



# Chainsaw Safety Level 2

**Education. Empowerment. Leadership.**

**WTCW.org**

*Arborists, Practitioners & Passionate Educators*

# Chainsaw Safety Course Layout

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This class will cover chainsaw safety in a classroom, interactive setting in the morning. We will break for a brief lunch and then continue education outdoors with hands-on chainsaw operation.

Your instructor/s will have cutting stations that you will rotate through using Husqvarna & other brands of chainsaws of different sizes & fuel types.

Attendees will practice cutting techniques while receiving real-time constructive positive feedback.

## Topics you will learn:

- Safety Features of a Chainsaw
- PPE & Why
- First Aid
- Starting Procedures
- Operator Ergonomics
- Reactive Forces
- Cutting & Wedges



Sponsored By:



**SLIDES** are available upon request

*\*please - you shall not use without permission :)*





# CHAINSAW SAFETY

## REFRESHERS



Safety  
Statistics



OSHA &  
ANSI



PPE



Chainsaw  
Anatomy



Maintenance  
& Tools



# General Chainsaw Info

- Chain Speed ~ 68 MPH
- RPMs – 15,000
- 600 teeth per second pass any one point on the bar
- The muffler ~ 900° F
- Average Chainsaw Cut – 110 stitches



# Chainsaw Statistics





From 2010 to 2019,

**282,000  
EMERGENCY  
HOSPITAL VISITS**

related to chainsaw accidents were recorded.

## DIY-er's Statistics

- **40,000** are injured annually
- **28,000** visit hospitals a year
- **70 people are killed**

***Hand & leg lacerations, amputations, burns & fractures***



# TYPES of INJURIES

**Contact** with a **moving chain** accounts for **85%** of injuries to chainsaw operators

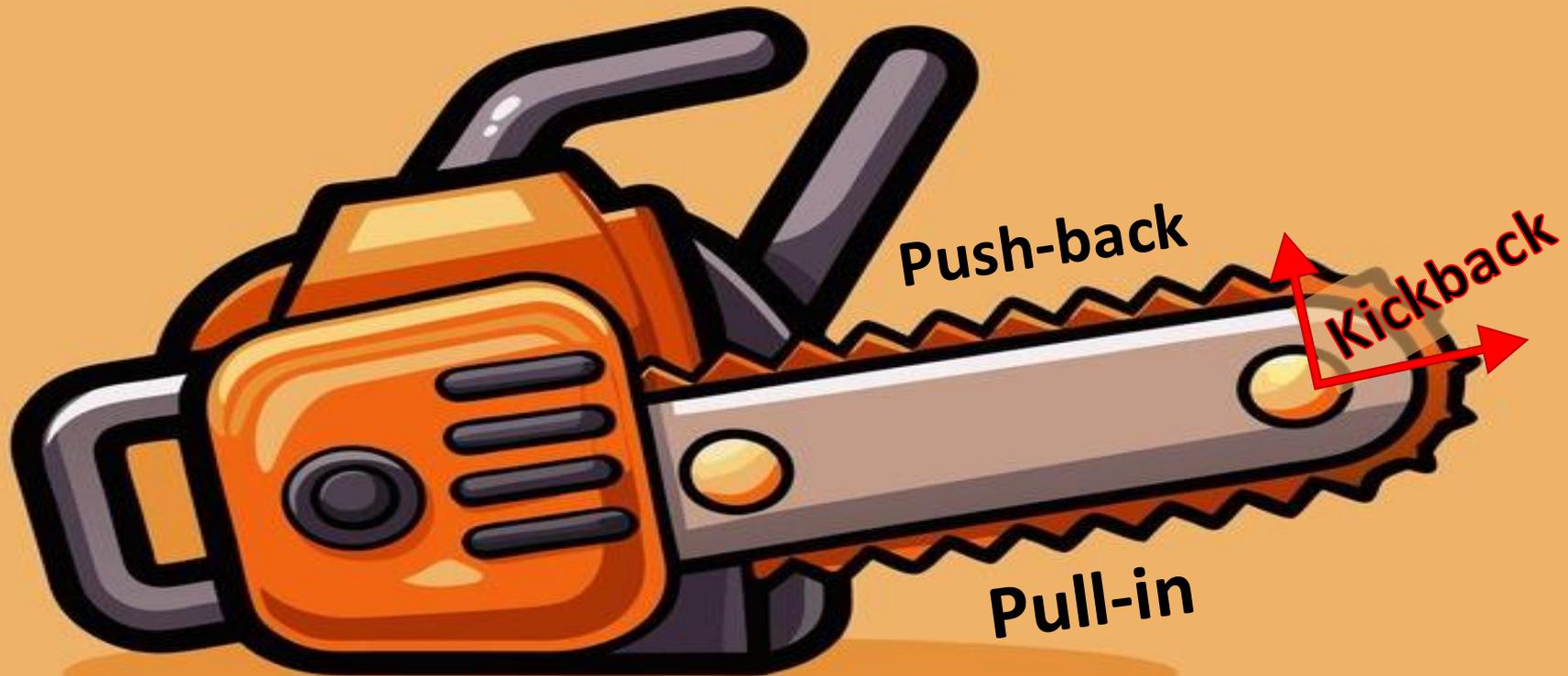
*The most serious accidents involving the moving chain result from kickback.*

*U.S. Consumer Product Safety Commission—University of Minnesota Extension Service*



# CHAINSAW FORCES CAUSING INJURY

The most common hazards associated with chainsaws are injuries caused by:



# STITCHES... cost to you

The average **chainsaw injury**  
requires **110 stitches**

**2024** = average person's medical cost  
~ **\$10,000**

*Credit: CDC*



# WARNING



**110**  
**Stitches**  
*per*  
**SECOND**

---





# PPE

# Using a Chainsaw



# COMMON CHAINSAW INJURIES

## LOCATIONS ON THE BODY

*WHY these locations?*

Accident location and frequency as related to chain saw use. Total for 2004: 32,436

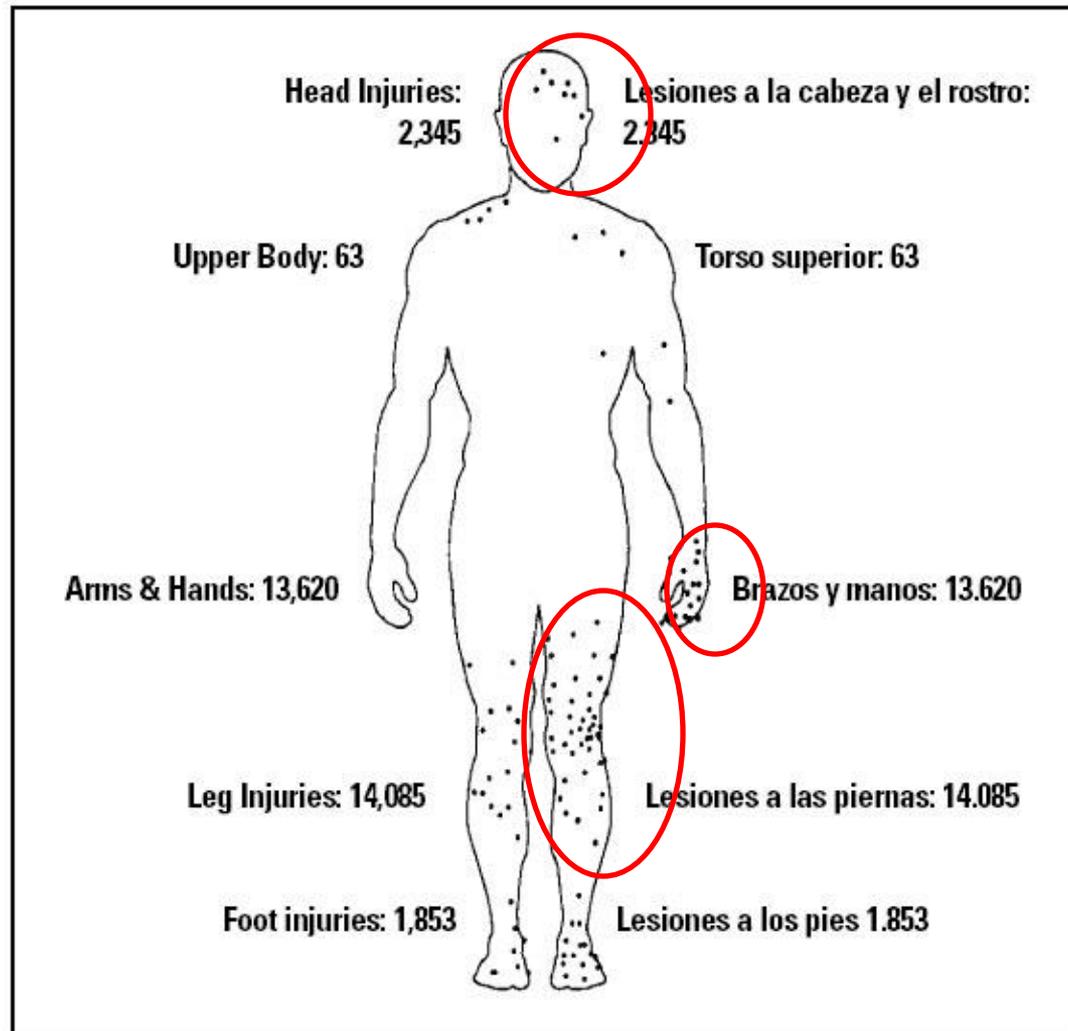
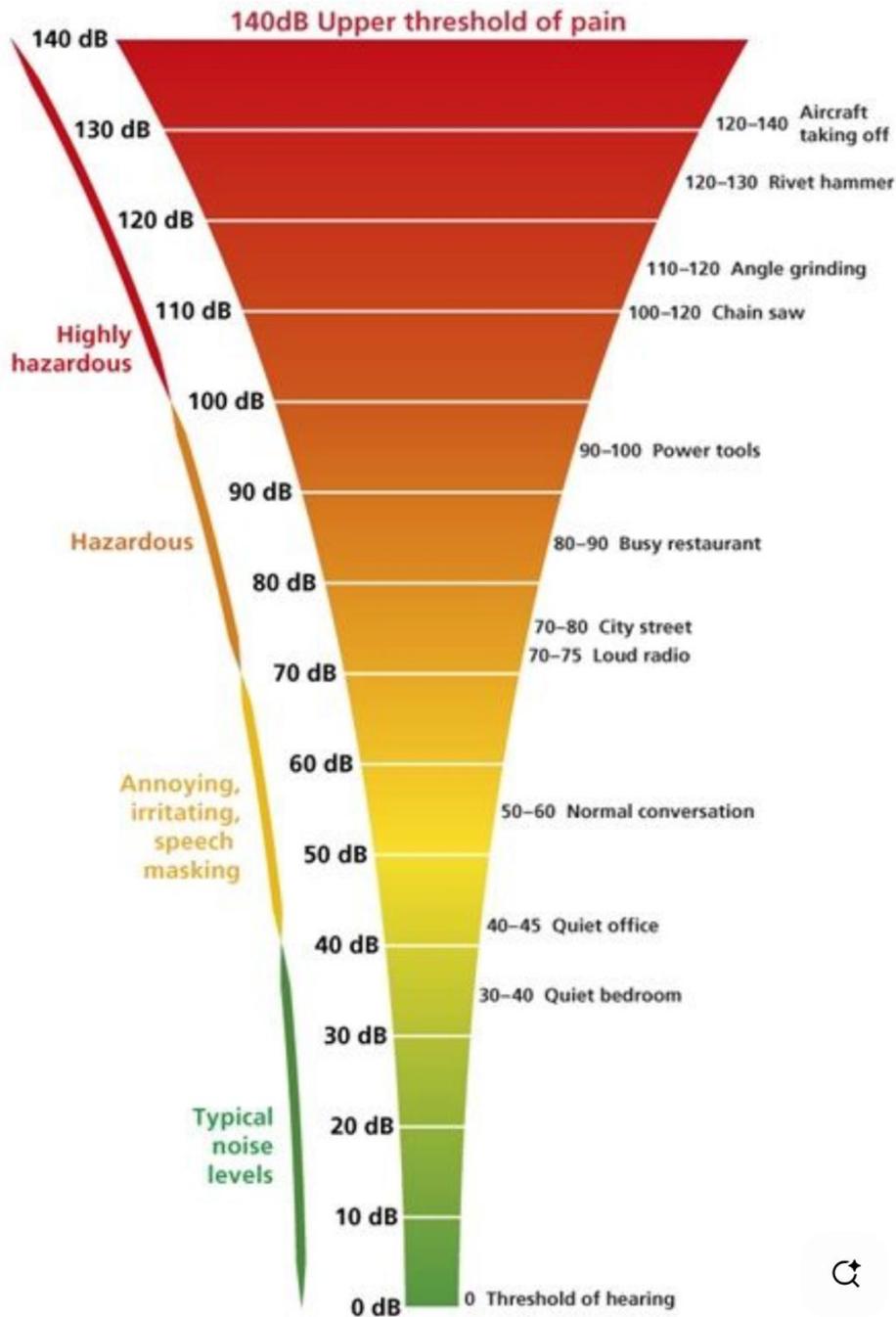


Chart developed by Gransfors Bruks based on 2004 statistics provided by U.S. Consumer Products Safety Commission

Tabla desarrollada por Gränsfors Bruks según las estadísticas de 2004 de la Comisión de Seguridad de Productos de Consumo de EE.UU.

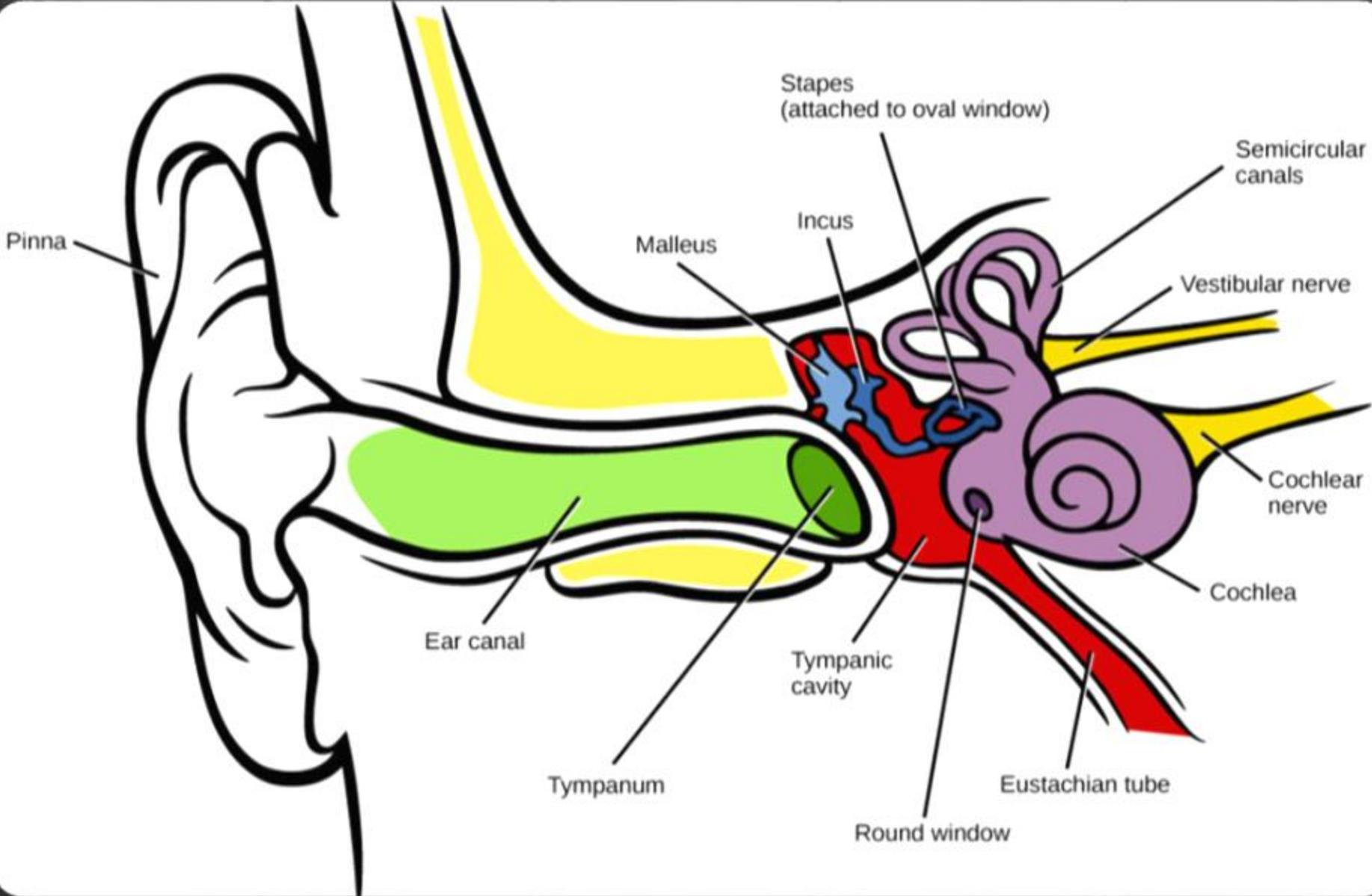
Education. Empowerment. Leadership.





# EARS





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Round window

Unknown



# ANSI Standards - PPE



## EYES

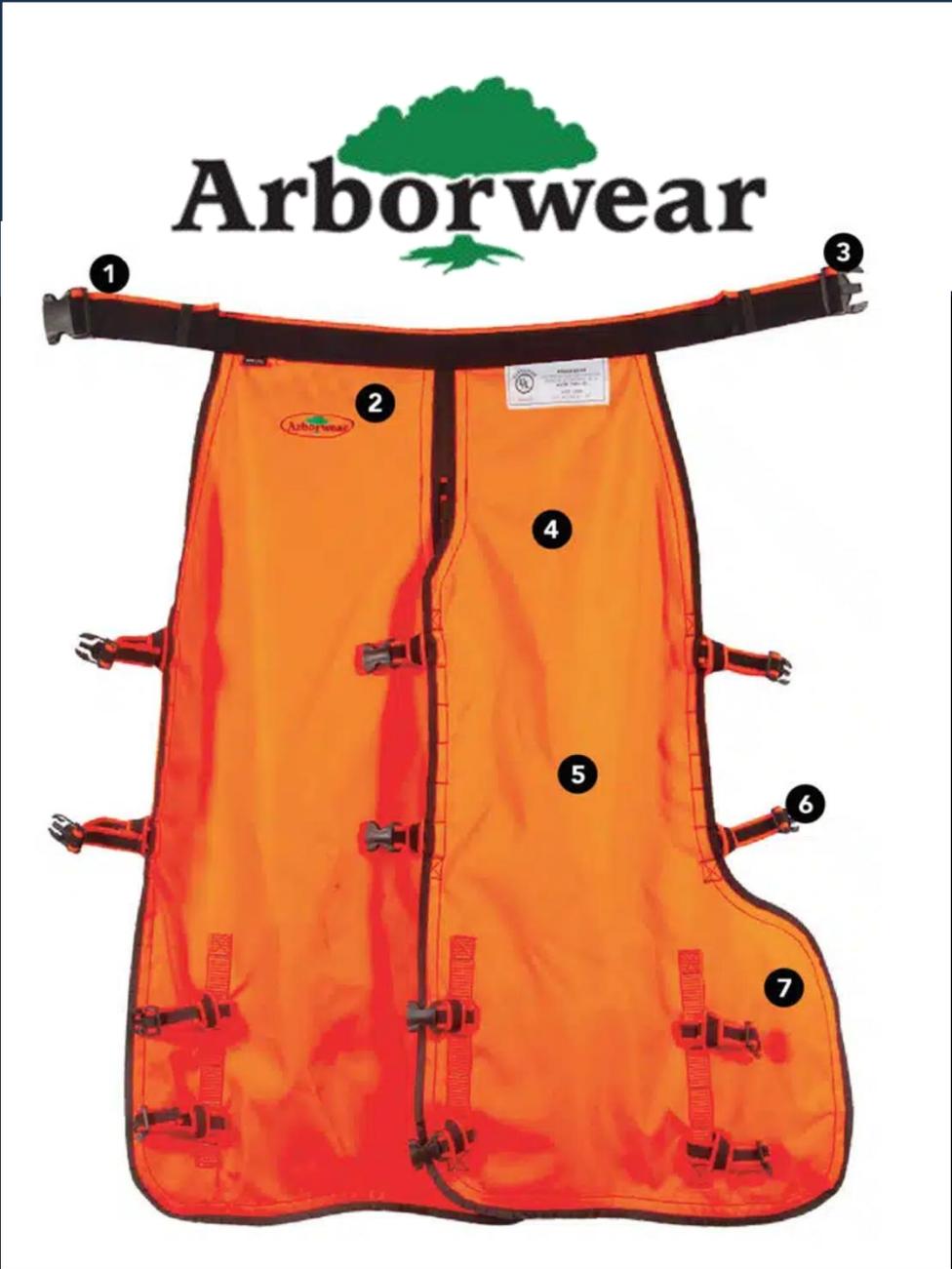
### 3.3.6

- Arborists engaged in arboricultural operations **shall** wear **eye protection** that conforms to ANSI Z87.1



# Leg Protection

# Chaps



# Leg Protection

EN STANDARDS  
& UL LISTED

## EN Standards

Chainsaw trousers sold in Europe must adhere to the EN ISO 11393. Trousers are tested extensively to ensure they meet this standard.

This standard splits chainsaw trousers into four classes (covering chainsaw speed) and two types (covering the extent of protection.)

The four classes and two types are as follows:

- Class 0: 16 m/s
  - Class 1: 20 m/s
  - Class 2: 24 m/s
  - Class 3: 28 m/s
- 
- Type A: Protection to the front of the legs.
  - Type B: Chap design. Protection to the front of the legs
  - Type C: Full protection to the front and back of the legs.

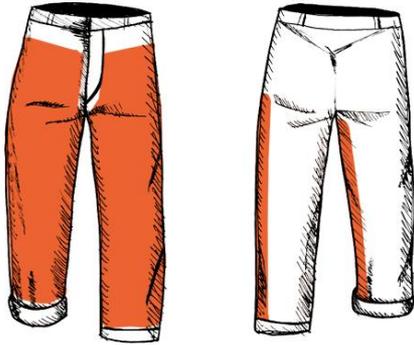
# M/S?

For example: Class 1 Type C pairs of trousers must be able to protect against a 20 m/s chainsaw to the front and back of the legs.

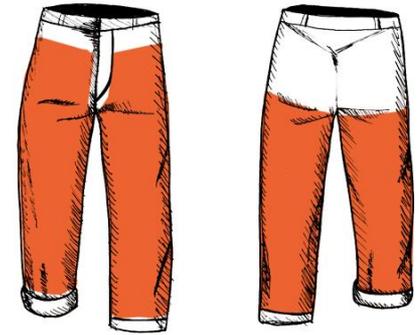
# Leg Protection

EN STANDARDS  
& UL LISTED

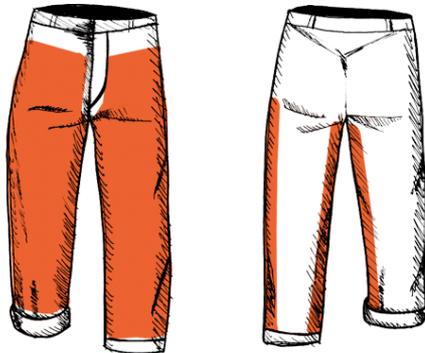
Type A



Type C



Type B



Type B is identical to type A, but has an extra 5 cm of protection to the interior part of the left leg.

# Leg Protection

## EN STANDARDS & UL LISTED

### **UL Standards**

Chainsaw trousers sold in the USA must be certified by UL to ASTM F1897-14.

UL only makes a distinction between chainsaw trousers and chainsaw chaps. Both of these garments protect the front of the legs with the trousers including a 100mm wrapping around the left of each leg.

UL certified trousers also have a large tag on the back clearly marking it as such.

### **The Differences**

The most obvious difference between these two standards is the extent of options customers can consider. European customers are able to choose the design that best suits them from a variety of options.

The UL standards are more straightforward, offering two similar options for chainsaw protection.

There are a few differences regarding the testing methods used in each standard. Aspects such as drive units, number of tests and the material the test is performed on varies slightly.

Because of the differences in power, fixing methods, size of chains and angle of cuts, users should not assume that a garment is fit for use just because it passed another standard. An American user should not use trousers that have passed EN standards and not UL.



# Leg Protection Pants



**Dogwood**  
\$290 - \$310



**Ironwood**  
\$320 - \$350



# FEET

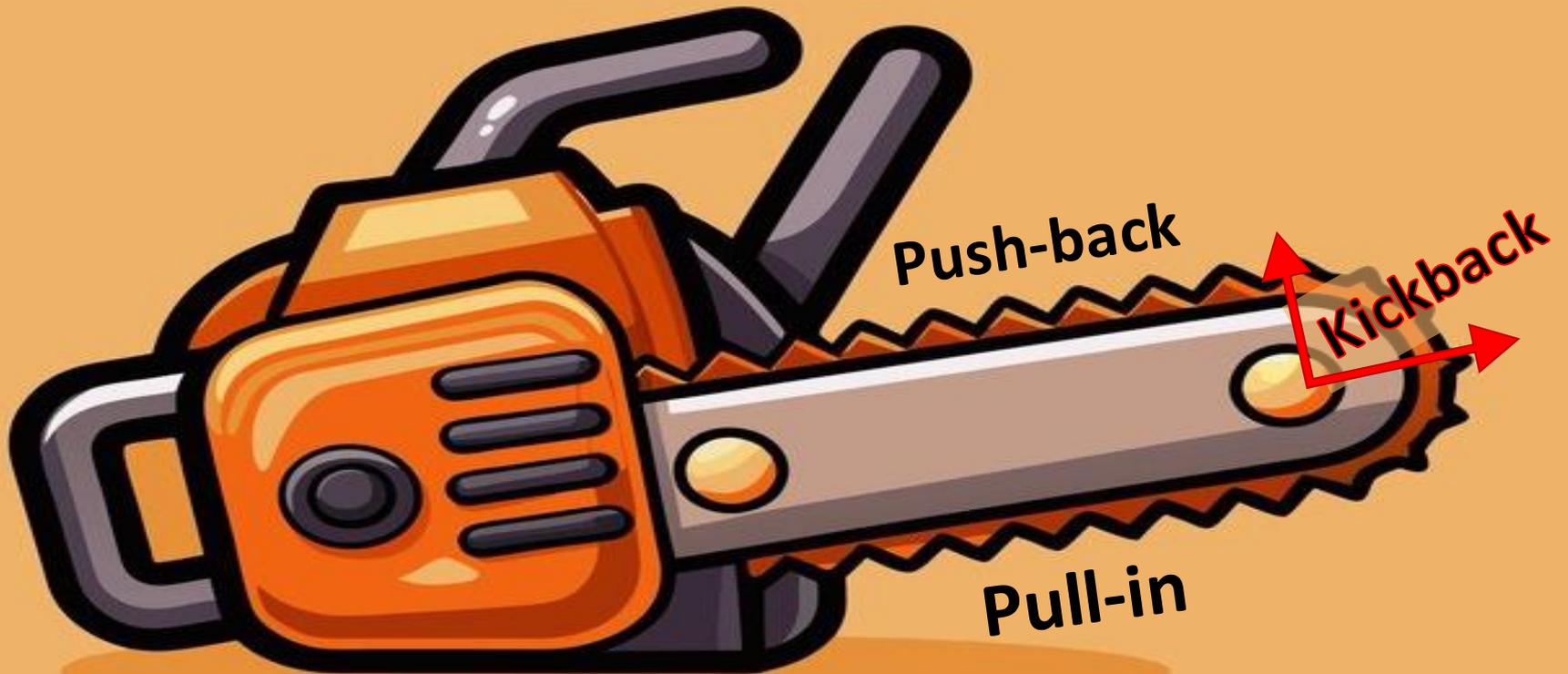
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HAIX - ARBORTEC - HUSQVARNA - STILL - \* MORE

# CHAINS SAW FORCES



# Forces of a Chainsaw

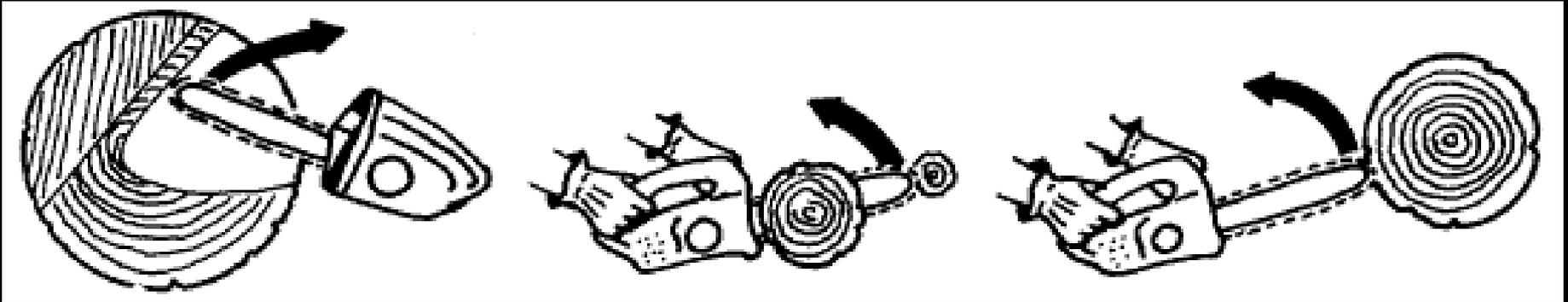


# KICK BACK

- Happens 7x faster than your **brain** reacts
- Bar travels 90 degrees in 3/10ths of a second
- 300 - 400" pounds per second
- Chain brake needs to work in 1/10<sup>th</sup> of a second to be effective



# KICK BACK FORCES



**The result often throws the bar and chain backwards and/or upwards towards the user in a violent release of energy.**



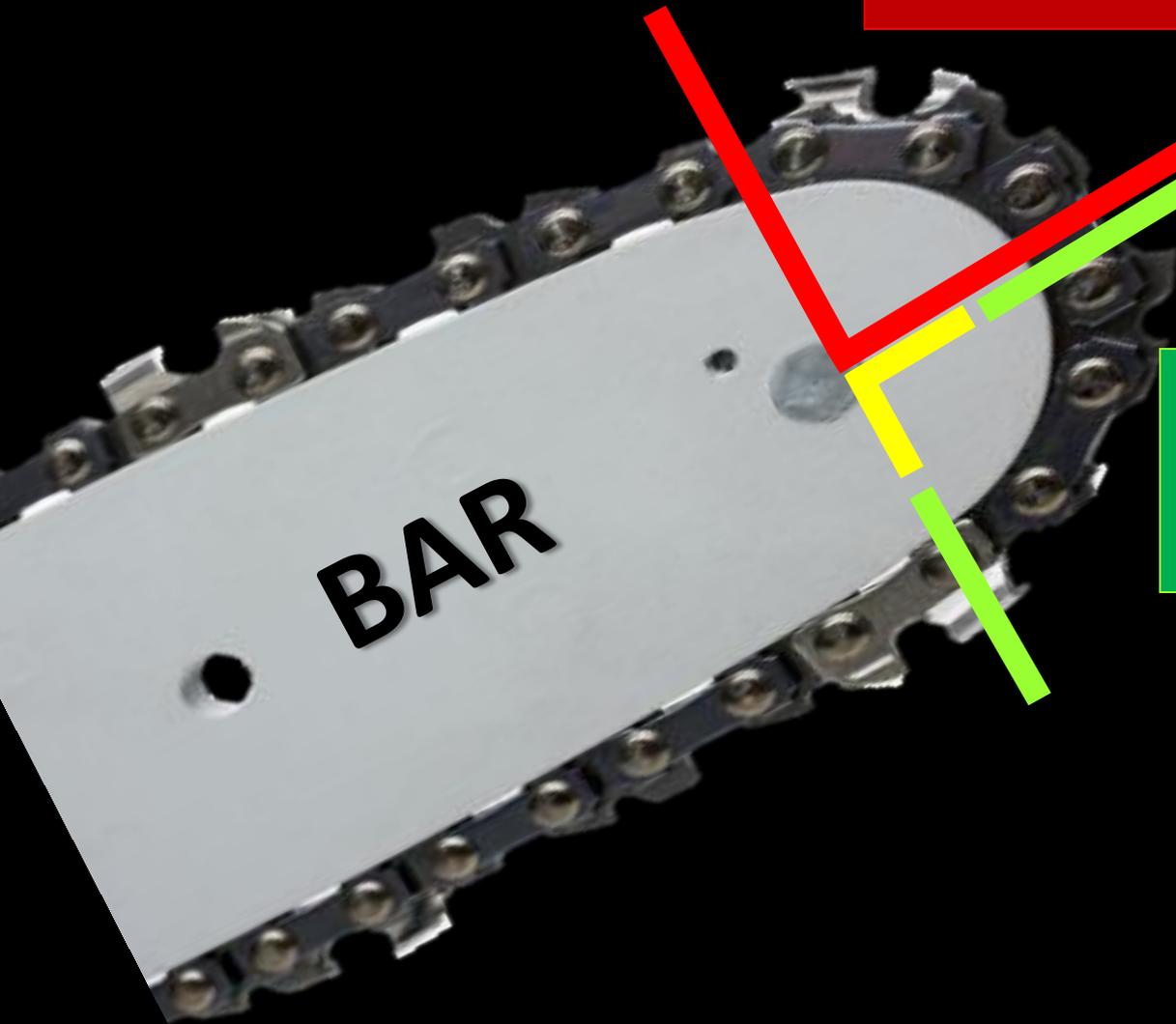
# KICK BACK OCCURS WHEN

1. Chain tooth near the nose or tip of the bar catches on wood without cutting through it, or
2. When a piece of wood closes in and pinches the chainsaw chain.



**KICKBACK** or  
**“NO” Zone**

**NO**



**GO**

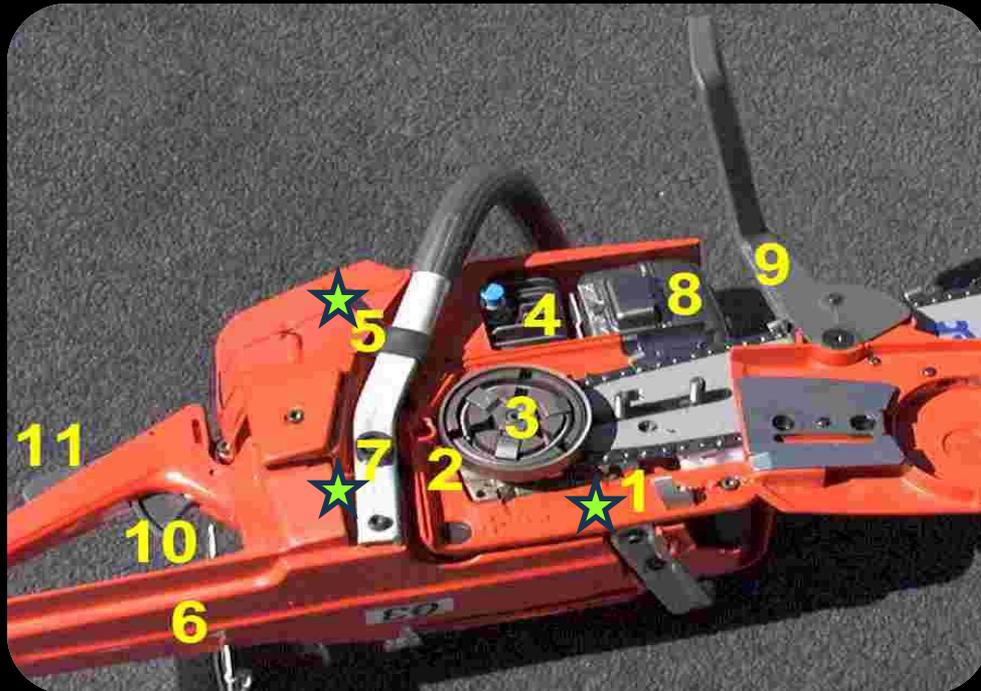
**Attack or  
GO Zone**



# Chainsaw Anatomy & Safety Features *Gas*



## \*Denotes Safety Features

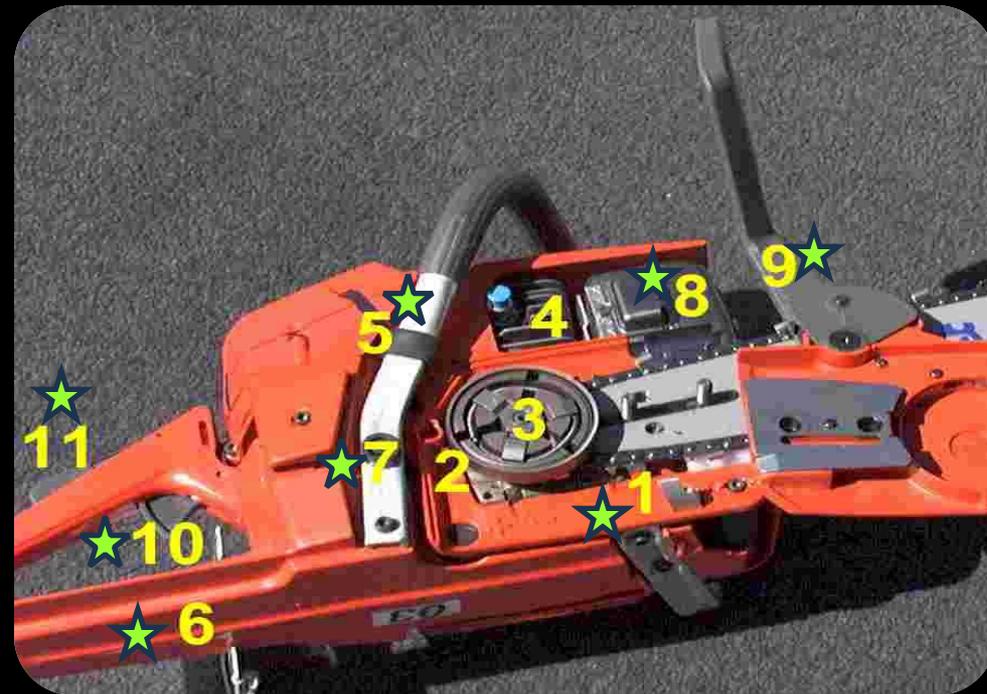


## \*On/Off Switch

1. **\*Chain catcher** to prevent a broken or dislodged chain from striking the logger.
2. Flywheel
3. Clutch (*outboard or inboard*)
4. Decompression valve
5. & 7. **\*Anti-vibration handle system** is recommended by OSHA to limit ergonomic stress to the logger's joints

2.





**\*Inertia Chain Brake - Inside saw**

6. **\*Rear Handguard**
7. **\*Anti vibration handle**
8. **\*Muffler** dampens noise & emissions
9. **\*Chain brakes** (manual & inertia) to stop the chain if kickback occurs, *after February 9, 1995*
10. **\*Throttle** which will stop the chain when pressure on the throttle is released.
11. **\*Inter Throttlelock** which prevents the throttle from activating until the interlock is depressed.

**\*Scabbard**

**\*Spark Arrester**



# Chainsaw Anatomy & Safety Features *Battery*



# Safety Features of a Chainsaw



# C O S M I C S T A R<sup>TM</sup>



**C** hain Catcher

**O** n/Off Switch

**S** cabbard

**M** uffler

**I** nter-throttle lock

**C** hain Brakes - Manual & Inertia

**S** park Arrester

**T** hrottle

**A** nti-vibration Handle

**R** ear Handguard



# So now, do you have the following?

## Tools

- First Aid Kit
- Maintenance kit
- Sharpening tools
- Gas can *or* Charging station
- Bar oil
- Axe
- Peavy
- Wedges





# STOP THE BLEED®

## BASIC KIT

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 curaplex®

It is sterilized and tamper-proofed.

Item # 8600-STB001B

- 1 Permanent marker
- 1 Pair of gloves, latex-free, LG
- 1 C-A-T® tourniquet
- 1 Emergency bandage
- 1 Pair of trauma shears, 7.5"
- 2 Rolls of primed, compressed gauze dressing





# Necessary Tools



# NECESSARY TOOLS

- First Aid Kit(s)
- Mixed gas & oil
  - *Properly mixed*
  - *Proper container*
- Bar oil
- Felling wedges
- Tools – peavy, axe, etc.



# After you bought your chainsaw...

- Maintenance
- What have you done?
- What now...

**Let's Do!**



# Chainsaw Maintenance

## What to look for

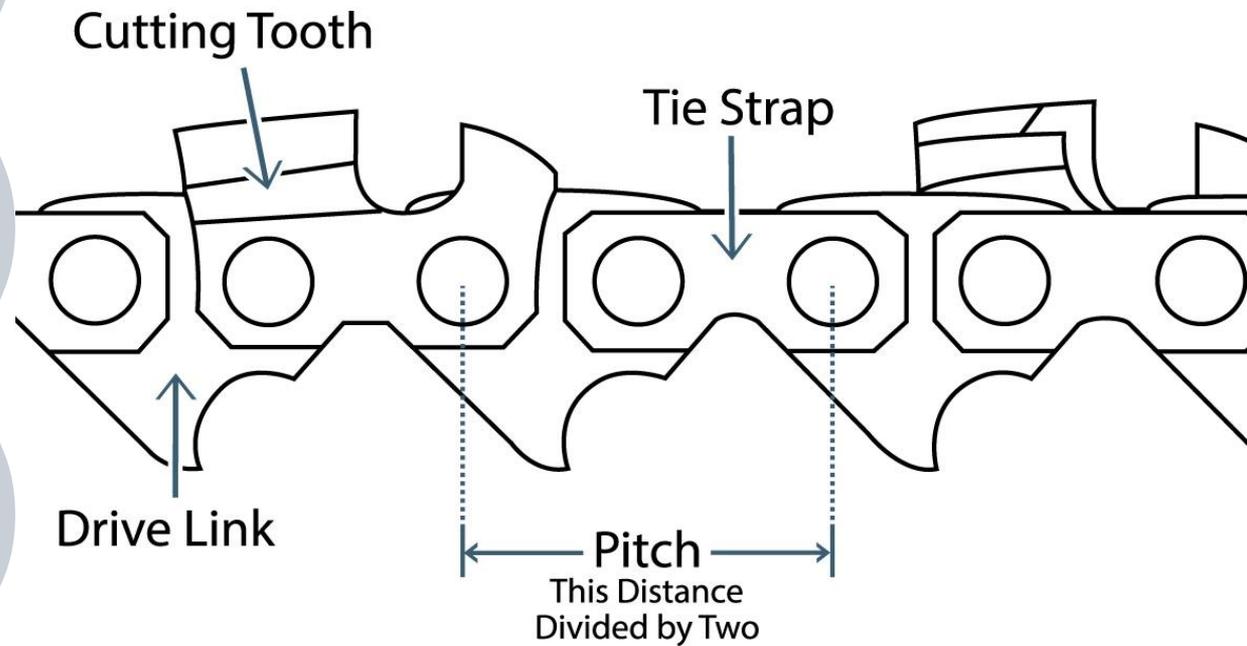
- Read Owner's Manual
- No loose bolts or parts
- Clean air filter
- Clean spark plug
- All safety features are present & work
- Chain and Bar wear & tensioned correctly
- Bar lubrication system works
- Appearance of drive sprocket



# Chainsaw Tooth Anatomy



# CHAINSAW CHAIN Anatomy



Filing Angle

Witness Mark  
(Not on all Cutters)

Top Plate

Cutting Corner

Side Plate

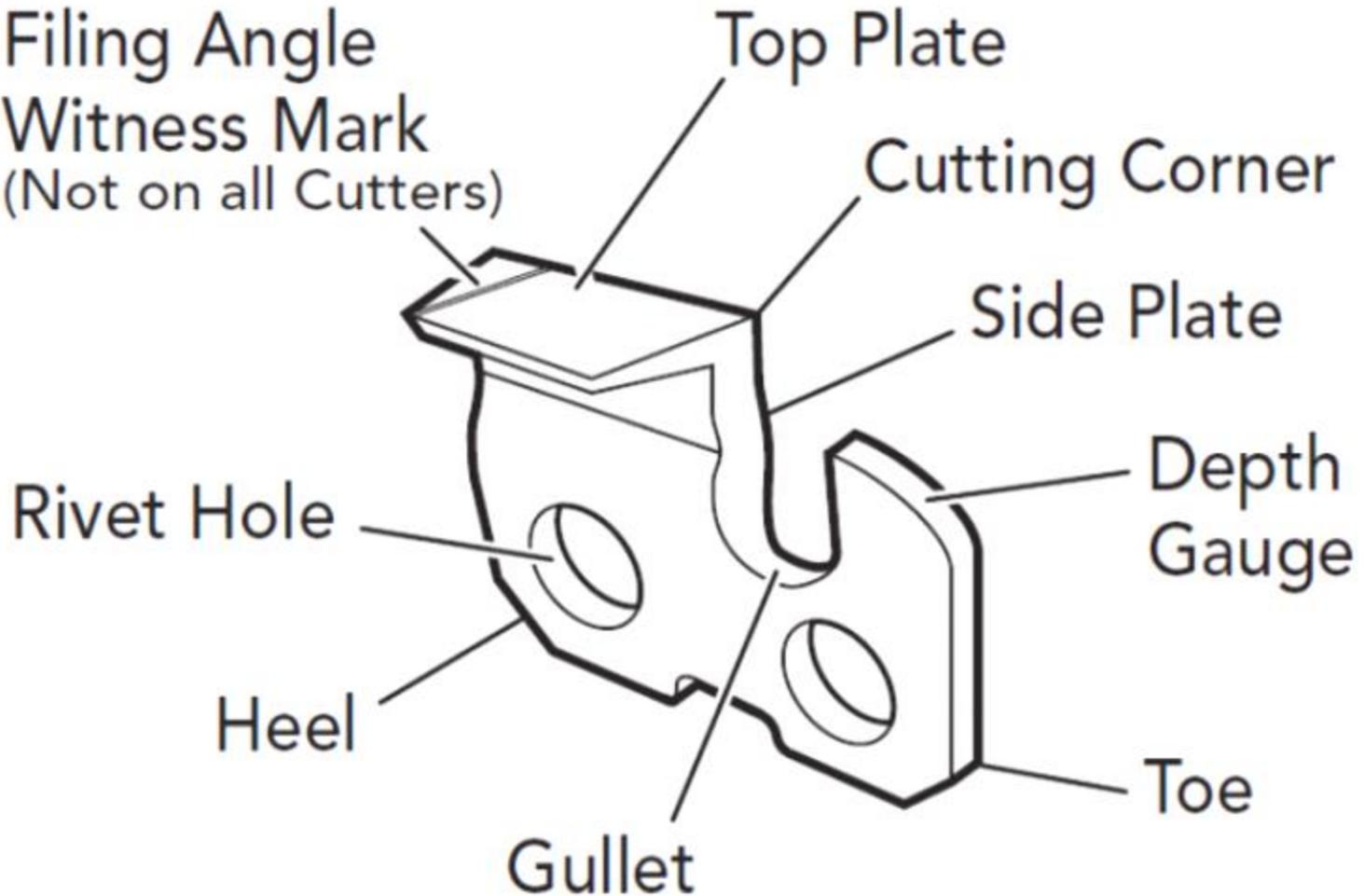
Rivet Hole

Depth Gauge

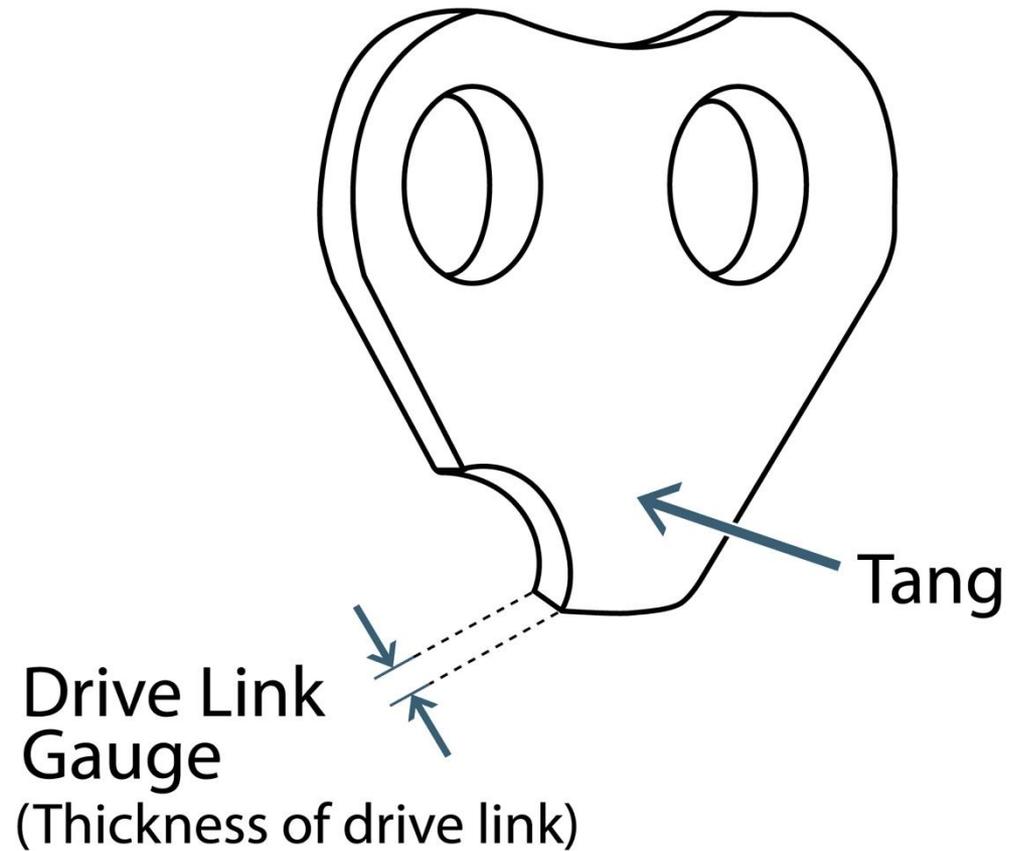
Heel

Toe

Gullet



# CHAINSAW Drive Link



# Chainsaw Tooth

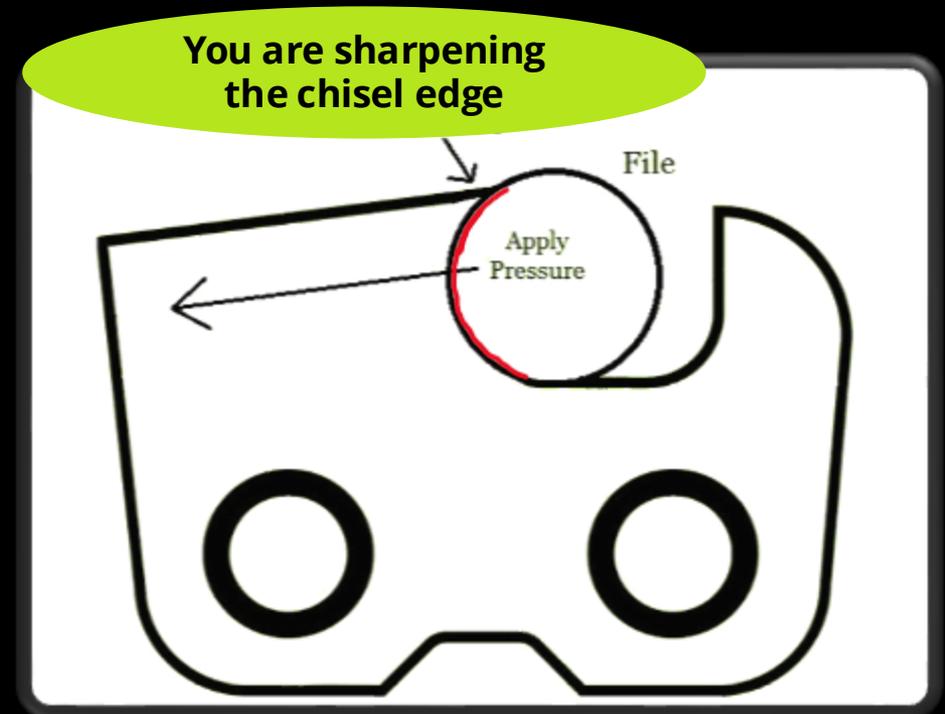
## Sharpen your saw



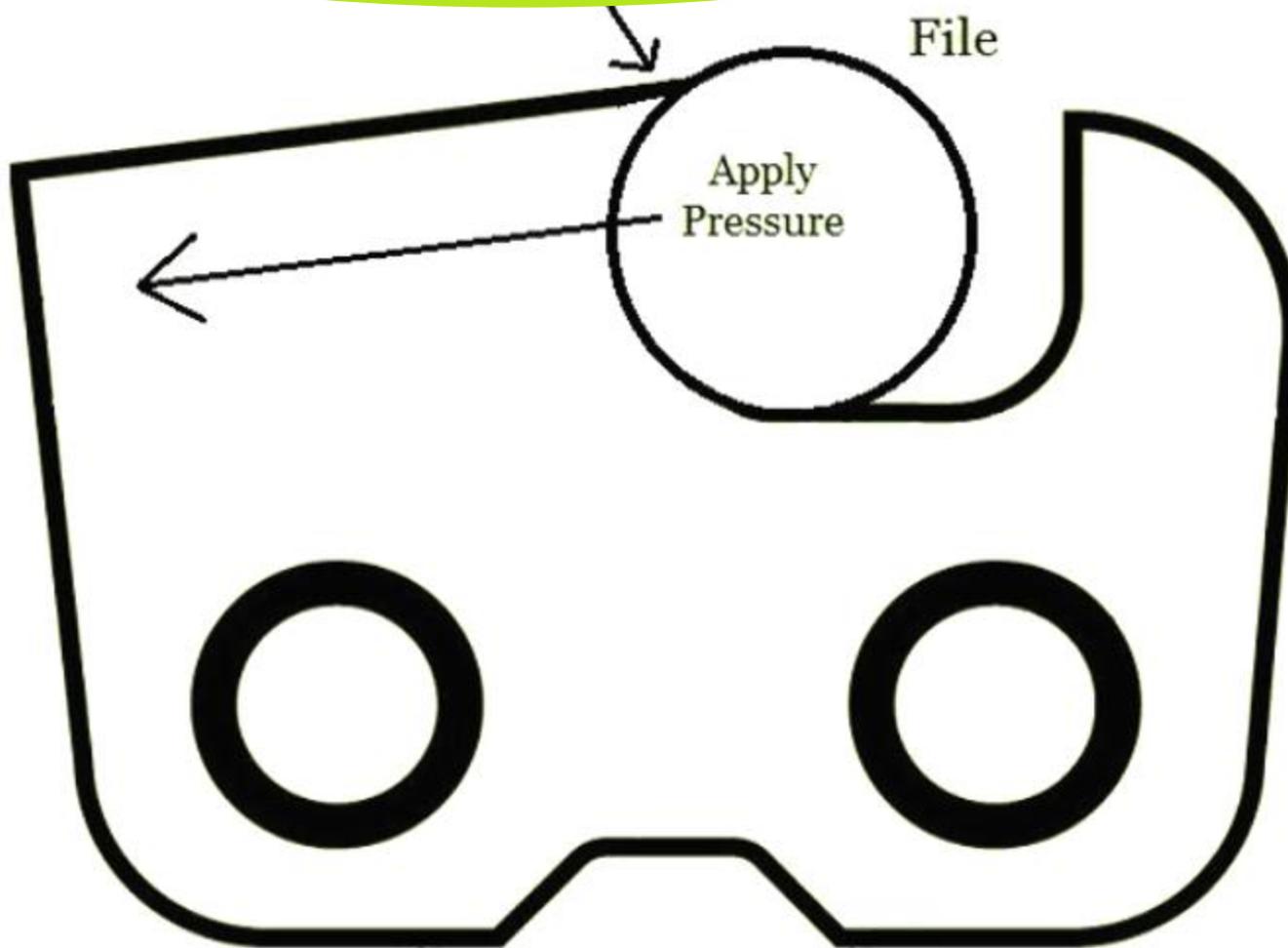
# SHARP TEETH

## TOOLS

- **Round files**
- **Flat file**
- **Colored Sharpie**
- **Gloved hands**
- **Left & Right Teeth**
- **File Angle - Witness mark**
- **Base to Point**



**You are sharpening  
the chisel edge**



# Starting Your Saw

## REVIEW



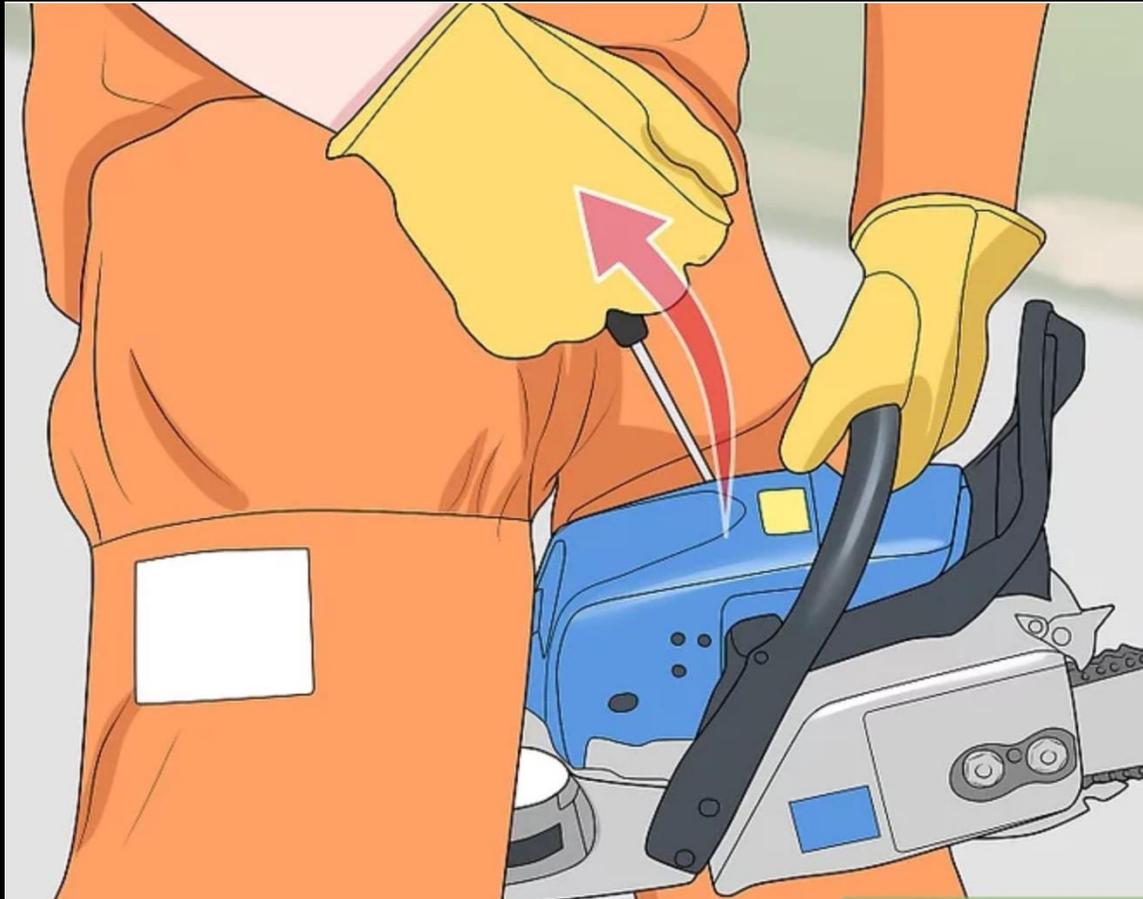
# TWO WAYS - Gas

## 1. Ground start



# TWO WAYS - Gas

## 2. Between legs



# BODY MECHANICS - REVIEW

## STRONG BODY POSTURE

- **Keep saw in "power box"**
- **Two hands on saw – always**
- **Thumbs wrapped**
- **Left arm straight**
- **Tall, upright back; no letter C!**
- **Legs firmly planted; ready to brace**
- **Don't align face with bar**



**C O S M I C  
S T A R™**



# OUTDOORS

*PPE*

*Tree Removal Demo*

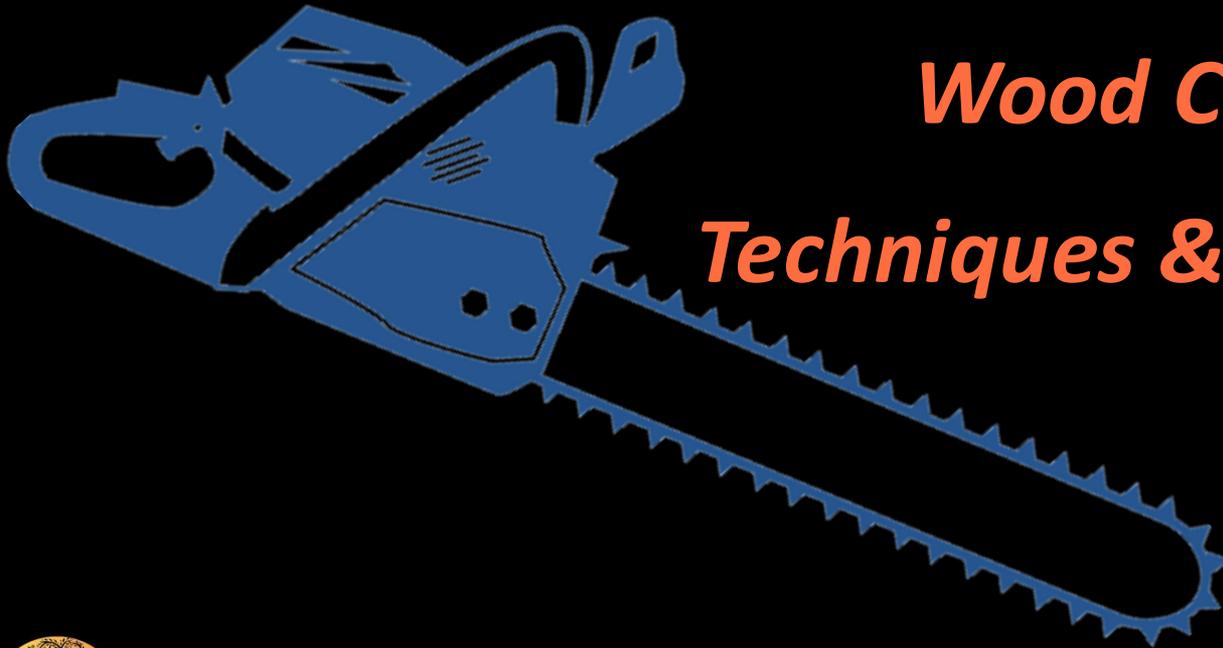
*Demonstrate Cuts*

*Wood Cutting Stations*

*Techniques & Body Postures*

*Approaches*

*PRACTICE*



# Video: Chap Cutting Demo



<https://youtu.be/P-GtYUQFwAM>



# THANK YOU! Please Visit our Resources Page:

We encourage you to use the follow links:

- Job Site Assessment
- New Z133

## We also want to share our discount codes with you:

- 20% at Arborwear Code - WTCW25  
(Saws, PPE, Equipment & Clothing)
- 10% at DGP - WTCW (Bar & Hydraulic oil & more)
- 15% at Shelvertree.com - WTCWCC (Equipment & More!)
- 15% at ArbSession - WTCW (Equipment)  
Create an account and then Email [info@arbssession.com](mailto:info@arbssession.com) and they will add you to the WTCW pricing group.
- 20% at Plaine Products - WTCW  
(Awesome lotions & body care)

## Tool Share Info:

- Logrite Tools : <https://logrite.com/toolusage.pdf>
- Yellow Xtreme tools
- Other tools - Peavy, cant hooks & more



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