PRE-INSTALLATION GUIDE

For DynoWare RT Automotive Dynamometers

P/N 98200083.01
# Pre-Installation

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Thank you for your interest in Dynojet’s Motorcycle Dynamometers. Dynojet’s software and dynamometers will give you the power to get the maximum performance out of vehicles you evaluate. Whether you are new to the benefits of a chassis dynamometer or an experienced performance leader, the repeatability and diagnostic tools of Power Core software and a Dynojet dynamometer (dyno) will give you the professional results you are looking for.

This document is designed to help you set up your dyno room before your above ground or in ground model 224x, 424x, 224xLC, or 424xLC2 automotive dyno arrives. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

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- Introduction, page 2
- Your Dyno Room, page 3
- Specifications and Requirements, page 5
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- Above Ground Model 224x Dynamometer, page 12
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- Unpacking the Dyno, page 46
INTRODUCTION

Thank you for your interest Dynojet’s Automotive Dynamometers. Before receiving your dyno, please take a moment to read this guide for dyno specifications and requirements, Power Core requirements, and dyno room set-up.

This document provides information for DynoWare RT automotive dynamometers including:

<table>
<thead>
<tr>
<th>part number</th>
<th>dynamometer model</th>
</tr>
</thead>
<tbody>
<tr>
<td>81200000</td>
<td>224-2 DynoWare RT Generic</td>
</tr>
<tr>
<td>81200001</td>
<td>224x DynoWare RT Base</td>
</tr>
<tr>
<td>81200002</td>
<td>224xLC DynoWare RT Above Ground</td>
</tr>
<tr>
<td>81200003</td>
<td>224xLC DynoWare RT In Ground</td>
</tr>
<tr>
<td>81200004</td>
<td>224-4WD DynoWare RT Generic</td>
</tr>
<tr>
<td>81200005</td>
<td>424x DynoWare RT Above Ground</td>
</tr>
<tr>
<td>81200006</td>
<td>424xLC DynoWare RT Above Ground</td>
</tr>
<tr>
<td>81200007</td>
<td>424x DynoWare RT In Ground</td>
</tr>
<tr>
<td>81200008</td>
<td>424xLC DynoWare RT In Ground</td>
</tr>
<tr>
<td>81200009</td>
<td>424x DynoWare RT Generic</td>
</tr>
</tbody>
</table>

CONVENTIONS USED IN THIS MANUAL

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>![Caution Icon]</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>![Warning Icon]</td>
<td>The Warning icon indicates potential harm to the person performing a procedure and/or the dynamometer equipment.</td>
</tr>
<tr>
<td>Blue Underlined</td>
<td>Highlights items you can click on directing you to a location with more information.</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 89081.

Visit us on the World Wide Web at [www.dynojet.com](http://www.dynojet.com) where Dynojet provides state of the art technical support, on-line shopping, and press releases about our latest product lines.
YOUR DYNO ROOM

This section is not meant to imply that a dyno room is essential to repeatable results on a Dynojet dynamometer. However, a dyno room with an engine cooling intake fan, exhaust extraction, and noise reduction capabilities can add a new dimension to your shop.

SETTING UP A DYNO ROOM

A proper dyno room design will help to ensure repeatable, accurate runs. A good dyno room should do the following:

- exhaust extraction
- minimize noise
- provide a controlled environment for testing
- provide a view window (safety glass) for customers
- be designed with safety in mind

Exhaust Extraction—Exhaust extraction is needed to remove exhaust gasses, especially carbon monoxide, from the dyno room. Carbon monoxide is potentially lethal to people if not removed from the room and will affect engine power when mixed with fresh air.

⚠️ WARNING

Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death. Operate machine in well ventilated area.

Equalizer Box—If the air flow rate coming into the dyno room is greater than the air flow rate leaving the dyno room, the room will become pressurized. A pressurized dyno room will make measured power misleading. To compensate, you need an equalizer box. The equalizer box is a baffled (to reduce noise) vent to the outside of your dyno room. The size of the equalizer box is dependent on the size of your dyno room and the size of your fans.
Intake Air Fan—After building your dyno room, you will need to supply a cooling fan. The cooling fan supplies air to cool the vehicle’s engine while supplying fresh oxygen for you and your vehicle to breathe. It is a common misconception that you cannot tune a vehicle without a large fan simulating exact road conditions; however, a good cooling fan is the only requirement for consistent diagnostics and tuning. The installed fan should be at least 5200 CFM (147 m³/min) or determined by Industrial Noise Control.

**Note:** If the air flow rate coming into the dyno room is greater than the air flow rate leaving the dyno room, the room will become pressurized. A pressurized dyno room will make measured power misleading.

Fire Suppression—Always have adequate fire suppression or fire extinguishers in your dyno room.

Industrial Noise Control, Inc—Industrial Noise Control, Inc. offers a zinc-coated steel room custom built to your specifications. This room meets all dyno room requirements. The dyno room must be clean and dry with a comfortable room air temperature above 32 degrees Fahrenheit (0 degrees Celsius), and have some system of exhaust extraction.
SPECIFICATIONS AND REQUIREMENTS

The following specifications and requirements apply to all automotive dynos in this manual. Take a moment to review the requirements and make sure you can provide what your dyno will need.

COMPRESSED AIR

You will need to provide an air hose nipple (1/4-inch NPT) to connect your clean, dry shop air supply (100-140 psi) to the dynamometer.

The following requirements are needed for the air brake:

- air dryer
- shut off valve
- gauge on the regulator
- 1/4-inch NPT pipe thread connector (to attach air to the dyno)

The following requirements are needed for the optional AFR module:

- Clean and dry air, 100 psi regulated (690 kPa), 5 CFM (.014 m³/min) or better flow
- 1/4-inch NPT pipe thread compressed air connector
- optional air regulator

COMPUTER SPECIFICATIONS

You will need to provide a computer system to run the Power Core software. Refer to www.dynojet.com for the latest computer requirements.

<table>
<thead>
<tr>
<th>description</th>
<th>minimum specifications</th>
<th>recommended specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Windows 7 or later</td>
<td>Windows 7 or later</td>
</tr>
<tr>
<td>Processor</td>
<td>Dual Core Processor,</td>
<td>Intel Core i5 2.8GHz or</td>
</tr>
<tr>
<td></td>
<td>2GHz or faster</td>
<td>faster</td>
</tr>
<tr>
<td>Memory</td>
<td>4GB System Ram</td>
<td>8GB System Ram or more</td>
</tr>
<tr>
<td>Hard Drive</td>
<td>100GB or larger</td>
<td>500GB or larger</td>
</tr>
<tr>
<td></td>
<td>(54MB required for program)</td>
<td>(54 MB required for program)</td>
</tr>
<tr>
<td>Monitor/Graphics Card</td>
<td>1280x1024 (SXGA) resolution or higher</td>
<td>1440x900 (WSXGA) resolution or higher</td>
</tr>
<tr>
<td>Network Adapter</td>
<td>1 free 10/100 Mbps RJ45 Ethernet Port</td>
<td>1 free 10/100Mbps RJ45 Port on IP Router, Wireless, or Wired and Internet Access</td>
</tr>
<tr>
<td>External Media</td>
<td>CD Rom Drive</td>
<td>CD Rom Drive</td>
</tr>
<tr>
<td>Printer</td>
<td>Printer, if prints or needed</td>
<td>Color printer, if prints are needed</td>
</tr>
</tbody>
</table>
DRILL AND DRILL BIT REQUIREMENTS

You will need to provide a drill and drill bit capable of drilling holes in concrete. Refer to Appendix A for more information on installing Red Head Anchors.

- drill bit size: 1/2-inch
- minimum hole depth: 1 5/8-inch (41.2 mm)

ELECTRICAL REQUIREMENTS

Each optional eddy current brake requires a power socket that you may order ahead of time and install.

- Domestic: P/N 43826430 Receptacle, Turnlock, 30A, 125/250
- European: P/N 43826431 Power Socket, AC, IEC, 30A, 250V

<table>
<thead>
<tr>
<th>description</th>
<th>specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Requirements: 4WD electronics</td>
<td>110v 60Hz or 240v 50Hz</td>
</tr>
<tr>
<td>Power Requirements: dyno electronics</td>
<td>110v 60Hz or 240v 50Hz</td>
</tr>
<tr>
<td>Power Requirements: AFR module</td>
<td>110v 60Hz or 240v 50Hz</td>
</tr>
<tr>
<td>Power Requirements: hydraulic motor</td>
<td>110v 60Hz or 240v 50Hz or 60Hz</td>
</tr>
<tr>
<td>Power Requirements: computer</td>
<td>110v 60Hz or 240v 50Hz</td>
</tr>
<tr>
<td>Power Requirements: optional eddy current brake</td>
<td>240v 30amp single-phase circuit for each eddy current brake</td>
</tr>
<tr>
<td></td>
<td>Refer to Appendix B for power requirements and installation.</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL REQUIREMENTS

<table>
<thead>
<tr>
<th>description</th>
<th>specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>operating min./max</td>
<td>10°C/50°C (50°F/122°F)</td>
</tr>
<tr>
<td>storage min./max</td>
<td>0°C/60°C (32°F/140°F)</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 95% non condensing</td>
</tr>
</tbody>
</table>
FIRE SUPPRESSION

Always have adequate fire suppression or fire extinguishers in your dyno room.

FORKLIFT REQUIREMENTS

The crate the dyno is shipped in is eight feet long and will be in the truck the long way. If you have access to a loading dock, you can drag the crate out of the truck and a large forklift is not required. Without a loading dock, you will need a forklift that meets the following requirements.

In order to remove the crate from the truck, you will need to provide a forklift with a lift capacity of 6,124 kg (13,500 lb.) at 61.00 cm (24.00 in.) load center. The lift range needs to be at least 182.88 cm (72.00 in.) and the forks need to be at least 182.88 cm (72.00 in.) long or increased to 182.88 cm (72.00 in.) with approved extensions.

Once off of the truck, you will need to provide equipment capable of lifting at least 2,495 kg (5,500 lb.) with 122.00 cm (48.00 in.) forks lifting to a height of at least 182.88 cm (72.00 in.) to lift the crated dyno and to lift the dyno off the crate and into position in your dyno room. You will also need a pair of straps capable of supporting the uncrated dyno. Dynojet recommends using single loop style straps. Use an approved strap lifting attachment for the forklift to prevent strap slippage. To use lift straps with bare forks is not OSHA compliant.

GROUNDING REQUIREMENTS

You will need to ground the vehicle to the dynamometer before every run using the vehicle grounding kit P/N 76100015. Never operate the dynamometer without first grounding the vehicle to the dyno. Use the following steps to install the grounding bracket and ground the vehicle to the dyno.

**CAUTION**
Always ground the vehicle to the dynamometer. Never operate the dynamometer without first grounding the vehicle to the dyno.

You will need the following parts:

- 21600084 Grounding Bracket
- 36560834 Screw, 1/4-20 x 1/2"
- 76950788 Vehicle Grounding Cable

1. Choose any location on your dyno with a black 1/4-20 x 5/8-inch torx screw that threads directly into the sheet metal and remove this screw.
2. Secure the grounding bracket to this location using one 1/4-20 x 1/2-inch screw.
3. Attach the vehicle ground cable to an exhaust bolt or engine bolt on the vehicle.
4. Attach the vehicle ground cable to the grounding bracket.
NETWORK CONNECTIONS

The Dynojet DynoWare RT dyno electronics connects to your computer directly or over a Local Area Network. If you have an existing network, connect the DynoWare RT main module to a router or a network switch on your network. If you don’t have an existing network, you can create a network for the DynoWare RT by connecting the main module to a router.

There are some advantages to connecting the DynoWare RT to a network, particularly a wireless network. With DynoWare RT on a network, you don’t have to have one dedicated computer for the dyro. Any computer on the network can connect and operate the dyro. A wireless connection allows you to control the dyro from inside the vehicle without a cable running to the DynoWare RT main module.

**Note:** Only one computer at a time can connect.

When the DynoWare RT main module is on a network connected to the internet, automatic updates for both the box and software are possible.

<table>
<thead>
<tr>
<th>connection method</th>
<th>auto updates</th>
<th>multi-computer connection</th>
<th>wireless connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless Network Internet</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wireless Network Router</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

Figure 1: DynoWare RT Network Connections
PHONE AND INTERNET ACCESS

Dynojet recommends you have a phone close to the dyno to call for assistance in an emergency. You may also wish to contact Dynojet to troubleshoot your dyno. Internet access on your computer is desirable for contacting Dynojet and downloading new information and updates.

TIE-DOWN STRAPS

Dynojet recommends using tie-down straps for securing the vehicle on the dyno. The dyno comes with an automotive tie-down package.
Dynojet recommends installing the four-post lift before installing your dynamometer. However, if space constraints make it difficult to install the lift first, the dynamometer can be installed before the lift.

Dynojet acts as a liaison for Rotary Lifts, to ensure that you receive the proper four-post lift. Contact Rotary Lift for technical assistance and installation instructions, 1-800-532-6973.

<table>
<thead>
<tr>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage single-phase</td>
<td>208V-230V</td>
</tr>
</tbody>
</table>

Figure 2: Four-Post Lift
POWER RAMP SPECIFICATIONS AND REQUIREMENTS

The Dynojet Power Ramp is used with model 224x and 224xLC dynamometers and provides a unique alternative to the four-post lift. The following specifications for the 224 dynamometer ramp will help you set up your dyno area and verify you have met the requirements necessary to operate your ramp safely.

<table>
<thead>
<tr>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of ramp</td>
<td>393.70 cm (155.00 in.)</td>
</tr>
<tr>
<td>of deck, frame, and ramp</td>
<td>538.48 cm (212.00 in.)</td>
</tr>
<tr>
<td>Width</td>
<td>210.82 cm (83.00 in.)</td>
</tr>
<tr>
<td>Maximum Wheelbase</td>
<td>335.28 cm (132.00 in.)</td>
</tr>
<tr>
<td>Weight of each ramp assembly</td>
<td>188.24 kg (415 lbs)</td>
</tr>
<tr>
<td>total</td>
<td>385.55 kg (850 lbs)</td>
</tr>
<tr>
<td>Maximum Weight of Lifted Vehicle Axle</td>
<td>1588 kg (3500 lbs)</td>
</tr>
<tr>
<td>Approach Angle</td>
<td>8°</td>
</tr>
<tr>
<td>Hydraulic Fluid</td>
<td>AW68</td>
</tr>
<tr>
<td>Power</td>
<td>110VAC or 220VAC</td>
</tr>
</tbody>
</table>

Figure 3: Power Ramp
ABOVE GROUND MODEL 224X DYNAMOMETER

The following specifications and requirements will help you set up your dyno area and verify you have the requirements necessary to operate your dyno safely.

CHASSIS SPECIFICATIONS

<table>
<thead>
<tr>
<th>description</th>
<th>specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>including feet</td>
<td>89.54 cm (35.25 in.)</td>
</tr>
<tr>
<td>including air brake</td>
<td>96.52 cm (38.00 in.)</td>
</tr>
<tr>
<td>frame and deck</td>
<td>165.74 cm (65.25 in.)</td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>Width</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>frame and deck</td>
<td>228.60 cm (90.00 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>224 dyno/crated dyno</td>
<td>1588 kg (3500 lb.)/ 1905.09 kg (4200 lb.)</td>
</tr>
<tr>
<td>Drum</td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>61.00 cm (24 in.)</td>
</tr>
<tr>
<td>width</td>
<td>206.00 cm (81 in.)</td>
</tr>
<tr>
<td>Frame</td>
<td>structural steel channel and angle</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1361 kg (3000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 4: Above Ground Model 224x Dyno Dimensions

- 218.44 cm (86.00 in.) frame
- 165.74 cm (65.25 in.) frame and deck
- 96.52 cm (38.00 in.) frame and air brake
- 58.42 cm (23.00 in.) frame
- 73.66 cm (29.00 in.) frame
- 89.54 cm (35.25 in.) frame and feet
ROOM LAYOUT—ABOVE GROUND MODEL 224X WITH LIFT

Use the following information to locate various dyno equipment, power outlets, compressed air, and properly set up your dyno room.

Figure 5: Room Layout—Above Ground Model 224x with Lift
**ROOM LAYOUT—ABOVE GROUND MODEL 224x WITH POWER RAMP**

Use the following information to locate various dyno equipment, power outlets, compressed air, and properly set up your dyno room.

Figure 6: Room Layout—Above Ground Model 224x with Power Ramp
IN GROUND MODEL 224X DYNAMOMETER

The following specifications and requirements will help you set up your dyno area and verify you have met the requirements necessary to operate your dyno safely.

CHASSIS SPECIFICATIONS

<table>
<thead>
<tr>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>including feet</td>
<td>89.54 cm (35.25 in.)</td>
</tr>
<tr>
<td>including air brake</td>
<td>96.52 cm (38.00 in.)</td>
</tr>
<tr>
<td>frame with pit covers</td>
<td>144.78 cm (57.00 in.)</td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>Width</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>including pit covers</td>
<td>279.40 cm (110.00 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>224 dyno/crated dyno</td>
<td>1588 kg (3500 lb.)/ 2087 kg (4600 lb.)</td>
</tr>
<tr>
<td>Drum</td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>61.00 cm (24.00 in.)</td>
</tr>
<tr>
<td>width</td>
<td>206.00 cm (81.00 in.)</td>
</tr>
<tr>
<td>Frame</td>
<td>structural steel plate and angle</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1361 kg (3000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 7: In Ground Model 224x Dyno Dimensions
ROOM LAYOUT—IN GROUND MODEL 224X

Use the following information to locate the necessary dyno equipment, power outlets, compressed air, and properly set up your dyno room.

Before proceeding, take a moment to look over the pit dimensions and requirements for your in ground dyno. Refer to the pit dimensions (P/N 98219103) you received from your salesman for more detailed specifications or download the latest pit dimensions.

Figure 8: Room Layout—In Ground Model 224x
ABOVE GROUND MODEL 224XLC DYNAMOMETER

The following specifications and requirements will help you set up your dyno area and verify you have the requirements necessary to operate your dyno safely.

**CHASSIS SPECIFICATIONS**

<table>
<thead>
<tr>
<th>description</th>
<th>specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>including feet</td>
<td>89.54 cm (35.25 in.)</td>
</tr>
<tr>
<td>including air brake</td>
<td>96.52 cm (38.00 in.)</td>
</tr>
<tr>
<td>including eddy current brake</td>
<td>74.83 cm (29.46 in.)</td>
</tr>
<tr>
<td>frame and deck</td>
<td>165.74 cm (65.25 in.)</td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>to top of eddy current brake</td>
<td>65.58 cm (25.82 in.)</td>
</tr>
<tr>
<td>Width</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>including eddy current brake</td>
<td>321.23 cm (126.47 in.)</td>
</tr>
<tr>
<td>frame and deck</td>
<td>228.60 cm (90.00 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>224 dyno/crated dyno</td>
<td>1588 kg (3500 lb.)/ 1905.09 kg (4200 lb.)</td>
</tr>
<tr>
<td>eddy current brake</td>
<td>635 kg (1400 lb.)</td>
</tr>
<tr>
<td>Drum</td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>61.00 cm (24 in.)</td>
</tr>
<tr>
<td>width</td>
<td>206.00 cm (81 in.)</td>
</tr>
<tr>
<td>Frame</td>
<td>structural steel channel and angle</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1361 kg (3000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 9: Above Ground Model 224xLC Dyno Dimensions

- 218.44 cm (86.00 in.) frame only
- 321.23 cm (126.47 in.) frame and brake
- 165.74 cm (65.25 in.) frame and deck
- 73.66 cm (29.00 in.) frame
- 106.93 cm (42.10 in.) brake
- 228.60 cm (90.00 in.) deck
- 65.58 cm (25.82 in.) brake only
**ROOM LAYOUT—ABOVE GROUND MODEL 224xLC WITH LIFT**

Use the following information to locate various dyno equipment, power outlets, compressed air, and properly set up your dyno room.

For optimal eddy current brake cooling, the brake should turn in the direction of the arrows on the rotor. The dyno will perform correctly in either direction, but cooling of the rotors may be less effective when turning in the direction opposite of the arrows.

The eddy current brake is set up to run on the right side of the vehicle type (front/rear wheel drive) you test most often. If this does not work for your dyno room, contact Dynojet. Figure 10 shows a front wheel drive setup.

---

**Figure 10: Room Layout—Above Ground Model 224xLC with Lift**
ROOM LAYOUT—ABOVE GROUND MODEL 224xLC WITH POWER RAMP

Use the following information to locate various dyno equipment, power outlets, compressed air, and properly set up your dyno room.

For optimal eddy current brake cooling, the brake should turn in the direction of the arrows on the rotor. The dyno will perform correctly in either direction, but cooling of the rotors may be less effective when turning in the direction opposite of the arrows.

The eddy current brake is set up to run on the right side of the vehicle type (front/rear wheel drive) you test most often. If this does not work for your dyno room, contact Dynojet. Figure 10 shows a front wheel drive setup.

![Diagram of Room Layout—Above Ground Model 224xLC with Power Ramp]

Figure 11: Room Layout—Above Ground Model 224xLC with Power Ramp
The following specifications and requirements will help you set up your dyno area and verify you have met the requirements necessary to operate your dyno safely.

**CHASSIS SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>of frame</td>
<td>89.54 cm (35.25 in.)</td>
</tr>
<tr>
<td>including feet</td>
<td>96.52 cm (38.00 in.)</td>
</tr>
<tr>
<td>including air brake</td>
<td>144.78 cm (57.00 in.)</td>
</tr>
<tr>
<td>frame with pit covers</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>to top of frame</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>of frame</td>
<td>321.23 cm (126.47 in.)</td>
</tr>
<tr>
<td>including eddy current brake</td>
<td>381.00 cm (150.00 in.)</td>
</tr>
<tr>
<td>including pit covers</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1588 kg (3500 lb.)</td>
</tr>
<tr>
<td>224 dyno/crated dyno</td>
<td>2087 kg (4600 lb.)</td>
</tr>
<tr>
<td>eddy current brake</td>
<td>635 kg (1400 lb.)</td>
</tr>
<tr>
<td>Drum</td>
<td>61.00 cm (24.00 in.)</td>
</tr>
<tr>
<td>diameter</td>
<td>206.00 cm (81.00 in.)</td>
</tr>
<tr>
<td>width</td>
<td>structural steel plate and angle</td>
</tr>
<tr>
<td>Frame</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>1361 kg (3000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 12: In Ground Model 224xLC Dyno Dimensions
**ROOM LAYOUT—IN GROUND MODEL 224xLC**

Use the following information to locate the necessary dyno equipment, power outlets, compressed air, and properly set up your dyno room.

Before proceeding, take a moment to look over the pit dimensions and requirements for your in ground dyno. Refer to the pit dimensions (P/N 98219103) you received from your salesman for more detailed specifications or download the latest pit dimensions.

For optimal eddy current brake cooling, the brake should turn in the direction of the arrows on the rotor. The dyno will perform correctly in either direction, but cooling of the rotors may be less effective when turning in the direction opposite of the arrows.

The eddy current brake is set up to run on the right side of the vehicle type (front/rear wheel drive) you test most often. If this does not work for your dyno room, contact Dynojet. Figure 13 shows a front wheel drive setup.

---

![Figure 13: Room Layout—In Ground Model 224xLC](image)
ABOVE GROUND MODEL 424X DYNAMOMETER

The following specifications and requirements will help you set up your dyno area and verify you have met the requirements necessary to operate your dyno safely.

CHASSIS SPECIFICATIONS

<table>
<thead>
<tr>
<th>description</th>
<th>specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>including air brake</td>
<td>93.83 cm (36.94 in.)</td>
</tr>
<tr>
<td>including air brake and interface kit</td>
<td>115.49 cm (45.47 in.)</td>
</tr>
<tr>
<td>including cradle assembly</td>
<td>130.18 cm (51.25 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full in</td>
<td>388.62 cm (153.00 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full in with extension kit</td>
<td>414.02 cm (163.00 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full out</td>
<td>495.30 cm (195.00 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full out with extension kit</td>
<td>520.70 cm (205.00 in.)</td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>to top of frame with feet/track assembly</td>
<td>72.07 cm (28.375 in.)</td>
</tr>
<tr>
<td>Width</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>of deck</td>
<td>228.60 cm (90.00 in.)</td>
</tr>
<tr>
<td>Track Assembly</td>
<td></td>
</tr>
<tr>
<td>length</td>
<td>224.15 cm (88.25 in.)</td>
</tr>
<tr>
<td>width</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>stationary crated dyno</td>
<td>2,114 kg (4,660 lb.)</td>
</tr>
<tr>
<td>4WD crated dyno</td>
<td>2,495 kg (5,500 lb.)</td>
</tr>
<tr>
<td>Drum</td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>61.00 cm (24.00 in.)</td>
</tr>
<tr>
<td>width</td>
<td>206.00 cm (81.00 in.)</td>
</tr>
<tr>
<td>Frame</td>
<td>structural steel channel and angle</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1,361 kg (3,000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 14: Above Ground Model 424x Stationary Dyno Dimensions
Figure 15: Above Ground Model 424x 4WD Dyno with Track Assembly Dimensions
extension kit dimensions
533.40 cm (210.00 in.)
   deck full out to lift
426.72 cm (168.00 in.)
   deck full in to lift
520.70 cm (205.00 in.)
   frame and deck full out
414.02 cm (163.00 in.)
   frame and deck full in

Figure 16: Above Ground Model 424x Dyno with Bridge and Deck Dimensions
**ROOM LAYOUT—ABOVE GROUND MODEL 424X WITH LIFT**

Use the following information to locate the necessary dyno equipment, power outlets, compressed air, and properly set up your dyno room.

![Room Layout Diagram](image)

- **Provide compressed air:**
  - to release the air brake
  - to run the optional AFR

- **Locate the following items close to the vehicle:**
  - dyno electronics
  - computer
  - monitor

- **Provide 110V outlets for the:**
  - hydraulic motor
  - dyno electronics
  - computer
  - monitor

---

**Figure 17: Room Layout—Above Ground Model 424x with Lift**
IN GROUND MODEL 424X DYNAMOMETER

The following specifications and requirements will help you set up your dyno area and verify you have met the requirements necessary to operate your dyno safely.

CHASSIS SPECIFICATIONS

<table>
<thead>
<tr>
<th>description</th>
<th>specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>including air brake</td>
<td>93.83 cm (36.94 in.)</td>
</tr>
<tr>
<td>including cradle assembly</td>
<td>130.18 cm (51.25 in.)</td>
</tr>
<tr>
<td>both frames, bridge, covers—full out</td>
<td>584.20 cm (230.00 in.)</td>
</tr>
<tr>
<td>both frames, bridge, covers—full out with extension kit</td>
<td>609.60 cm (240.00 in.)</td>
</tr>
<tr>
<td>both frames, bridge, covers—full in</td>
<td>469.90 cm (185.00 in.)</td>
</tr>
<tr>
<td>both frames, bridge, covers—full in with extension kit</td>
<td>495.30 cm (195.00 in.)</td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>to top of frame with feet/track assembly</td>
<td>72.07 cm (28.375 in.)</td>
</tr>
<tr>
<td>Width</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>Track Assembly</td>
<td></td>
</tr>
<tr>
<td>length</td>
<td>224.15 cm (88.25 in.)</td>
</tr>
<tr>
<td>width</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>stationary crated dyno</td>
<td>2,114 kg (4,660 lb.)</td>
</tr>
<tr>
<td>4WD crated dyno</td>
<td>2,495 kg (5,500 lb.)</td>
</tr>
<tr>
<td>Drum</td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>61.00 cm (24.00 in.)</td>
</tr>
<tr>
<td>width</td>
<td>206.00 cm (81.00 in.)</td>
</tr>
<tr>
<td>Frame</td>
<td>structural steel channel and angle</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1361 kg (3000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 18: In Ground Model 424x Stationary Dyno Dimensions
Figure 19: In Ground Model 424x 4WD Dyno with Track Assembly Dimensions
584.20 cm (230.00 in.) frame and covers full out
609.60 cm (240.00 in.) out with bridge extension
469.90 cm (185.00 in.) frame and covers full in
495.30 cm (195.00 in.) in with bridge extension

Figure 20: In Ground Model 424x Dyno with Bridge and Pit Covers Dimensions
ROOM LAYOUT—IN GROUND MODEL 424X

Use the following information to locate the necessary dyno equipment, power outlets, compressed air, and properly set up your dyno room.

Before proceeding, take a moment to look over the pit dimensions and requirements for your in ground dyno. Refer to the pit dimensions (P/N 98219111) you received from your salesman for more detailed specifications or download the latest pit dimensions.

Figure 21: Room Layout—In Ground Model 424x
Above Ground Model 424xLC® Dynamometer

ABOVE GROUND MODEL 424XLC® DYNAMOMETER

The following specifications and requirements will help you set up your dyno area and verify you have met the requirements necessary to operate your dyno safely.

**CHASSIS SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>including cradle assembly</td>
<td>130.18 cm (51.25 in.)</td>
</tr>
<tr>
<td>including air brake</td>
<td>93.83 cm (36.94 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full in</td>
<td>388.62 cm (153.00 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full in with extension kit</td>
<td>414.02 cm (163.00 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full out</td>
<td>495.30 cm (195.00 in.)</td>
</tr>
<tr>
<td>both frames, deck, bridge—full out with extension kit</td>
<td>520.70 cm (205.00 in.)</td>
</tr>
<tr>
<td>Linx option</td>
<td>470.00 cm (185.00 in.)</td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
<tr>
<td>to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>to top of frame with feet/track assembly</td>
<td>72.07 cm (28.375 in.)</td>
</tr>
<tr>
<td>floor to top of eddy current brake</td>
<td>80.01 cm (31.50 in.)</td>
</tr>
<tr>
<td>Width</td>
<td></td>
</tr>
<tr>
<td>of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>of frame with eddy current brake</td>
<td>321.23 cm (126.47 in.)</td>
</tr>
<tr>
<td>of frame with eddy current brake and Linx option</td>
<td>385.00 cm (151.47 in.)</td>
</tr>
<tr>
<td>of Linx option</td>
<td>63.50 cm (25.00 in.)</td>
</tr>
<tr>
<td>Track Assembly</td>
<td></td>
</tr>
<tr>
<td>length</td>
<td>224.15 cm (88.25 in.)</td>
</tr>
<tr>
<td>width</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>stationary crated dyno</td>
<td>2,114 kg (4,660 lb.)</td>
</tr>
<tr>
<td>4WD crated dyno</td>
<td>2,495 kg (5,500 lb.)</td>
</tr>
<tr>
<td>eddy current brake</td>
<td>635 kg (1400 lb.)</td>
</tr>
<tr>
<td>Drum</td>
<td></td>
</tr>
<tr>
<td>diameter</td>
<td>61.00 cm (24.00 in.)</td>
</tr>
<tr>
<td>width</td>
<td>206.00 cm (81.00 in.)</td>
</tr>
<tr>
<td>Frame</td>
<td>structural steel channel and angle</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1361 kg (3000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 22: Above Ground Model 424xLC² Stationary Dyno Dimensions
Figure 23: Above Ground Model 424xLC^2 4WD Dyno with Track Assembly Dimensions
extension kit dimensions*

533.40 cm (210.00 in.)
deck full out to lift
441.96 cm (174.00 in.)
deck full in to lift

513.08 cm (202.00 in.)
frame and deck full out
422.40 cm (166.30 in.)
frame and deck full in

508.00 cm (200.00 in.)
deck full out to lift
416.56 cm (164.00 in.)
deck full in to lift

487.5 cm (192.00 in.)
frame and deck full out
397.00 cm (155.30 in.)
frame and deck full in

470.00 cm (185.00 in.)
Linux option

63.50 cm (25.00 in.)
Linux option

228.60 cm (90.00 in.)
deck

292.00 cm (115.00 in.)
frame and Linux option

285.00 cm (112.2 in.)
frame, brake, and Linux option

*requires extension parts, inquire with Dynojet sales

Figure 24: Above Ground Model 424xLC² Dyno with Bridge and Deck Dimensions
**ROOM LAYOUT—ABOVE GROUND MODEL 424xLC² WITH LIFT**

Use the following information to locate the necessary dyno equipment, power outlets, compressed air, and properly set up your dyno room.

The eddy current brake is set up to run on the right side of the vehicle.

Figure 25: Room Layout—Above Ground Model 424xLC² with Lift
The following specifications and requirements will help you set up your dyno area and verify you have met the requirements necessary to operate your dyno safely.

**CHASSIS SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of frame</td>
<td>73.66 cm (29.00 in.)</td>
</tr>
<tr>
<td>Including cradle assembly</td>
<td>130.18 cm (51.25 in.)</td>
</tr>
<tr>
<td>Including air brake</td>
<td>93.83 cm (36.94 in.)</td>
</tr>
<tr>
<td>Both frames, bridge, covers—full out with extension kit</td>
<td>584.20 cm (230.00 in.)</td>
</tr>
<tr>
<td>Both frames, bridge, covers—full in with extension kit</td>
<td>609.60 cm (240.00 in.)</td>
</tr>
<tr>
<td>Both frames, bridge, covers—full in</td>
<td>469.90 cm (185.00 in.)</td>
</tr>
<tr>
<td>Both frames, bridge, covers—full out with extension kit</td>
<td>495.30 cm (195.00 in.)</td>
</tr>
<tr>
<td>Height to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>To top of frame with feet/track assembly</td>
<td>72.07 cm (28.375 in.)</td>
</tr>
<tr>
<td>Width of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>Width of frame with eddy current brake</td>
<td>321.23 cm (126.47 in.)</td>
</tr>
<tr>
<td>Including eddy current brake covers</td>
<td>345.44 cm (136.00 in.)</td>
</tr>
<tr>
<td>Including eddy current brake covers and Linx option covers</td>
<td>464.00 cm (182.75 in.)</td>
</tr>
<tr>
<td>Track Assembly</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>224.15 cm (88.25 in.)</td>
</tr>
<tr>
<td>Width</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>Weight of stationary crated dyno</td>
<td>2,114 kg (4,660 lb.)</td>
</tr>
<tr>
<td>4WD crated dyno</td>
<td>2,495 kg (5,500 lb.)</td>
</tr>
<tr>
<td>Eddy current brake</td>
<td>635 kg (1400 lb.)</td>
</tr>
<tr>
<td>Drum Diameter</td>
<td>61.00 cm (24.00 in.)</td>
</tr>
<tr>
<td>Width</td>
<td>206.00 cm (81.00 in.)</td>
</tr>
<tr>
<td>Frame Structural steel channel and angle</td>
<td></td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 kph (200 mph)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1361 kg (3000 lb.)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
Figure 26: In Ground Model 424xLC² Stationary Dyno Dimensions
Figure 27: In Ground Model 424xLC^2 4WD Dyno with Track Assembly Dimensions
In Ground Model 424xLC² Dynamometer

Figure 28: In Ground Model 424xLC² with Bridge and Pit Covers Dimensions

584.20 cm (230.00 in.) frame and covers full out
609.60 cm (240.00 in.) out with bridge extension
469.90 cm (185.00 in.) frame and covers full in
495.30 cm (195.00 in.) in with bridge extension

161.54 cm (63.60 in.)
118.75 cm (46.75 in.) Linx option covers

492.76 cm (194.00 in.) eddy current brake covers

345.44 cm (136.00 in.)
229.87 cm (90.50 in.)
**ROOM LAYOUT—IN GROUND MODEL 424xLC²**

Use the following information to locate the necessary dyno equipment, power outlets, compressed air, and properly set up your dyno room.

Before proceeding, take a moment to look over the pit dimensions and requirements for your in ground dyno. Refer to the pit dimensions (P/N 98219111) you received from your salesman for more detailed specifications or download the latest [pit dimensions](#).

The eddy current brake is set up to run on the right side of the vehicle.

Figure 29: Room Layout—In Ground Model 424xLC²

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**Figure 29: Room Layout—In Ground Model 424xLC²**

- **Pit Conduits**
- **Front of Dyno**
- **Provide Compressed Air:**
  - To release the air brake
  - To run the optional APR
- **Provide Two 240V Outlets** for the eddy current brakes
- **Locate the Following Items** close to the vehicle:
  - Dyno electronics
  - Computer
  - Monitor
- **Provide 110V Outlets** for the:
  - Hydraulic motor
  - Dyno electronics
  - Computer
  - Monitor
- **Pit Conduits**
- **Pit Covers**
- **Eddy Current Brake**
- **Linx Option:**
  - 118.75 cm (46.75 in.)
  - 584.20 cm (230.00 in.) frame and covers full out
  - 669.50 cm (263.00 in.) full out with bridge extension
  - 469.90 cm (185.00 in.) frame and covers full in
  - 495.30 cm (195.00 in.) full in with bridge extension
- **Dimensions:**
  - 492.76 cm (194.00 in.) eddy current brake pit covers
  - 229.87 cm (90.50 in.)
  - 345.44 cm (136.00 in.)
UNPACKING THE DYNO

When you receive your dyno, examine the exterior of the shipping container for any visible damage. If damage is detected at this stage, contact the shipper or Dynojet before proceeding with unpacking.

You will need to provide equipment capable of lifting and moving the dyno. Refer to “Forklift Requirements” on page 7 for more information.

REMOVING THE CRATE TOP AND SIDES

1. Move the crated dyno to a clear area near your dyno room.
2. Using a pry bar, or a large flat screwdriver, and a hammer, carefully remove the top and sides of the crate.

Note: At this point, you will want to inspect the exterior of the dyno for any indications of damage. Report any damage immediately.
LOCATING THE INSTALLATION GUIDE

Your dynamometer installation guides and user guides are located in a manila envelope and secured to the following location.

- On a regular 224 dyno, the manual is slipped behind the brake hoses on the brake side of the dyno.
- On a 424 dyno, the manuals are in the same location except in the 4WD crate, not in the stationary dyno crate.

**Note:** The following illustration shows the above ground model 224 dyno, but the location of the installation guide is the same for all dynos.

![Figure 31: Locating the Installation Guide](image-url)
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

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

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.

2. Insert the anchor.
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](image)

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](image)
APPENDIX B

POWER REQUIREMENTS AND INSTALLATION

This appendix contains power requirements and installation instructions for the dyno. 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.

Note: The following instructions are intended as a guide to aide in the electrical installation of your dynamometer. All local regulations shall supersede any instructions herein and should always be considered.

This Appendix is divided into the following categories:
- North America, Japan, and Locations Using 60 Hz Power, on page B-2
- Excluding North America and Japan, on page B-5
POWER REQUIREMENTS AND INSTALLATION—NORTH AMERICA, JAPAN, AND LOCATIONS USING 60 HZ POWER

The following power requirements and instructions are for North America, Japan, and locations using 60 Hz power. Refer to “Power Requirements and Installation—Excluding North America and Japan” on page B-5 for all other locations.

The dyno requires a dedicated 240VAC single-phase power outlet rated for 30A for proper operation. Failure to follow these instructions could result in personal injury or damage to the dyno. Connecting the dyno to the incorrect voltage will void the warranty. Contact Dynojet with any questions.

The dyno is equipped with a twenty-five foot power cord with a twist lock plug pre-wired on the end.

The dedicated wall receptacle is a twist lock four wire grounded 30A NEMA L14-30 type and must be wired in accordance with local building codes and requirements. If the facility does not have 120/240 volt single-phase power, and it does have 120/208 volt three-phase Y power, then it is acceptable to connect the four wire receptacle with two of the three-phase lines, the neutral and the ground. With this arrangement, there will only be 208 volts between line 1 and line 2 instead of 240 volts. This is acceptable, but performance of the dyno will be reduced. In no case shall all three-phase lines be connected to the receptacle! Installation may require a licensed electrician and must conform to UL and NEC safety standards.

Note: If you are installing your dyno in North American or Japan and the dyno is not equipped with twist lock four wire grounded plug, contact Dynojet before attempting to connect the dyno.

Local and national electrical codes require a grounded receptacle box.

• This circuit should have a dedicated 30A double pole circuit breaker.
• The dyno should be the only device connected to this circuit.

INSTALLING THE WALL RECEPTACLE

The wall receptacle is included with your dyno and is shipped in a separate box or may be shipped in advance in a separate package.

The wall receptacle is a single-phase 240 volt 30A dedicated circuit with a neutral wire. The neutral wire is not used by the dyno, but needs to be connected to terminal W.

The cable carrying the power to this receptacle should be ten gauge or larger. Check with local building codes for the correct size.

1 Connect one of the 240V legs to the X terminal (gold colored screw).
2 Connect the other 240V leg to the Y terminal (gold colored screw).
3 Connect the neutral conductor to the W or WH terminal (silver screw).
4 Connect the ground conductor to the G terminal (green colored screw).
TESTING FOR CORRECT VOLTAGES

You must test the receptacle for proper voltages before the dyno is connected to the outlet.

⚠️ CAUTION ⚠️

If the voltage readings do not match the following table, DO NOT connect the dyno. You must have a licensed electrician correct the power connection. Connecting the dyno to the incorrect voltage can result in damage to the dyno and will void the dyno warranty. Contact Dynojet with any questions.

Using a voltmeter that is capable of measuring AC voltage, measure between the points listed below and verify that the correct voltages are present.

<table>
<thead>
<tr>
<th>probe 1</th>
<th>probe 2</th>
<th>desired voltage measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>216V to 260V*</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>108V to 130V</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>108V to 130V</td>
</tr>
<tr>
<td>3</td>
<td>box</td>
<td>&lt;5V</td>
</tr>
</tbody>
</table>

*If using two of the three-phase lines of a 120/208 V 3 phase Y system, then expect to see 187V to 225V.

Figure B-1: Dedicated Power Receptacle
HARD WIRING TO THE BUILDING

Use the following instructions to wire the dyno directly to the building.

The dyno must connect to a two pole disconnect switch to allow the removal of all power to the dyno for servicing. This box may contain fusing, circuit breakers, or the circuit protection may be upstream in the building power system. The circuit must be protected to 30A with slow blow fuses or time delayed circuit breakers.

The power cord that attaches to the dyno has three conductors internally and their colors are white, black, and green.

1. Remove the dyno power plug and connect 240VAC single-phase between the black and the white wires through the disconnect switch.
2. Connect the green wire to the ground connection.
3. Refer to the previous table for testing and probe the new connections as follows:
   - white wire as location #2
   - black wire as location #4
   - green wire as location #3
POWER REQUIREMENTS AND INSTALLATION—EXCLUDING NORTH AMERICA AND JAPAN

The dyno (excluding North America and Japan) requires a dedicated wall receptacle which must be wired for operation and is included with the dyno or may be shipped in advanced in a separate package. The dyno is equipped with a twenty-five foot power cord with a twist lock plug pre-wired on the end.

The dyno requires a dedicated 240VAC single-phase power outlet rated for 30A for proper operation. **Failure to follow these instructions could result in personal injury or damage to the dyno.** Connecting the dyno to the incorrect voltage will void the dyno warranty. Contact Dynojet with any questions.

The dedicated wall receptacle is a three-pin IEC grounded 30A type and must be wired in accordance with local building codes and requirements. Installation may require a licensed electrician to conform to applicable safety standards.

⚠️ **CAUTION**

If you are installing your dyno in a location other than North America or Japan and the dyno is not equipped with a three pin IEC grounded plug, **contact Dynojet before attempting to connect the dyno.**

Local and national electrical codes will require that the box containing the receptacle is grounded.

- This circuit should have a dedicated 30A double-pole circuit breaker.
- The dyno should be the only device connected to this circuit.
INSTALLING THE WALL RECEPTACLE

The wall receptacle is a single 240 volt 30A dedicated circuit with a ground.

Note: The actual wall receptacle may be different from the image shown in Figure B-2; however, the installation instructions are the same.

The cable carrying the power to this receptacle should be 4.0 mm² (ten gauge) or larger. Check with local building codes for the correct size.

1. Connect the grounded 240V conductor to the N terminal.
2. Connect the ungrounded 240V conductor to the L terminal.
3. Connect the ground conductor to the green terminal.

![Figure B-2: Wiring the Wall Receptacle](image)
TESTING FOR CORRECT VOLTAGES

You must test the receptacle for proper voltages before the dyno is connected to the outlet.

Using a voltmeter that is capable of measuring AC voltage, measure between the points listed below and verify that the correct voltages are present.

<table>
<thead>
<tr>
<th>probe 1</th>
<th>probe 2</th>
<th>desired voltage measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>220V to 250V</td>
</tr>
<tr>
<td>2</td>
<td>box</td>
<td>&lt;5V</td>
</tr>
</tbody>
</table>

Figure B-3: Testing the Wall Receptacle

HARD WIRING TO THE BUILDING

Use the following instructions to wire the dyno directly to the building.

The dyno must connect to a two pole disconnect switch to allow the removal of all power to the dyno for servicing. This box may contain fusing, circuit breakers, or the circuit protection may be upstream in the building power system. The circuit must be protected to 30A with slow blow fuses or time delayed circuit breakers.

The power cord that attaches to the dyno has three conductors internally and their colors are white, black, and green.

1. Remove the dyno power plug and connect 240VAC single-phase between the black and the white wires through the disconnect switch.
2. Connect the green wire to the ground connection.
3. Refer to the previous table for testing and probe the new connections as follows:
   - white wire as location #1
   - black wire as location #3
   - green wire as location #2
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  224xLC in ground  2-23
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  424x in ground  2-31
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  424x above ground  2-26
  424x in ground  2-31
  424xLC2 above ground  2-36
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