



Pacific Crest Trail Association



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Association

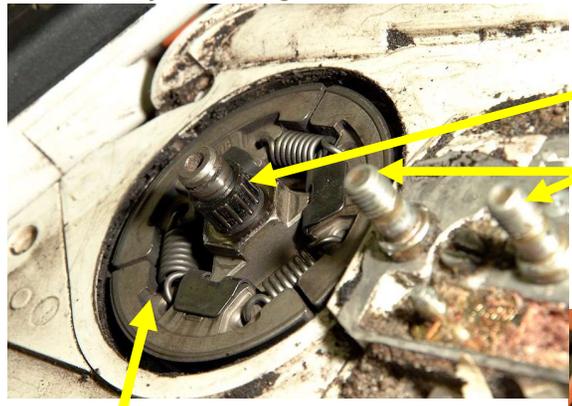
# Additional Chain Saw Maintenance & Chain Filing





# Sprocket & Clutch Cover

Clutch and flywheel bearings

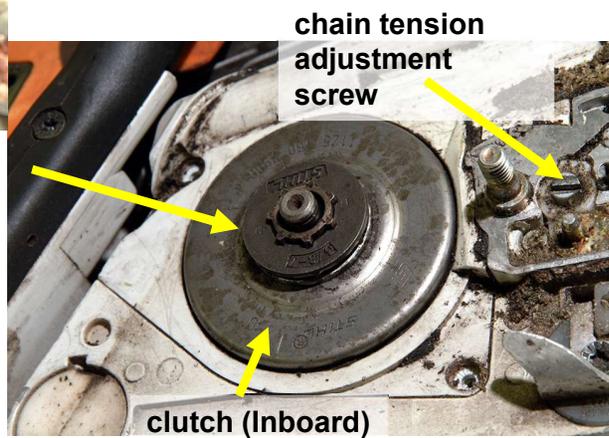


needle bearings  
bar studs

clutch assembly  
(clutch cup removed)

drive sprocket  
(rim sprocket shown – sprocket pitch must match chain pitch)

(Wildland Fire Chain Saws, S-212, National Wildfire Coordinating Group)



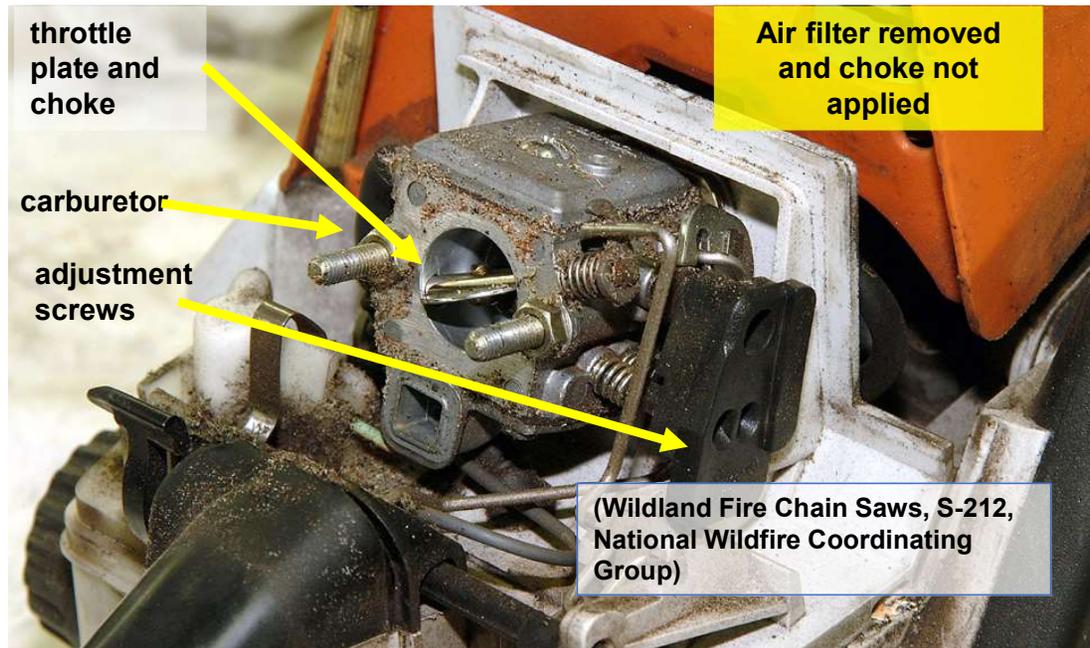
chain tension adjustment screw

clutch (Inboard)



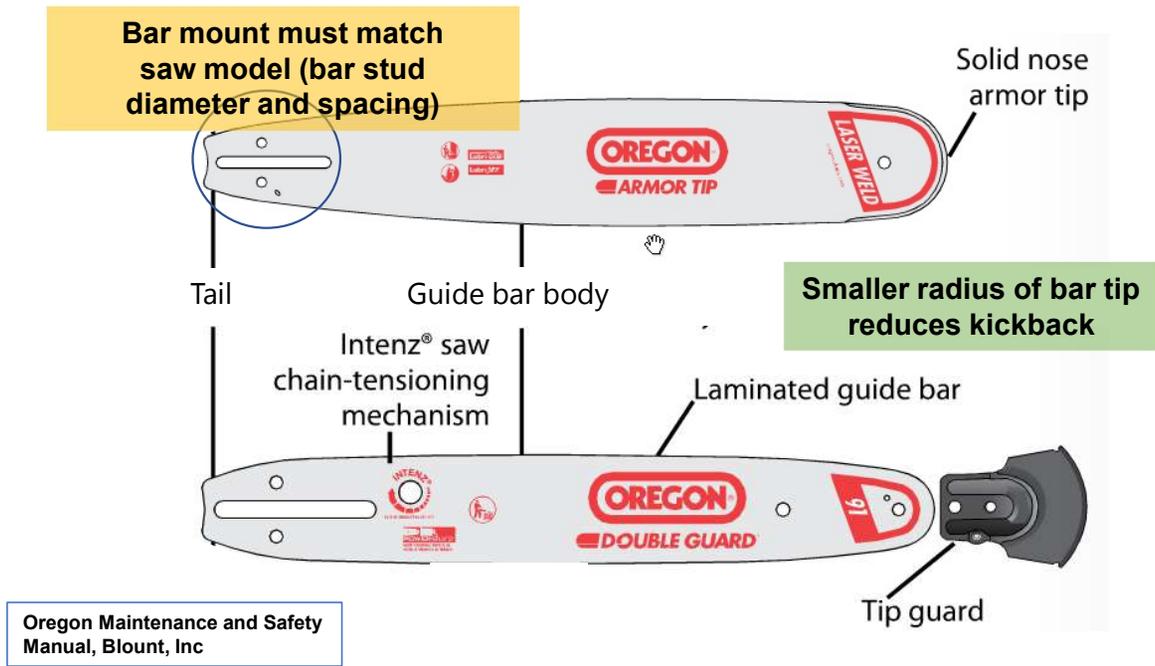


# Carburetor





# Saw Bar Terms





## Types of Saw Chain

Semi-Chisel	
	
Chisel	
	

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Manual, Blount, Inc

- More durable in dirty conditions
- Becoming less common to find
- Available in square ground and round ground
- Round ground easier to file in the field with round file
- Square ground cuts faster, but harder to file



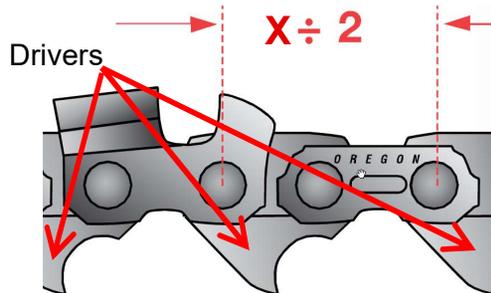


# Types of Saw Chain

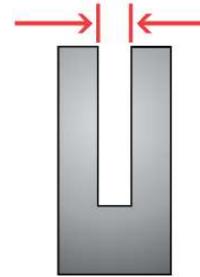
## Pitch

Pitch = (Distance of Drivers) / 2  
Standard Pitches: 0.325" & 3/8"

Chain length determined by  
number of drivers



## Gauge



Width of groove in Bar  
Standard Gauges:  
0.050" (1.3 mm), 0.058"  
(1.5 mm) & 0.063" (1.6 mm)

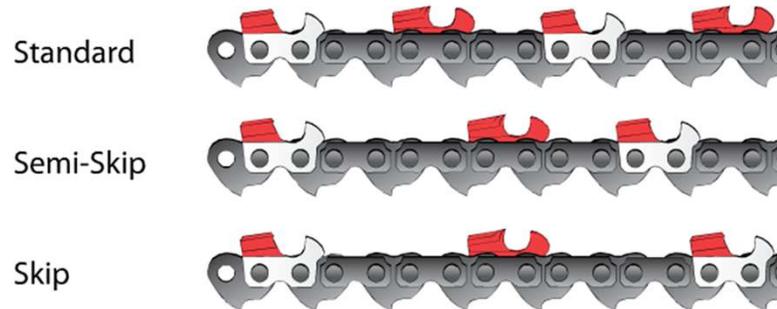
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## Types of Saw Chain

### Saw Chain Cutter Sequence Terms



- Standard chain (or Full Comp) recommended up to 24" bars
- Skip chains recommended for 28" bars and longer, especially when cutting softer wood (more room for chips)

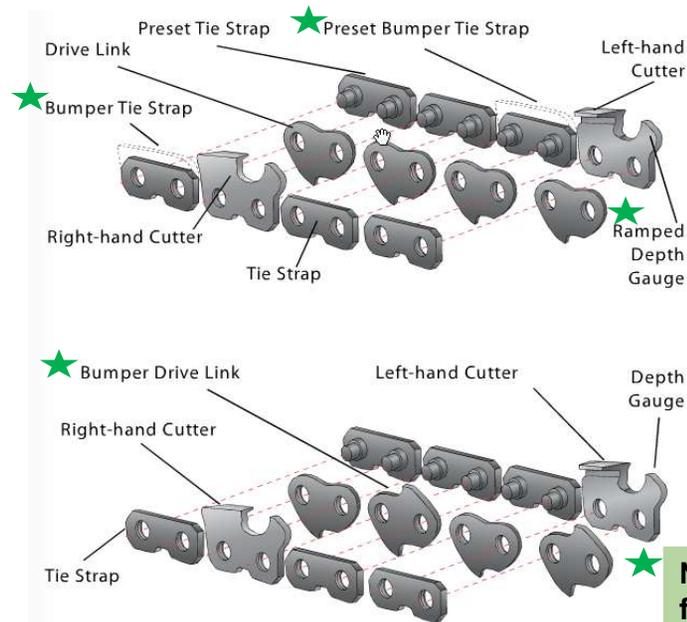
**Caution:** Skip Chains are not recommended for brushing with higher kickback potential and harsh operation, due to wide tooth spacing

Oregon Maintenance and Safety Manual,  
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# Saw Chain



Tie Straps and Cutters held together with rivets

★ Note: These parts of a chain are features that can reduce kickback

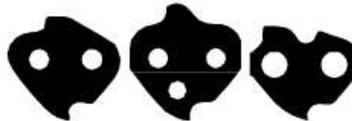
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# Low Kickback Saw Chain

Bumper Drive Links



Ramped Depth Gauge



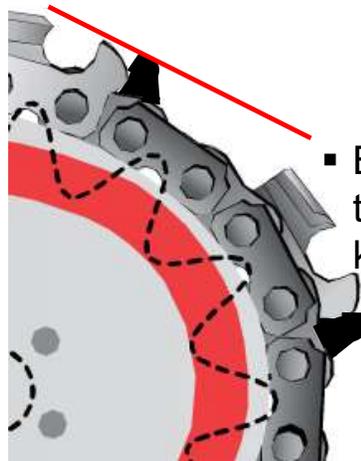
Bumper Tie Straps



Low Profile Ramped Depth Gauge



Wide-Track Vanguard™ Depth Gauge



- Bumpers increase raker height as tooth passes thru bar tip, reducing kickback potential
- Most low kickback chains do not allow for boring into wood

These parts of a chain are features that can reduce kick back of the chain

Low kickback chain often designated by a green drive link or green label on box

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# Low Kickback Saw Chain



**Green** = Safety chain, low kickback

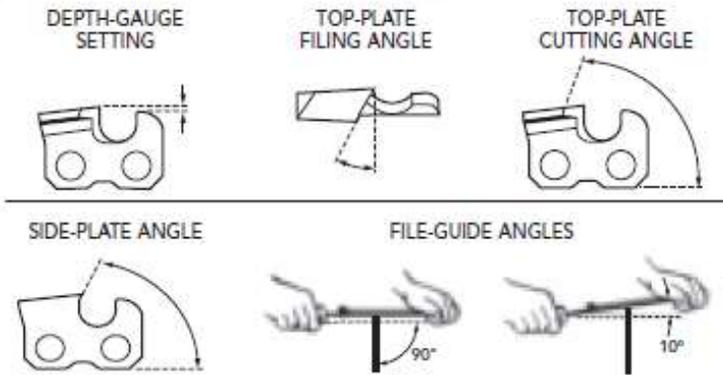
**Yellow** = Professional chain





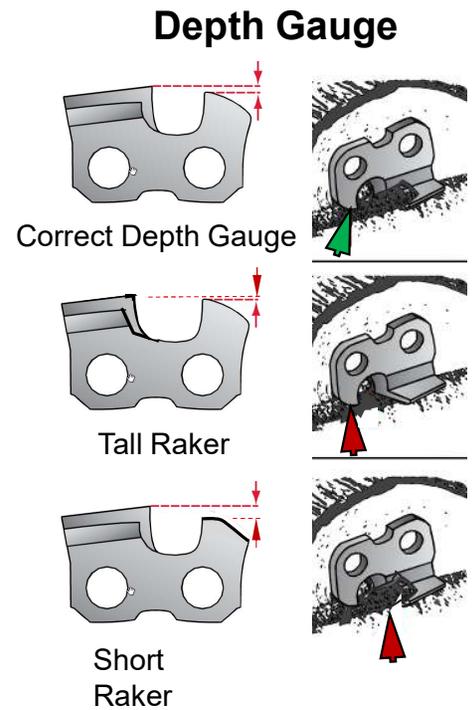
# Saw Cutter

## CUTTER MAINTENANCE TERMS



- Correct raker height is key for cutting performance and safety
- Tall raker will not cut wood
- Short raker has higher kickback potential due to aggressive cut

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## Filing a Chain Saw

- **Square ground chains can be filed with a double bevel flat file, 3 corner file, or a square grinding wheel**
- **Requires specialized equipment and requires advanced filing technique**
- **Round ground chains can be hand filed in the field using a round file with the diameter specified by the chain manufacturer**
- **File guides allow for precise control of height of file in the cutter tooth and also filing angle – some include raker files**
- **Bar mounted file guides allow for more precise hand filing**
- **Round wheel grinders are also available for high volume chain sharpening**





## Filing Tools



Round file, raker file,  
depth gauge, roller guide,  
file guide, file guide with  
raker file (single & dual side)



Bar mount file guide



Stump vise





# File Instruction

**Wear Indicator**

**File Information on Chain Box**

			A	B	D		
ROUND GROUND CHISEL	33-34-35SL	11/64"	4.5 mm	25°	10"	0.025"	65 mm
	72-73-75V	7/32"	5.5 mm	25°	10"	0.025"	65 mm
CHAMFER CHISEL™	905G (H)	1/16"	4.5 mm	30°	0"	0.025"	65 mm
	91VG, 91P, 91PX	5/32"	4.0 mm	30°	0"	0.025"	65 mm
MICRO CHISEL	95VPX (H)	1/16"	4.8 mm	30°	10"	0.025"	65 mm
	95V (H)	5/16"	8.0 mm	30°	10"	0.025"	65 mm

\* When using an OREGON® Filing Guide, ALWAYS add 1/2 level, 0", flat on the top plate.

**Depth Gauge**

**File Diameter**

**Top Plate File Angle**





## Filing Technique

- **MUST match file technique to the chain manufacturer instructions and guidelines:**
  - File Diameter
  - File Angles
  - Raker Depth
  - File Depth
  - Cutter Angle
  - File Guide
- **Only file in the direction, from the inside to the outside, and only file cutters on one side, then switch to other side**
- **File cutters that are accessible, then roll chain forward to reveal unfiled cutters**
- **Ensure bar is supported when filing – use vise when possible, use kept in log, or control with spare hand**
- **Increase the tension on the chain to improve control to restrain each too then filing**





## Filing Technique

- Always match the angle of the file to the recommended top-plate filing angle, use the marked angles in the file guide aligned to the bar, as an aid
- Top-plate file angle is usually 25° or 30°
- The top-plate and side plate cutting angles are reference, very difficult to measure, and are achieved when following the recommended filing guidelines
- When hand filing, the file guide is held 90° to the bar
- Throw away chain when filed down to the wear indicators on the cutter
- **ALWAYS WEAR CUT-RESISTANT GLOVES** when filing and handling chain





# Filing Technique

## Videos (online only)

### Stihl Chain Saw Maintenance and Operation, Chapter 3

<https://www.youtube.com/watch?v=qvcCh2XqEPc>

### Husqvarna Chain Saw How to Use Videos, Getting Started 6

<http://www.husqvarna.com/us/support/how-to-videos/chain-saw-videos-how-to-use/>





## Filing Technique

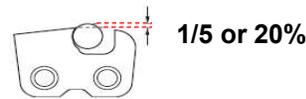
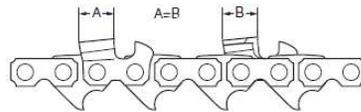
- **Match file technique to type of file guide used:**
  - ▶ Free hand: use slight rotation of file, rotate upwards along the cutter, to help keep the proper file height
  - ▶ Roller guide: ensure guide sits on tie straps, with correct orientation, so the roller angle matches the top plate angle (high end of guide towards power head). File in direction of arrow on the guide
  - ▶ File guide: Ensure file guide sits on both top plate and raker (usually at 90° to bar, per instructions)
  - ▶ File guide with raker file: File only in the proper direction to match side of cutters. Follow instructions. Does not work with skip chains



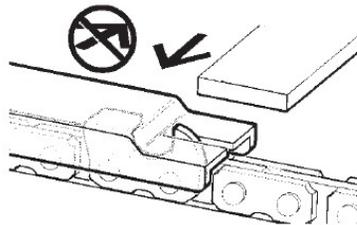


# Filing Technique

- Ensure cutters are filed to the same length with proper file height



- Repair any damaged cutting surfaces during filing
- Check raker depth using depth gauge and file with raker file to required height



- Use proper depth gauge, ensure it rests on all the cutters
- Only file inside to outside
- Use raker file with no teeth on edges
- Dress to round off sharp corner of raker





## Transportation & Storage

- **Long-term Storage – End of season**
  - ▶ Drain fuel tank
  - ▶ Run the chain saw at idle to use remaining fuel
  - ▶ Open tank and let evaporate
  - ▶ If possible, remove bar and chain and hang in safe location
  - ▶ Consolidate fuel and store in safe location
    - *Note: Fuel and fuel-mixes diminish over time and should be recycled if stored for more than a few months*

[Link: Back to chain saw specific training](#)

