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REF: General-MSR 11

Cutting Oils

See also [Wet Torque Value Chart for Lubed Threads](#) in the Tool section of the Sportsterpedia.

- Everybody has a favorite cutting oil that used to be better than it is now or is out of production. There may have been recent performance issues with the existing oil or something has changed in the manufacturing process that precludes its use. New machines, additional contracts, changing environmental concerns, product cancellations, sustainability goals and other factors can all combine to limit the effectiveness or applicability of the current oil. ¹⁾
- Some metals are more difficult to machine than others. Stainless steel, exotic alloys and very hard metals demand a very high level of performance from the cutting oil. Other metals, like brass and aluminum, are easy to machine with general-purpose oils. ²⁾
- Grinders, hand drills and deep-hole drilling machines require lighter viscosity oils for high rates of cooling and good chip and swarf flushing through-the-tool delivery and high-pressure application without foaming. ³⁾
- Some cutting oils make great penetrating oil for soaking stuck bolts.
- Straight oils
 - Non-emulsifiable and are used in an undiluted form, composed of a base mineral or petroleum oil and often contain polar lubricants such as fats, vegetable oils and esters as well as extreme pressure additives such as Chlorine, Sulphur and Phosphorus. Straight oils provide the best lubrication and the poorest cooling characteristics among cutting fluids. ⁴⁾
- Synthetic Fluids
 - Contain no petroleum or mineral oil base and are formulated from alkaline inorganic and organic compounds along with additives for corrosion inhibition. They are generally used in a diluted form (usual concentration = 3 to 10%). Synthetic fluids often provide the best cooling performance among all cutting fluids. ⁵⁾
- Soluble Oil Fluids
 - Form an emulsion when mixed with water. The concentrate consists of a base mineral oil and emulsifiers to help produce a stable emulsion. They are used in a diluted form (usual concentration = 3 to 10%) and provide good lubrication and heat transfer performance. They are widely used in industry and are the least expensive among all cutting fluids. ⁶⁾
- Semi-synthetic fluids
 - Combination of synthetic and soluble oil fluids and has characteristics common to both types. The cost and heat transfer performance of semi-synthetic fluids lie between those of synthetic and soluble oil fluids. ⁷⁾
- Cutting oils/ fluids/ lubes for tapping and/ or soaking:
 - SuperAllTap by Hangsterfer's Laboratories ⁸⁾
 - Tap Magic ⁹⁾
 - CT-90 by Action Can ^{10) 11)}

- RIDGID® Thread Cutting Oil ¹²⁾
- Kroil: Most things are free in less than a day since I started using Kroil ¹³⁾
- Lower alternatives include WD-40, bacon grease, motor oil, 3in1 oil (light household oil)
- Windex: I have found that Windex window cleaner is the best cutting fluid ever for aluminum to keep bits or tools from fouling with aluminum. ¹⁴⁾
- Instead of the common oils, try Bees Wax, if the part can be heated.
 - Bees wax will penetrate and follow the threads, it will kill loctite and corrosion like nothing else.
 - Bees Wax has a much higher flash point than oil, will not burn to carbon like oil causing the fastener to become more stuck. ¹⁵⁾

Penetrating Oil

- **Chemical attacks are not instantaneous events**
- **The secret to using penetrating oil is time.**

Even a good penetrating oil sometimes just needs time. First, follow the label on your choice of oil. A rule of thumb is a 24 hour soak, followed by a few taps with a hammer or rubber mallet to set up some vibration in the threads to distribute oil and friction.

This procedure can be duplicated as often as you feel comfortable with and it depends entirely on your time frame allowed.

It's not possible to nail down a set day(s) or hour(s) as every situation and climate is different.

Pop would, when working a bolt on his Model A, often squirt the bolt once a day for two weeks, then give it a rap to try to loosen corrosion before walking it out conventionally.

Sometimes it works, sometimes it doesn't. ¹⁶⁾

- **The chemical saturation starts with a good penetrating oil.** There are lots of good products for loosening stuck bolts including but not limited to:
 - P'B Blaster
 - Kroil (petroleum base oil, Naptha and mineral spirits)
 - Liquid Wrench
 - Tap Magic is a cutting oil but works wonders for deep penetration
 - Kerosene
 - WD-40 is not considered a good penetrating oil.
But if the bolt can be turned just a pinch (left or right) and back, then you can squirt this into the threads on every turn.
It may help but your still better off using penetrating oil instead. ¹⁷⁾
 - A 50:50 solution of Acetone and Automatic transmission fluid (ATF) (or power steering fluid) has been floated around shops and the internet for years for a rust penetrant. ¹⁸⁾

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<http://www.machinerylubrication.com/Read/29574/choose-cutting-oil>

4) 5) 6) 7)

<http://www.mfg.mtu.edu/testbeds/cfest/fluid.html>

8)

Hangsterfer's Laboratories

9)

<http://www.tapmagic.com/>

10)

<http://www.actioncan.com/application/cutting-fluid/>

11)

Folkie from the XLFORUM

<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-general-discussion-and-problems/181908-assembly-prep/page2?threadid=1959533&page=2>

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<https://www.ridgid.com/us/en/thread-cutting-oil>

13)

Shadowdog500 of the XLFORUM

<http://xlforum.net/forums/showthread.php?t=614423&highlight=tap+die>

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/181706-cleaning-up-screw-recesses?t=1957073&highlight=tap+post+#4>

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old guy with kmodel of the XLFORUM

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chuckspeed of the XLFOUM

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<https://www.practicalmachinist.com/vb/general/ot-penetrating-oil-196347/>

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