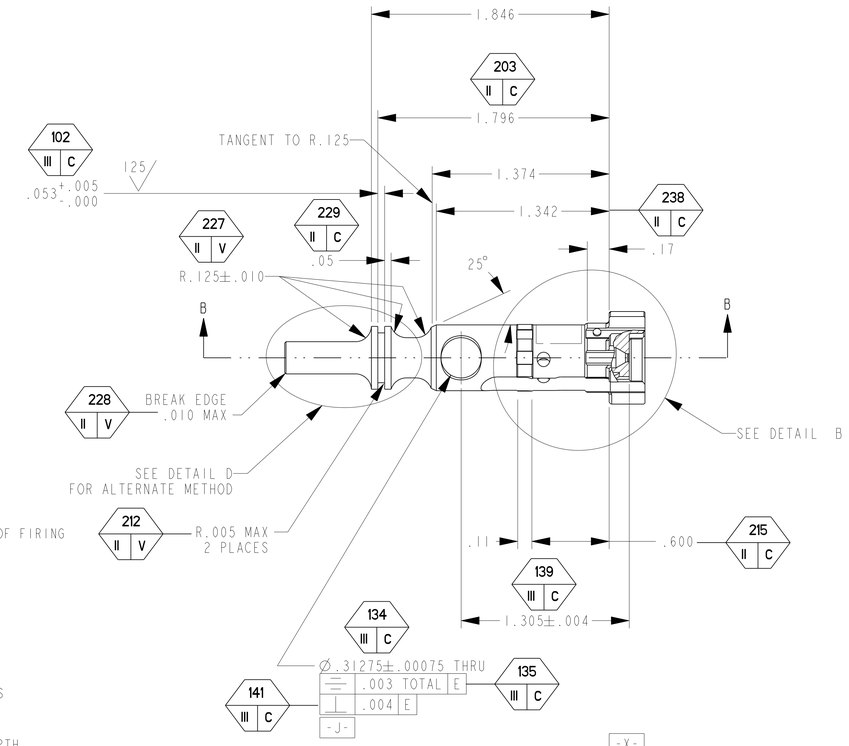
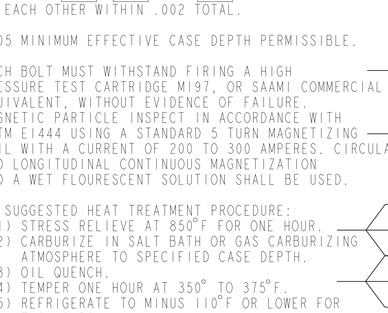
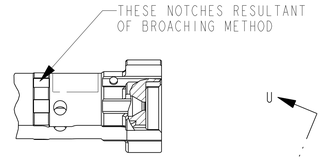
DRAWING SIZE F

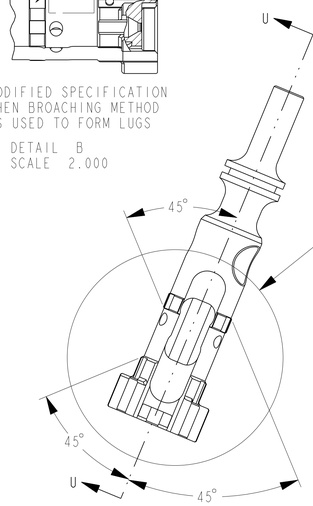
NOTES

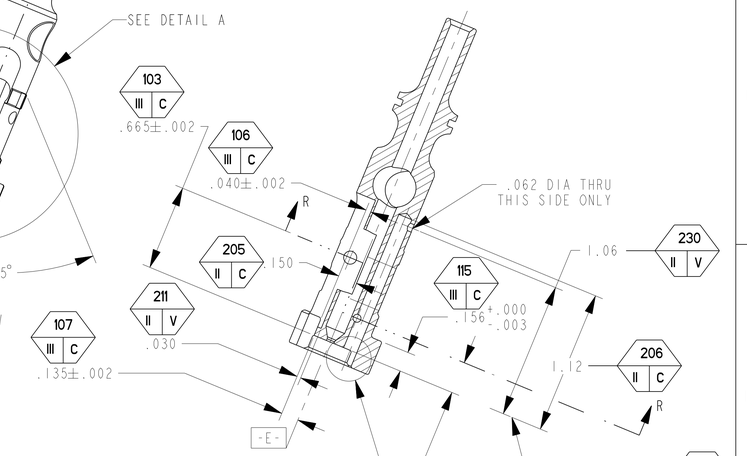
1. APPLICABLE STANDARDS/SPECIFICATIONS:
   A. MIL-W-13855.
2. MATERIAL: STEEL-CARPENTER 158 GUN QUALITY ANNEALED STRESS RELIEVED BAR. BRINNELL HARDNESS 170/235. AIM FOR 210. — 401 Y — MATERIAL
3. SURFACE FINISH 63 EXCEPT AS NOTED. — 234 II C
4. AXIS -E- ESTABLISHED BY -F- AND -H-.
5. -P- ESTABLISHED BY INTERSECTION WITH -E- AND .051 DATUM.
6. DIAMETERS -F-, -G-, AND -H- TO BE CONCENTRIC TO EACH OTHER WITHIN .002 TOTAL. — 101 III C
7. .005 MINIMUM EFFECTIVE CASE DEPTH PERMISSIBLE.
8. EACH BOLT MUST WITHSTAND FIRING A HIGH PRESSURE TEST CARTRIDGE MI97, OR SAAMI COMMERCIAL EQUIVALENT, WITHOUT EVIDENCE OF FAILURE. — 301 Z PROOF FIRING
   MAGNETIC PARTICLE INSPECT IN ACCORDANCE WITH ASTM E1444 USING A STANDARD 5 TURN MAGNETIZING COIL WITH A CURRENT OF 200 TO 300 AMPERES. CIRCULAR AND LONGITUDINAL CONTINUOUS MAGNETIZATION AND A WET FLOURESCENT SOLUTION SHALL BE USED. — 302 Z MPI
9. A. SUGGESTED HEAT TREATMENT PROCEDURE:
   (1) STRESS RELIEVE AT 850°F FOR ONE HOUR.
   (2) CARBURIZE IN SALT BATH OR GAS CARBURIZING ATMOSPHERE TO SPECIFIED CASE DEPTH. — 501 Z HARDNESS
   (3) OIL QUENCH.
   (4) TEMPER ONE HOUR AT 350° TO 375°F.
   (5) REFRIGERATE TO MINUS 110°F OR LOWER FOR TWO HOURS. — 505 Z CASE DEPTH
   (6) REPEAT ONE HOUR, 350° TO 375°F TEMPER TREATMENT.
   B. MANDATORY HEAT TREATMENT REQUIREMENTS:
   (1) EFFECTIVE CASE DEPTH (HARDNESS Rc 50 MIN) .010 TO .014, TOTAL CASE DEPTH NOT TO EXCEED .025. SURFACE HARDNESS ROCKWELL 15N 89/90.5 (CASE DEPTH AND SURFACE HARDNESS APPLY PRIOR TO MACHINING AFTER HEAT TREAT.)
   (2) MICROSTRUCTURE OF CARBURIZED CASE SHALL SHOW NO CARBIDE OR PRECIPITATE NETWORKS. IF PRESENT, CARBIDES OR INTERGRANNULAR PRECIPITATES SHALL BE VERY FINE, WELL DISPERSED, AND EXTEND NO DEEPER THAN .0005 BELOW THE SURFACE.
   (3) AFTER CARBURIZE AND QUENCHING OPERATIONS, TEMPER AT NOT LESS THAN 350°F FOR NOT LESS THAN ONE HOUR. REFRIGERATE AT MINUS 100°F OR LOWER FOR NOT LESS THAN TWO HOURS. RE-TEMPER AT NOT LESS THAN 350°F FOR NOT LESS THAN ONE HOUR.
   (4) THE USE OF A STRAIGHT CYANIDE BATH OR CARBO-NITRIDING PROCESS SHALL NOT BE PERMITTED.
10. BREAK SHARP EDGES .005+.010 UNLESS OTHERWISED SPECIFIED.
11. FINAL PROTECTIVE FINISH 5.3.1.2 OF MIL-STD-171. — 402 Y PROTECTIVE FINISH
12. QUALITY ASSURANCE PROVISIONS REQUIREMENTS PER DRAWING 12993884 APPLY.











REVISIONS

MODEL REV	DRAWING REV	DESCRIPTION	DATE(YEAR-MO-DA)	APPROVED
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N/A	J	NOR G6S3031 / 1996-05-23	1996-07-17	FET
N/A	K	NOR L1S3016 / 2001-04-09	2001-04-30	RLV
-	L	NOR L1S3067 / 2002-03-26	2002-05-23	JJW
A	M	NOR L2S3080 / 2002-12-10	2003-03-31	RJC
B	N	NOR L3S3118 / 2003-07-03	2003-08-19	RSB/RJC
C	P	NOR L04S3003 / 2004-02-19	2004-03-11	RLV
D	R	NOR L3S3161 / 2004-03-31	2004-08-13	RLV
E	T	NOR L05S2015 / 2005-07-12	2005-08-11	BMG
F	U	NOR L06S5164 / 2006-04-25	2006-05-04	JEF
G	V	NOR L07S3098 / 2007-10-31	2007-11-06	BMG
H	W	NOR L08S3054 / 2008-05-20	2008-06-13	BMG
J	Y	NOR L09S5081 / 2009-03-12	2009-03-24	BMG
K	AA	NOR L09S3043 / 2009-04-17	2009-05-04	BMG
L	AB	NOR L09S3142 / 2009-09-23	2009-09-29	AMW
M	AC	NOR L10S3002 / 2010-01-22	2010-02-01	BMG
N	AD	NOR L11S3031 / 2011-04-14	2011-04-21	RLV

CURRENT DESIGN ACTIVITY CAGE CODE 19200
US ARMY
ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
PICATINNY ARSENAL, NEW JERSEY 07806-5000

THIS DRAWING WAS GENERATED FROM A SOLID MODEL AND IS CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.

PART NO. 8448510

PMIC			DO NOT SCALE DRAWING	CONTRACT NUMBER	DESIGN ACTIVITY
		M23I	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CONTRACTOR	US ARMY ROCK ISLAND ARSENAL ROCK ISLAND, ILLINOIS
MECHANICAL PROPERTIES		M4	TOLERANCES ON ANGLES ± 1 ° 2 PLACE DECIMALS ± .01 3 PLACE DECIMALS ± .005	DRAWN BY S. GALL - ESERV 1970-04-27	BOLT
YP		M4A4		CHECKER G. STRAHL	ENGINEER J. WINDHAM
TS	13004787	M16A3	THIRD ANGLE PROJECTION	ENGINEER L. KO	QUALITY ENGINEER L. CICHUCKI
EL2	12972691	M16A2		DRAWING APPROVAL L. BRUNTON 2002-03-21	SIZE F · CAGE CODE 19204 · DWG NO. 8448510
RA	9327073	M16A1			
BH	8448509	M16			
RH	NEXT ASSY	USED ON	MATL ENGR / MODELED BY S. GALL - ESERV	DESIGN APPROVAL R. ELBE 2002-03-21	SCALE 2.000 · UNIT WT. 0.086 · SHEET 1 OF 3
	APPLICATION				

REV STATUS OF SHEETS	REV	AD	AD	AD
	SHEET	1	2	3

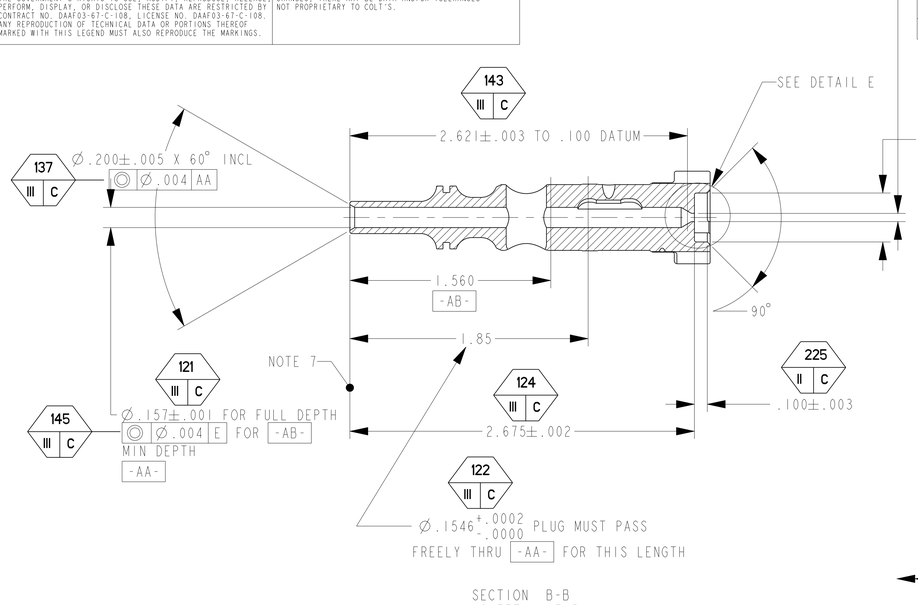
DISTRIBUTION STATEMENT F: FURTHER DISTRIBUTION ONLY AS DIRECTED BY US ARMY ARDEC, AMSTA-AR-CCL-F, ROCK ISLAND, IL; 1993-09-14.

FORMAT: F_TACOM_ENG_1.0

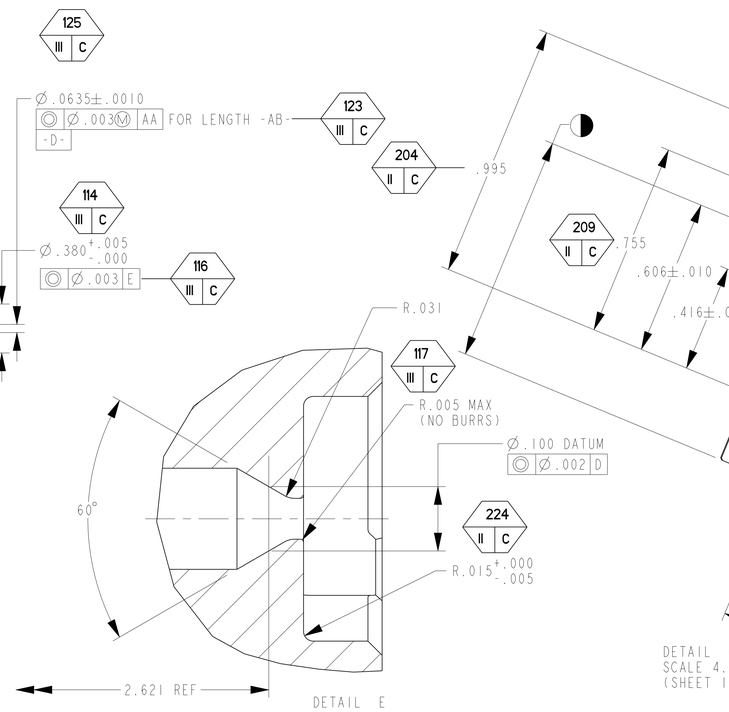
DRAWING SIZE F

REVISIONS

MODEL REV	DRAWING REV	DESCRIPTION	DATE(YEAR-MO-DA)	APPROVED
A	M	NOR L2S3080 / 2002-12-10	2003-03-31	RJC
B	N	NOR L3S3118 / 2003-07-03	2003-08-19	RSB/RJC
C	P	NOR L04S3003 / 2004-02-19	2004-03-11	RLV
D	R	NOR L3S3161 / 2004-03-31	2004-08-13	RLV
E	T	NOR L05S2015 / 2005-07-12	2005-08-11	BMG
F	U	NOR L06S5164 / 2006-04-25	2006-05-04	JEF
G	V	NOR L07S3098 / 2007-10-31	2007-11-06	BMG
H	W	NOR L08S3054 / 2008-06-13	2008-06-13	BMG
J	Y	NOR L09S5081 / 2009-03-12	2009-03-24	BMG
K	AA	NOR L09S3043 / 2009-04-17	2009-05-04	BMG
L	AB	NOR L09S3142 / 2009-09-23	2009-09-29	AMW
M	AC	NOR L10S3002 / 2010-01-22	2010-02-01	BMG
N	AD	NOR L11S3031 / 2011-04-14	2011-04-21	RLV



SECTION B-B
(SHEET 1, E-5)



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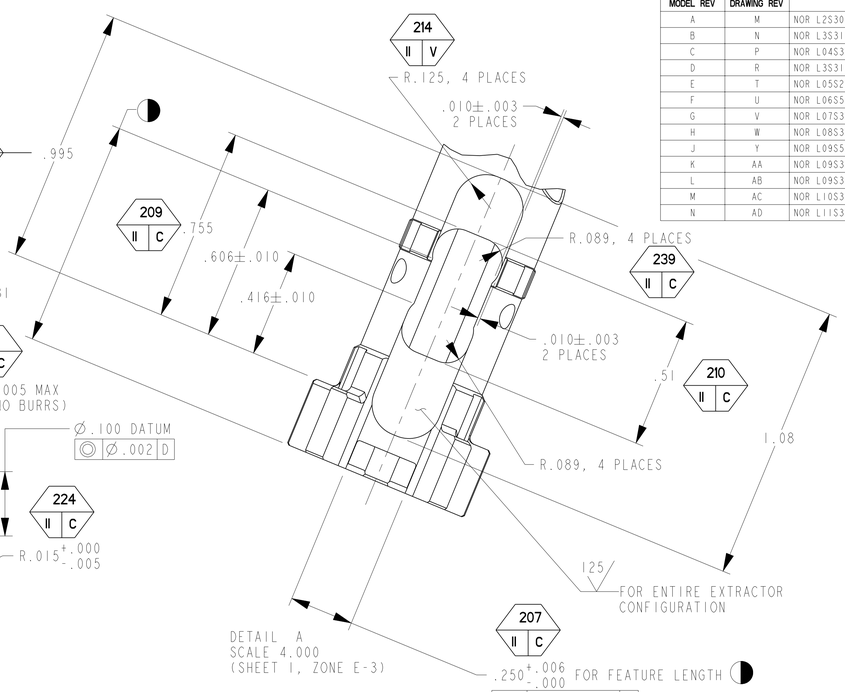

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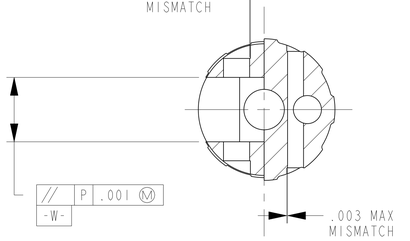
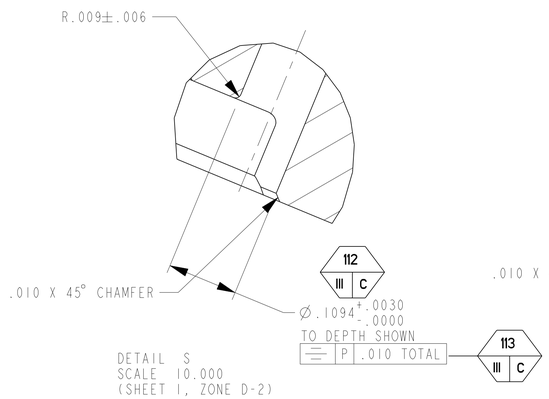
(SHEET 1, ZONE E-3)





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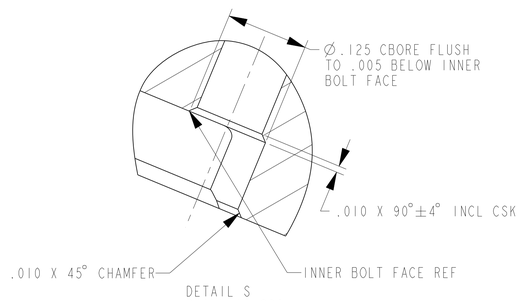
(SHEET 1, ZONE D-2)



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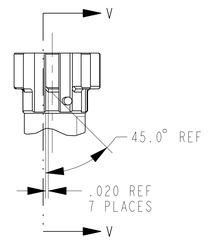
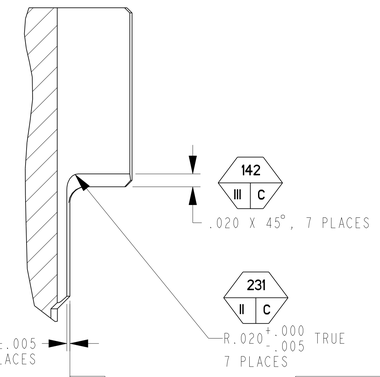
SCALE 10.000
(SHEET 1, ZONE D-2)
ALTERNATE METHOD



SECTION Z-Z
(SHEET 1, ZONE C-2)



SECTION V-V
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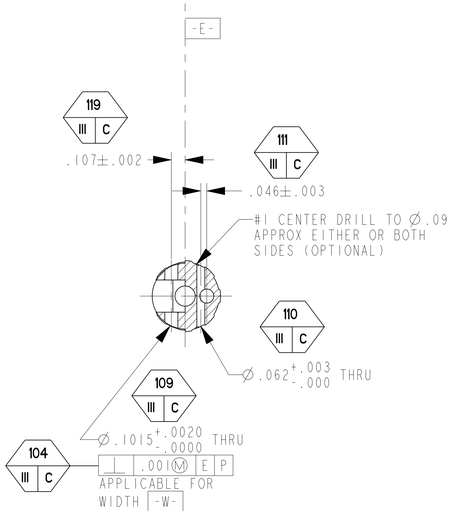

SECTION R-R
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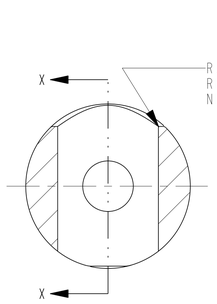

SECTION T-T
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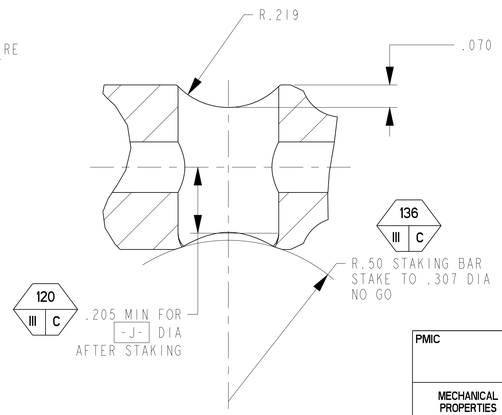

SECTION X-X
SCALE 5.000

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CURRENT DESIGN ACTIVITY CAGE CODE 19200
US ARMY
ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
PICATINNY ARSENAL, NEW JERSEY 07806-5000

PART NO. 8448510

PMIC			DO NOT SCALE DRAWING	CONTRACT NUMBER	DESIGN ACTIVITY
		M23I	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	CONTRACTOR	US ARMY ROCK ISLAND ARSENAL ROCK ISLAND, ILLINOIS
MECHANICAL PROPERTIES		M4AI	TOLERANCES ON ANGLES ± 1°		BOLT
YP		M4	2 PLACE DECIMALS ± .01	DRAWN BY: S. GALL - ESERV	DATE (YEAR-MO-DA): 1970-04-27
TS		M16A4	3 PLACE DECIMALS ± .005	CHECKER: G. STRAHL	ENGINEER: J. WINDHAM
EL2	13004787	M16A3	THIRD ANGLE PROJECTION	ENGINEER: L. KO	QUALITY ENGINEER: L. CICHUCKI
RA	12972691	M16A2		DRAWING APPROVAL: L. BRUNTON	2002-03-21
BH	9327073	M16AI		DESIGN APPROVAL: R. ELBE	2002-03-21
RH	8448509	M16	MATL ENGR	MODELED BY: S. GALL - ESERV	SIZE: F; CAGE CODE: 19204; DWG NO.: 8448510
	NEXT ASSY	USED ON			SCALE: 2.000; UNIT WT.: 0.086; SHEET: 2 OF 3
	APPLICATION				

FORMAT: F_TACOM_ENG_1.0

REVISIONS

MODEL REV	DRAWING REV	DESCRIPTION	DATE(YEAR-MO-DA)	APPROVED
-	L	NOR LIS3067 / 2002-03-26	2002-05-23	JJW
A	M	NOR L2S3080 / 2002-12-10	2003-03-31	RJC
B	N	NOR L3S3118 / 2003-07-03	2003-08-19	RSB/RJC
C	P	NOR L04S3003 / 2004-02-19	2004-03-11	RLV
D	R	NOR L3S3161 / 2004-03-31	2004-08-13	RLV
E	T	NOR L05S2015 / 2005-07-12	2005-08-11	BMG
F	U	NOR L06S5164 / 2006-04-25	2006-05-04	JEF
G	V	NOR L07S3098 / 2007-10-31	2007-11-06	BMG
H	W	NOR L08S3054 / 2008-05-20	2008-06-13	BMG
J	Y	NOR L09S5081 / 2009-03-12	2009-03-24	BMG
K	AA	NOR L09S3043 / 2009-04-17	2009-05-04	BMG
L	AB	NOR L09S3142 / 2009-09-23	2009-09-29	AMW
M	AC	NOR L10S3002 / 2010-01-22	2010-02-01	RLV
N	AD	NOR L11S3031 / 2011-04-14	2011-04-21	RLV

301 - PROOF FIRING. EACH BOLT SHALL BE PROOF FIRED BY THE SUPPLIER IN FIXTURE 11837944 (F-AJ-27418) USING HIGH PRESSURE TEST CARTRIDGE AS SPECIFIED.

302 - MAGNETIC PARTICLE INSPECTION. EACH BOLT SHALL BE MAGNETIC PARTICLE INSPECTED BY THE SUPPLIER, AND THE GOVERNMENT REPRESENTATIVE SHALL BE PROVIDED WITH A CERTIFIED TEST REPORT OF EACH MAGNETIC PARTICLE INSPECTION AS SPECIFIED ON THE APPLICABLE DRAWING. ANY BOLT SHOWING EVIDENCE OF CRACKS, SEAMS, INCLUSIONS, DEFORMATION, OR INJURIOUS DEFECTS SHALL BE CAUSE FOR REJECTION OF THE ITEM.

303 - ENDURANCE TEST. (EITHER I OR II SHALL APPLY.)

I. WHEN BOLTS ARE PROVIDED TO THE GOVERNMENT EITHER (1) AS A COMPONENT OF A WEAPON OR (2) AS A SPARE PART CONCURRENT WITH WEAPONS PRODUCTION, ENDURANCE TESTING OF THE BOLTS SHALL BE IN CONJUNCTION WITH THE WEAPON ENDURANCE TEST SPECIFIED IN THE APPLICABLE WEAPON SPECIFICATION. BOLTS PRODUCED AS A SPARE PART CONCURRENT WITH WEAPONS PRODUCTION SHALL BE INCORPORATED INTO WEAPONS PRODUCTION TO ENSURE ALL BOLT PRODUCTION LOTS ARE REPRESENTED DURING ENDURANCE TESTING. UPON COMPLETION OF THE FIRST 2,400 ROUNDS OF THE 6,000-ROUND ENDURANCE TEST, EACH BOLT SHALL BE VISUALLY INSPECTED AND MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH THE PROCEDURE SPECIFIED IN THE WEAPONS SPECIFICATION. IF CRACKS THAT ARE VISIBLE TO THE UNAIDED, NAKED EYE ARE DETECTED IN ANY AREA OF THE BOLT, THE BOLT SHALL BE CLASSIFIED AS AN UNSERVICEABLE PART, AS DEFINED IN THE WEAPON SPECIFICATION. THE OCCURRENCE OF MAGNETIC PARTICLE CRACK INDICATIONS IN ANY AREA OF THE BOLT OTHER THAN THE LUG AREA SHALL ALSO RESULT IN THE CLASSIFICATION OF THE BOLT AS AN UNSERVICEABLE PART. IF MAGNETIC PARTICLE CRACK INDICATIONS IN THE LUG AREA OF LENGTH LESS THAN OR EQUAL TO .078 INCHES ARE DETECTED, THE BOLT SHALL BE CONSIDERED SERVICEABLE. IF MAGNETIC PARTICLE CRACK INDICATIONS IN THE LUG AREA OF LENGTH GREATER THAN .078 INCHES ARE DETECTED ON ONE OR MORE BOLTS, SELECT THE BOLT WITH THE MOST SIGNIFICANT CRACK INDICATIONS FOR DIMENSIONAL AND METALLURGICAL ANALYSIS AS FOLLOWS (UPON COMPLETION OF THE VISUAL INSPECTION AND THE MAGNETIC PARTICLE INSPECTION, CONTINUE THE 6,000-ROUND ENDURANCE TEST TO COMPLETION BEFORE BEGINNING THE DIMENSIONAL AND METALLURGICAL INSPECTION OUTLINED BELOW):

A. DIMENSIONALLY INSPECT THE R.025-.005 LUG FILLET RADII (7 PLACES), THE R.020-.005 FILLET RADII AT THE BASE OF THE LUG CHAMFER (7 PLACES), THE .102±.002 LUG WIDTH (7 PLACES) AND THE 32 SURFACE FINISH ON THE LUG RADII.

B. IF THE ABOVE DIMENSIONAL FEATURES ARE FULLY CONFORMING, PERFORM A METALLURGICAL ANALYSIS FOR CONFORMANCE TO THE DEPTH REQUIREMENTS OF NOTES 7 AND 9B (1) & (2) OF DRAWING 8448510 IN ACCORDANCE WITH THE PROCEDURE SPECIFIED IN SPECIAL TEST METHOD 505.

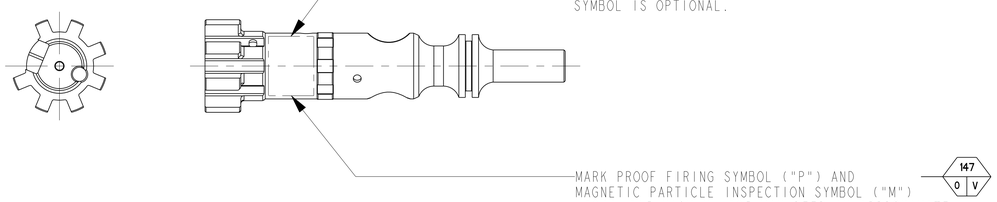
IF A NON-CONFORMANCE IS FOUND IN EITHER THE DIMENSIONAL OR METALLURGICAL ANALYSIS, THE BOLT SHALL BE CLASSIFIED AS AN UNSERVICEABLE PART. IF THE BOLT IS FOUND FULLY CONFORMING, ALL BOLTS IN THIS ENDURANCE TEST SHALL BE CONSIDERED TO BE SERVICEABLE PARTS.

II. WHEN BOLTS ARE PROVIDED TO THE GOVERNMENT AS A SPARE PART NOT CONCURRENT WITH WEAPONS PRODUCTION, TWO BOLTS SELECTED FROM EACH LOT SHALL BE ENDURANCE TESTED IN M4 CARBINES IN ACCORDANCE WITH PARAGRAPH 4.5.7.1 OF MIL-DTL-70599. UPON COMPLETION OF THE FIRST 2,400 ROUNDS OF THE 6,000-ROUND ENDURANCE TEST, EACH BOLT SHALL BE VISUALLY INSPECTED AND MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH THE PROCEDURE SPECIFIED IN THE WEAPONS SPECIFICATION. IF CRACKS THAT ARE VISIBLE TO THE UNAIDED, NAKED EYE ARE DETECTED IN ANY AREA OF THE BOLT, THE BOLT SHALL BE CLASSIFIED AS AN UNSERVICEABLE PART, AS DEFINED IN THE WEAPON SPECIFICATION. THE OCCURRENCE OF MAGNETIC PARTICLE CRACK INDICATIONS IN ANY AREA OF THE BOLT OTHER THAN THE LUG AREA SHALL ALSO RESULT IN THE CLASSIFICATION OF THE BOLT AS AN UNSERVICEABLE PART. IF MAGNETIC PARTICLE CRACK INDICATIONS IN THE LUG AREA OF LENGTH LESS THAN OR EQUAL TO .078 INCHES ARE DETECTED, THE BOLT SHALL BE CONSIDERED SERVICEABLE. IF MAGNETIC PARTICLE CRACK INDICATIONS IN THE LUG AREA OF LENGTH GREATER THAN .078 INCHES ARE DETECTED ON ONE OR MORE BOLTS, SELECT THE BOLT WITH THE MOST SIGNIFICANT CRACK INDICATIONS FOR DIMENSIONAL AND METALLURGICAL ANALYSIS AS FOLLOWS (UPON COMPLETION OF THE VISUAL INSPECTION AND THE MAGNETIC PARTICLE INSPECTION, CONTINUE THE 6,000-ROUND ENDURANCE TEST TO COMPLETION BEFORE BEGINNING THE DIMENSIONAL AND METALLURGICAL INSPECTION OUTLINED BELOW):

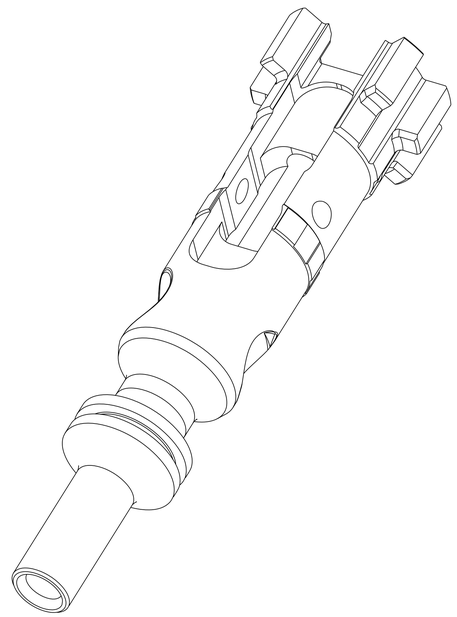
A. DIMENSIONALLY INSPECT THE R.025-.005 LUG FILLET RADII (7 PLACES), THE R.020-.005 FILLET RADII AT THE BASE OF THE LUG CHAMFER (7 PLACES), THE .102±.002 LUG WIDTH (7 PLACES) AND THE 32 SURFACE FINISH ON THE LUG RADII.

B. IF THE ABOVE DIMENSIONAL FEATURES ARE FULLY CONFORMING, PERFORM A METALLURGICAL ANALYSIS FOR CONFORMANCE TO THE DEPTH REQUIREMENTS OF NOTES 7 AND 9B (1) & (2) OF DRAWING 8448510 IN ACCORDANCE WITH THE PROCEDURE SPECIFIED IN SPECIAL TEST METHOD 505.

IF A NON-CONFORMANCE IS FOUND IN EITHER THE DIMENSIONAL OR METALLURGICAL ANALYSIS, THE BOLT SHALL BE CLASSIFIED AS AN UNSERVICEABLE PART. IF THE BOLT IS FOUND FULLY CONFORMING, ALL BOLTS IN THIS ENDURANCE TEST SHALL BE CONSIDERED TO BE SERVICEABLE PARTS.



148 III C — ALL SURFACES WITH 32 SURFACE FINISH
237 II V — MISSING OR DEFECTIVE PROTECTIVE FINISH
239 II V — WORKMANSHIP
303 Z — ENDURANCE TEST
502 Z — SALT SPRAY TEST
503 Z — COATING WEIGHT
504 Z — SUPPLEMENTARY OIL TREATMENT, SALT SPRAY TEST



ISOMETRIC VIEW
SCALE 4.000

DISTRIBUTION STATEMENT F: FURTHER DISTRIBUTION ONLY AS DIRECTED BY US ARMY ARDEC, AMSTA-AR-CCL-F, ROCK ISLAND, IL; 1993-09-14.

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PICATINNY ARSENAL, NEW JERSEY 07806-5000

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PART NO. 8448510

DESIGN ACTIVITY	US ARMY ROCK ISLAND ARSENAL ROCK ISLAND, ILLINOIS
	BOLT
SIZE F	CAGE CODE 19204
DWG NO.	8448510
SCALE 2.000	UNIT WT. 0.086
SHEET	3 OF 3