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Installation Guide for Above Ground Model 224 Automotive Dynamometers.

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Dynamometer Number: ____________________________________________________
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Specifications and Operating Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td></td>
<td>Conventions Used In This Manual</td>
</tr>
<tr>
<td></td>
<td>Technical Support</td>
</tr>
<tr>
<td></td>
<td>Your Dyno Room</td>
</tr>
<tr>
<td></td>
<td>Dynamometer Specifications and Requirements</td>
</tr>
<tr>
<td></td>
<td>Chassis Specifications</td>
</tr>
<tr>
<td></td>
<td>Compressed Air</td>
</tr>
<tr>
<td></td>
<td>Computer Specifications</td>
</tr>
<tr>
<td></td>
<td>Electrical Requirements</td>
</tr>
<tr>
<td></td>
<td>Environmental Requirements</td>
</tr>
<tr>
<td></td>
<td>Fire Suppression</td>
</tr>
<tr>
<td></td>
<td>Forklift Requirements</td>
</tr>
<tr>
<td></td>
<td>Phone and Internet Access</td>
</tr>
<tr>
<td></td>
<td>Tie-Down Straps</td>
</tr>
<tr>
<td></td>
<td>Model 224 Above Ground Automotive Dynamometer</td>
</tr>
<tr>
<td></td>
<td>Dyno Electronics</td>
</tr>
<tr>
<td></td>
<td>Lift Specifications and Requirements</td>
</tr>
</tbody>
</table>

Warnings ................................................................. v

Chapter 1 Specifications and Operating Requirements

Introduction ............................................................... 1-2
Conventions Used In This Manual .................................. 1-3
Technical Support ...................................................... 1-3
Your Dyno Room .......................................................... 1-4
Dynamometer Specifications and Requirements ...................... 1-5
Chassis Specifications ................................................. 1-5
Compressed Air ............................................................. 1-6
Computer Specifications .............................................. 1-6
Electrical Requirements ............................................... 1-7
Environmental Requirements ......................................... 1-7
Fire Suppression ......................................................... 1-7
Forklift Requirements .................................................. 1-7
Phone and Internet Access ............................................ 1-7
Tie-Down Straps ........................................................... 1-7
Model 224 Above Ground Automotive Dynamometer .................. 1-8
Dyno Electronics .......................................................... 1-9
Lift Specifications and Requirements ................................ 1-10
# TABLE OF CONTENTS

## Chapter 2  Installation

- Unpacking and Inspecting the Dyno ............................................. 2-2
- Dyno Installation ................................................................. 2-4
  - Removing the Dyno from the Crate ...................................... 2-4
  - Placing the Dyno in Front of the Lift ................................. 2-5
  - Installing the Drum Guards .................................................... 2-6
  - Installing the Interface Guide .............................................. 2-7
  - Anchoring the Dyno ............................................................ 2-10
  - Installing the Eddy Current Brake ...................................... 2-10
- Cable Routing ................................................................. 2-11
  - Connecting the Dyno Electronics and Shop Air ...................... 2-11
  - Aligning the Optical Pickup Card Tab ................................. 2-12
  - Wiring the Breakout Board .................................................. 2-13
- Deck Installation ............................................................... 2-14
- Logo Panel Installation ....................................................... 2-20

## Chapter 3  Basic Dyno Operation

- Loading the Vehicle .............................................................. 3-2
- Connecting the RPM Pickup .................................................... 3-6
  - RPM Pickup Descriptions ....................................................... 3-6
  - Connecting the Secondary Inductive Pickup ....................... 3-7
  - Connecting the Primary Inductive Pickup ............................ 3-8
- Pre-Run Inspection ............................................................... 3-9
  - Before Starting the Engine .................................................. 3-9
  - Engine Warm Up .................................................................. 3-10
  - After Engine Warm Up .......................................................... 3-10
- Making a Test Run ................................................................. 3-11
- Preventative Maintenance ....................................................... 3-12
  - Things to Check .................................................................. 3-12
  - Verifying the SAAR Brake Pressure ................................... 3-13
  - Maintaining the SAAR Brake Shoe Clearance ....................... 3-14

## Appendix A  Red Head Anchor Installation

- Installation ........................................................................  A-2

## Appendix B  Early Style Deck Installation

- Early Style Deck Installation .................................................. B-2
# Appendix C Interface Roller Assembly Installation

Interface Roller Assembly Installation ........................................... C-2

# Appendix D Torque Values

| Standard Bolt Torque Values | D-2      
|-----------------------------|---------|
| Grade 5                     | D-2     
| Grade 8                     | D-3     

| Metric Bolt Torque Values  | D-4      
|-----------------------------|---------|
| Grade 8.8                   | D-4     
| Grade 10.9                  | D-4     

# Index

Index ................................................................. Index-i
WARNINGS

Disclaimers

Dynojet Research, Inc. (Dynojet) makes no representation or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability for any particular purpose. Dynojet reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of Dynojet to notify any person of such revision or changes. Dynojet is not responsible for false operation due to unexpected dynamometer operation such as may be caused by static, software bugs, hardware failure, etc. Dynojet is not responsible for damage resulting from improper installation of the dynamometer or from improper service rendered to the dynamometer. Dynojet is not responsible for damage incurred due to alteration of the dynamometer or components, use of unapproved parts, or abuse to the dynamometer. Do not connect or disconnect cables or components on the dynamometer with the power on. Always wear protective clothing, ear protection, and eye protection (goggles, safety glasses) when using and servicing the dynamometer.

CAUTION

Equipment Power Requirements

The dynamometer has specific power requirements. Connecting the dynamometer to the incorrect voltage will void the dynamometer warranty. Installation may require a licensed electrician.

WARNING

Potentially Lethal Voltages

Components attached to and within the dynamometer operate with potentially lethal voltages. To provide the greatest assurance of safety, the AC power cord(s) must be disconnected from the power source before servicing electrical components or wiring. Disconnect all power cords before servicing electrical components for the greatest assurance of safety.
**WARNINGS**

**Electrostatic Discharge Precautions**

**Electrostatic Discharge**

Electrostatic Discharge (ESD), or static shock, can damage electronic components within the dynamometer. The damage may occur at the time of an ESD occurrence, or the shock may degrade the component, resulting in a premature component failure later. To avoid ESD damage, always practice good ESD control precautions when servicing the dynamometer. Dynojet designs its dynamometers to be very tolerant of static shocks by the users, but the electronics are vulnerable when the electronics are exposed. ESD occurs as a result of a difference of potential between two objects when the two objects touch. Damage occurs as a result of the energy released when the discharge (touch) occurs. The difference of potential can accumulate by as simple an action as a user moving across carpet or a seat. If that person’s energy is discharged directly to the electronics, the electronics can be damaged.

**Precautions**

To protect against ESD damage, you must eliminate the difference of potential before the electronics are handled. Touch the chassis of the dynamometer before touching any of the electronics. By touching the chassis, you discharge any static shocks to the chassis instead of to the electronics.

If you are holding a circuit board or dynamometer component in your hand when you approach the machine, touch the chassis of the dynamometer with your hand before installing the circuit board or component.

When handling a circuit board or component to someone, touch that person with your hand first, then hand them the component.

Always carry circuit boards in anti-static bags when the boards are exposed (removed from the dynamometer).

**Battery Fire and Explosion Hazards**

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer’s instructions.

**Automotive Batteries**

In operation, batteries generate and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

Do not allow the positive and negative terminals to short-circuit. The dynamometer chassis is tied to the negative side of the battery. Do not short between the positive battery terminal or the starter connections to the chassis. In addition, make sure metal tools such as screw drivers, wrenches, and torque wrenches do not come in contact with the negative and positive terminals of the battery. Short circuiting the terminals of the battery can cause burn injuries, damage to the dynamometer, or trigger explosions.

**Charging**

Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby.

Wear protective clothing, eye and face protection, when charging or handling batteries.
Other Potential Hazards

The AC power outlet shall be installed near the equipment and it shall be easily accessible to allow for disconnect before service.

The dynamometer should be located in a well ventilated area. There is a carbon monoxide hazard with all internal combustion engines. Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death.

Any dyno room design must incorporate sufficient exhaust extraction.

Always wear proper ear and eye protection when operating the dynamometer.

Never operate the dynamometer with the covers removed.

Never stand behind the dynamometer when in operation.

Never operate the dynamometer when there is excessive vibration or noise. Resolve these problems before proceeding.

Never fuel the vehicle on the dynamometer unless appropriate safety measures are taken.

Verify brake operation before beginning any dynamometer testing.

Verify the vehicle is properly secured to the dynamometer.

Never operate the blowers without the guards installed.

Exercise care with any dynamometer testing; portions of the dynamometer and vehicle may become hot.

As with any equipment using electricity and having moving parts, there are potential hazards. To use this dynamometer safely, the operator should become familiar with the instructions for operation of the dynamometer and always exercise care when using it.

Do not repair or replace any part of the dynamometer or attempt any servicing unless specifically recommended in published user-repair instructions that you understand and have the skills to carry out.
Thank you for purchasing Dynojet’s Above Ground Model 224 Automotive Dynamometer (dyno). 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 WinPEP 7 software and a Dynojet dynamometer will give you the professional results you are looking for.

This document provides instructions for installing the dyno. This document will walk you through operating requirements, installation, and basic dyno operation. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

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Version 4
Last Updated: 04-28-08

This chapter is divided into the following categories:
- Introduction, page 1-2
- Dyno Specifications and Requirements, page 1-5
- Model 224 Above Ground Dynamometer, page 1-8
- Dyno Electronics, page 1-9
- Lift Specifications and Requirements, page 1-10
INTRODUCTION

Before installing your dyno, please take a moment to read this guide for installation instructions, dyno features, and other important information.

This guide is designed to be a reference tool in your everyday work and includes the following chapters and information:

SPECIFICATIONS AND OPERATING REQUIREMENTS
This chapter describes the requirements and specifications for the dyno.

INSTALLATION
This chapter describes the procedures for installing the dyno.

BASIC DYNO OPERATION
This chapter describes basic dyno operating procedures and maintenance.

RED HEAD INSTALLATION
This appendix describes the procedures for installing the Red Head anchors.

EARLY STYLE DECK INSTALLATION
This appendix describes the procedures for installing the early style deck.

INTERFACE ROLLER ASSEMBLY INSTALLATION
This appendix describes the procedures for installing the interface roller assembly to the four-post lift.

TORQUE VALUES
This appendix describes standard and metric torque values.
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</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</td>
<td>The Warning icon indicates potential harm to the person performing a procedure and/or the dynamometer equipment.</td>
</tr>
<tr>
<td>RECORD #</td>
<td>The Record # icon reminds you to record your dynamometer and/or eddy current brake (retarder) number on the inside cover of this manual.</td>
</tr>
<tr>
<td>Bold</td>
<td>Highlights items you can select on in the software interface, including buttons and menus.</td>
</tr>
<tr>
<td></td>
<td>The arrow indicates a menu choice. For example, “select File ▶ Open” means “select the File menu, then select the Open choice on the File menu.”</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 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.

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

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

Intake Air Fan—After building your dyno room, you will need to supply an intake air fan. The intake air 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 5200 CFM.

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.

Exhaust Extraction—An exhaust fan 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.

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.
DYNAMOMETER SPECIFICATIONS AND REQUIREMENTS

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 of frame</td>
<td>218.44 cm (86.00 in.)</td>
</tr>
<tr>
<td>Height to top of frame</td>
<td>58.42 cm (23.00 in.)</td>
</tr>
<tr>
<td>Width 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 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>Weight 224 dyno/crated dyno</td>
<td>1588 kg (3500 pounds)/ 1905.09 kg (4200 pounds)</td>
</tr>
<tr>
<td>Drum diameter</td>
<td>60.96 cm (24.00 in.)</td>
</tr>
<tr>
<td>width</td>
<td>205.74 cm (81.00 in.)</td>
</tr>
<tr>
<td>Frame</td>
<td>structural steel channel and angle</td>
</tr>
<tr>
<td>Maximum Horsepower</td>
<td>745.58 KW (1000 HP)</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>322 KPH (200 MPH)</td>
</tr>
<tr>
<td>Maximum Axle Weight</td>
<td>1361 kg (3000 pounds)</td>
</tr>
<tr>
<td>Remote Switches</td>
<td>remote software control</td>
</tr>
</tbody>
</table>
CHAPTER 1
Dynamometer Specifications and Requirements

COMPRESSED AIR
The following requirements are needed for the air brake:
- Clean and dry air, between 100-140 psi
- shut off valve
- 1/4-inch NPT pipe thread connector (to attach air to the dyno), if air hose does not have a 3/8-inch inside diameter

COMPUTER SPECIFICATIONS
You will need to provide a computer system to run the WinPEP software. A complete list of system requirements can be found in your WinPEP 7 User Guide. This manual is included with your dyno and is also available on your WinPEP 7 CD.
ELECTRICAL REQUIREMENTS

<table>
<thead>
<tr>
<th>description</th>
<th>specifications</th>
</tr>
</thead>
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<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: air pump</td>
<td>110v 60Hz or 240v 50Hz</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. Refer to the Eddy Current Brake Installation and User Guide for Model 224 Above Ground Automotive Dynamometers (P/N 98215100) for more information.</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/70°C (32°F/158°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

You will need to provide equipment capable of lifting a minimum of 2,722 kg. (6,000 lb.) 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 2,722 kg. (6,000 lb.) to attach to the dyno. Dynojet recommends using single loop style straps.

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 car on the dyno. The 224 dyno comes with an automotive tie-down package.
MODEL 224 ABOVE GROUND AUTOMOTIVE DYNAMOMETER

Figure 1-2: Model 224 Dyno with the Above Ground Kit

- Drum Guard
- Air Brake
- Interface Guide
- Drum (precision balanced and knurled)
- Breakout Board
- Deck
- Deck Brace
- Mounting Foot
- Tie-down (used to secure the auto to dyno)
- Pickup Card (not visible from this view)
DYNO ELECTRONICS

The standard dyno electronics package is comprised of four interconnected modules. Use the figure below to identify the modules and connectors when routing cables. A detailed description of each module along with the instructions for connecting the dyno electronics to the WinPEP 7 software can be found in your WinPEP 7 User Guide.

Figure 1-3: Dyno Electronics
LIFT SPECIFICATIONS AND REQUIREMENTS

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. Dynojet recommends purchasing Rotary Lift’s SM14L four-post lift. The information given and the images shown in this manual is currently based on Rotary Lift’s SM14L four-post lift. This information is subject to change, 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>
This chapter will walk you through unpacking and installing the dynamometer. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

This chapter is divided into the following categories:

- Unpacking and Inspecting the Dyno, page 2-2
- Dyno Installation, page 2-4
- Cable Routing, page 2-11
- Deck Installation, page 2-14
- Logo Panel Installation, page 2-20
UNPACKING AND INSPECTING 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.

Use the following steps to unload your dyno. You will need to provide equipment capable of lifting a minimum of 2,722 kg. (6,000 lb.) to move the crated dyno into position in your dyno room. Refer to “Forklift Requirements” on page 1-7 for more information.

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, remove the top and sides of the crate.
3. Inspect the exterior of the dyno for any indications of damage. Report any damage immediately.
4. Remove the boxes and loose parts from the crate, verify their condition and contents and set them aside.

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ground hook/D-ring (6)</td>
<td>P/N 10111</td>
</tr>
<tr>
<td>support angle, rear deck (2)</td>
<td>P/N 21610807</td>
</tr>
<tr>
<td>D-ring bracket, surface mount (6)</td>
<td>P/N 10112</td>
</tr>
<tr>
<td>brace mount, rear deck (2)</td>
<td>P/N 21614102</td>
</tr>
<tr>
<td>mounting bracket, logo panel (4)</td>
<td>P/N 21200004</td>
</tr>
<tr>
<td>rear deck tube</td>
<td>P/N 21619103</td>
</tr>
<tr>
<td>lower mounting bracket</td>
<td></td>
</tr>
<tr>
<td>logo end panel (2)</td>
<td>P/N 21200009</td>
</tr>
<tr>
<td>brace, rear deck (4)</td>
<td>P/N 21714200</td>
</tr>
<tr>
<td>center panel, rear deck</td>
<td>P/N 21214300</td>
</tr>
<tr>
<td>cap plug, 1.75” x 1/2”, black (2)</td>
<td>P/N 35521420</td>
</tr>
<tr>
<td>part</td>
<td>description</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>outer panel, rear deck (2)</td>
<td>P/N 21214301</td>
</tr>
<tr>
<td>right drum guard</td>
<td>P/N 21216101</td>
</tr>
<tr>
<td>left drum guard</td>
<td>P/N 21216102</td>
</tr>
<tr>
<td>lateral drum guard (2)</td>
<td>P/N 21216103</td>
</tr>
</tbody>
</table>
DYNO INSTALLATION

This section will walk you through removing the dyno from the crate and installing the dyno in front of your lift.

REMOVING THE DYNO FROM THE CRATE

You will need to provide equipment capable of lifting a minimum of 2,722 kg. (6,000 lb.) to move the crated dyno into position in your dyno room. You will also need a pair of straps capable of supporting the same weight. Dynojet recommends using two 2-inch x 6-foot single loop style straps. Refer to “Forklift Requirements” on page 1-7.

Be sure you record the dynamometer number on the inside cover of this manual.

1. Remove the crate braces that support the top portion of the crate.
2. Remove the four lag bolts and washers securing the dyno to the crate base using a 9/16-inch socket, open or box end wrench.
3. Route the loop strap through the opening in the dyno frame and through itself. Pull the strap tight. Do this on each side of the dyno frame.
4. Push the forklift forks together.
5. Place each loop strap over both forks.
   Note: The straps must be the same length and meet in the middle. Verify each loop strap is over both forks to prevent the forks from being pulled apart.
6. Using the forklift, carefully lift the dyno off the crate and move it into position in your dyno room.

![Figure 2-1: Loop Strap Placement](image)
**Placing the Dyno in Front of the Lift**

1. Verify that the interface bracket faces the lift as shown in Figure 2-2.
2. Verify that the lift is in the down position.
3. Use the forklift to position the dyno in front of the lift. The dyno should be about 10.1 cm (4.00 in.) from the lift cross member.
4. Center the dyno drum with the lift runways.
5. Gently lower the dyno into position.
Installing the Drum Guards

You will need the following parts:

- 21216101 Right Drum Guard
- 21216102 Left Drum Guard
- 21216103 Lateral Drum Guard (2)
- 36582034 Bolt, 3/8-16 x 1.25", Button-Head, Flange, Allen (8)

1 Secure the left and right drum guards using one 3/8-16 x 1.25-inch button-head flange bolt each.
2 Secure the front lateral drum guard using five 3/8-16 x 1.25-inch button-head flange bolts.
3 Loosely attach the rear lateral drum guard using the center 3/8-16 x 1.25-inch button-head flange bolt only.

Figure 2-3: Install the Drum Guards
INSTALLING THE INTERFACE GUIDE

The interface guide secures the dyno to the four-post lift. It is a good idea to install your interface guide before anchoring your dyno to the ground. If you have the interface roller assembly instead of the interface guide, refer to Appendix C.

You will need the following parts:

- 21600000 Interface Bar
- 21600001 Interface Bracket secured to the dyno using P/N 36582471 Bolt, 3/8-16 x 1.5", Flange-Hex (2)
- 36488100 Nut, 3/8-16, Nylock (2)
- 36500000 Bolt, 3/8-16 x 4.5", Hex, Full Thread (2)
- 36923100 Washer, 3/8", Hardened, Flat, Steel (4)
- 61100000 Interface Guide

1. Raise the lift until the bottom of the lift is approximately 86.36 cm (34.00 in.) above the floor.

2. Loosely attach the interface guide to the lift cross member using two 3/8 x 4.5-inch bolts, four 3/8-inch flat washers, and two 3/8-inch nylock nuts.

Note: Verify the interface guide with the pin is facing the dyno and is near the bottom of the lift cross member.

Figure 2-4: Interface Guide and Lift Cross Member
3. Align the interface guide pin on the lift cross member with the interface bracket on the dyno. The interface bracket is already installed on the dyno. **Note:** The distance between the dyno and the lift may need to be adjusted.

4. Lower the lift until the interface guide pin just starts to enter the interface bracket on the dyno.

![Figure 2-5: Align the Interface Bracket and the Interface Guide](image-url)
5 Verify the interface guide clears the interface bracket by 3 mm to 6 mm (1/8-inch to 1/4-inch) as shown in Figure 2-6.

6 Slide the interface guide up until the bottom bolt touches the cross member. Lower the top bolt down in the slots until it touches the cross member.

7 Tighten the hardware securing the interface guide to the lift cross member. **Note:** The lower and upper interface guide mounting bolts should touch the lift cross member.

8 Raise and lower the lift several times to make sure that the interface guide is working smoothly. Adjust the interface guide if needed.

9 Verify the lift can be lowered down to floor level.

Figure 2-6: Verify Distance Between Interface Guide and Interface Bracket
ANCHORING THE DYNO

Dynojet recommends you secure your dyno to the floor in your dyno room using concrete anchors.

You will need the following parts:

- 36923100 Washer, 3/8", Hardened, Flat, Steel (4)
- 37513200 Anchor, Redhead, 3/8" (4)
- 37518200 Redhead Anchor Installation Tool
- DM150-019-012 Bolt, 3/8-16 x 1", Hex (4)

1. Using the mounting feet as a template, mark and drill each hole needed to secure the four dyno feet to the floor.
2. Remove the 3/8 x 1-inch bolt and 5/16-inch flat washer securing each mounting foot to the dyno and set aside.
3. Remove each mounting foot and set aside.
4. Install four Red Head anchors. Refer to Appendix A for installation instructions.
5. Secure each mounting foot to the dyno using the bolts and flat washers removed earlier.
6. Secure each mounting foot to the floor using one 3/8-16 x 1-inch hex bolt and one 3/8-inch flat washer.

![Figure 2-7: Secure the Dyno to the Floor](image)

INSTALLING THE EDDY CURRENT BRAKE

Refer to the Eddy Current Brake Installation and User Guide for Model 224 Above Ground Automotive Dynamometers (P/N 98215100) for eddy current brake installation instructions and install your eddy current brake at this time.
CABLE ROUTING

Use the following instructions to route the cables. You will need to route the cables before installing the deck.

CONNECTING THE DYNO ELECTRONICS AND SHOP AIR

You will need the following parts:

- 318110301 Power Cord
- 42924250 25-pin Cable
- 53415040 Power Supply
- 76199003N Dyno Electronics

1. Route the 25-pin cable from the dyno electronics to the Breakout board. Connect the 25-pin cable to the Breakout board.
   Refer to page 1-9 for more information on connecting to the dyno electronics.
   Refer to page 2-13 for more information on wiring the Breakout board.

2. Connect the air hose to the T fitting on the dyno brake solenoid.
   Note: The air brake comes installed with a hose barb for a 3/8-inch inside diameter air hose. If your hose does not have an inside diameter of 3/8-inch then you will need an air hose nipple (1/4-inch NPT) to connect your clean, dry shop air supply to the dyno. Once the pressure is connected, the air brake is ready to use.

3. Connect the power supply to the dyno electronics. Plug the power supply into your power source.

Figure 2-8: Routing the Cables
ALIGNING THE OPTICAL PICKUP CARD TAB

The optical pickup card is an electronic circuit board that accurately senses each drum revolution. The pickup card is recessed into the side of your dyno. The optical pickup card comes installed, the cable routed, and ready to use, but should be checked for alignment before the drum is turned.

Should the pickup cable become disconnected, refer to Figure 2-9 for routing instructions and page 2-13 for wiring instructions.

1. While looking through the optical pickup window, slowly turn the drum until the tab approaches the pickup. The tab should pass through the pickup without contact and should be centered in the pickup.
2. If the tab is not centered adjust by loosening the mounting screws.

⚠️ CAUTION

The optical pickup is very delicate. Be careful not to damage the optical pickup.

Figure 2-9: Pickup Card and Cable
**WIRING THE BREAKOUT BOARD**

1. Attach the pickup card cable to the Breakout board. This cable may already be connected. The pickup card cable has four wires which connect to the wiring block labeled DRUM 1.
   - Red wire connects to R1
   - Black wire connects to B1
   - White wire connects to W1
   - Ground (shield) wire connects to S1

2. Attach the brake solenoid cable to the Breakout board. The brake signal cable has two wires which connect to the wiring block labeled BRAKE.

3. Attach the 25-pin cable from the dyno electronics to the Breakout board location as shown in Figure 2-10.

4. Verify the jumpers are set as shown in Figure 2-10.

![Figure 2-10: Wiring the Breakout Board](image-url)
DECK INSTALLATION

Use the following instructions to install the deck. Be sure you have routed any cables and connected your shop air.

Note: Refer to Appendix B for early style deck installation.

You will need the following parts:

- 10111 Ground Hook/D-Ring (6)
- 10112 D-Ring Bracket, Surface Mount (6)
- 21214300 Center Panel
- 21214301 Outer Panel (2)
- 21610807 Support Angle (2)
- 21614102 Rear Deck Brace Mount (2)
- 21619103 Rear Tube
- 21714200 Rear Deck Brace (4)
- 35521420 Cap Plug (2)
- 36561045 Screw, 1/4-20 x 5/8", Pan-Head, Torx (12)
- 36488100 Nut, 3/8-16, Nylock (22)
- 36582471 Bolt, 3/8-16 x 1.5", Flange-Hex (30)
- 36584871 Bolt, 3/8-16 x 3", Flange-Hex (4)
- 36923100 Washer, 3/8", Hardened, Flat, Steel, (22)
- DM150-020-005 Nut, Crush, 1/4-20 (12)
1. Verify the drum guards are installed. Refer to page 2-6 for more information.
2. Install the rear deck brace mounting brackets using two 3/8-16 x 1.5-inch flange-hex bolts each.
   
   **Note:** If you have an eddy current brake, use only one mounting bracket.

---

Figure 2-11: Install the Rear Deck Brace Mounting Bracket
3 Loosely install the inner rear deck braces to the dyno using two 3/8-16 x 1.5-inch flange-hex bolts each.

4 Loosely install the outer rear deck braces to the mounting brackets using two 3/8-16 x 1.5-inch flange-hex bolts, washers, and nylock nuts each.

**Note:** If you have an eddy current brake, the outer rear deck brace will secure directly to the brake with no mounting bracket.

5 Verify there are no bolts securing the left and right drum guards in the locations shown in Figure 2-12.

![Figure 2-12: Install the Rear Deck Braces](image-url)
6  Install the outside panels.
   6a  Secure the panel to the dyno frame using three 3/8-16 x 1.5-inch flange-hex bolts.
   6b  Secure the three tie-downs to the panel and to the deck braces using two
       3/8-16 x 1.5-inch flange-hex bolts, two 3/8-inch washers, and two 3/8-inch
       nylock nuts each.
       Verify the panel is sandwiched between the tie-downs and the brace.
   6c  Secure the inside of the panel to the inner brace using one 3/8-16 x 1.5-inch
       flange-hex bolt, one 3/8-inch washer, and one 3/8-inch nylock nut.

Figure 2-13: Install the Outside Panels
7 Remove the center bolt from the drum guard and set aside.
8 Secure the supports to the outer panels using three 1/4-20 x 5/8-inch screws and crush nuts each.
9 Secure the center panel to each support using three 1/4-20 x 5/8-inch screws and crush nuts each.
10 Secure the center panel to the dyno with the center bolt removed earlier.

Figure 2-14: Install the Center Panel
11 Install the rear tube to the outer panels and deck supports using four 3/8-16 x 3-inch flange-hex bolts, four 3/8-inch flat washers, and four 3/8-inch nylock nuts.

12 Install a plastic plug in each end of the tube.

13 Tighten all brace hardware.

Figure 2-15: Install the Rear Tube
LOGO PANEL INSTALLATION

Use the following instructions to install the logo panels on your dyno.

You will need the following parts:

- 21200004 Mounting Bracket (4)
- 21200009 Lower Mounting Bracket (2)
- 36491100 Nut, 7/16-14, Hex, Grade-5 (4)
- 36561045 Screw, 1/4-20 x 5/8", Pan-Head, Torx (10)
- 36591670 Bolt, 7/16-14 x 1", Hex (4)
- 36933100 Washer, 7/16", Flat, Steel (4)
- 61100001 Logo Panel Assembly (2)
- DM150-011-002 Washer, 3/8", Flat (8)
- DM150-019-008 Bolt, 3/8-16 x 3/4", Hex (8)

Repeat the following steps for both logo panels.

1. Secure the lower mounting bracket to the dyno using two 7/16-14 x 1-inch hex bolts, two 7/16-inch flat washers, and two 7/16-14 nuts.

Figure 2-16: Install the Lower Mounting Bracket
2 Secure each mounting bracket to the dyno using two 3/8-16 x 3/4-inch hex bolts and two 3/8-inch flat washers. There are two mounting brackets per logo panel.

![Figure 2-17: Install the Mounting Brackets](image)

3 Secure the logo panel to the mounting brackets using five 1/4-20 x 5/8-inch pan-head torx screws.

![Figure 2-18: Install the Logo Panel](image)
The Dynojet Dynamometer gives you the state of the art technology, durability, and accuracy that you need. Dynojet’s advanced engineering delivers the precise horsepower measurements a technician needs to make quick and accurate evaluations of engine performance and drive train problems.

This chapter includes instructions for basic dyno operation. For more detailed instructions, refer to the WinPep 7 User Guide. This manual can also be found on your WinPep CD or at www.dynojet.com.

This chapter is divided into the following categories:

- Loading the Vehicle, page 3-2
- Connecting the RPM Pickup, page 3-6
- Pre-Run Inspection, page 3-9
- Making a Test Run, page 3-11
- Preventative Maintenance, page 3-12
LOADING THE VEHICLE

Use the following steps to load a vehicle on the dyno. Refer to your lift instructions for lift operation.

You will need the following parts:

<table>
<thead>
<tr>
<th>part description</th>
<th>part description</th>
</tr>
</thead>
<tbody>
<tr>
<td>short axle strap, 10M #, 21&quot; (4)</td>
<td>car tie-down, high performance, 2&quot; x 10&quot; (2)</td>
</tr>
<tr>
<td>P/N 30AS21</td>
<td>P/N 500-C10W</td>
</tr>
<tr>
<td>long axle strap, 10M #, 6&quot; (4)</td>
<td>inductive secondary pickup (2)</td>
</tr>
<tr>
<td>P/N 30AS72</td>
<td>P/N DE100-109S</td>
</tr>
<tr>
<td>car tie-down, 2&quot; x 10&quot; (4)</td>
<td>inductive primary pickup</td>
</tr>
<tr>
<td>P/N 500-C10</td>
<td>P/N DE100-110L</td>
</tr>
</tbody>
</table>
1. Verify your computer is running. Set the dyno brake on by pressing the red button on the hand-held pendant.
2. Drive the vehicle onto the lift and raise the lift to the same height as the dyno.
3. Drive the vehicle onto the dyno and align the vehicle straight with the dyno.
4. Stop the vehicle when the drive axle is centered on the drum.

**WARNING**

Do not drive your vehicle onto the deck of the dyno.

![center drive axle on dyno drum]

Figure 3-1: Center the Drive Axle on the Drum
5 When the vehicle is positioned properly on the dyno, shut the engine off.
   • If the vehicle has an automatic transmission, place it in park.
   • If the vehicle has a manual transmission, place it in gear.
6 Set the vehicle’s emergency brake.
7 Secure the non-drive wheels using the provided tire chocks. Do not use tire chocks for four wheel drive vehicles on four wheel drive dynos.
8 Attach the tie-down straps.
   Rear Wheel Drive
   • Attach two tie-down straps from secure anchor points to the rear of the vehicle. Attach additional tie-down straps from the rear of the vehicle as shown in Figure 3-2.
   • Attach two tie-down straps from secure anchor points to the front of the vehicle.
   Front Wheel Drive
   • Attach two tie-down straps from secure anchor points to the rear of the vehicle.
   • Attach two tie-down straps from secure anchor points to the front of the vehicle. Attach additional tie-down straps across the front of the vehicle to form a crisscross.

**WARNING**

With front wheel drive vehicles, always use longitudinal and cross straps at the front of the vehicle.

![Figure 3-2: Attach Tie-down Straps](image-url)
9  Tighten the tie-down straps evenly making sure that the drive wheels remain centered on the drum.

**CAUTION**

The tie-down straps should always be connected to the vehicle’s solid axle or the suspension control arms. Factory tie-down hooks connected to the vehicle’s frame may be used on the end opposite the drive wheels (for example: the front end of a rear driven vehicle).

10  Release the brake on the vehicle and the dyno.
11  Start the vehicle and put the transmission into first gear or drive.
12  Press the accelerator pedal so the drums begin turning slowly. While the drums are slowly turning, verify the stability of the vehicle.
13  Check all the straps and ensure the vehicle is tracking straight on the dyno.
CONNECTING THE RPM PICKUP

Your Dynojet dynamometer includes a primary wire inductive pickup and two secondary wire inductive pickups. These small “clothespin like” inductive pickups are used to sense RPM. An RPM pickup is required if you want to view torque graphs. Generally you will use one secondary wire inductive pickup on a spark plug wire. Vehicles with wasted spark ignition systems may require two secondary inductive pickups. On a wasted spark ignition, typically one coil will be connected to two spark plug wires. Attach one secondary pickup to each of these wires. If the pickups are connected to two plug wires that do not fire at the same time, an erratic RPM readout may occur. The primary wire inductive pickup senses RPM pulses from the coil. Although this pickup location generally works better, it is harder to find the correct location to connect the RPM pickup.

**Note:** If a pickup is not being used, disconnect it from the dyno electronics to prevent any stray pick up of signals.

The optional Optical Sensor is useful on diesel powered vehicles, MSD ignitions, and other high RFI ignition systems. For more detailed information on the Optical Sensor, refer to the Optical RPM Sensor Installation Guide (P/N 98295109).

**CAUTION**

Inductive pickups are very fragile. The ferrite core can easily be damaged and is not covered under warranty. Dropping, snapping, vibration, and heat can all damage the ferrite core.

The dyno electronics RPM module contains the electronics that sense the RPM pulses. An auto-gain circuit looks at only the peak voltage of the vehicle’s spark, ignoring the lower voltages to help reduce electronic noise problems. Wasted spark ignition systems will produce a lower voltage level on the exhaust stroke than the compression stroke. By definition of the auto-gain circuit, lower voltage spark levels will be ignored, missing every other spark the vehicle would produce.

**RPM PICKUP DESCRIPTIONS**

<table>
<thead>
<tr>
<th>RPM pickup</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondaries (Non- wasted spark system)</td>
<td>Use one secondary pickup. Unplug the other pickup from the RPM module and set the degrees between plug fires to 720° in WinPEP.</td>
</tr>
<tr>
<td>Secondaries (Wasted spark ignition system)</td>
<td>Use two secondary pickups. Attach one pickup on each spark plug wire on the same coil and set the degrees between plug fires to 360° in WinPEP.</td>
</tr>
<tr>
<td>Primary pickup</td>
<td>Attach the primary wire pickup to the primary side of the coil. Set the degrees between plug fires by taking 720/number of cylinders. For example, the number of degrees between plug fires on a V-8 engine with a single coil is 720/8=90 degrees.</td>
</tr>
<tr>
<td>Optional Optical RPM Sensor</td>
<td>Attach the sensor wire to the RPM module, also be sure to plug in the small power lead into the CPU module. The other end of the wire attaches to the Optical Sensor. Set the degrees between plug fires to 360° in WinPEP. Refer to the Optical RPM Sensor Installation Guide (P/N 98295109).</td>
</tr>
</tbody>
</table>
**CONNECTING THE SECONDARY INDUCTIVE PICKUP**

The secondary inductive pickup cannot be in contact with, or its connecting wire be crossing, other engine electrical wires or stray electrical interference may result.

1. Clip the secondary inductive pickup around one spark plug wire.
2. Route the inductive pickup cable to the RPM Module making sure the cable is clear of devices that produce electronic noise (spark plug wires, coil wire, coil etc.).

**Note:** Inductive pickup placement is important. Position the inductive pickup so that it is not making contact with any other spark plug wires. Separate the spark plug wire from the spark plug wire bundle for proper operation.

**Note:** You must ground the vehicle to the dyno for the electronics to function properly.

![Figure 3-3: Secondary Inductive Pickup](image)

![Figure 3-4: Separate Spark Plug Wire](image)
CHAPTER 3
Connecting the RPM Pickup

CONNECTING THE PRIMARY INDUCTIVE PICKUP

The primary inductive pickup cannot be in contact with, or it’s connecting wire be crossing, other engine electrical wires or stray electrical interference may result.

1. Clip the primary inductive pickup around the primary side of the coil.
2. Route the primary wire cable to the RPM Module making sure the cable is clear of devices that produce electronic noise (spark plug wires, coil wire, coil, etc.).

Note: You must ground the vehicle to the dyno for the electronics to function properly.

Figure 3-5: Primary Inductive Pickup
PRE-RUN INSPECTION

Perform a vehicle inspection before making a run.

- Check the radiator coolant and oil levels.
- Check the fuel source.
- Rotate the drum(s) and check for rocks caught in the tire tread that could fly out.
- Check the tire pressure and tire speed rating. Improperly inflated tires or exceeding the maximum speed rating can result in premature wear or severe tire damage. Make sure the tire has no major deficiencies (cracks in sidewalls, tread life, etc.).
- Visually inspect the vehicle. Make sure it is in safe running order.
- Make sure ear protection and safety glasses are used when the dyno is being operated.
- Check the tie-down straps to make sure that they are tight and secured.
- Check the drive tires to be sure that they are aligned correctly on the dynamometer’s drums.
- Keep all rotating components clear at all times.
- Only the operator should be near the dyno or the vehicle during the test.
- Never allow any person(s) to stand behind the dyno or vehicle when it is being operated.
- Perform any other safety inspections appropriate to running your vehicle on the dyno.

WARNING

Never allow any person(s) to stand behind the dyno or vehicle when it is being operated. Only the operator should be near the dyno or the vehicle during the test.

BEFORE STARTING THE ENGINE

Connect an exhaust hose or hoses (if dual exhaust) on the vehicle, make sure the hose fits over the tail pipe, is not plugged or kinked and the hose is vented correctly out of the dyno room.

WARNING

Engine exhaust contains poisonous carbon monoxide gas. Breathing it could cause death. Operate machine in well ventilated area.
CHAPTER 3
Pre-Run Inspection

ENGINE WARM UP

Warm the vehicle’s engine and drivetrain before beginning testing. Consistent engine temperatures will assure your runs are repeatable.

AFTER ENGINE WARM UP

Always leave the vehicle in park (automatic transmission) or in first gear (manual transmission), with the engine off, and make sure the emergency brake and the dyno brake are on when you get out of the vehicle.

• Fix any fuel, oil, or coolant leaks that may have shown up after engine warm up and check the carburetor for leaks.

• Any loud or unusual engine noises or excessive exhaust smoke should be resolved before continuing.
MAKING A TEST RUN

Dyno runs provide safe, reliable road testing right in the shop. The dyno allows you to measure, record, and diagnose performance problems quickly. The dyno combined with WinPEP 7 produces consistent, easily interpretable power graphs. Use the following instructions to ensure repeatable and accurate measurements.

1 Verify the vehicle is secured properly.
2 Place the vehicle in a low gear and release the dyno brake using the hand held pendant.
3 Slowly accelerate the vehicle to 20 m.p.h.
4 Test the tachometer operation.
   4a Rev the engine. The gauges on the computer screen should be moving. If the tachometer is moving but not registering the correct RPM values, the number of degrees of revolution of the crank shaft (the plug fires number) is incorrect.
   4b Stop the vehicle, return to the MakeRun Configuration dialog box, and enter the correct value for the plug firing order.
5 Press the red brake button to apply 100% braking and slow down the vehicle.

**CAUTION**

Using the vehicle's own brakes to slow or stop the drum at speeds over 30 m.p.h. can severely over heat the brake parts. Dynojet dynamometers with the air brake or eddy current brake accessory can be used to slow the vehicle and drum to a full stop at any speed. The vehicle’s brakes should be used in an emergency stop situation only.

6 Shut the engine off and put the vehicle in gear (manual transmission) or park (automatic transmission).
7 Set the vehicle’s parking brake and leave the dyno brake on.
8 Perform a final inspection.
   • Verify the drive tire’s alignment on the dyno drums.
   • Make any adjustments to the tie-down straps as needed.
   • Perform any other safety checks that you deem appropriate to your particular situation.

You are now ready to make a high speed run on the dyno. Refer to your WinPep 7 User Guide for more detailed instructions.
PREVENTATIVE MAINTENANCE

This section covers maintenance items for all model 224 dynos with the Spring Applied Air Release (SAAR) brake. For more detailed maintenance instructions, refer to the Maintenance Guide for Automotive Dynamometers (P/N 98119101).

THINGS TO CHECK

• Check all air fittings for leaks monthly. Correct any leaks found.

• Once per month verify the brake pressure gauge reads 100psi (690kPa). Adjust the regulator if the pressure is out of specification. Refer to page 3-13 for more information.

• Check the brake shoe clearance. Refer to page 3-14 for more information.

• Dyno Bearing Grease:
  
  Under steady use, over 25 runs per day, each bearing should receive .65oz (19 ml) of a recommended grease every 2 months.
  
  Under occasional use, less than 25 runs per day, each bearing should receive .65oz (19 ml) of a recommended grease every six months.

  Recommended Grease:

<table>
<thead>
<tr>
<th>grease specification</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>thickener</td>
<td>Lithium 12 Hydroxy Stearate</td>
</tr>
<tr>
<td>oil</td>
<td>Petroleum</td>
</tr>
<tr>
<td>thickness</td>
<td>NLGI 2</td>
</tr>
<tr>
<td>operating temperature (Fahrenheit)</td>
<td>-20°F to 200°F, intermittent to 250°F</td>
</tr>
<tr>
<td>operating temperature (Celsius)</td>
<td>-29°C to 93°C, intermittent to 121°C</td>
</tr>
<tr>
<td>EP additive</td>
<td>yes</td>
</tr>
<tr>
<td>examples</td>
<td>Mobil Mobilith AW-2</td>
</tr>
</tbody>
</table>
**VERIFYING THE SAAR BRAKE PRESSURE**

1. Verify the SAAR brake pressure gauge reads 100psi (690kPa).
2. Using the knob, adjust the regulator until the correct pressure is achieved.

![Diagram of brake pressure regulator and gauge]

**Figure 3-6: Check the SAAR Brake Pressure and Adjust the Regulator**
MAINTAINING THE SAAR BRAKE SHOE CLEARANCE

1. Verify the area is clear and the dyno can be operated safely.
2. Power up the dyno electronics.
3. Using the pendant, turn the brake to the OFF position. This will release the SAAR brake by moving the brake shoe away from the drum.

WARNING

Keep hands and fingers clear when operating dyno.

4. Measure the gap between the brake shoe and the drum surface. This gap should be between .125 inch - .375 inch (3mm - 10mm).
   
   Note: For clarity, the dyno frame is shown transparently to reveal the drum.
   
   Note: The mounting bracket shown is used with the SAAR upgrade. Factory installed SAAR brakes use a slightly different bracket.

Figure 3-7: Measure the Gap Between the Brake Shoe and Drum
5 If the brake shoe clearance is out of specification, loosen the upper nut on the bottom of the air can rod.
6 Adjust the lower nut until the brake shoes are .25 inch (6mm) away from the dyno drum.
7 Tighten the upper nut on the air can rod down onto the brake actuating tube to sandwich the tube between the two nuts.
8 Torque the lower nut to 110 foot-pounds.

If you cannot adjust the brakes to specification, you will need new brake shoes. Contact Dynojet.

Figure 3-8: Adjust the Brake Shoe Clearance
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.

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](image)

2. Insert the anchor.

![Figure A-2: Red Head Anchor—Insert the Anchor](image)
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

EARLY STYLE DECK INSTALLATION

This appendix contains instructions for installing the early style deck to the model 224 automotive dyno. To ensure safety and accuracy in the procedures, perform the procedures as they are described.
EARLY STYLE DECK INSTALLATION

Before installing the deck, be sure you have routed any cables and connected your shop air.

If you did not order the Above Ground Kit you will not have a deck.

1. Install the rear deck mounting brackets using two 3/8-16 x 1-inch bolts and two washers.
   Note: If you have an eddy current brake you will only install one mounting bracket.

2. Loosely attach the two outside braces to the dyno using two 3/8 x 1-inch bolts and two 3/8 x 1-inch nylock nuts.

3. Loosely attach the two inside braces to the dyno using two 3/8 x 1-inch bolts and two 3/8-inch lock washers.
   Note: Leave bolts loose.

Figure B-1: Deck Brace Installation
4 If not already removed, remove the two 3/8-16 x 1.25-inch button-head flange bolts securing the side drum guards. Leave the side drum guards in place.

5 If not already removed, remove the three 3/8-16 x 1-inch button-head flange bolts from the front drum guard.

Figure B-2: Removing Drum Guard Bolts
6 Gently place the deck on the deck braces making sure the deck lip is on top of the drum guards.

7 Using the two side drum guard bolts and three front drum guard bolts removed earlier, secure the deck lip to the dyno.

Figure B-3: Positioning the Deck
8 Secure the deck to each deck brace using two 3/8 x 1-inch bolts and two 3/8-inch lock washers each. Make sure to use one 3/8-inch flat washer and one 3/8-inch nut on the inside of each outer deck brace.

9 Tighten all deck brace hardware.

Figure B-4: Securing the Deck
This appendix contains instructions for installing the interface roller assembly to the four-post lift. To ensure safety and accuracy in the procedures, perform the procedures as they are described.
The roller assembly secures the dyno to the four-post lift. It is a good idea to install your interface roller assembly before anchoring your dyno to the ground. If you have the interface guide, refer to “Installing the Interface Guide” on page 2-7.

**Note:** If you did not purchase the Above Ground Kit you will not have the interface roller assembly.

1. Raise the lift until the bottom of the lift is approximately 86.36 cm (34.00 in.) above the floor.
2. Loosely attach the interface roller assembly to the lift cross member using four 3/8 x 5-inch bolts, eight 3/8-inch flat washers, and four 3/8-inch nylock nuts. **Note:** Be sure to attach the interface roller assembly with the roller facing the dyno near the bottom of the lift cross member.

![Interface Roller Assembly and Lift Cross Member](image)

**Figure C-1: Interface Roller Assembly and Lift Cross Member**
3. Align the rollers on the interface roller assembly with the interface tube on the dyno.
   **Note:** The distance between the dyno and the lift may need to be adjusted.

4. Using the 1/2-inch and the 1/4-inch thick shims as necessary, adjust the interface roller assembly to fit the lift cross member.

5. Lower the lift until the interface roller assembly just starts to enter the interface tube.

6. Tighten the hardware securing the interface roller assembly to the lift cross member.
   **Note:** The interface roller assembly mounting bolts should touch the bottom of the lift cross member.

7. Raise and lower the lift several times to make sure that the interface roller assembly is working smoothly. Adjust the interface roller assembly if needed.

8. Verify the lift can be lowered down to floor level.

---

**Figure C-2: Align the Interface Tube and the Interface Roller Assembly**
This appendix contains tables for standard and metric torque values. Use these values when specified values are not given in other sections of this manual.
STANDARD BOLT TORQUE VALUES

Always use the torque values specified in other sections of this manual. When specific values are not available, use the torque values listed below. Use the following guidelines when tightening torque:

- These values are based on use of clean, dry threads.
- The following tables include values for plain finish and plated fasteners.
- Reduce torque by 10% when engine oil is used as a lubricant.

⚠ CAUTION ⚠
The following tables are meant to be used as guidelines for Dynojet product torque values only. Always use caution when torquing fasteners.

GRADE 5

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METRIC BOLT TORQUE VALUES

Always use the torque values specified in other sections of this manual. When specific values are not available, use the torque values listed below. Use the following guidelines when tightening torque:

- These values are based on use of clean, dry threads.
- The following tables include values for plain finish and plated fasteners.
- Reduce torque by 10% when engine oil is used as a lubricant.

![CAUTION]
The following tables are meant to be used as guidelines for Dynojet product torque values only. Always use caution when torquing fasteners.

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INDEX

A
above ground kit
   deck 2-14
   deck, early style 8-2
interface guide assembly 2-7
interface roller assembly C-2
air brake 2-11
anchor the dyno 2-10

B
battery hazards vi
bearing grease 3-12
brake
   pressure gauge 3-12, 3-13
   regulator 3-12, 3-13
   shoe clearance 3-14
brake solenoid cable, wiring 2-13
breakout board
   jumper settings 2-13
   wiring 2-13

C
compressed air requirements 1-6
computer specifications 1-6
conventions 1-3
crate
   removing the dyno 2-4
   unpacking the dyno 2-2

D
deck
   center panel 2-18
   inner deck braces 2-16
   installing 2-14
   mounting brackets 2-15
   outer deck braces 2-16
   plastic plug 2-19
   rear tube 2-19
   tie-downs 2-17
deck, early style
   inside braces B-2
   installing B-2
   mounting bracket B-2
   outside braces B-2
dimensions 1-6
disclaimers v
document part number 1-1
drum guards 2-6
dyno electronics 1-9, 2-11
dyno requirements 1-5–1-7
   see also requirements

E
eddy current brake 2-10
electrical requirements 1-7
electrostatic discharge vi
environmental requirements 1-7
equalizer box 1-4
ESD precautions vi
exhaust extraction 1-4

F
fire suppression 1-4, 1-7
forklift requirements 1-7
INDEX

G
grade 10.9 torque values D-4
grade 5 torque values D-2
grade 8 torque values D-3
grade 8.8 torque values D-4

H
hazards vii
height 1-5

I
Industrial Noise Control, Inc. 1-4
intake air fan 1-4
interface bracket 2-8
interface guide 2-7
interface roller assembly C-2
interface tube C-3

J
jumper settings 2-13

L
length 1-5
lift 1-10
cross member 2-9, C-3
dyno placement 2-5, 2-8, C-3
interface guide 2-7
interface roller assembly C-2
requirements 1-10
loading the vehicle 3-2
logo panel 2-20
loop straps 2-4

M
making a test run 3-11
metric torque values
grade 10.9 D-4
grade 8.8 D-4
model 224 dyno 1-8

O
optical pickup card
aligning the tab 2-12
wiring the breakout board 2-13

P
pickup card cable
routing 2-12
wiring 2-13
power supply 2-11
pre-run inspection 3-9, 3-10
preventative maintenance 3-12
primary inductive pickup 3-8

R
red head anchor
contact information A-1
installation A-2
setting tool A-3
warnings A-1
requirements
chassis 1-5
compressed air 1-6
computer specifications 1-6
electrical 1-7
environmental 1-7
fire suppression 1-7
forklift 1-7
tie-down straps 1-7
roller assembly C-2
Rotary Lift 1-10
routing cables
25-pin cable 2-11
dyno electronics 2-11
pickup card cable 2-12
power supply 2-11
shop air 2-11
RPM pickup 3-6
primary inductive 3-8
secondary inductive 3-7

S
SAAR brake
pressure gauge 3-12, 3-13
regulator 3-12, 3-13
shoe clearance 3-14
secondary inductive pickup 3-7
setting tool A-3
shop air 2-11
standard torque values
grade 5 D-2
grade 8 D-3
strap 1-7

T
technical support 1-3
tie-downs 2-17
torque values
metric D-4
standard D-2

W
warnings v
weight 1-5
width 1-5

Y
your dyno room 1-4
equalizer box 1-4
exhaust extraction 1-4
fire suppression 1-4
intake air fan 1-4
noise control 1-4

Index-ii

Above Ground Model 224 Automotive Dynamometer Installation Guide