

DESCRIPTION FOR PURCHASE (DFP)  
For  
SMALL ARMS SHOP SET (SASS)

1. Scope. This shop set provides the necessary components for small arms field and sustainment level maintenance. It is intended for use by personnel needing small arms repair capabilities at the field and sustainment levels.

2. APPLICABLE DOCUMENTS

2.1 General. The following documents form a part of this description to the extent specified herein. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2. Government Documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issue of the documents shall be the latest listed in the ASSIST database as of the date of this DFP.

MILITARY STANDARDS

MIL-STD-1916 - Preferred Methods for Acceptance of Product

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents are those cited in the solicitation or contract.

Army Drawings

12901228 - Gage Set, Cannon Bore Erosion

2.3. Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issue of the documents shall be the latest listed in the ASSIST database as of the date of this DFP.

## AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

- ASME B5.1M - Slots, Their Bolts, Nuts and Tongues
- ASME B94.52M - Specifications for Hacksaw Blades
- ASME B107.500 (B107.19) - Pliers: Retaining Ring
- ASME B107.410 - Struck Tools

(ASME standards are available for purchase from ASME International, Three Park Avenue, M/S 10E, New York, NY 10016-5990 or online at [www.asme.org/kb/standards](http://www.asme.org/kb/standards).)

## B11/STD - B11 STANDARDS INC. (FORMERLY AMT)

- B11/STD B11.8 - Drilling, Milling, and Boring Machines

(B11 standards are available from B11 Standards Inc. (Formerly AMT), 7901 Westpark Drive, McLean, VA 22102-4269.)

## UNDERWRITERS LABORATORIES (UL)

- UL 154 - UL Standard for Safety Carbon Dioxide Fire Extinguishers
- UL 711 - UL Standard for Safety Rating and Fire Testing of Fire Extinguishers

(UL standards are available for purchase from Underwriters Laboratories, 2600 N.W. Lake Road, Camas, WA 98607-8542 or online at <http://www.comm-2000.com/default.aspx>.)

2.4. Order of Precedence. In the event of a conflict between the text of this document and the references cited herein (except for associated detail specifications, specifications sheets, or Military Standards), the text of this DFP shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1. Preproduction verification. When specified in the contract, the contractor shall furnish one or more sets for preproduction verification inspection in accordance with Section 4 herein. The sets submitted shall be in accordance with the terms of the contract. Approval of the preproduction verification shall not relieve the contractor of the responsibility to furnish equipment in accordance with the requirements of this DFP. All items supplied under this contract shall be identical to the preproduction verification sample; including packaging requirements stated in the contract or delivery order.

3.2 Materials. Unless otherwise specified herein, the set and its various items shall be made of any suitable material that will meet the performance requirements set forth in this description. Other materials may be offered so long as it can be demonstrated that they meet the

same performance requirements. Detailed requirements are given for each item individually in the paragraphs below, where special requirements are warranted.

3.2.1. Construction of the set. The set shall be new and constructed of parts and materials that are without defects.

3.2.2. Workmanship. The quality of workmanship imparted to the tool set shall equal or exceed that typically provided to domestically manufactured commercial products of this type. The tools presented for acceptance shall have been manufactured with skill and care; shall be uniform, neat, and clean and shall be free from irregularities and anomalies that degrade form, fit, function, and performance or appearance. When practical all the tools shall be marked with the manufacturer's name or identifying symbol and the state or country of manufacturer in a manner that will insure the markings remain clearly legible throughout the life of the item.

3.2.3 Industrial quality tools. All components supplied with this set shall be industrial quality. For the purposes of this procurement, the term "industrial quality tools" versus household-use tools or general purpose tools are defined as tools commercially marketed and manufactured for constant, rigorous, industrial or professional environment use. The items offered shall have either achieved industrial market acceptance (as defined in paragraph 3.2.4) or have been satisfactorily supplied to the Government under current or recent contracts for the same or similar requirements. Industrial quality tools are used primarily by skilled professionals and technicians in such areas as machine shops, automotive maintenance and repair facilities, aircraft maintenance and repair facilities, industrial automotive assembly plants, fleet maintenance facilities, and airline service facilities. The tools will be used for specialized applications in an environment of virtual constant use, (i.e. around-the-clock 8 hour shifts), with applications requiring high torque, low slippage, and strict tolerances.

3.2.4 Market acceptance. Market acceptance is demonstrated by the component having a higher percentage of sales to industrial/professional customers than to retail or government customers. Advertising or marketing literature that indicates "professional grade" or "industrial quality", or merely stating that an item is "professional grade" or "industrial quality" is insufficient to establish industrial quality tools since these are terms for which there is no generally accepted definition. A claim that an item is manufactured to an industry consensus standard is also insufficient to establish industrial quality tools. The contracting officer may require offerors to provide evidence of market acceptance in the professional or industrial market. Evidence of acceptance by industrial/professional customers includes sales to fleet operators, contractors, industrial and professional users, and sales to distributors who sell exclusively to the professional or industrial market.

3.2.5. Commercial-Off-The-Shelf ( COTS) Literature. The contractor shall insert any COTS literature in the set and package it to prevent damage from moisture. This COTS literature shall be placed with the literature in paragraph 3.3. COTS literature includes, but is not limited to, manuals, instruction sheets, and parts lists.

3.2.6. Warranty. All components shall be supplied with the same or better warranties as specified in Table 1 below in paragraph 3.5. The offeror shall state the length and terms of the warranties in response to the solicitation.

3.2.6.1. Warranty Placard. The placard shown below shall be attached to the inside of the cabinet door described in paragraph 3.4.1 below and located so that it can be read and is protected from damage by moisture and abrasion.



3.2.7. Identification Data Plate Information. A second placard shall also be attached inside the cabinet described in paragraph 3.4.1 below. The placard shall be attached to the door and located so that it can be read, and is protected from damage by moisture and abrasion. The placard shall minimally contain:

Nomenclature:	Small Arms Shop Set
Part Number:	(To be assigned after award)
Net Weight:	(To be assigned after award)
Cube:	(To be assigned after award)
Contract Number:	(To be assigned after award)
CAGE Code:	(To be assigned after award)
Date Manufactured:	(To be assigned after award)

3.3. Inventory List. The components identified in paragraph number 3.4 shall be supplied in the quantities as stated in Table 1. Each item is described separately in the paragraph indicated in the first column on the left side of the table. All literature and lists shall be placed in an abrasion and water resistant container and placed in a drawer of the cabinet in paragraph 3.4.1 and conspicuously marked indicating the contents.

3.4. The tool load. Unless otherwise specified, all wrenches, socket wrenches, adapters, and sockets shall have chromium plating. All other component items shall have a corrosion protective finish or be made of corrosion resistant material unless otherwise specified. The tools identified under this paragraph number shall be supplied in the quantities as stated in Table 1. Each

item is described separately in the paragraph indicated in the first column on the left side of the table.

3.4.1. Storage Cabinet. The components indicated by an X in the Cabinet column of Table 1 shall be stored in one or more storage cabinets. The storage cabinets shall have full width, full-extension drawers with contoured storage locations for the components. To allow mounting in a 2-1/2 ton cargo truck, the cabinet shall be no taller than 48 inches, no deeper than 25 inches including handles, and no wider than 45 inches. Each drawer shall be capable of holding no less than 400 pounds and shall have lock-in/lock-out devices or other restraints to secure them open or closed. The cabinet shall be designed so that it can be fastened to the floor, the cargo deck of a tactical truck or semi-trailer, or attached to a wall to prevent movement or toppling over when drawers are fully loaded and extended. The mounting features shall be readily accessible from the front of the cabinet; temporary removal of drawers and shelves to facilitate mounting is permissible. The cabinet shall be able to be moved by fork truck and shall be capable of being mounted and transported in a military vehicle over all road conditions including off-road. The cabinet color shall be a dark subdued color such as olive drab, black, dark gray, navy blue, etc. The surface treatment shall be an enamel or similar treatment. The cabinet shall be able to be secured with one padlock. Brand Name or Equal to: Champion Built, P/N WBL42-7.

3.4.1.1. Drawers. The components indicated in Table 1 shall be assembled into drawer organizer liners that will allow them to be placed as an assembly into the cabinet drawers. The tool organizing liners shall fill the drawers from side to side and front to back and shall be contoured to hold each tool in an individual pocket or retention feature. The tool organizing liner shall contain the part number and CAGE code for each tool. A separate data tag (data plate) shall be added if the part number and CAGE code in the liner cutout is too small to read legibly. The part number and CAGE code shall be durable and resistant to wear and removal. The tool organizing liner shall retain tools in position to provide for rapid inventory of the tool load, and to maintain the position of tools under rough handling and shipping conditions. If foam is used, it shall be closed cell of no less than 4 pound density. If foam is used it shall be closed-cell and shall have a water absorption rate of no greater than 0.02 pounds/square foot over the cut surfaces when tested in accordance with ASTM D3575. The organizing method shall provide contrasting color underneath the tools to aid in rapid inventory. The materials used in the tool organizing method, shall be resistant to water, refrigerants, automotive oils, greases, lubricants, fuels including gasoline, diesel fuel, JP-8 and JP-4, acids, bases, coolants, alcohols and cleaning agents. Each contoured retention feature shall allow easy removal of the tool and shall include as necessary pick holes, cut out or recessed areas or protrusion of tools above the tool organizing method. Each retention feature shall be smooth and free from rough edges. Each contoured retention feature shall securely hold hand tools in place so that when the cabinet is moved over rough terrain the tools will be retained in the drawer. Each contoured retention feature shall allow easy removal of the tool and shall include as necessary pick holes, cut out or recessed areas or protrusion of tools above the tool organizing liner. Each retention feature shall be smooth and free from rough edges. The organizing liners shall withstand temperatures of -25°F or colder to 140°F or warmer. Tools with similar purpose shall be stored together as much as practical. Drawers shall be labeled with the contents.

3.4.2. Repair Parts Storage Cabinet. The repair parts storage cabinet shall be similar in dimensions to the cabinet of paragraph 3.4.1. The cabinet shall have full width full extension

drawers of substantially equal depth. Each drawer shall have a capacity of no less than 400 pounds. Each drawer shall be furnished with dividers to divide the drawers into at least 16 substantially equal compartments. The cabinet shall be painted olive drab or some other subdued color such as black, brown, dark green or navy blue. The removable drawers shall contain stops to prevent unintentional removal. All drawers shall be able to be secured with one padlock. Brand Name or Equal to: Champion Built, P/N WBL42-5.

3.4.3. Work Table. The work table shall be non-portable, contain drawers and shelves, and a hardwood top on a metal cabinet. The work table shall have a nominal work surface length of 72 inches, a nominal height of height of 35.5 inches including the top, and a nominal depth of 25 inches. The table shall have two pedestals with an open area between the pedestals. The pedestals shall be equal width. One pedestal shall have no fewer than five full width full extension drawers. The bottom three drawers shall be of substantially equal depth. The top two drawers shall also be of equal depth. The drawers shall be removable and shall contain stops to prevent unintentional removal. Each drawer shall be designed to accept, and be equipped with, adjustable metal dividers to create approximately two-inch bins. The other pedestal shall contain no less than 3 adjustable shelves and a bottom shelf. There shall be a door that can be closed and locked over the shelves. Each pedestal shall be capable of being locked with a single padlock. Each drawer and shelf shall be capable of supporting no less than 400 pounds. The worktable – other than the top – shall be painted a dark subdued color such as olive drab, black, dark gray, navy blue, etc. Brand Name or Equal to: Champion Built, P/N TBL-5-1.

3.4.3.1. Top. The tabletop shall be made from vertically laminated strips of hard wood such as maple laid edge grain up, approximately 1-3/4 inches thick and 25 inches wide with a clear lacquer, enamel, or polyurethane finish on all sides. There shall be no knots less than 1/2 inch from the outside edge of the front and back face strips. The strips shall not exceed 3 inches in width and be free from decay, splits warp, decayed-thru knots and grain slope exceeding 1 inch in 10 inches. Scattered sound knots less than 1 inch in length and more than 12 inches apart will be permitted on the top surface of the strips. The working surface of the tabletop shall be flat and uniform in a true plane to within 1/16 inch between any two points that are 24 inches apart. The tabletop shall be securely bolted to the metal frame. The tabletop shall also overhang the front of the work table to allow the attachment of clamp on equipment and permit the use of the surface while seated on the stool in paragraph 3.4.6. The top shall not fracture if a load of 100 pounds is set on the edge, or the vise of paragraph 3.4.9 or the bench grinder of 3.4.7 is mounted and used.

3.4.4. Folding Table. The table shall be a folding table nominally 72 inches long by 30 inches wide by 30 inches high with a metal frame and an aluminum or durable plastic top. All hardware shall be treated with a corrosion inhibitor and/or painted with corrosion inhibiting paint. All metal parts shall be color coordinated with the top, which shall be a subdued color like a walnut, brown or black. The edges of the table shall be protected with a suitable edging/molding, either black in color or the same/or similar color as the top. The legs shall be fabricated of metal tubing with one set of legs located at each end of the table and the bottom of the legs shall have smooth caps, plugs or glides of steel. The legs shall fold under the table and each set of legs shall have steel braces of the manual folding type with a positive locking device when extended. The braces, legs and mounting plates shall be attached to the tabletop. The table shall be designed to support a load up to 500 pounds at the center of the table without causing permanent deformation

or cracking. Brand Name or Equal to: Southern Aluminum Manufacturing, P/N A306WL (walnut).

3.4.5. Work Table. The worktable shall be nominally 60 inches long by 25 inches wide by 35.5 inches high with two open shelves. All hardware on the table shall be painted or coated to resist corrosion. The color shall be olive drab or similar subdued color such as brown, navy, black, etc. Brand Name or Equal to: Champion Built, P/N WEB-SASS.

3.4.5.1. Top. The tabletop shall be made from vertically laminated strips of hard wood such as maple, laid edge grain up, 1-3/4 inches thick and 30 inches wide with a clear lacquer, enamel, or polyurethane finish on all sides. There shall be no knots less than 1/2 inch from the outside edge of front and back face strips. The strips shall not exceed 3 inches in width and be free from decay, splits warp, decayed-thru knots and grain slope exceeding 1 inch in 10 inches. Scattered sound knots less than 1 inch in length and more than 12 inches apart will be permitted on the top surface of the strips. The working surface of the tabletop shall be flat and uniform in a true plane to within 1/16 inch between any two points that are 24 inches apart. The tabletop shall be securely bolted to the metal frame. The top shall be capable of supporting 1200 pounds distributed evenly over the top of the table. The tabletop shall allow the attachment of clamp on equipment and permit the use of the surface while seated on the stool in paragraph 3.4.5. The top shall not fracture if a load of 100 pounds is set on the edge, or the vise of paragraph 3.4.9 or the bench grinder of 3.4.7 is mounted and used.

3.4.5.2. Legs. The table legs and supports shall be of sufficient strength to enable the worktable to support 1200 pounds on the top and 600 pounds on each shelf. They shall have sufficient rigidity and floor bearing area to withstand handling of the worktable without damage to any components by lifting, pushing, or sliding of the table when the table is unloaded. The legs shall be capable of being secured to the floor.

3.4.5.3. Shelf. There shall be two shelves on the table nominally running the full length and width of the table leg area. A middle support leg is allowed. The composition and construction of the shelves is up to the manufacturer, but they shall be capable of supporting no less than 600 pounds distributed evenly over the surface of each shelf. The bottom shelf shall be about 6 inches off the floor. The clearance between the bottom shelf and the second/middle shelf shall be approximately 13 inches.

3.4.5.4. Back. There shall be a metal back sheet over the back of the work table fastened to the legs and shelves.

3.4.6. Shop Stool. The stool shall be an industrial or workbench shop stool with a revolving seat that is adjustable in height from 26 inches or lower to 31 inches or higher. The seat shall be plastic, metal or wood and have a nominal diameter of 13 inches. The base shall have a metal footrest and floor glides. The color shall be gray or some other subdued color (black, olive drab, navy blue, etc.). The finish on the metal frame shall be enamel or similar durable rust inhibiting finish. Brand Name or Equal to: Safco, P/N 5117.

3.4.7. Bench Grinder. The grinder shall be bench mounted and have an electric motor that drives two 7 inch wheels. The grinder shall operate from 120 volt, 60 hertz, single-phase AC power. The bench grinder motor shall have a rating of no less than 1/2 horsepower and 3450 RPM. The grinder shall be furnished with one straight 36 grit and one straight 100 to 120 grit, 1 inch thick (maximum) abrasive wheel installed on the bench grinder. Brand Name or Equal to: Baldor, P/N 712 (remove B74 grinding wheel and supply with C121 grinding wheel).

3.4.8. Grinder Brush. The rotary wheel wire brush shall be rated for 6,000 RPM, be nominally 6 inches in diameter, crimped wire with a nominal face width of 1-1/4 inches and a trim length of 1-1/8 inches. The wheel shall be compatible with and able to be mounted to the bench grinder of paragraph 3.4.7. Brand Name or Equal to: Weiler Brush, P/N 03060 (brush) and 03810 (arbor adapter).

3.4.9. Machinist Bench Vise. The machinist's bench vise shall have a swivel base, a nominal 6 inch jaw opening and nominally 4 inch wide jaw faces. Jaw faces shall be replaceable. There shall be no less than 2 slots for mounting bolts. The swivel base shall rotate not less than 360 degrees in a plane parallel to the mounting surface. Brand Name or Equal to: Yost, P/N 204.

3.4.10. Vise Jaw Caps. The caps shall be for use in the 4 inch machinist's vise above to protect hardware finish. The caps shall be copper, brass, or aluminum. The vise jaw facing shall be no less than 1 inch. Brand Name or Equal to: Yost, P/N SA-340.

3.4.11. Drill Press Vise. The machinist's drill press vise shall have a nominal jaw width of 6 inches, and a nominal jaw depth of 2 inches with a nominal 6 inch opening. The base of the body for the vise shall contain no fewer than two bolt slots for mounting purposes. In general the vise consists of a body with a fixed jaw, a sliding jaw and a vise screw with a handle. The vise body, fixed jaw and sliding jaw shall be of cast iron or steel. Brand Name or Equal to: Yost, P/N 6D.

3.4.12. Upright Drilling Machine. The drilling machine shall be an upright, bench mounted, single spindle drilling machine with a swing of no less than 15 inches. The drilling machine shall support a worktable, round column, and drill head assembly. The base shall be T-slotted and rectangular. The number and size of the T-slots shall conform to the requirements of ASME B5.1M. The base shall have a means for leveling and anchoring the machine to a bench. The worktable shall rotate 360 degrees about the center of the column and adjust vertically along the column to any position between the drill head assembly and the base. The tilt adjustment for the worktable surface shall be 45 degrees both left and right. A locking device shall be provided to secure the worktable after adjustment. The worktable shall have T-slots that conform to the requirements of ASME B5.1M. The drill head assembly shall include a power transmission system and a quill and spindle. The drill head assembly shall rotate 360 degrees about the center of the column and be vertically adjustable along the column. A locking device shall be provided to secure the drill head assembly after adjustment. The drill feed shall be accomplished by means of a hand feed spoke lever and a rack and pinion gear arrangement. The spindle shall have a Morse taper. The spindle shall have no less than 4 speeds between 400 and 3040 RPM. The machine shall have a depth stop equipped with a positive locking device. The depth stop shall have an indication scale marked in increments of not greater than 1/16 inch. The nominal spindle travel shall be 4 inches. The drilling machine shall operate from 115/230 volt single phase, 60

hertz power. A drill chuck shall be provided with a ½ inch diameter drill capacity and taper shank that corresponds to the spindle taper. Mechanisms requiring periodic manual lubrication shall be readily accessible for servicing and the drive motor shall have sealed and permanently lubricated bearings and be energy efficient. Controls shall be ergonomically located for ease of operation. Minimum controls shall be an on/off switch. An emergency stop is required. If the off switch serves as an emergency stop it shall completely shut down the drilling machine similar to an emergency stop, be located where it can be easily reached while operating the drill press, and meet all the industry standard or OSHA requirements for an emergency stop switch. All equipment and accessories shall be in compliance with OSHA standards. If a conflict arises the OSHA standard shall apply. Brand Name or Equal to: Palmgren, P/N 80155.

3.4.13. Power Cable Assembly. The cable shall be a three-conductor, #12 AWG extension cord for 120 VAC with insulation rated for 300 volts. The cable jacket shall be resistant to oil and abrasion, and the cable shall remain flexible at –25 degrees F. The cable assembly shall be no less than 50 feet long with a NEMA 5-15P male plug on one end and a molded block with no fewer than three NEMA 5-15R receptacles on the other end. Terminals shall be molded on the cable. A 3 wire to 2 wire adapter shall be provided with the cable. Brand Name or Equal to: Coleman Cable Inc., P/N 03488 (extension cord) and 09901 (3 wire to 2 wire adapter).

3.4.14. Extension Light. The light shall be an LED hand lamp with light output of no less than 750 lumens. The light shall be no less than 25 feet long, have a NEMA 5-15P plug and be for use in 115 VAC service. The lamp shall be impact-resistant and have a swivel hook for hanging and an insulated handle. Brand Name or Equal to: Lumapro (Grainger), P/N 2YKN3.

3.4.15. Flashlight. The flashlight shall be an aluminum body LED flashlight providing no less than 90 lumens for no less than 2 hours using two standard AA alkaline batteries. The batteries shall be furnished. Brand Name or Equal to: Pelican, P/N 2360-010-110 (with batteries).

3.4.16. Grounding Rod. The ground rod kit shall include no less than three sectional ground rods each no less than 3 feet long, 5/8 inches in diameter, and constructed of copper clad steel. A separable ground clamp that fits over the grounding rod and is sized for 7 AWG stranded wire connector shall be furnished. A 6 foot long #7 AWG flexible bare stranded ground wire shall also be provided. The contact resistance between the terminal connection and the ground rod shall not exceed 0.005 ohms. Brand Name or Equal to: Erico, P/N 635837.

3.4.17. Grounding Rod Slide Hammer. The slide hammer shall be for driving segmented or solid grounding rods. The slide hammer shall drive the ground rod described above. Brand Name or Equal to: Continental Tool & Mfg, P/N 5120-01-013-1676.

3.4.18. Pry Bar. The bar shall be a rolling head pry bar with nominal overall length between 14 and 18 inches and a nominal handle diameter of ½ inches. Brand Name or Equal to: Snap-On, P/N 1650.

3.4.19. Wrecking Bar. The wrecking bar shall have a nominal overall length between 15 and 21 inches and be forged of nominal ¾ inch hex stock. Brand Name or Equal to: Vaughan & Bushnell, P/N RB18.

3.4.20. Multipurpose Nail Puller Bar. The bar shall be a flat pry bar with nail slots and shall have a nominal overall length of 12 inches. Brand Name or Equal to: Vaughan & Bushnell, P/N B215S.

3.4.21. Hand Hacksaw Frame. The hacksaw frame shall be of steel or similar material, and have a hard rubber or plastic pistol/open grip and accept 12 inch long blades. Clearance from teeth of blade to the nearest inside edge shall be no less than 3 inches. Brand Name or Equal to: Klein Tool, P/N 701-S.

3.4.22. Hacksaw Blade. Blade shall be nominally 12 inches long, have 32 teeth per inch, and 0.025 +/- 0.003 inches thick in accordance with ASME B94.52M. Material shall be flexible high-speed steel. Brand Name or Equal to: Disston Company, P/N 1232UL.

3.4.23. Small Parts Box. Material shall be cellulose acetate butyrate or similar plastic material. The nominal inside dimensions of the box shall be 3-15/16 inches wide by 6-7/8 inches long by 1-1/16 inches deep with a hinged cover. Interior shall be divided into 16 compartments inside the box nominally dimensioned 1-3/8 by 1-3/16 and one compartment 4-1/16 by 1-3/8. Any color is acceptable. Brand Name or Equal to: Flambeau, P/N 5126CL.

3.4.24. Drain Pan. Drain pan shall be high density polyethylene or corrosion resistant metal designed to collect engine fluids, including boiling radiator liquid and hot motor oil. The capacity shall be no less than 15 quarts. The drain pan shall maintain a stable form, holding its shape when containing either hot or cold liquids and be resistant to degradation caused by moisture, water, solvents, and other liquids normally used in truck and automobile repair shops. Brand Name or Equal to: Lisle Corp, P/N 17942.

3.4.25. Funnel. Funnel shall be a one-quart capacity galvanized funnel with a flexible spout and a removable strainer. The nominal spout length shall be 14 inches. The strainer shall have a mesh of 70-100 per linear inch. Brand Name or Equal to: S&K Products, P/N 495.

3.4.26. C-clamp. The C-clamp shall have 2-1/4 inch throat depth and a 3-3/4 inch minimum jaw opening with the screw fully retracted and an opening of zero when closed. The clamp shall be certified to a proof load of 10,000 lbs. The screw shall have a swivel pad and a sliding cross pin handle. Brand Name or Equal to: Wilton, P/N 14142.

3.4.27. Ball-Peen Machinist's Hammer. The hammer shall be a 20 ounce machinist's ball-peen hammer. The handle shall be fiberglass. Brand Name or Equal to: Nupla, P/N 21020.

3.4.28. Ball-Peen Machinist's Hammer. The hammer shall be a 32 ounce machinist's ball-peen hammer. The handle shall be fiberglass. Brand Name or Equal to: Snap-On, P/N BPN32B.

3.4.29. Soft Face Hammer, 42 ounces. The hammer shall be a 42 ounce soft face urethane coated dead-blow hammer. Brand Name or Equal to: Stanley Proto, P/N 57-533.

3.4.30. Soft Face Hammer, 21 ounces. The hammer shall be a 21 ounce soft face urethane coated dead-blow hammer. Brand Name or Equal to: Stanley Proto, P/N 57-532.

3.4.31. Cold Chisel. The cold chisel shall have a ¼ inch cut and a nominal 4 inch overall length. Brand Name or Equal to: Snap-On, P/N PPC808A.

3.4.32. Cold Chisel. The cold chisel shall have a ½ inch cut and a nominal 5-¾ inch overall length. Brand Name or Equal to: PPC816B.

3.4.33. Hand File, Flat. The file shall be a nominal 10 inch long American pattern, second cut flat file. Brand Name or Equal to: ICS Cutting Tools, P/N F-H-10SC.

3.4.34. Hand File, Half Round. The file shall be a nominal 10 inch long American pattern second cut half-round file. Brand Name or Equal to: ICS Cutting Tools, P/N F-HR-10SC.

3.4.35. Hand File, Mill. The file shall be a nominal 10 inch long American pattern smooth cut mill file. Brand Name or Equal to: ICS Cutting Tools, P/N F-M-10SM.

3.4.36. Hand File, 3-Square. The file shall be a nominal 8 inch long American pattern 3-square smooth cut file. Brand Name or Equal to: ICS Cutting Tools, P/N F-TSQ-08SM.

3.4.37. Hand File, Mill. The file shall be a nominal 10 inch long American pattern bastard cut mill file. Brand Name or Equal to: ICS Cutting Tools, P/N F-M-10B.

3.4.38. File Handle. The file handle shall have adjustable steel jaws to use with all the files listed in this document. The handle shall be suitable for use in dusty, oily and wet areas. Brand Name or Equal to: General Tool, P/N 890.

3.4.39. Paint Brush. The brush shall be a 3 inch medium grade paintbrush with unbleached and undyed natural hog bristle. The bristle shall be treated so it will not twist or curl, and be free from reconditioned bristle or adulterants. The bristle shall be free from added color or dyes. The ferrule shall be metal that is either corrosion resistant or made corrosion resistant by electro-plating. The handle shall be a finished close-grained hardwood or a synthetic material, and the handle, ferrule and setting compound shall be securely fastened together. Brand Name or Equal to: Torrington Brush, P/N 1025.

3.4.40. Acid Brush. The brush shall be a hog bristle and/or horsehair brush, with a minimum brush width of 3/8 inch and length of 3/4 inch. The overall length shall be no less than 5-¾ inches. The handle shall be flattened or round tubular metal, approximately ¼ inch diameter with a corrosion resistant finish. Brand Name or Equal to: Mack Brush, P/N MAK-7-1.

3.4.41. Bench Dusting Brush. The bench dusting brush shall be for general use and the brush portion shall be of horsetail hair. The shape of the brush is straight slope tip, round tapered handle, nominal overall length 14 inches, with 100% horsehair brush material. The trim length shall be nominally 2-1/2 inches long with a nominal 9 inches of the brush covered with bristles.

Handle shall be close-grained hardwood or plastic. Brand Name or Equal to: Weiler Brush, P/N 44351.

3.4.42. File Cleaner Brush. The brush shall consist of a handle of a straight close grained beach, birch, or maple wood or other suitable material with a fine ¼ inch trim steel wire card on one side, and a stiff bristle fiber brush on the other side. Brush shall be approximately 9 inches overall length, bristle area shall be approximately 4.5 inches long by 1-1/2 inches wide and bristles a nominal 5/8 inch long. Brand Name or Equal to: Apex (Nicholson), P/N 21467.

3.4.43. Metal Stamp Die Set. The characters shall be 1/8 inch high. Characters shall include from 0 to 8 (9 pieces). The dies shall be supplied in a reusable case. Brand Name or Equal to: CH Hanson, P/N 21360.

3.4.44. Metal Stamp Die Set. The stamp set shall be a set of dies for hand-stamping characters into metal and shall contain heavy-duty alphabetic metal stamps with a gothic character design. The characters shall be 3/8 inch high. The characters shall include upper case letters from A to Z with the ampersand symbol (&) and a period (28 pieces). The dies shall be supplied in a reusable case with a stand for the letters. Brand Name or Equal to: CH Hanson, P/N 21151 and 21151PD.

3.4.45. Metal Stamp Die Set. The set shall be a set of heavy-duty alphabetic and numerical metal dies for hand-stamping gothic characters into metal. The set shall contain 1/8 inch tall upper case letters from A to Z, the ampersand symbol (&), and a period (.) (28 pieces). The dies shall be supplied in a reusable case with a stand for the letters. Brand Name or Equal to: CH Hanson, P/N 20851 and 20851PD.

3.4.46. Metal Stamp Die Set. The set shall be a set of heavy-duty alphabetic and numerical metal dies for hand-stamping gothic characters into metal. The set shall contain 3/16 inch tall upper case letters from A to Z, the ampersand symbol (&), a period (.), and numeric characters from 0 to 8 (36 pieces). The dies shall be supplied in a reusable case with a stand for the letters and numbers. Brand Name or Equal to: CH Hanson, P/N 21627 and 21627PD.

3.4.47. Metal Stamp Die Set. The stamp set shall be a set of dies for hand-stamping numeric characters into metal and shall contain heavy-duty numeric metal stamps with a gothic character design. The set shall contain 1/4 inch tall numbers from 0 to 8 (9 pieces). The dies shall be supplied in a reusable case with a stand for the numbers. Brand Name or Equal to: CH Hanson, P/N 21440.

3.4.48. Metal Stamp Die Set. The stamp set shall be a set of dies for hand-stamping numeric characters into metal and shall contain heavy-duty numeric metal stamps with a gothic character design. The set shall contain 3/8 inch tall numbers from 0 to 8 (9 pieces). The dies shall be supplied in a reusable case with a stand for the numbers. Brand Name or Equal to: CH Hanson, P/N 21480.

3.4.49. Electric Drill Driver. The drill shall be a 120 Volt 3/8 inch variable speed reversible pistol grip drill with keyless chuck and carrying case. The drill shall be capable of

no-load speeds of 0 to 2500 RPM. The cord length shall be no less than 8 feet. The pistol grip trigger shall have a lock-on button. Brand Name or Equal to: Makita, P/N 6408K.

3.4.50. Cordless Drill Driver. The drill shall be a 24 or 36 volt cordless drill/driver with a keyless chuck of ½ inch capacity. The drill/driver shall be furnished with a battery charger that will charge the battery in 30 minutes, two batteries, a side handle, and a carrying case. Brand Name or Equal to: Bosch, P/N 38636-01.

3.4.51. Drill Bit Set. The drill set shall contain 29 straight shank cobalt steel jobber length drill bits with 135 degree split points in fractional sizes starting at 1/16 inch and increasing by 1/64 inch increments up to ½ inch. The drills shall be furnished in a metal indexed case. Brand Name or Equal to: Rocky Mountain Twist, P/N 95090844.

3.4.52. Drill Bit Set. The drill bit set shall contain 60 straight shank cobalt jobber length drill bits in wire gage sizes 1 through 60 inclusive, housed in a metal indexed case. The drills shall be made of cobalt steel. The drills shall have straight round shanks and 135 degree split points. Brand Name or Equal to: Rocky Mountain Twist, P/N 95090854.

3.4.53. Drill Bit Set. The drill bit set shall contain straight round shank cobalt steel jobber length drill bits in sizes from 1mm to 13mm in 0.5mm increments housed in a metal indexed case. The drills shall have 135 degree split points. Brand Name or Equal to: McMaster Carr, P/N 27945A27.

3.4.54. Drill Bit Sharpener. The drill bit sharpener shall be portable and capable of sharpening 135 degree high-speed steel, cobalt, carbide, TiN and masonry drill bits with diameters of 3/32 in. to ½ in. and 2.5mm to 13mm. The drill sharpener shall include a carrying case. The sharpener shall operate from 110 Volts single phase power. Brand Name or Equal to: Drill Doctor, DD500X.

3.4.55. Twist Drill and Drill Rod Gage. The gauge shall be for gauging number 1 to number 60 letter size drills. The gage number and decimal equivalents of the hole sizes shall be stamped on the front. Brand Name or Equal to: LS Starrett, P/N 50676.

3.4.56. Twist Drill and Drill Rod Gage. The gauge shall be for gauging 1/16 to ½ inch drills in 1/64 inch increments. The gage number and decimal equivalents of the hole sizes shall be stamped on the front. Brand Name or Equal to: LS Starrett, P/N 50677.

3.4.57. Extractor Set. The extractor set shall be for removing screws ¼ to 1 inch in diameter and pipe in sizes 1/8 to 1 inch. The extractor set shall contain straight flute extractors with a sliding turn nut for sizes 1 through 5, straight flute extractors size 6 through 8 may be without the sliding turn nut, matching drills, drill guides and bushings for the extractors. A drill and drill guide shall be provided for each extractor size. The set shall be packaged in a case which contains the items and protects them from damage. Brand Name or Equal to: Snap-On, P/N E1025.

3.4.58. Tap, 1/8-27 NPT. The tap shall be for hand tapping tapered pipe thread 1/8-27 NPT. Brand Name or Equal to: Morse Cutting Tools, P/N 36142.

3.4.59. Tap, 1/4-18 NPT. The tap shall be for hand tapping tapered pipe thread 1/4-18 NPT. Brand Name or Equal to: Morse Cutting Tools, P/N 36124.

3.4.60. Tap, M2X0.4. The tap shall be a bottoming thread cutting tap for M2X0.4 (2.0 mm diameter by 0.40 mm pitch) right hand threads. Brand Name or Equal to: Morse Cutting Tools, P/N 38118.

3.4.61. Tap, M4X0.7. The tap shall be a bottoming thread cutting tap for M4X0.7 (4.0 mm diameter by 0.7mm pitch) right hand threads. Brand Name or Equal to: Morse Cutting Tools, P/N 38104.

3.4.62. Tap, M6X1. The tap shall be a bottoming thread cutting tap for M6X1 (6.0 mm diameter by 1.0 mm pitch) right hand threads. Brand Name or Equal to: Morse Cutting Tools, P/N 38107.

3.4.63. Tap, M5X0.8. The tap shall be a bottoming thread cutting tap for M5X0.8 (5.0 mm diameter by 0.8 mm pitch) right hand threads. Brand Name or Equal to: Morse Cutting Tools, P/N 38106.

3.4.64. Tap, M2.5X0.45. The tap shall be a bottoming thread cutting tap for M2.5X0.45 (2.5 mm diameter by 0.45 mm pitch) right hand threads. Brand Name or Equal to: Morse Cutting Tools, P/N 38101.

3.4.65. Tap, 3/8-18 NPT. The tap shall be for hand tapping tapered pipe thread 3/8-18-NPT threads. Brand Name or Equal to: Morse Cutting Tools, P/N 36125.

3.4.66. Tap and Reamer Wrench. The tap and reamer wrench shall have a straight handle and adjustable jaws for no less than 1/16 to 1/4 inch taps and 1/8 to 1/4 inch hand reamers. The handle length shall be 5 to 9 inches. Brand Name or Equal to: ICS Cutting Tools, P/N TW-4.

3.4.67. Tap and Reamer Wrench. The tap and reamer wrench shall have straight handle and adjustable jaws for no less than 1/2 to 1 inch taps, 1/8 to 1/2 inch pipe taps, and 3/8 to 1/2 inch hand reamers. The nominal handle length shall be 15 to 21 inches. Brand Name or Equal to: ICS Cutting Tools, P/N TW-7.

3.4.68. Vernier Caliper. The caliper shall be for inside, outside and depth measurement in the range of 0 to 6 inches and 0 to 150mm. The caliper shall display both metric and English measurements. The caliper shall have an electronic digital readout with resolution of 0.0005 inches and 0.010mm or finer. The caliper shall have a plastic, wood or similar storage container that secures and protects the caliper and has complete operating and maintenance instructions. Brand Name or Equal to: LS Starrett, P/N 67410.

3.4.69. Outside Micrometer Set, 0-6 inches. The micrometer set shall be a set of outside micrometers for measuring in the range 0 to 1, 1 to 2, 2 to 3, 3 to 4, 4 to 5, and 5 to 6 inches. The micrometers shall be graduated in no greater than 0.001 inch graduations. The micrometers shall

have a ratchet stop, solid anvils, spindle lock nuts and ratcheting or frictional thimbles and shall be furnished in a case. Brand Name or Equal to: LS Starrett, P/N 68043.

3.4.70. Micrometer Depth Gage, 0-6 inches. The micrometer shall be an electronic digital depth micrometer for measuring depths in the range of 0 to 6 inches and 0 to 150 mm. The micrometer shall display both metric and English measurements. The micrometer shall consist of a micrometer head with a ratchet stop, a base and measuring rods to measure to a depth of 6 inches. The micrometer head shall have a resolution of 0.0001 inches and 0.001 mm or finer. The entire set shall be housed in a substantial case that secures each item. Operating instructions for the micrometer shall be furnished and stored inside the micrometer case. Brand Name or Equal to: LS Starrett, P/N 65063.

3.4.71. Thickness Gage. The thickness gage shall have 26 leaves in thickness of 0.0015, 0.002, 0.0025, and 0.003 through 0.025 by thousandths of an inch. The case shall be designed to enclose the edges of all leaves and conform to the approximate shape of the leaves. The leaves shall be held in the case by a knurled or serrated locknut no smaller in diameter than the width of the case. Brand Name or Equal to: LS Starrett, P/N 50314.

3.4.72. Machinist's Scriber. The machinist's scriber shall have a nominal length of 8-1/2 inches and a double point, one straight and one bent. Brand Name or Equal to: LS Starrett, P/N 50321.

3.4.73. Machinist's Rule. The rule shall be a steel rule 18 inches long, 1-1/8 inch wide and 3/64 inches thick. The rule shall be marked in 1 inch increments and graduated in 1/8, 1/16, 1/32 and 1/64 increments. Brand Name or Equal to: LS Starrett, P/N 52680.

3.4.74. Trimmer Shears. The shears shall be straight trimmer shears for industrial use. The shears shall have one blade pointed and the other beveled. The shears shall be of steel, forged, and of either inlaid or solid steel construction. The shears may have a bent handle for grip comfort. The length shall be nominally 9 inches. The length of cut shall be no less than 4 inches. The blades shall be chrome-nickel plated. Brand Name or Equal to: Klein Tool, P/N 23011.

3.4.75. Putty Knife. The putty knife shall be nominally 1-1/4 inch wide with a flexible plastic blade. Brand Name or Equal to: Bon Tool, P/N 18-409-B10.

3.4.76. Monocular Magnifier. The magnifier shall be a hand held reading type monocular magnifier with a circular lens between 2-3/4 and 3-1/4 inches in diameter. The magnification shall be no less than 1.7 times. The handle shall be integral to the frame of the magnifier. A case shall be included. Brand Name or Equal to: Bausch and Lomb, P/N 813303 with a case.

3.4.77. Hex Pipe Nipple. The hex nipple shall be made of brass with both ends threaded 1/4-NPSM. The ends shall have an inverted flare seat angle of 30 degrees. Brand Name or Equal to: Parker, P/N 896-WM.

3.4.78. Hand Held Oil Can. The hand-pumped oiler shall have a pistol body style and a capacity of no less than 6 ounces. The material shall be steel and painted or treated to resist

corrosion. The spout shall be no less than 5 inches long and non removable. The oiler shall be operated by an internal pump operated by an external lever. Brand Name or Equal to: Plews, P/N 50-515.

3.4.79. Abrasive Wheel Dresser. The wheel dresser shall be for resurfacing grinding wheels up to 10 inches in diameter. The dresser shall have revolving replaceable cutters. Brand Name or Equal to: Desmond, P/N 11210.

3.4.80. Etcher, electric. The etcher shall be the heavy duty vibrating type with case. The etcher shall have an adjustable stroke length and be furnished with etching points: 2 with diamond tips and 4 with tungsten-carbide tips. The etcher shall operate from 120 Volts, 60 Hertz power. Brand Name or Equal to: Ideal, P/N 11-113 (electric marker, qty 1), 11-200 (carbide point tip, qty 4), and 11-201 (diamond point, qty 2) in a case.

3.4.81. Fire extinguisher. The fire extinguisher shall be a 5B:C five pound carbon dioxide fire extinguisher with hand grip and a permanent shut-off valve with a squeeze grip control. A wall bracket for hanging the extinguisher shall be included. The extinguisher shall conform to the requirements of UL 154 and UL 711. Brand Name or Equal to: Amerex, P/N 322.

3.4.82. Face shield. The face shield shall be designed to shield the wearer's face and eyes from various hazards. The face shield shall be designed to wear in conjunction with spectacles and goggles. The shield shall protect from impact, dust, liquid splash and optical radiation. The visor shall be supported by a plastic visor with forehead and semi-skull guard headgear. The face shield shall be clear and able to tilt up when not in use. The face shield shall be no less than 0.040 inches thick, 8 to 10 inches long and 17 to 19 inches wide. The shield shall meet all federal and state safety standards and requirements. Brand Name or Equal to: Kimberly-Clark/Jackson Safety, P/N 29083 (face shield) and 14940 (headgear).

3.4.83. Trigger Pull Gage. The trigger pull gage shall measure and record the trigger pull of pistols and rifles. The gage shall measure in the range of 4 to 10 pounds accurate within 0.5 pounds (8 ounces). Brand Name or Equal to: Timney Triggers, P/N TS-010.

3.4.84. Air Hose Assembly. The air hose shall be no less than 25 feet long, no less than ¼ inches inside diameter and made of ozone and oil resistant rubber or synthetic rubber cover. The operating pressure shall be no less than 150 psi, the hydrostatic test pressure no less than 250 psi, and the burst pressure no less than 700 psi. Both ends shall have straight fittings with an inverted flare swivel nut with a right hand internal ¼ NPSM threads and a seat angle of 30 degrees. Brand Name or Equal to: Bahcall Rubber Co., P/N ¼" x 25' lg Ortac Hose Assy (includes Ortac 250 ¼" x 25' quantity of 1 and Dixon BFS22 quantity of 2).

3.4.85. Safety Air Gun. The air gun shall have a push button, a ¼-18 NPT threaded internal inlet, a removable tip and a hanger. The nozzle shall be designed to limit the outlet pressure to 30 psi with the air valve full open and to deflect chip blowback. Brand Name or Equal to: Milton, P/N 92-A1-107.

3.4.86. Magnetic Parts Tray. The tray shall be nominally 9 inches by 6 inches and be magnetized to hold items such as fasteners and tools. Brand Name or Equal to: Snap-On, P/N MRB10A.

3.4.87. Magnetic Parts Bowl. The bowl shall be nominally 6 inches in diameter and be fully magnetized to hold items such as fasteners and tools. Brand Name or Equal to: Snap-On, P/N MRB5A.

3.4.88. Slip Joint Pliers. The pliers shall be a nominal 10 inch combination jaw, straight nose regular slip joint pliers with a wire cutter and comfort grips. Brand Name or Equal to: Pro America, P/N 7010.

3.4.89. Duckbill Pliers. The pliers shall be a nominal 8 inch flat nose duckbill, long reach pliers with comfort grip. The gripping surfaces of the jaws shall be serrated. The jaw length shall be nominally 1-1/2 inches, the nose tip thickness nominally 1/8 inches and the nose tip width nominally 1/4 inches. Brand Name or Equal to: Pro America, P/N 5022.

For the Type, Class and Style stated below refer to ASME B107.500 (B107.19), Pliers: Retaining Ring.

3.4.90. Retaining Ring Pliers. The pliers shall be Type I, Class 1, Style A internal, with adjustable jaw stop and spring, straight tip with tip diameter 0.038 inch retaining ring pliers. Brand Name or Equal to: Stride Tool, P/N 1R.

3.4.91. Retaining Ring Pliers. The pliers shall be Type I, Class 1, Style A internal, with adjustable stop and spring, straight tip with tip diameter 0.070 inches retaining ring pliers. Brand Name or Equal to: Stride Tool, P/N 3R.

3.4.92. Retaining Ring Pliers. The pliers shall be Type I, Class 2, Style A internal, without adjustable stop, straight tip with tip diameter 0.025 inches retaining ring pliers. Brand Name or Equal to: Stride Tool, P/N 2101R.

3.4.93. Retaining Ring Pliers. The pliers shall be Type 1, Class 2, Style C internal, without adjustable stop, 45 degrees bent tips with tip diameter 0.025 inch retaining ring pliers. Brand Name or Equal to: Stride Tool, P/N 210145R.

3.4.94. Retaining Ring Pliers. The pliers shall be Type 1, Class 2, Style C internal, without adjustable stop, 45 degrees bent tips with tip diameter 0.038 inch retaining ring pliers. Brand Name or Equal to: Stride Tool, P/N 2145R.

3.4.95. Retaining Ring Pliers. The pliers shall be Type 1, Class 2, Style C internal, without adjustable stop, 45 degrees bent tips with tip diameter 0.070 inch retaining ring pliers. Brand Name or Equal to: Stride Tool, P/N 2345R.

3.4.96. Retaining Ring Pliers. The pliers shall be Type 1, Class 2, Style B internal, without adjustable stop, 90 degree bent tips with tip diameter 0.090 inch retaining ring pliers. Brand Name or Equal to: Stride Tool, P/N 2590R.

3.4.97. Retaining Ring Pliers. The pliers shall be Type 2, Class 1, Style A external with fixed jaw stop and spring, straight tip with tip diameter 0.023 inches retaining ring pliers. Brand Name or Equal to: Rotor Clip, P/N RP-15.

3.4.98. Retaining Ring Pliers. The pliers shall be Type II, Class 1, Style A external retaining ring pliers with fixed jaw stop and spring, straight tip with tip diameter of 0.023 inches. The external retaining ring pliers shall have a flat jaw with a fixed jaw stop, spring, and a shielded straight tip. The pliers shall be for external retaining rings with nominal shaft diameters of 0.188 through 0.236 inch ring size. The pliers shall have integral tips for expanding external retaining rings. Nominal length shall be 5-5/16 inches long. Pliers size 2-1-A. Brand Name or Equal to: Rotor Clip, P/N RP-18.

3.4.99. Retaining Ring Pliers. The pliers shall be Type II, Class 2, Style A external retaining ring pliers with adjustable stop and spring, straight tip with tip diameter 0.038 inches. Brand Name or Equal to: Stride Tool, P/N 2R.

3.4.100. Retaining Ring Pliers. The pliers shall be Type II, Class 2, Style B external with adjustable jaw stop and spring, 90 degree bent tip with tip diameter 0.038 inches. Brand Name or Equal to: Stride Tool, P/N 290R.

3.4.101. Retaining Ring Pliers. The pliers shall be Type II, Class 3, Style C external without jaw stop and spring, with 45 degree bent tip of tip diameter 0.070 inches. Brand Name or Equal to: Stride Tool, P/N 2445R.

3.4.102. Retaining Ring Pliers. The pliers shall be Type II, Class 3, Style A external, without jaw stop and spring, straight tip with tip diameter 0.115 inches. Brand Name or Equal to: Stride Tool, P/N 266R.

3.4.103. Retaining Ring Pliers. The pliers shall be Type IV, Class 3 internal, double ratchet, and replaceable tip retaining ring pliers with tip diameter of 0.120 inches. No fewer than the 0° tips shall be furnished. Brand Name or Equal to: Stride Tool, IR-50H (pliers) and IR-5120T (tips).

3.4.104. Pilot Bearing Puller. The pilot bearing puller shall be a screw-type puller clutch pilot bearing puller with head guide. The capacity shall be no less than 25/64 (0.390) inches to 1-¼ inches. The reach shall be no less than 1-1/8 inches. Brand Name or Equal to: Snap-On, P/N A78.

3.4.105. Mechanical Jaw Puller. The puller shall be a reversible mechanical gear and bearing puller with the capability of having 2 or 3 external jaws. The reach shall be no less than 5-1/2 inches and the spread no less than 8 inches. Brand Name or Equal to: Stanley Proto, P/N J4047.

3.4.106. Aligning Punch. The aligning punch shall have a point diameter of 1/8 inch and a nominal overall length of 8 inches. Brand Name or Equal to: Mayhew, P/N 22010.

3.4.107. Aligning Punch. The aligning punch shall have a point diameter of 1/4 inch, and overall length of no less than 12 inches. Brand Name or Equal to: Mayhew, P/N 22003.

3.4.108. Drive Pin Punch, 1/16. The punch shall be a straight drive pin punch with a nominal length of 4 inches and a 1/16 inch diameter point. The nominal point length shall be 1-1/2 inches. Brand Name or Equal to: Mayhew, P/N 71000.

3.4.109. Drive Pin Punch, 1/8. The punch shall be a straight drive pin punch with a nominal length of 8 inches and a 1/8 inch diameter point. Nominal point length shall be 3-1/2 inches. Brand Name or Equal to: Mayhew, P/N 21500.

3.4.110. Drive Pin Punch, 5/32. The punch shall be a straight drive pin punch with a nominal length of 8 inches and a 5/32 inch diameter point. Nominal point length shall be 3-1/2 inches. Brand Name or Equal to: Mayhew, P/N 21506.

3.4.111. Drive Pin Punch, 5/16. The punch shall be a straight drive pin punch with a nominal length of 4 inches and a 5/16 inch diameter point. The nominal point length shall be 1 inch. Brand Name or Equal to: LS Starrett, P/N 52585.

3.4.112. Drive Pin Punch, 3/32. The punch shall be a straight drive pin punch with a nominal length of 4 inches and a 3/32 inch diameter point. The nominal point length shall be 11/16 inch. Brand Name or Equal to: LS Starrett, P/N 52579.

3.4.113. Prick Punch. The punch shall be a straight prick punch with a nominal length of 4 inches. Brand Name or Equal to: Mayhew, P/N 23000.

3.4.114. Drift Pin. The drift pin shall be made of half-hard brass, be 3/4 inches in diameter and nominally 12 inches long with one end tapering down to 5/8 inch diameter end. The larger end is to be chamfered. Brand Name or Equal to: Snap-On, P/N PPB12075SP.

3.4.115. Drift Pin. The drift pin shall be made of half-hard brass, be 1/2 inch in diameter and 4 inches long with one end tapering down to a 5/16 inch diameter end. Brand Name or Equal to: Snap-On, P/N PPB4050SP.

3.4.116. Rotary Tool Kit. The rotary tool shall operate from single-phase 120 volts AC, 50 to 60 Hertz and 120 VDC. The motor shall be no less than 1/4 hp with a no load speed of no less than 25,000 RPM and a full load speed of no less than 14,000 RPM. The rotary tool shall allow the use of 1/8-inch and 1/4-inch collet type chucks. Both collets shall be furnished. The kit shall include six each spare motor brushes (3 pair), one dressing stone (3 x 3/4 x 3/8 inches), one flexible drive shaft not less than 36 inches long, one headpiece for use with the flexible shaft, one universal tool mount, one wrench set, operating/maintenance instructions and a safety manual. All items in the kit, including the wheels and points, shall be contained in a carrying case. The rotary tool kit shall conform to Underwriters' Laboratory (UL) standards for use in non-hazardous locations.

The kit shall be furnished with one each of the following mounted wheels or points. The wheels or points shall be aluminum oxide and vitrified bond. The shanks shall be suitable for ½ inch overhang with maximum engagement in the chuck.

Points and Wheels							
Shape	Grit	Shape	Grit	Shape	Grit	Shape	Grit
B-42	60	B-73	80	W-144	60	W-183	60
B-44	60	B-103	80	W-152	60	W-185	60
B-51	60	B-112	60	W-154	60	W-193	60
B-52	90	B-121	60	W-160	60	W-200	60
B-53	90	B-131	60	W-163	60		
B-63	60	B-135	60	W-175	60		
B-70	60	W-143	60	W-176	60		

The kit shall be furnished with one each of the abrasive wheels and points listed below. The wheels and points shall be aluminum oxide abrasive and either resin bonded with cotton fiber or vitrified. The shanks shall be suitable for ½ inch overhang with maximum engagement in the chuck.

Points and Wheels					
Shape	Grit	Shape	Grit	Shape	Grit
A-5*	80	A-12	80	A-22*	80
B-41*	80	B-51	80	B-52	80
B-61*	80	B-91*	80	B-102	80
W-186*	80	W-202*	80	W-203*	80

\*only ¼ inch diameter shanks shall be acceptable

The kit shall be furnished with one each of no less than the carbide rotary files (burs) listed below. The shanks shall be ¼ inch diameter and suitable for ½ inch overhang with maximum engagement in the chuck.

Rotary files			
Shape	Diameter Inches	Flute Length Inches	Cutting teeth per inch
Cylindrical	3/16	½	20
Cylindrical	¼	1	25
Cylindrical	3/8	1	20
Cylindrical (radius end)	1/8	½	50
Cylindrical (radius end)	¼	1	25
Cylindrical (radius end)	3/8	1	20

Brand Name or Equal to: Dumore, P/N 8449-210.

3.4.117. Hex Key Socket Head Set, inch. The hex key set shall consist of short series inch hex keys. The set shall be furnished in a roll or plastic case that shall have individual pockets or

clamps for each size. The pocket or clamp shall be labeled with each key size. The set shall contain the following sizes. 0.028, 0.035, 0.050, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, and 3/4 inches. Brand Name or Equal to: Snap-On, P/N AW1020DK.

3.4.118. Hex Key Socket Head Set, metric. The hex key set shall consist of short series metric hex keys. The set shall be furnished in a roll or plastic case that shall have individual pockets or clamps for each size. The pocket or clamp shall be labeled with each key size. The set shall contain the following sizes: 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, and 10.0 mm. Brand Name or Equal to: Eklind, P/N 10509.

3.4.119. Offset Screwdriver Set. The set shall include four double offset screwdrivers in tip widths 5/32, 1/4, 5/16, and 3/8 inches. The screwdrivers shall have flat tips on each end. The flat tips shall be at right angles to the body and right angles to each other. Brand Name or Equal to: Pratt Read, P/Ns 54611, 54612, 54613, and 54614.

3.4.120. Flat tip Screwdriver. The screwdriver shall be a flat tip, flared side general purpose screwdriver with bolster or a square shank, a 1/2 inch wide blade and nominal blade length of 12 inches. Brand Name or Equal to: Klein Tool, P/N 600-12.

3.4.121. Torx® Screwdriver Set. The set shall consist of seven Torx® screwdrivers in sizes T-8, T-10, T-15, T-20, T-25, T-27, and T-30. The shank lengths shall be nominally 3 to 4 inches. Brand Name or Equal to: Snap-On, P/Ns SHDTX380, SHDTX3100, SHDTX3150, SHDTX3200, SHDTX4250, SHDTX4270, and SHDTX4300.

3.4.122. T-Handle Ball Socket Drive Hex Set. The set shall consist of T-handle ball hex drivers in both metric and inch sizes. The metric sizes shall be 4mm, 5mm, 6mm, and 8mm. The inch sizes shall be 1/16, 1/8, 3/16, 1/4, and 5/16 inches. The 1/16 inch driver may be a long arm L-shaped ball end hex. Brand Name or Equal to: Snap-On, P/Ns AWBCG1608, AWBCG1612, AWBCG1616, AWBCG1620, AWBMCG1604, AWBMCG1605, AWBMCG1606 and AWBMCG1608; and Eklind, P/N 15104.

3.4.123. Countersink. The countersink shall be a high-speed steel 100 degree, 3 flute countersink with a 1/4 inch straight shank and a body diameter of 1/2 inch. Brand Name or Equal to: Chicago Latrobe, P/N 56879.

3.4.124. V-Block. The V-Block set shall be a matched set of two V-blocks with precision ground surfaces and clamps. The V-blocks shall be for use with cylindrical objects up to 1.5 inches in diameter. The clamping device shall consist of a reversible yoke and two yoke screws which attach to a groove on two sides of the block. The blocks shall be nominally 1-1/2 inches wide by 2 inches long by 1-1/2 inches high. The block shall have a V-groove cut 45 degrees from both sides of center extending the entire length of the block top and bottom. At the apex of the groove there shall be a slot to facilitate chip relief. The V-groove shall be central, square with the sides and parallel to the base. The surface finish of the V-block shall be not greater than 32 micro-inches. Brand Name or Equal to: LS Starrett, P/N 52592.

3.4.125. Gasket Scraper. The gasket scraper shall be made of steel with a screwdriver-type handle. The scraper shall have a 1 inch wide blade and a nominal length of 10 inches. Brand Name or Equal to: Snap-On, P/N CSA12C.

3.4.126. Torque Wrench. The torque wrench shall be a ½ inch square drive fixed ratchet head click-type torque wrench with a range of no less than 50 to 250 foot-pounds in 1 foot-pound increments. The torque wrench shall be furnished in a protective case. Brand Name or Equal to: Snap-On, P/N QD3R250.

3.4.127. Torque Wrench. The torque wrench shall be a ¾ inch square drive fixed ratchet head click-type torque wrench with a range of no less than 120 to 600 foot-pounds in five foot pound increments. The torque wrench shall be furnished in a protective case. Brand Name or Equal to: Snap-On, P/N QD4R600.

3.4.128. Torque Wrench. The torque wrench shall be a ¼ inch square drive ratcheting head click-type torque wrench with a range of no less than 10 to 50 inch-pounds in 1 inch-pound increments. The wrench shall be furnished in a protective case. Brand Name or Equal to: Snap-On, P/N QD1R50.

3.4.129. Torque wrench. The torque wrench shall be a 3/8 inch square drive adjustable click-type fixed ratcheting torque wrench with a range of no less than 200 to 1,000 inch-pounds in five inch-pound increments. A protective case shall be included for storage of the torque wrench. Brand Name or Equal to: Snap-On, P/N QD2R1000.

3.4.130. Breaker Bar. The breaker bar shall be ½ inch square drive with a nominal length of 24 inches and a chromium finish. Brand Name or Equal to: Snap-On, P/N SN24C.

3.4.131. Socket Wrench Adapter. The adapter shall have a 1/2 inch male square drive and a 3/8 inch female square drive. The adapter shall have a chromium finish. Brand Name or Equal to: Snap-On, P/N A2A.

3.4.132. Drag Link Socket. The socket shall be a 3/8 inch square drive flat drag link socket. Brand Name or Equal to: Snap-On, P/N GF22.

3.4.133. Inch Hex Bit Sockets. The sockets shall be 3/8 inch square drive hex bit sockets with hex bits in sizes 1/8, 3/16, ¼, 5/16 and 3/8 inches. The bit holders shall have a chromium finish. The hex bits shall be replaceable. The sockets shall be furnished on a rail that firmly retains the sockets. Brand Name or Equal to: Snap-On, P/N 208EFAY (with rail and clips).

3.4.134. Metric Hex Bit Sockets. The sockets shall be 3/8 inch square drive hex bit sockets with hex bits in sizes 4, 5, 6, 7, 8, and 10 mm. The bit holders shall have a chromium finish. The hex bits shall be replaceable. The sockets shall be furnished on a rail that firmly retains the sockets. Brand Name or Equal to: Snap-On, P/N 206EFAML (with rail and clips).

3.4.135. Socket, 8 mm. The socket shall be a 1/4 inch square drive standard length 12-point socket with an 8 mm wrenching size. The finish shall be chromium. Brand Name or Equal to:

Snap-On, P/N TMMD8.

3.4.136. Socket, 12 mm. The socket shall be a 1/4 inch square drive standard length 12-point socket with a 12 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N TMMD12.

3.4.137. Socket, 10 mm. The socket shall be a 3/8 inch square drive standard length 12-point socket with a 10 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N FM10.

3.4.138. Socket, 13 mm. The socket shall be a 3/8 inch square drive standard length 12-point socket with a 13 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N FM13.

3.4.139. Socket, 15 mm. The socket shall be a 1/2 inch square drive standard length 12-point socket with a 15 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N SWM151A.

3.4.140. Socket, 17 mm. The socket shall be a 1/2 inch square drive standard length 12-point socket with a 17 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N SWM171.

3.4.141. Socket, 19 mm. The socket shall be a 1/2 inch square drive standard length 12-point socket with a 19 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N SWM191.

3.4.142. Socket, 1 inch. The socket shall be a 1/2 inch square drive standard length 12-point socket with a 1 inch wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N SW321.

3.4.143. Socket Wrench Set, 1/4 inch drive. The socket wrench set shall consist of 1/4 inch square drive, 6 point and 12 point standard length chrome plated sockets and other items as listed below. The finish shall be chromium. The set shall be furnished in a case that shall be capable of maintaining the sockets in a readily accessible presentation, and being securely latched close for storage.

Description	Brand Name or Equal to:
Ratchet handle, nominal 5 inches, sealed head	Snap-On TL72
1/4 inch universal joint	Snap-On TMU8B
1/4 Spinner handle	Snap-On TM9CSA
Extension, nominal length 2 inches	Snap-On TMXK2
Socket, 3/16 inch 6-point	Snap-On TM6
Socket, 7/32 inch 6-point	Snap-On TM7
Socket, 1/4 inch 6-point	Snap-On TM8
Socket, 9/32 inch 6 point	Snap-On TM9
Socket, 5/16 inch 12-point	Snap-On TMD10

Socket, 11/32 inch 12-point	Snap-On TMD11
Socket, 3/8 inch 12-point	Snap-On TMD12
Socket, 7/16 inch 12-point	Snap-On TMD14
Socket, 1/2 inch 12-point	Snap-On TMD16
Box	Snap-On KRA229
Foam	

3.4.144. Socket Wrench Set, 3/8 inch drive. The socket wrench set shall consist of 3/8 inch square drive 12-point standard length and long length chromium plated sockets and attachments as listed below. The set shall be furnished in a case that shall be capable of maintaining the sockets in a readily accessible presentation, and being securely latched close for storage.

Description	Brand Name or Equal to:
Hinged handle	Snap-On F10LC
Ratchet handle, sealed head	Snap-On F80
Extension, nominal length 6 inches	Snap-On FXK6
Extension, nominal length 12 inches	Snap-On FXK11
Universal joint	Snap-On FU8A
Speeder handle	Snap-On F4LB
Socket, 3/8 inch standard length	Snap-On F121
Socket, 7/16 inch standard length	Snap-On F141
Socket, 1/2 inch standard length	Snap-On F161
Socket, 9/16 inch standard length	Snap-On F181
Socket, 5/8 inch standard length	Snap-On F201
Socket, 11/16 inch standard length	Snap-On F221
Socket, 3/4 inch standard length	Snap-On F241
Socket, 13/16 inch standard length	Snap-On F261
Socket, 7/8 inch standard length	Snap-On F281
Socket, 1/2 inch long length	Snap-On SF161
Socket, 9/16 inch long length	Snap-On SF181
Socket, 5/8 inch long length	Snap-On SF201
Socket, 11/16 inch long length	Snap-On SF221
Socket, 3/4 inch long length	Snap-On SF241
Socket, 13/16 inch long length	Snap-On SF261
Universal socket, 1/2 inch	Snap-On FU16B
Universal socket, 9/16 inch	Snap-On FU18B
Box	Snap-On KRA250
Foam	

3.4.145. Crowfoot Wrench, 20 mm. The wrench shall be a 3/8 inch square drive open end crowfoot wrench with a 20 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N FCOM20A.

3.4.146. Crowfoot Wrench, 22 mm. The wrench shall be a 3/8 inch square drive open end crowfoot wrench with a 22 mm wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N FCOM22A.

3.4.147. Crowfoot Wrench, 1-7/16 inch. The wrench shall be a 3/8 inch square drive open end crowfoot wrench with a 1-7/16 inch wrenching size. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N FC46A.

3.4.148. Box End Wrench, 8 x 9 mm. The wrench shall be a short length, double head, 15±5 degree offset, 12-point box end wrench with 8mm and 9mm wrenching sizes. The overall length shall be no greater than 110 mm. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N XSM89A.

3.4.149. Box End Wrench, 9 x 10 mm. The wrench shall be a short length, double head, 15±5 degree offset, 12-point box end wrench with 9mm and 10mm wrenching sizes. The overall length shall be no greater than 120 mm. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N XSM910A.

3.4.150. Box End Wrench, 13 x 15 mm. The wrench shall be a double head, 15±5 degree offset, 12-point box end wrench with 13mm and 15mm wrenching sizes. The overall length shall be no greater than 246 mm. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N XBM1315A.

3.4.151. Box End Wrench, 17 x 19 mm. The wrench shall be a short length, double head, 15±5 degree offset, 12-point box end wrench with 17 mm and 19 mm wrenching sizes. The overall length shall be no greater than 185 mm. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N XSM1719A.

3.4.152. Combination Wrench, 3/16 inch. The wrench shall be a 3/16 inch wrenching size short length 6-point combination wrench. The wrench length shall not exceed 3-3/8 inches. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N OXI6SB.

3.4.153. Combination Wrench, 1/4 inch. The wrench shall be a 1/4 inch wrenching size regular length 12 point combination wrench. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N OEX8B.

3.4.154. Combination Wrench Set. The set shall contain standard length 12-point combination wrenches in metric sizes 7 mm through 24 mm inclusive. The finish shall be chromium. The wrenches shall be furnished in a wrap or box. Brand Name or Equal to: Snap-On, P/Ns OEXM7B, OEXM80B, OEXM90B, OEXM100B, OEXM110B, OEXM120B, OEXM130B, OEXM140B, OEXM150B, OEXM160B, OEXM170B, OEXM180B, OEXM190B, OEXM200B, OEXM210B, OEXM220B, OEXM230B, and OEXM240B (with a wrap or box).

3.4.155. Combination Wrench Set. The set shall contain standard length 12-point combination wrenches in inch sizes 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, and 1 inch. The finish shall be chromium. The wrenches shall be furnished in a wrap or box. Brand

Name or Equal to: Snap-On, P/Ns OEX10B, OEX12B, OEX14B, OEX16B, OEX18B, OEX20B, OEX22B, OEX24B, OEX26B, OEX28B, OEX30B, and OEX32B (with a wrap or box).

3.4.156. Open End Wrench, 21 x 24 mm. The wrench shall be a 15 degree angle open end wrench with wrenching sizes 21 mm and 24 mm. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N VOM2124B.

3.4.157. Open End Wrench, 11 x 13 mm. The wrench shall be a 15 degree angle open end wrench with wrenching sizes 11 mm and 13 mm. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N COM1113B.

3.4.158. Adjustable Wrench, 12 inches. The adjustable wrench shall be nominally 12 inches long with a jaw opening of no less than 1-5/16 inches. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N JHWAP-12A.

3.4.159. Adjustable Wrench, 15 inches. The adjustable wrench shall be nominally 15 inches long with a jaw opening of no less than 1.698 inches. The finish shall be chromium. Brand Name or Equal to: Snap-On, P/N JHWAP-15A.

3.4.160. Adjustable Wrench. The wrench shall be a nominal 11 inch auto (monkey) wrench with a jaw opening of no less than 3 inches. Brand Name or Equal to: Martin Sprocket, P/N 89311.

3.4.161. Pipe Wrench, 14 inches. The pipe wrench shall be a nominal 14 inch straight pipe wrench with a nominal pipe capacity of no less than 2 inches. Brand Name or Equal to: Snap-On, P/N PW14C.

3.4.162. Strap Wrench. The strap wrench shall be suitable for pipe capacity of up to 5 inches in diameter. Brand Name or Equal to: Rigid, P/N 31360.

3.4.163. Upper Receiver Action Block with Lower Receiver Action Block. The receiver action block shall be designed to secure and protect the M16 receiver when it is held in a vise. The receiver action block shall include an upper receiver internal support, an upper receiver action block and a lower receiver action block. Brand Name or Equal to: Brownell, P/N 080-000-659.

3.4.164. Air Compressor. The compressor shall be the oil-less type, capable of air delivery of no less than 5 SCFM at 90 psig and shall also be capable of pressures to no less than 150 psig. The compressor shall be able to maintain pressures between 120 psig and 150 psig. The compressor shall operate from 120 Volts, 60 hertz, single phase power and shall be suitable for no less than 50% duty cycle. The compressor shall be equipped with an on-off switch. The compressor shall have no fewer than two industrial interchange quick disconnect outlets. The outlet pressure shall be adjustable through a built-in regulator and shall be equipped with an outlet pressure gauge that indicates the pressure at the regulator outlet. The receiver tank shall be no less than 4.5 gallons and shall be equipped with a drain valve. The compressor shall be furnished with wheels and a collapsible pull handle that allow the compressor to be pulled around a job site. If the

operating noise level exceeds 85 dBA, a conspicuously placed warning label shall be placed on the compressor or receiver tank. Brand Name or Equal to: Porter Cable, P/N C3151.

3.4.165. Bore erosion gage. The bore erosion gage shall be in accordance with drawing 12901228. Brand Name or Equal to: HJM Precision Inc., P/N 12901228.

3.4.166. Long Nose Locking Pliers. The locking pliers shall be nominally 6 inches long with a long, straight nose. Brand Name or Equal to: Snap-On, P/N LP6LN.

3.5. Component listing.

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
3.4.1	Storage Cabinet	As req'd	M	7125		Champion WBL42-7	573P6
3.4.2	Repair Parts Storage Cabinet	1 Each	M	7125		Champion WBL42-5	573P6
3.4.3	Work Table	1 Each	M	4910		Champion TBL-5-1	573P6
3.4.4	Folding Table	1 Each	M	7195		Southern Aluminum Manufacturing A306WL (walnut)	0C561
3.4.5	Work Table	2 Each	M	4910		Champion WEB-SASS	573P6
3.4.6	Shop Stool	2 Each	M	7110		Safco 5117	3KPT9
3.4.7	Bench Grinder	1 Each	M	3415		Baldor 712 (remove B74, replace with C121)	05472
3.4.8	Grinder brush	2 Each	M	3415	X	Weiler Brush 03060 and 03810	17699
3.4.9	Machinist Bench vise	1 Each	M	5120		Yost 204	66983
3.4.10	Vise Jaw Caps	2 pair	L	5120	X	Yost SA-340	66983
3.4.11	Drill Press Vise	2 Each	L	5120	X	Yost 6D	66983
3.4.12	Upright Drilling Machine	1 Each	M	3413		Palmgren 80155	7L048
3.4.13	Power Cable Assembly	5 Each	M	6150	X	Coleman Cable Inc. 3488 and 09901	OXDS2
3.4.14	Extension Light	1 Each	M	6230	X	Lumapro (Grainger) 2YKN3	25795
3.4.15	Flashlight	1 Each	M	6230	X	Pelican 2360-010-110 (with batteries)	11214
3.4.16	Grounding Rod	1 Each	N	5975		Erico 635837	14045
3.4.17	Grounding Rod Slide Hammer	1 Each	M	5120		Continental Tool Mfg 5120-01-013-1676	63003
3.4.18	Pry Bar	1 Each	L	5120	X	Snap-On 1650	55719
3.4.19	Wrecking Bar	1 Each	L	5120	X	Vaughan & Bushnell RB18	009J9
3.4.20	Multipurpose Nail Puller Bar	1 Each	L	5120	X	Vaughan & Bushnell B215S	009J9
3.4.21	Hand Hacksaw Frame	1 Each	L	5110	X	Klein Tool 701-S	3X6M9

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
3.4.22	Hacksaw Blade	20 Each	M	5110	X	Disston Company 1232UL	20455
3.4.23	Small Parts Box	6 Each	M	8115	X	Flambeau 5126CL	19986
3.4.24	Drain Pan	1 Each	M	3990		Lisle Corp 17942	36540
3.4.25	Funnel	1 Each	M	7240	X	S & K Products 495	0T115
3.4.26	C-Clamp	2 Each	L	5120	X	Wilton 14142	1WKM5
3.4.27	Ball-Peen Machinist's Hammer	1 Each	L	5120	X	Nupla 21020	76732
3.4.28	Ball-Peen Machinist's Hammer	1 Each	L	5120	X	Snap-On BPN32B	55719
3.4.29	Soft Face Hammer, 42 ounces	1 Each	L	5120	X	Stanley Proto 57-533	76377
3.4.30	Soft Face Hammer, 21 ounces	2 Each	L	5120	X	Stanley Proto 57-532	76377
3.4.31	Cold Chisel	1 Each	M	5110	X	Snap-on PPC808A	55719
3.4.32	Cold Chisel	1 Each	M	5110	X	Snap-on PPC816B	55719
3.4.33	Hand File, Flat	1 Each	M	5110	X	ICS Cutting Tools F-H-10SC	1YS26
3.4.34	Hand File, Half Round	1 Each	M	5110	X	ICS Cutting Tools F-HR-10SC	1YS26
3.4.35	Hand File, Mill	1 Each	M	5110	X	ICS Cutting Tools F-M-10SM	1YS26
3.4.36	Hand File, 3-Square	1 Each	M	5110	X	ICS Cutting Tools F-TSQ-08SM	1YS26
3.4.37	Hand File, Mill	1 Each	M	5110	X	ICS Cutting Tools F-M-10B	1YS26
3.4.38	File Handle	2 Each	M	5120	X	General Tool 890	3JKA4
3.4.39	Paint brush	1 Each	M	7920	X	Torrington Brush 1025	0P5U8
3.4.40	Acid brush	1 Gross	M	7920	X	Mack Brush MAK-7-1	71973
3.4.41	Bench Dusting Brush	2 Each	M	7920	X	Weiler Brush 44351	17699
3.4.42	File Cleaner Brush	2 Each	M	7920	X	Apex (Nicholson) 21467	65LN0
3.4.43	Metal Stamp Die Set	1 Each	M	5110	X	CH Hanson 21360	73062
3.4.44	Metal Stamp Die Set	1 Each	M	5110	X	CH Hanson 21151 and 21151PD	73062
3.4.45	Metal Stamp Die Set	1 Each	M	5110	X	CH Hanson 20851 and 20851PD	73062
3.4.46	Metal Stamp Die Set	1 Each	M	5110	X	CH Hanson 21627 and 21627PD	73062
3.4.47	Metal Stamp Die Set	1 Each	M	5110	X	CH Hanson 21440	73062
3.4.48	Metal Stamp Die Set	1 Each	M	5110	X	CH Hanson 21480	73062
3.4.49	Electric Drill Driver	1 Each	M	5130	X	Makita 6408K	0U901
3.4.50	Cordless Drill Driver	1 Each	M	5130	X	Bosch 38636-01	57064
3.4.51	Drill Bit Set	1 Each	M	5133	X	Rocky Mountain Twist 95090844	
3.4.52	Drill Bit Set	1 Each	M	5133	X	Rock Mountain Twist 95090854	
3.4.53	Drill Bit Set	1 Each	M	5133	X	McMaster Carr 27945A27	39428

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
3.4.54	Drill Bit Sharpener	1 Each	M	5130	X	Drill Doctor DD500X	1WGF1
3.4.55	Twist Drill and Drill Rod Gage	1 Each	M	5120	X	LS Starrett 50676	57163
3.4.56	Twist Drill and Drill Rod Gage	1 Each	M	5120	X	LS Starrett 50677	57163
3.4.57	Extractor Set	1 Set	M	5120	X	Snap-on E1025	55719
3.4.58	Tap, 1/8-27 NPT	1 Each	M	5136	X	Morse Cutting Tools 36142	5M2Q1
3.4.59	Tap, ¼-18 NPT	1 Each	M	5136	X	Morse Cutting Tools 36124	5M2Q1
3.4.60	Tap, M2x0.4	1 Each	M	5136	X	Morse Cutting Tools 38118	41672
3.4.61	Tap, M4x0.7	1 Each	M	5136	X	Morse Cutting Tools 38104	41672
3.4.62	Tap, M6x1	1 Each	M	5136	X	Morse Cutting Tools 38107	41672
3.4.63	Tap, M5x0.8	1 Each	M	5136	X	Morse Cutting Tools 38106	41672
3.4.64	Tap, M2.5x0.45	1 Each	M	5136	X	Morse Cutting Tools 38101	41672
3.4.65	Tap, 3/8-18 NPT	1 Each	M	5136	X	Morse Cutting Tools 36125	5M2Q1
3.4.66	Tap and Reamer Wrench	1 Each	L	5120	X	ICS Cutting Tools TW-4	1YS26
3.4.67	Tap and Reamer Wrench	1 Each	L	5120	X	ICS Cutting Tools TW-7	1YS26
3.4.68	Vernier Caliper	1 Each	M	5210	X	LS Starrett 67410	57163
3.4.69	Outside micrometer set, 0 – 6 inches	1 Each	M	5120	X	LS Starrett 68043	57163
3.4.70	Micrometer Depth Gage, 0 – 6 inches	2 Each	L	5120	X	LS Starrett 65063	57163
3.4.71	Thickness Gage	2 Each	M	5120	X	LS Starrett 50314	57163
3.4.72	Machinist's Scriber	1 Each	M	5120	X	LS Starrett 50321	57163
3.4.73	Machinist's Rule	1 Each	M	5204	X	LS Starrett 52680	57163
3.4.74	Trimmer Shears	1 Each	L	5110	X	Klein Tool 23011	3X6M9
3.4.75	Putty Knife	2 Each	L	5120	X	Bon Tool 18-409-B10	0EZD5
3.4.76	Monocular Magnifier	1 Each	M	6650	X	Bausch and Lomb 813303	06175
3.4.77	Hex Pipe Nipple	1 Each	M	4730	X	Parker 896-WM	93181
3.4.78	Hand Held Oil Can	1 Each	M	4930	X	Plews 50-515	77335
3.4.79	Abrasive Wheel Dresser	1 Each	M	5120	X	Desmond 11210	17049
3.4.80	Etcher, Electric	1 Each	M	5130	X	Ideal 11-113 (qty 1), 11-200 (qty 4), 11-201 (qty 2)	30119
3.4.81	Fire Extinguisher	1 Each	M	4210		Amerex 322	49376
3.4.82	Face Shield	2 Each	M	4240	X	Kimberly-Clark/Jackson Safety 29083 and 14940	82060
3.4.83	Trigger Pull Gage	2 Each	M	4933	X	Timney Triggers	

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
						TS-010	
3.4.84	Air Hose Assembly	1 Each	M	4720	X	Bahcall Rubber Co. ¼" x 25' Ig Ortac Hose Assy (includes Ortac 250 ¼" x 25' quantity of 1 and Dixon BFS22 quantity of 2)	0CME1
3.4.85	Safety Air Gun	1 Each	M	4940	X	Milton 92-A1-107	94894
3.4.86	Magnetic Parts Tray	1 Each	L	4940	X	Snap-On MRB10A	55719
3.4.87	Magnetic Parts Bowl	1 Each	L	4940	X	Snap-On MRB5A	55719
3.4.88	Slip Joint Pliers	1 Each	L	5120	X	Pro America 7010	60043
3.4.89	Duckbill Piers	1 Each	L	5120	X	Pro America 5022	60043
3.4.90	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 1R	85688
3.4.91	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 3R	85688
3.4.92	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 2101R	85688
3.4.93	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 210145R	85688
3.4.94	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 2145R	85688
3.4.95	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 2345R	85688
3.4.96	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 2590R	85688
3.4.97	Retaining Ring Pliers	1 Each	L	5120	X	Rotor Clip RP-15	07382
3.4.98	Retaining Ring Pliers	1 Each	L	5120	X	Rotor Clip RP-18	07382
3.4.99	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 2R	85688
3.4.100	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 290R	85688
3.4.101	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 2445R	85688
3.4.102	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool 266R	85688
3.4.103	Retaining Ring Pliers	1 Each	L	5120	X	Stride Tool IR-50H and IR-5120T	85688
3.4.104	Pilot Bearing Puller	1 Each	L	5120	X	Snap-On A78	55719
3.4.105	Mechanical Jaw Puller	1 Each	L	5120	X	Stanley Proto J4047	76377
3.4.106	Aligning Punch	1 Each	M	5120	X	Mayhew 22010	39068
3.4.107	Aligning Punch	1 Each	M	5120	X	Mayhew 22003	39068
3.4.108	Drive Pin Punch, 1/16	1 Each	M	5120	X	Mayhew 71000	39068
3.4.109	Drive Pin Punch, 1/8	1 Each	M	5120	X	Mayhew 21500	39068
3.4.110	Drive Pin Punch, 5/32	2 Each	M	5120	X	Mayhew 21506	39068
3.4.111	Drive Pin Punch, 5/16	1 Each	M	5120	X	LS Starrett 52585	57163
3.4.112	Drive Pin Punch, 3/32	4 Each	M	5120	X	LS Starrett 52579	57163
3.4.113	Prick Punch	1 Each	M	5120	X	Mayhew 23000	39068
3.4.114	Drift Pin	1 Each	M	5120	X	Snap-On PPB12075SP	55719
3.4.115	Drift Pin	1 Each	M	5120	X	Snap-On PPB4050SP	55719
3.4.116	Rotary tool kit	1 Each	M	5120	X	Dumore 8449-210	18797
3.4.117	Hex Key Socket Head Set, inch	1 Set	L	5120	X	Snap-On AW1020DK	55719
3.4.118	Hex Key Socket Head Set, metric	1 Set	L	5120	X	Eklind 10509	05253
3.4.119	Offset Screwdriver Set	1 Each	L	5120	X	Pratt Read 54611, 54612, 54613 and 54614	15142
3.4.120	Flat tip Screwdriver	1 Each	L	5120	X	Klein Tool 600-12	3X6M9

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
3.4.121	TORX® Screwdriver Set	1 Each	L	5120	X	See below:	
1	Torx Screwdriver #8	1 Each		5120		Snap-On SHDTX380	55719
2	Torx Screwdriver #10	1 Each		5120		Snap-On SHDTX3100	55719
3	Torx Screwdriver #15	1 Each		5120		Snap-On SHDTX3150	55719
4	Torx Screwdriver #20	1 Each		5120		Snap-On SHDTX3200	55719
5	Torx Screwdriver #25	1 Each		5120		Snap-On SHDTX4250	55719
6	Torx Screwdriver #27	1 Each		5120		Snap-On SHDTX4270	55719
7	Torx Screwdriver #30	1 Each		5120		Snap-On SHDTX4300	55719
3.4.122	T-Handle Ball Socket Drive Hex Set	1 Each	L	5120	X	See below:	
1	Cushion Grip 1/8"	1 Each		5120		Snap-On AWBCG1608	55719
2	Cushion Grip 3/16"	1 Each		5120		Snap-On AWBCG1612	55719
3	Cushion Grip 1/4"	1 Each		5120		Snap-On AWBCG1616	55719
4	Cushion Grip 5/16"	1 Each		5120		Snap-On AWBCG1620	55719
5	Cushion Grip 4mm	1 Each		5120		Snap-On AWBMCG1604	55719
6	Cushion Grip 5mm	1 Each		5120		Snap-On AWBMCG1605	55719
7	Cushion Grip 6mm	1 Each		5120		Snap-On AWBMCG1606	55719
8	Cushion Grip 8mm	1 Each		5120		Snap-On AWBMCG1608	55719
9	L-wrench 1/16"	1 Each		5120		Eklind 15104	05253
3.4.123	Countersink	1 Each	M	5133	X	Chicago Latrobe 56879	60NQ9
3.4.124	V-Block	1 Each	M	3640	X	LS Starrett 52592	57163
3.4.125	Gasket Scraper	1 Each	L	5120	X	Snap-On CSA12C	55719
3.4.126	Torque Wrench	1 Each	L	5120	X	Snap-On QD3R250	55719
3.4.127	Torque Wrench	1 Each	L	5120		Snap-On QD4R600	55719
3.4.128	Torque Wrench	1 Each	L	5120	X	Snap-On QD1R50	55719
3.4.129	Torque Wrench	1 Each	L	5120	X	Snap-On QD2R1000	55719
3.4.130	Breaker Bar	1 Each	L	5120	X	Snap-On SN24C	55719
3.4.131	Socket Wrench Adapter	1 Each	L	5120	X	Snap-On A2A	55719
3.4.132	Drag Link Socket	1 Each	L	5120	X	Snap-On GF22	55719
3.4.133	Inch hex bit sockets	1 Each	L	5120	X	Snap-On 208EFAY (with rail)	55719
3.4.134	Metric hex bit sockets	1 Each	L	5120	X	Snap-On 206EFAML (with rail)	55719
3.4.135	Socket, 8 mm	1 Each	L	5120	X	Snap-On TMMD8	55719

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
3.4.136	Socket, 12 mm	1 Each	L	5120	X	Snap-On TMMD12	55719
3.4.137	Socket, 10 mm	1 Each	L	5120	X	Snap-On FM10	55719
3.4.138	Socket, 13 mm	1 Each	L	5120	X	Snap-On FM13	55719
3.4.139	Socket, 15 mm	1 Each	L	5120	X	Snap-On SWM151A	55719
3.4.140	Socket, 17 mm	1 Each	L	5120	X	Snap-On SWM171	55719
3.4.141	Socket, 19 mm	1 Each	L	5120	X	Snap-On SWM191	55719
3.4.142	Socket, 1 inch	1 Each	L	5120	X	Snap-On SW321	55719
3.4.143	Socket Wrench Set, 1/4 inch drive	1 Set	L	5120	X	See below:	
1	Ratchet handle	1 Each		5120		Snap-On TL72	55719
2	1/4" universal joint	1 Each		5120		Snap-On TMU8B	55719
3	1/4" spinner	1 Each		5120		Snap-On TM9CSA	55719
4	Extension	1 Each		5120		Snap-On TMXK2	55719
5	3/16", 6pt. socket	1 Each		5120		Snap-On TM6	55719
6	7/32", 6pt. socket	1 Each		5120		Snap-On TM7	55719
7	1/4", 6pt. socket	1 Each		5120		Snap-On TM8	55719
8	9/32", 6pt. socket	1 Each		5120		Snap-On TM9	55719
9	5/16", 12pt. socket	1 Each		5120		Snap-On TMD10	55719
10	11/32", 12pt. socket	1 Each		5120		Snap-On TMD11	55719
11	3/8", 12pt. socket	1 Each		5120		Snap-On TMD12	55719
12	7/16", 12pt. socket	1 Each		5120		Snap-On TMD14	55719
13	1/2", 12pt. socket	1 Each		5120		Snap-On TMD16	55719
14	Box	1 Each		5120		Snap-On KRA229	55719
15	Foam insert for kit	1 Each		5120			55719
3.4.144	Socket Wrench Set, 3/8 inch drive	1 Set	L	5120	X	See below:	
1	Flex hinged handle	1 Each		5120		Snap-On F10LC	55719
2	Ratchet handle	1 Each		5120		Snap-On F80	55719
3	Extension, 6"	1 Each		5120		Snap-On FXK6	55719
4	Extension, 12"	1 Each		5120		Snap-On FXK11	55719
5	Universal joint	1 Each		5120		Snap-On FU8A	55719
6	Speeder Handle	1 Each		5120		Snap-On F4LB	55719
7	3/8", 12pt. socket	1 Each		5120		Snap-On F121	55719
8	7/16", 12pt. socket	1 Each		5120		Snap-On F141	55719
9	1/2", 12pt. socket	1 Each		5120		Snap-On F161	55719
10	9/16", 12pt. socket	1 Each		5120		Snap-On F181	55719
11	5/8", 12pt. socket	1 Each		5120		Snap-On F201	55719
12	11/16", 12pt. socket	1 Each		5120		Snap-On F221	55719
13	3/4", 12pt. socket	1 Each		5120		Snap-On F241	55719
14	13/16", 12pt. socket	1 Each		5120		Snap-On F261	55719
15	7/8", 12pt. socket	1 Each		5120		Snap-On F281	55719
16	1/2", 12pt. deep socket	1 Each		5120		Snap-On SF161	55719
17	9/16", 12pt. deep socket	1 Each		5120		Snap-On SF181	55719
18	5/8", 12pt. deep socket	1 Each		5120		Snap-On SF201	55719
19	11/16", 12pt. deep socket	1 Each		5120		Snap-On SF221	55719
20	3/4", 12pt. deep socket	1 Each		5120		Snap-On SF241	55719
21	13/16", 12pt. deep socket	1 Each		5120		Snap-On SF261	55719
22	Universal Socket 1/2"	1 Each		5120		Snap-On FU16B	55719
23	9/16"	1 Each		5120		Snap-On FU18B	55719
24	Box	1 Each		5120		Snap-On KRA250	55719
25	Foam insert for kit	1 Each		5120			55719

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
3.4.145	Crowfoot Wrench, 20 mm	1 Each	L	5120	X	Snap-On FCOM20A	55719
3.4.146	Crowfoot Wrench, 22 mm	1 Each	L	5120	X	Snap-On FCOM22A	55719
3.4.147	Crowfoot Wrench, 1-7/16 inch	1 Each	L	5120	X	Snap-On FC46A	55719
3.4.148	Box End Wrench, 8 x 9 mm	1 Each	L	5120	X	Snap-On XSM89A	55719
3.4.149	Box End Wrench, 9 x 10 mm	1 Each	L	5120	X	Snap-On XSM910A	55719
3.4.150	Box End Wrench, 13 x 15 mm	1 Each	L	5120	X	Snap-On XBM1315A	55719
3.4.151	Box End Wrench, 17 x 19 mm	1 Each	L	5120	X	Snap-On XSM1719A	55719
3.4.152	Combination Wrench, 3/16 inch	1 Each	L	5120	X	Snap-On OXI6SB	55719
3.4.153	Combination Wrench, 1/4 inch	1 Each	L	5120	X	Snap-On OEX8B	55719
3.4.154	Combination Wrench Set	1 Each	L	5120	X	See below:	
1	7mm	1 Each		5120		Snap-On OEXM7B	55719
2	8mm	1 Each		5120		Snap-On OEXM80B	55719
3	9mm	1 Each		5120		Snap-On OEXM90B	55719
4	10mm	1 Each		5120		Snap-On OEXM100B	55719
5	11mm	1 Each		5120		Snap-On OEXM110B	55719
6	12mm	1 Each		5120		Snap-On OEXM120B	55719
7	13mm	1 Each		5120		Snap-On OEXM130B	55719
8	14mm	1 Each		5120		Snap-On OEXM140B	55719
9	15mm	1 Each		5120		Snap-On OEXM150B	55719
10	16mm	1 Each		5120		Snap-On OEXM160B	55719
11	17mm	1 Each		5120		Snap-On OEXM170B	55719
12	18mm	1 Each		5120		Snap-On OEXM180B	55719
13	19mm	1 Each		5120		Snap-On OEXM190B	55719
14	20mm	1 Each		5120		Snap-On OEXM200B	55719
15	21mm	1 Each		5120		Snap-On OEXM210B	55719
16	22mm	1 Each		5120		Snap-On OEXM220B	55719
17	23mm	1 Each		5120		Snap-On OEXM230B	55719
18	24mm	1 Each		5120		Snap-On OEXM240B	55719

Table 1							
Para	Item Name	QTY	Wty	FSC	Cabinet	Source	Mfr CAGE*
19	Bag	1 Each		5120			55719
3.4.155	Combination Wrench Set	1 Set	L	5120	X	See below:	
1	5/16 inch	1 Each		5120		Snap-On OEX10B	55719
2	3/8 inch	1 Each		5120		Snap-On OEX12B	55719
3	7/16 inch	1 Each		5120		Snap-On OEX14B	55719
4	½ inch	1 Each		5120		Snap-On OEX16B	55719
5	9/16 inch	1 Each		5120		Snap-On OEX18B	55719
6	5/8 inch	1 Each		5120		Snap-On OEX20B	55719
7	11/16 inch	1 Each		5120		Snap-On OEX22B	55719
8	¾ inch	1 Each		5120		Snap-On OEX24B	55719
9	13/16 inch	1 Each		5120		Snap-On OEX26B	55719
10	7/8 inch	1 Each		5120		Snap-On OEX28B	55719
11	15/16 inch	1 Each		5120		Snap-On OEX30B	55719
12	1 inch	1 Each		5120		Snap-On OEX32B	55719
13	Bag	1 Each		5120			55719
3.4.156	Open End Wrench, 21 x 24 mm	1 Each	L	5120	X	Snap-On VOM2124B	55719
3.4.157	Open End Wrench, 11 x 13 mm	1 Each	L	5120	X	Snap-On VOM1113B	55719
3.4.158	Adjustable Wrench, 12 inches	1 Each	L	5120	X	Snap-On JHWAP-12A	55719
3.4.159	Adjustable Wrench, 15 inches	1 Each	L	5120	X	Snap-On JHWAP-15A	55719
3.4.160	Auto Wrench	1 Each	L	5120	X	Martin Sprocket 89311	05506
3.4.161	Pipe Wrench, 14 inches	1 Each	L	5120	X	Snap-On PW14C	55719
3.4.162	Strap Wrench	1 Each	L	5120	X	Rigid Tool 31360	50893
3.4.163	Upper Receiver Action Block with Lower Receiver Action Block	1 Each	M	4933	X	Brownell 080-000-659	12238
3.4.164	Air Compressor	1 Each	M	1560		Porter Cable C3151	68821
3.4.165	Bore erosion gauge, 5280-01-560-1762	1 Each	M	5280		HJM Precision Inc. 12901228	1S9D5
3.4.166	Long Nose Locking Pliers	1 Each	L	5120	X	Snap-On LP6LN	55719

WTY (warranty) definitions:

L – Original Equipment Manufacturer's Lifetime warranty

M – Original Equipment Manufacturer's warranty

N – No warranty

\*Mfr CAGE: Manufacturer Contractor and Government Entity code

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 General provisions. The inspections (demonstration and/or examination) herein shall be performed to determine whether the item conforms to Section 3 of this Description for Purchase.

4.1.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Product performance verification (see 4.2)
- b. Conformance inspection (see 4.3)

4.1.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the inspection conditions specified herein.

4.2 Product performance verification. Unless otherwise specified in the contract, the contractor is responsible for the performance of all verification requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the verification requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the verifications set forth in the specifications where such verifications are deemed necessary to assure services and supplies conform to prescribed requirements.

4.2.1 Submission. The contractor shall submit a product verification tool set as specified in paragraph 3.1 for evaluation in accordance with the specified verification methods of paragraph 4.2.2.

4.2.2 Inspections to be performed. As determined by the Government, the product verification assemblies, components and test specimens may be subjected to any or all of the verification methods specified in paragraphs 4.4 and 4.5.

4.2.3 Rejection. If any test assemblies, test specimens or test components fail to comply with any of the applicable requirements, the product verification sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of a test assembly, specimen or component to comply with any of the requirements.

4.3 Conformance inspection.

4.3.1 Compliance. Conformance inspection shall be applied to production units being offered for acceptance under the contract. These inspections shall include all verifications listed in paragraph 4.5 and be limited to the examination of product to verify compliance with design requirements established during product verification.

4.3.2 Inspection lot formation. Lot formation shall be in accordance with Section 4 of MIL-STD-1916.

4.3.3 Sampling plan determination. Conformance verification methods are specified in paragraphs 4.5. When required by contract or cited herein, attribute-sampling inspections shall be conducted in accordance with MIL-STD-1916 using Verification Level I.

4.3.4 Rejection. Failure of any unit to pass any verification shall be cause for rejection of the lot.

4.5 Product conformance inspection. Verify all delivered items meet all requirements of this contract. The absence of any verification requirements shall not relieve the contractor of the responsibility of assuring that all products submitted to the Government for acceptance comply with all requirements of the contract. In the event a tool set is delivered with missing/broken items or is otherwise defective, the contractor shall provide replacement items (for those missing/broken) or a replacement tool set at no cost to the Government.

4.5.1 Product examination. Visually, dimensionally, and manually examine each sample tool set to determine conformance with the requirements of paragraphs 3.4.1 through 3.4.166. Visual examination shall include verification of completeness of manufacture and assembly, proper cleaning, and freedom from the identified defects. Dimensional examination includes measuring dimensions as specified. Manual examination shall include the operation of movable parts by hand to assure proper functioning. Failure of any sample unit to pass any examination shall result in the inspection of each unit of that lot for the failure. Units that fail any examination shall not be offered to the government for acceptance.

4.5.2 Industrial quality tools. When required, verify that tools provided conform to industrial quality standards through substantial evidence of sales to industrial customers. (See 3.2.4)

4.5.3 COTS Literature. Verify that components that may have supplemental Commercial Off The Shelf (COTS) literature, the literature is provided. (See 3.2.5)

4.5.4 Warranty. Verify that all parts, as indicated in paragraph 3.5, are warranted in accordance with manufacturing requirements as specified and all warranty literature is provided. (See 3.2.6)

4.5.4.1 Warranty Placard. Verify a warranty placard is attached to the inside of the door on the cabinet as described in 3.4.1. (See 3.2.6.3)

4.5.5 Identification Data Plate Information. Verify a second placard is attached inside of the door on the cabinet described in 3.4.1. (See 3.2.7) 4.5.6 Inventory List. Verify a listing identifying the make, manufacture, and other information needed to replace any item of paragraph 3.4 is provided. (See 3.3) 4.5.7 Quantities. Verify the quantities listed in the parts listing are provided in each kit. (See 3.6) 4.5.8 Packaging. Verify that unit packaging, unit package markings, shipping containers, shipping container markings, packing lists, quality certification heat treatment markings and unitization requirements are in accordance with Section 5 of this DFP. Failure to comply with the requirements may be cause for rejection.

4.6 Changes to materials, processes, or configuration. The contracting officer shall be informed of any changes to the materials, processes, configuration or other characteristic of the units. The contracting officer shall determine if the reported changes to items shall require the verifications of paragraphs 4.4 and 4.5 to be repeated.

4.7 Conformance of subsequent production quantity. All products offered for acceptance throughout the life of the contract shall conform to all of the requirements of the contract. The

Government reserves the right to re-verify conformance with requirements, at its own facility and at its own expense, at any time during the life of the contract and return to the contractor for warranty replacement such product that does not conform to the specified requirements.

5. PRESERVATION, PACKING, AND PACKAGING.

5.1. Preservation, Marking, Packing and Packaging. Preservation, packaging, packing, unitization and marking shall be in accordance with the contract or delivery order.

## Appendix A: Army Drawings

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	-	INITIAL RELEASE SEE L07J1031		
	A	SEE L07J1039	080328	MM
	B	SEE L08J1012	080702	MM

NOTE:

MATERIAL AND FINISHING:

- CONTAINER SHELL: EXTRA HIGH MOLECULAR WEIGHT CO-POLYMER POLYETHYLENE IN ACCORDANCE WITH ASTM-D4976, GROUP 2 CLASS 3, GRADE 5 AND/OR L-P-390C, TYPE III CLASS H, GRADE 2.  
COLOR: IMPREGNATED INTO SHELLS, COLOR TO BE TAN (SAND) COLOR NUMBER 36415, PER FED-STD-595.
- EDGE EXTRUSIONS: ALUMINUM 6063-T52. CONFORMING TO QQ-A-200/9. TO BE ROLL CRIMPED ONTO THE SHELLS AND PAINTED TO MATCH CONTAINER SHELL.
- LATCH: STEEL PER SAE 1010, IS SPRING LOADED, FINISH ZINC PLATED PER ASTM-B-633, .0005 THICK, COLOR NATURAL. TO BE INSTALLED ONTO THE MALE EXTRUSION OF CASE WITH "T" TOOL AND PAINTED TO MATCH CONTAINER SHELL.
- HANDLE: STEEL PER SAE1010, IS SPRING LOADED, FINISH TO BE ZINC PLATED PER ASTM-B-633, .0005 THICK, COLOR NATURAL, SLEEVE RUBBER. TO BE INSTALLED ONTO THE MALE EXTRUSION OF CASE WITH "T" TOOL AND 02 RIVETS AND PAINTED TO MATCH CONTAINER SHELL.
- GASKET: PER MIL-R-6855, CLASS 2, GRADE 60, .125 INSIDE DIAMETER, .006 WALL. TO BE INSTALLED INTO FEMALE EXTRUSION OF CASE.
- HINGE: STEEL PER SAE 1010. IS ZINC PLATED PER ASTM-B-633, .0005 THICK, COLOR NATURAL. TO BE INSTALLED ONTO THE EXTRUSIONS OF CASE WITH "T" TOOL AND PAINTED TO MATCH CONTAINER SHELL.
- SEE PAGE 2 FOR LAYOUT GUIDANCE.
- CUSHIONING: POLYETHYLENE FOAM IN ACCORDANCE WITH A-A-59136 AND/OR A-A-59135, CLASS 1, GRADE A, TYPE I. CUSHIONING TO BE BONDED INTO INTERIOR OF TRANSIT CASE.
- DOCUMENT PROTECTOR & HOLDER: .016" THICK CLEAR PVC. TO BE BONDED TO TOP INSERT OF TRANSIT CASE.
- OVERALL DIMENSIONS: NO LARGER THAN 45.5 ±2" X 14.25 ±2" X 7.4 ±2"

DISTRIBUTION STATEMENT A.  
APPROVED FOR PUBLIC RELEASE;  
DISTRIBUTION IS UNLIMITED.

A-A-59135
A-A-59136
MIL-R-6855
SAE-1010
ASTM-B-633
QQ-A-200/9
FED-STD-595
L-P-390C
ASTM-D4976
ASME Y14.5M 1994
MIL-STD-130
ASME Y14.100-2000
NUMBER
SPEC SUMMARY (REF)

"INTERPRET DRAWING IN ACCORDANCE WITH SPEC ASME Y14.100-2000 AND ASME Y14.5M 1994"

CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.

MARKING REQUIREMENTS PER MIL-STD-130		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		MECHANICAL PROPERTIES		DATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050	
<input checked="" type="checkbox"/> DO NOT APPLY MARKING		TOLERANCES: ANGLES± 3 PLACE DECIMALS± 2 PLACE DECIMALS± BREAK EDGES FILLETS FINISH _____ J		YS MIN		07-08-14		SHIPPING & STORAGE CONTAINER DIAL BORE GAGE	
<input type="checkbox"/> DO APPLY: 1NUW7-MFR-		MATERIAL		YS MAX		DATE		SUBMITTED	
METHOD: _____		NOTE 1		EL2		PREP. CHK. ENGR.	DPM DM	MICHAEL MIZENKO	
SIZE: _____		FINAL PROTECTIVE FINISH		RA		APPROVED		MORGAN LONGMATE	
		APPLICATION		BH		SUBMITTED		11581897	
		NEXT ASSY USED ON		RH		APPROVED		11581897	
		12901228				SCALE		SHEET 1 of 2	

12

11

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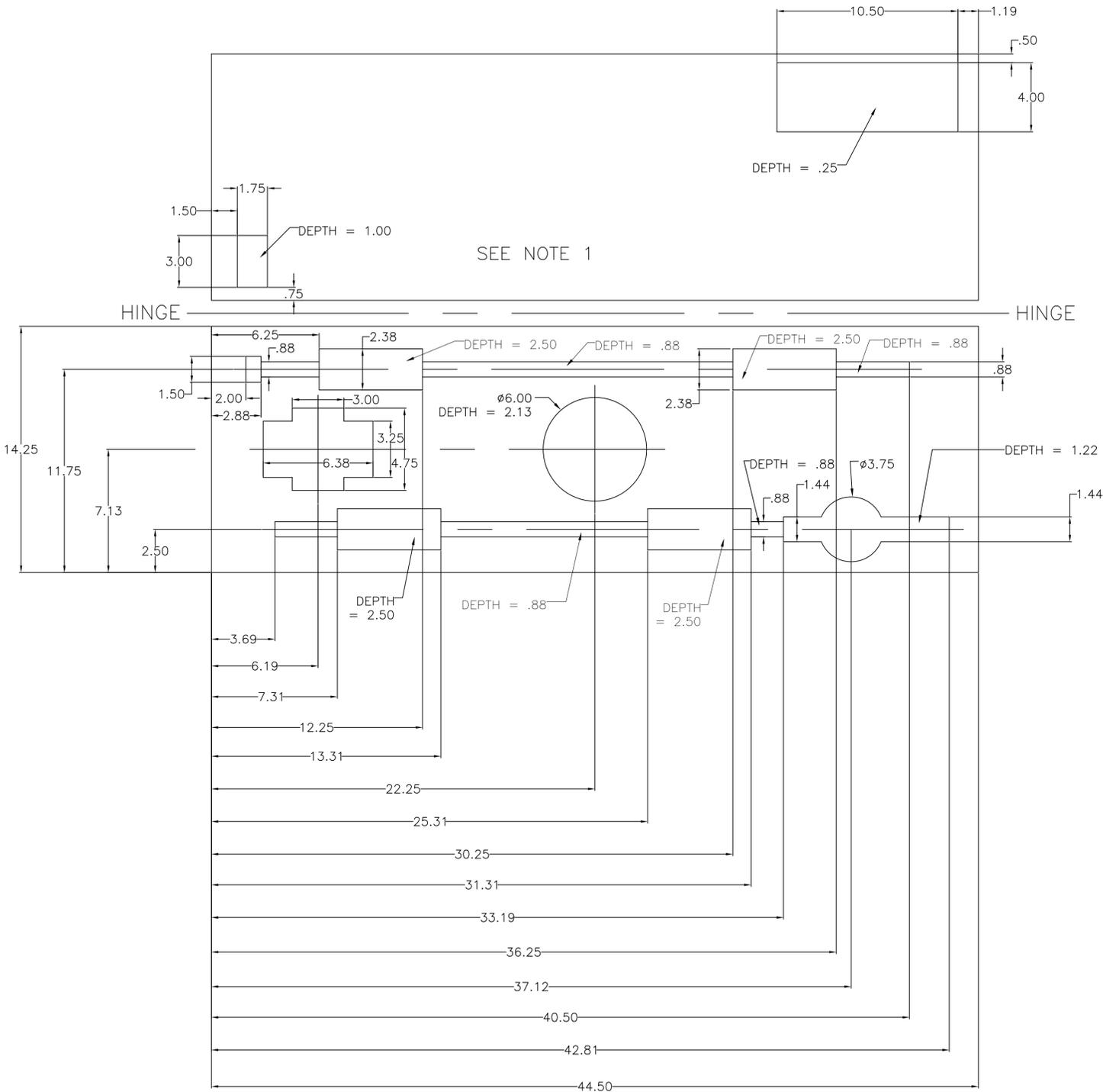
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D11581897

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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE L07J1039	08-03-28	M.M.
	B	SEE L08J1012	08-07-02	M.M.



NOTES:

1. CONTAINER FOR 60, 81 AND 120MM EXTENSIONS WITH FOAM INSERT.
2. CASE INSERT SHOWN WITH CASE OPEN.
3. MINIMUM OF 1" SPACING BETWEEN COMPONENTS.

A-A-59135
A-A-59136
MIL-R-6855
SAE-1010
ASTM-B-633
QQ-A-200/9
FED-STD-595
L-P-390C
ASTM-D4976
MIL-STD-130

"INTERPRET DRAWING IN ACCORDANCE WITH SPEC ASME Y14.100-2000 AND ASME Y14.5M-1994"

CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.

ASME Y14.100-2000 SPEC SUMMARY (REF)

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input checked="" type="checkbox"/> DO NOT APPLY MARKING <input type="checkbox"/> DO APPLY: 1NUW7- MFR- METHOD: SIZE:	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES: 3 PLACE DECIMALS± 2 PLACE DECIMALS± .125 BREAK EDGES FILLETS FINISH _____ J MATERIAL 12901325 NEXT ASSY USED ON APPLICATION	<b>MECHANICAL PROPERTIES</b> YS min YS max EL2 RA BH RH	DATE 07-08-14 PREP. GREGOR CHK. DPM ENGR. MICHAEL MIZENKO SUBMITTED APPROVED MICHAEL MIZENKO MORGAN LONGMATE	U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>SHIPPING &amp; STORAGE CONTAINER DIAL BORE GAGE</b> SIZE CAGE CODE DRAWING NO. <b>D11NUW7 11581897</b> SCALE SHEET 2OF 2
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D 12901220

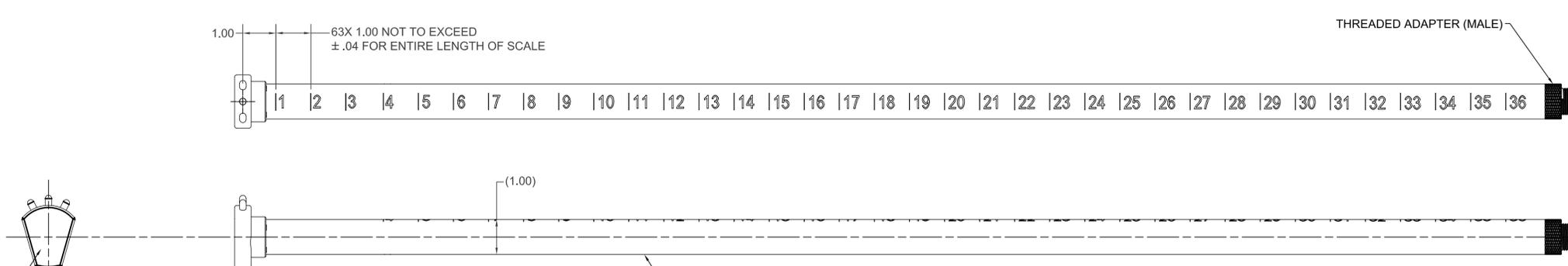
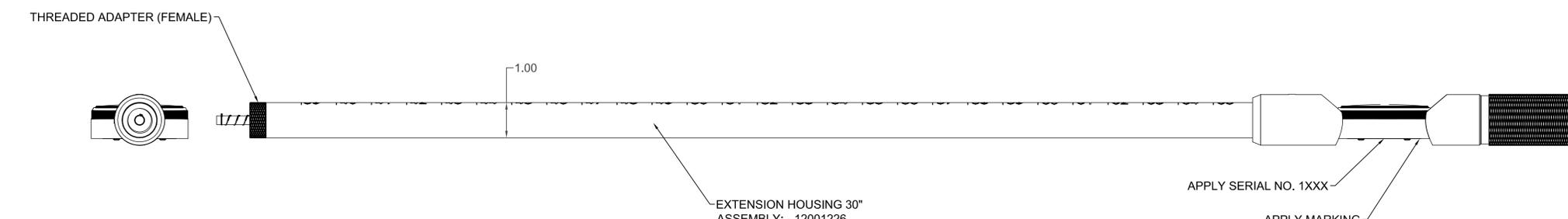
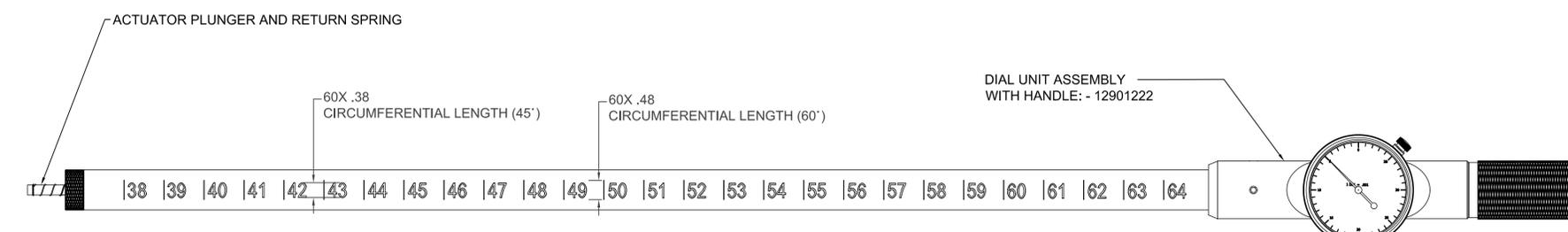
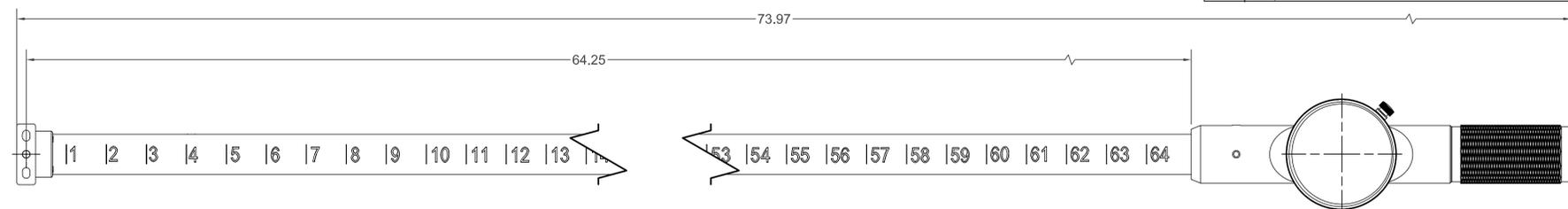
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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	09-03-16	M.M.

DIAL BORE GAGE, 60MM, 81MM, 120MM

1. MEASURING DEPTH, UP TO AND INCLUDING 64.25".
2. MAIN ROD SCALE: 1.00 INCREMENTAL SCALE, LASER ETCHED AS SHOWN. LINE WIDTH .020 ± .004. NUMERALS 1 THRU 65 TO BE .38 ± .02 HIGH, AND ORIENTED IN POSITIONS SHOWN. SEE DRAWING FOR OTHER DIMENSIONAL DETAILS. LINES AND NUMERALS TO BE BLACK, COLOR NO. 37030, 37031, OR 37038 PER FED-STD-595.
3. PROPER PROTECTIVE FINISH SHALL BE APPLIED TO ALL COMPONENTS TO INSURE PROTECTION FROM DISSIMILAR COMPONENT MATERIALS AND ENVIRONMENT.



VENDOR ITEM CONTROL DRAWING

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602 (845) 454-3111	06253	DS-B1-81104-64-MILA

MARKING REQUIREMENTS PER MIL-STD-130	
<input type="checkbox"/> DO NOT APPLY MARKING	
<input checked="" type="checkbox"/> DO APPLY:	1NUW7 - 12901220
	MFR -
METHOD: ENGRAVE OR ETCH	
SIZE: 1/8	

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES	
TOLERANCES:	ANGLES ± 5°
	3 PLACE DECIMALS ± .005
	2 PLACE DECIMALS ± .01
	BREAK EDGES .015 MAX
	FILLETS R.02 - .01
FINISH	125 J
MATERIAL	
FINAL PROTECTIVE FINISH	

MECHANICAL PROPERTIES	
YS min	
YS max	
EL2	
RA	
BH	
RH	

U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIT, NEW YORK 12189-4050	
<b>GAGE, DIAL BORE (NO RANGE EXTS.)</b>	
DATE: 08-03-28	
PREP: GREGOR	PROC:
CHK: DM	
ENGR: MICHAEL MIZENKO	
SUBMITTED: MICHAEL MIZENKO	
APPROVED: MORGAN LONGMATE	
SIZE: D1NUW7	DRAWING NO. 12901220
SCALE: 1/2	SHEET OF

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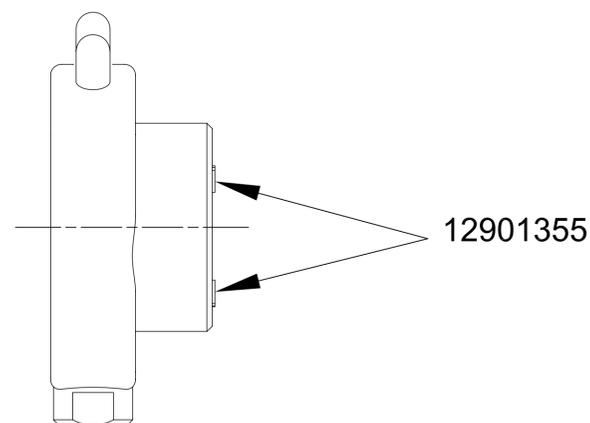
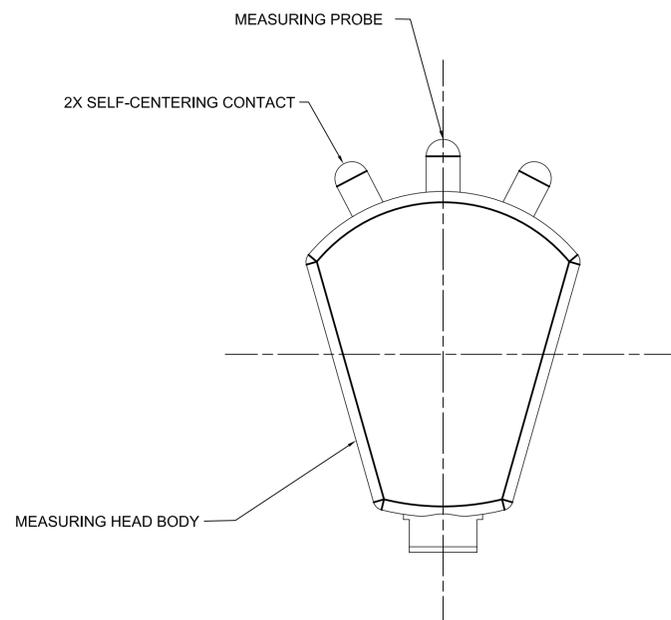
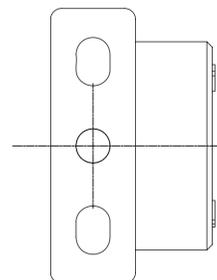
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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	09-03-16	M.M.

1. THE SINGLE POINT MEASURING HEAD SHALL HAVE A TRAVEL OF .075 MAX.



VENDOR ITEM CONTROL DRAWING

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602 (845) 454-3111	06253	DX2-86054ET

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input type="checkbox"/> DO NOT APPLY MARKING <input checked="" type="checkbox"/> DO APPLY: 1NUW7- 12901221 MFR-		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES± 5° 3 PLACE DECIMALS± .005 2 PLACE DECIMALS± .01 BREAK EDGES .015 MAX FILLETS R.02-.01	MECHANICAL PROPERTIES YS MIN YS MAX EL2 RA BH RH	DATE: 08-03-28 PREP. GREGOR CHK. DPM ENGR. MICHAEL MIZENKO SUBMITTED MICHAEL MIZENKO APPROVED MORGAN LONGMATE	MIL-STD-130 ASME Y14.100-2000 ASME Y14.5M-1994 U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>ASSEMBLY, GAGING HEAD</b> SIZE: <b>D 1NUW7</b> SCALE: 2/1 DRAWING NO.: <b>12901221</b> SHEET OF
METHOD: <b>ENGRAVE OR ETCH</b>	NEXT ASSY	USED ON	APPLICATION	FINAL PROTECTIVE FINISH	
SIZE: <b>1/8</b>					

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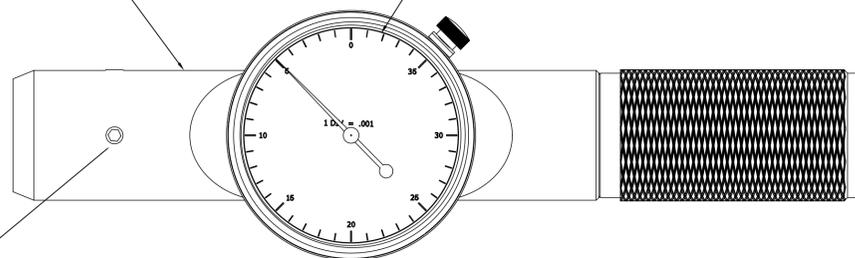
DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	09/03/16	M.M.
	C	SEE L09J1031	09/09/22	M.L.

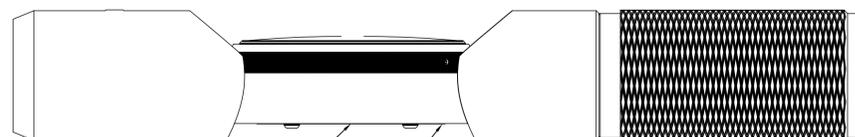
1. "DIAL INDICATOR: PER ASME B89.1.10M, TYPE A, GROUP 3"

12901326, FACE, DIAL INDICATOR SPECIAL

INDICATOR HANDLE AND HOUSING



2 SCREWS, SET 1/4-28UNF X 3/16" PER ASME B18.3.  
S300NA42FAD05193A1AB1



APPLY SERIAL NO. 1XXX FOR SPARE PART:  
APPLY SERIAL NO. 1XXX THAT MATCHES PART THAT IT IS REPLACING

APPLY MARKING

VENDOR ITEM CONTROL DRAWING

ASME B18.3
ASME B89.1.10M
MIL-STD-130
ASME Y14.100-2000
SPEC SUMMARY (REF)

\*INTERPRET DRAWING IN ACCORDANCE WITH SPEC ASME Y14.100-2000 AND ASME Y14.5M-1994\*

CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602  (845) 454-3111	06253	DS-3DM125-10AM

MARKING REQUIREMENTS PER MIL-STD-130		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		MECHANICAL PROPERTIES		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050	
<input type="checkbox"/> DO NOT APPLY MARKING		TOLERANCES:		YS min		DATE	08-03-28
<input checked="" type="checkbox"/> DO APPLY:		ANGLES: 5°		YS max		PREP:	GREGOR
1NUW7- 12901222	60MM, 81MM,	3 PLACE DECIMALS ± .005		EL2		CHK:	DPM
1NUW7- ASSY-12901325	12901220 120MM GAGE,	2 PLACE DECIMALS ± .01		RA		ENGR:	MICHAEL MIZENKO
	DIAL BORE	BREAK EDGES .015 MAX		BH		SUBMITTED	MICHAEL MIZENKO
METHOD: ENGRAVE OR ETCH		FILLET R.02-.01		RH		APPROVED	MORGAN LONGMATE
SIZE: 1/8		FINISH	125 J			SCALE	1/1
	NEXT ASSY	USED ON	FINAL PROTECTIVE FINISH			DRAWING NO.	12901222
	APPLICATION					SIZE	1NUW7
						SHEET OF	

DIAL UNIT ASSEMBLY WITH HANDLE

12901222

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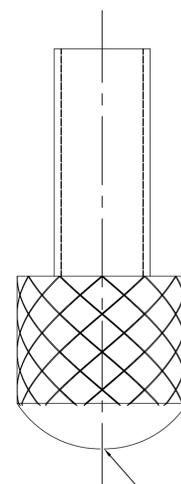
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D12901223

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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	INITIAL RELEASE SEE L07J1039		
A		SEE L08J1012	08-07-02	M.M.
B		SEE L08J1060	09-03-16	M.M.



HEAD EXTENSION, 60MM

VENDOR ITEM CONTROL DRAWING

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602 (845) 454-3111	06253	8516

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input type="checkbox"/> DO NOT APPLY MARKING <input checked="" type="checkbox"/> DO APPLY: 1NUW7- 12901223 MFR-		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES± 5° 3 PLACE DECIMALS± .005 2 PLACE DECIMALS± .01 BREAK EDGES .015 MAX FILLETS R.02-.01 FINISH		<b>MECHANICAL PROPERTIES</b> YS MIN YS MAX EL2 RA BH RH		DATE 08-03-28 PREP. GREGOR PROC. CHK. DPM ENGR. MICHAEL MIZENKO SUBMITTED APPROVED MICHAEL MIZENKO MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>60MM RANGE EXTENSION</b>		MIL-STD-130 ASME Y14.100-2000 SPEC SUMMARY (REF)	
METHOD: <u>BAG &amp; TAG</u> SIZE: <u>1/8</u>		60MM, 81MM, 12901325 120MM GAGE, DIAL BORE		MATERIAL		SCALE 5/1		DRAWING NO. 12901223		SHEET OF	
NEXT ASSY. USED ON APPLICATION		FINAL PROTECTIVE FINISH		DATE 08-03-28		SUBMITTED		DRAWING NO. 12901223		SHEET OF	

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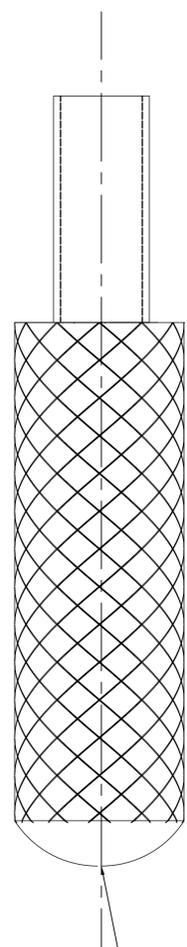
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D 12901224

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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	090316	M.M.



HEAD EXTENSION, 81MM

VENDOR ITEM CONTROL DRAWING

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602 (845) 454-3111	06253	8517

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input type="checkbox"/> DO NOT APPLY MARKING <input checked="" type="checkbox"/> DO APPLY: 1NUW7- 12901224 MFR-		60MM, 81MM, 12901325 120MM GAGE, DIAL BORE		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES± 5° 3 PLACE DECIMALS± .005 2 PLACE DECIMALS± .01 BREAK EDGES .015 MAX FILLETS R.02-.01 FINISH $125\sqrt{\text{ }}$		<b>MECHANICAL PROPERTIES</b> YS MIN YS MAX EL2 RA BH RH		DATE 08-03-28 PREP. GREGOR CHK. DPM ENGR. MICHAEL MIZENKO SUBMITTED MICHAEL MIZENKO APPROVED MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>81MM RANGE EXTENSION</b> SIZE CAGE CODE DRAWING NO. <b>D 1NUW7 12901224</b> SCALE 5/1 SHEET OF	
METHOD: BAG & TAG SIZE: 1/8		NEXT ASSY USED ON APPLICATION		FINAL PROTECTIVE FINISH		MIL-STD-130 ASME Y14.100-2000 SPEC SUMMARY (REF)		"INTERPRET DRAWING IN ACCORDANCE WITH SPEC ASME Y14.100-2000 AND ASME Y14.5M-1994" CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050	

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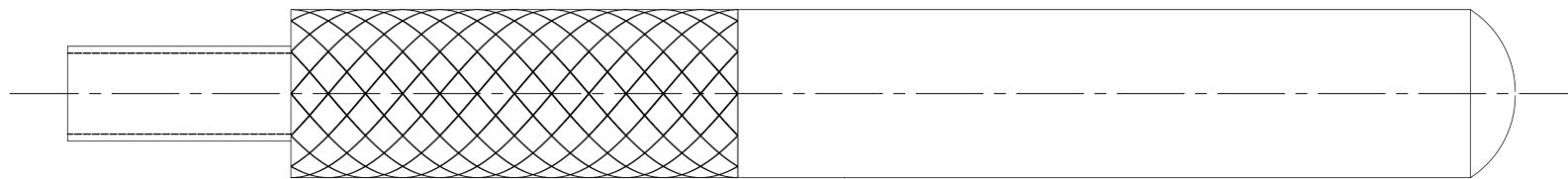
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D 12901225

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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	09-03-16	M.M.



HEAD EXTENSION, 120MM

VENDOR ITEM CONTROL DRAWING

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602 (845) 454-3111	06253	8518

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input type="checkbox"/> DO NOT APPLY MARKING <input checked="" type="checkbox"/> DO APPLY: 1NUW7- 12901325 MFR-		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES± 5° 3 PLACE DECIMALS± .005 2 PLACE DECIMALS± .01 BREAK EDGES .015 MAX FILLETS R.02-.01 FINISH $125 \sqrt{\text{ }}$		<b>MECHANICAL PROPERTIES</b> YS MIN YS MAX EL2 RA BH RH		DATE 08-03-28 PREP. GREGOR   PROC. CHK. DPM ENGR. MICHAEL MIZENKO SUBMITTED APPROVED MICHAEL MIZENKO MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>120MM RANGE EXTENSION</b>		MIL-STD-130 ASME Y14.100-2000 SPEC SUMMARY (REF)	
METHOD: <u>BAG &amp; TAG</u> SIZE: <u>1/8</u>		60MM, 81MM, 12901325 120MM GAGE, DIAL BORE		MATERIAL		SCALE 5/1		DRAWING NO. 12901225		SHEET OF	

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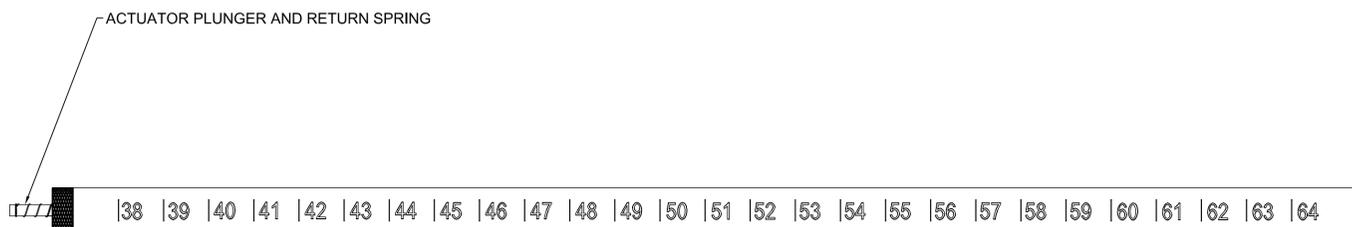
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D 12901226

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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	09-03-16	M.M.



THREADED ADAPTER (FEMALE)



VENDOR ITEM CONTROL DRAWING

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602 (845) 454-3111	06253	8500-30

MARKING REQUIREMENTS PER MIL-STD-130		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		MECHANICAL PROPERTIES		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050	
DO NOT APPLY MARKING		60MM, 81MM,	3 PLACE DECIMALS± .005	YS min		DATE	08-03-28
<input checked="" type="checkbox"/> DO APPLY:	1NUW7- 12901226	12901220 120MM GAGE,	2 PLACE DECIMALS± .01	YS max		PREP.	GREGOR
MFR-		DIAL BORE	BREAK EDGES .015 MAX	EL2		CHK.	DM
METHOD: ENGRAVE OR ETCH			FILLET R.02-.01	RA		ENGR.	MICHAEL MIZENKO
SIZE: 1/8			FINISH	BH		SUBMITTED	MICHAEL MIZENKO
				RH		APPROVED	MORGAN LONGMATE
						SCALE	1/2
						DRAWING NO.	12901226
						SHEET OF	

EXTENSION HOUSING 30" ASSEMBLY

SIZE D 1NUW7 CAGE CODE DRAWING NO. 12901226

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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	09-03-16	M.M.

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THREADED ADAPTER (MALE)



VENDOR ITEM CONTROL DRAWING

SOLE SOURCE OF SUPPLY		
VENDOR	CAGE CODE	PART NO.
DORSEY METROLOGY 53 OAKLEY ST. POUGHKEEPSIE, NY 12602 (845) 454-3111	06253	8500-34

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input type="checkbox"/> DO NOT APPLY MARKING <input checked="" type="checkbox"/> DO APPLY: 1NUW7 - 12901227 MFR -		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES ± 5° 3 PLACE DECIMALS ± .005 2 PLACE DECIMALS ± .01 BREAK EDGES .015 MAX FILLETS R.02 - .01 FINISH $125 \sqrt{\text{ }}$		<b>MECHANICAL PROPERTIES</b> YS MIN YS MAX EL2 RA BH RH		DATE: 08-03-28 PREP: GREGOR CHK: DM ENGR: MICHAEL MIZENKO SUBMITTED: MICHAEL MIZENKO APPROVED: MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>EXTENSION HOUSING 34" ASSEMBLY</b> SIZE: <b>D1NUW7</b> SCALE: 1/2		MIL-STD-130 ASME Y14.100-2000 SPEC SUMMARY (REF) DRAWING NO. <b>12901227</b> SHEET OF	
METHOD: <b>ENGRAVE OR ETCH</b> SIZE: <b>1/8</b>		NEXT ASSY USED ON APPLICATION		MATERIAL		FINAL PROTECTIVE FINISH		DRAWING NO. <b>12901227</b>		SHEET OF	

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DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	INITIAL RELEASE SEE L07J1039		
	A	SEE L08J1012	08-07-02	M.M.
	B	SEE L08J1060	09-03-16	M.M.

DIAL BORE GAGE ASSEMBLY - KIT DRAWING		
ITEM	CAGE CODE	PART NO.
DIAL BORE GAGE 60mm, 81mm, 120mm	1NUW7	12901325
SET RING ASS'Y.	1NUW7	12901281
DIAL BORE GAGE SHIPPING & STORAGE CONTAINER	1NUW7	11581897
DIAL BORE GAGE MANUAL	1NUW7	TM 9-4933-274-23&P
TRAINING CD		

FED STD-595  
ASME B89.1  
MIL-STD-130

\*INTERPRET DRAWING IN ACCORDANCE WITH SPEC  
ASME Y14.100-2000 AND ASME Y14.5M-1994\*

CAD MAINTAINED. CHANGES  
SHALL BE INCORPORATED BY  
THE DESIGN ACTIVITY.

ASME Y14.100-2000  
SPEC SUMMARY (REF)

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input type="checkbox"/> DO NOT APPLY MARKING <input checked="" type="checkbox"/> DO APPLY: 1NUW7- 12901228 MFR-		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES± .5° 3 PLACE DECIMALS± .005 2 PLACE DECIMALS± .01 BREAK EDGES .015 MAX FILLETS R.02-.01 FINISH $125 \sqrt{\text{ }}$		<b>MECHANICAL PROPERTIES</b> YS MIN YS MAX EL2 RA BH RH		DATE 08-03-28 PREP. GREGOR CHK. DM ENGR. MICHAEL MIZENKO SUBMITTED APPROVED MICHAEL MIZENKO MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>GAGE, DIAL BORE (KIT DRAWING)</b>		SIZE CAGE CODE DRAWING NO. <b>D 1NUW7 12901228</b>		SCALE NONE SHEET OF	
METHOD: <u>ENGRAVE OR ETCH</u> SIZE: <u>1/8</u>		MATERIAL 60MM, 81MM, 120MM GAGE, DIAL BORE		APPLICATION NEXT ASSY USED ON		FINAL PROTECTIVE FINISH							

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# SPECIAL PACKAGING INSTRUCTION

Form Approved  
OMB No. 0704-0188

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<b>1. PART OR DRAWING NO. NOMENCLATURE</b> 12901228 GAGE, DIAL BORE (KIT DRAWING)		<b>2. CODE INDENT</b> 1NUW7	<b>3. SPI NO.</b> AM12901228
<b>4. NATIONAL STOCK NO.</b>		<b>5. DATE OF DRAWING/SPI (YYMMDD)</b> 080702	<b>6. REVISION / ERR NO.</b> - / L08J1012
<b>7. QUP / UNIT OF ISSUE</b> 1EA.	<b>8. ICQ</b>	<b>9. UNIT PACK WT. (LB) (0.0)</b> 57	<b>10. UNIT PACK CU (CU. FT.) (0.000)</b> 4.62
		<b>11. UNIT PACK SIZE (INCHES)(00.0)</b> 48 X 17 X 9.9	

	18. STEPS	19. REQD	20. DESCRIPTION
<b>12. MILITARY PRESERVATION</b> MIL-STD-2073-1, Method 10			SEE NOTES
<b>13. CLEANING</b> SEE NOTE A			
<b>14. DRYING</b> SEE NOTE A			
<b>15. PACKING</b>			
<b>a. LEVEL A</b> MIL-STD-2073-1			
<b>b. LEVEL B</b> MIL-STD-2073-1			
<b>16. MARKING</b> MIL-STD-129			

**17. NOTES/DRAWING**

- UNLESS OTHERWISE SPECIFIED, CLEANING AND DRYING SHALL BE IN ACCORDANCE WITH PARAGRAPH 5.2.1 OF MIL-STD-2073-1. WEIGHTS AND SIZES ARE ESTIMATED AND MAY VARY SLIGHTLY INTERMEDIATE PACKAGING AND PACKING WILL BE IN ACCORDANCE WITH SPECIFICATION MIL-STD-2073-1 OR AS OTHERWISE SPECIFIED HEREIN.

**KIT CONTENTS INCLUDE:**

QUANTITY	NOMENCLATURE	DRAWING NUMBER
1	DIAL BORE GAGE	12901325
1	SET RING ASSEMBLY	12901281
1	DIAL BORE GAGE SHIPPING & STORAGE CONTAINER	11581897
1	DIAL BORE GAGE MANUAL	TM 9-4933-274-13&P
1	TRAINING CD	

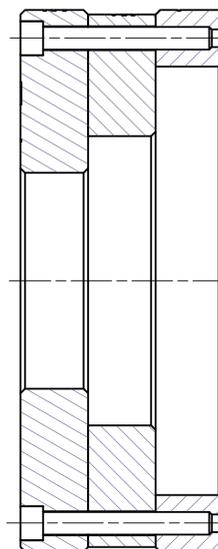
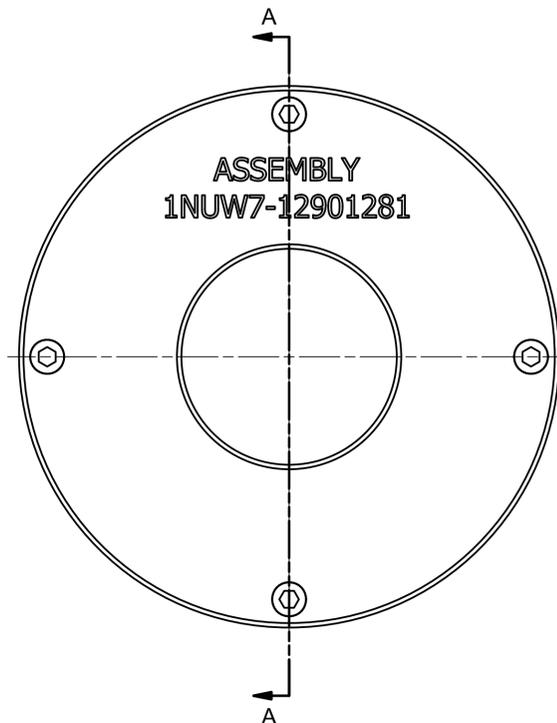
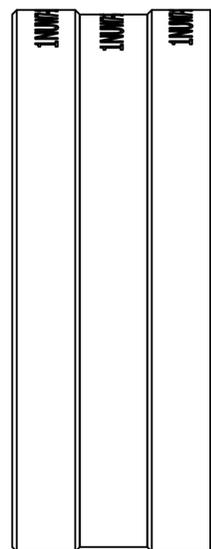
- A. ALL COMPONENTS SHALL BE INSERTED I N THE APPROPRIATE POSITION IN THE FOAM INSERT IN THE SHIPPING & STORAGE CONTAINER (11581897).
- B. SEE SHIPPING & STORAGE CONTAINER DIAL BORE GAGE SPI(AM11581897), PAGE 2, FOR A SUGGESTED FOAM TEMPLATE.
- C. THE SHIPPING & STORAGE CONTAINER SHALL BE CLOSED AND PACKAGED IAW SPI AM11581897.

**WSC:** GG      **ITEM SIZE** 47.5" x 16.5" x 9.4"      **ITEM WEIGHT:** 55 LB.      **APPROVED:** D. McDermott

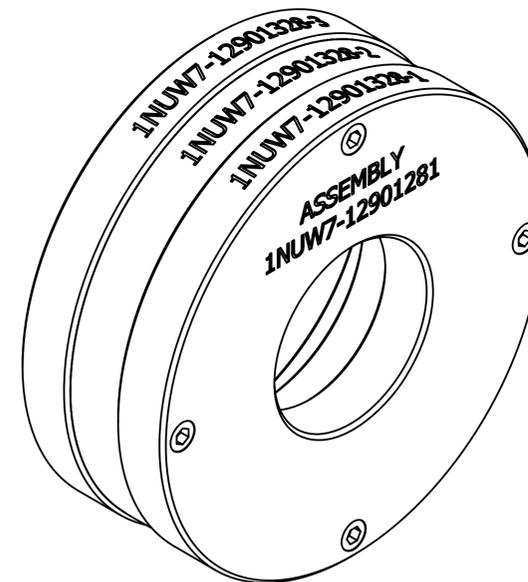
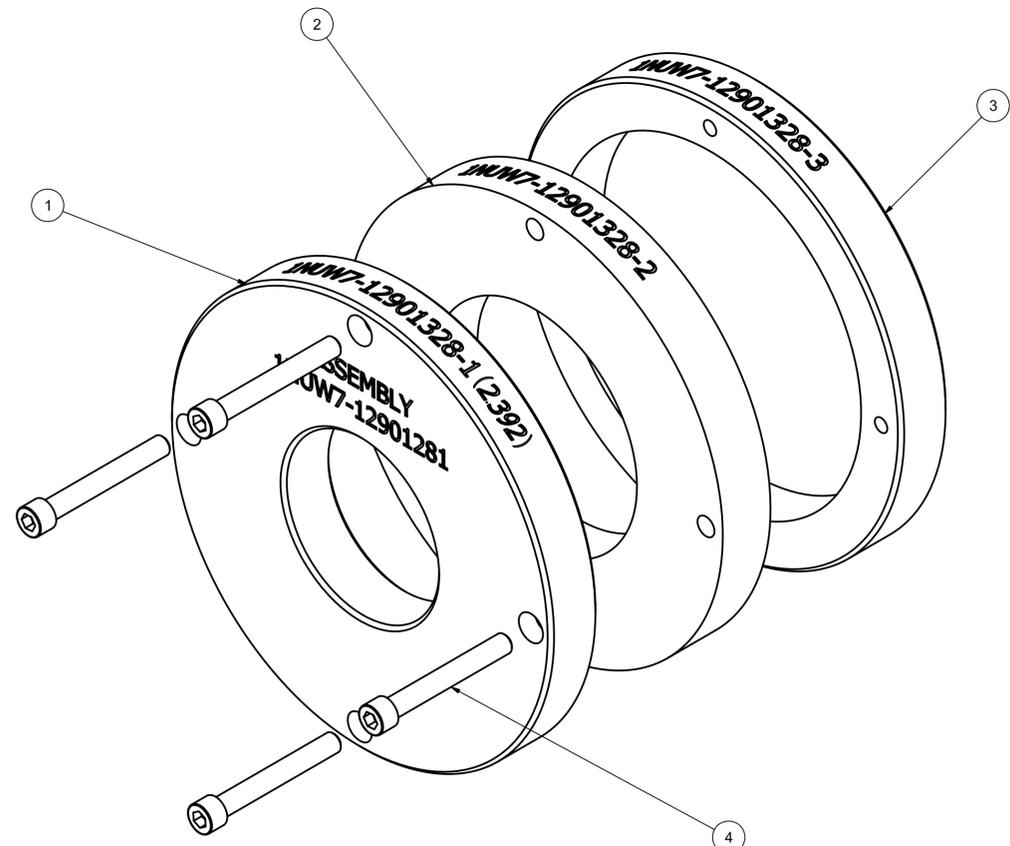
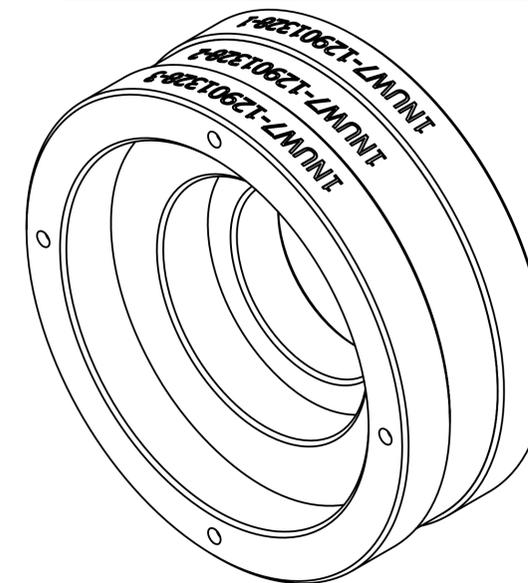
**STATEMENT A, UNLIMITED**

DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	NEW	SEE L07J1036		
	A	SEE L07J1039	08-03-28	M.M.
	B	SEE L08J1012	08-07-02	M.M.
	C	SEE L08J1060	09-03-16	M.M.



SECTION A-A  
SCALE 1:1



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	12901328-1	SET RING, DIA. 2.3920
2	1	12901328-2	SET RING, DIA. 3.2050
3	1	12901328-3	SET RING, DIA. 4.7470
4	4	ANSI B18.3 - 1/4 - 20 UNC - 1 7/8	HEX SOCKET HEAD CAP SCREW

"INTERPRET DRAWING IN ACCORDANCE WITH SPEC ASME Y14.100-2000 AND ASME Y14.5M-1994"

CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.

MIL-STD-130  
ASME Y14.100-2000  
SPEC SUMMARY (REF)

MARKING REQUIREMENTS PER MIL-STD-130	
<input checked="" type="checkbox"/>	DO NOT APPLY MARKING
<input type="checkbox"/>	DO APPLY: 1NUW7- MFR-
METHOD: <u>CHEMICAL ETCH</u>	
SIZE: <u>1/4"</u>	

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES	
TOLERANCES:	
ANGLES ± 5°	
3 PLACE DECIMALS ± .005	
2 PLACE DECIMALS ± .01	
BREAK EDGES .015 MAX	
FILLET R.02-.01	
FINISH	125√
MATERIAL	SEE PARTS LIST
NEXT ASSY	USED ON
FINAL PROTECTIVE FINISH	

MECHANICAL PROPERTIES	
YS MIN	
YS MAX	
EL2	
RA	
BH	
RH	

U.S. ARMY  
BENET LABORATORIES AMSTA-AR-CCB  
WATERVLIET, NEW YORK 12189-4050

**SET RING SPECIAL**

DATE: 07-08-29  
PREP. TJO PROC.  
CHK. DPM  
ENGR. MICHAEL MIZENKO  
SUBMITTED  
MICHAEL MIZENKO  
APPROVED MORGAN LONGMATE

SIZE: **D 1NUW7**  
CAGE CODE  
DRAWING NO. **12901281**  
SCALE: 1/1  
SHEET OF

DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE SEE L07J1031		
	A	REDRAWN WITH CHANGES, SEE L07J1039	08-03-28	M.M.
	B	SEE L08J1012	08-07-02	M.M.
	C	SEE L08J1060	09-03-16	M.M.

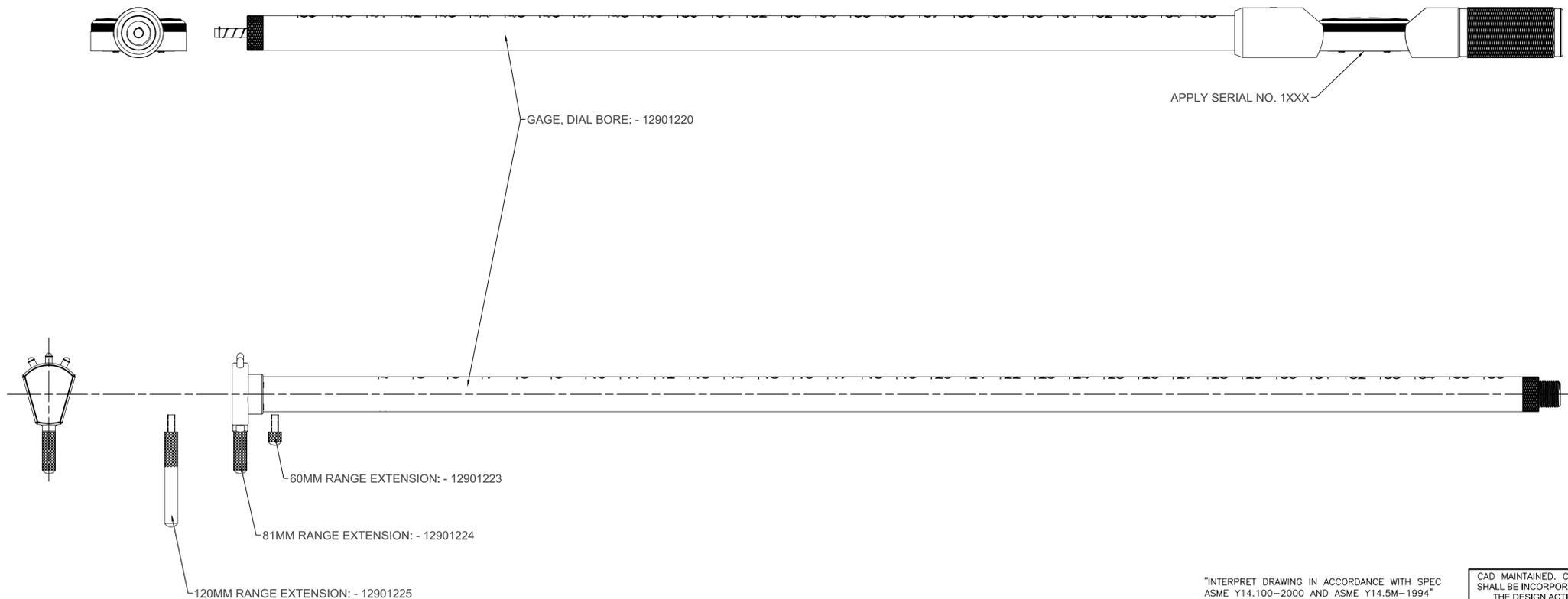
1. THE SINGLE POINT MEASURING HEAD SHALL HAVE A TRAVEL OF .075 MAX. SHALL HAVE THE ABILITY TO MEASURE THE INSIDE DIAMETERS OF THE 60MM, 81MM, AND 120MM MORTAR CANNONS, HAVING A MEASURING RANGE OF:

- Ø2.382 TO Ø2.427 USING 60MM, RANGE EXTENSION, 12901223
- Ø3.195 TO Ø3.240 USING 81MM, RANGE EXTENSION, 12901224
- Ø4.724 TO Ø4.784 USING 120MM, RANGE EXTENSION, 12901225

THREE (3) RANGE EXTENSIONS SHALL BE NON-ADJUSTABLE WITH A KNURL SURFACE FOR REMOVING AND TIGHTENING THREADED ENDS. MEASURING PROBE SHALL HAVE A SPHERICAL RADIUS OF .125. HEAD EXTENSION SHALL HAVE A SPHERICAL RADIUS OF .25. THE SELF-CENTERING CONTACTS SHALL HAVE A SPHERICAL RADIUS OF .187.

2. PROPER PROTECTIVE FINISH SHALL BE APPLIED TO ALL COMPONENTS TO INSURE PROTECTION FROM DISSIMILAR COMPONENT MATERIALS AND ENVIRONMENT.

3. DIAL BORE GAGE IS TO BE CALIBRATED ON A YEARLY BASIS.



MARKING REQUIREMENTS PER MIL-STD-130		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES: 5 3 PLACE DECIMALS 2 PLACE DECIMALS BREAK EDGES FILLETS FINISH		MECHANICAL PROPERTIES		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050	
<input checked="" type="checkbox"/> DO NOT APPLY MARKING	12901228	60MM, 81MM, 120MM GAGE, DIAL BORE		YS <sub>min</sub>		DATE 07-08-14	<b>GAGE, DIAL BORE 60MM, 81MM, 120MM</b>  D 12901325
<input type="checkbox"/> DO APPLY: 1NUW7- MFR-				YS <sub>max</sub>		PREP. TJO CHK. DPM ENGR. MICHAEL MIZENKO	
METHOD:	NEXT ASSY	USED ON		EL2		SUBMITTED MICHAEL MIZENKO	
SIZE:	APPLICATION	FINAL PROTECTIVE FINISH		RA		APPROVED MORGAN LONGMATE	
				BH		DATE 07-08-14	
				EL2		PREP. TJO CHK. DPM ENGR. MICHAEL MIZENKO	
				RA		SUBMITTED MICHAEL MIZENKO	
				BH		APPROVED MORGAN LONGMATE	
				RH		DATE 07-08-14	
						PREP. TJO CHK. DPM ENGR. MICHAEL MIZENKO	
						SUBMITTED MICHAEL MIZENKO	
						APPROVED MORGAN LONGMATE	

FED STD-595
ASME 89.1.10M
MIL-STD-130
ASME Y14.100-2000

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901325	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Gage, Dial Bore, 60mm, 81mm, 120mm	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	C
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

**PART I – LIST OF APPLICABLE DOCUMENTS**

NUMBER

NOMENCLATURE

QAP-APPENDIX-BL

General Requirements for Quality Assurance Provisions

**REFERENCED DRAWINGS**

12901220

Dial Bore Gage (No Range Extension)

12901221

Gage Head Assembly

12901222

Dial Unit Assembly, With Handle

12901223

Head Extension, 60mm

12901224

Head Extension, 81mm

12901225

Head Extension, 120mm

12901226

Extension Housing Assembly

12901227

Extension Housing Assembly

12901326

Face, Dial Indicator, Special

**REFERENCED SPECIFICATIONS & STANDARDS**

ASME B 89.1.10M

Dial Indicators (for Linear Measurements)

FED-STD-595

Colors Used In Government Procurement

MIL-DTL-13931

Cannon: General Specification for

NCSL Z540.3

Requirements for the Calibration of Measuring and Test Equipment

**PART II – QUALITY PROVISIONS**

NUMBER

NOMENCLATURE

- 1 The contract requirements and inspection provisions contained in QAP-APPENDIX-BL form part of this QAP.
- 2 Quality conformance inspection shall consist of inspection of all contract quality requirements in accordance with QAP-APPENDIX-BL and this QAP.
- 3 FIRST ARTICLE INSPECTION: When specified in the contract, the First Article Inspection shall be conducted in accordance with QAP-APPENDIX-BL and STM-1.
- 4 Inspection equipment used shall be capable of repeatable measurements by various experienced inspection/test personnel, to an accuracy of 10% of the total tolerance of the characteristic being inspected. In the event the contractor desires relief from this requirement, a technically supported request for relief or waiver shall be submitted to the procuring activity.

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIT, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 1 of 5

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901325	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Gage, Dial Bore, 60mm, 81mm, 120mm	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	C
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

- 5 Where SMTE is specified, the manufacturer can use any inspection method that meets the accuracy requirement above. In addition, when approved by the procuring activity, the characteristic can be inspected using a qualified tool (tool control) in lieu of inspecting the characteristic. The inspection results for the qualified tool shall be provided to the procuring activity upon request. Functional gages may be used when approved by the government.
- 6 When characteristics are inspected using approved functional gages, the inspection shall be performed at sampling frequency A and attribute data is authorized. If the specified gages are not used, variable data shall be required and the sampling rate shall be as specified for each characteristic. Characteristics with a sampling frequency of C shall be considered Minor characteristics if functional gages are not used.
- 7 All inspection and test equipment shall be calibrated in accordance with the requirements of NCSL Z540.3. Proof of calibration shall be provided upon demand.

**PART III – INSPECTION REQUIREMENTS**

SAMPLE SIZE FOR PRODUCTION SHALL BE AS LISTED THE FREQUENCY TABLE  
ACCEPT ON ZERO DEFECTS

NUMBER OF PARTS IN LOT	NUMBER OF PARTS TESTED FOR SAMPLE FREQUENCY A	NUMBER OF PARTS TESTED FOR SAMPLE FREQUENCY B	NUMBER OF PARTS TESTED FOR SAMPLE FREQUENCY C
Up to 8	ALL	ALL	5
9 to 15	ALL	13	5
16 to 25	ALL	13	5
26 to 50	ALL	13	7
51 to 90	ALL	13	11
91 to 150	ALL	13	11
151 to 280	ALL	29	13
281 – Over	ALL	8%	4%

NOTE: UNLESS OTHERWISE SPECIFIED ON THE DRAWING, ALL DIMENSIONS APPLY AFTER APPLICATION OF PROTECTIVE FINISH

SHEET 1 OF DRAWING  
MAJOR, Type 1

All major type 1 characteristics are sampled at sampling rate A or B. **Variable data required.** SMTE can be used.

NUMBER	CHARACTERISTICS	LOCATION	SAMPLE FREQUENCY	INSPECTION METHOD	
101	60mm Measurement Range: Ø2.382 to Ø2.427	Note 3	A	SMTE & STM-2	Calibration Required

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIT, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 2 of 5

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901325	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Gage, Dial Bore, 60mm, 81mm, 120mm	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	C
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

NUMBER	CHARACTERISTICS	LOCATION	SAMPLE FREQUENCY	INSPECTION METHOD	
102	81mm Measurement Range: Ø3.195 to Ø3.240	Note 3	A	SMTE & STM-2	Calibration Required
103	120mm Measurement Range: Ø4.724 to Ø4.784	Note 3	A	SMTE & STM-2	Calibration Required

**MAJOR, Type 2**

All major type 2 characteristics are sampled at sampling rate A or B. **Variable or attribute data is authorized.** SMTE can be used.

NUMBER	CHARACTERISTICS	LOCATION	SAMPLE FREQUENCY	INSPECTION METHOD
104	Workmanship IAW MIL-DTL-13931	ALL	A	Visual
105	Marking. Serial Number (Complete & Legible)	D-3	A	Visual
106	Marking. Serial Number (Complete & Legible)	D-3	A	Visual

**ALL SHEETS OF DRAWING**

NUMBER	CHARACTERISTICS	MINOR LOCATION	SAMPLING FREQUENCY
299	Unless otherwise specified in this QAP or in the contract, all drawing requirements (Including Applicable Drawing Notes) not elsewhere listed in Part III of this QAP are classified as MINOR.	ALL	These characteristics accepted based on results of a 1 <sup>st</sup> piece check performed within the last six months. Any characteristic found to be out of tolerance during the 1 <sup>st</sup> piece check shall be inspected at sampling level C

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIT, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 3 of 5

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901325	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Gage, Dial Bore, 60mm, 81mm, 120mm	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	C
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

**PART IV – CERTIFICATIONS**

Number CERTIFICATION (Documentation Must Be Provided)

- 301 Gage Accuracy: Certificate that all gages used shall meet the requirements of Quality Provision 4 of this QAP.
- 302 1<sup>ST</sup> Piece Check Inspection Results:
  - Date of inspection – Must be within the previous 6 months
  - List of all MINOR characteristic that were found to be out of tolerance.
- 303 GAGE RECORD CARD: A gage record card, DA FORM 3023 shall be provided with each gage. The GAGE RECORD CARD shall include all characteristics requiring calibration in Part III
- 304 Gage per ASME B 89.1.10M, Type A, Group 3

The remaining certification requirements are identified on each QAP listed in Part I.

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIET, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 4 of 5

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901325	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Gage, Dial Bore, 60mm, 81mm, 120mm	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	C
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

**PART V – TEST METHODS AND PROCEDURES**

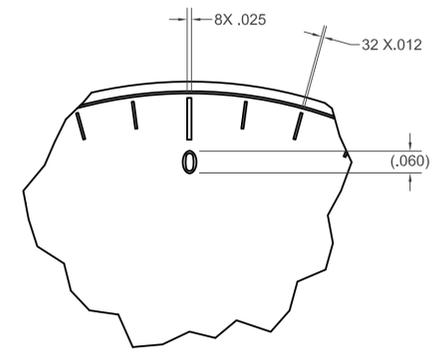
NUMBER	TITLE	DETAILS
STM-1	First Article Requirements	Two DIAL BORE GAGES, 12901325, shall be furnished for 100% inspection, of all requirements, to assure compliance with QAP(s), specification(s), drawing(s), and the contract.
STM-2	Gage Measurement Range	<p>With the 60mm head extension installed:</p> <p>Zero the gage using set ring, 12901238:</p> <p>Measure and record the gage error at <math>\varnothing</math>2.382 inches, <math>\varnothing</math>2.391 inches, <math>\varnothing</math>2.400 inches, <math>\varnothing</math>2.409 inches, <math>\varnothing</math>2.418 inches &amp; <math>\varnothing</math>2.427 inches.</p> <p>With the 81mm head extension installed:</p> <p>Zero the gage using set ring, 12901238:</p> <p>Measure and record the gage error at <math>\varnothing</math>3.195 inches, <math>\varnothing</math>3.204 inches, <math>\varnothing</math>3.213 inches, <math>\varnothing</math>3.222 inches, <math>\varnothing</math>3.231 inches &amp; <math>\varnothing</math>3.240 inches.</p> <p>With the 120mm head extension installed:</p> <p>Zero the gage using set ring, 12901238:</p> <p>Measure and record the gage error at <math>\varnothing</math>4.724 inches, <math>\varnothing</math>4.736 inches, <math>\varnothing</math>4.748 inches, <math>\varnothing</math>4.760 inches, <math>\varnothing</math>4.772 inches &amp; <math>\varnothing</math>4.784 inches.</p> <p>The maximum acceptable gage error is <math>\pm</math> .0005 inches for any of the measurements taken above.</p>

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIT, NY 12189-4050**

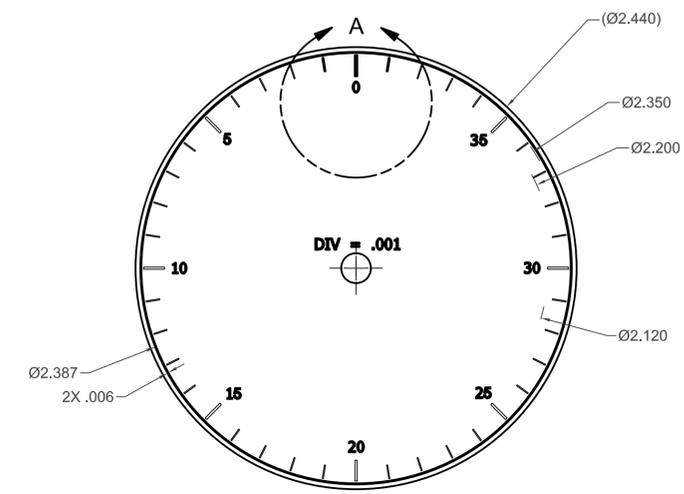
PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 5 of 5

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		INITIAL RELEASE SEE L07J1031		
	A	SEE L07J1039	08-03-28	M.M.
	B	SEE L08J1012	08-07-02	M.M.



DETAIL A  
SCALE 4 : 1



NOTES:

1. DIAL FACE SHALL HAVE SHARP, DISTINCT GRADUATIONS AND ALPHA-NUMERIC CHARACTERS. GRADUATION VALUE OF (.001) INCH. A ONE-REVOLUTION DIAL FACE OF (.040) INCHES. THE DIAL FACE MUST FIT A TYPE A, GROUP 3, DIAL INDICATOR PER ASME B89.1.10M OR APPROVED EQUAL.
2. ALL LINES (.006, .012 WIDE), CIRCLES AND "1 DIV=.001" ALPHA-NUMERIC CHARACTERS TO BE COLOR NO. 37030 (BLACK) PER FED-STD-595.  
ALL ALPHA-NUMERIC CHARACTERS TO BE .060 MINIMUM HIGH.
3. BACKGROUND OF DIAL FACE TO BE COLOR NO. 37925 (WHITE) PER FED-STD-595.
4. ALL ALPHA-NUMERIC CHARACTERS TO BE ORIENTATED IN POSITONS SHOWN.
5. ART WORK FOR DIAL INDICATOR FACE MUST BE APPROVED THRU BENET LABS PRIOR TO MANUFACTURE.

DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> <input checked="" type="checkbox"/> DO NOT APPLY MARKING <input type="checkbox"/> DO APPLY: 1NUW7- MFR-		60MM, 81MM, 12901222 120MM GAGE, DIAL BORE		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES± 5° 3 PLACE DECIMALS± .005 2 PLACE DECIMALS± .01 BREAK EDGES .015 MAX FILLETS R.02-.01 FINISH		MECHANICAL PROPERTIES YS MIN YS MAX EL2 RA BH RH		DATE 07-08-14 PREP: TJO CHK: DPM ENGR: MICHAEL MIZENKO SUBMITTED: MICHAEL MIZENKO APPROVED: MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>FACE, DIAL INDICATOR, SPECIAL</b>		MIL-STD-130 ASME Y14.100-2000 SPEC SUMMARY (REF)	
METHOD: _____		NEXT ASSY USED ON _____		FINAL PROTECTIVE FINISH _____		APPROVED: MORGAN LONGMATE		SIZE: <b>D 1NUW7</b> SCALE: 2/1		DRAWING NO.: <b>12901326</b> SHEET OF _____			

12

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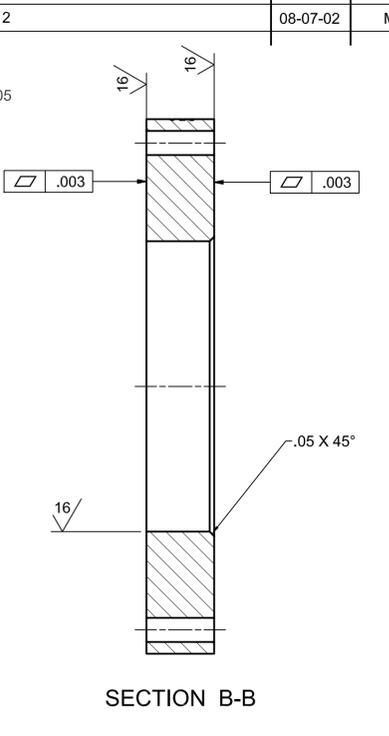
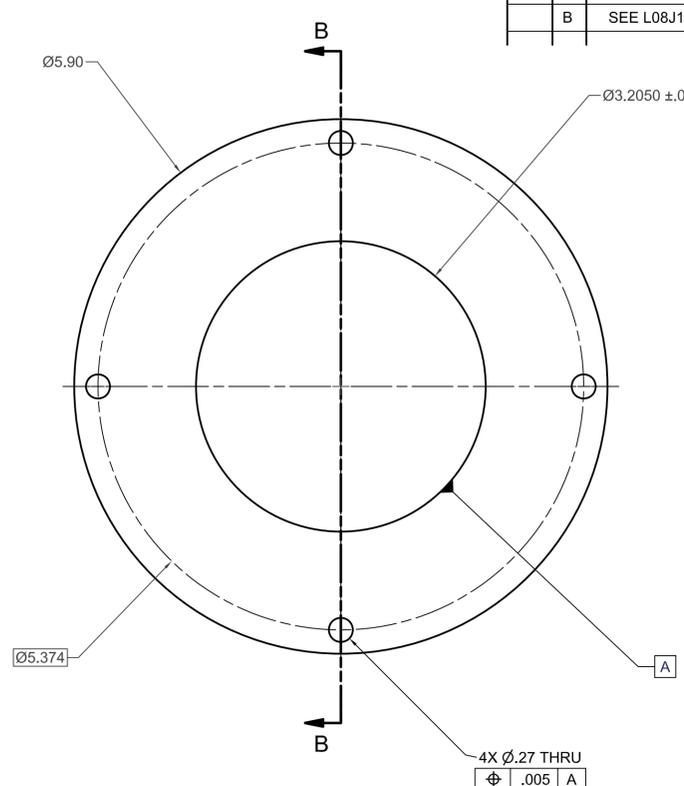
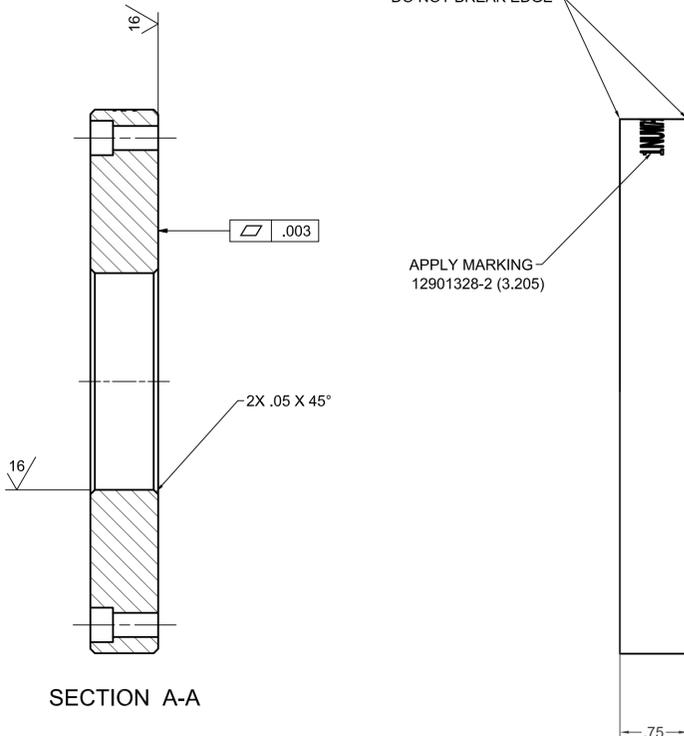
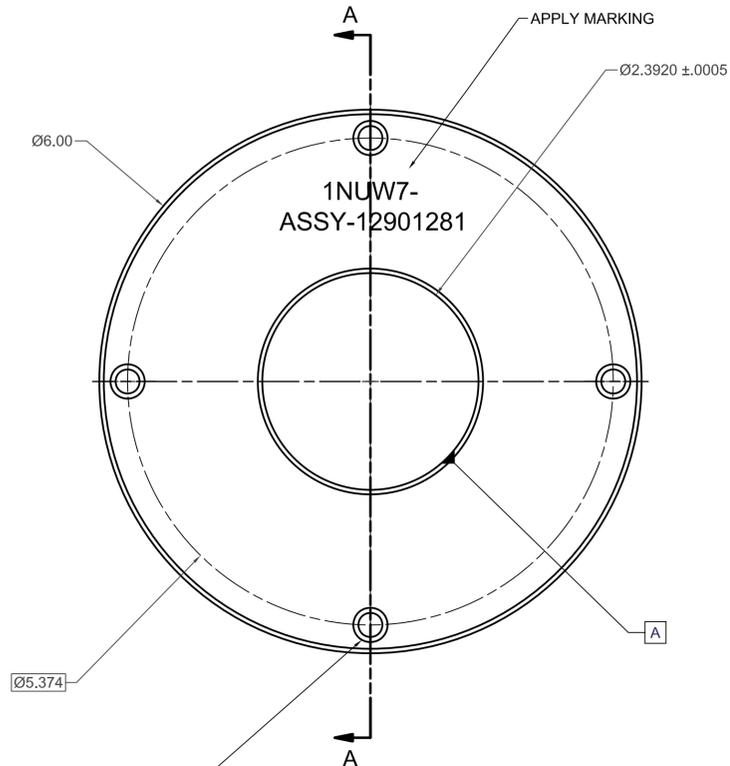
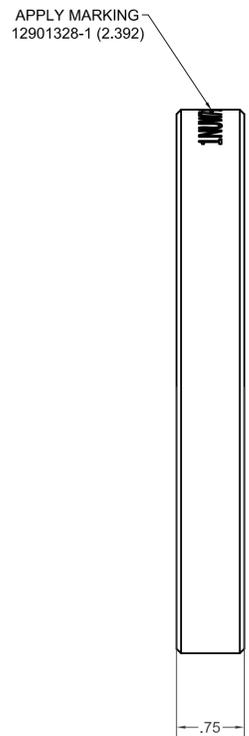
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D 12901328

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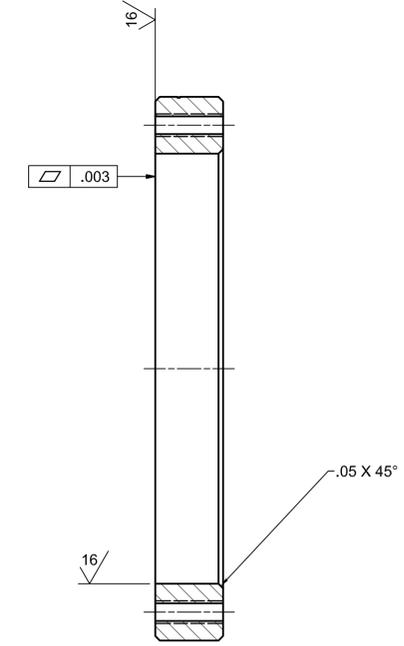
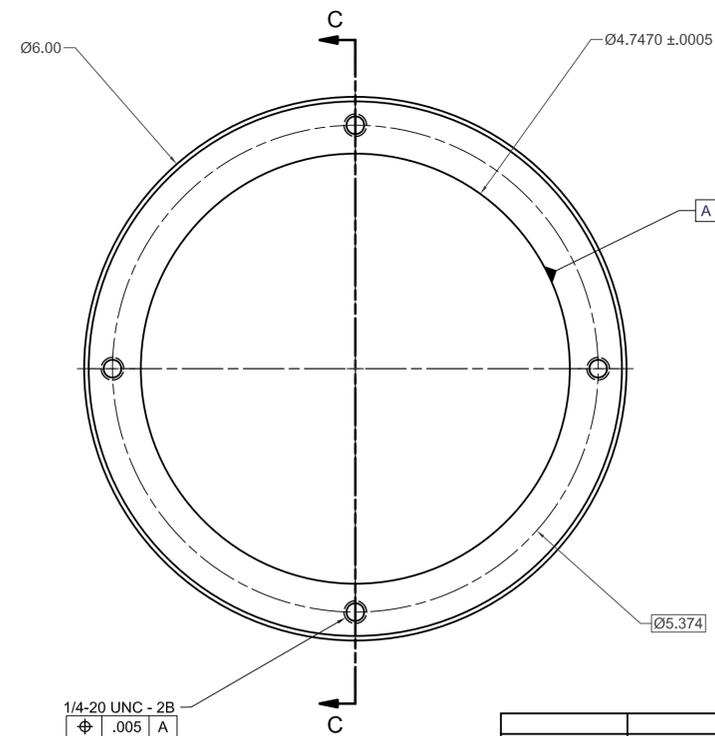
DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REVISION HISTORY				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	NEW	SEE L07J1036		
	A	SEE L07J1039	08-03-26	M.M.
	B	SEE L08J1012	08-07-02	M.M.



4X Ø.27 THRU  
 Ø.38 ±.02 √.25  
 .005 A

APPLY MARKING  
 12901328-3 (4.747)



NOTE:  
 INSIDE DIAMETERS 2.3920 ± .0005, 3.2050 ± .0005, AND 4.7470 ± .0005 SHALL BE LISTED ON GAGE RECORD CARD DA FORM 3023 IN THE BLOCK ENTITLED "REQUIRED COMPONENT DIMENSION ." EACH DIMENSION SHALL BE MEASURED AND THE MEASUREMENT RECORDED IN THE BLOCK ENTITLED "ACTUAL GAGE DIMENSION." EACH CARD SHALL BE SIGNED AND DATED BY THE CONTRACTOR CERTIFYING THAT THE GAGE COMPLIES WITH THE REQUIRED DIMENSIONS SPECIFIED ON THE GAGE DRAWING. EACH GAGE RECORD CARD SHALL BE PLACED IN THE PACKAGING ALONG WITH THE GAGE. EACH PACKAGE ASSEMBLY SHALL CONTAIN ONE GAGE AND THE GAGE RECORD CARD SPECIFIC TO THAT GAGE. THE GAGE RECORD CARD MUST BE COMPLETED AT THE TIME OF ACCEPTANCE BY THE ACCEPTANCE POINT (ORIGIN OR DESTINATION) IDENTIFIED IN THE CONTRACT.

"INTERPRET DRAWING IN ACCORDANCE WITH SPEC ASME Y14.100-2000 AND ASME Y14.5M-1994"

MIL-STD-130  
 CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.  
 ASME Y14.100-2000  
 SPEC SUMMARY (REF)

<b>MARKING REQUIREMENTS PER MIL-STD-130</b> DO NOT APPLY MARKING DO APPLY: 11NUW7- (SEE VIEWS) MFR- METHOD: CHEMICAL ETCH SIZE: 1/4"		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES ± 5° 3 PLACE DECIMALS ± .005 2 PLACE DECIMALS ± .01 BREAK EDGES .015 MAX FILLETS R.02-.01 FINISH 125		<b>MECHANICAL PROPERTIES</b> YS MIN YS MAX EL2 RA BH RH C56 C62		DATE: 07-08-29 PREP: TJO CHK: DPM ENGR: MICHAEL MIZENKO SUBMITTED: MICHAEL MIZENKO APPROVED: MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>SET RING SPECIAL</b>		SIZE: D 11NUW7 CAGE CODE: 12901328 DRAWING NO.: 12901328 SCALE: 1/1 SHEET OF:	
NEXT ASSY: APPLICATION USED ON:		MATERIAL: TOOL STEEL - 01 FINAL PROTECTIVE FINISH: ELECTROLESS NICKEL		DATE: 07-08-29 PREP: TJO CHK: DPM ENGR: MICHAEL MIZENKO SUBMITTED: MICHAEL MIZENKO APPROVED: MORGAN LONGMATE		U.S. ARMY BENET LABORATORIES AMSTA-AR-CCB WATERVLIET, NEW YORK 12189-4050 <b>SET RING SPECIAL</b>		SIZE: D 11NUW7 CAGE CODE: 12901328 DRAWING NO.: 12901328 SCALE: 1/1 SHEET OF:			

12

11

10

9

8

7

6

5

4

3

2

1

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901328	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Set Ring, Special	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	B
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

### PART I – LIST OF APPLICABLE DOCUMENTS

NUMBER

NOMENCLATURE

QAP-APPENDIX-BL                      General Requirements for Quality Assurance Provisions

### **REFERENCED SPECIFICATIONS & STANDARDS**

ASME B 46.1	Surface Texture (Surface Roughness, Waviness, And Lay)
ASTM E 18	Standard Test Methods For Rockwell Hardness and Rockwell Superficial Hardness Of Metallic Materials
MIL-DTL-13931	Cannon: General Specification for
NCSL Z540.3	Requirements for the Calibration of Measuring and Test Equipment

### PART II – QUALITY PROVISIONS

NUMBER                      NOMENCLATURE

- 1                      The contract requirements and inspection provisions contained in QAP-APPENDIX-BL form part of this QAP.
- 2                      Quality conformance inspection shall consist of inspection of all contract quality requirements in accordance with QAP-APPENDIX-BL and this QAP.
- 3                      FIRST ARTICLE INSPECTION: When specified in the contract, the First Article Inspection shall be conducted in accordance with QAP-APPENDIX-BL and STM-1.
- 4                      Inspection equipment used shall be capable of repeatable measurements by various experienced inspection/test personnel, to an accuracy of 10% of the total tolerance of the characteristic being inspected. In the event the contractor desires relief from this requirement, a technically supported request for relief or waiver shall be submitted to the procuring activity.
- 5                      Where SMTE is specified, the manufacturer can use any inspection method that meets the accuracy requirement above. In addition, when approved by the procuring activity, the characteristic can be inspected using a qualified tool (tool control) in lieu of inspecting the characteristic. The inspection results for the qualified tool shall be provided to the procuring activity upon request. Functional gages may be used when approved by the government.
- 6                      When characteristics are inspected using approved functional gages, the inspection shall be performed at sampling frequency A and attribute data is authorized. If the specified gages are not used, variable data shall be required and the sampling rate shall be as specified for each characteristic. Characteristics with a sampling frequency of C shall be considered Minor characteristics if functional gages are not used.

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIT, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 1 of 4

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901328	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Set Ring, Special	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	B
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

7 All inspection and test equipment shall be calibrated in accordance with the requirements of NCSL Z540.3. Proof of calibration shall be provided upon demand.

**PART III – INSPECTION REQUIREMENTS**

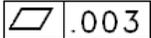
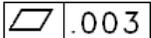
SAMPLE SIZE FOR PRODUCTION SHALL BE AS LISTED THE FREQUENCY TABLE  
ACCEPT ON ZERO DEFECTS

NUMBER OF PARTS IN LOT	NUMBER OF PARTS TESTED FOR SAMPLE FREQUENCY A	NUMBER OF PARTS TESTED FOR SAMPLE FREQUENCY B	NUMBER OF PARTS TESTED FOR SAMPLE FREQUENCY C
Up to 8	ALL	ALL	5
9 to 15	ALL	13	5
16 to 25	ALL	13	5
26 to 50	ALL	13	7
51 to 90	ALL	13	11
91 to 150	ALL	13	11
151 to 280	ALL	29	13
281 – Over	ALL	8%	4%

NOTE: UNLESS OTHERWISE SPECIFIED ON THE DRAWING, ALL DIMENSIONS APPLY AFTER APPLICATION OF PROTECTIVE FINISH

SHEET 1 OF DRAWING  
MAJOR, Type 1

All major type 1 characteristics are sampled at sampling rate A or B. **Variable data required.** SMTE can be used.

NUMBER	CHARACTERISTICS	LOCATION	SAMPLE FREQUENCY	INSPECTION METHOD	
101	∅2.3920	H-9	A	SMTE	Calibration Required
102		H-8	A	ASME B46.1	
103		F-8	A	ASME B46.1	
104		G-7	A	SMTE	
105	∅3.2050	G-3	A	SMTE	Calibration Required
106		G-7	A	SMTE	
107		G-2	A	ASME B46.1	

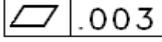
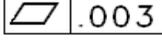
**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIT, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 2 of 4

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901328	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Set Ring, Special	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	B
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

NUMBER	CHARACTERISTICS	LOCATION	SAMPLE FREQUENCY	INSPECTION METHOD	
108		H-2	A	ASME B46.1	
109		G-7	A	SMTE	
110		F-2	A	ASME B46.1	
111	Ø4.7470	D-5	A	SMTE	Calibration Required
112		F-2	A	ASME B46.1	
113		G-7	A	SMTE	
114		F-2	A	ASME B46.1	
115	58-62 HRC	A-4	A	ASTM E 18	

MAJOR, Type 2

All major type 2 characteristics are sampled at sampling rate A or B. **Variable or attribute data is authorized.** SMTE can be used.

NUMBER	CHARACTERISTICS	LOCATION	SAMPLE FREQUENCY	INSPECTION METHOD	
116	Marking (Complete & Legible)	H-12	A	Visual	
117	Marking (Complete & Legible)	G-6	A	Visual	
118	Marking (Complete & Legible)	D-9	A	Visual	
119	Workmanship IAW MIL-DTL-13931	ALL	A	Visual	

ALL SHEETS OF DRAWING

NUMBER	CHARACTERISTICS	MINOR LOCATION	SAMPLING FREQUENCY
299	Unless otherwise specified in this QAP or in the contract, all drawing requirements (Including Applicable Drawing Notes) not elsewhere listed in Part III of this QAP are classified as MINOR.	ALL	These characteristics accepted based on results of a 1 <sup>st</sup> piece check performed within the last six months. Any characteristic found to be out of tolerance during the 1 <sup>st</sup> piece check shall be inspected at sampling level C

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIT, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 3 of 4

QUALITY ASSURANCE PROVISION	REVISION STATUS				
QAP & DRAWING NUMBER: 12901328	ERR No.	QAP Date	Rev.	DWG Date	DWG Rev.
FOR: Set Ring, Special	L07J1039	080328	ORIG	080328	A
END ITEM: Gage, Dial Bore 60mm, 81mm, 120mm	L08J1060	090316	A	090316	B
DRAWING CAGE CODE: 1NUW7					

**IF THERE IS A CONFLICT BETWEEN THE QAP AND THE DRAWING, THE DRAWING TAKES PRECEDENCE**

#### **PART IV – CERTIFICATIONS**

Number CERTIFICATION (Documentation Must Be Provided)

- 301 Gage Accuracy: Certificate that all gages used shall meet the requirements of Quality Provision 4 of this QAP.
- 302 1<sup>ST</sup> Piece Check Inspection Results:
- Date of inspection – Must be within the previous 6 months
  - List of all MINOR characteristic that were found to be out of tolerance.
- 303 GAGE RECORD CARDS: A gage record card, DA FORM 3023 shall be provided with each set ring segment 12901328-1 (2.392), 12901328-2 (3.205) & 12901328-3 (4.747). The GAGE RECORD CARD shall include all characteristics requiring calibration in Part III.

#### **PART V – TEST METHODS AND PROCEDURES**

NUMBER	TITLE	DETAILS
STM-1	First Article Requirements	Two SPECIAL SET RINGS, 12901328, shall be furnished for 100% inspection, of all requirements, to assure compliance with QAP(s), specification(s), drawing(s), and the contract.

**TACOM – ARDEC – QUALITY ENGINEERING & SYSTEMS ASSURANCE  
BENET LABORATORIES SUPPORT, WATERVLIET, NY 12189-4050**

PREPARED BY CAGE CODE: 1NUW7  
SUBMITTED BY: JEFFREY PAINE  
APPROVED BY: ERIC SWORD

SHEET: 4 of 4

**GENERAL REQUIREMENTS FOR QUALITY ASSURANCE PROVISIONS**

**1 SCOPE**

This document is applicable for the inspection of all materiel. It establishes general quality assurance provisions used in addition to the specific quality assurance provisions or verifications contained in a specification or a Quality Assurance Provision (QAP). The contractor requirements and inspection provisions contained in this document are applicable to a Technical Data Package (TDP). Quality conformance and first article inspection(s) shall consist of inspection of all contract or purchase order quality requirements in accordance with this document. A QAP is a documented inspection criteria used to assess conformance to drawing requirements, part of the TDP, and contains reference documents, classification of characteristics, sampling criteria, inspection methods, certification requirements, test methods and procedures. Beneficial comments (recommendations, additions, deletions) and any pertinent data, which may be of use in improving this document, should be addressed to the design activity.

a When SQAP/SQ/QS is specified in any document, it is synonymous with QAP. Wherever QAP-APPX-BL is specified, it is synonymous with this document.

b This document replaces MIL-W-63150 wherever specified in the contract or purchase order.

c APPENDIX A of this QAP refers to MIL-STD-1916, which is only applicable to a contract or purchase order when QAP(s) requirements are specified on a drawing.

d APPENDIX B of this QAP refers to test methods, which are only applicable to a contract or purchase order when the requirements are specified on a drawing.

e APPENDIX C of this QAP refers to special process procedure, which is only applicable when the requirement is specified on a QAP or in the contract or purchase order.

**2 ORDER OF PRECEDENCE**

In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. This precedence shall only be used in case of conflict between inspection requirements. The supplier shall request clarification from the procuring activity of what is required when there are conflicts, missing data (including tolerances), or other drawing or quality requirement ambiguities.

**3 IN-PROCESS CONTROL**

The inspection requirements shall be applied at the earliest practical point in manufacture at which it is feasible to inspect for acceptance without risk of change in the characteristic by subsequent operations. The supplier shall establish in-process inspection at strategically located points throughout the manufacturing processes to assure continuous control of unit quality. The supplier's inspection system shall provide for inspection and approval of the first piece at each operation, and/or the finished unit, before quantity production. The supplier shall provide and maintain work gages and other measuring and testing devices necessary to accomplish inspection and to control quality during the manufacturing processes.

REVISION STATUS			DESIGN ACTIVITY	
ERR	DATE	REV	TACOM ARDEC - QUALITY ENGINEERING DIRECTORATE BENET LABORATORIES (BL) SUPPORT WATERVLIET, NY 12189-4050	
LIQ1006	20010731	ORIG	DOCUMENT TITLE: GENERAL REQUIREMENTS FOR QUALITY ASSURANCE PROVISIONS <u>DISTRIBUTION STATEMENT A UNLIMITED</u>	
			SUBMITTED BY	R. HUYCK QAP ID QAP APPENDIX BL
			APPROVED BY	M. LONGMATE SHEET 1 OF 12
			PREPARED BY AND FOR CAGE CODE	1NUW7 DOCUMENT TYPE QS/SQ

#### 4 MANUFACTURING PROCESSES

The supplier is required to request authorization from the procuring activity before changing to any unspecified material, welding, heat treatment, plating and/or coating operations, nondestructive testing methods, or fabrication methods. The procuring activity will make a determination whether the change is significant enough to warrant reevaluation and testing/verification of production or initial production unit(s). A written clause or the Contract or Purchase Order Data Requirements List (CDRL) shall specify when a requirement for a special manufacturing process procedure (e.g., protective finish, soldering, surface hardening) must be submitted to the procuring activity. The supplier shall assure that acceptable manufacturing processes and treatments are being used to prevent the hazards of stress corrosion cracking, hydrogen embrittlement, or other deteriorating conditions.

#### 5 QUALITY CONFORMANCE INSPECTION

Whenever a QAP is specified in the contract or purchase order, the inspection provisions of the QAP are the minimum quality conformance requirements for those units to which the QAP pertains. An Acceptable Quality Level (AQL) is prohibited from used as an attribute sampling plan for inspection on DoD procurement actions and shall not be included in a QAP.

a When a QAP is not specified in the contract or purchase order, the supplier's quality plan shall address the frequency and the type of process control used for inspection of the drawing characteristic. The plan shall be available for review, when requested, and is subject to approval of the procuring activity.

b A variable sampling plan for quality conformance inspection of a characteristic listed in a QAP may be permitted. Before implementation of a variable sampling plan, the supplier shall secure the written concurrence of the procuring activity. All approved variable sampling plans shall be incorporated into the supplier's inspection system.

c Reduced inspection may be allowed when the manufacturing equipment, methods, and tool control are in process control and controlled by highly repeatable manufacturing techniques. Examples of types of manufacturing that should be considered for this includes die forgings, die stamping, extrusions, investment castings, and numerically-controlled machining processes. Tightened inspection (original sampling plan) shall be used for the re-inspection of a characteristic, when it is found to be nonconforming.

d When the number of units manufactured is less than 50, the number of units sampled shall be equal to all of the units or the stated sample size on the QAP, whichever is less. For example, the contract or purchase order quantity is 8 units and all units are manufactured as one lot. The inspection requirement is 13 units per lot size of 50 units on the QAP. Therefore, the sample size will be 8 units (less than the stated sample size). When the number of units manufactured is greater than any multiple of 50, the number of units sampled from that remaining quantity shall be equal to all of that quantity or the stated sample size, whichever is less. For example, the contract or purchase order quantity is 112 units and all units are manufactured as one lot. The inspection requirement is 13 units per lot size of 50 units on the QAP. Therefore, the sample size will be 38 units (e.g., 13 out of 50, plus 13 out of 50, plus 12).

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LIQ1006	20010731	ORIG	DOCUMENT TITLE GENERAL REQUIREMENTS FOR QUALITY ASSURANCE PROVISIONS DISTRIBUTION STATEMENT A UNLIMITED	
			SUBMITTED BY R. HUYCK	QAP ID QAP APPENDIX BL
			APPROVED BY M. LONGMATE	SHEET 2 OF 12
			PREPARED BY AND FOR CAGE CODE INUW7	DOCUMENT TYPE QS

**6 CERTIFICATIONS**

The method of submittal, for certification requirements, is a Certified Test Report (CTR) or Certificate Of Conformance (COC) The procuring activity will specify the type of certification required per the Contract or Purchase Order Data Requirements List (CDRL) using DD Form 1423 or any other method as specified in the contract or purchase order

- a A CTR and/or a COC may be submitted to the Government representative or to the procuring activity A CTR and/or a COC must be specifically identifiable to and provided with each Material Inspection and Receiving Report (DD Form 250) and/or Record of Treatment and Test (DD Form 1155) submitted
- b For contract or purchase orders consisting of multiple shipments, the supplier shall submit for the first production shipment, all CTR(s) and/or COC(s) required After the initial submittal the supplier is permitted to submit certification(s) that shall only have to specify the initial shipment contract or purchase order number, a certification that no manufacturing process has changed from the initial shipment, and the original paperwork This type of certification does not apply to nondestructive testing requirements or inspection records These requirements cannot be summarized
- c A CTR or a COC shall not be used as the sole basis for Government acceptance of contract or purchase order unit(s) unless approved by the procuring activity A CTR or a COC are in addition to, and not in lieu of, any rights of the Government under the contract or purchase order or law
- d The procuring activity will determine if a CTR or a COC is required for Military Standard (MS) units, critical fasteners and commercial units
- e A COC is to cite compliance to the specific data for which the COC is presented for acceptance (e.g., personnel qualification, procedure or process compliance to a specification and/or standard, material compliance to acceptance criteria, standard, composition, type, etc.) The supporting data (chemical analysis of the material or certification from the raw material producer or processor) shall be available for examination upon request by the Government representative even though it may not have to be submitted with a COC
- f A CTR shall contain actual results of tests for the chemical analysis, heat treatment, and/or mechanical properties of the drawing and/or specification Include in the report the number of specimens tested, grade and/or type of material (if applicable)
- g When the drawing specifies a generalized material note for steel, the steel selected must conform to one standard wrought AISI grade of the proper carbon content and series designation The plain carbon steels are nonresulfurized with maximum manganese content of 1.00 percent Steels of merchant quality, leaded, resulfurized, rephosphorized, or combinations thereof, are not acceptable Unless otherwise specified, castings are also not acceptable A CTR or a COC addressing material requirements should specifically state **"Unit was not made from castings, merchant quality, leaded, resulfurized or rephosphorized steels"**, unless otherwise specified on a drawing or in the contract or purchase order.

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LIQ1006	20010731	ORIG	DOCUMENT TITLE GENERAL REQUIREMENTS FOR QUALITY ASSURANCE PROVISIONS DISTRIBUTION STATEMENT A UNLIMITED		
			SUBMITTED BY	R HUYCK	QAP ID QAP-APPENDIX BL
			APPROVED BY	M LONGMATE	SHEET 3 OF 12
			PREPARED BY AND FOR CAGE CODE	1NUW7	DOCUMENT TYPE QS

h A CTR identifiable with the material may, at the option of the Government, be accepted in lieu of tests. When the identity or quality of the material is in doubt and valid and acceptable data is absent, tests shall be conducted within the material as required by the Government representative to determine the identity and quality. If proven to be unacceptable, the material shall be rejected.

i When the supplier certifies that the material delivered for source accepted material (e.g., castings and forgings) is in accordance with the applicable specification, the procuring activity may perform a physical/chemical analysis of the material to assure conformance to the specification requirement. Failure of the material to meet the physical/chemical requirements will be a cause for rejection as a latent material defect and will necessitate replacement of the material at the supplier's expense when so directed by the procuring activity.

j As a minimum a CTR and/or a COC shall contain the following:

- (1) Name of company and date, contract or purchase order number
- (2) Drawing number, serial number (if applicable), and the quantity in each lot or shipment
- (3) Complete nomenclature of the unit together with the lot number or other identification
- (4) A statement, with the signature and title of certifying official from the supplier. The statement

certifying that the unit met all the requirements of the contract or purchase order may be in the format as stated below:

"The undersigned, individually, and as the authorized representative of the supplier, warrants and represents that all the information supplied above is true and accurate. The material covered by this certificate conforms to all contract or purchase order requirements (including but not limited to the drawings and specifications), the inspection test results and the analyses appearing herein are true and accurate, and this certificate is made for the purpose of inducing payment and with knowledge that the information and certification may be used as a basis for payment."

**7 INSPECTION RECORDS**

The inspection records shall be accurate, complete, documented on a suitable format, and made readily available to the procuring activity, upon request. The supplier shall maintain the records of qualifications of operators and equipment. This shall apply whether manufacturing processes are performed at the sub-supplier's facility or at the supplier's plant. After the life of the contract or purchase order, unless otherwise specified by the procuring activity, records for units that are serialized shall be maintained for a minimum of three years and nonserialized units shall be maintained for a minimum of one year.

a When a commercial gage, functional gage, go/no-go type gage, visual, manual, and/or a certification is the inspection method, the use of OK, check marks, "X's" or ACC may be used to document acceptance. Use REJ to document nonacceptance. When inspection records are required to be delivered to the procuring activity, the supplier may summarize and report the range (minimum and maximum) values recorded for each characteristic inspected in the lot. Special Measuring Test Equipment (SMTE) that gives actual dimensional readings is the preferred method of reporting and/or recording inspection results. Inspection records will be documented and/or recorded in accordance with the specified unit of measure (e.g., metric, inch) as specified on a drawing or in a QAP.

REVISION STATUS			DESIGN ACTIVITY			
ERR	DATE	REV	TACOM ARDEC QUALITY ENGINEERING DIRECTORATE BENET LABORATORIES (BL) SUPPORT, WATERVLIET, NY 12189-4050			
L1Q1006	20010731	ORIG	DOCUMENT TITLE GENERAL REQUIREMENTS FOR QUALITY ASSURANCE PROVISIONS DISTRIBUTION STATEMENT A UNLIMITED			
			SUBMITTED BY	R. HUYCK	QAP ID	QAP-APPENDIX BL
			APPROVED BY	M. LONGMATE	SHEET 4 OF 12	
			PREPARED BY AND FOR CAGE CODE	1N1W7	DOCUMENT TYPE QS	

b The raw data produced by computer controlled electronic special inspection equipment (e.g., Gun Tube Inspection Station, Gymnasticators) shall be maintained in its original format as a part of inspection records. The data shall be recorded on Government acceptable media and be made available to the Government upon request for the duration of the contract or purchase order. At the completion of the contract or purchase order, the media shall be appropriately packaged, marked, and provided to the procuring activity.

c The inspection record shall provide, as a minimum, the following:

- (1) Contract or purchase order number, nomenclature of unit
- (2) Drawing number with revision and date, serial number (if applicable)
- (3) Lot size and lot quantity, sample size (number of units inspected)
- (4) The method of inspection, identification of the inspector, the date of the inspection
- (5) The results of the inspection, each characteristic inspected including any specified tolerance
- (6) Specify QAP characteristic number (if applicable)

#### 8 WORKMANSHIP

All finished surfaces shall be protected against foreign material and damage during manufacture and storage prior to delivery. Material shall not be treated or touched up in any manner to conceal defects and shall be free from defects which adversely affect the safety, function, performance, serviceability, interchangeability, appearance or longevity of the unit. Unless otherwise allowed per the drawing, finished units shall not have the following conditions: seams, laps, laminations, cracks, extraneous material, visible steps or irregularities, sharp edges and corners. Salvaging operations (e.g., hammering to shape, repair by welding, straightness, bending), welding or other means for the repair of defects in materials shall not be performed unless specifically authorized by the procuring activity. Evidence of poor workmanship include the following: scratches in excess of drawing and specification requirements, burrs, nicks, corrosion and non-specified oxidation (rust), tool scores, gouges, deformations, missing operations, improper assembly, missing units, stains, knife edges, fins, extraneous material, and missing or damaged protective finish.

#### 9 PROTECTIVE FINISHES AND COATINGS

Protective finish and/or coating shall be visually examined for completeness, uniformity in appearance and color, and for freedom from pits, corrosion, scratches, and worn or bare spots. Touch up may be used with the approval of the procuring activity, in lieu of refinishing with the original finish, for restoration of small areas of finish as long as form, fit, and function are not affected. Dimensional requirements and tolerances shall apply prior to the application of organic coatings (e.g., paint, varnish, lacquers), phosphate coatings, and solid film lubricant. Dimensional requirements apply after the application of non-organic coatings such as black oxide, metallic plating substances (e.g., chromium, cadmium) and anodic coatings.

#### 10 INSPECTION EQUIPMENT AND METHODS

An assembly shall be visually examined for completeness and conformance to specified requirements. When possible, the functioning of an assembly shall be inspected by manual operation. The assembly shall be checked manually for tightness, protrusion, operation or similar condition, as applicable. The following applies to inspection and test equipment:

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a The supplier is responsible for providing all SMTE required that will assure full form for the entire surface of the specified characteristic. The supplier may use any type of industry-developed, commercially available, multi-usage equipment.

b Inspection equipment used shall be capable of repeatable measurements by various experienced inspection/test personnel, to an accuracy of 10% of the total tolerance of the characteristic being inspected. In the event the supplier desires relief from this requirement for electrical testing, a technically supported request for relief or waiver shall be submitted to the procuring activity.

c When a Special Test Method (STM) is specified as the method of inspection, the methods and procedures shall be as specified in the applicable QAP.

d Special Inspection Equipment (SIE) applies prior to the application of phosphate protective finish. SIE shall not be applied with any method that will damage the SIE. When SIE is specified and provided as Government Furnished Equipment (GFE) to the supplier as the inspection method, the supplier shall use the GFE. When SIE is not provided, not available, or unserviceable, the supplier shall document and describe in writing the inspection method to be used in lieu of the SIE specified, and submit the written inspection method to the procuring activity prior to applying an alternate inspection method.

e An alternate inspection method is a method, which equals or exceeds the specified accuracy and provides, as a minimum, the quality assurance requirements in the contract or purchase order documents. The procuring activity will determine if the alternate method is acceptable and provide written approval or disapproval. The supplier must receive approval prior to applying an alternate inspection method. The supplier may be authorized to use SMTE, another inspection method or be required to fabricate the SIE in accordance with the Government drawing.

f If applicable, Government designed inspection and test equipment shall be as specified in the contract or purchase order. When a Government representative desires to use supplier or GFE for contract or purchase order related purposes, such use shall be permitted without charge. Design responsibility (other than GFE) for all other inspection equipment is assigned to the supplier. Such designs may include commercial equipment, which the supplier proposes to use. Supplier designs shall include appropriate operating instructions, calibration procedures, and maintenance procedures. Designs, which provide variable measurements instead of attributes data, are preferred in order to maximize the benefits of utilizing Statistical Process Control.

g The method of restoration and returning GFE will be determined on an individual basis by the procuring activity. Restoration is meant to include the repair or replacement of GFE found to be unserviceable from supplier use.

h An inspection standard shall be utilized for those characteristics requiring inspection decisions by visual (eyesight) means. Units selected as a visual comparison standard shall be mutually agreed to by the supplier and the Government, within drawing and specification requirements, and shall be used to assist in determining configuration and minimum acceptance criteria. Each comparison or inspection standard shall be kept under the control of the supplier's inspection element and shall be positively identified as to the characteristic or condition the standard represents, date established as the standard, number of the standard, and identity of the supplier and the Government inspection personnel establishing the standard.

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APPENDIX A

CLASSIFICATION OF CHARACTERISTICS AND INSPECTION METHODS ON DRAWINGS

1 MIL-STD-1916 APPLIES

2 CLASSIFICATION OF CHARACTERISTICS AND INSPECTION REQUIREMENTS The following figure provides explanation of the standard QAP application when it appears on a drawing

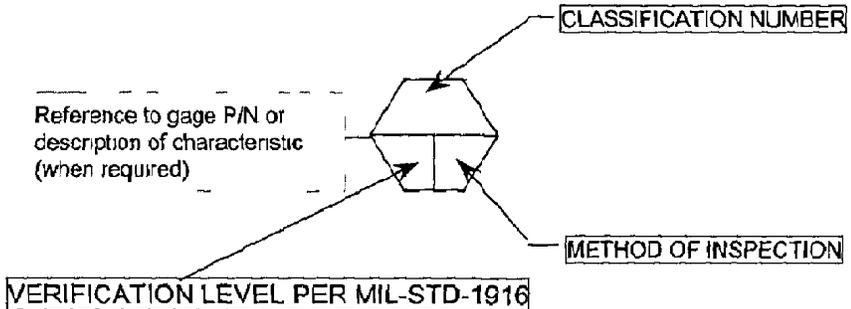
3 VERIFICATION LEVEL When a verification level requirement in accordance with MIL-STD-1916 is applied on a drawing, the following are applicable When the verification level is indicated as "0", 100% inspection is required

4 CLASSIFICATION OF CHARACTERISTICS When specified on a drawing, the following characteristic numbers designate the classification of characteristics

- 1 thru 99 CRITICAL
- 101 thru 199 MAJOR
- 201 thru 299 MINOR
- 301 thru 399 SPECIAL SAMPLING REQUIREMENTS
- 401 thru 499 CERTIFICATION REQUIREMENTS (e.g., material, mechanical properties, heat treatment, surface hardening, protective finish, welding and NDT)
- 501 thru 599 TEST METHODS AND PROCEDURES

5 METHODS OF INSPECTION When specified on a drawing, the following symbols designate the method of inspection for the classification of characteristics

- C STANDARD MEASUREMENT AND TEST EQUIPMENT
- S SPECIAL TEST EQUIPMENT
- V VISUAL
- W CERTIFICATE OF COMPLIANCE
- Y CERTIFIED TEST REPORT
- Z TEST METHOD AND PROCEDURES



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APPENDIX B

TEST METHODS

1 APPLICABLE DOCUMENTS

ANSI/SAE J423	Method of Measuring Case Depth, Recommended Practice
ASTM E10	Method of Tests for Brinell Hardness of Metallic Materials
ASTM E18	Method of Tests for Rockwell Superficial Hardness of Metallic Materials
ASTM E1077	Test Methods for Estimating the Depth of Decarburization of Steel Specimens
ASTM E1444	Standard Practice for Magnetic Particle Examination
ASTM E1742	Standard Practice for Radiographic Examination
NAS 410	Certification and Qualification Of Nondestructive Test Personnel

2 TORQUE

The supplier shall furnish written notice to the Government representative of the time, date, and location of the torque operation testing, so that the Government representative may witness the testing on a sufficient number of units. The aforementioned requirement for witnessing application of torque does not relieve the supplier of actually conducting torque tests.

3 SOLDERING AND BRAZING

All soldering and brazing related operations shall be performed in accordance with a process plan to be developed and maintained by the supplier as part of the documentation supporting the inspection system. The plan shall include the procedures to be used. As a minimum, each procedure shall include the process, tools, equipment, materials and acceptance criteria used for the operation. The process control plan shall be made available to the Government representative upon request.

4 NONDESTRUCTIVE TESTING (NDT)

NDT shall be conducted in accordance with the criteria specified in the contract or purchase order, drawing, specification and/or QAP. Written inspection procedures shall be made available to the Government representative upon request. Personnel performing NDT shall be qualified in accordance with NAS 410 or as specified in the contract or purchase order. For final acceptance, seventy-two (72) hours must pass before magnetic particle inspection shall be conducted on ferromagnetic materials, which are heat treated with a liquid quenching process. Magnetic particle indications shall be defined as lineal discontinuities. The standard practice for magnetic particle examination is outlined in ASTM E1444. The standard practice for radiographic examination is outlined in ASTM E1742. When radiography is specified and no sampling plan is provided, the radiographic sampling plan below shall apply to each heat of castings. Sample castings shall be randomly selected from each heat.

<u>CASTINGS PER HEAT</u>	<u>SAMPLE SIZE</u>
1-8	ALL
9-25	8
26-50	13
OVER 50	13 PLUS 20% OF THE CASTINGS OVER 50, ROUNDED TO THE NEXT HIGHER INTEGER

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The castings may be radiographed prior to heat treatment providing that liquid penetrant or magnetic particle inspection is performed after heat treatment. The castings of each heat and the radiographic sample from that heat shall be marked with a permanent identification (engraving, stamping or raised letters), which will relate the sample to the heat. The related radiographic film data shall be identifiable to the sample and heat. If any casting in the sample fails to meet the specified radiographic requirements, then all castings comprising the heat shall be subjected to 100% radiographic inspection in the area(s) where the rejection was located. Each casting that fails the radiographic inspection shall be rejected.

**5 HARDNESS TEST**

Brinell hardness tests shall be performed in accordance with ASTM E10. Rockwell hardness tests shall be performed in accordance with ASTM E18. The following applies to forgings and/or castings. A minimum of two hardness tests shall be conducted. One test for the thinnest cross-section and one test for the thickest cross-section, if possible. Surface decarburization or any form of superficial hardening shall be removed, prior to hardness testing, by grinding or other suitable means. Material removal is .12 maximum for forgings and .03 maximum for castings. Preparation shall be carried out in such a way that any alteration of the surface hardness (e.g., heat or cold-working) is minimized. Care should be taken to avoid over-heating or cold-working the surface. The tested work piece surface must be representative of the material. ASTM E1077 may be used as a reference for decarburization. Dimensions do not apply in areas tested for hardness. All hardness readings shall conform to the requirements of the drawing and conversions to HRC values will include rounding up (xx.5 or higher) or down (xx.4 or lower), if applicable.

**6 CARBURIZING, NITRIDING, SURFACE HARDENING-FLAME OR INDUCTION**

"Case depth" identified on a drawing is usually "total case depth." The recommended practice of measuring depth of case hardness is in accordance with ANSI/SAE J423. A test specimen of the same alloy, same hardness and similar configuration as the unit shall be processed with each heat treat lot to verify case depth, hardness requirements, and microstructure. When required by the procuring activity, an approved process must be on file at the procuring activity prior to processing any units. The supplier shall provide certification with each lot stating the approved procedure was used and a report showing actual case depth surface and core hardness values obtained. Changes to the procedure will require resubmission of the procedure and a specimen for the procuring activity approval.

**7 FIRST ARTICLE REQUIREMENTS (FA)**

The FA produced must be representative of the manufacturing processes to be used during production. Any change in location or ownership of a previously qualified manufacturer or source requires reevaluation of the FA. Previous production units will not be used to meet FA requirements. The Government representative may witness destructive testing, when required to be performed by the supplier. Unless otherwise specified by the procuring activity, the quantity and configuration of the FA shall be as specified in the contract or purchase order. The FA shall be inspected and tested by the supplier for all requirements of the drawing, specification and/or QAP specified except for inspection and test contained in a material specification and/or MS unit(s) provided that the required inspection and test have been performed previously and a certification of conformance is submitted with the FA test report.

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**APPENDIX C**

**SPECIAL PROCESS PROCEDURE**

A Special Process (SP) is a process where the results of the process cannot be fully verified by subsequent inspection and where deficiencies may become apparent only after the unit is in use. To ensure that the specific requirements are met, a SP shall require continuous monitoring and control of the process variables or parameters. This will require a Special Process Procedure (SPP). The following applies to a SPP.

A SPP is a written documented set of instructions for a SP. The QAP shall identify the need for a SPP. The supplier is responsible for preparing the SPP.

The SPP may include requirements for personnel or equipment, as appropriate, is a deliverable item and is part of the first article when required by the specific QAP. The Government representative will perform onsite audits of an SPP in accordance with the Government's established audit plans and/or procedures. The SPP shall be acceptable when the First Article is approved.

The supplier shall not deviate from the approved SPP. The supplier shall notify the Government, in writing, prior to implementing any changes to the approved SPP so that a determination can be made regarding the need for recertification of the manufacturing process (First Article inspection or onsite audit).

The SPP format shall include:

1. **APPLICATION BLOCKS** At the top of the first page and at the bottom of each page. The application block at the top shall provide unit information. The bottom block shall provide information about the SPP (title and the date prepared).
2. **SCOPE** State process involved.
3. **APPLICABLE DOCUMENTS** List all applicable document numbers and document titles (if none, so state).
4. **REQUIREMENTS** (All requirements specified below are mandatory - if none, so state)
  - 4.1 **APPROVED EQUIPMENT AND EXPENDABLE SUPPLIES** List all approved equipment and expendable supplies required by the SPP and their minimum requirements.
  - 4.2 **MATERIAL** List all of the units/materials that are used in the procedure (As defined in the technical data package).
  - 4.3 **PROCEDURE IN SEQUENCE** List, in sequence, all steps, operations, inspections, warnings and cautions for control of the process.
  - 4.4 **CONTROL OF NONCONFORMING UNIT** State the procedure to be followed if units are nonconforming.

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4 5 CORRECTIVE ACTION State the procedure to be followed to eliminate causes of nonconformities

4 6 CONTROL OF INSPECTION MEASURING, AND TEST EQUIPMENT State the procedure that assures that measurement uncertainty is known

4 7 CERTIFICATION List all material certification and operator certification requirements required by the process

4 8 QUALITY ASSURANCE PROVISIONS (If none so state) Provide any inspection and testing in accordance with the technical data requirements

4 9 STATISTICAL PROCESS CONTROL (If none, so state) State the procedure for identifying how statistical techniques are implemented for control of the process

4 10 HANDLING, STORAGE, PACKAGING, PRESERVATION, AND DELIVERY State the procedures used to assess and prevent a unit from damage/deterioration, control packing, packaging and marking, and assure preservation when a unit is in the supplier's control

4 11 NOTES, ADDITIONAL INFORMATION, AND SIGNATURE PAGE Provide any additional information pertinent to the procedure. The last page of the SPP shall include dates and signatures of the author and all approving officials

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## DEFINITIONS

Accept on Zero Defects - On a QAP means if any characteristic (including any unlisted defects) of any sample unit for the lot size inspected is found to be defective, each unit in the lot will be inspected for the nonconforming characteristic

Attribute Inspection - A method of inspection whereby the unit is classified simply as "defective" or "nondefective", or the number of nonconforming characteristics (defects) in the unit is counted with respect to a given requirements or set of requirements

Defect - Any nonconformance of a characteristic with specified requirements

First Article Inspection - Evaluation of a unit, representative of the production process, to validate that the supplier has adequate manufacturing and assembly processes in place to assure that the unit meets requirements. First Article testing means testing and evaluating the First Article for conformance with specified contract or purchase order requirements before, or in the initial state of, production

Foreign Matter - Substances on a unit, which include but are not limited to dirt, corrosion, grease, and chips

Frequency and Process Control - The time and quantity of sampling inspection and the equipment and/or method used

Full Form - The term used to indicate that a characteristic feature shall be within specified geometric form, size, and orientation (if applicable) wherever the characteristic is defined. Geometric dimensioning and tolerancing control orientation

Heat - All the castings produced from one batch of melted alloy (furnace charge), and poured under the same foundry practices within a brief and continuous production run

Inspection - The term that encompasses all actions used to assess conformance of units to their requirements. Inspection includes visual examination, tactile examination, gauging, tests, and all other measures used to determine conformance or non-conformance. First article inspection encompasses first article test and first piece inspection

Lot size - A homogeneous collection of units from which a representative sample is drawn

Unlisted Defects - Not listed in the specified inspection characteristics

Variable Inspection - A method of inspection whereby a measurement is made to determine and record the numerical magnitude of a characteristic under consideration. This involves reading a scale of some kind and recording the measurement on the units desired (e.g., pounds, inches, seconds, ohms, degrees Fahrenheit, percent chemical content, etc.)

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