Pick & Mix Self Tune

Manitou MC² Damper Mezzer Pro

Installation Instructions

serious bicycle suspension
shockcraft

Introduction

The Shockcraft Pick & Mix Mezzer Pro Self Tune Kit enables technically minded riders and bike shops to install Shockcraft engineered and tested tunes in the Mezzer Pro MC² damper with only normal service tools.

Kit Contents

- Shockcraft High Flow V2 Piston
- Shim kit, which covers the required tune range. Shim sizes and thicknesses have been chosen so you don't need to accurately measure them.
- A paper tune drawing to scale. This shows your specific tunes for rebound and compression and lays out the shims required for each tune. The drawing also shows 1-2 optional softer/firmer tunes for compression and 1-2 optional sticky/poppy tunes for rebound damping.

Mezzer Pro Damper Details

The Manitou MC² damper is a cartridge style damper which uses a cylindrical rubber bladder to compensate for shaft volume.

Figure 1. Manitou MC² damper assembly.

It has Low Speed Compression (LSC) and High Speed Compression (HSC) dials on the top of the damper. It has a Low Speed Rebound (LSR) dial on the bottom of the damper. It has two bleed screws for through-bleeding and a pressure relief valve built into the damper top-cap.

Fitting

The damper is threaded into the crown at the top of the fork and is retained with a nut on the casting at the bottom of the fork.

Tools Recommended

- T10 torx screwdriver or wrench
- Hex key (allen key) set with 40 mm reach & 2-8 mm range
- Adjustable spanner (crescent wrench)
- Bench vise with soft-jaws
- Cassette tool (Unior 1670.9/4 with pin removed is ideal)
- Clamp block with 10 and 16.3 mm clamps (versions available by Shockcraft (see Figure 2) and Manitou are ideal)
- M5 bleeding tools. Manitou set is ideal, Reverb and Shimano brake fittings also work. (Do not use brake fittings that have contacted DOT fluid).
- 8 mm modified socket (Figure 3, available here from Shockcraft)
- 14 mm open ended spanner
- 11 mm socket and driver
- Digital or Vernier calipers
- Torque wrench (optional but recommended)

Figure 2. Shockcraft Clamp Block for Manitou single crown forks.

Figure 3. Shockcraft 8 mm modified socket.

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Fluids & Grease

- Stock fork oil – Maxima 5 wt
- Shockcraft recommended fork oil:
  - Standard - Motorex 2.5 wt
  - Heavy duty - Shockcraft Hot Oil Green
  - Extreme temperatures - Shockcraft Hot Oil Pink
- Stock all season splash bath oil - Motorex Fully Synthetic 5W40
- Shockcraft recommended splash bath oil:
  - 3 Season option - Motorex Supergliss 68K
  - Summer option, most slippery - Motorex Supergliss 100K
- Grease - Slickoleum

Figure 4. Selection of oils tested by Shockcraft.

Fluids and grease can be purchased with the Pick & Mix Mezzer Pro Self Tune Kit or separately at Shockcraft using the links above.

Supplies

- Gloves
- Lint free rags
- Beakers or cups to collect drained oil
- Clean work-space

Torque Settings

- Damper top-cap to crown – 25 Nm
- Foot-Nuts – 4 Nm
- Dial retaining nut (11 mm) – 0.5 Nm (finger-tip tight only)
- Knob screws (2 mm hex) – 0.5 Nm
- Damper HBO cup and cone – 3 Nm
- Damper tube to caps – 5 Nm
- Bleed screws – 2 Nm (screw-driver tight)

Damper Removal

Hold the fork level, remove the rebound knob screw, pull the knob off and undo the 14 mm rebound side foot-nut. Remove the compression knob screw, pull out the LSC knob and undo the 11 mm nut behind it. Now the HSC knob and seal will come out. The cassette tool can be used to unscrew the damper and it will slide out of the fork. It will be oily.

Damper Disassembly

Remove the lower bleed screw with a T10 torx and pump as much oil as possible out into a collection tray or cup.

Clamp the centre tube gently in a bench vise using a 16.3 mm clamp block (see Figure 5) so you can access both ends of the damper tube.

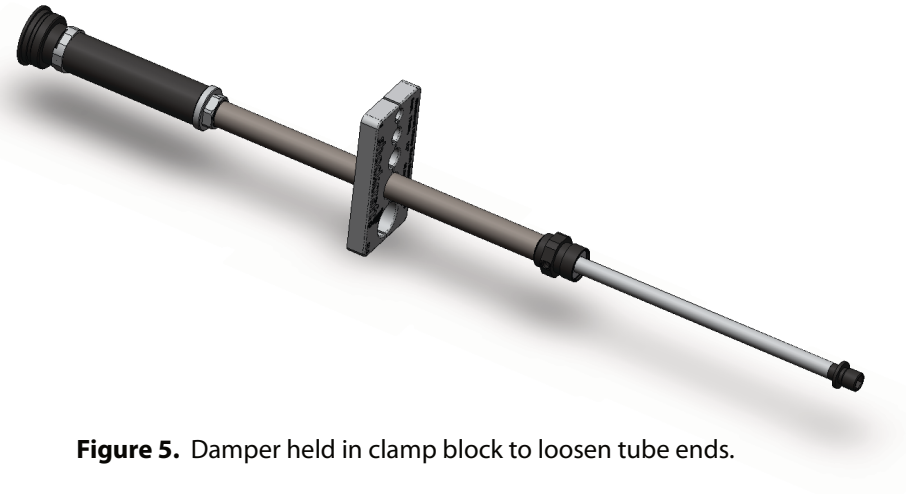

Figure 5. Damper held in clamp block to loosen tube ends.

Tighten the vise just enough to stop it slipping and loosen both tube end-caps; the one which holds the lower seal and the one which is attached to the compression damper and bladder.

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Unscrew by hand (see Figure 6) over your oil collection tray or cup to minimise mess.

Pump the bladder to drain the remaining oil. Place the rebound shaft assembly upright in the 10 mm clamps in the vise as shown in Figure 7.

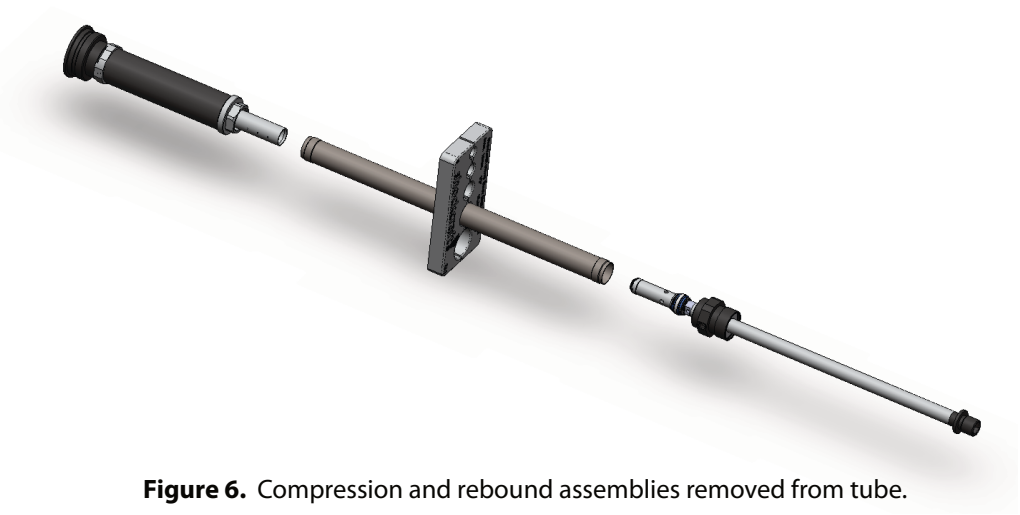

Figure 6. Compression and rebound assemblies removed from tube.

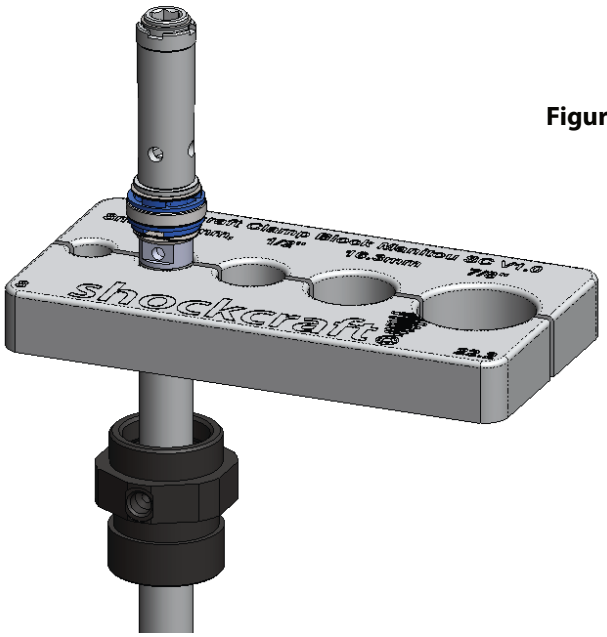

Figure 7. Rebound assembly in clamp block.

Use a 5 mm hex key to unscrew the HBO cone (it's the piston nut), extract the rebound shims and rebound piston (Figure 8). Set these aside but keep the HBO cone, 1 mm stop washer and check shims that sit under the piston.

Install your new rebound piston and rebound shim stack, fit the 1 mm thick stop washer and tighten the HBO cone first with your fingers. Be very careful not to pinch the rebound check shim that sits under the piston. Check it moves freely. If the folded-shim check spring isn't holding the check shim up you can increase the bend in them slightly.

Tighten the HBO cone (piston nut) to 3 Nm.

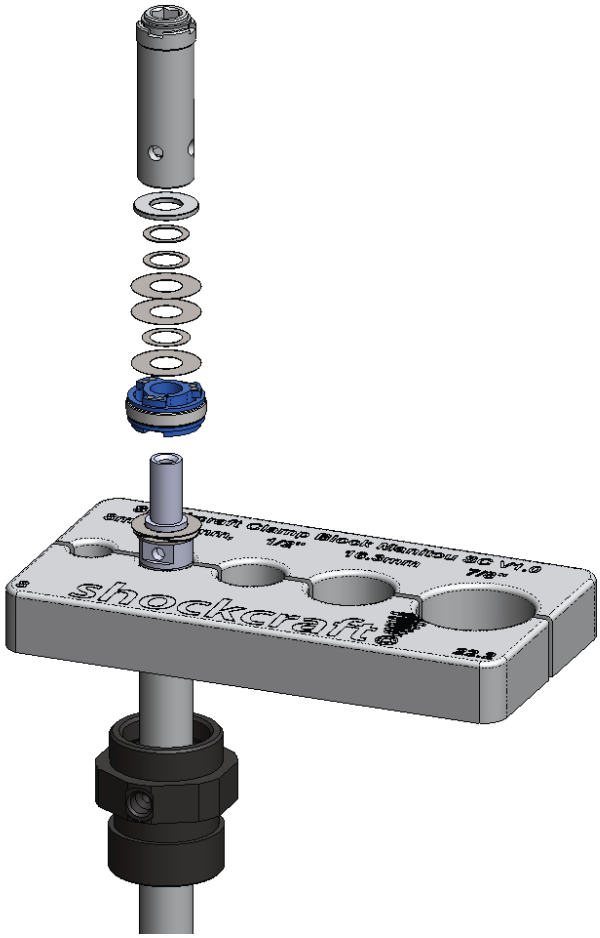

Figure 8. Removal of stock rebound shims & piston.

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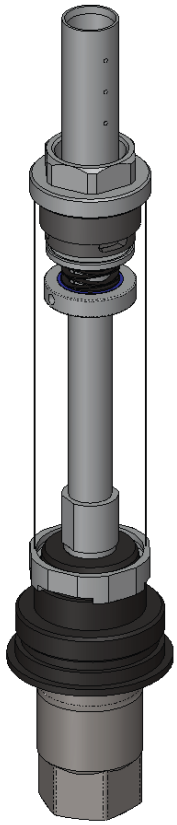

Figure 9. Compression assembly mounted on cassette tool.

Place the cassette tool upright in the vise and sit the compression assembly up-side down on it as shown in Figure 9.

Unscrew the HBO cup using a 6 mm hex key down inside. Then twist the retaining collar at the top of the bladder 45° so it unlocks.

Hold the bladder over a collection tray and draw the bladder off with end-cap and compression piston still attached (see Figure 10).

The compression shims may stay on the shaft or they may stick to the compression piston (seen inside the bladder). If they stick to the piston you can push them to the side and poke them loose through the centre hole. Make sure none are left behind.

There are three compression shims and one clamp shim stock. Your new tunes will re-use some or all of these.

The HSC preloader has a wave spring and shim either side of that to prevent the wave-spring wearing the aluminium faces. Reinstall it if it comes loose.

Place compression damper assembly back on the cassette tool in the vise, install your new compression shim-stack smallest shim first and slide the bladder down.

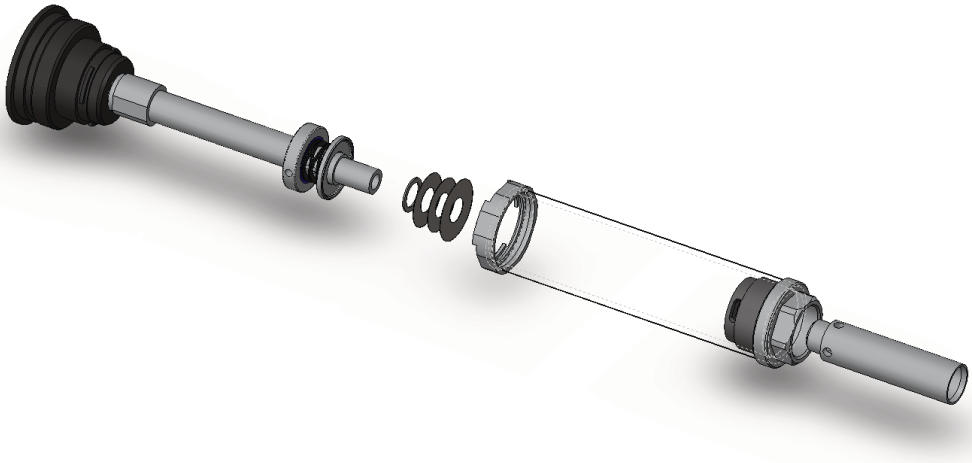

Figure 10. Compression damper exploded view showing shims.

Install the HBO cup carefully to ensure the check spring and shim (captive below the piston) are not damaged. Snug it to 3 Nm. Twist the bladder locking ring until it is fully engaged.

Note: If your bladder has become unseated, you will need to separate the compression piston and bladder from the end-cap to reassemble. Do this by sliding the compression piston back on the compression assembly and using the damper tube threaded into the end-cap to wiggle them apart.

Bladders will regain original shape when gently heated, they often trap air against the end-cap during assembly and this prevents proper seating. You can vent them with the tail of a zip-tie.

Once the compression assembly is back together you can reassemble both damper ends into the damper tube and rebleed.

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Set the final oil volume with the bladder relaxed and the shaft compressed 100 mm from full extension. This gives the bladder plenty of free space to work without being pinched or overinflated.

Reinstall

The damper slides back into the top of the fork, top is tightened to 25 Nm with a cassette tool. Then you invert the fork and add bath oil.

The Mezzer forks use 15 cc of bath oil in each side of the lower legs. This can be increased to 21 cc for longer service intervals.

If you drained the fork then add 15 or 21 cc per side of bath oil. Stock is Motorex Fully Synthetic 5W40, which covers a very wide temperature range. Shockcraft recommend Motorex Supergliss, which is more slippery but has a narrower temperature range. Supergliss 100K is suitable for 10°C and above, Supergliss 68K is okay down to freezing.

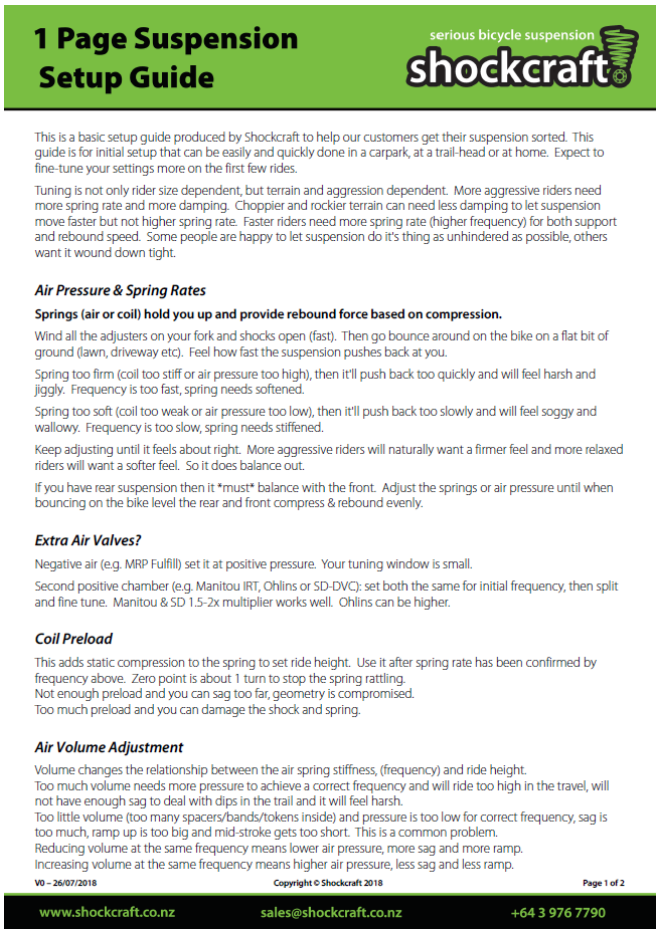
Foot nuts are 4 Nm max and you usually need to hold the inner shaft while you snug them up, using an 8 mm modified socket on one side and 8 mm allen key on the other. Rebound shaft screw is only 0.5 Nm but needs to be snug so you don't lose your knob.

Initial Setup

Tunes are intended to run with LSC closed, HSC open and LSR 3-5 clicks open from fully closed. But you can do whatever feels good.

If you choose a poppy tune the LSR will run more open, 4-7 clicks.
If you choose a sticky tune the LSR will run more closed, 2-4 clicks.
Individual forks can have rebound range +/-1 click either way from this.

Shockcraft 1 Page Suspension Setup Guide is here.



1 Page Suspension Setup Guide

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This is a basic setup guide produced by Shockcraft to help our customers get their suspension sorted. This guide is for initial setup that can be easily and quickly done in a carpark, at a trail-head or at home. Expect to fine-tune your settings more on the first few rides.

Tuning is not only rider size dependent, but terrain and aggression dependent. More aggressive riders need more spring rate and more damping. Choppier and rockier terrain can need less damping to let suspension move faster but not higher spring rate. Faster riders need more spring rate (higher frequency) for both support and rebound speed. Some people are happy to let suspension do it's thing as unhindered as possible, others want it wound down tight.

Air Pressure & Spring Rates

Springs (air or coil) hold you up and provide rebound force based on compression.

Wind all the adjusters on your fork and shocks open (fast). Then go bounce around on the bike on a flat bit of ground (lawn, driveway etc). Feel how fast the suspension pushes back at you.

Spring too firm (coil too stiff or air pressure too high), then it'll push back too quickly and will feel harsh and jiggly. Frequency is too fast, spring needs softened.

Spring too soft (coil too weak or air pressure too low), then it'll push back too slowly and will feel soggy and wallowy. Frequency is too slow, spring needs stiffened.

Keep adjusting until it feels about right. More aggressive riders will naturally want a firmer feel and more relaxed riders will want a softer feel. So it does balance out.

If you have rear suspension then it *must* balance with the front. Adjust the springs or air pressure until when bouncing on the bike level the rear and front compress & rebound evenly.

Extra Air Valves?

Negative air (e.g. MRP Fulfill) set it at positive pressure. Your tuning window is small.

Second positive chamber (e.g. Manitou IRT, Ohlins or SD-DVC): set both the same for initial frequency, then split and fine tune. Manitou & SD 1.5-2x multiplier works well. Ohlins can be higher.

Coil Preload

This adds static compression to the spring to set ride height. Use it after spring rate has been confirmed by frequency above. Zero point is about 1 turn to stop the spring rattling.
Not enough preload and you can sag too far, geometry is compromised.
Too much preload and you can damage the shock and spring.

Air Volume Adjustment

Volume changes the relationship between the air spring stiffness, (frequency) and ride height.
Too much volume needs more pressure to achieve a correct frequency and will ride too high in the travel, will not have enough sag to deal with dips in the trail and it will feel harsh.
Too little volume (too many spacers/bands/tokens inside) and pressure is too low for correct frequency, sag is too much, ramp up is too big and mid-stroke gets too short. This is a common problem.
Reducing volume at the same frequency means lower air pressure, more sag and more ramp.
Increasing volume at the same frequency means higher air pressure, less sag and less ramp.

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