DB Electrical 410-48013

DB Electrical 410-48013 Starter Instruction Manual

Model: 410-48013

Introduction

This manual provides essential information for the proper installation, operation, and maintenance of your DB Electrical 410-48013 Starter. This starter is designed as a compatible replacement for various Mitsubishi Forklift models and other applications as specified. Please read this manual thoroughly before proceeding with any installation or service to ensure safety and optimal performance.

Product Overview

The DB Electrical 410-48013 Starter is a new aftermarket unit engineered to meet or exceed OEM specifications. It is a direct drive (DD) type starter with specific voltage, rotation, and teeth count designed for reliable engine starting.

Figure 1: Front view of the DB Electrical 410-48013 Starter, showing the main body, solenoid, and drive gear.

Key Features:

- **Unit Type:** Starter
- **Voltage:** 24V
- **Rotation:** Clockwise (CW)
- **Teeth:** 11
- **Power (KW):** 3.0
- **Starter Type:** Direct Drive (DD)
- 100% new aftermarket unit built to OEM specifications.

Compatibility

This starter is compatible with and serves as a replacement for various Mitsubishi Forklift models and other industrial equipment. Please verify the part fits your specific application before purchase and installation.

Compatible With/Replacement For:

- **MITSUBISHI:** FD-10, FD-14, FD-15, FD-15T, FD-20, FD-20B-D, FD-20B-DS, FD-20D, FD-25, FD-25B-D, FD-25B-DS, FD-25D, FD-25DS, FD-25T, FD-30, FD-30B-D, FD-30B-DS, FD-30D, FD-30DS, FD-30T, FD-35A, FD-35A-D, FD-35AB-D, FD-35AT, FDC-20-D, FDC-25-D

Replaces OEM Numbers:

- **ARROWHEAD:** 410-48013
- **ARROWHEAD (OEM) (OLD):** M2T65271
- **CARGO:** 111913
- **J & N:** 410-48013
- **LESTER:** 18245
- **MITSUBISHI:** M2T65271, M2T65272, M3T54071, M3T54072, M5T27671, M5T27672
- **MITSUBISHI INDUSTRIAL:** 34466-03101, 34466-15100, 34466-15101, 34466-15102, 34466-20100, 34466-20102
- **NSA:** STR-6144
- **UNIPOINT:** STR-6144
- **WAI:** 18245N

Installation and Setup

Installation of a starter motor requires mechanical aptitude and proper tools. If you are not confident in your ability to perform this installation, it is highly recommended to seek assistance from a qualified mechanic or service professional.

Safety Precautions:

- Always disconnect the vehicle's battery (negative terminal first) before beginning any electrical work.
- Wear appropriate personal protective equipment, including safety glasses and gloves.
- Ensure the vehicle is securely supported on jack stands or a lift.
- Allow the engine to cool down completely before working on it.

General Installation Steps (Consult Vehicle Service Manual for Specifics):

1. Locate the existing starter motor on your vehicle.
2. Disconnect all electrical connections from the old starter, noting their positions for reinstallation.
3. Remove the mounting bolts securing the old starter to the engine or transmission.
4. Carefully remove the old starter. It may be heavy.
5. Compare the new DB Electrical starter with the old unit to ensure they are identical in fit and connections.
6. Install the new starter, ensuring it seats correctly. Secure it with the mounting bolts, tightening them to the manufacturer's specified torque.
7. Reconnect all electrical connections to the new starter. Ensure connections are clean and tight.
8. Reconnect the vehicle's battery (positive terminal first, then negative).
9. Test the starter by attempting to start the engine.

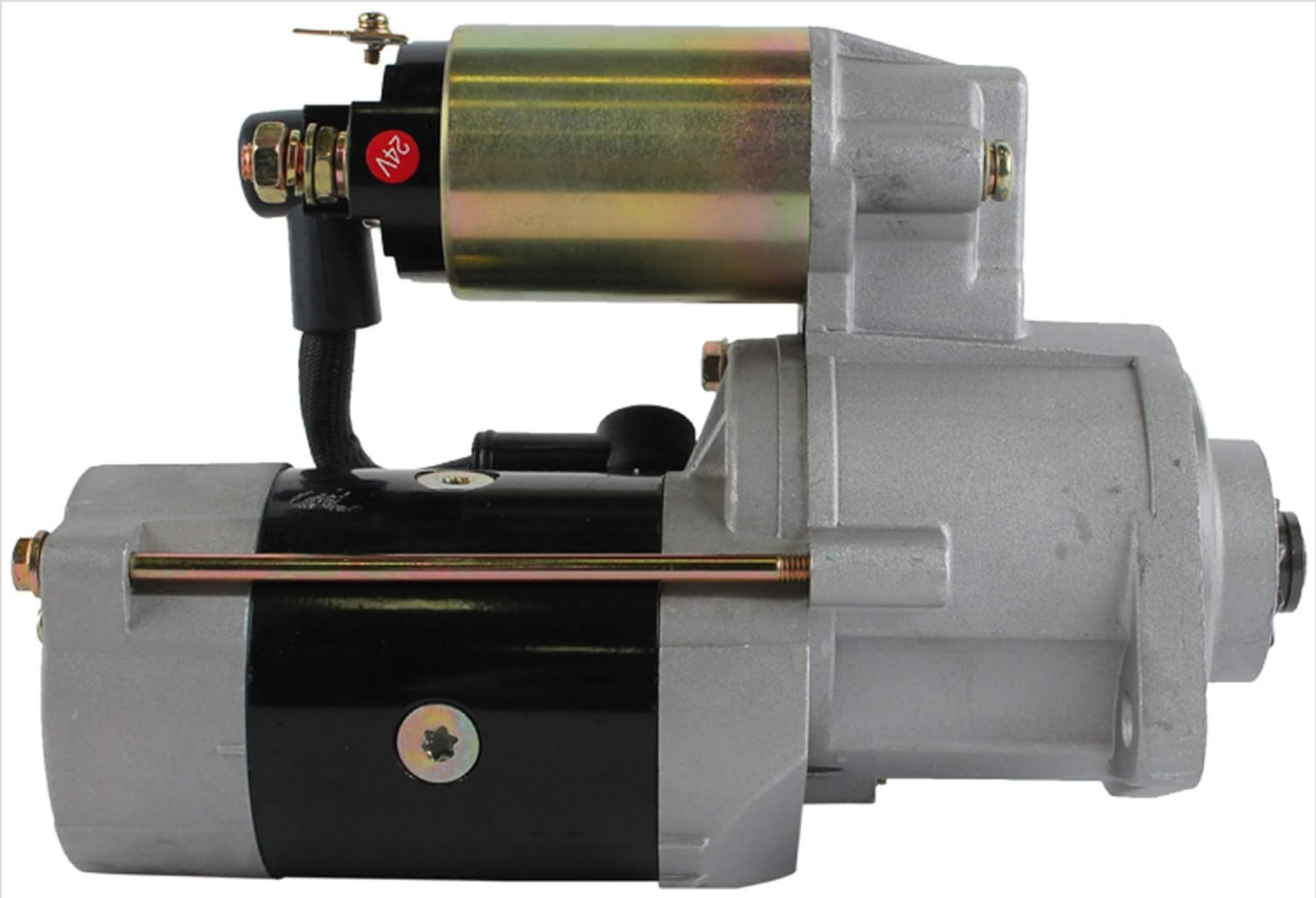

Figure 2: Side view of the starter, highlighting the 24V solenoid. Proper electrical connections are crucial for safe operation.

Operating Principles

The starter motor is an electric motor that rotates the engine's flywheel to initiate the combustion process. When the ignition key is turned to the "start" position, electrical current flows from the battery to the starter solenoid. The solenoid engages the starter drive (bendix) with the engine's flywheel and simultaneously closes a high-current switch, allowing power to flow to the starter motor. The motor then spins the flywheel, cranking the engine. Once the engine starts, the bendix disengages from the flywheel to prevent damage to the starter motor from over-speeding.

[redacted]

Video 1: An informational video from DB Electrical demonstrating the function and components of a starter motor and bendix. This video provides a visual explanation of how these parts work together to start an engine.

Maintenance

Starter motors are generally low-maintenance components. However, regular inspection of related systems can prolong the life of your starter and prevent premature failure.

Recommended Checks:

- **Battery Condition:** Ensure your vehicle's battery is in good condition and fully charged. A weak battery can put excessive strain on the starter.
- **Electrical Connections:** Periodically check all electrical connections to the starter and battery for corrosion or looseness. Clean and tighten as necessary.
- **Cables:** Inspect battery cables and starter cables for fraying, damage, or excessive heat buildup during cranking.
- **Engine Condition:** Ensure the engine is well-maintained and easy to turn over. Issues like incorrect timing or thick oil in cold weather can increase the load on the starter.

Figure 3: Angled view of the starter, showing the robust casing and mounting points. Regular inspection of these areas can help identify potential issues.

Troubleshooting

If you experience issues with your starter, consult the following common troubleshooting steps. Always ensure safety precautions are followed before attempting any diagnosis or repair.

Symptom	Possible Cause	Solution
Starter does not crank or clicks once.	Dead or weak battery, loose battery cables, faulty solenoid, corroded terminals.	Charge/replace battery, clean and tighten battery/starter connections, test solenoid.
Starter cranks slowly.	Weak battery, corroded cables, high resistance in circuit, engine mechanical issue.	Test battery and charging system, inspect and clean cables, check engine for binding.
Starter spins but engine does not crank.	Faulty starter drive (bendix), damaged flywheel teeth.	Inspect starter drive and flywheel. Replacement of starter may be necessary.

Symptom	Possible Cause	Solution
Grinding noise during cranking.	Misalignment, worn starter drive, damaged flywheel teeth.	Inspect mounting, starter drive, and flywheel.

Figure 4: Close-up view of the starter's drive gear (bendix). Inspect this area for wear or damage if the starter spins but does not engage the engine.

Specifications

Attribute	Value
Manufacturer	DB Electrical
Model Number	410-48013
Unit Type	Starter
Voltage	24 Volts
Rotation	CW (Clockwise)
Teeth	11
KW (Kilowatt)	3.0
Starter Type	DD (Direct Drive)
Item Weight	11.18 pounds
Product Dimensions	6 x 7.5 x 11 inches
UPC	701485528873

Warranty and Support

DB Electrical stands behind the quality of its products. This starter is covered by a**1-year warranty** from the date of purchase. We are confident that our products will function flawlessly once installed. In the rare event that a product does not perform as expected, we will replace it within one year of your order.
For warranty claims, technical assistance, or any other inquiries, please contact DB Electrical customer support. We are committed to assisting you with any issues you may encounter.
Note: The warranty covers manufacturing defects and product failures under normal operating conditions. It does not cover damage due to improper installation, misuse, neglect, or unauthorized modifications.