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EVO: Engine Mechanicals - Sub-09A

Sequence of Installing Rigid Evo XL Motor Mounts

From the Service Manuals

NOTE: Use your Service Manual for torque specs or [Click Here](#) for OEM torque specs in the Sportsterpedia).

The factory service manuals lay out the procedure for 'stripping the motorcycle for engine repair'. This covers the procedure for removing / installing the motor and also includes the motor mounts. However, the whole story is not in the manual.

You can induce added vibration and potential for cracks in the mounts or cases if the mounts aren't installed properly.

Below is the procedure from the manuals for removing and installing the mounts.

To remove the motor mounts (given all other particulars have been removed as this is strictly regarding the mounts themselves);

Note: Drain engine and primary oils before removing the engine from the frame.

The order of installation should be done as numbered below.

1. Remove top center mount:
Remove the both bolts to the frame, nutplate and shim(s).
Remove both bolts and washers from the heads and including ground wire for VOES (if applicable).
2. Remove upper front mount:
Remove both bolts and washers from the frame along with nutplate.
Remove both right bolt and left nut and washers along with the mount bracket.
3. Remove lower front mounts:
The upper rear bolt is threaded into a welded not on the right mount plate.
Remove the bolts and their respective nuts and washers along with the mount plates.
4. Remove rear mount bolts, nuts and washers from the frame.

To install the motor mounts (Again, this is strictly regarding the mounts themselves and all other parts will need to be addressed that were removed).

The manuals simply states to install the bolts loosely in each mount along with the respective nuts and washers.

Then tighten the bolts per the FSM specs. See the link to OEM torque specs in the at the top of this section.

The order of installation should be done as numbered below.

1. Install rear mount bolts.
2. Install the lower front mounts.
3. Install the upper front mount.

It is not suggested to leave it off. It adds rigidity to the entire engine/frame structure. ¹⁾

Tighten the bracket to the head before you tighten the bracket to the frame to keep from introducing any additional stress. ²⁾

4. Install the top center mount.

Motor Mount Pics

Upper Front Mount

Here is how the upper front mount looks as installed.

The washers in the 1st pic aren't OEM matches but as you can see in the 2nd pic, that's Ok. ³⁾

- Factory bolts and washers: ⁴⁾
 - Bolts (4716W) 3/8"-16 x 1-1/4" Hex Head - Grade 5
 - Washers: (6701) 3/8" x 13/16" x 1/16"





Cracked head at the front mount threads

From aswacing of the XLFORUM ⁵⁾

Unfortunately, this is not an uncommon problem. It was especially a problem on Buells, which don't have a frame under the motor and therefore those two bolts were supporting the entire weight of the engine. But even on solid mount Sportsters, these cracks happen sometimes. The top end of the motor grows with heat and the frame doesn't grow near as much, so this spot gets progressively more stressed. Add in a little vibration and you can see the result.

The Motor Company pulled that bolt inboard on the Buell XB's in 2003 to get some more material around it and make it stronger. Then they did the same with the rubber mount Sportsters in 2004. So all the new heads have that bolt hole relocated inboard a little.

I've seen people cause this failure themselves, too, by using a bolt that's too long for the hole. Once that bolt bottoms in the hole, continuing to tighten it just pushes the threaded portion away and causes the failure.

As far as fixing goes, I've seen it hold up after welding, and I've seen it just crack again. So that's an iffy repair. The head needs to come off regardless and that vintage heads are generally pretty darn common and not expensive in the used market, so I personally would just replace it. But that's just me.



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1)

John Harper of the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/frame-mount-evo-sportster-talk-1986-2003-models/203891-top-motor-mount>

2)

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/frame-mount-evo-sportster-talk-1986-2003-models/193620-crack-in-head#post4209755>

3)

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/frame-mount-evo-sportster-talk-1986-2003-models/201174-front-motor-mount#post4454811>

4)

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/frame-mount-evo-sportster-talk-1986-2003-models/201174-front-motor-mount#post4454811>

5)

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/frame-mount-evo-sportster-talk-1986-2003-models/193620-crack-in-head#post4209755>

6)

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/frame-mount-evo-sportster-talk-1986-2003-models/193620-crack-in-head#post4209755>

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