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NOTE: This drawing was prepared by joint action of the Air Force and Navy Departments under the authority of the Department of Defense. It is intended to be used as a standard drawing for the same product and shall be used for the procurement of commercial supplies, or for use in new designs, not later than 6 months after the latest date of approval shown.

USE WASHER AN960, 1/16 THICK FOR FITTINGS SIZE -6 OR SMALLER, AND 3/32 THICK FOR FITTINGS SIZE -8 OR LARGER WHEN BULKHEAD IS 3/16 THICK OR LESS. WHEN BULKHEAD IS THICKER THAN 3/16, WASHER IS NOT REQUIRED PROVIDED HOLE IN BULKHEAD IS EQUAL TO THE HOLE IN APPLICABLE AN960 WASHER. WASHER IS NOT REQUIRED WHERE FITTING END HAS REX INSTEAD OF FLANGE SHOWN, PROVIDED HOLE IN BULKHEAD IS EQUAL TO HOLE SIZE IN APPLICABLE AN960 WASHER.

(A) FITTING HAVING A BULKHEAD FLARED TUBE CONNECTION END IN ACCORDANCE WITH AND10057

FITTING WITH BULKHEAD END CONFORMING TO AND10057, STYLE B, IN SIZES -6 AND SMALLER, MAY BE USED THROUGH BULKHEADS UP TO 1/4 MAXIMUM THICKNESS. SIZES -8 AND LARGER AND ALL SIZES OF AN672 MAY BE USED THROUGH BULKHEADS UP TO 3/8 MAXIMUM THICKNESS.

SLEEVE AN619
TUBING - FLARED IN ACCORDANCE WITH AND10061 OR AND10078

NUT AN924
NUT AN618

BULKHEAD AND FLARED TUBE INSTALLATION

DASH NOS. REF.	TUBING OD INCHES	WRENCH TORQUE FOR TIGHTENING AN618 NUT (POUND INCH)						ROSE END FITTINGS AND ROSE ASSEMBLIES (POUND INCH)	
		ALUMINUM-ALLOY TUBING FLARE AND10061 OR AND10078		STEEL TUBING FLARE AND10061		ALUMINUM-ALLOY TUBING (FLARE AND10078) FOR USE ON OXYGEN LINES ONLY		MS26710 AN6292	
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
	1/8	—	—	—	—	—	—	—	—
-3	3/16	—	—	90	100	—	—	70	100
-4	1/4	40	65	135	150	—	—	70	(6) 120
-5	5/16	60	80	180	200	100	125	85	180
-6	3/8	75	125	270	300	—	—	100	250
-8	1/2	150	250	450	500	—	—	210	420
-10	5/8	200	350	650	700	—	—	300	480
-12	3/4	300	500	900	1000	—	—	500	850
-16	1	500	700	1200	1400	—	—	700	1150
-20	1-1/4	600	900	—	—	—	—	—	—
-24	1-1/2	600	900	—	—	—	—	—	—
-28	1-3/4	—	—	—	—	—	—	—	—
-32	2	—	—	—	—	—	—	—	—

INSTALLATION OF FITTINGS HAVING THE CONNECTION END IN ACCORDANCE WITH AND10056 IS SIMILAR, EXCEPT THAT THE END IS NOT USED THROUGH BULKHEADS. WRENCH TORQUES FOR ASSEMBLING THE TUBING ARE THE SAME.

NOMINAL USE: AIRFRAME FLUID CONNECTIONS.

SHEET NO. 4 ADDED.

THIS DOCUMENT HAS BEEN SUPERSEDED BY
MS 21344

AIR FORCE-NAVY AERONAUTICAL DESIGN STANDARD
FITTINGS - INSTALLATION OF FLARED TUBE,
STRAIGHT THREADED CONNECTORS

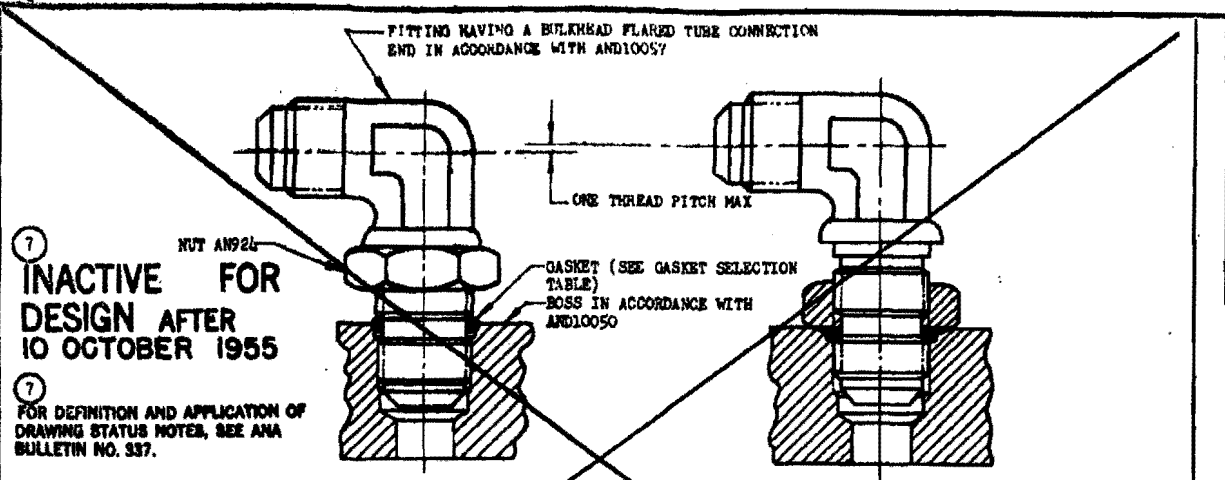
AND10064
SHEET 1 OF 4

NOT A PART NUMBER

APPROVED 19 Dec 42 REVISED 1 1 Nov 45 2 7 Nov 46 3 16 May 47 4 14 Jun 51 5 22 Jun 54 6 10 Feb 56

NOTE 2: This drawing is a design modification, as such it is not to be used for any purpose other than its replacement with a standard, unless otherwise noted. It is the responsibility of the user to determine the applicability of this drawing to their specific application. This drawing is not to be used for any purpose other than its replacement with a standard, unless otherwise noted. It is the responsibility of the user to determine the applicability of this drawing to their specific application.

NOTE 1: This drawing was approved by joint action of the Air Force and Navy Departments on the Air Force-Navy standardization program. This drawing represents the standard form/fit for the standard product and shall be used for the procurement of standard parts, or for the use of any design, see Item 6 and Item 8 of the standard for the procurement of standard parts, or for the use of any design, see Item 6 and Item 8 of the standard for the procurement of standard parts.



⑦ **INACTIVE FOR DESIGN AFTER 10 OCTOBER 1955**

⑦ FOR DEFINITION AND APPLICATION OF DRAWING STATUS NOTES, SEE ANA BULLETIN NO. 337.

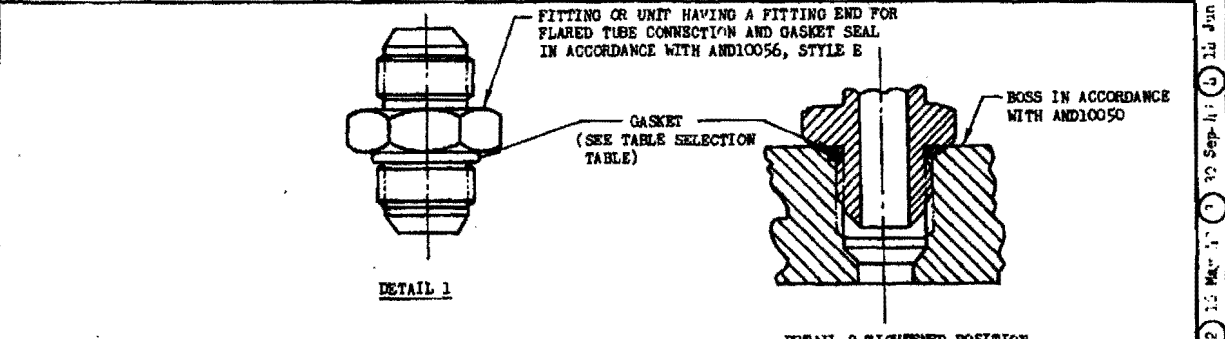
FITTING INSERTED UNTIL GASKET CONTACTS BOSS **FITTING POSITIONED AND LOCKNUT TIGHTENED**
POSITIONING TYPE UNIVERSAL FITTING INSTALLATION SUITABLE FOR NOMINAL OPERATING PRESSURES UP TO AND INCLUDING 1000 PSI

PROCEDURE FOR INSTALLATION OF UNIVERSAL FITTINGS:

1. ASSEMBLE NUT AN924 ON FITTING END AND RUN ALL THE WAY BACK TO CLEAR GASKET GROOVE.
2. LUBRICATE GASKET IN APPROPRIATE LIQUID. (SEE TABLE)
3. PLACE GASKET IN GASKET GROOVE.
4. RUN NUT DOWN UNTIL IT CONTACTS THE GASKET AND MAINTAIN THIS CONTACT DURING POSITIONING TO PREVENT CUTTING THE GASKET ON THE FITTING THREAD.
5. SCREW FITTING INTO BOSS UNTIL GASKET CONTACTS THE BOSS.
6. SCREW FITTING IN AN ADDITIONAL 180°. ANY FURTHER POSITIONING OF THE FITTING MUST BE ACCOMPLISHED BY TURNING THE FITTING IN UP TO AN ADDITIONAL 270° OR BY BACKING OUT UP TO 90°.
7. TIGHTEN LOCK NUT LIGHTLY.
8. ASSEMBLE FLARED TUBE TO FITTING.
9. TIGHTEN LOCK NUT AGAINST BOSS.

NOT TO BE USED IN HYDRAULIC OR PNEUMATIC SYSTEMS. SEE SHEET 3 FOR HYDRAULIC AND PNEUMATIC SYSTEM USAGE.

GASKET SELECTION TABLE		
APPLICATION	AN OR MS NO.	APPROPRIATE LUBRICATING LIQUID
ENGINE OIL	AN6290	ENGINE OIL
FUEL	MS29512	APPLICABLE FUEL



NON-POSITIONING TYPE FITTING INSTALLATION SUITABLE FOR NOMINAL OPERATING PRESSURES UP TO AND INCLUDING 3000 PSI

PROCEDURE FOR INSTALLATION OF AND10056 FITTING END, STYLE B.

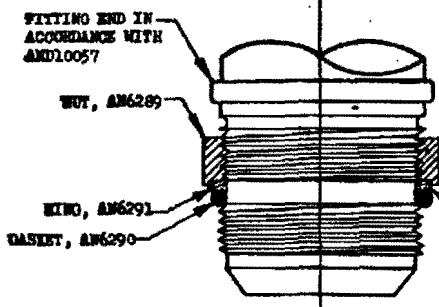
1. LUBRICATE THE GASKET IN APPROPRIATE LIQUID (SEE TABLE).
2. INSTALL GASKET ON THE FITTING AS SHOWN IN DETAIL 1.
3. SCREW THE FITTING ASSEMBLY INTO THE BOSS UNTIL IT BOTTOMS TIGHTLY ON THE BOSS AS SHOWN IN DETAIL 2.

GASKET SELECTION TABLE		
APPLICATION	AN OR MS NO.	APPROPRIATE LUBRICATING LIQUID
HYDRAULIC	AN6290	MIL-O-5606 OR PETROLATUM
ENGINE OIL	AN6290	ENGINE OIL
FUEL	MS29512	APPLICABLE FUEL
PNEUMATIC	AN6290	MIL-O-1343

APPROVED 1 Nov 45 REVISED 17 Nov 46 2 15 MAR 47 3 10 SEP 47 4 10 JAN 48 5 10 FEB 52 6 17 NOV 51 7 10 OCT 55

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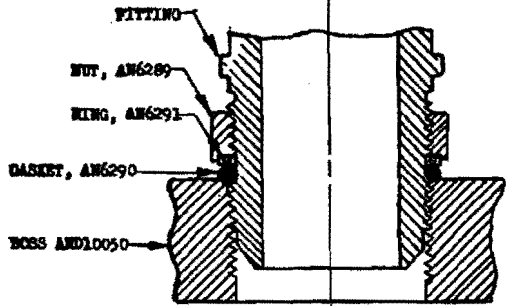
NOTE: This drawing was prepared by John Smith of the Air Force and Navy Department at the Air Force-NAVY Design Center, Dayton, Ohio. This drawing represents an unclassified standard developed for the common use of all Air Force and Navy aircraft. It is the policy of the Department of Defense to make its information available to the maximum extent possible consistent with national security. This document is unclassified and its contents are not to be controlled by exportation or otherwise. It is the policy of the Department of Defense to make its information available to the maximum extent possible consistent with national security.



COAT MALE THREADS OF FITTING, RING, AM6291, AND GASKET, AM6290, SPARINGLY WITH PETROLATUM, SPECIFICATION AN-P-51 (VASELINE), OR HYDRAULIC FLUID AND ASSEMBLE AS SHOWN. WORK THE RING, AM6291, INTO THE COUNTERBORE OF THE NUT, AM6289; THEN TURN THE NUT, AM6289, DOWN UNTIL THE GASKET, AM6290, IS PUSHED FIRMLY AGAINST THE LOWER THREADED SECTION OF THE FITTING

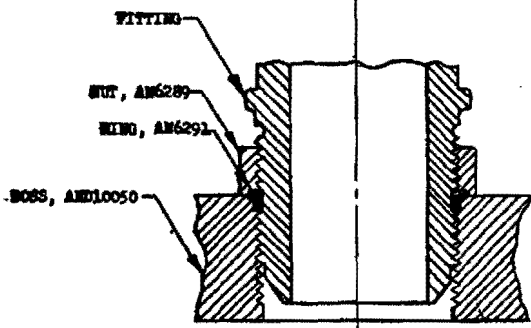
3 INSTALL AM6291 RING WITH SMOOTH (HAIR) SIDE TOWARD THE O RING

STEP 1



INSTALL THE FITTING INTO THE BOSS, AND10050, AND, AT THE SAME TIME, KEEP THE NUT, AM6289, TURNING WITH THE FITTING UNTIL THE GASKET, AM6290 CONTACTS THE BOSS, AND10050. THIS POINT CAN BE DETERMINED BY A SUDDEN INCREASE IN TORQUE. WITH THE FITTING IN THIS POSITION, PUT A WRENCH ON THE NUT, AM6289, TO PREVENT ITS TURNING AND, AT THE SAME TIME, TURN THE FITTING IN 1-1/2 TURNS. POSITION FITTING BY TURNING IN NOT MORE THAN ONE ADDITIONAL TURN

STEP 2



HOLD FITTING AND TURN NUT, AM6289, DOWN TIGHTLY AGAINST BOSS, AND10050. SLIGHT EXTRUSION OF THE RING, AM6291 IS NOT DETRIMENTAL.

STEP 3

POSITIONING TYPE UNIVERSAL FITTING INSTALLATION SUITABLE FOR NORMAL OPERATING PRESSURES UP TO AND INCLUDING 3000 PSI IN HYDRAULIC AND PNEUMATIC SYSTEMS

APPROVED 15 May 49 REVISED 1 14 Jun 51 2 1 May 53 3 23 Nov 54

AIR FORCE-NAVY AERONAUTICAL DESIGN STANDARD

FITTINGS - INSTALLATION OF FLARED TUBE, STRAIGHT THREADED CONNECTORS

AND10064

SHEET 3

NOT A PART NUMBER

SUPERSEDES USAF DRAWING 46R1656

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NOTES: This drawing was prepared by the Air Force and Navy Departments as the Air Force-Navy standard for this product. This drawing represents the minimum standard drawings for the same product and shall become obsolete for the procurement of conventional supplies, or for use in new designs, and later than 6 months after the latter date of approval thereof.

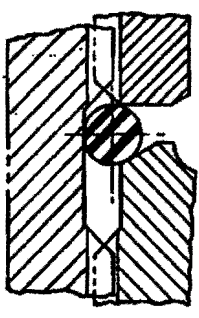


FIGURE I
DETAIL OF POSITIONING TYPE
NOMINAL CONTACT POSITION OF SEAL

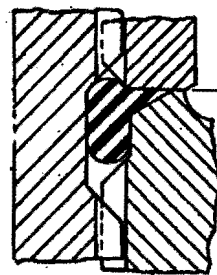


FIGURE II
NUT CONTACTS BOSS

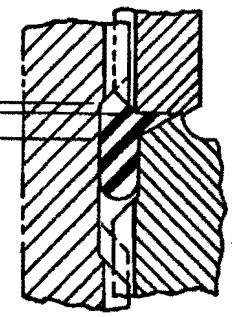


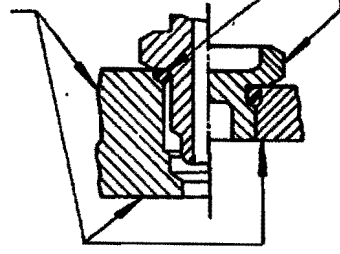
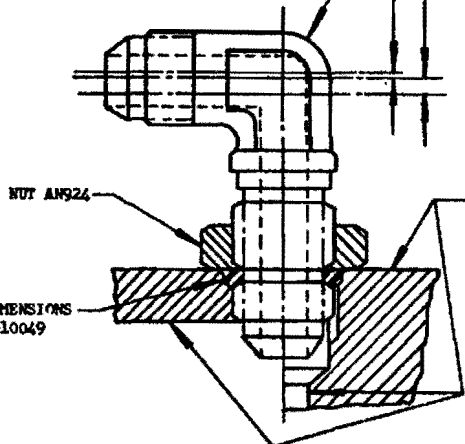
FIGURE III
POSITIONING OF FITTING

AND10059 APPLICABLE FITTINGS HAVING A SEAL GROOVE ON THE BOSS CONNECTION END CONFORMING TO AND10057

TURN OUT POSITION (A)
TURN IN POSITION (B)

FITTING OR PLUG HAVING A SEAL-GROOVE ON THE BOSS CONNECTION END CONFORMING TO AND10056, STYLE E

SEAL DIMENSIONS, SEE AND10049



POSITIONING TYPE UNIVERSAL FITTING INSTALLATION
PROCEDURE FOR INSTALLATION

ASSEMBLE NUT AN924 ON FITTING END UNTIL WASHER FACE OF NUT LINES UP WITH UPPER CORNER OF SEAL GROOVE (FIG I). LUBRICATE SEAL SPARINGLY WITH WHITE PETROLATUM AND PLACE SEAL ON FITTING GROOVE SO IT CONTACTS NUT (FIG I). SCREW FITTING (AND NUT SIMULTANEOUSLY) INTO BOSS UNTIL SEAL CONTACTS BOSS CHAMFER (FIG I) AND UNTIL NUT CONTACTS BOSS (FIG II). BEFORE TIGHTENING LOCKNUT AN924, POSITION FITTING DIRECTION BY EITHER TURNING IN AS MUCH AS 3/4 TURN (+270°) OR TURNING OUT AS MUCH AS 1/4 TURN (-90°) (FIG III). ASSEMBLE FLUID LINE TO AND10059 FITTING END. HOLDING THE FITTING STATIONARY IN SELECTED POSITION, TIGHTEN LOCKNUT.

NON-POSITIONING TYPE FITTING OR PLUG INSTALLATION
PROCEDURE FOR INSTALLATION

1. LUBRICATE SEAL SPARINGLY WITH WHITE PETROLATUM AND PLACE SEAL IN GROOVE.
2. SCREW FITTING OR PLUG INTO BOSS UNTIL CONTACT IS MADE WITH BOSS SURFACE.

NOMINAL USE: AIRCRAFT ENGINE FLUID CONNECTION.

AIR FORCE-NAVY AERONAUTICAL DESIGN STANDARD

FITTINGS - INSTALLATION OF FLARED TUBE, STRAIGHT THREADED CONNECTORS

AND10064

SHEET 4

NOT A PART NUMBER

APPROVED 1 Feb 54 REVISED