The STEN MKII

Complete machine plans

STEN SUBMACHINE GUN, 9-millimetre submachine gun that became the standard such weapon in the British Commonwealth armed forces during World War II. Moreover, hundreds of thousands of Sten guns were provided to underground movements everywhere in Europe during that war. The gun was so ubiquitous that its name became all but a generic term for submachine gun. The Sten gun remained in service until the late 1950s.

The most common version of the Sten gun was 30 inches (76.2 cm) long with a barrel of 7.5 inches (19 cm). It fired at a rate of 550 rounds per minute, and it had a 32-round box magazine that, however, tended to jam if more than 30 rounds were loaded. The butt was a steel frame that, with the barrel, could be removed without difficulty so that the disassembled weapon could be easily hidden. Its weight was just over six pounds (2.7 kg) unloaded.

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Sten Mk II

PARTS LIST

1. Barrel
2. Barrel sleeve
3. Barrel sleeve lock
4. Barrel sleeve lock spring
5. Front sight
6. Barrel bushing
7. Receiver tube
8. Receiver cap
9. Trigger housing
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    stock ring
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13. Magazine housing spacer screw
14. Magazine latch
15. Magazine latch spring
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17. Trigger spring
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20. Disconnector pin
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26. Sear pin
27. Bolt
28. Firing pin
29. Extractor
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32. Bolt angle
33. Closing spring
34. Closing spring cup
35. Trigger housing cover
36. Trigger housing cover screw (2)
37. Magazine housing
38. Magazine follower
39. Magazine spring
40. Magazine spring latch
41. Magazine bottom
42. Rear sight

NOTES:
1. Bolt stopping surface on barrel is 1mm forward of magazine well slot.
2. Bolt stroke is
Receiver tube
Material: seamless steel tubing

Top view rotated 25°

Bottom view

Center line of sear pin - ref.

Scale: .87 : 1
Main spring cap
Material: 1mm stock

Scale: 1:1

Receiver rear end bushing
Material: AISI 1010 or equivalent

Scale: 1:1
Barrel hushing
Material: 4140

Scale:

Note: Stake at assembly
with magazine housing
Butt stock assembly
Material: low carbon steel
or aluminum, welded construction
Ejector

Material: 4140 steel, hardened.

Construction: Mill, or filed from stock, pins shown can be replaced by slotting the receiver and welding in place, although harder to position.

The ejector is positioned central with the magazine aperture of the receiver tube as shown. Construction can vary, here an ejector supported by two pins through the receiver tube is welded in place.
Magazine housing
Material: as noted

Scale: 1 : 1
Magazine latch
Material: AISI 1010 or equivalent
2.7mm stock. Case harden 0.1mm deep

Magazine housing spacer
Material: AISI 1010 or equivalent
3mm stock. Heat treat: none
Barrel
Material: AISI 4140
Harden to: Br 255-277

Twist: 1/250mm RH
Number of grooves: 6
Groove width: 2.5 +.02
Bore diameter: 8.84 +.02
Rifling diameter: 9.06 +.05

9x19 (9mm Parabellum)
STEN Mk II SPECIFICATIONS

1. Cartridge:
   - 9mm Parabellum
   - Bullet weight 116 grains
   - Powder weight 6 grains
   - Muzzle velocity 1400 ft./sec.

2. Recoil Spring:
   - Wire diameter 0.067 in.
   - Spring OD 1.00 in.
   - Active coils 15
   - Free length 9.40 in.
   - Initial length 6.80 in.
   - Final length 3.20 in.
   - Work stroke 3.60 in.

3. Bolt:
   - Weight (including extractor) 1.327 lb. (9290 grains)
   - Cocking handle 0.077 lb. (540 grains)

   Total recoiling weight: 1.404 lb. (9830 grains)

   - Bolt maximum dia. 1.381 in.
   - Bolt overall dia. 5.75 in.
   - Bolt body length 4.21 in.

SUGGESTED STEN MANUFACTURING MODIFICATIONS

1. Select suitable lightwall steel tubing which is commercially available. For example, a fence post pipe (galvanized) is 38.5mm OD and 35.0mm ID, most suitable for use as a receiver.

2. Eliminate barrel sleeve.

3. Weld barrel bushing into the front end of the receiver for simple, permanent assembly.

4. Turn barrel blank OD (outside diameter) without any shoulder, fit the barrel in the bushing by sliding fit.

5. Fasten the barrel in the bushing by two roll pins of 3/16" diameter, or equivalent.

6. Turn the bolt OD to fit the receiver ID.

7. The external portion of the cocking handle (sticking out of the receiver) may be a straight 8.8mm OD, the same as the inside.

8. The trigger housing cover acts only as a guard against dirt entering the trigger assembly. This cover can be eliminated or made from plastic.

9. All pins can be roll pins of standard commercial size, or pieces of drill rod.

10. All springs can be of a standard commercial size.

11. Trigger material may be aluminum or plastic, side tabs may be replaced by spacers or washers to keep the trigger located neutrally.

12. 1-1/4" diameter nominal size galvanized pipe, schedule 40 is suitable for a modified receiver:
   - OD: 42.2mm
   - ID: 35.05mm
   - Wall thickness: 3.55mm

Note: A 1" galvanized pipe fits loosely inside a 1-1/4" pipe and can be welded as a filler-spacer where needed.
Extractor
Material: AISI 1040 or equiv., stock 4.7 wide
harden to: Rc 48-52

Bolt handle
Material: mild steel
Heat treat: none

Selector
Material: mild steel
Heat treat: none
Trigger housing cover
Material: 1mm stock, formed
Required: 1

Scale: 1:1

10-32 drill and tap at assembly with trigger housing.

All Sten screws are 10-32 thread, round head type. Trigger housing screws (2) are 13mm long.
Material: 2.5mm stock
Rewired: 2

Material: 2.5mm stock
Required: 1 each
5.5 R ref.

3.1 ø wire

Note: Trigger pin may be substituted by spring pin 3.1 ø by 26 long.

Extractor 2.5 25
Sear 5.5 24

Trigger pin

Firing pin
Material: Drill rod
Harden to Rc 50

PINS (Spring pins)

<table>
<thead>
<tr>
<th>USE</th>
<th>DIAMETER</th>
<th>LENGTH</th>
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</thead>
<tbody>
<tr>
<td>Extractor</td>
<td>2.5</td>
<td>25</td>
</tr>
<tr>
<td>Sear</td>
<td>5.5</td>
<td>24</td>
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**SPRINGS**

<table>
<thead>
<tr>
<th>USE</th>
<th>Wire dia.</th>
<th>Coil OD</th>
<th>Free length</th>
<th>Number of coils</th>
<th>Coil ends</th>
<th>SUBSTITUTE*</th>
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<tbody>
<tr>
<td>Extractor</td>
<td>1</td>
<td>7.1</td>
<td>12</td>
<td>5.5</td>
<td>Sq.</td>
<td>LC-040C-4</td>
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<tr>
<td>Magazine latch</td>
<td>1</td>
<td>8.7</td>
<td>15.5</td>
<td>6</td>
<td>Gr.</td>
<td>LC-040C-6</td>
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<tr>
<td>Closing</td>
<td>1.6</td>
<td>26.5</td>
<td>245</td>
<td>17</td>
<td>Sq.</td>
<td></td>
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<tr>
<td>Trigger</td>
<td>0.7</td>
<td>4.6</td>
<td>57</td>
<td>72</td>
<td>Extension spring loops</td>
<td>LE-026B-7 or LE-026C-8</td>
</tr>
<tr>
<td>Selector</td>
<td>0.45</td>
<td>4.6</td>
<td>14</td>
<td>8</td>
<td>Gr.</td>
<td>LC-018B-6</td>
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<tr>
<td>Barrel sleeve latch</td>
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<td>8.7</td>
<td>35</td>
<td>15</td>
<td>Sq.</td>
<td></td>
</tr>
</tbody>
</table>

Sear spring, formed substitute LT-059K-1-R

3.5 coils, 1.6 φ wire

Spring Company, 30 Mail St., Brooklyn, N.Y. 11201: zuglog Xo. 112/1970
Trigger
Material: AISI 1010 or equivalent,
1.6mm stock
Heat treat: none
Top view

Full automatic position

Trigger assembly

Bottom view

Sear pin
Sear lever
Sear spring
Trigger spring
Trigger pin
Trigger stop pin
Selector
Trigger
Material: AISI 4140 or equivalent
Harden to Rc 55
Top view

Material: 1mm steel stock

Front view

Rear view

Bottom view
Magazine follower
Material: low carbon steel

Scale: 1:1

Note: The magazine follower is a complex stamping made on a progressive die. To make a follower in a simpler way is to follow the Degtyarev DP LMG approach — using a dummy round as the last one in the magazine. Thus a simple, flat follower with a dummy round soldered and/or screwed to it will replace a complicated stamping.
Magazine spring
Material: Music wire 1.5mm dia.

Over-all length: 313
Number of coils: 26

Scale: 87:1

Magazine bottom retainer
Material: 1mm mild steel

Retaining lip bent over magazine
spring tab at assembly

Magazine bottom plate
Material: 1mm mild steel

Scale: 87:1