Eddy Current Brake Installation Guide
For Motorcycle Dynamometers

P/N 98226100.08
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Eddy Current Brake Installation

This document provides instructions for installing the Eddy Current Brake (retarder) optional hardware to Dynojet’s Model 150 and 200 Motorcycle Dynamometers. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

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CONVENTIONS

The conventions used in this manual are designed to protect both the user and the equipment.

<table>
<thead>
<tr>
<th>Example of Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="example.png" alt="Caution" /> CAUTION</td>
<td>The Caution icon indicates a potential hazard to the dynamometer equipment. Follow all procedures exactly as they are described and use care when performing all procedures.</td>
</tr>
<tr>
<td><img src="example.png" alt="Warning" /> WARNING</td>
<td>The Warning icon indicates potential harm to the person performing a procedure and/or the dynamometer equipment.</td>
</tr>
</tbody>
</table>

TECHNICAL SUPPORT

For assistance, please contact Dynojet Technical Support at 1-800-992-3525, or write to Dynojet at 2191 Mendenhall Drive, North Las Vegas, NV 89031.

Visit us on the World Wide Web at www.dynojet.com where Dynojet provides state of the art technical support, on-line shopping, 3D visualizations, and press releases about our latest product line.
## PARTS LIST

The following table lists all of the parts included in the Eddy Current Brake Installation kit. Check your kit against the parts listed to make sure you have received all of the parts. If any part is missing, contact Dynojet Technical Support.

<table>
<thead>
<tr>
<th>part number</th>
<th>description</th>
<th>quantity</th>
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</thead>
<tbody>
<tr>
<td>197104130</td>
<td>4” Zip Tie</td>
<td>4</td>
</tr>
<tr>
<td>25111310</td>
<td>Clamp, Retarder Hood</td>
<td>2</td>
</tr>
<tr>
<td>61229101</td>
<td>Hood Assembly, M/C Retarder</td>
<td>1</td>
</tr>
<tr>
<td>62992001</td>
<td>Retarder-Generic</td>
<td>1</td>
</tr>
<tr>
<td>Or</td>
<td>Retarder-Generic, European</td>
<td></td>
</tr>
<tr>
<td>62992002</td>
<td>Mod-Key, 1/2 x 7/16 x 2”</td>
<td>1</td>
</tr>
<tr>
<td>29250002</td>
<td>Key, 3/8 x 3/8 x 2” (installed)</td>
<td>1</td>
</tr>
<tr>
<td>32431332</td>
<td>Male Coupler, mounted on eddy current brake (with male coupler hub, P/N 32431330, installed)</td>
<td>1</td>
</tr>
<tr>
<td>32431333</td>
<td>Female Coupler Assembly with four set screws (with female coupler hub, P/N 32431331, installed)</td>
<td>1</td>
</tr>
<tr>
<td>36488101</td>
<td>Nut, 3/8-16, Hex, W/Tlok</td>
<td>5</td>
</tr>
<tr>
<td>36581270</td>
<td>Bolt, 3/8-16 x 3/4”, W/Tlok</td>
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<tr>
<td>36581670</td>
<td>Bolt, 3/8-16 x 1”, W/Tlok (for right side installation)</td>
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<tr>
<td>43312200</td>
<td>Grommet, 1-5/8OD x 1-3/8ID (one is installed)</td>
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</tr>
<tr>
<td>61329105</td>
<td>Connecting Rod Sub-Assembly</td>
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</tr>
<tr>
<td>66411002</td>
<td>Theta-2 Controller-120V</td>
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</tr>
<tr>
<td>Or</td>
<td>Theta-2 Controller-240V</td>
<td></td>
</tr>
<tr>
<td>66952004</td>
<td>Power Cable, M/C Retarder Sub-Assembly</td>
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<tr>
<td>DC100-104</td>
<td>Pendant and Cable</td>
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<tr>
<td>DM150-002-007</td>
<td>5/16” Flat Washer</td>
<td>8</td>
</tr>
<tr>
<td>DM150-033</td>
<td>Rubber Grommet</td>
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</tr>
<tr>
<td></td>
<td>Red Head Anchor Kit</td>
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</tr>
<tr>
<td></td>
<td>Theta Controller Mounting Hole Drill Template For Left Side Mounting</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Theta Controller Mounting Hole Drill Template For Right Side Mounting</td>
<td>1</td>
</tr>
<tr>
<td>78122002</td>
<td>Coupler Kit</td>
<td></td>
</tr>
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</table>
PREPARATION

This section describes how to unpack the eddy current brake and remove the hood from your dyno.

UNPACKING THE EDDY CURRENT BRAKE

1. Remove the top and sides of the crate.
2. If you ordered a hood upgrade, remove the new hood from the crate.
3. Remove the four bolts securing the eddy current brake cover and set aside.
4. Remove the two bolts securing the hood clamps to the brake and set aside.
5. Remove the hardware box from the crate and verify the hardware box contents. Refer to the parts list on page 1-2.

Figure 1-1: Remove the Brake Cover and Hood Keepers
6 Remove the eddy current brake from the crate.

**Note:** Dynojet recommends using a continuous nylon loop style strap to lift the eddy current brake from the crate.

6a Remove the bolts securing the eddy current brake to the crate.

6b Place the nylon loop strap around the top of the brake frame making sure it crosses as shown in Figure 1-2.

6c Using the nylon loop strap, remove the eddy current brake from the crate and place it near the dyno.

![Figure 1-2: Remove the Eddy Current Brake from the Crate](image1.png)

**REMOVING THE DYNO HOOD**

1 Remove the four bolts securing the hood to the dyno and set aside. Prop up the hood.

2 If present, disconnect the wires to the key switch.

3 Remove the hood from the dyno and set aside.

4 Disconnect all battery wires.

![Figure 1-3: Remove the Hood](image2.png)
AIR BRAKE AND MANUAL BRAKE REMOVAL

This section describes how to remove both the air brake and the manual brake, the brake caliper assembly, and the rotor.

If you are mounting the eddy current brake on the right side of your dyno, you do not need to remove the air or manual brake.

Note: Safety requirements of your local country may require that both brakes are installed. Be sure to follow the safety requirements specific to your country.

REMOVING THE AIR BRAKE

1. Disconnect all air lines from the dyno.
2. Disconnect the brake electrical wires.
   - **Model 150 dynos**: Disconnect the brake wires from the electrical block mounted on the center of the dyno frame. Refer to the DynoWare EX+ Upgrade manual for more information.

   ![Figure 1-4: Remove the Air Brake Solenoid Wires](image)

   **Figure 1-4: Remove the Air Brake Solenoid Wires**

   - **Upgraded Model 150/Model 200 dynos**: Disconnect the brake wires from the Breakout board located on the side of the dyno.

   ![Figure 1-5: Remove the Brake Wires from the Breakout Board](image)

   **Figure 1-5: Remove the Brake Wires from the Breakout Board**
3 Remove the jam nuts, adjuster nuts, retainers, and springs.

⚠️ **CAUTION**

The springs are compressed. Use caution when removing the springs.

4 Disconnect the brake line from the master cylinder to the caliper.

   **Note:** Make sure you have disconnected all air lines and released the tension in the springs before disconnecting the brake line.

5 Remove the two bolts securing the master cylinder to the air cylinder using a 3/16-inch allen wrench. Remove the master cylinder.

---

![Figure 1-6: Air Brake—Remove the Springs](image)

![Figure 1-7: Air Brake—Remove the Master Cylinder](image)
6  Remove the bolt securing the spring bolt mounting plate.
7  Remove the mounting plate and the air cylinder from the dyno frame.

Figure 1-8: Air Brake—Remove the Air Cylinder

REMOVING THE MANUAL BRAKE

1  Disconnect the brake line from the master cylinder to the caliper.
2  Remove the four bolts, lock washers, and flat washers that secure the master cylinder and foot pedal.
   The bolts run from the inside, through the master cylinder, and into the foot pedal mounting plate.
REMOVING THE BRAKE CALIPER ASSEMBLY

1. Remove the four bolts and washers that secure the caliper assembly.
2. Loosen the brake pads and remove the assembly.
   **Note:** Do not put the bolts back into the dyno frame. The holes will be used to mount the eddy current brake to the dyno.
3. Loosen the set screw above the keyway in the drum axle using a 3/16-inch allen wrench.
4. Remove the three 5/16-inch bolts in the lock collar and insert these bolts in the three threaded holes in the lock collar. Tighten the bolts until the collar comes loose.
5. Slide the rotor and lock collar off the drum axle and remove the key.

![Figure 1-10: Remove the Brake Caliper Assembly](image-url)
EDDY CURRENT BRAKE

The eddy current brake can be installed on either the left or right side of the dyno. Be sure to check the dyno drum axle for damage or rust and carefully file any marks flush with the axle.

ADJUSTING THE BRAKE FOR RIGHT SIDE INSTALLATIONS

Make the following adjustments to the eddy current brake only if the brake will be mounted on the right side of the dyno.

1. Move the coupler and key to the other side of the brake.
2. Move the sensor temperature cable and power cable to the other side of the brake.

INSTALLING THE CONNECTING ARMS

Attach the upper and lower connecting arms on the corresponding side of the eddy current brake. The connecting arms are identical and interchangeable.

1. Remove the eight 3/8-inch bolts and washers from the side of the eddy current brake.
2. Loosely attach one of the connecting arms to the bottom of the eddy current brake using four 3/8-inch bolts and four 3/8-inch washers.

3. Loosely attach the remaining connecting arm to the top of the eddy current brake using four 3/8-inch bolts and four 3/8-inch washers.

**Note:** All eight bolts need to remain loose in order to align the brake.

*Figure 1-13: Install the Connecting Arms*
INSTALLING THE DYNO SHAFT COUPLER

1. Replace the existing set screw in the key way of each coupler with the thread-lock set screws provided.
   
   **Note:** Replace the dyno shaft coupler set screw before installing the coupler on the shaft.

2. Insert the key into the keyway.
3. Slide the coupler over the key on the axle.
   
   **Note:** Do not tighten the set screw in the coupler.

---

**Figure 1-14: Replace the Coupler Set Screws**

**Figure 1-15: Install the Dyno Shaft Coupler**
CONNECTING THE EDDY CURRENT BRAKE

The following instructions and figures show the eddy current brake mounting to the left side of the dyno; however, the instructions are the same for both left and right side installations.

Use the following instructions to install the eddy current brake to both the standard and high inertia drums. If you have a high inertia drum, refer to Appendix B for installation details.

1. If not already removed, remove the bolts and washers from the dyno frame as shown in Figure 1-16.

2. Place the eddy current brake next to the dyno.

3. Line up the connecting arms with the dyno and loosely attach the arms to the dyno using four 3/8-inch bolts and 3/8-inch washers for each arm. These bolts need to remain loose in order to align the brake.

   Note: If you have an older dyno with no threaded insert, you will also need to use 3/8-inch nuts with threadlock on the inside of the dyno side panel.

Figure 1-16: Remove the Connecting Bolts from the Dyno

Figure 1-17: Connect the Eddy Current Brake
ALIGNING THE EDDY CURRENT BRAKE

**CAUTION**

Eddy current brake and coupler alignment is very important. You must follow these instructions very carefully to ensure proper alignment and function. Dynojet will not warranty any coupler that is damaged due to improper installation.

1. Place a straight edge with a notch across the apex of the drum with the notch across the eddy current brake.
2. Using the straight edge as a guide, measure the distance to the collars on the axle shaft of the eddy current brake (not the black bearing lock collars).
3. Place shims between the floor and the eddy current brake or dyno until the collars are 7 19/32-inch (19.288 cm), +/- 1/16-inch (1.58 mm), down from the top of the drum on the dyno.
4. Torque all the bolts securing the connecting arms to the dyno and to the eddy current brake to 33 ft. lb. (45 N-m). Verify the height and make sure nothing has moved.

![Figure 1-18: Align the Eddy Current Brake](image-url)
COUPLING THE EDDY CURRENT BRAKE

**CAUTION**

Coupler alignment is very important. You must follow these directions very carefully to ensure proper alignment and function. Dynojet will not warranty any coupler that is damaged due to improper installation.

1. Slide the dyno coupler over the eddy current brake coupler so the three holes in each of the couplers line up.
2. Secure the couplers together using three 3/8-inch bolts and tighten to 33-37 ft. lb. (45-50 N-m).
3. Verify the key has not moved laterally.
4. Tighten the set screws in the couplers to 24 ft. lb. (29-33 N-m).

![Figure 1-19: Secure the Couplers](image)

SECURING THE EDDY CURRENT BRAKE

**Note:** Dynojet recommends you anchor the dyno to the floor in your dyno room as well.

1. Install the Red Head Anchors. Refer to Appendix A for Red Head Anchor installation instructions.
2. Secure the eddy current brake to the ground.

![Figure 1-20: Secure the Brake to the Ground](image)
THETA CONTROLLER

This section describes how to install the Theta Controller, make power adjustments, and replace the fuses.

ADJUSTING THE POWER

Newer Theta Controllers are capable of operating at either 60 Hz or 50Hz and are able to compensate for a lower AC line voltage allowing improved performance under varying AC power conditions. Each Theta Controller is designed for either the 240 VAC or the 120 VAC range and are not interchangeable. Each eddy current brake is wired for either 240 VAC or 120 VAC operation and must match the specific Theta Controller for the desired line voltage.

To determine whether a Theta Controller is capable of power adjustments, look for a metal plug on the bottom of the Theta Controller. Refer to Figure 1-21. If this metal plug is not present, the Theta Controller is not capable of power line frequency selection. Continue with the installation instructions.

WARNING

Hazardous voltage. To avoid risk of electrical shock, disconnect the power cord to the Theta Controller. Do not remove the cover. No user serviceable parts inside.

CAUTION

The two dip switches are the only adjustments that can be altered. Be sure not to damage any other parts on the circuit board. Do not attempt any other adjustments.

Dynojet recommends you set the dip switches at the time of installation.

1  Remove the metal plug from the bottom of the Theta Controller.
2  Use a small screwdriver to set the dip switches for the desired line voltage. Refer to “120 VAC Theta Controller (P/N 66411002)” on page 1-16 and “240 VAC Theta Controller (P/N 66411003)” on page 1-17 for more information on dip switch settings.
3  Replace the metal plug.

Figure 1-21: Theta Controller—Metal Plug
CHAPTER 1
Theta Controller

120 VAC THETA CONTROLLER (P/N 66411002)

The 120 VAC Theta Controller is designed for operation in North America and Japan and is identified by a single external fuse holder. This controller is nominally calibrated for 115 to 120 VAC line voltage; in Japan, the nominal line voltage is 100 VAC and the dip switch on the Theta Controller can be set to compensate for the reduced line voltage while still providing the full output current of 20 amps.

**Note:** This controller cannot be converted to operate on 240 VAC line voltage.

**Power Line Frequency Adjustment**—The Theta Controller is shipped with the dip switch set for 60 Hz. For all of North America, this switch should be set to the 60 Hz position. In Japan, there may be either 50 Hz or 60 Hz power line frequency; determine the correct line frequency and set the switch accordingly.

**Power Line Voltage Adjustment**—The Theta Controller is shipped with the dip switch set for normal (NORM) line voltage. In the NORM position, the controller is calibrated for a nominal 115 to 120 VAC line voltage. For all of North America, this switch should be set to the NORM position. In Japan, the nominal line voltage is rated for 100 VAC and the dip switch should be set to the LO position.

In some cases in North America, it may be necessary to set the dip switch to the LO position when the AC line voltage is consistently around or below 110 VAC and combined with reduced brake performance.

- Measure the AC line voltage with all normal AC loads running in the shop (lights, heater, etc.).
- If the line voltage is reduced to or below 110 VAC and remains at these levels, move the switch to the LO position. This will boost the output current with the lower AC power voltages.

**Note:** Be sure to review and comply with the model 250 motorcycle dyno installation requirements before setting the dip switch to the LO position. The Theta Controller should be on its own dedicated AC power circuit.

**Note:** If the AC power voltage returns above the 115 VAC range while the dip switch is set to LO, overheating and damage to the eddy current brake or fuse failure may result. Review the LO/NORM dip switch position setting and re-measure your incoming AC line voltage.

![Figure 1-22: Theta Controller—North America 120 VAC Dip Switch Settings](image-url)
240 VAC Theta Controller (P/N 66411003)

The 240 VAC Theta Controller is identified by the two external fuse holders. The 240 VAC Theta Controller is calibrated for a nominal 230 to 240 VAC line voltage; in certain countries, line voltages of 210 to 220 VAC may be encountered and the dip switch can be set to provide full output current of 10 amps even with the reduced line voltage.

Note: This controller cannot be converted to operate on 120 VAC line voltage.

Power Line Frequency Adjustment—The Theta Controller is shipped with the dip switch set for 50 Hz. Determine the correct line frequency and set the switch accordingly.

Power Line Voltage Adjustment—The Theta Controller is shipped with the dip switch set for normal (NORM) line voltage. In the NORM position, the controller is calibrated for a nominal 235 to 240 VAC line voltage.

In some cases in Europe, it may be necessary to set the dip switch to the LO position when the AC line voltage is consistently around or below 225 VAC and combined with reduced brake performance.

- Measure the AC line voltage with all normal AC loads running in the shop (lights, heater, etc.).
- If the line voltage is reduced to or below 225 VAC and remains at these levels, move the switch to the LO position. This will boost the output current with the lower AC power voltages.

Note: Be sure to review and comply with the model 250 motorcycle dyno installation requirements before setting the dip switch to the LO position. The Theta Controller should be on its own dedicated AC power circuit.

Note: If the AC power voltage returns above the 230 VAC range while the dip switch is set to LO, overheating and damage to the eddy current brake or fuse failure may result. Review the LO/NORM dip switch position setting and re-measure your incoming AC line voltage.

Figure 1-23: Theta Controller—Europe and Australia 240 VAC Dip Switch Settings
DRILLING THE MOUNTING HOLES

Depending on the age of your dyno, you may need to drill the holes needed to mount the Theta Controller. If your dyno already has the required holes, skip these steps and continue with the installation.

LEFT SIDE INSTALLATION

1. Locate the template for left side installations included with the control box. This template can also be found in Appendix D.
2. Locate the large hole on the left side of the dyno. This hole should have four smaller holes around it.
3. Place the template on the dyno. Line the template up using the large hole and the four smaller holes around it.
4. Mark and drill the four mounting holes to 3/16-inch (5 mm).
   **Note:** Make sure no metal chips come in contact with the electrical components.

![Figure 1-24: Theta Controller—Drill Mounting Holes on Left Side](image)
**RIGHT SIDE INSTALLATION**

1. Locate the template for right side installations included with the control box. This template can also be found in Appendix D.

2. Place the template on the dyno. Line the template up using the existing hole and the bottom lip of the dyno frame.

3. Mark and drill the three mounting holes to 3/16-inch (5 mm).
   
   **Note:** Make sure no metal chips come in contact with the electrical components.

---

*Figure 1-25: Theta Controller—Drill Mounting Holes on Right Side*
**Installing the Theta Controller—Left Side**

The Theta Controller is mounted on the left side of the dyno regardless of which side the eddy current brake is on. The only exception is when the air brake is mounted on the left side and the eddy current brake is mounted on the right side. Refer to “Installing the Theta Controller—Right Side” on page 1-22 for more information.

Be sure to set the dip switch power settings before installation.

1. Attach the input power cable to the Theta Controller as shown in Figure 1-27.
2. Place the large rubber grommet over the plug on the eddy current brake power cable.
3. Route the brake power cable through the dyno as shown in Figure 1-27 and attach the cable to the Theta Controller. Secure the rubber grommet in the hole.
4. Secure the Theta Controller to the dyno using four No. 8 screws and lock washers.

![Figure 1-26: Theta Controller—Install on Left Side](image-url)
5 Route the input power cable under and out the front of the dyno.
6 Insert the smaller rubber grommet as shown in Figure 1-27.
7 Route the temperature sensor cable from the eddy current brake through the dyno to the Breakout board.
8 Route the control cable from the Theta Controller to the Breakout board.

Figure 1-27: Theta Controller—Routing the Cables on Left Side
INSTALLING THE THETA CONTROLLER—RIGHT SIDE

1. Install the Theta Controller using four No. 8 screws and washers. The screws will mount from the inside of the dyno.

2. Attach the input power cable to the Theta Controller and route the input power cable along the side of the dyno.

3. Attach the eddy current brake cable to the Theta Controller.
   **Note:** Make sure the brake power cable is clear of the coupler.

4. Attach the temperature sensor cable from the eddy current brake to the Breakout board.

5. Attach the control cable from the Theta Controller to the Breakout board.

Figure 1-28: Theta Controller—Install on Right Side

Figure 1-29: Theta Controller—Routing the Cables on Right Side
WIRING

1. Remove the four screws securing the Breakout board and cover. Set the cover aside.

   Figure 1-30: Theta Controller—Remove the Breakout Board Cover

2. Attach the temperature cable to the Breakout board. The temperature cable has five wires which connect to the wiring block labeled TEMP.

   - Green wire connects to G1
   - White wire connects to W1
   - Black wire connects to B1
   - Red wire connects to R1
   - Ground (shield) wire connects to S1

3. Attach the control cable to the Breakout board. The control cable has five wires which connect to the wiring block labeled LOAD CONTROL.

   - Black wire connects to V-
   - Red wire connects to V+
   - White wire connects to O+
   - Green wire connects to O-
   - Ground (shield) wire connects to SH

4. Verify jumpers J1 and J2 are set either for the eddy current brake only or for the eddy current and air brake as shown in Figure 1-31.

5. Replace the Breakout board cover using the four screws removed earlier.

   Figure 1-31: Theta Controller—Breakout Board Wiring and Jumper Settings
CHAPTER 1
Theta Controller

REPLACING THE FUSE

Older Theta Controllers have an internal fuse. Refer to Appendix C for more information on replacing an internal fuse.

WARNING
Hazardous voltage. To avoid risk of electrical shock, disconnect the power cord to the Theta Controller before replacing the fuse. Do not remove the cover. No user serviceable parts inside.

1. Remove the Theta Controller from the dyno. Refer to Figure 1-26 or Figure 1-28.
2. Gently push the fuse holder slightly inward and rotate counterclockwise to remove.
3. Replace the fuse. Refer to the table on page 1-25 for fuse replacement types.

CAUTION
For continued protection against risk of fire, replace only with a fuse of the same type and having the same electrical rating.

Figure 1-32: Theta Controller—Replace the Fuse
To determine whether you have a 120 volt or 240 volt Theta Controller, look at the serial number/fuse(s) on the Theta Controller. If the serial number begins with an “E”, and the control box has dual fuses, then it is a 240 volt unit; if the serial number does not begin with an “E” and the control box has a single fuse, then it is a 120 volt unit.

![Theta Controller—Determine the Type](image)

**Table:**

<table>
<thead>
<tr>
<th>Theta Controller</th>
<th>replacement fuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>240 volt</td>
<td>Buss P/N BAF-15, 15A Fuse</td>
</tr>
<tr>
<td></td>
<td>Little Fuse, KLK 15</td>
</tr>
<tr>
<td></td>
<td>Fast Blow, Dynojet P/N 54211201</td>
</tr>
<tr>
<td>120 volt</td>
<td>Buss P/N BAF-25, 25A Fuse</td>
</tr>
<tr>
<td></td>
<td>Little Fuse, KLK 25</td>
</tr>
<tr>
<td></td>
<td>Fast Blow, Dynojet P/N 54202501</td>
</tr>
</tbody>
</table>

**Note:** Changing the fuse rating to the higher or lower specification does not allow you to use the Theta Controller with an eddy current brake that was wired for 120 volt or 240 volt originally. Refer to “Verifying the Eddy Current Brake Wiring Configuration” on page 1-26.

**Note:** If the eddy current brake has been rewired to a different voltage, you will need a different Theta Controller. The original Theta Controller will not work.
**CHANGING THE INPUT POWER CABLE PLUG**

If the input power cable is not provided with a power plug, you must install the correct power plug for your country. The input power cable plug must connect to a properly grounded outlet and be easily accessible so that it may be disconnected. Do not wire the input power cable directly into the power panel. Refer to Figure 1-34 for individual wire descriptions.

*Note:* The eddy current brake is set up to run on 120 volts/20 amps/60 Hz for North America and 240 volts/10 amps/50 Hz for Europe/Australia.

*Note:* The voltage source and power plug must be capable of handling a minimum of 20 amps for North America and 10 amps for Europe/Australia.

![Figure 1-34: Theta Controller—Input Power Cable Plug](image)

**VERIFYING THE EDDY CURRENT BRAKE WIRING CONFIGURATION**

Refer to Figure 1-35 to determine whether the eddy current brake is currently wired for 120 or 240 volt operation.

![Figure 1-35: Theta Controller —Eddy Current Brake Wiring](image)
HOOD UPGRADE

Use the following instructions to assemble and install the hood upgrade or to attach the eddy current brake cover to your existing hood.

ASSEMBLING THE HOOD

1 Verify that the dyno hood side panel is on the correct side for your eddy current brake. You may have to remove the side panel and move it to the opposite side for your particular installation.

2 Place the eddy current brake cover in position next to the dyno hood. 
   Note: Place the front and rear flanges of the eddy current brake cover on the inside of the dyno hood. Place the top flange of the eddy current brake cover on top of the dyno hood.

3 Secure the eddy current brake cover to the dyno hood using the six 1/4-inch button head screws and locking nuts.
INSTALLING THE HOOD

1. Verify the bolts and the set screws on the couplers are tight.
2. Connect the battery.
3. Carefully place the hood on the dyno leaving it propped up. Secure the key switch, if present.
4. Lower and secure the hood using the four bolts removed earlier.

**CAUTION**

Verify the hood is not pinching or contacting any cables or wires.

5. Secure the hood clamps to the brake using the two bolts you removed earlier.
6. Secure the brake cover using the four bolts you removed earlier.

**WARNING**

Never operate the dyno with this cover removed.

7. Plug the input power cable into a wall outlet.

Figure 1-38: Install the New Dyno Hood

Figure 1-39: Secure the Hood Clamps and Brake Cover
This appendix contains instructions for installing the Red Head Multi-Set™II Anchors. The anchors will be used to secure the dyno to concrete. To ensure safety and accuracy in the procedures, perform the procedures as they are described. Be sure to read and understand the warnings included in this appendix.

WARNINGS

⚠️ WARNING
Always wear safety glasses and other necessary protective devices or apparel when installing or working with anchors.

⚠️ CAUTION
ITW Ramset/Red Head Multi-Set II Anchors are designed to operate properly only when installed with ITW Ramset/Red Head brand Setting Tools.

The use of a 24 to 40 ounce hammer is recommended for expanding Multi-Set II anchors.

The use of carbide drill bits manufactured with ANSI B94. 12-77 drill bit diameter requirements is recommended for installation of this anchor.

Not recommended for use in lightweight masonry material such as block or brick.

Use of core drills is not recommended to drill holes for use with this anchor.

Not recommended for use in new concrete which has not had sufficient time to cure.

Anchor spacing and edge distance requirements (anchor installation locations) are the responsibility of the engineer of record.

CONTACT INFORMATION FOR ITW RAMSET/RED HEAD
Contact ITW Ramset/Red Head at 1-630-350-0370, or 1300 North Michael Drive, Wood Dale, IL 60191.
INSTALLATION

Use the table below to determine the catalog number, drill bit size, minimum hole depth, and setting tool catalog number.

<table>
<thead>
<tr>
<th>catalog number</th>
<th>drill bit size</th>
<th>minimum hole depth</th>
<th>setting tool catalog number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Steel RM-38/RL-38 (9.5 mm)</td>
<td>1/2-inch</td>
<td>1 5/8-inch (41.2 mm)</td>
<td>RT-138</td>
</tr>
</tbody>
</table>

Use the following instructions to install the Red Head anchors.

1. Drill the hole in the concrete the same outside diameter as the anchor being used to any depth exceeding minimum embedment.

![Figure A-1: Red Head Anchor—Drill the Hole](image1)

2. Insert the anchor.

![Figure A-2: Red Head Anchor—Insert the Anchor](image2)
3 Using a hammer, drive the anchor flush with the surface of the concrete, or below the surface if the hole depth exceeds minimum embedment.

Figure A-3: Red Head Anchor—Drive the Anchor Flush

4 Using a hammer, expand the anchor with the setting tool. The anchor is properly expanded when the shoulder of the setting tool is flush with the top of the anchor.

Note: Use only Ramset/Red Head setting tools to insure proper installation.

Figure A-4: Red Head Anchor—Expand the Anchor
Older high inertia dynos may not have threaded mounting holes for the eddy current brake. You will need to use nuts to secure the brake to the dyno. This appendix contains instructions for mounting the eddy current brake to the older high inertia dyno.

**CONNECTING THE EDDY CURRENT BRAKE**

1. Verify the axle length.
   1a. Measure the axle from the bearing on the starter side to the end of the axle.
   1b. If the measurement is more than four inches, mark four inches on the axle and cut the axle.

![Figure B-1: High Inertia Drum—Measure the Axle]
2 If not already removed, remove the four bolts in the dyno frame from the positions shown in Figure B-2.
3 Remove the four nuts and washers from the positions shown in Figure B-2 leaving the bolts in place.

![Figure B-2: High Inertia Drum—Remove Nuts and Washers](image)

4 Slip the connecting arms over the four existing bolts on the dyno frame and loosely attach the arms using the four washers and nuts removed earlier. These nuts need to remain loose in order to align the brake.
5 Loosely attach the connecting arms using the four 3/8-inch bolts and 3/8-inch washers removed earlier. These bolts need to remain loose in order to align the brake.
6 Continue with “Aligning the Eddy Current Brake” on page 1-13.

![Figure B-3: High Inertia Drum—Connect Brake](image)
THETA CONTROLLER—INTERNAL FUSE

Older Theta Controllers have the fuse located inside the theta control box. This appendix contains instructions to replace the internal fuse.

REPLACING THE INTERNAL FUSE

WARNING
Hazardous voltage. To avoid risk of electrical shock, disconnect the power cord to the Theta Controller before replacing the fuse.

1. Remove the six screws that secure the cover to the base of the Theta Controller. There are two screws on top and two on each side of the cover.
2. Remove the theta control cover and set it aside.
3. Remove the blown fuse and replace it. Refer to the table below for fuse replacement types.
4. Replace the theta control cover.

Figure C-1: Theta Controller—Replace Internal Fuse
CAUTION
For continued protection against risk of fire, replace only with a fuse of the same type and having the same electrical rating.

To determine whether you have a 120 volt or 240 volt early style Theta Controller, look at the serial number on the Theta Controller. If it begins with an “E”, then it is a 240 volt unit; if it does not begin with an “E”, then it is a 120 volt unit.

<table>
<thead>
<tr>
<th>Theta Controller</th>
<th>replacement fuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>240 volt</td>
<td>Buss P/N FNQ-15, 15A Time Delayed Fuse</td>
</tr>
<tr>
<td>120 volt</td>
<td>Buss P/N FNQ-25, 25A Time Delayed Fuse</td>
</tr>
</tbody>
</table>

Note: Changing the fuse rating to the higher or lower specification does not allow you to use the Theta Controller with an eddy current brake that was wired for 120 volt or 240 volt originally. Refer to “Verifying the Eddy Current Brake Wiring Configuration” on page 1-26.

Note: If the eddy current brake has been rewired to a different voltage, you will need a different Theta Controller. The original Theta Controller will not work.
Depending on the age of your dyno, you may need to drill the holes needed to mount the Theta Controller. This appendix contains the templates needed to locate and place the mounting holes for both left and right side installations.

This appendix contains the following templates:

- Theta Controller Mounting Hole Drill Template For Left Side Mounting
- Theta Controller Mounting Hole Drill Template For Right Side Mounting
EXISTING HOLES

DRILL 3/16" (5mm) 4 PLACES

4 PLACES

DRILL Ø3/16" (5mm)

EXISTING HOLES

Theta Controller Mounting Hole Drill Template for Left Side Mounting
EXISTING HOLE

DRILL 3/16" (5MM) HOLES IN THREE LOCATIONS

THETA CONTROLLER MOUNTING HOLE DRILL TEMPLATE FOR RIGHT SIDE MOUNTING

EXISTING HOLE

P:\Templates\ right theta template 12/13/01