

GERMAN ARTILLERY PROJECTILES AND FUZES

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This publication is issued solely to give proper and speedy dissemination to timely, useful information concerning pertinent trends and developments. Nothing herein is to be construed as necessarily coinciding with United States Army doctrine. Changes in official doctrine, as they become necessary, will be officially published as such by the War Department.

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INTRODUCTION TO GERMAN ARTILLERY PROJECTILES.

CLASSES OF GERMAN ARTILLERY AMMUNITION

German artillery ammunition may be divided into the following classes:

Class #1 - (Fixed Ammunition.) Ammunition, the complete round of which, can be loaded into the weapon in one operation. The cartridge case, containing a primer and propelling charge is permanently crimped to the projectile.

Examples: 2cm, 2.8/2.0cm, 3cm, 3.7cm, 4cm, 4.2/2.8cm, 5cm, 7.5cm gun, 7.62cm, 8.8cm, 10.5cm A.A. gun.

Class #2 - Ammunition, the complete round of which, is loaded in two operations.

The cartridge case, containing a primer and a propellant charge is not crimped to the projectile.

The propelling charge is in bags and the charge can be varied at the point of firing.

The projectile is packed and shipped separately, and the cartridge case and propellant are packed as one unit.

Examples: 7.5cm Howitzer, 10.5cm Howitzer, 15cm Gun and Howitzer, 17cm Gun, 21cm, 24cm ammunition.

The Germans employ cartridge cases in all their artillery ammunition. The cases are employed for the main purpose of preventing the escape of gas to the rear.

NOMENCLATURE

The Germans designate a round of artillery ammunition by the Caliber, Type of Ammunition, (Model No. of the round), Type of Weapon fired from, and (Model No. of the Weapon.)

The caliber of German Artillery Ammunition is measured in centimeters. The Germans refer to calibers approximately; for instance, the 10.5cm gun is always known as the "s 10cm K.18, (Heavy 10cm Model No. 18.)

In naming the various types of projectiles, the Germans employ the word, "Granate," (abbreviated "gr." or "Gr."). "Granate" is used as a base word for all the various types of rounds. By adding a prefix and/or a suffix to the word, the exact nature of the projectile is indicated.

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PREFIX ADDED TO THE WORD "GRANATE"

<u>Prefix</u>	<u>Abbrev.</u>	<u>Combined Word</u>	<u>Combined Abbrev.</u>	<u>American Type</u>
Spreng	Spr.	Sprenggranate	Sprgr.	H.E. Shell
Nebel	Nb.	Nebelgranate	Nbgr.	Smoke Shell
Panzer	Pz.	Panzergranate	Pzgr.	A.P. Shell

(In order to differentiate between the various types of Armor Piercing Rounds, numbers are added after the word Pzgr.)

Panzergranate 39	Pzgr. 39	APCBCHE (Armor Piercing Cap, Ballistic Cap (windshield) (High Explosive)
Panzergranate 40	Pzgr. 40	A.P. Shot with a tungsten carbide core.
Panzergranate 41	Pzgr. 41	A.P. Shot with a tungsten carbide core for tapered bore gun. (Gerlich round.)
Sprenggranate 41	Sprgr. 41	H.E. Shell for a tapered bore gun.

SUFFIX ADDED AFTER "GRANATE"

Beton	Be	Granate Beton	Gr. Be.	Anti-concrete shell
	H1	Granate H1	Gr. H1.	Hollow charge shell

For the most part the Germans do not give Model Numbers to their artillery ammunition. In several of the old rounds Model Numbers are indicated. The numbers used are the last two of the year in which the round was made standard. These are only used in the nomenclature when there is more than one model of any specific type. In the case of the "Pzgr." (Armor Piercing) rounds, the numbers appearing after the word merely indicates the type of Armor Piercing round and are not Model Numbers.

Rot. or L'spur. (Leuchtspur) included in the designation indicates tracer.

This nomenclature is followed by the word "Patronen" abbreviated Patr., meaning cartridge. This is the German way of indicating a complete round. It is similar to the British nomenclature, in that the British use the word "cartridge" to designate all their complete rounds.

The Germans include the name of the type of the weapon in designating their ammunition. This nomenclature is given in the form of an abbreviation.

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<u>Abbreviation</u>	<u>Type</u>	<u>American Equivalent</u>
F.K.	Feldkanone	Field gun
Flak	Flugabwehrkanone	Antiaircraft gun
Kwk	Kampfwagenkanone	Tank gun
Pak	Panzer abwehrkanone	Antitank gun
S.K.		Naval gun
Stu. K.	Sturm kanone	Assault gun
Stu. G. (caliber)	Sturm Geschutz	Assault gun
Geb. H. (model no.)	Gebirgshaubitze	Mountain howitzer
Geb. K. (model no.)	Gebirgskanone	Mountain gun
L.F.H.	Leichte Feldhaubitze	Light field howitzer (British equivalent: Gun howitzer)
s.F.H.	Schwer Feldhaubitze	Heavy field howitzer
L.I.G.	Leichte Infanterie Geschutz	Light Infantry howitzer <i>WEAPON</i>
s.I.G.	Schwer Infanterie Geschutz	Heavy Infantry howitzer <i>WEAPON</i>
s. (cal.) K	Schwer Geschutz	Heavy gun
L.G.	Leichte Geschutz	Light recoilless gun
K. (model no.) (E)	Kanone (Eisenbahn)	Railway gun

In some instances a letter in parenthesis is added to the nomenclature after the word indicating the type of projectile. These letters are used to indicate material of foreign origin. The following are some of the letters used for this purpose.

(t) Czech (f) French (p) Polish (r) Russian (ö) Austrian

In some cases the following may be included in the nomenclature:

German	English
NA	New Pattern
umg	Modified
St	Steel <i>OR STRENGTHENED "STEIGEND"</i>

The following details of stencilling on projectiles are arranged in the sequence in which the markings are normally found commencing at the nose of the projectile.

Z.F.Hbgr - (In black) On the windshield of an H.E.B.C. shell indicates the use of a nose fuze under the windshield.

R or Mr - (In black near the tip) Indicates the presence of a smoke box.

Arabic numerals - (In black on the head of the shell just below the fuze hole, or on the body of the shell), indicates the type of H.E. filler. The more common of these are given on the following page.

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Stencilling	Indication
1	T.N.T. in cardboard carton packed with magnesium putty.
1A	T.N.T. in cardboard carton packed with paper.
2	Picric acid in cardboard carton packed with magnesium putty or wax.
5	T.N.T./Wax 95/5 in paper or cardboard carton.
10	T.N.T./Wax 90/10 in paper or cardboard carton.
13	Amatol 40/60, cast.
14	T.N.T., cast.
32	P.E.T.N./Wax 90/10.
36/38	P.E.T.N./Wax 60/40 or 65/35.
91	Cyclonite/Wax 95/5.
95	Cyclonite/T.N.T.

The following are some examples of German ammunition nomenclature.

- 4.7cm Sprgr. Patr. Pak (t) - 47mm H.E. Shell for the A.T. gun of Czech make.
- 3.7cm Pzgr. Patr. 40 Pak - 37mm A.P. Shot - tungsten carbide core for A.T. gun.
- 7.62cm Pzgr. Patr. 40 Pak. 36 (r) - 76.2mm (3") A.P. Shot - tungsten carbide core for A.T. gun 36 (Russian design.)
- 8.8cm Sprgr. Patr. Flak 36 - 88mm H.E. Shell for the Antiaircraft gun 36.

COLOR OF THE PROJECTILE

Pzgr. - A.P. Shot	Black
- A.P.C. Projectile	Black
- A.P.C. Projectile (H.E.)	Black
Sprgr. H.E. Shell (except A.A. and Naval)	Deep Olive Green
Nbgr. - Smoke Shell	Deep Olive Green
Gr. Be. - Anti-concrete	Deep Olive Green
Gr. (H1) - Hollow	Deep Olive Green
Naval and Flak (Antiaircraft) H.E. Shell	Yellow
3.7cm Shell with a two-compartment cavity, one filled H.E. and the other filled tracing composition.	Aluminum color - yellow band midway between the rotating band and fuze-hole.

Projectiles of the latter type are sometimes painted white. This color appears to be used for projectiles in the experimental stage supplied for trial by the Army in the field.

Band marking is not in common use except for a red band above the rotating band in some shells, indicating a tracer, and a yellow band for the 3.7cm aluminum colored H.E. tracer shell.

RESTRICTED

The place and date of the filling of the projectile, followed by a lot number in black, is on the shoulder of the projectile in the form of an abbreviation.

The Weight Zone of the projectile is indicated by Roman numerals, black in color near the bourrelet.

In the following instances the type of shell, and to some extent the nature of filling, is indicated by 2.4" letters stencilled at two positions round the shell midway between the rotating band and bourrelet.

<u>Stencilling</u>	<u>Indication</u>
A or LS (White)	Base ejection shell with flash-producing charge.
Al (Black)	Filling includes aluminum powder to produce flash.
Bl (White)	Inert filling.
Ex (Red)	Drill projectile.
Nb (White)	Smoke shell.
Ub (White)	Practice projectile, filled gunpowder.
Ub:B (White)	Practice projectile, filled TNT.
Vp (Black)	Dummy projectile.
Bo (1" lettering midway between the rotating band and shoulder.)	Indicates a light case shell of pressed steel with a corresponding large bursting charge.
F (Black)	Shell to be fired with Super Charge F only.
Stg (2.4" lettering, in black, at a short distance from the rotating band.)	Indicates a light case shell of cast steel.
KPS (White or red lettering above the rotating band.)	Indicates a rotating band of the bi-metal type, iron covered with copper.
FES (White or red lettering above the rotating band.)	Indicates a sintered iron rotating band.

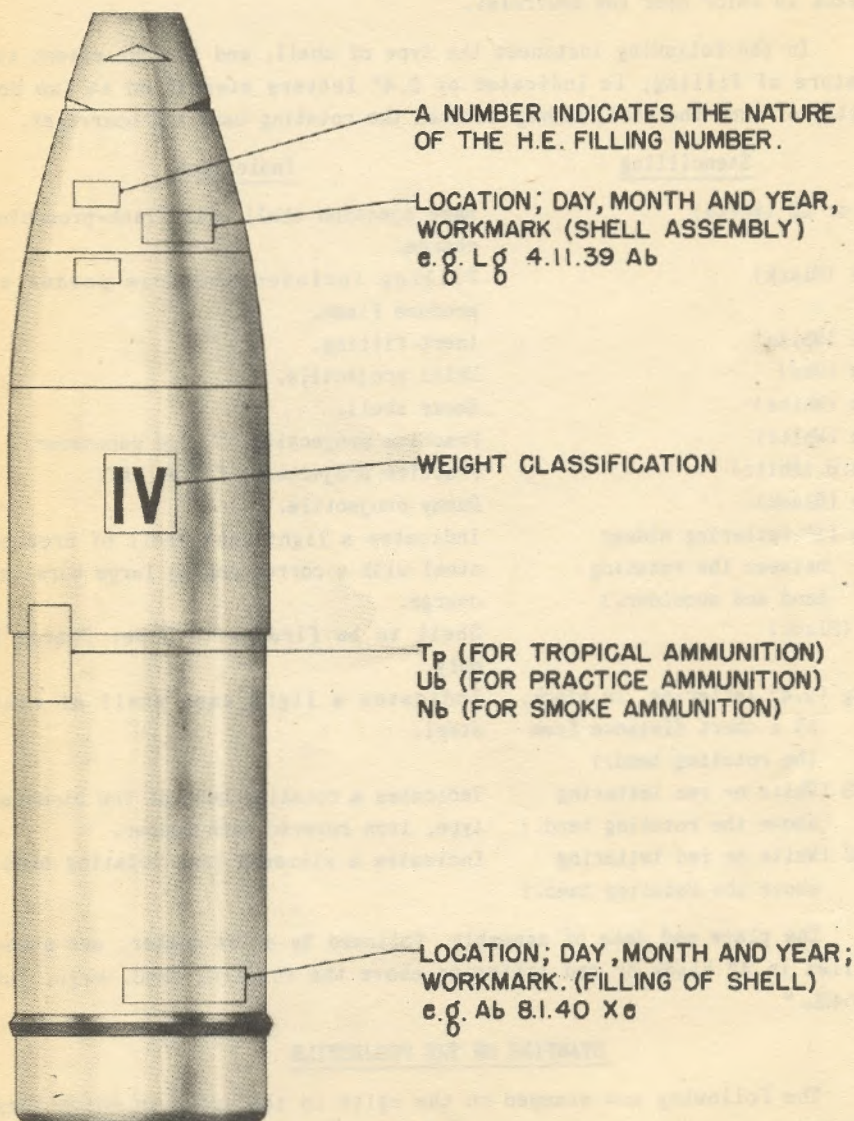
The place and date of assembly, followed by a lot number, are stencilled in 4" black or red lettering above the rotating band, e.g., "Lr 4.640L."

STAMPING ON THE PROJECTILE

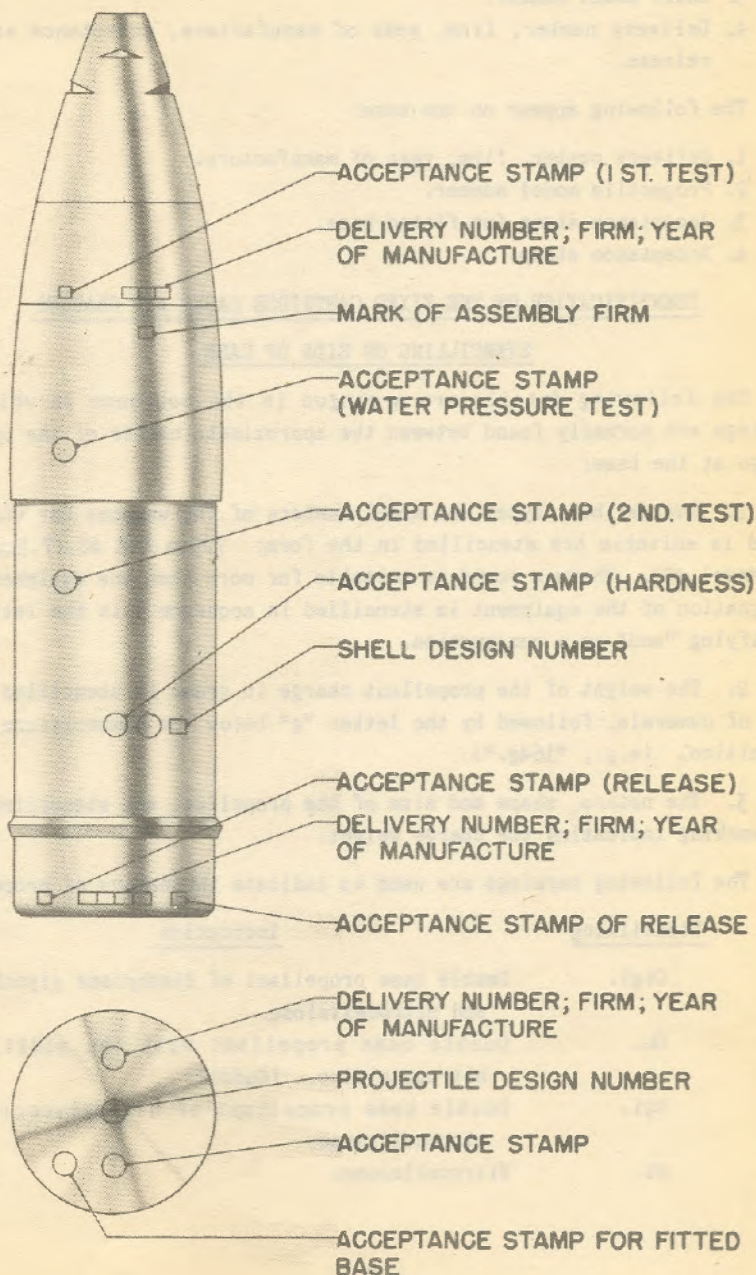
The following are stamped on the ogive in the order in which they appear.

1. Acceptance test number.
2. Delivery number, firm and year of manufacture.
3. Firm's proof mark.

STENCILINGS ON GERMAN SHELL



STAMPINGS ON GERMAN SHELL



RESTRICTED

The following appear on the body of the projectile:

1. An acceptance stamp, water pressure test and an acceptance stamp, second test.
2. Acceptance stamp (Hardness).
3. Shell model number.
4. Delivery number, firm, year of manufacture, acceptance stamp of release.

The following appear on the base:

1. Delivery number, firm, year of manufacture.
2. Projectile model number.
3. Acceptance stamp for fitted base.
4. Acceptance stamp.

IDENTIFICATION OF THE FIXED CARTRIDGE CASES AND CHARGES

STENCILLING ON SIDE OF CASE

The following details are arranged in the sequence in which the markings are normally found between the approximate center of the case and flange at the base:

1. The caliber, types and model numbers of the weapons for which the round is suitable are stencilled in the form: 7.5cm KWK 40 (7.5cm. tank gun Model 40). Where a round is suitable for more than one equipment, the designation of the equipment is stencilled in sequence with the letter "u" signifying "and" as a conjunction.
2. The weight of the propellant charge in grams is stencilled in the form of numerals, followed by the letter "g" below the nomenclature of the ammunition. (e.g., "164g.")
3. The nature, shape and size of the propellant are stencilled below the marking indicating the charge weight.

The following markings are used to indicate the nature of propellant:

<u>Stencilling</u>	<u>Indication</u>
Digl.	Double base propellant of diethylene glycoldinat- and nitrocellulose.
Gu.	Double base propellant with the addition of nitroguanidine. (Gudol)
Ngl.	Double base propellant of nitroglycerine and nitrocellulose.
Nz.	Nitrocellulose.

RESTRICTED

These letters, in the case of double base propellant, are followed by figures or letters which also appear to relate to the composition. The shape of propellant is indicated by the following letters added to those used to indicate the nature:

Bl.P.	Blatchen Pulver	Flake
Rg.P.		Perforated disc (resembling a washer.
R.P.	Rohren Pulver	Tubular
Str.P.	Striefen Pulver	Strip

In the case of a double base powder the number outside the brackets indicates the percentage of explosive base added to nitrocellulose. The size of the propellant is given by a statement of the dimensions in millimeters following the letters used to indicate the shape. The dimension figures are enclosed in a bracket and are arranged, as follows with commas serving as decimal points:

Flake	(length-breadth-thickness) (3.3.0.8)
Perforated disc	(thickness, external diameter/internal diameter) (1.9x15/4)
Tubular	(length with minus tolerance, external diameter/internal diameter), - (175-2,2/0,85) An "X" is sometimes used instead of the "-" between the length and the tolerance. (Length-breadth-thickness), e.g. (125 x 5 x 0, 5)

Examples

Digl. R.P. 8,2(175-2,2/0,85)
Gu.Bl.P.A.O. (4,4,0,6)
Ngl.Bl.P.12,5(40x40x0,2)
Nz R.P. (135-5,5/2)
Digl.Str.P.-9.2-(125x5x0,5)

4. The place and year of manufacture of the propellant, followed by a lot number are stencilled below the marking relating to nature, shape and size. The following is a typical example:

dbg 1942/3

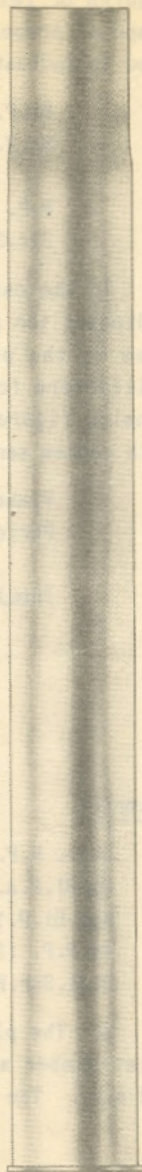
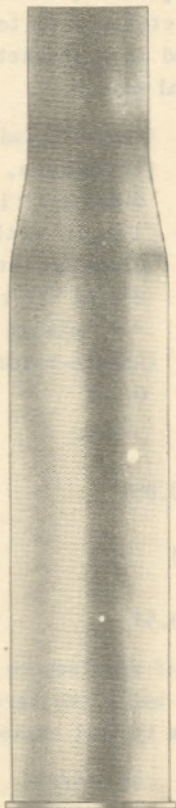
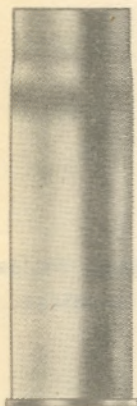
5. The place and date of the filling of the propelling charge, followed by a lot number are stencilled below the marking relating to the manufacture of the propellant.

(On 17.642.xv)

FIXED CARTRIDGE CASE

7.5 CM. KWK 40

7.5 CM. KWK



- 10 -

G354

G339

G340

RESTRICTED

6. The red stencilling used to indicate propellant charges of a reduced weight for hot climates may be found near the base of the case, just above the flange, or higher up the side of the case, above the other stencilling. The marking used:

Tp ---- 25° C.

indicates that the normal or standard charge temperature on which the weight of the charge is based is 25° C. (77° F.). The German standard charge temperature for normal European temperatures is 10° C. (50° F.).

7. In some instances cases are stencilled:

"Abgebr Ldg" in red.

This marking is found near the base (corresponding to the position of the Tp - 25° C. marking) and probably refers to the propellant charges of low stability which are to be given priority in expenditure.

STENCILLING ON THE BASE OF FIXED CARTRIDGE CASES

Type of the projectile is stencilled in white or black to the left above the primer hole.

In some instances the Roman numerals indicating the weight classification of the projectile are stencilled in white to the right below the primer hole.

STAMPINGS ON THE BASE OF FIXED CARTRIDGE CASES

Model number of case.

St. - after model number of case -- indicates a steel case.

Model, Cal. and type of weapon.

Manufacturer's Initial.

Delivery number.

Year of manufacture.

MARKINGS ON CARTRIDGE BAGS IN FIXED ROUNDS

The markings are the same as those stencilled on the side of the case except that the caliber, type and model number of the equipment are not included.

MARKINGS ON SEMI-FIXED CARTRIDGE CASES AND CHARGE

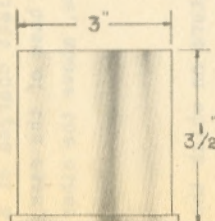
A cardboard or leatherboard cup is used to close the mouth of the cartridge case in a round where the cartridge case is packed separately.

A label, found on the closing cup, contains information corresponding to the stencilling on the side of the fixed cartridge case. The information is as follows:

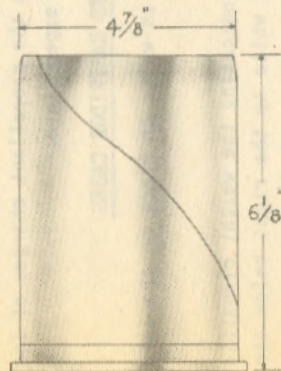
RESTRICTED

(SEMI-FIXED CARTRIDGE CASE)

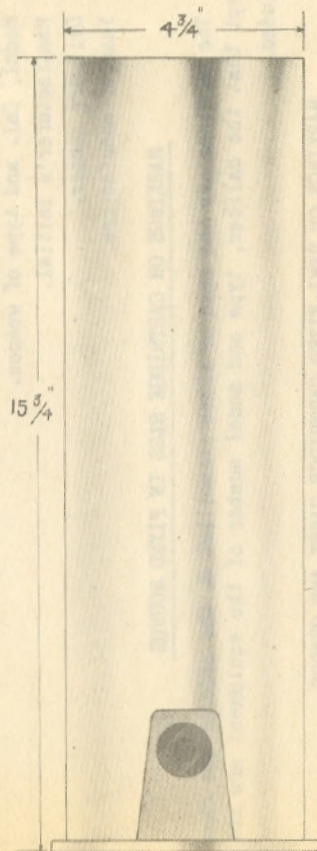
7.5 GEB K15



10.5 CM.L.F.H.18



10.5 CM.LG 40



RESTRICTED

6. The red stencilling used to indicate propellant charges of a reduced weight for hot climates may be found near the base of the case, just above the flange, or higher up the side of the case, above the other stencilling. The marking used:

Tp ---- 25° C.

indicates that the normal or standard charge temperature on which the weight of the charge is based is 25° C. (77° F.). The German standard charge temperature for normal European temperatures is 10° C. (50° F.).

7. In some instances cases are stencilled:

"Abgebr Ldg" in red.

This marking is found near the base (corresponding to the position of the Tp - 25° C. marking) and probably refers to the propellant charges of low stability which are to be given priority in expenditure.

STENCILLING ON THE BASE OF FIXED CARTRIDGE CASES

Type of the projectile is stencilled in white or black to the left above the primer hole.

In some instances the Roman numerals indicating the weight classification of the projectile are stencilled in white to the right below the primer hole.

STAMPINGS ON THE BASE OF FIXED CARTRIDGE CASES

Model number of case.

St. - after model number of case -- indicates a steel case.

Model, Cal. and type of weapon.

Manufacturer's Initial.

Delivery number.

Year of manufacture.

MARKINGS ON CARTRIDGE BAGS IN FIXED ROUNDS

The markings are the same as those stencilled on the side of the case except that the caliber, type and model number of the equipment are not included.

MARKINGS ON SEMI-FIXED CARTRIDGE CASES AND CHARGE

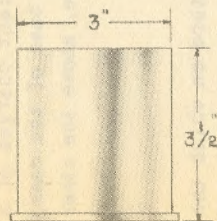
A cardboard or leatherboard cup is used to close the mouth of the cartridge case in a round where the cartridge case is packed separately.

A label, found on the closing cup, contains information corresponding to the stencilling on the side of the fixed cartridge case. The information is as follows:

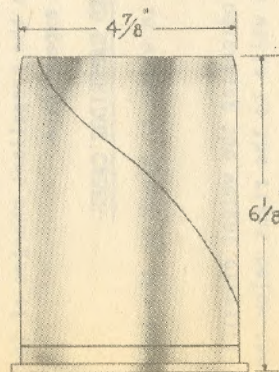
RESTRICTED

(SEMI-FIXED CARTRIDGE CASE)

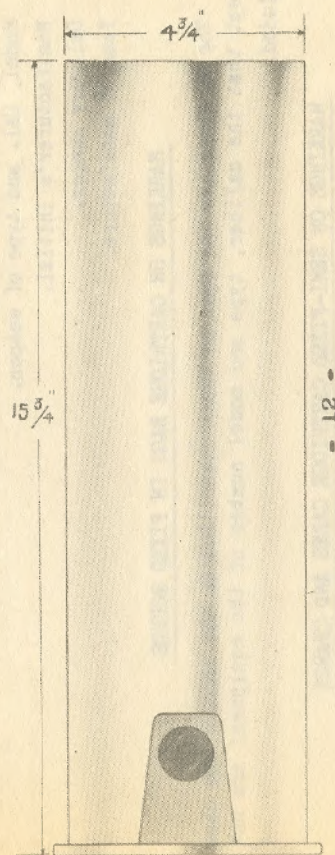
7.5 GEB K15



10.5 CM.L.F.H.18



10.5 CM.LG 40



RESTRICTED

Details of the weapon.

Charge weight.

Kind.

Type (size and shape of the charge.)

Place and date of manufacture of propellant.

Place and date of filling.

Indication of propellant charges for hot climates.

Cases with steel covers for packing and transport, which are removed before loading, have neither labels nor stencilling relating to the propellant charge except the stencilling "Tp. 25° C." imprinted on the base where applicable. Details of the propellant are available, however, from the stencilling on the charge bags.

Stamping on the base of the case is the same as that on the base of a fixed round, except that the caliber of the equipment is sometimes omitted.

MARKINGS ON THE CARTRIDGE BAGS OF A "SEMI-FIXED" ROUND

These bags are marked similarly to the markings on fixed bags, except that the designation of the weapon is included. In some cases the caliber is not included. Bleidraht im Beutel indicates lead wire is included in the bag as a decoppering agent.

The number indicating the charge is marked prominently in black. The letter "D" often follows this number and in some instances the marking is encircled by a red ring.

Sonderkart - Supercharge - With certain weapons additional charge sections, to be used for long ranges in place of those in the cartridge case, are supplied in cylindrical cardboard packages. These sections are numbered in continuation of those supplied for use at normal ranges in the case. Cardboard packages containing these additional charge sections are marked "Sonderkart" followed by the numeral of the section.

MARKING OF PRIMERS FOR "FIXED" AND "SEMI-FIXED" AMMUNITION

Designation -- C followed by number.

Example:- C/33

nA - New pattern

St - Steel

MARKING OF FLASH REDUCING CHARGES

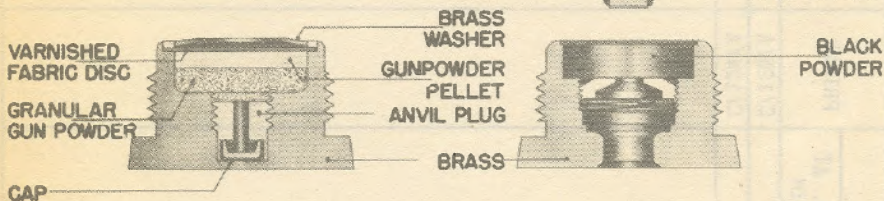
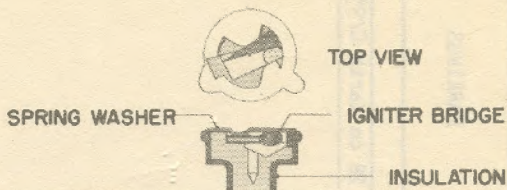
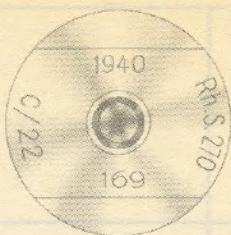
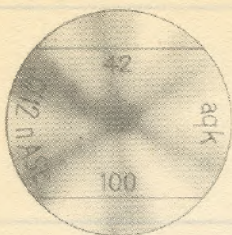
This charge is found in a flat circular silk bag and is identified by the words Kart. Vorl., followed by the abbreviation indicating the weapon with which used and the weight of the charge in grams.

WEAPON Calibre	CARTRIDGE CASE DESIGN NUMBER	TYPE	DIMENSIONS				PRIMER	MARKINGS	REMARKS
			LENGTH	DIA. AT MOUTH	DIA. AT SHOULDER	DIA. AT RIM			
10 cm L G 40			15.625"	4.75"		5.5"	C/13N/A		Plastic Base primer on side base 3.312" dia.
15 cm K 18 & 15 cm K(E)	6352		32.13"			7.007"	C/12N/A		
15 cm K 16	6304		28.54"			6.929"	C/12N/A		
15 cm s H T	6357						C/12N/A		
15 cm K 39	6318		20.67"			7.283"	C/12N/A		
15 cm K ins Mrs Laf	6352						C/12N/A		
15 cm s FH 13 & IG 33	6303		4.448"	6.102"		6.653"	C/12N/A	6303 lgs FH 13	
15 cm SFH 18	6350	Sep.	10.23"	6.338"		7.007"	C/12N/A	SFH 18	A black painted steel case also is in use. It has a vertical lap joint and is stamped 6350/17.
17 cm KAN (E)	C 95						C/12N/A	17 cm KAN (E) C/95	
17 cm K i Mrs L	6324		28.562"	7.5"		8.5"	C/12N/A		A black spiral steel case 6324/ 78C also exists.
20 cm KAN (E)	C/34						C/12N/A		
21 cm Lg Mrs 18	6305						C/12N/A		
21 cm Mrs 18	6351		16.125"	8.75"		9.5"	C/12N/A	21 cm Mrs 18	
24 cm Th Br Kan (E)		Sep.					C/12N/A	Th. Br Kan (E)	
24 cm Th Kan (E)							C/12N/A	C/95 Th Kan (E)	
28 cm Lg U.S Br Kan (E)	L/45/50						C/12N/A	L/45/50	

WEAPON Calibre	CARTRIDGE CASE DESIGN NUMBER	TYPE	DIMENSIONS				PRIMER	MARKINGS	REMARKS
			LENGTH	DIA. AT MOUTH	DIA. AT SHOULDER	DIA. AT RIM			
7.5 Geb K 15	6335	Sep.	5.078"	3.031"		3.34"	C/12N/A		
7.5 cm K W K 38	6354		9.56"	2.93"	3.01"	3.62"	C/22	7.5 cm KWK	4150 6354 ST
7.5 cm Pak 40	6340	Fixed	28.1"	3.062"	3.187"	3.937"	C/12N/A	6340 st 7.5 cm Pak 40	Same as 7.62 Pak 36
7.62 Pak 36	6340	Fixed	28.1"	3.062"	3.187"	3.937"	C/12N/A	6340 st 7.5 cm Pak 40	Same as 7.5 cm Pak 40
7.62 FK 296(r) 7.62 cm Inf KH 290(r)	42 M or 37(r)		15.125"	3.07"	3.062"	3.531"	42 M or 33		Same case except for primer.
8.8 cm Flak 18, 36 & 37 KWK 36	6347	Fixed	22.375"	3.625"	3.812"	4.02"	C/12N/A C/22		Same case except for primer.
8.8 cm Flak 41		Fixed	34.687"	3.562"	4.125"	4.844"	C/22	8.8 cm Flak 41	
s 10 cm K 18	6349	Sep.	17.5"	4.312"		5.062"	C/12		
10 cm K 17 and 17/04n/a	6302	Sep.					C/12N/A		
m 10 cm KK and m 10 cm KT	6356	Fixed					C/22		
Lg 10 cm KT							C/12N/A		
10 cm LFH 18 & 18M	6342	Sep.	6.125"	4.375"	4.5"	4.937"	C/12N/A	6342 st LFH	This case may be of brass-coated steel, unpainted steel, or black- painted steel spirally wound. In the last case it is marked:- 6342/65C.
10 cm Flak 38	6307*	Fixed	30.25"	4.187"	4.625"	5.375"	C/22	10 cm Flak 38	*Usually absent.

WEAPON Calibre	CARTRIDGE CASE DESIGN NUMBER	TYPE	DIMENSIONS				PRIMER	MARKINGS	REMARKS
			LENGTH	DIA. AT MOUTH	DIA. AT SHOULDER	DIA. AT RIM			
28/20 sPz Bu 41	345 P	Fixed	7.375"	1.187"	1.562"	1.875"	C/13N/A		
42/28 L Pak 41	6329	Fixed	16.0"	1.75"	1.875"	2.625"	C/13N/A	4.2 cm Pak 41	
3.7 cm Pak	6331	Fixed	9.75"	1.5"	1.625"	2.0"	C/13N/A	3.7 cm Pak	
3.7 cm Flak 18 & 36	6348	Fixed	10.156"	1.594"	1.625"	1.844"	C/13N/A		
3.7 cm Polish AT	-	Fixed	10.125"	1.5"	1.687"	2.187"		3.7 WZ 36 Pk 4 398m	
3.7 cm C/30 (Naval)	P-397	Fixed	14.96"				C/13	P 397 C/30	
4 cm Flak 28		Fixed	12.25"	1.625"	1.812"	2.437"	C/12 or C/33	4 cm 28 st	"BoFors"
4.7 Czech	M 36	Fixed	15.875"	1.937"	2.125"	2.5"		4 cm M 36	
4.7 Böhler Gun			9.25"	1.875"	-	2.187"		Enz 4.7 cm M 35	
5 cm KWK 38	6317	Fixed	11.375"	2.0"	2.687"	3.062"	C/22	5 cm KWK	
5 cm Pak KUT (Kz.L.)		Fixed					C/22	5 cm Pak KZ	
5 cm Pak		Fixed					C/22	5 cm Pak	
5 cm Pak 38	6360	Fixed	16.5"	2.0"	2.625"	3.062"	C/12N/A	5 cm Pak 6360 st	
75/50 SKODA			22.83"	3.15"	3.228"	3.74"	M 39 s	1941 38 75 AA	
75 cm KWK 40	6339		19.4"	3.15"	3.8"	4.0"	C/22		
7.5 cm LIG 18	6341		3.5"	3.0"		3.375"	C/22	L I G 18	
7.5 cm LGEB IG18	6341		3.5"	3.0"		3.375"	C/22	L I G 18	
7.5 cm L G 40			6.062"	4.409"	4.5"	4.921"	C/13		
7.5 cm GEB G 36	6359						C/12N/A		
7.5 cm FK 16 n/a	6343	Sep.					C/12N/A		
7.5 cm Self Propelled Gun	6310						C/22		
7.5 cm L F K 18	6316	Sep.	13.97"	3.070"		3.582"	C/12N/A		

[illegible]



PERCUSSION PRIMER C/12 na ELECTRIC PRIMER C/22

EMPLOYMENT:

German Electric Primer used in the 7.5 cm Q.F.H.E. Cartridge.

DESCRIPTION:

- 1.25 inches, Diameter at lip.
- 1.0 inches, Diameter of body.
- 0.28 inches, Threaded length.
- 0.19 inches, Thickness of lip.
- 0.75 inches, Length of body.
- Number of threads - 5 RH.

CONSTRUCTION:

The primer houses an igniter bridge which consists of lead styphnate dipped in gelatin. This bridge has a resistance of approximately 2.2 ohms and is in the circuit with the insulated contact plug, the spring washer, and the primer body. A 31 grain Black Powder filling, in both pellet and granular forms, is housed in the upper recess of the primer. The top of the primer is closed by an aluminum disc and discs of paper or varnished fabre.

FUNCTIONING:

An electric current is passed through the insulated contact plug in the base of the cartridge case. The current passes through the igniter bridge, igniting it, and back to the source by way of the spring washer and primer body. The flash from the igniter bridge ignites the Black Powder and this, in turn, sets off the propelling charge.

RESTRICTED

PERCUSSION PRIMER C/12 n A

EMPLOYMENT:

German Percussion Primer used in the 5 cm Q.F., H.E. Cartridge.

DESCRIPTION:

- 1.25 inches, Diameter of lip.
- 1.0 inches, Diameter of body.
- 0.75 inches, Length of body.
- 0.281 inches, Threaded length.
- 0.188 inches, Thickness of lip.
- Number of threads - 5 RH.

CONSTRUCTION:

The primer is of the normal German type consisting of a brass body with the enclosed cap and brass anvil plug. The cap filling is shaped to fit around the anvil and consists of:-

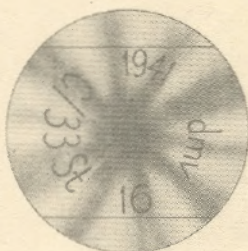
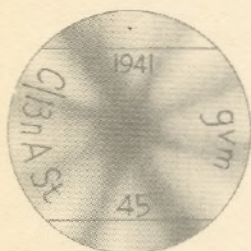
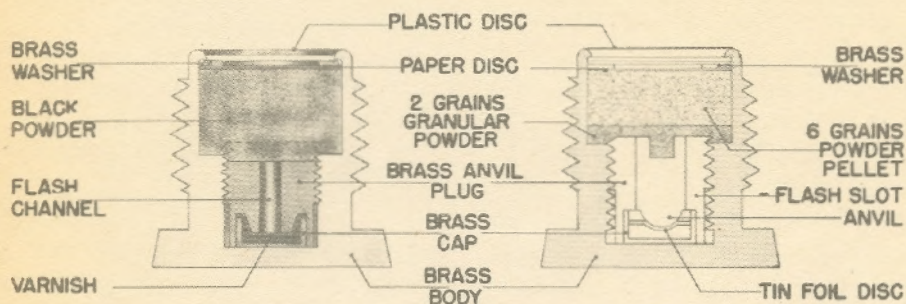
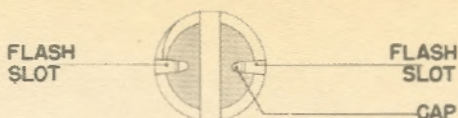
- 28% Mercury fulminate.
- 34% Potassium chlorate.
- 32% Antimony sulphide.
- 6% Glass powder.

The cap is a push fit in the underside of the anvil plug. The magazine contains a 1.44 gram pellet of Black Powder over a 0.65 gram of granular Black Powder. The primer is closed by a brass washer and a varnished fibric disc.

FUNCTIONING:

The cap is pressed against the anvil by the firing pin. The flash from the primer fires the two chambers of Black Powder and these in turn fire the propelling charge.

HEAD OF ANVIL PLUG



PERCUSSION PRIMER PERCUSSION PRIMER
C/13 nA C/33

RESTRICTED

PERCUSSION PRIMER C/33

EMPLOYMENT:

German Percussion Primer used on Q. F. Cartridges.

DESCRIPTION:

0.56 inches, Overall length.
0.63 inches, Diameter at lip.
0.50 inches, Diameter of body.
0.31 inches, Threaded length.
0.09 inches, Thickness of lip.
Number of threads - 5 RH.

CONSTRUCTION:

A brass cap is positioned under the anvil in the base of the primer.
The cap contains:-

24.6% Mercury fulminate.
37.6% Potassium chlorate.
29.6% Antimony sulphide.
8.2% Abrasives.

The cap is sealed by a tinfoil disc without varnish.

The anvil, which is screwed into the primer, has two flash channels, diametrically opposite, along its sides.

The upper recess of the primer houses an 8 grain Black Powder charge. The top of the primer is sealed by a plastic disc inserted over a brass washer.

FUNCTIONING:

The cap is forced against the anvil by the firing pin. The resulting flash passes through the two channels in the anvil firing the Black Powder and this, in turn, fires the propelling charge.

RESTRICTED

PERCUSSION PRIMER C/13 n A

EMPLOYMENT:

German Percussion Primer used on Q. F. Cartridges.

DESCRIPTION:

0.63 inches, Diameter at lip.
0.50 inches, Diameter of body.
0.56 inches, Length of body.
0.25 inches, Threaded length.
0.09 inches, Thickness of lip.
Number of threads - 5 RH.

CONSTRUCTION:

A brass cap is positioned under the anvil in the base of the primer. The cap contains:-

23.0% Potassium chloride.
52.0% Mercury fulminate.
19.7% Antimony sulphide.
5.3% Abrasives.

The composition is sealed by a covering of varnish without the addition of a foil disc.

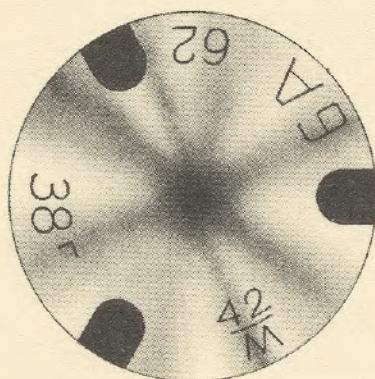
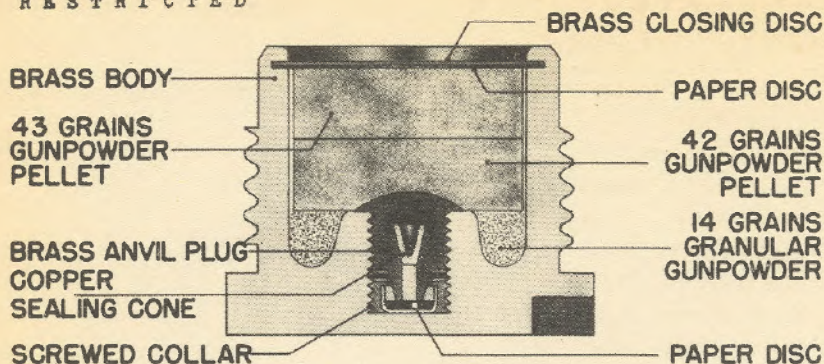
The anvil, which is screwed into the primer, has a flash channel through its center.

The upper recess of the primer houses 8.7 grains of Black Powder. The top of the primer is sealed by a brass washer and a plastic disc.

FUNCTIONING:

The cap is forced against the anvil by the firing pin. The resulting flash passes through the anvil firing the Black Powder and this, in turn, fires the propelling charge.

RESTRICTED



BASE MARKINGS

PERCUSSION PRIMER 42/M

RESTRICTED

PERCUSSION PRIMER 42/M

EMPLOYMENT:

Russian Primer from German 7.62 cm. round.

DESCRIPTION:

0.875 inches, Overall length.
1.188 inches, Diameter of lip.
0.938 inches, Diameter of body.
0.375 inches, Threaded length.
0.094 inches, Thickness of lip.
Number of threads - 5 RH

CONSTRUCTION:

The brass body of the primer houses a percussion cap which fits in the base below a brass anvil. The cap consists of:-

21.9% Mercury fulminate.
40.3% Potassium chlorate.
37.8% Antimony sulphide.

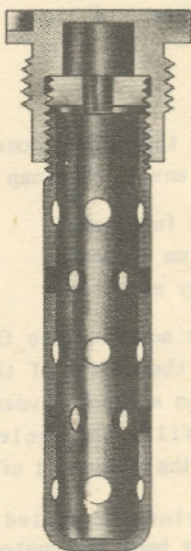
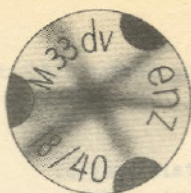
The brass anvil is screwed into the primer body and houses a copper sealing cone. Through the center of the anvil and the sealing cone is a flash channel leading to a Black Powder charge in the top of the primer. This 99 grain charge fills the whole upper recess of the primer and extends slightly below the upper end of the anvil.

The top of the primer is sealed by a brass closing ring and the whole primer, except the base, is coated with black varnish.

FUNCTIONING:

The cap is forced against the anvil by the firing pin. The flash is then transmitted through the anvil igniting the Black Powder which, in turn, fires the propelling charge.

RESTRICTED



PERCUSSION PRIMER M 33

- 28 -

RESTRICTED

PERCUSSION PRIMER M33

EMPLOYMENT:

Percussion Primer used on the German 47 mm. cartridge case.

DESCRIPTION:

2.438 inches, Overall length.
Number of holes - 30
0.094 inches, Diameter of holes.
0.625 inches, Body diameter.
0.875 inches, Lip diameter.
0.250 inches, Threaded length.
Number of threads - 6 RH.

CONSTRUCTION:

Into the base of this primer is screwed an extra 3.1 gram charge of black powder. The brass body contains the standard anvil with a flash hole and a cap consisting of:

29.1% Potassium chloride.
16.7% Mercury fulminate.
43.4% Antimony sulphide.
10.8% Abrasives.

FUNCTIONING:

The firing pin hits the rear of the primer forcing the cap against the anvil. The flash passes through the anvil firing the black powder charge which then fires the propelling charge.

GERMAN CARTRIDGES, S.A.A., 7.92 MM.

TYPE	IDENTIFICATION MARKING		MATERIAL	FILLING AND/OR CORE	PENETRATING HARD ARMOR AT 100 YDS. N.I.	REMARKS
	CARTRIDGE CASE	PROJECTILE				
Practice Tracer.	5 mm Green Lacquer band across base.	10 mm black tip.	Steel coated gilding metal.	Aluminum 25 grains		White trace 800 yards.
Ball.	Green Annulus.	Plain.	Steel, coated gilding metal (both sides).	Lead.		
Practice Ball (H.V.)	5 mm Green Lacquer band across base.	Plain.	Steel, coated gilding metal.	Aluminum 42 grains		Used in practice manoeuvres.
Incendiary observing.	Black Annulus.	Chromium plated tip (obsolete) or plain tip with Black rear part.	Steel, coated gilding metal (both sides).	Phosphorus 6 grains.		Base fuze detonator, striker and split sleeve in tube.
H.V.I.O.	Black Annulus.	Black body, plain tip, with Green ring.	Steel, coated gilding metal (both sides).	Phosphorus 6 grains.		Base fuze detonator, striker and split sleeve in tube.
A.P.	Red Annulus.	Plain or Red Ring above cartridge case.	Steel, coated gilding metal (both sides).	Steel 89 grains.	12 mm	
H.V.A.P.	Red Annulus.	Green tip (10 mm) or 1.5 mm green ring or green tip with R.R.	Steel, coated gilding metal (both sides).	Steel 89 grains.	14.5 mm	
A.P. (with tungsten carbide core)	Red Annulus or red cap.	Black, plain or copper nickel coated steel.	Steel, coated gilding metal (both sides).	Tungsten carbide 127 grains.	19.0 mm 13.5 mm at 30°	

REF ID: A66584

GERMAN CARTRIDGES, S.A.A., 7.92 MM. (cont'd)

TYPE	IDENTIFICATION MARKING		MATERIAL	FILLING AND/OR CORE	PENETRATING HARD ARMOR AT 100 YDS. N.I.	REMARKS
	CARTRIDGE CASE	PROJECTILE				
A.P./I	Black or Red Annulus or Red Stripe.	Plain or Black Band above cartridge cases.	Steel, coated gilding metal (both sides).	Steel core 38 grains. Phosphorus 6 grains.	8 mm.	White smoke 400-500 yards.
H.V.A.P./I	Black Annulus.	Green tip (10 mm) or 1.5 mm green ring.	Steel, coated gilding metal (both sides).	Steel core 38 grains. Phosphorus 6 grains.	9 mm.	White smoke 400-500 yards.
A.P./T	Red Annulus.	Black tip (10 mm)	Steel, coated gilding metal (both sides).	Steel 39 grains.	8 mm.	Green changing to Red. All Yellow or All Green. Change at 400-500 yards. 900 - 1,000 yards
H.V.A. P/T	Red Annulus.	Black tip (10 mm) green ring 1.5 mm below black.	Steel, coated gilding metal (both sides).	Steel 39 grains.	10.5 mm.	Green changing to Red. All Yellow or All Green. Change at 400-500 yards. 900 - 1,000 yards
Semi-A.P.	Deep Green Annulus.	Copper Nickel.	Steel, coated copper nickel.	Machine steel core 90 grains.	12 mm.	

RESTRICTED

RESTRICTED

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RESTRICTED

[illegible]

GERMAN 20 MM MAUSER & OERLIKON AMMUNITION

TYPE	PROJECTILE MARKINGS		MATERIAL	FILLING (grains)	TRACE (Secs)	PENETRATION @ 100 YARDS. NORMAL IMPACT.	FUZE
	BODY	BANDS					
Ball.	Olive Green.	None.	Steel.	None.	None.		None.
A.P.	Black.	None.	A.P. Steel.	Inert.	None.	17 mm Normal 10 mm 100 yds. 30°	None.
A.P./I	Black.	.2" Blue Band at .7" from nose or .2" Blue band at .4" above D.B.	A.P. Steel.	Phosphorus 52. In light alloy case.	None.	17 mm	None.
A.P./H.E.	Black.	.7" Yellow band at .2" above D.B. or .2" Yellow band .7" below nose.	A.P. Steel.	Penthrite Wax 78.	None.	17 mm	None.
Tracer. * *	Olive Green.	Yellow and mauve above driving band.	Steel.	None.	Brilliant White 1.8.	7.5 mm @ 200 yards 20°.	None.
Tracer.	Olive Green.	Yellow above driving band and white below nose with 3 arrows stamped on nose plug.	Steel.	None.	Brilliant White or Yellow.		None.
I/T	Navy Blue.	.2" red band or maroon band.	Steel.	Incendiary filling similar to green band type.	Approx. 4 secs.		Aluminum Det. in nose. (strikerless).
H.E./T. XX (S.D.)	Yellow.	Black .4" above driving band.	Steel.	Penthrite Wax - 57.1	Yellow 2.0		A.Z. 1501 (Brass)
H.E./T (S.D.)	Yellow.	None.	Steel.	Penthrite Wax - 57.1	Pale Green 1.4	None.	A.Z. 1504 Alum.

RESTRICTED

GERMAN 20 MM MAUSER & OERLIKON AMMUNITION (cont'd.)

TYPE	PROJECTILE MARKINGS		MATERIAL	FILLING (grains)	TRACE (Secs)	PENETRATION @ 100 YARDS. NORMAL IMPACT.	FUZE
	BODY	BANDS					
H.E./T (S.D.) xx	Steel Unpainted.	White band above driving band.	Steel.	Penthrite Wax - 49.2	Brilliant White 6.0		A.Z. 1502 (Brass).
H.E. (M Pro- jectile)	Yellow	Black below fuze.	Drawn steel hemospherical base.	Penthrite Wax - 262.	None.	6 mm @ 200 yds. 20°.	A.Z. 1502 (Brass).
H.E./I(M) Projectile.	Yellow.	Green below fuze.	Drawn steel hemospherical base.	Penthrite Wax Incendiary Pellet.	None.		Z.Z. 1505 Steel, brass coated.
H.E./I/T (S.D.)	Yellow.	.2" blue .4" above driving band or .25" blue below fuze.	Steel.	Penthrite Wax - 55. Incendiary 6.			Alum. A.Z. 1504.
H.E./I/T (S.D.)	Yellow.	Brown above DB, blue below fuze.	Steel.		Bright Night		Aluminum plated A.Z. 1504.
H.E./I/T (S.D.)	Yellow.	.25" Green band below fuze .2" Red band above DB.	Steel.	Penthrite Wax - 36. Incendiary 34.	Deep Yellow.		Aluminum plated A.Z. 1504.

xx These types are out-of-date but may be still in service.

RESTRICTED

RED TIP

BLACK

RED
BAND

x 18d⁺
Ph

BLACK

YELLOW
BAND

BLACK

trop

Wg 5f 42
9VK

8 1/8"

5 3/4"

AA 1b

OERLIKON A.P.

MAUSER A.P.

SOLOTHURN A.P.

20 MM. A.P. AMMUNITION

RESTRICTED

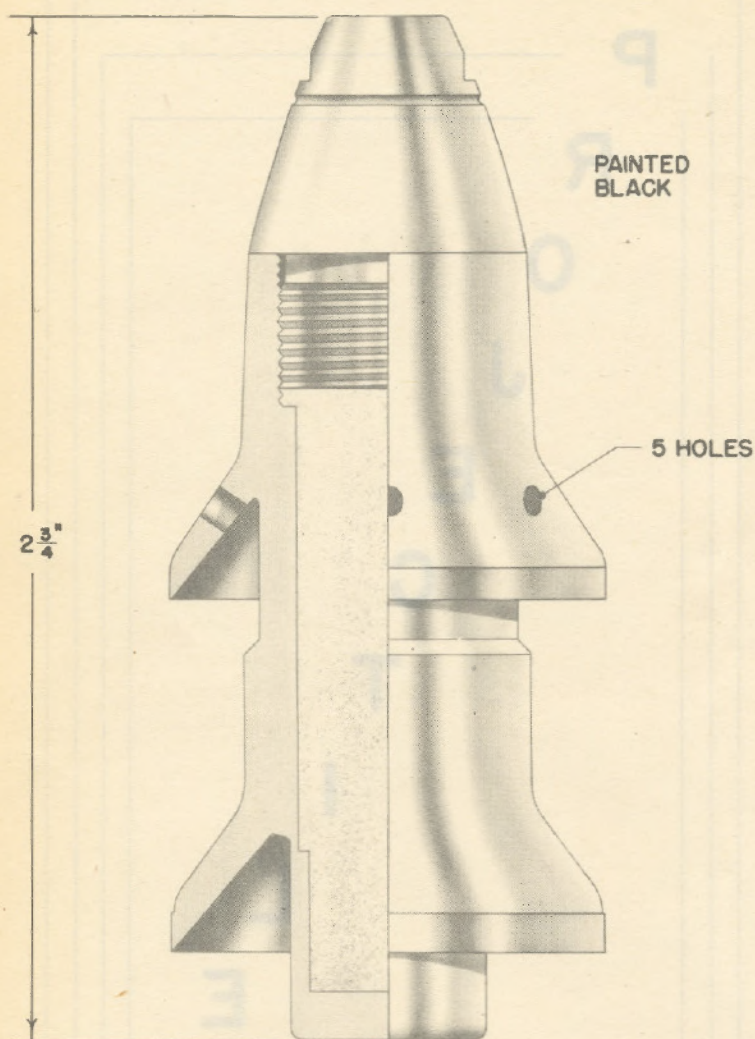


20 MM H.E. AMMUNITION

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RESTRICTED

H.E. PROJECTILE FOR TAPERED BORE GUN, 28.20mm.



Sprgr. Patr. Pz. B41

R E S T R I C T E D H.E. PROJECTILE FOR TAPERED BORE GUN, 28.20 mm.

GERMAN DESIGNATION: Sprgr. Patr. Pz. B41
(Sprenggranate Patrone Panzerbuchse 41)

EMPLOYMENT:

s. Pz B 41 - (schweres Panzerbuchse 41) - Gerlich Type Tapered Bore Gun

COMPLETE ROUND:

8.5 inches, overall length.

PROJECTILE:

Painted Black.

2.531 inches, overall length.

1.129 inches, diameter of bourrelet.

0.752 inches, diameter of body midway.

1.128 inches, diameter of base.

3.1 ounces, total weight.

1.8 ounces, weight of bursting charge.

PETN/Wax, type of bursting charge.

Tracer present.

CARTRIDGE CASE:

German designation, P 345.

7.375 inches, overall length.

1.175 inches, diameter of neck.

1.567 inches, diameter of shoulder.

1.885 inches, depth of extracting groove.

5.3 ounces, weight of propellant.

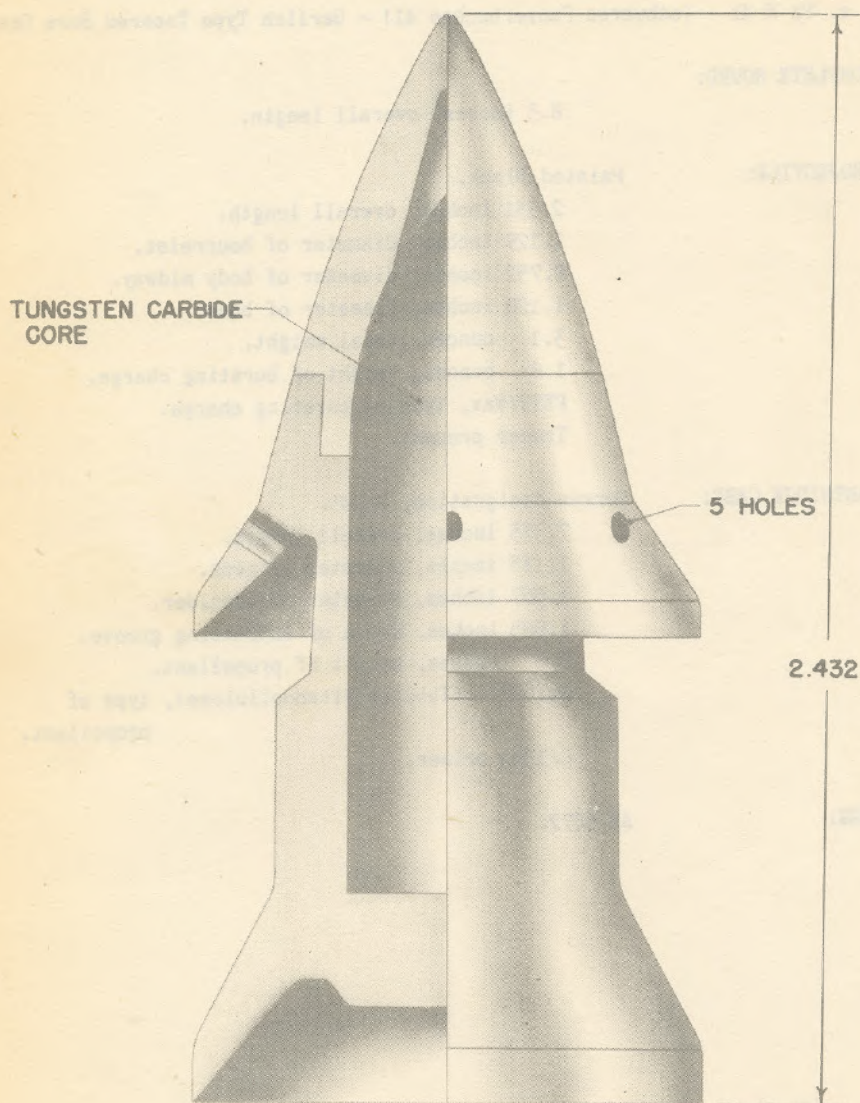
Nz. RP - (Tubular Nitrocellulose), type of
propellant.

C/13nA primer.

FUZE:

AZ 5072.

A.P. SHOT WITH CORE, FOR TAPERED BORE GUN, 28.20mm.



Pzgr. Patr. Pz B4I

RESTRICTED

A.P. SHOT WITH CORE, FOR TAPERED BORE GUN, 28.20 mm.

GERMAN DESIGNATION: Pzgr. Patr. Pz B41

(Panzergranate patrone Panzerbuchse 41)

EMPLOYMENT:

s. Pz. Bu. 41 - (schweres Panzerbuchse 41) - Gerlich Type - Tapered
Bore Gun

COMPLETE ROUND:

8.5 inches, overall length.

PROJECTILE:

Black with red band.

2.531 inches, overall length.

1.129 inches, diameter of bourrelet.

0.752 inches, width of body midway.

1.128 inches, diameter of base.

4.6 ounces, total weight.

1.593 inches, length of core.

0.430 inches, diameter of core.

Tracer present.

CARTRIDGE CASE:

German designation, P 345.

7.375 inches, overall length.

1.175 inches, diameter of neck.

1.567 inches, diameter of shoulder.

1.885 inches, depth of extracting groove.

5.4 ounces, weight of propellant.

Tubular Nitrocellulose, type of propellant.

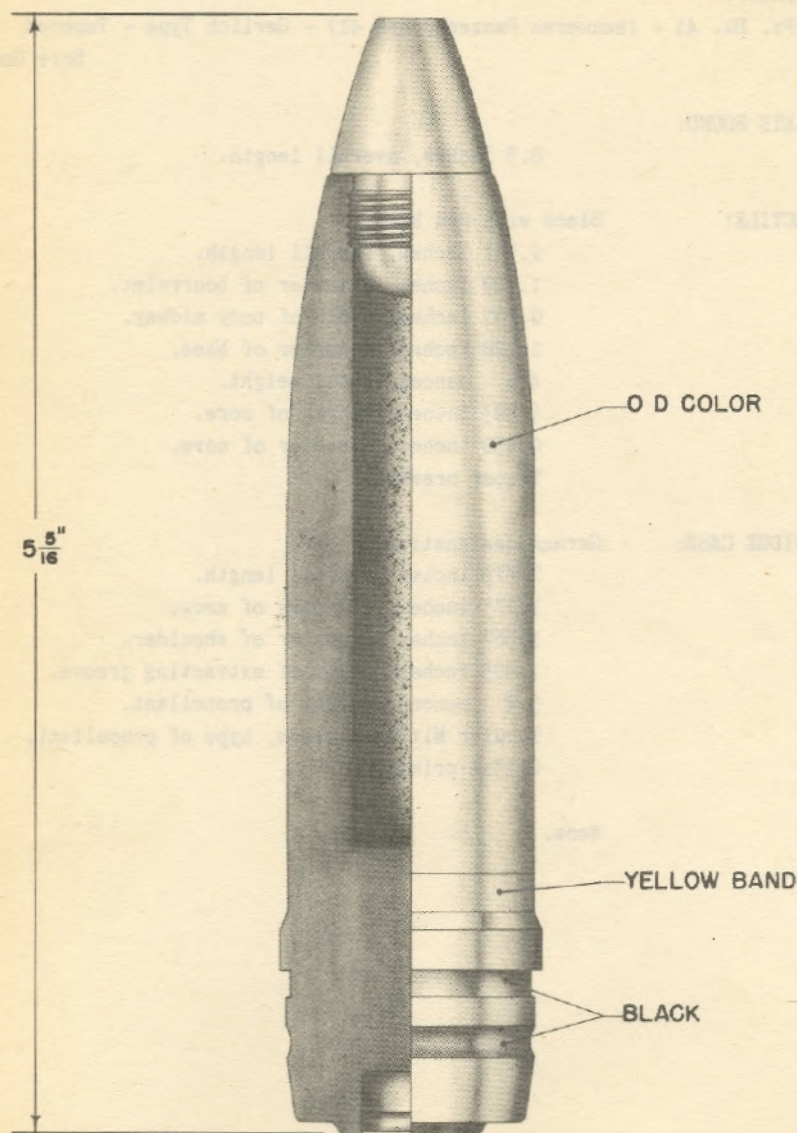
C/13nA primer.

FUZE:

None.

RESTRICTED

INERT-LOADED PROJECTILE FOR AIRCRAFT CANNON, 30mm.



3cm

- 42 -

R E S T R I C T E D

INERT-LOADED PROJECTILE FOR AIRCRAFT CANNON, 30 mm.

GERMAN DESIGNATION: 3cm

EMPLOYMENT: 3cm Solothurn - (Aircraft Cannon) *MK-103*
Rheinmetall
or MK 101 (Mann)

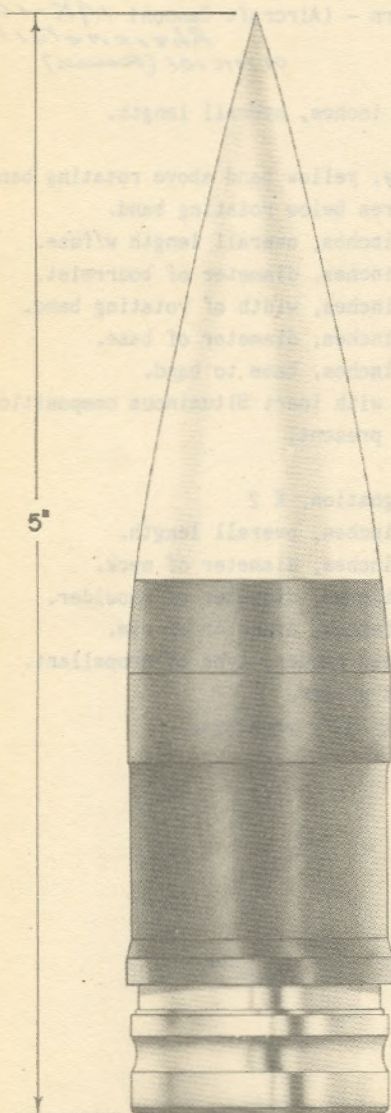
COMPLETE ROUND: 11.719 inches, overall length.

PROJECTILE: Painted Grey, yellow band above rotating band.
Two cannellures below rotating band.
5.25 inches, overall length w/fuze.
1.187 inches, diameter of bourrelet.
0.312 inches, width of rotating band.
1.125 inches, diameter of base.
0.781 inches, base to band.
Filled with inert Bituminous composition.
Tracer present.

CARTRIDGE CASE: German designation, K 2
7.25 inches, overall length.
1.25 inches, diameter of neck.
1.375 inches, diameter of shoulder.
1.5 inches, diameter of rim.
Smokeless powder, type of propellant.
C/33 St primer.
"Wb K2 41", markings.

FUZE: Dummy.

A.P. PROJECTILE WITH CORE FOR AIRCRAFT CANNON, 30mm.



3cmPzgr. 40

R E S T R I C T E D

A.P. PROJECTILE WITH CORE FOR AIRCRAFT CANNON, 30 mm.

GERMAN DESIGNATION: 3cm Pzgr. 40
(Panzergranate 40)

EMPLOYMENT: 3cm Solothurn - (Aircraft Cannon) *MK-103*
Rheinmetall

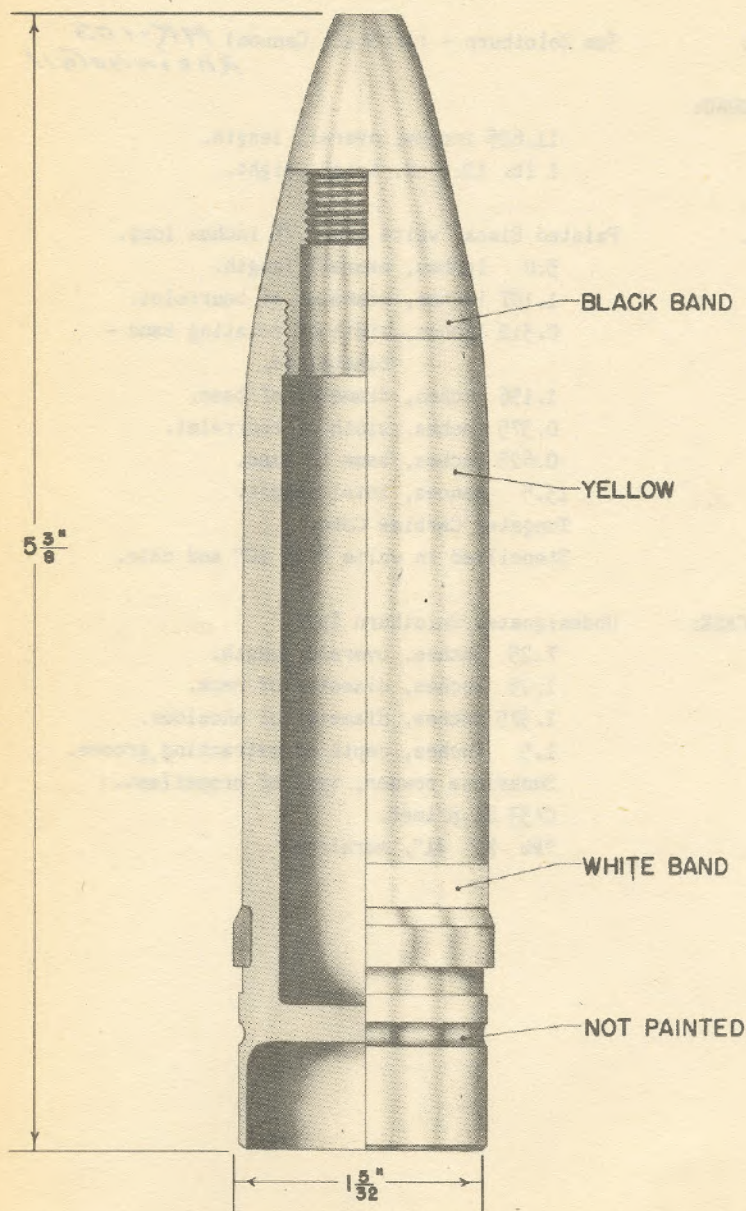
COMPLETE ROUND:
11.625 inches, overall length.
1 lb. 12.5 oz. total weight.

PROJECTILE: Painted Black; white tip 1.75 inches long.
5.0 inches, overall length.
1.187 inches, diameter of bourrelet.
0.312 inches, width of rotating band -
bimetallic.
1.156 inches, diameter of base.
0.375 inches, width of bourrelet.
0.625 inches, base to band.
13.5 ounces, total weight.
Tungsten Carbide Core.
Stencilled in white "UNT 1C" and date.

CARTRIDGE CASE: Undesignated Solothurn Type.
7.25 inches, overall length.
1.25 inches, diameter of neck.
1.375 inches, diameter of shoulder.
1.5 inches, depth of extracting groove.
Smokeless powder, type of propellant.
C/33 St primer.
"Wb K2 41", markings.

RESTRICTED

H.E. PROJECTILE FOR AIRCRAFT CANNON, 30 mm.



3cm Sprgr.

R E S T R I C T E D

H.E. PROJECTILE FOR AIRCRAFT CANNON, 30 mm.

GERMAN DESIGNATION: 3cm Sprgr.
(Sprenggranate)

EMPLOYMENT: 3cm Solothurn - (Aircraft) *max 103*

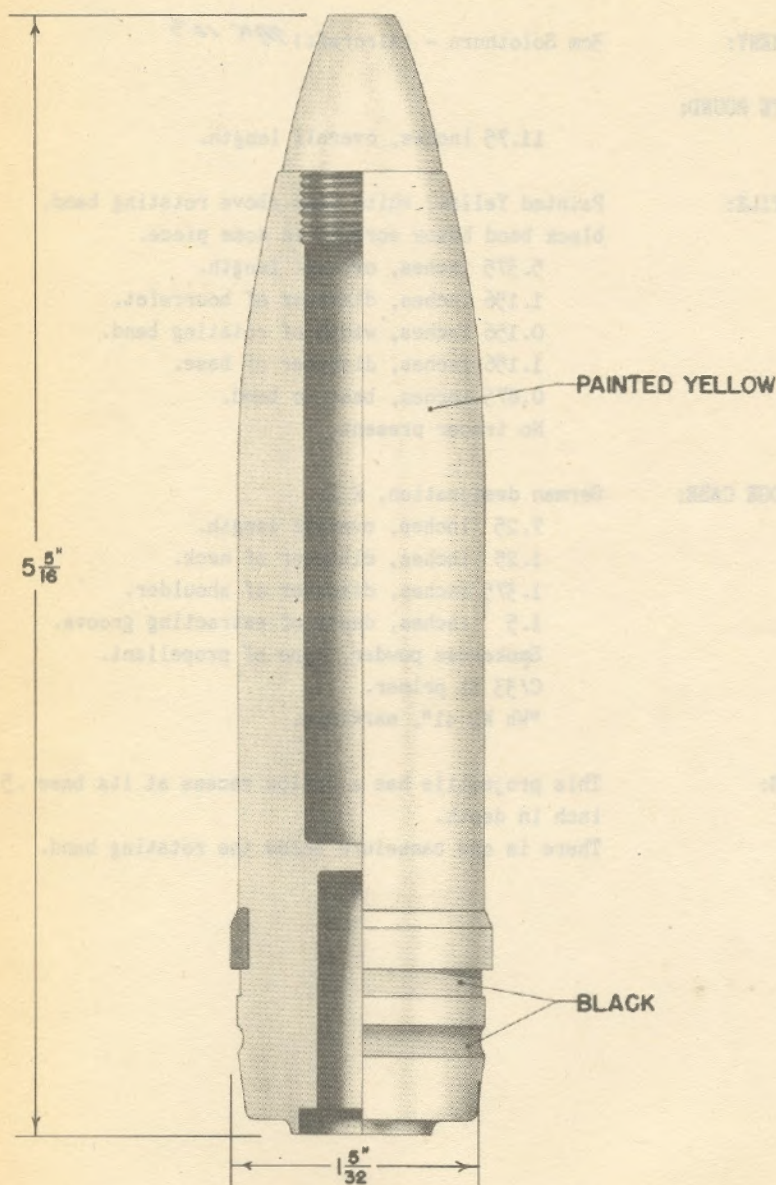
COMPLETE ROUND:
11.75 inches, overall length.

PROJECTILE: Painted Yellow; white band above rotating band,
black band below screwed-in nose piece.
5.375 inches, overall length.
1.156 inches, diameter of bourrelet.
0.156 inches, width of rotating band.
1.156 inches, diameter of base.
0.875 inches, base to band.
No tracer present.

CARTRIDGE CASE: German designation, K 2.
7.25 inches, overall length.
1.25 inches, diameter of neck.
1.375 inches, diameter of shoulder.
1.5 inches, depth of extracting groove.
Smokeless powder, type of propellant.
C/33 St primer.
"Wb K2 41", markings.

REMARKS: This projectile has a hollow recess at its base .5
inch in depth.
There is one cannellure below the rotating band.

H.E. PROJECTILE WITH TRACER FOR AIRCRAFT CANNON, 30mm.



3cm Sprgr. L' spur

R E S T R I C T E D

H.E. PROJECTILE WITH TRACER FOR AIRCRAFT CANNON, 30 mm.

GERMAN DESIGNATION: 3cm Sprgr. L'spur
(Sprenggranate Leuchtspur)

EMPLOYMENT: 3cm Solothurn - (Aircraft Cannon) 171103

50- 43005

COMPLETE ROUND: 11.718 inches, overall length.

PROJECTILE: Painted Yellow; aluminum fuze.
5.25 inches, overall length w/fuze.
1.156 inches, diameter of bourrelet.
0.312 inches, width of rotating band.
1.125 inches, diameter of base.
0.781 inches, base to band.
Tracer present (not self-destroying)

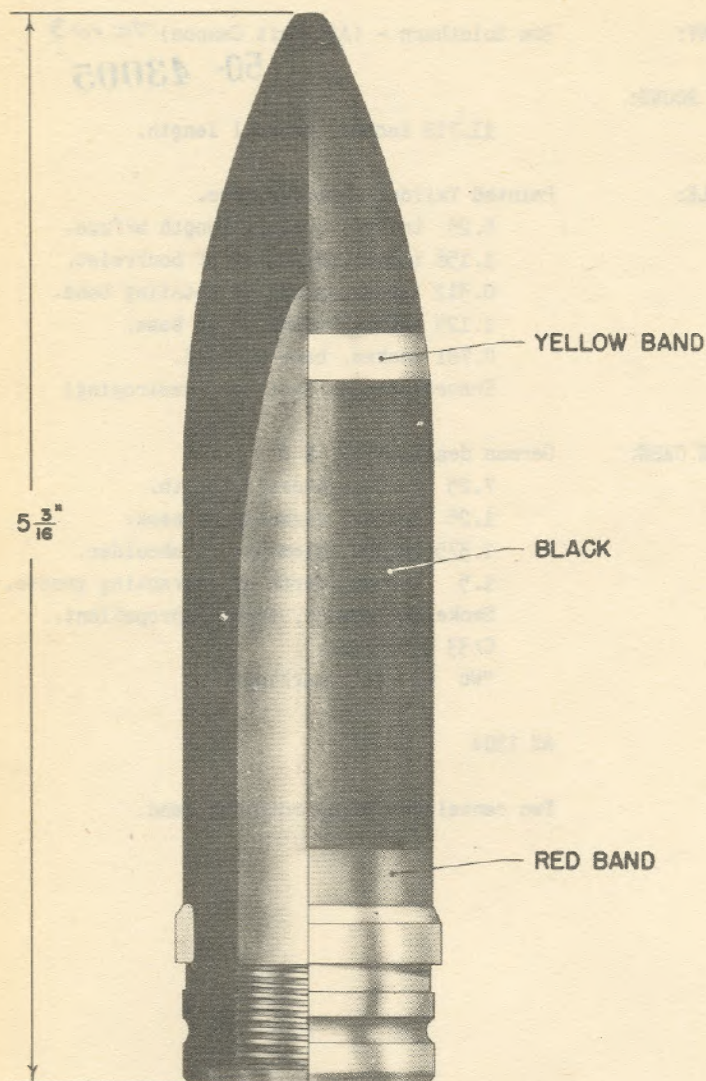
CARTRIDGE CASE: German designation, K 2
7.25 inches, overall length.
1.25 inches, diameter of neck.
1.375 inches, diameter of shoulder.
1.5 inches, depth of extracting groove.
Smokeless powder, type of propellant.
C/33 St primer.
"Wb K2 41", markings.

FUZE: AZ 1504

REMARKS: Two cannellures below rotating band.

RESTRICTED

A.P. PROJECTILE FOR AIRCRAFT CANNON, 30 mm.



3cm Pzgr.

GERMAN DESIGNATION: 3cm Pzgr.
(Panzergranate)

EMPLOYMENT: 3cm Solothurn - (Aircraft Cannon) *M/K-103*

COMPLETE ROUND:
12.218 inches, overall length.

PROJECTILE: Painted Black; yellow band above bourrelet, red band above rotating band.
5.656 inches, overall length w/ fuze.
5.187 inches, overall length w/o fuze.
1.187 inches, diameter of bourrelet.
0.25 inches, width of rotating band.
1.156 inches, diameter of base.
0.687 inches, base to band.
TNT, type of bursting charge.
Tracer present.

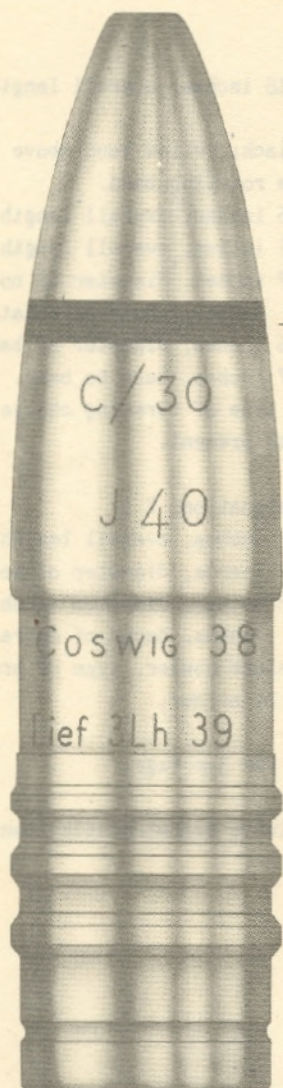
CARTRIDGE CASE: German designation, K 2
7.25 inches, overall length.
1.25 inches, diameter of neck.
1.375 inches, diameter of shoulder.
1.5 inches, depth of extracting groove.
Smokeless powder, type of propellant.
C/33 St primer.

FUZE: Base fuze for 3cm Pzgr.

REMARKS: Two cannellures below rotating band.

RESTRICTED

H.E./T PROJECTILE FOR NAVAL GUN C/30, 37mm.



← BLACK BAND

3.7cm Sprgr. L'spur.

R E S T R I C T E D

H.E./T PROJECTILE FOR NAVAL GUN C/30. 37 mm.

GERMAN DESIGNATION: 3.7cm Sprgr. L'spur
(Sprenggranate Leuchtspur)

EMPLOYMENT: 3.7cm Naval C/30

COMPLETE ROUND: 20.0 inches, overall length.
4.5 pounds, total weight.

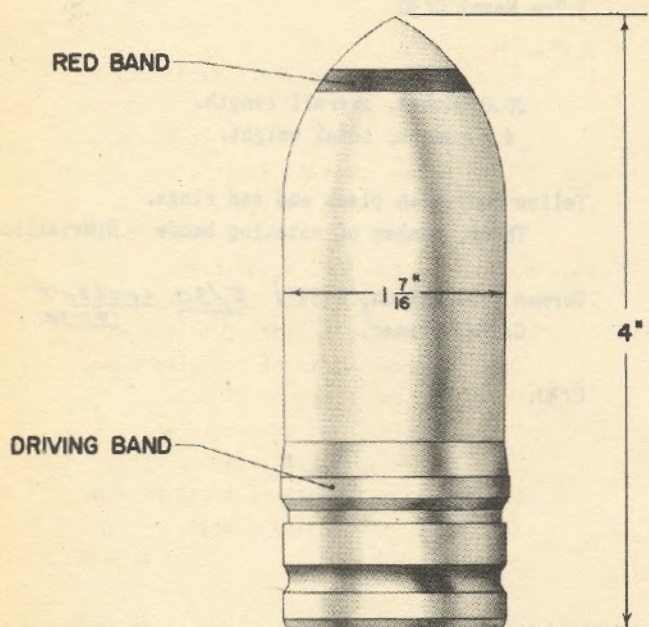
PROJECTILE: Yellow body with black and red rings.
Three, number of rotating bands - Bimetallic.

CARTRIDGE CASE: German designation (P 397) C/30 CORRECT
C/13nA primer. 1918C

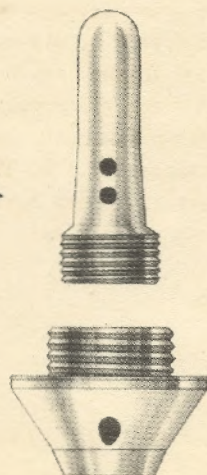
FUZE: C/30.

RESTRICTED

A.P. PROJECTILE WITHOUT CAP FOR POLISH AT GUN, 37 mm.



BASE FUZE



3.7 CM PZGR.

R E S T R I C T E D

A.P. PROJECTILE WITHOUT CAP FOR POLISH AT GUN, 37 mm.

GERMAN DESIGNATION: 3.7cm Pzgr.

(Panzergranate)

EMPLOYMENT:

3.7cm Pak. (P)

(Panzerabwehrkanone (Polish)) 141936

COMPLETE ROUND:

13.3 inches, overall length.

2.97 pounds, total weight.

PROJECTILE:

Painted Yellow, red band below nose.

4.625 inches, overall length with fuze.

1.375 inches, diameter of bourrelet.

0.437 inches, width of rotating band.

0.562 inches, diameter of base.

0.812 inches, base to band.

1 lb. 7.98 oz., total weight.

0.44 ounces, weight of bursting charge.

TNT, type of bursting charge.

No tracer present.

Stamped: C-21

PK-21-38

CARTRIDGE CASE:

German designation, 37 wz 36 Pk 39

10.125 inches, overall length

1.5 inches, diameter of neck.

1.687 inches, diameter of shoulder.

2.187 inches, depth of extracting groove.

6.5 ounces, weight of propellant.

Strip propellant, type of propellant.

Markings: 3.7 WZ 36

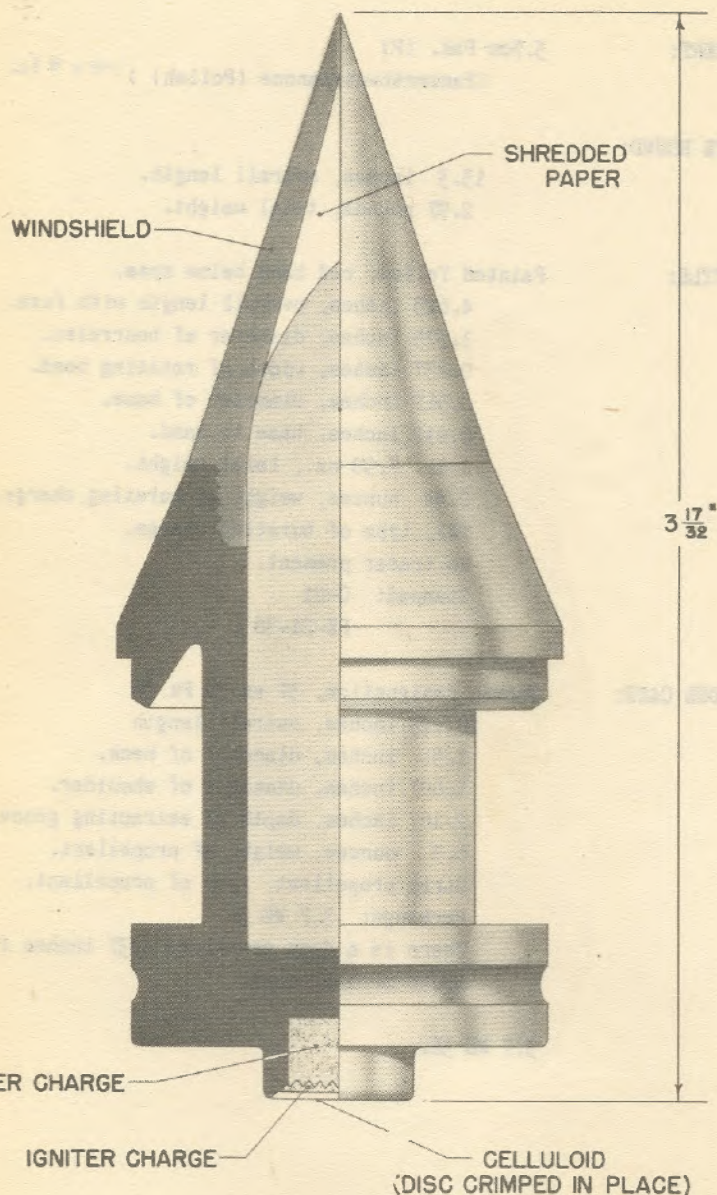
There is a deep cannellure .437 inches from the mouth of this case.

FUZE:

3.7 WZ 36.

RESTRICTED

A.P. PROJECTILE WITH CORE (ARROWHEAD DESIGN), 37 mm.



3.7 CM PZGR. PATR. 40

R E S T R I C T E D

A.P. PROJECTILE WITH CORE (ARROWHEAD DESIGN), 37 mm.

GERMAN DESIGNATION: 3.7cm Pzgr. Patr. 40
(Panzergranate Patronen 40)

EMPLOYMENT: 3.7cm Pak. *36 Rheinmetall*
(Panzerabwehrkanone)

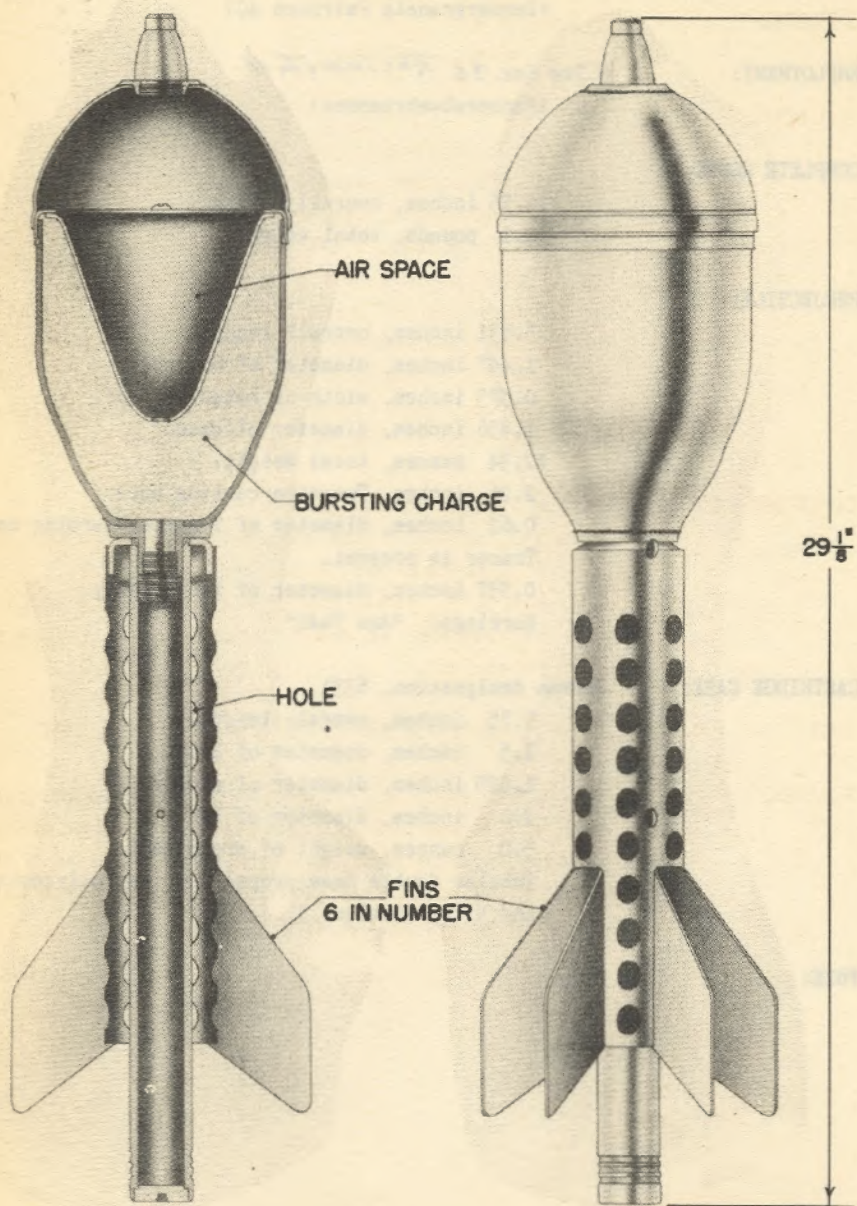
COMPLETE ROUND:
11.95 inches, overall length.
2.1 pounds, total weight.

PROJECTILE:
3.531 inches, overall length.
1.447 inches, diameter of bourrelet.
0.375 inches, width of rotating band.
1.456 inches, diameter of base.
12.34 ounces, total weight.
2.26 inches, Tungsten carbide core.
0.62 inches, diameter of Tungsten carbide core
Tracer is present.
0.937 inches, diameter of body midway.
Markings: "Aux 7a40"

CARTRIDGE CASE: German designation, 6331
9.75 inches, overall length.
1.5 inches, diameter of neck.
1.625 inches, diameter of shoulder.
2.0 inches, diameter of rim.
5.0 ounces, weight of propellant.
Tubular double base propellant (Nitroglycerine
and Nitrocellulose.)

FUZE: None.

RODDED BOMB FOR A T GUN 41, 37mm.



3.7cm Pak 41

R E S T R I C T E D

RODDED BOMB FOR AT GUN 41, 37 mm.

GERMAN DESIGNATION: 3.7cm Stielgranat 41

EMPLOYMENT: 3.7cm Pak 41
(Panzerabwehrkanone 41)

PROJECTILE:

27.362 inches, total length.

10.826 inches, length of bomb body.

5.708 inches, diameter of bomb body.

18.26 pounds, total weight.

5.28 pounds, weight of bursting charge.

Cyclonite/TNT (60/40, 2 blocks in wax paper wrapping cemented to interior wall of bomb) - type of bursting charge.

Two boosters Kz. Zdlg. 34 Np end to end, one detonator facing forward, the other aft.

CARTRIDGE CASE:

German designation, 6331.

Standard cartridge case closed by two cork discs.

6.61 ounces, weight of propellant.

Ngl R.P. (Tubular double base propellant Nitroglycerine and Nitrocellulose) - Type of propellant.

FUZE:

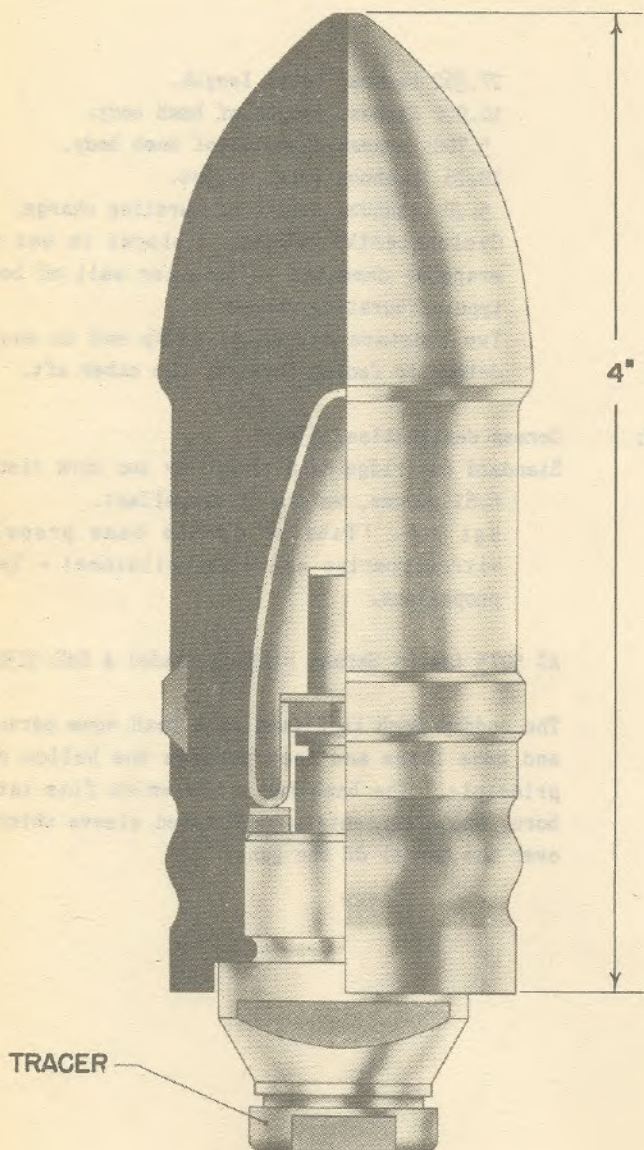
AZ 5075 (as in German rifle grenade) & BdZ 5130

REMARKS:

The rodded bomb is fitted with both nose percussion and base fuzes and incorporates the hollow charge principle. The bomb has a rod which fits into the bore, and a concentric perforated sleeve which fits over the barrel of the gun.

RESTRICTED

A.P. PROJECTILE WITHOUT CAP FOR AA GUN, 37mm.



3.7cm Pzgr. Patr. 18

R E S T R I C T E D

A.P. PROJECTILE WITHOUT CAP FOR AA GUN, 37 mm.

GERMAN DESIGNATION: 3.7cm Pzgr. Patr. 18
(Panzergranate Patronen 18)

EMPLOYMENT: 3.7cm Flak. 18 - (Flugabwehrkanone 18)
3.7cm Flak. 36 - (Flugabwehrkanone 36)

COMPLETE ROUND: C/R is identical for both weapons.
12.519 inches, overall length.
3.476 pounds, total weight.

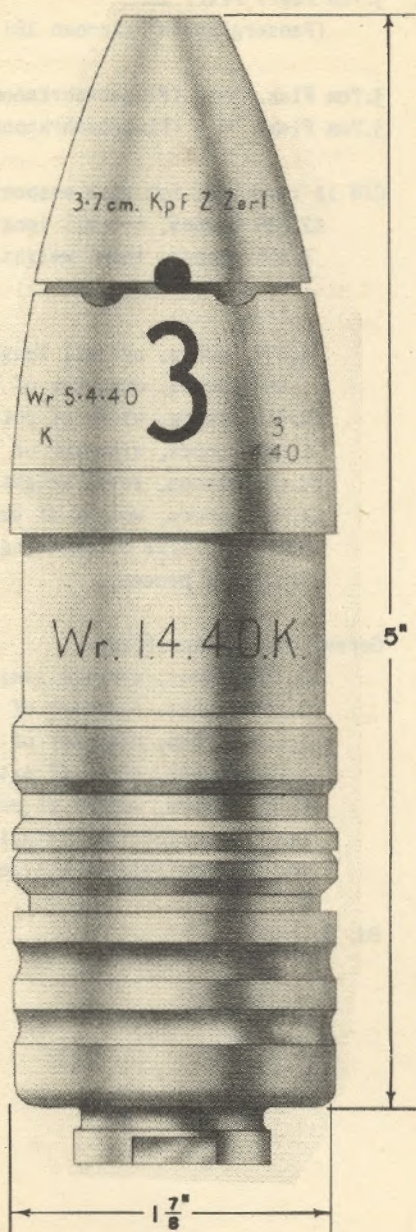
PROJECTILE:
4.055 inches, overall length.
1.49 inches, diameter of bourrelet.
0.312 inches, width of rotating band.
1.437 inches, diameter of base.
24.68 ounces, total weight.
4.58 ounces, weight of bursting charge.
PETN/Wax, type of bursting charge.
Tracer is present.

CARTRIDGE CASE: German designation 6348.
10.156 inches, overall length.
1.594 inches, diameter of neck.
1.625 inches, diameter of shoulder.
1.844 inches, depth of extracting groove.
6.52 ounces, weight of propellant.
Digl R.P. (Tubular Diethylene Glycoldinitrate
and Nitrocellulose) - type of propellant.

FUZE: Bd. Z. 5103.

RESTRICTED

H.E. PROJECTILE FOR A.A. GUN, 37mm.



3.7 CM SPRGR. PATR. 18

GERMAN DESIGNATION: 3.7cm Sprgr. Patr. 18
(Sprenggranate Patronen 18)

EMPLOYMENT: 3.7cm Flak. 18 - (Flugabwehrkanone 18)
3.7cm Flak. 36 - (Flugabwehrkanone 36)

COMPLETE ROUND: C/R is identical for both weapons.
13.779 inches, overall length.
3.32 pounds, total weight.

PROJECTILE: Painted Yellow; two deep cannellures below rotating band.

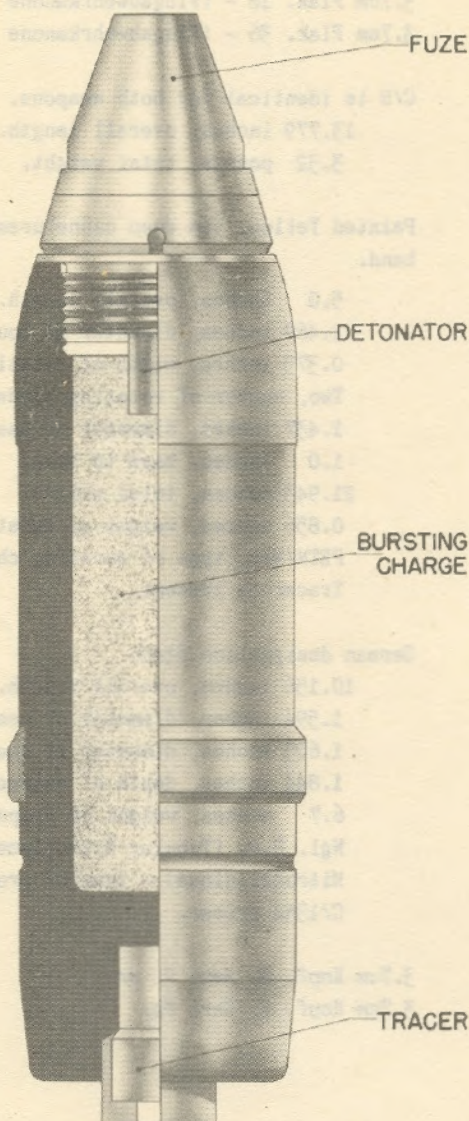
5.0 inches, overall length.
1.469 inches, diameter of bourrelet.
0.375 inches, width of rotating bands.
Two, number of rotating bands.
1.437 inches, diameter of base.
1.0 inches, base to band.
21.943 ounces, total weight.
0.856 ounces, weight of bursting charge.
PETN/Wax, type of bursting charge.
Tracer is present.

CARTRIDGE CASE: German designation 6348.
10.156 inches, overall length.
1.594 inches, diameter of neck.
1.625 inches, diameter of shoulder.
1.844 inches, depth of extracting groove.
6.7 ounces, weight of propellant.
Ngl. R.P. (Tubular Nitroglycerine and Nitrocellulose) - type of propellant.
C/13nA primer.

FUZE: 3.7cm Kopf. Z. Zerl P. or
3.7cm Kopf. Z. Zerl Fg.

RESTRICTED

H.E. PROJECTILE (TYPE 40) FOR AT GUN, 37mm.



3.7cm Sprgr. Patr. 40

R E S T R I C T E D

H.E. PROJECTILE (TYPE 40) FOR AT GUN, 37 mm.

GERMAN DESIGNATION: 3.7cm Sprgr. Patr. 40
(Sprenggranate Patronen 40)

EMPLOYMENT: 3.7cm Pak.
(Panzerabwehrkanone)

COMPLETE ROUND:
13.937 inches, overall length.
2.90 pounds, total weight.

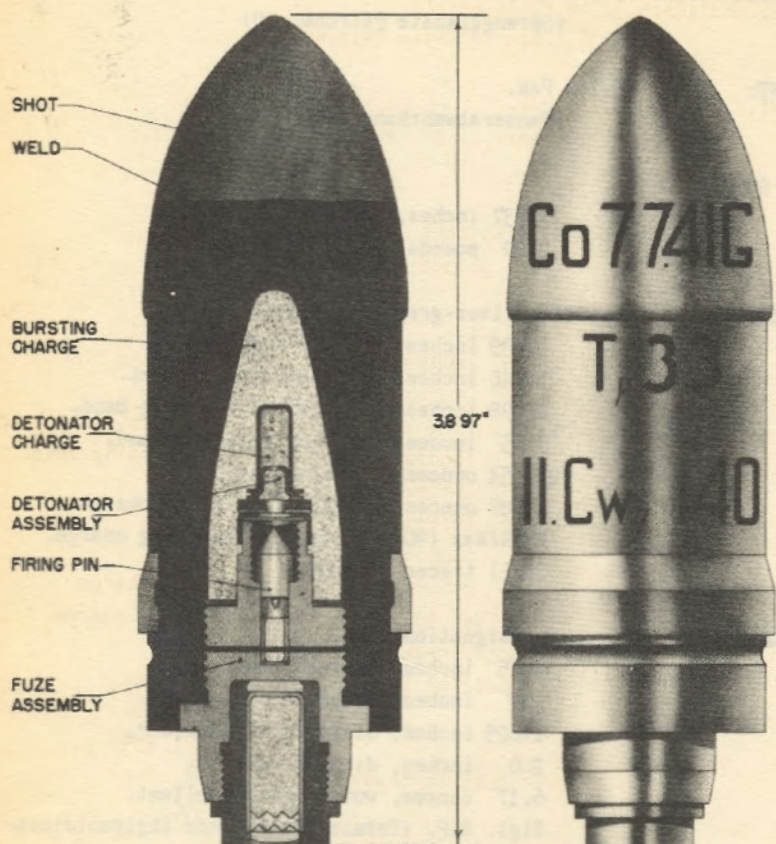
PROJECTILE: Painted Silver-grey, no colored bands.
5.039 inches, overall length.
1.448 inches, diameter of bourrelet.
1.599 inches, diameter of rotating band.
0.33 inches, width of rotating band.
23.454 ounces, total weight.
1.587 ounces, weight of bursting charge.
PETN/Wax (90/10), type of bursting charge.
Small tracer present.

CARTRIDGE CASE: German designation 6331.
9.75 inches, overall length.
1.5 inches, diameter of neck.
1.625 inches, diameter of shoulder.
2.0 inches, diameter at rim.
6.17 ounces, weight of propellant.
Digl. R.P. (Tubular Diethylene Diglycoldinitrate and Nitrocellulose) - type of propellant.
C/13nA primer.

FUZE: AZ 39.

RESTRICTED

A.P. PROJECTILE WITHOUT CAP FOR A T GUN, 37mm.



3.7cm Pzgr. Patr.

R E S T R I C T E D

A.P. PROJECTILE WITHOUT CAP FOR AT GUN, 37 mm.

GERMAN DESIGNATION: 3.7cm Pzgr. Patr.
(Panzergranate Patronen)

EMPLOYMENT: 3.7cm Pak.
(Panzerabwehrkanone)

COMPLETE ROUND:
13.27 inches, overall length.
2.9 pounds, total weight.

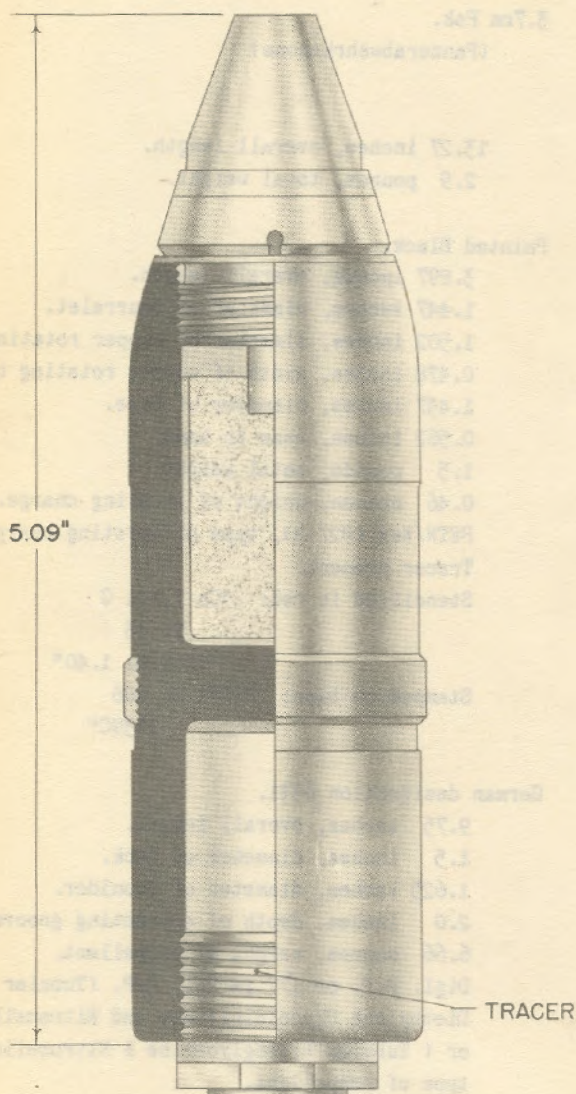
PROJECTILE: Painted Black.
3.897 inches, overall length.
1.447 inches, diameter of bourrelet.
1.502 inches, diameter of copper rotating band.
0.478 inches, width of copper rotating band.
1.437 inches, diameter of base.
0.562 inches, base to band.
1.5 pounds, total weight.
0.46 ounces, weight of bursting charge.
PETN/Wax (82/18), type of bursting charge.
Tracer present.
Stencilled in red: "Co 7.741 G
Tp 33
11Cw.G. 1.40"
Stamped on base: "G251 DL 608
1939C"

CARTRIDGE CASE: German designation 6331.
9.75 inches, overall length.
1.5 inches, diameter of neck.
1.625 inches, diameter of shoulder.
2.0 inches, depth of extracting groove.
6.66 ounces, weight of propellant.
Digl. R.P. or 177 gm Ngl. R.P. (Tubular
Diethylene Glycoldinitrate and Nitrocellulose)
or (Tubular Nitroglycerine & Nitrocellulose)-
type of propellant.
C/13nA primer.

FUZE: 5103.

RESTRICTED

H.E. PROJECTILE, TYPE 18, FOR AT GUN, 37mm.



3.7cm Sprgr. Patr. 18 umg

R E S T R I C T E D

H.E. PROJECTILE, TYPE 18, FOR AT GUN, 37 mm.

GERMAN DESIGNATION: 3.7cm Sprgr. Patr. 18 umg
(Sprenggranate Patronen 18 umgeändert)

EMPLOYMENT: 3.7cm Pak.
(Panzerabwehrkanone)

COMPLETE ROUND:
13.503 inches, overall length.
2.838 pounds, total weight.

PROJECTILE: Painted Silver-grey, yellow band.
5.093 inches, overall length.
1.448 inches, diameter of bourrelet.
1.599 inches, diameter of rotating band.
0.33 inches, width of rotating band.
21.767 ounces, total weight.
0.917 ounces, weight of bursting charge.
PETN/Wax (90/10), type of bursting charge.
Large tracer present.

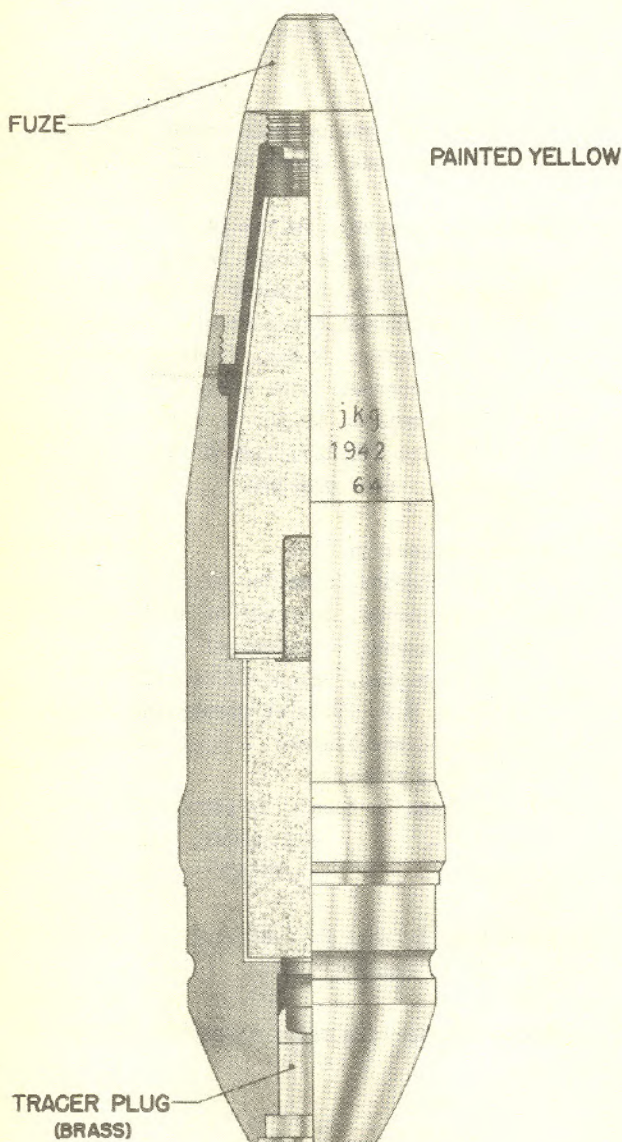
CARTRIDGE CASE: German designation 6331
1.51 inches, diameter of neck.
1.61 inches, diameter of shoulder.
1.80 inches, diameter of flange.
6.17 ounces, weight of propellant.
Digl. R.P. (Tubular Diethylene Glycoldinitrate
and Nitrocellulose) - type of propellant.
C/13nA primer.
Stamped in base: "P 180 G
d.7 cm Pak.
6331"

FUZE: 3.7cm Kopf Z. Zerl P. (red tip)
AZ 39 (yellow tip)

PACKAGING: Twelve rounds to a metal carrier - 20.0 Kg.

RESTRICTED

H.E. PROJECTILE FOR ANTI-AIRCRAFT GUN, 40mm.



4cm Sprgr. Patr.

RESTRICTED

H.E. PROJECTILE FOR ANTI-AIRCRAFT GUN, 40 mm.

GERMAN DESIGNATION: 4cm Sprgr. Patr.
(Sprenggranate Patronen)

EMPLOYMENT: Flak. 28 *Bofors*
(Flugabwehrkanone 28)

COMPLETE ROUND:
17.7 inches, overall length.

PROJECTILE: Painted Yellow; red band.
7.062 inches, overall length with fuze.
1.571 inches, diameter of bourrelet.
1.437 inches, base to band.
0.625 inches, width of rotating band -
Bimetallic.
0.75 inches, diameter of base.
2.2 pounds, total weight.
1.38 ounces, weight of bursting charge.
TNT, type of bursting charge.
Tracer present (11 to 12 sec. self-destroying)

CARTRIDGE CASE: German designation 4 cm 28
12.25 inches, overall length.
1.6 inches, diameter of neck.
1.88 inches, diameter of shoulder.
2.44 inches, diameter of extracting base.
9.7 ounces, weight of propellant.
Ngl. R.P. (Tubular Nitroglycerine and
Nitrocellulose), type of propellant.
C/13nA primer.

FUZE: KZ 38

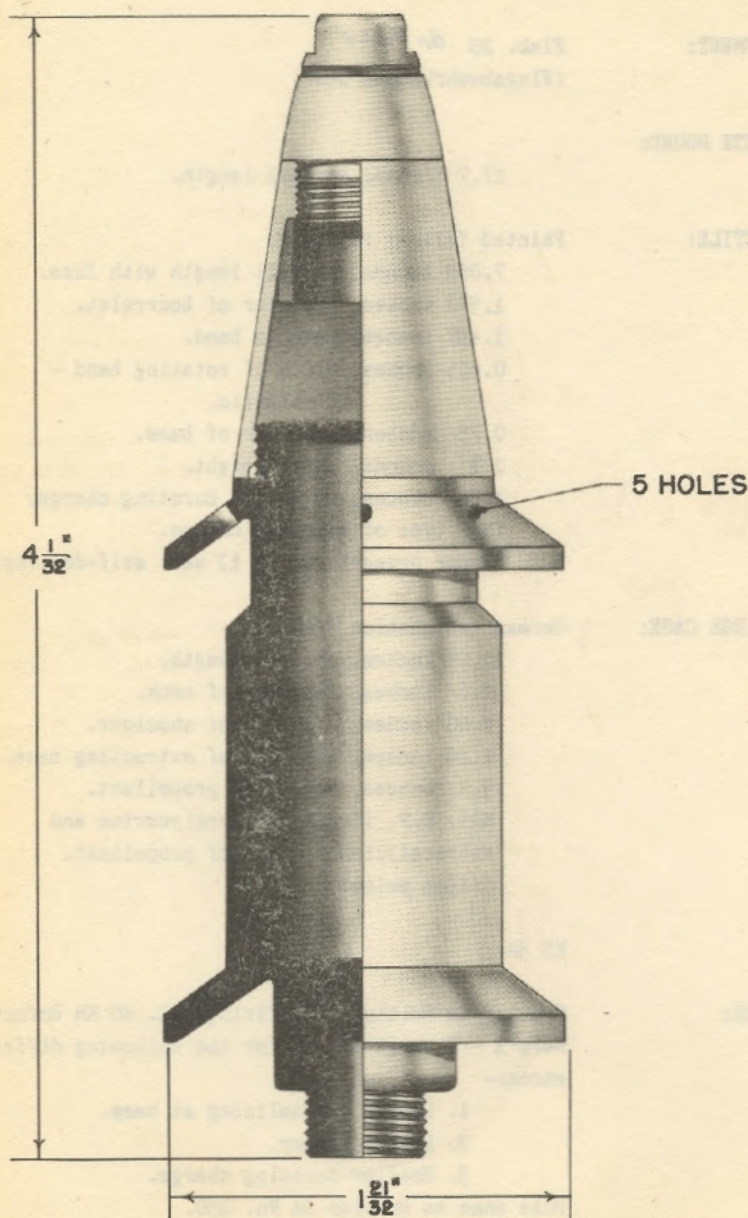
REMARKS: Similar to British Quickfiring H.E. 40 MM Bofors,
Mark 1 - T shell except for the following differences:-

1. Larger streamlining at base.
2. Larger tracer.
3. Smaller bursting charge.

Fuze same as British DA No. 250.

RESTRICTED

H.E. PROJECTILE FOR TAPERED BORE GUN, 42.28mm.



4.2-2.8cm Sprgr. Patr. L Pak. 41

R E S T R I C T E D

H.E. PROJECTILE FOR TAPERED BORE GUN, 42.28 mm.

GERMAN DESIGNATION: 4.2-2.8cm Sprgr. Patr. L Pak. 41
(Sprenggranate Patronen L Pak 41)

EMPLOYMENT: L Pak 41
(L. Panzerabwehrkanone 41)

COMPLETE ROUND:
17.875 inches, overall length.
2.992 pounds, total weight.

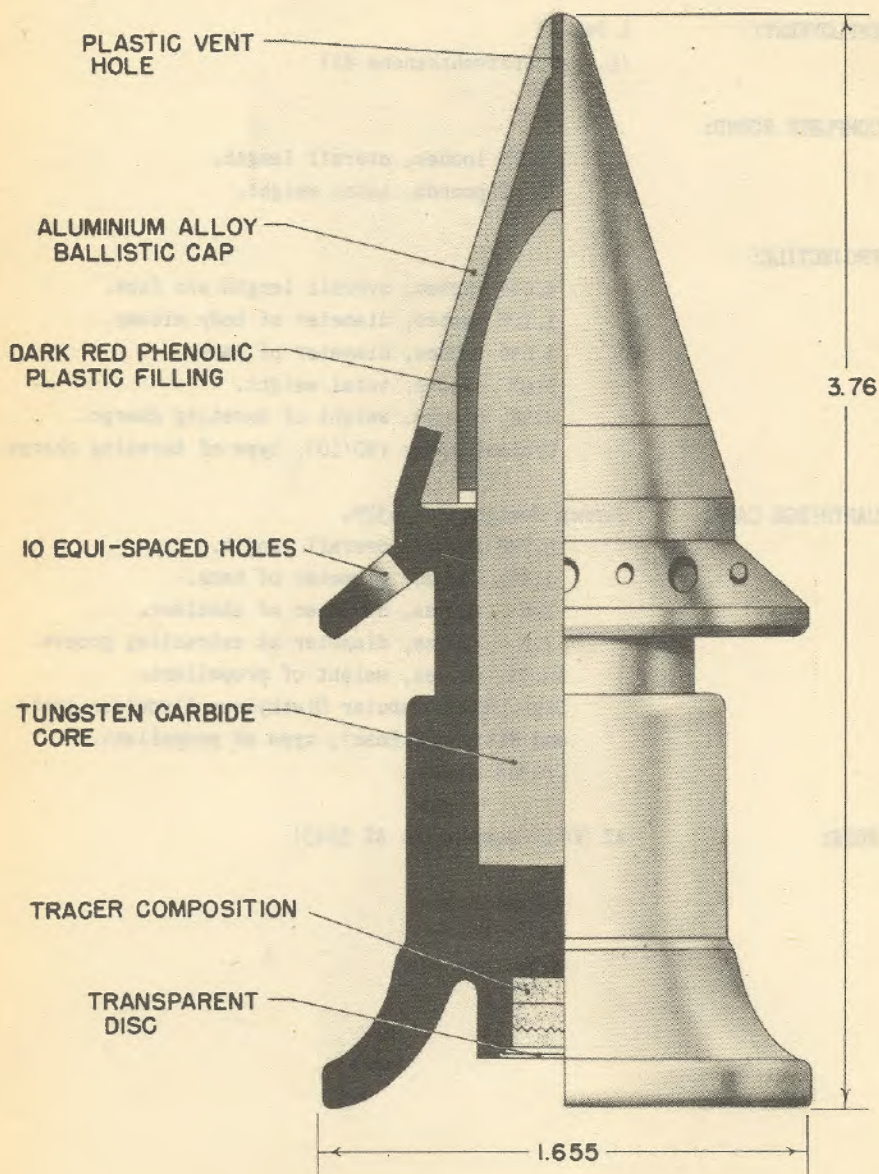
PROJECTILE:
4.031 inches, overall length w/o fuze.
1.125 inches, diameter of body midway.
1.656 inches, diameter of base.
9.87 ounces, total weight.
0.98 ounces, weight of bursting charge.
Cyclonite/Wax (90/10), type of bursting charge.

CARTRIDGE CASE: German designation 6329.
15.748 inches, overall length.
1.45 inches, diameter of neck.
1.6 inches, diameter of shoulder.
2.0 inches, diameter at extracting groove.
10.94 ounces, weight of propellant.
Digl. R.P. (Tubular Diethylene Glycoldinitrate
and Nitrocellulose), type of propellant.
C/13nA primer.

FUZE: AZ 5072 (similar to AZ 5045)

RESTRICTED

A.P. PROJECTILE WITH CORE FOR TAPERED BORE GUN, 42-28mm.



4.2cm- 2.8cm Pzgr. Patr. L. Pak. 41

R E S T R I C T E D

A.P. PROJECTILE WITH CORE FOR TAPERED BORE GUN, 42 - 28 mm.

GERMAN DESIGNATION: 4.2cm - 2.8cm Pzgr. Patr. L. Pak. 41
(Panzergranate Patronen L. Panzerabwehrkanone 41)

EMPLOYMENT: L. Pak. 41
(L. Panzerabwehrkanone 41)

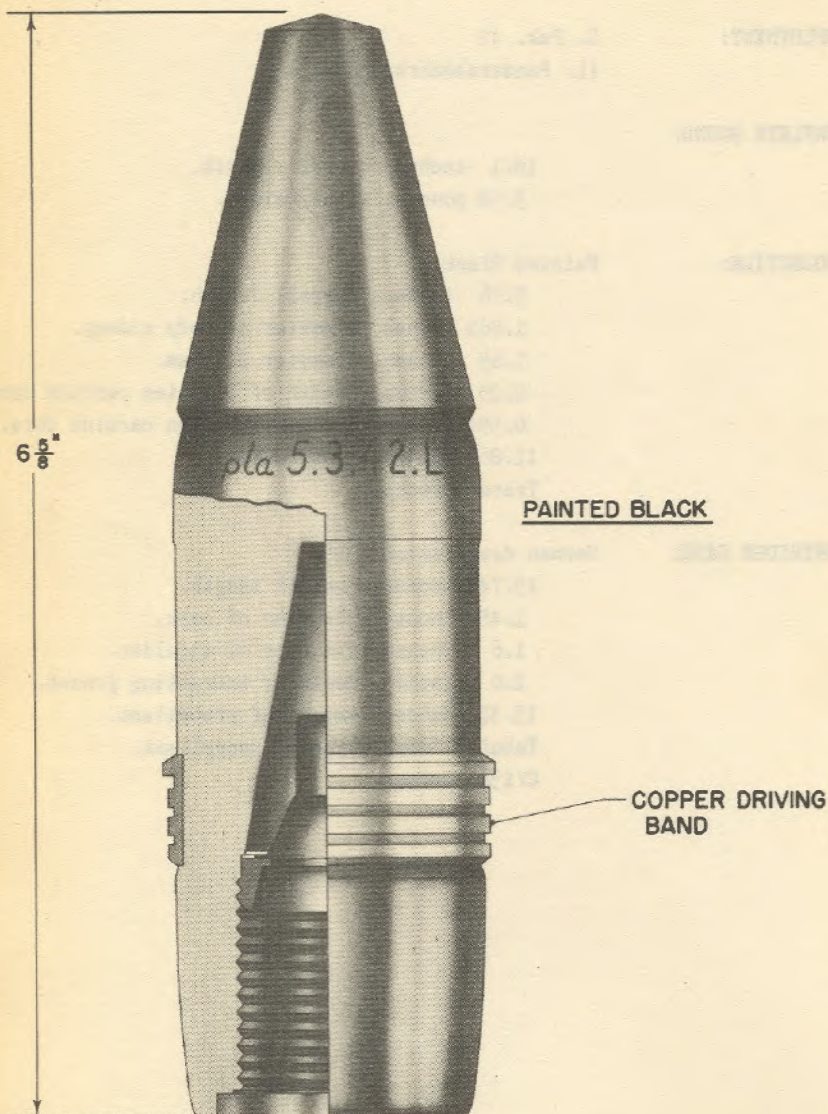
COMPLETE ROUND:
18.1 inches, overall length.
3.34 pounds, total weight.

PROJECTILE: Painted Black.
3.76 inches, overall length.
1.062 inches, diameter of body midway.
1.65 inches, diameter of base.
2.25 inches, length of Tungsten carbide core.
0.594 inches, dia. of Tungsten carbide core.
11.86 ounces, total weight.
Tracer present.

CARTRIDGE CASE: German designation 6329.
15.748 inches, overall length.
1.45 inches, diameter of neck.
1.6 inches, diameter of shoulder.
2.0 inches, depth of extracting groove.
15.32 ounces, weight of propellant.
Tubular Gudol, type of propellant.
C/13nA primer.

RESTRICTED

A.P.C. PROJECTILE TYPE 36 (CZECH DESIGN), 47 mm.



4.7 CM PZGR. PATR. 36 (T)

R E S T R I C T E D

H.E. PROJECTILE TYPE 36 (CZECH DESIGN), 47 mm.

GERMAN DESIGNATION: 4.7cm Sprgr. Patr. 36 (t)
(Sprenggranate Patronen 36 (t))

EMPLOYMENT: 4.7cm Pak. (t) - (Panzerabwehrkanone (t))
4.7cm K 36 (t) - (Kanone 36 (t))

COMPLETE ROUND:
22.44 inches, overall length.
6.25 pounds, total weight.

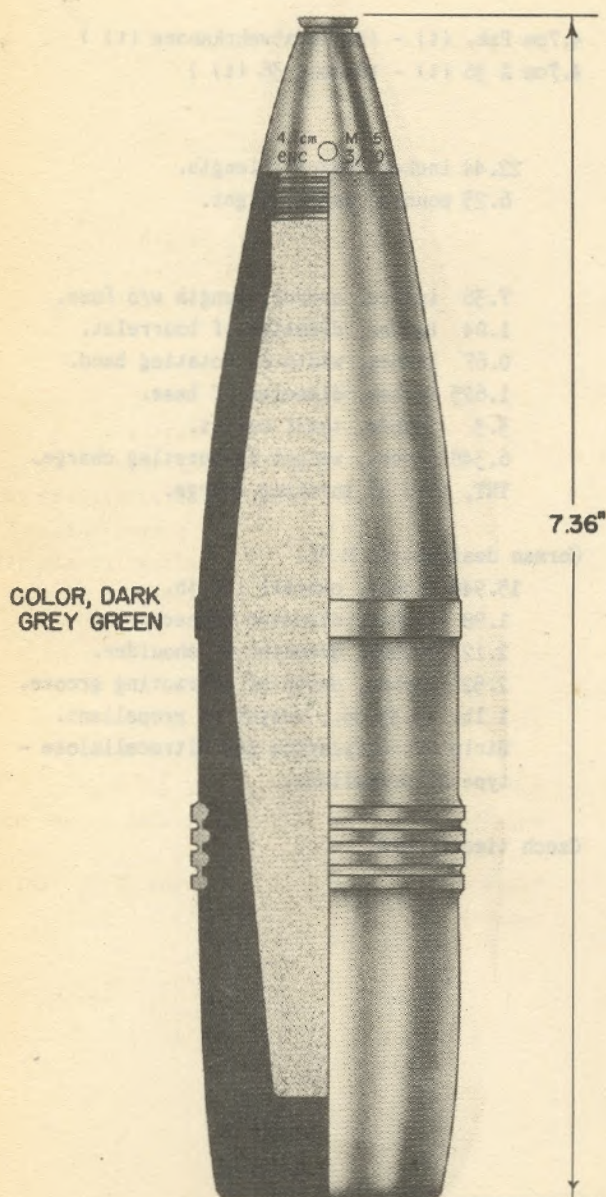
PROJECTILE:
7.36 inches, overall length w/o fuze.
1.84 inches, diameter of bourrelet.
0.67 inches, width of rotating band.
1.625 inches, diameter of base.
3.3 pounds, total weight.
6.348 ounces, weight of bursting charge.
TNT, type of bursting charge.

CARTRIDGE CASE: German designation M 36.
15.944 inches, overall length.
1.98 inches, diameter of neck.
2.12 inches, diameter of shoulder.
2.52 inches, depth of extracting groove.
1 lb. 15.35 oz., weight of propellant.
Strip Nitroglycerine and Nitrocellulose -
type of propellant.

FUZE: Czech time or S/D.

RESTRICTED

H.E. PROJECTILE FOR BÖHLER GUN (AUSTRIAN DESIGN), 47mm.



4.7 cm Sprgr. Patr. (Ö)

R E S T R I C T E D

H.E. PROJECTILE FOR BÖHLER GUN (AUSTRIAN DESIGN), 47 mm.

GERMAN DESIGNATION: 4.7cm Sprgr. Patr. (Ö)
(Sprenggranate Patronen (Ö))

EMPLOYMENT: 4.7cm Böhler K. (Ö)

COMPLETE ROUND: 16.312 inches, overall length.

PROJECTILE:
8.625 inches, overall length.
0.375 inches, width of rotating band.
1.594 inches, diameter of base.
No tracer present.

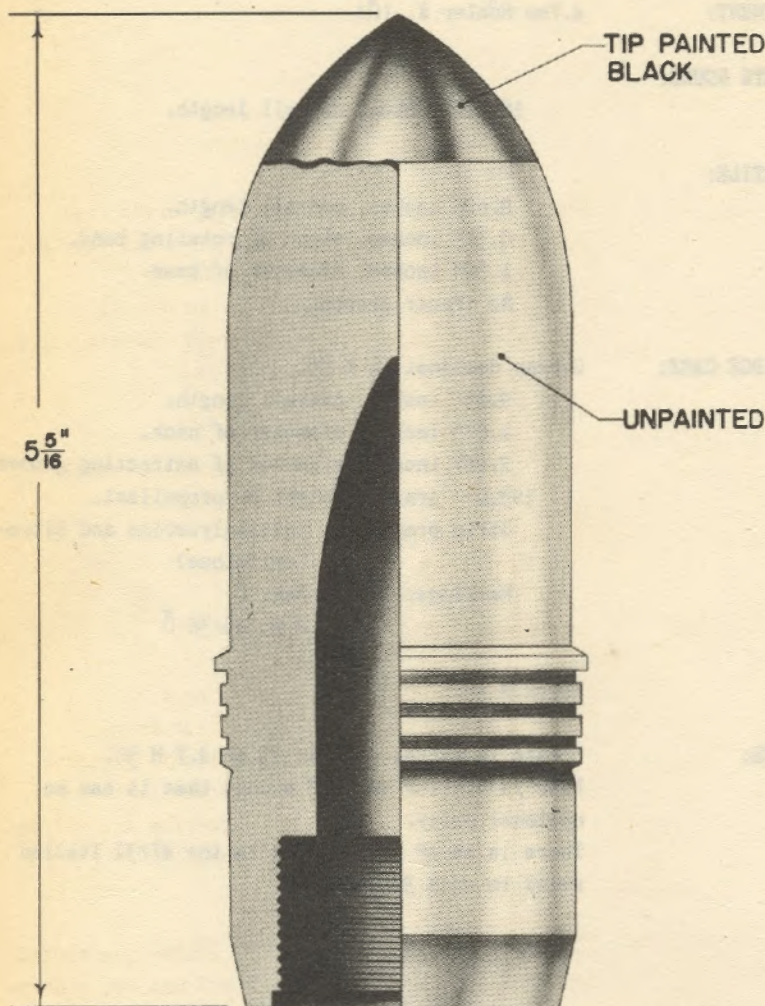
CARTRIDGE CASE: German designation M 35.
9.25 inches, overall length.
1.875 inches, diameter of neck.
2.187 inches, diameter of extracting groove.
193.0 grams, weight of propellant.
Strip propellant (Nitroglycerine and Nitro-cellulose)
Markings:- 4.7cm Pak. Ö
4.7cm J.K. 35/36 Ö

FUZE: 4.7cm M 35.

REMARKS: * Fuze is marked 4.7 Pak 35 or 4.7 M 35.
Fuze is similar to AZ23 except that it has no optional delay.
There is an AP round which is the 47/32 Italian round in an M 35 case.

RESTRICTED

A.P. PROJECTILE FOR A T GUN (AUSTRIAN DESIGN), 47mm.



4.7cm Pzgr.Patr. 35 (Ö)

R E S T R I C T E D

A.P. PROJECTILE FOR AT GUN (AUSTRIAN DESIGN), 47 mm.

GERMAN DESIGNATION: 4.7cm Pzgr. Patr. 35 (Ö)
(Panzergranate Patronen 35 (Ö))

EMPLOYMENT: 4.7cm Pak. (t) - (Panzerabwehrkanone (t))
4.7cm K 36 (t) - (Kanone 36 (t))

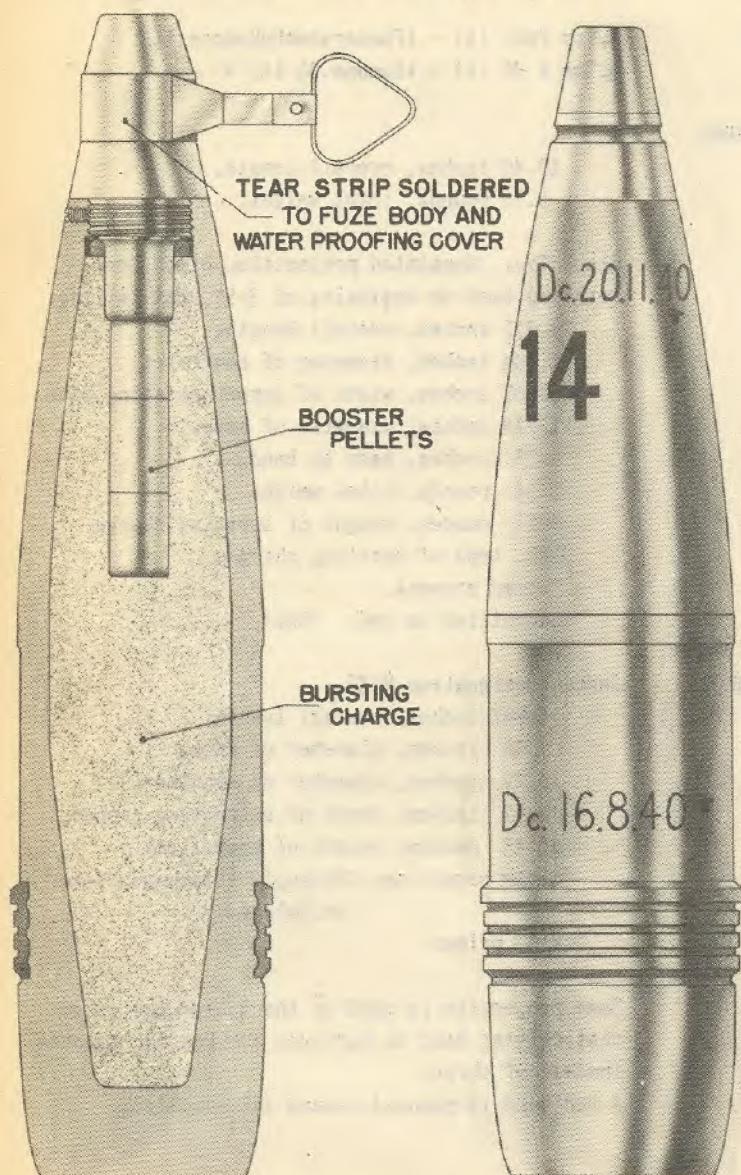
COMPLETE ROUND:
19.48 inches, overall length.
6.7 pounds, total weight.

PROJECTILE: Black Tip. Unpainted projectile, blued from
rotating band to beginning of 3/8" boat-tailing.
5.312 inches, overall length.
1.844 inches, diameter of bourrelet.
0.687 inches, width of copper rotating band.
1.719 inches, diameter of base.
1.25 inches, base to band.
3.14 pounds, total weight.
0.74 ounces, weight of bursting charge.
TNT, type of bursting charge.
Tracer present.
Stencilled in red: "ENZ"

CARTRIDGE CASE: German designation M 36.
15.944 inches, overall length.
1.98 inches, diameter of neck.
2.12 inches, diameter of shoulder.
2.52 inches, depth of extracting groove.
15.43 ounces, weight of propellant.
Strip propellant (Nitroglycerine and Nitro-
cellulose).
M 33 primer.

REMARKS: Same projectile is used in the Böhler gun except
that driving band is narrower and has two grooves
instead of three.
A red band is painted around the shoulder.

H.E. PROJECTILE TYPE 36 (CZECH DESIGN), 47mm.



4.7cm Sprgr. Patr. 36 (t)

R E S T R I C T E D

A.P.C. PROJECTILE TYPE 36 (CZECH DESIGN), 47 mm.

GERMAN DESIGNATION: 4.7cm Pzgr. Patr. 36 (t)
(Panzergranate Patronen 36 (t))

EMPLOYMENT: 4.7cm Flak. 37 - (Flugabwehrkanone 37)
4.7cm Pak. (t) - (Panzerabwehrkanone (t))

COMPLETE ROUND: 21.069 inches, overall length.

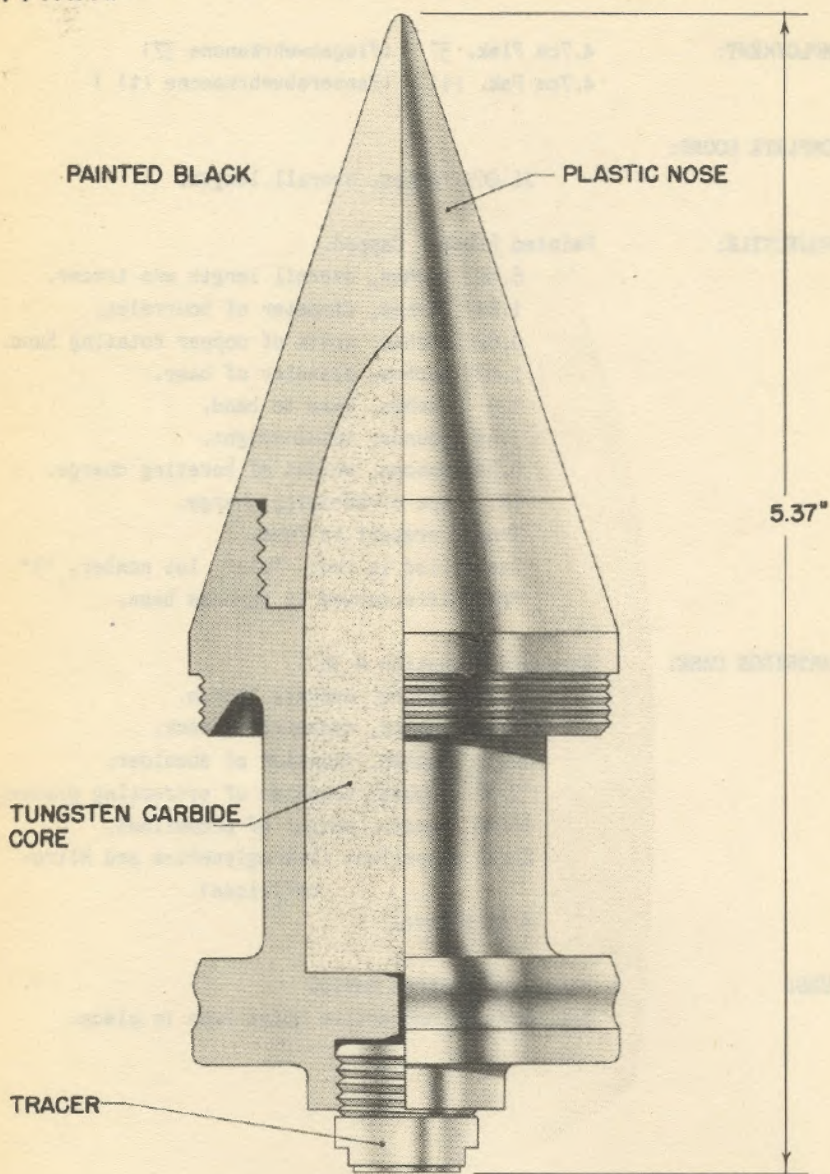
PROJECTILE: Painted Black. Capped.
6.625 inches, overall length w/o tracer.
1.844 inches, diameter of bourrelet.
0.625 inches, width of copper rotating band.
1.625 inches, diameter of base.
1.5 inches, base to band.
3.64 pounds, total weight.
0.74 ounces, weight of bursting charge.
TNT, type of bursting charge.
Tracer present in fuze.
Stencilled in red: "pla", lot number, "1"
Projectile curved in towards base.

CARTRIDGE CASE: German designation M 36.
15.944 inches, overall length.
1.98 inches, diameter of neck.
2.12 inches, diameter of shoulder.
2.52 inches, diameter of extracting groove.
15.49 ounces, weight of propellant.
Strip propellant (Nitroglycerine and Nitro-cellulose)
M 33 primer.

FUZE: Base fuze (2steel balls)
Set screw in projectile holds fuze in place.

RESTRICTED

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE (ARROWHEAD DESIGN), 47mm.



4.7cm Pzgr.Patr. 40

R E S T R I C T E D

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE (ARROWHEAD DESIGN), 47 mm.

GERMAN DESIGNATION: 4.7cm Pzgr. Patr. 40
(Panzergranate Patronen 40)

EMPLOYMENT: 4.7cm Pak. (t) - (Panzerabwehrkanone (t))
4.7cm K 36 (t) - (Kanone 36 (t))

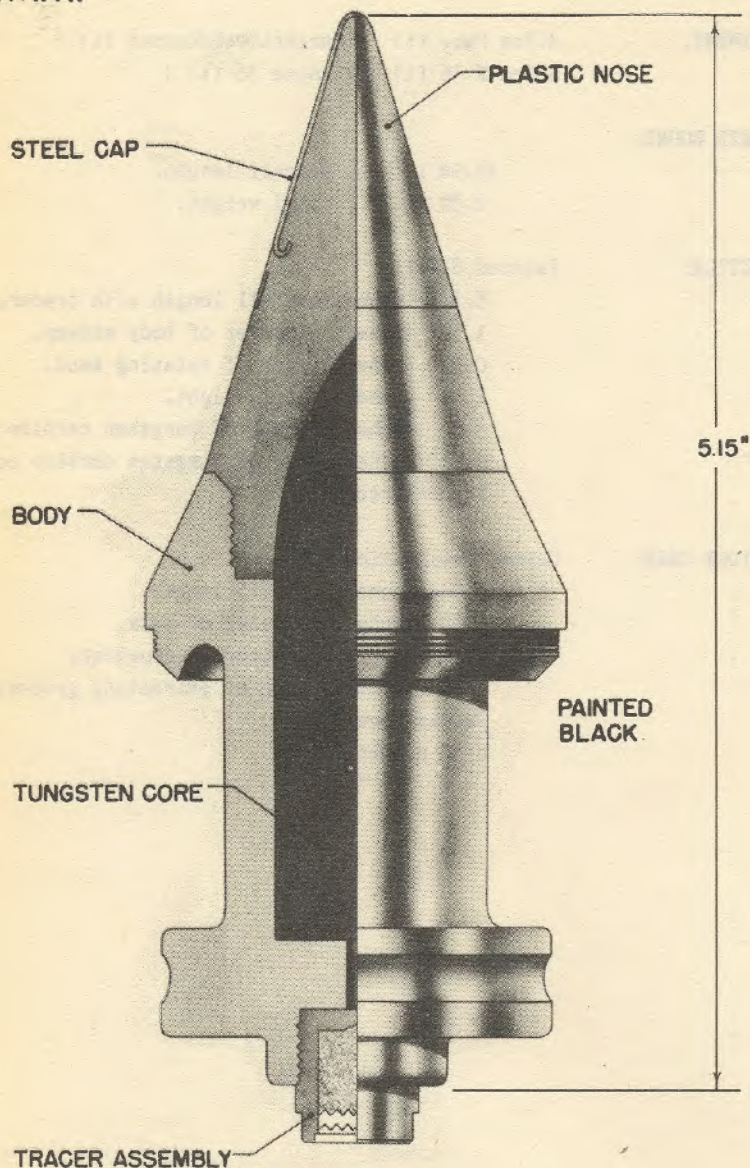
COMPLETE ROUND:
18.94 inches, overall length.
2.50 Kg. , total weight.

PROJECTILE: Painted Black.
5.375 inches, overall length with tracer.
1.187 inches, diameter of body midway.
0.51 inches, width of rotating band.
1.81 pounds, total weight.
3.0 inches, length of Tungsten carbide core.
0.812 inches, dia. of Tungsten carbide core.
Tracer present.

CARTRIDGE CASE: German designation M 36.
15.944 inches, overall length.
1.98 inches, diameter of neck.
2.12 inches, diameter of shoulder.
2.52 inches, depth of extracting groove.
Tubular propellant.
M 33 primer.

RESTRICTED

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE (ARROWHEAD), 50mm.



5cm Pzgr. Patr. 40 KwK

R E S T R I C T E D

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE (ARROWHEAD), 50 mm.

GERMAN DESIGNATION: 5cm. Pzgr. Patr. 40 KwK
(Panzergranate Patrone 40 Kampfwagenkanone)

EMPLOYMENT: 5cm. KwK Kampfwagenkanone - Tank Gun
5cm. KwK 39 Kampfwagenkanone 39 - Tank Gun 39
5cm. Pak 38 Panzerabwehrkanone 38 - Anti-Tank Gun 38

COMPLETE ROUND: Description of c/r is for 5cm. KwK.
14.48 inches , overall length
5 lb. 3 oz. , total weight

PROJECTILE: Painted Black
5.75 inches, overall length w/tracer
1.95 inches, diameter of bourrelet
2.269 inches, diameter of rotating band
0.5 inches, width of rotating band
1.258 inches, diameter of body midway
1.95 pounds, total weight
2.937 inches, length of tungsten carbide core
.81 inches, diameter of core
.74 pounds, weight of core
Tracer in cup at base

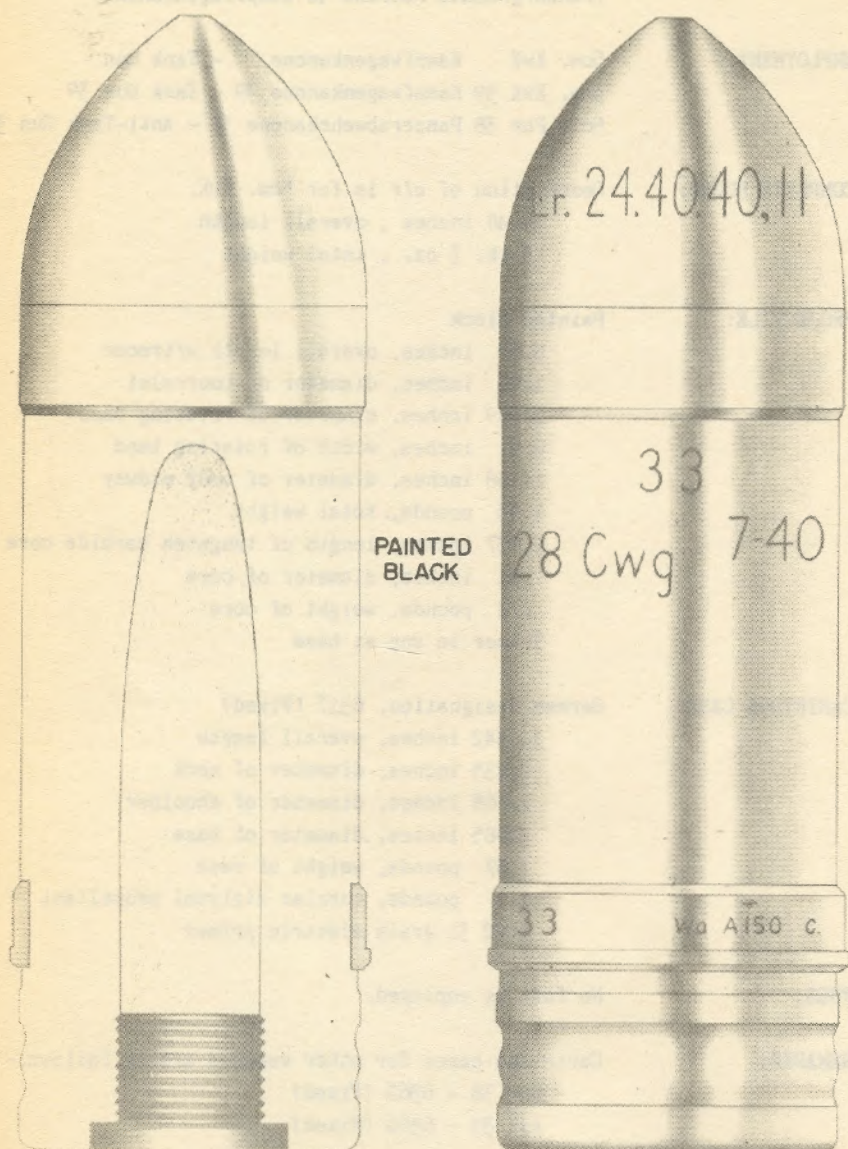
CARTRIDGE CASE: German designation, 6317 (Fixed)
11.342 inches, overall length
2.035 inches, diameter of neck
2.668 inches, diameter of shoulder
3.085 inches, diameter of base
1.87 pounds, weight of case
1.2 pounds, tubular diglycol propellant
C/22 31 grain electric primer

FUZE: No fuze is employed.

REMARKS: Cartridge cases for other weapons are as follows:-
Pak 38 - 6360 (Fixed)
KwK 39 - 6360 (Fixed)

RESTRICTED

A.P. PROJECTILE WITHOUT CAP FOR TANK GUN, 50mm.



5cm. Pzgr. Patr. KwK.

R E S T R I C T E D

A.R. PROJECTILE WITHOUT CAP FOR TANK GUN, 50 mm.

GERMAN DESIGNATION: 5cm. Pzgr. Patr. KwK.

(Panzergranate Patrone Kampwagenkanone)

EMPLOYMENT: 5cm. KwK. (Kampwagenkanone) Tank Gun

COMPLETE ROUND: 16.357 inches, overall length
7 lb. 10 oz., total weight

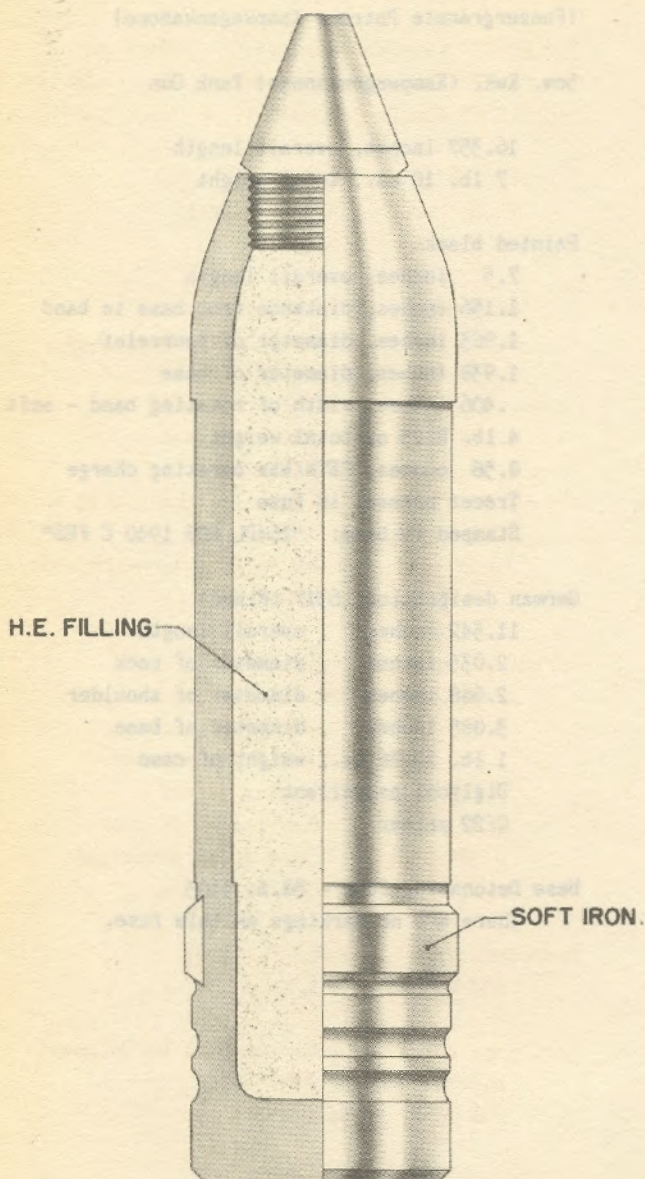
PROJECTILE: Painted black
7.5 inches, overall length
1.156 inches, distance from base to band
1.963 inches, diameter of bourrelet
1.938 inches, diameter of base
.406 inches, width of rotating band - soft iron
4 lb. 8.25 oz total weight
0.58 ounces, PETN/Wax bursting charge
Tracer present in fuze
Stamped in base: "164DL 608 1940 C FES"

CARTRIDGE CASE: German designation, 6317 (Fixed)
11.342 inches , overall length
2.035 inches , diameter of neck
2.668 inches , diameter of shoulder
3.085 inches , diameter of base
1 lb. 12.76 oz., weight of case
Diglycol propellant
C/22 primer

FUZE: Base Detonating fuze - Rd.Z. 5103
There are no markings on this fuze.

RESTRICTED

H.E. PROJECTILE, TYPE 38, 50mm.



5cm Sprgr. Patr. 38 KwK

GERMAN DESIGNATION: 5cm Sprgr. Patr. 38 KwK - Sprenggranate
Patrone 38 Kampfwagenkanone

EMPLOYMENT: 5cm KwK Kampfwagenkanone - Tank gun
5cm Pak 38 Panzerabwehrkanone - Anti-tank gun 38
5cm KwK 39 Kampfwagenkanone - Tank gun 39

COMPLETE ROUND: Description of c/r is for 5cm - KwK
18.61 inches, overall length
6.85 pounds, total weight

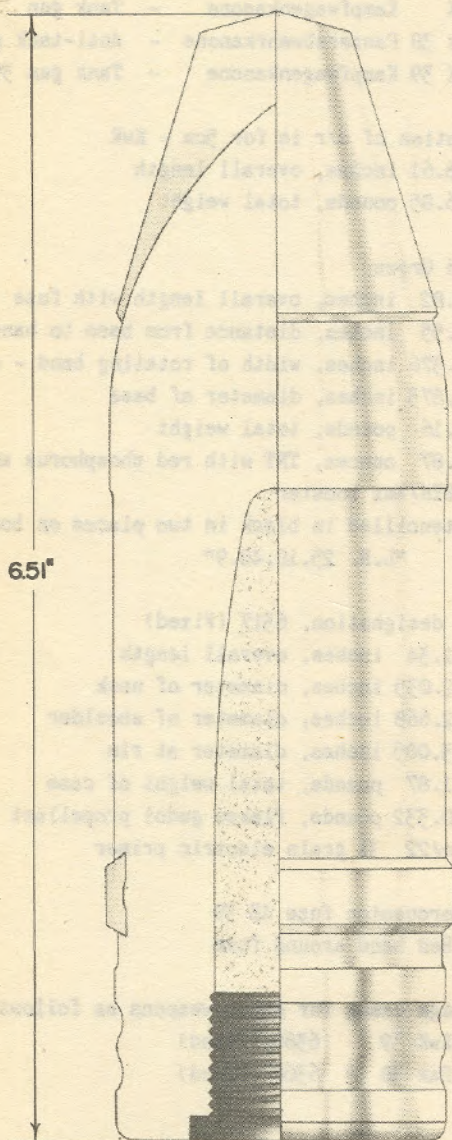
PROJECTILE: Painted Green
8.82 inches, overall length with fuze
1.55 inches, distance from base to band
.376 inches, width of rotating band - soft iron
1.873 inches, diameter of base
4.16 pounds, total weight
5.87 ounces, TNT with red phosphorus smoke box
PETN/Wax booster
Stencilled in black in two places on body:-
"L.R. 25.10.40.9"

CARTRIDGE CASE: German designation, 6317 (Fixed)
11.34 inches, overall length
2.035 inches, diameter of neck
2.668 inches, diameter of shoulder
3.085 inches, diameter at rim
1.87 pounds, total weight of case
0.332 pounds, flaked gudol propellant
c/22 31 grain electric primer

FUZE: Nose percussion fuze AZ 39
Red band around fuze

REMARKS: Cartridge cases for other weapons as follows:-
KwK 39 - 6360 (Fixed)
Pak 38 - 6360 (Fixed)

A.P. PROJECTILE WITH CAP FOR TANK GUN, 50mm.



5cm Pzgr. Patr. KwK

R E S T R I C T E D

A.P. PROJECTILE WITH CAP FOR TANK GUN, 50 mm.

GERMAN DESIGNATION: 5cm. Pzgr. Patr. KwK
(Panzergranate Patrone Kampfwagenkanone)

EMPLOYMENT: 5cm. KwK Kampfwagenkanone - Tank Gun
5cm. KwK 39 Kampfwagenkanone 39 - Tank Gun 39
5cm. Pak 38 Panzerabwehrkanone 38 - Anti-Tank Gun 38

COMPLETE ROUND: Description of c/r is for 5cm. KwK:
16.683 inches, overall length
7.7 pounds, total weight

PROJECTILE: Painted Black, unpainted band at nose
6.51 inches, overall length
1.969 inches, diameter of bourrelet
1.156 inches, distance from base to band
1.312 inches, diameter of base
.406 inches, width of rotating band - soft iron
4.56 pounds, total weight
0.87 ounces, PETN/Wax, 87/13 bursting charge
Tracer present in fuze

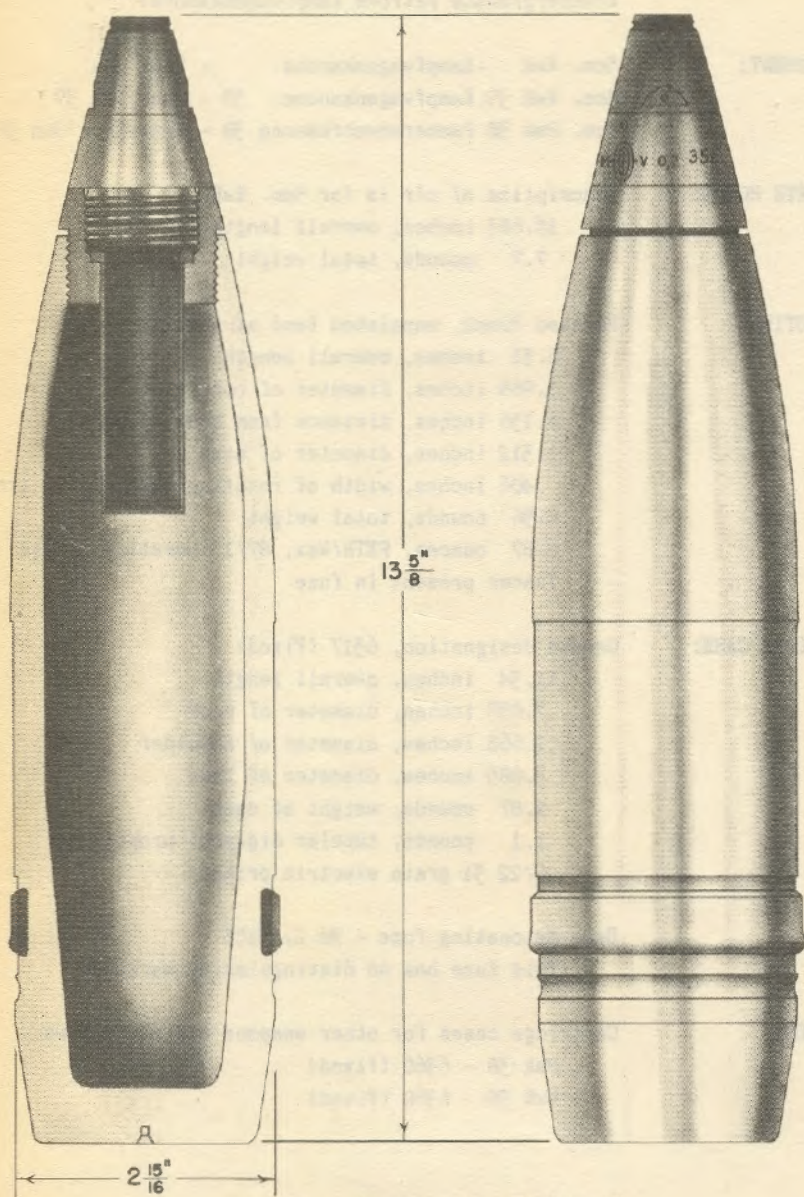
CARTRIDGE CASE: German designation, 6317 (Fixed)
11.34 inches, overall length
2.035 inches, diameter of neck
2.668 inches, diameter of shoulder
3.085 inches, diameter of base
1.87 pounds, weight of case
1.1 pounds, tubular diglycol propellant
C/22 31 grain electric primer

FUZE: Base detonating fuze - Bd.Z. 5103
This fuze has no distinguishing markings

REMARKS: Cartridge cases for other weapons are as follows:-
Pak 38 - 6360 (Fixed)
KwK 39 - 6360 (Fixed)

RESTRICTED

H.E. PROJECTILE, TYPE 34, 75mm.



Sprgr. Patr. KwK (34)

RESTRICTED

H.E. PROJECTILE, TYPE 34, 75 mm.

GERMAN DESIGNATION: Sprgr. Patr. KwK (34)
(Sprenggranate Patrone Kampfwagenkanone 34)

EMPLOYMENT:

- 7.5cm KwK - (Kampfwagenkanone) - Tank Cannon
- 7.5cm Stu. G. - (Sturm Geschutz) - Assault Gun
- 7.5cm KwK 40 - (Kampfwagenkanone 40) - Tank Cannon 40
- 7.5cm Stu. G. 40 - (Sturm Geschutz 40) - Assault Gun 40
- 7.5cm Pak 40 - (Panzerabwehkanone 40) - Anti-Tank Cannon 40
- 7.5cm Geb. G. 36 - (Gebirgs Geschutz 36) - Mountain Gun 36
- 7.5cm L.G. 40 - (Leuchtes Geschutz 40) - Recoilless Gun for
Airborne Troops
- 7.5cm L.F.K. 18 - (Leuchtes Feld Kanone 18) - Light field Cannon 18

COMPLETE ROUND:

Description of c/r is for KwK (Stu. G.)
Painted Green
13.5 inches, overall length w/fuze
11.6 inches, overall length w/o fuze
2.187 inches, distance from base to band
.7 inches, width of bimetallic rotating band
2.5 inches, diameter of base
12.6 pounds, total weight
30.0 ounces, amatol 40/60 Bursting charge
plus smoke box of red phosphorus
(TNT/Amatol 90/10 when used for Geb. G. 36)
Zdlz C/98 Booster

CARTRIDGE CASE:

German designation, 6354 or 6354 St. (Fixed)
9.56 inches, overall length
2.93 inches, diameter of neck
3.01 inches, diameter of shoulder
3.60 inches, diameter of base
12.25 ounces, tubular nitrocellulose propellant
C/22 31 grain electric primer

FUZE:

Nose percussion fuze K1 AZ 23

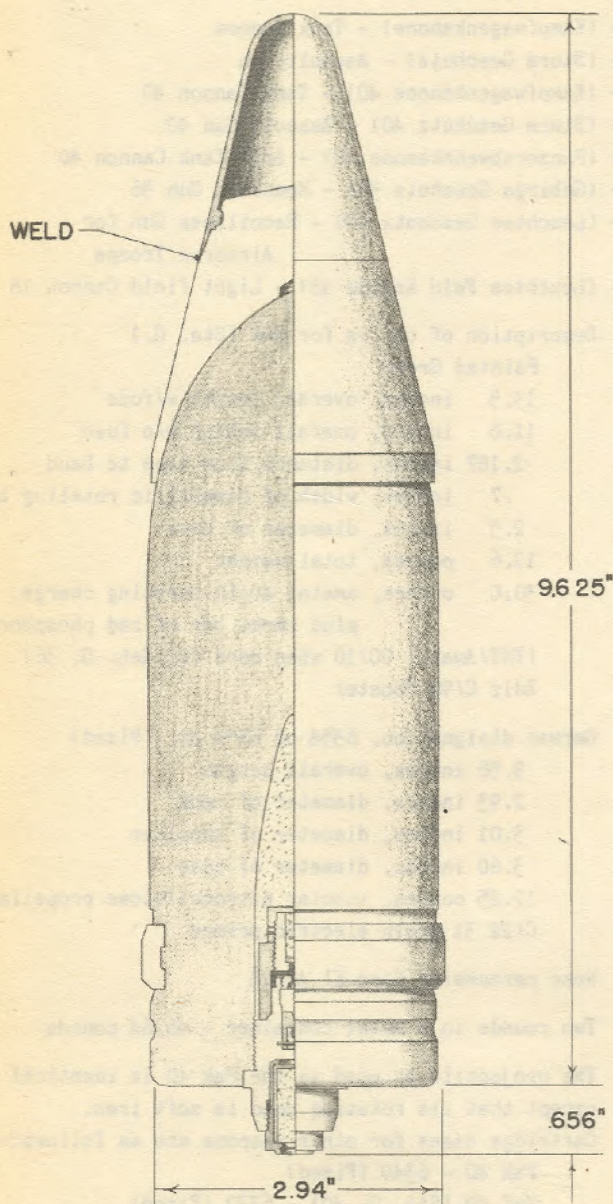
PACKAGING:

Two rounds to a metal container - 46.64 pounds

REMARKS:

The projectile as used in the Pak 40 is identical except that its rotating band is soft iron.
Cartridge cases for other weapons are as follows:-
Pak 40 - 6340 (Fixed)
KwK 40 (Stu. G. 40) - 6339 (Fixed)
Geb. G. 36 - (Semi-Fixed) *C389*
Leuchtes Geschutz 40 - Plastic Base Case (S-F)
L.F.K. 18 - 6316 - (Semi-Fixed)

A.P. PROJECTILE WITH BALLISTIC CAP AND PIERCING CAP, TYPE 39, 75mm.



Pzgr. Patr. 39 KwK 40

R E S T R I C T E D

A.P. PROJECTILE WITH BALLISTIC CAP AND PIERCING CAP, TYPE 39, 75 mm.

GERMAN DESIGNATION: Pzgr. Patr. 39 KwK 40
(Panzergranate Patrone 39 Kampfwagenkanone 40)

EMPLOYMENT:

7.5cm KwK 40 - (Kampfwagenkanone 40) - Tank Gun 40
7.5cm Stu. G. 40 - (Sturm Geschutz 40) - Assault Gun 40
7.5cm Pak. 40 - (Panzerabwehrkanone 40) - Anti-Tank Gun 40

COMPLETE ROUND: Description of c/r is for KwK 40
29.3 inches, overall length
29.4 pounds, total weight

PROJECTILE: Painted Black with red band and red stencilling
9.625 inches, overall length w/o tracer
0.98 inches, distance from base to band
0.67 inches, width of bimetallic rotating band
2.94 inches, diameter of base
Cyclonite bursting charge
Tracer is present in fuze
PETN/Wax booster

CARTRIDGE CASE: German designation, 6339 (Fixed)
19.4 inches, overall length
3.15 inches, diameter at mouth
3.8 inches, diameter at shoulder
4.0 inches, diameter at base
5.35 pounds, tubular diglycol propellant
C/22 Electric primer

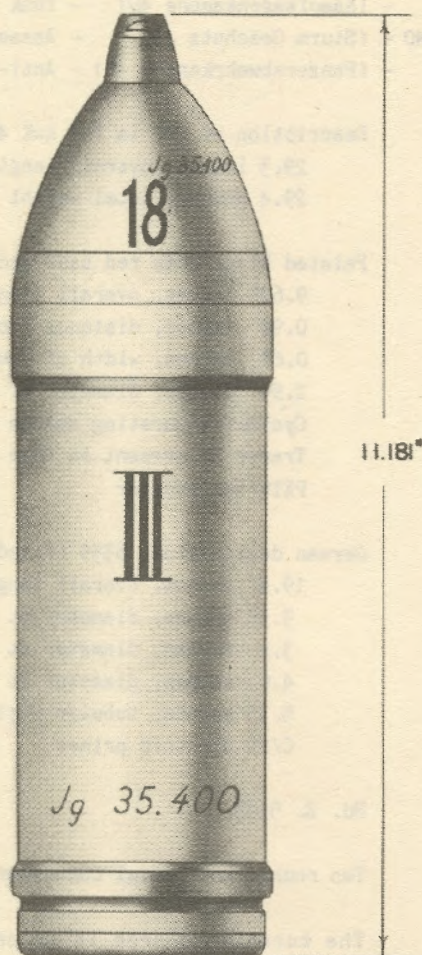
FUZE: Bd. Z. 5103

PACKAGING: Two rounds to a metal container

REMARKS: The bursting charge is in an aluminum container which is a tight fit in the projectile cavity. This projectile may or may not have a cannellure on the cap.
A round exists for the Pak 40 designated "Pzgr. Patr. 40 Pak 40," which is an A.P. projectile with a tungsten carbide core. It has not been recovered as yet but is reported to weigh 7.06 pounds.
Cartridge case for the Pak 40 is 6340 (Fixed)

RESTRICTED

HOLLOW CHARGE PROJECTILE, TYPE 39, 75mm.



7.5cm Gr.39

R E S T R I C T E D

HOLLOW CHARGE PROJECTILE, TYPE 39, 75 mm.

GERMAN DESIGNATION: 7.5cm Gr. 39
(Granate 39)

EMPLOYMENT: Geb. K. 15 - (Gebirgs Kanone 15) - Mountain Gun 15

COMPLETE ROUND: 14.68 inches, overall length

PROJECTILE: Painted Green
11.181 inches, overall length w/fuze
0.7 inches, distance from base to band
0.43 inches, width of bimetallic rotating band
2.95 inches, diameter of base
9.9 pounds, total weight
Cyclonite/Wax/TNT bursting charge

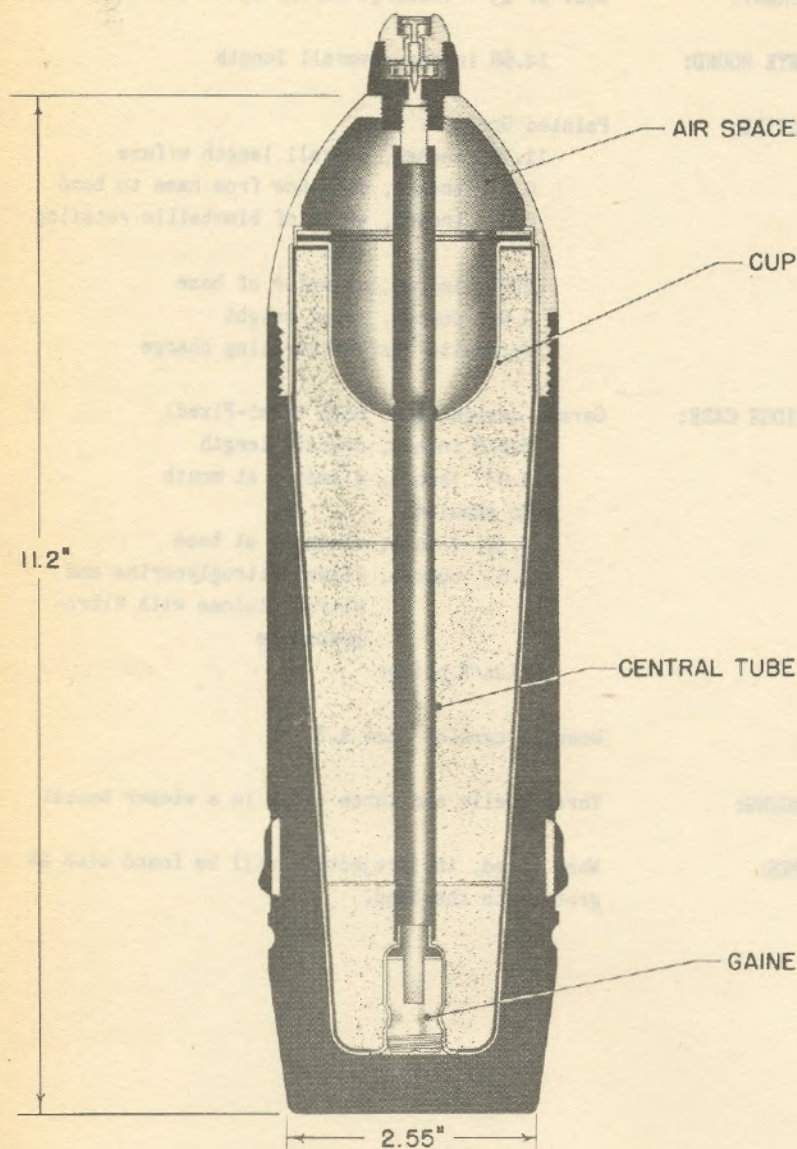
CARTRIDGE CASE: German designation, 6335 (Semi-Fixed)
5.078 inches, overall length
3.03 inches, diameter at mouth
No shoulder
3.34 inches, diameter at base
11.6 ounces, Flaked Nitroglycerine and Nitrocellulose with Nitroguanidine
C/12n/A primer

FUZE: Nose percussion fuze A.Z. 38

PACKAGING: Three shells and three cases in a wicker basket

REMARKS: When fired, the projectile will be found with 28 grooves in the band.

HOLLOW CHARGE PROJECTILE FOR TANK GUN, 75mm.



7.5cm Gr. Patr. 38 KwK (H.L.)

HOLLOW CHARGE PROJECTILE FOR TANK GUN, 75 mm.

GERMAN DESIGNATION: 7.5cm Gr. Patr. 38 KwK (H.L.)
(Granate Patrone 38 Kampfwagenkanone (Hohl Ladung))

EMPLOYMENT:

7.5cm KwK	- (Kampfwagenkanone)	- Tank Cannon
7.5cm Stu. G.	- (Sturm Geschutz)	- Assault Gun
7.5cm KwK 40	- (Kampfwagenkanone 40)	- Tank Cannon 40
7.5cm Stu. G. 40	- (Sturm Geschutz 40)	- Assault Gun 40
7.5cm L.F.K. 18	- (Leuchtes field Kanone 18)	- Light Field Cannon 18
7.5cm Geb. G. 36	- (Gebirgs Geschutz 36)	- Mountain Gun 36
7.5cm L.G. 40	- (Leuchtes Geschutz 40)	- Recoilless Gun for Airborne Troops

COMPLETE ROUND: Description of c/r is for KwK (Stu. G.)
18.5 inches, overall length
12.0 pounds, 14.0 ounces, total weight

PROJECTILE: Painted Green
11.2 inches, overall length w/fuze
2.2 inches, distance from base to band
.66 inches, width of bimetallic rotating band
2.55 inches, diameter of base
(9.75 pounds, total weight
1.22 pounds, cyclonite/wax/TNT bursting charge
Zdlg 40 Booster

CARTRIDGE CASE: German designation, 6354 or 6354 St. (Fixed)
9.56 inches, overall length
2.93 inches, diameter of neck
3.01 inches, diameter of shoulder
3.60 inches, diameter of rim
2 lbs., 1.79 oz., weight of case
12.61 ounces, tubular nitrocellulose propellant
C/22 31 grain electric primer

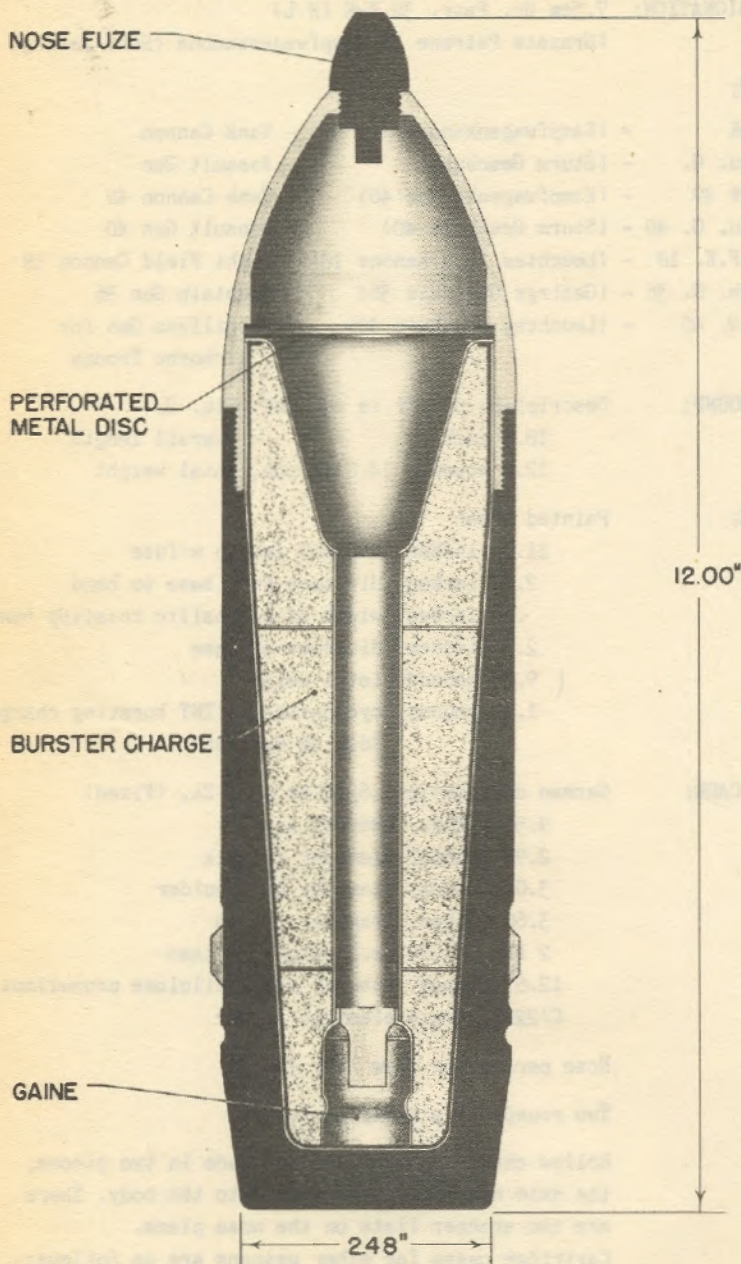
FUZE: Nose percussion fuze A.Z. 38

PACKAGING: Two rounds to a metal container

REMARKS: Hollow charge projectiles are made in two pieces; the male nose being threaded into the body. There are two spanner flats on the nose piece.
Cartridge cases for other weapons are as follows:-
KwK 40 (Stu. G. 40) - 6339 (Fixed)
Pak 40 - 6340 (Fixed)
Geb. G. 36 6359 - (Semi-Fixed)
L.G. 40 - Plastic base (Semi-Fixed)
L.F.K. 18 - 6316 (Semi-Fixed)

RESTRICTED

HOLLOW CHARGE PROJECTILE FOR TANK GUN, TYPE B, 75mm.



75mm Gr. Patr. KwK (H.L/B)

RESTRICTED

HOLLOW CHARGE PROJECTILE FOR TANK GUN, TYPE B, 75 mm.

GERMAN DESIGNATION: 7.5cm Gr. Patr. KwK (H.L/B)
(Granate Patrone Kampfwagenkanone (Hohl Ladung/B))

EMPLOYMENT:

7.5cm KwK	- (Kampfwagenkanone)	- Tank Cannon
7.5cm Stu. G.	- (Sturm Geschutz)	- Assault Gun
7.5cm KwK 40	- (Kampfwagenkanone 40)	- Tank Cannon 40
7.5cm Stu. G. 40	- (Sturm Geschutz 40)	- Assault Gun 40
7.5cm Pak 40	- (Panzerabwehrkanone 40)	- Anti-Tank Cannon 40
7.5cm L.F.K 18	- (Leichte Feld Kanone 18)	- Light Field Cannon 18
7.5cm Geb. G. 36	- (Gebirgs Geschutz 36)	- Mountain Gun 36
7.5cm L.G. 40	- (Leuchtes Geschutz 40)	- Recoilless Gun for Airborne Troops

COMPLETE ROUND: Description of c/r is for KwK
19.36 inches, overall length w/fuze

PROJECTILE: Painted Green
12.00 inches, overall length w/fuze
2.2 inches, distance from base to band
.63 inches, width of rotating band -
(bimetallic or sintered iron)
2.48 inches, diameter of base
Cyclonite/Wax/TNT bursting charge
"HL/B" stencilled in black on nose

CARTRIDGE CASE: German designation, 6354 or 6354 St. (Fixed)
9.56 inches, overall length
2.93 inches, diameter of neck
3.01 inches, diameter of shoulder
3.60 inches, diameter of rim
2 lbs., 1.79 oz., weight of case
12.61 ounces, tubular nitrocellulose propellant
C/22 31 grain electric primer

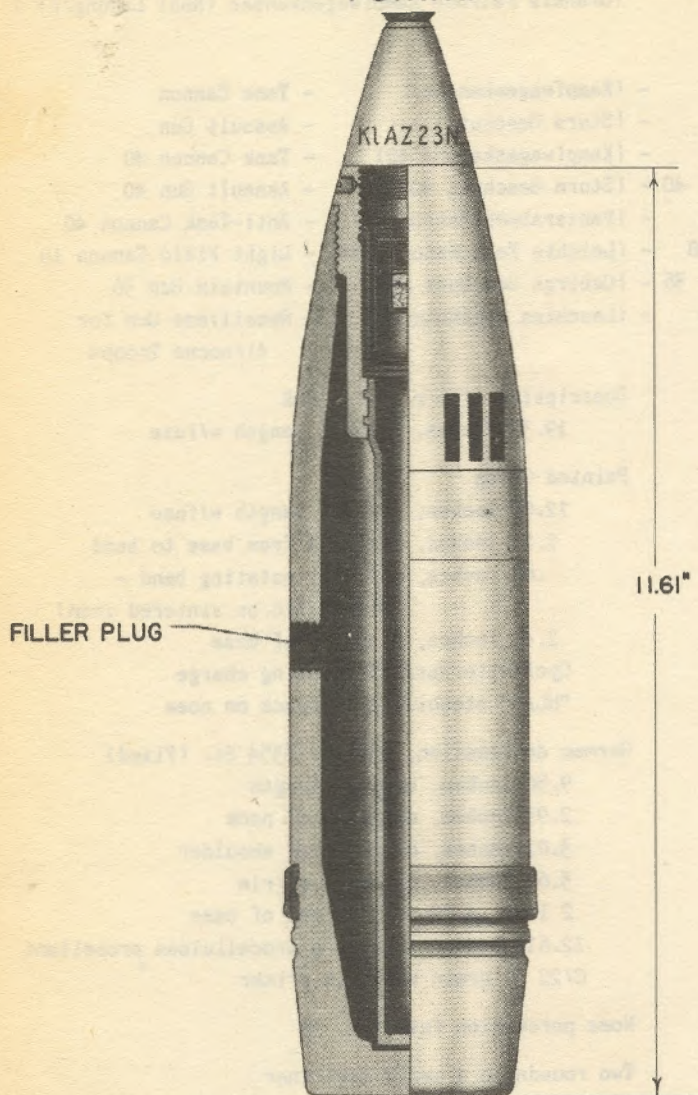
FUZE: Nose percussion fuze A.Z. 38

PACKAGING: Two rounds to a metal container

REMARKS: Hollow charge projectiles are made in two pieces, the male nose being threaded into the body. There are two spanner flats on the nose piece.
Cartridge cases for other weapons are as follows:-
KwK 40 (Stu. G. 40) - 6339 (Fixed)
Pak 40 - 6340 (Fixed)
Geb. G. 36 - (Semi-Fixed)
L.G. 40 - Plastic base (Semi-Fixed)
L.F.K. 18 - 6316 (Semi-Fixed)

RESTRICTED

SMOKE PROJECTILE FOR TANK GUN, 75mm.



7.5cm Nbgr. Patr. KwK.

GERMAN DESIGNATION: 7.5cm Nbgr. Patr. KwK.
(Nebelgranate Patrone Kampfwagenkanone)

EMPLOYMENT:

7.5cm KwK	- (Kampfwagenkanone)	- Tank Cannon
7.5cm Stu. G.	- (Sturm Geschutz)	- Assault Gun
7.5cm KwK 40	- (Kampfwagenkanone 40)	- Tank Cannon 40
7.5cm Stu. G. 40	- (Sturm Geschutz 40)	- Assault Gun 40
7.5cm L.F.K. 18	- (Leichte Feld Kanone 18)	- Light Field Cannon 18
7.5cm L.G. 40	- (Leuchtes Geschutz 40)	- Recoilless Gun for Airborne Troops

COMPLETE ROUND: Description of c/r is for KwK.
20.9 inches, overall length.

PROJECTILE: Painted Green.

13.5	inches, overall length w/ fuze.
11.6	inches, overall length w/o fuze.
2.187	inches, distance from base to band.
0.67	inches, width of rotating band.
2.5	inches, diameter of base.
13.6	pounds, total weight.
2.0	ounces, picric acid burster charge.
80/20	Oleum impregnated in pumice, smoke mixture.

PETN/Wax booster.
"Nb" Stencilled on body in white.

CARTRIDGE CASE: German designation, 6354 or 6354 St. (Fixed)

9.56	inches, overall length.
2.93	inches, diameter of neck.
3.01	inches, diameter of shoulder.
3.60	inches, diameter of rim.
2 lbs., 1.79 oz.,	weight of case.
12.61	ounces, tubular nitrocellulose propellant.
C/22 31	grain electric primer.

FUZE: Nose Percussion Fuze K1 A.Z. 23 Nb.

PACKAGING: Two rounds in a metal box.

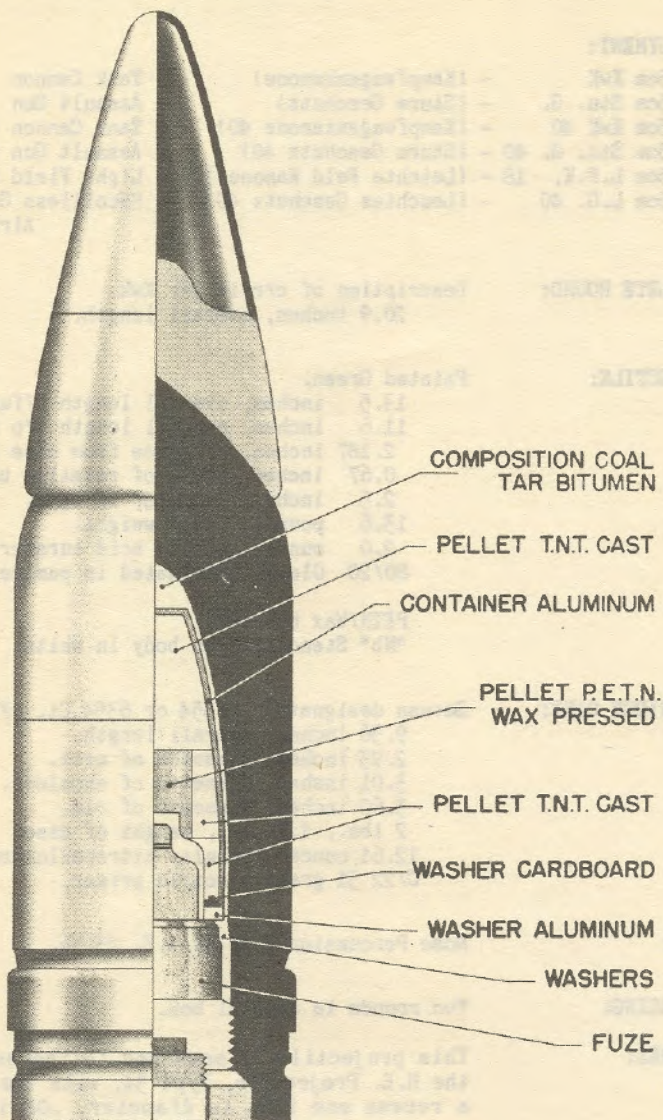
REMARKS: This projectile is machined to the same design as the H.E. Projectile, Type 34, with the exception of a recess one inch in diameter, .08 inch in depth provided at base of cavity for seating lower end of burster tube. There is a threaded plug in the side wall used to close the filling hole.

Cartridge cases for other weapons are as follows:-

L.F.K. 18	- 6316 (Semi-Fixed)
KwK 40 (Stu. G. 40)	- 6339 (Fixed)
Pak 40	- 6340 (Fixed)
L.G. 40	- Plastic base (Semi-Fixed)

RESTRICTED

A.P. C. TANK GUN PROJECTILE, 75mm.



Pzgr. Patr. KwK

GERMAN DESIGNATION: Pzgr. Patr. KwK
(Panzergranate Patrone Kampfwagenkanone)

EMPLOYMENT:

7.5cm KwK	- (Kampfwagenkanone)	- Tank Cannon
7.5cm Stu. G.	- (Sturm Geschutz)	- Assault Gun
7.5cm L.F.K. 18	- (Leuchtes Feld Kanone)	- Light Field Cannon 18
7.5cm L.G. 40	- (Leuchtes Geschutz 40)	- Recoilless Gun for Airborne Troops

COMPLETE ROUND: Description of c/r is for KwK
19.89 inches, overall length

PROJECTILE: Painted Black

11.312 inches,	overall length w/o tracer
.98 inches,	distance from base to band
.67 inches,	width of rotating band
	(Bimetallic)
2.93 inches,	diameter of base
15.4 pounds,	total weight
2.92 pounds,	TNT and PETN/Wax bursting charge
	Tracer is present in fuze

CARTRIDGE CASE: German designation, 6354 or 6354 St. (Fixed)

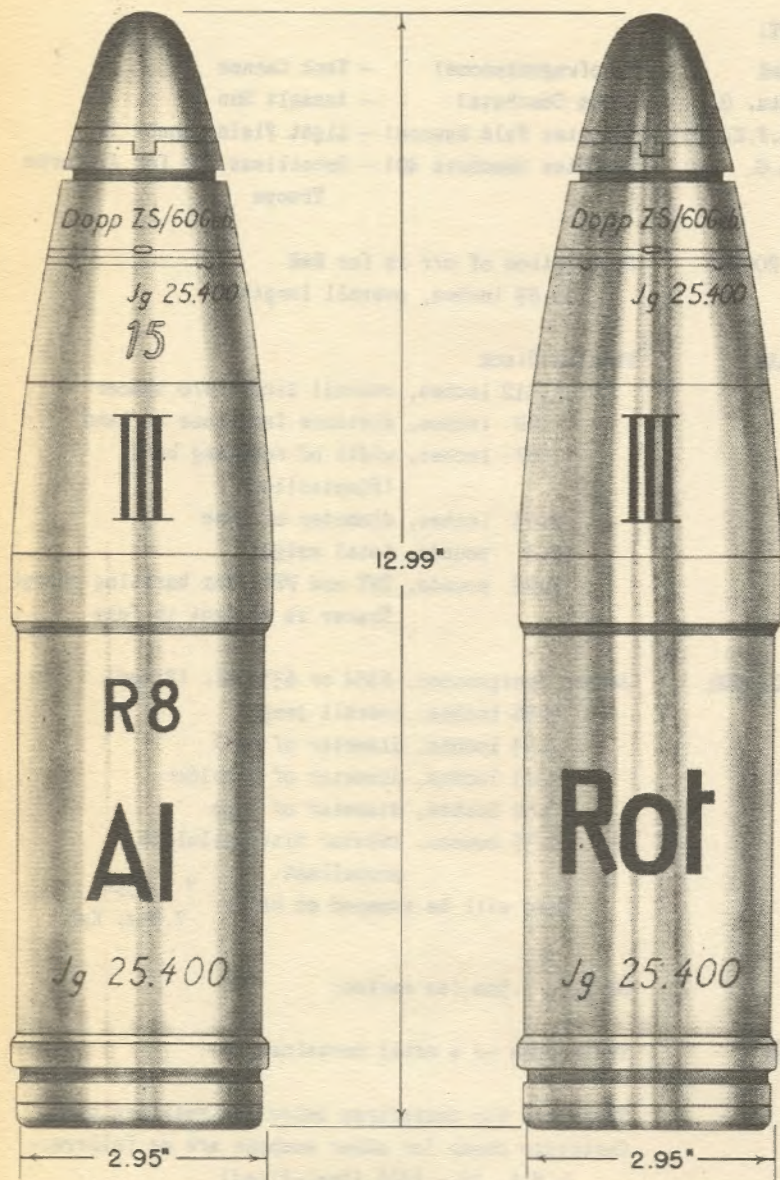
9.56 inches,	overall length
2.93 inches,	diameter of neck
3.01 inches,	diameter of shoulder
3.60 inches,	diameter of base
12.39 ounces,	tubular nitrocellulose -
	propellant
Case will be stamped on base:	" 6354
	7.5cm. KwK"

FUZE: Bd.Z.f. 7.5cm (so marked)

PACKAGING: Two rounds to a metal container

REMARKS: There are two cannellures below the rotating band.
Cartridge cases for other weapons are as follows:-
L.F.K. 18 - 6316 (Semi-Fixed)
L.G. 40 - Plastic base case

H.E. PROJECTILE
FOR MOUNTAIN GUN, 75 mm.



Geb Gr. 15 AI

R E S T R I C T E D

H.E. PROJECTILE FOR MOUNTAIN GUN, 75 mm.

GERMAN DESIGNATION: Geb. Gr. 15 Al.
(Gebirgs Granate 15 Aluminum)

EMPLOYMENT:

7.5cm Geb. K. 15 - (Gebirgs Kanone 15) - Mountain Gun 15

COMPLETE ROUND: 15.75 inches, overall length

PROJECTILE: Painted Green
12.99 inches, overall length w/fuze
0.687 inches, distance from base to band
0.433 inches, width of rotating band
2.95 inches, diameter of base
12.0 pounds, total weight
TNT/Aluminum, 90/10 and red phosphorus smoke
box bursting charge.
C/98 Np. booster.

CARTRIDGE CASE: German designation, 6335 (Semi-Fixed)
5.078 inches, overall length
3.03 inches, diameter of neck
No shoulder
3.34 inches, diameter of rim
11.6 ounces, Flaked nitroglycerine and nitro-
cellulose with nitroguanadine.
C/12nA primer.

FUZE: Nose percussion fuze A.Z. 23 Geb.
Time and percussion fuze Dopp Z. s/60 Geb.

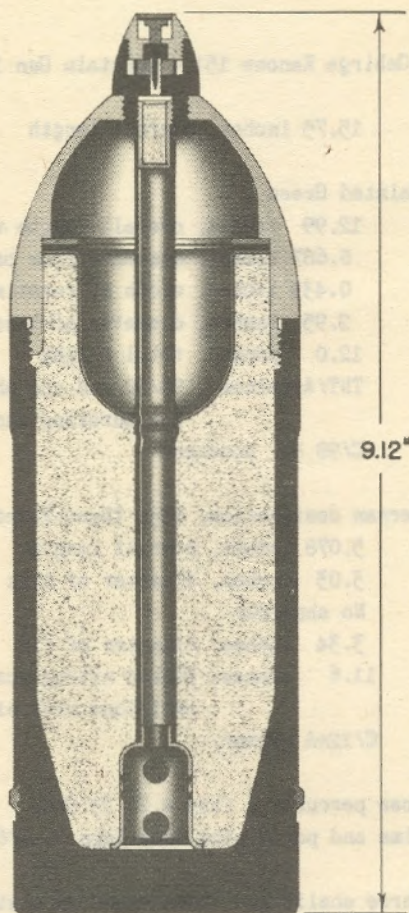
PACKAGING: Three shells and three cases in a wicker basket.

REMARKS: There is round designated: "Geb. Gr. 15 rot"
which is identical with the above except that
it does not contain any aluminum.

RESTRICTED

HOLLOW CHARGE

PROJECTILE FOR INFANTRY GUN, 75mm.



7.5cm Igr. 38

R E S T R I C T E D

HOLLOW CHARGE PROJECTILE FOR INFANTRY GUN, 75 mm.

GERMAN DESIGNATION: 7.5cm Igr. 38
(Iager 38)

EMPLOYMENT:

7.5cm L.I.G. 18 - (Leichte Infanterie Geschutz 18)
Light Infantry Gun 18
7.5cm L. Geb. I.G. 18 - (Leichte Gebirgs Infanterie Geschutz 18)
Light Mountain Infantry Gun 18

COMPLETE ROUND: Description of c/r is identical for both weapons
11.562 inches, overall length

PROJECTILE: Painted Green

9.134 inches, overall length w/o fuze
1.125 inches, distance from base to band
0.236 inches, width of bimetallic rotating band
2.875 inches, diameter of base
6 lbs. 10 oz. total weight
Cyclonite bursting charge
Zdlg 40 booster

CARTRIDGE CASE: German designation, 6341 or 6341 St. (Semi-Fixed)
3.5 inches, length
3.0 inches, diameter at mouth
No shoulder.
3.375 inches, diameter at base
2.52 ounces, Nitroglycerine Disc Powder
C/12nA primer

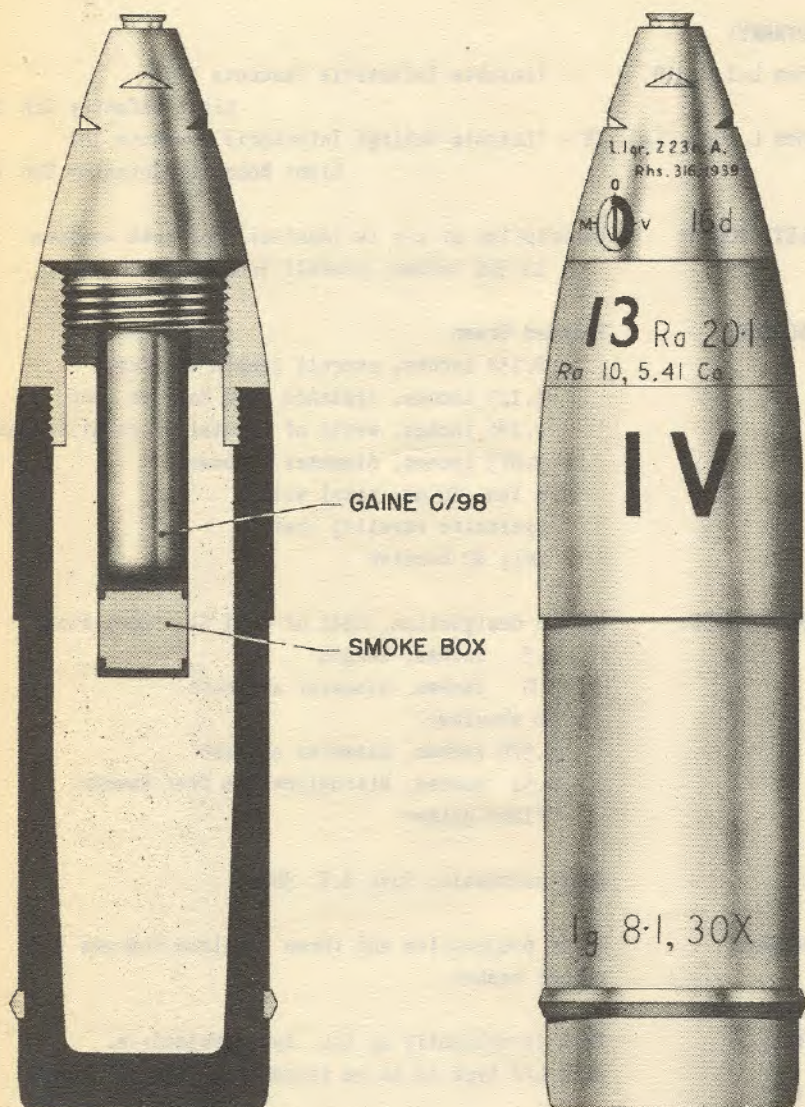
FUZE: Nose percussion fuze A.Z. 38

PACKAGING: Three, projectiles and three complete charges in a
wicker basket.

REMARKS: This is evidently an H.L. type projectile.
An H.L/A type is to be introduced.

RESTRICTED

H.E. PROJECTILE FOR INFANTRY GUN, 75 mm.



Igr. 18 A.Z. 23 nA

R E S T R I C T E D

H.E. PROJECTILE FOR INFANTRY GUN, 75 mm.

GERMAN DESIGNATION: Igr. 18 A.Z. 23nA
(Iager 18 Aufschlag Zunder neu Abteilung)

EMPLOYMENT:

L.I.G. 18 - (Leichte Infanterie Geschutz 18) - Light Infantry
Gun 18
L. Geb. I.G. 18 - (Leichte Gebirgs Infanterie Geschutz 18) - Light
Mountain Infantry Gun 18

COMPLETE ROUND: Description of c/r is for L.I.G. 18
15.49 inches, overall length
13 lbs. 10 oz., total weight

PROJECTILE: Painted Green
12.99 inches, overall length w/fuze
1.102 inches, distance from base to band
0.236 inches, width of rotating band,
bimetallic or sintered iron.
2.95 inches, diameter of base
1.21 pounds, Amatol 40/60 bursting charge.
Stencilled: "7.5cm Igr. 18, L. Igr. Z 23nA"
Gr. Zdlg. C/98 Np. Booster

CARTRIDGE CASE: German designation, 6341 or 6341 St. (Semi-Fixed)
3.5 inches, overall length
3.0 inches, diameter of neck
No shoulder
3.375 inches, diameter of base
2.52 ounces, Nitroglycerine Disc Powder
C/12nA primer.

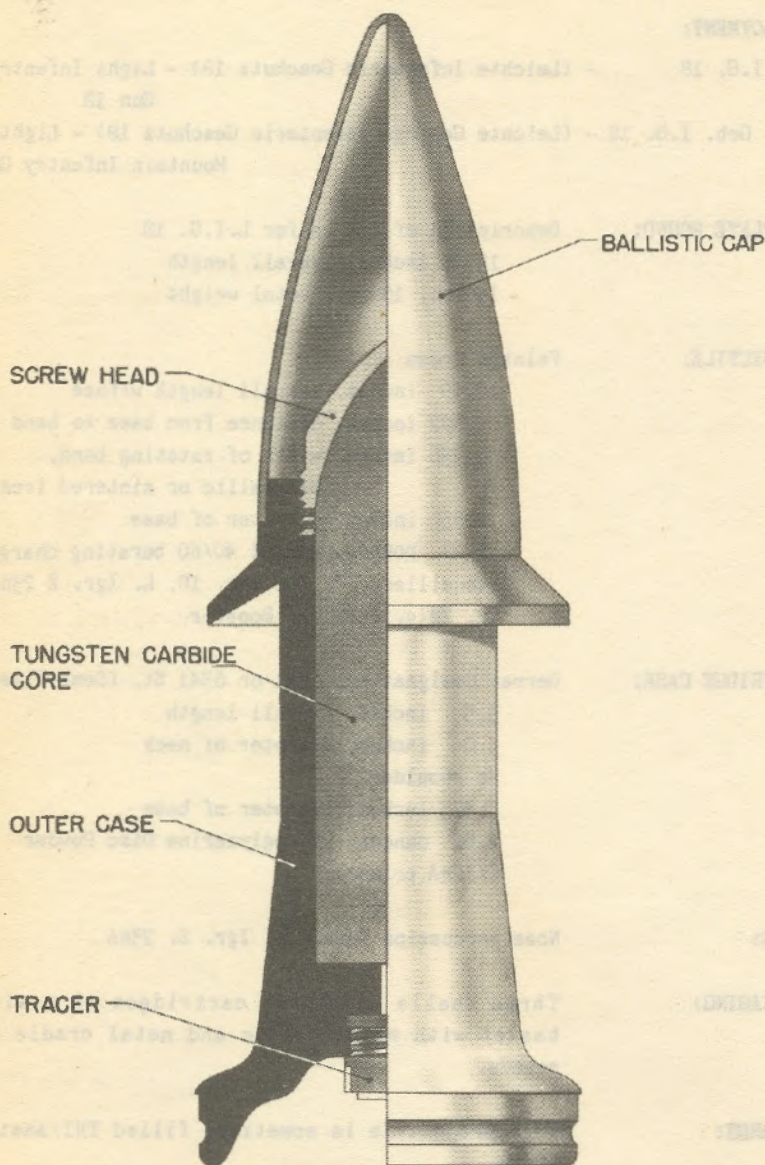
FUZE: Nose percussion fuze - L. Igr. Z. 23nA

PACKAGING: Three shells and three cartridges in a wicker
basket with metal bottom and metal cradle - 49
pounds.

REMARKS: This projectile is sometimes filled TNT/Amatol -
90/10.
Cartridge case for L. Geb. I.G. - 6341 (Semi-Fixed)
When this projectile has been fired from the L.I.G.
18, the rotating band will show 24 riflings.

RESTRICTED

A.P. PROJECTILE WITH TUNGSTEN CORE (ARROWHEAD), 75mm.



Pzgr. Patr. 41

R E S T R I C T E D

A.P. PROJECTILE WITH TUNGSTEN CORE (ARROWHEAD), 75 mm.

GERMAN DESIGNATION: Pzgr. Patr. 41
(Panzergranate Patrone 41)

EMPLOYMENT:

Pak 41 - (Pangerabwehrkanone 41) - Anti-Tank Gun 41

COMPLETE ROUND: 29.8 inches, overall length
16.65 pounds, total weight

PROJECTILE: Painted Black
5.68 pounds, total weight
2.01 pounds, weight of tungsten carbide core
1.16 inches, diameter of core
Tracer is present

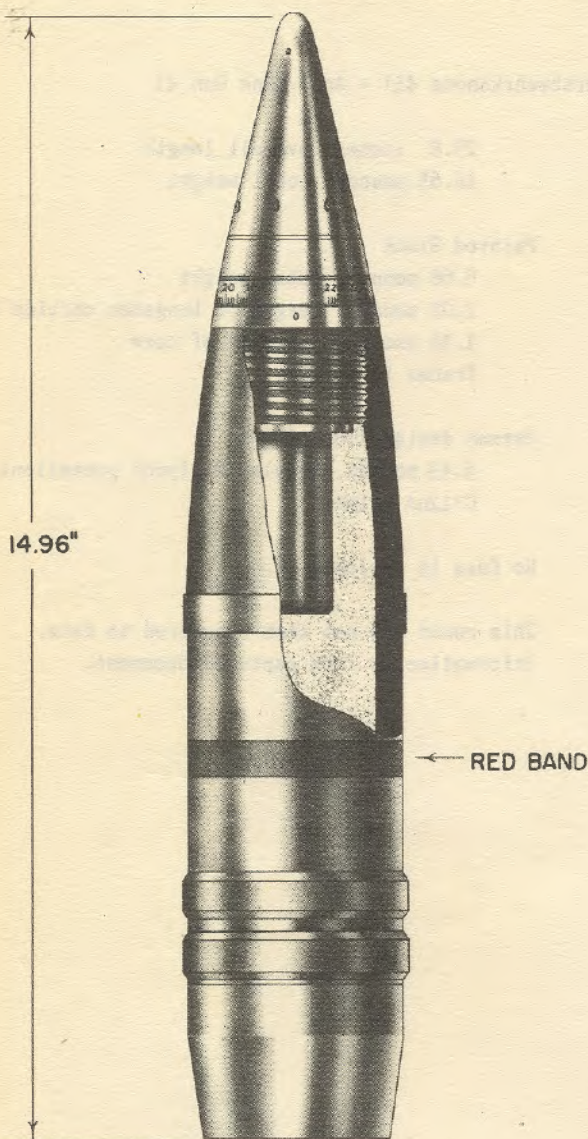
CARTRIDGE CASE: German designation, 6344
5.43 pounds, Tubular Diglycol propellant
C/12nA primer

FUZE: No fuze is employed.

REMARKS: This round has not been recovered to date.
Information is from captured document.

RESTRICTED

H.E. PROJECTILE FOR DUAL-PURPOSE SKODA GUN, 75mm.



Sprgr. Patr. 75/50

- 116 -

R E S T R I C T E D

H.E. PROJECTILE FOR DUAL-PURPOSE SKODA GUN, 75 mm.

GERMAN DESIGNATION: Sprgr. Patr. 75/50
(Sprenggranate Patrone 75/50)

EMPLOYMENT: 75/50 Skoda Dual-Purpose Gun

COMPLETE ROUND: 27.5 pounds, total weight

PROJECTILE: Red banded, stencilled in red.
14.96 inches, overall length w/fuze
2.948 inches, diameter of bourrelet
0.472 inches, width of rotating bands
2, Number of rotating bands
510.0 grams, TNT bursting charge
0.511 inches, width of bourrelet

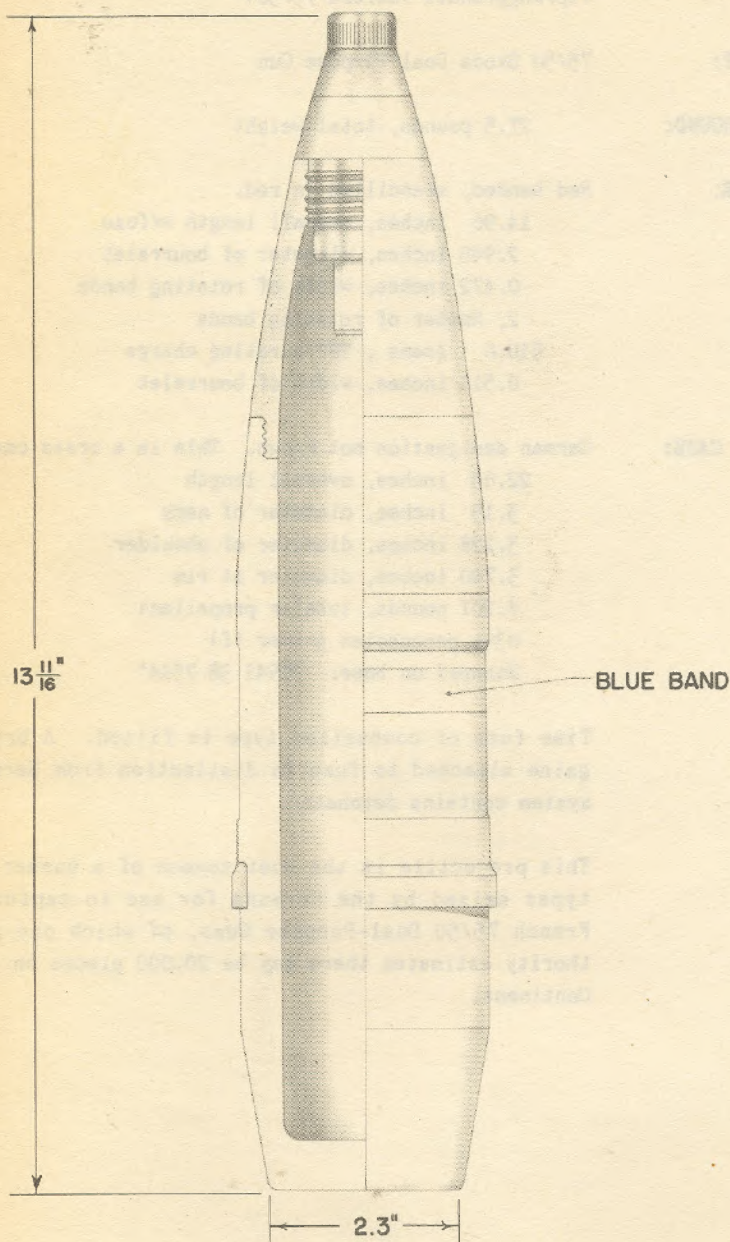
CARTRIDGE CASE: German designation not known. This is a brass case.
22.83 inches, overall length
3.15 inches, diameter of neck
3.228 inches, diameter of shoulder
3.740 inches, diameter at rim
4.201 pounds, tubular propellant
M39s percussion primer (f)
Stamped on base: "1941 38 75AA"

FUZE: Time fuze of combustion type is fitted. A brass gaine attached to fuze in distinction from German system contains detonator.

REMARKS: This projectile is the most common of a number of types seized by the Germans for use in captured French 75/50 Dual-Purpose Guns, of which one authority estimates there may be 20,000 pieces on the Continent.

RESTRICTED

H.E. PROJECTILE
TYPE 284, RUSSIAN, 76.2 mm.



7.62 cm Sprgr. Patr. 284(r)

R E S T R I C T E D

H.E. PROJECTILE TYPE 284, RUSSIAN, 76.2 mm.

GERMAN DESIGNATION: 7.62cm Sprgr. Patr. 284(r)
(Sorenggranate Patrone 284 (russ))

EMPLOYMENT: 7.62cm F.K. 296 r
7.62cm F.K. 36 r

COMPLETE ROUND: 29.156 inches, overall length
18.04 pounds, total weight

PROJECTILE: Painted Grey-green with blue band below bourrelet.
12.719 inches, overall length w/o fuze.
14.406 inches, overall length w/fuze.
3.375 inches, distance from base to band.
0.5 inches, width of rotating band - copper.
3.0 inches, diameter of bourrelet.
0.625 inches, width of bourrelet.
2.312 inches, diameter of base.
13.64 pounds, total weight.
1.5 pounds, TNT bursting charge.

CARTRIDGE CASE: Russian designation, 42M (Fixed)
15.125 inches, overall length.
3.07 inches, diameter of neck.
3.062 inches, diameter of shoulder.
3.44 inches, diameter of base.
2.28 pounds, Russian nitrocellulose powder.
42M primer.

FUZE: Nose percussion fuze - KTMI
(German designation - AZ 214 o V (r))

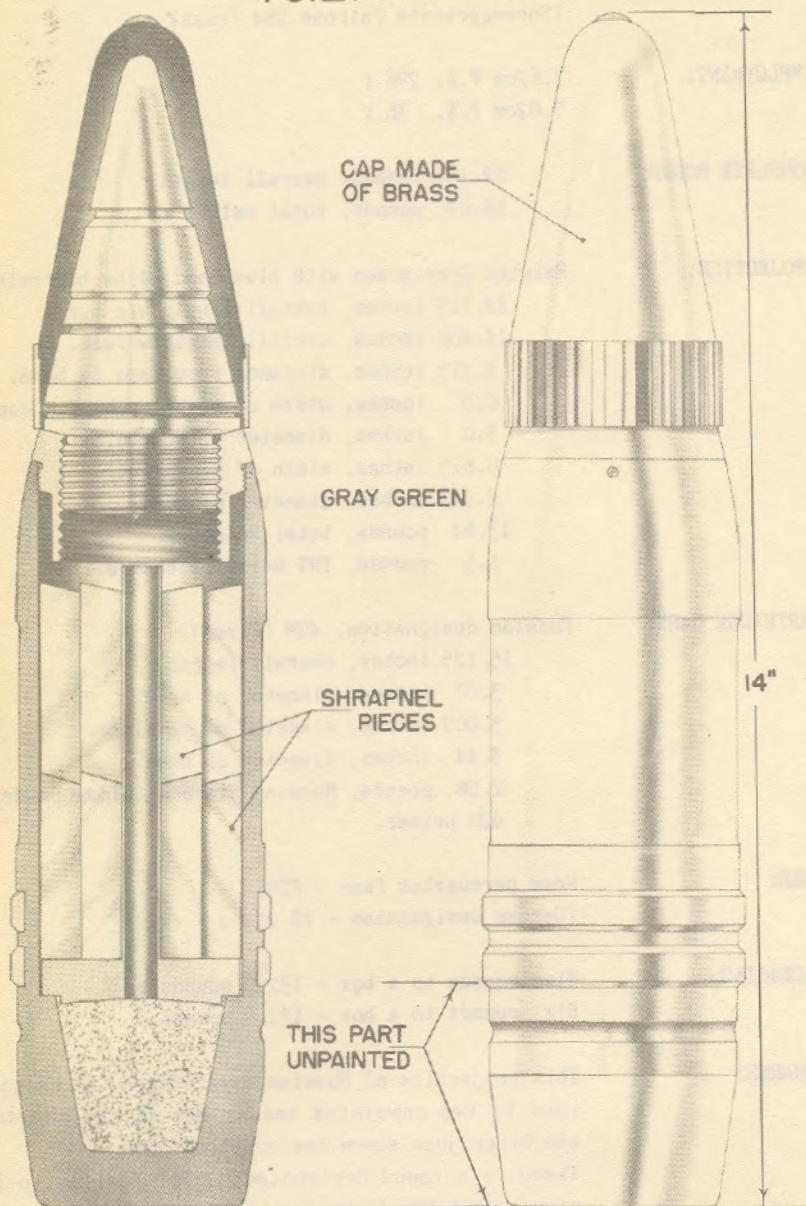
PACKAGING: Five rounds to a box - 132.0 pounds or
Six rounds to a box - 171.6 pounds.

REMARKS: This projectile of Russian manufacture is characterized by two unpainted bands, one at the shoulder, the other just above the rotating band.
There is a round designated "287r" similar to this except that the bursting charge is smaller.

RESTRICTED

SHRAPNEL PROJECTILE (RUSSIAN)

76.2mm.



R E S T R I C T E D

SHRAPNEL PROJECTILE (RUSSIAN) 76.2 mm.

GERMAN DESIGNATION: Not known.

EMPLOYMENT:

7.62cm F.K. 296 r - (Feld Kanone 296 (russ)) - Field Gun 296, Russian

7.62cm F.K. 36 r - (Feld Kanone 36 (russ)) - Field Gun 36, Russian

COMPLETE ROUND: 26.281 inches, overall length.

PROJECTILE: Painted Grey-green.

9.0 inches, overall length w/o fuze.

14.0 inches, overall length with fuze.

2.531 inches, distance from base to band.

0.5 inches, width of rotating bands.

Two, Number of rotating bands.

3.0 inches, diameter of bourrelet.

2.437 inches, diameter of base.

Black powder expelling charge.

No tracer is present.

CARTRIDGE CASE: Russian designation - 42M (Fixed)

15.125 inches, overall length.

3.0 inches, diameter of neck.

3.062 inches, diameter of shoulder.

3.531 inches, diameter of rim.

Russian nitrocellulose powder - propellant,

42M or 33 primer.

FUZE: Nose time fuze - combustion type - 253M

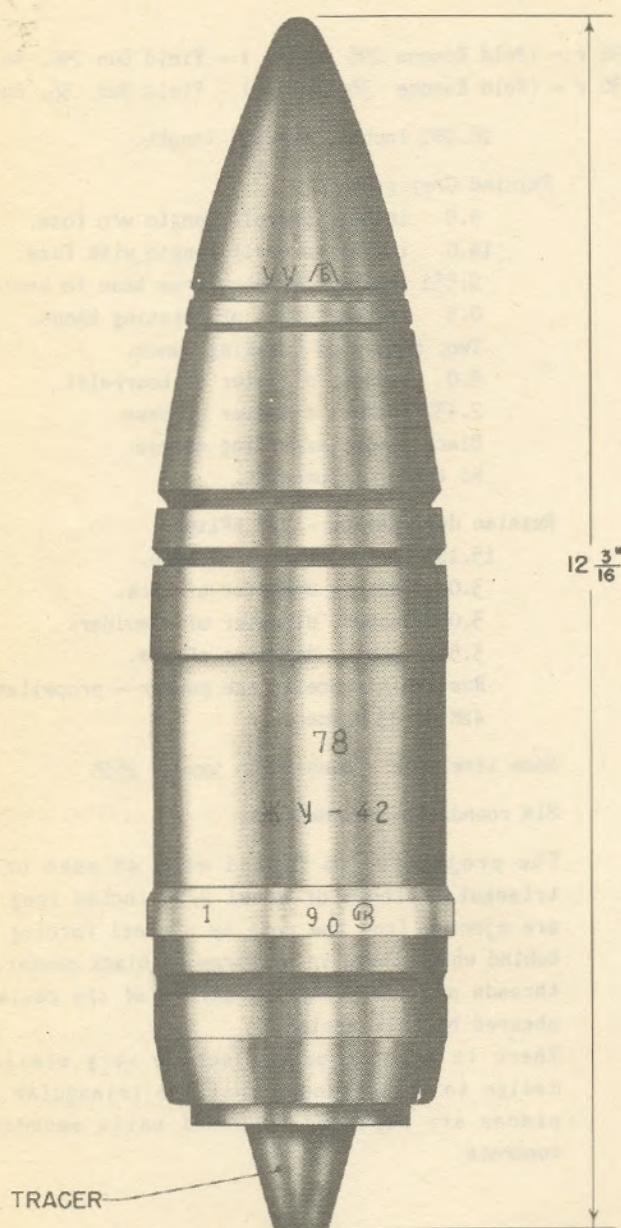
PACKAGING: Six rounds to a wooden box.

REMARKS: The projectile is filled with 48 more or less triangular pieces of steel 2.25 inches long which are ejected from the nose by a steel forcing plate behind which there is a charge of black powder. The threads and two retaining screws of the collar are sheared by this action.

There is a Japanese projectile very similar in design to this, except that the triangular steel pieces are replaced by steel balls embedded in concrete.

RESTRICTED

A.P.C. PROJECTILE (RUSSIAN) 76.2mm.



7.62 cm Pzgr. Patr. (r.)

GERMAN DESIGNATION: 7.62cm Pzgr. Patr. (r)
(Panzergranate Patrone (russ))

EMPLOYMENT:

7.62cm F.K. 296 (r) - (Feld Kanone 296 (russ)) - Field Gun 296
(Russian)
7.62cm F.K. 36 (r) - (Feld Kanone 36 (russ)) - Field Gun 36
(Russian)

COMPLETE ROUND: 25.375 inches, overall length.

PROJECTILE:

Unpainted. Machined surface on bourrelet.
12.187 inches, overall length with fuze.
1.687 inches, distance from base to band.
0.5 inches, width of rotating band.
2.99 inches, diameter of bourrelet.
0.687 inches, width of bourrelet.
2.71 inches, diameter of base.
14.3 pounds, total weight.
Tracer present in fuze.

CARTRIDGE CASE:

Russian designation - 42M (Fixed)
15.125 inches, overall length.
3.07 inches, diameter of neck.
3.062 inches, diameter of shoulder.
3.44 inches, diameter of base.
2.519 pounds, Russian nitrocellulose powder.
42M primer.

FUZE:

Base detonating fuze of Russian manufacture.

PACKAGING:

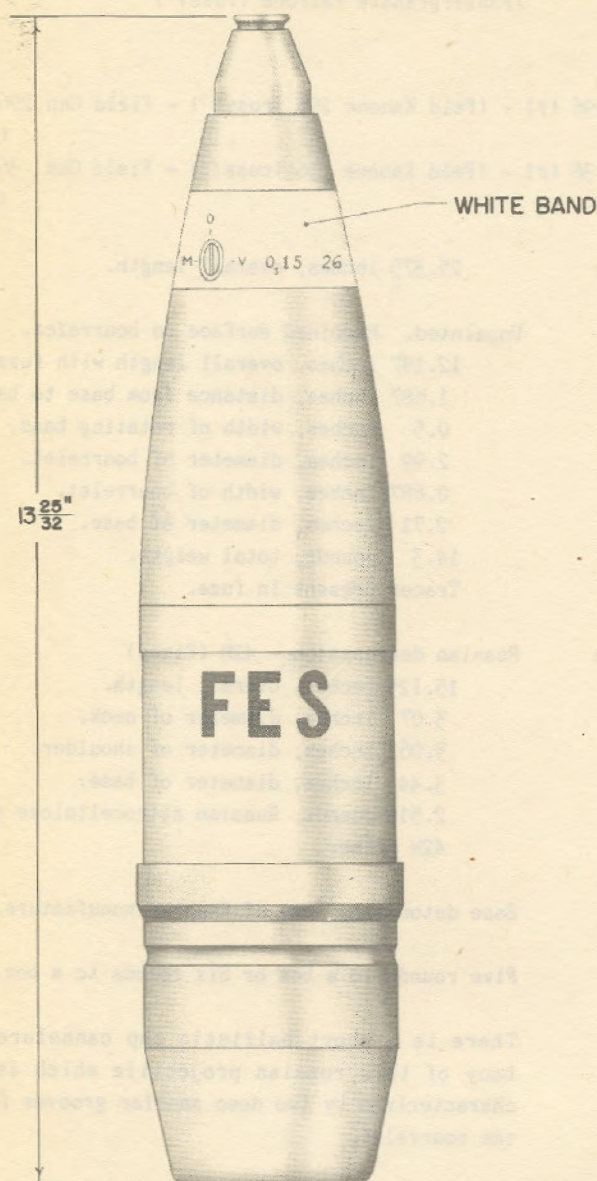
Five rounds to a box or Six rounds to a box.

REMARKS:

There is a short ballistic cap cannellured to the body of this russian projectile which is further characterized by two deep annular grooves forward of the bourrelet.

RESTRICTED

H.E. PROJECTILE TYPE 39, 76.2 mm.



7.62cm Sprgr. Patr, 39

R E S T R I C T E D

H.E. PROJECTILE TYPE 39, 76.2 mm.

GERMAN DESIGNATION: 7.62cm Sprgr. Patr. 39
(Sprenggranate Patrone 39)

EMPLOYMENT:

7.62cm F.K. 36 (r) - (Feld Kanone 36 (russ)) - Field Gun 36 (Russian)
7.62cm Pak. 36 (r) - (Panzerabwehrkanone 36 (russ)) - Anti-Tank Gun 36
(Russian)

COMPLETE ROUND: 39.52 inches, overall length
22.0 pounds, total weight

PROJECTILE: Painted Green, white band below nose fuze.
13.97 inches, overall length
3.187 inches, distance from base to band
2.95 inches, diameter of bourrelet
0.687 inches, width of rotating band -
soft iron
2.312 inches, diameter of base
12.64 pounds, total weight
568.0 grams , Amatol bursting charge
Gr. Zdlg C/98 Np booster

CARTRIDGE CASE: German and Russian designations, 37r or 42M (Fixed)
15.16 inches, overall length
3.07 inches, diameter of neck
3.11 inches, diameter of shoulder
3.44 inches, diameter of base
775.0 grams , Flaked Gudol propellant plus
20.0 grams , Potassium sulphate flash reducer
42M or 33 primer.

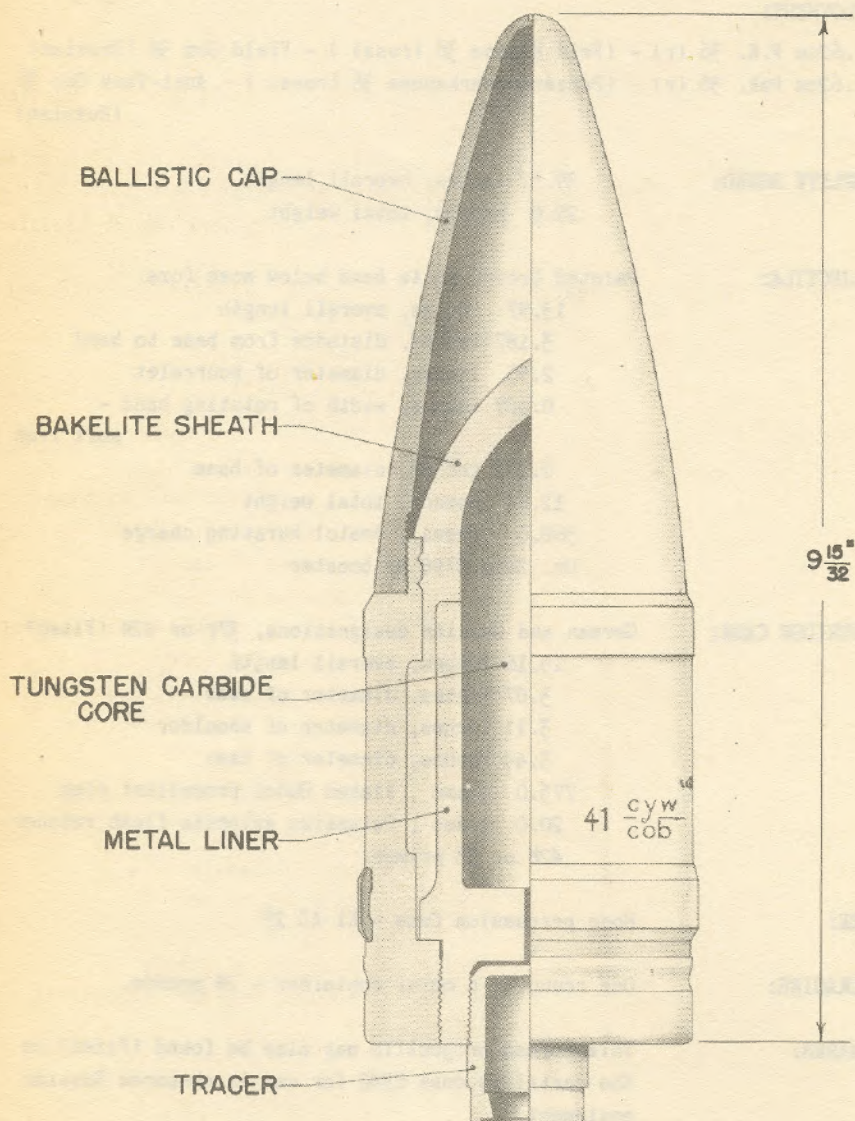
FUZE: Nose percussion fuze - K1 AZ 23

PACKAGING: One round to a metal container - 28 pounds.

REMARKS: This German projectile may also be found (Fixed) in
the cartridge case 6340 for use in re-bored Russian
equipment.

RESTRICTED

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE, 76.2 mm.



Pzgr. Patr. 40(r)

R E S T R I C T E D

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE, 76.2 mm.

GERMAN DESIGNATION: Pzgr. Patr. 40(r)
(Panzergranate Patrone 40(russ))

EMPLOYMENT:

7.62cm F.K. 296 (r) - (Feld Kanone 296 (russ)) -
Field Gun 296 (Russian)
7.62cm F.K. 36 (r) - (Feld Kanone 36 (russ)) -
Field Gun 36 (Russian)
7.62cm Pak. 36 (r) - (Panzerabwehrkanone 36 (russ)) -
Anti-Tank Gun 36 (Russian)

COMPLETE ROUND: Description of c/r is for projectile in Russian cartridge case.

24.28 inches, overall length

14.74 pounds, total weight

PROJECTILE:

Painted Black

10.157 inches, overall length

1.0 inches, distance from base to band

0.687 inches, width of rotating band

2.91 inches, diameter of base

9.13 pounds, total weight

4.344 inches, length of tungsten carbide core

1.125 inches, diameter of core

4.921 inches, length of ballistic cap

Tracer present in base of projectile

Stamped on body: " 41 $\frac{\text{CYW}}{\text{COB}}$ "

CARTRIDGE CASE: German and Russian designations, 42m or 37r (Fixed).

15.125 inches, overall length

3.07 inches, diameter of neck

3.062 inches, diameter of shoulder

3.531 inches, diameter of base

364.0 grams, tubular Diglycol propellant.

42/m or 33 primer

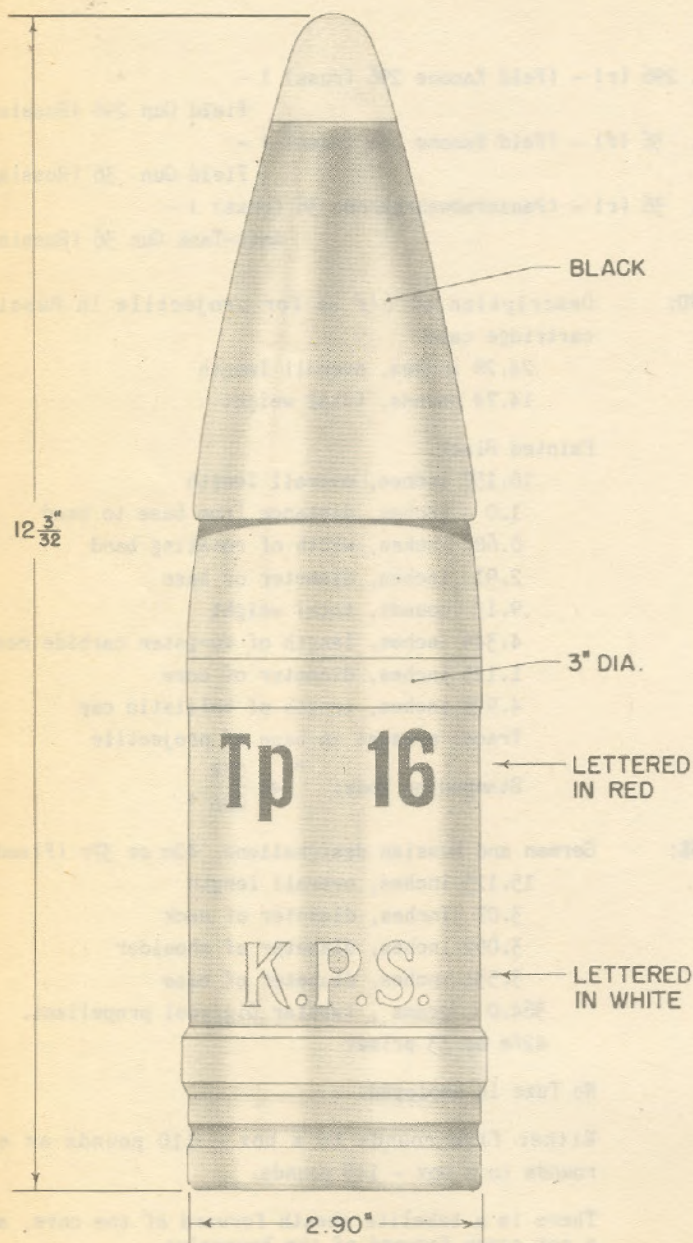
FUZE: No fuze is employed.

PACKAGING: Either five rounds to a box - 110 pounds or six rounds to a box - 145 pounds.

REMARKS: There is a bakelite sheath forward of the core, and a set-screw forward of the bourrelet.
This German projectile may be found (fixed) in the German case 6340 for use in captured weapons which the Germans have re-bored.

RESTRICTED

A.P. PROJECTILE WITH CAP TYPE 39, 76.2 mm.



7.62 cm Pzgr. Patr. 39(r)rot

GERMAN DESIGNATION: 7.62cm Pzgr Patr. 39 (r) rot
(Panzergranate Patrone 39 (russ) rot)

EMPLOYMENT:

7.62cm Pak 36 (r) - (Panzerabwehrkanone 36 (russ)) -
Anti-Tank Gun 36 (Russian)

COMPLETE ROUND: 26.219 inches, overall length
28.6 pounds, total weight

PROJECTILE: Painted Black, with white tip.
12.062 inches, overall length
0.969 inches, distance from base to band
0.687 inches, width of rotating band
2.906 inches, diameter of base
16.72 pounds, total weight
2.519 pounds, Russian nitrocellulose powder or
2.886 pounds, tubular Diglycol
Tracer is present in fuze

CARTRIDGE CASE: German and Russian designations, 42m or 37r (Fixed).
15.125 inches, overall length
3.07 inches, diameter of mouth
3.062 inches, diameter of shoulder
3.44 inches, diameter of base
775.0 grams, flaked Gudol propellant plus
20.0 grams, potassium sulphate flash reducer
33 or 42m or C/12nA primer

FUZE: Base detonating fuze - Bd. Z. f 7.5cm.

PACKAGING: One round to a metal container - 34.32 pounds.

REMARKS: This German projectile may also be found (fixed) in the cartridge case 6340 for use in re-bored Russian equipment.
A 7.62 A.P. Projectile with a small bursting cavity containing RDX is also made. Bd. Z 5103 will be found in this type.

GERMAN DESIGNATION: H L Gr. Patr. 39 Flak
(Hohl Ladung Granate Patrone 39 Flugabwehrkanone)

EMPLOYMENT:

8.8cm Flak 18 - (Flugabwehrkanone 18) - Anti-Aircraft Gun 18
8.8cm Flak 36 - (Flugabwehrkanone 36) - Anti-Aircraft Gun 36
8.8cm Flak 37 - (Flugabwehrkanone 37) - Anti-Aircraft Gun 37

PROJECTILE:

Painted Grey, stencilled in black.
16.83 pounds, total weight.
1.5 pounds, bursting charge.
Zdlg. 40 , booster.
Soft iron ., rotating bands.
"HL FES" , stencilled on body.

CARTRIDGE CASE:

German designation, 6347 (Fixed)
22.4 inches, overall length.
3.625 inches, diameter of neck.
3.812 inches, diameter of shoulder.
4.02 inches, diameter of base.
11.625 pounds, weight of case.
Diglycol propellant charge.
C/12nA primer.

FUZE:

Nose percussion fuze - AZ 38 St.
This fuze is identical with the AZ 38 except that
it is made of steel.

REMARKS:

This round has not been recovered to date.
Information is from captured documents.
All three weapons employ the same cartridge case.

GERMAN DESIGNATION: Pzgr. Patr. 39
(Panzergranate Patrone 39)

EMPLOYMENT:

8.8cm Flak. 41 - (Flugabwehrkanone 41) - Anti-Aircraft Gun 41

COMPLETE ROUND: 45.5 inches, overall length.
46.0 pounds, total weight.

PROJECTILE: Painted Black with white tip.
13.5 inches, overall length.
1.937 inches, distance from base to band.
0.469 inches, width of rotating bands.
Two, number of rotating bands.
3.437 inches, diameter of base.
22.44 pounds, total weight.
2.12 ounces, Cyclonite bursting charge.
Tracer present in fuze.

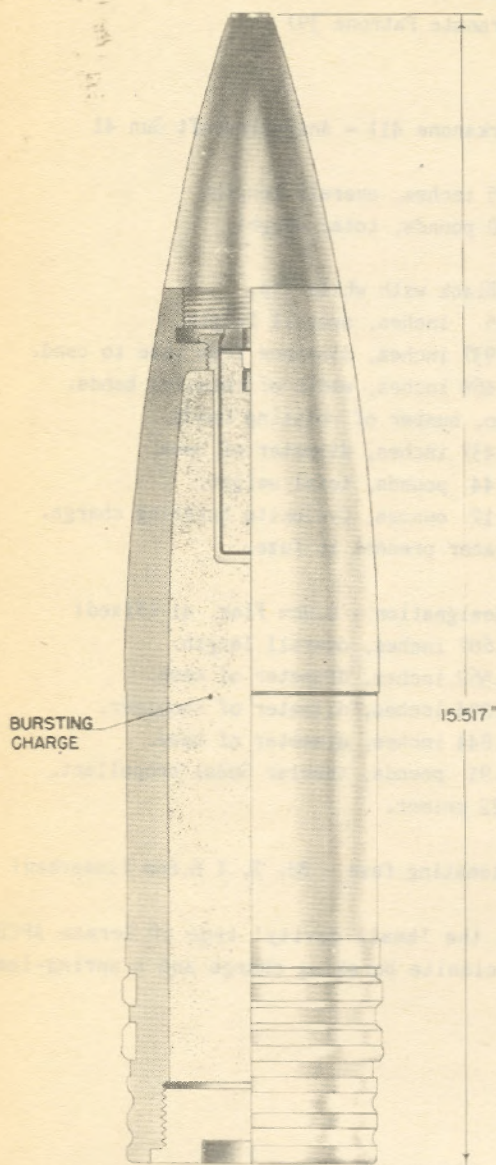
CARTRIDGE CASE: German designation - 8.8cm Flak. 41 (Fixed)
33.687 inches, overall length.
3.562 inches, diameter of neck.
4.094 inches, diameter of shoulder.
4.844 inches, diameter of base.
11.91 pounds, tubular Gudol propellant.
C/22 primer.

FUZE: Base detonating fuze - Bd. Z. f 8.8cm (unmarked)

REMARKS: This is the 'small cavity' type of German APCBCHE with Cyclonite bursting charge and a spring-loaded fuze.

RESTRICTED

H.E. PROJECTILE TYPE L/4.5, 88mm.



Sprgr. Patr. L/4.5 (Kz)

GERMAN DESIGNATION: Sprgr. Patr. L/4.5 (Kz)
(Sprenggranate Patrone Ladung/4.5 (Kopfzunder))

EMPLOYMENT:

8.8cm Flak 18 - (Flugabwehrkanone 18) - Anti-Aircraft Gun 18
8.8cm Flak 36 - (Flugabwehrkanone 36) - Anti-Aircraft Gun 36
8.8cm Flak 37 - (Flugabwehrkanone 37) - Anti-Aircraft Gun 37

PROJECTILE:

Painted Yellow or Green.

15.51 inches, overall length.
1.375 inches, distance from base to rotating band.
0.531 inches, width of lower rotating band.
0.469 inches, width of upper rotating band.
Two, number of rotating bands.
3.446 inches, diameter of bourrelet.
3.447 inches, diameter of base.
20.35 pounds, total weight.
1.9 pounds, weight of bursting charge.
40/60 Amatol, type of bursting charge.
C/98 booster.
No tracer is present.

CARTRIDGE CASE:

German designation, 6347 (Fixed)
22.4 inches, overall length.
3.625 inches, diameter of neck.
3.812 inches, diameter of shoulder.
4.02 inches, diameter of base.
11.625 pounds, weight of case.
5.03 pounds, weight of propellant.
Tubular Diglycol, type of propellant.
C/12 nA primer.

FUZE:

Nose percussion fuze - AZ 23/28 or
Mechanical time fuze - Zt. Z. s/30

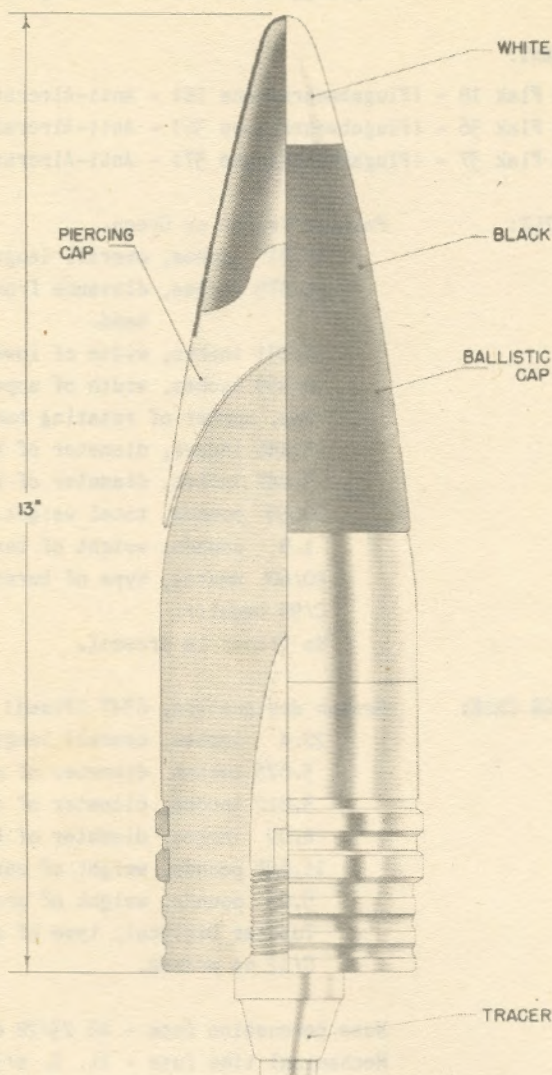
PACKAGING:

Three rounds in wicker basket - 123.0 pounds.
One round in metal cylinder - 47.3 pounds.

REMARKS:

All three weapons employ the same cartridge case. There are two types of this projectile. One has a screwed-in base plate and a bursting charge in a cardboard container. The other has a solid base and is poured filled.

RESTRICTED
A.P. PROJECTILE
FOR 88mm ANTI-TANK GUN



88cm Pzgr. Patr. 41

R E S T R I C T E D A.P. PROJECTILE FOR 88mm ANTI-TANK GUN

GERMAN DESIGNATION: 8.8cm Pzgr. Patr. 41
(Panzergranate Patrone 41)

EMPLOYMENT:

8.8cm Flak 36 - (Flugabwehrkanone 36) - Anti-Aircraft Gun 36

8.8cm Flak 41 - (Flugabwehrkanone 41) - Anti-Aircraft Gun 41

PROJECTILE:

13.0 inches, Overall length without fuze.

1.375 inches, Distance from rotating bands
to base.

0.48 inches, Width of rotating bands.

3.45 inches, Diameter of base.

22.8 pounds, Total weight.

CARTRIDGE CASE:

German designation, 8.8cm Flak 41

33.625 inches, Overall length.

3.55 inches, Diameter of neck.

4.1 inches, Diameter of shoulder.

4.65 inches, Diameter of base.

5.38 Kg. , Weight of propellant.

Type of propellant - Tubular Diglycol.

C/22 electric primer.

FUZE:

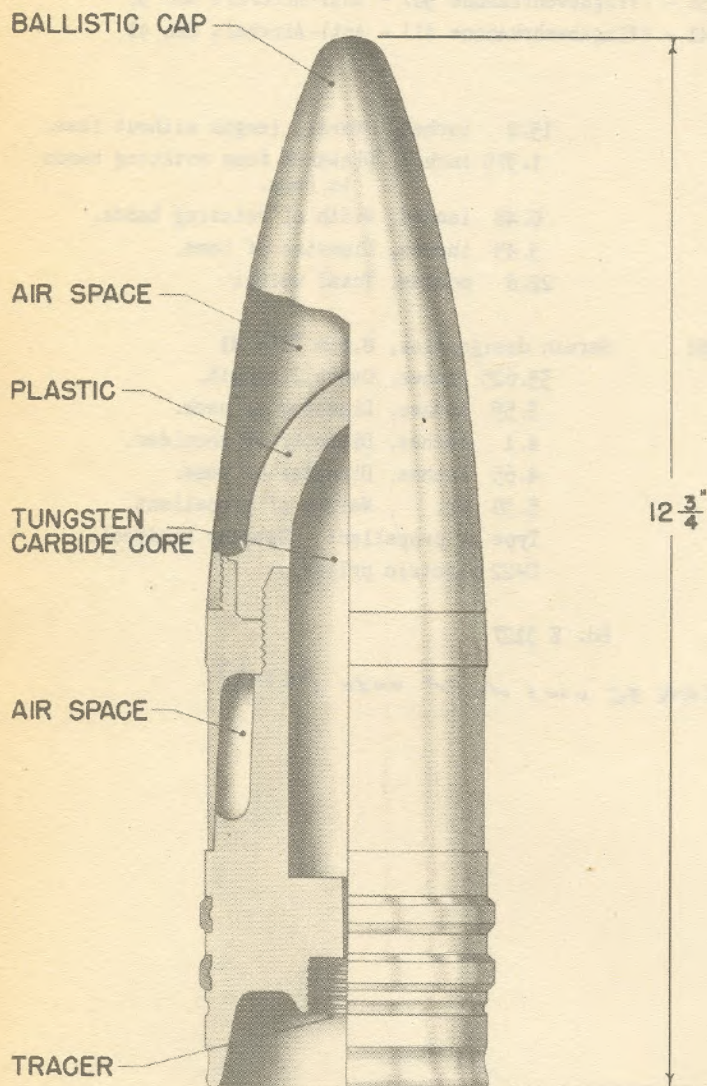
Bd. Z 5127

REMARKS:

FLAK 36 uses diff case (6347)

RESTRICTED

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE (TYPE 40) 88mm.



8.8 cm. Pzgr. 40

R E S T R I C T E D

A.P. PROJECTILE WITH TUNGSTEN CARBIDE CORE (TYPE 40) 88 mm.

GERMAN DESIGNATION: 8.8cm Pzgr. 40
(Panzergranate 40)

EMPLOYMENT:

8.8cm Flak 36 - (Flugabwehrkanone 36) - Anti-Aircraft Gun 36
8.8cm Flak 41 - (Flugabwehrkanone 41) - Anti-Aircraft Gun 41

COMPLETE ROUND: Description of c/r is for Flak 36.
33.99 inches, overall length.

PROJECTILE:

Painted Black.

12.75 inches, overall length.
1.166 inches, distance from base to band.
0.437 inches, width of rotating bands.
Two, number of rotating bands.
3.437 inches, diameter of bourrelet.
3.562 inches, diameter of base.
5.437 inches, length of tungsten carbide core.
1.406 inches, diameter of core.
4.25 pounds, weight of core.
16.0 pounds, total weight.
Tracer is present in base of projectile.

CARTRIDGE CASE:

German designation, 6347 (Fixed)
22.4 inches, overall length.
3.625 inches, diameter of neck.
3.812 inches, diameter of shoulder.
4.02 inches, diameter of base.
11.625 pounds, weight of case.
Diglycol, type of propellant.
C/22 electric primer.

FUZE:

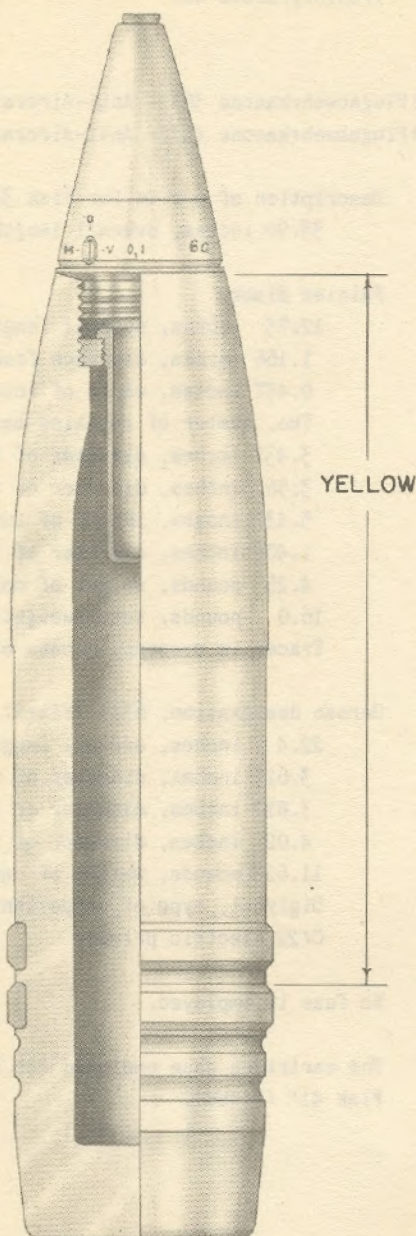
No fuze is employed.

REMARKS:

The cartridge case employed for Flak 41 is "8.8cm Flak 41" (Fixed).

RESTRICTED

H.E. PROJECTILE, TYPE L/4.7, 88 mm.



Sprgr. Patr. L/4.7 FES

GERMAN DESIGNATION: Sprgr. Patr. L/4.7 FES
(Sprenggranate Patrone Ladung/4.7 FES)

EMPLOYMENT:

8.8cm Flak 41 - (Flugabwehrkanone 41) - Anti-Aircraft Gun 41
8.8cm Flak 43 - (Flugabwehrkanone 43) - Anti-Aircraft Gun 43

COMPLETE ROUND: Description of c/r is for Flak 41.
47.0 inches, overall length.
46.42 pounds, total weight.

PROJECTILE: Painted Yellow.
16.35 inches, overall length.
2.905 inches, distance from base to rotating band.
0.51 inches, width of rotating bands - soft iron.
Two, number of rotating bands.
3.425 inches, diameter of bourrelet.
3.031 inches, diameter of base.
20.68 pounds, total weight.
1.9 pounds, 40/60 Amatol bursting charge.

CARTRIDGE CASE: German designation, 8.8cm Flak 41 (Fixed)
33.687 inches, overall length.
3.562 inches, diameter of neck.
4.094 inches, diameter of shoulder.
4.844 inches, diameter of base.
Tubular Gudol propellant.
C/22 electric primer.

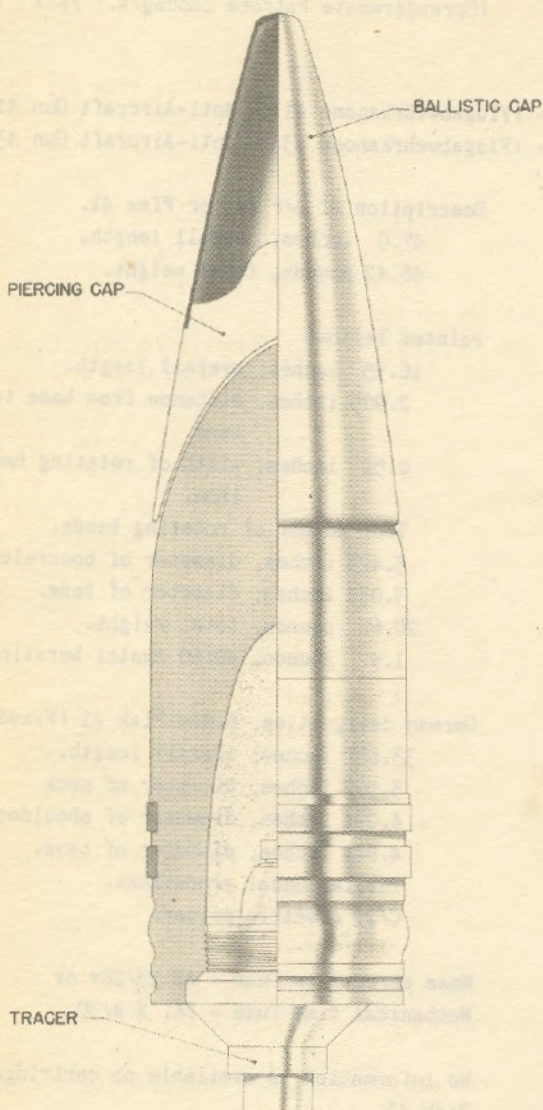
FUZE: Nose percussion fuze - AZ 23/28v or
Mechanical time fuze - Zt. Z s/30

REMARKS: No information is available on cartridge case for Flak 43.

RESTRICTED

A.P.C.

PROJECTILE FOR A.A. GUN 18,88mm.



Pzgr. Patr. m Bb. Z.

- 142 -

GERMAN DESIGNATION: Pzgr. Patr. m. Bd. Z.
(Panzergranate Patrone mit Boden Zunder)

EMPLOYMENT:

8.8cm Flak 18 - (Flugabwehrkanone 18) - Anti-Aircraft Gun 18
8.8cm Flak 36 - (Flugabwehrkanone 36) - Anti-Aircraft Gun 36
8.8cm Flak 37 - (Flugabwehrkanone 37) - Anti-Aircraft Gun 37

COMPLETE ROUND: 34.25 inches, overall length.
35.2 pounds, total weight.

PROJECTILE: Painted Black.
13.25 inches, overall length.
0.469 inches, width of bimetallic rotating bands.
Two, number of rotating bands.
3.437 inches, diameter of base.
20.75 pounds, total weight.
5.5 ounces, weight of bursting charge.
TNT/Wax, type of bursting charge.
Tracer is present in fuze.

CARTRIDGE CASE: German designation, 6347 (Fixed)
22.4 inches, overall length.
3.625 inches, diameter of neck.
3.812 inches, diameter of shoulder.
4.02 inches, diameter of base.
5.65 pounds, weight of propellant.
Tubular Diglycol, type of propellant.

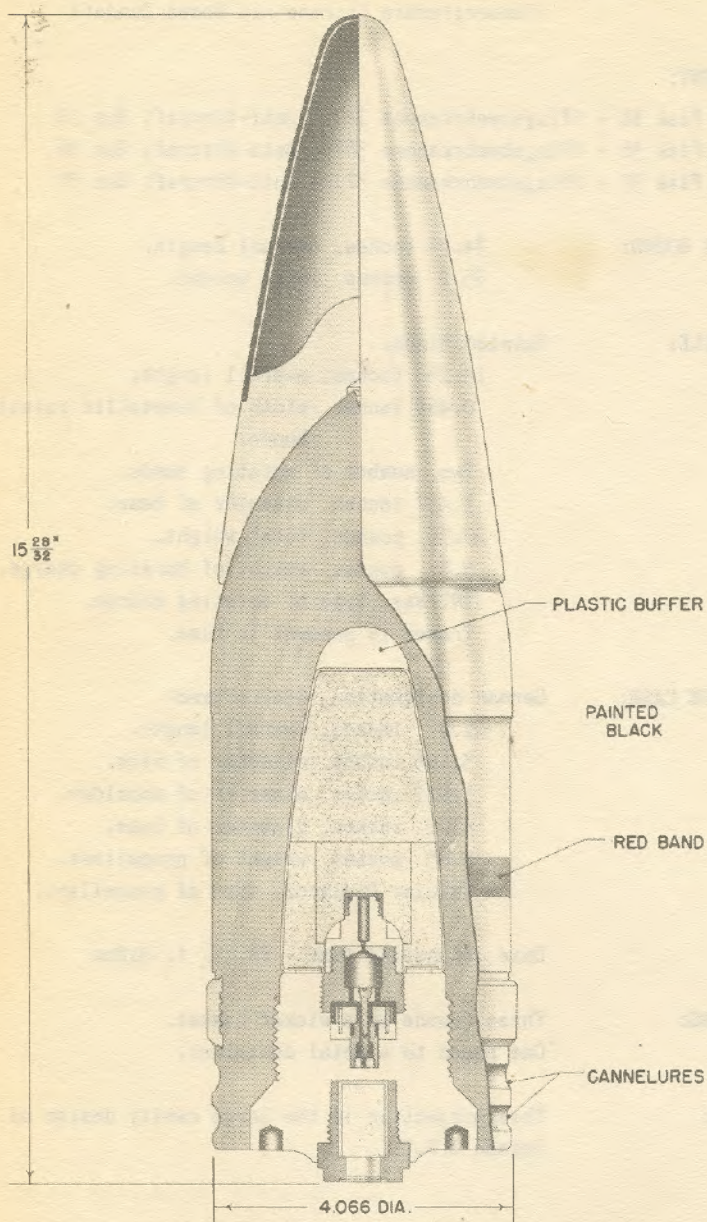
FUZE: Base detonating fuze - Bd. Z. f. 8.8cm

PACKAGING: Three rounds to a wicker basket.
One round to a metal container.

REMARKS: This projectile is the large cavity design of
German A.P.C.

RESTRICTED

A.P.C. PROJECTILE WITH TRACER, 105mm.



10cm Pzgr. rot

A.P.C. PROJECTILE WITH TRACER, 105 mm.

GERMAN DESIGNATION: 10cm Pzgr. rot
(Panzergranate rot)

EMPLOYMENT:

10cm Flak 38 - (Flugabwehrkanone 38) - Anti-Aircraft Gun 38
10cm Flak 39 - (Flugabwehrkanone 39) - Anti-Aircraft Gun 39
s 10cm K.T. - (Schweres Kanone Turren) - Heavy Turret Gun
s 10cm K. 18 - (Schweres Kanone 18) - Heavy Gun 18

COMPLETE ROUND: Description of c/r is for Flak 38 and Flak 39
44.25 inches, overall length.
57.625 pounds, total weight.

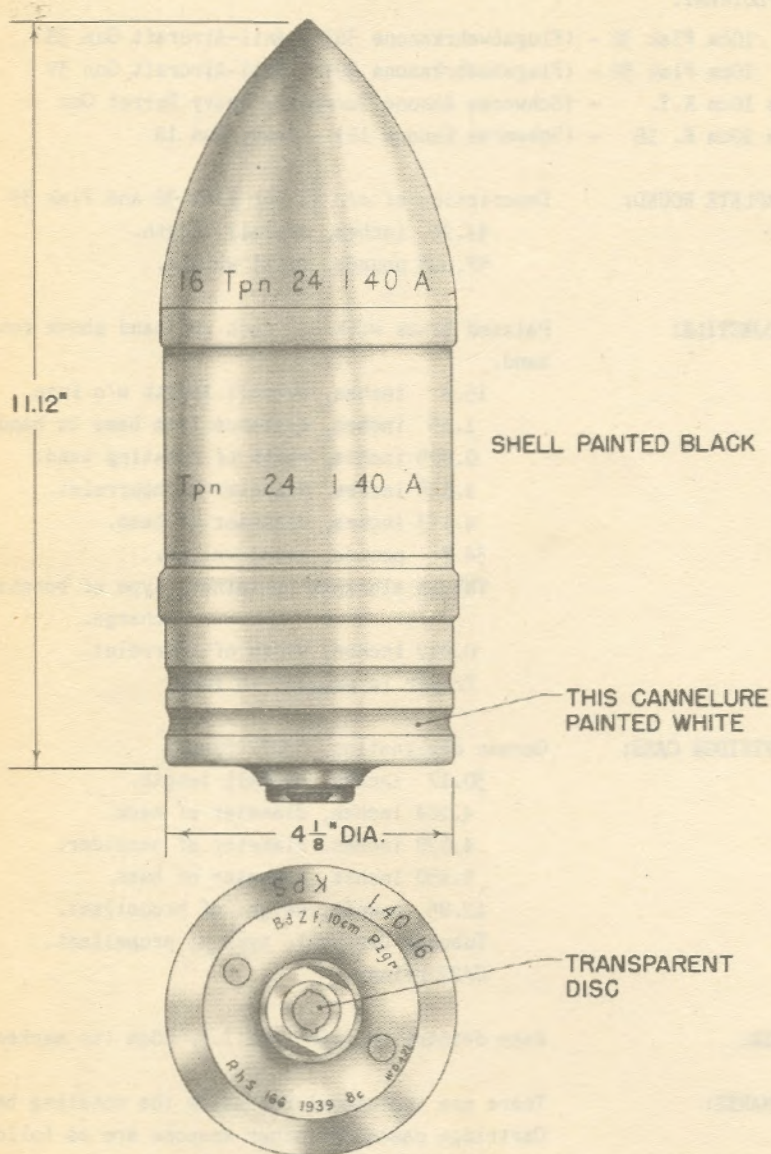
PROJECTILE: Painted black with 0.5 inch red band above rotating band.
41.4 inches, overall length w/o fuze.
1.15 inches, distance from base to band.
0.905 inches, width of rotating band.
4.125 inches, diameter of bourrelet.
4.133 inches, diameter of base.
34.7 pounds, total weight.
TNT in aluminum container, type of bursting charge.
0.812 inches, width of bourrelet.
Tracer is present in fuze.

CARTRIDGE CASE: German designation, 6307 (Fixed)
30.17 inches, overall length.
4.204 inches, diameter of neck.
4.628 inches, diameter of shoulder.
5.450 inches, diameter of base.
12.85 pounds, weight of propellant.
Tubular Diglycol, type of propellant.
C/22 primer.

FUZE: Base detonation fuze - Bd.Z.f. 10cm (so marked)

REMARKS: There are two cannellures below the rotating band.
Cartridge cases for other weapons are as follows:-
10cm K.T. - 6356 (Semi-Fixed)
10cm K 18 - 6349 (Semi-Fixed)

RESTRICTED
A.P. PROJECTILE FOR
LIGHT FIELD HOWITZER, 105mm.



Pzgr. rot L' spur.

RESTRICTED

A.P. PROJECTILE FOR LIGHT FIELD HOWITZER, 105 mm.

GERMAN DESIGNATION: Pzgr. rot L'spur

(Panzergranate rot Leuchtspur)

EMPLOYMENT:

10cm LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
10cm LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18
10cm LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake
10cm K.K. - (Kanone Kasematte) - Casemate Cannon
10cm K.T. - (Kanone Turren) - Turret Cannon

COMPLETE ROUND:

Description of c/r is for LFH 16.
37.441 inches, overall length

PROJECTILE:

Painted Black, with red stencilling.
11.5 inches; overall length w/ fuze.
10.285 inches, overall length w/o fuze.
2.579 inches, distance from base to band.
0.625 inches, width of rotating band.
4.062 inches, diameter of base.
34.62 pounds, total weight.
8.11 ounces, weight of bursting charge.
TNT, type of bursting charge.
Tracer present in fuze.

CARTRIDGE CASE:

German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer.

FUZE:

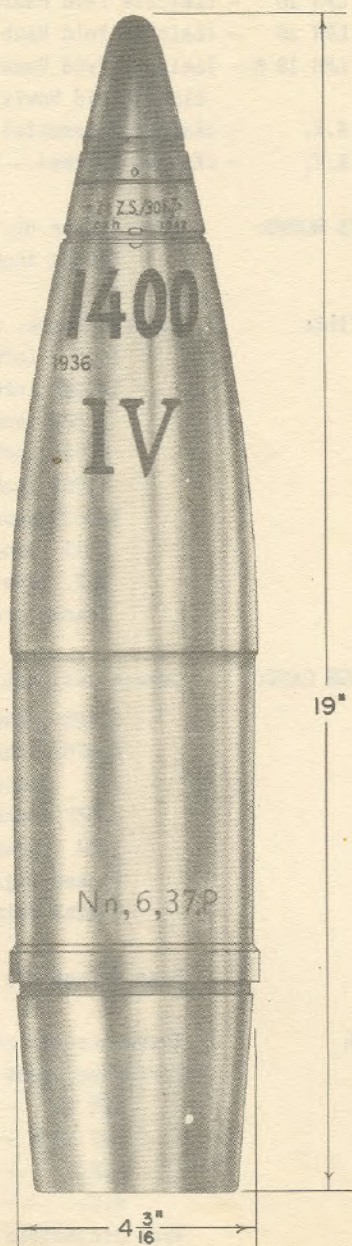
Base Detonating fuze - Bd. Z. f. 10cm.

REMARKS:

There are two cannellures below the rotating band.
Cartridge cases for other weapons are as follows:-
LFH 18 - 6342 (Semi-Fixed)
LFH 18 M - 6342 (Semi-Fixed)
K.K. - 6356 (Semi-Fixed) ?
K.T. - 6356 (Semi-Fixed) ?

When projectile has been fired from LFH 16 there will be 32 engravings on the band.

RESTRICTED
H.E. PROJECTILE
FOR FIELD HOWITZER, 105 mm.



F. H. Gr.

H.E. PROJECTILE FOR FIELD HOWITZER, 105 mm.

EMPLOYMENT:

10cm LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
 10cm LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18
 10cm LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
 Light Field Howitzer 18 Muzzle Brake
 10cm Stu H 42 - (Sturm Haubitze 42) - Assault Howitzer 42
 10cm LG 40 - (Leuchtes Geschutz 40) - Recoilless Gun for Airborne Troops
 10cm LG 42 - (Leuchtes Geschutz 42) - Recoilless Gun for Airborne Troops

COMPLETE ROUND: Description of c/r is for LFH 16.
25.295 inches, overall length.

PROJECTILE: Painted Green.

- 19.17 inches, overall length w/ fuze.
- 15.55 inches, overall length w/o fuze.
- 3.385 inches, distance from base to rotating band.
- 0.59 inches, width of single rotating band.
- 33.08 pounds, total weight.
- 3.0 pounds, weight of bursting charge plus
- 4.0 ounces, red phosphorus smoke box.
- TNT or Amatol, type of bursting charge.
- Gr. Zdlg C/98 No booster.

CARTRIDGE CASE: German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer.

This case may be of brass-coated steel, unpainted steel or black steel spirally wound. In the last instance it is designated and marked 6342/65C.

FUZE: Nose Percussion Fuze AZ 23v (0.15), (0.25) or
Time and Percussion Fuze Dopp Z s/60.

PACKAGING: One projectile in a wooden crate - 41.8 pounds.

REMARKS:

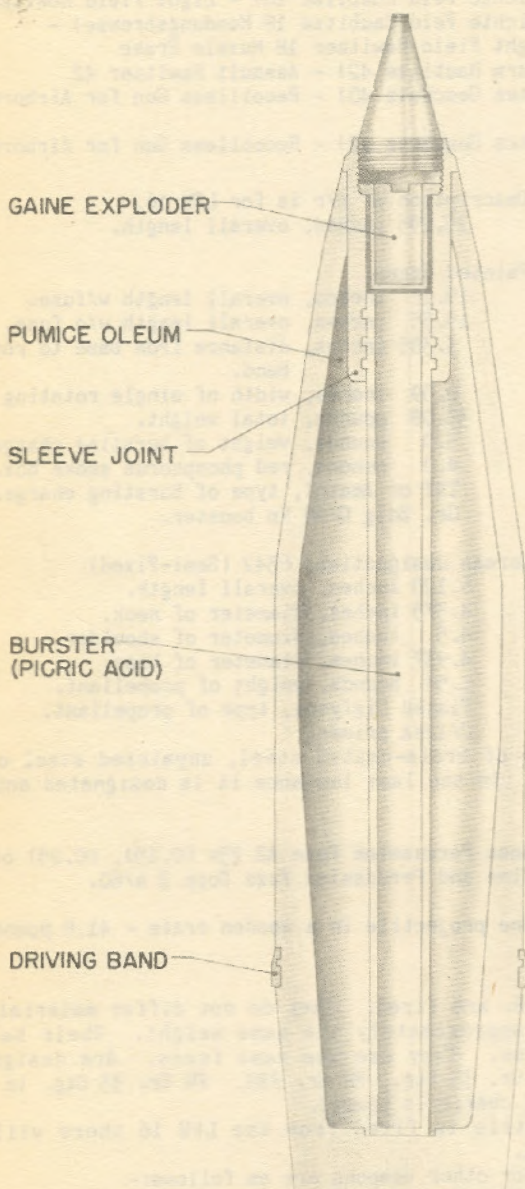
Four types of H.E. are fired. They do not differ materially from each other and have approximately the same weight. Their ballistic qualities are the same. They use the same fuzes. Are designated:- FH Gr., FH Gr. 38, FH Gr. 33 Stg., FH Gr. PES. FH Gr. 33 Stg. is of cast steel and the bursting charge is poured.

When the projectile is fired from the LFH 16 there will be 32 engravings on the band.

Cartridge cases for other weapons are as follows:-

LFH 18 - 6342 (Semi-Fixed)
LFH 18 M - 6342 (Semi-Fixed)
LG 40 - Plastic disc base side primer (Semi-Fixed)
LG 42 - Plastic disc base side primer (Semi-Fixed)
Stu H 42 - -

RESTRICTED
SMOKE PROJECTILE
FOR FIELD HOWITZER, 105 mm.



10cm F. H. Gr. Nb.

RESTRICTED

SMOKE PROJECTILE FOR FIELD HOWITZER, 105 mm.

GERMAN DESIGNATION: 10cm F.H. Gr. Nb. (Feld Haubitze Granate Nebel)

EMPLOYMENT:

LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18
LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake
Stu H 42 - (Sturm Haubitze 42) - Assault Howitzer 42

COMPLETE ROUND: Description of c/r is for LFH 16.
15.905 inches, overall length.

PROJECTILE: Painted Green, stencilled in white.
19.29 inches, overall length w/fuze.
17.32 inches, overall length w/o fuze.
3.385 inches, distance from base to band.
0.59 inches, width of rotating bands.
3.3 inches, diameter of base.
30.8 pounds, total weight.
4.3 ounces, weight of bursting charge.
Picric Acid , type of bursting charge.
4.1 pounds, weight of smoke mixture.
Oleum impregnated in pumice, type of smoke
mixture.
Zdkg C/98 booster.
"Nb" Stencilled on body.

CARTRIDGE CASE: German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer.

FUZE: Nose Percussion Fuze K1 AZ 23 Nb

PACKAGING: One round in wooden crate - 40 pounds.

REMARKS:

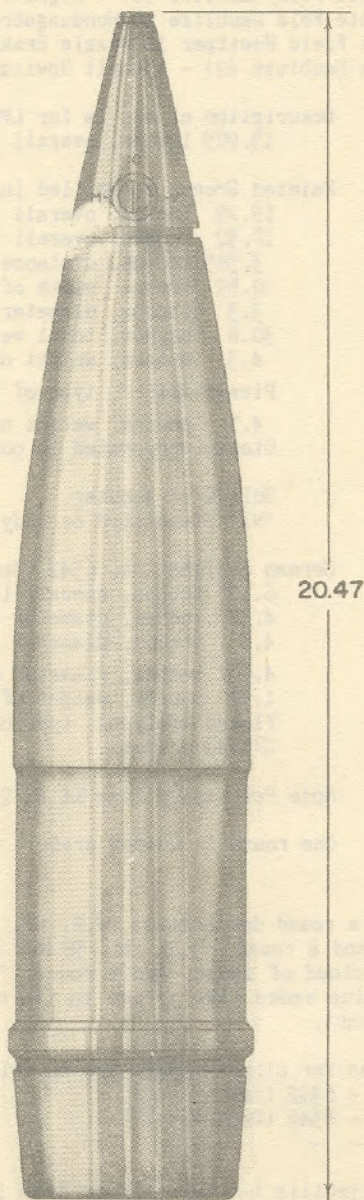
There is also a round designated: "F.H. Gr. 40 Nb" believed to be of the ejector type, and a round, "F.H. Gr. 38 Nb" similar to the above but producing a large cloud of smoke, and a round, "F.H. Gr. 40 Deut" which emits a cloud of blue smoke lasting one to two minutes and is used as a marker for air support.

Cartridge cases for other weapons are as follows:-

LFH 18 - 6342 (Semi-Fixed)
LFH 18 M - 6342 (Semi-Fixed)
Stu H 42 - -

When this projectile has been fired from LFH 16 there will be 32 engravings on the band.

RESTRICTED
H.E. PROJECTILE FOR LONG
DISTANCE USE IN FIELD HOWITZER, 105mm.



10cm F. H. Gr. F.

RESTRICTED

H.E. PROJECTILE FOR LONG DISTANCE USE IN FIELD HOWITZER, 105 mm.

GERMAN DESIGNATION: 10cm F.H. Gr. F.
(Feld Haubitze Granate (distance))

EMPLOYMENT:

LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake

COMPLETE ROUND: 24.233 inches, overall length.

PROJECTILE: Painted Green.

20.47 inches, overall length w/ fuze.

16.77 inches, overall length w/o fuze.

2.362 inches, distance from base to band.

0.59 inches, width of rotating band.

32.58 pounds, total weight.

Amatol, type of bursting charge.

CARTRIDGE CASE: German designation, 6342.

6.125 inches, overall length.

4.375 inches, diameter of neck.

4.5 inches, diameter of shoulder.

4.937 inches, diameter of base.

3.4 pounds, weight of propellant.

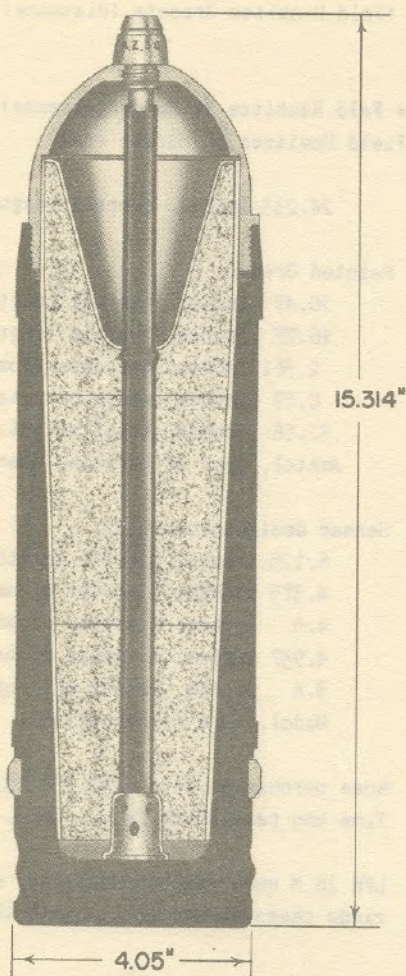
Gudol, type of propellant.

FUZE: Nose percussion fuze - AZ 23v (0.15) or
Time and percussion fuze - Dopp. Z. s/60 Fl.

REMARKS: LFH 18 M uses same projectiles, charges and cartridge cases as the LFH 18 with the above addition.

RESTRICTED

HOLLOW CHARGE PROJECTILE, 105mm.



10cm Gr. 39 rot HL

GERMAN DESIGNATION: 10cm Gr. 39 rot HL
(Granate 39 rot Hohl Ladung)

EMPLOYMENT:

- 10cm LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
- 10cm LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18
- 10cm LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake
- 10cm LG 40 - (Leuchtes Geschutz 40) - Light Recoilless Gun for Air-
borne Troops.
- 10cm LG 42 - (Leuchtes Geschutz 42) - Light Recoilless Gun for Air-
borne Troops.

COMPLETE ROUND: Description of c/r is for LFH 16.
12.699 inches, overall length.

PROJECTILE: Painted Green, with red band above rotating band.
15.314 inches, overall length w/ fuze.
2.165 inches, distance from base to band.
0.669 inches, width of rotating band.
4.055 inches, diameter of base.
25.56 pounds, total weight.
3.91 pounds, weight of bursting charge.
Cyclonite/Wax/TNT, type of bursting charge.
Zdlg 40 booster.

CARTRIDGE CASE: German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer.

FUZE: Nose percussion fuze AZ 38.

REMARKS:

When used with LG 40, rotating band is 0.59 inches in width.

Cartridge cases for other weapons are as follows:-

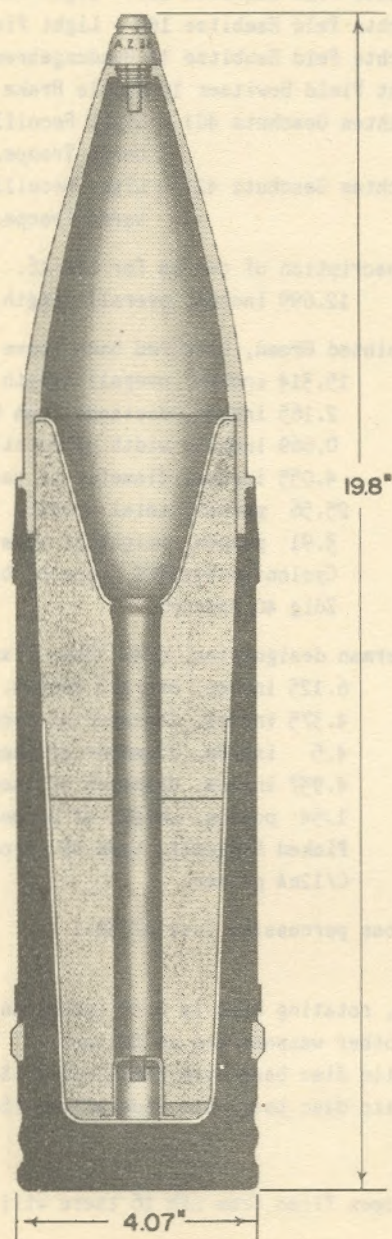
- LG 40 - Plastic disc base with side primer (Semi-Fixed)
- LG 42 - Plastic disc base with side primer (Semi-Fixed)
- LFH 18 - 6342
- LFH 18 M - 6342

When projectile has been fired from LFH 16 there will be 32 engravings on the band.

RESTRICTED

TYPE A, 105mm.

HOLLOW CHARGE PROJECTILE,



10cm Gr. 39 rot HL/A

RESTRICTED

HOLLOW CHARGE PROJECTILE, TYPE A, 105 mm.

GERMAN DESIGNATION: 10cm Gr. 39 rot HL/A
(Granate 39 rot Hohl Ladung/A)

EMPLOYMENT:

10cm LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
10cm LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18.
10cm LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake
10cm LG 40 - (Leuchtes Geschutz 40) - Light Recoilless Gun for Air-
borne Troops.
10cm LG 42 - (Leuchtes Geschutz 42) - Light Recoilless Gun for Air-
borne Troops.

COMPLETE ROUND: Description of c/r is for LFH 16.
23.76 inches, overall length.

PROJECTILE: Painted Green, with red band above rotating band.
19.803 inches, overall length w/fuze.
2.165 inches, distance from base to band.
0.669 inches, width of rotating band.
4.074 inches, diameter of base.
27.156 pounds, total weight.
Cyclonite/Wax/TNT, type of bursting charge.
Zdlg 40 booster.

CARTRIDGE CASE: German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer.

FUZE: Nose percussion fuze AZ 38.

REMARKS:

When used with LG 40, rotating band is 0.59 inches in width.

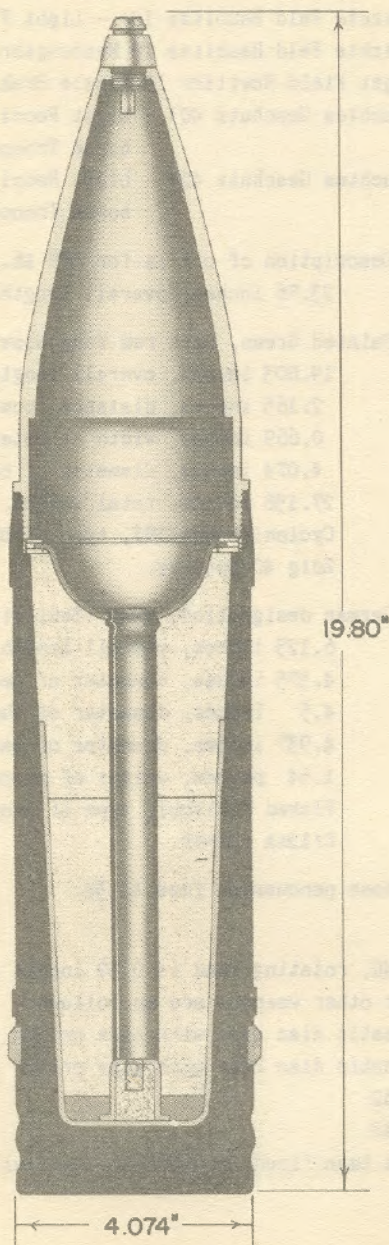
Cartridge cases for other weapons are as follows:-

LG 40 - Plastic disc base with side primer (Semi-Fixed)
LG 42 - Plastic disc base with side primer (Semi-Fixed)
LFH 18 - 6342
LFH 18 M - 6342

When projectile has been fired from LFH 16 there will be 32 engravings on the band.

RESTRICTED

HOLLOW CHARGE PROJECTILE, TYPE B, 105mm.



10cm Gr. 39 HL/B

RESTRICTED

HOLLOW CHARGE PROJECTILE, TYPE B, 105 mm.

GERMAN DESIGNATION: 10cm Gr. 39 HL/B
(Granate 39 Hohl Ladung/B)

EMPLOYMENT:

10cm LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
10cm LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18
10cm LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake
10cm LG 40 - (Leuchtes Geschutz 40) - Light Recoilless Gun for Air-
borne Troops.
10cm LG 42 - (Leuchtes Geschutz 42) - Light Recoilless Gun for Air-
borne Troops.

COMPLETE ROUND: Description of c/r is for LFH 16.
23.76 inches, overall length.

PROJECTILE: Painted Green, with red band above rotating band.
19.803 inches, overall length w/fuze.
2.165 inches, distance from base to band.
0.669 inches, width of rotating band.
4.074 inches, diameter of base.
26.719 pounds, total weight.
Cyclonite/Wax/TNT, type of bursting charge.
Zdlg 40 booster.

CARTRIDGE CASE: German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer.

FUZE: Nose percussion fuze AZ 38.

REMARKS:

When used with LG 40, rotating band is 0.59 inches in width.

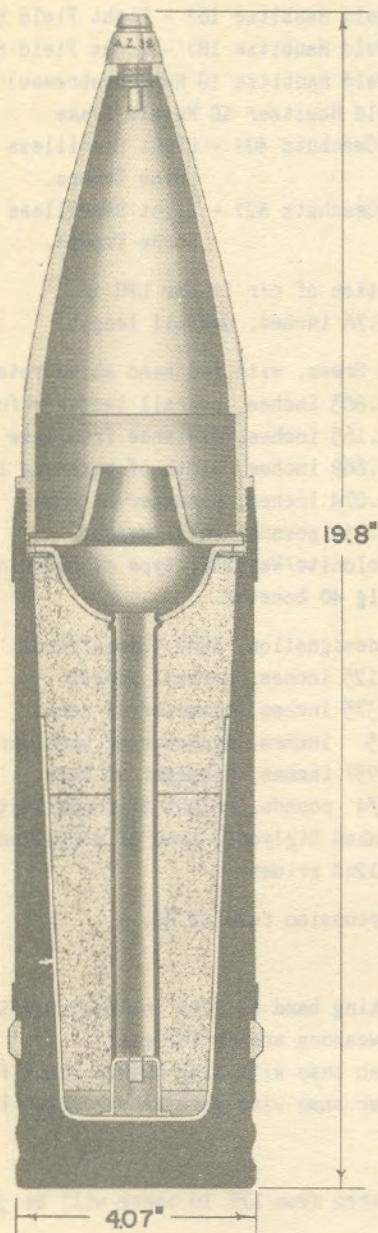
Cartridge cases for other weapons are as follows:-

LG 40 - Plastic disc base with side primer (Semi-Fixed)
LG 42 - Plastic disc base with side primer (Semi-Fixed)
LFH 18 - 6342
LFH 18 M - 6342

When projectile has been fired from LFH 16 there will be 32 engravings on the band.

RESTRICTED

HOLLOW CHARGE PROJECTILE, TYPE C, 105mm.



10cm Gr. 39 rot HL/C

RESTRICTED

HOLLOW CHARGE PROJECTILE, TYPE C, 105 mm.

GERMAN DESIGNATION: 10cm Gr. 39 rot HL/C
(10cm Granate 39 rot Hohl Ladung/C)

EMPLOYMENT:

- 10cm LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
- 10cm LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18
- 10cm LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake
- 10cm LG 40 - (Leuchtes Geschutz 40) - Light Recoilless Gun for Air-
borne Troops.
- 10cm LG 42 - (Leuchtes Geschutz 42) - Light Recoilless Gun for Air-
borne Troops.

COMPLETE ROUND: Description of c/r is for LFH 16.
23.76 inches, overall length.

PROJECTILE: Painted Green, red band above rotating band.
19.803 inches, overall length w/fuze.
2.165 inches, distance from base to rotating
band.
0.650 inches, width of rotating band.
4.074 inches, diameter of base.
26.875 pounds, total weight.
3.286 pounds, weight of bursting charge.
Cyclonite/Wax/TNT, type of bursting charge.
Zdlg 40 booster.

CARTRIDGE CASE: German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12A primer.

FUZE: Nose percussion fuze AZ 38.

REMARKS:

When used with LG 40, rotating band is 0.59 inches in width.

Cartridge cases for other weapons are as follows:-

- LG 40 - Plastic disc base with side primer (Semi-Fixed)
- LG 42 - Plastic disc base with side primer (Semi-Fixed)
- LFH 18 - 6342
- LFH 18 M - 6342

When projectile has been fired from LFH 16 there will be 32 engravings
on the band.

GERMAN DESIGNATION: 10cm F.H. Gr. Sprg. Brand.
(Feld Haubitze Granate Spreng Brand)

EMPLOYMENT:

10cm LFH 16 - (Leichte Feld Haubitze 16) - Light Field Howitzer 16
10cm LFH 18 - (Leichte Feld Haubitze 18) - Light Field Howitzer 18
10cm LFH 18 M - (Leichte Feld Haubitze 18 Mundungsbremse) -
Light Field Howitzer 18 Muzzle Brake

COMPLETE ROUND: Description of c/r is for LFH 16.
18.29 inches, overall length.

PROJECTILE: Painted Grey, stencilled in black.
15.55 inches, overall length.
3.385 inches, distance from base to band.
3.346 inches, diameter of base.
34.81 pounds, weight of bursting charge.
TNT and Incendiary Composition, type of
bursting charge.
Stencilled "BR" on body.

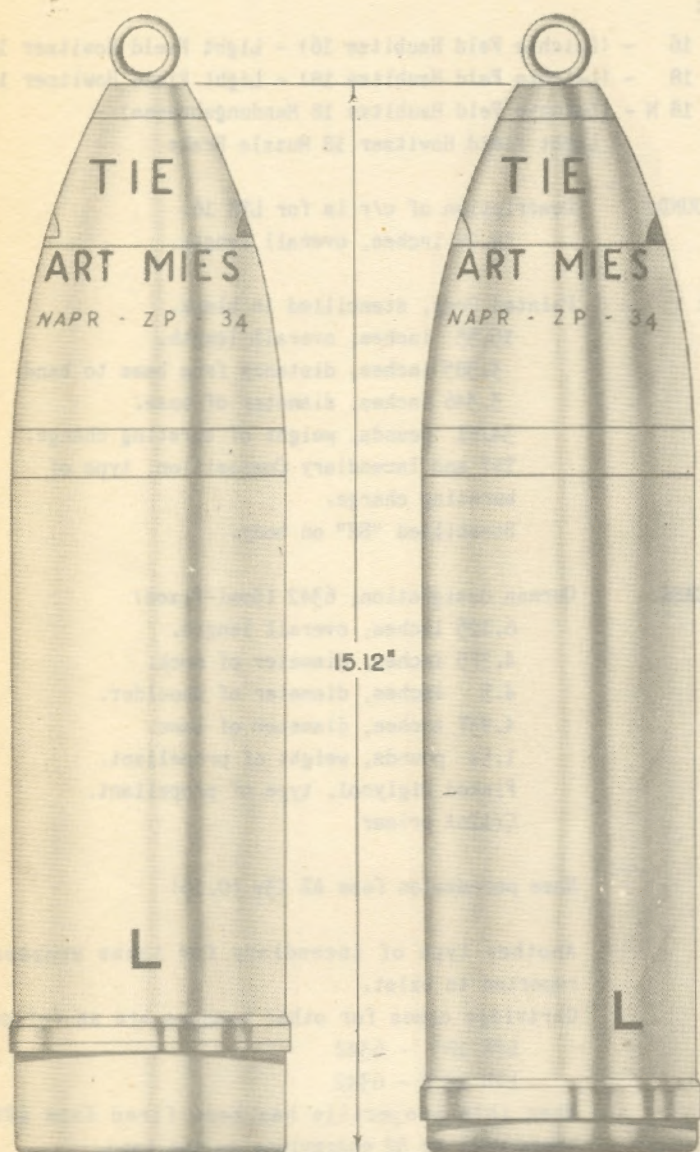
CARTRIDGE CASE: German designation, 6342 (Semi-Fixed)
6.125 inches, overall length.
4.375 inches, diameter of neck.
4.5 inches, diameter of shoulder.
4.937 inches, diameter of base.
1.54 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer

FUZE: Nose percussion fuze AZ 23v (0.15)

REMARKS: Another type of incendiary for these weapons is
reported to exist.
Cartridge cases for other weapons are as follows:-
LFH 18 - 6342
LFH 18 M - 6342
When this projectile has been fired from LFH 16
there will be 32 engravings on the band.

RESTRICTED

H.E. PROJECTILE, MODEL 15, FOR SKODA HOWITZER, 105mm.



RESTRICTED H.E. PROJECTILE, MODEL 15, FOR SKODA HOWITZER, 105 mm.

GERMAN DESIGNATION: Not known.

EMPLOYMENT: 10cm Skoda Howitzer. 4/19

PROJECTILE: Unpainted. There are two types:

I II

15.12 inches; 15.12 inches, overall length w/o fuze.

0.55 inches; 0.55 inches, width of rotating band.

28.62 pounds; 28.62 pounds, total weight.

*0.58 inches; 1.57 inches, distance from base to band.

TNT ; TNT , type of bursting charge.

CARTRIDGE CASE: Designation Unknown.

There are two types of cartridge cases: (1) is used for a plug-in style of primer (diameter of primer 0.83 inches); (2) is used for screw-in type of primer (diameter of primer 1.3 inches).

On base of case is stamped year of manufacture, lot number and caliber of piece.

FUZES: Fuzes of French origin are used as follows:

1. Nose Percussion Fuze Model 18

German designation, AZ 24/31 RYC wz 18

2. Nose Percussion Fuze Model 15

German designation, AZ 24/31 Wz 99/15

3. Time and Percussion Fuze Model 18

German designation, Dopp Z. 24/31 A wz 18

4. Time and Percussion Fuze Model 15

German designation, Dopp Z. 24/31 L.D. 17

There are three types of the Nose Percussion Fuze Model 18

1) Instantaneous (B.Z.) Tip painted Green.

2) Short Delay (K.Z.) Black

3) Long Delay (D.Z.) Black, detonator violet.

and three types of the Nose Percussion Fuze Model 15

1) Instantaneous (B.Z.) Upper part of fuze painted white.

2) Short Delay (.05 sec) Upper part of fuze painted black.

3) Long Delay (.15 sec) Upper part of fuze painted black, detonator violet.

Time and percussion fuze Model 18 has a cap which is black with a green stripe on its lower edge. Maximum time of delay - 31 sec.

Time and percussion fuze Model 17 is similar to 18. Maximum time of delay - 51 sec.

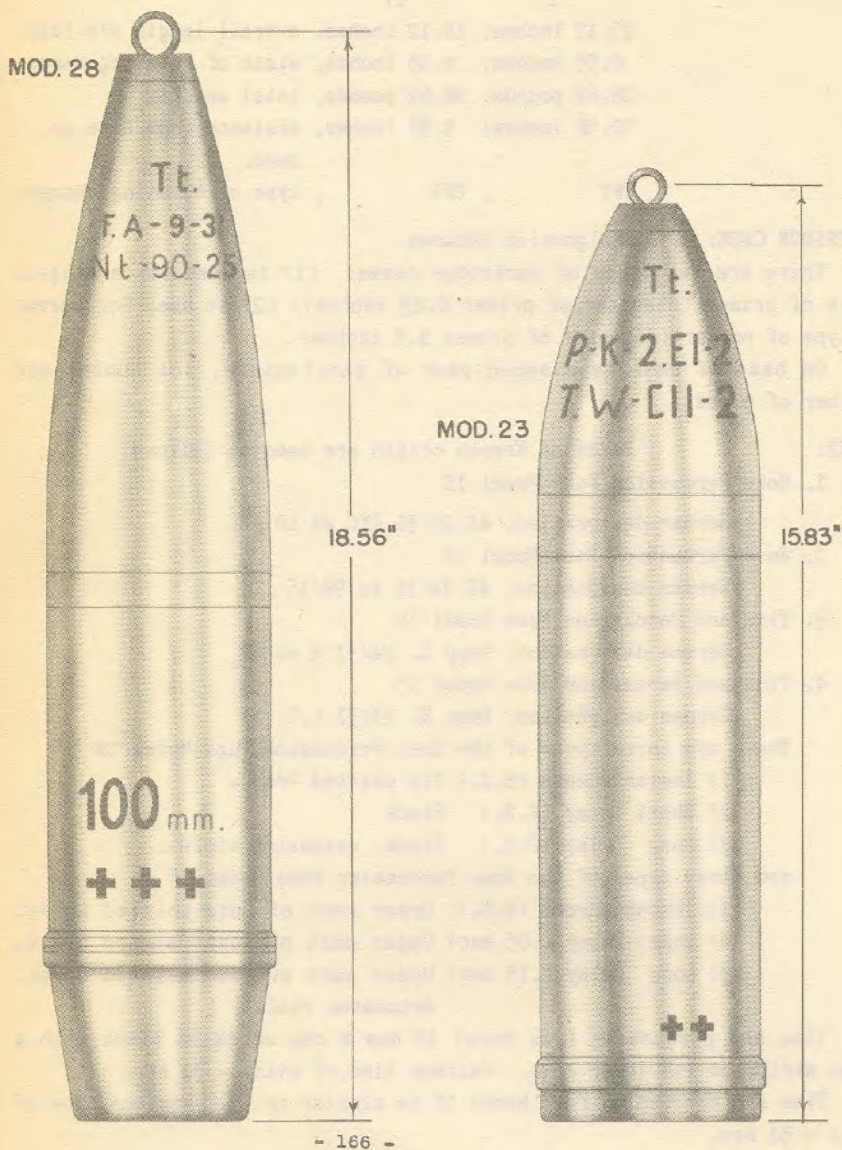
REMARKS:

*The position of the rotating band, it will be noted, is the only distinction between these two projectiles.

These projectiles have fallen into German hands in considerable quantities and are reported to be in use with the German Army.

RESTRICTED

H.E. PROJECTILES, MODELS 23 AND 28 FOR SKODA HOWITZER, 105 mm.



RESTRICTED

H.E. PROJECTILES, MODELS 23 AND 28 FOR SKODA HOWITZER, 105 mm.

GERMAN DESIGNATION: Not known.

EMPLOYMENT: 10cm Skoda Howitzer.

PROJECTILE: Model 23 Model 28
15.83 inches; 18.56 inches, overall length
0.51 inches; 0.63 inches, width of rotating band.
30.6 pounds; 31.21 pounds, total weight.
TNT ; TNT , type of bursting charge.
0.59 inches; 2.74 inches, distance from base to
band.
Yellow ; Unpainted , color of projectile.

CARTRIDGE CASE: Designation Unknown.

There are two types of cartridge cases: (1) is used for a plug-in style of primer (diameter of primer 0.83 inches); (2) is used for screw-in type of primer (diameter of primer 1.3 inches).

On base of case is stamped year of manufacture, lot number and caliber of piece.

FUZES: Fuzees of French origin are used as follows:

1. Nose Percussion Fuze Model 18
German designation, AZ 24/31 RYC wz 18
2. Nose Percussion Fuze Model 15
German designation, AZ 24/31 Wz 99/15
3. Time and Percussion Fuze Model 18
German designation, Dopp Z. 24/31 A wz 18
4. Time and Percussion Fuze Model 15
German designation, Dopp Z. 24/31 L.D. 17

There are three types of the Nose Percussion Fuze Model 18

- 1) Instantaneous (B.Z.) Tip painted Green.
- 2) Short Delay (K.Z.) Black.
- 3) Long Delay (D.Z.) Black, detonator violet.

and three types of the Nose Percussion Fuze Model 15

- 1) Instantaneous (B.Z.) Upper part of fuze painted white.
- 2) Short Delay (.05 sec) Upper part of fuze painted black.
- 3) Long Delay (.15 sec) Upper part of fuze painted black, detonator violet.

Time and percussion fuze Model 18 has a cap which is black with a green stripe on its lower edge. Maximum time of delay - 31 sec.

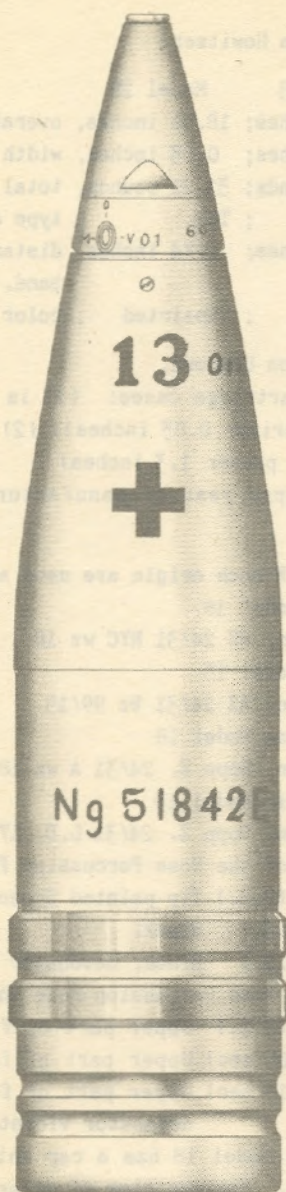
Time and percussion fuze Model 17 is similar to 18. Maximum time of delay - 51 sec.

REMARKS:

These projectiles have fallen into German hands in considerable quantities and are reported to be in use with the German Army.

RESTRICTED

H.E. PROJECTILE, TYPE L/4.4 Kz., 105mm.



10 cm Sprgr. Patr. L/4.4 Kz.

RESTRICTED

H.E. PROJECTILE, TYPE L/4.4 Kz., 105 mm.

GERMAN DESIGNATION: 10cm Sprgr. Patr. L/4.4 Kz.
(Sprenggranate Patrone Ladung/4.4 Kopfzunder)

EMPLOYMENT:

10cm Flak 38 - (Flugabwehrkanone 38) - Anti-Aircraft Gun 38
10cm Flak 39 - (Flugabwehrkanone 39) - Anti-Aircraft Gun 39

COMPLETE ROUND: Description of c/r fits either weapon.
46.0 inches, overall length.

PROJECTILE: Painted Yellow.
14.369 inches, overall length w/o fuze.
2.480 inches, distance from base to rotating band.
0.669 inches, width of rotating bands.
Two, number of rotating bands.
4.133 inches, diameter of base.
33.2 pounds, total weight.
3.3 pounds, weight of bursting charge.
TNT, type of bursting charge.

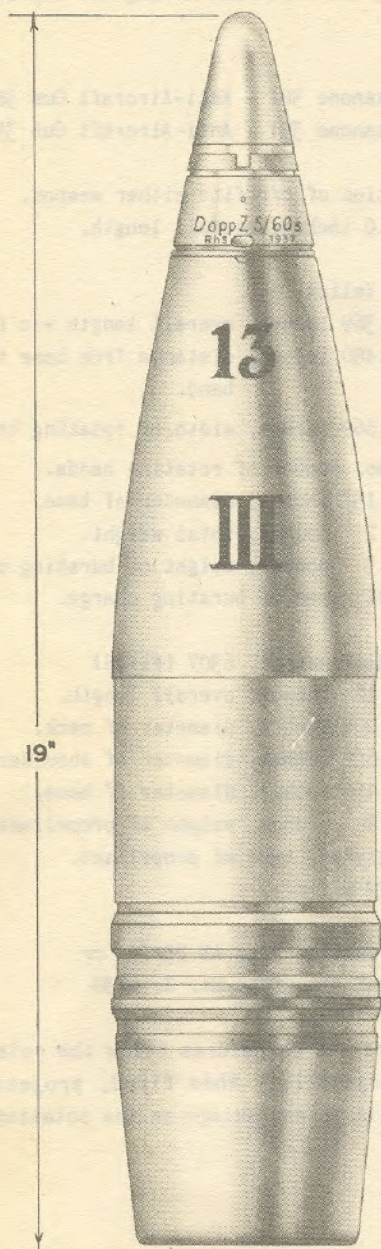
CARTRIDGE CASE: German designation, 6307 (Fixed)
30.17 inches, overall length.
4.204 inches, diameter of neck.
4.628 inches, diameter of shoulder.
5.450 inches, diameter of base.
10.9 pounds, weight of propellant.
Diglycol, type of propellant.
C/22 primer.

FUZE: Nose percussion fuze AZ 23/28v or
Mechanical time fuze Zt. Z. s/30

REMARKS: There are two cannellures below the rotating band c
this projectile. When fired, projectile will t
found with 36 engravings on the rotating band.

RESTRICTED

H.E. PROJECTILE, TYPE 19, 105mm.



Gr. 19 Kz 13

GERMAN DESIGNATION: Gr. 19 Kz 13

(Granate 19 Kopfzunder 13)

EMPLOYMENT:

s. 10cm K 18 - (Schweres 10cm Kanone 18) - Heavy 10cm Gun 18

10cm K.T. - (Kanone Turren) - Turret Gun

lg. 10cm K.T. - (lange 10cm Kanone Turren) - long 10cm Turret Gun

COMPLETE ROUND:

Description of c/r is for s. 10cm K 18.

33.09 inches, overall length.

PROJECTILE:

Painted Green.

19.17 inches, overall length w/fuze.

3.582 inches, distance from base to band.

0.669 inches, width of rotating bands.

Two, number of rotating bands.

3.464 inches, diameter of base.

32.58 pounds, total weight.

3.5 pounds, weight of bursting charge.

TNT, type of bursting charge.

C/98 Np booster.

CARTRIDGE CASE:

German designation, 6349 (Semi-Fixed)

17.5 inches, overall length.

4.41 inches, diameter of neck.

No shoulder.

5.12 inches, diameter of base.

12.85 pounds, weight of propellant.

Tubular Diglycol, type of propellant.

C/12nA primer.

FUZE:

Nose percussion fuze - AZ 23v (0.15) or

Time and percussion fuze - Dopp. Z. s/60.

REMARKS:

When fired from s. 10cm K 18 projectile will bear
36 engravings on rotating band.

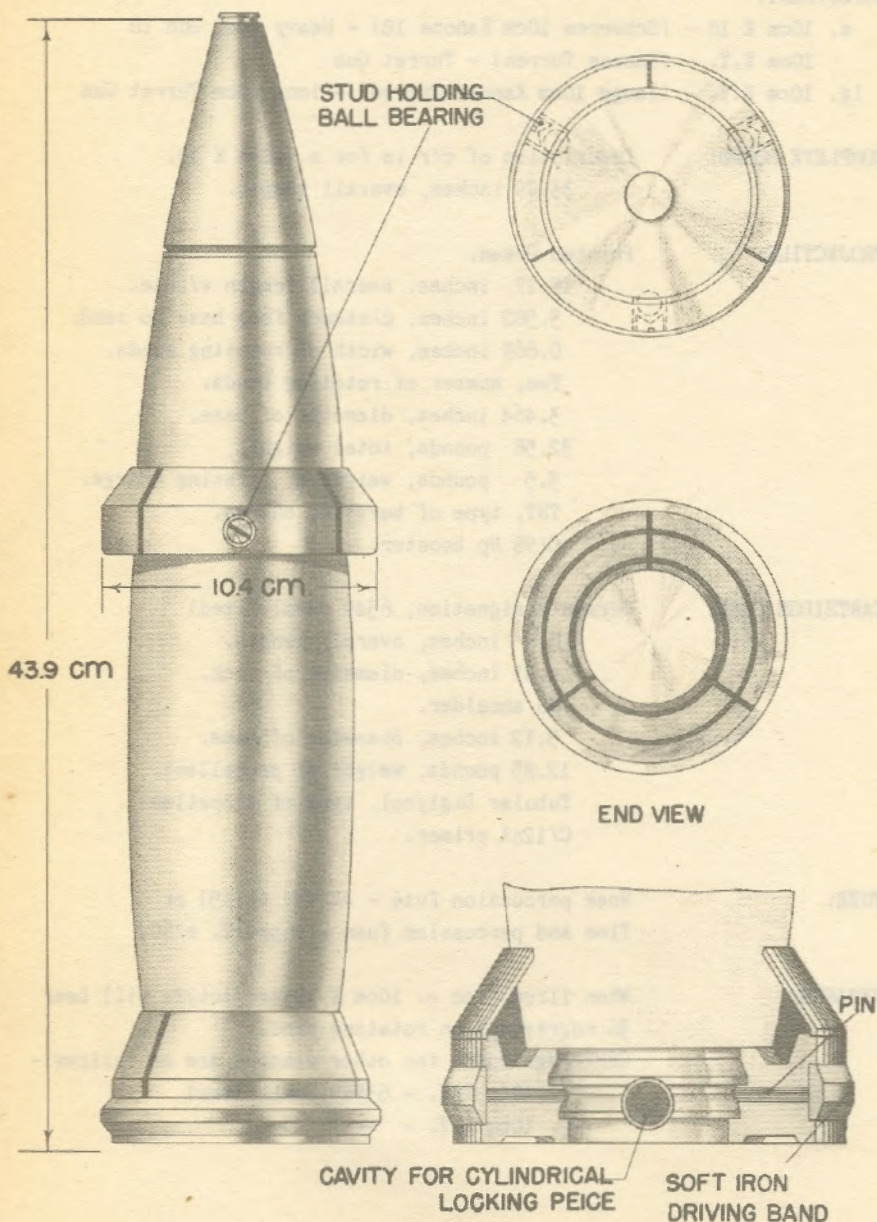
Cartridge cases for other weapons are as follows:-

10cm K.T. - 6356 (Semi-Fixed)

lg. 10cm K.T. - -

RESTRICTED

H.E. PROJECTILE, WITH DISINTEGRATING BAND, 105mm.



RESTRICTED H.E. PROJECTILE WITH DISINTEGRATING BANDS, 105 mm.

GERMAN DESIGNATION: Not known. ~~3.2 inch 81 mm. (81 mm. 3.2 inch)~~

EMPLOYMENT: Not known. 10 cm FLAK 38, 39? ~~4.2 inch 107 mm.~~

PROJECTILE: Painted Yellow.
23.1 pounds, total weight.
1.1 pounds, weight of bursting charge.
TNT, type of bursting charge.
Zdlg C/98 Np booster.

CARTRIDGE CASE: Not known.

FUZE: Nose Percussion Fuze AZ 23v.

PACKAGING: One in a wooden crate.

REMARKS:

At the shoulder of the projectile is a detachable guide band. This band is trisected by cuts almost completely through the band and the complete band, which is a push fit on the shoulder, it is held in position by three ball bearings. These are seated in cavities spaced equally round the periphery of the shoulder of the shell and project into cylindrical drillings through each segment of the guide band. The drillings are threaded towards the outer circumference and the ball bearings after insertion are finally located by screws which seat the outer surface of the bearings. After insertion of the balls and the positioning of the three screws, therefore, the guide band is firmly attached to the shell body, but should trisection of the guide band be completed, each segment, together with its retaining ball, would therefore be free to fall away from the shell body.

The rotating band holder is located at the base of the shell, which is keyed to receive it. The holder itself is in three detached segments held in position only by the soft iron driving band. Movement is prevented by three cylindrical pieces fitting into cavities located in the shell body and the driving band holder. There are also three cylindrical pins between the segments.

It is believed that after leaving the gun the guide band and the rotating band holder are each split into three separate segments which, together with the ball bearings, pins and cylindrical pieces retaining them, are flung off. The remaining projectile is then of much better aero-dynamic shape than is possible with a conventional projectile.

RESTRICTED

SOLID SHOT PROJECTILE, 150 mm.

GERMAN DESIGNATION: 15cm Kt.

EMPLOYMENT:

15cm s.H.T. - (schweres Haubitze Turren) - Heavy Turret Howitzer

PROJECTILE:

16.495 inches, overall length.

One, number of rotating bands.

5.905 inches, diameter of base.

88.0 pounds, total weight.

No bursting charge.

Solid steel body.

CARTRIDGE CASE:

German designation 6357 (Semi-Fixed)
C/12nA primer.

FUZE:

No fuze employed.

PACKAGING:

One projectile in a wicker basket - 94.6 pounds.

REMARKS:

This round has not as yet been recovered.
Information is from captured documents.

RESTRICTED

H.E. PROJECTILE, TYPE 36, 150 mm.

GERMAN DESIGNATION: 15cm Gr. 36 FES
(Granate 36 FES)

EMPLOYMENT:

15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18

COMPLETE ROUND:

28.916 inches, overall length.

PROJECTILE:

Painted Green.

23.07 inches, overall length.

4.409 inches, distance from base to band.

0.866 inches, width of rotating band -
sintered iron.

5.196 inches, diameter of base.

84.7 pounds, total weight.

CARTRIDGE CASE:

German designation, 6350

10.255 inches, overall length.

6.338 inches, diameter of mouth.

No shoulder.

7.007 inches, diameter of base.

C/12nA primer.

FUZE:

Nose Percussion Fuzes: AZ 23 (0.8) umg; AZ 23
(0.2) umg; AZ 23 m. 2 V umg or

Time and Percussion Fuzes: Dopp.Z.s/60s; Dopp.
Z.s/60 lm.

REMARKS:

This round has not been recovered as yet.

Information is from captured documents.

After firing, rotating band will bear 40 engravings.

RESTRICTED

HOLLOW CHARGE PROJECTILE, TYPE 39, 150 mm.

GERMAN DESIGNATION: 15cm Gr. 19 HL
(15cm Granate 19 Hohl Ladung)

"GRAFS-H/A"

EMPLOYMENT:

15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18
15cm s.F.H. 13 - (schweres Feld Haubitze 13) - Heavy Field Howitzer 13

PROJECTILE:

Painted Green.

22.834 inches, overall length.

5.905 inches, diameter of base.

54.076 pounds, total weight.

Cyclonite/Wax, type of bursting charge.

Tracer is fitted in base of projectile.

CARTRIDGE CASE:

German designation, 6350 (Semi-Fixed)

10.255 inches, overall length.

6.338 inches, diameter of neck.

No shoulder.

7.007 inches, diameter of base.

C/12nA primer.

FUZE:

Nose Percussion Fuze Kl AZ 40 Nb

PACKAGING:

One projectile in a wicker basket - 58.3 pounds.

REMARKS:

Cartridge case for s.F.H. 13 - 6303 (Semi-Fixed).
Information is from captured documents. Projectile
has not as yet been recovered.

After firing from s.F.H. 18, rotating band will bear
40 engravings.

RESTRICTED A.P. PROJECTILE TYPE L 3/8 WITH BALLISTIC CAP, 150 mm.

GERMAN DESIGNATION: 15cm Pzsprgr. L 3/8 m. Haube
(Panzersprengende Ladung 3/8 mit Haube)

EMPLOYMENT:

15cm K. ins Mrs. Laf. - (Kanone ins Morser Lafette) - Gun in Mortar
Mount
Naval 15cm Gun. C/28

PROJECTILE: Painted Blue for Naval use.
21.771 inches, overall length.
Two, number of rotating bands.
99.66 pounds, total weight.
Ballistic cap attached.
Unstreamlined base.

CARTRIDGE CASE: Not known. (4352)
RPC/32 propellant
(Tubular in form and composed as follows:-
Nitrocellulose - 64.76%
Nitroglycerine - 26.87%
Ethyl Centralite - 5.71%
Sodium Nitrate - 0.56%
Volatile Matter - 1.90%
Graphite - 0.20%

FUZE: Nose Percussion Fuze Bd. Z. C/38

PACKAGING: One projectile in wicker basket - 100 pounds.

REMARKS: This projectile is used interchangeably in land and
naval weapons.

RESTRICTED

H.E. PROJECTILE, TYPE L 4/5 WITH NOSE FUZE AND BALLISTIC CAP, 150 mm.

GERMAN DESIGNATION: 15cm Sprgr. L 4/5 Kz (m. Haube)
(Sprenggranate Ladung 4/5 Kopfzunder (mit Haube))

EMPLOYMENT:

15cm K. ins. Mrs. Laf. - (Kanone in Morser Lafette) - Gun in Mortar
Mounting

PROJECTILE:

26.7 inches, overall length.
Two, number of rotating bands.
One lead ring behind rotating bands.
100.0 pounds, total weight.
Ballistic cap.
Unstreamlined base.

CARTRIDGE CASE:

Not known.

14.15 Kg., weight of propellant when RPC/38 is
type of propellant.

14.0 Kg., weight of propellant when RPC/32 is
type of propellant.

(Tubular in form and composed as follows:-

Nitrocellulose - 64.76%

Nitroglycerine - 26.87%

Ethyl Centralite - 5.71%

Sodium Nitrate - 0.56%

Volatile Matter - 1.90%

Graphite - 0.20%

FUZE:

Nose Percussion Fuze Kz. C/27 lm. or St. or
Time and Percussion Fuze M. Dopp. Z. 3/60 St.

PACKAGING:

One projectile in a wicker basket - 105.6 pounds.

RESTRICTED

ANTI-CONCRETE PROJECTILE, 150mm.

WOODEN
BLOCK

CARDBOARD
CARTON

23.25"

5.842" DIA.

5.30"

15cm Gr. 19 rot Be

- 184 -

ANTI-CONCRETE PROJECTILE, 150 mm.

RESTRICTED

GERMAN DESIGNATION: 15cm Gr. 19 rot Be
(Granate 19 rot Beton)

EMPLOYMENT:

- 15cm K. 18 - (Kanone 18) - Gun 18
- 15cm K. 39 - (Kanone 39) - Gun 39
- 15cm K. (E) - (Kanone (Eisenbahn)) - Gun (Railway)

PROJECTILE:

Red band above rotating bands.
23.25 inches, overall length.
5.86 inches, diameter of bourrelet.
95.37 pounds, total weight.
7.12 pounds, weight of bursting charge.
TNT, type of bursting charge.
Tracer is fitted in base of fuze.

CARTRIDGE CASE:

(for K. 18) German designation, 6352 (Semi-Fixed)
32.07 inches, overall length
No shoulder.
7.007 inches, diameter of base.
Tubular Diglycol, type of propellant.
20.0 pounds, weight of propellant
small charge plus
3.0 ounces, igniter powder.
39.0 pounds, weight of propellant
medium charge plus
3.0 ounces, igniter powder.
43.0 pounds, weight of propellant
large charge plus
3.0 ounces, igniter powder.
C/12NA primer.

FUZE:

Base Detonating Fuze Bd. Z. f. 15cm Gr. 19 Be

PACKAGING:

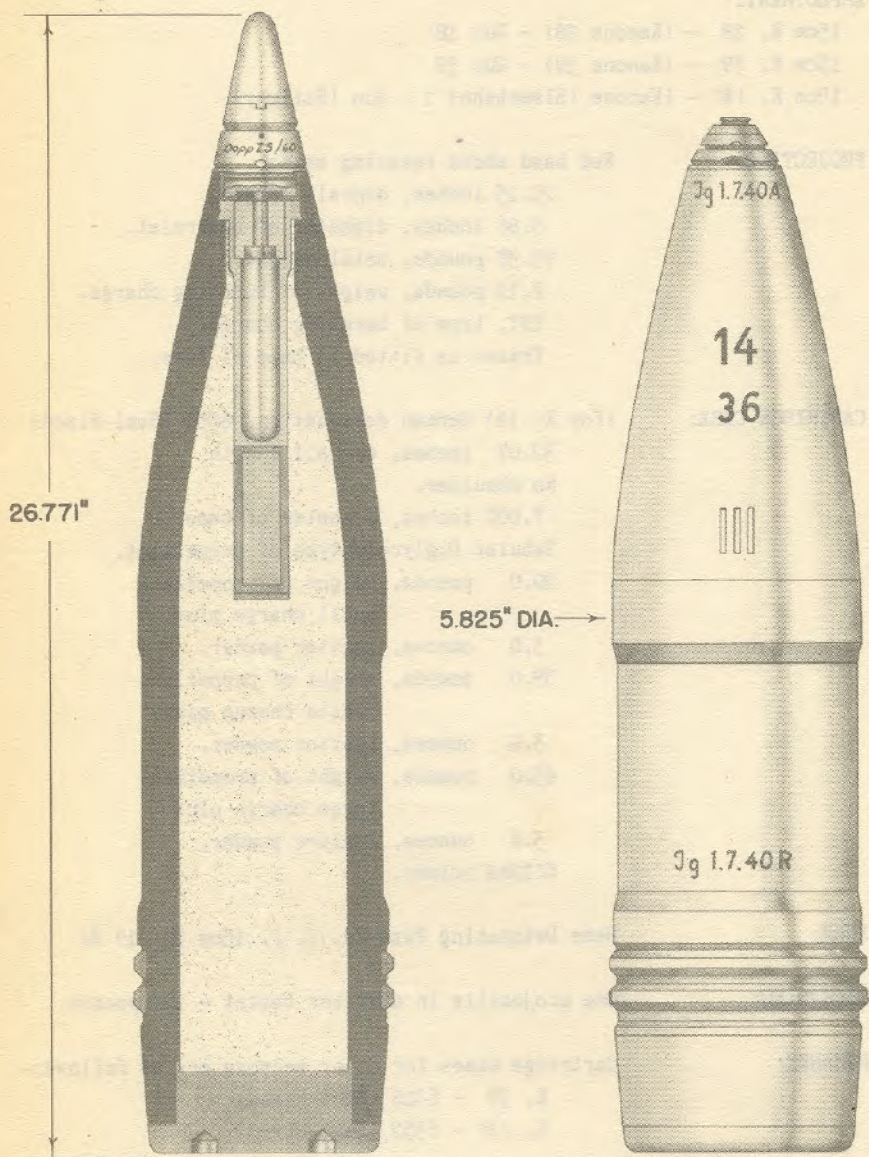
One projectile in a wicker basket - 102 pounds.

REMARKS:

Cartridge cases for other weapons are as follows:-
K. 39 - 6318 (Semi-Fixed)
K. (E) - 6352 (Semi-Fixed)

RESTRICTED

H.E. PROJECTILE, TYPE 19 WITH GAIN 36, 150mm.



15cm Gr. 19 mit Zdlg 36

RESTRICTED

H.E. PROJECTILE, TYPE 19 WITH GAINÉ 36, 150 mm.

GERMAN DESIGNATION: 15cm Gr. 19 mit Zdlg 36
(Granate 19 mit Zundladung 36)

EMPLOYMENT:

15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18

COMPLETE ROUND:

31.239 inches, overall length w/AZ fuze.
33.799 inches, overall length w/Dopp.Z. fuze.

PROJECTILE:

Painted Green.

24.211 inches, overall length w/AZ fuze.
26.771 inches, overall length w/Dopp.Z. fuze.
3.22 inches, distance from base to band.
0.472 inches, width of rotating bands.
Two, number of rotating bands.
5.825 inches, diameter of bourrelet.
5.196 inches, diameter of base.
95.7 pounds, total weight.
11.22 pounds, weight of bursting charge.
Poured TNT, type of bursting charge.
Projectile has screwed-in base plate.

CARTRIDGE CASE:

German designation, 6350 (Semi-Fixed)
10.255 inches, overall length.
6.338 inches, diameter of neck.
No shoulder.
7.007 inches, diameter of base.
Flaked Diglycol propellant.
C/12nA primer.

FUZE:

Nose Percussion Fuzes: AZ 23 (0.8) umg; AZ 23
(0.2) umg; AZ 23 m. 2 V umg or
Time and Percussion Fuzes: Dopp.Z.s/60s; Dopp.
Z.s/60 lm.

PACKAGING:

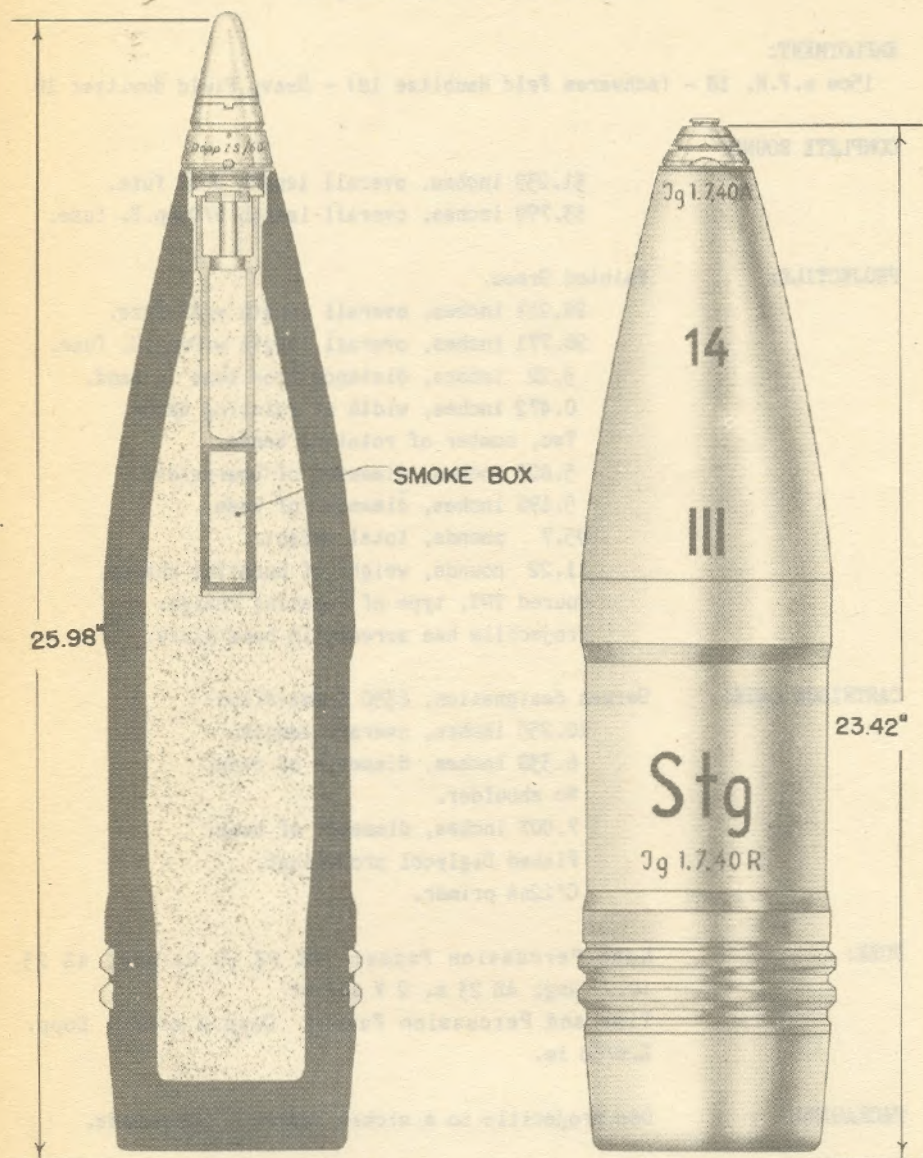
One projectile to a wicker basket - 100 pounds.

REMARKS:

After firing, projectile will bear 40 engravings on
rotating band.

RESTRICTED

H.E. PROJECTILE OF CAST STEEL, 150mm.



150mm Gr. 19 Stg.

RESTRICTED

H.E. PROJECTILE OF CAST STEEL, 150 mm.

GERMAN DESIGNATION: 15cm Gr. 19 Stg. (Granate 19 Stg.)

EMPLOYMENT:

- 15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18
- 15cm s.F.H. 13 - (schweres Feld Haubitze 13) - Heavy Field Howitzer 13
- 15cm s.H.T. - (schweres Haubitze Turren) - Heavy Turret Howitzer

COMPLETE ROUND:

Description of c/r is for s.F.H. 18.

32.991 inches, overall length w/Dopp.Z. fuze.

30.431 inches, overall length w/AZ fuze.

PROJECTILE:

Painted Green, stencilled in black.

23.424 inches, overall length w/AZ fuze.

25.984 inches, overall length w/Dopp.Z. fuze.

3.228 inches, distance from base to band.

0.472 inches, width of rotating bands.

Two, number of rotating bands.

5.826 inches, diameter of bourrelet.

5.196 inches, diameter of base.

95.7 pounds, total weight.

9.68 pounds, weight of bursting charge.

TNT (poured), type of filling plus smoke box
below gaine.

Zdlg 36 booster.

CARTRIDGE CASE:

German designation, 6350 (Semi-Fixed)

10.255 inches, overall length.

6.338 inches, diameter of mouth.

No shoulder.

7.007 inches, diameter of base.

11.750 pounds, weight of case.

Flaked Diglycol, type of propellant.

C/12nA primer.

FUZE:

Nose Percussion Fuzes: AZ 23 (0.8) umg; AZ 23
(0.2) umg; AZ 23 m. 2 V umg or

Time and Percussion Fuzes: Dopp.Z.s/60s; Dopp.
Z.s/60 lm.

REMARKS:

This projectile is made of cast steel.

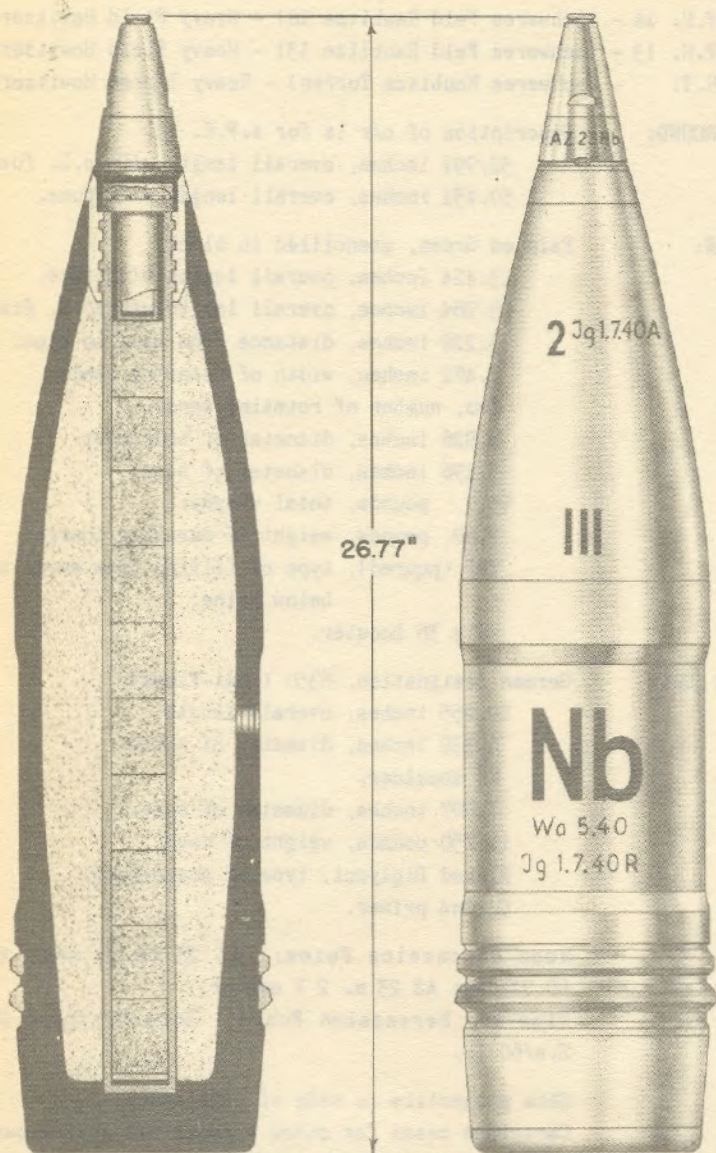
Cartridge cases for other weapons are as follows:-

s.F.H. 13 - 6303 (Semi-Fixed)

s.H.T. - 6357 (Semi-Fixed)

RESTRICTED

SMOKE PROJECTILE, TYPE 19, 150mm.



15cm Gr. 19 Nb

RESTRICTED

SMOKE PROJECTILE, TYPE 19. 150 mm.

GERMAN DESIGNATION: 15cm Gr. 19 Nb.
(Granate 19 Nebel)

EMPLOYMENT:

15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18
15cm s.F.H. 13 - (schweres Feld Haubitze 13) - Heavy Field Howitzer 13

COMPLETE ROUND: Description of c/r is for s.F.H. 18.
33.778 inches, overall length.

PROJECTILE: Painted Green, stencilled in white.
26.771 inches, overall length w/fuze.
3.22 inches, distance from base to band.
0.472 inches, width of rotating band -
Bimetallic.
5.825 inches, diameter of bourrelet.
5.196 inches, diameter of base.
85.8 pounds, total weight.
1.21 pounds, weight of bursting charge.
Picric Acid, type of bursting charge.
Gr. Zdlg C/98 Np booster.
14.08 pounds, weight of smoke mixture.
Oleum impregnated in pumice, type of smoke
mixture.
"Nb" stencilled on body.

CARTRIDGE CASE: German designation, 6350 (Semi-Fixed)
10.255 inches, overall length.
6.338 inches, diameter of neck.
No shoulder.
7.007 inches, diameter of base.
C/12nA primer.

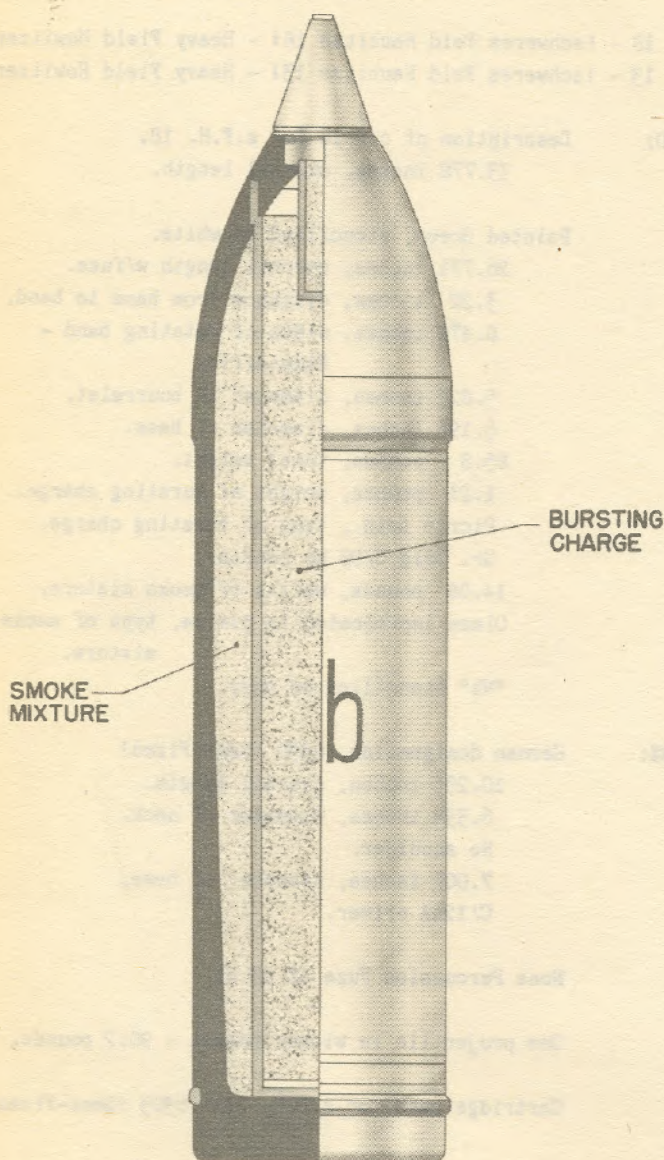
FUZE: Nose Percussion Fuze AZ 23 Nb

PACKAGING: One projectile in wicker basket - 90.2 pounds.

REMARKS: Cartridge case for s.F.H. 13 - 6303 (Semi-Fixed)

RESTRICTED

SMOKE PROJECTILE FOR HEAVY INFANTRY GUN, 150mm.



15cm Jgr. 38 Nb

RESTRICTED

SMOKE PROJECTILE FOR HEAVY INFANTRY GUN, 150 mm.

GERMAN DESIGNATION: 15cm Jgr. 38 Nb
(Jaeger 38 Nb)

EMPLOYMENT:

15cm s.I.G. 33 - (schweres Infanterie Geschutz 33) - Heavy Infantry
Gun 33

PROJECTILE:

Painted Green, stencilled in white.

25.747 inches, overall length.

0.433 inches, width of rotating band.

Bimetallic or sintered iron, composition of
rotating band.

5.905 inches, diameter of base.

84.0 pounds, total weight.

4.93 pounds, weight of bursting charge.

Picric Acid, type of bursting charge.

Gr. Zdlg. C/98 Np booster.

Oleum impregnated in pumice, type of smoke
mixture.

"Nb" stencilled on body.

CARTRIDGE CASE:

German designation, 6303 (Semi-Fixed)

4.448 inches, overall length.

6.102 inches, diameter of mouth.

No shoulder.

6.653 inches, diameter of base.

C/12nA primer.

FUZE:

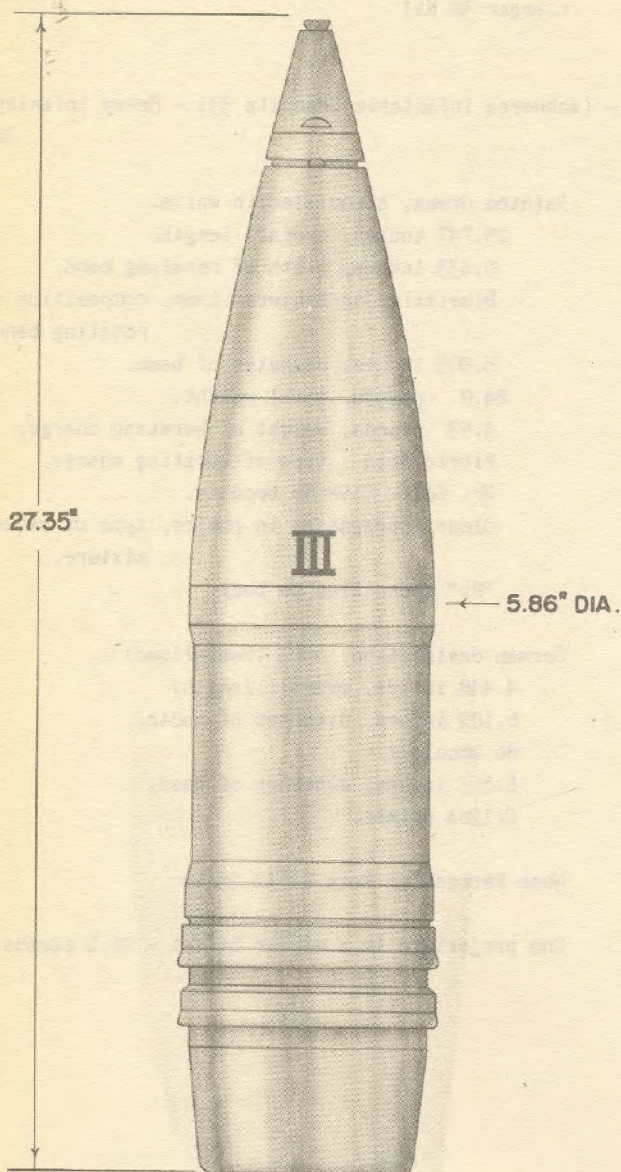
Nose Percussion Fuze Kl AZ 23 Nb

PACKAGING:

One projectile in a wicker basket - 90.2 pounds.

RESTRICTED

H.E. PROJECTILE, TYPE 18, 150mm.



15cm K. Gr. 18

RESTRICTED

H.E. PROJECTILE, TYPE 18. 150 mm.

GERMAN DESIGNATION: 15cm K. Gr. 18
(Kanone Granate 18)

EMPLOYMENT:

15cm K. 18 - (Kanone 18) - Gun 18
15cm K. 39 - (Kanone 39) - Gun 39
15cm K. (E) - (Kanone (Eisenbahn)) - Gun (Railway)

PROJECTILE:

27.35 inches, overall length.
5.86 inches, diameter of bourrelet.
Two, number of rotating bands.
94.75 pounds, total weight.

CARTRIDGE CASE: (for K 18) German designation 6352 (Semi-Fixed)

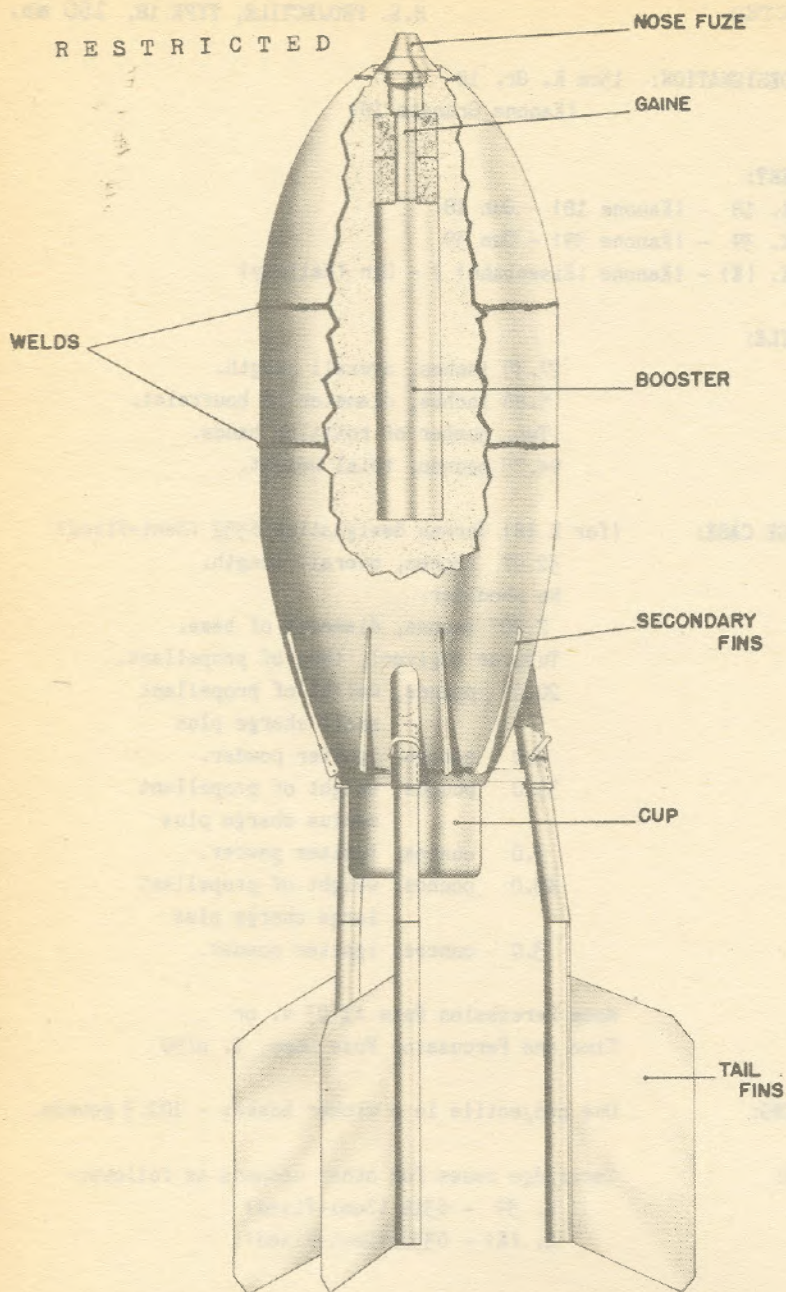
32.07 inches, overall length.
No shoulder
7.007 inches, diameter of base.
Tubular Diglycol, type of propellant.
20.0 pounds, weight of propellant
small charge plus
3.0 ounces, igniter powder.
39.0 pounds, weight of propellant
medium charge plus
3.0 ounces, igniter powder.
43.0 pounds, weight of propellant
large charge plus
3.0 ounces, igniter powder.

FUZE: Nose Percussion Fuze AZ 23 v. or
Time and Percussion Fuze Dopp. Z. s/90

PACKAGING: One projectile in a wicker basket - 102.3 pounds.

REMARKS: Cartridge cases for other weapons as follows:-
K. 39 - 6318 (Semi-Fixed)
K. (E) - 6352 (Semi-Fixed)

RESTRICTED



GERMAN 15 C STICK BOMB

RESTRICTED

RODDED BOMB FOR HEAVY INFANTRY GUN 33, 150 mm.

GERMAN DESIGNATION: 15cm Stielgranat 42

EMPLOYMENT:

15cm s.I.G. 33 - (schweres Infanterie Geschutz 33) - Heavy Infantry
Gun 33

PROJECTILE:

Painted Field Grey, stencilled in black.

50.5 inches, overall length.

11.5 inches, maximum diameter.

105.0 pounds, total weight.

60.0 pounds, weight of bursting charge.

40/60 Amatol, type of bursting charge.

"13 A" stencilled on nose.

CARTRIDGE CASE:

German designation, 6303 (Semi-Fixed)

4.448 inches, overall length.

6.102 inches, diameter of neck.

No shoulder.

6.653 inches, diameter of base.

12.1 pounds, weight of propellant.

C/12nA primer.

FUZE:

Nose Percussion Fuze Wgr. Z. 36

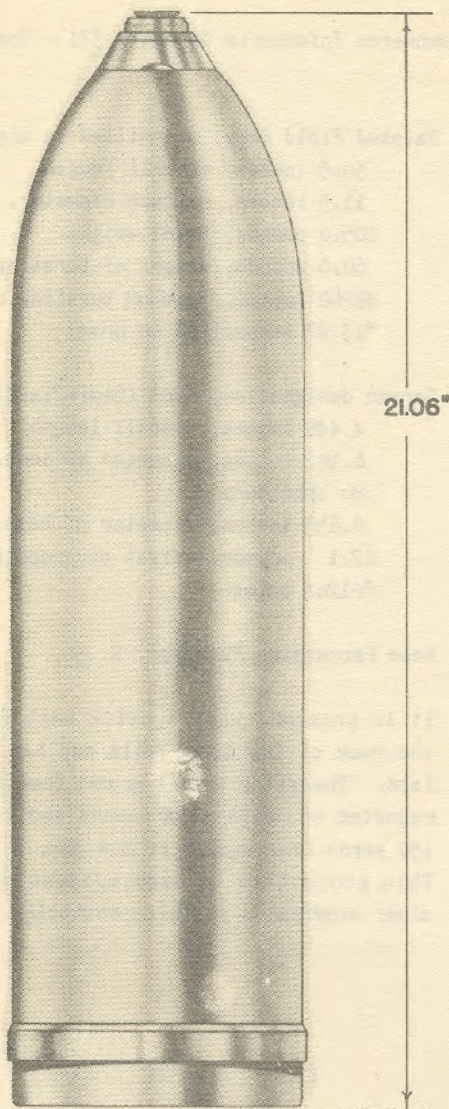
REMARKS:

It is presumed that a stick unit fits over cup at the base of the bomb; this cup has a machined surface. The stick unit has not been recovered but is reported to weigh 48.4 pounds and leaves projectile 150 yards from muzzle of the gun.

This projectile is used against personnel and to clear minefields and wire obstacles.

RESTRICTED

H.E. PROJECTILE TYPE 18, 150mm.



15cm. Gr. 18

RESTRICTED

H.E. PROJECTILE TYPE 18, 150 mm.

GERMAN DESIGNATION: 15cm Gr. 18
(Granate 18)

EMPLOYMENT:

15cm s.F.H. 13 - (schweres Feld Haubitze 13) - Heavy Field Howitzer 13

COMPLETE ROUND:

24.605 inches, overall length.

PROJECTILE:

Painted Green.

21.062 inches, overall length w/ fuze.

19.842 inches, overall length w/o fuze.

0.905 inches, distance from base to band.

0.59 inches, width of bimetallic rotating band.

5.905 inches, diameter of base.

89.76 pounds, total weight.

Gr. Zdlg. C/98 Np or Zdlg. C/98 booster.

CARTRIDGE CASE:

German designation, 6303 (Semi-Fixed)

4.448 inches, overall length.

6.102 inches, diameter of neck.

No shoulder.

6.653 inches, diameter of base.

C/12nA primer.

FUZE:

Nose Percussion Fuzes: AZ 23 (0,8) umg; AZ 23 (0,2) umg; AZ 23m 2 V umg or

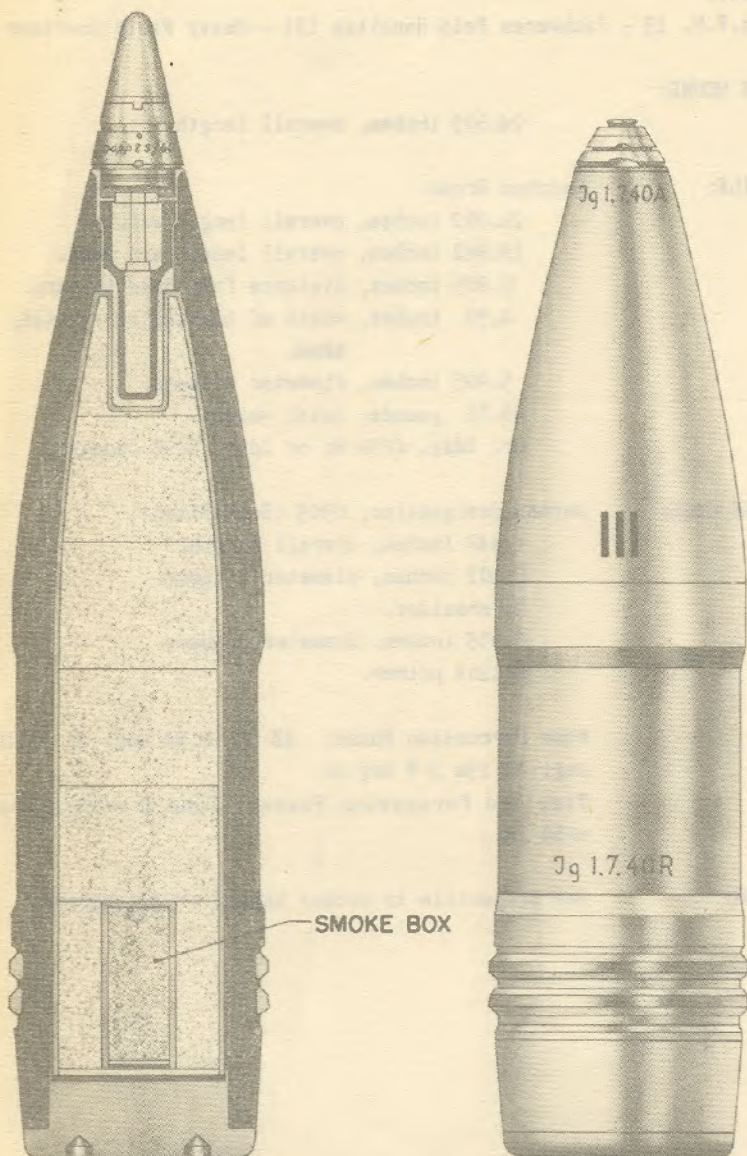
Time and Percussion Fuzes: Dopp Z s/60s, Dopp Z s/60 lm.

PACKAGING:

One projectile in wicker basket - 94.1 pounds.

RESTRICTED

H.E. PROJECTILE, TYPE 19, FOR HEAVY FIELD HOWITZER, 150mm.



15cm Gr. 19

RESTRICTED

H.E. PROJECTILE, TYPE 19, FOR HEAVY FIELD HOWITZER, 150 mm.

GERMAN DESIGNATION: 15cm Gr. 19
(Granate 19)

EMPLOYMENT:

15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18
15cm s.F.H. 13 - (schweres Feld Haubitze 13) - Heavy Field Howitzer 13
15cm s.H.T. - (schweres Haubitze Turren) - Heavy Turret Howitzer

COMPLETE ROUND: Description of c/r is for s.F.H. 18.
33.778 inches, overall length w/Dopp.Z. fuze.
31.218 inches, overall length w/AZ fuze.

PROJECTILE: Painted Green.
24.211 inches, overall length w/AZ fuze.
26.771 inches, overall length w/Dopp.Z. fuze.
3.22 inches, distance from base to band.
0.472 inches, width of rotating bands.
Two, number of rotating bands.
5.196 inches, diameter of base.
5.825 inches, diameter of bourrelet.
95.7 pounds, total weight.
9.46 pounds, weight of bursting charge.
TNT in cardboard container with smoke box at its base, type of bursting charge.
Gr. Zdlg C/98 Np or Zdlg C/98 booster.
Projectile has a screwed-in base plate.

CARTRIDGE CASE: German designation, 6350 (Semi-Fixed)
10.255 inches, overall length.
6.338 inches, diameter of neck.
No shoulder.
7.007 inches, diameter of base.
11.750 pounds, weight of case.
4.1 pounds, weight of propellant.
Flaked Diglycol, type of propellant.
C/12nA primer.

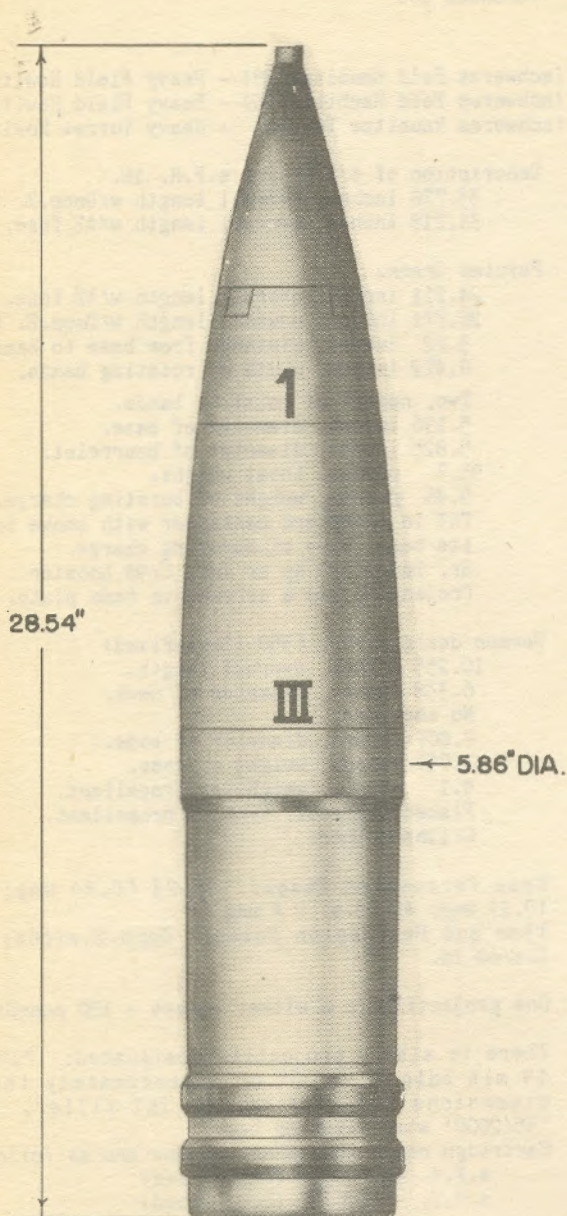
FUZE: Nose Percussion Fuzes: AZ 23 (0.8) umg; AZ 23 (0.2) umg; AZ 23 m. 2 V umg or
Time and Percussion Fuzes: Dopp.Z.s/60s; Dopp. Z.s/60 lm.

PACKAGING: One projectile in a wicker basket - 100 pounds.

REMARKS: There is also a projectile designated: "15cm Gr. 19 mit Zdlg 35/2000" of approximately the same dimensions but with poured TNT filler. It has '35/2000' stencilled on body.
Cartridge cases for other weapons are as follows:-
s.F.H. 13 - 6303 (Semi-Fixed)
s.H.T. - 6357 (Semi-Fixed)

RESTRICTED

H.E. PROJECTILE FOR GUN 16, 150mm.



15cm Hbgr. 16

RESTRICTED

H.E. PROJECTILE FOR GUN 16, 150 mm.

GERMAN DESIGNATION: 15cm Hbgr. 16
(Haub~~e~~granate 16)

EMPLOYMENT:

15cm K. 16 - (Kanone 16) - Gun 16

PROJECTILE:

29.59 inches, overall length.
5.86 inches, diameter of bourrelet.
5.89 inches, diameter of base.
113.0 pounds, total weight.
TNT in cardboard container, type of bursting
charge.
Ballistic cap.
Unstreamlined base.

CARTRIDGE CASE:

German designation, 6304 (Semi-Fixed)
28.54 inches, overall length.
No shoulder.
6.929 inches, diameter of base.
Tubular Nitroglycerine and Nitrocellulose with
Nitroguanadine, type of propellant.
16.0 pounds, weight of propellant
small charge plus
3.0 ounces, igniter powder.
26.0 pounds, weight of propellant
medium charge plus
3.0 ounces, igniter powder.
29.0 pounds, weight of propellant
large charge plus
3.0 ounces, igniter powder.

FUZE:

Nose Percussion Fuze Hbgr. Z. 17/23 or 17/23 umg or
Time and Percussion Fuze Dopp. Z. 16mK or 16mF.

PACKAGING:

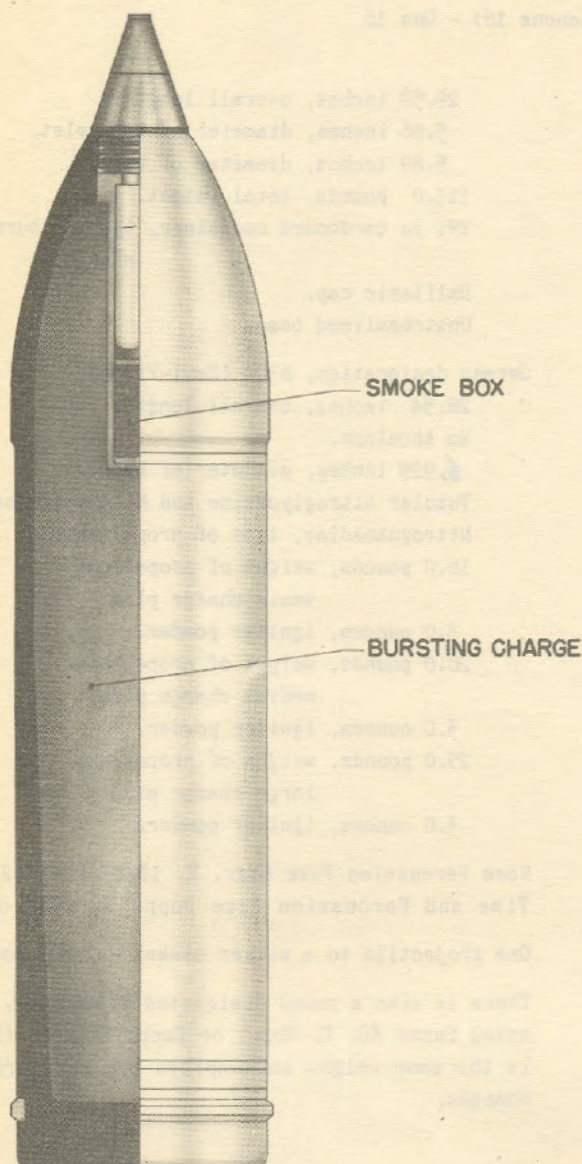
One projectile to a wicker basket - 118.8 pounds.

REMARKS:

There is also a round designated "15cm Hbgr. 16 umg"
using fuzes AZ. f. Hbgr. or Dopp. Z. s/60 (Ms). It
is the same weight and employs the same propellant
charges.

RESTRICTED

H.E. PROJECTILE FOR HEAVY INFANTRY GUN, 150mm.



15cm Jgr. 38

RESTRICTED

H.E. PROJECTILE FOR HEAVY INFANTRY GUN, 150 mm.

GERMAN DESIGNATION: 15cm Jgr. 38
(Jaeger 38)

EMPLOYMENT:

15cm schweres Infanterie Geschütz 33 - (Heavy Infantry Gun 33)

PROJECTILE:

Painted Green.

25.747 inches, overall length.

0.433 inches, width of rotating band - single.

Bimetallic or soft iron, composition of
rotating band.

5.905 inches; diameter of base.

83.6 pounds, total weight.

18.26 pounds, weight of bursting charge.

TNT plus Smoke Box, type of bursting charge.

Zdlg. 36 booster.

CARTRIDGE CASE:

German designation, 6303 (Semi-Fixed)

4.448 inches, overall length.

6.102 inches, diameter of mouth.

No shoulder.

6.653 inches, diameter of base.

1.2 pounds, weight of propellant.

Flaked Diglycol, type of propellant.

C/12nA primer.

FUZE:

Nose Percussion Fuze s. Jgr. Z. 23 (0.4)

PACKAGING:

One projectile to a wicker basket.

REMARKS:

When this projectile has been fired, there will be 44 engravings on its rotating band.
There is also a round designated "15cm Jgr. 33" which is similar except that the projectile has a screwed-in base plate.

RESTRICTED

H.E. PROJECTILE, TYPE L 4/5 WITH BASE FUZE AND BALLISTIC CAP, 150mm.



15cm Sprgr. L 4/5 Bd. Z.m Haube

RESTRICTED

H.E. PROJECTILE, TYPE L 4/5 WITH BASE FUZE AND BALLISTIC CAP, 150 mm.

GERMAN DESIGNATION: 15cm Sprgr. L 4/5 Bd. Z. m. Haube
(Sprenggranate Ladung 4/5 Boden Zunder mit Haube)

EMPLOYMENT:

15cm K. ins. Mrs. Laf. - (Kanone ins Morser Lafette) - Gun in Mortar
NAVY C/28 Mounting

PROJECTILE:

Painted Yellow, with black tip, black arrow on cap,
stencilled in black.

26.7 inches, overall length.

Two, number of rotating bands, with one lead
band behind them.

100.0 pounds, total weight.

" 303

W41

blu 4.40 Fl

Spl. a + b

13 Ed. 5111

Ballistic cap.

Unstreamlined base.

Screwed-in plug in ballistic cap.

A4.9 lrg.

Stencilled markings

"

CARTRIDGE CASE:

Not known

RPC/32 propellant

(Tubular in form and composed as follows:-

Nitrocellulose - 64.76%

Nitroglycerine - 26.87%

Ethyl Centralite - 5.71%

Sodium Nitrate - 0.56%

Volatile Matter - 1.90%

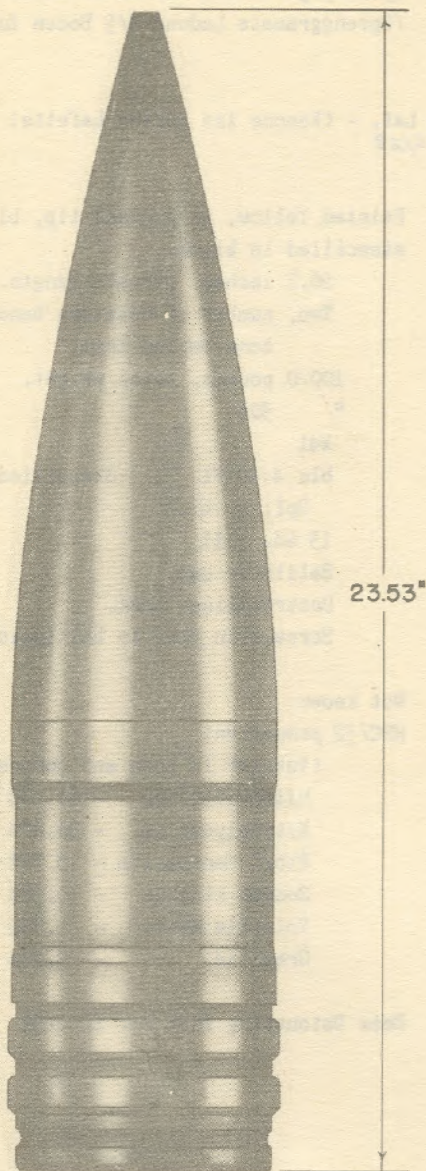
Graphite - 0.20%

FUZE:

Base Detonating Fuze Bd. Z. C/38.

RESTRICTED

S.A.P. PROJECTILE FOR GUN 39, 150mm.



15cm Hpzgr.

RESTRICTED

S.A.P. PROJECTILE FOR GUN 39, 150 mm.

GERMAN DESIGNATION: 15cm Hpzgr.
(Halbpanzergranate)

EMPLOYMENT:

15cm K. 39 - (Kanone 39) - Gun 39

PROJECTILE:

Black Tip.

23.53 inches, overall length.

5.866 inches, diameter of bourrelet.

6.102 inches, diameter of base.

99.0 pounds, total weight.

CARTRIDGE CASE:

German designation, 6318 (Semi-Fixed)

20.66 inches, overall length.

No shoulder.

7.28 inches, diameter of base.

C/12nA primer.

FUZE:

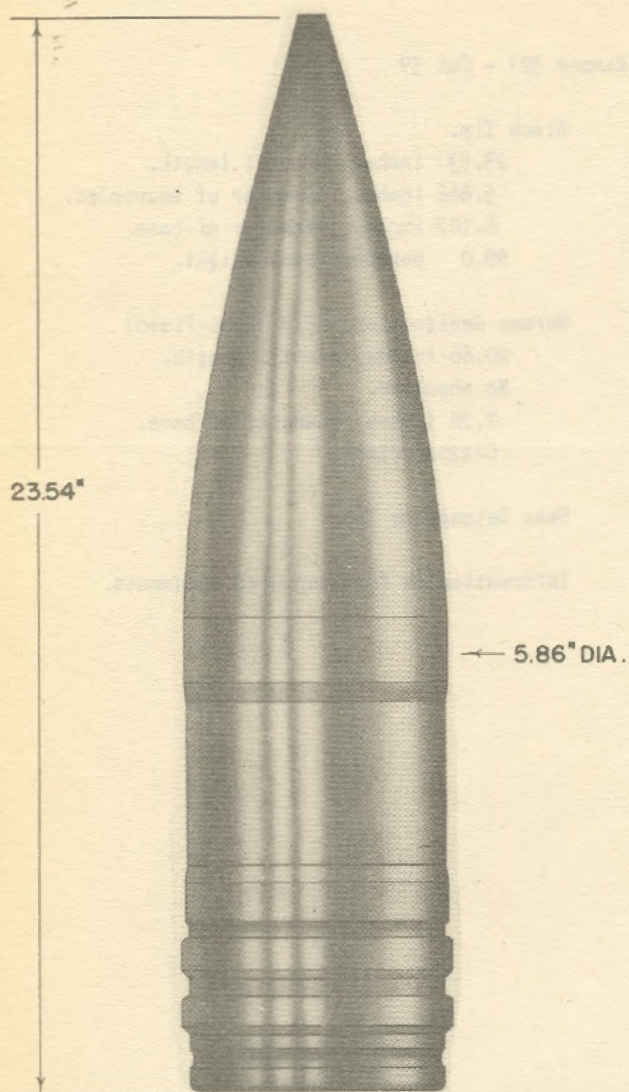
Base Detonating Type.

REMARKS:

Information is from captured documents.

RESTRICTED

A.P. PROJECTILE FOR GUN 39, 150mm.



15cm Pzgr.

- 210 -

RESTRICTED

A.P. PROJECTILE FOR GUN 39, 150 mm.

GERMAN DESIGNATION: 15cm Pzgr.
(Panzergrate)

EMPLOYMENT:

15cm K 39 - (Kanone 39) - Gun 39

PROJECTILE:

23.542 inches, overall length.
5.866 inches, diameter of base.
99.0 pounds, total weight.

CARTRIDGE CASE:

German designation, 6318 (Semi-Fixed)
20.67 inches, overall length.
7.283 inches, diameter of base.
C/12nA primer.

FUZE:

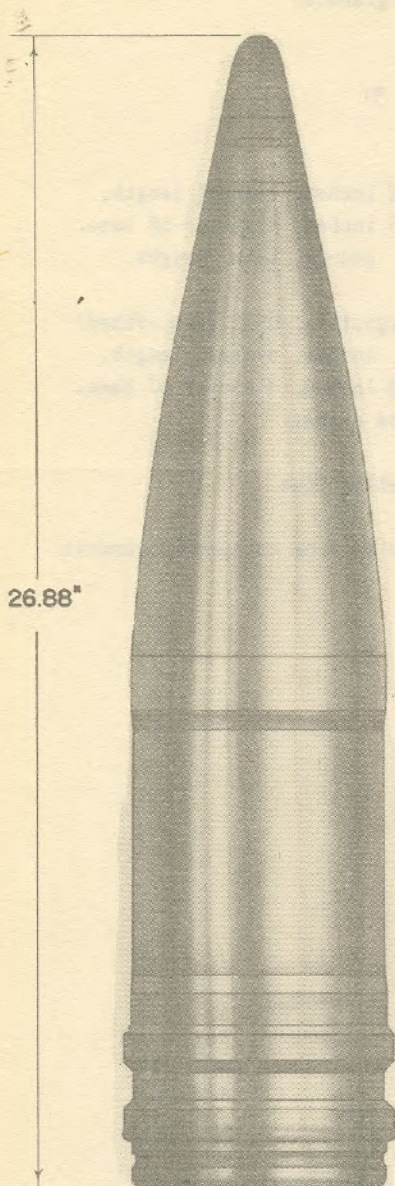
Base Detonating Type

REMARKS:

Information is from captured documents.

RESTRICTED

L/4.6 WITH NOSE FUZE, 150mm.



15cm Sprge L/4.6 (Kopfzunder)

RESTRICTED

H.E. PROJECTILE TYPE L/4.6 WITH NOSE FUZE, 150 mm.

GERMAN DESIGNATION: 15cm Sprge. L/4.6 (Kopfzunder)

EMPLOYMENT:

15cm K. 39 - (Kanone 39) - Gun 39

PROJECTILE:

26.88 inches, overall length.

5.86 inches, diameter of bourrelet.

99.0 pounds, total weight.

Unstreamlined base.

CARTRIDGE CASE:

German designation, 6318 (Semi-Fixed)

20.67 inches, overall length.

No shoulder.

7.28 inches, diameter of base.

31.9 pounds, weight of propellant.

Tubular Diglycol, type of propellant.

C/12nA primer.

FUZE:

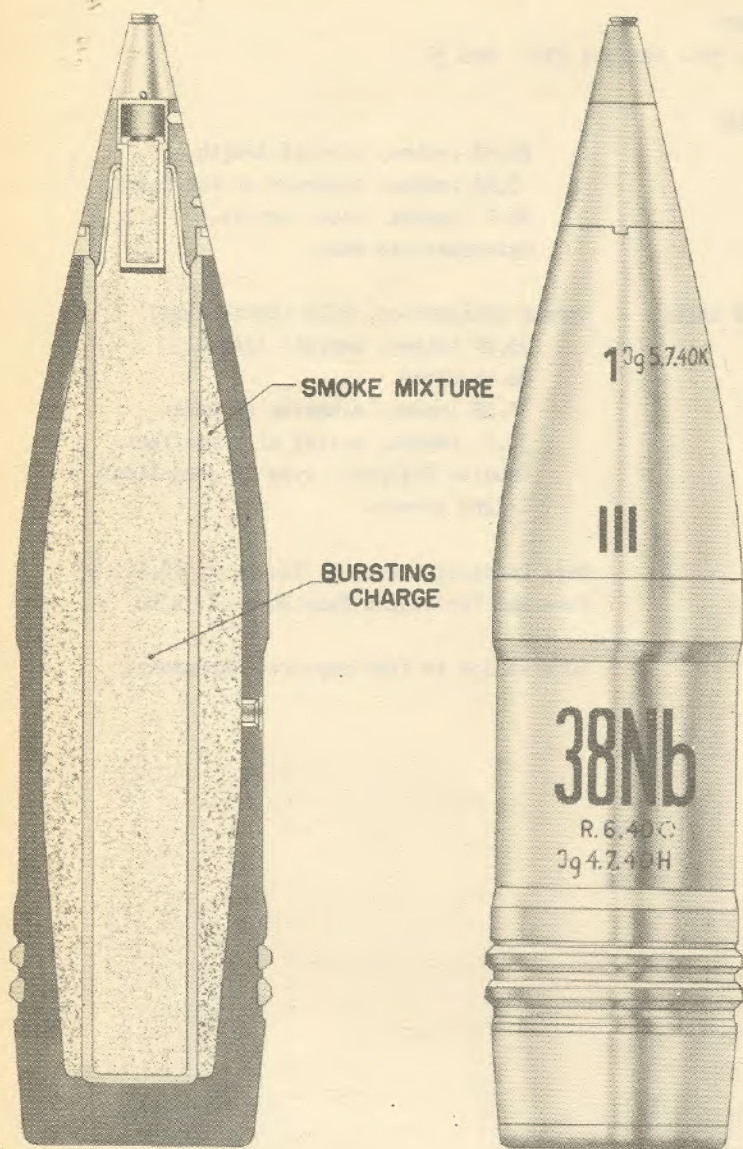
Nose Percussion Fuze E. Kz. m. V. (0,12) or
Time and Percussion Fuze Dopp. Z. s/60

REMARKS:

Information is from captured documents.

RESTRICTED

SMOKE PROJECTILE, TYPE 38, 150mm.



15cm Gr. 38 Nb

RESTRICTED

SMOKE PROJECTILE, TYPE 38. 150 mm.

GERMAN DESIGNATION: 15cm Gr. 38 Nb
(Granate 38 Nebel)

EMPLOYMENT:

15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18

COMPLETE ROUND:

31.751 inches, overall length.

PROJECTILE:

Painted Green, stencilled in white.

24.723 inches, overall length w/fuze.

3.22 inches, distance from base to band.

0.472 inches, width of rotating bands.

Two, number of rotating bands.

5.825 inches, diameter of bourrelet.

5.196 inches, diameter of base.

TNT, type of bursting charge.

Oleum impregnated in pumice, type of smoke
mixture.

"38 Nb" stencilled on body.

Gr. Zdlg. C/98 Np booster.

CARTRIDGE CASE:

German designation, 6350 (Semi-Fixed)

10.255 inches, overall length.

6.338 inches, diameter of mouth.

No shoulder.

7.007 inches, diameter of base.

C/12nA primer.

FUZE:

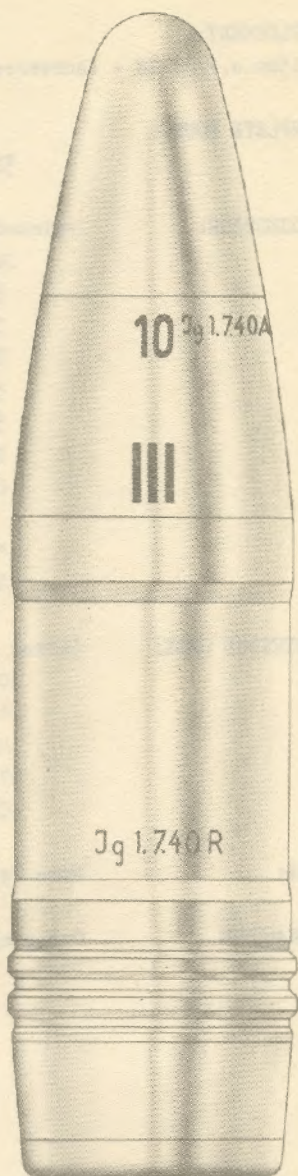
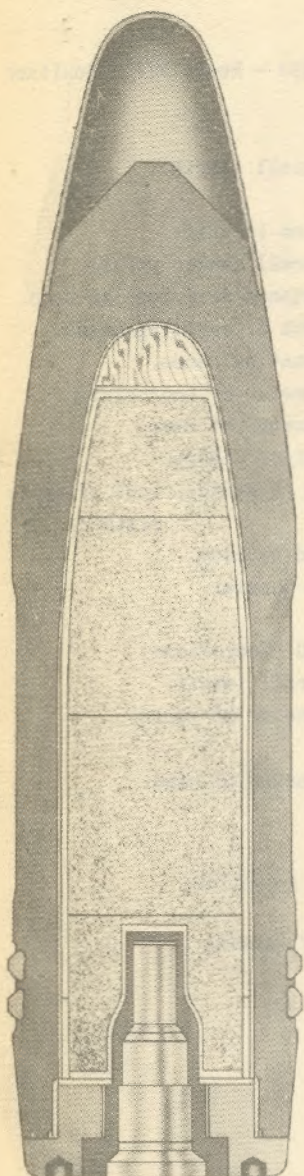
Nose Percussion Fuze K1 AZ 40 Nb.

PACKAGING:

One projectile in wicker basket.

RESTRICTED

ANTI-CONCRETE PROJECTILE, TYPE 19, 150mm.



15cm Gr. 19 Be

RESTRICTED

ANTI-CONCRETE PROJECTILE, TYPE 19. 150 mm.

GERMAN DESIGNATION: 15cm Gr. 19 Be
(Granate 19 Beton)

EMPLOYMENT:

15cm s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18
15cm s.F.H. 13 - (schweres Feld Haubitze 13) - Heavy Field Howitzer 13
15cm s.H.T. - (schweres Haubitze Turren) - Heavy Turret Howitzer

COMPLETE ROUND: Description of c/r is for s.F.H. 18.
30.215 inches, overall length.

PROJECTILE:

Painted Green.

23.267 inches, overall length.
3.228 inches, distance from base to band.
0.472 inches, width of rotating bands -
bimetallic.

Two, number of rotating bands.
5.825 inches, diameter of bourrelet.
5.196 inches, diameter of base.

95.7 pounds, total weight.
7.1 pounds, weight of bursting charge.
TNT, type of bursting charge.

(Four blocks in cardboard carton cemented
to internal walls of projectile. From
base to nose: TNT

TNT
TNT/Wax 95/5
TNT/Wax 90/10

Gr. Zdlg. C/98 Np booster.
Projectile has screwed-in base plate.
Ballistic cap is welded to shell.

CARTRIDGE CASE:

German designation, 6350 (Semi-Fixed)
10.255 inches, overall length.
6.338 inches, diameter of mouth.
No shoulder.
7.007 inches, diameter of base.
C/12nA primer.

FUZE:

Base Detonating Fuze Bd. Z. f. 15cm Gr. 19 Be

PACKAGING:

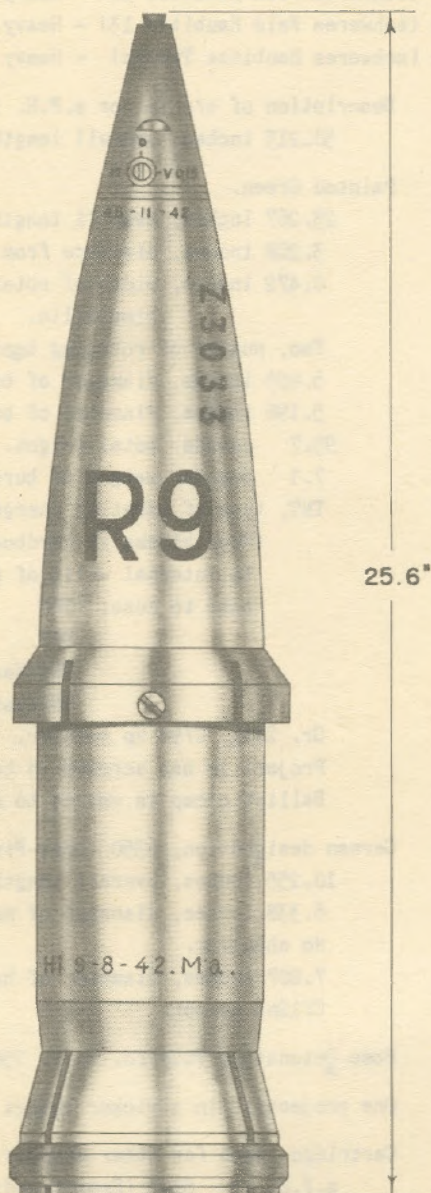
One projectile in a wicker basket - 100 pounds.

REMARKS:

Cartridge cases for other weapons are as follows:-
s.F.H. 13 - 6303 (Semi-Fixed)
s.H.T. - 6357 (Semi-Fixed)

RESTRICTED

H.E. PROJECTILE WITH DISINTEGRATING ROTATING BANDS (SABOT TYPE), 150mm.



RESTRICTED

H.E. PROJECTILE WITH DISINTEGRATING ROTATING BANDS (SABOT TYPE), 150 mm.

GERMAN DESIGNATION: Not known. *"Rackling Granate 9"*

EMPLOYMENT: Not known. *5FH 18M, 18/40, 18/42*

PROJECTILE:

25.6 inches, overall length.
5.84 inches, diameter of bourrelet.
Soft iron, composition of rotating band.
6.01 inches, diameter of base.
63.14 pounds, total weight.
7.48 pounds, weight of bursting charge.
Smoke box present beneath booster.
Zdlg. 36 booster.
"156" Stamped on base.
"R 9" Stencilled on body.

CARTRIDGE CASE: Not known.

FUZE: Nose Percussion Fuze AZ 23v

REMARKS:

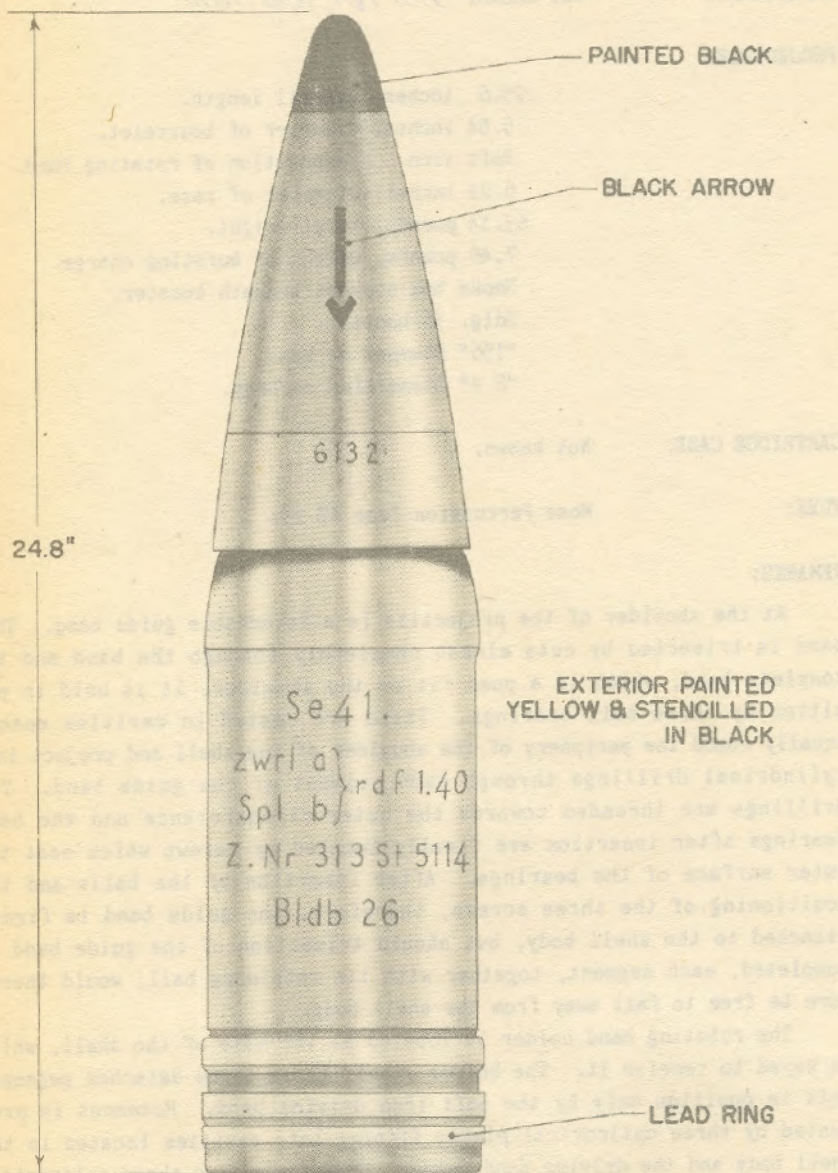
At the shoulder of the projectile is a detachable guide band. This band is trisected by cuts almost completely through the band and the complete band, which is a push fit on the shoulder, it is held in position by three ball bearings. These are seated in cavities spaced equally round the periphery of the shoulder of the shell and project into cylindrical drillings through each segment of the guide band. The drillings are threaded towards the outer circumference and the ball bearings after insertion are finally located by screws which seat the outer surface of the bearings. After insertion of the balls and the positioning of the three screws, therefore, the guide band is firmly attached to the shell body, but should trisection of the guide band be completed, each segment, together with its retaining ball, would therefore be free to fall away from the shell body.

The rotating band holder is located at the base of the shell, which is keyed to receive it. The holder itself is in three detached segments held in position only by the soft iron driving band. Movement is prevented by three cylindrical pieces fitting into cavities located in the shell body and the driving band holder. There are also three cylindrical pins between the segments.

It is believed that after leaving the gun the guide band and the rotating band holder are each split into three separate segments which, together with the ball bearings, pins and cylindrical pieces retaining them, are flung off. The remaining projectile is then of much better aero-dynamic shape than is possible with a conventional projectile.

RESTRICTED

A.P.C. PROJECTILE FOR UNKNOWN WEAPON, 150mm.



RESTRICTED

A.P.C. PROJECTILE FOR UNKNOWN WEAPON, 150 mm.

GERMAN DESIGNATION: Not known.

EMPLOYMENT: Not known but believed to be for naval use.

PROJECTILE: Painted Yellow with black tip, black arrow pointed down towards base, black stencilling.
24.8 inches, overall length (approximately)
98.47 pounds, total weight.

CARTRIDGE CASE: Not known. "C/28"

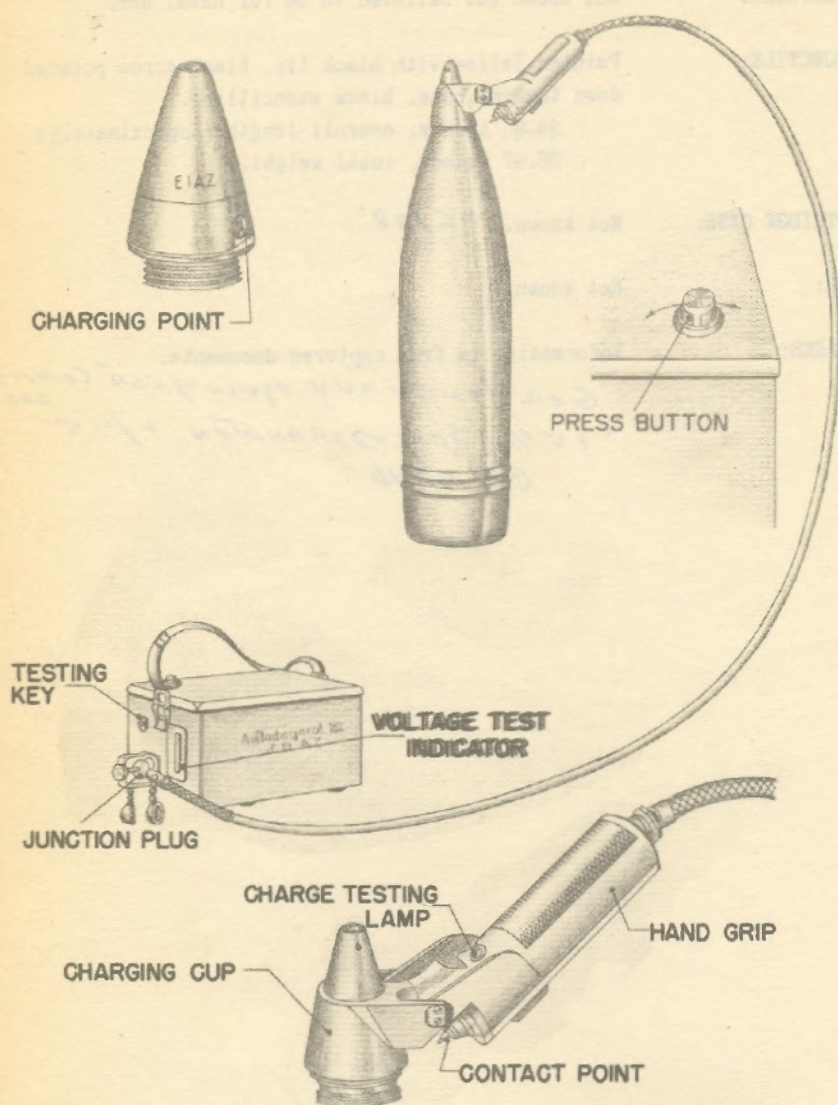
FUZE: Not known.

REMARKS: Information is from captured documents.

*GERMAN NAVY. equiv of USN "COMMON shell"
"1 5/16 SPRENGGRANATEN 4/4.5
BZ m/Hb"*

RESTRICTED

ROCKET ASSISTED PROJECTILE, 150mm.



15cm R. Granate 19

GERMAN DESIGNATION: 15cm R. Granate 19

EMPLOYMENT:

s.F.H. 18 - (schweres Feld Haubitze 18) - Heavy Field Howitzer 18

PROJECTILE:

99.5 pounds, total weight.

CARTRIDGE CASE:

German designation, 6350 (Semi-Fixed)

10.23 inches, overall length.

6.338 inches, diameter of mouth.

No shoulder.

7.007 inches, diameter of base.

13.64 pounds, weight of propellant.

Tubular Diglycol, type of propellant.

C/12nA primer.

"R" Stencilled in red on charge bag.

FUZE:

Electric Nose Percussion Fuze, graze operated instantaneous: El. A.Z. or El. A.Z. m. R.

Base Fuze R (transition fuze)

REMARKS:

This is an experimental projectile. No specimens have been recovered as yet. Two types were designed. On the first the base plate is held in position with magnesia luting. It is thrown clear when the gun fires. In the new pattern the jets are closed by small individual plugs which fall out when the gun fires.

RESTRICTED

H.E. PROJECTILE OF RUSSIAN ORIGIN, 152 mm.

GERMAN DESIGNATION: 15cm Sprgr. 436 (r)
(Sprenggrante 436 (russ))

EMPLOYMENT:

15.2cm Kan. H.L 33/1 (r) - (Kanone Haubitze L 33/1 (russ)) -
Gun Howitzer L 33/1 (Russian)

15.2cm russ 37 - (Russian 37) '152 3/4 G.H 1937'

PROJECTILE:

Painted Green, unpainted band at shoulder and above rotating band.

25.5 inches, overall length w/o fuze.

0.826 inches, width of rotating band.

3.622 inches, distance from base to band.

One, number of rotating bands.

Copper, composition of rotating band.

4.921 inches, diameter of base.

12.51 inches, distance from base to shoulder.

1.574 inches, diameter of fuze hole.

CARTRIDGE CASE:

Not known.

FUZE:

Not known.

REMARKS:

This projectile has a streamlined base.

There is an ogive adapter attached 4.251 inches from fuze hole.

RESTRICTED

H.E. PROJECTILE TYPE L/4.7 WITH NOSE FUZE AND BALLISTIC CAP, 170 mm.

GERMAN DESIGNATION: 17cm Sprgr. L/4.7 Kz. (m. Haube)
(Sprenggranate Ladung/4.7 Kopfzunder (mit Haube)

EMPLOYMENT:

17cm Kan. (E) - (Kanone (Eisenbahn)) - Gun (Railway)

PROJECTILE:

31.496 inches, overall length.
Two, number of rotating bands.
138.0 pounds, total weight.
TNT in cardboard container, type of bursting
charge.

CARTRIDGE CASE:

German designation, Karth C/95
52.0 pounds, weight of propellant.
RPC/32, type of propellant
Tubular in form and composed as follows
Nitrocellulose - 64.76%
Nitroglycerine - 26.87%
Ethyl Centralite - 5.71%
Sodium Nitrate - 0.56%
Volatile Matter - 1.90%
Graphite - 0.20%
C/12nA primer.

FUZE:

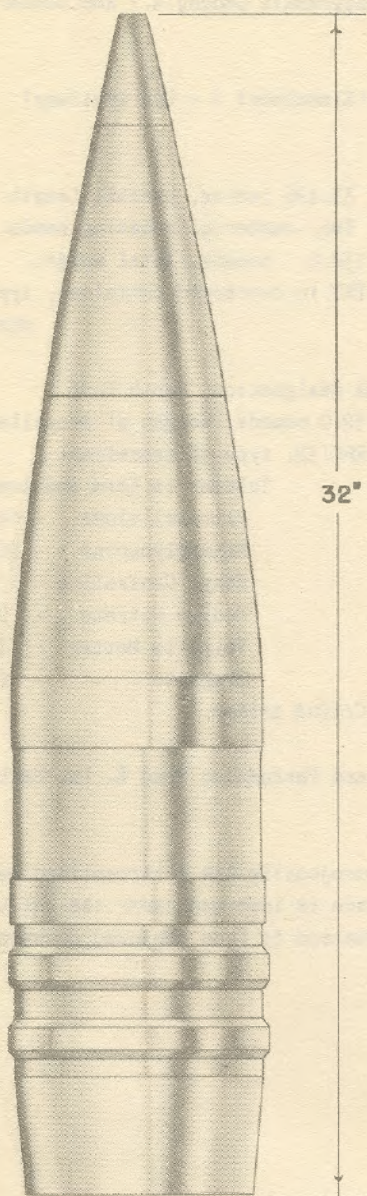
Time and Percussion Fuze E. (m. Haube) M. Dopp. Z.
s/90

REMARKS:

This projectile has a streamlined base.
The fuze is inserted under the ballistic cap.
Information is from captured documents.

RESTRICTED

H.E. PROJECTILE, TYPE 39, 170mm.



17cm K. Gr. 39

RESTRICTED

H.E. PROJECTILE, TYPE 39. 170 mm.

GERMAN DESIGNATION: 17cm K. Gr. 39
(Kanone Granate 39)

EMPLOYMENT:

17cm K. i. Mrs. Laf. - (Kanone ins Morser Lafette) - Gun in Mortar
Mounting

PROJECTILE:

29.172 inches, overall length w/o fuze.
3.35 inches, distance from base to band.
1.023 inches, width of rotating bands.
Two, number of rotating bands.
Bimetallic, composition of rotating bands.
6.771 inches, diameter of bourrelet.
5.984 inches, diameter of base.
150.0 pounds, total weight.
TNT, type of bursting charge.
Tracer is present.
Zdlg. 36 booster.

CARTRIDGE CASE:

German designation, 6324 (Semi-Fixed)
29.562 inches, overall length.
7.5 inches, diameter of neck.
No shoulder.
8.5 inches, diameter of base.
64.0 pounds, weight of propellant.
Tubular Diglycol, type of propellant.
C/12nA primer.

FUZE:

Nose Percussion Fuze AZ 35 K or
Time and Percussion Fuze Dopp. Z. s/90 K

PACKAGING:

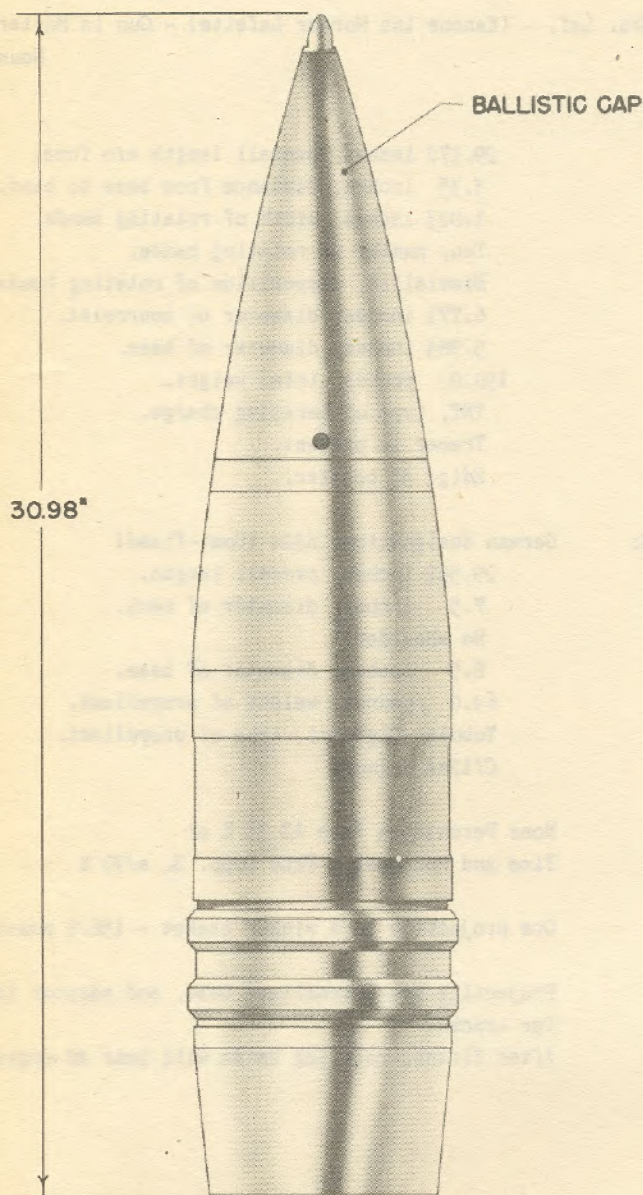
One projectile in a wicker basket - 156.8 pounds.

REMARKS:

Projectile has streamlined base, and adapter in base
for tracer.
After firing, rotating bands will bear 48 engravings

RESTRICTED

H.E. PROJECTILE, TYPE 38, WITH BALLISTIC CAP, 170mm.



17 cm K. Gr. 38 (Hb)

RESTRICTED H.E. PROJECTILE, TYPE 38, WITH BALLISTIC CAP, 170 mm.

GERMAN DESIGNATION: 17cm K. Gr. 38 (Hb)
(Kanone Granate 38 (Haube))

EMPLOYMENT:

17cm K. i. Mrs. Laf. - (Kanone ins Morser Lafette) - Gun in Mortar
Mounting

COMPLETE ROUND:

54.622 inches, overall length.

PROJECTILE:

Painted Green.

30.983 inches, overall length w/o fuze.
4.921 inches, distance from base to band.
1.023 inches, width of rotating bands.
Two, number of rotating bands.
Bimetallic, composition of rotating bands.
6.967 inches, diameter of bourrelet.
5.984 inches, diameter of base.
138.0 pounds, total weight.
15.37 pounds, weight of bursting charge.
TNT in cardboard container cemented in
projectile, type of bursting charge.
Smoke box present.
Tracer present in base plug.
Zdkg. 36 booster.

CARTRIDGE CASE:

German designation, 6324 (Semi-Fixed)
28.56 inches, overall length.
7.5 inches, diameter at mouth.
No shoulder.
8.5 inches, diameter at base.
Tubular Diglycol, type of propellant.
C/12nA primer.

FUZE:

Nose Percussion Fuze Hbgr. Z. 35 K or
Time and Percussion Fuze Dopp. Z. s/90s

PACKAGING:

One projectile to a wicker basket - 145.2 pounds.

REMARKS:

Fuze is under ballistic cap.
Projectile has streamlined base.
After firing, rotating band will bear 48 engravings.

RESTRICTED

H.E. PROJECTILE, TYPE L/4.7 WITH NOSE FUZE AND BALLISTIC CAP, 203 mm.

GERMAN DESIGNATION: 20.3cm Sprgr. L/4.7 Kz (m. Haube)
(Sprenggranate Ladung Kopfzunder (mit Haube))

EMPLOYMENT:

20cm Kan (E) - (Kanone (Eisenbahn)) - Gun (Railway)

PROJECTILE: 37.519 inches, overall length.
Three, number of rotating bands.
26.84 pounds, weight of bursting charge.
TNT in cardboard container, type of bursting
charge.
Ballistic cap.
Unstreamlined base.

CARTRIDGE CASE: German designation, C/34
61.6 pounds, weight of propellant.
PRC/32, type of propellant.
C/12nA primer.

FUZE: Nose Percussion Fuze Kz C/27 Lm., St. or Ms.

PACKAGING: One projectile in wicker basket - 286 pounds.

REMARKS: There is also a round designated: "20.3cm Sprgr.
L/4.7m Bd. Z. m. Haube", which is identical except
that this type is also fitted with base fuze Bd. Z.
C/38.

GERMAN DESIGNATION: 21cm Gr. 17
(Granate 17)

EMPLOYMENT:

lg. 21cm Mrs. 18 - (lange 21cm Morser 18) - long 21cm Mortar 18

PROJECTILE: . 31.614 inches, overall length.
One, number of rotating bands.
8.267 inches, diameter of base.
264.0 pounds, total weight.
Pointed projectile.
Unstreamlined base.

CARTRIDGE CASE: German designation, 6305
C/12nA primer.

FUZE: Base Detonating Fuze K. Bd. Z. 10 or 10+

REMARKS: There is also a round designated: "21cm Gr. 17 umg"
which is identical except that the base fuze employed is Bd. Z. f. 15cm Gr. 19 Be.
Information is from captured documents.

GERMAN DESIGNATION: 21cm Granate 18

EMPLOYMENT: 21cm Mrs. 18 - (21cm Morser 18) - Mortar 18

COMPLETE ROUND: 46.084 inches, overall length.

PROJECTILE: Painted Green.

34.565 inches, overall length.

4.606 inches, distance from base to band.

0.590 inches, width of rotating bands.

Two, number of rotating bands.

7.480 inches, diameter of base.

249.0 pounds, total weight.

TNT, type of bursting charge.

Streamlined base.

PETN/Wax booster.

CARTRIDGE CASE: German designation, 6351 (Semi-Fixed)

16.125 inches, overall length.

8.75 inches, diameter of neck.

No shoulder.

9.5 inches, diameter of base.

34.4 pounds, weight of propellant.

Diglycol, type of propellant.

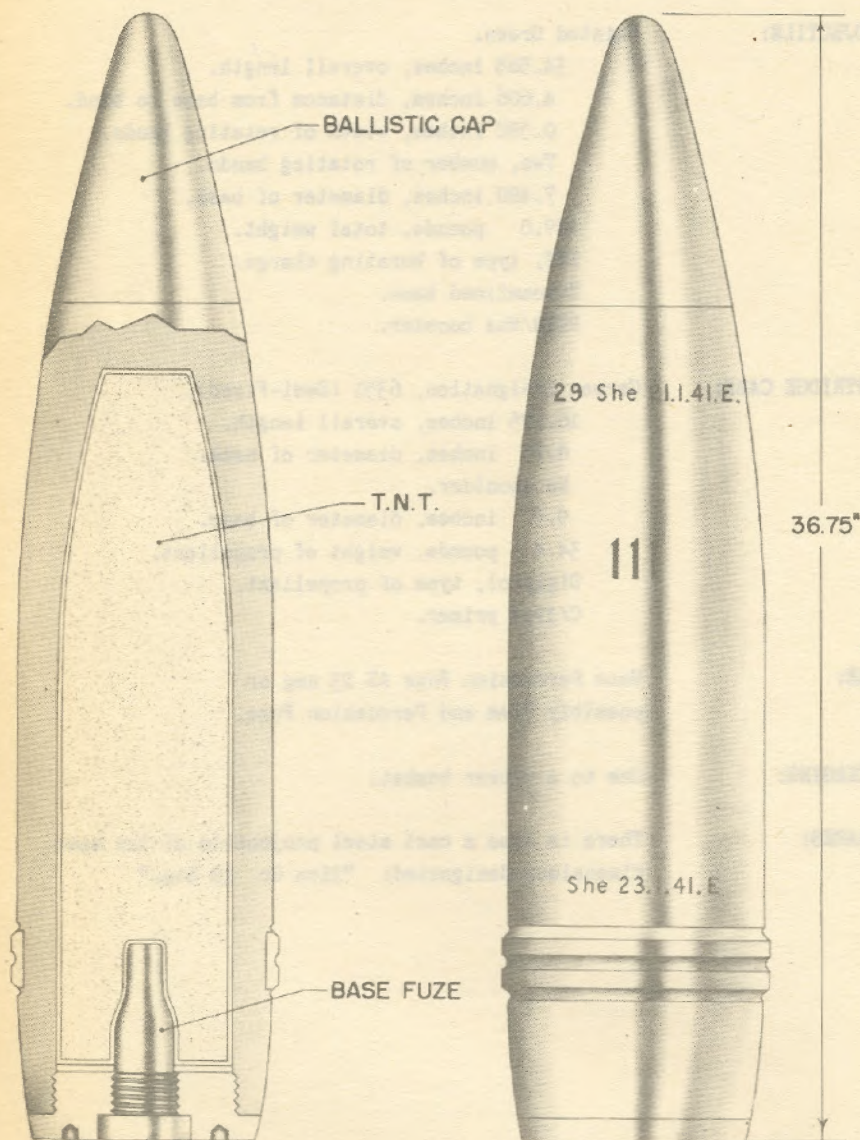
C/12nA primer.

FUZE: Nose Percussion Fuze AZ 23 umg or possibly Time and Percussion Fuze.

PACKAGING: One to a wicker basket.

REMARKS: There is also a cast steel projectile of the same dimensions designated: "21cm Gr. 18 Stg."

ANTI-CONCRETE PROJECTILE, TYPE 18, 210mm.



21cm Gr. 18 Be

GERMAN DESIGNATION: 21cm Gr. 18 Be
(Granate 18 Beton)

EMPLOYMENT:

21cm Mrs. 18 - (Morser 18) - Mortar 18
lg. 21cm Mrs. 18 - (lange Morser 18) - long Mortar 18

PROJECTILE:

Painted Green.

36.534 inches, overall length.
4.606 inches, distance from base to band.
0.590 inches, width of rotating bands.
Two, number of rotating bands.
7.480 inches, diameter of base.
268.0 pounds, total weight.
25.6 pounds, weight of bursting charge.
TNT, type of bursting charge.
Zdlg C/98 booster (Picric Acid).

CARTRIDGE CASE:

German designation, 6351 (Semi-Fixed)
16.125 inches, overall length.
8.75 inches, diameter of neck.
No shoulder.
9.50 inches, diameter of base.
31.0 pounds, weight of propellant.
Diglycol, type of propellant.
C/12nA primer.

FUZE:

Base Detonating Fuze Bd. Z. f. 21cm

PACKAGING:

One to a wicker basket.

REMARKS:

Projectile has streamlined base, ballistic cap.

RESTRICTED

H.E. PROJECTILE, TYPE L/4.2 W/NOSE & BASE FUZES & BALLISTIC CAP, 240 mm.

GERMAN DESIGNATION: 24cm Sprge. L/4.2 m. Bd.Z.v.Kz. (mit Haube)
Sprenggranate Ladung 4.2 mit Boden Zunder und
Kopfzunder (mit Haube)

EMPLOYMENT: Th. Kan (E) Theodor Kanone (Eisenbahn) Theodor
(Bruno) Gun (Railway)

PROJECTILE: 39.172 inches, overall length
2. , number of rotating bands
9.448 inches, diameter of base
326.0 pounds, total weight
TNT in cardboard container - type of bursting
charge.

CARTRIDGE CASE: German designation, Karth C/95 (semi-fixed)
98.0 pounds, weight of propellant
RPC/32 , type of propellant
C/12nA , primer

FUZE: Nose percussion fuze: Kz. C/27m., St. or Ms. or
Time & percussion fuze: M.Dopp. Z. s 90 St. plus
Base detonating fuze: Bd Z. C 38

REMARKS: Projectile has ballistic cap, unstreamlined base.
Information is from captured document.

RESTRICTED

H.E. PROJECTILE TYPE L/4.1 WITH BASE FUZE, 240 mm.

GERMAN DESIGNATION: 24cm Sprgr. L/4.1 m. Bd. Z.
(Sprenggranate Ladung 4.1 mit Boden Zunder)

EMPLOYMENT: 24cm Ph. Kan. (E) Theodor Kanone (Eisenbahn)
Theodor (Bruno) Gun (Railway)

PROJECTILE: 38.463 inches, overall length
9.448 inches, diameter of base
332.2 pounds, total weight
TNT in cardboard container - type of bursting
charge.

CARTRIDGE CASE: German designation, Karth C/95 (semi-fixed)
98.0 pounds, weight of propellant
RPC/32 , type of propellant
C/12hA , primer

FUZE: Base detonating fuze: Bd.Z.f. Sprgr. m.K.

REMARKS: Projectile has ballistic cap, unstreamlined base.
Information is from captured documents.

RESTRICTED

H.E. PROJECTILE TYPE 44.2 W/NOSE & BASE FUZES & BALLISTIC CAP, 240 mm.

GERMAN DESIGNATION: 24cm Sprgr. 44.2 m.Bd.Z.v.Kz. (M.Haube)
24cm Sprenggranate Ladung/4.2 mit Boden Zunder und
Kopfzunder (mit Haube)

EMPLOYMENT: 24cm Ph. Kan (E) Theodor Kanone (Eisenbahn) Theodor
(Bruno) Gun (Railway)

PROJECTILE: 38.07 inches, overall length
2 number of rotating bands
9.448 inches, diameter of base
326.7 pounds, total weight
TNT in cardboard container - type of bursting
charge.

CARTRIDGE CASE: Not known
98.0 pounds, weight of propellant
RPC/32 , type of propellant

FUZE: Base detonating fuze: Bd.Z.f. Sprgr. m.H. plus
Point detonating fuze: E.Kzdr.t Sprgr. (m. Haube)
Time and percussion fuze: Dopp. Z. 16 nF.

REMARKS: Projectile has ballistic cap, unstreamlined base.
Information is from captured document.

RESTRICTED

H.E. PROJECTILE TYPE L/4.5 WITH BASE FUZE & BALLISTIC CAP, 240 mm.

GERMAN DESIGNATION: 24cm. Sprgr. L/4.5 m.Bd.Z. (m. Haube)
Sprenggranate Ladung/4.5 mit Boden Zunder
(mit Haube)

EMPLOYMENT: 24cm. Th. Br. K. (E) Theodor Bruno Kanone
(Eisenbahn) Theodor Bruno Gun (Railway)

PROJECTILE: 42.715 inches, overall length
9.448 inches, diameter of base
2. , number of rotating bands
332.0 pounds, total weight
TNT in cardboard container - type of bursting
charge.

CARTRIDGE CASE: German designation, Karth S. Th. Br. K. (E)
68.2 pounds, weight of propellant
RPC/32 , type of propellant

FUZE: Base detonating fuze: Bd.Z.f. Sprgr. m. K.

REMARKS: Projectile has ballistic cap, unstreamlined base.
Information is from captured document.

RESTRICTED

H.E. PROJECTILE TYPE L/3.5 WITH BASE FUZE, 280 mm.

GERMAN DESIGNATION: 28cm Sprge. L/3.5 m Bdz.

EMPLOYMENT: 28cm H. L/12
28cm KST. H

PROJECTILE: Body has a white ring.
39.370 inches, length.
770.0 pounds, total weight.
One driving band.

CARTRIDGE CASE:

Sep. Semi.
37.2; 45.7 pounds, weight of propellant.
C/12; C/12 primer.

FUZE: Bdz.

REMARKS: Same projectile on both guns.
H. L/12 is sep. and KST. H is semi-fixed.

RESTRICTED

H.E. PROJECTILE, TYPE L/4.1 WITH NOSE FUZE AND BALLISTIC CAP, 280 mm.

GERMAN DESIGNATION: 28cm Sprge. L/4.1 Kz (m Haube)

EMPLOYMENT: Kz Br. Kan. (E)

PROJECTILE:

44.724 inches, length.

11.023 inches, diameter of base.

528.0 pounds, total weight.

Two, number of rotating bands.

CARTRIDGE CASE:

German designation, Karth C/95.

147.5 pounds, weight of propellant.

C/22 primer.

FUZE:

Kz. C/27 LM; M Dopp Z. s/90.

RESTRICTED

H.E. PROJECTILE TYPE L/4.4 WITH NOSE AND BASE FUZES, 280 mm.

GERMAN DESIGNATION: 28cm Sprgr. L/4.4 mBd Zu. Kz.

EMPLOYMENT: L6 U.S. Br. Kan (E)
"Large Bruno"?

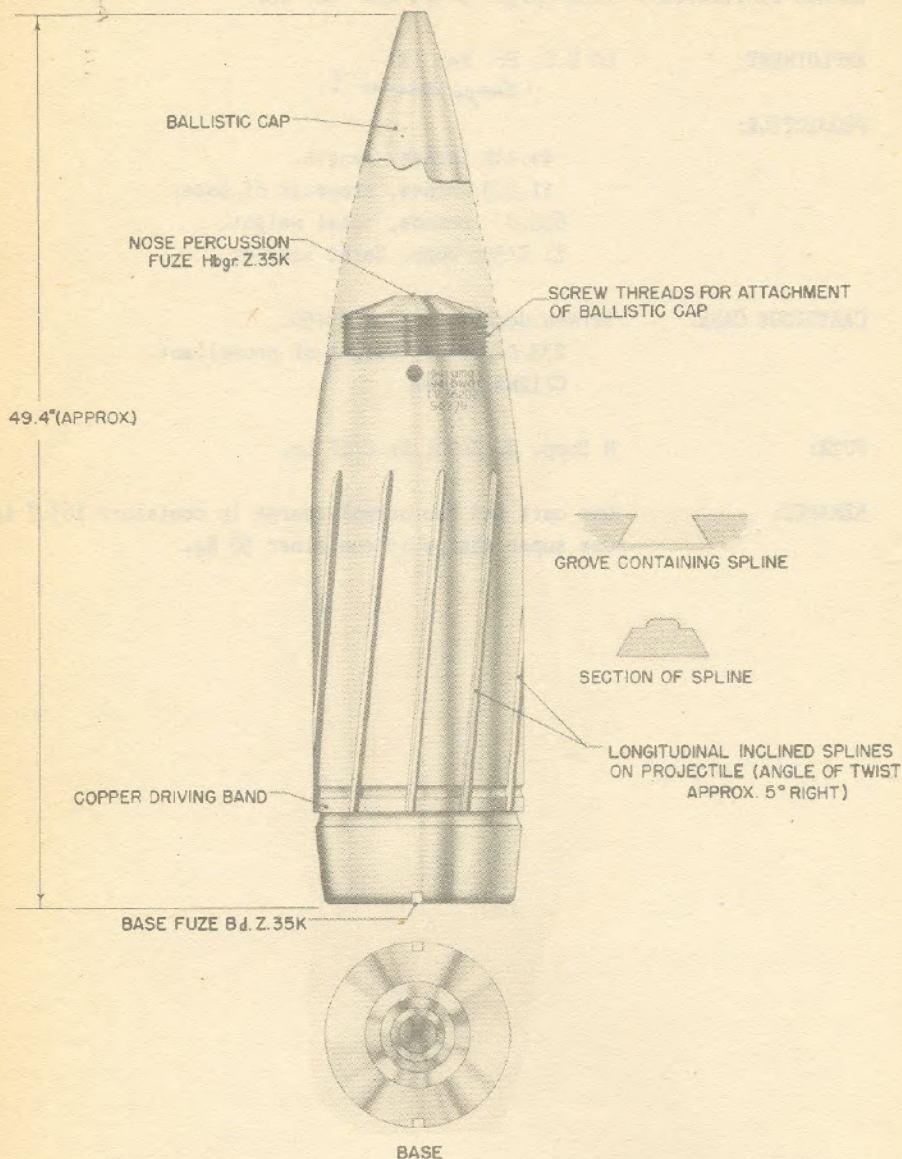
PROJECTILE:
49.448 inches, length.
11.023 inches, diameter of base.
628.0 pounds, total weight.
Z. C/38; Dopp. Zs/60 booster.

CARTRIDGE CASE: German designation, L 45/50.
233.0 pounds, weight of propellant.
C/12nA primer.

FUZE: M Dopp. Z. S/90; Kz C/27 Lm.

REMARKS: One cart and one normal charge in container 163.7 Kg.
One super charge in container 50 Kg.

RIFLED H.E. PROJECTILE, 28 cm.



GERMAN DESIGNATION: Not known.

EMPLOYMENT: Not known. *28cm KSE TIEFZUG 1074
ON TIEFZUG 707*

COMPLETE ROUND: Not known.
Total weight not known.

PROJECTILE: 5.079 inches, base to band.
49.4 inches, overall length (approx.).
0.787 inches, width of rotating band -
bimetallic.
551.0 pounds, total weight.
66.0 pounds, weight of bursting charge.
18.897 inches, length of splines.
Bursting charge in cardboard container.
Small tracer is fitted.
Gr. Zdlg. C/98 booster.

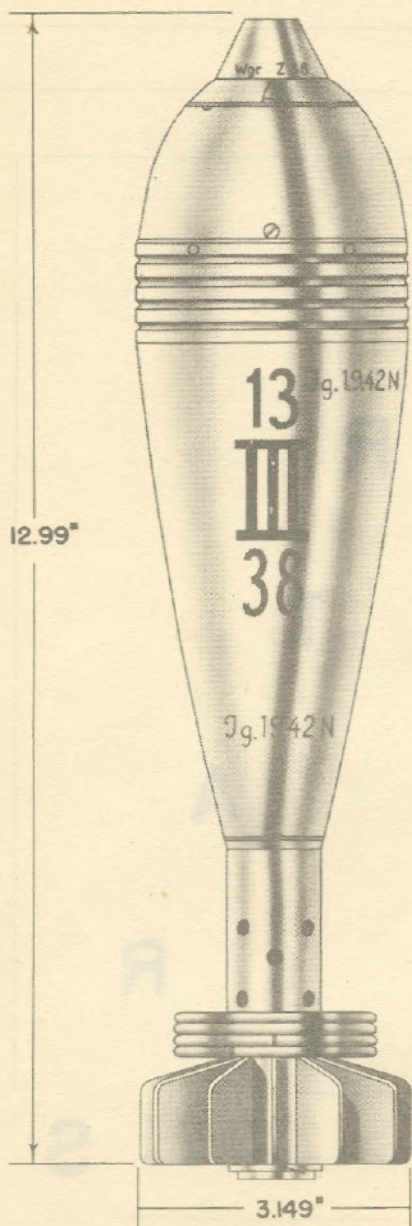
CARTRIDGE CASE: Not known.

FUZE: Nose - Hbgr. Z. 35K
Base - Bd. Z. 35K

REMARKS: Slightly streamlined base. Ballistic cap threaded to body of projectile.
Projectile has rifled design which takes the form of 12 longitudinal inclined splines (inclination 5° (approx.)). These are approximately 60 mm apart and are probably intended to engage in the rifling of the gun. The splines do not appear to be machined from the main projectile body but are constructed separately on strips of steel which are then fitted into grooves cut in the projectile body. These grooves are under-cut to produce secure attachment. To the rear is a copper or bimetallic driving band, the probable function of which is to act as a gas seal.

RESTRICTED

H.E. MORTAR PROJECTILE TYPE 38, 80mm.



8cm Wgr. 38

RESTRICTED

H.E. MORTAR PROJECTILE TYPE 38. 80 mm.

GERMAN DESIGNATION: 8cm Wgr. 38
(Werfergranate 38).

EMPLOYMENT: 8cm s. Granat Werfer 34

COMPLETE ROUND: 12.99 inches, overall length.

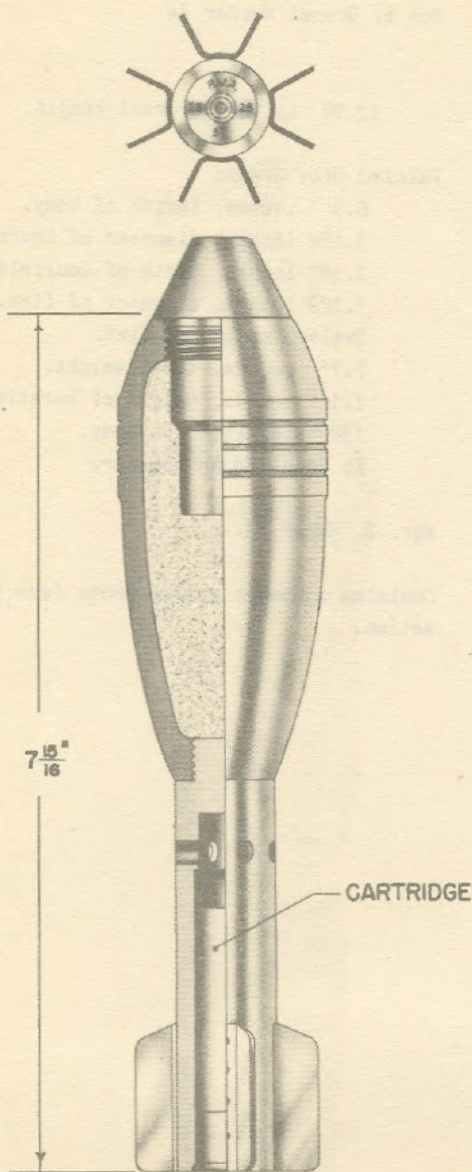
PROJECTILE: Painted Grey Green.
8.5 inches, length of body.
3.188 inches, diameter of bourrelet.
1.187 inches, width of bourrelet.
3.189 inches, diameter of fins.
Twelve, number of fins.
7.75 pounds, total weight.
1.11 pounds, weight of bursting charge.
'38' stencilled on body.
Kz Zdlg. 34 Np booster.

FUZE: Wgr. Z. 38 or 34.

REMARKS: Contains a powder pellet under fuze to give delay action.

RESTRICTED

H.E. MORTAR PROJECTILE, 50mm.



5cm H.E. Bomb

GERMAN DESIGNATION: 5cm H.E. Bomb

EMPLOYMENT: 5cm L. Granat Werfer 36

PROJECTILE: Painted Dull Red.

8.625 inches, overall length.

4.25 inches, length of body.

1.312 inches, diameter of bourrelet.

1.0 inches, width of bourrelet.

0.937 inches, diameter of base.

2.2 pounds, total weight.

Eight, number of fins.

112 grams TNT, type of bursting charge.

Kz. Zdlg. 34-Np booster.

CARTRIDGE CASE:

4 grams of Powder, type of propellant.

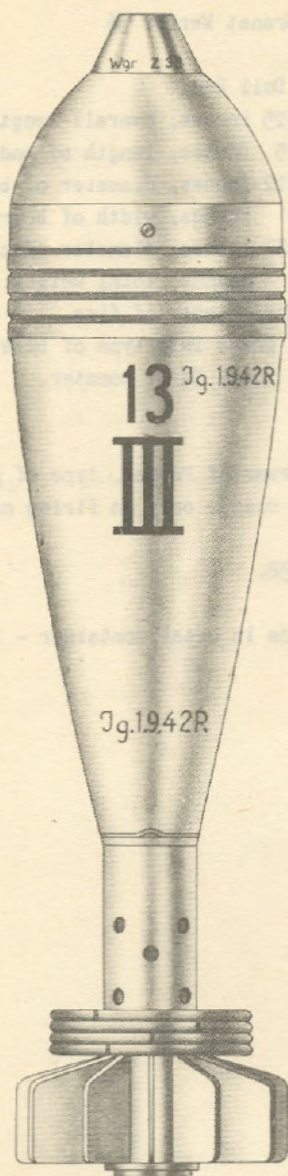
One charge only in firing cartridge.

FUZE: Wgr. Z. 38.

REMARKS: Ten rounds in metal container - 12.5 Kg.

RESTRICTED

H.E. MORTAR PROJECTILE, TYPE 39, 80mm.



8cm Wgr. 39

RESTRICTED

H.E. MORTAR PROJECTILE, TYPE 39, 80 mm.

GERMAN DESIGNATION: 8cm Wgr. 39
(Werfergranate 39)

EMPLOYMENT: 8cm s. Granat Werfer 34

COMPLETE ROUND: 13.109 inches, overall length.

PROJECTILE:

- 8.5 inches, length of body.
- 3.188 inches, diameter of bourrelet.
- 1.187 inches, width of bourrelet.
- 3.189 inches, diameter of fins.
- Twelve, number of fins.
- 7.75 pounds, total weight.
- 1.11 pounds, weight of bursting charge.
- TNT, type of bursting charge.

FUZE: Wgr. Z. 38 or 34.
ZZ Zdlg. 34 Np - booster.

REMARKS: An improved model of 38.

RESTRICTED

COLORED SMOKE MORTAR PROJECTILE, 80mm.



8cm Wgr. 38 Deut

RESTRICTED

COLORS SMOKE MORTAR PROJECTILE, 80 mm.

GERMAN DESIGNATION: 8cm Wgr. 38 Deut.
(Werfergranate 38 Deut.)

EMPLOYMENT: 8cm s. Gr. Werfer 34

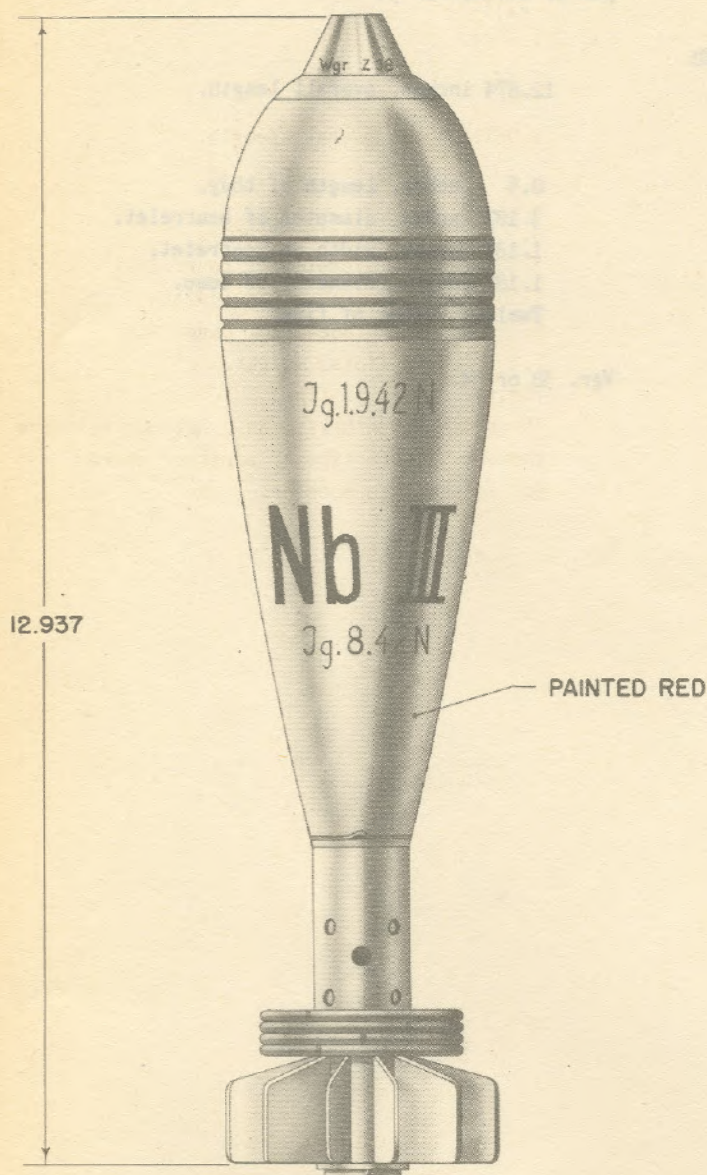
COMPLETE ROUND: 12.874 inches, overall length.

PROJECTILE:
8.5 inches, length of body.
3.187 inches, diameter of bourrelet.
1.187 inches, width of bourrelet.
1.187 inches, diameter of base.
Twelve, number of fins.

FUZE: Wgr. 38 or 34.

RESTRICTED

SMOKE MORTAR PROJECTILE, TYPE 34, 80 mm.



8cm Wgr. 34 Nb.

RESTRICTED

SMOKE MORTAR PROJECTILE, TYPE 34, 80 mm.

GERMAN DESIGNATION: 8cm Wgr. 34 Nb.
(Werfergranate 34 Nebel)

EMPLOYMENT: M. Gr. W. 34
Kz. Gr. W. 42

COMPLETE ROUND: 12.937 inches, overall length.

PROJECTILE:
8.5 inches, length of body.
3.187 inches, diameter of bourrelet.
1.187 inches, width of bourrelet.
1.187 inches, diameter of base.
7.85 pounds, total weight.
Twelve, number of fins.
36 grams of Penthrate Wax. Sulphur trioxide
smoke mixture - type of bursting charge.
Kz. Zdlg. 34 Np booster.

FUZE: Wgr. Z. 38 or 34.

RESTRICTED

H.E. MORTAR
PROJECTILE TYPE 34, 80mm.



8 CM WGR 34

GERMAN DESIGNATION: 8cm Wgr. 34
(Werfergranate 34)

EMPLOYMENT: Kz. Gr. W 42
8cm s. Granat Werfer 34

COMPLETE ROUND:
13.070 inches, overall length.

PROJECTILE: Painted Reddish Brown.
8.5 inches, length of body.
3.188 inches, diameter of bourrelet.
1.187 inches, width of bourrelet.
3.189 inches, diameter of fins.
Twelve, number of fins.
7.75 pounds, total weight.
1.11 pounds, weight of bursting charge.
Gr. Zdlg. C/98 Np, booster gaine.

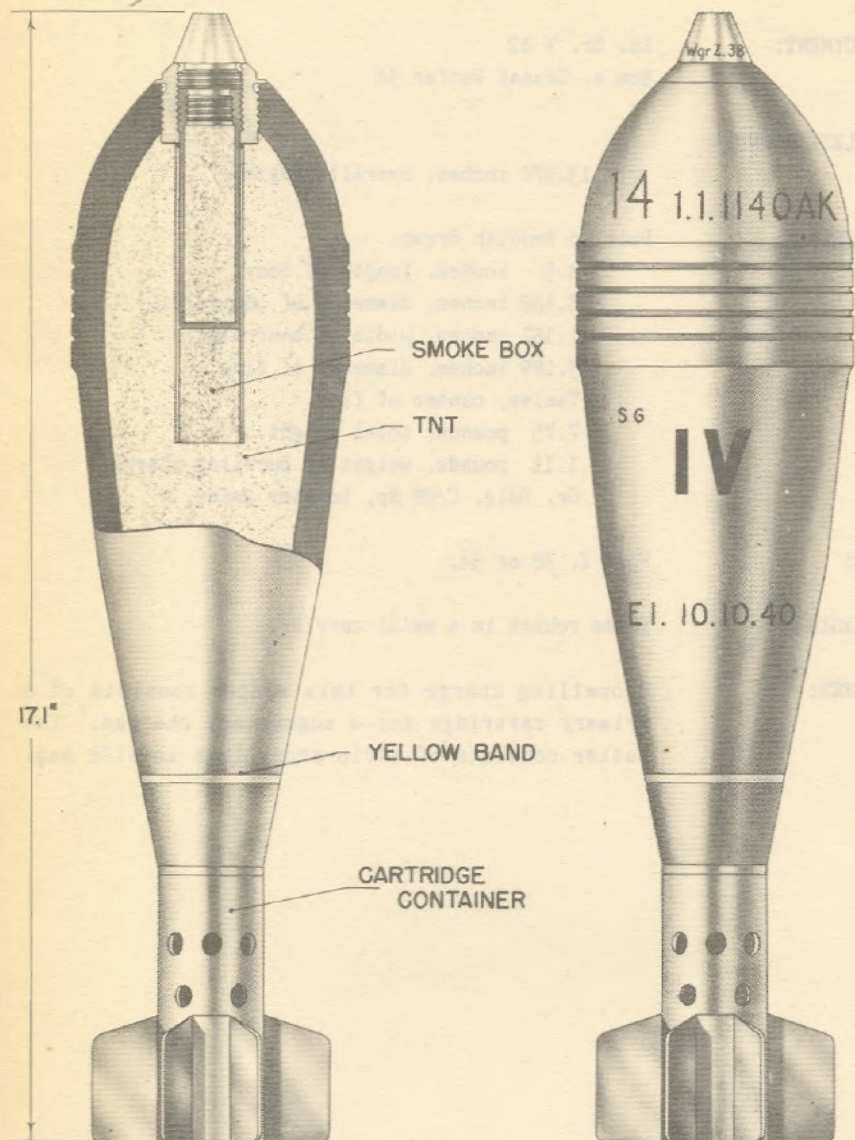
FUZE: Wgr. Z. 38 or 34.

PACKAGING: Three rounds in a metal carrier.

REMARKS: Propelling charge for this weapon consists of a primary cartridge and 4 augmentary charges. The latter consists of strip propellant in silk bag.

RESTRICTED

H.E. MORTAR PROJECTILE, 100 mm.



10cm Wgr. 37

GERMAN DESIGNATION: 10cm Wgr. 37
(Werfergranate 37)

EMPLOYMENT: 10cm Nb W 35

PROJECTILE: Painted Grey Green:
17.12 inches, overall length.
4.09 inches, diameter of bourrelet.
16.0 pounds, total weight.
3.125 pounds, weight of bursting charge.
TNT, type of bursting charge.
Gr Zdlg. C/98 Np booster.

FUZE: Wgr. Z. 38

REMARKS: Information is from captured documents.

RESTRICTED

SMOKE MORTAR PROJECTILE, 100 mm.

GERMAN DESIGNATION: 10cm Wgr. 35 Nb St
(Werfergranate 35 Nebel Stahl)

EMPLOYMENT: 10cm Nb W 35

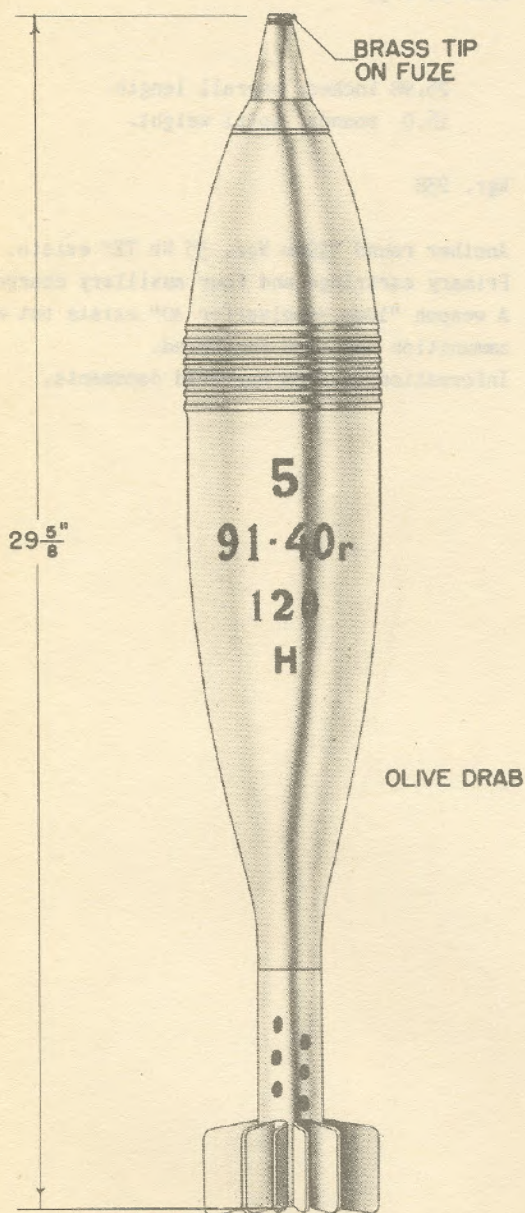
PROJECTILE:
25.98 inches, overall length.
16.0 pounds, total weight.

FUZE: Wgr. 238

REMARKS: Another round "10cm Wgr. 35 Nb TE" exists.
Primary cartridge and four auxillary charges.
A weapon "10cm Nebelwerfer 40" exists but no
ammunition has been recovered.
Information is from captured documents.

RESTRICTED

H.E. MORTAR PROJECTILE (RUSSIAN ORIGIN), 120mm.



12cm Wgr. 378/1, 2 OR 3 (r)

RESTRICTED

H.E. MORTAR PROJECTILE (RUSSIAN ORIGIN), 120 mm.

GERMAN DESIGNATION: 12cm Wgr. 378/1, 2 or 3 (r)
(Werfergranate 378/1, 2 or 3 (r))

EMPLOYMENT: 12cm Russian Mortar

COMPLETE ROUND: 30.0 inches, overall length.

PROJECTILE:
23.5 inches, length of body.
4.719 inches, diameter of bourrelet.
1.594 inches, width of bourrelet.
1.562 inches, diameter of base of body.
36.0 pounds, total weight.
Twelve, number of fins.

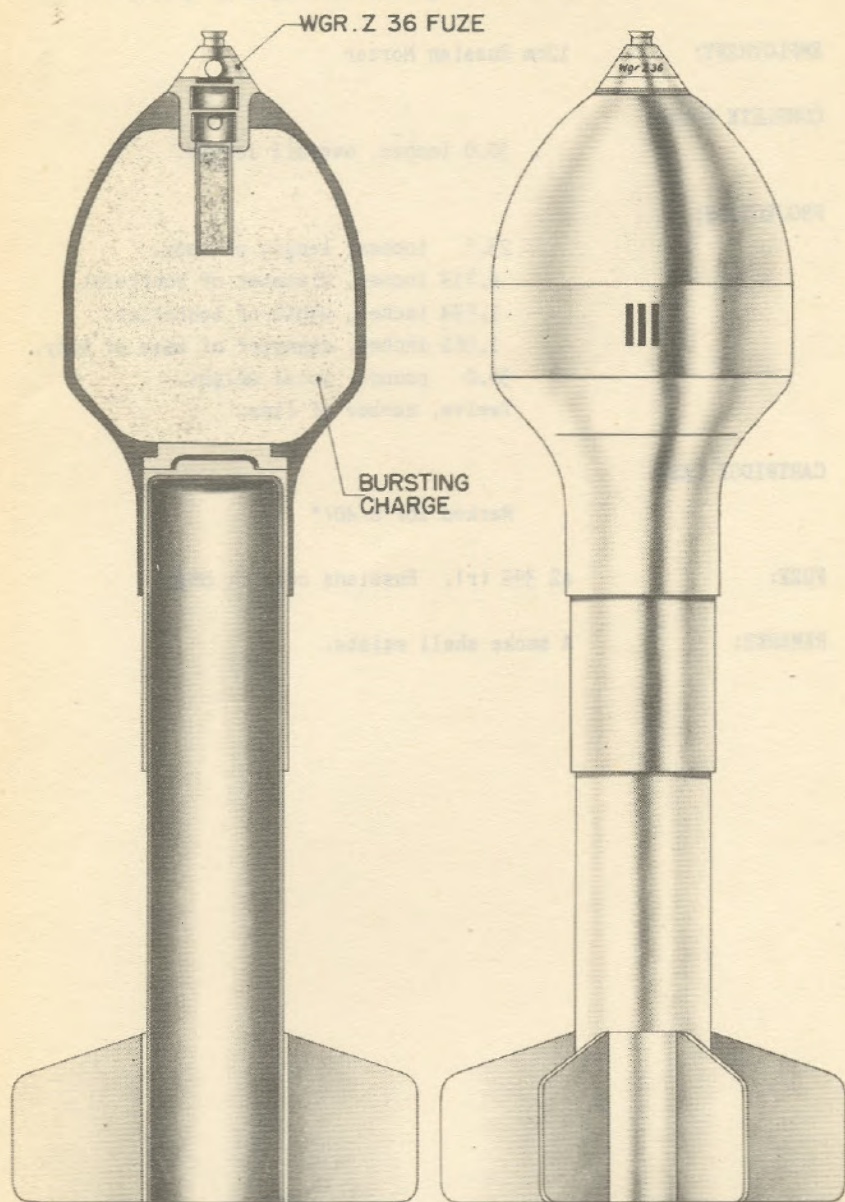
CARTRIDGE CASE:
Marked 26/58/40/*

FUZE: AZ 399 (r). Russians call it BMZ

REMARKS: A smoke shell exists.

RESTRICTED

H.E. MORTAR PROJECTILE, 200mm.



20cm Wgr. 40

RESTRICTED

H.E. MORTAR PROJECTILE, 200 mm.

GERMAN DESIGNATION: 20cm Wgr. 40
(Werfergranate 40)

EMPLOYMENT: 20cm L. Ladingswerfer

COMPLETE ROUND: 30.86 inches, overall length.

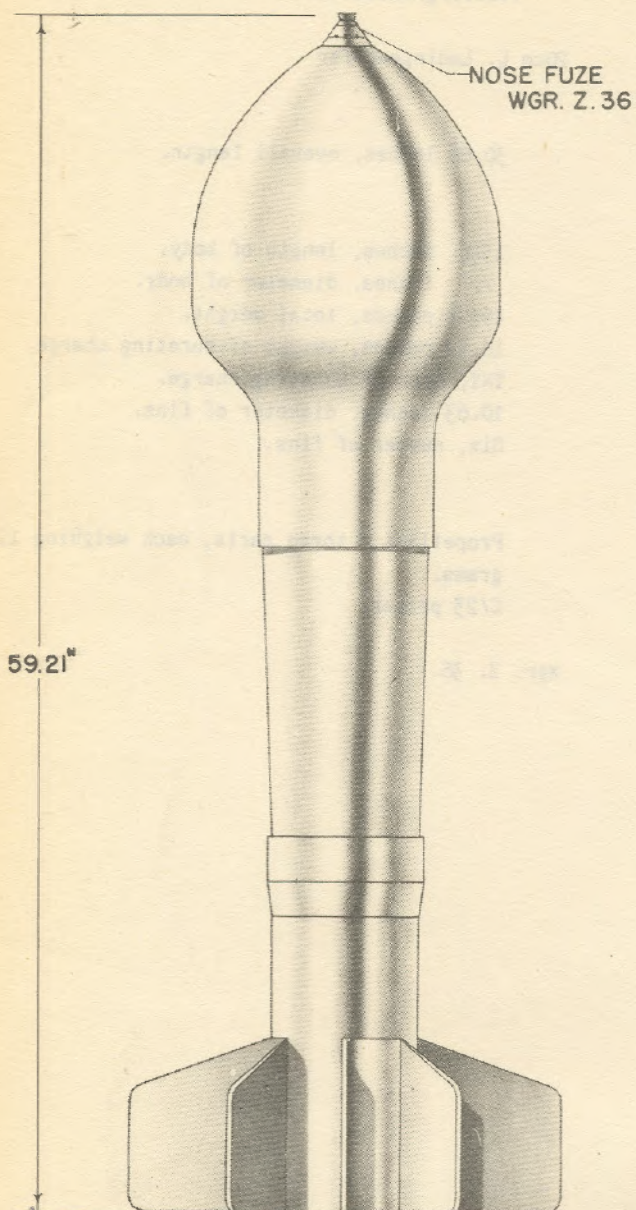
PROJECTILE:

- 13.0 inches, length of body.
- 7.5 inches, diameter of body.
- 49.94 pounds, total weight.
- 16.94 pounds, weight of bursting charge.
- TNT, type of bursting charge.
- 10.63 inches, diameter of fins.
- Six, number of fins.

CARTRIDGE CASE:

- Propellant - three parts, each weighing 12 grams.
- C/23 primer.

FUZE: Wgr. Z. 36



38cm Wgr. 40

GERMAN DESIGNATION: 38cm Wgr. 40
(Werfergranate 40)

EMPLOYMENT: 38cm s. Ladingswerfer

COMPLETE ROUND: 59.21 inches, overall length.

PROJECTILE: 24.606 inches, length of body.
14.96 inches, maximum diameter of body.
327.8 pounds, total weight.
110.0 pounds, weight of bursting charge.
21.18 inches, diameter of fins.
Six, number of fins.

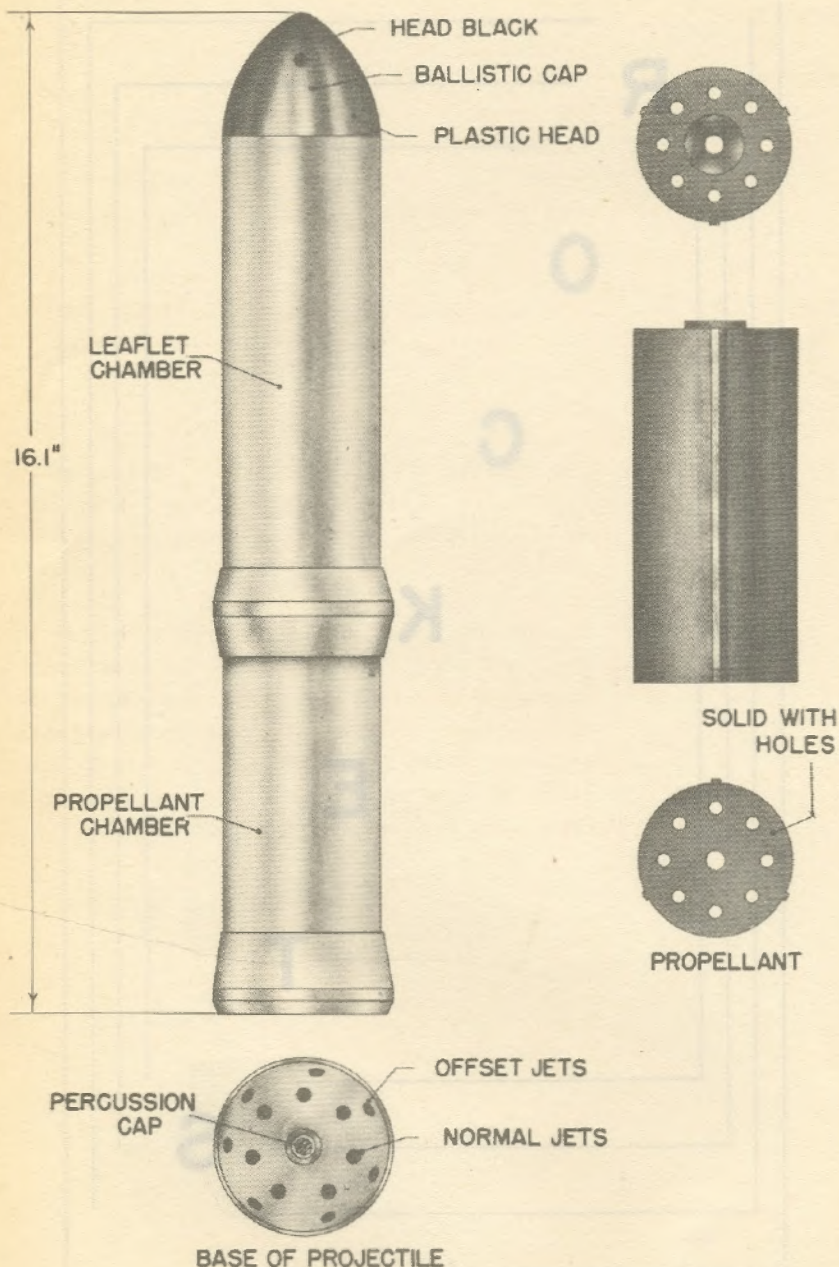
CARTRIDGE CASE: C/23 primer.

FUZE: Wgr. Z. 36

REMARKS: A smoke bomb exists with the designation "38cm Wgr.
40 Nb."

RESTRICTED

ROCKET PROPAGANDA LEAFLET, 7.3 cm.



7.3cm Propaganda-granate 41

RESTRICTED

ROCKET PROPAGANDA LEAFLET, 7.3 cm.

GERMAN DESIGNATION: 7.3 cm Propaganda-granate 41

EMPLOYMENT: Propaganda Gesdults 41.

DESCRIPTION: 7.2 pounds, total weight.
16.1 inches, length of body.
4.5 pounds, weight of body.
Weight and type of bursting charge - Propaganda
leaflets expelled by ejector C charge in flight.
1.0 pound, weight of propellant.

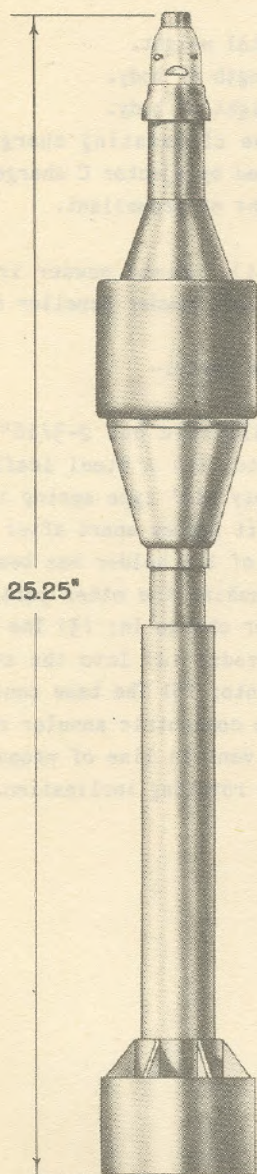
FUZE: Time (Air burst). Black powder train burns from
propellant to black powder expeller charge.

REMARKS: Consists of five parts:-

(1) Plastic ballistic cap 2-3/16" long which is tightly fit into; (2) A steel leaflet holder containing a 'safety pin' type spring in a split steel cylinder which it forces apart after the plastic and cardboard bore of the holder has been blown out the forward end, pushing the other parts before it, by the black powder charge in; (3) The brass base time fuze which threads; (4) Into the steel motor tube male-threaded into; (5) The base containing multiple venturis in two concentric annular rings. Venturis in center ring vent in line of propulsion, those in outer ring have rotating inclination.

RESTRICTED

H.E. HOLLOW CHARGE BAZOOKA ROCKET, 8.8cm.



8.8cm R. Pz. B. Gr.

RESTRICTED

H.E. HOLLOW CHARGE BAZOOKA ROCKET, 8.8 cm.

GERMAN DESIGNATION: 8.8 cm R. Pz. B. Gr.

EMPLOYMENT: Bazooka type launcher.
(Weighs 20-1/3 pounds.)

DESCRIPTION: 25.25 inches, overall length.
7.250 pounds, total weight.
3.5 inches, diameter of body.
3.4 inches, diameter of tail.
6.125 inches, length of fuze housing.
Digl. R.P., type of propellant.

FUZE: Nose percussion AZ 50955.

REMARKS: Electric ignition similar to American launcher M1 and rocket HE A.T. 2.36" M6A1. Rocket and launcher of heavier weight than American counterpart. Generates own electricity, no battery.

GERMAN DESIGNATION: 15 cm Wurfgranate 41 w Rn Nebel

EMPLOYMENT: 6 tube Nebelwerfer 41
15 cm Do-Geraet 38
15 cm Panzerwerfer 42
(Single frame mounted on A.F.V.)

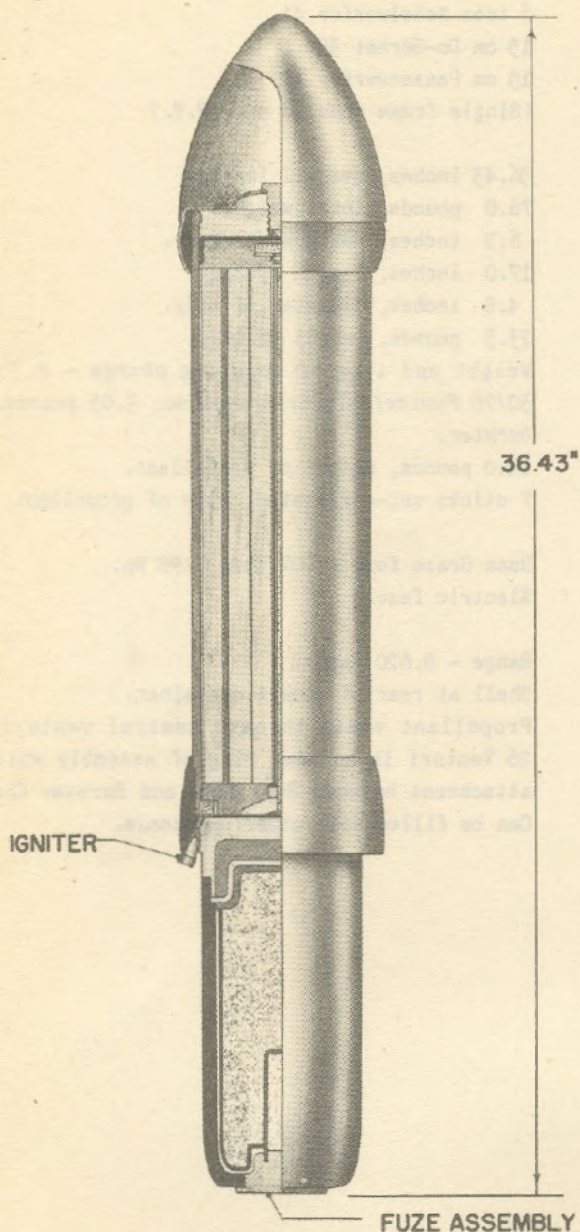
DESCRIPTION: 36.43 inches, overall length.
78.0 pounds, total weight.
6.2 inches, maximum diameter.
17.0 inches, length of body.
4.8 inches, diameter of body.
23.5 pounds, weight of body.
Weight and type of bursting charge - 8.5 pounds,
30/70 Pumice/Sulphur Tri-oxide; 3.05 pounds, picric
burst.
14.0 pounds, weight of propellant.
7 sticks uni-perforated, type of propellant.

FUZE: Base Graze fuze - DOV Zldg C/98 Np.
Electric fuze.

REMARKS: Range - 8,620 yards.
Shell at rear of rocket container.
Propellant vents through central venturi block.
26 Venturi in annular ring of assembly which forms
attachment between Body Tube and Burst Container.
Can be filled with other chemicals.

RESTRICTED

H.E. ROCKET, 15 cm.



15cm Wurfkoerper 4l Apreng.

GERMAN DESIGNATION: 15 cm Wurfkoerper 41 Aprengr.

EMPLOYMENT: 6 tube Nebelwerfer 41
15 cm Do-Geraet 38
15 cm Panzerwerfer 42
(Single frame mounted on A.F.V.)

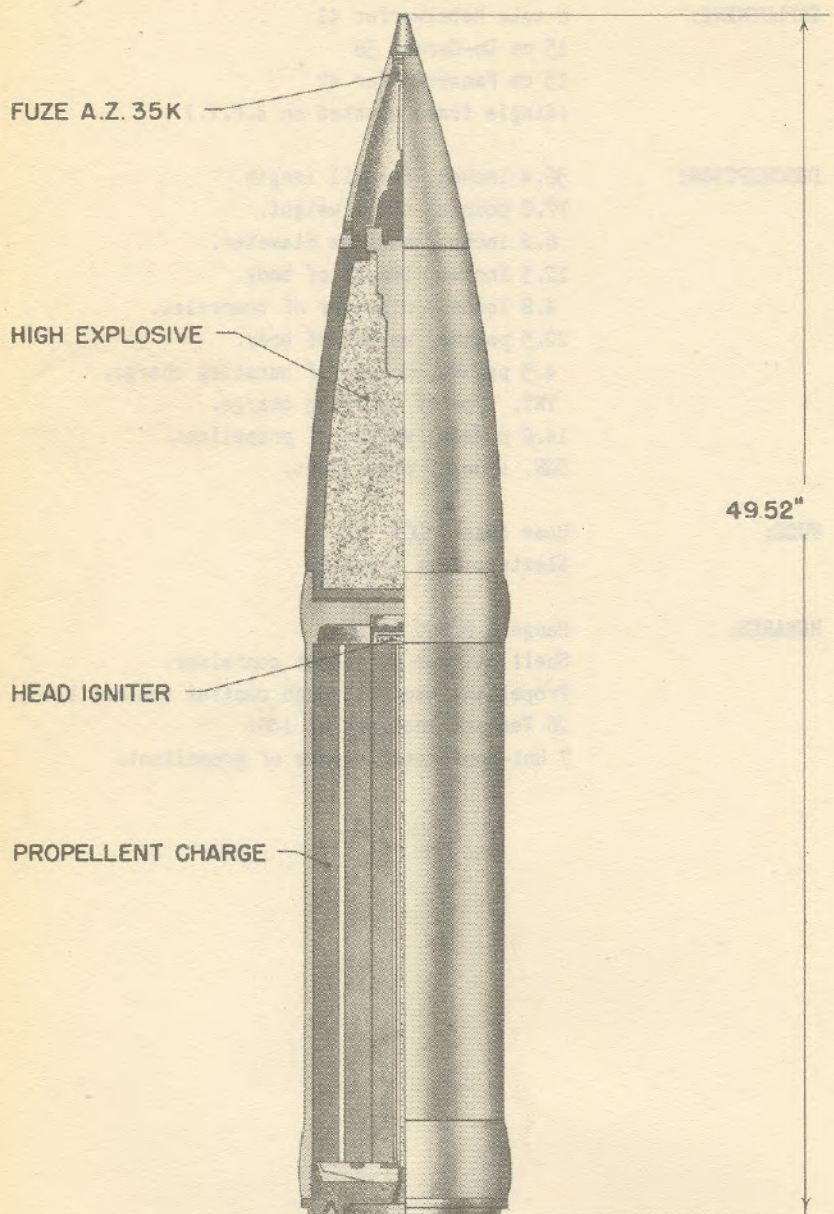
DESCRIPTION: 36.4 inches, overall length.
77.0 pounds, total weight.
6.2 inches, maximum diameter.
12.5 inches, length of body.
4.8 inches, diameter of bourrelet.
22.5 pounds, weight of body.
4.5 pounds, weight of bursting charge.
TNT, type of bursting charge.
14.0 pounds, weight of propellant.
DGN, type of propellant.

FUZE: Base fuze - DOV
Electric fuze - Erz 39

REMARKS: Range - 8,620 yards.
Shell at rear of rocket container.
Propellant vents through central venturi block.
26 Venturi inclined at 140.
7 Uni-perforated sticks of propellant.

RESTRICTED

H.E. ROCKET, 21 cm.



21 cm Wurfkoerper 42 Spreng.

GERMAN DESIGNATION: 21 cm Wurfkoerper 42 Spreng.

EMPLOYMENT: 21 cm Nebelwerfer (5 or 6 barrels) aircraft.

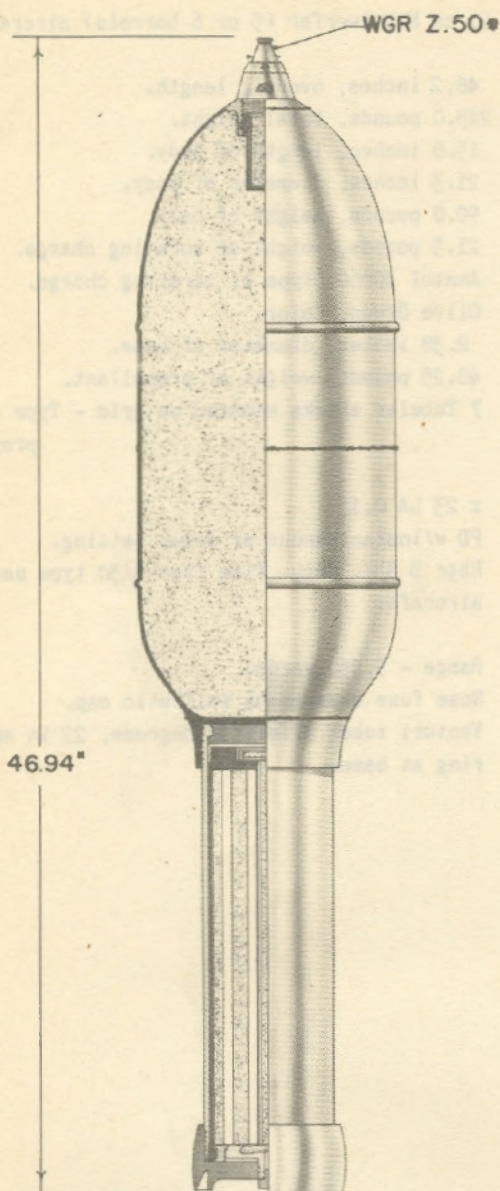
DESCRIPTION: 48.2 inches, overall length.
245.0 pounds, total weight.
15.8 inches, length of body.
21.3 inches, diameter of body.
90.0 pounds, weight of body.
21.5 pounds, weight of bursting charge.
Amatol 40/60, type of bursting charge.
Olive Green, Color.
8.38 inches, diameter of base.
40.25 pounds, weight of propellant.
7 Tubular sticks mounted on grid - Type of
propellant.

FUZE: z 23 LA 0.15
PD w/instantaneous or delay setting.
Hbgr Z 35K. Mech. Time fuze S/30 type used on
aircraft.

REMARKS: Range - 9,950 yards.
Nose fuze underneath ballistic cap.
Venturi tubes offset 16 degrees, 22 in annular
ring at base.

RESTRICTED

H.E. ROCKET, 28 cm.



28cm Wurfkörper Spreng.

GERMAN DESIGNATION: 28 cm Wurfkoerper Spreng.

EMPLOYMENT: Schweres Wurfgeraet 40 wooden frame.
Schweres Wurfgeraet 41 steel frame.
Schweres Wurfalimen 6 metal frames mounted on half-tracked vehicle.
28/32 Nebelwerfer 41

DESCRIPTION:

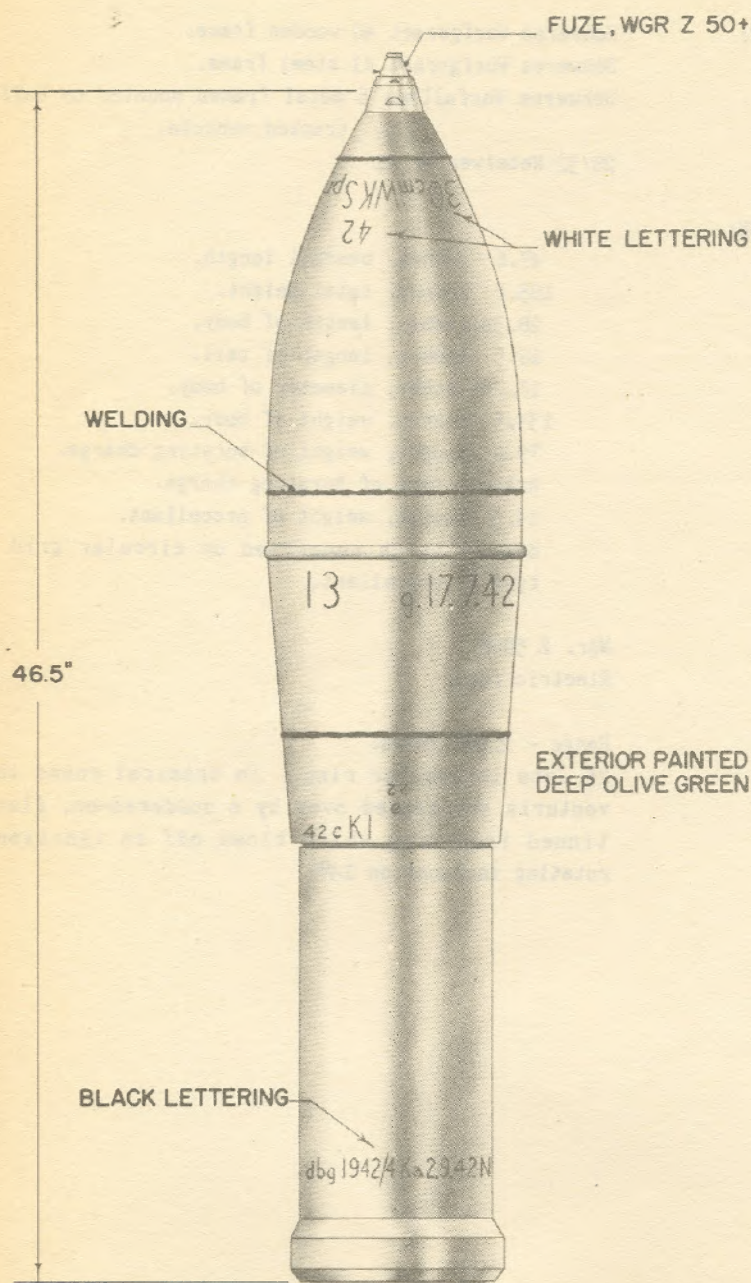
47.6 inches, overall length.
183.0 pounds, total weight.
28.34 inches, length of body.
18.5 inches, length of tail.
10.75 inches, diameter of body.
133.5 pounds, weight of body.
79.0 pounds, weight of bursting charge.
Amatol, type of bursting charge.
14.5 pounds, weight of propellant.
Single stick supported on circular grid - type of propellant.

FUZE: Wgr. Z 50 +
Electric fuze.

REMARKS: Range - 2,080 yards.
26 Jets in annular ring. In tropical round the venturis are sealed over by a soldered-on, flat, tinned iron ring which blows off on ignition; rotating inclination 14°.

RESTRICTED

H.E. ROCKET, 30 cm.



30cm Wurfkoerper Spreng.

RESTRICTED

H.E. ROCKET, 30 cm.

GERMAN DESIGNATION: 30 cm Wurfkoerper Spreng.

EMPLOYMENT: 30 cm Nebelwerfer 42

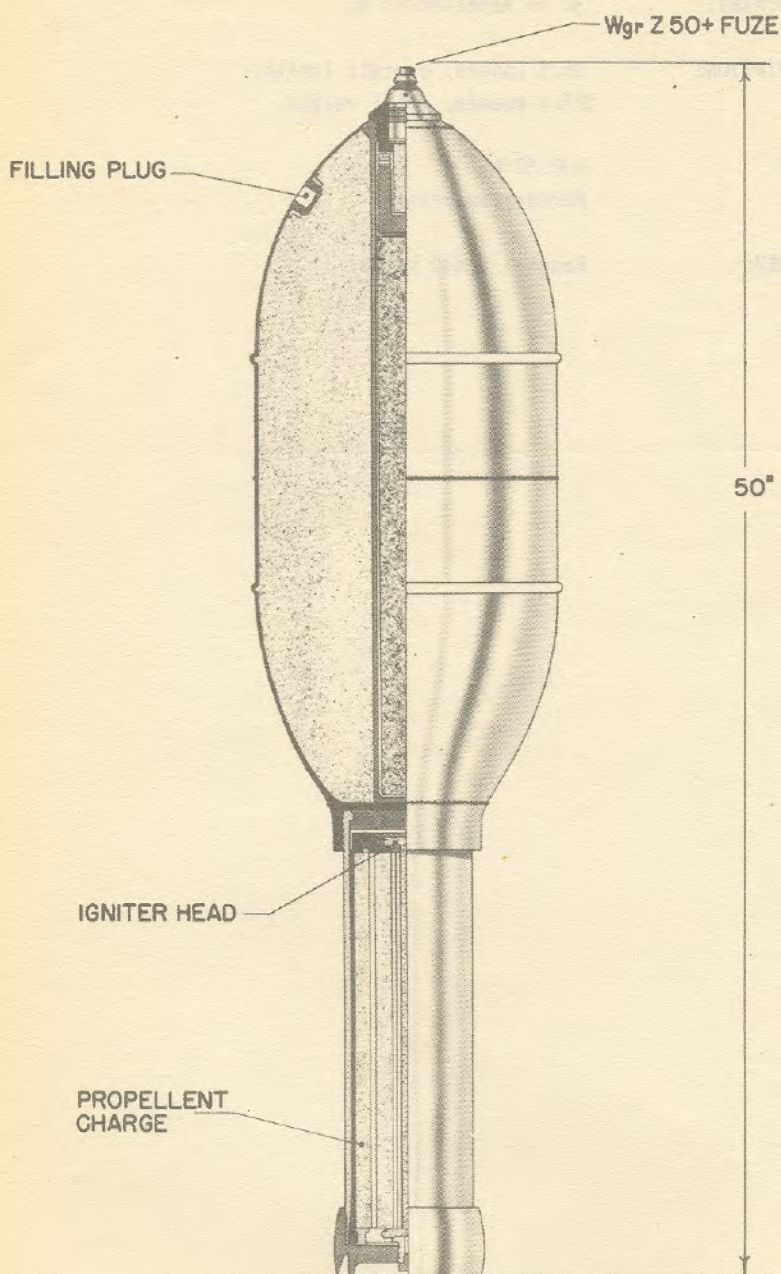
DESCRIPTION: 46.5 inches, overall length.
275.0 pounds, total weight.

FUZE: WGR 50 +
Percussion primer.

REMARKS: Range - 2,440 yards.

RESTRICTED

INCENDIARY ROCKET, 32 cm.



32cm Wurfkoerper mit Flamme

GERMAN DESIGNATION: 32 cm Wurfkoerper mit Flamme

EMPLOYMENT: Schweres Wurfgeraet 40 Wooden Frame
Schweres Wurfgeraet 41 Steel Frame
Schweres Wurfalimen (6 metal frames mounted on half-track vehicle.)
28/32 Nebelwerfer

DESCRIPTION: 49.2 inches, overall length.
173.41 pounds, total weight.
32.67 inches, length of body.
18.11 inches, length of tail.
13.18 inches, diameter of body.
124.5 pounds, weight of body.
Weight and type of bursting charge - 11 gals filling (gas and oil) 87.69 lbs.; PETN blocks - .39 pounds.
14.24 pounds, weight of propellant.
One stick, six celluloid tubes in slottings around its circumference, one containing quick match with G.P. pellet at each end in central hole. - Type of propellant.

FUZE: Wgr. Z 50+

REMARKS: Range - 2,430 yards.
Single multi-perforated stick of propellant. 26 Venturi in annular ring at base, rotating inclination of 14°.

INTRODUCTION TO GERMAN FUZES

The designation of the fuze is customarily stamped above the flange on nose fuzes and on the underside of the base fuzes.

NOSE FUZES

Nose fuzes, with the exception of one of the models used in 3.7 cm Pak (anti-tank gun) ammunition, are designated in a numbered series. In some instances -- as, for example, the 23 fuze -- there is more than one type of the model, but these are all designated under the same number.

The letter "S" with an oblique stroke immediately in front of the fuze number indicates a mechanical fuze.

The following letters included in the designation of nose fuzes will precede the model number (or letter and number):

- A.Z. Point Detonation Fuze.
- E.K.Zdr. Sensitive type of Point Detonating Fuze.
- K.Z. Point Detonating type under a ballistic cap, except in the case of the KZ 38, an ordinary P.D. Fuze.
- Kl.A.Z. Smaller size of a Point Detonating fuze model.
- l.I.gr.Z. Fuze for infantry gun or howitzer shell.
- Zt.Z. Time fuze.
- Dopp.Z. Combination Fuze - Time and Impact.

Fuzes for smoke shells have the letters Nb following the fuze number.

The exception 3.7 cm fuze referred to is designated 3.7 cm Kpf.Z. Zerl.P. The letters "Kpf.Z." indicates a nose fuze, while Zerl P indicates the presence of a gunpowder pellet which is destroyed on firing to release a centrifugal safety device.

BASE FUZES

Base fuzes, are designated to include the calibre of the equipment and the nature of projectile in which used.

The following are typical examples:

- Bd.Z.f 7.5 cm Pzgr. -- Indicates base fuze for 7.5 cm armor-piercing projectile.
- Bd.Z.f 15 cm Gr. 19 Be -- Indicating base fuze for 15 cm anti-concrete shell Model 19.

DELAY AND SUPERQUICK SETTINGS

Fuzes with a setting device for optional delay are stamped with the letters "M", "V", "O", to indicate the positions to which the slot in the setting plug must be set to obtain either delay or non-delay action.

RESTRICTED

With nose fuzes the "M" and the "V" are normally diametrically opposite and the plug is turned so that the slot in its head is aligned with them to obtain "with delay" action.

With base fuzes the "M" and "V" are stamped together as "MV" and the slot in the setting plug is aligned with this stamping to obtain delay action.

The "O" stamping indicates the setting position for "without delay."

The stamping settings are colored in red. With these types of fuzes the letter "V" followed by numerals enclosed in brackets, is printed after the fuze number on package labels and also on the fuze body. The letter indicates delay and the figures the period of delay.

Examples:

AZ 23 m.V (0.25) or	Point Detonating Fuze No. 23 with .25
AZ 23 v. (0.25)	seconds delay.
MV (mit versogerung)	With delay.
O or OV	Without delay.
(Ohne versogerung)	

MARKINGS ON FUZE BOXES

Fuze markings give the type of fuze, the manufacturer, the lot number and the number of fuzes packed.

In addition, Point Detonating fuze boxes are marked at each end with vertical stripes.

Examples:

One (1) red band at each end.	Box contains a Point Detonating Fuze.
One (1) white band at each end.	Box contains a Point Detonating Super-quick Fuze.
One (1) black band at each end.	Box contains fuzes with a short delay.
One (1) violet band at each end.	Box contains fuzes with long delay.

If the fuzes are of the type with reinforced springs, one of the bands mentioned above is replaced by a green band.

BOOSTERS

Boosters are designated in a numbered series, sometimes with a letter and an oblique stroke immediately in front of the number.

Black markingsIndications

Zdlg A

Booster A

Zdlg B

Booster B

Zdlg C/98

Booster C/98

Zdlg C/98 Np

Booster C/98 filled P.E.T.N./Wax

Gr. Zdlg C/98

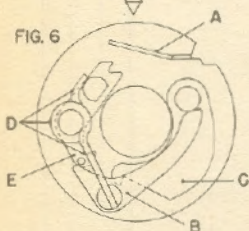
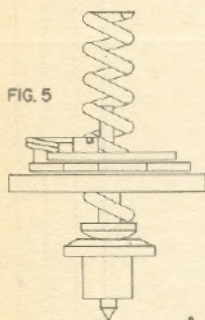
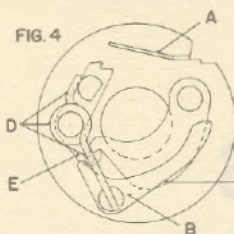
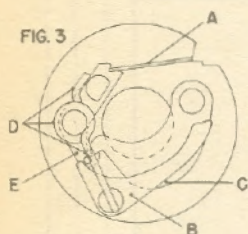
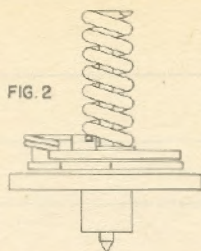
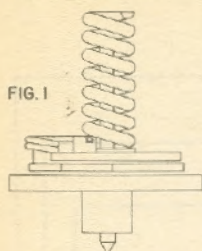
Larger Booster C/98

AUXILIARY BOOSTERS

Where paper wrappers are used, the marking "Zdlg" is also used as the designation for auxiliary boosters and for the bursting charge similar to a burster which is used in smoke shells.

The Cyclonite/Wax used in exploders is colored blue or bluish-green.

The PETN/Wax used in exploders is colored pink.



A. CENTRIFUGAL SEGMENT

B. CENTRIFUGAL LEVER

C. FIRING LEVER

D. FIRING LEVER CATCH SPRING

E. FIRING LEVER CATCH

1. FUZE BODY

2. FIRING SPRING & BUSHING

3. SELF DESTROYING FIRING MECHANISM

4. FIRING PIN

5. SPIRAL BORE SAFETY RIBBON

6. DETONATOR ADAPTER

GERMAN SELF DESTROYING FUZE Z. Zerl. Fg.

EMPLOYMENT:

Nose fuze for 20mm AA projectile with self-destroying arrangement.

DESCRIPTION:

1.062 inches, Overall length.
0.75 inches, Maximum diameter.
0.375 inches, Threaded length.
Number of threads - 8 RH.

FUNCTIONING:

As the projectile leaves the weapon the rotation imparted to it by the rifling causes the spiral bore safety ribbon (5) to unwind enabling the firing pin to pass on to the primer on impact.

The following is the self-destroying actions:

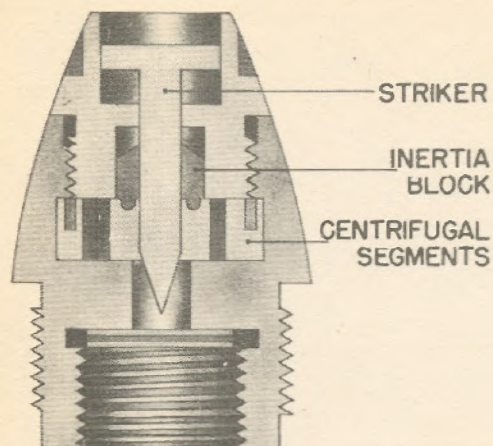
Figs. 1 & 2. - Preparatory to firing, the fuze is in the position shown in figures 1 and 2. The firing spring bushing is under tension because of the firing spring (2) and is held in a cocked position by the firing lever (6). This lever (C) is held in position by the catch (E). The centrifugal segment (A) allows catch (E) to remain in the locking position and prevents lever (C) from unhooking itself. Should this lever (C) unhook itself the firing spring bushing, because of the firing spring, would force lever (C) out of position and the firing pin would be shoved through the central hole stopping on the spiral bore safety ribbon (5).

Figs. 3 & 4. - Upon firing, centrifugal force causes the centrifugal lever (B) to move outward. This movement causes catch (E) to pivot slightly taking the strain off of the segment (A). As soon as the segment (A) is set free, it is bent outward because of centrifugal force. Since the metal in segment (A) is soft, there is no spring action to bring it back to its former position. During flight lever (B) because of centrifugal force continues to hold the catch (E) in the locked position. The mechanism remains in this position as long as centrifugal force can equal the tension created by the spring (D) which tends to release the catch (E).

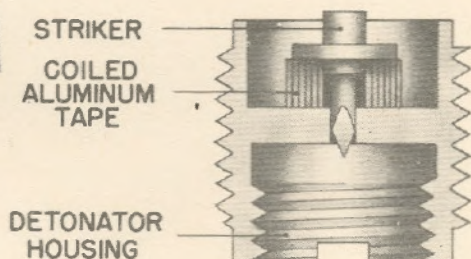
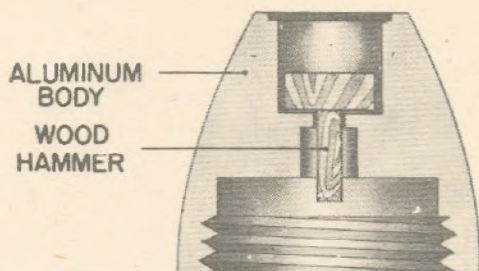
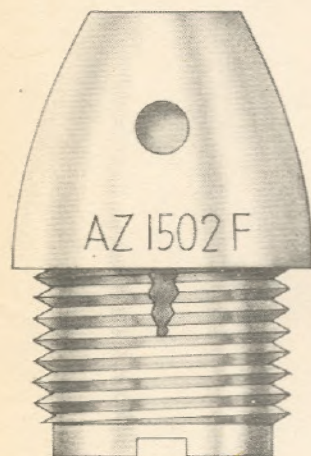
Figs. 5 & 6. - As the rotation of the projectile decreases, the centrifugal force accordingly decreases causing the centrifugal lever (B) to relax its pressure on the catch (E). The tension of spring (D) opens catch (E) which releases firing lever (C). The firing spring and bushing (2), together with centrifugal force moves lever (C) outward, allowing the firing spring bushing to pass through the central hole. Since the spiral bore safety ribbon (5) has now completely unwound, the firing pin will carry through and fire the primer.

FUNCTIONING:

Of special note in the mechanism is the highly polished surface of the firing spring bushing. This smoothness is probably necessary for the proper functioning of the fuze.



NOSE FUZE Z 45



NOSE FUZE A.Z. 1502 F

RESTRICTED

NOSE FUZE A.Z. 1502 F

EMPLOYMENT:

Nose fuze used on German 20 mm. ammunition.

DESCRIPTION:

1.000 inches, Overall length.

0.781 inches, Maximum diameter.

0.250 inches, Threaded length (with washer)

Number of threads - 6 RH.

CONSTRUCTION:

The fuze is aluminum and has a recess in the base which houses a detonator cup. A floating striker is held in position by a coiled aluminum tape bearing against a shoulder on the striker body. A wooden hammer rests against the striker head and is just below the nose closing cap.

FUNCTIONING:

Centrifugal force unwraps the aluminum tape freeing the striker. On impact the hammer forces the striker into the detonator.

REMARKS:

The A.Z. 1502, an earlier version of the 1502 F, employs the standard German centrifugal segments surrounded by a coiled strip of brass, but that is the only difference in the two fuzes.

EMPLOYMENT:

Nose fuze used on German 20 mm. ammunition.

DESCRIPTION:

1.000 inches, Overall length.
0.781 inches, Maximum diameter.
0.250 inches, Threaded length (with washer)
Number of threads - 6 RH.

CONSTRUCTION:

The body construction is similar to the A.Z. 1502 F.

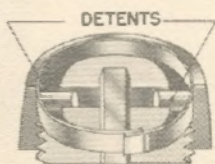
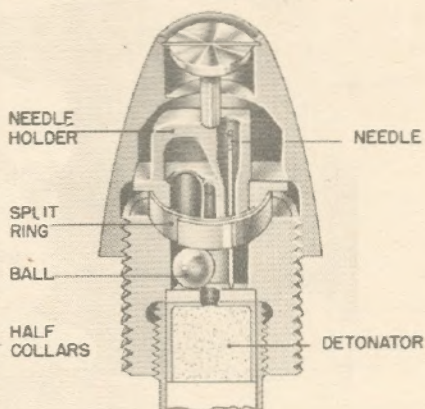
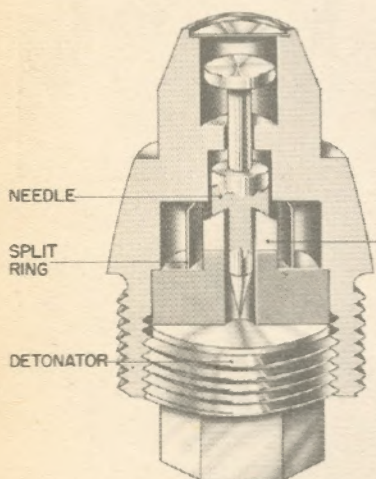
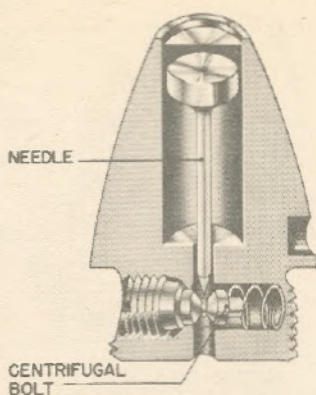
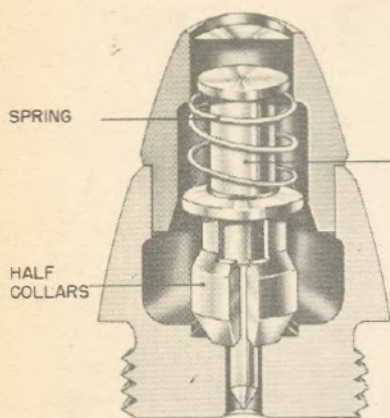
This fuze, however, employs the standard centrifugal segments surrounded by a coiled brass strip. These segments are grooved on the top to engage the small projections on the bottom of an inertia block which surrounds the striker. The striker and hammer of the 1502F are replaced in the Z. 45 by a striker of single piece construction.

FUNCTIONING:

On set-back, the inertia block engages the centrifugal segments preventing them from releasing the striker. During flight, the inertia block creeps forward and the segments are permitted to fly out as the brass strip uncoils. On impact, the striker is driven into the detonator.

RESTRICTED
NOSE FUZE AZ 1531

NOSE FUZE AZ 1532



NOSE FUZE
AZ. 1551 & AZ.1552

NOSE FUZE
AZ. 1503 & AZ.1504

EMPLOYMENT:

Nose fuze used in 20 mm. Aircraft Cannon Ammunition.

CONSTRUCTION:

The single piece body has a closing disc in the nose and threads at the base to engage the projectile.

A shoulder on the floating needle bears against two half collars on the bottom and a light spring on the top. The bottom of the half collars are locked in a seat in the fuze body and are kept there by the force of the light spring.

FUNCTIONING:

The needle and half collars are held in position during the initial phases of the projectile's flight. Upon deceleration, however, the needle creeps forward compressing the spring and thus freeing the half collars. These collars creep forward out of the seat and are separated by centrifugal force. The needle is then permitted to pierce the detonator upon impact.

NOSE FUZE A.Z. 1532

EMPLOYMENT:

Nose fuze used in German 13 mm ammunition.

DESCRIPTION:

0.594 inches, Overall length.
0.406 inches, Maximum diameter.
0.156 inches, Threaded length.
Number of threads - 5 RH.

CONSTRUCTION:

The fuze is of single piece construction with a closing cap in the nose and threads on the base for engaging the projectile. A long needle is housed in a central cavity and it is held in place by a centrifugal bolt.

FUNCTIONING:

On set-back, the needle engages a groove in the centrifugal bolt locking it in place. During deceleration, the needle creeps forward permitting the bolt to move outward clearing the central channel. The needle is then free to strike the detonator upon impact.

RESTRICTED

NOSE FUZES A.Z. 1551 & A.Z. 1552

EMPLOYMENT:

Nose fuzes used in German 15 mm ammunition.

DESCRIPTION:

0.688 inches, Overall length.

0.500 inches, Maximum diameter.

0.188 inches, Threaded length.

Number of threads - 5 RH.

CONSTRUCTION:

The brass body has a closing disc in the nose and threads near the base of the fuze for engaging the projectile. A detonator screws into a recess in the base of the fuze body.

A needle is supported in a central recess of the fuze by two half collars surrounded by a split ring. The under side of the shoulder on the needle is grooved to engage the top of the half collars holding them in place during set-back.

FUNCTIONING:

After set-back has been overcome, the needle creeps forward freeing the half collars. Centrifugal force then throws the half collars and the split ring outward permitting the needle to pierce the detonator upon impact.

REMARKS:

The A.Z. 1552 is the same fuze as the A.Z. 1551 except that it is made of steel.

RESTRICTED

NOSE FUZES A.Z. 1503 & A.Z. 1504

EMPLOYMENT:

Nose fuzes used in German 20 mm. ammunition.

DESCRIPTION:

1.094 inches, Overall length.
0.750 inches, Maximum diameter.
0.375 inches, Threaded length.
Number of threads - 9 RH.

CONSTRUCTION:

The steel body has a closing disc in the nose and threads on the base of the fuze for engaging the projectile. A detonator screws into a recess in the base of the fuze body.

Inside the fuze body, a needle holder keeps the needle out of line with the detonator. This holder is kept from moving down by two detents attached to a split ring which surrounds the holder.

A small steel ball rides in a slot below the needle holder and keeps it in the offset position.

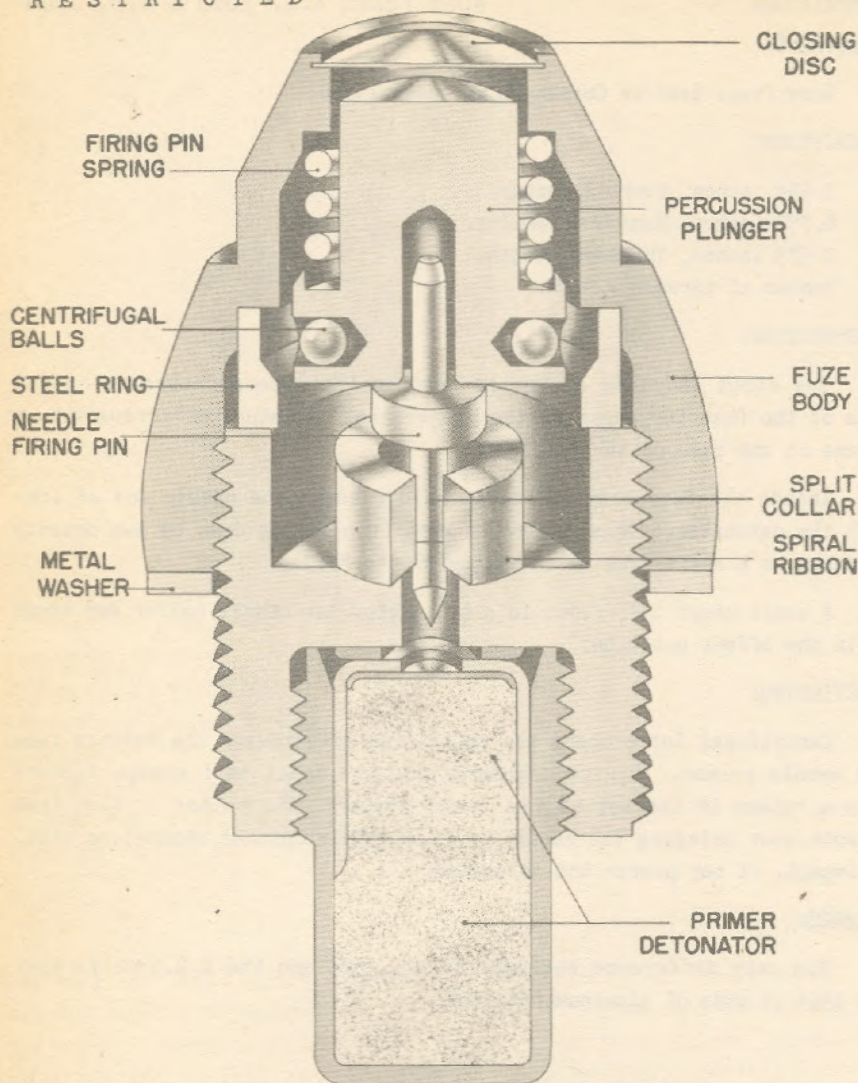
FUNCTIONING:

Centrifugal force opens the split ring withdrawing the detents from the needle holder. During deceleration, the small ball creeps forward into a recess in the top of the needle holder. The holder is then free to move over bringing the needle in line with a central channel so that, on impact, it may pierce the detonator.

REMARKS:

The only difference between the A.Z.1503 and the A.Z.1504 is that the 1504 is made of aluminum not steel.

R E S T R I C T E D



SELF-DESTROYING NOSE FUZE Z.Z. 1505

EMPLOYMENT:

German self-destroying nose fuze used in the 2 cm. Mauser (H.E. Ammunition).

DESCRIPTION:

1.063 inches, Overall length.
1.781 inches, Maximum diameter.
0.250 inches, Threaded length.
Number of threads - 7 RH.

CONSTRUCTION:

The steel body of the fuze has a metal closing disc at the nose which protects the striker from air pressure and it is threaded at the base to engage the threads of the projectile. A primer detonator is screwed into the base of the fuze.

Inside the fuze a shoulder on the firing pin bears against a split collar on the bottom and a percussion plunger on the top. The split collar is housed in a recess in the center of the fuze and is held together by a spiral brass ribbon. The percussion plunger in the upper recess of the fuze is surrounded by a compressed spring bearing against the fuze body at the top and a shoulder on the plunger at the bottom. The shoulder on the plunger is grooved to house eight steel centrifugal balls. The balls are retained in position by a steel ring which increases in its internal diameter towards the top and is supported by the body of the fuze. There is a central hole in fuze to permit the striker to reach the primer.

FUNCTIONING:

Centrifugal force causes the steel balls to fly out into the enlarged portion of the retaining ring thus locking the percussion plunger and its compressed spring in place. Centrifugal force also loosens the brass ribbon permitting the split collar to be thrown free of the striker. Upon impact the steel balls are cammed back into their housing and the compressed spring aids in activating first the plunger and then the firing pin, the latter piercing the primer.

When impact does not occur before a certain length of time, the spring overcomes the decreasing centrifugal force and causes the balls to be cammed back into their housing again releasing the plunger so that it may force the firing pin into the primer.

R E S T R I C T E D

CLOSING CAP

ALUMINUM
BODY

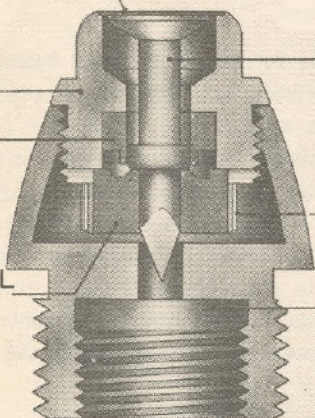
STEEL RING

CENTRIFUGAL
SEGMENTS

STRIKER

SPRING
BAND

DETONATOR
RECESS



NOSE FUZE AZ 5072

EMPLOYMENT:

Mechanical Impact Nose Fuze for H.E. Projectile in 28-20 and 42-28 tapered bore guns.

DESCRIPTION:

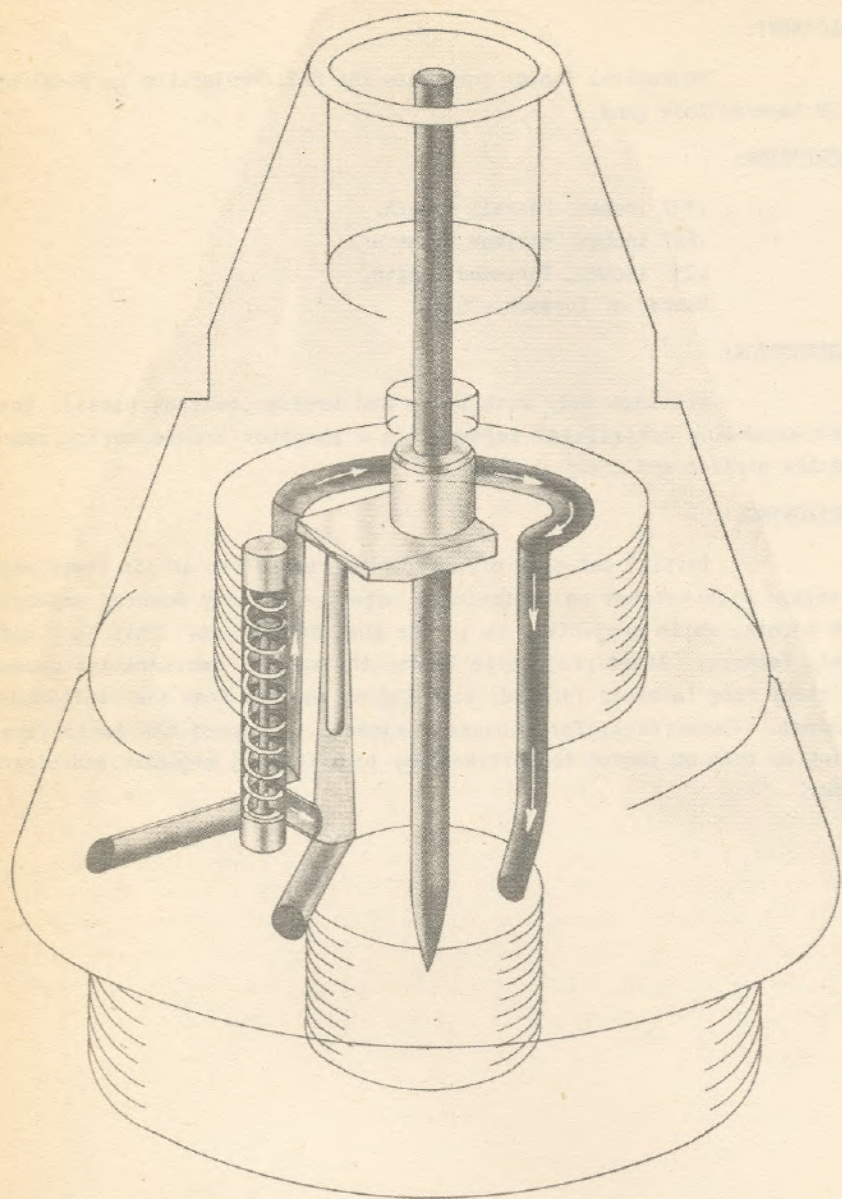
.937 inches, Overall length.
.687 inches, Maximum diameter.
.25 inches, Threaded length.
Number of threads - 6 RH.

CONSTRUCTION:

Aluminum body with brass and bronze internal parts. Contains expanding centrifugal segments in a phosphor bronze spring and a moveable striker and creep spring.

FUNCTIONING:

Initial set-back of steel ring causes lip on its lower edge to engage with notches on centrifugal segments thereby keeping segments from opening while projectile is in the bore of the gun. This is a bore safety feature. After projectile leaves the weapon, deceleration causes the steel ring to creep forward, disengaging the lip from the centrifugal segments. Centrifugal force causes segments to expand the centrifugal spring so that on impact the striker may pass through segments and pierce primer.



NOSE FUZE KZ 40 FOR 3.7cm H.E.
SHELLS

EMPLOYMENT:

Mechanical Nose Fuze with self-destroying arrangement for 3.7 cm H.E. shells.

DESCRIPTION:

2.0 inches, Overall length.
1.125 inches, Maximum diameter.
0.312 inches, Length of threads.
Number of threads - 5 RH.

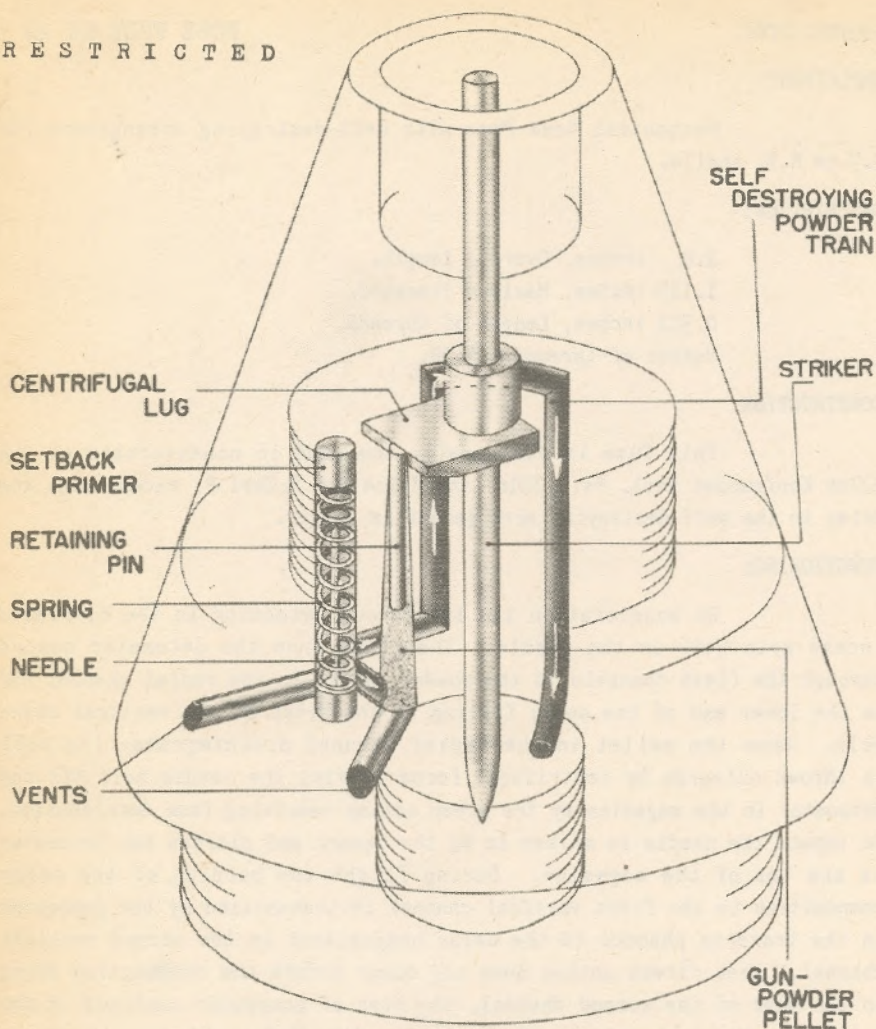
CONSTRUCTION:

This fuze is essentially the same in construction as the 3.7cm Kopfzunder Zerl. Pv. (ZZ16) and 3.7cm Kpf Z. Zerl P. except that the delay in the self-destroying arrangement is longer.

FUNCTIONING:

On acceleration the igniferous detonator in the displaced recess sets back on the needle. The flash from the detonator passes through the flash channels to the powder pellet in the radial channel and to the lower end of the delay filling in the first of the vertical channels. When the pellet in the radial channel disintegrates the bolt is thrown outwards by centrifugal force leaving the needle held off the detonator in the magazine by the creep action resulting from deceleration. On impact the needle is driven in by the hammer and pierces the detonator in the top of the magazine. During flight the burning of the delay composition in the first vertical channel is transmitted by the gunpowder in the traverse channel to the delay composition in the second vertical channel. When direct action does not occur before the composition burns to the base of the second channel, the disc of gunpowder confined in the top of the magazine adapter is ignited and explodes and thus initiates the detonation of the magazine.

R E S T R I C T E D



Kpf Zerl Pv. NOSE FUZE
FOR 3.7 A.A. SHELLS

RESTRICTED

NOSE FUZE 3.7cm Kopfzunder Zerl Pv.

EMPLOYMENT:

Mechanical Nose Fuze with self-destroying arrangement for 3.7 A.A. Gun H.E. shells.

DESCRIPTION:

1.75 inches, Overall length.
1.25 inches, Maximum diameter.
0.312 inches, Threaded length.
Number of threads - 5 RH.

CONSTRUCTION:

The above is apparently an improved type of the earlier version, the 3.7cm Kopfzunder Zerl.P. Only minor modifications are incorporated. The centrifugal bolt holding the needle off the detonator is flat and is held in position by a detent which sits on a gunpowder pellet.

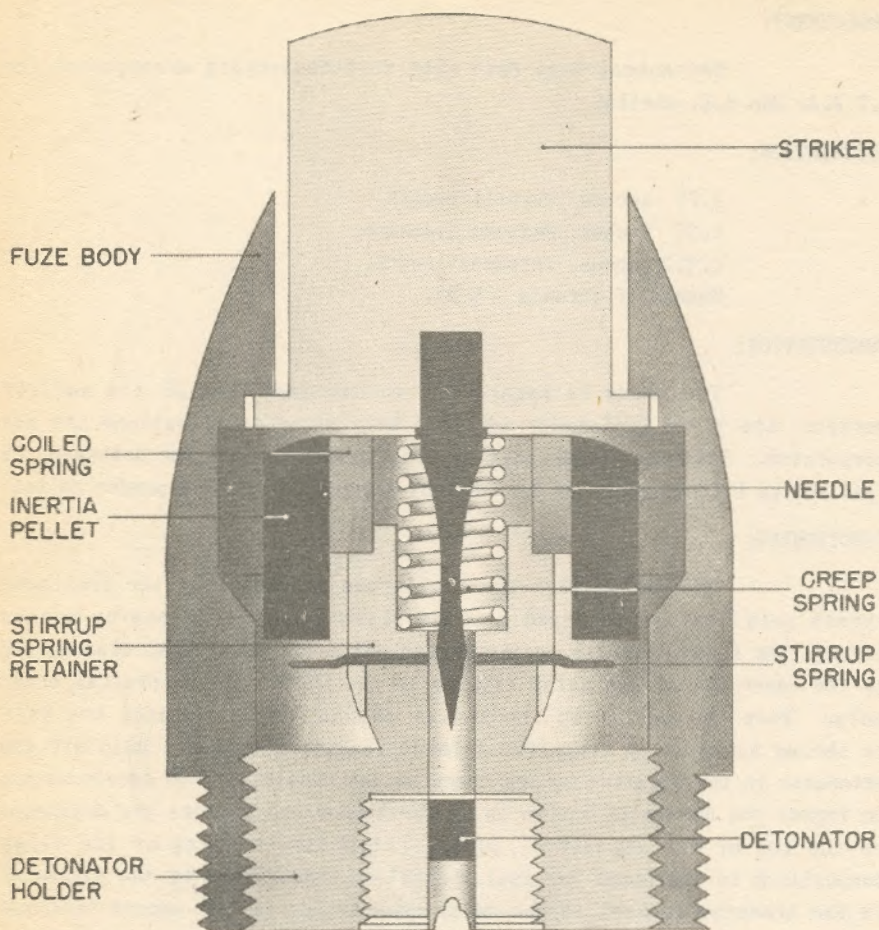
FUNCTIONING:

On acceleration the igniferous detonator in the displaced recess sets back on the needle. The flash from the detonator passes through the flash channels to the powder pellet in the radial channel and to the lower end of the delay filling in the first of the vertical channels. When the pellet in the radial channel disintegrates the bolt is thrown outwards by centrifugal force leaving the needle held off the detonator in the magazine by the creep action resulting from deceleration. On impact the needle is driven in by the hammer and pierces the detonator in the top of the magazine. During flight the burning of the delay composition in the first vertical channel is transmitted by the gunpowder in the traverse channel to the delay composition in the second vertical channel. When direct action does not occur before the composition burns to the base of the second channel, the disc of gunpowder confined in the top of the magazine adapter is ignited and explodes and thus initiates the detonation of the magazine.

REMARKS:

Now issued in light steel body and known as ZZ 16.

R E S T R I C T E D



NOSE FUZE AZ 5075

RESTRICTED

NOSE FUZE AZ 5075

EMPLOYMENT:

Nose Fuze for the 3.7cm Strelgranate (3.7mm Rodded Bomb) fired from the 3.7mm Pak.

DESCRIPTION:

1.875 inches, Overall length.
1.187 inches, Maximum diameter.
0.25 inches, Threaded length.
Number of threads - 7 RH.

CONSTRUCTION:

The fuze is of aluminum and has an ogival body with a hole at the nose through which the cylindrical striker protrudes. The body is screwthreaded for insertion in the grenade and has an internal circumferential recess below the striker to permit the expansion of the coiled spring in flight. The striker carries a needle surrounded by a spiral spring which is held between the underside of the striker and a cup-shaped retainer. The retainer has a central hole for the needle and has a step formed near the front end around which a length of flat spring is coiled. The coiled spring is retained by a cylindrical arming ferrule with an internal groove near its base end. A stirrup spring is held between the retainer and the detonator holder. The detonator holder is screwed into the base of the fuze and carries an igniferous detonator in a perforated screwed plug. The holder is secured in the fuze body by a set screw.

FUNCTIONING:

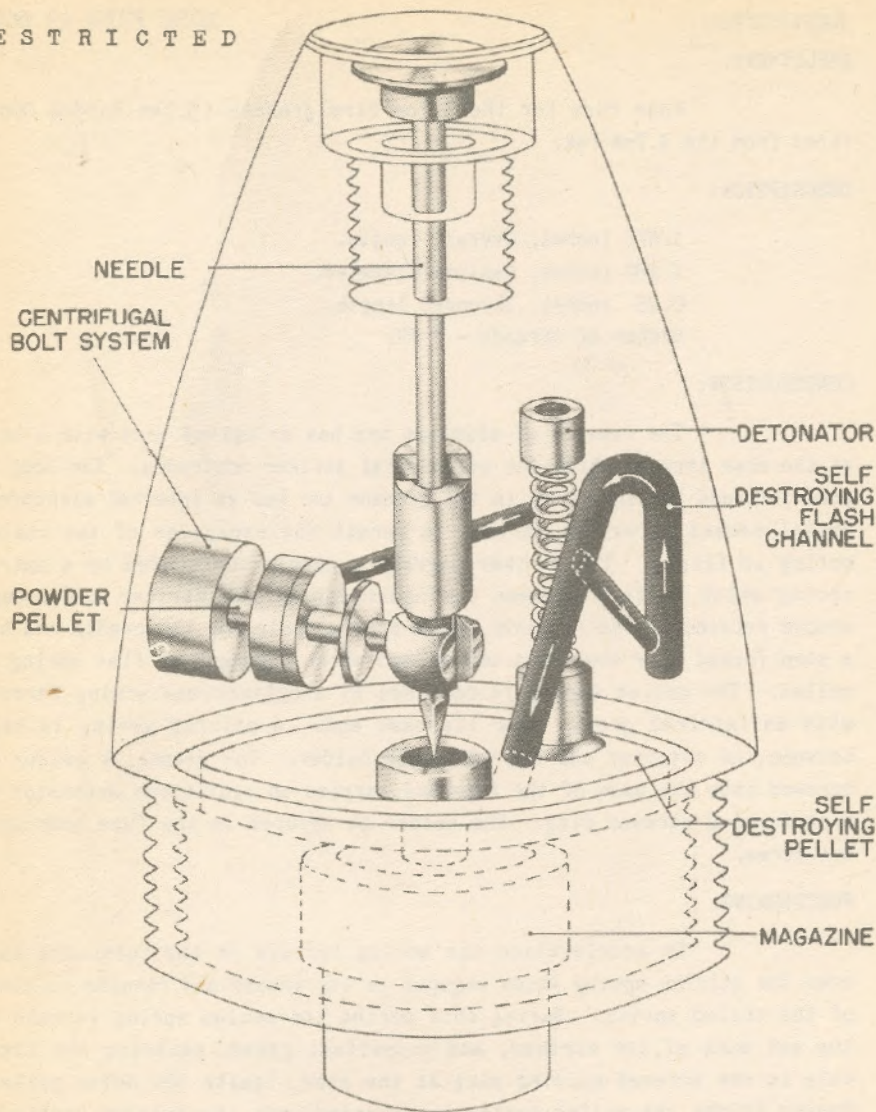
On acceleration the arming ferrule in the fuze sets back over the stirrup spring which engages in its groove and retains it clear of the coiled spring. During this period the coiled spring is held by the set back of the striker, and propellant gases, entering the flash hole in the screwed closing plug at the base, ignite the delay pellet. During flight the coiled spring is expanded into the annular recess in body by centrifugal force, thus leaving the striker with its needle supported only by the striker spring.

On impact the striker is driven in and the needle pierces the igniferous detonator of the fuze. The flash from this detonator initiates the detonator in the grenade, which in turn brings about the detonation of the bursting charge.

REMARKS:

This fuze is also used on the German H.E. Rifle and Hand Grenade "Gewehrgranate Spreng."

R E S T R I C T E D



SELF DESTROYING FUZE Kpf. Z. Zerl. P.

RESTRICTED

NOSE FUZE 3.7cm Kpf. Z.Zerl. P.

EMPLOYMENT:

Mechanical Nose Fuze with self-destroying arrangement for 3.7cm Pak H.E. shells.

DESCRIPTION:

- 1.75 inches, Overall length.
- 1.25 inches, Maximum diameter.
- 0.437 inches, Threaded length.
- Number of threads - 5 RH.

CONSTRUCTION:

The fuze, which weighs 2 oz. 0-3/4 dr., is used in the 3.7 cm. Pak (anti-tank gun) H.E. Tracer shell, and is of aluminum alloy with a body tapering towards the flat topped nose. The tip of the fuze is red and the stamping, "3.7 cm. Kpf. Z.Zerl.P." on the side of the body, is also colored red. The fuze is of the direct action type and includes a safety device which is released by the disintegration of a pellet of gunpowder. The detonator which ignites the powder pellet also ignites a delay composition which connects with the magazine of the fuze and provides a self-destroying action when direct action does not occur.

The direct action mechanism is contained in a central recess in the body and consists of an aluminum hammer supported by a steel pellet which is integral with the needle. The needle pellet is supported by a centrifugal bolt which protrudes from a radial channel in the body. The hammer consists of a circular disc with a stem which passes through a guide screwed into the body recess. The recess is closed at the top by a thin brass disc and has a hole at the base for the stem of the needle which enters a guide in the magazine adapter.

The brass centrifugal bolt is slotted at its inner end to fit around the stem of the needle and has a collar formed round its center which limits its inward movement. A stem formed on its outer end bears against a pellet of gunpowder contained in an aluminum perforated capsule attached to the inner side of the closing plug of the radial channel. The capsule is cylindrical with a concave wall with perforations equally spaced around it. The inner end of the capsule, which bears against a lead washer supported by a shoulder in the radial channel has a hole in the center to receive the stem of the centrifugal bolt. The screwed closing plug carrying the capsule has a lightly closed vent at its center for the escape of pressure when the powder is ignited. Two inclined flash channels connect the radial channel with a recess containing a detonator and needle assembly.

RESTRICTED

NOSE FUZE 3.7cm Kpf. Z.Zerl. P.

CONSTRUCTION:

The recess containing the detonator with its spiral supporting spring and screwed needle is displaced from the center of the fuze. The two inclined flash channels connecting the recess with the radial channel are located one near the top of the recess and the other near the bottom. An additional inclined flash channel, also near the bottom of the recess, connects with the channels containing the delay composition for the self-destroying action.

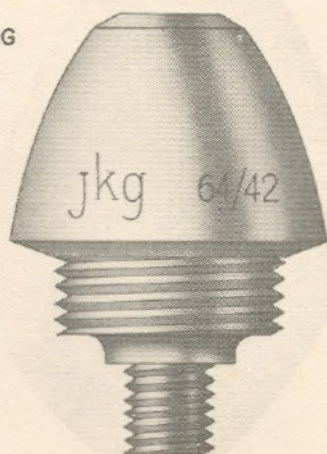
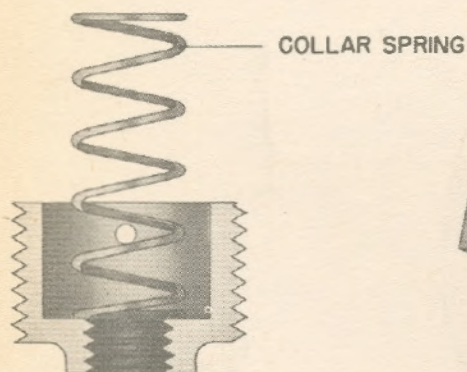
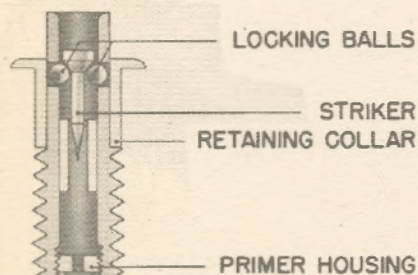
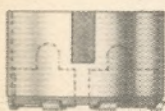
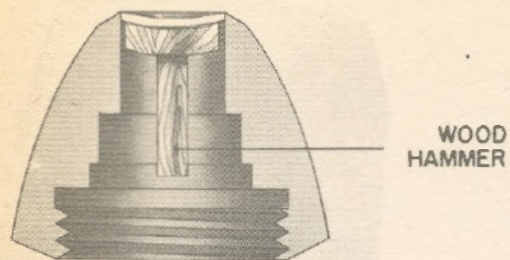
The delay composition for the self-destroying action is contained in two vertical channels with a transverse connecting channel. The flash channel from the detonator recess leads into the closed lower end of the first vertical channel. This channel is filled from the upper end with delay composition and closed at the top by a plug which is machined to correspond with the tapering body of the fuze. Near the top of the channel a traverse channel containing pressed gunpowder leads into the upper end of the second vertical channel which also contains delay composition and is open at the base where it is in contact with a circular disc of pressed gunpowder carried in a recess in the top of the magazine adapter.

The magazine adapter screws into the underside of the body and carries a magazine similar to that of the A.Z. 39. The circular recess in the top of the adapter has a cylindrical projection in the center which is drilled to form a guide for the needle. The pressed pellet of gunpowder contained in the recess is in the form of a washer to fit over the needle guide.

FUNCTIONING:

On acceleration the igniferous detonator in the displaced recess sets back on the needle. The flash from the detonator passes through the flash channels to the powder pellet in the radial channel and to the lower end of the delay filling in the first of the vertical channels. When the pellet in the radial channel disintegrates the bolt is thrown outwards by centrifugal force leaving the needle held off the detonator in the magazine by the creep action resulting from deceleration. On impact the needle is driven in by the hammer and pierces the detonator in the top of the magazine. During flight the burning of the delay composition in the first vertical channel is transmitted by the gunpowder in the traverse channel to the delay composition in the second vertical channel. When direct action does not occur before the composition burns to the base of the second channel, the disc of gunpowder confined in the top of the magazine adapter is ignited and explodes and thus initiates the detonation of the magazine.

R E S T R I C T E D



NOSE FUZE KZ 38

RESTRICTED

NOSE FUZE KZ 38

EMPLOYMENT:

Mechanical Impact Nose Fuze for 40 mm Bofors Gun H.E. shell.

DESCRIPTION:

1.125 inches, Overall length.
0.75 inches, Maximum diameter.
0.219 inches, Threaded length.
Number of threads - 5 RH.

CONSTRUCTION:

Fuze is identical with the British Type #250. Fuze is made of brass and steel. The upper and lower body surround the inner housing which contains retaining collar and retaining collar spring. In the lower body is the primer housing, striker, striker retaining balls. In the top of the upper body is a wooden hammer.

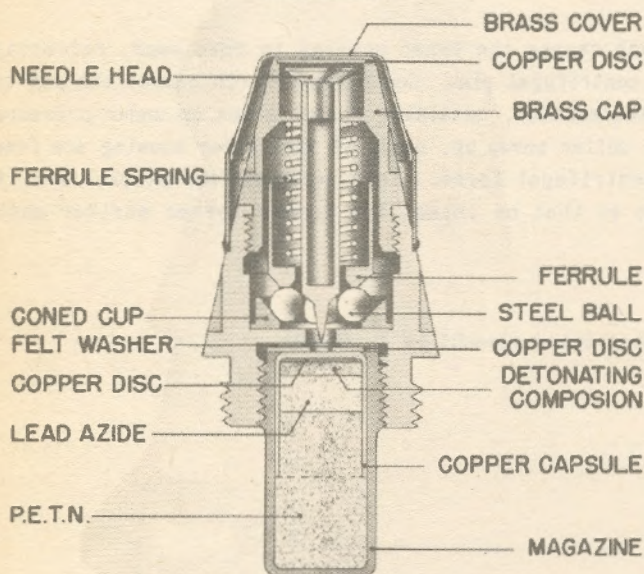
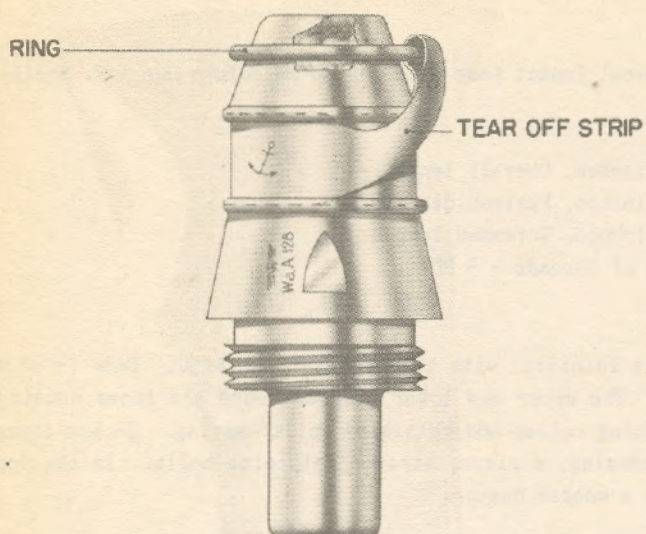
FUNCTIONING:

Set-back causes the inner housing to move back, releasing the pressure on the centrifugal pin. Centrifugal force causes the pin to move out and upon deceleration, retaining collar moves up under pressure from its spring. As collar moves up, balls in the primer housing are free to move out under centrifugal force. This releases the striker and it drops into position so that on impact the hammer forces striker onto primer.

REMARKS:

Self-destroying element is in tracer.

R E S T R I C T E D



NOSE FUZE FOR 4.7cm. H.E. SHELL

RESTRICTED

NOSE FUZE FOR 4.7cm H.E. SHELL

EMPLOYMENT:

Used in 4.7cm H.E. Shell (4.7cm Pak Spgr.)

DESCRIPTION:

1.312 inches, Overall length.
1.0 inches, Maximum diameter.
0.312 inches, Threaded length.
Number of threads - 3 RH.

CONSTRUCTION:

The fuze used is of the direct action detonating type in which the needle is held off the detonator by four steel balls.

The hollow stemmed aluminum needle with enlarged head passes through a cup-shaped ferrule and is supported at the cone, near the point, by four steel balls. The balls are located in the internally coned metal cup and retained by the ferrule which is pressed on to them by the spiral spring. The cone of the needle corresponds with the coned interior of the cup so that a force acting along the axis of the needle will not displace the balls. The head of the needle is housed in a recess in the cap of the fuze, the recess being closed against air pressure by a copper disc.

The magazine is screwed into the underside of the fuze and contains the initiator compositions in a copper capsule over a 48 gram filling of P.E.T.N. The copper capsule has a copper disc soldered in the front end and a second copper disc, with felt washer attached, interposed between it and the needle point. The initiator filling in the capsule consists of a 25 gram layer of detonating composition over 31 grams of lead azide. The detonating composition consists of:- Mercury fulminate 28.7%, potassium chlorate 39.8%, and antimony sulphide 31.5%.

The fuze is fitted with a brass cover secured by a tear-off strip. The strip is provided with a finger ring which is lightly soldered to the cover.

FUNCTIONING:

The cover is removed before loading. During acceleration the balls are held by set-back and the ferrule. When acceleration ceases and the rate of spin is sufficient, the balls are forced outwards by centrifugal force and retained in this position by the ferrule under the pressure of the spring. The needle is then held off the detonator by creep action. On impact the needle is driven in and pierces the detonator.

RESTRICTED

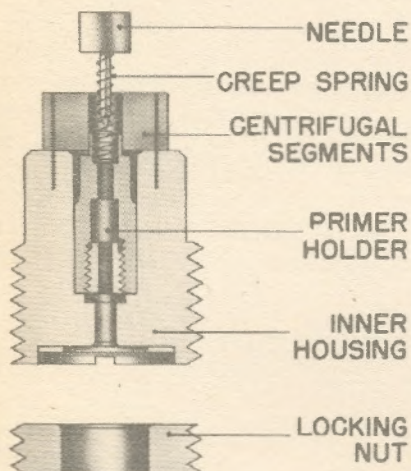
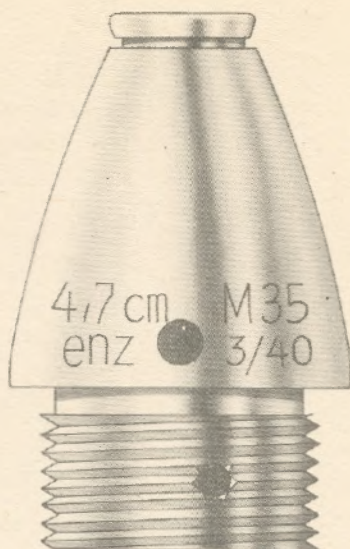
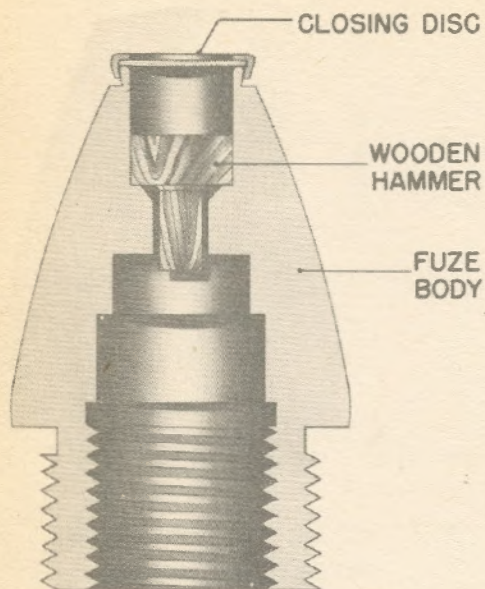
NOSE FUZE FOR 4.7cm H.E. SHELL

REMARKS:

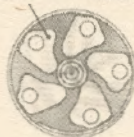
The copper disc over the initiator capsule is probably intended to act as a resistance to the needle and to prevent premature action by wind pressure acting on the needle such as might occur if the copper disc in the cap of the fuze were punctured.

Neither the needle, ferrule, nor the spring are positively located, and it appears that the needle is so designed that the point of the needle may rove considerably off its normal axis without jamming, which, should it occur, would render the fuze insensitive on a light target.

R E S T R I C T E D



CENTRIFUGAL SEGMENTS



4.7 cm M35 enz 3/40

RESTRICTED

NOSE FUZE M35 enz 3/40

EMPLOYMENT:

Czech. nose fuze used in German 4.7 cm ammunition.

DESCRIPTION:

2.438 inches, Overall length.
1.625 inches, Maximum diameter.
0.625 inches, Threaded length.
Number of threads - 10 RH.

CONSTRUCTION:

The body has a closing disc in the nose and threads on the base to engage the projectile. Beneath the closing disc is a wooden hammer which bears against the needle.

The needle, creep spring, primer holder, and centrifugal segments are all contained in a single inner housing which screws into the base of the fuze body and is secured by a locking nut.

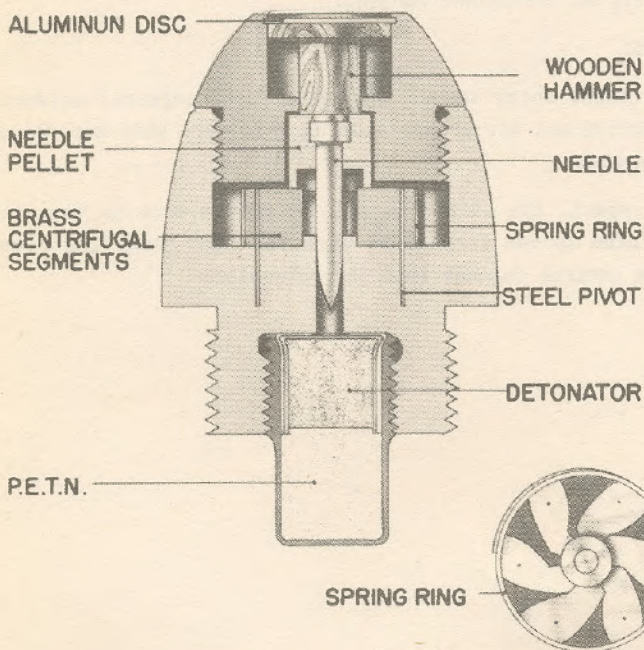
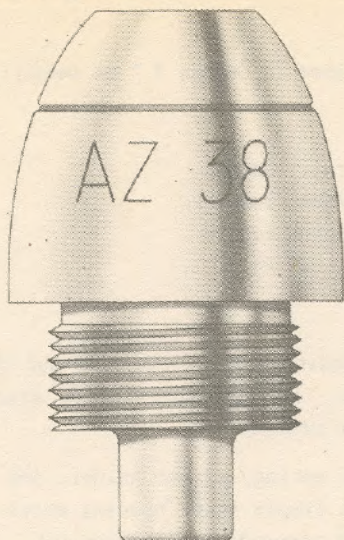
The centrifugal segments are interposed between the needle and primer housing. A light creep spring surrounds the needle and bears against a lip on the primer housing.

FUNCTIONING:

Centrifugal force throws the centrifugal segments outward freeing both the needle and the primer housing which are then separated only by the creep spring.

Upon impact, the hammer forces the needle back to meet the primer which has been thrown forward by inertia. The resulting flash passes through the central channel into the detonator.

R E S T R I C T E D



NOSE FUZE A.Z. 38

RESTRICTED

NOSE FUZE AZ 38

EMPLOYMENT:

Mechanical Impact Fuze used in Hollow Charge shells.

DESCRIPTION:

1.125 inches, Overall length.
0.937 inches, Maximum diameter.
0.25 inches, Threaded length.
Number of threads - 7 RH.

CONSTRUCTION:

The body of the fuze is screwthreaded externally to .69 inch gauge with a pitch of approximately 1 mm. for insertion in the shell. A recess formed in the underside is screwthreaded to receive the magazine which contains a 6.2 grain filling of P.E.T.N. under a 5.9 grain detonator of lead azide/calcium silicide 65/35. The upper part of the body is recessed to accommodate six pivoted centrifugal segments and threaded internally to receive the aluminum head of the fuze. A central channel is formed between the upper and lower recess for the needle.

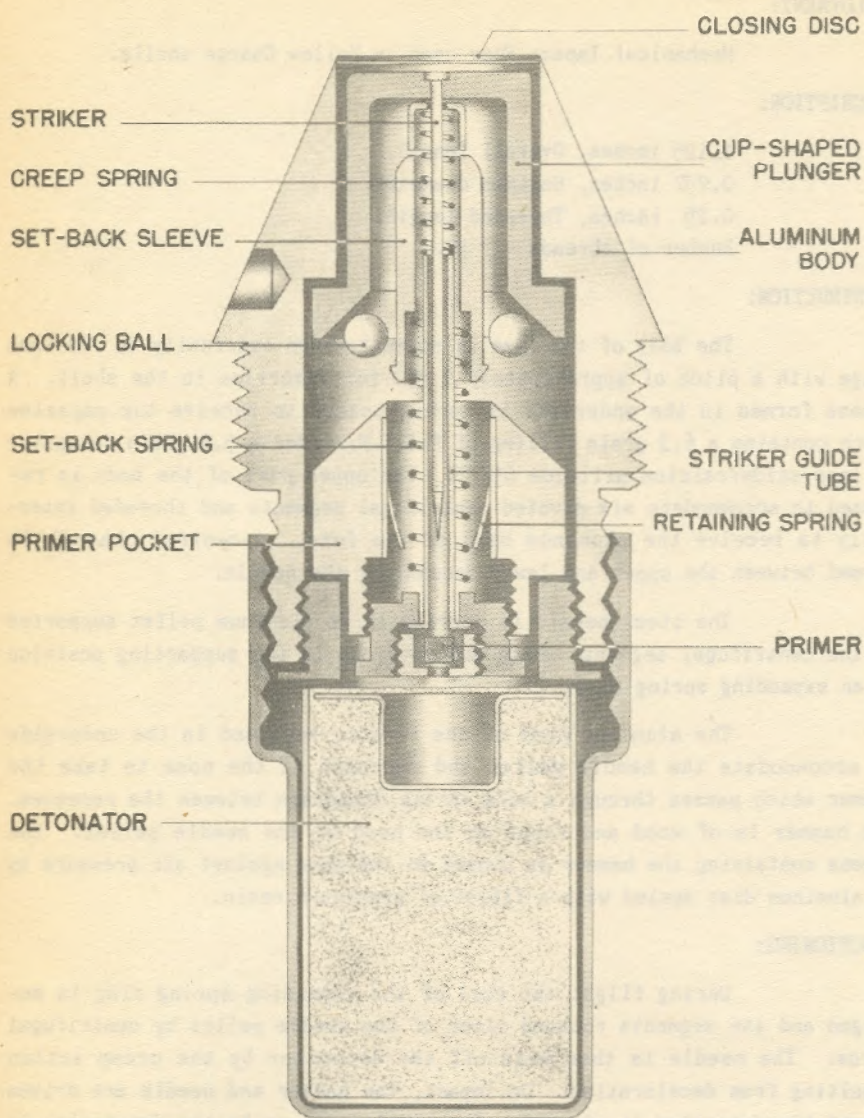
The steel needle is carried in an aluminum pellet supported by the centrifugal segments which are retained in the supporting position by an expanding spring ring.

The aluminum head of the fuze is recessed in the underside to accommodate the needle pellet and recessed at the nose to take the hammer which passes through a hole in the diaphragm between the recesses. The hammer is of wood and rests on the head of the needle pellet. The recess containing the hammer is closed at the nose against air pressure by an aluminum disc sealed with a fillet of synthetic resin.

FUNCTIONING:

During flight the coil of the expanding spring ring is enlarged and the segments rotated clear of the needle pellet by centrifugal force. The needle is then held off the detonator by the creep action resulting from deceleration. On impact, the hammer and needle are driven in and the detonator is pierced. The impulse set-up by the detonation is communicated through the aluminum tube in the shell to the gaine in the base of the shell cavity. The construction of the detonator in the gaine is such that it could be initiated either by a flash or a pressure gaine.

R E S T R I C T E D



NOSE FUZE Wgr. Z.38 FOR
GERMAN MORTAR BOMB

RESTRICTED

NOSE FUZE Wgr. Z 38

EMPLOYMENT:

Mechanical Impact Nose Fuze for German H.E. 5 cm. Mortar Bomb.

DESCRIPTION:

2.563 inches, Overall length with gaine.
1.563 inches, Overall length without gaine.
1.250 inches, Maximum diameter.
0.375 inches, Threaded length.
Number of threads - 5 RH.

CONSTRUCTION:

The fuze body is aluminum and houses a steel primer pocket and a brass retaining spring. Within the fuze there is a striker secured to a cup-shaped movable plunger in the head and a striker guide tube which leads to a primer in the base. The tube is attached to the primer pocket and is separated from the striker plunger by a creep spring. The fuze is kept in the unarmed position by nine steel balls located between the striker plunger and the primer pocket. These balls are arranged around a central set-back sleeve which is held in position by a set-back spring. The set-back sleeve has a flange formed around the rear end to engage with the tongues of the retaining spring (fitted in the primer pocket) when the fuze is armed.

FUNCTIONING:

Upon discharge, the set-back sleeve is driven down compressing the set-back spring and engaging the tongues of the retaining spring. This creates a clearance in the striker plunger into which the nine steel balls are forced by a creep action during flight. In this position, the fuze is armed with only the creep spring preventing contact of the striker with the primer. There is a brass closing disc over the head of the fuze which prevents air pressure from functioning the fuze in flight. Upon impact or graze, the creep spring is overcome and the striker pierces the primer.

REMARKS:

According to a German firing table, the fuze can be made more sensitive in order to function in mud or snow, by removing the brass closing disc. Another fuze which can be used on the 5 cm. mortar is the plastic fuze, Mgr. Zt., which differs internally from the Wgr. Z. 38.

The fuze, Wgr. Z. 38 is interchangeable with all German 5 and 8 cm. mortars. It is believed the German Nomenclature, stamped near the base, designates the model number and the type of metal used in the fuze construction.

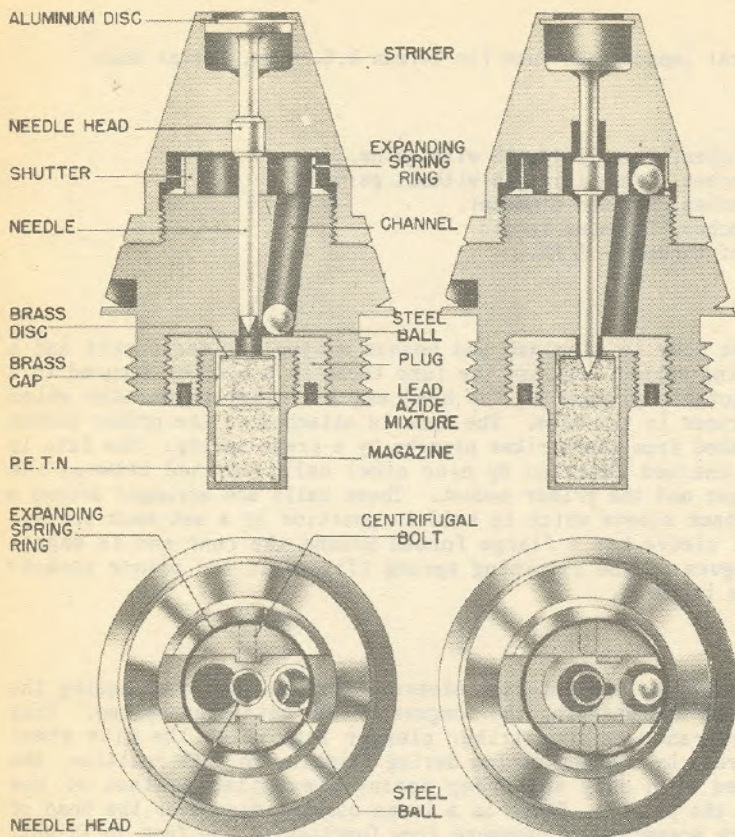
Wgr. Z. 38 - Aluminum

Wgr. Z. 38 st - Steel

Wgr. Z. 38 z - Zinc

All of the fuzes are of the set-back armed, instantaneous ignition type.

RESTRICTED



GERMAN NOSE PERCUSSION FUZE A.Z. 39

EMPLOYMENT:

Used in 5cm H.E. Shell.

DESCRIPTION:

1.719 inches, Overall length.
1.312 inches, Maximum diameter.
0.312 inches, Threaded length.
Number of threads - 5 RH.

CONSTRUCTION:

This is a detonating type with a direct action in which the needle is supported by a shutter.

The direct action mechanism consists of an aluminum needle supported over the detonator by the shutter, which engages under the enlarged head on the needle. An aluminum striker is positioned in front of the needle in a recess in the cap of the fuze. The recess is closed against air pressure by an aluminum disc.

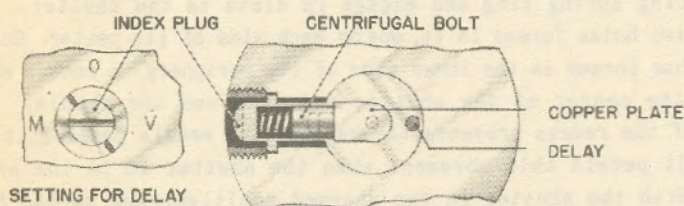
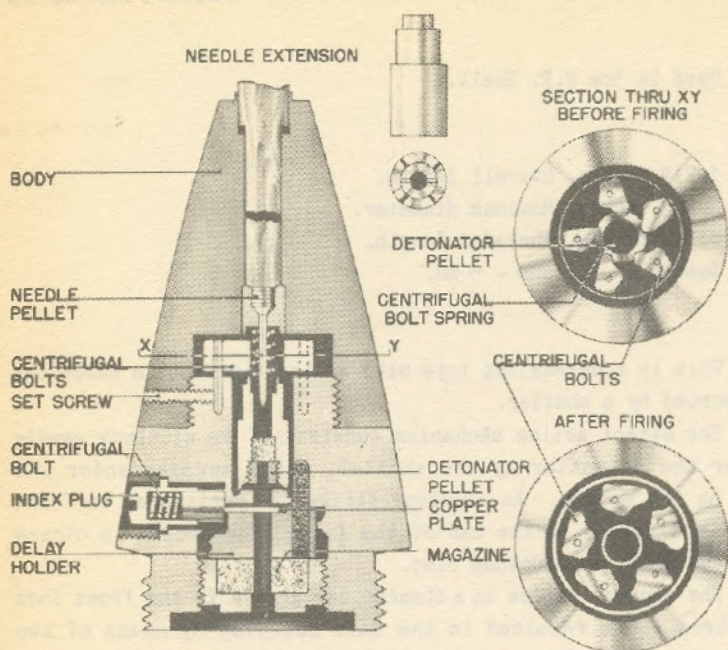
The shutter slides in a diametrical groove in the front face of the body where it is retained in the safe position by means of two centrifugal steel bolts. The bolts are housed in holes in the body within an expanding spring ring and engage in slots in the shutter. The shutter has two holes formed in it, one on each side of its center. One of these holes has formed in the inner side of its periphery, a recess which expands to the center of the shutter and receives the needle. The dimensions of the recess prevents the head of the needle passing it but the hole will permit this movement when the shutter is in the armed position. With the shutter in the unarmed position, the second hole coincides with a channel in the body which houses a shell ball.

The brass magazine of the fuze is fitted to the underside of the body by means of an aluminum screwed plug. The magazine is fitted with a brass detonator containing .33 grams of lead azide with calcium silicide over a filling of 48 grams P.E.T.N.

FUNCTIONING:

On acceleration the ball is held in the channel by set-back. During flight the ball is caused to move forward by creep action combined with the effort of the slope of the channel and centrifugal force until it enters the hole in the shutter. The rotation of the shell also causes the spring ring to expand and the bolts to disengage the shutter which, with the ball as a displaced weight, slides across the body and ceases to support the needle at the head. The needle is then held off the detonator by creep action. On impact the needle is driven in and pierces the detonator.

REMARKS: Sometimes marked AZ 39ZN.



GERMAN NOSE PERCUSSION FUZE A.Z. 23v (0.15) OR (0.25)

EMPLOYMENT:

This percussion fuze, with 0.15 or .25 seconds delay, is used in the 105 mm howitzer and also in 75 mm separate ammunition. It is designed to function on impact or graze.

DESCRIPTION:

4.375 inches, Overall length.
2.375 inches, Maximum diameter.
0.625 inches, Threaded length.
Number of threads - 4 RH.

CONSTRUCTION:

The fuze consists chiefly of a body, needle and needle pellet, centrifugal bolts with spring, detonator pellet with detonator, green spring, delay mechanism and magazine.

The body, of aluminum, is in two parts, screwed together and secured by a set-screw. The upper part has a central channel throughout its length to receive the needle, which is secured in the aluminum needle pellet by a securing screw. The needle is fitted with a wooden extension. On the underside of the needle pellet, the central channel is enlarged to house five centrifugal bolts, each with its pivot pin. The bolts are kept pressed towards the center of the fuze by means of a phosphor bronze spring, which maintains the bolts in such a position that when the fuze is at rest, the needle cannot pierce the detonator.

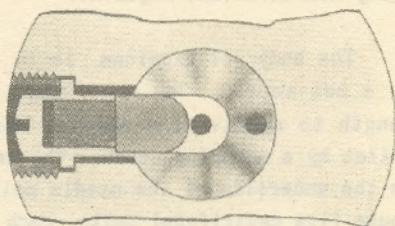
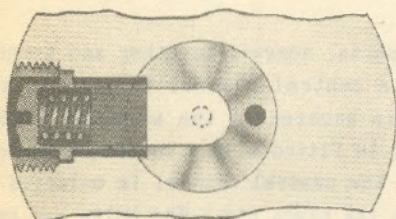
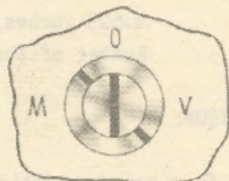
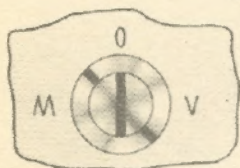
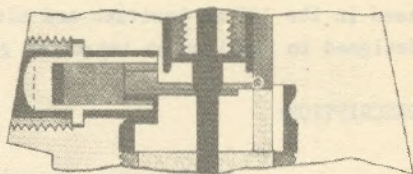
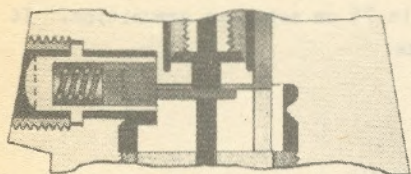
The lower part of the body contains a brass detonator pellet and detonator, the delay mechanism and a magazine. The detonator is secured in the pellet by a screw having a central fire channel. Four radial slots are cut on the underside of the pellet to ensure that the flash from the detonator reaches the delay channel.

The delay mechanism consists chiefly of a delay holder, index plug with centrifugal bolt and spring, and a copper plate. The holder is pierced by two channels, one central and empty, the other eccentric and carrying the delay. On the upper portion of the holder a recess is cut in which a copper plate can slide. According to its position this plate covers or uncovers the central channel.

SETTING FOR NON-DELAY

BEFORE FIRING

AFTER FIRING



GERMAN NOSE PERCUSSION FUZE
A.Z. 23v (0.15) OR (0.25)

CONSTRUCTION:

The index plug is secured in the body of the fuze by a screwed collar. A cylindrical cavity is formed in the plug to receive the centrifugal bolt with spring and a recess is cut in the plug to receive the copper plate. On the outside of the plug a slot is cut which serves as an index for setting the delay mechanism. If the plug is set in the delay position, the recess does not coincide with the plate, the latter therefore, remains in the closed position masking the central fire channel. If the fuze is set to the instantaneous position, the recess is in line with the plate and the latter is free to move outwards under centrifugal force and so unmask the central fire channel. A brass plate with holes bored to correspond with the delay and central channel is placed on the delay holder and forms an upper bearing surface for the copper plate.

The bottom of the fuze is closed by the magazine, having a central fire channel, which is screwed in and retains in position the delay holder.

FUNCTIONING:

Before firing - The needle is separated from the detonator by the centrifugal bolts which are retained in the closed position by their spring. The copper plate of the delay mechanism closes the central fire channel by the pressure from the centrifugal bolt. This position is maintained whether the fuze is set delay or instantaneous. The delay channel is always uncovered.

Thus, even if a failure of the safety arrangements occur and the needle pierces the detonator or the detonator itself fires, the fuze can only function with delay; the shell, therefore, cannot burst at less than .15 seconds time of flight from the muzzle.

To set the fuze for instantaneous action the slot in the index plug is turned to a position parallel to the axis of the fuze bringing the recess in the plug opposite the copper plate. For delay action the slots is turned at right angles to the fuze axis opposite the marks M. and V.; in this position the plug retains the copper plate in the closed position.

After firing - The centrifugal bolts swing outwards over-coming the spring, thus leaving the needle and detonator pellets free to move towards each other. The creep spring prevents creep action. The centrifugal bolt of the delay mechanism moves outward compressing its spring. If the index

RESTRICTED NOSE FUZE AZ 23v (0.15) or (0.25)

FUNCTIONING:

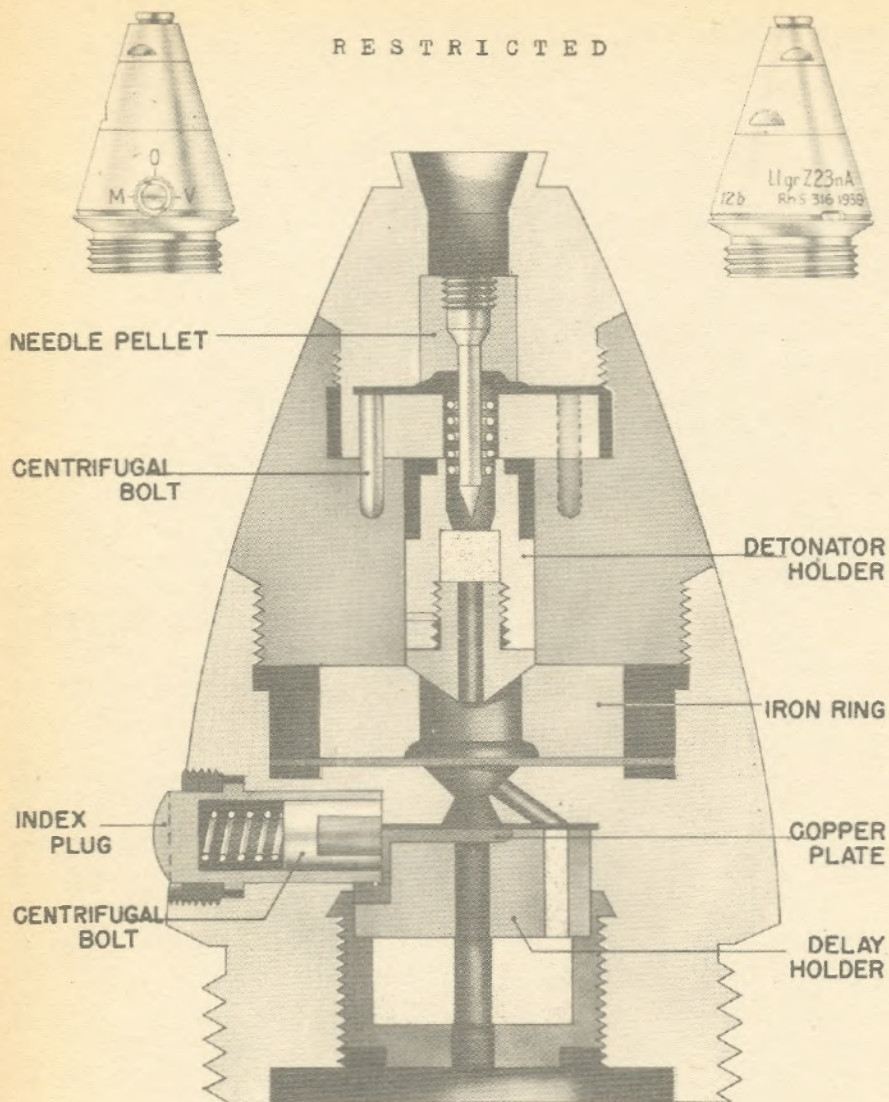
plug is in the delay position, the copper plate is held by the plug and thus the central channel remains closed. If the plug is in the instantaneous position, the plate is moved by centrifugal force into the slot in the plug and the central channel is thus opened.

On impact - The needle is forced on to the detonator by direct action. On graze the detonator pellet is carried forward on to the needle. The flash from the detonator passes either through the delay channel or the central channel, according to the setting of the fuze, to the magazine and thence to the detonator and exploder in the shell.

REMARKS:

AZ 23/42 is identical in dimensions and operation; the segments open at different speeds of rotation.

R E S T R I C T E D



GERMAN NOSE PERCUSSION FUZE
Jgr. Z. 23nA (0.15)

RESTRICTED NOSE FUZE Jgr.Z.23nA (0.15) - Diagram 57

EMPLOYMENT:

This aluminum fuze has so far only been found in 7.5 cm separate ammunition.

DESCRIPTION:

3.562 inches, Overall length.

2.375 inches, Maximum diameter.

0.5 inches, Threaded length.

Number of threads - 4 RH.

CONSTRUCTION AND FUNCTIONING:

In appearance it is similar to the A.Z. 23v (0.25) previously described. The only difference is in the dimensions and in the following points of details:-

- (a) The body of the fuze is in three parts instead of two, the three parts being screwed and pegged to each other.
- (b) The detonator holder is of a slightly different form with a lower end of truncated cone shape, screwed and pegged into the cylindrical part containing the detonator.
- (c) A cylindrical iron ring held by the prongs of a brass washer is held between the center and lower portions of the body. It supports the detonator holder against the effect of set back and has a central hole communicating with the open central channel and with the channel containing the delay through an oblique passage.
- (d) The delay holder is marked 0.15 instead of 0.25.

The delay mechanism and the method of operation are identical with those of the fuze A.Z. 23v (0.25).

RESTRICTED

NOSE FUZE s.Jgr.Z.23v (0.4)

DESCRIPTION:

3.562 inches, Overall length.
0.5 inches, Threaded length.
2.375 inches, Maximum diameter.
Number of threads - 4 RH.

CONSTRUCTION:

This fuze is very similar in construction and operation to the Jgr.Z.23nA (0.15). The following are the main differences:

There is no spring surrounding the segments. In place of one of the segments is a detent which is kept in position by a pin which passes through the body of the fuze.

FUNCTIONING:

Before firing, the pin is removed. On firing, the detent sets back so that the segments can open out when centrifugal force becomes effective.

EMPLOYMENT:

88 cm Flak (H.E. Ammunition)

DESCRIPTION:

4.375 inches, Overall length.
2.375 inches, Maximum diameter.
0.625 inches, Threaded length.
Number of threads - 4 RH.

CONSTRUCTION:

This fuze is made up in two sections, both aluminum, the cap and the body. To assemble, the cap is screwed into the body and held by a set screw. Underneath the impact cap is a wooden plunger which rests on an aluminum plug containing a firing pin approximately one inch long. This firing pin is pointed downward and is held away from the upper detonator by five centrifugal blocks and a spring which is fitted around the firing pin.

This fuze is made of aluminum with the exception of some small parts which are made of copper and brass.

FUNCTIONING:

When the round gains sufficient centrifugal force, the centrifugal blocks spread a split ring spring which is wrapped around the blocks. After pivoting outward their maximum distance the blocks lock in place and the fuze is then in the armed position. On impact the fuze upper detonator compresses the spring and impales itself on the firing pin. Beneath the brass housing containing the upper detonator is a circular aluminum block which contains two holes. The hole in the center is for instantaneous action and the one on the side has a charge of compressed black powder which is used for the delay element. The center hole is covered by a sliding copper plate which is locked in place for delay action or slides out due to centrifugal force for instantaneous action. Beneath the aluminum circular block is a large black powder pellet which has a hole through its center and this hole is lined up with the center hole in the aluminum circular block.

FUNCTIONING:

Selection of action is accomplished by turning a set screw in the side of the fuze. When the groove in the set screw head points toward O the fuze is set for instantaneous action and when it points to M and V the fuze is set for 1/10 sec. delay action. This set screw turns a split hollow shaft inside of which is a spring-loaded centrifugal plug. This centrifugal plug holds the sliding copper plate, on top of the aluminum circular block, in place until centrifugal force overcomes the spring and allows the plate to slide from over the center hole if set for instantaneous action. If set for delay action, the split hollow shaft is turned so that the copper plate is locked in place covering the center hole and the split of flame goes through the side hole into the black powder pellet contained below.

REMARKS:

This fuze has the same construction as the A.Z. 23 V nose fuze the only difference being in the time of delay.

A plastic type of the fuze AZ 23 (0.15) has been recovered and examined.

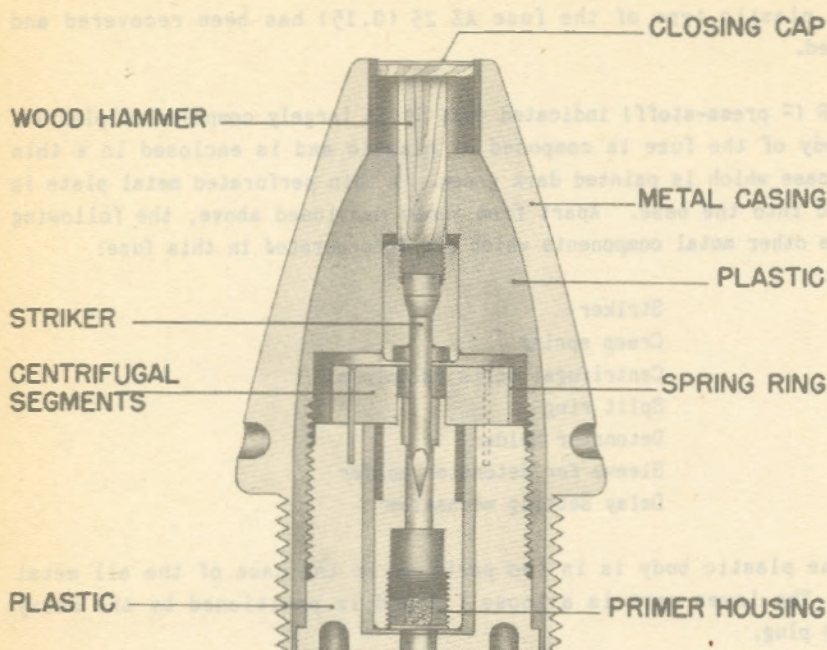
PR (= press-stoff) indicated that it is largely composed of plastic. The body of the fuze is composed of plastic and is enclosed in a thin metal case which is painted dark green. A thin perforated metal plate is screwed into the base. Apart from those mentioned above, the following are the other metal components which are incorporated in this fuze:

- Striker
- Creep spring
- Centrifugal bolts (aluminum)
- Split ring
- Detonator holder
- Sleeve for detonator holder
- Delay setting mechanism

The plastic body is in two parts as in the case of the all metal fuze. The lower part is a loose fit and is positioned by the delay setting plug.

The fuze examined was of 1943 manufacture.

RESTRICTED



NOSE FUZE KI AZ 23

EMPLOYMENT:

Used in: 7.5 Geb. G. 36 H.E.
7.5 KwK. Ster G. H.E.
7.5 cm K Gr Rot Nb
7.5 cm F H Cr Nb
7.5 cm F H Gr Nb 38
7.5 cm F H Gr 41 Nb
10 cm Gr. 38 Nb

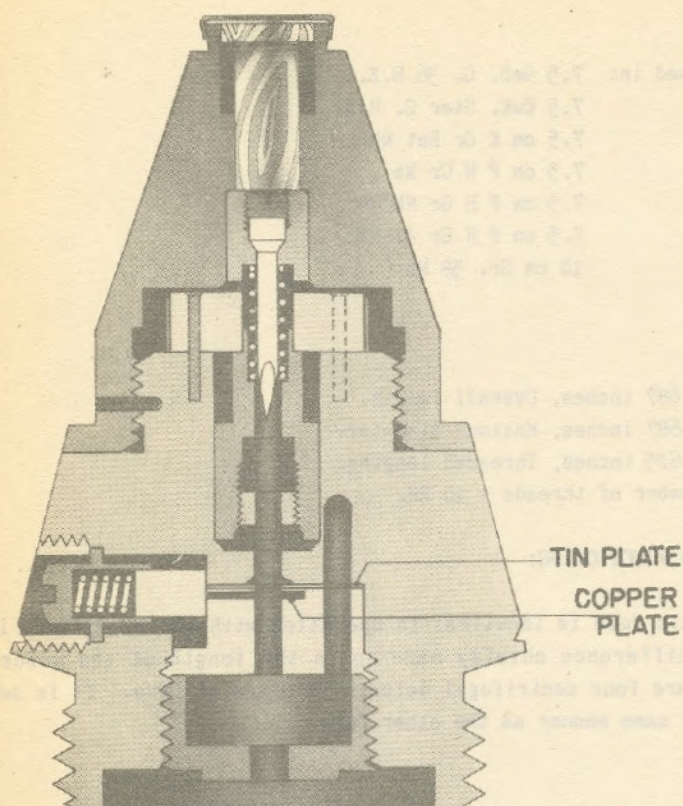
DESCRIPTION:

2.687 inches, Overall length.
1.687 inches, Maximum diameter.
0.625 inches, Threaded lengths.
Number of threads - 10 RH.

CONSTRUCTION AND FUNCTIONING:

This fuze is identical in operation with the AZ 23/28. It is smaller, a difference chiefly made up in the length of the wooden hammer. There are four centrifugal detents in place of five. It is set for delay in the same manner as the other fuze.

RESTRICTED



NOSE FUZE AZ 23 G.6b.

RESTRICTED

NOSE FUZE AZ 23 Geb.

EMPLOYMENT:

75 mm Mountain Gun.

DESCRIPTION:

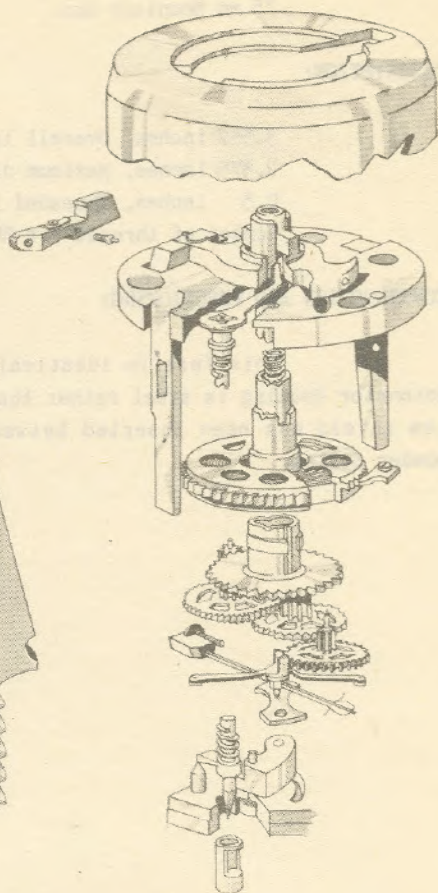
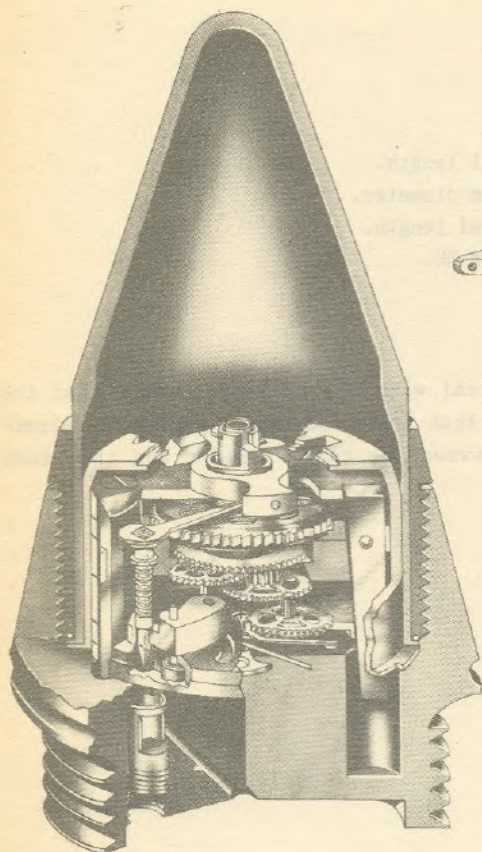
3.562 inches, Overall length.
2.375 inches, Maximum diameter.
0.5 inches, Threaded length.
Number of threads - 4 RH.

CONSTRUCTION AND FUNCTIONING:

This fuze is identical with the AZ 23/28 except that the detonator housing is steel rather than brass and that a paper-thin aluminum shield has been inserted between the copper slider and the black powder pellet.

RESTRICTED

DIAGRAMMATIC
ARRANGEMENT
OF MECHANISM



GERMAN MECHANICAL TIME FUZE S/30
(Zt. Z. S/30)

EMPLOYMENT:

Mechanical Time Fuze used in 8.8 cm and 105 cm H.E. Anti-aircraft shells.

DESCRIPTION:

- 4.375 inches, Overall length.
- 2.375 inches, Maximum diameter.
- 0.5 inches, Threaded length.
- Number of threads - 4 RH.

CONSTRUCTION:

The fuze has a time of running of 30 seconds and is similar in design to the British No. 207 fuze. The base piece is not graduated for setting and the dome, with its hand race, is inserted into the cap where it is held, to turn with the cap, by four lugs on its base flange which engage in stops formed in the base of the cap. The tensioning of the cap is approximately 400 inch/oz.

The mechanism is assembled in a cylindrical unit of superimposed brass plates and consists of:-

The center arbor in the form of a tubular shaft with a pinion at its base end. The upper end of the shaft is open and has two slots formed in the wall which engage the hand center. An external projection is formed near the base of the shaft to engage one end of the main spring.

The main spring coiled under tension in a brass barrel or casing. One end of the spring engages the center arbor whilst the other engages the casing. The cylindrical casing fits around the lower end of the center arbor and has ratchet teeth formed around its periphery. These teeth are engaged by a ratchet and provide the means of revolving the case to wind the spring during the assembly of the fuze.

An escapement engaging the base pinion of the central arbor comprising two spurs with pinions and a spur with the escapement wheel. The ratchet teeth of the escapement wheel are engaged by two vertical arms on the pallet which is weighted at each end and controlled by a straight adjustable hair spring.

CONSTRUCTION:

The hand assembly carried at the upper end of the center arbor consists of the hand center, the hand and the hand spring. The hand center consists of a short hollow cylinder, open at the base, fitted with two rectangular brass arms carrying a ring near the head. The hand is of aluminum and is fixed to the ring of the hand center. The outer end of the hand is recessed at one side to engage the spring catch on the trigger. The spiral hand spring is inserted in the open base end of hollow cylinder in the hand center and is compressed when the hand assembly is inserted in the center arbor and depressed to engage the rectangular arms in the slots of the arbor. The hand is retained in this position by the hand race on the dome inset and is thus prevented from rising until it has been rotated into alignment with the cut away portion of the hand race.

The brass trigger, holding the outer end of the hand, consists of a brass arm pivoted at one end and stepped at the other to engage the hand. The step is slightly undercut. A small hole in the outer side of the trigger contains a minute spring-loaded plunger. The plunger is pressed into the hole by contact with the side of the slot in the top plate in which the trigger is located. A safety bridge, fitted across the slot has a projection which overlaps the hand and thus prevents the hand rising until it has been rotated clear of the projection. This movement takes approximately one second of time.

The striker, located near the circumference of the cylindrical mechanism unit, is a steel spindle with a cam collar near the lower end and a pyramid shaped point at the base. Two flats are formed at the upper end of the spindle to engage with corresponding surfaces in the safety lever. The striker is held off the detonator by its cam collar resting on a conical headed steel pillar and on a step in the centrifugal safety catch. The spiral striker fits over the spindle and is compressed between the cam collar and the sleeve portion of the safety lever.

The safety lever is of steel and consists of a sleeve, shaped internally to fit the flat surfaces on the spindle of the striker, and carrying an arm with an upturned end. The arm bears against the underside of the top plate and the upturned end is held adjacent to the center arbor by the ring of the hand center. A curved slot is cut in the top plate to permit a swinging movement of the arm.

CONSTRUCTION:

The centrifugal safety catch pivoted in the lower plate is of brass and has a step formed in one side to support the cam collar on the striker. The pivot pin is slotted to engage a coil spring which keeps the catch in the safe position. The swinging movement of the catch is limited by a steel pin fixed in the catch near the free end and a curved slot, through which the pin moves, in the lower plate.

Two tapered steel locking plungers are carried in vertical slots formed down the side of the cylindrical mechanism unit. The slots are diametrically opposed and each has a hemispherical recess in one side to receive a corresponding projection on the side of the tapered plunger. The plungers are comparatively weighty and consist of steel strips tapering towards the base on the inner side. On the outer side of each, approximately at the center, a projecting vertical knife edge is formed. The plungers project below the base of the mechanism unit into recesses formed in the platform of the fuze body. The recesses are sufficiently deep to permit the plungers to set back during acceleration.

FUNCTIONING:

The time of running is governed by the size of the arc extending counter-clockwise between the position of the hand when held by the trigger and the position of the cut away portion of the hand race. The fuze is set by turning the cap with the aid of a setting device. The dome inset, with the hand race formed in its upper part, is rotated with the cap to the set position. The turning of the cap is retarded by the waved wire tension spring between the screwed collar and the flange at the base of the cap.

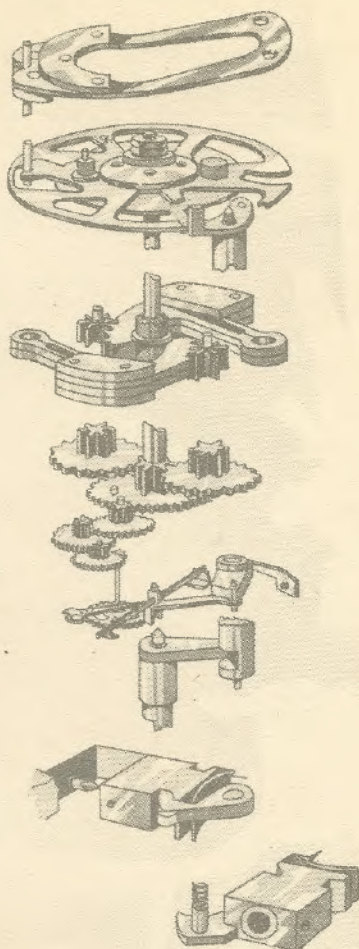
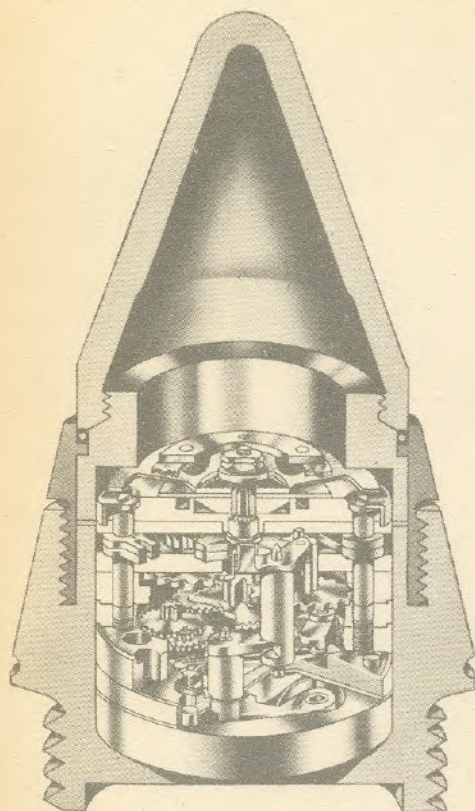
On acceleration the two tapered plungers set back into the recesses in the platform. As their wider portions with the projecting knife edge move back through the slots, the knife edges cut into the wall of the dome and thus prevent rotation of the dome relative to the mechanism. At the same time the trigger, hinging on its pivot, sets back and releases the hand. The spring-loaded plunger in the side of the trigger then emerges and prevents rebound of the trigger. The release of the hand enables the main spring to rotate the center arbor, under the control of the escapement. The rotating hand, moving clear of the safety bridge, is pressed up against the hand race by the spiral spring in the hand center.

FUNCTIONING:

During flight, the safety catch is swung clear of the striker which is then supported only by the pillar. When the hand reaches the part of the hand race which is cut away, it is forced upwards and the ring on the hand center moves clear of the upturned end of the safety lever. The end of the safety lever is then swung outwards by centrifugal force. The striker is turned by the lever so that the cam collar loses the support of the pillar. The spring, bearing on the cam collar, then drives the striker away from the safety lever on to the detonator.

R E S T R I C T E D

DIAGRAMMATIC ARRANGEMENT
OF MECHANISM



GERMAN MECHANICAL TIME FUZE
S/30 Fgl. (Zt. Z. S/30 Fgl.)

RESTRICTED

FUZE, NOSE, MECHANICAL TIME, Zt. Z. S/30 Fgl.

EMPLOYMENT:

Mechanical Time Nose Fuze used in 8.8cm and 10.5cm H.E. Anti-aircraft shells.

DESCRIPTION:

- 4.375 inches, Overall length.
- 2.375 inches, Maximum diameter.
- 0.5 inches, Threaded length.
- Number of threads - 4 RH.

CONSTRUCTION:

The fuze shell resembles the Zt.Z.S/30 in external appearance but differs in the mechanism in which the motive power is derived from centrifugal force instead of from a clock spring. The type is identified by the stamping "Zt.Z.S/30 Fgl" around the side of the body above the flange. The fuze is igniferous and has a maximum time of running of 30 seconds. The mechanism governing the setting is designed to prevent the fuze functioning at settings shorter than approximately one second.

The fuze consists of the base piece or body, the cap, the screwed collar and the mechanism.

The base piece is screwthreaded externally below the flange for insertion in the shell and has a large cylindrical recess in which the mechanism is located. The recess is screwthreaded internally for the assembly of the screwed collar retaining the cap and has a flash hole and a number of holes for the retaining bolts of the mechanism in the base.

The cap is cone shaped with a rounded head and is screwed to a base ring with which it forms a groove to receive an internal rib on the screwed collar and the waved tensioning wire. The base ring carries the setting pin and the hammer spring and is secured by a fixing screw. The steel pin is let into the base and engages an up-turned forked strip on the setting disc of the mechanism. The hammer spring is secured to the shoulder in the cap base by two screws at one end and extends diametrically across the interior of the cap. The unsupported end is forked to fit round the setting pin and is fitted with three brass hammer pieces on the underside. The two larger of these pieces are fitted one on each projection of the fork, i.e., each side of the setting pin, and the third smaller piece is nearer the center of the spring. These positions coincide respectively with the projections on the fork end of the strip on the setting disc and a locking pin carried in the setting disc.

RESTRICTED

FUZE, NOSE, MECHANICAL TIME, Zt. Z. S/30 Fgl.

CONSTRUCTION:

The screwed collar fitting over the lower portion of the cap is attached to the cap but is free to turn for insertion in the base piece.

The mechanism is assembled in a cylindrical unit of superimposed plates of brass and aluminum and consists of:-

A central shaft with a spur near the lower end and a pinion at the base. The upper part of the shaft is reduced in diameter to receive the bush carrying the setting and safety discs and is screwthreaded to receive the tensioning and locking nuts. The sloping shoulder formed by the reduction of the diameter is serrated to engage with similar serrations on the bush so that the bush is locked to the shaft. The pinion at the base of the shaft is fitted with a stop pin which limits its rotation.

Two weighted centrifugal toothed segments pivoted near the circumference of a circular plate and each enmeshed with a spur. The spurs carry pinions at their base ends which are enmeshed with the spur on the central shaft. The plate carrying the centrifugal segments is cut away to provide clearance for the movement of the segments and the recesses thus formed are fitted with a spring strip which imparts the initial movement to the segment.

An escapement engaging the base pinion of the central shaft comprising three spurs with pinions and a spur with the escapement wheel. The wheel is engaged by two vertical arms on the pallet which is weighted at each end and controlled by a straight adjustable hair spring. The pallet is locked at one end by a centrifugal safety lever which is fitted with a weighting pin and held by a retaining spring. A step formed on the pivoted end of the lever is engaged by the end of the spring strip when the lever has swung to the armed position.

A disc assembly fitted at the upper end of the central shaft consists of a bush carrying two discs and a tensioning arrangement. The bush is in the form of a sleeve with a hemispherical flange at the base. The sleeve portion fits over the head of the central shaft and is serrated at the lower end to engage a corresponding shoulder on the shaft. The lower of the two discs, the safety disc, is keyed to the flange of the bush and so must always turn with the central shaft. The disc is smaller in diameter than the upper disc but has a projecting leaf formed at one part of its circumference to close a slot in the upper disc and so prevent the operation of the firing mechanism. The upper disc is the setting disc and is held on the sleeve of the bush under the tension of a saucer shaped spring compressed and locked by two nuts on the central shaft. Before firing, the setting disc can be rotated relative to the bush and safety

RESTRICTED

FUZE, NOSE, MECHANICAL TIME, Zt. Z. S/30 Fgl.

CONSTRUCTION:

disc but after firing, the discs are locked together when the locking pin carried in the setting disc is driven into the safety disc by the hammer spring. The setting disc has an upturned forked strip which engages the setting pin in the cap and, diametrically opposite, a curved slot which when aligned with a projection on the firing arm releases the firing mechanism.

The firing arm, operated by centrifugal force, consists of a shaft with a flat formed by a recess near its lower end and with a cross-head at its upper end. The crosshead has a weight attached to the underside at the end of one arm and a vertical strip projecting upwards from the end of the other arm. The strip bears against the edge of the setting disc and the lower end of the shaft obstructs the rotation of the retaining bolt.

The retaining bolt securing the retaining catch in contact with the detonator pellet is a centrifugal device held in the safe position by the shaft of the firing arm. The bolt consists of a short shaft with a radial arm attached at the head and a flat formed near the base. The radial arm engages the firing arm and provides the weight for centrifugal action whilst the flat engages the end of the flat side on the retaining catch.

The retaining catch in the form of a hook is pivoted at one end and hooked to engage the detonator pellet at the other.

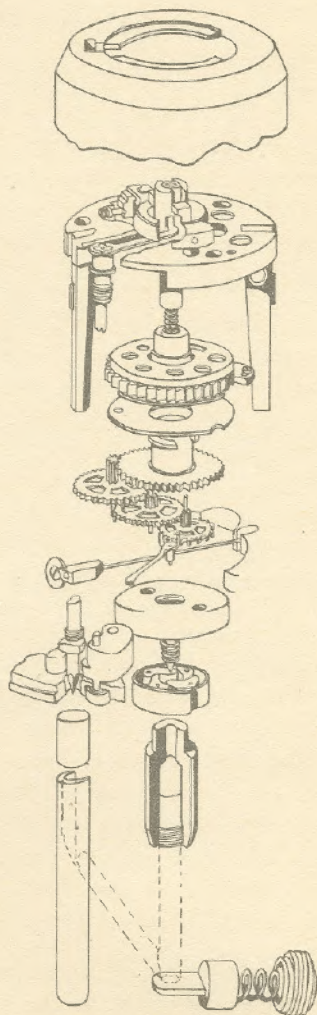
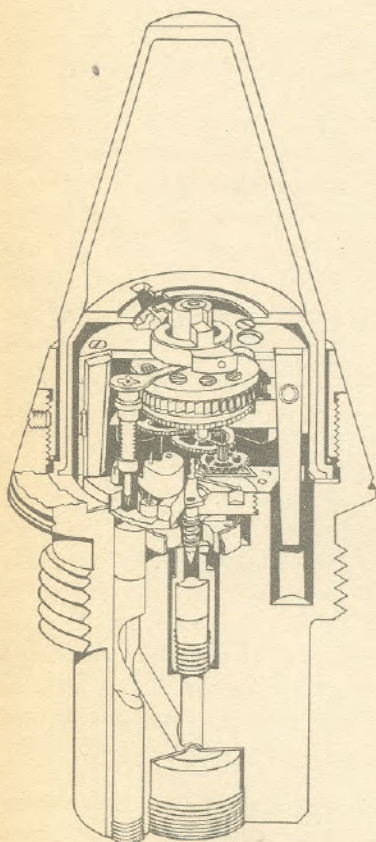
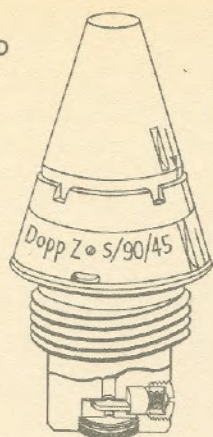
The detonator pellet contained in a transverse rectangular slot in the base of the mechanism unit is of brass and is rectangular in shape. A notch is cut in the two vertical sides and the detonator is contained in a recess at the inner end. A flash channel from this recess emerges at the underside of the pellet. A curved spring strip between the outer end of the pellet and one end of the pellet slot is held under compression by the retaining catch engaging in one of the side recesses of the pellet. The needle is fixed in the opposite end of the slot. The detonator pellet is also held by a centrifugal safety catch.

The safety catch, located in a channel cut in the side of the pellet slot, consists of a flat brass plate shaped at its inner end to engage the front end and one side of the detonator pellet. The catch is retained in the safe position by a spring-loaded plunger with a rounded base which enters a recess in its surface.

FUNCTIONING:

The time of running is governed by the size of the arc extending clockwise between the curved slot in the setting disc and the position of the vertical projection on the crosshead of the firing arm.

R E S T R I C T E D



NOSE FUZE DOPP. Z. S/90/45

EMPLOYMENT:

The fuze is presumably used as an alternative in the H.E. shell (K.Gr 39) and the H.E.B.C. shell (K.Gr 38 (Hb)) for the 17 cm K.Mrs.Laf.

DESCRIPTION:

4.812 inches, Overall length.
2.25 inches, Maximum diameter.
0.5 inches, Threaded length.
Number of threads - 4 RH.

CONSTRUCTION:

The fuze has a mechanical time action with a maximum time of running of 90 seconds and a graze action of the normal German type. The time mechanism appears to be a 45 second mechanism modified by a change in the ratio of the gear train and an increase in the strength of the main spring. The weight of the fuze is 1 lb. 12 oz.

In external appearance the fuze consists of a flat topped cone-shaped head of aluminum secured to a dull steel body near its base by a bright steel securing ring. The upper part of the body is coned above the flange to match the head. Below the flange it is screwthreaded for insertion in the shell and below the thread there is a plain cylindrical portion. The designation of the fuze, "Dopp Z S/90/45," is stamped in the body above the flange. Rectangular key slots for setting are formed in the head and the body and a setting arrow for percussion action is engraved in the head adjacent to the slot. When inserted in the shell the fuze protrudes to the extent of approximately 3 inches. The diameter of the screwthreaded part is 1.96 inches.

Body. - The body is recessed at the base to accommodate the shutter assembly and, equally spaced around the recess, there are three vertical channels for the bolts securing the time mechanism unit. An additional vertical channel, closed at the base by a screwed plug, accommodates the holder of the detonator for the time action. A radial channel in the wall of the recess contains a brass centrifugal bolt and is closed at the outer end by a screwed plug. A portion of the top of the recess is cut away to permit movement of the bolt and a flash channel in the center of the top connects with a recess in the upper part of the body.

The upper recess contains the graze pellet of the percussion mechanism and is connected to the channel containing the detonator for the time action by an inclined channel which enters the recess near its base. Near the top, the recess is enlarged to form a platform on which four centrifugal segments of brass are fitted on steel pivots. Above this the recess is screwthreaded to receive the percussion needle holder. The coned

RESTRICTED

NOSE FUZE Dopp Z S/90/45

CONSTRUCTION:

flanged top of the body is recessed to form a platform for the time mechanism unit and is screwthreaded internally to receive the securing ring for the aluminum head. Two holes, diametrically opposite, are formed in the platform to receive the locking plungers of the time unit. There is also a locating stud for the unit, and a circular seating for a fiber washer. Four small screws are inserted through the coned flange to lock the securing ring when the fuze is tensioned during assembly.

Percussion Mechanism. - The graze pellet, carrying an igniferous detonator secured by a perforated screwed plug, is of brass with a shoulder near the top which is engaged by the four centrifugal brass segments. The segments are retained in a position overlapping the pellet by an expanding spring ring. A spiral creep spring is fitted between the pellet and a needle holder which consists of a steel disc screwed into the top of the recess containing the graze mechanism. The needle protruding from its underside has a pyramid shaped point.

Shutter Assembly. - The assembly contained in the lower recess in the body consists of a copper plate shutter moving in a guideway formed in the top of a cylindrical aluminum holder. The holder has a central flash hole and is recessed at one side for the centrifugal bolt which, under the pressure of its spiral spring, bears against the outer end of the shutter and keeps the shutter in a position masking the flash hole in its aluminum holder. The centrifugal bolt is a cylindrical pellet of brass with a recess at its outer end to locate the inner end of its spiral spring. The outer end of the spring is held under compression by the screwed plug closing the radial channel in the wall of the recess and located by a circular groove in the inner face of the plug. A thin disc of tin, with a central flash hole and with part of its circumference cut away for the centrifugal bolt, is placed on top of the shutter holder. The recess containing the shutter assembly is closed at the base by a screwed plug which has a central flash hole. The flash hole is closed by a thin disc of tin fitted between the inner face of the plug and the base of the shutter holder.

Head Assembly. - The flat topped aluminum head is in the shape of a cone with a cylindrical portion near the base. An external flange is formed at the base which supports the tensioning wire. The underside of the flange is cut away at four places to receive corresponding projections at the base of the dome. The dome, fitted inside the head, is of thin aluminum and is in the form of an inverted cup which fits over the time mechanism unit and is keyed to the flange at the base of the aluminum head by four projections at its base. The inside of the top of the dome is shaped to form a race against which the hand on the top of the time unit bears when rotating. Part of the race is cut away so that the hand can be pushed upwards by its spring when in alignment with the slot so formed.

RESTRICTED
CONSTRUCTION:

NOSE FUZE Dopp Z S/90/45

The head of the fuze is secured to the body by a steel securing ring which screws into the internal screwthread above the flange. Between the base of the securing ring and the flange at the base of the head there is a length of waved spring wire which is compressed between the ring and the flange when the ring is screwed down. By this means the tensioning of the head is adjusted during the assembly so that it can be turned for setting but will not slip.

Time Mechanism Unit. - The time mechanism is assembled in a cylindrical unit of superimposed brass plates with an aluminum hand on the top and two locking plungers in slots cut down diametrically opposite sides of the cylindrical assembly. The plungers are comparatively weighty and consist of steel strips tapering towards the base on the inner side. On the outer side of each, approximately at the center, a projecting vertical knife edge is formed. A spring-loaded ball protruding from one side of the plungers engaged a corresponding recess in the slots and thus supports the plungers which protrude below the base of the unit into recesses in the fuze body.

The mechanism is similar to that in the S/30 and S/60s fuzes, that is, it consists principally of a spring-loaded striker held off the detonator by an eccentric cam collar on the striker which is supported by a pillar and a centrifugal safety catch. The cam collar is kept in this position by a safety lever which fits over flats formed on the forward end of the striker and is held by the ring shaped center of the hand. The hand, with a spiral spring beneath it, is keyed to rotate with the center arbor under the control of a train of gear wheels and an escapement and, before firing is held by the pivoted trigger. Adjacent to the trigger a safety bridge is fitted which overlaps the hand to prevent functioning at settings of less than approximately one second. The spring plunger supporting the trigger engages in the end of trigger instead of the inner side as with the S/30 and S/60s fuzes. The use of a stronger main spring, which is of wider strip than the original, has resulted in the use of a thin steel disc instead of the normal base of the spring barrel to support the spring.

FUNCTIONING:

The time of running is governed by the size of the arc extending counterclockwise between the position of the hand when held by the trigger and the position of the slot in the dome hand race. The fuze is set by turning the head with the aid of a setting device which consists of a graduated ring surrounding a moveable ring on which there is a setting index and a handle. The device is placed over the fuze and the outer ring, bearing the graduations, is clamped by a key engaging in the key

R E S T R I C T E D

NOSE FUZE Dopp Z S/90/45

FUNCTIONING:

slot above the flange in the fuze body. A key in the inner ring, bearing the index, engages in the key slot in the head of the fuze. The inner ring is then rotated by means of its handle until the index is aligned with the required graduation and takes with it the head of the fuze. The dome inset, with the hand race formed in its upper part, is rotated with the head to the set position. The turning of the head is retarded by the waved wire tension spring between the securing ring and flange at the base of the head.

On acceleration the two tapered locking plungers set back into the recesses in the top of the body. As their wider portions with the protruding knife edges move back through the slots, the knife edges cut into the wall of the dome and thus prevent rotation of the dome relative to the mechanism unit. At the same time, the trigger hinging on its pivot, sets back and releases the hand. The small spring-loaded plunger in the trigger is then free to emerge and thus prevents the trigger rebounding. The release of the hand enables the main spring to rotate the center arbor under the control of the escapement. The hand, rotating with the arbor, moves clear of the safety bridge and is pressed up against the hand race in the top of the dome by the spiral spring in the top of the arbor beneath the hand center.

During flight, the safety catch is swung clear of the cam collar on the striker by centrifugal force and the striker is then supported only by the pillar. When the rotating hand reaches the slot in the hand race, it is forced upwards by its spring and thus releases the safety lever keyed to the top of the striker. The striker, with the lever, is then rotated by the pressure of its spring combined with the effect of the inclined surface on the cam collar bearing on the pillar so that the collar moves clear of the pillar. The striker is driven away from the safety lever by its spring and pierces the detonator. The flash from the detonator, directed by the shape of the detonator holder, passes into the lower part of the recess containing the graze pellet and follows the same course as that described for the percussion action.

Percussion Action. - When set for percussion, the arrow on the head of the fuze coincides with the index line on the securing ring and the key slots in the head and body are in alignment. At this setting, the slot in the hand race of the dome is masked by the safety bridge so that although the hand is released when acceleration occurs, it cannot rise through the slot to release the safety lever and the striker.

R E S T R I C T E D R U S S I A N N O S E F U Z E F O R 7 . 6 2 S H R A P N E L S H E L L

EMPLOYMENT:

Used by Germans in captured Russian equipment.

DESCRIPTION:

6.125 inches, Overall length.

2.5 inches, Maximum diameter.

0.875 inches, Threaded length.

Number of threads - 8 RH.

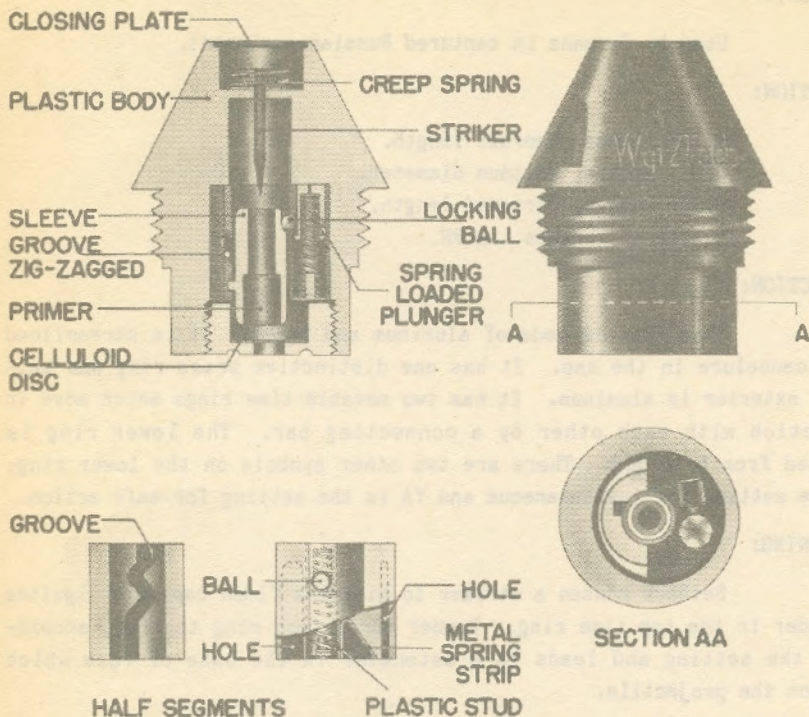
CONSTRUCTION:

This fuze is made of aluminum and brass. It is streamlined with a cannellure in the cap. It has one distinctive brass ring and balance of exterior is aluminum. It has two movable time rings which move in conjunction with each other by a connecting bar. The lower ring is graduated from 5 to 165. There are two other symbols on the lower ring; K is the setting for instantaneous and YA is the setting for safe action.

FUNCTIONING:

Setback causes a striker to pierce a flash cap which ignites the powder in the top time ring. Powder burns from ring to ring, according to the setting and leads to a detonator in the base of fuze which functions the projectile.

RESTRICTED



NOSE FUZE Wgr. ZT acb

EMPLOYMENT:

Plastic nose fuze used in German 8 cm. smoke mortar shells.

DESCRIPTION:

1.625 inches, Overall length.
1.313 inches, Maximum diameter.
0.375 inches, Threaded length.
Number of threads - 5 RH.

CONSTRUCTION:

The black colored plastic body has a closing plate in the nose to protect the striker from air pressure and it is threaded at its mid-section for screwing into the mortar shell.

The striker is held in the top of the fuze by a light creep spring and extends down into a central cavity.

The primer fits into the base of a sleeve which is slipped into the bottom of the fuze. A stud on the sleeve rides in a zig zagged groove in the inside wall of the fuze body.

A locking ball which is held in place by a spring-loaded plunger locks the primer sleeve in the unarmed position.

In the base of the fuze, is a metal spring strip which causes a plastic stud to catch and hold the spring-loaded plunger on set-back.

A celluloid disc seals the base of the fuze and helps to hold the sleeve from falling out of the bottom of the fuze.

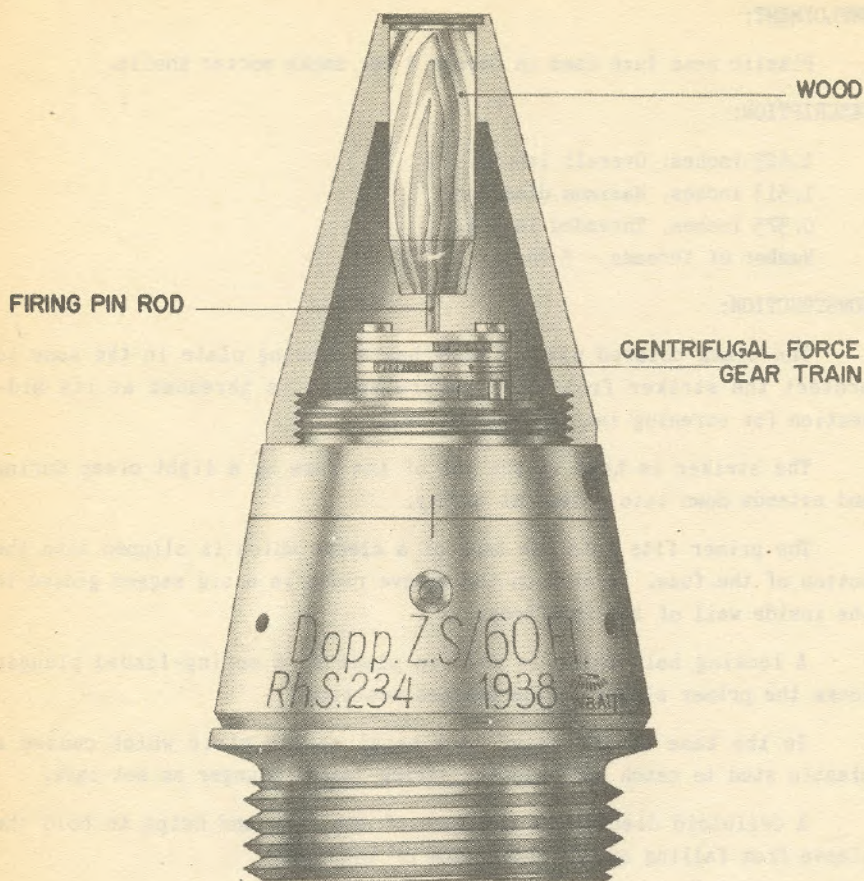
FUNCTIONING:

Set-back throws the spring-loaded plunger back until it is caught and held by the plastic stud. This releases the locking ball and the primer sleeve is free to creep forward toward the striker during flight.

Upon impact the primer will impinge upon the striker and at the same time the nose of the fuze will give forcing the striker into the primer.

The flash from the primer melts the celluloid disc and fires the round.

RESTRICTED



DOPP Z S/60 FI.

RESTRICTED

DOPP. Z. S/60 Fl.

EMPLOYMENT:

Mechanical time and/or impact nose fuze used in German 8.8 cm. and 10.5 cm. H.E. anti-aircraft shells.

DESCRIPTION:

- 4.375 inches, Overall length.
- 2.375 inches, Maximum diameter.
- 0.500 inches, Threaded length.
- Number of threads - 4 RH.

CONSTRUCTION:

The body construction and clock mechanism are similar to the Zt. Z. S/30 Fgl. It differs in that the time can be set up to 60 seconds and it has an impact firing pin. A firing pin rod passes through the hollow center of the fuze. This rod is kept in place by the fact that its diameter is larger than the hollow center hole. The hole diameter is enlarged, however, by the action of a gear train which is activated by centrifugal force.

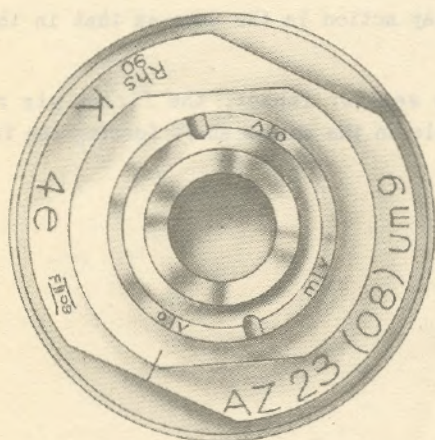
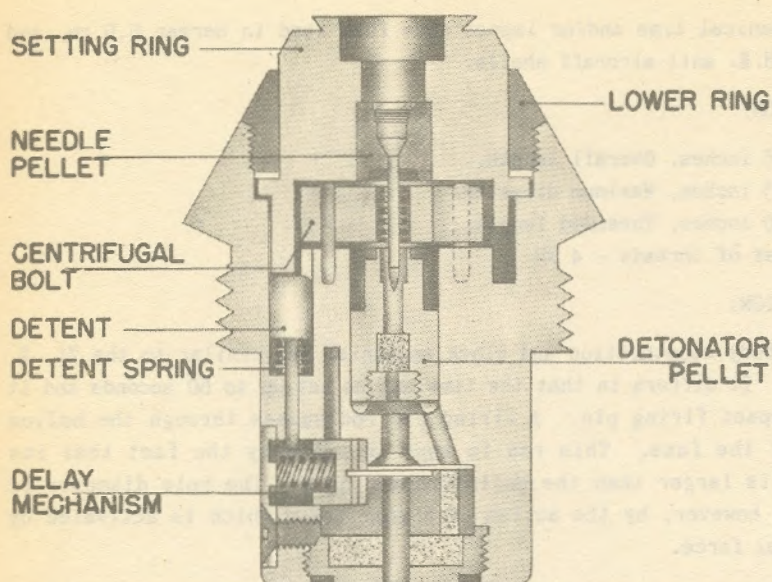
The firing pin is also released during flight by a centrifugal arm.

FUNCTIONING:

The clockwork delay action is the same as that in the Zt. Z. S/30 Fgl.

When the fuze is set for impact, the firing pin rod is driven through the enlarged hole in the hollow shaft forcing the firing pin into the detonator.

RESTRICTED



NOSE FUZE A.Z. 23 umg

EMPLOYMENT:

Used in 15cm H.E. Shells.

DESCRIPTION:

3.125 inches, Overall length.

2.312 inches, Maximum diameter.

0.5 inches, Threaded length.

Number of threads - 4 RH.

CONSTRUCTION:

This is generally similar to the A.Z.23v (0.25), the only difference being in its dimensions and in the delay mechanism.

It consists chiefly of a steel body, a fixed lower ring and an upper setting ring which can be turned by means of notches, using a special key. The lines at O.V. and M.V. can thus be brought to coincide with the lines marked on the body and lower fixed ring.

The fixed lower ring is screwed and pinned to the body. It bears on a shoulder on the setting ring and thus secures it in position. The setting ring on the underside is formed with three distinct bearing planes by means of which the delay mechanism is actuated.

Delay Mechanism - This differs from the A.Z.23 (0.25) fuze, in the control mechanism. In this case the copper plate instead of being free in relation to the centrifugal bolt is attached to it by a small pin. Displacement of the centrifugal bolt and consequently the copper plate under the effects of centrifugal force can be prevented by the stem of a detent which is actuated by a spring.

The position of this detent is controlled by the bearing planes of the setting ring. When Part 1 of the bearing planes is over the detent (setting M.V.), the stem of the latter protrudes into the space in which the centrifugal bolt is positioned and prevents its movement. The central channel is thus closed and the fuze can only function on delay.

When Part 2 or 3 of the setting planes (setting O.V.) is brought over the detent, the latter is free to move slightly longitudinally and, under pressure from its spring, its tip is withdrawn from behind the centrifugal bolt. The bolt can then move outwards and compress its spring thus withdrawing the copper plate and leaving the central channel of the fuze clear.

RESTRICTED

NOSE FUZE AZ 23umg

CONSTRUCTION:

It will be observed that the setting cap has three bearing plates, although only two are required in this fuze. The reason for this is that the setting cap is identical with that used with the A.Z.23 umg. M.2.V. (which is similar to the A.Z.23 umg (0.8)) in which the three settings (no delay, 0.2 delay, 0.8 delay) are used. In this case, the three planes are necessary. It is, therefore, probably with a view to securing standardization that the fuze described here has three planes as in the corresponding setting cap of the A.Z. 23 umg M.2.V.

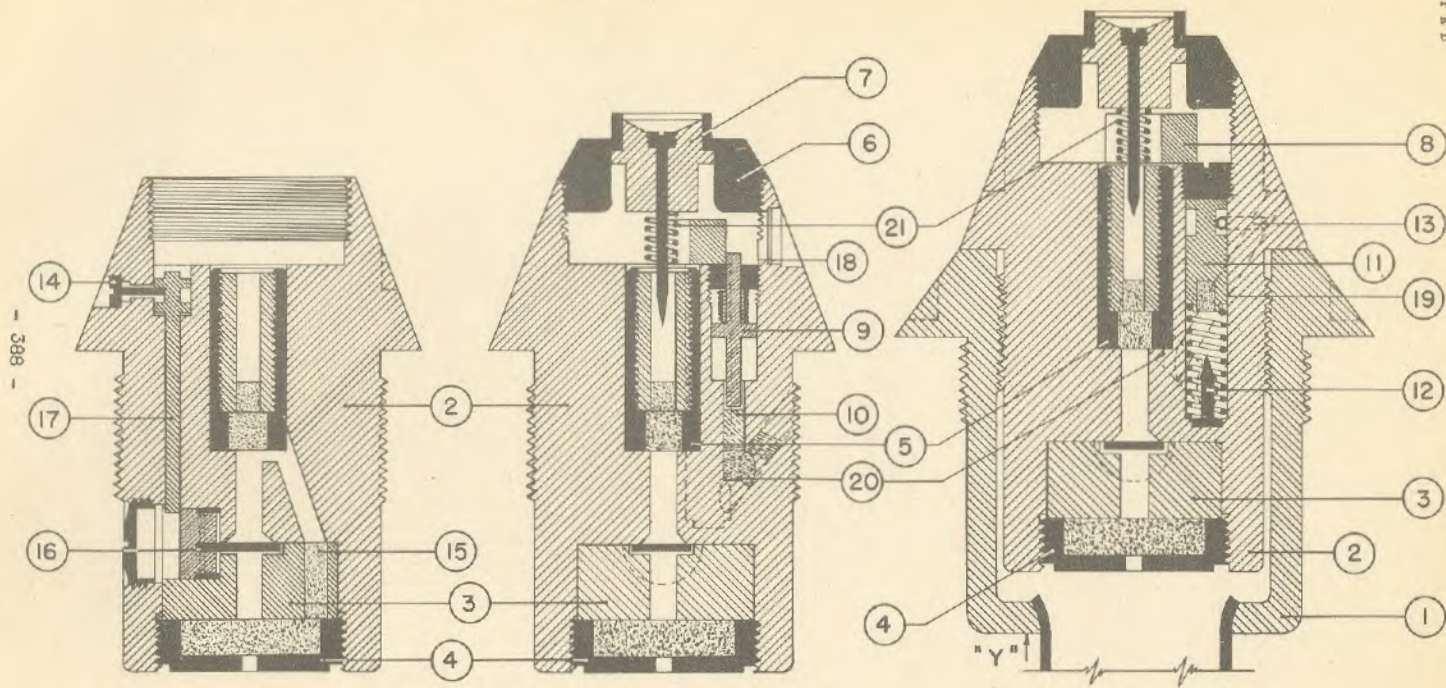
FUNCTIONING:

AFTER FIRING - The centrifugal bolts swing outwards overcoming the spring thus leaving the needle and detonator pellets free to move towards each other. The creep spring prevents creep action. The centrifugal bolt of the delay mechanism moves outward compressing its spring. If the index plug is in the delay position, the copper plate is held by the plug and thus the central channel remains closed. If the plug is in the instantaneous position, the plate is moved by centrifugal force into the slot in the plug and the central channel is thus opened.

ON IMPACT - The needle is forced on to the detonator by direct action. On graze the detonator pellet is carried forward on to the needle. The flash from the detonator passes either through the delay channel or the central channel, according to the setting of the fuze, to the magazine and thence to the detonator and exploder in the shell.

GERMAN NOSE FUSE Wgr. Z 36 (PERCUSSION)

REPRODUCED



EMPLOYMENT:

Used in 15cm Stick Bomb and 20cm Spigot Mortar Bomb.

DESCRIPTION:

A steel fuze adaptor (1) which carries the gaine, screws into the nose of the bomb. The body of the fuze (2) which is of aluminum, screws into this adaptor. A circular aluminum block (3) slides into the base of the fuze and is held in position by an aluminum plug (4) which carries a block of match composition. The body is recessed from the front to carry a steel striker guide (5) at the base of which is the detonator, and a steel head (6), which carries the aluminum striker pellet (7).

A steel detent (8), pivoted at one end and spring-loaded, is retained beneath the striker pellet by a spring-loaded pin (9) which in turn is held forward by a powder plug (10).

A steel inertia pellet (11) carrying a cap is held by a creep spring from a secondary striker pin (12). A safety pin (13) passes through the face of the fuze body and a cannellure in the forward end of this inertia pellet.

The fuze has alternative settings, instantaneous and short-delay. The setting is effected by a selector screw (14) recessed into the face of the fuze body. Alternative flash tubes lead from the detonator to the match composition, (a) a central tube and (b) a tube leading to a pyrotechnic delay (15) offset in the aluminum block (3). When set for delay the central flash tube is masked by a spring-loaded slide (16) which is held by a detent (17). When set for instantaneous, this detent is moved forward, by the selector screw, to release the slide. The letters O and M are stamped on either side of the selector screw to indicate "without delay" and "with delay" respectively.

A round inspection window (18) is provided in the face of the fuze body. A hole (19) pierces the fuze body to form a ventilating shaft to the pyrotechnic train (20).

MARKINGS:

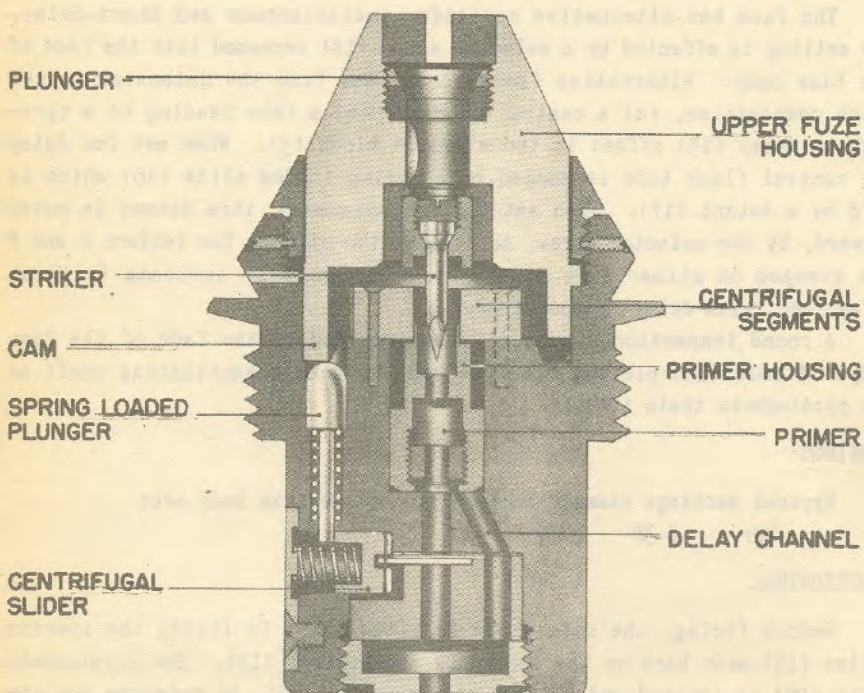
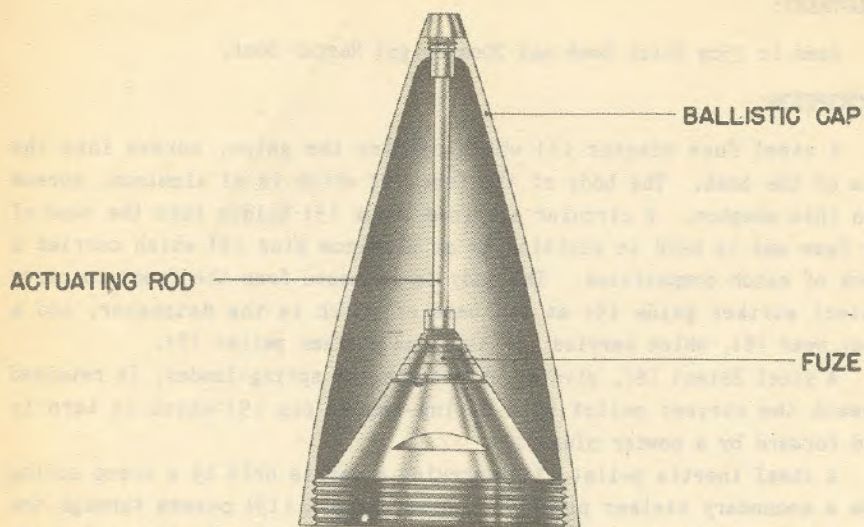
Typical markings stamped on the face of the fuze body are:

Wgr Z 36 bmv 42

FUNCTIONING:

Before firing, the safety pin is withdrawn. On firing the inertia pellet (11) sets back on the secondary striker pin (12). The pyrotechnic train (20) is ignited and melting the wax plug (10), it releases the pin (9) which sets back to release the detent (8). The fuze is then armed.

On impact the striker pellet sets back against the creep spring (21) and the detonator is fired.



NOSE FUZE Hbgr Z 35 K

RESTRICTED

NOSE FUZE Hbgr Z 35 K

EMPLOYMENT:

Nose fuze used in German 17 cm. H.E. projectiles.

DESCRIPTION:

3.500 inches, Overall length.
2.375 inches, Maximum diameter.
0.500 inches, Threaded length.
Number of threads - 4 RH.

CONSTRUCTION:

This fuze is screwed into the nose of the projectile and a long ballistic cap or windshield is fitted over the fuze screwing directly onto the projectile. An actuating rod which reaches from the nose of the cap to the nose of the fuze transmits the shock of impact directly to the striker.

The fuze itself is fitted with a plunger in the nose which bears against a striker. The striker is held in the safe position by the standard German centrifugal segments. The primer housing is also held in position by these same segments.

To one side of the striker assembly is a spring-loaded plunger which rides against the cam-shaped base of the upper fuze housing. This upper housing is free to turn in order to set the cam with relation to the spring-loaded plunger.

The base of the plunger forms a lock for a centrifugal slider in the side of the fuze body. This slider is used to open or close the instantaneous firing channel through the center of the fuze.

This fuze also has a 0.15 second delay firing channel which is always opened.

FUNCTIONING:

Delay Setting:

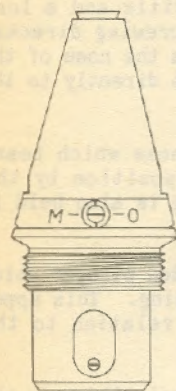
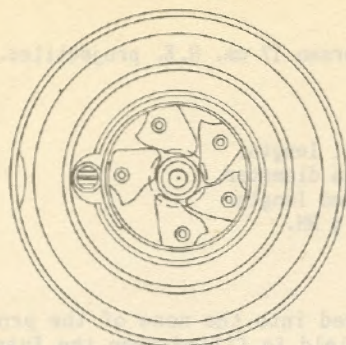
The head of fuze is turned so that the cam holds the spring-loaded plunger in place thus locking the centrifugal slider. In the locked position the central or instantaneous channel is closed. Centrifugal force throws the centrifugal segments outward freeing the striker and primer housing. Upon impact the ballistic cap crushes forcing the actuating rod into the fuze. The striker is thus pushed backward to meet the primer which is thrown forward by inertia. The resulting flash fires the delay pellet which fires the projectile.

Instantaneous Setting:

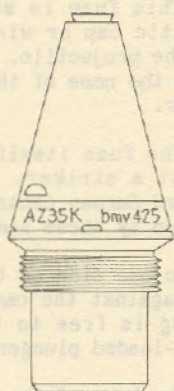
The head of the fuze is turned so that the cam does not hold the spring-loaded plunger in place and it is free to move up releasing the centrifugal slider. The fuze is armed in the same manner as the delay setting, but, in addition, the centrifugal slider moves out opening the instantaneous channel. If the fuze does not fire immediately it will fire after the short delay.

RESTRICTED

TOP VIEW



WOOD
HAMMER



DELAY
SETTING PLUG

DETONATOR

SHUTTER
LOCKING BOLT

CENTRIFUGAL
BOLT

SPRING RING

CENTRIFUGAL
SEGMENTS

NEEDLE

GRAZE PELLETT

DELAY CHANNEL

SHUTTER

NOSE FUZE A.Z.35K

EMPLOYMENT:

Used in H.E. Shell "K Gr 39" in the 17cm Mrs L equipment.

DESCRIPTION:

4.937 inches, Overall length.
2.312 inches, Maximum diameter.
0.5 inches, Threaded length.
Number of threads - 4 RH.

CONSTRUCTION:

The fuze is of the igniferous type with a combined graze and direct action mechanism and an optional delay setting device which produces a .3 second delay.

Constructed mainly of steel, the portion protruding from the shell is coned with a flat top and is closed at the nose by a brass disc. The designation, "A.Z. 35 K" is stamped near the base of the cone head and, diametrically opposite, is a delay setting plug with setting marks lettered "M" and "O" stamped adjacent to it on either side. The overall length of the fuze is 4.94 inches and the weight 2 lb. 3 oz. 5 dr. The portion which is exposed when in the shell protrudes to a length of three inches.

The fuze body is screwthreaded externally for insertion in the shell and below the thread it is reduced in diameter and has a side aperture for the assembly of a centrifugal bolt attached to a shutter. The aperture is closed by a plate secured by a screw. Above the threaded portion a flange is formed which is coned to match the head. Above the flange the body is reduced in diameter and screwthreaded externally to receive the head. The delay setting plug, engraved with an arrowhead, is screwed into a radial hole in the flange, and on its inner end has an eccentric projection which bears on the upper end of the shutter locking bolt. The body is recessed from the base to accommodate the delay arrangement with a perforated pellet of gunpowder, and is closed by a screwed plug with a central flash hole. A flash channel in the top of the recess communicates with an upper recess containing a steel graze pellet carrying the detonator. This recess is enlarged near the top to form a platform for five pivoted centrifugal segments of aluminum. The segments are held in a position to overlap a shoulder on the graze pellet by an expanding spring ring surrounding them. The needle, carried in a cylindrical pellet of aluminum, is supported above the graze pellet by a spiral creep spring, the pellet being kept in alignment with the wooden hammer in the fuze head by a steel sleeve which fits over and protrudes above the pellet. The pellet and sleeve are accommodated in a central hole in a screwed plug which closes the top of the upper recess.

CONSTRUCTION:

The delay holder consists of an aluminum cylindrical pellet with a flash channel through the center and a second channel, displaced from the center, which contains a pressing of delay composition. A guideway for the shutter is cut in the top of the pellet and extends beyond the central open flash hole. The figures "0,30" (indicating a delay of .3 seconds), are stamped in the base of the holder. A thin disc of tin placed over the top of the holder has two perforations which correspond with the holes in the holder and is cut away to permit movement of the centrifugal bolt.

The shutter consists of a copper plate which fits in the guideway on the delay holder and is connected at its outer end to a centrifugal bolt. The bolt is pressed towards the center of the body by a spiral spring held between the outer end of the bolt and a ring-shaped recess in the plate closing the aperture in the side of the body. The shutter locking bolt is contained in a vertical channel between the top of the aperture and the top of the body and consists of a solid cylindrical pellet of steel with a stem at its base. A spiral spring surrounding the stem supports the pellet, the upper end of which is engaged by the eccentric projection on the inner end of the delay setting plug.

FUNCTIONING:

When delayed action is required the delay setting plug is turned so that the arrowhead engraved in its head is set to the "M" graduation on the flange. At this setting the eccentric on its inner end is lowered and the shutter locking bolt is pushed, against this spring, down into the aperture in the side of the fuze body, thus preventing the centrifugal bolt from moving outwards. For non-delay action the plug is set to the "0" graduation. The eccentric is then in the raised position and the shutter locking bolt is clear of the path of the centrifugal bolt.

During flight the coil of the expanding spring ring is enlarged and the segments swung clear of the graze pellet by centrifugal force. When set for non-delay the centrifugal bolt is also thrown outwards, taking with it the shutter and thus exploding the open flash hole in the center of the delay holder. If set for delay the centrifugal bolt is held by the locking bolt. During the period of deceleration, "creep" of the graze pellet is prevented by the creep spring. On graze the pellet overcoming the spring by its momentum, moves forward and the detonator is pierced by the needle. When suitable impact is obtained, the hammer, and consequently the needle, is driven in at the same time as the pellet moves forward and direct action results. The path of the flash from the detonator to the magazine is governed by the setting. If set for delay, the

RESTRICTED

NOSE FUZE AZ 35K

FUNCTIONING:

empty channel in the delay holder is masked by the shutter and the path is through the channel containing the delay composition. If set for non-delay the flash passing through the exposed empty channel will reach the magazine first.

STRIKER

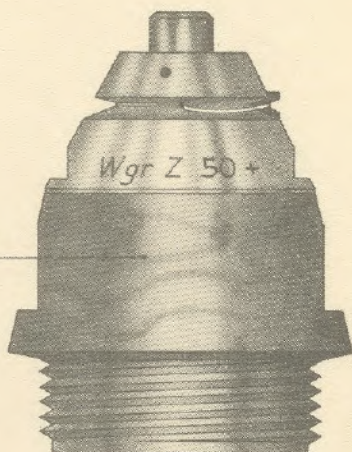
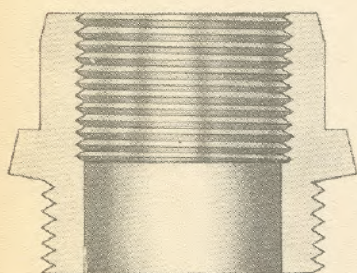
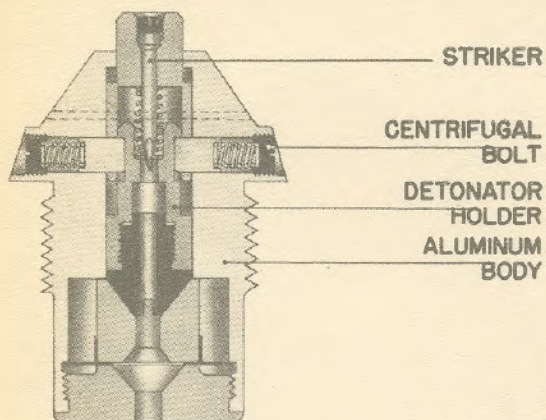
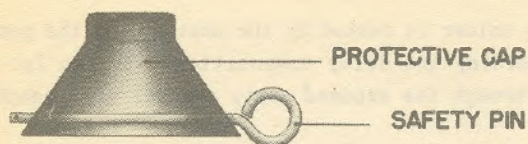
CENTRAL
BOLT

DETACHED
WHEEL
MAGNETIC
BODY

ADAPTER
BANK

NOSE FUZE Wg. 2.50

R E S T R I C T E D



NOSE FUZE Wgr. Z. 50+

EMPLOYMENT:

Used in the nose of 28 cm and 32 cm rockets.

DESCRIPTION:

2.87 inches, Overall length.

1.69 inches, Maximum diameter.

0.625 inches, Threaded length.

Number of Threads - 11

CONSTRUCTION:

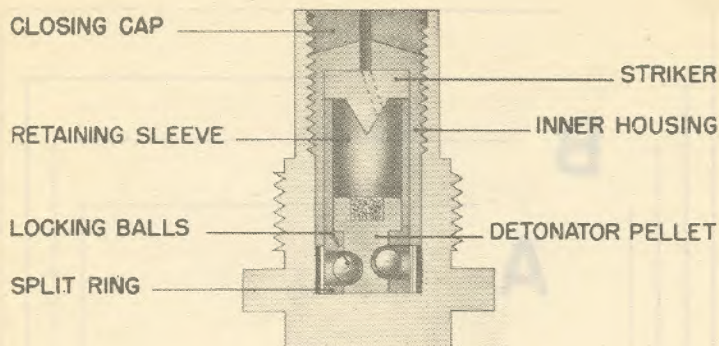
This fuze screws into a steel or plastic adapter which screws into the nose of the projectile. The fuze body is aluminum and contains a steel detonator holder which is movable and has an inertia weight behind it. The striker is movable also and extends out of the nose of the fuze. The striker is held in a safe position by two centrifugal plungers. A safety pin passes through the fuze body and the striker and a protective cap.

FUNCTIONING:

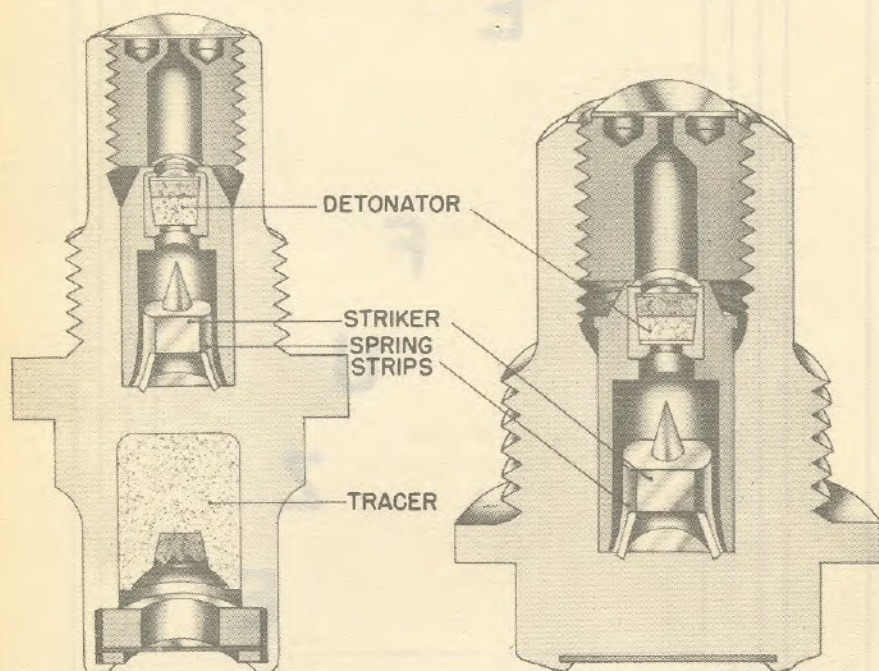
Safety pin is withdrawn and protective cap is removed before projectile is fired. As the projectile leaves the crate from which it is fired, centrifugal force causes the plunger to move out, freeing the detonator holder which will move back by acceleration of the projectile. The firing pin will also be free so that upon impact, the detonator holder will move forward, due to inertia to meet the firing pin or the firing pin will be driven into the detonator. When this fuze is armed, a red line is visible around the protruding end of the firing pin.

REMARKS:

Another type exists which is a modification of the above. Fuze is similar in construction and action. Main difference is that when plungers move out due to centrifugal force, they expand a spring wire and fall away. Externally they appear alike except for a cannulure on the nose in which the expanding wire is contained.



Bd. Z. 1513
(NOMENCLATURE UNCERTAIN)



Bd. Z. 1511

Bd. Z. 1512

BASE FUZES FOR 20mm. AMMUNITION

RESTRICTED

BASE FUZES Bd.Z. 1511 & Bd.Z. 1512

EMPLOYMENT:

Base fuzes used in German 20 mm ammunition.

CONSTRUCTION:

The fuzes are threaded at the center of the body to engage the threads of the projectile.

A fixed detonator is held in the central flash channel of the fuze body. A striker with a large circular head which tapers outward is retained by two spring strips which partially surround the head. One end of each spring is fixed to the fuze body and the remainder follows the contour of the striker head fitting closely against it.

FUNCTIONING:

On impact, inertia forces the striker forward onto the detonator. As the striker is pulled free from the springs, the enlarged diameter of the tapered striker head spreads the springs apart.

REMARKS:

Both fuzes function in the same manner, but the 1511 has a tracer and the 1512 does not have a tracer.

(Nomenclature Uncertain) BASE FUZE Bd.Z. 1513

EMPLOYMENT:

Base fuze used in German 20 mm ammunition.

CONSTRUCTION:

The fuze which screws into the base of 20 mm ammunition contains no tracer element.

A movable detonator pellet is retained by two small locking balls in the base of the fuze body. A split ring holds the balls in the unarmed position.

A fixed striker is housed in the top of the fuze. The nose is closed by a cap containing a central flash hole.

FUNCTIONING:

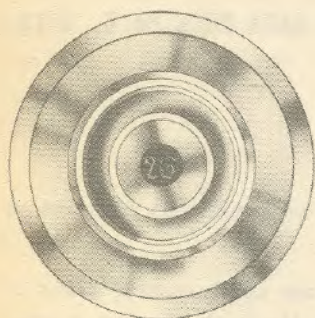
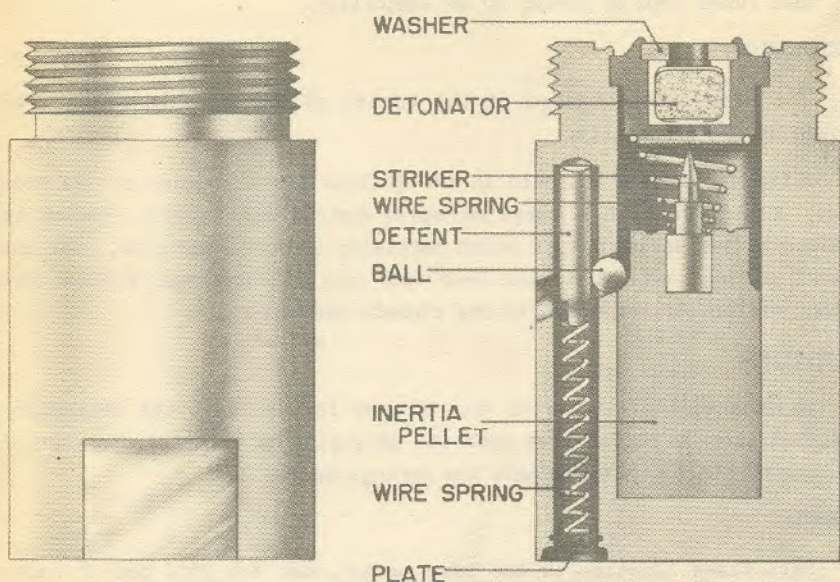
Centrifugal force opens the split ring releasing the locking balls. Upon impact, inertia causes the detonator pellet to set forward impinging upon the striker.

REMARKS:

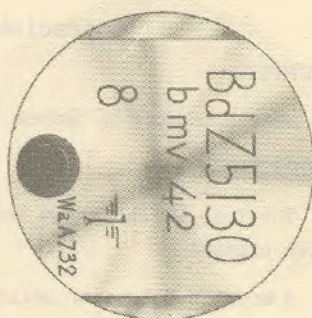
It is believed that this fuze is being used extensively today, but the exact nomenclature is uncertain.

Since it is used interchangeably with the Bd.Z. 1511 and Bd.Z. 1512 fuzes, it is assumed that the fuze is designated, Bd.Z. 1513.

RESTRICTED



(BASE MARKINGS IN WHITE)



BASE FUZE BdZ 5130 FOR
 GERMAN 3.7cm STICK BOMB

EMPLOYMENT:

Base fuze for the 3.7cm Stick Bomb (3.7cm Stiel Gr 41)

DESCRIPTION:

1.65 inches, Overall length.
1.0 inches, Maximum diameter.
0.25 inches, Threaded length.
Number of threads - 5 RH.

CONSTRUCTION:

The fuze is used in the 3.7cm Pak, hollow charge, muzzle stick bomb and is of the igniferous type with a graze action. The designation of the fuze "Bd.Z.5130" is stamped in the base. The weight of the fuze is 4 oz. 12 dr.

The body of the fuze is cylindrical with a threaded portion of reduced diameter at the head for insertion in the bomb. A large recess formed from the head, contains the graze pellet and is closed at the top by the detonator holder. A smaller recess near the periphery is formed from the base and contains a detent supported by a spiral spring. This recess is closed at the base by a disc secured by the turned over metal of the body. A channel, with a downward incline towards the side, is drilled from the exterior of the body, through the recess containing the detent and into the recess containing the graze pellet. A ball which engages a shoulder on the graze pellet is held in this channel, between the two recesses, by the detent. Two key flats are formed near the base end of the body.

The graze pellet consists of a solid cylindrical pellet fitted with a needle at the head. An inclined shoulder, with which the ball engages, is formed below the head. A helical spring is held between the head of the pellet and the base of the detonator holder, the smaller end of the spring fitting around the needle.

The detonator holder consists of a flanged cup with a flash hole in its base and contains an igniferous detonator stamped with the number "26". The detonator is retained by the mouth of the cup being turned in to overlap a washer. The holder is supported at its flange by a step formed in the top of the recess and is secured by turned in metal of the body.

The detent is a solid cylindrical pellet with a concave head and a short stem at the base around which the upper end of spiral supporting spring is positioned.

RESTRICTED

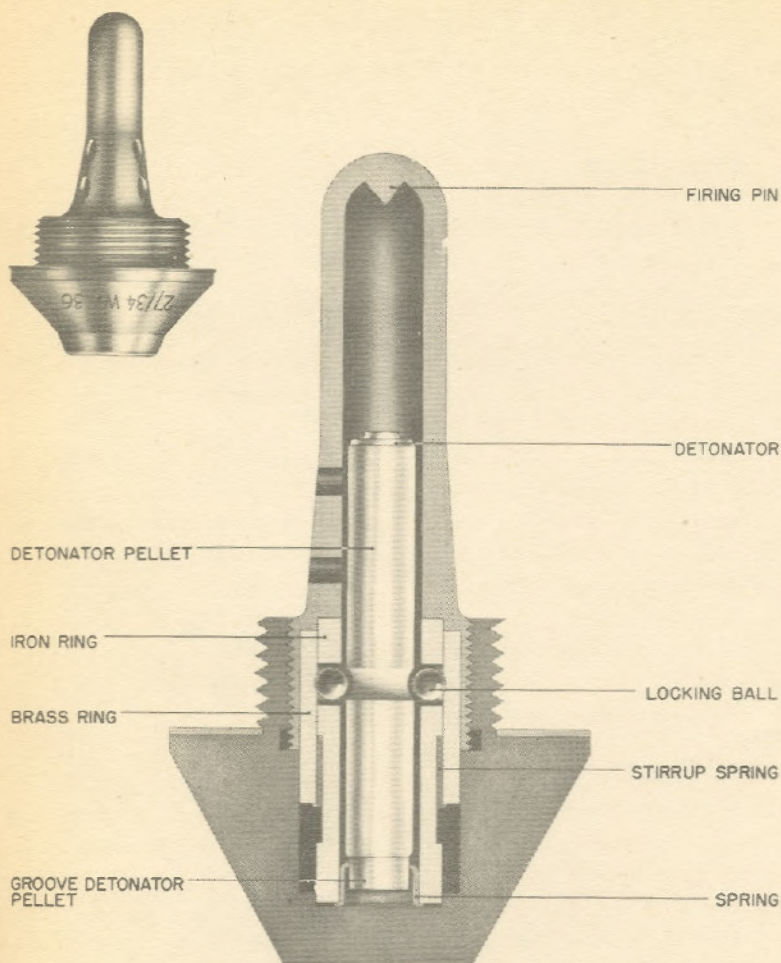
BASE FUZE Bd Z 5130

FUNCTIONING:

During transport the graze pellet is held away from the detonator by the ball which is held in contact with the shoulder on the pellet by the detent.

On acceleration the detent, overcoming the spring, sets back and thus releases the ball which moves down the inclined channel and leaves the graze pellet held off the detonator only by the helical creep spring. The concave head of the detent is apparently designed to receive the ball when the detent rises again and so to push the ball up into the top of the recess.

On graze the pellet moves forward, compressing the creep spring and the needle pierces the detonator.



BASE FUZE WZ 36 FOR POLISH 3.7cm. A.P. SHELLS

EMPLOYMENT:

Mechanical Impact Base Fuze for Polish 3.7 mm A.P. Shell.

DESCRIPTION:

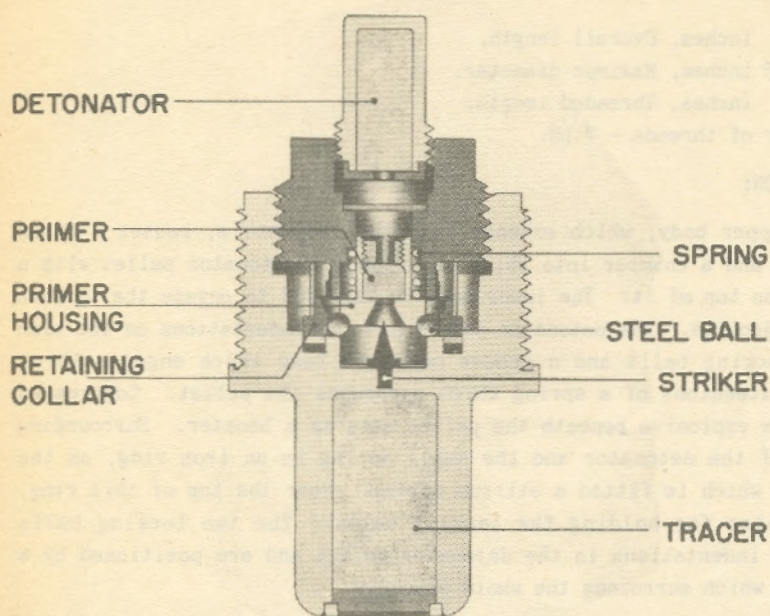
2.0 inches, Overall length.
1.0625 inches, Maximum diameter.
0.5 inches, Threaded length.
Number of threads - 7 LH.

CONSTRUCTION:

The upper body, which extends into the projectile, houses a fixed firing pin and a chamber into which is slipped a detonator pellet with a detonator on top of it. The lower body is threaded to engage the threads on the projectile. The detonator pellet has two indentations on the side to hold locking balls and a groove near the base which engages three vertical extensions of a spring which surrounds the pellet. Compressed composition explosive beneath the pellet acts as a booster. Surrounding the base of the detonator and the small spring is an iron ring, on the outside of which is fitted a stirrup spring. Near the top of this ring, are two holes for holding the locking balls. The two locking balls engage the indentations in the detonator pellet and are positioned by a brass ring which surrounds the whole assembly.

FUNCTIONING:

Set-back causes the brass ring to bear against the stirrup spring located outside the iron ring. When set-back has been overcome, the brass ring has been driven to the base of the fuze creating a clearance into which the locking balls are thrown by centrifugal force. The detonator pellet is now held only by the three spring extensions at the base. On impact, inertia forces the detonator pellet to free itself from these spring extensions and to move forward against the fixed firing pin in the top of the fuze.



BASE FUZE M35

- 406 -

R E S T R I C T E D

BASE FUZE M35

EMPLOYMENT:

Base fuze used on German 4.7 cm. A.P. ammunition.

DESCRIPTION:

2.656 inches, Overall length.
1.406 inches, Maximum diameter.
0.688 inches, Threaded length.
Number of threads - 11 RH.

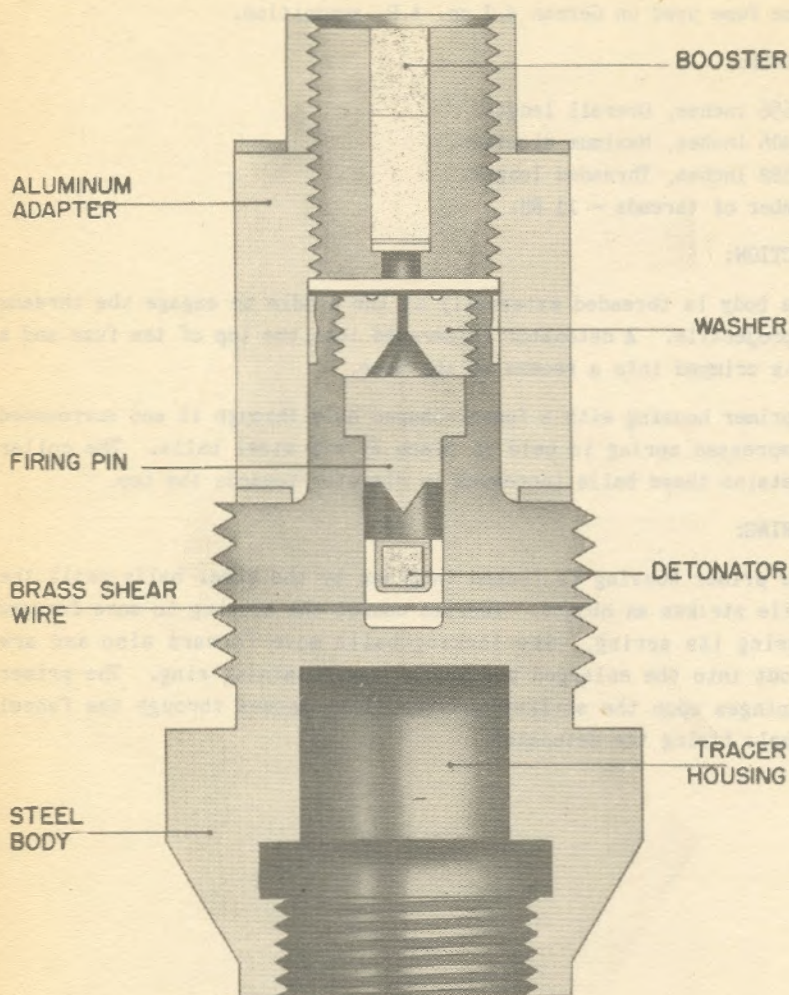
CONSTRUCTION:

The body is threaded externally at the middle to engage the threads of the projectile. A detonator is screwed into the top of the fuze and a tracer is crimped into a recess at the base.

A primer housing with a funnel-shaped hole through it and surrounded by a compressed spring is held in place by six steel balls. The collar which retains these balls increases in diameter towards the top.

FUNCTIONING:

The primer housing is locked in place by the steel balls until the projectile strikes an object. Inertia causes the housing to move forward compressing its spring. The locking balls move forward also and are cammed out into the enlarged portion of the retaining ring. The primer then impinges upon the striker and the flash passes through the funnel shaped hole firing the detonator.



BASE FUZE FOR 7.5 Cm. SHELLS

R E S T R I C T E D

BASE FUZE FOR 7.5 cm. (SMALL CAVITY)

EMPLOYMENT:

Base fuze used on German 7.5 cm. H.E. projectiles and 5 cm. A.P. shells.

DESCRIPTION:

- 1.781 inches, Overall length W/tracer.
- 1.563 inches, Overall length W/O tracer.
- 1.063 inches, Maximum diameter.
- 0.438 inches, Threaded length.
- Number of threads - 6 LH.

CONSTRUCTION:

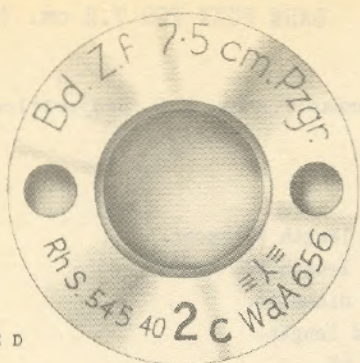
The base of the steel body is threaded internally to receive a brass tracer container. The center of the body is threaded externally to engage the threads on the projectile. An aluminum adapter is screwed over the top of the fuze body. A booster containing either pellets of lead azide, calcium silicide, and PETN wax or tetryl is screwed into this adapter and is sealed by an aluminum cap.

A funnel-shaped washer secures a firing pin in the body of the fuze. The flash from the primer passes through the washer and a channel in the firing pin. The washer is separated from the booster by a series of paper and gauze discs which delay the action of the fuze.

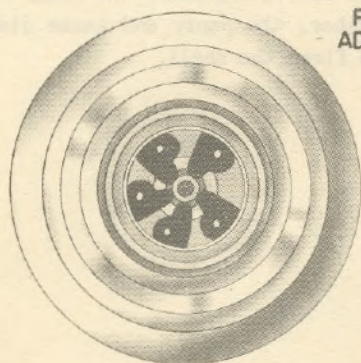
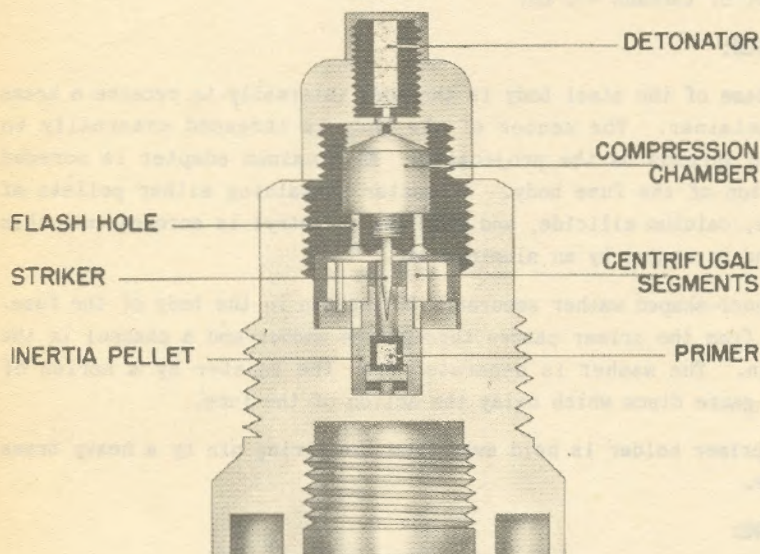
The primer holder is held away from the firing pin by a heavy brass shear wire.

FUNCTIONING:

Upon impact the primer holder moves forward shearing the shear wire and impinging the primer on the firing pin. The flash passes through the firing pin, the funnel washer, the paper and gauze discs, and into the booster. The booster then fires the shell.



RESTRICTED



PLAN WITH GAINÉ
ADAPTER REMOVED
SHOWING
CENTRIFUGAL
SEGMENTS

IMPACT BASE FUZE Bd. Z_f. 7.5cm Pzgr.
(LARGE CAVITY)

R E S T R I C T E D

Bd. Zf. 7.5cm Pzgr. (Large Cavity)

EMPLOYMENT:

Mechanical Impact Base Fuze used in German 7.5 cm A.P.C. Shells.

DESCRIPTION:

- 3.875 inches, Overall length.
- 2.188 inches, Maximum diameter.
- 0.875 inches, Threaded length.
- Number of threads - 6 RH.

CONSTRUCTION:

This fuze is similar in exterior construction to the 7.5 cm (small type) fuze. It has a fixed striker and an inertia pellet containing a primer in the top. It has the standard German centrifugal arming mechanism. Four flash holes around the striker lead to a compression chamber which is closed by a brass disc with a pin point hole in the center. The top of the fuze closing plug is threaded externally to accept an aluminum cap which has a center hole lining up with the hole in the disc. This hole leads to another detonator composed of lead styphnate, lead azide, and Petn wax.

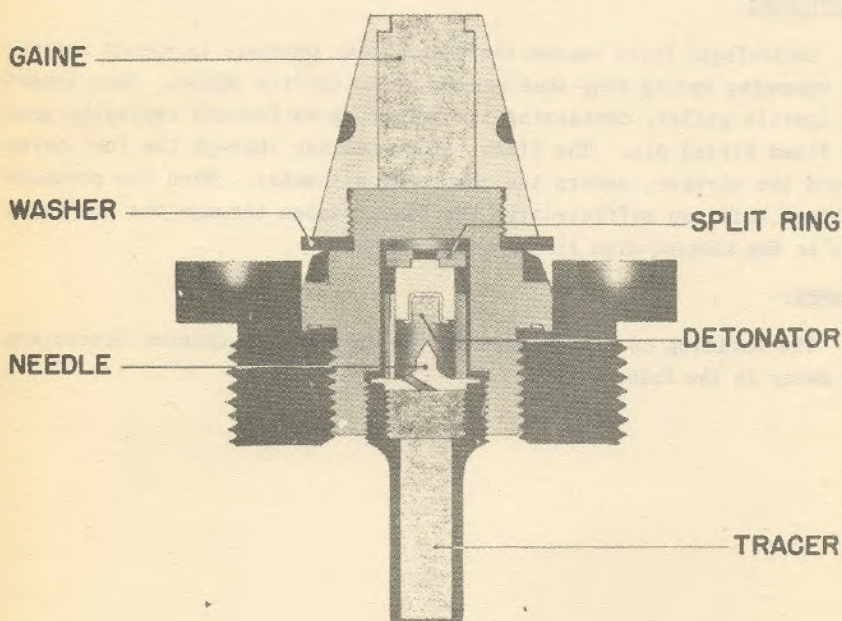
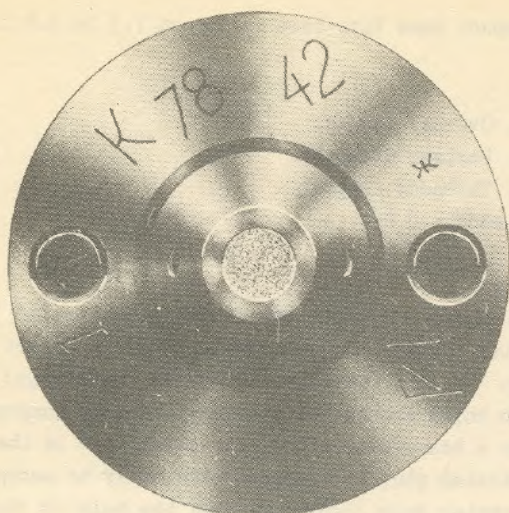
FUNCTIONING:

Centrifugal force causes the centrifugal segments to expand against the expanding spring ring thus releasing the inertia pellet. Upon impact the inertia pellet, containing the primer, goes forward impinging upon the fixed firing pin. The flash, after passing through the four holes around the striker, enters the compression chamber. When the pressure has been built up sufficiently, the flash passes through the pin point hole in the closing disc firing the detonator.

REMARKS:

The building up of pressure in the compression chamber determines the delay in the fuze.

RESTRICTED



RUSSIAN BASE FUZE FOR 7.62 cm AMMUNITION

RESTRICTED

BASE FUZE RUSSIAN 7.62cm

EMPLOYMENT:

Found in ammunition fired by Germans in captured Russian equipment.

DESCRIPTION:

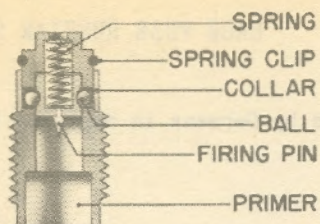
2.687 inches, Overall length.
2.25 inches, Maximum diameter.
0.5 inches, Threaded length.
Number of threads - 6 LH.

CONSTRUCTION:

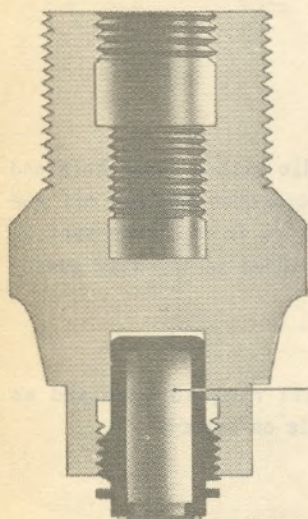
The base fuze contains a fixed needle with a flash hole and beneath this a movable detonator holder. The detonator is held off the needle by a split ring. A tracer is fitted. There is no creep spring. Situated above the needle is a gaine which is embedded in the main bursting charge.

FUNCTIONING:

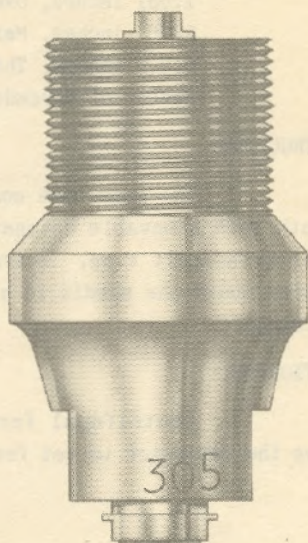
Centrifugal force causes the split ring to open and so allows the detonator to set forward onto the needle on impact.



RESTRICTED



TRACER



BASE FUZE Bd. Z. for 8.8 PZGR.

R E S T R I C T E D

Bd Z FOR 8.8cm PZGR.

EMPLOYMENT:

Small cavity fuze for 8.8cm A.P. Projectile.

DESCRIPTION:

2.312 inches, Overall length.
0.812 inches, Maximum diameter.
0.812 inches, Threaded length.
Number of threads - 14 RH.

CONSTRUCTION:

This fuze contains a spring-loaded striker. Fuze is contained in a housing that fits into the base of the projectile. In the fuze the detonator is fixed. The firing pin is fitted with a spring under compression. The firing pin is held under compression by two balls which are held in position by a collar. The collar is held stationary by a spring clip in a slight cannellure just forward of the collar.

FUNCTIONING:

Upon impact the collar moves forward due to inertia forcing the spring clip out of position. The balls are free to move out of position, releasing the spring-loaded striker which is forced on to the primer.

REMARKS:

Another version of this fuze has been identified in which there is no spring clip or cannellure but in their place, a shear wire restrains the collar until impact.

R E S T R I C T E D

COMPRESSION
CHAMBER

STRIKER

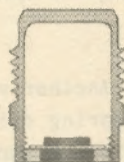
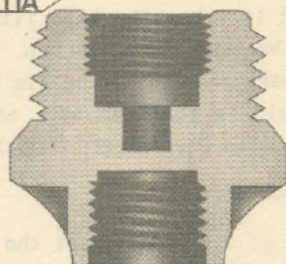
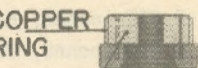
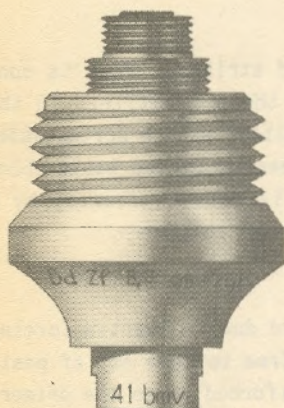
CREEP SPRING

TOP VIEW

COPPER
RING

CENTRIFUGAL
SEGMENTS

PRIMER INERTIA
PELLET



IMPACT BASE FUZE
Bd. Z. F. 8.8 P_{zgr}
(LARGE CAVITY)

RESTRICTED

Bd. Z.F. 8.8 Pzgr (large cavity)

EMPLOYMENT:

Mechanical Impact Base Fuze used on German 8.8 cm. A.P. projectiles.

DESCRIPTION:

2.50 inches, Overall length.

2.563 inches, Maximum diameter.

0.75 inches, Threaded length.

Number of threads - 6 RH.

CONSTRUCTION:

This fuze is similar in construction to the fuze used on the 7.5 cm A.P.C. shell. The centrifugal segments of the customary arming device are of light alloy rather than brass and a steel detonator holder replaces the brass type. A light creep spring is incorporated as an added safety feature between the detonator holder and the fixed firing pin. The flash is transmitted through four holes surrounding the striker to a compression chamber closed by a coned brass disc with a pin point hole leading to the booster.

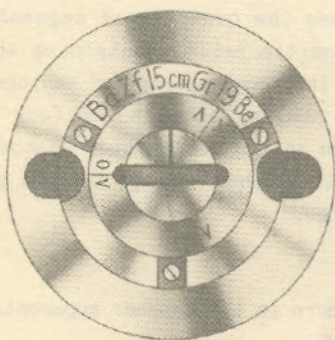
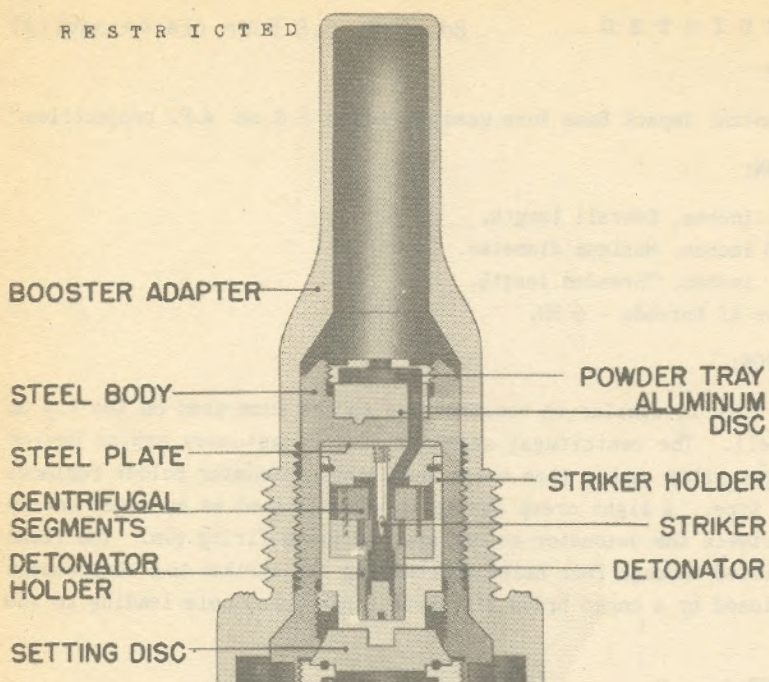
FUNCTIONING:

Centrifugal force causes the centrifugal segments to expand the copper ring releasing the inertia pellet containing the primer. Upon impact, the primer overcomes the creep spring and impinges upon the fixed striker. The flash, after passing through the four holes below the striker, builds up a pressure in the compression chamber. When a great enough pressure is reached, it flashes through the pin point hole in the coned disc firing the detonator.

REMARKS:

The building up of pressure in the chamber apparently is what determines the delay in this fuze.

R E S T R I C T E D



BASE FUZE Bd. Z. 15cm Gr 19 Be

EMPLOYMENT:

Base fuze for 15 cm Granat 19 Anti-Concrete shell.

DESCRIPTION:

Fuze

3.0 inches, Overall length.
2.0 inches, Maximum diameter.
1.0 inches, Threaded length.
Number of threads - 12 RH.

Booster Holder

6.125 inches, Overall length.
3.0 inches, Maximum diameter.
1.062 inches, Threaded length.
Number of threads - 8 RH.

CONSTRUCTION:

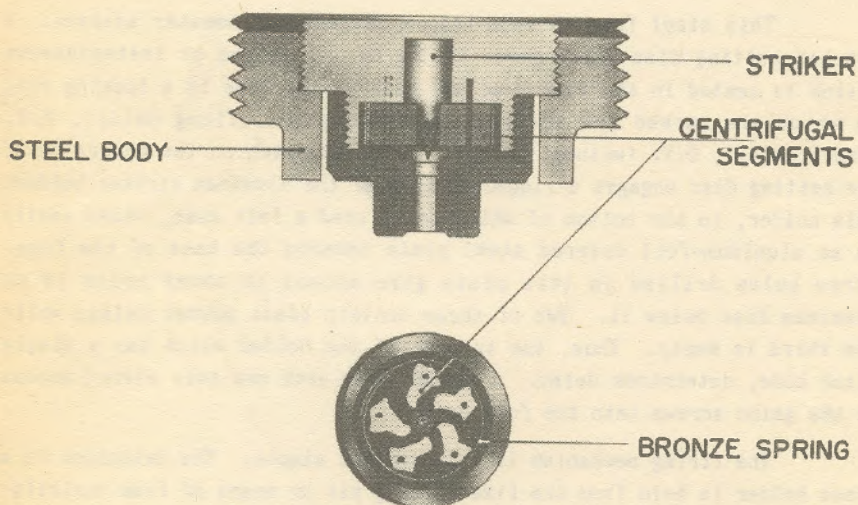
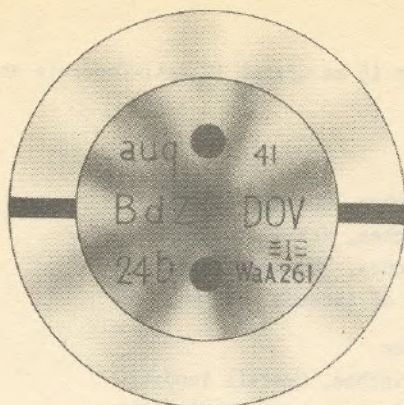
This steel fuze threads into a large steel booster adapter. A notched setting disc which gives choice of two delays or instantaneous action is seated in the fuze head and held in the fuze by a locking ring on which are marked the setting indications G.V. (long delay), K.V. (short delay), O.V. (without delay). A second notch on the underside of the setting disc engages a ridged portion of the aluminum striker holder. This holder, to the bottom of which is affixed a felt disc, rides easily on an aluminum-foil covered steel plate towards the base of the fuze. Three holes drilled in this plate give access to three holes in an aluminum disc below it. Two of these contain black powder delays while the third is empty. Thus, the turning of the holder which has a single flash hole, determines delay. A powder tray with one hole giving access to the gaine screws into the fuze base.

The firing mechanism is standard and simple. The detonator in a brass holder is held from the fixed firing pin by means of fine centrifugal detents in a spring ring.

FUNCTIONING:

Rotation of the projectile causes the centrifugal detents to swing out against the spring, arming the fuze. On impact the detonator impinges on the striker and flashes through a flash hole beside the striker, to the aluminum disc containing the delays.

RESTRICTED



GERMAN BASE FUZE BdZ DOV

RESTRICTED

BASE FUZE Bdz DOV

EMPLOYMENT:

Used in 15 cm Wurfgranate 41 (15 cm Rocket).

DESCRIPTION:

- 1.375 inches, Overall length.
- 1.75 inches, Maximum diameter.
- 1.469 inches, Threaded length.
- Number of threads - 7 LH.

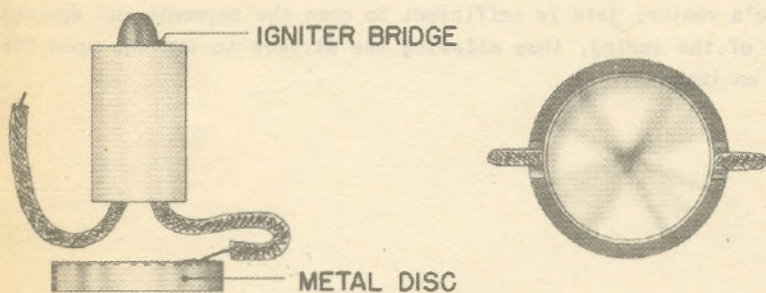
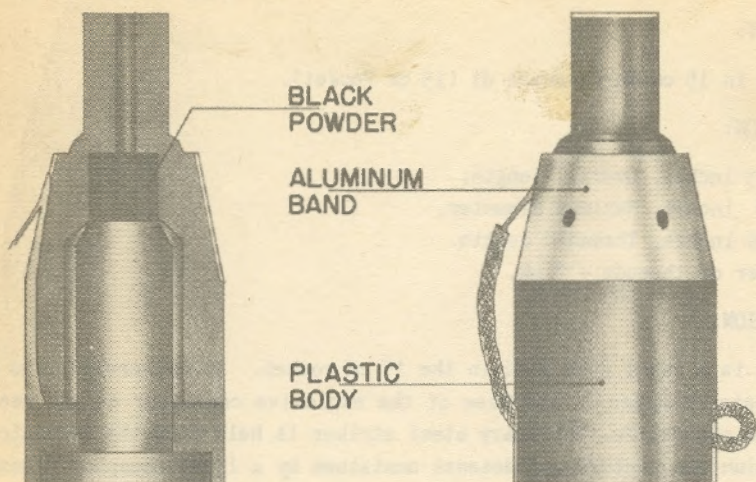
CONSTRUCTION:

This is a steel fuze used in the 15 cm rocket. It is screwed into a steel booster adapter in the base of the explosive container at the rear end of the projectile. The heavy steel striker is held from the detonator by five aluminum centrifugal detents contained by a light phosphor bronze spring.

FUNCTIONING:

The rotational velocity achieved by the 14° inclinations of the projectile's venturi jets is sufficient to open the segments out against the force of the spring, thus allowing the striker to impinge upon the detonator on impact.

RESTRICTED



ELECTRIC FUZE ERZ 39

RESTRICTED

ELECTRIC FUZE ERZ 39

EMPLOYMENT:

This base fuze fits into one of the venturi of the German 15 cm. and 21 cm. rockets.

DESCRIPTION:

1.438 inches, Overall length.

0.563 inches, Maximum diameter.

No threads.

CONSTRUCTION:

The body is made of a black colored plastic with an aluminum band around the shoulder.

Within the body is an igniter bridge from which runs two wires. One wire is connected to the aluminum band around the shoulder and the other to a metal disc in the base of the fuze. A black powder charge is located just above the igniter bridge.

FUNCTIONING:

An electric current is passed through the fuze firing the igniter bridge. This, in turn, fires the black powder charge which sets off the propellant.

REMARKS:

This fuze is to be replaced by the type ERZ 39 (B) which is manufactured from heat resistant materials. The distinguishing feature of this new fuze is the grey color of the body.

