

Framework for Functionality

Photo by Michael Tain

Reduce your downtime
— and your
blood pressure —
with proper chain saw
maintenance

By Michael Tain

Poorly maintained chain saws are an efficiency issue on a professional tree crew, creating lost time in extended starting procedures, poor and balky running, and wood cut either too slowly or in interesting/unwanted shapes. Poorly maintained saws are also a safety issue.

Beyond the fact that frustrated chain saw operators are probably not focusing on the cutting they are doing, poorly maintained saws take a toll on operators' bodies. Muscle fatigue and other physical issues could easily result in the operator not having the strength, reaction time, or energy reserves to react or deal with an unexpected occurrence. Additionally, a poorly tuned or maintained saw that lacks the rpm to complete a cut readily can lead to an operator being in a dangerous position or situation for too long. The most ready solution to this problem is properly maintained chain saws.

Cleaning and preventative maintenance

The most valuable tool for basic chain saw maintenance is one that many in the tree care profession throw away as soon as the new saw is removed from the box — the owner's/operator's manual. This handy guide offers information on everything from safe cutting techniques to carburetor adjustment,

depending on the manufacturer. It also offers excellent guidelines for the easiest way to assure well-running, functional chain saws — cleaning and preventative maintenance.

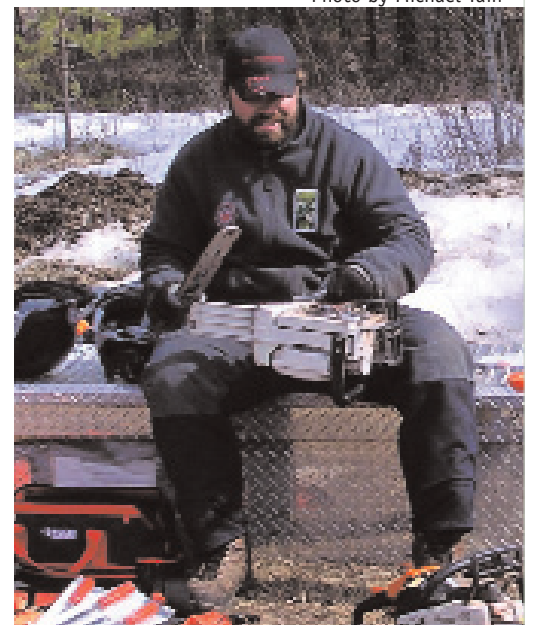
A thorough weekly cleaning of all the chain saws in the inventory will go a long way toward ensuring that they function properly. This will also allow them to be examined closely for loose bolts, nuts, "wear" items, and the functionality of pieces/parts. Four safety features that particular attention should be paid to for existence and functionality are as follows:

- Manual/inertia chain brake
- Chain catcher pin
- Wrist guard
- Throttle interlock.

The most efficient way to accomplish this cleaning operation is to have one crewmember clean all the saws at a designated time during the week — usually after the end of the shift on the last day of the work week. Chain saws will certainly not suffer from being cleaned more often than this, and some manufacturers actually recommend cleaning after eight hours of use. But this can be difficult to accomplish within a busy work schedule. Therefore, a set weekly cleaning might be a better alternative (although particularly dirty conditions may require more frequent cleaning).

Basic cleaning can be easily accomplished with compressed air, though extreme care or even avoidance must be practiced by the cleaner in regard to the air filter and the vicinity of the carburetor, as serious damage can result. The saw need not be completely broken down for weekly cleaning, but, at a minimum, the following pieces/parts should be removed and cleaned along with the main body of the chain saw:

- Side cover (Pay particular attention to external brake band if present.)
- Bar and chain (Most bars not only can be rotated, but should be to ensure even wear. Also, lay the bar on a flat surface to check for bends.)



A demonstration of saw breakdown for cleaning. In the field, where compressed air may not be available, paint and tooth brushes are excellent cleaning tools.

- Air filter
- Air intake/recoil start mechanism.

Parts replacement

Hours of operation, conditions, and manufacturers' recommendations will dictate how often certain parts should be replaced, but operators should be aware that all professional chain saws have items such as fuel filters, drive sprockets, clutch drum bearings, etc. that will need to be replaced during the life of the saw. One basic guideline for replacement is that a new bar be accompanied by three new chains and a new drive sprocket, either a rim or spur sprocket depending on the chain saw model; and once all three chains have worn out, all of the items replaced in unison. This ensures that a new chain is not being made inefficient or damaged by running on a worn sprocket or bar, and vice versa. The presence of three chains per

saw also reduces the need for in-field sharpening. This allows the operator to remove the dull chain, and replace it at least twice with the sharp ones remaining in the toolbox before having to field sharpen a chain.

Fuel and lubricants

The use of quality clean fuel of the manufacturers' recommended octane rating along with the proper mixture rate of a quality two cycle mix, typically a 50-to-1 ratio, will help ensure better saw performance. Improper fuel mix rates or dirty fuel may cause issues with the spark arrestor, causing the screen to become blocked with carbon, and not allowing the exhaust to escape freely out of the chain saw's muffler. These screens are usually easily removed and cleaned, and should be checked as a possible cause of decreased saw performance. Additionally, the use of a quality chain saw bar oil of the proper seasonal variety can help minimize many oiler, bar and chain problems created by the use of inappropriate but cheaper alternatives such as regular motor oil. Environmentally friendly bar oils are available, and should be considered for both operator health and environmental reasons. Different models of chain saws will have different lubrication requirements, but operators should be aware of the manufacturers' recommended lubrication needs of both the bar tip sprocket, if present, and the needle bearing at the drive sprocket of their particular model.

Proper tuning

The ability of chain saw operators to adjust their saw's carburetor has been increasingly limited due to air quality issues, and the current amount of adjustment available is fairly small. But for those operators wishing to have some knowledge of carburetor adjustment, a few basic guidelines should be followed. A new saw should not need adjustment until it has been broken in, typically after eight to 10 tanks of fuel. No carburetor adjustments should be made before the chain saw is clean — particularly the air filter — and the saw has been refilled with fresh, clean, properly mixed fuel, as gasoline's octane can degrade over time as it sits, possibly changing the adjustments needed. A properly tuned saw should not show any rotation of the chain while idling,

should idle readily without "bogging" or dying in various cutting positions, should start readily and accelerate without hesitation, and should "4-cycle" or "diesel" a bit at maximum speed. The manufacturer's recommendations for idle and maximum rpm, typically available in the owner's manual or online, should be followed; and can easily be determined through the use of a hand-

will cause the saw to run at excessively high rpm and "whistle" or "scream," possibly damaging the engine. Adjusting it too richly will cause excessive exhaust and a rough-running engine with low chain speed. A correctly adjusted high jet will create a "4-cycling" or "dieseling" sound. Once again, a handheld tachometer can remove the guesswork from determining the correct high-end adjustment.



Photo by Ryan Senechal

Various chain saw maintenance tools and materials, including a "scrench," a flat file, file holder and guide for cutter teeth, a combination depth gauge guide and bar cleaner, and grease for drive sprocket needle bearings.



Photo by Hollywood Neustaeter

An example of what one might discover in removing the side plate cover for cleaning. In this case, it includes evidence of a chap demonstration cut or major twine interaction.

held engine tachometer. The three adjustment possibilities are the low-speed jet, the high-speed jet, and the idling or timing screw. Although the labeling of these may vary with model, the functionality remains the same. A small screwdriver will be required to adjust these jets and screws, and care should be taken not to attempt to adjust them beyond the stops installed by the manufacturer, as damage can occur. The starting point for adjustment of the low and high jets will either be illustrated on the body of the chain saw or at the midpoint between the stops, depending on the saw's manufacturer. Once the saw has been started and warmed up, if any chain movement exists, the timing or idling screw should be turned until the chain stops. The low jet should be adjusted first to correct poor/hesitant acceleration and erratic idling; the timing/idling is then adjusted, if required, to prevent chain movement; and the high jet is adjusted in the final step. The high end affects the power of the saw. Adjusting it too leanly

Chain tension

Improper chain tension can affect chain and sprocket wear, cutting efficiency, and even safety through thrown chains adversely; and thus is a fairly important, yet often debated, feature of chain saw maintenance. As most tree care professionals know, the bar — when mounted on the saw — has a certain amount of "play" in it. This phenomenon is of particular importance when adjusting chain tension, as the bar must be in the "up" position to assure the correct tension. Those who have struggled, particularly with larger saws, to adjust the tension by themselves may appreciate the following technique:

With the bar nuts already loosened for chain adjustment, simply turn the chain saw on its top, taking care that the chain brake does not engage, and let gravity do the work of holding the bar in the "up," now "down," position. By increasing tension until the tie straps of the chain contact the bar, then giving the adjustment screw another quarter turn, proper chain tension is quickly and easily achieved. The bar nuts should then be tightened prior to restoring the chain saw to an upright position.

Chain saw maintenance is a vast topic, one that has only been lightly scratched on the surface here. Yet, by following these few basic guidelines and techniques, most chain saw operators should find their frustration levels, saw downtime, and blood pressure reduced at least slightly, while their cutting efficiency and safety increases. **A!**

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