Ministry of Defence
Defence R&D Organisation

STEC PAMPHLET – 24

Safety Guidelines on Breakdown of Ammunition

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Issued by

Storage & Transport of Explosives Committee
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PREFACE

The purpose of this STEC Pamphlet is to provide safety guidelines and safety procedures during breakdown of ammunition and recovery of explosive fillings for chemical analysis. Ammunition breakdown is carried out by reverse engineering methods for the purpose of defect investigation, check proof, depot proof and indigenisation of store.

These procedures should be carefully exercised keeping all the safety measures in mind while carrying out the breakdown. This pamphlet is a general document pertaining to the safe breakdown of ammunition to its component level and should be followed after careful analysis of each case. Additional information regarding specific tools and machinery may be sought from CQA(A) and this document is not to be considered as a replacement to Ammunition Maintenance Instruction (AMI).

It is hoped that users will find this revised STEC Pamphlet 2025 simpler, easier to understand and implement, thereby promoting the safe storage and transportation of military explosive. This publication supersedes STEC Pamphlet, 2017 on the subject.

SECTION-I
INTRODUCTION

SCOPE

1. This STEC Pamphlet lays down guidelines and safety measures to be adopted for breakdown of live ammunition stores. It is emphasized that breakdown of ammunition should be carried out by an authorized agency only.

2. Breakdown of live ammunition may become necessary to ascertain cause of defect, assessment of shelf life, acceptance and indigenization of ammunition Ex-Import or for disposal of unserviceable ammunition.

3. The breakdown of ammunition should be planned carefully after thorough study of relevant drawings and component details. Various items fastened together should be identified. Fastening joints should be studied with a view to evolve suitable dismantling operation schedule.

4. In case of ammunition received Ex-Import, no drawings will be available. In such a case, under the guidance of experienced and skilled persons, sequence of dismantling should evolve as it proceeds. Efforts should be made to get the details of explosive/explosive compositions contained in different components and supply this information to CQA(ME) for undertaking the chemical analysis.

5. The contents of succeeding paragraphs deal with the safety requirements and processes to be followed for breakdown of ammunition and are based on knowledge and skill gained in breakdown of ammunition over a long period of time at CQA(A) Services and laboratory. These practices are general in nature and should be followed after careful study of each case without any prejudice. If required, the specific information on tools, machinery and protective features for breakdown of specific ammunition can be sought from CQA(A).

SECTION-II

SAFETY REQUIREMENTS FOR BREAKDOWN OF AMMUNITION

6. It must be borne in mind that breakdown of live ammunition is a highly hazardous operation and exposes the personnel to high risk. It is, therefore, incumbent upon all involved in this activity, to follow the safety requirements in toto. Such practices must be evolved continuously and upgraded based on experience.

7. General safety requirements as per Section-II of "STEC Pamphlet-4" must be followed in letter and spirit.

8. In addition to above said safety requirements, the additional safety requirements required for carrying out breakdown of live ammunition are given below:

a) Before taking up breakdown operation of an ammunition, SOP (Standing Operating Procedure) to be prepared for the same which should include among other things:
   (i) Detail sketch /drawing among other things
   (ii) Process flow-chart for the breakdown of the ammunition
   (iii) Type of tools to be used
   (iv) Type of PPE to be used
   (v) Communication system in case of emergency
   (vi) Fire-fighting equipments appropriate to the explosive stores
   (vii) First-aid facility
   (viii) Type of electrical installation/fittings
b) Before entering process building, all individuals must earth themselves to remove any body static charge.
c) Mobile phones should be strictly prohibited inside the process premises.
d) Safety instructions board should be placed at the entrance of each process building.
e) Personnel must not be emotionally disturbed when carrying out breakdown.
f) Explosive limits and man limit authorized should be strictly adhered to.

g) The doors of the room/building, where breakdown operation is in progress, must be open while working.
h) Conductive/anti-static flooring should be provided in the breakdown room and on the working table.
i) Floor and interior of breakdown laboratory should be kept free from grit and explosive dust.
j) All operations of breakdown should be carried out in a laboratory under the supervision of senior staff/officer. No person should be allowed to work alone.
k) Tools and implements should be arranged & handled carefully; should never be handled by unskilled persons and should never be allowed to fall on floor even accidentally.
l) Only appropriate machines and authorized apparatus should be used for carrying out operations of breakdown.
m) Only non-sparking tools should be used.
n) Approved type of protective safety shield should always be used while working.
o) Approved type of PPEs should be used by all present inside the process building.
p) Earth connection between the machine and earth-pit should be checked periodically to ensure that the ear thing is in good condition.
q) Persons carrying explosives should never move fast and should never pass another person on the gantries or in a building.
r) A very disciplined work culture must prevail.
s) Disorderly conduct of any type should be strictly forbidden.
t) Waste explosives should be kept in receptacles.

SECTION-III

PLANNING AND SCHEDULING OF BREAKDOWN OPERATION

9. An ammunition store consists of a number of assemblies and sub-assemblies. These assemblies and sub-assemblies are held together by threaded fasteners or pins. Each sub-assembly is an independent entity and sealed by crimping. All the assemblies are held together by punch stabbings, grub screws, shear pins, etc. A list of authorized equipment and other items required for breakdown should be displayed.

a) The breakdown of ammunition requires retrieval of sub-assemblies by machine cutting of various types of mechanical seals. The sketches showing various types of mechanical seals are enclosed at Appendix 'A'.

b) The component should be judiciously clamped on the machine/fixture. It is to be ensured that no undue pressure is applied.

c) Machining should be done at the lowest possible speed and feed to avoid excess generation of heat.

d) Appropriate type of coolant should be used depending upon the type of operation, tool and type of shell/explosive subject to approval from competent authority.

e) Care should be taken to avoid friction between explosive filling and cutting tool while machining metallic components containing initiatory composition.

f) The depth of cut should be closely monitored.

g) The process of machining operations such as drilling, boring, milling, sawing, turning,etc. should be chosen carefully taking various factors into account. The machine should be switched ON/OFF from a safe place by the operator with a switch connected in parallel. Once the machining parameters (depth of cut, feed rate, etc.) are set, half nut and lock nut can be used to control the operation. This would avoid the presence of the operator near the machine during the operation.

SECTION-IV

PROCESS OF METAL CUTTING

10. The metal cutting operations, wherever necessary, should be carried out on general-purpose machine tools such as centre lathe machine, drilling machine, milling machine.

11. It must be ensured that machines have flameproof electrical connections as per the laid down standards.

12. Various components are manufactured from non-ferrous as well as ferrous alloys. As no coolant is permitted, the cutting speed and feed should be very low. Cutting speed as low as 2.0mm/min and depth of cut 0.1mm are frequently used. After each depth of cut is completed, tool must be withdrawn and temperature should be allowed to come down before another cut is undertaken. The process should be extremely slow and deliberate.

13. The above procedure can be followed for all the three types of cutting operations namely turning, milling and drilling operation.

14. Regarding cutting tool signature namely rake angle, clearance and side rake, standard practice should be retained.

SECTION – V

RETRIEVAL OF EXPLOSIVES

15. The aim of breakdown of ammunition is to finally retrieve the explosive contained in various sub-assemblies. The various assemblies and sub-assemblies from which explosives are required to be retrieved are as follows:

a) Detonator
b) Delay unit
c) Magazine
d) HE/HEAT shells
e) Tracer units
f) Smoke containers
g) Illuminating canister/star candles
h) Cartridge case/primer caps

16. A brief description of process for retrieval of explosive filling from above type of components is given in succeeding paragraphs.

RECOVERY OF DETONATOR FILLING

17. Detonator is a closed unit. The crimping/turnover of detonator cup should be machined on precision lathe machine till the metallic washer/closing disc over the detonator filling is removed and explosive filling is exposed. This operation should be undertaken behind a safety shield. A sketch showing construction of various types of detonators is enclosed at Appendix ‘B’.

18. Explosive filling should be taken out by squeezing and tapping method by holding detonator in a suitable plier and tapping with brass rod. The detonator filling should be taken out in stages layer by layer and collected separately. The explosive composition from different layers should be collected and sealed.

RECOVERY OF DELAY FILLING

19. Delay filling from delay unit should be removed by hand drilling using suitable drill bit. Drilling of delay filling should be done in stages to avoid generation of heat due to friction. The recovered filling should be collected separately layer-wise. The sketches showing construction of various delay units are enclosed at Appendix 'C'.

RECOVERY OF FUZE MAGAZINE FILLING

20. Magazine filling should be removed from fuze magazine by using brass pricker. Care should be taken to avoid friction between brass picker and magazine body.

RECOVERY OF HE FILLING FROM SHELLS

For Large Calibre HE Ammunition

21. The filling from shell should be taken out using digging method with the help of brass pricker and brass hammer/wooden mallet. The filling should be removed in stages.

For Small Calibre HE Ammunition (Internal diameter less than 25 mm)

22. HE filling from shell should be taken out by drilling operation, holding shell on lathe machine and using suitable drill. The filling should be removed in stages. A sketch is enclosed at Appendix 'D'.

For HEAT Ammunition

23. After dismantling of nose/head and fuze, the HE filling from HEAT shell should be removed by tapping the shell externally with the help of brass hammer/wooden mallet.

RECOVERY OF TRACER FILLING

24. Tracer filling from tracer unit should be removed by drilling, holding the tracer unit on lathe machine. The filling should be taken out in stages. Priming composition and tracer filling should be collected separately.

RECOVERY OF SMOKE AND ILLUMINATING COMPOSITION

25. After taking out smoke containers, the crimped portion of smoke-containers should be machined on lathe machine to remove closing discover smoke-composition. The exposed smoke composition should be removed by digging using brass pricker and brass hammer/wooden mallet.

26. After taking out illuminating canister/candle, the container should be cut into two halves by taking two longitudinal cuts by slit cutter on milling machine and then filling should be taken out.

RECOVERY OF PROPELLANT

27. In case of fixed type of ammunition, projectile should be separated from cartridge case on shell extraction machine and then propellant from cartridge case should be taken out by pouring.

28. In case of separate ammunition, the closing cup should be removed by pulling and propellant bags/loose propellant is taken out.

RECOVERY OF CAPS

29. In case of single flash hole cartridge case, the cap should be removed by inserting brass drift through flash hole on hand press machine.

30. For removing of caps from cartridge case having double flash holes, the complete base of cartridge case should be machined up to cap chamber till cap is taken out. A sketch showing general make up of small arms ammunition is enclosed at Appendix ‘E’.

SECTION-VI

PACKING OF RECOVERED EXPLOSIVES

31. Recovered explosives from all explosive-filled components should be packed in semi-glossy white paper and subsequently packed in tin/plastic containers. These containers should be finally sealed by using adhesive tape to avoid ingress of moisture. Such a sealed container should be then packed in air-tight steel box and transported for carrying out chemical analysis of explosive fillings. Propellant (sticks/grains) samples should be wrapped in waxed paper and kept in hermetically sealed containers.

32. Each container should be labeled appropriately to enable the personnel in the vicinity to know the hazard they are subjected to.

SECTION-VII

A. DISPOSAL OF LEFT-OVER/UNSERVICEABLE EXPLOSIVES

33. After breakdown of live ammunition the leftover/unserviceable explosives should be kept in separate receptacles.

34. Disposal must not be accomplished by dumping in waste places, pits, wells and inland waterways.

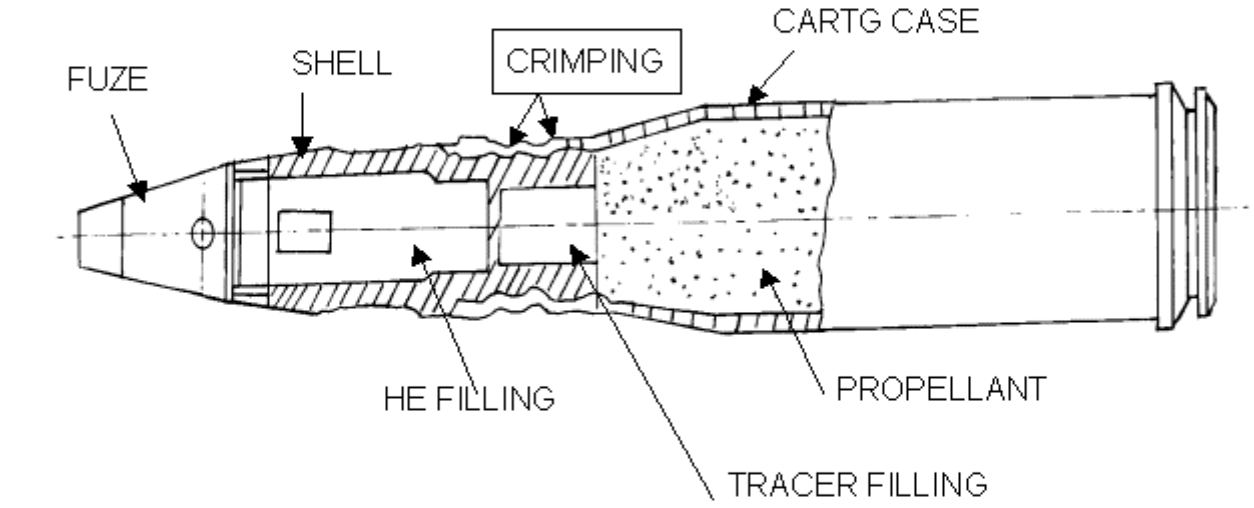
35. These explosives should be disposed off by burning or by detonation as per the laid down procedure for each type of explosives. The explosives will be disposed only at authorized locations designated for this purpose.

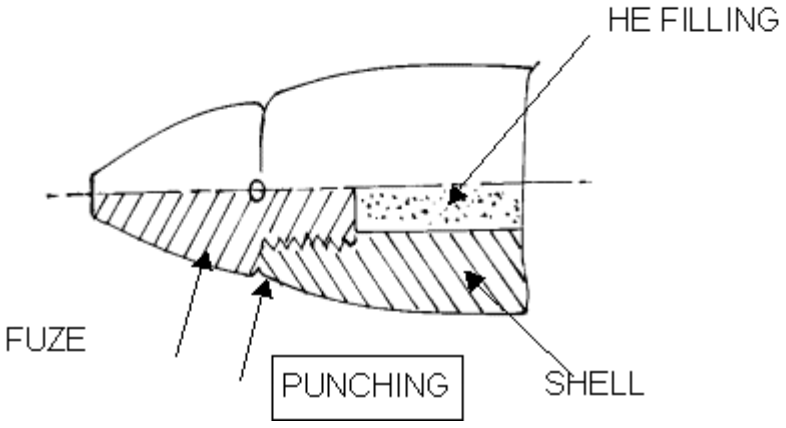
B. PROCEDURE FOR MANUAL BREAKDOWN OF SHELL 125 mm HE

36. As an example to explain the various steps in breakdown, step-by-step breakdown procedure for different components of 125mm HE shell is placed on Appendix ‘F’.

MECHANICAL SEALING

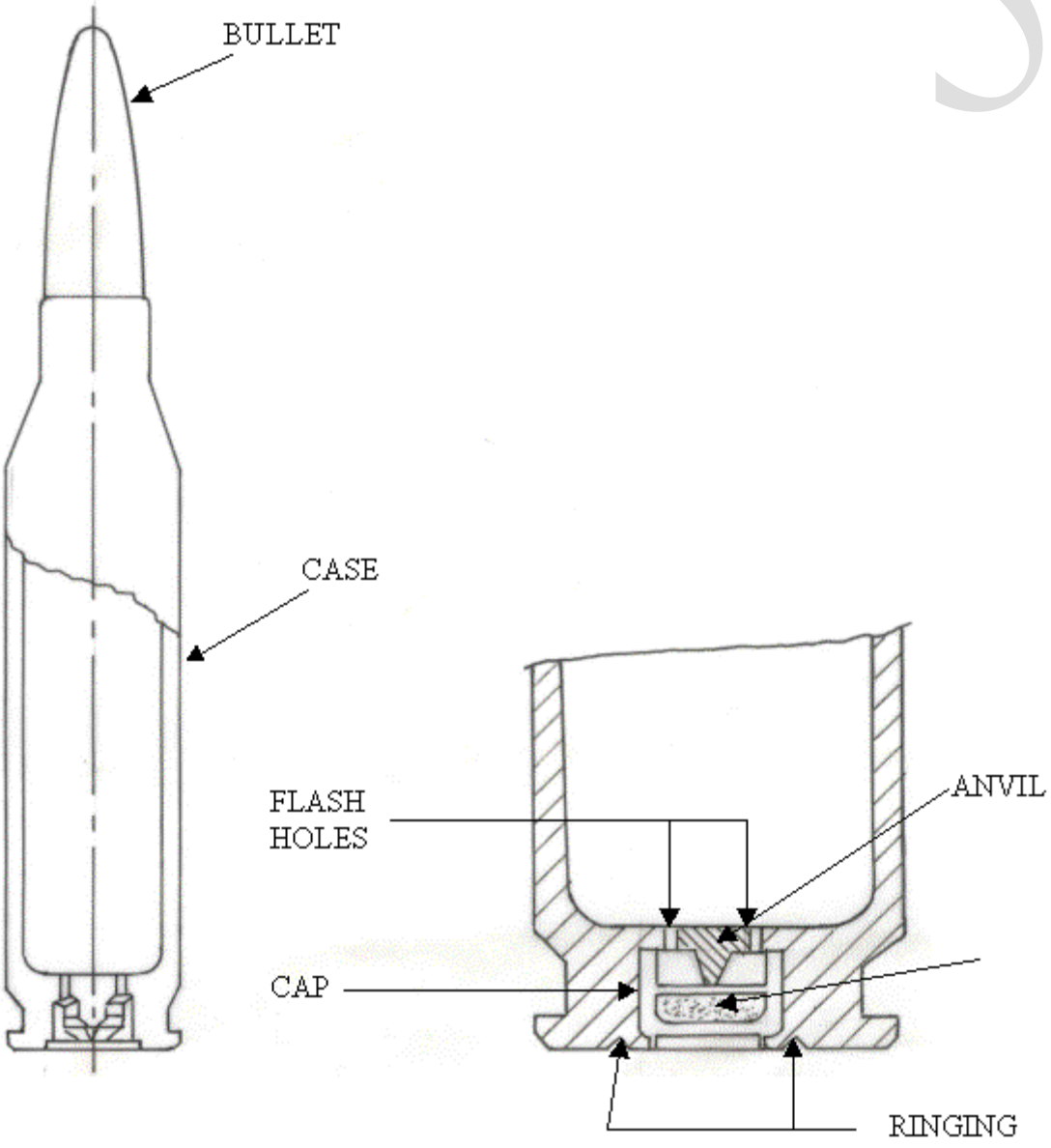
CRIMPING & PUNCHING





MECHANICAL SEALING

(RINGING)



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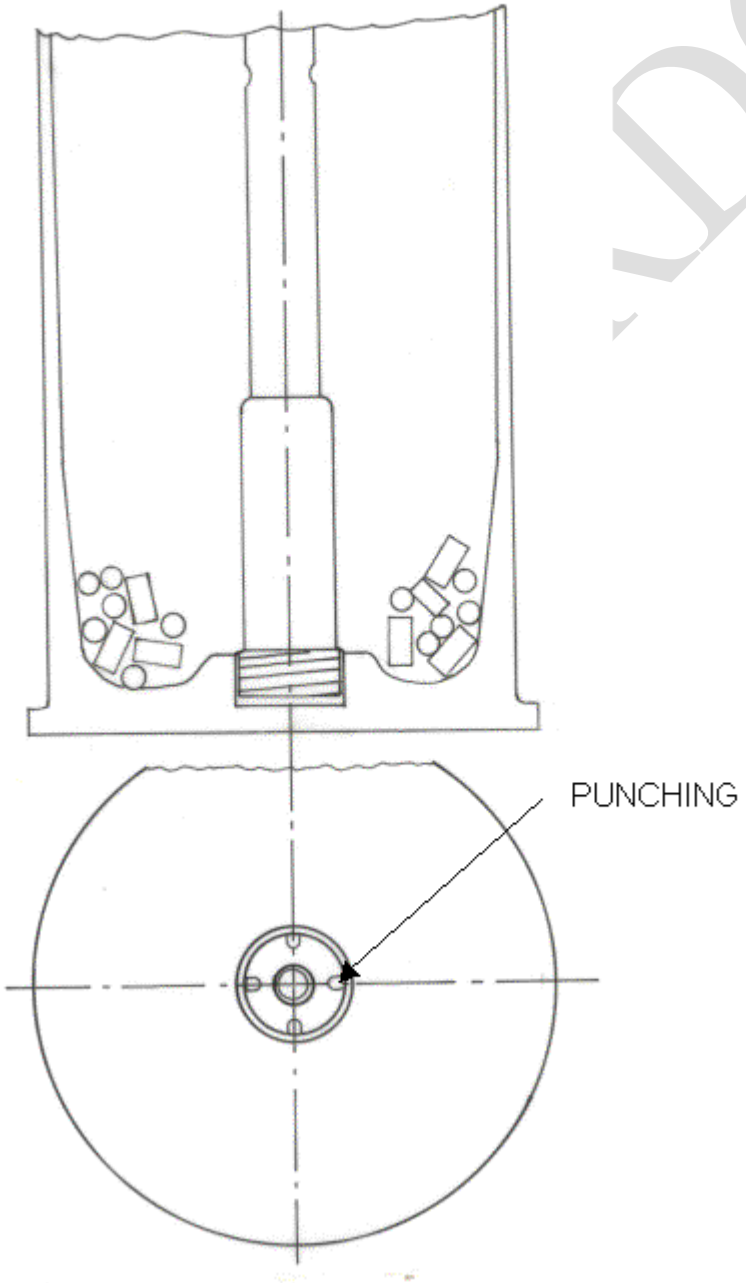
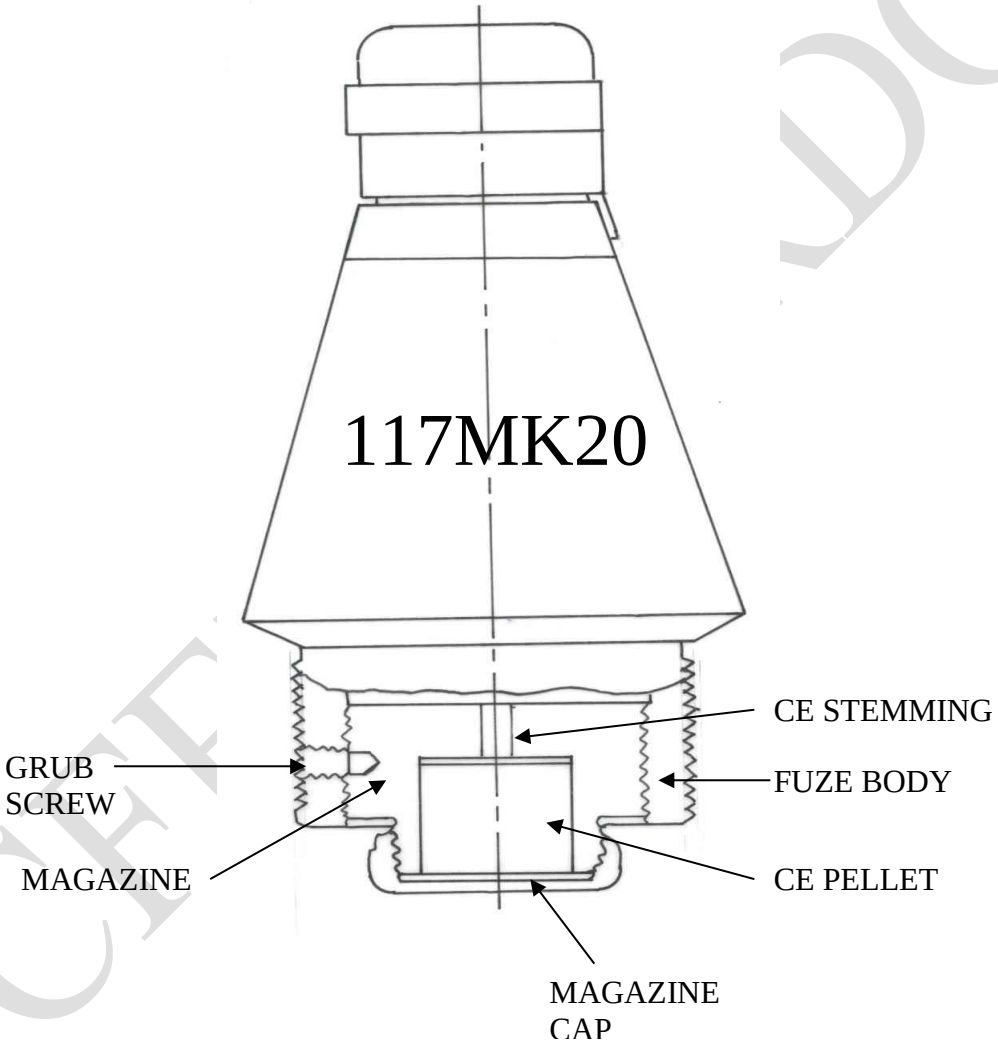
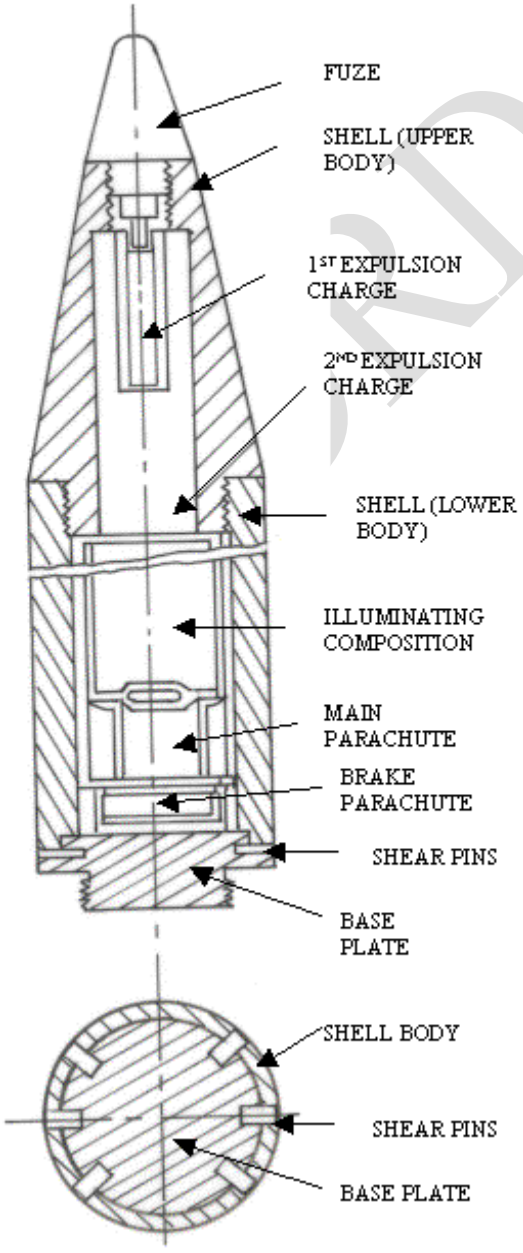


MECHANICAL SEALING (GRUB SCREW)



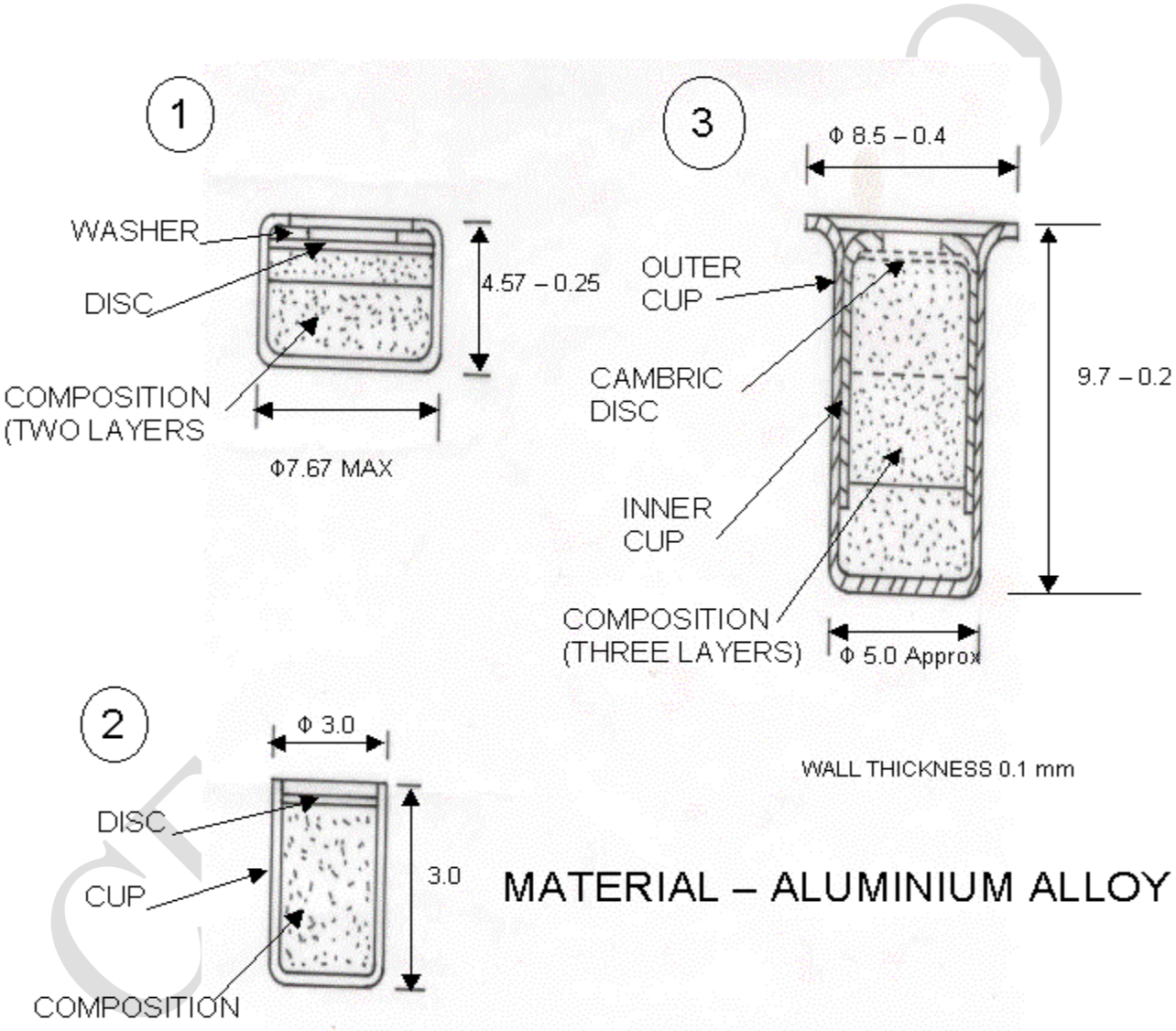
MECHANICAL SEALING

(PINING)



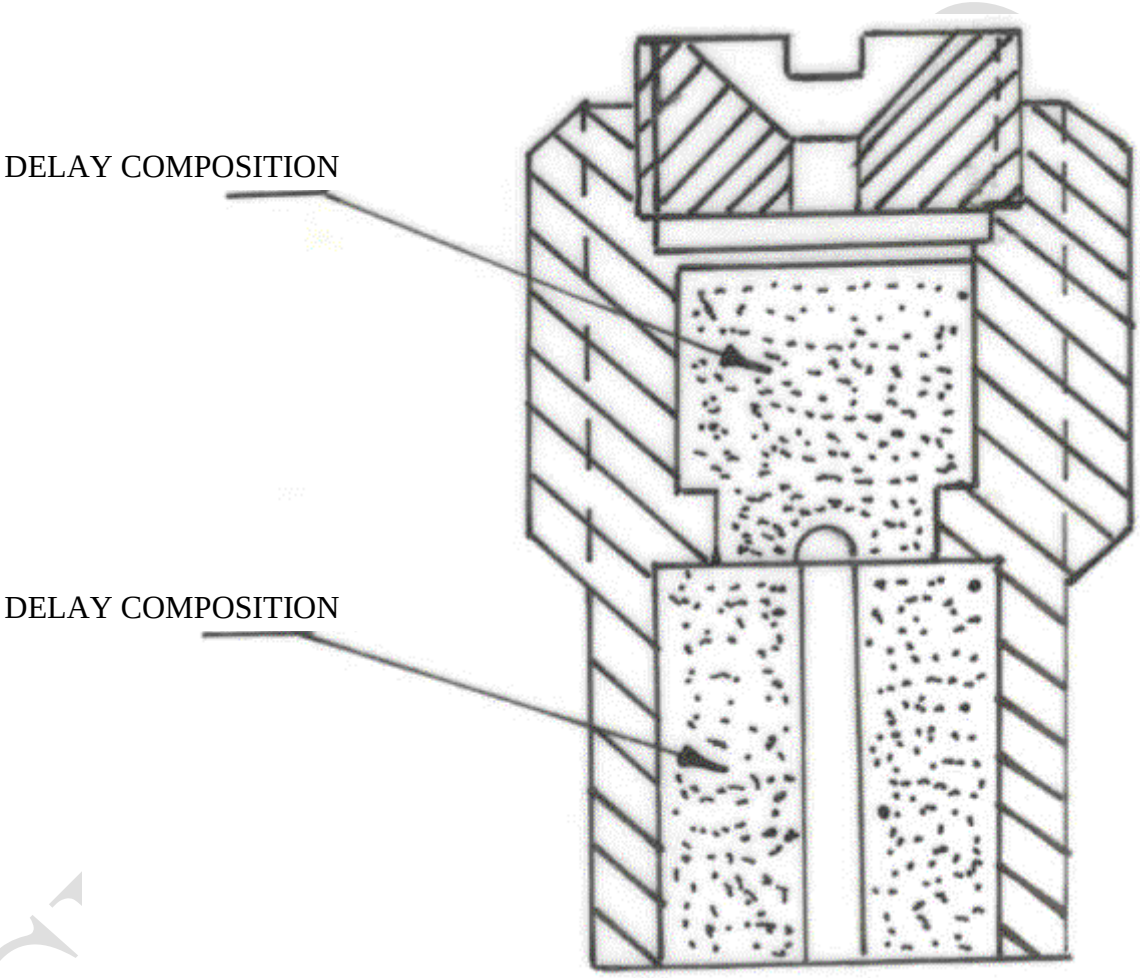
Appendix 'B'

MAKE-UP OF VARIOUS TYPES OF DETONATORS

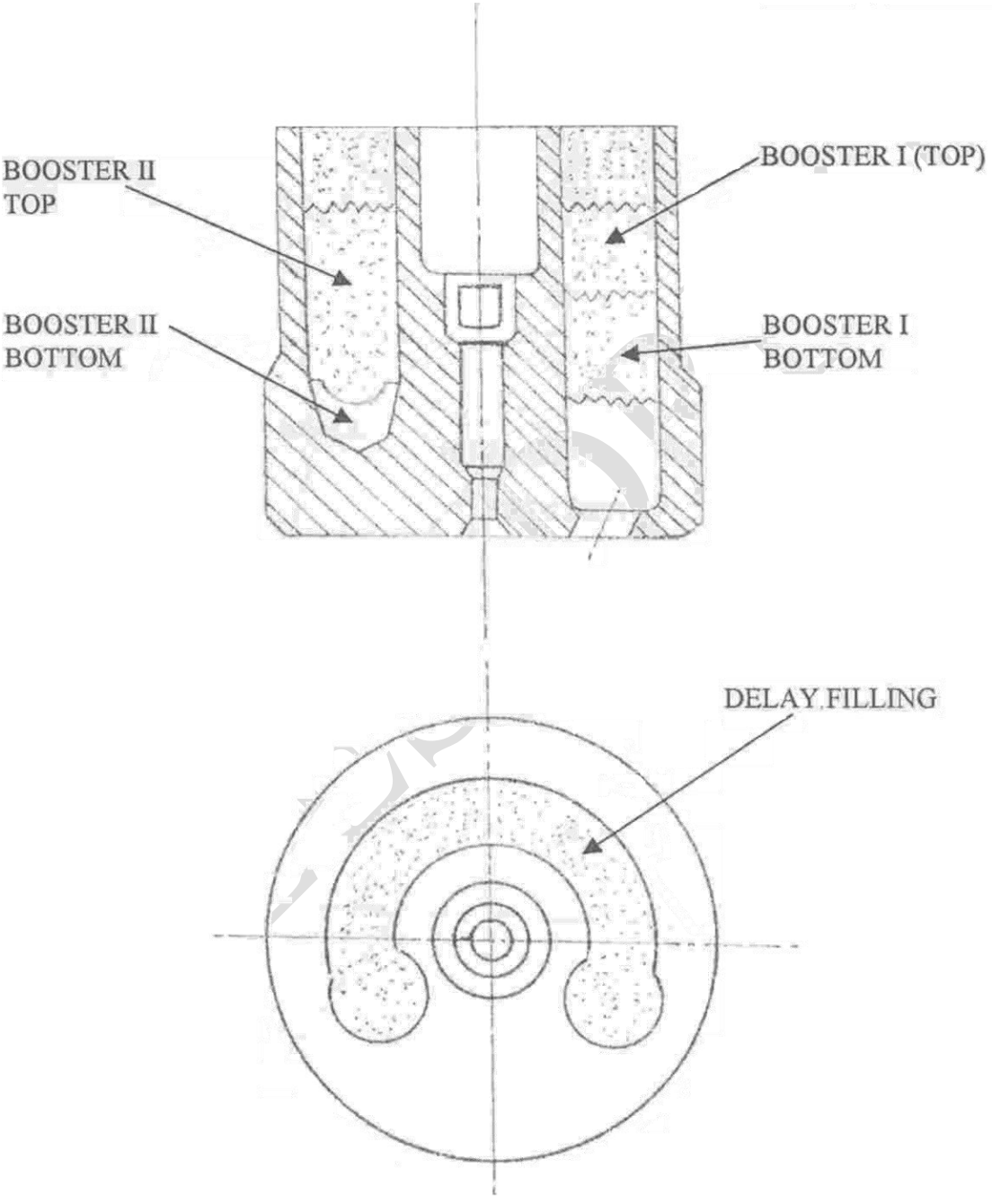


All dimensions are indicated in mm

DELAY UNIT FOR FUZE B429



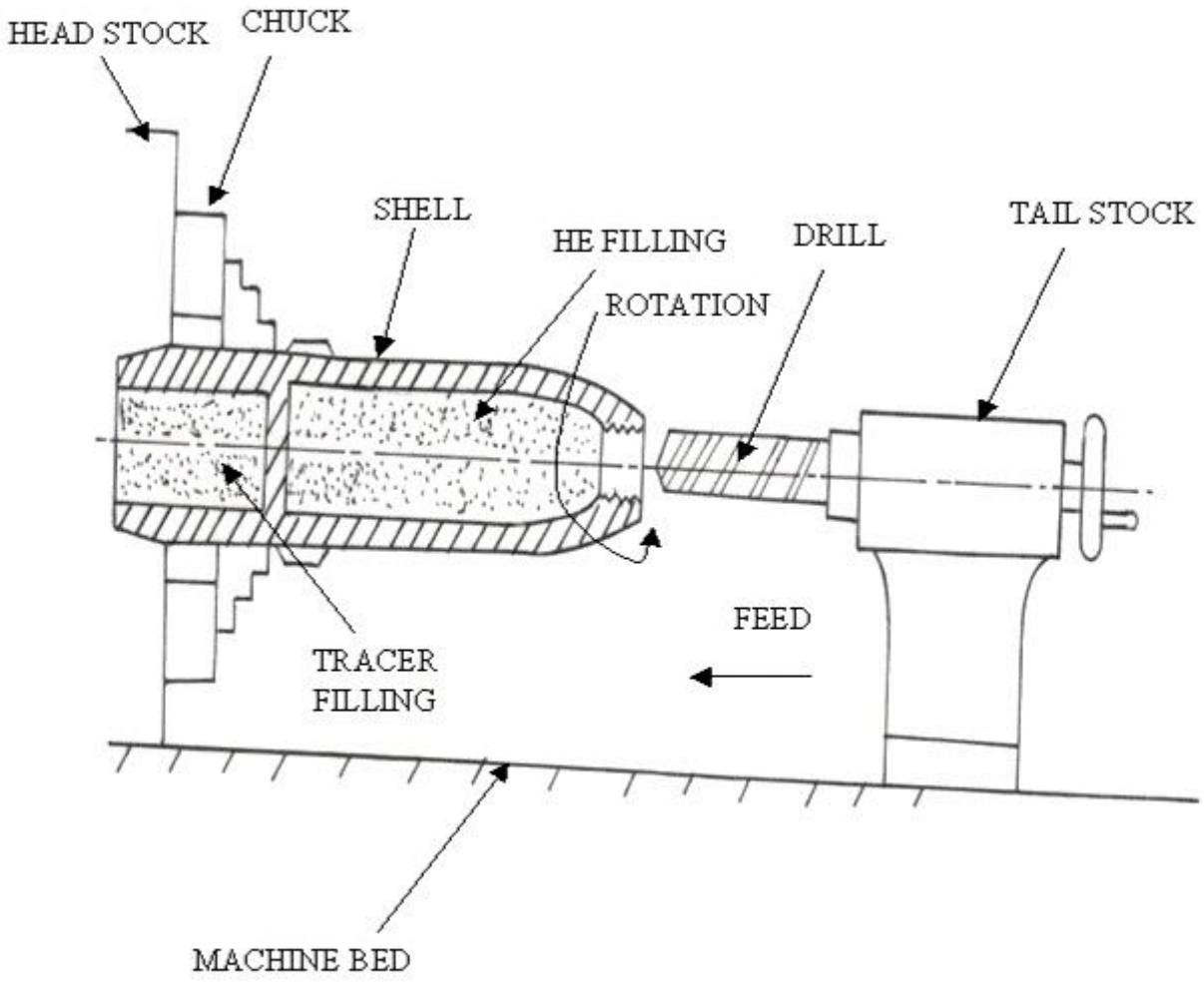
DELAY UNIT FOR 23 mm & 30 mm



REMOVAL OF DELAY FILLING (BY DRILLING)

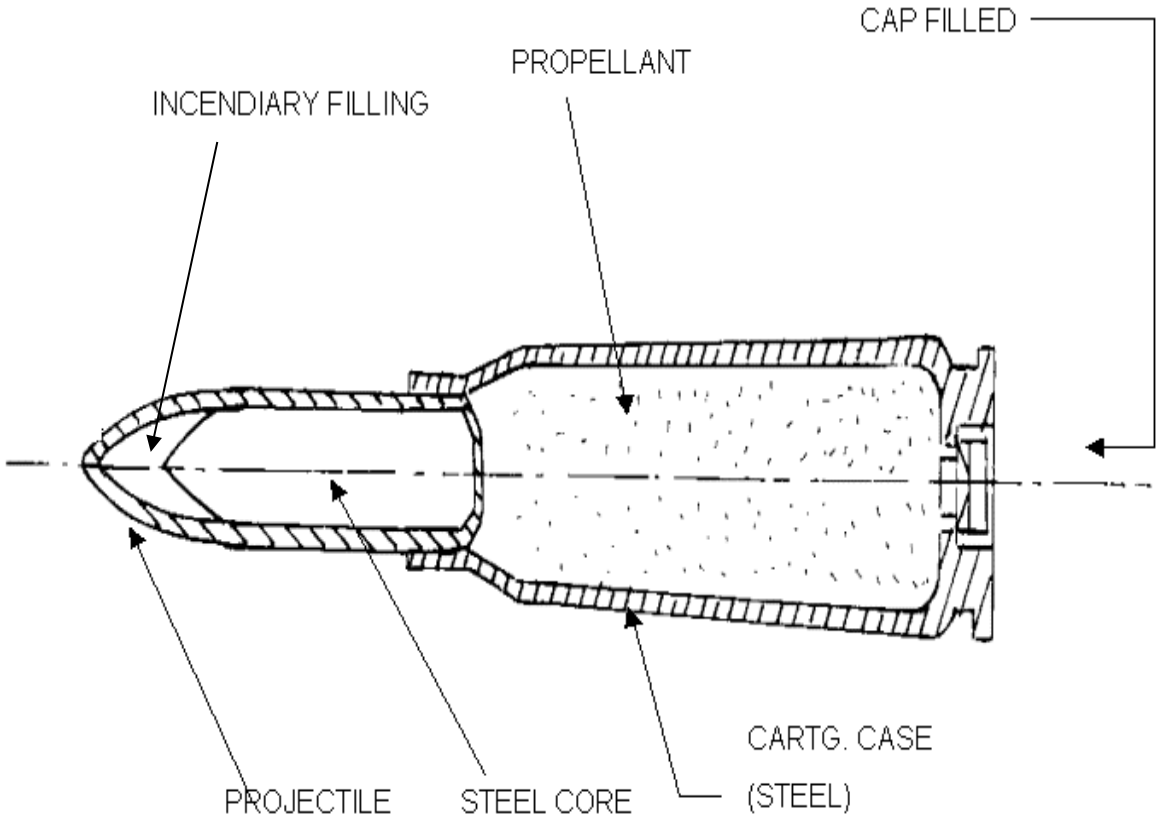
Appendix 'D'

REMOVAL OF HE FILLING FROM SHELL (SMALL CALIBRE) DRILLING



Appendix 'E'

MAKE-UP OF SMALL ARMS AMMUNITION



Appendix 'F'

PROCEDURE FOR MANUAL BREAKDOWN OF SHELL 125 MM HE

Note- Study the AMI Pamphlet of subject Ammunition store before commencement of breakdown to get acquainted with the constructional details.

1. TOOLS REQUIRED

(a) Electric drill machine.
(b) Twist drill of size 8 mm.
(c) V-Block or wooden block having wedge in centre to accommodate shell.
(d) Brass pricker 2mm diameter, 200 mm long with one end pointed and other end flat.
(e) Suitable key for removing nose adapter of shell holding exploder pellet.
(f) Brass hammer.
(g) Brass pricker 600 mm long with 10 mm flat end and other end circular.
(h) Screw driver with 6 mm flat end.
(i) Pipe wrench 600 mm long.
(j) Chain-vice size 100 mm.

2. GENERAL PRECAUTIONS - Only one shell is taken for breakdown at a time.

3. BREAKDOWN PROCEDURE

3.1 DISMANTLING OF NOSE ADAPTER FROM SHELL

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the shell horizontally using V blocks on the platform of electrical drilling machine with the punch stabbings in between the shell and adapter joint facing upwards.	
b)	Drill out the 2 punch stabbings using twist drill size 8 mm.	• Drilling to be carried out at very low speed (max. 25 rpm) to keep generation of heat to minimum. • Depth of cut to be monitored closely (max 0.1 mm). • No coolant is permitted. • Drilling to be carried out from behind the safety shield.
c)	Remove the shell from the drilling machine & grip the shell at the centre firmly on the chain-vice.	

d)	Grip the nose adapter of the shell with the suitable key. Tighten the bolts in the keyholes provided.	
e)	Grip the key with the help of pipe wrench 14"long. Unscrew the adapter. The adapter has right hand threads. If required, extension pipe can be used alongwith the pipe wrench.	Care should be taken that the extension pipe should not slip away from the pipe wrench.
f)	Keep the nose adapter aside. Remove shell from the chain-vice. Lay a brown paper on the floor. Hold the shell upside down and tap gently on the floor, the exploder pellet will fall down. If the exploder pellet does not come out, keepthe shell vertically with the mouth facing upwards. Using brass pricker, remove HE fillings from the vicinity of the exploder pellet and repeat the procedure until the exploder pellet gets loosened.	
g)	Pack the exploder in a semi-glossy paper.	

3.2 PROCEDURE FOR REMOVING OF HE FILLING FROM THE SHELL

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Lay a brown paper on the ground.	• A bucket full of water and a fire extinguisher to be kept aside prior to commencement of operation. • Digging to be carried out gently with the brass pricker resting on the HE filling. • Only brass tools to be used when in contact with the HE filling.
b)	Hold the shell vertically with the mouth of the shell facing upwards. Using a brass pricker with 10 mm flat end and brass hammer, recover the HE filling from the shell by digging method. Approximately 100 g of HE filling is required for carrying out chemical analysis.	
c)	Tilt the shell upside down and recover the loose HE filling and pack it in a semi-glossy paper and then in a plastic container.	

NOTES –

(a) In case of Shell 125 mm HE Ex – USSR the shell doesn't have any adapter. It has a plastic plug (Transit Plug) on the mouth. The exploder pellet and the HE filling can be recovered by unscrewing the plastic plug with a suitable pipe wrench.

(b) Left over half broken down shell may be disposed – off by demolition at a designated place.

PROCEDURE FOR MANUAL BREAKDOWN OF 125 mm SEMI COMBUSTIBLE CARTRIDGE CASE (SCCC)

Note – Study the AMI Pamphlet of subject Ammunition store before commencement of breakdown to get acquainted with the constructional details.

1. TOOLS REQUIRED

a) Bench-vice capacity 100 mm.
b) Pipe wrench 150 mm long with suitable pipe extension.
c) Brass pricker size 2 mm diameter, 200 mm long with one end pointed and other end flat.
d) Screw driver with 3 mm flat end.
e) Twist drill of size 2 mmdiameter
f) Hand drill machine.
g) Scissors.
h) Suitable brass drift to remove cap from cap holder.
i) Drift holder.
j) Hand press machine for removing cap.
k) Brass knife/cutter.
l) Brass hammer.
m) Key for removing primer from the cartridge case.
n) Gas plier.
o) Steel pricker size 2 mm diameter, 200 mm long with one end pointed and other end flat.
p) Small pipe wrench 6” long.
q) Suitable key for removing cap holder from the primer.
r) Precision lathe machine with cutting tools.

2. GENERAL PRECAUTIONS

a) While handling of SCCC care should be taken that there is no friction to the primer.
b) The SCCC should not be kept on the flooring where there are chances that static charge can be developed.
c) Only one shell is taken for breakdown at a time.

3. BREAKDOWN PROCEDURE

3.1 RECOVERY OF PRIMER FROM THE CARTRIDGE CASE

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the SCCC upside down with primer facing upwards.	
b)	Place the 3-jaw key in the slot of the primer. Press it from the top and with the help of a Brass hammer unscrew the primer by tapping on the tommy bar of key. The primer has right hand threads.	• The key should not touch the centre primer where the percussion cap and electric cap is situated. • Tapping should be carried out gently.
c)	Keep the primer aside.	

3.2 RECOVERY OF PROPELLANT FROM SCCC

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Keep SCCC horizontally on the table.	
b)	Cut the combustible part of the SCCC circumferentially at the joint of metallic base and the combustible case. Cutting to be carried out by hand with the help of brass knife and a brass hammer till the complete combustible part of the SCCC gets separated.	
c)	Recover the loose multi-tubular propellant and pack 100g of propellant in a semi-glossy paper.	
d)	Take out bundle of stick propellant & separate the igniter bag (top) & igniter bag (bottom) with the help of scissor by cutting the threads.	
e)	Pack the igniter bag (top) & igniter bag (bottom) separately in a sheet of paper.	
f)	Remove 100 gm of stick type propellant from the bundle & pack it separately in a paper.	

3.3 BREAKDOWN OF PRIMER GUV-7

3.3.1 RECOVERY OF PRIMER MAGAZINE FILLING

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the flange of Primer GUV-7 firmly on the bench-vice vertically with the Primer Magazine side facing upward.	

b)	Unscrew the magazine with the help of the suitable pipe wrench. The magazine has left hand threads.	
c)	Remove the primer from the bench-vice & keep aside.	
d)	Hold the primer magazine in the three-jaw chuck of the lathe machine.	• Machining operation to be carried out at a very slow speed (25-30 rpm max) • No coolant is permitted. • Care is taken that cutting tool should not touch the explosive filling. • Precaution should be taken to avoid excess generation of heat.
e)	Machine the turn over of the cup and obturator on the lathe machine till cover of obturator& packing ring is separated.	
f)	Remove the magazine from the lathe machine.	
g)	Remove magazine filling (GP) using brass pricker& collect it on semi-glossy paper & pack it.	

3.3.2 RECOVERY OF PERCUSSION AND ELECTRIC CAP

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the primer body upside down on the bench-vice with the base facing upwards.	
b)	Using steel pricker, remove the lead seal by tapping with hammer. Repeat the same procedure for recovery of the packing ring also. (Note-The lead seal & packing ring can also be removed by machining it on the lathe machine).	Care should be taken so that the pricker does not slip and hit the centre of the primer where percussion cap is situated.
c)	Unscrew the clamping nut from the primer body using suitable key.	
d)	Remove the primer body from the bench-vice & keep it aside.	
e)	Hold the clamping nut on the bench-vice with the cover facing upwards.	
f)	With the help of a small pipe wrench or a brass pricker remove the cover. The cover is press fitted.	
g)	Remove the clamping nut from the bench-vice. Turn it upside down. Electric cap will come out.	
h)	Keep the Electric cap aside.	

3.3.3 RECOVERY OF FILLING FROM ELECTRIC CAP

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the Electric cap in a gas plier.	
b)	Using a brass pricker recover the cap composition in a semi-glossy paper & pack it.	

3.3.4 RECOVERY OF PERCUSSION CAP FROM THE PRIMER

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the primer body firmly on the bench-vice with the open mouth facing upwards.	
b)	Drill out two punches stabbing with the help of a hand drill machine using 2mm diameter twist drill.	• Drilling to be carried out at a slow speed. • No coolant is permitted. • Precaution should be taken to avoid excess generation of heat.
c)	Unscrew the clamping bush with the help of screwdriver. It has right hand threads.	
d)	Remove the primer body from the bench-vice	
e)	Tap it upside down. Percussion cap along with anvil will fall down.	
f)	Remove the percussion cap from the anvil with the help of a brass drift on the hand press machine gently.	• Pressing should be carried out by putting the drift through the flash hole of the anvil. • Pressing should be carried out gently.
g)	Pack the percussion cap in semi-glossy paper.	

Note- All leftover loose propellants may be disposed off by burning at a designated place.

PROCEDURE FOR MANUAL BREAKDOWN OF FUZE DA, DELAY & GRAZE NO. B429E

Note-Study the AMI pamphlet of subject ammunition store before commencement of breakdown to get acquainted with constructional details.

1. TOOLS REQUIRED

a) Bench vice capacity 100mm.
b) Pipe wrench 150mm long with suitable extension pipe.
c) Brass pricker size 2mm diameter, 200mm long with one end pointed and other flat.
d) Screw driver with 3mm flat end.
e) Twist drill size 2mm & 4mm diameter.
f) Electric drill machine.
g) Hand drill machine.
h) Key for removal of top detonator (RGM) holder.
i) Brass drift suitable to remove top detonator (RGM) and bottom detonator (TAT-I-T) from detonator holder.
j) Drift holder.
k) Fixture for dismantling detonator.
l) Suitable key for removal of locking nut and magazine.
m) Wooden block 150mm X 75mm X 75mm.
n) Wooden block having cavity corresponding to shape of fuze to hold fuze horizontally during drilling operation.

2. GENERAL PRECAUTIONS

a) While handling of fuze, in **NO** case safety cap must be removed.
b) Only one fuze has to be taken at a time.
c) Handle fuze carefully to avoid shock and jerks.

3. BREAKDOWN PROCEDURE

3.1 DISMANTLING OF FUZE MAGAZINE

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the fuze firmly on the bench-vice vertically with magazine facing upwards.	
b)	Unscrew the locking nut with the help of suitable key/pipe wrench. Locking nut has left hand threads.	
c)	Keep the locking nut aside.	
d)	Unscrew the magazine using suitable key/pipe wrench. Magazine has left hand threads.	
e)	Keep the magazine aside.	

3.2 REMOVAL OF ROTOR MECHANISM

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Remove the lead disc along with lead ring using brass pickers. Note-In some cases, metal washer is provided in place of lead disc and lead ring. Metal washer is to be removed by tapping fuze gently on wooden block after removing from bench-vice.	Care to be taken that brass pricker should not touch CE stemming present below lead disc.
b)	Remove fuze from bench-vice.	Care should be taken that fuze should not fall on ground.
c)	Tap the fuze gently on the wooden block. The rotor mechanism along with the locking pin will come out.	
d)	Keep the rotor mechanism aside.	Do not handle rotor mechanism frequently or rub external surface of jacket.

3.3 REMOVAL OF STRIKER MECHANISM FROM FUZE HEAD

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the fuze in a cavity of wooden block horizontally with the punch stabbing of fuze head facing upwards.	
b)	Drill out the punch stabbings between fuze head and fuze body from two places 180° apart using twist drill of size 4mm diameter on drilling machine.	• Drilling to be done at very low speed to keep generation of heat to minimum. • Depth of cut should be monitored closely.

		• No coolant is permitted. • Drilling should be done from behind the shield.
c)	Hold the fuze firmly on the bench vice upside down at place where drilling operation is done.	Do not tighten excessively to avoid deshaping of fuze head. Otherwise difficulties may arise in removal of striker mechanism housed in fuze head
d)	Grip the fuze using pipe wrench on the threaded portion of fuze body. Unscrew the fuze body. fuze head has left hand threads. If required, extension pipe may be used along with pipe wrench.	Care should be taken that extension pipe should not slip away from the pipe wrench.
e)	Keep the fuze body aside and remove fuze head along with striker mechanism from bench vice.	Care should be taken that striker mechanism should not fall on ground.
f)	Gently remove the striker mechanism just by tilting the fuze head.	

3.4 DISMANTLING OF STRIKER MECHANISM

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold inertia sleeve in left hand and gently slide down the striker sleeve until steel ball at top is released and fall down. Gently release the striker sleeve towards upward direction till another two steel balls fall out. Thus releases the striker.	Ensure that no pressure is applied on striker head in downward direction or on any part of striker mechanism during the whole process.
b)	Remove striker along with striker spring and keep it aside.	

3.5 REMOVAL OF TOP DETONATOR (RGM)

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the inertia sleeve firmly on the bench-vice with the top detonator holder facing upwards.	Do not tighten excessively.
b)	Drill out the punch stabbings from two places using hand drill machine and twist drill of 2 mm diameter.	Drilling to be done slowly & depth of cut to be monitored closely.
c)	Using suitable key unscrew the detonator holder. The detonator holder has right hand threads.	• Do not rub the base of detonator holder. • Care should be taken that detonator holder should not fall on ground.
d)	Remove inertia sleeve from bench-vice.	

e)	Hold the top detonator holder in the suitable device on platform of fixture for dismantling detonator.	
f)	Using specified brass drift and drift holder remove detonator from detonator holder by pressing.	• In no case pressing should be done from initiation side of detonator. • Pressing should be done from behind shield. • Only specified drift should be used.

3.6 DISMANTLING OF ROTOR MECHANISM AND REMOVAL OF BOTTOM DETONATOR (TAT-I-T)

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the rotor mechanism on the drilling machine vice.	
b)	Using electric drilling machine and twist drill of 2mm diameter, drill out the crimping provided on the circumference of the jacket from three places.	• Drilling to be done at very low speed. • Depth of cut to be monitored closely. • Drilling to be done from behind shield.
c)	Remove stemming disc gently from rotor mechanism and keep it aside.	
d)	Remove helical spring from the rotor unit.	
e)	Using suitable screwdriver, remove two screws of cover plate of rotor unit.	
f)	Remove cover plate, steel ball, detent sleeve spring & detent spring.	
g)	Keep rotor with bottom detonator aside.	
h)	Hold the rotor unit in the suitable device on platform of fixture for dismantling of detonator facing bottom side of detonator (TAT-I-T) upwards.	
i)	Using specified brass drift and drift holder, remove bottom detonator by pressing	• In no case pressing should be done from initiation side of detonator. • Pressing should be done from behind shield. • Only specified drift should be used.

3.7 RECOVERY OF EXPLOSIVE FILLING FROM DETONATOR RGM &DETONATOR TAT-I-T

S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the detonator in a suitable collet on a lathe machine with coloured side of detonator facing cutting tool.	Do not tighten excessively.
b)	Using 'V' type cutting tool, machine turnover the detonator very slowly working from behind the shield till the turnover & closing disc of detonator is removed & explosive filling is exposed.	• Machining to be done at lowest possible speed (approx. 25 rpm) & feed. • Depth of cut is closely monitored. • Cutting is done very slowly to avoid excess generation of heat. • No coolant is permitted. • Care is to be taken that cutting tool do not touches the explosive filling.
c)	Remove cut detonator from machine & keep it on felt lined tray.	• Handle cut detonator very carefully to avoid shock & jerk. • Care is to be taken that detonator should not fall on ground.
d)	Grip the cut detonator in a gas plier.	
e)	Squeeze the detonator slightly by applying pressure on gas plier so that the explosive filling gets loosened.	Do not squeeze excessively.
f)	Using brass rod, tap the gas plier slowly & collect the loose detonator filling layer by layer on semi-glossy paper. Repeat the procedure of squeezing & tapping by further indexing at 90° and advancing up to bottom of detonator till complete explosive filling is recovered.	• Tapping should be done gently without any undue force and away from pivoted joint of plier (towards handle side). • Layer of explosive filling should be separated with the help of lettering brush. • Wipe out gas plier by cotton waste frequently to avoid accumulation of explosive dust at the holding of detonator.
g)	Pack recovered detonator filling layer wise in semi-glossy paper.	
h)	Keep the empty cup of detonator in an oil bath for disposal.	

3.8 RECOVERY OF MAGAZINE FILLING

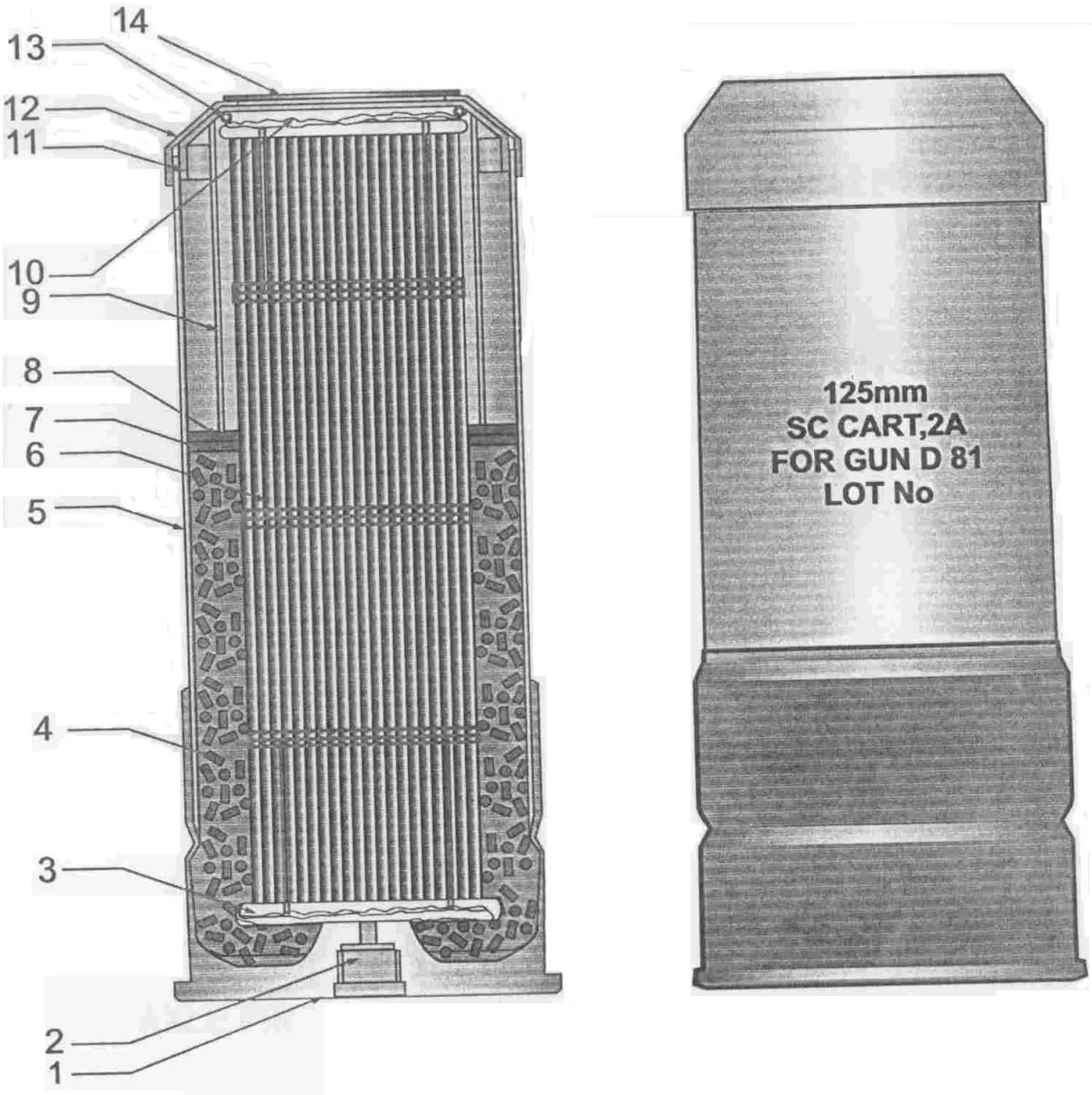
S. No.	OPERATION	SAFETY PRECAUTIONS

a)	Hold the magazine in the bench-vice facing the metallic cap upside.	
b)	Remove the metallic cap from the magazine with the help of a suitable pipe wrench.	
c)	Remove magazine filling slowly with the help of the brass pricker, collect it on a semi-glossy paper & pack it.	

3.9 RECOVERY OF STEMMING FILLING FROM STEMMING DISC

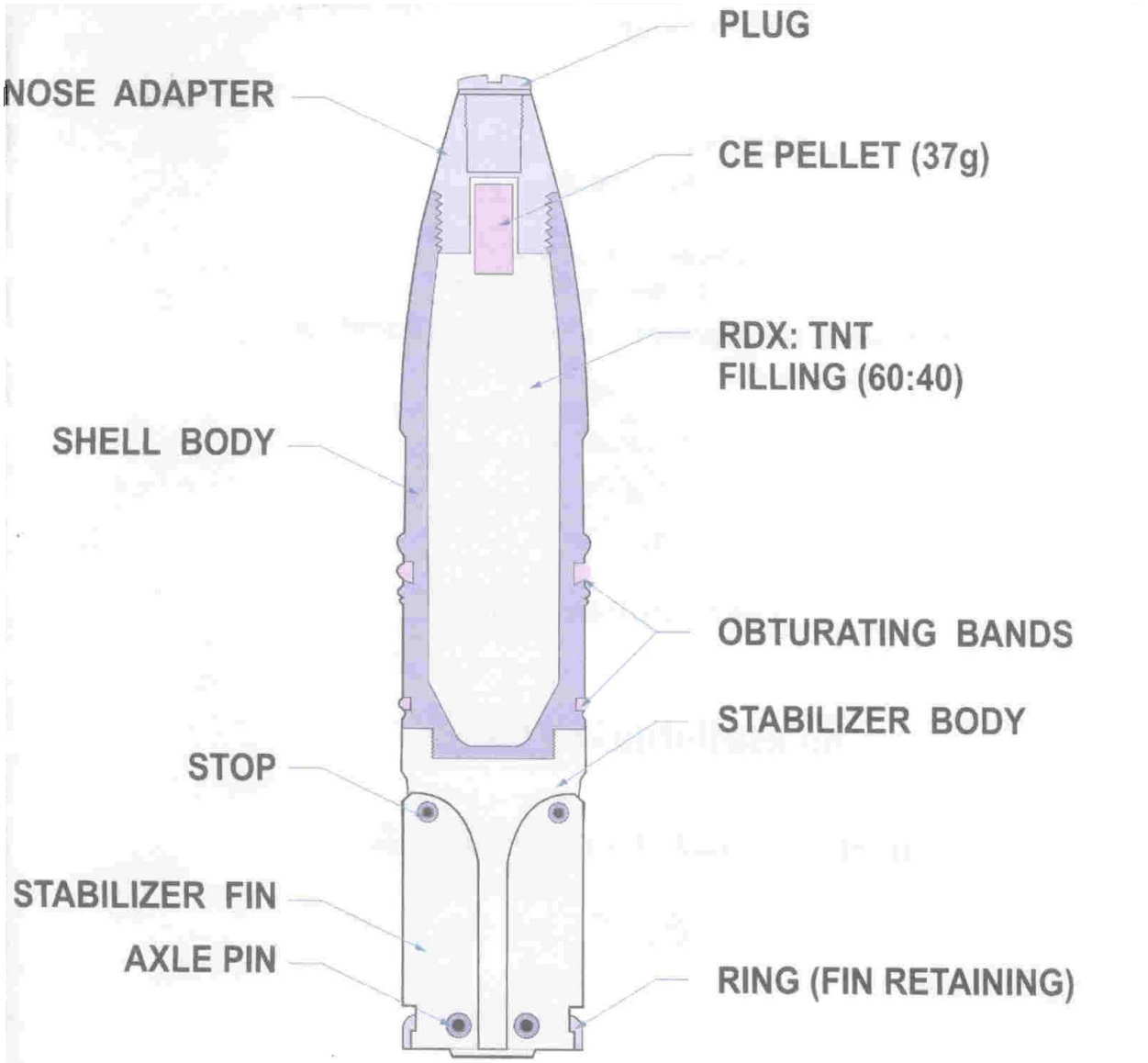
S. No.	OPERATION	SAFETY PRECAUTIONS
a)	Hold the stemming disc in hand, with the help of brass pricker, remove the stemming filling, collect it on a semi-glossy paper & pack it.	

NOTE- If the stemming disc is having a metal foil, first machine out the metal foil on a lathe & then recover the stemming filling with the process as stated above.



1. STEEL BASE
2. COMBINATION CASE IGNITI0N PRIMER GUV-7
3. IGNITER BAG BOTTOM
4. PROPELLANT NQ/M 119
5. COMBUSTIBLE BODY
6. PROPELLANT NQ/S 400-100 BUNDLE
7. DISC IV
8. DISC II
9. COMBUSTIBLE CYLINDER
10. IGNITER BAG TOP
11. COMBUSTIBLE CAP INNER
12. COMBUSTIBLE CAP OUTER
13. DE-COPPERING AGENT
14. NC COATED DISC

SEMI COMBUSTIBLE CARTRIDGE CASE FILLED 2A



SHELL 125mm HE 1A