Furnace: Guidance Instruction Data

Root Cause Analysis (Assisted)

- **Guidance Type:** Diagnostic Steps
- **Step-by-Step Instructions:**
    1. Ensure the furnace is powered off and locked out.
    2. Inspect the thermostat settings and confirm the call for heat.
    3. Check the furnace filter for blockage or excessive dirt.
    4. Examine the ignition system for visible damage or debris.
    5. Observe the control board for error codes or indicator lights.
- **Expected Outcomes:**
    - Thermostat is set to heat and calling for operation.
    - Filter is clean and properly installed.
    - Ignition system is intact; no debris.
    - Control board displays normal operation or specific error code.
- **Warnings/Precautions:**
    - Disconnect power before opening panels.
    - Beware of hot surfaces and sharp edges.
- **Reference Material:**
    - Furnace Manual, Section 3.1 (Diagnostics Table)
- **Next Action Prompts:**
    - “If an error code is present, please report the code for further guidance.”

Step-by-Step Repair Procedures

- **Guidance Type:** Repair Procedure
- **Step-by-Step Instructions:**
    1. Power off and lock out the furnace.

2. Remove the access panel to reach the faulty component (e.g., ignition module).
3. Disconnect wiring and mounting screws from the component.
4. Install the replacement part, reconnect wiring, and secure with screws.
5. Restore power and test the furnace operation.

- **Expected Outcomes:**
  - New component is securely installed.
  - Furnace completes ignition and heating cycle.
- **Warnings/Precautions:**
  - Use insulated tools.
  - Confirm all connections are tight before restoring power.
- **Tool & Parts Recommendation:**
  - Screwdriver set, multimeter, replacement ignition module (Part #IGN-1234)
- **Reference Material:**
  - Furnace Manual, Section 4.2 (Component Replacement)
- **Next Action Prompts:**
  - “Did the furnace ignite and run normally after replacement?”

Safety Protocols

- **Guidance Type:** Safety Alert
- **Step-by-Step Instructions:**
  1. Disconnect power supply before servicing.
  2. Wear gloves and eye protection.
  3. Ensure area is well-ventilated.
- **Expected Outcomes:**
  - Technician is protected from electrical and burn hazards.

- **Warnings/Precautions:**
    - Never bypass safety switches.
- **Reference Material:**
    - Furnace Safety Guidelines, Section 1.1
- **Next Action Prompts:**
    - “Confirm all safety steps completed before proceeding.”

Performance Verification

- **Guidance Type:** Performance Verification
- **Step-by-Step Instructions:**
    1. Set thermostat to call for heat.
    2. Observe furnace ignition and burner operation.
    3. Monitor temperature rise and airflow.
- **Expected Outcomes:**
    - Furnace ignites and heats as expected.
    - No error codes or abnormal noises.
- **Warnings/Precautions:**
    - Monitor for gas leaks or unusual odors.
- **Reference Material:**
    - Furnace Manual, Section 5.1 (System Checks)
- **Next Action Prompts:**
    - “Report any abnormal operation or error codes.”

HVAC Unit: Guidance Instruction Data

Root Cause Analysis (Assisted)

- **Guidance Type:** Diagnostic Steps

- **Step-by-Step Instructions:**
    1. Power off and lock out the HVAC unit.
    2. Check thermostat and system mode (cool/heat).
    3. Inspect air filters and coils for dirt or blockage.
    4. Examine refrigerant lines for leaks or frost.
    5. Check for error codes on the control panel.
- **Expected Outcomes:**
    - Thermostat is set correctly.
    - Filters and coils are clean.
    - No visible leaks or frost.
    - Control panel displays normal or specific error code.
- **Warnings/Precautions:**
    - Use proper PPE when handling refrigerants.
- **Reference Material:**
    - HVAC Manual, Section 3.2 (Diagnostics)
- **Next Action Prompts:**
    - “If an error code is found, please provide the code.”

Step-by-Step Repair Procedures

- **Guidance Type:** Repair Procedure
- **Step-by-Step Instructions:**
    1. Disconnect power and secure the area.
    2. Remove access panels to reach the faulty component (e.g., blower motor).
    3. Disconnect wiring and mounting hardware.
    4. Replace the component and reconnect wiring.
    5. Reinstall panels, restore power, and test operation.

- **Expected Outcomes:**
    - Component replaced successfully.
    - HVAC unit operates in correct mode.
- **Warnings/Precautions:**
    - Ensure all wiring is correct before powering up.
- **Tool & Parts Recommendation:**
    - Wrench set, multimeter, replacement blower motor (Part #BLM-5678)
- **Reference Material:**
    - HVAC Manual, Section 4.3 (Component Replacement)
- **Next Action Prompts:**
    - “Did the unit start and run normally after repair?”

Safety Protocols

- **Guidance Type:** Safety Alert
- **Step-by-Step Instructions:**
    1. Disconnect all power sources before opening panels.
    2. Wear gloves, eye protection, and, if needed, a respirator.
    3. Be cautious of moving fan blades and electrical terminals.
- **Expected Outcomes:**
    - Technician is protected from electrical and mechanical hazards.
- **Warnings/Precautions:**
    - Never work alone when handling refrigerants.
- **Reference Material:**
    - HVAC Safety Guidelines, Section 1.2
- **Next Action Prompts:**
    - “Confirm all safety steps completed before proceeding.”

Performance Verification

- **Guidance Type:** Performance Verification
- **Step-by-Step Instructions:**
    1. Set system to operate in the required mode (cool/heat).
    2. Monitor temperature and airflow at supply vents.
    3. Check for abnormal noises or vibrations.
- **Expected Outcomes:**
    - Unit cools/heats as expected.
    - No error codes or unusual sounds.
- **Warnings/Precautions:**
    - Watch for refrigerant leaks.
- **Reference Material:**
    - HVAC Manual, Section 5.2 (System Checks)
- **Next Action Prompts:**
    - “Report any abnormal operation or error codes.”