

EXPLANATION OF SPECIFICATIONS

- Part Number:** The catalog number for the individual shock absorber.
- Extended Length*:** The length of the shock absorber when it is fully extended. See "How to Measure" instructions.
- Collapsed Length*:** The length of the shock absorber when it is fully collapsed. See "How to Measure" instructions.
- Stroke:** This is the approximate length of the stroke of the individual shock absorber being described.
- Mounting Codes:** Indicates the type of mounting ends for the upper and lower end of each shock absorber. They are listed as follows:
 Top mounts ("TM")
 Eye ring and bushing with sleeve mounts ("ES")
 Stud type mounts ("S" & "DS")
 Eye ring and bushing with bar pin mounts ("BP")
 Special mounting codes ("SP")
 Eye ring and bushing mounts ("EB")
 Clevis mounts ("CL")
 Pinch socket mounts ("LP")
 U joint mounts ("LU")

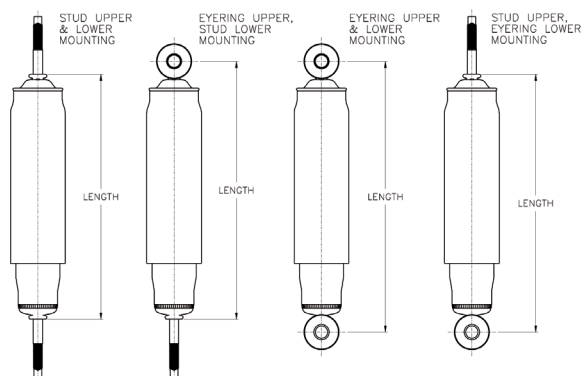
CONVERSION CHART

| Fraction (Inches) | Decimal (Inches) | Metric (MM) | Fraction (Inches) | Decimal (Inches) | Metric (MM) |
|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
| 1/64 | 0.016 | 0.397 | 33/64 | 0.516 | 13.097 |
| 1/32 | 0.031 | 0.794 | 17/32 | 0.531 | 13.494 |
| 3/64 | 0.047 | 1.191 | 35/64 | 0.547 | 13.891 |
| 1/16 | 0.063 | 1.588 | 9/16 | 0.563 | 14.288 |
| 5/64 | 0.078 | 1.984 | 37/64 | 0.578 | 14.684 |
| 3/32 | 0.094 | 2.381 | 19/32 | 0.594 | 15.081 |
| 7/64 | 0.109 | 2.778 | 39/64 | 0.609 | 15.478 |
| 1/8 | 0.125 | 3.175 | 5/8 | 0.625 | 15.875 |
| 9/64 | 0.141 | 3.572 | 41/64 | 0.641 | 16.272 |
| 5/32 | 0.156 | 3.969 | 21/32 | 0.656 | 16.669 |
| 11/64 | 0.172 | 4.366 | 43/64 | 0.672 | 17.066 |
| 3/16 | 0.188 | 4.763 | 11/16 | 0.688 | 17.463 |
| 13/64 | 0.203 | 5.159 | 45/64 | 0.703 | 17.859 |
| 7/32 | 0.219 | 5.556 | 23/32 | 0.719 | 18.256 |
| 15/64 | 0.234 | 5.953 | 47/64 | 0.734 | 18.653 |
| 1/4 | 0.250 | 6.350 | 3/4 | 0.750 | 19.050 |
| 17/64 | 0.266 | 6.747 | 49/64 | 0.766 | 19.447 |
| 9/32 | 0.281 | 7.144 | 25/32 | 0.781 | 19.844 |
| 19/64 | 0.297 | 7.541 | 51/64 | 0.797 | 20.241 |
| 5/16 | 0.313 | 7.938 | 13/16 | 0.813 | 20.638 |
| 21/64 | 0.328 | 8.334 | 53/64 | 0.828 | 21.034 |
| 11/32 | 0.344 | 8.731 | 27/32 | 0.844 | 21.431 |
| 23/64 | 0.359 | 9.128 | 55/64 | 0.859 | 21.828 |
| 3/8 | 0.375 | 9.525 | 7/8 | 0.875 | 22.225 |
| 25/64 | 0.391 | 9.922 | 57/64 | 0.891 | 22.622 |
| 13/32 | 0.406 | 10.319 | 29/32 | 0.906 | 23.019 |
| 27/64 | 0.422 | 10.716 | 59/64 | 0.922 | 23.416 |
| 7/16 | 0.438 | 11.113 | 15/16 | 0.938 | 23.813 |
| 29/64 | 0.453 | 11.509 | 61/64 | 0.953 | 24.209 |
| 15/32 | 0.469 | 11.906 | 31/32 | 0.969 | 24.606 |
| 31/64 | 0.484 | 12.303 | 63/64 | 0.984 | 25.003 |
| 1/2 | 0.500 | 12.700 | 1 | 1.000 | 25.400 |

METRIC CONVERSION CHART

| MILLIMETERS | INCHES | MILLIMETERS | INCHES | MILLIMETERS | INCHES |
|-------------|---------|-------------|---------|-------------|---------|
| 1 | 0.03937 | 10 | 0.39370 | 19 | 0.74803 |
| 2 | 0.07874 | 11 | 0.43307 | 20 | 0.78740 |
| 3 | 0.11811 | 12 | 0.47244 | 21 | 0.82677 |
| 4 | 0.15748 | 13 | 0.51181 | 22 | 0.86614 |
| 5 | 0.19685 | 14 | 0.55118 | 23 | 0.90551 |
| 6 | 0.23622 | 15 | 0.59055 | 24 | 0.94488 |
| 7 | 0.27559 | 16 | 0.62992 | 25 | 0.98425 |
| 8 | 0.31496 | 17 | 0.66929 | | |
| 9 | 0.35433 | 18 | 0.70866 | | |

HOW TO MEASURE EXTENDED & COLLAPSED LENGTHS OF SHOCK ABSORBERS

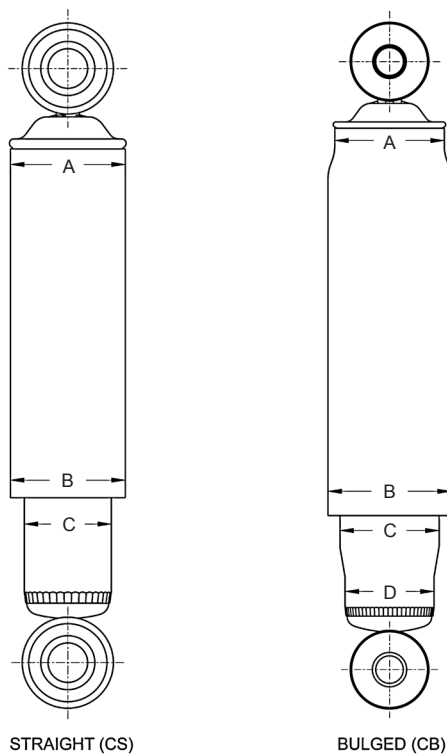


Instructions

1. Using the proper measuring points as shown above find the nearest replacement shock absorber from the listing increments of extended length.
2. Identify the proper mounting form the mounting codes and match these requirements by carefully measuring the mounting dimensions (top and bottom) of the shock absorber to be replaced.
3. Carefully take note of the following requirements:
 - a. **Mounting Accessories** - Contents and descriptions of parts are shown in this manual.
 - b. **Dust tubes** - This requirement should be noted in comparison with the shock absorber to be replaced. Shock absorber environment in its application makes this requirement necessary for piston rod protection and extended shock absorber life.
 - c. **Recoil Cutoff and Compression Bumper** - Carefully note these specifications- deviation of length requirements should not exceed $\pm\frac{1}{2}$ ". These shock absorber designs are footnoted for easy identification.
 - d. **Limited Environment Application** - Most conventional shock absorbers are offered in "straight" construction to fit limited environment applications. These shock absorber designs are footnoted.

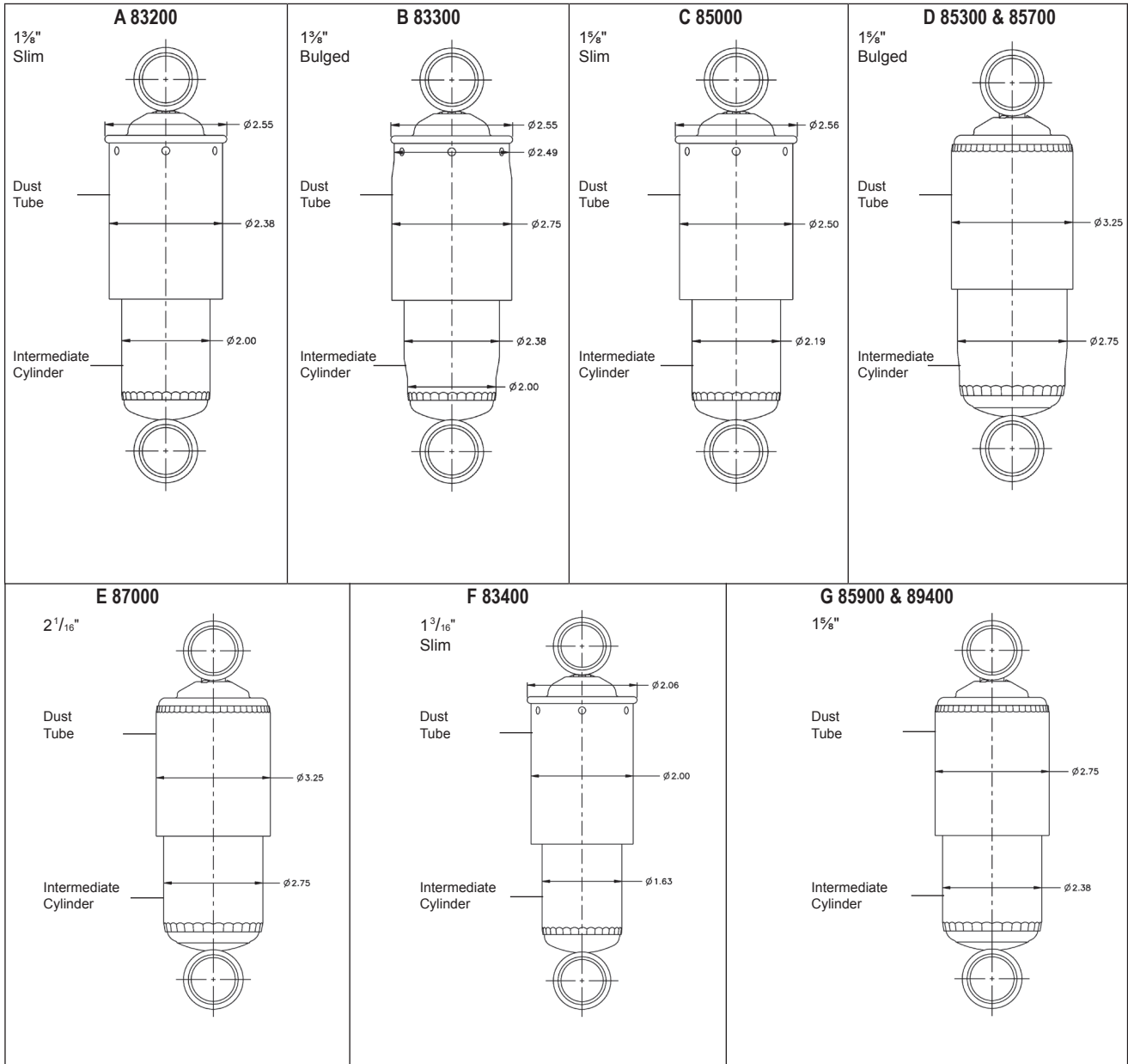
SHOCK ABSORBER DIAMETERS

Shown below are measuring points for diameters by type of shock absorber. Refer to the chart below which lists diameters for the various bore sizes available for each type.

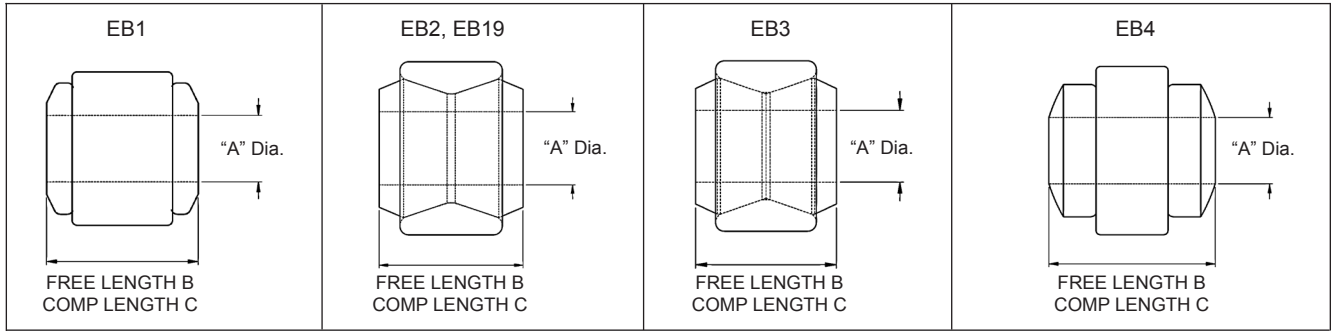


| BORE SIZE | SHOCK ABSORBERS | TYPE (Shown Above) | Diameters | | | |
|-----------|------------------------------------|-----------------------|-----------|------|------|------|
| | | | A | B | C | D |
| 1 3/16" | Classic, Guardian, Ultra Pass. Car | CS | 2.06 | 2.00 | 1.63 | NA |
| 1 3/16" | Classic, Guardian, Ultra Pass. Car | CB | 2.06 | 2.19 | 1.81 | 1.63 |
| 1 3/8" | Ultra Truck | CS | NA | 2.37 | 2.00 | NA |
| 1 3/8" | Ultra Truck | CB | 2.37 | 2.50 | 2.19 | 2.00 |

EXTERNAL DIMENSIONS

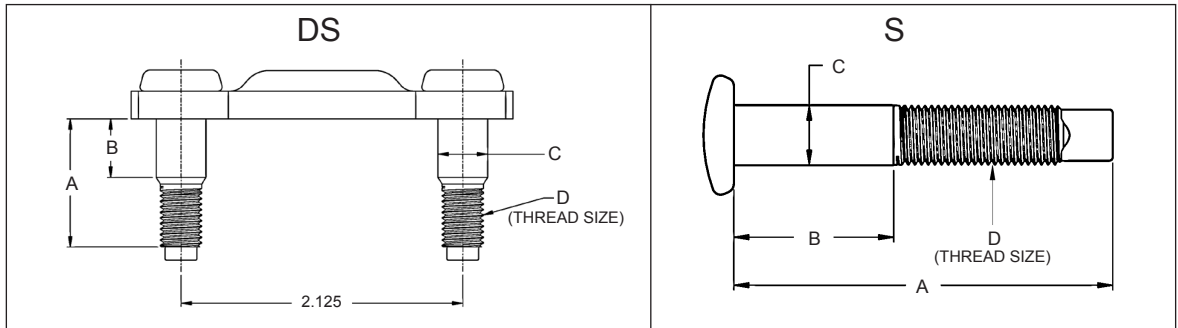


MOUNTING CODE "EB" EYE RING AND BUSHING



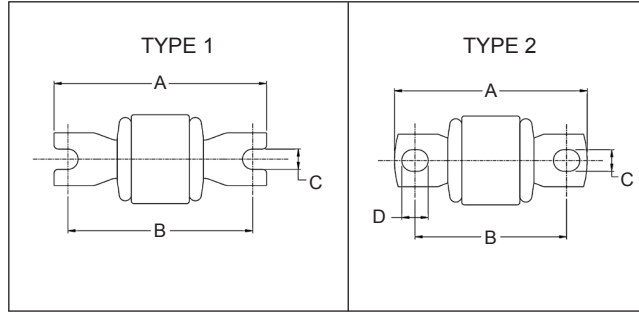
| MOUNTING CODE | A DIAMETER | B FREE LENGTH | C COMP. LENGTH | VEHICLE MOUNTING PIN DIAMETER |
|---------------|------------|---------------|----------------|-------------------------------|
| EB1 | 5/8 | 1.44 | 1.31 | 5/8 |
| EB2 | 3/4 | 1.75 | 1.50 | 3/4 |
| EB3 | 1.00 | 1.91 | 1.75 | 1.00 |
| EB4 | 11/16 | 1.72 | 1.55 | 11/16 |
| EB18 | 19MM | 1.65 | - | 19MM |
| EB19 | 20MM | 1.75 | 1.25 | 20MM |

"DS" & "S" STUD MOUNTS



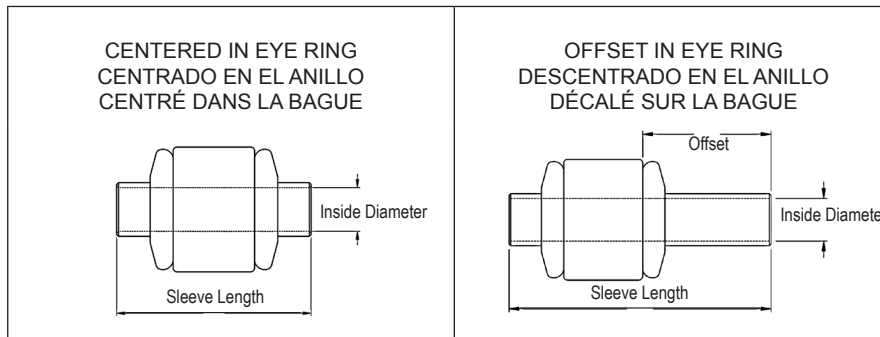
| MOUNTING CODE | DIMENSION | | | | | | |
|---------------|-----------|-------|----------|-------|----------|-------|----------|
| | A | | B | | C | | D |
| | (inches) | (mm) | (inches) | (mm) | (inches) | (mm) | (thread) |
| DS1 | 1.27 | | .66 | | 0.38 | | 5/16-24 |
| S1 | 2.37 | 60.20 | 1.00 | 25.40 | 0.38 | 9.53 | 3/8-24 |
| S11 | 3.00 | 76.20 | 1.12 | 28.45 | 0.38 | 9.53 | 3/8-24 |
| S12 | 2.37 | 60.20 | 1.15 | 29.21 | 0.44 | 11.11 | 3/8-24 |
| S16 | 2.95 | 74.93 | 1.45 | 36.83 | 0.63 | 16.00 | M16x1.5 |
| S21 | 3.28 | 83.31 | 1.75 | 44.45 | 0.63 | 15.88 | 5/8-18 |
| S29 | 2.99 | 75.95 | 1.87 | 47.50 | 0.38 | 9.53 | 3/8-24 |
| S36 | 2.49 | 63.25 | 1.33 | 33.78 | 0.44 | 11.11 | 3/8-24 |
| S38 | 2.75 | 69.85 | 1.70 | 43.18 | 0.55 | 14.00 | M12x1.25 |
| S40 | 2.52 | 64.01 | 1.33 | 33.78 | 0.44 | 11.11 | 3/8-24 |
| S42 | 3.50 | 88.90 | 2.00 | 50.80 | 0.63 | 15.88 | 5/8-18 |
| S43 | 2.75 | 69.85 | 1.25 | 31.75 | 0.63 | 15.88 | 5/8-18 |
| S47 | 2.20 | 55.88 | 1.31 | 33.27 | 0.39 | 10.00 | M10x1.25 |
| S61 | 3.11 | 78.99 | 1.45 | 36.83 | 0.55 | 14.00 | M12x1.25 |
| S62 | 3.24 | 82.30 | 1.70 | 43.18 | 0.56 | 14.29 | M12x1.25 |
| S68 | 2.95 | 74.93 | 1.45 | 36.83 | 0.63 | 15.88 | M16x1.5 |
| S92 | 1.42 | 36.07 | 0.63 | 16.00 | 0.41 | 10.41 | M12x1.25 |

MOUNTING CODE "BP" EYE RING AND BUSHING WITH BAR PIN



| MOUNTING CODE | TYPE | DIMENSION | | | | | | | | | |
|---------------|----------|-----------|--------|----------|-------|----------|-------|----------|-------|----------|------|
| | | A | | B | | C | | D | | E | |
| | | (inches) | (mm) | (inches) | (mm) | (inches) | (mm) | (inches) | (mm) | (inches) | (mm) |
| BP4 | 1 | 3.19 | 81.03 | 2.38 | 60.45 | 0.33 | 8.38 | -- | -- | -- | -- |
| BP6 | 1 | 4.25 | 107.95 | 3.62 | 91.95 | 0.33 | 8.38 | -- | -- | -- | -- |
| BP7 | 2 | 3.13 | 79.50 | 2.50 | 63.50 | 0.35 | 8.89 | 0.42 | 10.67 | -- | -- |
| BP8 | 2 | 3.50 | 88.90 | 2.87 | 72.90 | 0.35 | 8.89 | 0.42 | 10.67 | -- | -- |
| BP9 | 1 | 3.38 | 85.85 | 2.6 | 66.04 | 0.35 | 8.89 | 0.42 | 10.67 | -- | -- |
| BP11 | 1 | 2.96 | 75.18 | 2.52 | 64.01 | 0.33 | 8.38 | -- | -- | -- | -- |
| BP13 | 1 | 3.45 | 87.63 | 3.00 | 76.20 | 0.33 | 8.38 | -- | -- | -- | -- |
| BP14 | 2 | 3.43 | 87.12 | 2.87 | 72.90 | 0.45 | 11.43 | -- | -- | -- | -- |
| BP27 | 2 | 4.00 | 101.60 | 2.95 | 74.93 | 0.52 | 13.21 | 0.50 | 12.70 | -- | -- |
| BP38 | 2 | 3.22 | 81.79 | 1.54 | 39.12 | 0.40 | 10.16 | 0.40 | 10.16 | -- | -- |

MOUNTING CODE "ES" EYE RING AND BUSHING WITH STEEL SLEEVE



| MOUNTING CODE | DIMENSION | | | |
|---------------|-----------------|-------|---------------|-------|
| | Inside Diameter | | Sleeve Length | |
| | (inches) | (mm) | (inches) | (mm) |
| ES3 | 0.39 | 10.00 | 1.56 | 39.62 |
| ES7 | 0.56 | 14.29 | 1.25 | 31.75 |
| ES10 | 0.44 | 11.11 | 1.38 | 35.05 |
| ES13 | 0.56 | 14.29 | 1.89 | 48.01 |
| ES19 | 0.47 | 12.00 | 1.88 | 47.75 |
| ES24 | 0.50 | 12.70 | 1.38 | 35.05 |
| ES25 | 0.50 | 12.70 | 1.50 | 38.10 |
| ES26 | 0.50 | 12.70 | 1.56 | 39.62 |
| ES27 | 0.50 | 12.70 | 1.62 | 41.15 |
| ES31* | 0.50 | 12.70 | 2.25 | 57.15 |
| ES34 | 0.56 | 14.29 | 1.66 | 42.16 |
| ES35 | 0.63 | 15.88 | 1.38 | 35.05 |
| ES36 | 0.75 | 19.05 | 1.75 | 44.45 |
| ES38 | 0.44 | 11.17 | 2.18 | 55.37 |
| ES41 | 0.47 | 12.00 | 3.48 | 88.39 |
| ES45 | 0.51 | 13.00 | 1.68 | 42.67 |
| ES48 | 0.55 | 13.97 | 1.42 | 36.07 |

| MOUNTING CODE | DIMENSION | | | |
|---------------|-----------------|-------|---------------|-------|
| | Inside Diameter | | Sleeve Length | |
| | (inches) | (mm) | (inches) | (mm) |
| ES48 | 0.55 | 13.97 | 1.66 | 42.16 |
| ES56 | 0.55 | 14.00 | 1.58 | 40.13 |
| ES60 | 0.55 | 14.00 | 1.26 | 32.00 |
| ES64 | 0.63 | 16.00 | 1.25 | 31.75 |
| ES65 | 0.47 | 12.00 | 1.38 | 35.05 |
| ES77 | 0.79 | 20.07 | 1.48 | 37.59 |
| ES83 | 0.47 | 12.00 | 1.48 | 37.59 |
| ES87 | 0.48 | 12.30 | 1.65 | 41.91 |
| ES90 | 0.63 | 15.88 | 2.00 | 50.80 |
| ES120 | 0.75 | 19.05 | 2.76 | 70.10 |
| ES126 | 0.50 | 12.70 | 2.44 | 61.98 |
| ES128 | 0.50 | 12.70 | 1.66 | 42.16 |
| ES136 | 0.63 | 15.88 | 1.75 | 44.45 |
| ES141 | 0.47 | 12.00 | 1.61 | 40.89 |
| ES149 | 0.50 | 12.70 | 2.36 | 59.94 |
| ES150 | 0.75 | 19.05 | 2.24 | 56.90 |
| ES153 | 0.55 | 14.00 | 1.55 | 39.37 |

* 1" / 25.4mm Offset

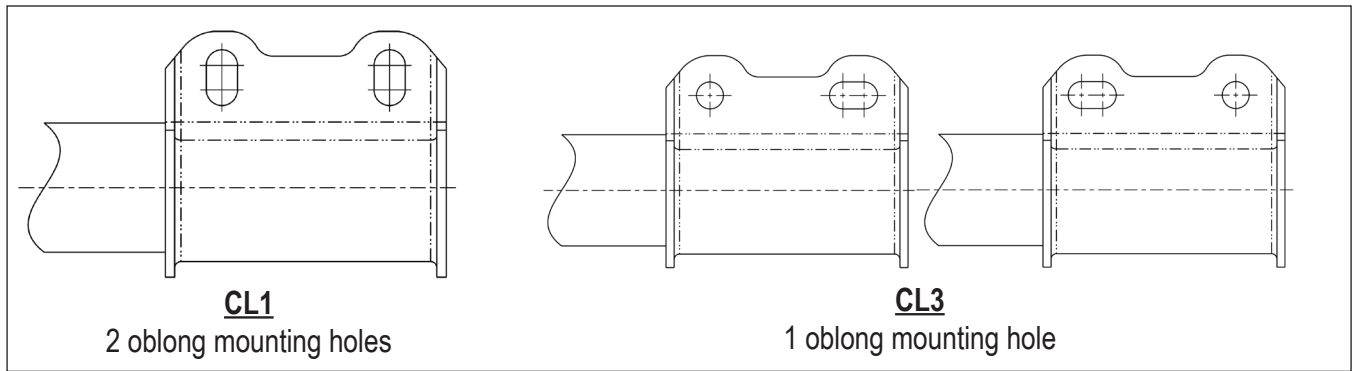
** 1.03" / 26.2 mm Offset

MOUNTING CODE "ES" EYE RING AND BUSHING WITH STEEL SLEEVE (CONTINUED)

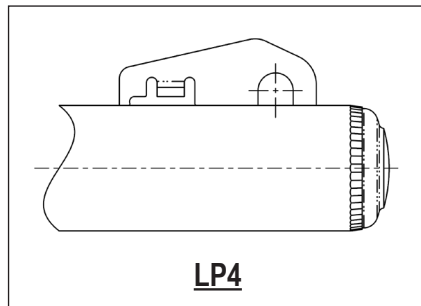
| MOUNTING CODE | DIMENSION | | | |
|---------------|-----------------|-------|---------------|--------|
| | Inside Diameter | | Sleeve Length | |
| | (inches) | (mm) | (inches) | (mm) |
| ES158 | 0.75 | 19.05 | 3.80 | 96.52 |
| ES159** | 0.75 | 19.05 | 3.21 | 81.53 |
| ES160 | 1.00 | 25.40 | 2.01 | 51.05 |
| ES161 | 0.63 | 16.00 | 3.95 | 100.33 |
| ES162 | 0.63 | 16.00 | 2.60 | 66.04 |
| ES163 | 0.44 | 11.11 | 2.50 | 63.50 |
| ES164 | 0.50 | 12.70 | 2.26 | 57.40 |
| ES165 | 0.50 | 12.70 | 1.75 | 44.45 |
| ES171 | 0.50 | 12.70 | 1.88 | 47.75 |
| ES172 | 0.50 | 12.70 | 2.72 | 69.09 |
| ES174 | 0.63 | 15.88 | 3.25 | 82.55 |
| ES175 | 0.63 | 16.00 | 1.96 | 49.78 |
| ES176 | 0.63 | 16.00 | 3.72 | 94.49 |

| MOUNTING CODE | DIMENSION | | | |
|---------------|-----------------|-------|---------------|-------|
| | Inside Diameter | | Sleeve Length | |
| | (inches) | (mm) | (inches) | (mm) |
| ES177 | 0.63 | 16.00 | 3.55 | 90.17 |
| ES178 | 0.75 | 19.05 | 1.96 | 49.78 |
| ES179 | 0.79 | 20.00 | 1.75 | 44.45 |
| ES183 | 0.79 | 20.00 | 3.80 | 96.52 |
| ES184 | 0.79 | 20.00 | 1.75 | 44.45 |
| ES185 | 0.47 | 12.00 | 2.44 | 61.98 |
| ES190 | 0.87 | 22.00 | 1.75 | 44.45 |
| ES194 | 0.88 | 22.23 | 2.28 | 57.91 |
| ES204 | 0.57 | 14.50 | 1.68 | 42.67 |
| ES210 | 0.73 | 18.50 | 1.87 | 47.50 |
| ES216 | 0.57 | 14.50 | 3.15 | 80.00 |

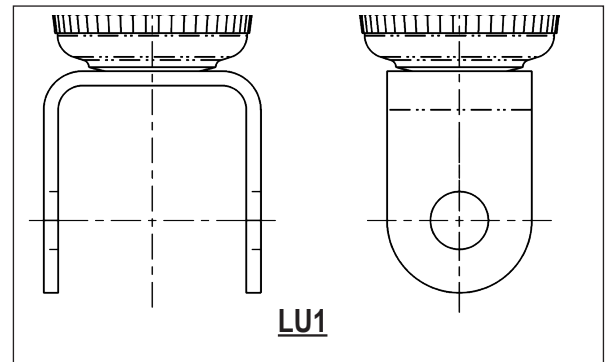
MOUNTING CODE "CL" CLEVIS



MOUNTING CODE "LP" PINCH SOCKET



MOUNTING CODE "LU" U JOINT



MOUNTING CODE "TM" TOP MOUNT

TM###

1st & 2nd digit - "Top Mount"

3rd digit - Part type/shape from the five categories listed below

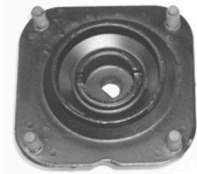
4th digit - Number of studs / bolts (the amount of mounting points to the vehicle (see example below)

5th digit - Design of the mounting point - Stud (S) Bolt (B) Clip (C) (see example below)

TOP MOUNT DESIGN SHAPES



Triangle



Square



Circle



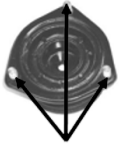
Oval



Unique

EXAMPLES

The fourth digit will note how many mounting points to the vehicle body exist.
The final digits indicate the type of mounting point **Stud (S) Bolt (B) Clip (C)**
(a combination is used for multiple mounting points)



3S

3 mounting points
stud type



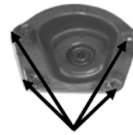
2C

2 mounting points
clip type



4S

4 mounting points
stud type



2S2B

2 mounting points, stud type
2 mounting points, bolt type

| TOP MOUNT CODE | TOP MOUNT DESIGN | MOUNTING TYPE |
|----------------|------------------|----------------|
| TMR4S | Rectangle | 4 Stud |
| TMT3S | Triangle | 3 Stud |
| TMU2B | Unique | 2 bolt |
| TMU2B1S | Unique | 2 Bolt, 1 Stud |