



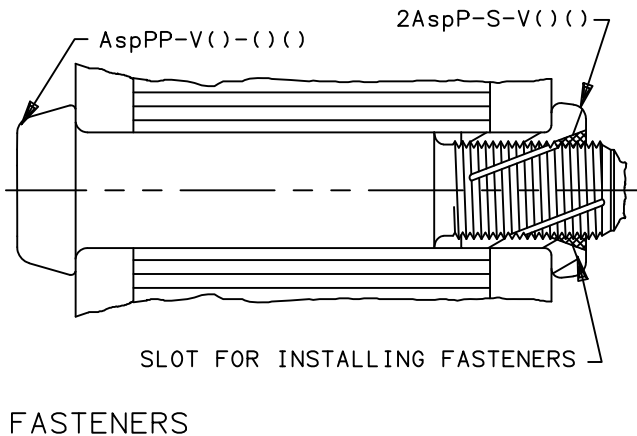
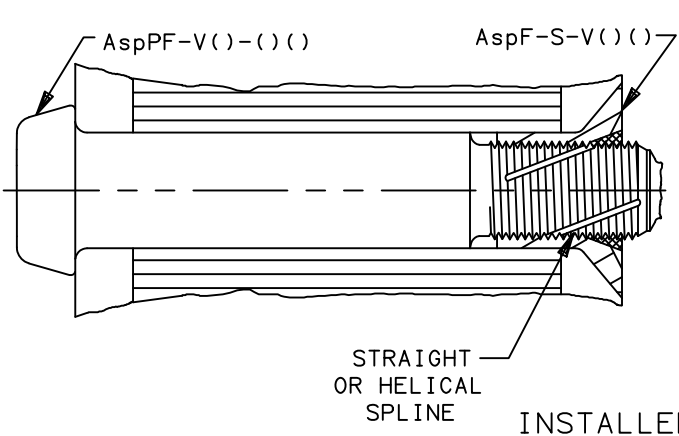
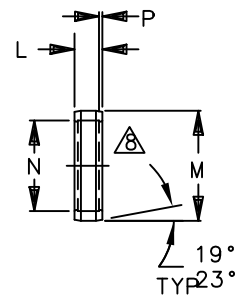
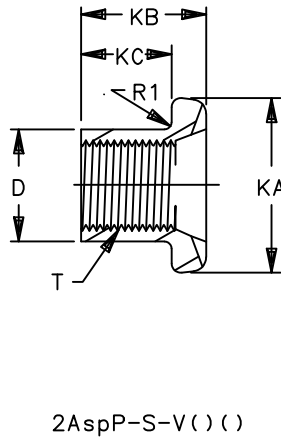
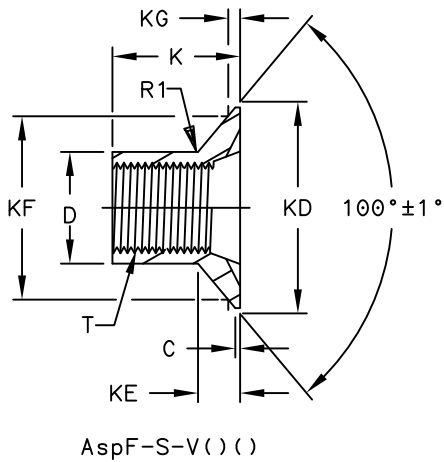
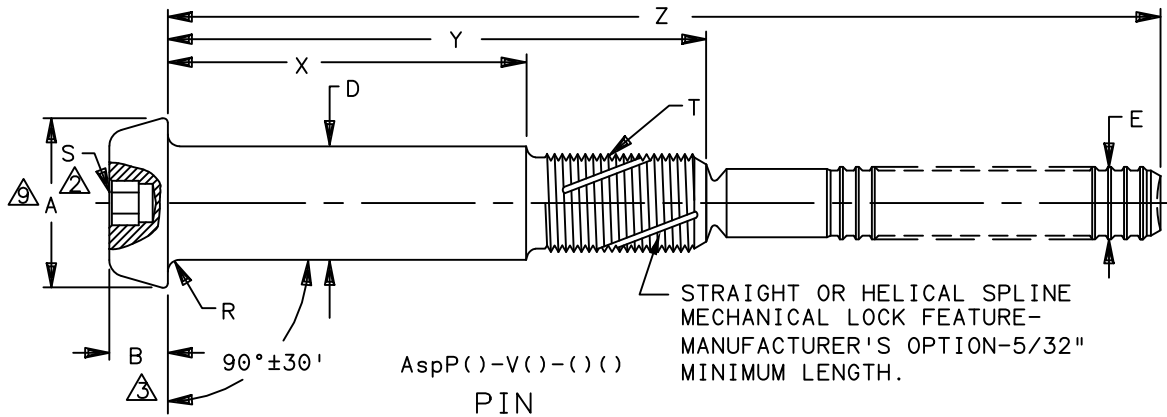
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 Carson Operations  
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ASP®

ENGINEERING  
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DIMENSIONS IN INCHES

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| DRAWN BY   | DH    | FSCM (Cage Code) 17446 - Carson |
| CHECKED BY | MM/HJ |                                 |

A6 REVISED COMPANY LOGO & UPDATED TRADEMARK INFORMATION.  
 CHANGED "KALGARD" TO "KAL-GARD" ON PAGE 2. (REF. ECR2670)

|         |            |
|---------|------------|
| ISSUED  | 11/22/95   |
| REVISED | 04/01/2020 |
| PAGE    | 1 OF 4     |

ASP® FASTENER, ADJUSTABLE PRELOAD-SELF SUSTAINING-POSITIVE MECHANICAL LOCK, PROTRUDING HEAD INSTALLED WITH FLUSH & PROTRUDING SLEEVES, 6AL-4V TITANIUM (95 KSI SHEAR).

|   |
|---|
| AspP()-V()-(-)() PIN<br>AspF-S-V()() &<br>2AspS-V()() SLEEVES<br>Asp-LC-2AC LOCK COLLAR |
| ASP109  |



HOWMET AEROSPACE

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Table with columns for Asp PIN PART NUMBER, NOM SIZE, A DIA, B HEAD HEIGHT, C MAX, D DIA BARE, D DIA COATED, E MAX DIA, SLEEVES (K, KA, KB, KC, KD, KE, KF, KG), LOCK COLLAR (L, M, N, P, R, R1, S), MIN. ULT. TENSILE, T MODIFIED THREAD, MIN SHEAR STRENGTH, HOLE LIMITS.

- MINIMUM ULTIMATE TENSILE STRENGTH, OF INSTALLED FASTENER. (IN POUNDS)
HEX SOCKET.
SQUARENESS BETWEEN BOTTOM OF PROTRUDING HEAD AND "D" DIAMETER TO BE WITHIN 90°±30'.
MAXIMUM THEORETICAL INTERSECTION DIAMETER.
MANUFACTURER'S OPTION TO SUPPLY SOLID OR SPLIT LOCK COLLAR.
CONICAL SURFACE OF HEAD TO BE CONCENTRIC WITH "D" DIAMETER WITHIN 5% OF "D" DIAMETER FIR.
MINIMUM SHEAR STRENGTH OF INSTALLED FASTENER TESTED IN SINGLE SHEAR, WHEN SHEAR PLANE FALLS IN PIN THREADED SECTION ONLY.
.072 FOR MV MATERIAL AND .083 FOR 2AC MATERIAL.

MATERIAL: PIN & SLEEVE - V - 6AL-4V TITANIUM ALLOY PER CHEMISTRY OF AMS4967.
LOCK COLLAR - 2AC - 2219-T6 ALUMINUM ALLOY PER CHEMISTRY OF QQ-A-430.
- MV - COMMERCIALY PURE (CP) TITANIUM PER CHEMISTRY OF ASTM B348.
HEAT TREATMENT: PIN & SLEEVE - MINIMUM SHEAR STRENGTH 95 KSI.
FINISH: PIN & SLEEVE - NO SUFFIX - NONE.
- SUFFIX "AC" - ALUMINUM COATED PER KAL-GARD 2242 ON HEAD AND SHANK ONLY.
LOCK COLLAR - 2AC - CHEMICAL SURFACE TREAT PER SPECIFICATION MIL-C-5541.
- MV - NONE.
LUBRICATION: SLEEVE - CETYL ALCOHOL (CHLORINE FREE) PER MIL-L-87132.
IDENTIFICATION: SLEEVE: HUCK SYMBOL (X) & "V",
PIN: HUCK SYMBOL (X) & "V", SLEEVE TYPE ("F" OR "P") AND GRIP DASH NUMBER.
INSTALLATION: IN ACCORDANCE WITH HUCK BROCHURE HCB-135.

PART NO. EXAMPLE AspP()-V06-06()
FINISH SUFFIX (SEE FINISH CODE).
GRIP LENGTH IN 16TH INCHES.
NOMINAL SHANK DIAMETER IN 32ND INCHES.
MATERIAL DESIGNATOR: 6AL-4V TITANIUM ALLOY.
SLEEVE HEAD STYLE DESIGNATOR:
"F" = 100° FLUSH HEAD SLEEVE.
"P" = PROTRUDING HEAD SLEEVE.
"P" = PROTRUDING HEAD PIN.
DESIGNATES PIN, ADJUSTABLE PRELOAD-SELF SUSTAINING-POSITIVE MECHANICAL LOCK.

DIMENSIONS IN INCHES

Table with 4 columns: A6, REVISIONS (ISSUED, REVISED, PAGE), PART DESCRIPTION (ASP FASTENER, ADJUSTABLE PRELOAD-SELF SUSTAINING-POSITIVE MECHANICAL LOCK...), and PART NUMBER (ASP109).



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 FOR PIN USING PROTRUDING SLEEVE SEE SHEET 4 OF 4.

| GRIP NUMBER TABULATION |                      |       |                  |        |                  |                  |        |                  |                  |        |                  |
|------------------------|----------------------|-------|------------------|--------|------------------|------------------|--------|------------------|------------------|--------|------------------|
| GRIP<br>DASH<br>NO.    | DESIGN GRIP<br>RANGE |       | 06 (13/64) DIA   |        |                  | 08 (17/64) DIA   |        |                  | 10 (21/64) DIA   |        |                  |
|                        | MIN                  | MAX   | X                | Y      | Z                | X                | Y      | Z                | X                | Y      | Z                |
|                        |                      |       | + .005<br>- .010 | ± .010 | + .125<br>- .000 | + .005<br>- .010 | ± .010 | + .125<br>- .000 | + .005<br>- .010 | ± .010 | + .125<br>- .000 |
| 07                     | .376                 | .438  | .188             | .468   | 1.281            | .125             | .477   | 1.438            | —                | —      | —                |
| 08                     | .439                 | .500  | .250             | .530   | 1.344            | .188             | .540   | 1.500            | —                | —      | —                |
| 09                     | .501                 | .562  | .312             | .592   | 1.406            | .250             | .602   | 1.563            | —                | —      | —                |
| 10                     | .563                 | .625  | .375             | .655   | 1.469            | .313             | .665   | 1.625            | —                | —      | —                |
| 11                     | .626                 | .688  | .438             | .718   | 1.531            | .375             | .727   | 1.688            | .313             | .732   | 1.813            |
| 12                     | .689                 | .750  | .500             | .780   | 1.594            | .438             | .790   | 1.750            | .375             | .795   | 1.875            |
| 13                     | .751                 | .812  | .562             | .842   | 1.656            | .500             | .852   | 1.813            | .438             | .857   | 1.938            |
| 14                     | .813                 | .875  | .625             | .905   | 1.719            | .562             | .915   | 1.875            | .500             | .920   | 2.000            |
| 15                     | .876                 | .938  | .688             | .968   | 1.781            | .625             | .977   | 1.938            | .562             | .982   | 2.063            |
| 16                     | .939                 | 1.000 | .750             | 1.030  | 1.844            | .688             | 1.040  | 2.000            | .625             | 1.045  | 2.125            |
| 17                     | 1.001                | 1.062 | .812             | 1.092  | 1.906            | .750             | 1.102  | 2.063            | .688             | 1.107  | 2.188            |
| 18                     | 1.063                | 1.125 | .875             | 1.155  | 1.969            | .812             | 1.165  | 2.125            | .750             | 1.170  | 2.250            |
| 19                     | 1.126                | 1.188 | .938             | 1.218  | 2.031            | .875             | 1.227  | 2.188            | .812             | 1.232  | 2.313            |
| 20                     | 1.189                | 1.250 | 1.000            | 1.280  | 2.094            | .938             | 1.290  | 2.250            | .875             | 1.295  | 2.375            |
| 21                     | 1.251                | 1.312 | 1.062            | 1.342  | 2.156            | 1.000            | 1.352  | 2.313            | .938             | 1.357  | 2.438            |
| 22                     | 1.313                | 1.375 | 1.125            | 1.405  | 2.219            | 1.062            | 1.415  | 2.375            | 1.000            | 1.420  | 2.500            |
| 23                     | 1.376                | 1.438 | 1.188            | 1.468  | 2.281            | 1.125            | 1.477  | 2.438            | 1.062            | 1.482  | 2.563            |
| 24                     | 1.439                | 1.500 | 1.250            | 1.530  | 2.344            | 1.188            | 1.540  | 2.500            | 1.125            | 1.545  | 2.625            |
| 25                     | 1.501                | 1.562 | 1.312            | 1.592  | 2.406            | 1.250            | 1.602  | 2.563            | 1.188            | 1.607  | 2.688            |
| 26                     | 1.563                | 1.625 | 1.375            | 1.655  | 2.469            | 1.312            | 1.665  | 2.625            | 1.250            | 1.670  | 2.750            |
| 27                     | 1.626                | 1.688 | 1.438            | 1.718  | 2.531            | 1.375            | 1.727  | 2.688            | 1.312            | 1.732  | 2.813            |
| 28                     | 1.689                | 1.750 | 1.500            | 1.780  | 2.594            | 1.438            | 1.790  | 2.750            | 1.375            | 1.795  | 2.875            |
| 29                     | 1.751                | 1.812 | 1.562            | 1.842  | 2.656            | 1.500            | 1.852  | 2.813            | 1.438            | 1.857  | 2.938            |
| 30                     | 1.813                | 1.875 | 1.625            | 1.905  | 2.719            | 1.562            | 1.915  | 2.875            | 1.500            | 1.920  | 3.000            |
| 31                     | 1.876                | 1.938 | 1.688            | 1.968  | 2.781            | 1.625            | 1.977  | 2.938            | 1.562            | 1.982  | 3.063            |
| 32                     | 1.939                | 2.000 | 1.750            | 2.030  | 2.844            | 1.688            | 2.040  | 3.000            | 1.625            | 2.045  | 3.125            |
| 33                     | 2.001                | 2.062 | 1.812            | 2.092  | 2.906            | 1.750            | 2.102  | 3.063            | 1.688            | 2.107  | 3.188            |
| 34                     | 2.063                | 2.125 | 1.875            | 2.155  | 2.969            | 1.812            | 2.165  | 3.125            | 1.750            | 2.170  | 3.250            |
| 35                     | 2.126                | 2.188 | 1.938            | 2.218  | 3.031            | 1.875            | 2.227  | 3.188            | 1.812            | 2.232  | 3.313            |
| 36                     | 2.189                | 2.250 | 2.000            | 2.280  | 3.094            | 1.938            | 2.290  | 3.250            | 1.875            | 2.295  | 3.375            |

DIMENSIONS IN INCHES

A6

REVISED COMPANY LOGO & UPDATED TRADEMARK INFORMATION.  
 CHANGED "KALGARD" TO "KAL-GARD" ON PAGE 2. (REF. ECR2670)

|         |            |
|---------|------------|
| ISSUED  | 11/22/95   |
| REVISED | 04/01/2020 |
| PAGE    | 3 OF 4     |

Asp® FASTENER, ADJUSTABLE PRELOAD-SELF  
 SUSTAINING-POSITIVE MECHANICAL LOCK, PROTRUDING  
 HEAD INSTALLED WITH FLUSH & PROTRUDING SLEEVES,  
 6AL-4V TITANIUM (95 KSI SHEAR)

AspP()-V()-()-() PINS  
 AspF-S-V()-()-() &  
 2AspP-S-V()-()-() SLEEVES  
 Asp-LC-2AC &  
 Asp-LC-MV LOCK COLLARS

ASP109



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 FOR PIN USING FLUSH SLEEVE SEE SHEET 3 OF 4.

| GRIP NUMBER TABULATION |                      |       |                  |        |                  |                  |        |                  |                  |        |                  |
|------------------------|----------------------|-------|------------------|--------|------------------|------------------|--------|------------------|------------------|--------|------------------|
| GRIP<br>DASH<br>NO.    | DESIGN GRIP<br>RANGE |       | 06 (13/64) DIA   |        |                  | 08 (17/64) DIA   |        |                  | 10 (21/64) DIA   |        |                  |
|                        | MIN                  | MAX   | X                | Y      | Z                | X                | Y      | Z                | X                | Y      | Z                |
|                        |                      |       | + .005<br>- .010 | ± .010 | + .125<br>- .000 | + .005<br>- .010 | ± .010 | + .125<br>- .000 | + .005<br>- .010 | ± .010 | + .125<br>- .000 |
| 07                     | .376                 | .438  | .156             | .530   | 1.344            | .125             | .572   | 1.533            | —                | —      | —                |
| 08                     | .439                 | .500  | .218             | .592   | 1.406            | .188             | .635   | 1.595            | —                | —      | —                |
| 09                     | .501                 | .562  | .281             | .655   | 1.469            | .250             | .697   | 1.658            | —                | —      | —                |
| 10                     | .563                 | .625  | .343             | .718   | 1.531            | .313             | .760   | 1.720            | —                | —      | —                |
| 11                     | .626                 | .688  | .406             | .780   | 1.594            | .375             | .822   | 1.783            | .313             | .857   | 1.938            |
| 12                     | .689                 | .750  | .468             | .842   | 1.656            | .438             | .885   | 1.845            | .375             | .920   | 2.000            |
| 13                     | .751                 | .812  | .531             | .905   | 1.719            | .500             | .947   | 1.908            | .438             | .982   | 2.063            |
| 14                     | .813                 | .875  | .593             | .968   | 1.781            | .562             | 1.010  | 1.970            | .500             | 1.045  | 2.125            |
| 15                     | .876                 | .938  | .656             | 1.030  | 1.844            | .625             | 1.072  | 2.033            | .562             | 1.107  | 2.188            |
| 16                     | .939                 | 1.000 | .718             | 1.092  | 1.906            | .688             | 1.135  | 2.095            | .625             | 1.170  | 2.250            |
| 17                     | 1.001                | 1.062 | .781             | 1.155  | 1.969            | .750             | 1.197  | 2.158            | .688             | 1.232  | 2.313            |
| 18                     | 1.063                | 1.125 | .843             | 1.218  | 2.031            | .812             | 1.260  | 2.220            | .750             | 1.295  | 2.375            |
| 19                     | 1.126                | 1.188 | .906             | 1.280  | 2.094            | .875             | 1.322  | 2.283            | .812             | 1.357  | 2.438            |
| 20                     | 1.189                | 1.250 | .968             | 1.342  | 2.156            | .938             | 1.385  | 2.345            | .875             | 1.420  | 2.500            |
| 21                     | 1.251                | 1.312 | 1.031            | 1.405  | 2.219            | 1.000            | 1.447  | 2.408            | .938             | 1.482  | 2.563            |
| 22                     | 1.313                | 1.375 | 1.093            | 1.468  | 2.281            | 1.062            | 1.510  | 2.470            | 1.000            | 1.545  | 2.625            |
| 23                     | 1.376                | 1.438 | 1.156            | 1.530  | 2.344            | 1.125            | 1.572  | 2.533            | 1.062            | 1.607  | 2.688            |
| 24                     | 1.439                | 1.500 | 1.218            | 1.592  | 2.406            | 1.188            | 1.635  | 2.595            | 1.125            | 1.670  | 2.750            |
| 25                     | 1.501                | 1.562 | 1.281            | 1.655  | 2.469            | 1.250            | 1.697  | 2.658            | 1.188            | 1.732  | 2.813            |
| 26                     | 1.563                | 1.625 | 1.343            | 1.718  | 2.531            | 1.312            | 1.760  | 2.720            | 1.250            | 1.795  | 2.875            |
| 27                     | 1.626                | 1.688 | 1.406            | 1.780  | 2.594            | 1.375            | 1.822  | 2.783            | 1.312            | 1.857  | 2.938            |
| 28                     | 1.689                | 1.750 | 1.468            | 1.842  | 2.656            | 1.438            | 1.885  | 2.845            | 1.375            | 1.920  | 3.000            |
| 29                     | 1.751                | 1.812 | 1.531            | 1.905  | 2.719            | 1.500            | 1.947  | 2.908            | 1.438            | 1.982  | 3.063            |
| 30                     | 1.813                | 1.875 | 1.593            | 1.968  | 2.781            | 1.562            | 2.010  | 2.970            | 1.500            | 2.045  | 3.125            |
| 31                     | 1.876                | 1.938 | 1.656            | 2.030  | 2.844            | 1.625            | 2.072  | 3.033            | 1.562            | 2.107  | 3.188            |
| 32                     | 1.939                | 2.000 | 1.718            | 2.092  | 2.906            | 1.688            | 2.135  | 3.095            | 1.625            | 2.170  | 3.250            |
| 33                     | 2.001                | 2.062 | 1.781            | 2.155  | 2.969            | 1.750            | 2.197  | 3.158            | 1.688            | 2.232  | 3.313            |
| 34                     | 2.063                | 2.125 | 1.843            | 2.218  | 3.031            | 1.812            | 2.260  | 3.220            | 1.750            | 2.295  | 3.375            |
| 35                     | 2.126                | 2.188 | 1.906            | 2.280  | 3.094            | 1.875            | 2.322  | 3.283            | 1.812            | 2.357  | 3.438            |
| 36                     | 2.189                | 2.250 | 1.968            | 2.342  | 3.156            | 1.938            | 2.385  | 3.345            | 1.875            | 2.420  | 3.500            |

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| REVISED | 04/01/2020 |
| PAGE    | 4 OF 4     |

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 Asp-LC-MV LOCK COLLARS

ASP109