

HARD STARTING

How to Diagnose & Repair Air Conditioner Compressor Hard Starting

- **Stuttering or on-off at startup:** A "hard starting" compressor may stutter or begin to cycle-on then stop, then restart. If a compressor is frequently tripping the circuit breaker (or blowing the fuse) which protects its circuit, compressor and wiring diagnosis and repair are needed.
- **Low line voltage:** Abnormally low line voltage may also be causing a compressor to "hard start". Air conditioner supply voltage is typically checked using a VOM (volt-ohm meter) right at the air conditioner service disconnect box near the compressor/condenser unit. Voltage should be within 10% of the required number (on the compressor/condenser data tag). A service technician may also check line voltage again at the compressor terminals when the compressor has reached normal operating speed (RLV) to be sure that there is no voltage drop.
- **Starting an air conditioner against compressor head-pressure:** When an air conditioning compressor has been running long enough to reach its normal operating condition, it has pumped refrigerant to a high pressure condition in the compressor head. When an A/C system compressor is running and is unexpectedly shut off, perhaps by a human testing a thermostat or switch, if the system is immediately turned back on, some compressors, particularly window units, wall units, and central units using a restrictor type metering device may be unable to re-start against this high head pressure. Simply waiting a few minutes for pressures to equalized may be all that's needed. So if the compressor is not starting in this condition we simply turn it off and wait. If

- this problem is happening often, a service technician may install one of several versions of "hard start kit".
- **Do not just install a larger fuse or circuit breaker** as doing so risks a fire or equipment burn up. **Do not bypass fuses** such as by installing copper tubing in place of fuses as some A/C service people recommend. This is a crazy electrical hazard risking fire, shock, and equipment burn-up. If new circuit breakers are to be installed to replace an older fuse-protection on an air conditioning circuit, the electrician should remove any obsolete, unused electrical equipment or devices to avoid future confusion or possible shock hazards.
 - A **"hard start kit"** is basically a capacitor and relay which gives an extra electrical "jolt" to the compressor motor.
 - **Tight or Seized Air Conditioner Motors** can be hard to start and may make a "humming" noise while trying to start-up and the compressor motor may fail to start at all, eventually tripping the circuit breaker or blowing the circuit fuse. It might be possible to get a slow or hard-starting tight or even seized AC compressor motor going again.
 - **End of air conditioning compressor life may be near:** A compressor which has difficulty starting might be fixed by installing a "hard start" kit, but depending on the reason for hard starting it's possible that the entire compressor will have to be replaced soon.

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