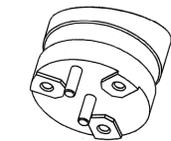
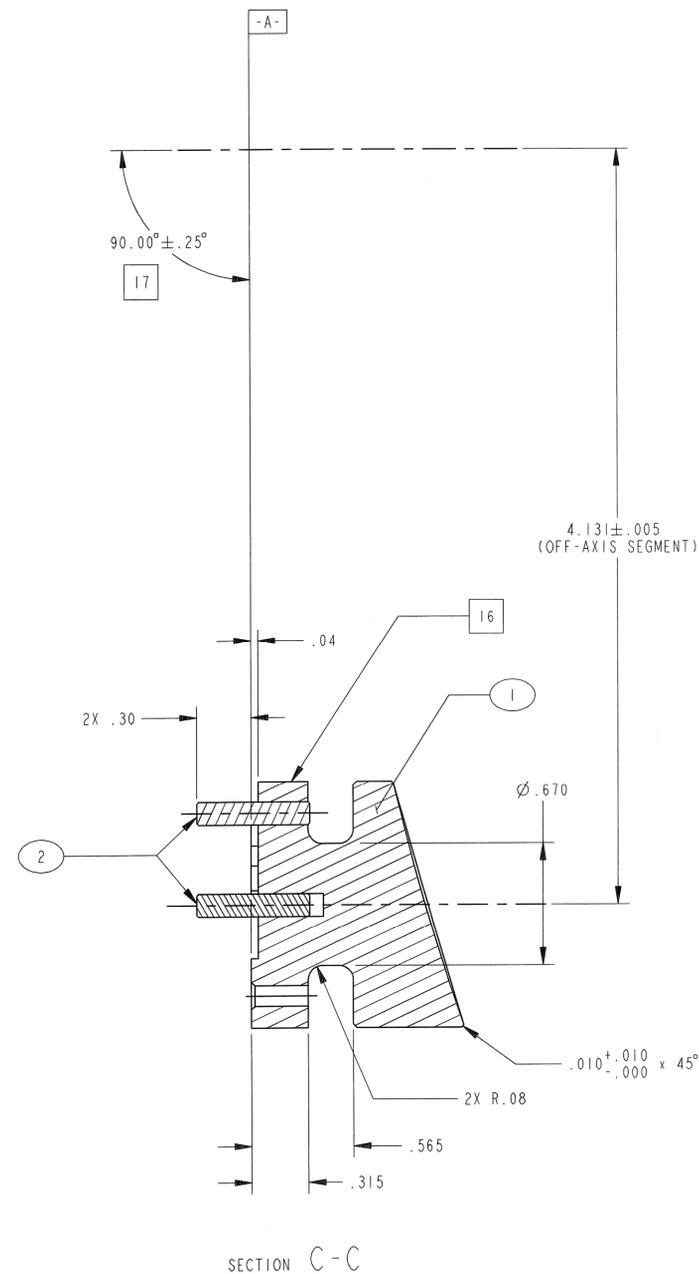
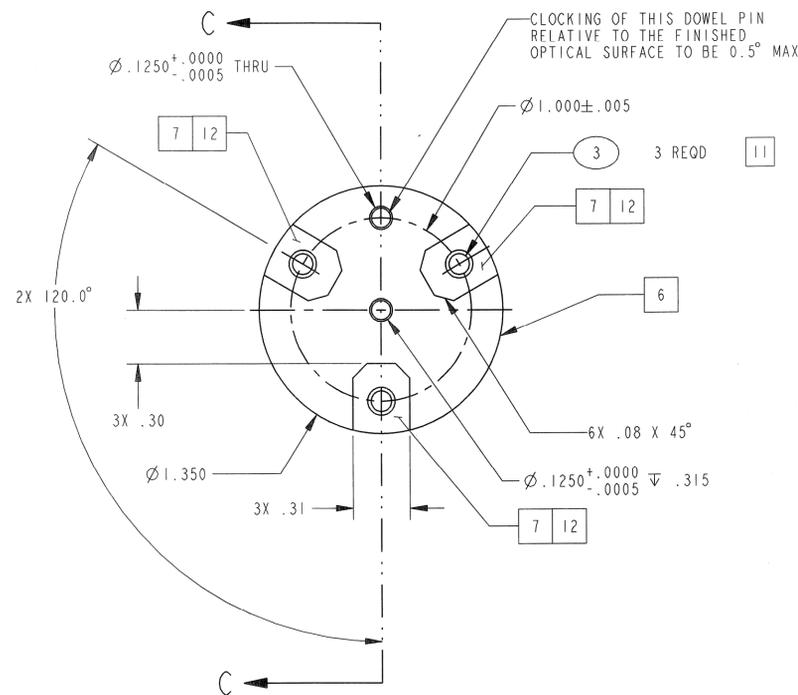


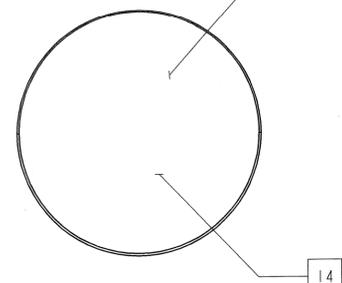
NOTES:

- APPLICABLE STANDARDS/SPECIFICATIONS:
MIL-STD-100, DOD STANDARD PRACTICE FOR ENGINEERING DRAWINGS,
ASME Y14.100M, ENGINEERING DRAWING PRACTICES,
MIL-T-31000, TECHNICAL DATA PACKAGES.
- BREAK ALL SHARP EDGES AND REMOVE ALL BURRS
.010 MAX CHAMFER OR RADIUS.
- NON-OPTICAL SURFACE ROUGHNESS SHALL BE 125 μ m RMS OR BETTER
UNLESS SPECIFIED OTHERWISE
- DIMENSIONS APPLY AFTER SURFACE TREATMENT(S)
- PERFORM HEAT TREAT AND THERMAL STABILIZATION PROCESSES IN THE
FOLLOWING ORDER, PRIOR TO PERFORMING DIAMOND TURNING OPERATIONS:
 - ROUGH MACHINE MIRROR TO WITHIN A MAXIMUM OF 0.050 OVERSIZED
OF FINAL DIMENSIONS TO ALLOW FOR DIMENSIONAL CHANGES DUE TO STRESS
RELAXATION
 - SOLUTION HEAT TREAT PART IN ACCORDANCE WITH AMS 2770. HEAT PART TO
985 DEG F (529 DEG C) +/- 10 DEG F FOR TWO HOURS MINIMUM. QUENCH IN A
20-22% POLYALKYLENE GLYCOL SOLUTION IN ACCORDANCE WITH AMS 3025.
QUENCH TEMPERATURE SHALL BE 85 TO 90 DEG F AT THE START OF THE QUENCH
 - PRECIPITATION AGE MIRROR IN ACCORDANCE WITH AMS 2770 AT 350 DEG F
(177 DEG C) +/- 10 DEG F FOR 8 TO 10 HOURS
 - FINISH MACHINE TO FINAL DIMENSIONS EXCLUDING DIAMOND TURNED
SURFACES
 - THERMAL CYCLE PART FIVE TIMES FROM ROOM TEMPERATURE TO -95 DEG F
(-70 DEG C) +/- 10 DEG F TO 200 DEG F (93 DEG C) +/- 10 DEG F
WITH THE TEMPERATURE CHANGE RATE NOT TO EXCEED 10 DEG F PER MINUTE.
DWELL TIME AT HIGH AND LOW TEMPERATURES SHALL BE 30 MINUTES MINIMUM
- CHROMATE CONVERSION COAT IN ACCORDANCE WITH MIL-C-5541, CL 1A PRIOR
TO FINISH OF OPTICAL SURFACES
- DIAMOND TURNED SURFACES SHALL BE ELECTROLESS NICKEL PLATED PER AMS2404F
PRIOR TO FINISH OF OPTICAL SURFACES. NICKEL PLATING THICKNESS SHALL BE
.001 MIN/.003 MAX AFTER DIAMOND TURNING
- CLEAR APERTURE SHALL EXTEND TO 0.040 FROM EDGE.
- SURFACE SHAPE AND DEFINITION: OFF-AXIS PARABOLIC SEGMENT SAG (Z) IS MEASURED
FROM A FLAT TANGENT TO THE BASE SPHERE AT ITS VERTEX. POWER/IRREGULARITY
OF THE SURFACE SHALL BE LESS THAN 12/3 FRINGES AT 632.8 nm.
$$Z = \frac{C Y^2}{2}$$

WHERE: C = 1 / RADIUS OF CURVATURE = 1 / 15.413 (391.5 mm)
- PARABOLIC SURFACE SHALL BE BETTER THAN 6 WAVES RMS AT 633nm
IN DOUBLE PASS CONFIGURATION
- INSTALL HELICOIL INSERTS PER NASM33537. BREAK
OFF DRIVING TANGS.
- INDICATED DIAMOND TURNED SURFACES (3 TOTAL) SHALL BE FLAT WITHIN 3 WAVES
- SURFACE ROUGHNESS SHALL BE DETERMINED BY MEASUREMENTS AT 3
LOCATIONS THAT ARE SPACED EQUALLY ACROSS THE CLEAR APERTURE ALONG A
PLANE THAT RUNS THROUGH THE OPTICAL AXIS. THE AVERAGE OF THE
MEASUREMENTS SHALL NOT EXCEED 40 ANGSTROMS RMS, WITH NO ONE
MEASUREMENT EXCEEDING 120 ANGSTROMS RMS. SCRATCH AND DIG
[40 & 20] IN ACCORDANCE WITH MIL-F-48616 IS PERMITTED
- COAT OPTICAL SURFACES IN ACCORDANCE WITH MIL-F-48616 AS FOLLOWS:
 - COAT CLEAR APERTURE WITH REFLECTIVE COATING AND PROTECTIVE
OVERCOAT AS FOLLOWS:
 - WAVELENGTH BAND: 5 TO 50 MICRONS
 - THE AVERAGE REFLECTANCE SHALL BE GREATER THAN 98% OVER THE
WAVELENGTH BAND AT ANGLES OF INCIDENCE BETWEEN $\pm 18^\circ$.
THE MINIMUM REFLECTANCE WITHIN THE WAVELENGTH BAND
AND RANGE OF ANGLES OF INCIDENCE SHALL BE GREATER THAN 96%.
 - THE COATING SHALL BE SUBJECT TO THE HUMIDITY, MODERATE ABRASION,
AND ADHESION TESTS OF MIL-F-48616. EXCEPT SEQUENCE OF TEST SHALL BE
HUMIDITY, MODERATE ABRASION, AND ADHESION
 - REFLECTANCE TESTS SHALL BE PERFORMED AT 15° ANGLE OF INCIDENCE
 - FOR THE PURPOSE OF JUDGING COATINGS IN ACCORDANCE WITH MIL-F-48616
THE CLEAR APERTURE OF A WITNESS SAMPLE SHALL BE DEFINED AS A
CENTRAL REGION OF THE COATED SURFACE HAVING DIMENSIONS 80% OF
THE OUTSIDE DIMENSIONS OF THE SAMPLE SURFACE
 - REFLECTANCE TRACES AND ONE WITNESS SAMPLE SHALL ACCOMPANY
HARDWARE FOR EACH COATING RUN
- PACKAGE IN ACCORDANCE WITH MIL-F-48616. INTERMEDIATE PACKAGES AND
SHIPPING CONTAINERS SHALL BE MARKED WITH "CAUTION: PRECISION OPTICAL
PART. DO NOT OPEN INDIVIDUAL UNIT CONTAINERS IN RECEIVING." ATTACH ALL
PACKING SLIPS, INVOICES, ETC., ON OUTSIDE OF PACKAGING
- IDENTIFY IN ACCORDANCE WITH MIL-STD-130, METHOD AND TYPE OPTIONAL.
LOCATE APPROXIMATELY WHERE SHOWN, RADIAL POSITION OPTIONAL. INCLUDE
PART NUMBER, DASH NUMBER, AND SERIAL NUMBER BEGINNING WITH SERIAL
NUMBER 001
- TOLERANCE BETWEEN MOUNTING PAD DATUM PLANE [A] AND OPTICAL AXIS.



SCALE 1/1



ZONE		REV	DESCRIPTION	DRAWN	CHECKED	LEAD ENGR	BRANCH	DATE
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REVISION HISTORY

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO.
3	91767	1185-04CNI68	Ø .112-40 X .168 THREADED INSERT	CRES	3
2	OKVE6	MS16555-628	Ø .1250 X .625 SOLID DOWEL PIN	CRES	2
1		-11	PARABOLA MIRROR	AL ALLOY 6061-T651 AMS QQ-A-225/8	1

PART DASH NO.		QTY REQD PER ASSY	APPLICATION	SIMILAR TO	SPECIAL MARKING SYM	CONTRACT NO.	APPROVALS	DATE	TITLE	SIZE	CAGE CODE	DWG. NO.	REV.
-1	6	6	TBD	CLARREO	[6] [7] [14]		C.M. BOYER	04-Nov-10	PARABOLA MIRROR IR INSTRUMENT ASSY CLARREO	D	25305	1251772	-
										SCALE	2/1		

NATIONAL AERONAUTICS & SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
HAMPTON, VA 23681-2199

PARABOLA MIRROR
IR INSTRUMENT ASSY
CLARREO

SCALE 2/1