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28 July 1961

MILITARY STANDARD

DIMENSIONING OF BARREL CHAMBERS SMALL ARMS WEAPONS



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Standardization Division

Dimensioning of Barrel Chambers of Small Arms Weapons

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1. This standard has been approved by the Department of Defense and is mandatory for use by the Departments of the Army, the Navy, and the Air Force.

2. In accordance with established procedure, the Standardization Division has designated the Ordnance Corps, the Bureau of Naval Weapons and Warner Robins Air Materiel Area, respectively, as Army-Navy-Air Force custodians of this standard.

3. Recommended corrections, additions, or deletions should be addressed to the Standardization Division, Armed Forces Supply Support Center, Washington 25, D. C.

FOREWORD

The purpose of this standard is to establish a uniform method of dimensioning barrel chambers for small arms weapons.

The word "barrel" as used in this standard includes barrel assembly. The words "small arms weapons" as used in this standard shall apply to guns of a caliber up to and including 30-mm. Hand, shoulder, and automatic weapons, such as pistols, carbines, rifles, shot-guns, machine guns, and automatic guns are included in the term.

Basically, the barrel chamber configuration and method of dimensioning is determined by the design of the cartridge to be chambered; however, the breech mechanism employed also must be taken into consideration since the chamber entrance and chamber dimensioning will be affected.

Barrel chambers covered by this standard are identified with the cartridge case classifications listed below (see 1.1.1). Also listed, for informational purposes, are typical types of ammunition identified with the cartridge case classification.

<i>Cartridge case classification</i>	<i>Ammunition</i>
Belted shoulder type	Cal .300 H&H Magnum
Rimless shoulder type	Cal .30, cal .30-06, cal .50 7.62-mm, 20-mm.
Rimmed shoulder type	Cal .22 hornet
Belted straight	30-mm.
Rimless straight	Cal .45, cal .30 (carbine)
Rimmed straight	Cal .38 special, cal .22 long rifle

The dimensioning methods specified herein for each type of barrel chamber takes into consideration the ammunition dimensions, the dimensional and functional requirements of the assembled weapon, the machining methods, and the gaging methods.

Compliance with this standard should promote uniform interpretation of barrel chamber requirements and aid in the design, manufacture, and inspection of small arms barrels.

Prepared by the Army Ordnance Corps in conjunction with the Department of Defense Standardization Program, it is one of a series of military standards which will encompass all FSC 1005 weapons, accessories and related equipment.

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1. SCOPE

1.1 This document establishes standard methods of dimensioning barrel chambers for small arms weapons on detailed drawings for each type of barrel chamber described herein. It also establishes standard methods for specifying headspace dimensions for the assembled weapon. Adherence to this standard is mandatory in the preparation of drawings by or for the Department of Defense. Dimensioning of revolver type weapon chambers is not covered by this standard inasmuch as the chamber for this weapon type normally is in the revolving cylinder and not in the barrel.

1.1.1 *Types of small arms barrels and barrel chambers.*

1.1.1.1 The types of small arms barrel chambers covered by this standard are:

- (a) Rimless shoulder type cartridge chamber.
- (b) Rimmed shoulder type cartridge chamber.

- (c) Rimless straight cartridge chamber.
- (d) Rimmed straight cartridge chamber.
- (e) Belted shoulder type cartridge chamber.
- (f) Belted straight cartridge chamber.

1.1.1.2 The types of small arms barrels containing these chambers that are covered by this standard are:

- (a) Threaded barrel, adjustable headspace.
- (b) Threaded barrel, fixed headspace.
- (c) Quick change barrel, fixed headspace.

1.1.2 The dimensioning methods specified herein should be applied to special purpose test barrel chambers whenever practicable.

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2. REFERENCED DOCUMENTS

Not applicable

3. DEFINITIONS

3.1 For the purpose of this standard, the following definitions shall apply:

3.1.1 *Belt*. A narrow enlarged portion of the chamber rearward of the body for the purpose of seating belted cartridges (see fig. 1B).

3.1.2 *Belt junction*. The intersection between the belt and the truncated cone of the stop surface (see fig. 1B).

3.1.3 *Body*. Normally, the portion of the chamber between the chamber entrance and stop shoulder. In a belted cartridge chamber, it is that portion just forward of the belt. For rimless straight cartridge chambers, the chamber consists entirely of the body. The chamber for this type cartridge has no truncated cone shoulder stop.

3.1.4 *Body junction*. The intersection between the chamber body and the truncated cone of the stop shoulder.

3.1.5 *Bullet seat*. The portion of the chamber between the neck shoulder and forcing cone. In some chamber designs the bullet seat and forcing cone may be combined.

3.1.6 *Chamber*. The enlarged rear portion of the interior of the barrel which contains or holds the cartridge when in position to be fired.

3.1.6.1 *Chamber, belted shoulder type cartridge*. A barrel chamber for a type of cartridge case which has a rimless head, a belt, a tapered body, and a shoulder. When chambered, the belt of the cartridge case is seated

against a chamber stop surface to the rear of the chamber body (see fig. 1B).

3.1.6.2 *Chamber, belted straight cartridge*. A barrel chamber for a type of cartridge which has a rimless head, a belt, and a straight body. When chambered, the belt of the cartridge case is seated against a chamber stop surface to the rear of the chamber body (see fig. 1B).

3.1.6.3 *Chamber, rimless shoulder type cartridge*. A barrel chamber for a type of cartridge which has a rimless head, a tapered body, and a stop shoulder. When chambered, the stop shoulder of the case is seated against the stop shoulder in the barrel chamber (see fig. 1).

3.1.6.4 *Chamber, rimless straight cartridge*. A barrel chamber for a type of cartridge which has a rimless head, a straight body, and a mouth whose inside diameter is equal to the inside diameter of the case body. When chambered, the face of the mouth is seated against the stop shoulder in the barrel chamber (see fig. 1A).

3.1.6.5 *Chamber, rimmed shoulder type cartridge*. A barrel chamber for a type of cartridge which has a rimmed head, a tapered body, and a shoulder. When chambered, the rim of the cartridge case is seated against a recessed stop surface in the breech end of the barrel chamber, or against the breech face of the barrel.

3.1.6.6 *Chamber, rimmed straight cartridge*. A barrel chamber for a type of cartridge with a rimmed head, a straight body,

and a mouth whose inside diameter is equal to the inside diameter of the case body. When chambered, the rim of the cartridge case is seated against a recessed stop surface in the breech end of the barrel chamber or against the breech face of the barrel (see fig. 1A).

3.1.7 Chamber entrance. The transition from the vertical breech face of the barrel to the chamber body. This may assume various forms depending upon the mechanism design (see fig. 1, views A, B, and C).

3.1.8 First shoulder. See stop shoulder.

3.1.9 Forcing cone. The tapered portion of the chamber beginning at the bullet seat and continuing until the full height of the lands is reached. In some designs the bullet seat may be incorporated into the forcing cone.

3.1.10 Forcing cone junction. The intersection of the bullet seat and forcing cone (see fig. 1).

3.1.11 Headspace. The distance between the face of the bolt (fully closed) and either (a) the cartridge stop surface, (b) the datum diameter in the stop shoulder or (c) the breech face of the barrel.

3.1.12 Neck. The reduced portion of the chamber which extends from the front to the stop shoulder to the rear of the bullet seat in a shoulder type cartridge chamber (see fig. 1).

3.1.13 Neck junction. The intersection of the truncated cone of the stop shoulder and the neck.

3.1.14 Neck junction, front. The intersection of the neck and the truncated cone of the neck shoulder.

3.1.15 Neck shoulder. The truncated cone portion of the chamber between the neck and the bullet seat. This portion of the chamber is also commonly referred to as the second shoulder.

3.1.16 Origin of rifling. The beginning of the helical grooves cut in the bore of a barrel; normally, within the forcing cone (see fig. 1).

3.1.17 Rifling. The helical grooves cut in the bore of a barrel, beginning at the forcing cone (rifling origin) and extending to the muzzle.

3.1.18 Second shoulder. See neck shoulder.

3.1.19 Stop shoulder. For rimless straight cartridge chamber, the stop shoulder is the step surface between the body and forcing cone. For rimless shoulder type cartridge chamber, the stop shoulder is the truncated cone portion of the chamber between the body and the neck. For this type cartridge chamber, this area is also commonly referred to as the first shoulder. These stop shoulders provide the longitudinal stopping surface for the cartridge case.

3.1.20 Stop surface. For belted cartridge chamber, the stop surface is the truncated cone portion of the chamber between the belt and the body. For rimmed cartridge chamber, the stop surface is either the breech face of the barrel or the recessed face at the chamber entrance. These areas provide the longitudinal stopping surface for the cartridge case.

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4. GENERAL REQUIREMENTS

4.1 NOMENCLATURE OF BARREL CHAMBER SURFACES. Figures 1, 1A, and 1B illustrate sectional views of typical small arms barrel chambers and indicate the nomenclature of the barrel chamber surfaces referenced herein. Definitions of these surfaces are continued in section 3. Detail requirements for dimensioning these surfaces for specific barrel chambers and for specifying headspace dimensions for the assembled weapon are contained in section 5.

4.2 TYPES OF BARRELS.

4.2.1 Threaded barrel, adjustable headspace. This type of barrel screws into the barrel extension or other part of the weapon. Adjustment of headspace is accomplished by

screwing the barrel in or out of the assembled weapon.

4.2.2 Threaded barrel, fixed headspace. This type of barrel screws into the receiver of the weapon and seats against a stop or draw shoulder. Headspace in the assembled weapon cannot be adjusted except by reaming the barrel chamber or by selective assembly.

4.2.3 Quick change barrel, fixed headspace. This type of barrel assembles to the weapon by engaging the locking lugs on the barrel with the barrel extension or other part. The locking lugs on the barrel may be interrupted or continuous. Headspace in the assembled weapon is predetermined by dimensions of related parts and cannot be adjusted except through selective assembly.

5. DETAIL REQUIREMENTS

5.1 DIMENSIONING OF BARREL CHAMBERS. Standard methods for dimensioning of barrel chambers for small arms weapons for each type of barrel chamber (see 1.1.1.1) shall be as follows:

5.1.1 *Rimless shoulder type cartridge chamber.* This type of barrel chamber shall be dimensioned as indicated in figure 3.

5.1.2 *Rimmed shoulder type cartridge chamber.* This type of barrel chamber shall be dimensioned as indicated in figure 4.

5.1.3 *Rimless straight cartridge chamber.* This type of barrel chamber shall be dimensioned as indicated in figure 5.

5.1.4 *Rimmed straight cartridge chamber.* This type of barrel chamber shall be dimensioned as indicated in figure 5.

5.1.5 *Belted shoulder type cartridge chamber.* This type of barrel chamber shall be dimensioned as indicated in figure 6

5.1.6 *Belted straight cartridge chamber.* This type of barrel chamber shall be dimensioned as indicated in figure 6.

5.2 DIMENSIONING OF HEADSPACE. Dimensioning of headspace for an assembled weapon is based upon the type of barrel chamber and manner in which the barrel is assembled into related parts to form the completed weapon. Standard methods for specifying headspace dimension for the assembled weapon for each type of barrel chamber (see 1.1.1.1) shall be as follows:

5.2.1 *Rimless shoulder type cartridge chamber.* For the threaded barrel, adjustable headspace, the headspace dimension in the assembled weapon is determined by meas-

uring from the breech face of the barrel to another surface such as the face of the bolt. For the threaded barrel, fixed headspace and quick change barrel, fixed headspace, the headspace dimension is determined by measuring from a datum diameter on the stop shoulder in the chamber to another surface such as the face of the bolt.

5.2.1.1 Dimensioning of the headspace for weapons with this type barrel chamber shall be as indicated in figure 2.

5.2.2 *Rimmed shoulder type cartridge chamber.* Headspace in the assembled weapon is determined by measuring from the cartridge rim stop surface or the breech face of the barrel to another surface such as the face of the bolt.

5.2.2.1 Dimensioning of headspace for weapons with this type barrel chamber shall be as indicated in figure 2A.

5.2.3 *Rimless straight cartridge chamber.* Headspace in the assembled weapon is determined by measuring from the stop shoulder in the chamber to another surface such as the face of the bolt.

5.2.3.1 Dimensioning of headspace for weapons with this type barrel chamber shall be as indicated in figure 2.

5.2.4 *Rimmed straight cartridge chamber.* Headspace in the assembled weapon is determined by measuring from the cartridge rim stop surface or breech face of the barrel to another surface such as the face of the bolt.

5.2.4.1 Dimensioning of headspace for weapons with this type barrel chamber shall be as indicated in figure 2A.

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5.2.5 Belted cartridge chamber. Headspace in the assembled weapon is measured from a datum diameter on the stop surface in the chamber to another surface such as the face of the bolt.

5.2.5.1 Dimensioning of headspace for weapons with this type of barrel chamber shall be as indicated in figure 2B.

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

(Copies of this standard for Military use may be obtained as indicated in the foreword to the Index of Military Specifications and Standards.)

(Both the title and identifying symbol should be stipulated when requesting copies of Military Standards.)

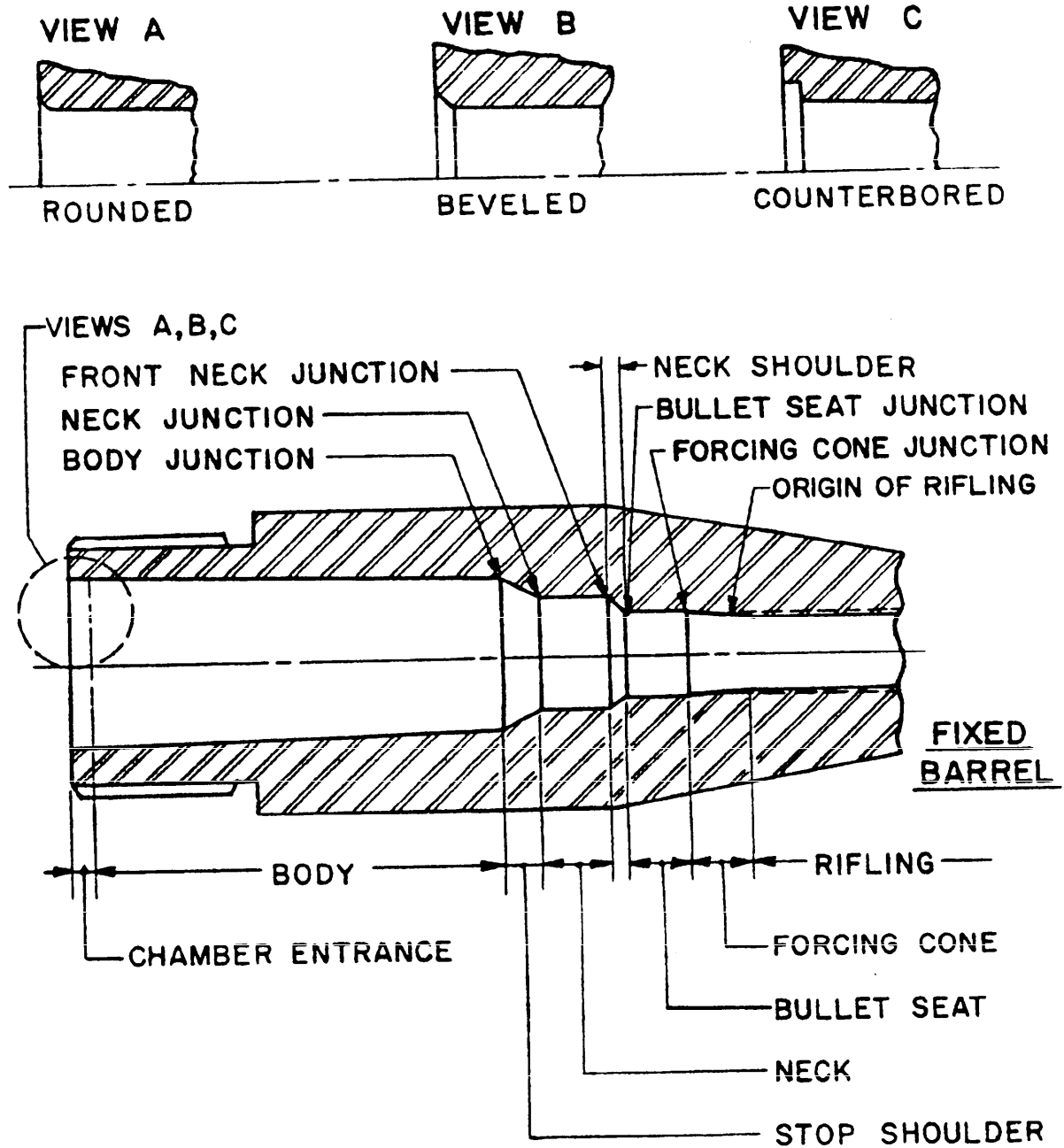
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Custodians:

**Navy—Wep
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Preparing activity:

Army—Ord



SHOULDER TYPE CARTRIDGE CHAMBER

FIGURE 1. Chamber nomenclature.

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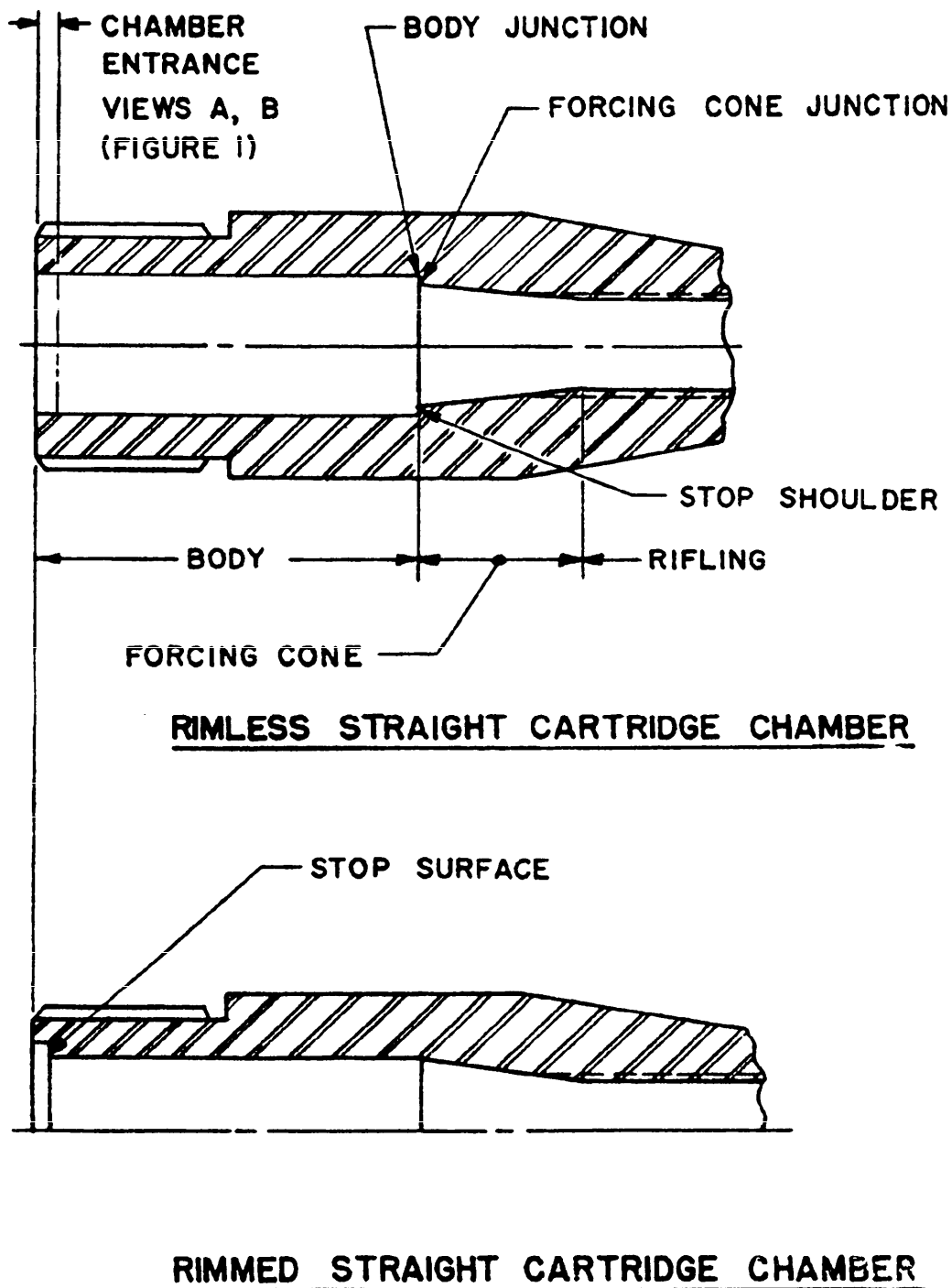


FIGURE 1A. Chamber nomenclature.

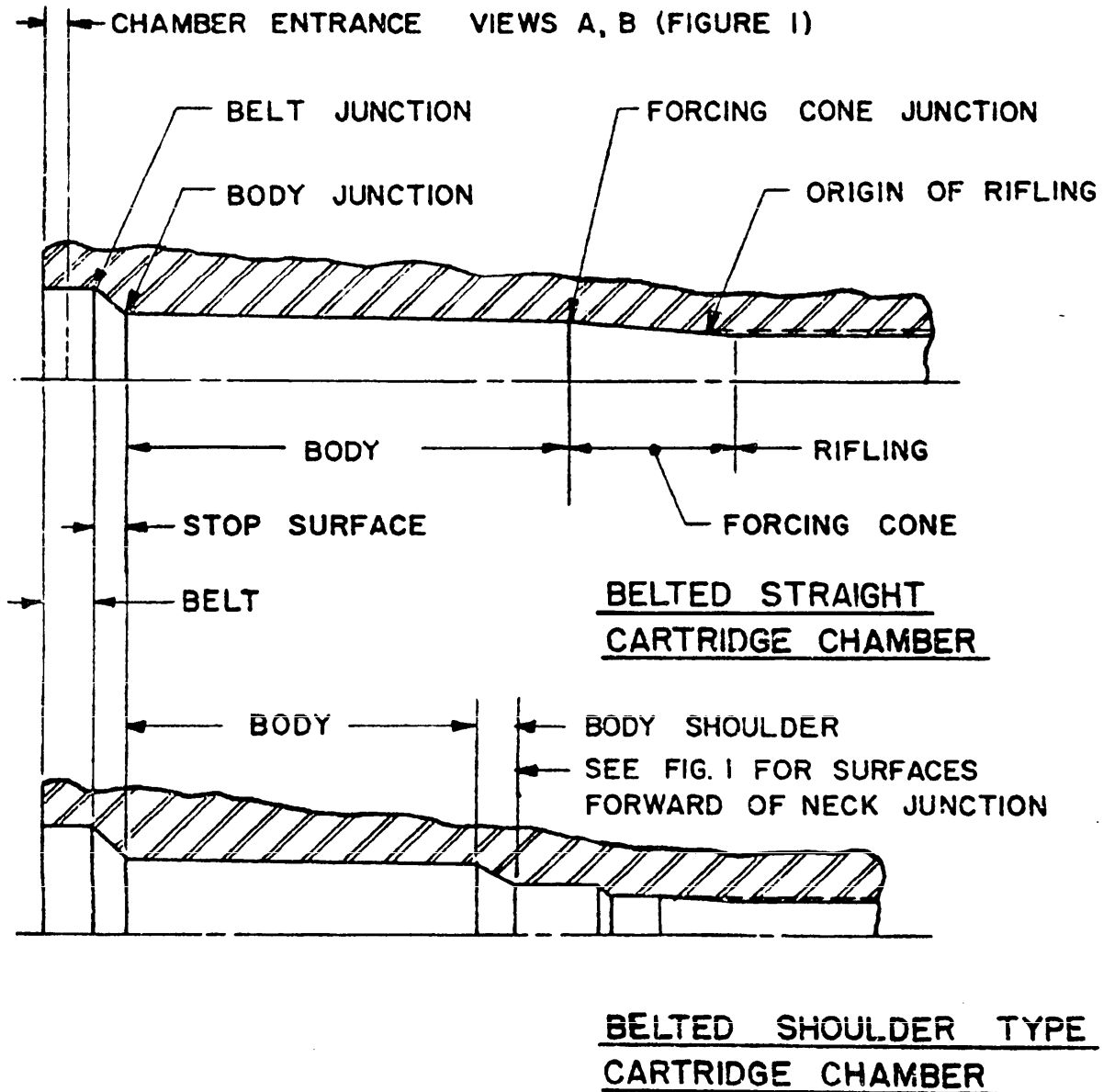


FIGURE 1B. Chamber nomenclature.

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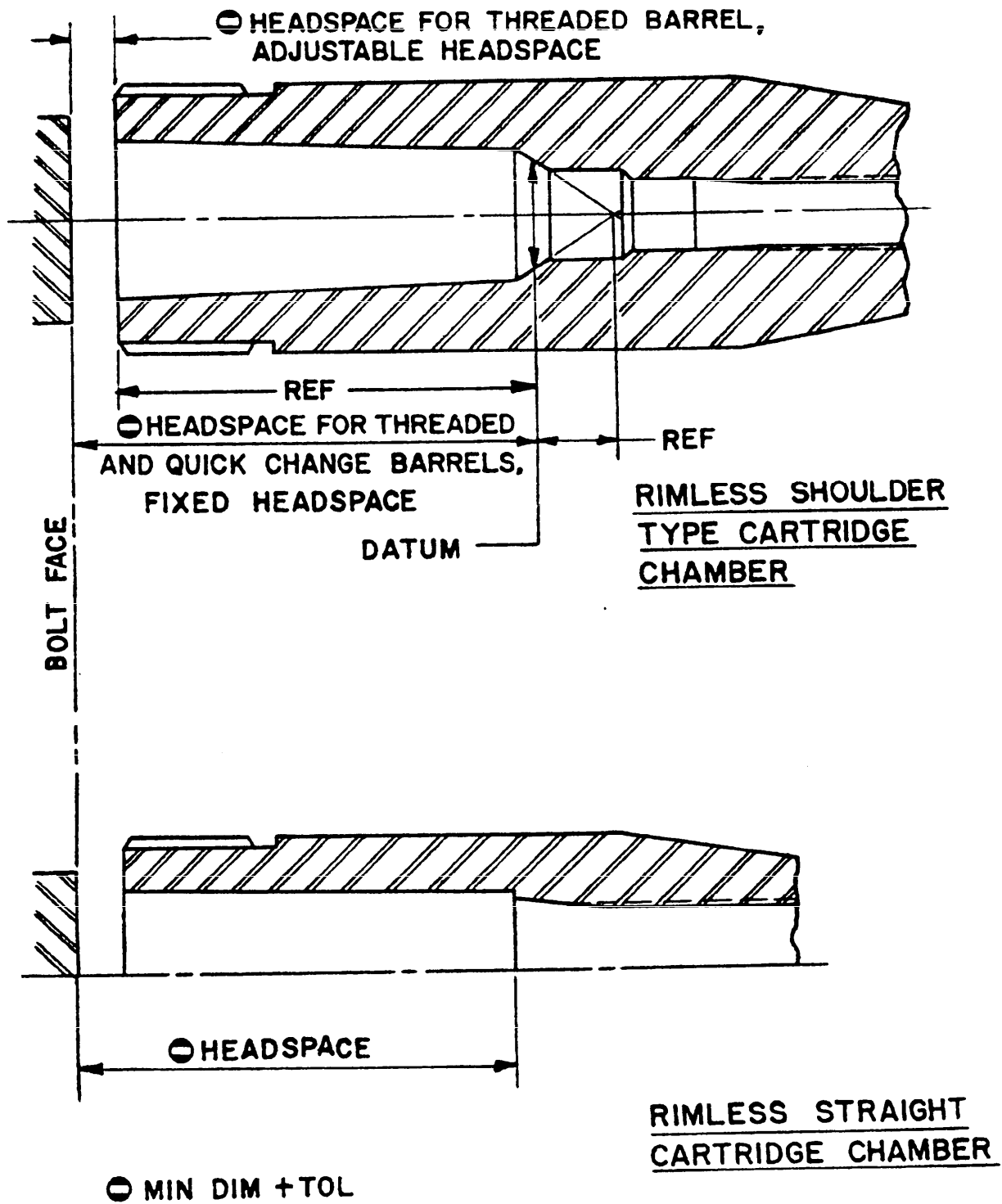
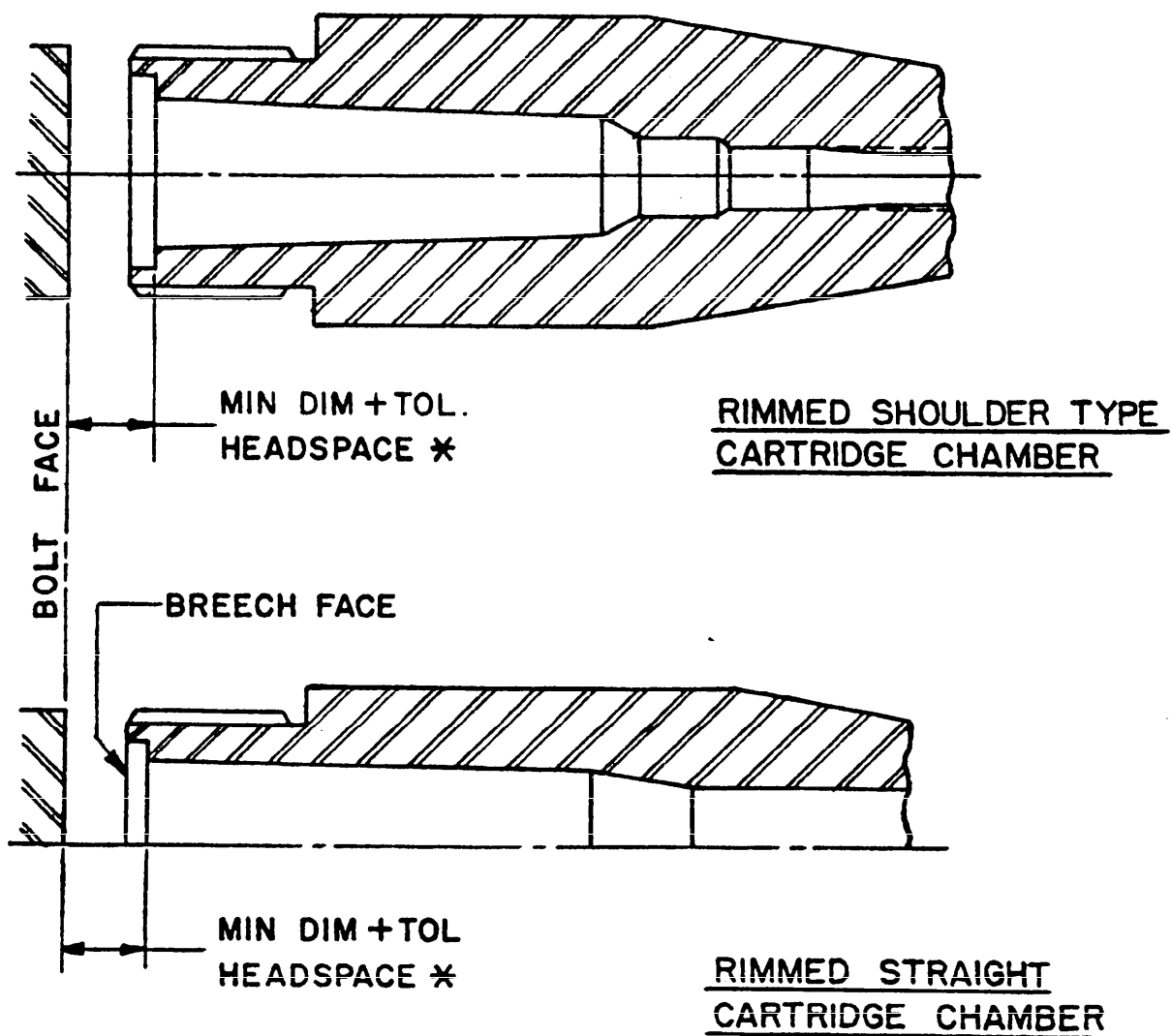


FIGURE 2. Headspace dimensioning.



* SOME CHAMBER DESIGNS MAY NOT HAVE A RECESSED STOP SURFACE. FOR THESE DESIGNS, HEADSPACE DIMENSION SHALL BE BETWEEN THE BREECH FACE OF THE BARREL AND THE BOLT FACE

FIGURE 2A. *Headspace dimensioning.*

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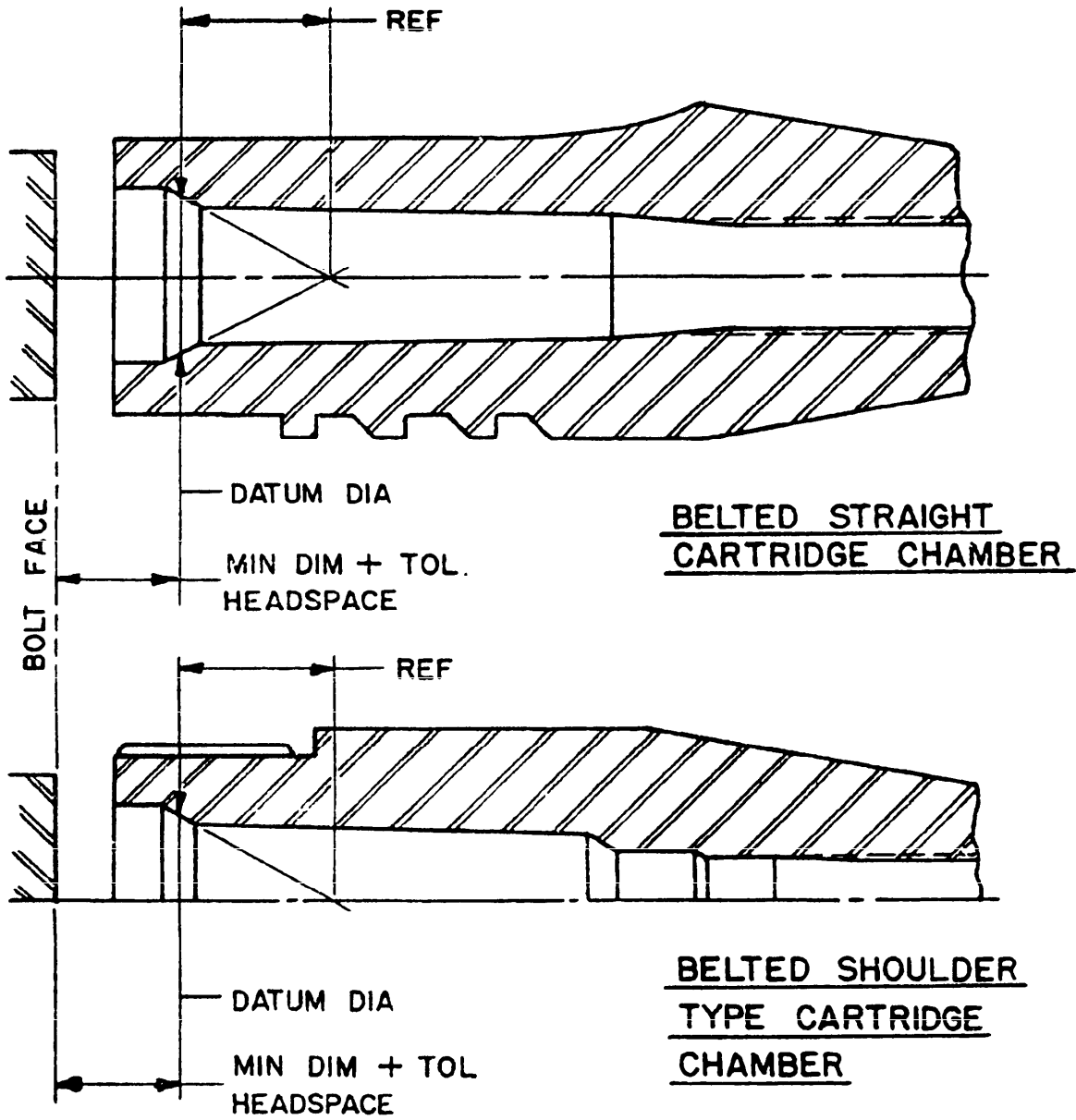


FIGURE 2B. Headspace dimensioning.

NOTES:

* MIN REF AT MIN DIA.

⊙ DIMS GIVEN TO INTERSECTION OF STRAIGHT LINES.

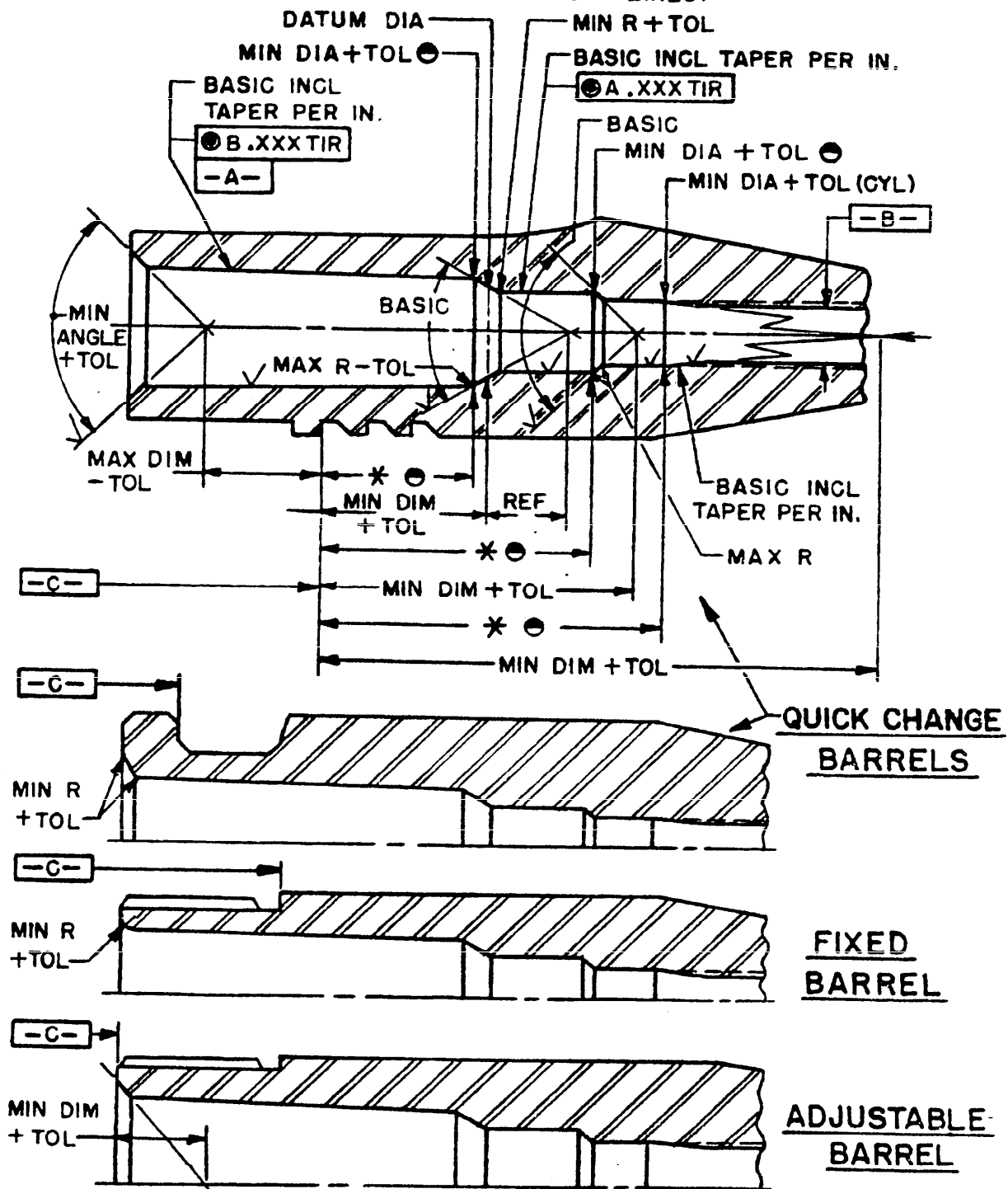
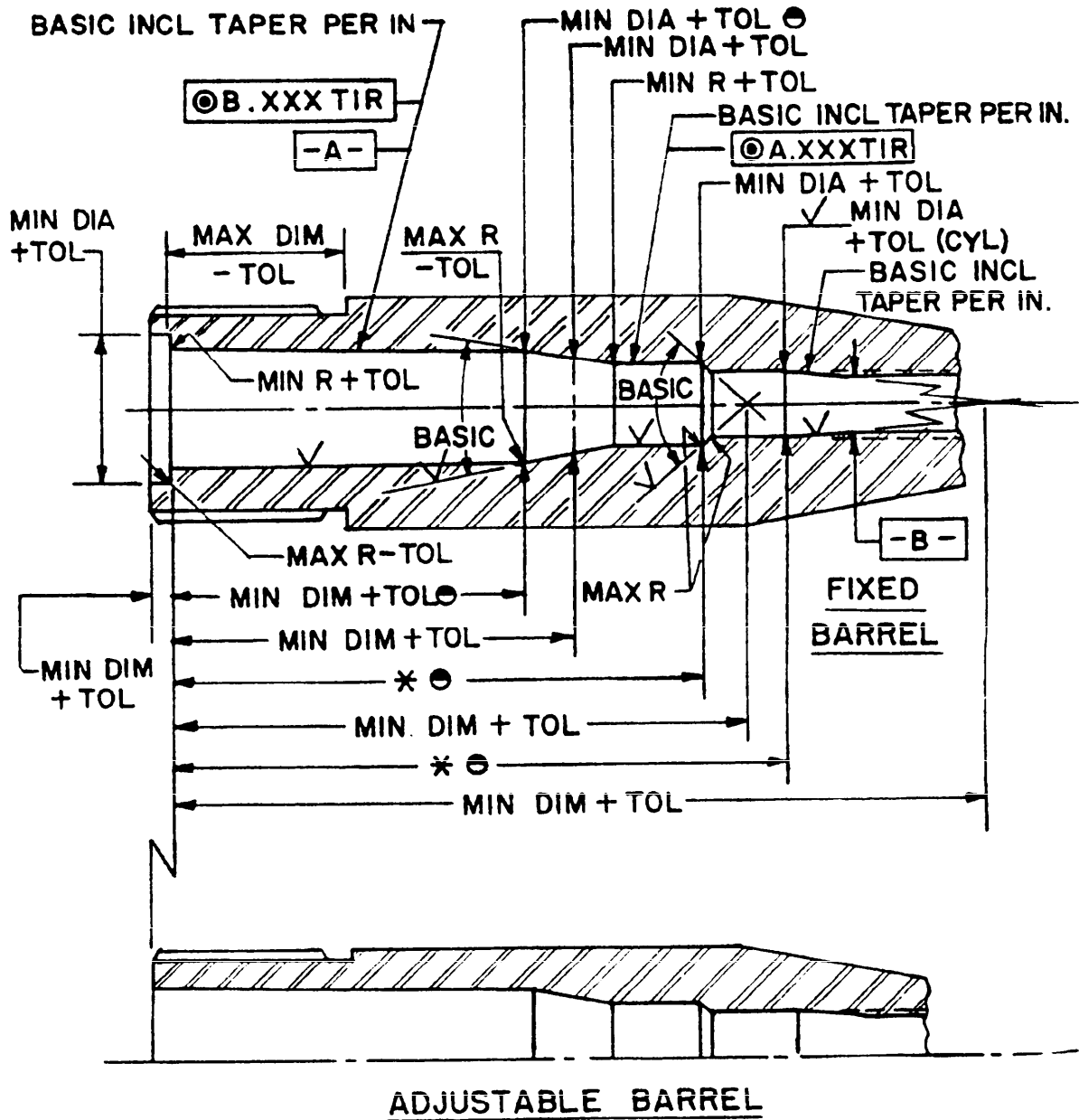


FIGURE 3. Dimensioning for rimless shoulder type cartridge chamber.

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NOTES:

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\ominus DIMENSIONS GIVEN TO INTERSECTION OF STRAIGHT LINES.

FIGURE 4. Dimensioning for rimmed shoulder type cartridge chamber.

● DIMENSIONS GIVEN TO INTERSECTION OF STRAIGHT LINES.

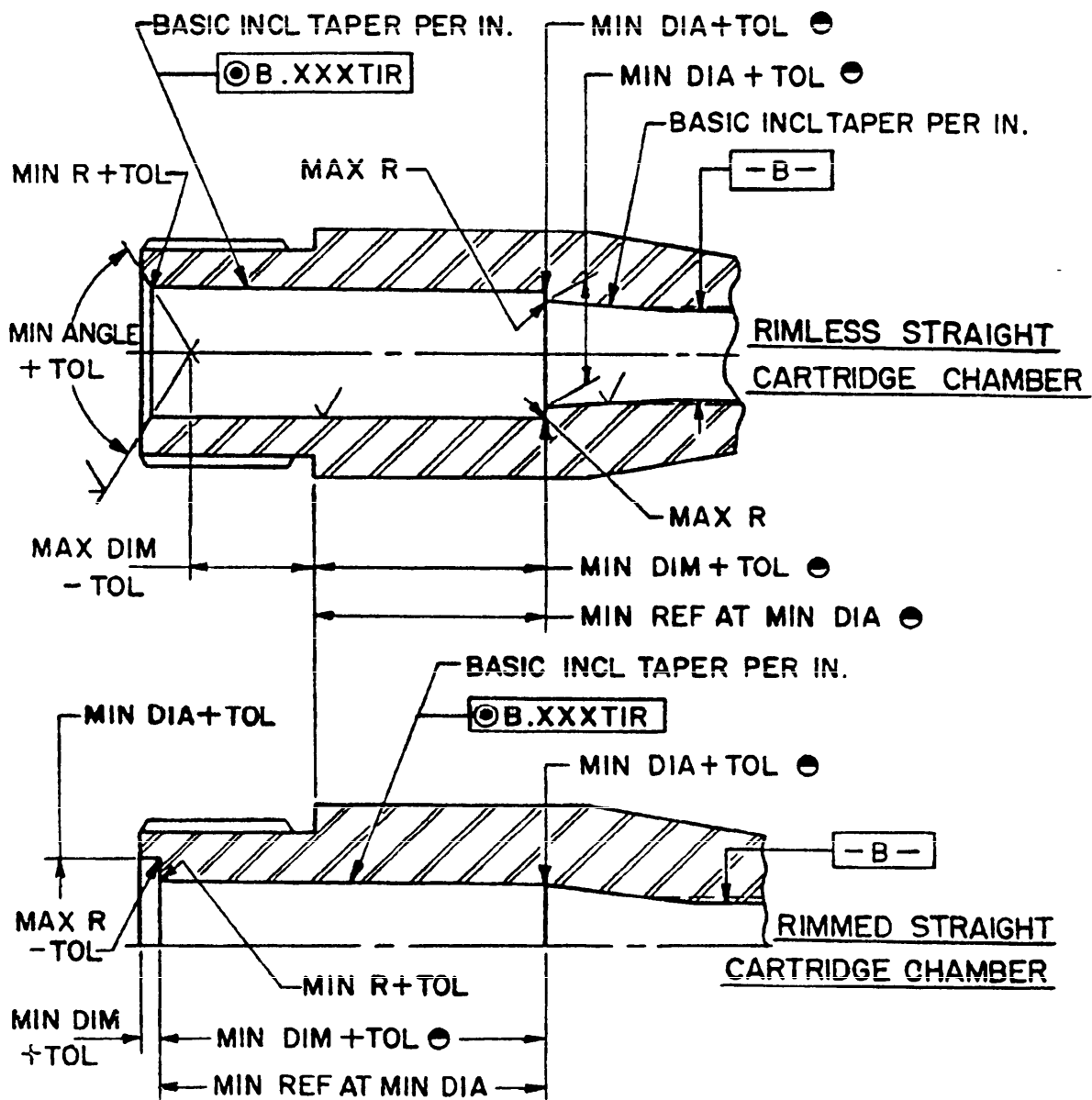


FIGURE 5. Dimensioning for straight cartridge chamber.

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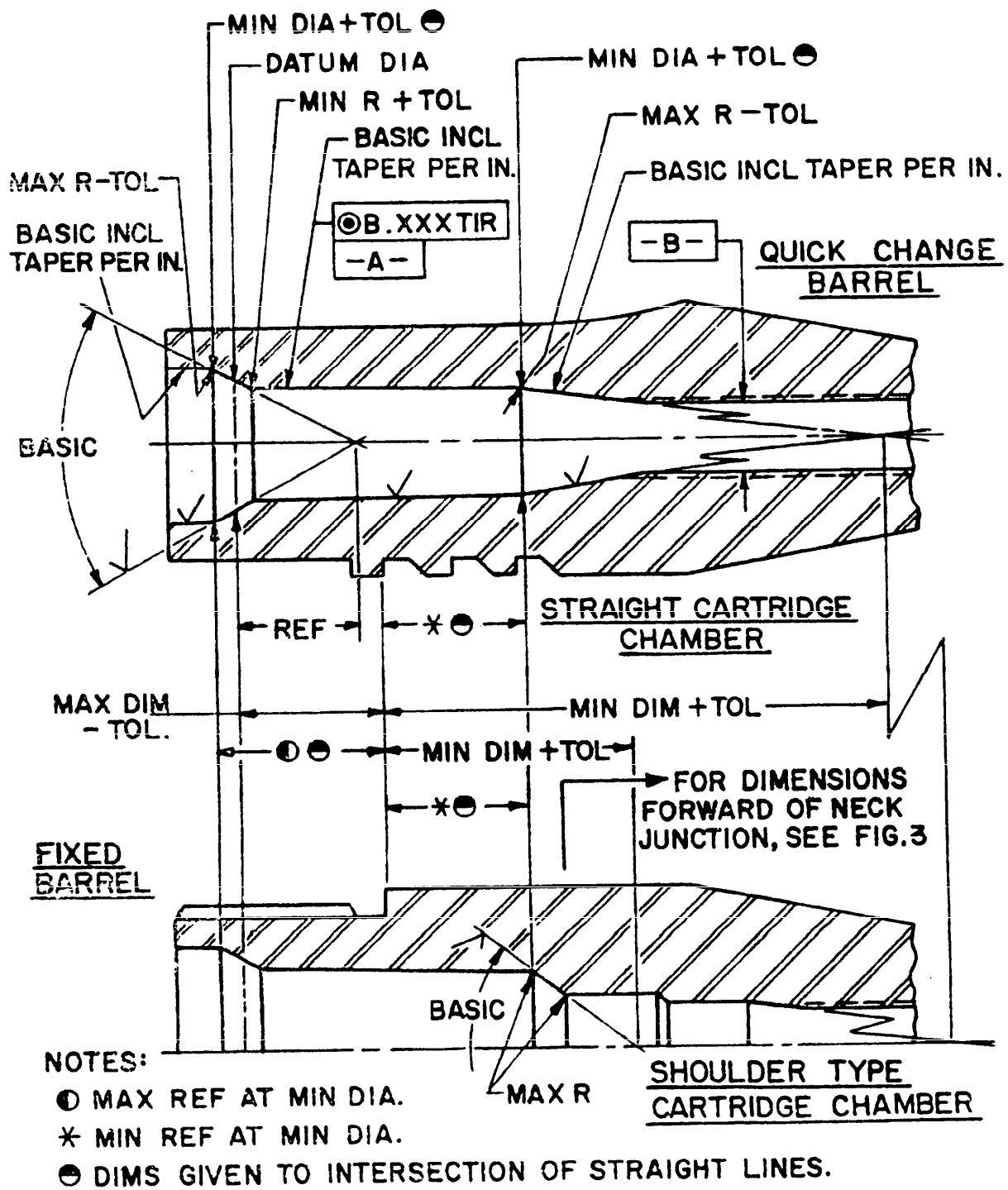


FIGURE 6. Dimensioning for belted cartridge chamber.