



Hearing Protection

TOOLBOX TALK: Hearing Protection

RATTLIR Safety Series – “Strike Before It Bites”

Purpose

Hearing loss is one of the most common occupational injuries, and once hearing is damaged, it cannot be restored. This toolbox talk covers noise hazards, OSHA exposure limits, types of hearing protection, proper use, and how Noise Reduction Rating (NRR) translates into real-world protection.

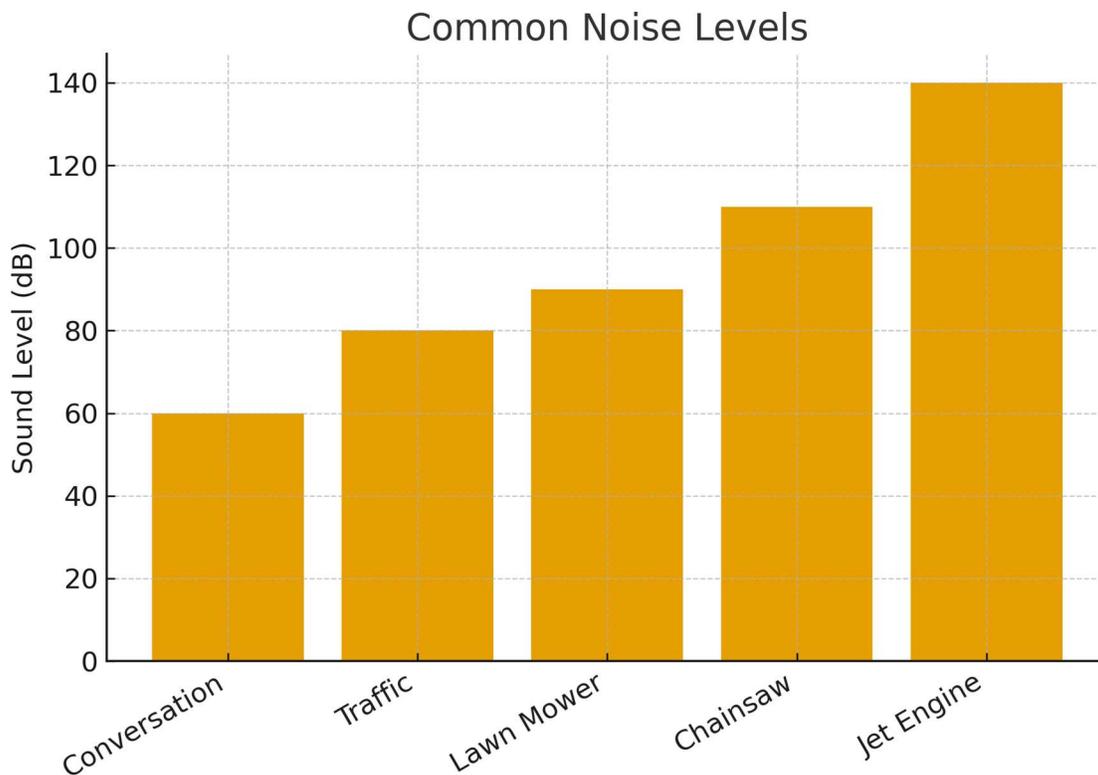


Figure 1 – Typical noise levels in common work and home environments.

OSHA Noise Exposure Limits (29 CFR 1910.95)

- 85 dBA – Action level requiring Hearing Conservation Program.



Hearing Protection

- 90 dBA – Maximum 8-hour Time Weighted Average (TWA).
- 95 dBA – 4-hour exposure limit.
- 100 dBA – 2-hour exposure limit.
- 105 dBA – 1-hour exposure limit.
- 115 dBA – 15-minute maximum exposure.

Understanding Noise Reduction Rating (NRR)

The Noise Reduction Rating (NRR) is a laboratory-measured estimate of how much a hearing protection device can reduce noise exposure. However, real-world protection is lower than the labeled NRR due to imperfect fit, movement, and environmental variability.

OSHA requires adjusting the NRR before applying it to dBA:

$$\text{Effective Protection} = (NRR - 7) \div 2$$

Example: Earplugs labeled NRR 33 dB $\rightarrow (33 - 7) \div 2 = 13$ dB of actual reduction.
This means a 100 dBA environment would be reduced to approximately 87 dBA.

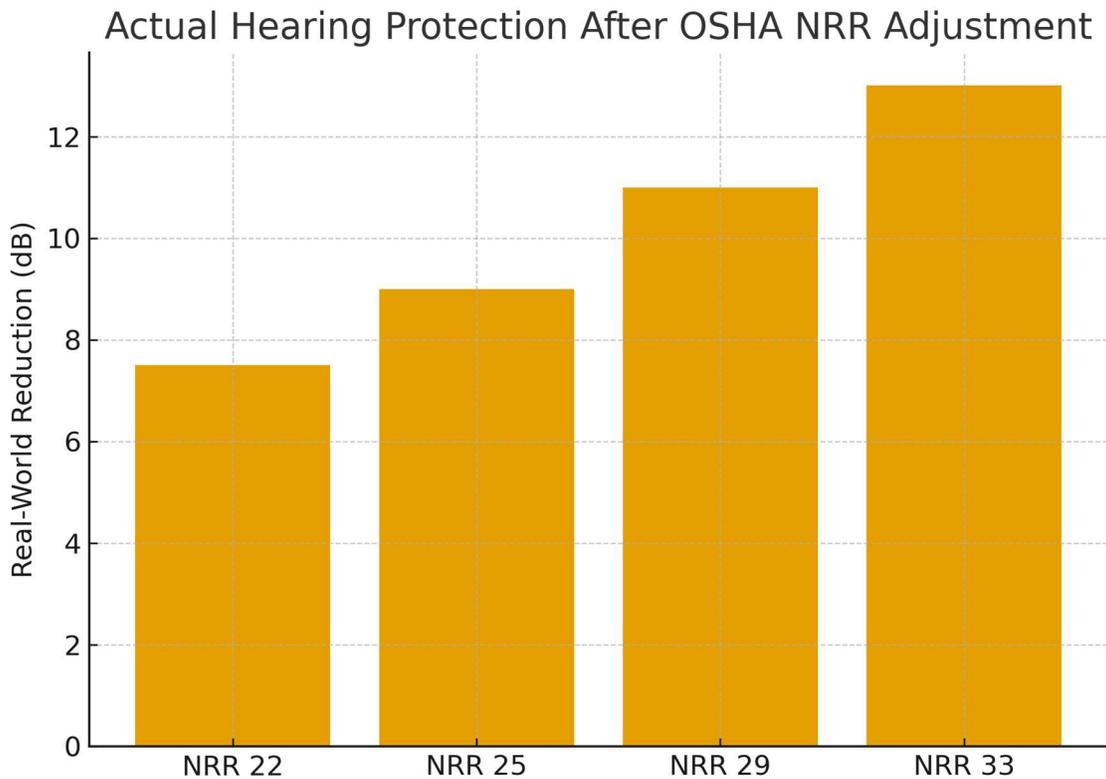


Figure 2 – Actual hearing protection provided after OSHA adjustment of NRR values.



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To determine the real-world attenuation of double hearing protection, use the OSHA/NIOSH dual-protection method.

$$\text{Effective Protection} = ((\text{Higher NRR} - 7) \div 2) + 5$$

Example: Earplugs labeled NRR 33 dB and Earmuffs labeled NRR 30 dB $\rightarrow ((33 - 7) \div 2) + 5 = 18$ dB of actual reduction.

This means a 100 dBA environment would be reduced to approximately 82 dBA.

Types of Hearing Protection

- Foam Earplugs: High attenuation; must be rolled, inserted fully, and allowed to expand.
- Reusable Earplugs: Durable and easier to insert; good for intermittent noise.
- Earmuffs: Provide consistent seal and excellent protection.
- Dual Protection: Earplugs + earmuffs required for noise above 100 dBA.

Proper Use & Fit

- Ensure earplugs fully seal the ear canal – partial insertion drastically reduces protection.
- Earmuff cushions must fully seal around ears; adjust for glasses or PPE straps.
- Replace foam earplugs after each use.
- Inspect earmuff cushions regularly for cracks or hardened foam.

Symptoms of Noise Exposure

- Ringing or buzzing in the ears (tinnitus).
- Difficulty understanding speech.
- Temporary hearing loss after exposure.
- Sensitivity to high-frequency sounds.

Emergency Response

- Move to a quieter area immediately.
- Report symptoms of hearing damage.
- Seek medical evaluation for persistent ringing or hearing changes.
- Re-evaluate hearing protection selection and fit.



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Discussion Questions

- Are we working above 85 dBA today?
- Do workers understand how to calculate effective NRR?
- Are dual hearing protection measures required?

RATTLIR Takeaway

Hearing loss is permanent. Understanding NRR and choosing properly fitted hearing protection ensures we strike before it bites.