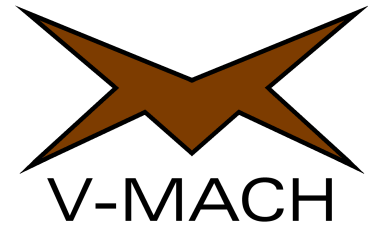


## V-Mach Custom Rifles Limited

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# HW57/85/95/98 Tuning Kit Fitting Instructions

## Contents

Your tuning kit contains those items marked with a tick ✓:-

✓ Fitting Instructions	✓ Guide Set	Piston Seal Fitting Tool	✓ Grease
✓ Spring	✓ Piston Sleeve	✓ Black Delrin Spacer	✓ Oil
✓ Seal	Breech Seal <sup>1</sup>	✓ Pre-Load Washers	

Note: <sup>1</sup> Optional Extra

## Disclaimer

Thank you for purchasing one of our specialised tuning kits. The components supplied are of the same high quality as those fitted to our tuned and custom rifles. Whilst every effort is made to ensure optimum performance is achieved when fitted, it is possible, due to manufacturers' tolerances, internal finish and possible action faults, that power levels and cocking and firing cycles will vary.

The tuning kit supplied is assembled and balanced to generate 11+ ft lbs on assembly for the make, model and calibre of rifle specified. We strongly advise that, after fitting, the rifle should be chronographed to ensure that it is operating safely within the UK limit of 12 ft lbs. Pre-compression washers and a nylon spring guide spacer are supplied to adjust the power level if required.

Use the oil and grease supplied very sparingly and never in front of the piston seal. Damage caused by incorrect or excessive lubrication cannot be deemed as our responsibility.

We recommend that, if possible, tuning kits should be fitted by a competent gunsmith. We do not accept any responsibility for personal injury or rifle damage incurred whilst fitting any of our kits or components.

If you experience any difficulties in fitting the kit, please contact us.

## Pre-Fitting Checks

- Please read the fitting instructions and disclaimer thoroughly.
- Ensure that you have the correct kit and that it is nominated in the correct calibre for your rifle.
- **Note for HW77/97s:**
  - In addition to the description on the packaging, check that the piston seal is of the correct size for your rifle. The early HW77/97 models, with a 25mm chamber and with a serial number of 1446048 and under, require a small piston seal. The seal is marked "S" on the inside face.
  - The later HW77/97 models with a serial number of 1446049 and over have a 26mm chamber and require a bigger piston seal. The seal is marked "B" on the inside face.

## Fitting

- 1 Check that the rifle is uncocked and unloaded.

- 2 Remove the stock screws (trigger guard and forend) and lift off stock.
- 3 Tap out the trigger retaining pins, front and rear, and remove trigger unit, safety catch and spring.
- 4 Using an angled tool (small Allen key shaped or similar), prise out the 4 retaining sections (2 on each side) from the inside of the trigger housing slot. This operation should be carried out with the rifle in a spring compressor.
- 5 *Note: HW85 Only: To unscrew the trigger housing and to remove the piston unit, the dovetail block must be removed. Remove the countersunk screws and tap the dovetail block forwards to disassemble from keyway location in the compression cylinder. Mild heat may be required to destroy the glue retaining the block and fixing screws. To unscrew the trigger block, which is usually very firm, insert a steel or brass block into the trigger housing slot and strike sharply anti-clockwise with a small/medium hammer. Once the trigger block is hand tight, continue to unscrew and remove with the aid of a spring compressor.*
- 6 Using the spring compressor and a plastic or wooden disc or block (no larger than the inside of the compression chamber) apply sufficient pressure to allow slight anti-clockwise rotation of the inner housing to allow the section to disengage the key way.
- 7 Slowly release the mainspring until it is under no compression. Remove spring and guide tube.
- 8 *Note: HW57 Only: Lift the cocking lever linkage at the joint connecting the 2 linkages and lift along and out of the slot to allow removal of the piston. Go to no. 11.*
- 9 Open barrel, remove the locking nut on the barrel pivot bolt (right-hand side).
- 10 Remove pivot bolt and spring washers and remove barrel. Complete with shims, cocking linkage and piston shoe.
- 11 Remove and degrease piston and compression chamber thoroughly and dry.
- 12 Prise off the piston seal and replace with the replacement seal.
- 13 Lightly apply grease to the piston slot area and very sparingly to the piston body. A barely visible coat of grease should be applied to the outside of the seal only, ensuring no grease is on the front of the seal face.
- 14 Add 2 pre-compression washers to the inside of the piston. Refit piston taking great care to ensure that it is not damaged in any way as it passes through any slots or holes within the compression chamber.
- 15 With the piston in the fully forward position, apply the grease supplied behind the piston directly into the compression chamber. This can be applied quite liberally.
- 16 Lightly coat the outside of the mainspring (guides x 2 already fitted and lubricated) and reassemble the rifle completely.
- 17 *Note: HW85 Only: Refit dovetail at this stage. You can apply a small amount of a semi-permanent Loc-tite underneath the countersunk head of the fixing screws to help prevent the unit becoming loose.*
- 18 Test fire: Should you encounter any difficulties or have any questions regarding the fitting of this kit, we are happy to advise.
- 19 The rifle should be chronographed using a selection of quality pellets to ensure that it does not exceed the legal limit of 12 ft lbs muzzle energy.
- 20 The nylon spacer supplied is designed to locate over the guide tube to add additional pre-compression if required to increase performance. The additional washers are designed to go inside the piston for the same reason. Do not add the spacer or additional washers until the rifle has been chronographed.

## **Fault Finding**

The single most common area for a tolerance discrepancy, which can effect performance, lies with the fit of the replacement seal on the piston and the corresponding fit inside the compression chamber.

The factory piston can vary in size and these tolerances can sometimes influence the correct fit of the seal. The piston seal should fit the piston without being excessively tight, bulging or failing to locate into the groove. This applies to the mushroom shaped piston found on the HW range. The seal should turn freely with a little friction only. A small amount of movement is not cause for concern if you have a slightly undersized piston, it will still be a far better fit than the factory seal on the factory piston. Note: The fit of the seal in the Air Arms, BSA, Diana and Webley kit is much tighter and this is how the seal is designed to fit

## **Piston Depth**

Ensure that there are no washers, spacers or guide tubes (top hats) already located in the piston. It is easy to overlook the fact that the rifle may not be standard and could already have been modified in some way. Any of the above located in the piston can prevent the rifle from cocking and greatly increase the preload of the mainspring and should be removed prior to the fitting of the kit.

**PLEASE NOTE:** Oil supplied is for external use only – eg pivot pins and safety catch. Do not insert oil into the rifle's barrel or compression chamber as "dieseling " will occur, which in turn will damage the piston seal and possibly the mainspring.

Sept 2013

# **HW80/85/95/98**

## **Supplement to Tuning Kit Fitting Instructions**

### **Important Notice:**

Weihrach has announced design changes, via Hull Cartridge Company (the UK's main importer for HW), to the current HW80, HW85, HW95 and HW98 models effective from the Serial Numbers listed below:-

<b>Model</b>	<b>Changes From Serial Number</b>
HW80	1823575
HW85/95/98	1830040

### **Design Changes**

The 3 design changes, which should be relevant to all models mentioned above, are detailed below, and this supplement explains these changes along **with additions in the content of the current tuning kit, which we have added to compensate.**

- 1 The forend stock screw fixing point now combines with the barrel detent closure wedge and incorporates a tensioner to minimise/reduce cocking lever "play". This alteration has no effect on the design or content of the standard V-Mach Tuning Kit.
- 2 The factory piston sleeve fitted as standard to all previous models of the HW80/85/95/98 is no longer fitted. This poses potential lubrication issues as the now open piston slot can allow lubrication from the mainspring to migrate into the working area of the compression chamber. In addition, there is also a much greater tolerance between the mainspring and the piston body interior, which was previously addressed by the factory fitted piston sleeve.

V-Mach now provides a piston sleeve to redress this problem. The open portion of the sleeve now provided should be inserted into the piston, serrated end first, with the open side of the sleeve opposite to the slot in the piston. (Tape wrapped around the sleeve on assembly should be removed first). The sleeve we provide is manufactured from thinner shim than the original version, however there is no load/pressure on this sleeve from the current cocking shoe compared to the previous design. This shim steel sleeve will adequately control lubrication to within the piston unit, whilst helping to reduce the tolerance between the mainspring and piston body. The piston sleeve provided may be fitted to the original HW80/85/95/98 piston design with the factory piston sleeve already fitted, but this is not necessary, and may in fact reduce tolerances too much by preventing the easy fitting and removal of the mainsprings forward guide (or top hat).

- 3 The cocking shoe/slipper, which connects the cocking linkage to the piston, has been re-designed to engage the action body tube as it locates the piston unit. The upper section of the shoe therefore rides on the top of the compression chamber, as opposed to the original, which located inside the piston slot and on top of the original piston sleeve. This should have no effect on the standard V-Mach Tuning Kit. We do recommend however that the shoe is lubricated well with a quality grease to help prevent any potential scuffing in this area.

If you require further explanation, please do not hesitate to contact us.

Jan 2012