Science Industrial association

FORT

of the MIA of Ukraine

Grenade launchers "FORT" caliber 40x46 mm

SIA «Fort» of the MIA of Ukraine
600-richchya Street 27
Vinnitsa, 21027, Ukraine
tel. (0432) 46-73-26
fax (0432) 46-80-16
siafort@ukr.net

Operational Manual

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Operational Manual

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This operation manual is intended for the learning of the principle of action and operation rules of grenade launchers "FORT" caliber 40x46 mm, hereinafter - launcher, and contains information about the design, operating procedures, safety requirements, disassembly and assembling, maintenance, cleaning, greasing, storage and guarantee statement.

You must always keep in mind that a source of higher risk during shooting is a grenade, which is fired from the barrel while shooting.

Only persons which have studied the physical facilities of launcher, learn firing process and rules, and requirements for safe use can be allowed to operating and combat employment of launchers.

Table 1.1

Parameter name	Norm for model		
	FORT 600	FORT 600A	FORT 600U
1 Caliber, mm	40x46	40x46	40x46
2 Barrel length, mm	280-0,3	280-0,3	250-0,3
3 Trigger pull, H, not more	50±5	50±5	50±5
4 Deviations of the mean point of impact from aiming point at distance of 100 meters (shooting accuracy), mm, not more	350	350	350
5 Average value grenade muzzle velocity , m/s, not less	78	78	78
6 Deliverable rate of fire, shots per minute, not less	5	5	5
7 Dimensions, mm, not more:			
- length with folded butt-stock	365	365	333
- length with extended butt-stock	580	from 605 to 695	550
- height	200	200	200
- width with folded butt-stock	90	90	90
- width with extended butt-stock	55	55	55
8 Weight without grenade, kg, not more	2,2	2,8	1,95

1 PRODUCT DESCRIPTION

1.1 Function

Launchers are designed for shooting by high explosive, hollow charge and other ball grenades for shooting by non-lethal ammunition (gas and flash bang grenades). It is intended for shooting for personnel target and fire means, which are open and out of the shelter, in open trenches on distances from 100 m to 400 m.

It is possible to shoot with using the launcher as desk type manner and curved fire from different positions (prone, stand up, kneeling position).

1.2 Technical characteristics

1.2.1 Launcher is available in such versions:

- FORT 600 with right side-folding butt-stock of costant length - picture C1;
- FORT 600A with telescoping right side-folding butt-stock - picture C2;
- FORT 600U with right side-folding butt-stock of costant length, with shorted barrel - picture C1.

For shooting from the launcer you should use low velosity ammunition caliber 40x46 mm HE M6P, TPT M6P, HEDP M7, and also others grenades caliber 40x46 mm which is comply with NATO standart and have overhand rip and load from breech end of the barrel.

1.2.2 Main characteristics and dimensions of launcher are in the table 1.1

1.3 Scope of supply

The launcher is supplied in such completeness:

grenade launcher.....1 pce
fore grip.....1 pce
launcher case.....1 pse
grenade pouch.....1 pce
wiper.....1 pce
sling.....1 pce
wrench s2.5 7812-0372.....1 pce
wrench s3.0 7812-0372.....1 pce
wrench s4.0 7812-0372.....1 pce
operation manual.....1 pce
individual package.....1 pce

1.4 Safety measures

1.4.1 **It is forbidden:**

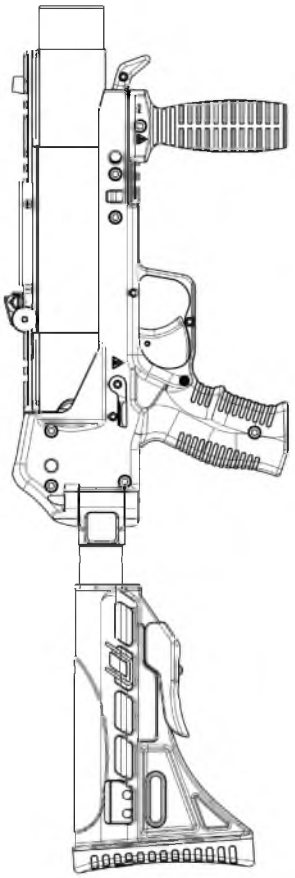
- fire a launcher under the angle more then 60°;
- to load the launcher if the barrel has foreign bodies.

1.4.2 During the action with grenades **it is forbidden:**

- to touch grenades which are not shredded after fire (such grenades must be ordnance disposal);
- disassembly and repair grenades and their elements;
- expose grenades mechanical shocks and falls;
- use for fire grenades which have green deposit or dimple case, ruptures or dimples at detonating fuze or tube;

Parts list for pictures C1, C2, C3

1 Frame
2 Barrel with Picatinny rail
3 Butt-stock with butt plate
4 Hammer with firing pin
5 Trigger
6 Sight shank
7 Butt-stock axis catch
8 Fore grip
9 Left strap
10 Right strap
11 Left lever of folding of the barrel
12 Right lever of folding of the barrel
13 Barrel backstop
14 Guide shoe
15 Spring guide of barrel hook
16 Barrel hook spring
17 Axis lever for folding of the barrel
18 Pusher
19 Safety lever
20 Safety lever retaining pin
21 Firing spring lever
22 Firing spring
23 Bolt stop
24 Hammer axle
25 Hammer spring



Picture C2 The appearance and location of the launcher controllers FORT 600A

- use foreign bodies for loading and reloading grenades;
- fire at distances less then 50 m can be cause of shooter injury by grenade detruits.

ATTENTION! During fire you must pay attention on absence of the obstructions, which could stop or change the flight trajectory of grenade, because destructor mechanism of detonating fuze operates at 14 s after shoot.

1.4.3 It always necessary to follow such safety indications on using launcher:

- do not use damaged launchers;
- direct the barrel of launcher in safe direction during loading/reloading;
- do not perform any action with load launcher except shooting;
- safety lever must be always in safe position. Turn the safety lever to "fire" position only before fire.

1.5 Launcher design

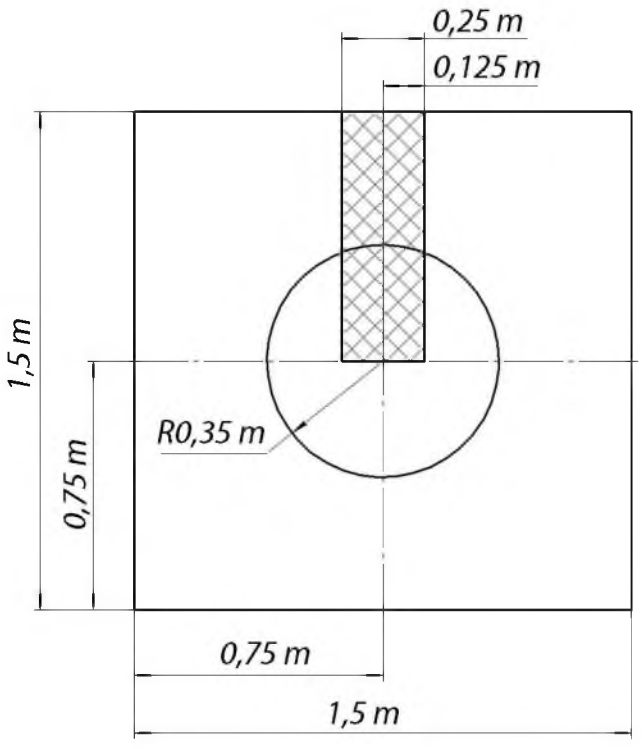
The launcher is single shot with one folded barrel, one cartridge chamber without feeding mechanism.

Launcher is single-action, all reloading operations (ejecting of empty case from cartridge chamber and grenade loading) are manual carried out by shooter through breech end of the barrel.

The appearance and location of the launcher controllers are shown in pictures C1 and C2, and the location of the launcher parts in picture C3 (Annex C).

Annex B

Target for fire testing of the launcher



Picture B1

1.6 Concept of launcher operation

The launcher reloading is manual. Press lever (11) or (12) of folding barrel for folding up of the barrel, therefore pusher ledge turns around the axis (17), pushes spring-actuated barrel backstop (13) and unhooks barrel hook (44). Synchronous under the springs (28) pressure breech end of the barrel (2) turns up and opens the access to cartridge chamber. Ejection case from the cartridge chamber and grenade loading are carry out manually.

For locking of the barrel press down the breech end of the barrel , with that barrel hook (44) pushes guide shoe (14), by pressing guide shoe retaining pin (26), which provides barrel (2) fixing in horizontal position, cartridge chamber is locked.

A shot is carryed out by pressing the trigger (5). Herewith, the trigger (5), turning around axis (36), pulls the rod toward hammer (4). Bend of the rod turns hammer (4) with firing pin around an axis (24). The hammer (4), turning around axis (24), pushes top end of firing spring lever (21) toward hammer axle and synchronous presses firing spring (22). When hammer will stay in unstable position, firing spring (22) releases, forces the hammer (4) to move forward and strike the grenade percussion capby by firing pin, which is in cartridge chamber. The shot is happened. After the shot the hammer spring (25) is under the pressure, hammer (4) deviates from percussion cap approximate in 14°.

Launcher consists of such parts:

- frame (1) to which a barrel (2) is fastened. There are breech and fold back mechanism of the barrel, percussion and trigger mechanism, safety lever (19) of button type inside of the frame. Lateral faces of frame (1) are covered by left (9) and right (10) plates, which are made of plastics material; butt-stock (3) is in the back part of frame, butt-stock is right-side folding with constant lenght or can be telescopic (that depends on launcher model);

- breech and fold back mechanism of the barrel contains barrel backstop (13) with spring (16) and guide shoe (14), that folded up the barrel springs (28); left (11) and right (12) levers of folding barrel;

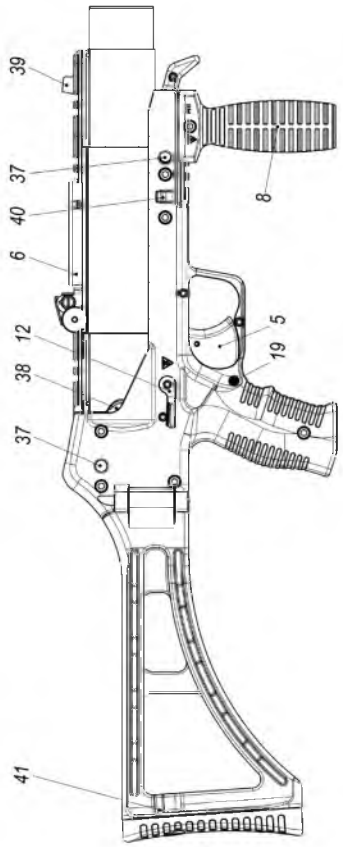
-self-cocking percussion and trigger mechanism has hammer (4) with firing pin, firing spring (22), which envelope firing spring lever (21), bolt stop (23) and trigger (5) with spring (47) and rod (46);

- safety lever (19) button-type which in safety position locks the trigger (5);

- sights: frame sight shank (6) and front sight (39), fixed at Picatinny rail (42) on the barrel (2) face. To take aim you need turn sight shank in vertical position. Sight shank (6) has aiming marks, which determined distance to target. Sight shank must be turn into horizontal position in portable station of launcher;

- fore grip (8), which is intended for holding of launcher during shooting, fixed at Picatinny rail (45), which is setup in front bottom part of launcher.

Annex C



Picture C1 The appearance and location of the launcher controllers - FORT 600, FORT 600U

Safety lever of button-type has an axis with notch. If safety lever is in fire position, trigger (5) moves in the safety lever notch. If safety lever is in safe position, trigger (5) is blocked by the safety lever axis.

1.7 Marking

At the launcher should be applied the following marking: manufacturer trade mark; title of the launcher model, caliber 40x46 mm; the words "Made in Ukraine".

Serial number on the launcher frame and barrel is applied by shock method.

1.8 Packing

The launcher in completeness according to section 1.3 of this manual is packed in individual packing box suitable for storage.

2 GRENADE LAUNCHER OPERATION

2.1 Checking of the launcher safety

2.1.1 Before carrying out any actions with the launcher, it is necessary to learn all rules and methods of firing, operation principles and maintenance of the launcher, which are given in this manual.

Checking of launcher safety carried out in the following cases:

- when receiving or transferring launcher;
- upon arrival to the place of fire;
- after the shooting;
- before exiting of the shooting range;
- before conducting of maintenance.

Picture A5
Shooting position at distance from 200 m to 400 m "standing up from under the hand"

Picture A4
Shooting position at distance from 200 m to 400 m "kneeling and from under the hand position"

2.1.2 To test the safety of the launcher, follow the steps below:

- point the barrel of the launcher in a safe direction;
- press the lever of folding barrel, breech end of the barrel is lifting up and opens the access to cartridge chamber;
- check that in the cartridge chamber and bore there is no empty case or other foreign objects;
- press down the breech end of the barrel, barrel must be fixed in horizontal position;
- holding the barrel of the launcher in safe direction, make sure safety lever is set in the "safe" position; at attempt of pressing, trigger must be locked;
- holding the barrel of the launcher in safe direction, put the safety lever to "fire" and press the trigger. Trigger mechanism must be deployed, firing pin with hammer must hit grenade percussion cap.

2.2 Checking of fighting position

Shooting by launcher can be made from any place where target area or fire are visible, where can appear the enemy. It is necessary to ensure that in the fire direction are not close objects that can catch a grenade during flight, such as branches of trees, bushes, stalks of plants. The above requirements must be carried for the safety of the shooter and surrounding persons despite the fact that the front grenade fuse will activate after meeting with any barrier.

Picture A2
Shooting position at distance from 100 m to 200 m "upright and off-shoulder firing position "

- at distance from 200 m to 400 m "kneeling and from under the hand position" picture A4 or "standing up from under the hand" picture A5.

2.5 Unloading instructions

Follow such steps to unload the launcher:

- make sure that safety lever is set in "safe position", point the barrel of the launcher in safe direction;
- press the lever of folding barrel, take out the case from the cartridge chamber, holding it by two fingers; for ease of that lateral sides of the cartridge chamber have radial grooves;
- press down the breech end of the barrel; barrel fixation in horizontal position is accompanied by a specific sound.

3 TECHNICAL MAINTENANCE

3.1 General

Carry out maintenance of the launcher immediately after shooting. With a large number of shoots for one day, carry maintenance after every 30 rounds.

If the launcher is not used, maintenance must be made weekly.

Before maintenance check the safety of the launcher, as described in 2.1.2 of the manual.

Sequence of maintenance:

- disassemble the launcher as described in 3.2, 3.3;
- clean the launcher as described in 3.4;
- check the disassembled launcher as described in 3.6;

2.3 Loading instructions

Follow such steps to load the launcher:

- make sure that safety lever is set in the "safe position", point the barrel of the launcher in safe direction;
- press the lever of folding barrel, insert the grenade into the cartridge chamber;
- press down the breech end of the barrel; barrel fixation in horizontal position is accompanied by a specific sound.

2.4 Targeting, firing and fire manipulations

2.4.1 For executing of the shot:

- move at fire position in according with Annex A;
- set safety lever in "fire" position;
- point the launcher at the target and press the trigger, launcher will shot.

2.4.2 For sighting on visual target: join the mark of sight shank, front sight and the top of the aiming point along aiming line. Aiming marks, which are on the sight shank,comply with distances 100 m, 150 m, 200 m, 250 m, 300 m, 325 m, 350 m and 375 m.

2.4.3 It is recommended to fire by launcher in such positions as shown in Annex A:

- at distance 100 m "prone supported position" picture A1;
- at distances from 100 m to 200 m "upright and off-shoulder firing position" picture A2 or "kneeling and off-shoulder" picture A3;

Picture A3
Shooting position at distance from 100 m to 200 m "kneeling and off-shoulder"

- lubricate and assemble the launcher as described in 3.7;
- check the operation of the launcher as described in 3.8.

3.2 Field stripping instructions

Field stripping carry out according picture 3 in such sequence:

1. Disconnect the butt-stock (3):
- disconnect the butt-stock axis catch (7);
- push the butt-stock axis (29).
2. Disconnect left (9) and right (10) straps:
- untwist takedown screws of levers (11, 12) of folding butt-stock at both sides of launcher and disconnect left and right levers of folding butt-stock;
- untwist connection screws of left (9) and right (10) straps and remove left strap.
3. Pull the bolt stop (23), then firing spring lever (21) with firing spring (22).
4. Remove right strap (10) with takedown screws.

3.3 Complete disassembly of the launcher

Carry out complete disassembling only in case strong pollution or operation is severe conditions.

Complete disassembly carry out according picture 3 in such sequence:

1. Carry out field stripping as directed by section 3.2 of this manual.
2. Disconnect the barrel:
- by pressing the pusher (18) fold up the barrel;

Annex A

Shooter positions during launcher firing

Picture A1
Shooting position at distance 100 m "prone supported position"

10 INFORMATION ABOUT CANNING AND PACKING

The grenade launcher FORT 600/ FORT 600A/ FORT 600U caliber 40x46 mm factory number _____ is canned and packed in accordance with requirements of the valid technical documents.

Executed preservation_____

Executed packing _____

Preservation date "____"_____ 20____

L.S.

7 TRANSPORTATION

Packed launcher in the origanal packing is transported by any transport for any distances: in the covered railroad car, covered cars, air-tight apartments of airplanes in accordance with rules of transportation with the proper transport. During the transportation must be assured position of boxes, which excludes the possibility of their strokes at one another.

8 CERTIFICATE OF ACCEPTANCE

The grenade launcher FORT 600/ FORT 600A/ FORT 600U caliber 40x46 mm factory number _____ is made and accepted in accordance with requirements of the normative documents, technical documents and is recognized as suitable for exploitation.

Executed acceptance _____

L.S. "_____"_____ 20_____

Sold _____

L.S. "_____"_____ 20_____

- push out the barrel axis (27) and separate the barrel (2), pull the springs (28) for folding of the barrel.

3. Push out the hammer axle, pull the hammer and hammer spring (25).

4. Push out trigger axis (36) and disconnect the trigger (5) with trigger rod (46) and trigger spring (47).

5. Push out the axis (17) of the barrel folding lever, pull out the pusher (18), barrel backstop (13) with guide shoe (14) and guide shoe retaining pin (26), as also barrel hook spring (16) and spring guide of barrel hook (15).

3.4 Cleaning of the launcher

Cleaning of the launcher carry out by special lubricating oil in such sequence:

1. Clear bore and cartridge chamber:

- stretch square of cloth and moist the cloth by lubricating oil.

- insert the cleaning brush with the moist cloth in the bore and clear bore and cartridge chamber till traces of dirt or soot will not remain;

- wipe dry the bore and cartridge chamber by clean and dry cloth;

- cloth must remain clean without traces of dirt or soot.

2. The rest of the details and mechanisms clean by moisted cloth by lubricating oil, then wipe dry with a cloth to the complete removal of traces of soot, dirt and moisture till cloth will remain clean.

3.7 Lubrication and assembly of the launcher

After cleaning and inspection of the disassembled launcher, lubricate components and launcher mechanisms by rifle oil.

Apply a thin coat of oil with a cloth moistened with oil and squeezed out. Remove oil flows by dry cloth.

Carry out the assembling of the launcher in the reverse sequence as described in section 3.2 and 3.3 of this manual.

3.8 Inspection of the launcher function

Inspection of the launcher function carry out in such sequence:

-make sure that the safety lever is in "safe" position, trigger must be blocked;

- turn the safety lever in "fire" position, press the trigger. Hammer cocks, hits the seat place of percussion cap by firing pin, then hammer is fixed in half-cock position.

3.9 Preservation

The manufacturer carries out canning/preserving of the launcher. Maximum term of storage of the launcher without repeated preservation is no more than one year.

At achieving the maximum term of its storage or in the case when the launcher is not used for a long time, it is necessary to carry out canning by using the method of putting thick layer of oil on its internal and external surfaces.

3.5 Special cleaning materials

For cleaning and lubricating of the launcher use:

- liquid rifle oil;
- patchs of cloth for wiping, cleaning and lubricating of launcher and its parts.

For convenience cleaning of grooves, notches and holes it is allowed to use wood wands.

The usage rate of such materials:

- liquid rifle oil - 0.5 kg;
- patchs of cloth - 0.1 kg.

3.6 Inspection of the dissamled launcher

Make inspection of the dissamled launcher after cleaning.

On the details should not be defects, which could have bed influence on working capacity, durability and safety exploitation:

- on the barrel and cartridge chamber should not be bulge deformation and disruption;
- Picatinny rail must be hardly fixed in the barrel surface, and back supporting surface of this rail should not have chips, disruptions and other defects.
- in the frame around the hole for barrel fixing axis should not be disruptions, metal crippling;
- firing pin should not has chips;
- launcher details should not have disruptions, plough defects, others defects and rust marks.

During carrying out the canning and uncanning of the launcher you should use the wiper, which is included in set of supply, rag and rifle oil.

4 CHECKING AND ZEROING

The launcher test is carry out in such cases;

- after receiving of the launcher by the subdivision;
- after workshop repair;
- in case of degeneration of firing accuracy;
- in case of launcher transfer to another shooter.

Zeroing of the launcher is executed by shooting with four grenades in firing position "front plank" (picture A1 of annex A) on checking target (picture B1 of annex B). Checking target must be pasted on plywood board and be located at distance 100 m from launcher muzzle end. Sighting is carry out by launcher sight mark "1"

After firing join along the sight line the sight mark "1", top edge of front sight and lower end of black rectangle target. At that lateral sides of rectangle target must be continuation of front sight lateral sides.

After firing and depending on holes position, determine location of mean point of impact (MPI). If normal accuracy - MPI of four holes or three (with one varied from) must be within of control circle with radius 0.35m and centre in aiming point.

Hole is obvious vary from if it varies from MPI of three holes, which are most closely-grouped, more than 2.5 circle radius, which contains these holes, at that centre of this circle is in MPI of three holes.

If MPI is out of control circle, then according to firing results you need to regulate sights.

9 WARRANTY

The manufacturer guarantees the conformity of the launcher to requirements of normative documents at the observance of exploitation rules, transportation and storage, which are described in this manual.

The warranty is 12 months from the introduction date in exploitation.

Average operation time of the launcher is not less five year or 1000 shoots from the day of the launcher introduction in exploitation.

SIA "FORT" removes discovered defects during the warranty free of charge, under the condition of observing all rules of exploitation and launcher storage, which are mentioned in this manual.

For fulfilling the guarantee repair the owner must send the launcher and this manual to SIA «FORT» to address:

600-richchya Street, 27, Vinnitsya, 21027, Ukraine

SIA "FORT" repairs the launcher after the end of warranty for the owner's cost.

5 POTENTIAL PROBLEMS

Common troubles and remedies are listed in table 5.1

Name of failure	Possible reason	Troubleshooting method
Misfire. Trigger is worked, but the shot is failed	Grenade defect	Change the grenade
	Precipitating or fracture of the firing spring	Unload the launcher and send it to workshop
Tight loading of grenade into the cartridge chamber	Cartridge chamber is polluted	Clean the cartridge chamber

6 STORAGE OF THE LAUNCHER

For a long-term storage of the launcher it is necessary to carry out its preservation. Preservation procedure is done in the section 3.9 of this manual.

Preserved and packed launcher must be stored in the closed storehouses, where temperature and humidity fluctuation are less than in open air.

Maximum storage term of the canned pistol is not more one year from the canning.