

## Tell me about the Compressor's Noise

**Complaint:** The AC compressor is making noise.

**Service Procedure:** Turn the A/C off and start the car. *Does it make a noise now?*

If it does, then there could be an objectionable noise from the compressor clutch, belt or idler pulley. The problem could be that when the A/C is off, the **stationary** clutch armature (on the front of the clutch) may interfere with the **rotating** pulley, but the **dragging, ringing noise** disappears when the armature is fully **engaged**. Also, the problem could be a failed clutch bearing or idler pulley bearing. Check for impact damage on clutch surfaces, which would indent the races of the clutch bearing ( **a whirring or thrumming sound** ) or deform the front of the clutch.

Dragging noise caused by interference between the coil and the pulley probably continues after disengagement.

**Next, Turn the A/C on and evaluate the sound as follows:**

1. **Quick few knocks, hammering, or popping-** then normal sound. This liquid slugging noise is sometimes heard at first start in the morning. This is due to liquid refrigerant migrating to the compressor. This is normal for some vehicle A/C systems and weather conditions that cause the compressor to be colder than the cabin before the A/C is turned on. This noise can be created even with a good compressor. Sometimes the knocks are intermittent during running which indicates the system could be slugging and show frost on the suction hose fitting. This may be due to an overcharge of refrigerant or oil or a faulty expansion device.
2. **Excessive click during engagement-** Check for correct air gap or damaged/missing clutch components especially leaf springs or rubber dampers.
3. **Hiss or slip noise during engagement-** An excessive clutch armature air gap, less than 11 volts at the coil during engagement, contamination on clutch friction surfaces or over 5 ohms resistance in the coil circuit could cause slow or incomplete engagement.
4. **Honk or loud short bang-** This is caused by the sudden release of the refrigerant oil mix from the compressor's high pressure relief valve (HPRV) due to overcharge, air in the system, insufficient condenser air flow or a blockage in the high side of the system. The resulting oil or green dye residue (which looks like antifreeze) behind the compressor indicates this problem. Usually the compressor is OK but the lost oil and refrigerant must be replaced.
5. **Whistle or hiss-** On some vehicles a certain amount is normal. This is probably caused by refrigerant flow noise as low pressure liquid refrigerant sprays into the evaporator. Check for the proper refrigerant charge, air inside the system or a faulty refrigerant expansion device.
6. **Rumble, growl or rattle sometimes with accompanying hose pulsation-** Check for refrigerant over charge or air inside the A/C system or an obstructed condenser. Identify if the noise is within the normal range for the vehicle. Higher ambient temperatures will result in an increased cooling load with high discharge pressures which normally causes the load to increase on internal bearings and increase of this sound which can be normal.
7. **Squeal, ticking or growling-** Check for a failed idler or alternator bearing with a stethoscope. Then remove the belt and turn the pulleys to feel for roughness or a worn or miss-aligned A/C belt. A straight edge laid across the pulley can show if the belt is properly aligned. If the belt seems to "dance" or "jump" the belt adjustment or idler pulley location may need to be improved. The clutch may be slipping due to low voltage or weak ground when engaged. Check for oil or water on the belt or clutch friction surface.
8. **Loud clunk, knock or rattle impact noise-** Check compressor mounting bolts and refrigerant line contact points with the body. Isolate and avoid any contact with the body. If no loose or contacting components are found and the noise is so loud that it is intolerable, listen to the compressor with the hood up to determine the source of unacceptable noise.
9. **Clacking noise-** Failed suction or discharge compressor valves due to AC system contamination can create this noise
10. **Grinding sound that is objectionable-** A normal amount of the sound in this category is acceptable. Also, a low charge can cause abnormal low suction pressure and compressor noise. Low suction pressure can be caused by a faulty freeze protection device or insufficient air flow over the evaporator. After confirming the refrigerant charge or correcting any abnormal pressure condition, identify the location and if this noise is severe before removing the compressor.

### Notes:

When recovering the A/C system refrigerant charge always record the quantity of recovered R-134a to help determine the root cause of the problem. Also, record the high and low side pressures. If the quantity of charge is low, thoroughly check **all** A/C components for leaks because a **primary** A/C system leak can result in an overheated compressor. This overheats the front shaft seal of the compressor and causes a **secondary** leak. Use new seals at all serviced fitting joints.

## Noise and Counter Measures

Sound	Cause	Counter Measure
Dragging or ringing with clutch disengaged	Air gap too small Damage to leaf springs, hit marks, bearing worn	Replace clutch
Excessive bearing click Hiss or slip during engagement	Worn or damaged springs or dampers air gap too large Low voltage when engaged Pressure Relief Valve releases R134a	Replace clutch Remove shims Repair wiring, remove corrosion Fix overcharge Fix condenser air flow Evacuate air from system Fix low condenser air flow Correct charge Fix expansion device Fix charge or air flow
Honk or bang		
Whistle or hiss	Refrigerant flow noise	
Rumble, growl or rattle with hose pulsation Squeal, ticking or growling	Overcharge or air in system Poor condenser air flow with high ambients Failed accessory bearings Belt wear or mis-alignment Oil on clutch or belt Compressor ears bowed Loose mounting bolts AC hose hitting body Condenser or drier mounting AC hose too stiff Compressor valves broken Low charge Faulty freeze protection Sealant blocking inside AC system No insulation Liquid slugging	Fix alternator, idler etc. Replace and align belt Repair oil source Shim mounting bracket  Remount, reroute hose Isolate mounting Use hose with thin plastic linner Replace compressor Fix leak, evacuate and charge Replace component Back flush components <b>Insulate firewall and under hood</b> Common with some AC systems Fix overcharge Engage while cranking
Clunk, knock or impact rattle		
Clacking noise Very objectional grinding noise		
Bang when starting AC		