt. (4) Install lever assembly to the vehicle, tighten for fit only—DO NOT TORQUE. (5) Finish tightening the cable clamp bolt. (6) Complete installation by tightening the mounting bolts.

**Flange Mount-dual output 165-508-023**



# Heavy-Duty Throttle

## Applications:

- Medium & heavy-duty trucks
- Construction equipment
- Farm equipment
- Buses

## Features:

- Die cast & steel components
- Multiple base bolt patterns
- Spring returned pedal
- Adjustable pedal angle
- Throttle cable exit is adjustable
- Travel: 2.00" maximum
- -25°F — 160°F temperature range (-14°C — 90°C)
- Corrosion-resistant die cast components, plated steel hardware and plastic bushings

## Material:

- Coated sheet metal
- Plastic bushings
- Plastic boot plated steel hardware

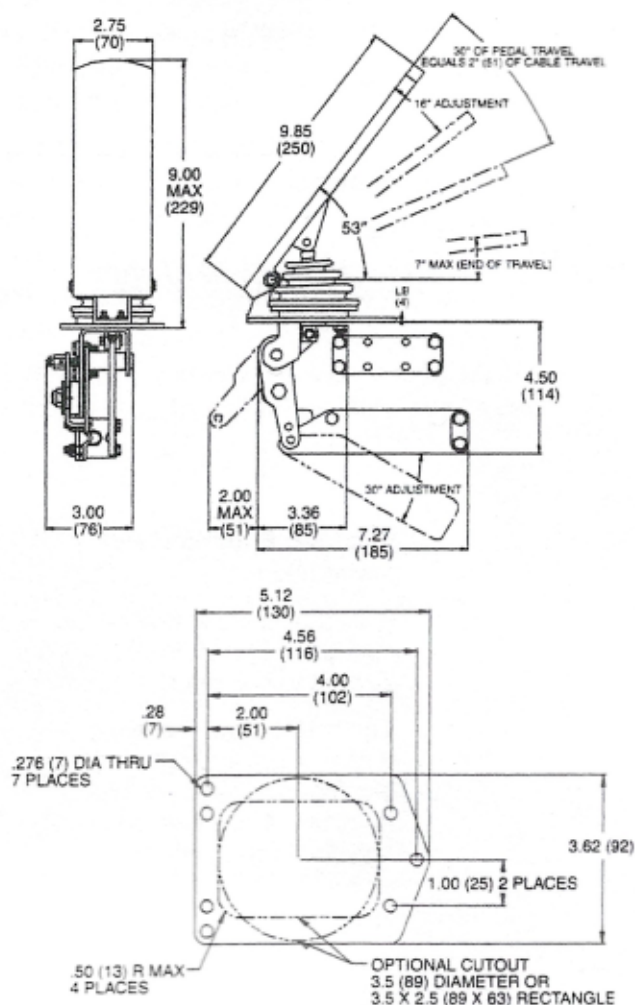
## Suggested End Fittings:

- Clevis and pin, or end fitting with right angle bend



**Standard Pedal 165-574-001**

For use with one pull-only accelerator cable.



# Medium-Duty Throttle

## Applications:

- Farm machinery
- Heavy machinery
- Landscaping equipment
- Construction equipment
- Warehouse equipment

## Features:

- Steel construction
- Rear or front throttle connection
- Multiple base bolt patterns
- Spring returned pedal
- Travel: 3.00" maximum
- -25°F —160°F temperature range (-14°C — 90°C)
- Coated sheet metal components
- Embossed pedal surface reduces slippage

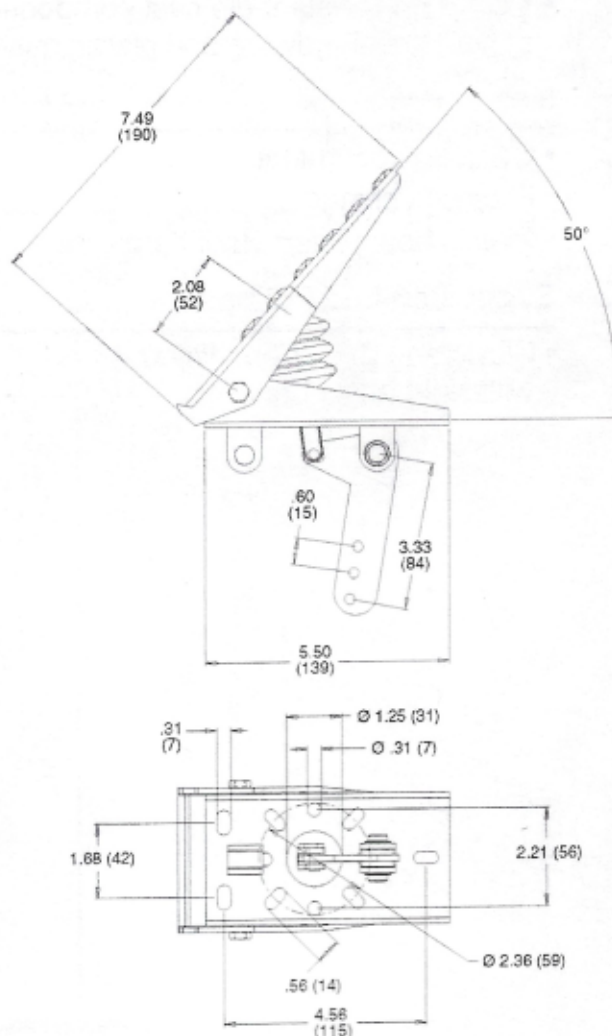
## Material:

- Coated sheet metal
- Plastic bushings
- Plastic boot plated steel hardware



### Medium-Duty Pedal CH530

For use with single pull-only throttle (gas) cables.



### Fast and Economical Installation

A throttle cable simplifies the installation, providing a complete system to suit many applications.

The pedal tower mechanism is designed to be dropped through the floor and secured. Cable attachment can then be quickly and easily completed.



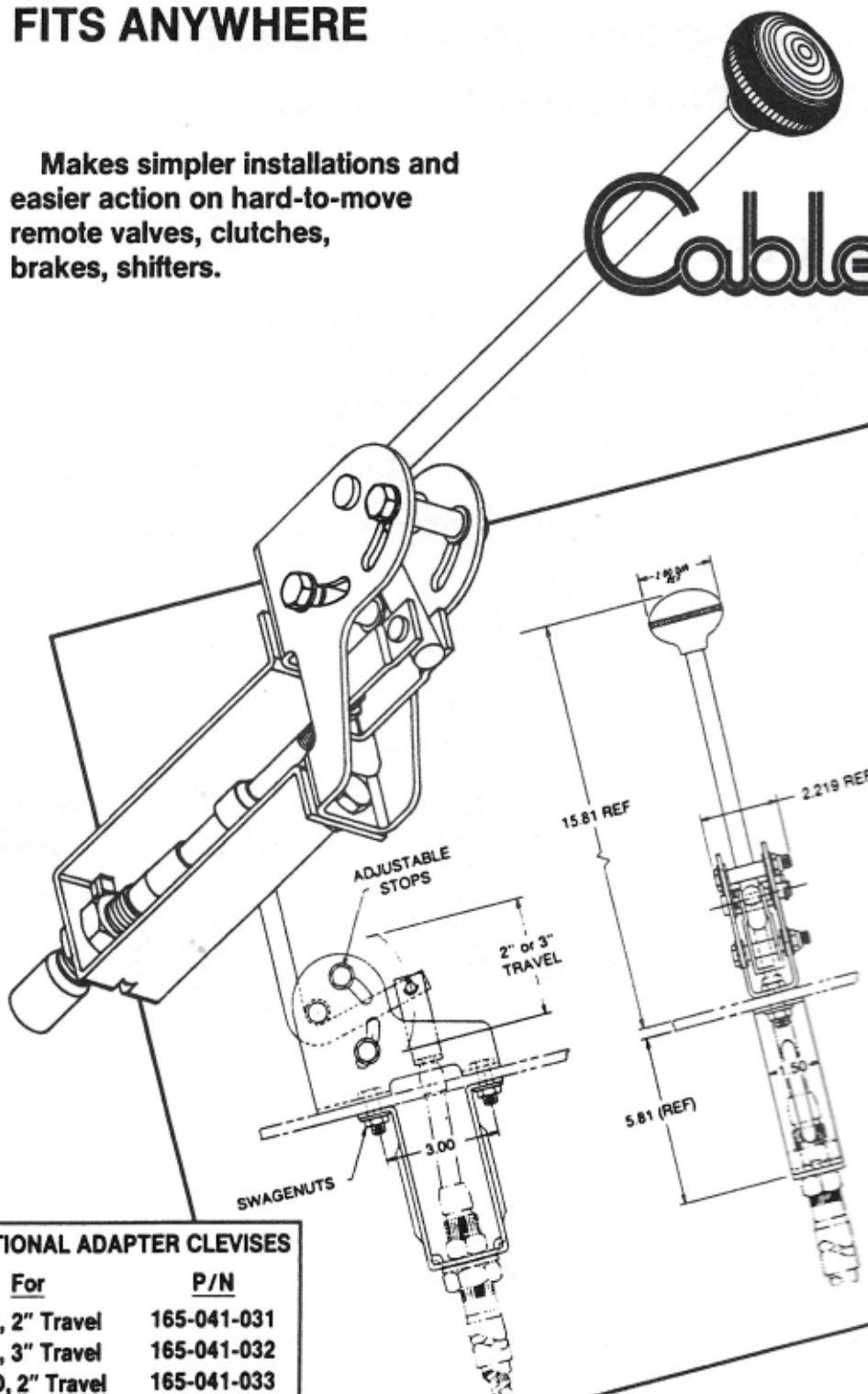
# HEAVY DUTY CONTROL LEVER

PART 165-041-002

- VERSATILE
- CUTS COST
- FITS ANYWHERE

Makes simpler installations and easier action on hard-to-move remote valves, clutches, brakes, shifters.

Cablecraft



USE LIGHT OR MEDIUM  
DUTY CABLES WITH 2  
OR 3 INCH TRAVEL

## OPTIONAL ADAPTER CLEAVISES

| For           | P/N         |
|---------------|-------------|
| LD, 2" Travel | 165-041-031 |
| LD, 3" Travel | 165-041-032 |
| MD, 2" Travel | 165-041-033 |
| MD, 3" Travel | 165-041-034 |

HEAVY DUTY  
CONTROL LEVER

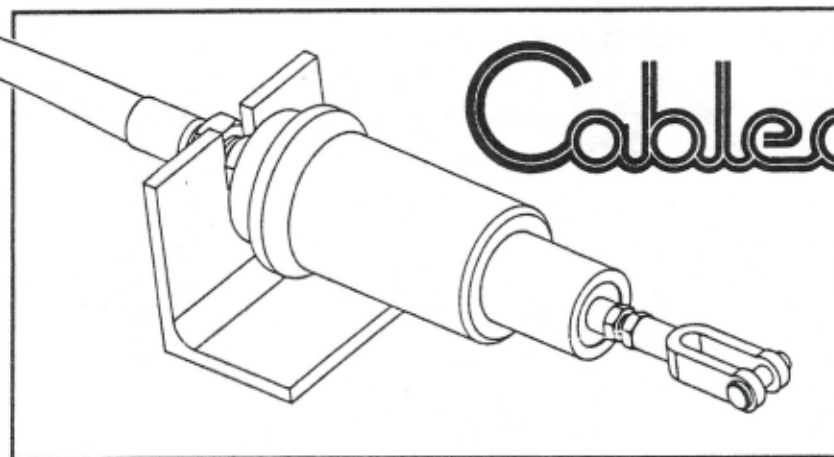
PART 165-041-002

# HYDROBACK\*

*A unique self-centering mechanism  
for push-pull control cables.*

## The HYDROBACK:

- especially useful for centering controls on  
Hydrostatic Transmissions  
Non-detented Hydraulic Valves
- Mounts directly on standard push-pull cables
- Eliminates bulky dual-spring systems and extra  
brackets and levers
- Protected linkage for safer operation



- |              |              |
|--------------|--------------|
| • Economical | • Adjustable |
| • Rugged     | • Safe       |
| • Compact    | • Dependable |

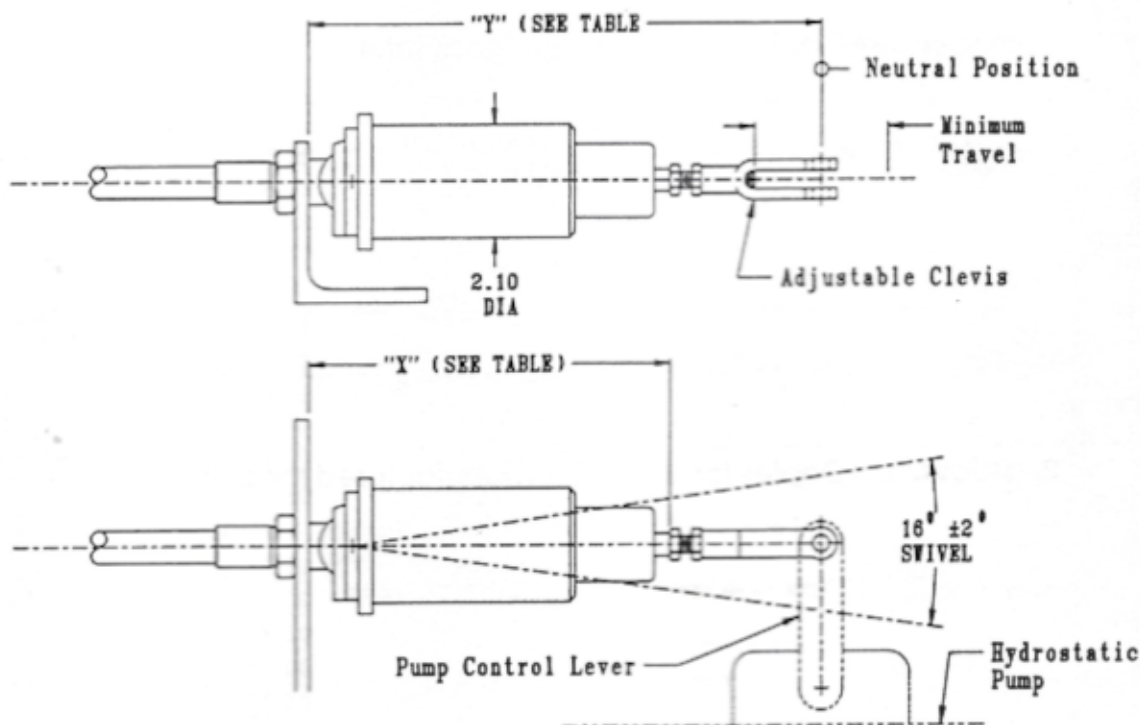


# Ordering Code

|                          |        |   |    |    |
|--------------------------|--------|---|----|----|
|                          | 165-07 | 2 | -3 | 20 |
| BASIC PART NUMBER        |        |   |    |    |
| SIZE                     |        |   |    |    |
| 2, for MD cables         |        |   |    |    |
| 3, for LD cables         |        |   |    |    |
| TRAVEL, MIN. FULL STROKE |        |   |    |    |
| 2"                       |        |   |    |    |
| 3"                       |        |   |    |    |
| SPRING LOAD, AT NEUTRAL  |        |   |    |    |
| 10 lbs.                  |        |   |    |    |
| 20 lbs.                  |        |   |    |    |

EXAMPLE SHOWN: 165-072-320 is Hydroback for MD Cables, 3" travel, 20 lb. spring load at neutral position.

## Dimensional Data All Dimensions Are In Inches.

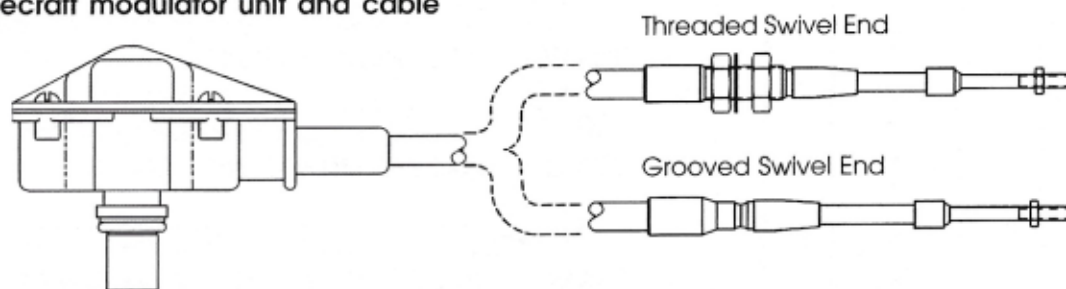


| Cable Size | Travel | Part Number  | Recommended Clevis | "X"  | "Y"  |      |
|------------|--------|--------------|--------------------|------|------|------|
|            |        |              |                    |      | Min  | Max  |
| LD         | 2.00   | 165-073-21b. | AC 208             | 5.63 | 7.63 | 7.87 |
|            | 3.00   | 165-073-31b. | AC 208             | 7.03 | 8.03 | 8.27 |
| MD         | 2.00   | 165-072-21b. | AC 212             | 5.63 | 7.88 | 8.20 |
|            | 3.00   | 165-072-31b. | AC 212             | 7.03 | 9.28 | 9.60 |

## Modulator Cables

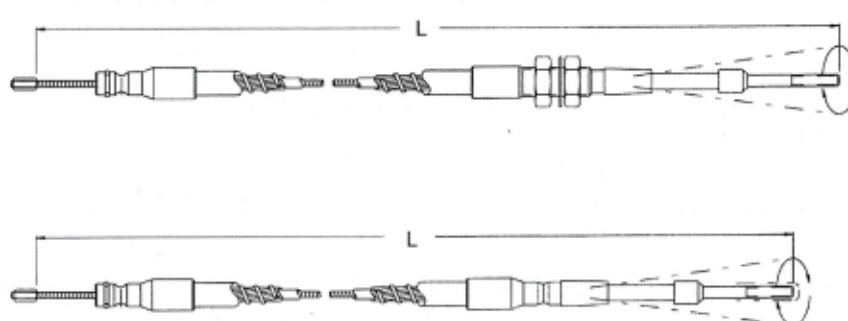
Modulator and cable interconnect Allison® automatic transmission with engine fuel control. Modulator can be set to either "push" or "pull" to operate.

### Cablecraft modulator unit and cable



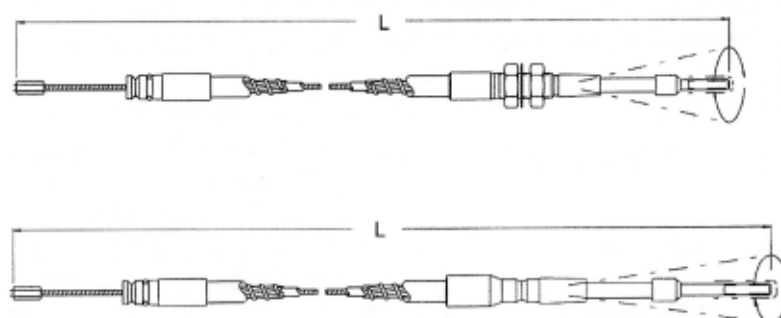
| CABLE OUTPUT END | MODULATOR UNIT WITH CABLE |                 | REPLACEMENT MODULATOR BOX |
|------------------|---------------------------|-----------------|---------------------------|
|                  | PULL TO OPERATE           | PUSH TO OPERATE |                           |
| GROOVED MOUNT    |                           |                 |                           |
| 173 UTILITY      | CA 343-001-L              | CA 343-002-L    | P/N 165-900               |
| 174 UTILITY      | CA 345-001-L              | CA 354-002-L    |                           |
| THREADED MOUNT   |                           |                 |                           |
| 173 UTILITY      | CA 343-001-L              | CA 342-002-L    | SLIP CLEVIS<br>P/N AC-310 |
| 174 UTILITY      | CA 341-001-L              | CA 341-002-L    |                           |

### Replacement Cables for Cablecraft modulator



| CABLE ONLY PART NO. | CABLE OUTPUT END |
|---------------------|------------------|
|                     | THREADED MOUNT   |
| CA 342-000-L        | 173 UTILITY      |
| CA 341-000-L        | 174 UTILITY      |
|                     | GROOVED MOUNT    |
| CA 343-000-L        | 173 UTILITY      |
| CA 345-000-L        | 174 UTILITY      |

### Replacement Cables for other USA manufactured modulator



| CABLE ONLY PART NO. | CABLE OUTPUT END |
|---------------------|------------------|
|                     | THREADED MOUNT   |
| CA 212 T-L          | 173 UTILITY      |
| CA 213 T-L          | 174 UTILITY      |
|                     | GROOVED MOUNT    |
| CA 212 G-L          | 173 UTILITY      |
| CA 213 G-L          | 174 UTILITY      |



## MTS (Manual Transmission System) "Quik Stik" cables

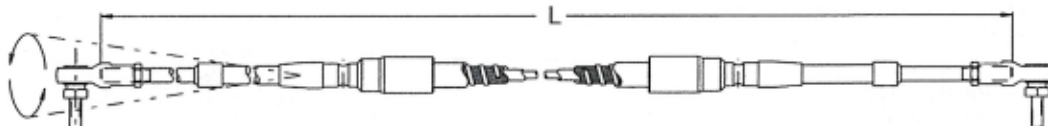
Replacements for Cablecraft's cable operated manual transmission shift system.

Order Code: X=3 for stainless end rods with mod 6 seals.

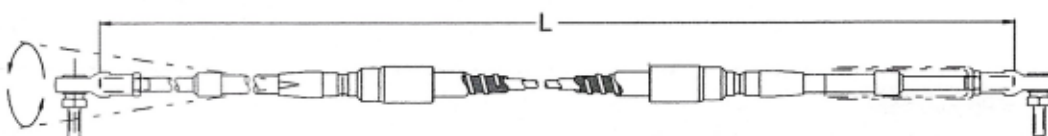
X=4 for stainless support tubes and end rods with mod 6 seals

L=Length

Part No. A31X-105-L Grooved-Grooved



Part No. A31X-106-L Same as -105 but with an umbrella seal

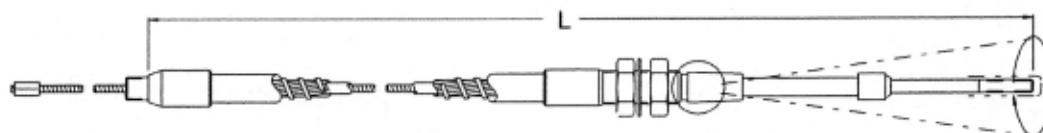


Part No. A31X-113-L Grooved-Threaded

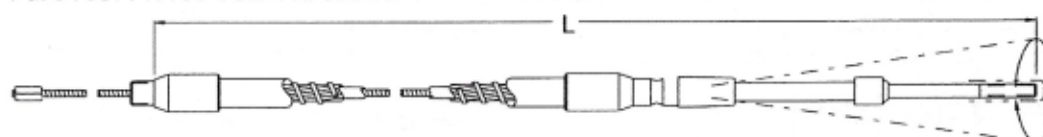


## Unidrum Lever Control Replacement Cables

Part No. A17X-330 Grooved



Part No. A17X-332 Threaded



# Ordering Code For Unidrum Controls

**UDL - 1 4 6 - 2 - 120**

**BASIC UNIDRUM LEVER** ——— **UDL**

**KNOB COLOR** ——— **1 4 6**

1. BLACK  
2. RED

**CABLE EXIT POSITION** ——— **2**  
(SEE ILLUSTRATION)

1. LOWER MOUNT, LEFT EXIT  
2. LOWER MOUNT, RIGHT EXIT  
3. UPPER MOUNT, LEFT EXIT  
4. UPPER MOUNT, RIGHT EXIT

**OVERALL LENGTH IN INCHES TO NEAREST 1/2 INCH** ——— **120**

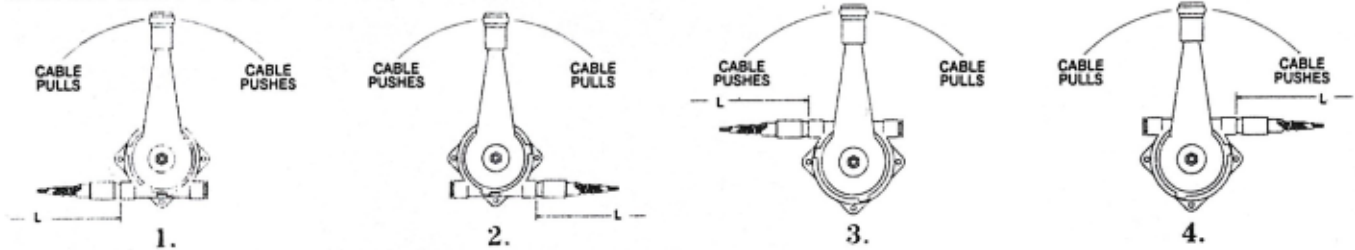
**TRAVEL**

|     | CABLE | LEVER |
|-----|-------|-------|
| 2 - | 2"    | 106°  |
| 3 - | 3"    | 160°  |

**OUTPUT END CONFIGURATION AND CABLE SIZE/TYPE**  
(SEE ILLUSTRATIONS)

| STYLE               | SIZE | TYPE    |
|---------------------|------|---------|
| 1. THREADED SWIVEL, | VLD, | UTILITY |
| 2. GROOVED SWIVEL,  | VLD, | UTILITY |
| 3. THREADED SWIVEL, | LD,  | UTILITY |
| 4. GROOVED SWIVEL,  | LD,  | UTILITY |
| 5. THREADED CAP,    | VLD, | BRISTOW |
| 6. GROOVED CAP,     | VLD, | BRISTOW |

## CABLE EXIT POSITIONS



Exit Positions

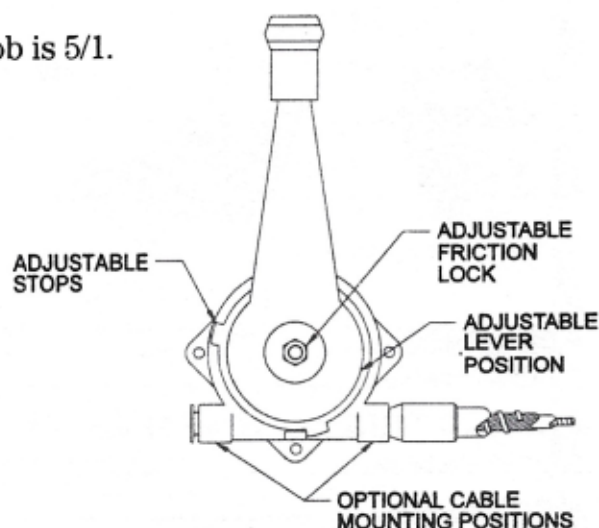
## CABLE OUTPUT END FITTINGS

|                    | Threaded Swivel "T"   | Dimension A                                                | Grooved Swivel "G"    | Dimension A                                                |
|--------------------|-----------------------|------------------------------------------------------------|-----------------------|------------------------------------------------------------|
| <b>VLD UTILITY</b> | <p>1.</p>             | <p>Per Stroke (extended)</p> <p>2" 6.94</p> <p>3" 8.94</p> | <p>2.</p>             | <p>Per Stroke (extended)</p> <p>2" 6.25</p> <p>3" 8.25</p> |
| <b>LD UTILITY</b>  | <p>3.</p>             | <p>2" 7.18</p> <p>3" 9.18</p>                              | <p>4.</p>             | <p>2" 6.56</p> <p>3" 8.56</p>                              |
| <b>VLD BRISTOW</b> | <p>5. (pull-only)</p> |                                                            | <p>6. (pull-only)</p> |                                                            |

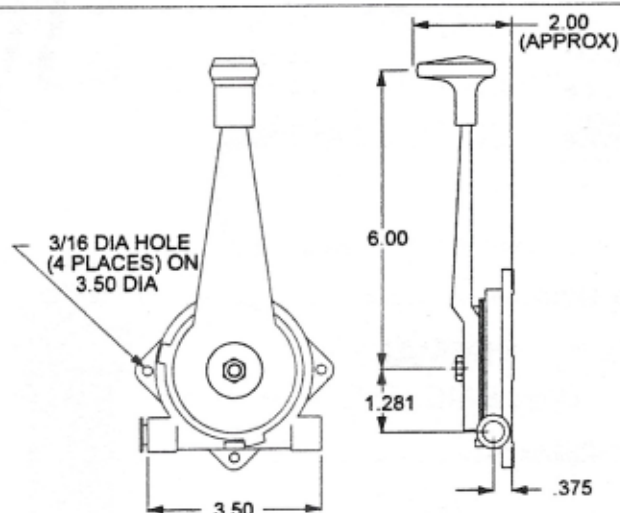
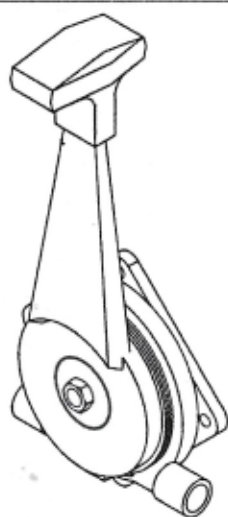
Output End Fittings

# Cablecraft's Unidrum Control Lever, the Choice of Professionals

- Hold and operate up to 25 lb. push/pull or pull-only output load. Mechanical advantage at knob is 5/1.
- Self-locking nut for operator adjustment of friction setting.
- Adjustable stop plates allow 10 degree (3/16" linear output) incremental travel adjustment. 2" of cable travel requires 106 degree lever travel. 3" of cable travel requires 160 degree lever travel.
- Lever position is adjustable in 60 degree increments to provide optimum operating range.
- Optional cable entry offers four mounting and direction of operation alternatives.
- Rugged diecast zinc alloy material.
- Mount with (4) 3/16" screws or bolts.



## Side Mount



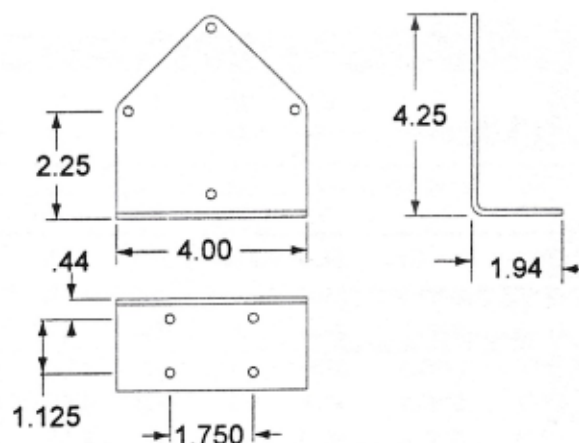
## Base Mount Accessory

### BASE MOUNT ACCESSORY

Converts a standard side mount UNIDRUM lever to a free-standing, base-mounted lever. For use on horizontal panels or surfaces.

Made from 1/8" steel and zinc-coated for weather resistance. Mounts to the UNIDRUM lever with four 3/16"x 5/8" bolts (not furnished with this bracket).

**ORDER PART NUMBER 165-506-003**





## STUDED ROD EYE

| PART<br>NUMBER | INTERNAL<br>THREAD | STUD<br>THREAD |
|----------------|--------------------|----------------|
| BRE 32 S       | 10/32              | 10/32          |
| BRE 52 S       | 1/4                | 1/4            |
| BRE 62 S       | 5/16               | 5/16           |
| BRE 72 S       | 3/8                | 3/8            |



## THREADED PIVOTS

| PART<br>NUMBER | INTERNAL<br>THREAD | STUD<br>THREAD |
|----------------|--------------------|----------------|
| 10/32 PIVOT    | 10-32              | 1/4"           |
| 1/4 PIVOT      | 1/4-28             | 1/4"           |



Bulkhead Bracket - Fits Light & Medium Duty Push Pull Cables

VLD Bulkhead Bracket (Very Light)

Cable Groove Mount - Fits Light & Medium Duty Push Pull Cables

VLD Swingover (Very Light Duty)

VLD Swingover Straight

## END ROD THREAD ADAPTERS

| PART<br>NUMBER | FROM<br>(INTERNAL) | TO<br>(EXTERNAL) |
|----------------|--------------------|------------------|
| 161-009-001    | 1/4-28             | 3/8-28           |
| 161-009-003    | 10-32              | 5/16-24          |
| 161-009-005    | 1/4-28             | 3/8-16           |
| 161-009-006    | 5/16-24            | 3/8-24           |
| 161-009-007    | 10-32              | 1/4-28           |

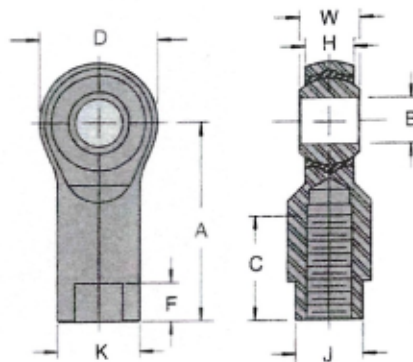


## WIRE STOP/PIVOT

| PART<br>NUMBER | WIRE  | PIN<br>DIA. | SET<br>SCREW |
|----------------|-------|-------------|--------------|
| SS 91          | .075" | 1/4"        | 10-32 UNF    |



## FEMALE ROD EYE

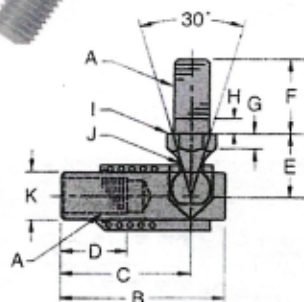
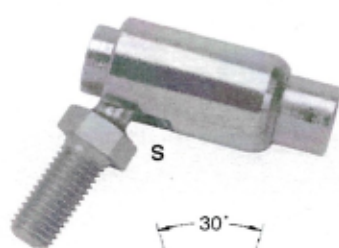


SPF Female Chart

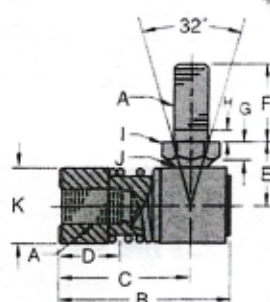
| Part Number   |              | B<br>+ .0020<br>- .0000 | W<br>± .005   | H<br>REF         | A<br>± .015          | D<br>± .015      | K<br>± .015       | J<br>± .015          | F<br>± .030           | REF              | C<br>± .060      | UNF-2B         | Ultimate<br>Radial<br>Static Load<br>Capacity<br>(Pounds) | Weight<br>(Pounds) |
|---------------|--------------|-------------------------|---------------|------------------|----------------------|------------------|-------------------|----------------------|-----------------------|------------------|------------------|----------------|-----------------------------------------------------------|--------------------|
| Right<br>Hand | Left<br>Hand | Ball<br>Bore            | Ball<br>Width | Housing<br>Width | Centerline<br>Length | Head<br>Diameter | Shank<br>Diameter | Wrench<br>Flat Width | Wrench<br>Flat Length | Ball<br>Diameter | Thread<br>Length | Thread<br>Size |                                                           |                    |
| SPF3          | SPFL3        | .1900                   | .312          | .250             | 1.062                | .625             | .406              | .312                 | .406                  | .438             | .562             | 10-32          | 1,210                                                     | .036               |
| SPF4          | SPFL4        | .2500                   | .375          | .281             | 1.312                | .750             | .469              | .375                 | .281                  | .516             | .750             | 1/4-28         | 2,470                                                     | .059               |
| SPF5          | SPFL5        | .3125                   | .437          | .344             | 1.375                | .875             | .500              | .437                 | .281                  | .625             | .750             | 5/16-24        | 2,740                                                     | .077               |
| SPF6          | SPFL6        | .3750                   | .500          | .406             | 1.625                | 1.000            | .687              | .562                 | .312                  | .719             | .937             | 3/8-24         | 4,100                                                     | .146               |
| SPF7          | SPFL7        | .4375                   | .562          | .437             | 1.812                | 1.125            | .750              | .625                 | .625                  | .812             | 1.031            | 7/16-20        | 5,350                                                     | .192               |
| SPF8          | SPFL8        | .5000                   | .625          | .500             | 2.125                | 1.312            | .875              | .750                 | .375                  | .938             | 1.187            | 1/2-20         | 6,430                                                     | .313               |
| SPF10         | SPFL10       | .6250                   | .750          | .562             | 2.500                | 1.500            | 1.000             | .875                 | .500                  | 1.125            | 1.500            | 5/8-18         | 8,300                                                     | .464               |
| SPF12         | SPFL12       | .7500                   | .875          | .687             | 2.875                | 1.750            | 1.125             | 1.000                | 1.000                 | 1.312            | 1.562            | 3/4-16         | 10,900                                                    | .672               |

# S/SS/SC Ball Joints

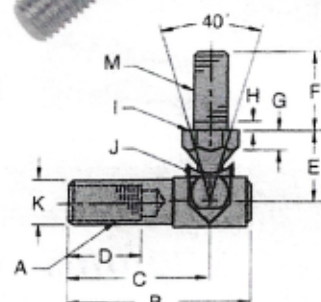
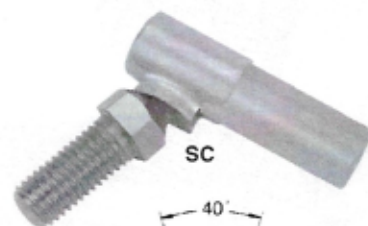
Quick Disconnect with Spring or Spring Clip



Type S



Type SS



Type SC

## S/SS/SC CHART

| Part Number | A<br>UNF | B<br>±.020 | C<br>±.020 | D<br>MIN | E<br>±.020 | F<br>±.020 | G<br>.REF | H<br>REF | I<br>REF | J<br>REF | K<br>REF | M<br>UNF | Ball<br>Diameter<br>REF |
|-------------|----------|------------|------------|----------|------------|------------|-----------|----------|----------|----------|----------|----------|-------------------------|
| S103        | 10-32    | 1.094      | .906       | .437     | .437       | .437       | .125      | .062     | .312     | .171     | .312     | —        | .253                    |
| S107S       | 1/4-28   | 1.094      | .906       | .531     | .469       | .562       | .141      | .062     | .312     | .171     | .312     | —        | .253                    |
| SS1002      | 1/4-28   | 1.250      | .969       | .531     | .469       | .562       | .125      | .078     | .375     | .192     | .561     | —        | .345                    |
| SS1003      | 5/16-24  | 1.453      | 1.125      | .594     | .531       | .687       | .125      | .094     | .437     | .224     | .625     | —        | .403                    |
| SS1004      | 3/8-24   | 1.750      | 1.375      | .812     | .687       | .875       | .156      | .109     | .500     | .273     | .750     | —        | .491                    |
| SC103       | 10-32    | 1.156      | .875       | .484     | .437       | .437       | .187      | .078     | .312     | .135     | .312     | 10-32    | .250                    |
| SCS103      | 10-32    | 1.156      | .875       | .484     | .437       | .562       | .125      | .078     | .312     | .135     | .312     | 1/4-28   | .250                    |
| SC107       | 1/4-28   | 1.250      | .969       | .531     | .437       | .562       | .125      | .078     | .312     | .135     | .312     | 1/4-28   | .250                    |
| SCS107      | 1/4-28   | 1.250      | .969       | .531     | .437       | .437       | .125      | .078     | .312     | .135     | .312     | 10-32    | .250                    |

## CLEVIS ASSEMBLIES

Includes Pin, Washer and Cotter Pin

| PART<br>NUMBER | THREAD      | PIN<br>DIA. | LENGTH | INSIDE<br>OPENING | INSIDE<br>DEPTH |
|----------------|-------------|-------------|--------|-------------------|-----------------|
| 175-601-202    | 10-32 UNF   | 3/16"       | 1.56"  | .19"              | 1.00"           |
| 175-601-204    | 10-32 UNF   | 1/4"        | 2.00"  | .29"              | 1.30"           |
| 175-601-206    | 1/4-28 UNF  | 1/4"        | 2.00"  | .29"              | 1.30"           |
| 175-601-210    | 1/4-28 UNF  | 5/16"       | 2.25"  | .34"              | 1.44"           |
| 175-601-208    | 5/16-24 UNF | 1/4"        | 2.00"  | .29"              | 1.30"           |
| 175-601-212    | 5/16-24 UNF | 5/16"       | 2.25"  | .34"              | 1.44"           |
| 175-601-216    | 5/16-24 UNF | 3/8"        | 2.50"  | .44"              | 1.63"           |
| 175-601-214    | 3/8-24 UNF  | 5/16"       | 2.25"  | .34"              | 1.44"           |
| 175-601-218    | 3/8-24 UNF  | 3/8"        | 2.50"  | .44"              | 1.63"           |
| 175-601-222    | 3/8-24 UNF  | 7/16"       | 2.88"  | .50"              | 1.88"           |
| 175-601-487    | 3/8-24 UNF  | 1/2"        | 3.00"  | .57"              | 1.88"           |
| 175-601-220    | 7/16-20 UNF | 3/8"        | 2.50"  | .44"              | 1.63"           |
| 175-601-226    | 1/2-20 UNF  | 7/16"       | 2.88"  | .50"              | 1.88"           |
| 175-601-230    | 1/2-20 UNF  | 1/2"        | 3.00"  | .57"              | 1.88"           |

Length is from center of pin to end of barrel.







## VLD/LD Mounting (fits grooved conduit fitting)

Part Number

ST3652



## Strap Clamps and Shims

| Use With | Strap       | Shim        |
|----------|-------------|-------------|
| VLD      | 161-011-001 | 175-435-050 |
| LD       | 161-011-002 | 175-435-051 |



## Compression Springs (for brake cables)

| Part Number | Inside Dia. | Outside Dia. | Length | Solid Height | Spring Rate   |
|-------------|-------------|--------------|--------|--------------|---------------|
| 175-923-001 | .30         | .437         | 12.0   | 4.60         | 3.93 lb/inch  |
| 175-923-002 | .30         | .437         | 6.4    | 3.20         | 5.75 lb/inch  |
| 175-923-006 | .30         | .437         | 5.7    | 2.87         | 6.23 lb/inch  |
| 175-924-001 | .26         | .437         | 10.0   | 6.62         | 15.97 lb/inch |
| 175-925-003 | .40         | .500         | 4.3    | 1.00         | 4.47 lb/inch  |



## Bellows (trim to length)

Adapter Ring

| Part Number | For Use With Cable Size |
|-------------|-------------------------|
| 175-435-072 | VLD                     |
| 175-435-081 | LD                      |
| 175-435-082 | MD                      |

| Part Number | For Use With Cable Size | Compressed Length | Extended Length | Max Travel |
|-------------|-------------------------|-------------------|-----------------|------------|
| 175-522-001 | VLD                     | 3.0"              | 8.0             | 6.0"       |
| 175-524-002 | LD                      | 3.4"              | 9.7             | 6.0"       |
| 175-525-001 | MD                      | 4.5"              | 11.3            | 6.0"       |

Maximum recommended is shown.

Must be trimmed shorter for use on shorter travel cables.

See cutting matrix #CC-111. Adapter rings to mount bellows to conduit fittings.



## Spring Return Kit

Convert any LD size, 2" travel threaded swivel end to spring loaded to extended position.

Force with end rod extended - 4.6 lb

Force with end rod retracted - 15.2 lb

### Part Numbers

|             |             |
|-------------|-------------|
| Spring      | 175-930-001 |
| Collar      | 175-435-118 |
| Outer Guide | 160-071-025 |



## Umbrella Seal

| Part Number | For Use With Cable Size |
|-------------|-------------------------|
| 160-071-005 | VLD, 2"                 |
| 160-071-006 | VLD, 3"                 |
| 160-071-007 | VLD, 4"                 |
| 160-071-008 | LD, 2"                  |
| 160-071-009 | LD, 3"                  |
| 160-071-010 | LD, 4"                  |
| 160-071-011 | MD, 2"                  |
| 160-071-012 | MD, 3"                  |
| 160-071-013 | MD, 4"                  |