



**AIR CONDITIONING  
TROUBLESHOOTING TABLES**

**REFRIGERATION, HEATING AND  
AIR CONDITIONING**

**BARD MANUFACTURING CO. • BRYAN, OHIO 43506**

*Dependable quality equipment... since 1914*

COMPLAINT: NO COOLING. A. FAULT: AIR CONDITIONER FAILS TO COOL.

SOURCE	PROCEDURE	CAUSES	CORRECTION
1 Thermostat	Check thermostat setting.	a. Thermostat set on heat or off.	Switch thermostat to cool.
		b. Thermostat set too high.	Set thermostat at desired temperature.
2 Power	Check main disconnect and unit disconnect.	a. Disconnect switch open.	Close disconnect switch.
		b. Blown fuse or tripped breaker.	Replace fuse or reset breakers. Check for cause of overload.
3 Furnace Blower	Check air filter and furnace blower for proper operation.	a. Dirty air filter.	Replace or clean filter.
		b. Broken belt.	Replace belt.
		c. Loose pulley.	Tighten pulley.
		d. Blower bearing seized.	Replace bearing and shaft.
		e. Blower motor seized or burned out.	Replace the motor.

COMPLAINT: NO COOLING. A. FAULT: AIR CONDITIONER FAILS TO COOL.

SOURCE	PROCEDURE	CAUSES	CORRECTION
4 Transformer	Check voltage at low voltage transformer.	a. 24 volt fuse blown (fused transformer).	Replace fuse.
		b. Low voltage (less than 22 volts).	If primary voltage is low, call power company. If secondary is low, replace transformer.
		c. Faulty transformer.	Replace transformer.
5 Compressor Contactor	Check voltage across contactor coil terminals.	a. Shorted or open coil.	Replace contactor.
		b. Loose or faulty wiring.	Repair wiring.
		c. Burned contacts or contacts stuck open.	Replace contactor.
6 Thermostat	Jumper voltage and compressor contactor sub-base terminals to determine if power is reaching thermostat.	a. Faulty thermostat or sub-base.	Replace thermostat and/or sub-base.
		b. Broken wire, loose connections or bad splices.	Replace wire or repair connections and splices.
7 Low Ambient Thermostat	Check low ambient thermostat.	a. Defective contacts in low ambient thermostat.	Replace thermostat.
8 Compressor	Turn off power to compressor. Check compressor windings and internal overload.	a. Compressor windings burned out.	Replace compressor.
		b. Internal overload defective.	Replace compressor.
9 Low Pressure Switch	Check low pressure switch.	a. Loss of charge.	Charge unit.
		b. Defective switch.	Replace switch.
10 High Pressure Switch	Check high pressure switch.	a. Overcharged unit.	Check and adjust charge.
		b. Plugged condenser coil.	Clean condenser coil.
		c. Inoperative condenser coil fan.	Repair or replace fan.
		d. Recirculation of condenser coil air.	Remove cause of recirculation.
		e. Reversed rotation of condenser coil fan.	Correct rotation.
		f. Defective switch.	Replace switch.

COMPLAINT: NO COOLING. A. FAULT: AIR CONDITIONER FAILS TO COOL.

SOURCE	PROCEDURE	CAUSES	CORRECTION
11 External Overloads	Check external overloads.	a. External overloads open.	Replace overloads and determine cause of failure.
12 Start Capacitor And Potential Relay	Check start capacitor and potential relay.	a. Shorted or open start capacitor.	Replace start capacitor. Check potential relay.
		b. Open coil or welded contacts in potential relay.	Replace potential relay. Check start capacitor.
13 Run Capacitor	Check run capacitor.	a. Shorted or open run capacitor.	Replace run capacitor.

COMPLAINT: NOT ENOUGH COOLING. A. FAULT: AIR CONDITIONER MALFUNCTIONING.

SOURCE	PROCEDURE	CAUSES	CORRECTION
1 Thermostat	Check thermostat.	a. Thermostat set too high.	Correct setting.
		b. Thermostat not level.	Level thermostat.
		c. Vibration at thermostat.	Correct source of vibration.
		d. Thermostat in cool draft.	Shield thermostat from draft or relocate.
		e. Thermostat on cool wall.	Relocate thermostat.
2 Furnace Air Volume	Check air volume over evaporator coil.	a. Dirty filter.	Replace or clean filter.
		b. Plugged evaporator coil.	Clean coil.
		c. Fan speed too low.	Adjust fan speed.
		d. Blower belt or pulley slipping.	Adjust for proper operation.
		e. Reversed blower rotation.	Reverse rotation.
		f. Blocked supply or return air opening.	Remove cause of blockage.
		g. Dirty blower wheel.	Clean blower wheel.
		h. Blocked supply outlet.	Remove cause of blockage.
3 Capillary Tube	Check capillary tube	a. Restricted or plugged.	Replace capillary tube.
4 Condensing Unit	Check condensing unit.	a. Refrigerant charge incorrect.	Check and correct charge.
		b. Plugged or clogged condenser coil.	Clean coil.
		c. Recirculation of air through condenser coil.	Correct cause of recirculation.
		d. Restriction in refrigerant system.	Remove restrictions in system.
		e. Noncondensable trapped in system.	Remove noncondensables from system.
5 Compressor Valves	Pump down unit.	a. Leaky discharge or suction valves.	Replace compressor.

COMPLAINT: TOO MUCH COOLING. A. FAULT: AIR CONDITIONER RUNS CONTINUOUSLY.

SOURCE	PROCEDURE	CAUSES	CORRECTION
1 Thermostat	Check thermostat.	a. Set too low.	Correct thermostat setting.
		b. Thermostat in warm draft.	Relocate thermostat.
		c. Shorted thermostat wiring.	Repair short.
		d. Thermostat on warm wall.	Relocate or insulate thermostat.
		e. Thermostat not level.	Level thermostat.
2 Compressor Contactor	Check compressor contactor.	a. Contacts welded or stuck.	Replace contactor or contacts.

COMPLAINT: NOISE. A. FAULT: MECHANICAL NOISE.

SOURCE	PROCEDURE	CAUSES	CORRECTION
1 Blower	Remove blower compartment door. Start blower by disconnecting power and check for noise source.  (OBSERVATION:) <i>Inspect blower wheel and check for end-play and side-play of shaft.</i>	a. Blower bearing loose allowing side-play.	Secure bearing.
		b. Blower thrust collar set too far out on shaft, allowing end-play.	Reset thrust collar to eliminate end-play of blower shaft.
		c. Blower bearing dry and squeaking.	Inspect bearing. If bearing is undamaged, then add lubrication.
		d. Blower bearing damaged.	Replace bearing. Inspect shaft for scoring or undercuts.
		e. Blower wheel touching scroll.	Center blower wheel in scroll.
		f. Loose blower wheel.	Check alignment and tighten set screws.
		g. Cutoff plate loose.	Tighten cutoff plate.
		h. Blower wheel out of balance.	Balance or replace wheel.
		i. Loose running gear cushion mounts.	Remove debris.
		2 Running Gear	Inspect running gear. Move it back and forth by hand to check for loose connections.
b. Worn or damaged blower belt.	Replace belt.		
c. Belt too loose causing slippage.	Correctly tighten belt.		
d. Motor and blower pulleys out of alignment.	Align pulleys.		
e. Loose blower or motor pulley.	Tighten set screws.		
3 Blower Motor	Remove blower compartment door, start blower and listen for source of noise.	a. Damaged and noisy motor bearings.	Replace motor.
		b. Loose or defective motor cushion mounts.	Tighten mounts or replace.
		c. Loose and rattling (Greenfield) armored cable to motor.	Isolate or secure Greenfield cable.
		d. AC motor hum.	Check resilient mountings.
		e. Regenerative motor braking (capacitor motor).	Replace capacitor or replace motor and capacitor.
4 Air Filter	Check filter assembly.	a. Filter loose in mounting rails.	Secure filter mounting.
		b. Filter screen contacting blower or running gear.	Bend screen or reposition filter to clear blower and running gear.

(CONTINUED) COMPLAINT: NOISE. A. FAULT: MECHANICAL NOISE.

SOURCE	PROCEDURE	CAUSES	CORRECTION
5 Controls	Listen for source of noisy control and check control. <i>(OBSERVATION:)</i> Check contactors, relays and transformer. Some contactors and controls may make a loud buzz or clacking noise when operated below their designed voltage.	a. Low voltage to relay coil. More than 10% below rated voltage.	Check transformer primary or replace transformer.
		b. Loose relay mounting.	Tighten mounting or isolate relay from direct metal to metal contact.
		c. Defective relay.	Replace relay.
		d. Low voltage to contactor coil. More than 10% below rated voltage.	Correct cause of low voltage or replace the transformer.
		e. Stuck or defective contactor.	Replace contactor.
		f. Noisy contactor.	Replace contactor.
		g. Loose transformer mounting.	Tighten mounting.
		h. Noisy humming transformer (loose windings on core).	Replace transformer.
6 Cabinet And Duct	Listen for source of noise and relate it to furnace operation. <i>(OBSERVATION:)</i> Check furnace with blower running.	a. Loose access door panels or casing panels.	Properly seat panel, secure at point of engagement or provide a pad at that point.
		b. Thermal expansion of metal causing "oil canning" or popping noise.	Determine point of "oil canning" and fasten panels to that point.
		c. Loose blower or running gear causing noise transmission to cabinet or duct.	Check blower bearings, pulleys, blower wheels, mount and belts.
		d. Loose duct work, duct hangers, unit hangers or connectors.	Properly seal joints, seams and hangers. Isolate hangers or pads.
		e. "Oil canning" of metal due to air pressure change when blower starts. It may be in either discharge side or return air side.	Determine point of "oil canning" and fasten panel at that point.
		f. Broken spot welded joint.	Secure joint with sheet metal screw

COMPLAINT: NOISE B. FAULT: AIR NOISE.

SOURCE	PROCEDURE	CAUSES	CORRECTION
1 Blower	Inspect blower and blower compartment for air obstruction or restriction. Turn blower on and listen for source of air noise.	a. Loose or improperly positioned blower cutoff plate.	Secure or reposition cutoff plate.
		b. Blower running too fast.	Slow blower down. Adjust for proper air volume.
		c. Extremely dirty or blocked air filters causing blower to stall.	Clean or change filters or remove source of blockage.
		d. Out of center blower wheel—too close to cutoff plate.	Check blower running gear mount and repair or reposition them to bring blower wheel back to center.
		e. Loose debris in blower housing causing air whistles.	Remove debris.

COMPLAINT: NOISE B. FAULT: AIR NOISE.

SOURCE	PROCEDURE	CAUSES	CORRECTION
2 Air Duct System	Turn blower on and listen for source of noise along duct system and at registers.	a. Air leaks in cabinet joints or duct system. b. Sharp metal obstruction in air stream causing whistle. c. Joint edge facing into air stream. d. Discharge system overly restricted. Dampers closed. Outlets closed or covered. Causes blower to stall. e. Return air grille close to blower compartment inlet.	Secure joint or cover opening in duct work. Remove obstruction. Cover edge of joint. Remove restrictions, check air volume. Line inlet duct with acoustic material.

COMPLAINT: ODOR

SOURCE	PROCEDURE	CAUSES	CORRECTION
1 Air System	Check furnace compartment, filters and duct system for dirt, oily films, debris and moisture.	a. Accumulated dirt and debris. b. Oily film in and around blower or in duct system. c. Water or moisture. d. Humidifier stagnant water or slush. e. Dirty filter. f. Moisture trapped in drain pan. Pan clogged.	Clean debris and vacuum duct system. Remove film and correct cause of film. Locate and correct cause of water or moisture. Clean humidifier and check operation. Clean or replace filters. Clean out drain pan.
2 Control Transformer	Check transformer.	a. Shorted winding.	Replace transformer.
3 Wiring	Check wiring for hot spots.	a. Overheated wiring.	Check for source of short, replace wiring.
4 Relays	Check relay.	a. Shorted or burned relay.	Replace relay.

COMPLAINT: COST OF OPERATION. C. FAULT: AIR CONDITIONER MALFUNCTIONING.

SOURCE	PROCEDURE	CAUSES	CORRECTION
1 Thermostat	Check thermostat.	a. Open first stage bulb. b. Loose terminal or broken wire.	Repair or replace thermostat. Repair wiring.
2 Power	Check heat pump disconnect.	a. Disconnect switch open. b. Blown fuse or tripped breaker.	Close disconnect switch. Replace fuse or reset breakers. Check for cause of overload.
3 Indoor Blower	Check air filter and indoor blower for proper operation.	a. Dirty air filter. b. Loose belt. c. Loose pulley. d. Dirty indoor coil. e. Low air volume.	Replace or clean filter. Tighten belt. Tighten pulley. Clean indoor coil. Adjust blower for proper air volume

SOURCE	PROCEDURE	CAUSES	CORRECTION
4 Compressor Contactor	Turn power off. Perform continuity check on contactor coil and contacts.	a. Shorted or open coil.	Replace contactor.
		b. Loose or faulty wiring.	Repair wiring.
		c. Burned contacts or contacts stuck open.	Replace contactor.
5 Low Ambient Thermostat	Perform continuity check on low ambient thermostat contacts.	a. Defective contacts in low ambient thermostat.	Replace thermostat.
		b. Thermostat set too high.	Reset to proper temperature.
		c. Thermostat out of calibration.	Recalibrate or replace thermostat.
6 Compressor	Turn off power to compressor. Perform continuity check on compressor windings and internal overload.	a. Compressor winding open or shorted.	Replace compressor.
		b. Internal overload defective.	Replace compressor.
7 Low Pressure Switch	Check low pressure switch. Turn off power. Run continuity check.	a. Loss of charge.	Charge unit.
		b. Defective switch.	Replace switch.
8 High Pressure Switch	Check high pressure switch. Turn off power. Run continuity check.	a. Overcharged unit.	Check and adjust charge.
		b. Plugged evaporator coil.	Clean evaporator coil.
		c. Dirty air filter.	Replace or clean filter.
		d. Indoor air volume too low or indoor fan speed too low.	Increase air volume to proper level.
		e. Reversed rotation of indoor coil fan.	Reverse rotation.
		f. Dirty blower wheel.	Clean blower wheel.
		g. Blocked supply or return air openings.	Remove cause of blockage.
9 External Overload	Check external overload. Perform continuity check.	a. External overload open.	Replace overload and determine cause of failure.

SOURCE	PROCEDURE	CAUSES	CORRECTION
10 Start Capacitor And Potential Relay	Check start capacitor and potential relay. See page 132.	a. Shorted or open start capacitor.	Replace start capacitor and check potential relay for burned contacts.
		b. Open coil or welded contacts in potential relay.	Replace potential relay and check start capacitor.
11 Run Capacitor	Check run capacitor.	a. Shorted or open run capacitor.	Replace run capacitor.
12 Capillary Tube	Check capillary tube.	a. Restricted or plugged.	Replace capillary tube.
13 Compressor Valve	Pump down unit.	a. Leaking discharge or suction valve.	Replace compressor.
		b. Internal pressure relief valve open.	Allow time for system to equalize pressure then reset.
14 Condensing Unit	Check volume of air over the condenser.	a. Blocked air flow or plugged coil.	Clean coil or remove cause of blockage.
		b. Ice on coil.	Check defrost cycle.
		c. Defective fan motor.	Replace fan motor.
		d. Open or shorted fan motor capacitor.	Replace capacitor.
		e. Reversed fan motor rotation.	Reverse rotation.

