



## Installation Procedure

- 1)** Measure the sleeve O.D., Top-middle-bottom, rotate the sleeve 90 degrees, and measure again top-middle-bottom. The average measurement is the size of the sleeve. This measurement is what is used to calculate press or interference fit. Some minor sleeve distortion may have occurred during shipment, however the sleeve will conform to the cylinder shape.
- 2)** Determine the amount of press needed for the application (see page III for press recommendations). Stop the boring tool 1/8" to 1/2" (depending on the type of block, piston travel, oil ring location, length of crack, etc.) from the bottom of the cylinder to leave a step (ledge) for the sleeve to sit on. The cylinder head will hold the sleeve from the top. When the block has been bored out to size to accept the sleeve, change the boring machine cutter to a pointed tool. In order to square the step/ledge, set the tool about .010" (PER SIDE) less than the block has been bored to. Lightly cut away some of the chamfer until the cutter reaches the flat, or the top of the step/ledge. This allows the sleeve to sit fully on the step/ledge, not partially on the chamfered edges.
- 3)** Apply a sleeve retainer compound of your choice (optional if not repairing a cracked block) to the outside diameter of the sleeve, then either press or carefully drive the sleeve into the block. Make sure the sleeve is all the way down and bottomed on the step/ledge. Trim the excess sleeve material from the top of the block (with the bottom flat of the boring tool if there is substantial material) Bore the sleeve to required inside diameter size. With a long sharp file, remove any sleeve protrusion that would cause head gasket problems, or deck the block with a mill. Finally chamfer the top inside diameter of the sleeve.

## Press Fit Recommendations

**2.00" BORE UP TO 5-1/8" = .003" PRESS MAXIMUM**  
**5-1/8" BORE UP TO 6-1/2" = .004" PRESS MAXIMUM**  
**6-1/2" BORE UP TO 8-1/2" = .005" PRESS MAXIMUM**

The above figures are for perfect to normal conditions, not for use in all applications. Please keep in mind that the machinist's past experiences should also be considered. There are numerous factors that will effect the amount of press that should be used.

Some of these include ***BUT ARE NOT LIMITED TO:***

- The location of the damage, crack or hole.
- A long crack or large chunk missing will reduce press because the damage will open under stress. Increase or decrease the amount of press according to what will seal the damage. Pressure testing recommended.
- The material and Strength Integrity of the block (an air-cooled aluminum jug vs. A high nickel block and a lightweight design vs. A rigid type block casting).
- If the remaining cylinders are going to be bored or not. (Remember, the more press - the greater the distortion to the surrounding cylinders. This distortion may not become round with just finish honing).
- Not using a step at the bottom of the cylinder means more press should be used to help keep the sleeve from dropping.

**Take these factors into consideration and adjust the amount of press for each sleeve installation accordingly!**



## Performance Cylinder Sleeves

Melling “HP” sleeves are made from centrifugally cast, high strength gray iron. It is a lower carbon iron alloyed with chromium, copper, and nickel to produce a harder (241-293 BHN) more wear resistant surface. The average tensile strength (45,000 - 50,000 p.s.i.) is 1/3 greater than “regular” iron sleeves and nearly all O.E.M. cylinder blocks. This translates into. This proven sleeve material has been used successfully for years in heavy-duty diesel and performance engines to give longer life with less distortion and enhanced reliability. Our “HP” iron is compatible with all ring materials.

## Performance Cylinder Sleeve Specifications

| NOMINAL<br>BORE | LENGTH | SEMI-FINISHED<br>INSIDE DIA. | 3/32" WALL |          | 1/8" WALL |          |
|-----------------|--------|------------------------------|------------|----------|-----------|----------|
|                 |        |                              | O.D.       | NUMBER   | O.D.      | NUMBER   |
| 4.000           | 6.250  | 3.970                        | 4.1905     | CSL136HP | 4.253     | CSL236HP |
| 4.125           | 6.250  | 4.095                        | 4.3155     | CSL161HP | 4.378     | CSL261HP |
| 4.250           | 7.000  | 4.220                        | 4.4405     | CSL197HP | 4.503     | CSL297HP |



**NEW!**



## Performance Cylinder Sleeves

- Universal flanged sleeves to provide extra insurance to prevent sleeve movement in performance applications.
- Reduce the critical factors that secure standard liners such as press fit, cylinder ledge at bottom of bore, and heat expansion rates of metals.
- Flanged counter bore thickness in block can be machined .002 less to provide extra sealing against the gasket and head from the flange on the sleeve.
- Bore can be up to .060 bigger than standard and still have a 3/32" wall
- Heavy duty 619 material.

| PART NUMBER | STANDARD BORE | SEMI-I.D. | FLANGE O.D. | FLANGE THICKNESS | SLEEVE O.D. | LENGTH THICKNESS                 |
|-------------|---------------|-----------|-------------|------------------|-------------|----------------------------------|
| 590203      | 3.9375        | 3.907     | 4.330       | .125             | 4.190       | 6 <sup>3</sup> / <sub>4</sub> "  |
| 590295      | 4.00          | 3.970     | 4.330       | .125             | 4.253       | 5 <sup>1</sup> / <sub>2</sub> "  |
| 590298      | 4.00          | 3.970     | 4.393       | .125             | 4.253       | 5 <sup>7</sup> / <sub>8</sub> "  |
| 590236      | 4.00          | 3.970     | 4.393       | .125             | 4.253       | 6 <sup>1</sup> / <sub>4</sub> "  |
| 590280      | 4.00          | 3.970     | 4.393       | .125             | 4.253       | 6 <sup>1</sup> / <sub>2</sub> "  |
| 590231      | 4.050         | 4.020     | 4.443       | .125             | 4.303       | 6 <sup>1</sup> / <sub>4</sub> "  |
| 590295      | 4.050         | 4.020     | 4.443       | .125             | 4.303       | 6 <sup>5</sup> / <sub>16</sub> " |
| 592274      | 4.110         | 4.080     | 4.503       | .125             | 4.363       | 6 <sup>7</sup> / <sub>8</sub> "  |
| 592256      | 4.125         | 4.095     | 4.518       | .125             | 4.378       | 7 <sup>1</sup> / <sub>2</sub> "  |
| 590261      | 4.125         | 4.095     | 4.518       | .125             | 4.378       | 6 <sup>1</sup> / <sub>4</sub> "  |
| 590297      | 4.250         | 4.220     | 4.643       | .125             | 4.503       | 7"                               |

# UNIVERSAL PROGRESSIVE SIZE CHART



| CYLINDER BORE<br>INCHES | LENGTH | 3/32" WALL | 1/8" WALL         |
|-------------------------|--------|------------|-------------------|
|                         |        | PART NO.   | PART NO.          |
| 2.000                   | 6-1/2  | CSL450     | CSL550            |
| 2.0625                  | 6-1/2  | CSL451     | CSL551            |
| 2.1250                  | 6-1/2  | CSL452     | CSL552            |
| 2.1875                  | 6-1/2  | CSL453     | CSL553            |
| 2.2500                  | 6-1/2  | CSL454     | CSL554            |
| 2.3125                  | 6-1/2  | CSL455     | CSL555            |
| 2.3750                  | 6-1/2  | CSL456     | CSL556            |
| 2.3750                  | 7      | CSL446     |                   |
| 2.4375                  | 6-1/2  | CSL457     | CSL557            |
| 2.5000                  | 6-1/2  | CSL458     | CSL558            |
| 2.5000                  | 7      | CSL447     |                   |
| 2.5420                  | 5-3/16 | CSL633     |                   |
| 2.5675                  | 6-1/2  | CSL459     | CSL559            |
| 2.5675                  | 7      | CSL448     |                   |
| 2.6250                  | 6-1/2  | CSL460     | CSL560            |
| 2.6250                  | 7      | CSL449     |                   |
| 2.6250                  | 8-1/4  | CSL488     | CSL588            |
| 2.6770                  | 5-3/4  | CSL622     | CSL722            |
| 2.6875                  | 8-1/4  | CSL461     | CSL561            |
| 2.7280                  | 5-5/16 | CSL634     |                   |
| 2.7500                  | 7-1/2  | CSL401     | CSL501            |
| 2.7500                  | 8-1/4  | CSL485     | CSL585            |
| 2.7950                  | 5-1/4  | CSL628     | CSL728            |
| 2.8125                  | 8-1/4  | CSL462     | CSL562            |
| 2.8350                  | 6-1/2  | CSL604A    | CSL704A           |
| 2.8740                  | 4-7/8  | CSL601     | CSL701            |
| 2.8740                  | 5-1/4  | CSL607     | CSL707            |
| 2.8740                  | 6-1/16 | CSL620     | CSL720            |
| 2.8750                  | 8-1/4  | CSL402     | CSL502            |
| 2.9130                  | 6-1/2  | CSL605A    | CSL705A           |
| 2.9375                  | 8-1/4  | CSL463     | CSL563            |
| 2.9530                  | 4-7/8  | CSL606     | CSL706            |
| 2.9530                  | 6-3/8  | CSL616     | CSL716            |
| 2.9720                  | 5-1/8  | CSL629     | CSL729            |
| 2.9920                  | 5-1/4  | CSL610     | CSL710            |
| 2.9920                  | 7      | CSL621     | CSL721            |
| 2.9920                  | 7      |            | CSL760 (2mm wall) |
| 3.0000                  | 6      | CSL1168    | CSL2268           |
| 3.0000                  | 6-3/8  | CSL150     | CSL250            |
| 3.0000                  | 7-1/2  | CSL154N    | CSL254N           |
| 3.0000                  | 8-1/4  | CSL403     | CSL503            |
| 3.0000                  | 9-1/4  | CSL486     | CSL586            |
| 3.0300                  | 5-3/4  | CSL1116    | CSL2216           |
| 3.0510                  | 5-1/8  | CSL631     | CSL731            |
| 3.0625                  | 8-1/4  | CSL404     | CSL504            |
| 3.0710                  | 5-5/8  | CSL618     | CSL718            |

#Denotes +.015 available

HP Denotes higher grade material used

† Denotes available in 1/16" wall-add X to sleeve number

F suffix denotes flanged sleeve

# UNIVERSAL PROGRESSIVE SIZE CHART



| CYLINDER BORE<br>INCHES | LENGTH  | 3/32" WALL | 1/8" WALL                   |
|-------------------------|---------|------------|-----------------------------|
|                         |         | PART NO.   | PART NO.                    |
| 3.0710                  | 6-3/8   | CSL1108N   | CSL2208N                    |
| 3.0730                  | 9-1/4   | CSL433     |                             |
| 3.1250                  | 6       | CSL1169    | CSL2269                     |
| 3.1250                  | 6-7/8   | CSL170     | CSL270                      |
| 3.1250                  | 8-1/8   | CSL135     | CSL235                      |
| 3.1250                  | 9       | CSL405     | CSL505                      |
| 3.1300                  | 5-3/4   | CSL1134    | CSL2234                     |
| 3.1500                  | 5-3/16  | CSL1131    | CSL2231                     |
| 3.1500                  | 6       | CSL1132    | CSL2232                     |
| 3.1500                  | 6-1/4   | CSL609     | CSL709                      |
| 3.1500                  | 7       |            | CSL800 (2mm wall)           |
| 3.1610                  | 6       | CSL619     | CSL719                      |
| 3.1875                  | 6       | CSL151     | CSL251                      |
| 3.1875                  | 6-1/2   | CSL105     | CSL205                      |
| 3.1875                  | 6-1/2   |            | CSL105F (Flanged .095 wall) |
| 3.1875                  | 6-1/2   |            | CSL301F (Flanged .040 wall) |
| 3.1875                  | 6-1/2   |            | CSL304F (Flanged .090 wall) |
| 3.1875                  | 7-1/2   | CSL153     | CSL253                      |
| 3.1875                  | 7-1/2   | CSL153N    | CSL253N                     |
| 3.1875                  | 9-1/4   | CSL406A    | CSL506A#                    |
| 3.1890                  | 5-1/2   | CSL623     | CSL723                      |
| 3.1890                  | 5-7/8   | CSL1118N   | CSL2218N                    |
| 3.1890                  | 7       |            | CSL810 (2mm wall)           |
| 3.2280                  | 5-3/8   | CSL1105    | CSL2205                     |
| 3.2283                  | 7       |            | CSL820 (2mm wall)           |
| 3.2500                  | 7-1/4   | CSL1142    | CSL2242                     |
| 3.2500                  | 7-1/2   | CSL1143    | CSL2243                     |
| 3.2500                  | 8-1/16  | CSL115N    | CSL215N                     |
| 3.2500                  | 9-1/4   | CSL407     | CSL507                      |
| 3.2680                  | 5-1/2   | CSL613     | CSL713                      |
| 3.2680                  | 5-3/4   | CSL624     | CSL724                      |
| 3.2680                  | 6-1/4   | CSL611     | CSL711                      |
| 3.2680                  | 7       | CSL803     | CSL903                      |
| 3.2680                  | 7       |            | CSL830 (2mm wall)           |
| 3.3000                  | 8-3/16  | CSL112     | CSL212                      |
| 3.3030                  | 7       |            | CSL840 (2mm wall)           |
| 3.3070                  | 5-5/8   | CSL1107    | CSL2207                     |
| 3.3070                  | 6-1/2   | CSL1128    | CSL2228                     |
| 3.3125                  | 7-9/16  | CSL107     | CSL207                      |
| 3.3125                  | 9-1/4   | CSL408     | CSL508                      |
| 3.3300                  | 5-11/16 | CSL1136    | CSL2236                     |
| 3.3440                  | 7-9/16  | CSL1144    | CSL2244                     |
| 3.3460                  | 5-1/4   | CSL602     | CSL702                      |
| 3.3460                  | 6       | CSL612     | CSL712                      |
| 3.3460                  | 6-1/4   | CSL617     | CSL717                      |
| 3.3464                  | 7       |            | CSL850 (2mm wall)           |

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| CYLINDER BORE<br>INCHES | LENGTH  | 3/32" WALL | 1/8" WALL                     |
|-------------------------|---------|------------|-------------------------------|
|                         |         | PART NO.   | PART NO.                      |
| 3.3750                  | 6       | CSL1145    | CSL2245                       |
| 3.3750                  | 7-5/16  | CSL125     | CSL225                        |
| 3.3750                  | 9-1/4   | CSL409     | CSL509                        |
| 3.3860                  | 5-3/4   | CSL615     | CSL715                        |
| 3.3860                  | 7       | CSL804     | CSL904                        |
| 3.3860                  | 7       |            | CSL860 (2mm wall)             |
| 3.4000                  | 5-15/16 | CSL156     | CSL256                        |
| 3.4000                  | 7-1/16  | CSL155     | CSL255                        |
| 3.4120                  | 6-15/16 |            | CSL311F (Flanged .134 wall)   |
| 3.4250                  | 5-1/2   | CSL1138    | CSL2238                       |
| 3.4250                  | 7       |            | CSL870 (2mm wall)             |
| 3.4330                  | 5-13/16 | CSL603     | CSL703                        |
| 3.4375                  | 5-13/16 | CSL1146    | CSL2246                       |
| 3.4375                  | 6-15/16 |            | CSL307F (Flanged 7/64 wall)   |
| 3.4375                  | 7-1/2   | CSL152     | CSL252                        |
| 3.4375                  | 7-1/2   | CSL152N    | CSL252N                       |
| 3.4375                  | 8-1/8   | CSL119N†   | CSL219N                       |
| 3.4375                  | 9-1/4   | CSL410     | CSL510                        |
| 3.4440                  | 6       | CSL1129    | CSL2229                       |
| 3.4440                  | 6-7/16  | CSL1171    | CSL2271                       |
| 3.4646                  | 7       |            | CSL880 (2mm wall)             |
| 3.4650                  | 5-45/64 |            | CSL327F (Flanged 1/8 wall)    |
| 3.4650                  | 5-7/8   | CSL614     | CSL714                        |
| 3.4840                  | 6-1/4   | CSL608     | CSL708                        |
| 3.5000                  | 5-1/8   | CSL104     | CSL204                        |
| 3.5000                  | 5-1/4   | CSL1112    | CSL2212                       |
| 3.5000                  | 5-1/2   | CSL1137†   | CSL2237                       |
| 3.5000                  | 5-9/16  | CSL1141    | CSL2241                       |
| 3.5000                  | 5-3/4   | CSL1122    | CSL2222                       |
| 3.5000                  | 5-3/4   |            | CSL307FXV (Flanged 5/64 wall) |
| 3.5000                  | 5-7/8   | CSL1120    | CSL2220                       |
| 3.5000                  | 5-15/16 | CSL141     | CSL241                        |
| 3.5000                  | 6       | CSL1111    | CSL2211                       |
| 3.5000                  | 7-1/16  | CSL109     | CSL209                        |
| 3.5000                  | 8-1/16  | CSL108     | CSL208                        |
| 3.5000                  | 9-1/4   | CSL411     | CSL511#                       |
| 3.5040                  | 7       |            | CSL890 (2mm wall)             |
| 3.5180                  | 5-1/2   | CSL1147    | CSL2247                       |
| 3.5512                  | 5-1/4   |            | CSL1177X (1/16" wall)         |
| 3.5512                  | 6-1/4   |            | CSL1178X (1/16" wall)         |
| 3.5675                  | 5-15/16 | CSL158     | CSL258                        |
| 3.5675                  | 6-7/8   | CSL102     | CSL202                        |
| 3.5675                  | 7-7/32  | CSL111     | CSL211                        |
| 3.5675                  | 7-9/16  | CSL123     | CSL223                        |
| 3.5675                  | 10      | CSL412     | CSL512                        |
| 3.5750                  | 5-5/8   | CSL190A    | CSL290A                       |

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# UNIVERSAL PROGRESSIVE SIZE CHART



| CYLINDER BORE<br>INCHES | LENGTH  | 3/32" WALL | 1/8" WALL                   |
|-------------------------|---------|------------|-----------------------------|
|                         |         | PART NO.   | PART NO.                    |
| 3.5830                  | 5-1/2   | CSL625     |                             |
| 3.5860                  | 5       | CSL1172    | CSL2272                     |
| 3.5860                  | 6-1/2   | CSL1130    | CSL2230                     |
| 3.6220                  | 5-25/64 |            | CSL328F (Flanged 1/8" wall) |
| 3.6220                  | 6-1/16  | CSL630     | CSL730                      |
| 3.6250                  | 6       | CSL144     | CSL244                      |
| 3.6250                  | 6-11/16 | CSL142     | CSL242                      |
| 3.6250                  | 7       | CSL134     | CSL234                      |
| 3.6250                  | 10-1/4  | CSL413A    | CSL513A                     |
| 3.6610                  | 5-1/16  | CSL174     | CSL274                      |
| 3.6610                  | 5-1/2   | CSL626     | CSL726                      |
| 3.6614                  | 7       |            | CSL930 (2mm wall)           |
| 3.6710                  | 5-1/2   | CSL1106    | CSL2206                     |
| 3.6800                  | 5-1/8   | CSL194     | CSL294                      |
| 3.6800                  | 5-1/2   | CSL1173    | CSL2273                     |
| 3.6800                  | 6       | CSL124     | CSL224                      |
| 3.6875                  | 5-1/8   | CSL1165    | CSL2265                     |
| 3.6875                  | 6       | CSL1166    | CSL2266                     |
| 3.6875                  | 7-9/16  | CSL1148    | CSL2248                     |
| 3.6875                  | 10-1/4  | CSL414     | CSL514                      |
| 3.7190                  | 7-3/4   | CSL145     | CSL245                      |
| 3.7360                  | 5-1/2   | CSL1149    | CSL2249                     |
| 3.7500                  | 5-7/8   | CSL126     | CSL226                      |
| 3.7500                  | 6       | CSL139     | CSL239                      |
| 3.7500                  | 6-1/16  | CSL117     | CSL217                      |
| 3.7500                  | 7-1/4   | CSL120     | CSL220                      |
| 3.7500                  | 10-1/4  | CSL415A    | CSL515A#                    |
| 3.7800                  | 5-1/2   | CSL173     | CSL273                      |
| 3.7813                  | 7-7/8   | CSL146     | CSL246                      |
| 3.8000                  | 5-1/4   | CSL1133    | CSL2233                     |
| 3.8000                  | 5-7/8   | CSL1123    | CSL2223                     |
| 3.8000                  | 5-7/8   | CSL1123N   | CSL2223N                    |
| 3.8000                  | 6       | CSL138†    | CSL238                      |
| 3.8000                  | 6-1/8   | CSL1101    | CSL2201                     |
| 3.8000                  | 6-3/8   | CSL183     | CSL283                      |
| 3.8000                  | 6-7/8   | CSL1124    | CSL2224                     |
| 3.8000                  | 6-15/16 | CSL143     | CSL243                      |
| 3.8125                  | 6-7/8   | CSL162     | CSL262                      |
| 3.8125                  | 10-1/4  | CSL428A    | CSL528A                     |
| 3.8750                  | 5-3/4   | CSL188     | CSL288                      |
| 3.8750                  | 5-7/8   | CSL122A    | CSL222A                     |
| 3.8750                  | 6-1/4   | CSL181     | CSL281                      |
| 3.8750                  | 6-3/8   | CSL133     | CSL233                      |
| 3.8750                  | 6-7/16  | CSL182     | CSL282                      |
| 3.8750                  | 7       | CSL165†    | CSL265                      |
| 3.8750                  | 7-1/2   | CSL101     | CSL201                      |

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# UNIVERSAL PROGRESSIVE SIZE CHART



| CYLINDER BORE<br>INCHES | LENGTH  | 3/32" WALL                   | 1/8" WALL                    |
|-------------------------|---------|------------------------------|------------------------------|
|                         |         | PART NO.                     | PART NO.                     |
| 3.8750                  | 10-1/4  | CSL416A                      | CSL516A#                     |
| 3.9000                  | 6-15/16 |                              | CSL308F (Flanged 1/16" wall) |
| 3.9100                  | 6       | CSL116                       | CSL216                       |
| 3.9375                  | 6-3/4   | CSL103                       | CSL203                       |
| 3.9375                  | 6-7/8   | CSL1151                      | CSL2251                      |
| 3.9375                  | 10-1/4  | CSL429A                      | CSL529A                      |
| 3.9650                  | 6       | CSL1119                      |                              |
| 3.9688                  | 6       |                              | CSL2219                      |
| 3.9760                  | 6-1/4   | CSL1152                      | CSL2252                      |
| 4.0000                  | 5-1/16  | CSL193                       | CSL293                       |
| 4.0000                  | 5-1/8   | CSL1113A                     | CSL2213A                     |
| 4.0000                  | 5-1/2   | CSL159                       | CSL259                       |
| 4.0000                  | 5-5/8   | CSL127                       | CSL227                       |
| 4.0000                  | 5-3/4   | CSL1104                      | CSL2204                      |
| 4.0000                  | 5-3/4   | CSL1104N                     | CSL2204N                     |
| 4.0000                  | 5-7/8   | CSL198†                      | CSL298                       |
| 4.0000                  | 5-1/2   | CSL198F (Flanged 1/16" wall) |                              |
| 4.0000                  | 6       | CSL1170                      |                              |
| 4.0000                  | 6-1/16  | CSL129                       | CSL229                       |
| 4.0000                  | 6-1/4   | CSL136                       | CSL236                       |
| 4.0000                  | 6-1/4   | CSL136HP                     | CSL236HP                     |
| 4.0000                  | 6-7/16  | CSL1153                      | CSL2253                      |
| 4.0000                  | 6-1/2   | CSL180†                      | CSL280                       |
| 4.0000                  | 6-7/8   | CSL137                       | CSL237                       |
| 4.0000                  | 7-7/8   | CSL157                       | CSL257                       |
| 4.0000                  | 9-3/8   | CSL175                       | CSL275                       |
| 4.0000                  | 10-1/4  | CSL417A                      | CSL517A#                     |
| 4.0312                  | 6-3/8   | CSL1154                      | CSL2254                      |
| 4.0400                  | 6-3/4   | CSL160                       | CSL260                       |
| 4.0500                  | 6-1/4   | CSL131                       | CSL231                       |
| 4.0500                  | 6-1/4   | CSL1139 (4.403 O.D.)         |                              |
| 4.0500                  | 6-5/16  | CSL195†                      | CSL295                       |
| 4.0625                  | 6-5/16  | CSL167                       | CSL267                       |
| 4.0625                  | 6-1/2   | CSL1102                      | CSL2202                      |
| 4.0625                  | 10-1/4  | CSL489                       | CSL589                       |
| 4.0625                  | 11      | CSL430                       | CSL530                       |
| 4.0820                  | 6-7/8   | CSL1155                      | CSL2255                      |
| 4.0937                  | 6       | CSL179                       | CSL279                       |
| 4.0940                  | 6-1/4   | CSL1179N                     | CSL2279N                     |
| 4.1100                  | 6-7/8   | CSL1174                      | CSL2274                      |
| 4.1100                  | 6-7/8   | CSL1174HP                    | CSL2274HP                    |
| 4.1250                  | 6-1/16  | CSL164                       | CSL264                       |
| 4.1250                  | 6-1/4   | CSL161                       | CSL261                       |
| 4.1250                  | 6-1/4   | CSL161HP                     | CSL261HP                     |
| 4.1250                  | 6-3/8   | CSL1109                      | CSL2209                      |
| 4.1250                  | 6-1/2   | CSL172                       | CSL272                       |

#Denotes +.015 available

HP Denotes higher grade material used

† Denotes available in 1/16" wall-add X to sleeve number

F suffix denotes flanged sleeve

# UNIVERSAL PROGRESSIVE SIZE CHART



| CYLINDER BORE<br>INCHES | LENGTH | 3/32" WALL           | 1/8" WALL            |
|-------------------------|--------|----------------------|----------------------|
|                         |        | PART NO.             | PART NO.             |
| 4.1250                  | 6-3/4  | CSL130†              | CSL230               |
| 4.1250                  | 7-1/2  | CSL1156              | CSL2256              |
| 4.1250                  | 10-1/4 | CSL418A              | CSL518A#             |
| 4.1500                  | 6-1/8  | CSL118               | CSL218               |
| 4.1875                  | 6-3/4  | CSL186               | CSL286               |
| 4.1875                  | 12-1/4 | CSL432A              | CSL532A              |
| 4.2330                  | 6-1/4  | CSL1158              | CSL2258              |
| 4.2500                  | 6      | CSL199               | CSL299               |
| 4.2500                  | 6-1/2  | CSL196†              | CSL296               |
| 4.2500                  | 7      | CSL197†              | CSL297               |
| 4.2500                  | 7      | CSL197HP             | CSL297HP             |
| 4.2500                  | 7-1/2  | CSL106               | CSL206               |
| 4.2500                  | 12-1/4 | CSL419A              | CSL519A#             |
| 4.3000                  | 7-1/2  | CSL187               | CSL287               |
| 4.3125                  | 6-3/4  | CSL1159              | CSL2259              |
| 4.3125                  | 12-3/4 | CSL420A              | CSL520A              |
| 4.3200                  | 6-3/4  | CSL121               | CSL221               |
| 4.3200                  | 7      | CSL114 (4.5105 O.D.) | CSL214 (4.5730 O.D.) |
| 4.3520                  | 6-1/4  | CSL169†              | CSL269               |
| 4.3500                  | 5-7/8  | CSL1114              | CSL2214              |
| 4.3600                  | 6      | CSL128               | CSL228               |
| 4.3600                  | 6-1/4  | CSL1125              | CSL2225              |
| 4.3600                  | 6-7/8  | CSL1160              | CSL2260              |
| 4.3750                  | 7-1/2  | CSL1161              | CSL2261              |
| 4.3750                  | 12-1/4 | CSL421A              | CSL521A#             |
| 4.3750                  | 12-3/4 | CSL487               | CSL587               |
| 4.4000                  | 8-1/2  | CSL1176              | CSL2276              |
| 4.4370                  | 12-3/4 | CSL427               | CSL527               |
| 4.4370                  | 12-1/4 |                      | CSL662 (4.7150 O.D.) |
| 4.5000                  | 7-3/8  | CSL1167              |                      |
| 4.5000                  | 7-3/4  | CSL1126              | CSL2226              |
| 4.5000                  | 8      | CSL1126X†            | CSL2226X             |
| 4.5000                  | 8      |                      | CSL2226X .020        |
| 4.5000                  | 8-1/4  | CSL1162              | CSL2262              |
| 4.5000                  | 8-3/4  |                      | CSL276 (Angle top)   |
| 4.5000                  | 8-3/4  | CSL1175              | CSL2275              |
| 4.5000                  | 9      | CSL1163              | CSL2263              |
| 4.5000                  | 12-1/4 | CSL422A              | CSL522A#             |
| 4.5620                  | 7-1/2  | CSL1117              | CSL2217              |
| 4.5675                  | 7-5/8  | CSL168               | CSL268               |
| 4.5675                  | 12-1/2 | CSL431               | CSL531               |
| 4.6250                  | 12-1/2 | CSL423               | CSL523               |
| 4.6875                  | 13     | CSL464               | CSL564               |
| 4.7500                  | 14     | CSL465               | CSL565               |
| 4.8750                  | 7-5/8  | CSL113               | CSL213               |
| 4.8750                  | 13     |                      | CSL525               |

#Denotes +.015 available

HP Denotes higher grade material used

† Denotes available in 1/16" wall-add X to sleeve number

F suffix denotes flanged sleeve

# UNIVERSAL PROGRESSIVE SIZE CHART



| CYLINDER BORE<br>INCHES | LENGTH | 3/32" WALL | 1/8" WALL |
|-------------------------|--------|------------|-----------|
|                         |        | PART NO.   | PART NO.  |
| 5.0000                  | 13     |            | CSL526#   |
| 5.0000                  | 14     | CSL426     |           |
| 5.0625                  | 14     |            | CSL566    |
| 5.1250                  | 7-1/4  | CSL1164    | CSL2264   |
| 5.1250                  | 14     |            | CSL567    |
| 5.2500                  | 14-1/4 |            | CSL568    |
| 5.3750                  | 14-1/4 |            | CSL569    |
| 5.5000                  | 17-1/2 |            | CSL570    |
| 5.6250                  | 17-1/2 |            | CSL571    |
| 5.7500                  | 17-1/2 |            | CSL572    |
| 5.8750                  | 17-1/2 |            | CSL573    |
| 6.0000                  | 17-1/2 |            | CSL574    |
| 6.1250                  | 17-1/2 |            | CSL575    |
| 6.2500                  | 17-1/2 |            | CSL576    |
| 6.5000                  | 17     |            | CSL577    |
| 6.7500                  | 17     |            | CSL578    |
| 7.0000                  | 17     | CSL479     |           |
| 7.0000                  | 17     |            | CSL579    |
| 7.2500                  | 22     |            | CSL580    |
| 7.5000                  | 22     |            | CSL581    |
| 7.7500                  | 22     |            | CSL582    |
| 8.0000                  | 22     |            | CSL583    |
| 8.5000                  | 24     |            | CSL584    |

#Denotes +.015 available

HP Denotes higher grade material used

† Denotes available in 1/16" wall-add X to sleeve number

F suffix denotes flanged sleeve



**We are automotive**



# FINISHED CYLINDER SLEEVES



## CHEVROLET/GM

| APPLICATION                         | PART NUMBER      | I.D.                                                              | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION                     |
|-------------------------------------|------------------|-------------------------------------------------------------------|-------|--------|-------------|---------------|---------------------------------|
| <b>NEW!</b> 2.2-F 00-04 GM 88984129 | <b>CSL326F</b>   | 3.388                                                             | 3.503 | 5.590  | 3.758       | 0.188         | Ecotec I.D. is finished honed   |
| 2.3-A,B 4CYL 71-77                  | <b>CSL307FXV</b> | 3.500                                                             | 3.744 | 5.750  | 3.742       | 0.180         | Vega I.D. is finished honed     |
| 4.1-8 V8 82-88                      | <b>CSL327F</b>   | 3.465                                                             | 3.892 | 5.580  | 4.213       | N/A           | Cadillac I.D. is finished honed |
| <b>NEW!</b> SLEEVE ASSY.            | <b>SA161</b>     | CONTAINS CSL327F, 3 RING STD. COMPRESSION PISTON & RINGS & O RING |       |        |             |               |                                 |
| 4.2-S I-6 02-07                     | <b>CSL331F</b>   | 3.632                                                             | 3.800 | 5.694  | 4.054       | 0.195         | Trailblazer                     |
| 4.5-5 88-89                         | <b>CSL328F</b>   | 3.623                                                             |       |        |             |               | Cadillac I.D. is finished honed |
| SLEEVE ASSY.                        | <b>SA171</b>     | CONTAINS CSL328F, 3 RING STD. COMPRESSION PISTON & RINGS & O RING |       |        |             |               |                                 |
| 4.5-3,8 90-92                       | <b>CSL328F</b>   | 3.623                                                             |       |        |             |               | Cadillac I.D. is finished honed |
| SLEEVE ASSY.                        | <b>SA170</b>     | CONTAINS CSL328F, 3 RING STD. COMPRESSION PISTON & RINGS & O RING |       |        |             |               |                                 |
| 4.9-B 91-95                         | <b>CSL328F</b>   | 3.623                                                             |       |        |             |               | Cadillac I.D. is finished honed |
| <b>NEW!</b> SLEEVE ASSY.            | <b>SA170</b>     | CONTAINS CSL328F, 3 RING STD. COMPRESSION PISTON & RINGS & O RING |       |        |             |               |                                 |
| 5.7-G,S 97-04                       | <b>CSL332F</b>   | 3.870                                                             | 4.180 | 5.600  | 4.320       | 0.285         | LS1                             |

## CONTINENTAL

| APPLICATION       | PART NUMBER    | I.D.                           | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION |
|-------------------|----------------|--------------------------------|-------|--------|-------------|---------------|-------------|
| Z129, Z134, 4CYL. | <b>CSL311F</b> | 3.375                          | 3.820 | 6.500  | 3.820       | 0.248         | Continental |
| SLEEVE ASSY.      | <b>SA214</b>   | CONTAINS SLEEVE, RINGS, PISTON |       |        |             |               |             |

## CUMMINS

| APPLICATION                          | PART NUMBER     | I.D.  | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION                                           |
|--------------------------------------|-----------------|-------|-------|--------|-------------|---------------|-------------------------------------------------------|
| 14L OHV DIESEL NT-NH 855 OE# 3055099 | <b>CSL335FS</b> | 5.500 | 6.200 | 11.290 | 6.560       | 0.355         | Cummins Sleeve I.D. is finished W/Seal Ring Kit honed |

## FORD INDUSTRIAL / TRACTOR

| APPLICATION                                                  | PART NUMBER    | I.D.                                                     | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION                         |
|--------------------------------------------------------------|----------------|----------------------------------------------------------|-------|--------|-------------|---------------|-------------------------------------|
| 120 4CYL. 2N, 8,9N 39-53 TO S/N 433577                       | <b>CSL301F</b> | 3.188                                                    | 3.345 | 6.500  | 3.344       | 0.050         | (.040" Wall) I.D. is finished       |
|                                                              | <b>CSL304F</b> | 3.188                                                    | 3.367 | 6.500  | 3.405       | 0.060         | (.090" Wall) honed                  |
|                                                              | <b>CSL105F</b> | 3.157                                                    | 3.378 | 6.500  | 3.430       | 0.090         | (.095" Wall)                        |
| SLEEVE ASSY.                                                 | <b>SA81</b>    | CONTAINS CSL301F, 4 RING STD. COMPRESSION PISTON & RINGS |       |        |             |               |                                     |
| SLEEVE ASSY.                                                 | <b>SA85</b>    | CONTAINS CSL301F, 3 RING STD. COMPRESSION PISTON & RINGS |       |        |             |               |                                     |
| SLEEVE ASSY.                                                 | <b>SA104</b>   | CONTAINS CSL301F, HIGH COMPRESSION PISTON & RINGS        |       |        |             |               |                                     |
| 120 4CYL. 2N,8,9N TO S/N 433577 39-51 AFTER S/N 433577 51-53 | <b>CSL304F</b> | 3.188                                                    | 3.410 | 6.500  | 3.405       | 0.060         | (.090" Wall) I.D. is finished honed |
| SLEEVE ASSY.                                                 | <b>SA82</b>    | CONTAINS CSL304F, 4 RING STD. COMPRESSION PISTON & RINGS |       |        |             |               |                                     |
| SLEEVE ASSY.                                                 | <b>SA86</b>    | CONTAINS CSL304F, 3 RING STD. COMPRESSION PISTON & RINGS |       |        |             |               |                                     |
| SLEEVE ASSY.                                                 | <b>SA105</b>   | CONTAINS CSL304F, HIGH COMPRESSION PISTON & RINGS        |       |        |             |               |                                     |

# FINISHED CYLINDER SLEEVES



## FORD INDUSTRIAL / TRACTOR (continued)

| APPLICATION                                | PART NUMBER | I.D.  | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION                         |
|--------------------------------------------|-------------|-------|-------|--------|-------------|---------------|-------------------------------------|
| 134 4CYL. NAA, NAB 53-65<br>500-700 SERIES | CSL307F     | 3.438 | 3.744 | 6.940  | 3.742       | 0.180         | (.109 Wall) I.D. is finished honed  |
| 172 4cyl. 800,900 55-65<br>MULTI-FUEL      | CSL308F     | 3.900 | 4.244 | 6.940  | 4.242       | 0.140         | (.100" Wall) I.D. Is finished honed |

## HERCULES

| APPLICATION   | PART NUMBER | I.D.  | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION |
|---------------|-------------|-------|-------|--------|-------------|---------------|-------------|
| HERCULES DJXC | CSL333F     | 3.750 | 4.000 | 8.940  | 4.085       | 1.192         | DJXC        |

## HONDA

| APPLICATION          | PART NUMBER | I.D.  | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION             |
|----------------------|-------------|-------|-------|--------|-------------|---------------|-------------------------|
| 1.8L B18 (81mm Bore) | CSL347F     | 3.080 | 3.500 | 5.400  | 3.800       | 2.000         | Honda/Acura Double Flat |
| 1.8L B18 (81mm Bore) | CSL348F     | 3.080 | 3.500 | 5.400  | 3.800       | 2.000         | Honda/Acura Single Flat |

**NEW!**

(2 of each sleeve must be ordered to complete engine)

## IHC

| APPLICATION              | PART NUMBER | I.D.  | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION                     |
|--------------------------|-------------|-------|-------|--------|-------------|---------------|---------------------------------|
| RD372,406,450,450A RED50 | CSL325F     | 4.375 | 4.565 | 8.690  | 4.562       | 0.125         | Navistar/IHC Truck (1/16" wall) |

## TOYOTA

| APPLICATION               | PART NUMBER | I.D.  | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION |
|---------------------------|-------------|-------|-------|--------|-------------|---------------|-------------|
| 2.2L L4 DIESEL TRUCK 1983 | CSL346F     | 3.520 | 3.703 | 6.330  | 3.969       | 0.140         | Toyota      |
| 3980cc 2H 6CYL. DIESEL    | CSL334F     | 3.550 | 3.724 | 7.245  | 3.964       | 0.102         | Toyota      |

## UNIVERSAL

| APPLICATION              | PART NUMBER | I.D.  | O.D.  | LENGTH | FLANGE DIA. | FLANGE HEIGHT | DESCRIPTION |
|--------------------------|-------------|-------|-------|--------|-------------|---------------|-------------|
| UNIVERSAL FLANGED SLEEVE | CSL330F     | 3.970 | 4.300 | 6.000  | 4.500       | 0.190         | Toyota      |
| UNIVERSAL FLANGED SLEEVE | CSL329F     | 4.375 | 4.629 | 8.125  | 4.742       | 0.200         | Toyota      |

# HEAVY DUTY CYLINDER SLEEVES



## ALLIS CHALMERS

| APPLICATION                                                                        | PART NUMBER     | BORE   | FLANGE |        | SLEEVE O.D. AT |        |       | LENGTH   | FIRE WALL |
|------------------------------------------------------------------------------------|-----------------|--------|--------|--------|----------------|--------|-------|----------|-----------|
|                                                                                    |                 |        | O.D.   | WIDTH  | PILOT          | BARREL | SEAL  |          |           |
| 685T,6000,7000,10000,11000 & MARK II DIESEL ENGINES WITH SHALLOW CUP PISTON DESIGN | <b>CSL344FS</b> | 4-7/16 | 5.251  | 0.3163 | 5.031          | 4.937  | 4.968 | 10-13/16 | 0.044     |
| D175,DA175,D262,DA262,6D262 DIESEL ENGINES & G262 GAS ENGINE                       | <b>CSL345FS</b> | 3-9/16 | 3.98   | 0.25   | 3.912          | 3.873  | 3.84  | 8-1/16   | NO        |
| B,BE,B15,B125 GAS ENGINES                                                          | <b>CSL338FS</b> | 3-3/8  | 3.994  | 0.248  | 3.778          | 3.74   | 3.716 | 6-9/16   | NO        |
| D2200,D2800,D2900,433,433T, 649,649T DIESEL ENGINES & G2800 GAS ENGINE             | <b>CSL336FS</b> | 3-7/8  | 4.627  | 0.319  | 4.437          | 4.31   | 4.375 | 8-1/8    | 0.045     |

## CASE

| APPLICATION                                                  | PART NUMBER     | BORE  | FLANGE |       | SLEEVE O.D. AT |        |        | LENGTH  | FIRE WALL |
|--------------------------------------------------------------|-----------------|-------|--------|-------|----------------|--------|--------|---------|-----------|
|                                                              |                 |       | O.D.   | WIDTH | PILOT          | BARREL | SEAL   |         |           |
| A-267D, A-401D DIESEL ENGINE                                 | <b>CSL343FS</b> | 4-1/8 | 4.997  | 0.252 | 4.823          | 4.75   | 4.658  | 9-25/32 | 0.030     |
| A-301,A-301D AFTER S/N 7070351, A-301DF,A-451D DIESEL ENGINE | <b>CSL342FS</b> | 4-3/8 | 5.172  | 0.252 | 4.965          | 4.921  | 4.8765 | 10.200  | 0.50      |
| A-301BD,A-451BD,A-451BDT DIESEL ENGINE                       | <b>CSL340FS</b> | 4-3/8 | 5.125  | 0.252 | 4.966          | 4.92   | 4.876  | 10.200  | 0.03      |

## JOHN DEERE

| APPLICATION                                                                                                        | PART NUMBER     | BORE  | FLANGE |       | SLEEVE O.D. AT |        |       | LENGTH | FIRE WALL |
|--------------------------------------------------------------------------------------------------------------------|-----------------|-------|--------|-------|----------------|--------|-------|--------|-----------|
|                                                                                                                    |                 |       | O.D.   | WIDTH | PILOT          | BARREL | SEAL  |        |           |
| 254,381,4270 (BLOCKS MARKED R26160, R32020, R40850). JD404, (BLOCKS MARKED R26070, R33180, R34340, R40890, R40900) | <b>CSL341FS</b> | 4-1/4 | 5.125  | 0.253 | 4.876          | 4.8125 | 4.628 | 9-1/8  | 0.04      |

NOTE: All CSLXXXFS numbers include O Ring Seals



## FRACTION / DECIMAL EQUIVALENT CHART

|        |        |          |
|--------|--------|----------|
|        | 1/64"  | .015625" |
|        | 1/32"  | .03125"  |
|        | 3/64"  | .046875" |
| 1/16"  |        | .0625"   |
|        | 5/64"  | .078125" |
| 3/32"  |        | .09375"  |
|        | 7/64"  | .109375" |
| 1/8"   |        | .125"    |
|        | 9/64"  | .140625" |
| 5/32"  |        | .15625"  |
|        | 11/64" | .171875" |
| 3/16"  |        | .1875"   |
|        | 13/64" | .203125" |
| 7/32"  |        | .21875"  |
|        | 15/64" | .234375" |
| 1/4"   |        | .250"    |
|        | 17/64" | .265625" |
| 9/32"  |        | .28125"  |
|        | 19/64" | .296875" |
| 5/16"  |        | .3125"   |
|        | 21/64" | .328125" |
| 11/32" |        | .34375"  |
|        | 23/64" | .359375" |
| 3/8"   |        | .375"    |
|        | 25/64" | .390625" |
| 13/32" |        | .40625"  |
|        | 27/64" | .421875" |
| 7/16"  |        | .4375"   |
|        | 29/64" | .453125" |
| 15/32" |        | .46875"  |
|        | 31/64" | .484375" |
| 1/2"   |        | .500     |

|        |        |          |
|--------|--------|----------|
|        | 33/64" | .515625" |
|        | 17/32" | .53125"  |
|        | 35/64" | .546875" |
| 9/16"  |        | .5625"   |
|        | 37/64" | .578125" |
| 19/32" |        | .59375"  |
|        | 39/64" | .609375" |
| 5/8"   |        | .625"    |
|        | 41/64" | .640625" |
| 21/32" |        | .65625"  |
|        | 43/64" | .671875" |
| 11/16" |        | .6875"   |
|        | 45/64" | .703125" |
| 23/32" |        | .71875"  |
|        | 47/64" | .734375" |
| 3/4"   |        | .750"    |
|        | 49/64" | .765625" |
| 25/32" |        | .78125"  |
|        | 51/64" | .796875" |
| 13/16" |        | .8125"   |
|        | 53/64" | .828125" |
| 27/32" |        | .84375"  |
|        | 55/64" | .859375" |
| 7/8"   |        | .875"    |
|        | 57/64" | .890625" |
| 29/32" |        | .90625"  |
|        | 59/64" | .921875" |
| 15/16" |        | .9375"   |
|        | 61/64" | .953125" |
| 31/32" |        | .96875"  |
|        | 63/64" | .984375" |
| 1"     |        | 1.00"    |

## METRIC CONVERSION - 1mm = .03937