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Tuhorse 208-250 MFD (uF)

Tuhorse BMI 208-250 MFD (uF) 3 HP Motor Start Capacitor Instruction Manual

1. Introduction

This manual provides essential information for the safe and effective use of the Tuhorse BMI 208-250 MFD (uF) 3 HP Motor Start Capacitor. This component is designed as a compatible replacement for various 3 HP motor control boxes, including Franklin 2823028110 (Standard Control Box), 2823028310 (Deluxe Control Box), and Franklin Part# 275463111. Motor start capacitors are critical for initiating the rotation of single-phase AC induction motors by providing a temporary phase shift to the start winding.

Please read this manual thoroughly before installation or maintenance to ensure proper function and safety.

2. Safety Information

WARNING: Electrical components can store high voltage even after power is disconnected. Improper handling can result in severe injury or death. Always follow safety precautions.

- **Disconnect Power:** Always ensure that the main power supply to the motor control box is completely disconnected and locked out before attempting any installation, inspection, or maintenance.
- **Discharge Capacitor:** Capacitors can retain an electrical charge. Before touching terminals, safely discharge the capacitor using a properly insulated tool or resistor. Never short the terminals with a screwdriver.
- **Qualified Personnel:** Installation and maintenance should only be performed by qualified electricians or technicians familiar with electrical systems and motor control boxes.
- **Personal Protective Equipment (PPE):** Wear insulated gloves and safety glasses when working with electrical components.
- **Inspect for Damage:** Before installation, visually inspect the capacitor for any signs of physical damage, such as dents, bulges, or leaks. Do not install a damaged capacitor.

3. Product Overview

The Tuhorse BMI 208-250 MFD (uF) Motor Start Capacitor is a high-quality component manufactured in the USA by Barker Microfarads (BMI). It is designed for reliable performance in 3 HP motor applications requiring a temporary starting torque boost.

Key Features:

- **Capacitance:** 208-250 MFD (uF)
- **Voltage Rating:** 220 VAC
- **Frequency:** 50/60 Hz
- **Compatibility:** Direct replacement for Franklin 3HP Standard Control Box 2823028110, Deluxe Control Box 2823028310, and Franklin Part# 275463111.
- **Construction:** Durable plastic casing, cylindrical shape.



Figure 1: Front view of the Tuhorse BMI 208-250 MFD Motor Start Capacitor. This image displays the capacitor's cylindrical black casing with the BMI logo and specifications label clearly visible, including capacitance, voltage, and frequency ratings.



Figure 2: Angled view of the Tuhorse BMI 208-250 MFD Motor Start Capacitor, showing the top terminals. This perspective highlights the two spade terminals used for electrical connections, along with the product label.



Figure 3: Close-up top view of the Tuhorse BMI 208-250 MFD Motor Start Capacitor terminals. This image provides a detailed look at the two spade terminals and the insulating material surrounding them, indicating the connection points for the motor control box wiring.

4. Specifications

Specification	Value
Capacitance	208-250 Microfarad (uF)
Operating Voltage	220 Volts AC
Frequency	50/60 Hz
Product Dimensions (Diameter x Height)	2.15 x 4.25 inches
Weight	9.59 ounces
Material	Plastic
Shape	Cylinder
Manufacturer	Barker Microfarads Inc (BMI)
Item Model Number	208-250 MFD (uF)

5. Setup and Installation (Replacement)

This capacitor is intended as a replacement part. Follow these steps carefully for safe and correct installation:

1. **Preparation:** Gather necessary tools: screwdriver set, wire cutters/strippers, multimeter with capacitance testing function, insulated gloves, and safety glasses.
2. **Power Disconnection:** Locate the main power breaker for the motor or pump system and turn it OFF. Verify that power is completely off using a voltage tester.
3. **Access Control Box:** Open the motor control box enclosure.

4. **Locate Old Capacitor:** Identify the existing start capacitor. Note its position and how it is wired. Taking a photograph of the wiring before disconnection can be helpful.
5. **Discharge Old Capacitor:** Even with power off, the old capacitor may retain a dangerous charge. Using an insulated screwdriver with a plastic handle, carefully short the terminals of the old capacitor to discharge any residual energy. Alternatively, use a resistor designed for capacitor discharge.
6. **Disconnect Old Capacitor:** Carefully disconnect the wires from the terminals of the old capacitor.
7. **Remove Old Capacitor:** Unmount the old capacitor from its bracket or housing.
8. **Install New Capacitor:** Place the new Tuhorse BMI 208-250 MFD (uF) capacitor into the control box, ensuring it fits securely in the designated mounting area.
9. **Connect Wiring:** Connect the wires to the terminals of the new capacitor exactly as they were connected to the old one. Ensure all connections are tight and secure.
10. **Verify Connections:** Double-check all wiring connections to ensure they are correct and no loose wires are present.
11. **Close Control Box:** Securely close the motor control box enclosure.
12. **Restore Power and Test:** Turn the main power breaker back ON. Test the motor's operation. The motor should start smoothly and quickly.

If the motor does not start correctly or exhibits unusual behavior, immediately disconnect power and re-check all connections and the capacitor's specifications.

6. Operating Principles

A motor start capacitor is a temporary component in a single-phase AC induction motor circuit. Its primary function is to create a phase shift in the current supplied to the motor's start winding. This phase shift generates a rotating magnetic field, providing the necessary torque to initiate motor rotation from a standstill. Once the motor reaches approximately 75% of its operating speed, a centrifugal switch or electronic relay typically disconnects the start capacitor from the circuit, as the motor can then operate efficiently on its run winding alone.

7. Maintenance

Motor start capacitors are considered consumable components. They are subjected to high electrical stress during each motor start cycle and will degrade over time and use. This degradation manifests as a loss of capacitance.

- **Regular Inspection:** Periodically inspect the capacitor for visual signs of failure, such as bulging, leaking electrolyte, or discoloration.
- **Capacitance Testing:** If a motor exhibits starting issues, use a multimeter with a capacitance testing function to measure the actual capacitance of the installed capacitor. Compare this reading to the rated value (208-250 MFD). If the measured capacitance falls significantly below the lower end of the specified range, the capacitor should be replaced.
- **Replacement Schedule:** While there is no fixed replacement schedule, it is good practice to consider replacing start capacitors every few years, especially in frequently used applications, or at the first sign of motor starting difficulties.

8. Troubleshooting

If your motor is experiencing starting problems, the start capacitor is a common point of failure. Here are some troubleshooting steps:

- **Motor Hums but Doesn't Start:** This is the most common symptom of a failed start capacitor. The motor attempts to start but lacks the initial torque to overcome inertia.
- **Slow or Delayed Start:** If the motor takes an unusually long time to reach operating speed, the capacitor may be

weakened.

- **Overheating Motor:** A motor struggling to start due to a faulty capacitor can draw excessive current, leading to overheating.
- **Visual Inspection:** After safely disconnecting power and discharging the capacitor, visually inspect it for any physical damage (bulging, leaks, burnt spots).
- **Electrical Test:** Use a multimeter to measure the capacitance. A reading significantly outside the 208-250 MFD range indicates a need for replacement.

If troubleshooting indicates a faulty capacitor, replace it with a new one of the correct specifications.

9. Warranty and Support

As an electronic component, this capacitor is subject to specific return and warranty policies. Please refer to the original point of purchase or the manufacturer, Barker Microfarads Inc (BMI), for detailed warranty information.

For technical assistance, installation guidance, or further inquiries, it is recommended to consult a qualified electrician or contact the manufacturer directly. Always prioritize safety and professional advice when dealing with electrical systems.

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