Dynojet RESEARCH

PRE-INSTALLATION GUIDE

For Model 224 and 424 Automotive Dynamometers

P/N 98200005.05

Pre-Installation Guide for Model 224 and 424 Automotive Dynamometers

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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.

WARNING

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).

CAUTION

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.

DYNO PRE-INSTALLATION INFORMATION

Thank you for your interest in Dynojet's Automotive 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 WinPEP 7 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 dyno arrives. To ensure safety and accuracy in the procedures, perform the procedures as they are described.

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Version 5

Last Updated: 05-10-11

This chapter is divided into the following categories:

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, WinPEP 7 requirements, and dyno room set-up.

Conventions Used In This Manual

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

example of convention	description
	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.
	The Warning icon indicates potential harm to the person performing a procedure and/or the dynamometer equipment.

Technical Support

For assistance, please contact Dynojet Technical Support at 1-800-992-3525, e-mail Dynojet at dynosales@dynojet.com, 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, 3D visualizations, 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:

- 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 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.

> **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.

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.

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

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

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
- have a 3/8-inch inside diameter

The following requirements are needed for the compressed air pump assembly:

- Clean and dry air, 100 psi regulated
- 5 CFM
- 1/4-inch NPT pipe thread connector (to attach air to the solenoid or pump ball valve)

COMPUTER SPECIFICATIONS

You will need to provide a computer system to run the WinPEP software.

minimum system requirements	**recommended systems requirements**
• Microsoft® Windows 2000/XP	• Microsoft® Windows 2000/XP
• 800 MHz Processor	• 2.4 GHz Processor or greater
• 256 MB of available RAM	• 512 MB of available RAM or greater
• one 9-pin COM port, two 9-pin COM ports for Tuning Link	• one 9-pin COM port, two 9-pin COM ports for Tuning Link
• 1024 x 768, 256 color monitor (XGA)	• 1280 x 1024 256 color monitor (SXGA) or better
• 1.2 gigabyte hard drive	• 40 gigabyte hard drive
• 30 MB of available hard-disk space	• 100 MB of available hard-disk space
• CD ROM	• CD ROM
• printer, if hard copies are needed	• printer, if hard copies are needed

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

description	specifications
Power Requirements: 4WD electronics	110v 60Hz or 240v 50Hz
Power Requirements: dyno electronics	110v 60Hz or 240v 50Hz
Power Requirements: AFR-3 air pump	110v 60Hz or 240v 50Hz
Power Requirements: hydraulic motor	110v 60Hz or 240v 50Hz or 60Hz
Power Requirements: computer	110v 60Hz or 240v 50Hz
Power Requirements: optional eddy current brake	240v 30amp single-phase circuit for each eddy current brake Refer to Appendix B for power requirements and installation.

Environmental Requirements

description	specifications
Temperature	
operating min./max	10°C/50°C (50°F/122°F)
storage min./max	0°C/70°C (32°F/158°F)
Humidity	0 to 95% non-condensing

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.

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 dyno comes with an automotive tie-down package.

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. Contact Rotary Lift for technical assistance and installation instructions, 1-800-532-6973.

description	specifications
voltage single-phase	208V-230V

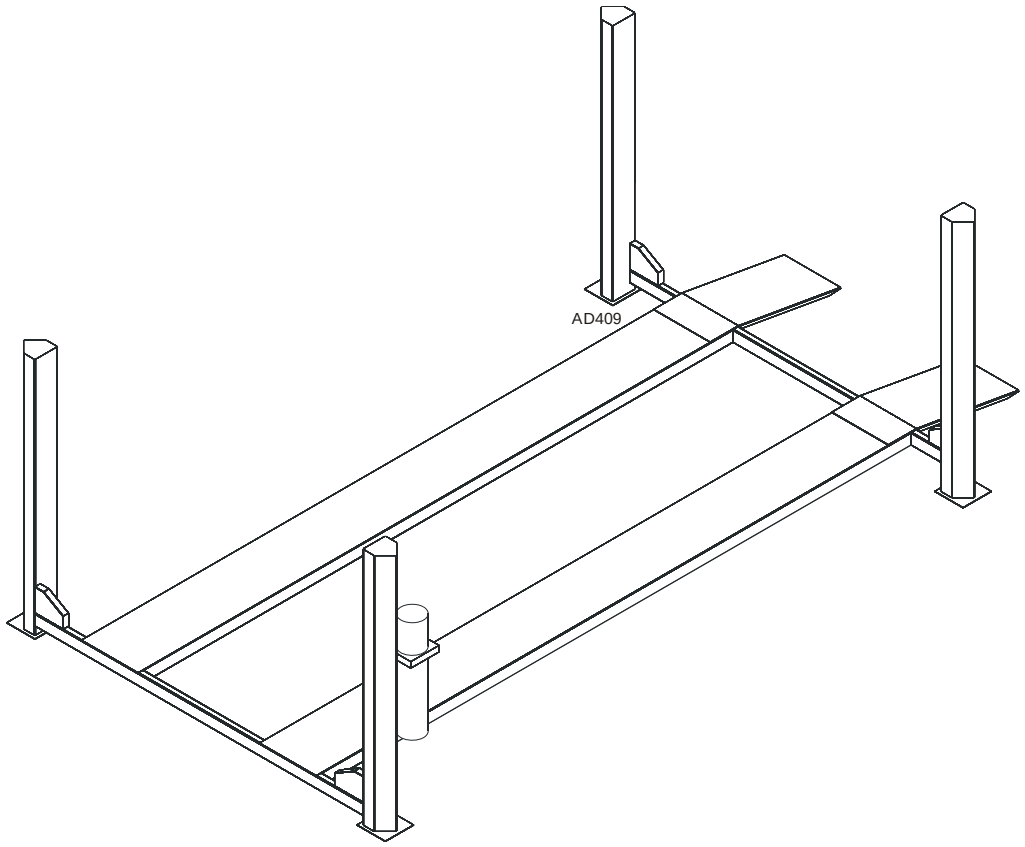

Figure 1: Four-Post Lift

ABOVE GROUND MODEL 224X DYNO

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

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
frame and deck	228.60 cm (90.00 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
Width	
of frame	73.66 cm (29.00 in.)
including feet	89.54 cm (35.25 in.)
including air brake	96.52 cm (38.00 in.)
frame and deck	165.74 cm (65.25 in.)
Weight	
224 dyno/crated dyno	1588 kg (3500 lb.)/ 1905.09 kg (4200 lb.)
Drum	
diameter	60.96 cm (24 in.)
width	205.74 cm (81 in.)
Frame	structural steel channel and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

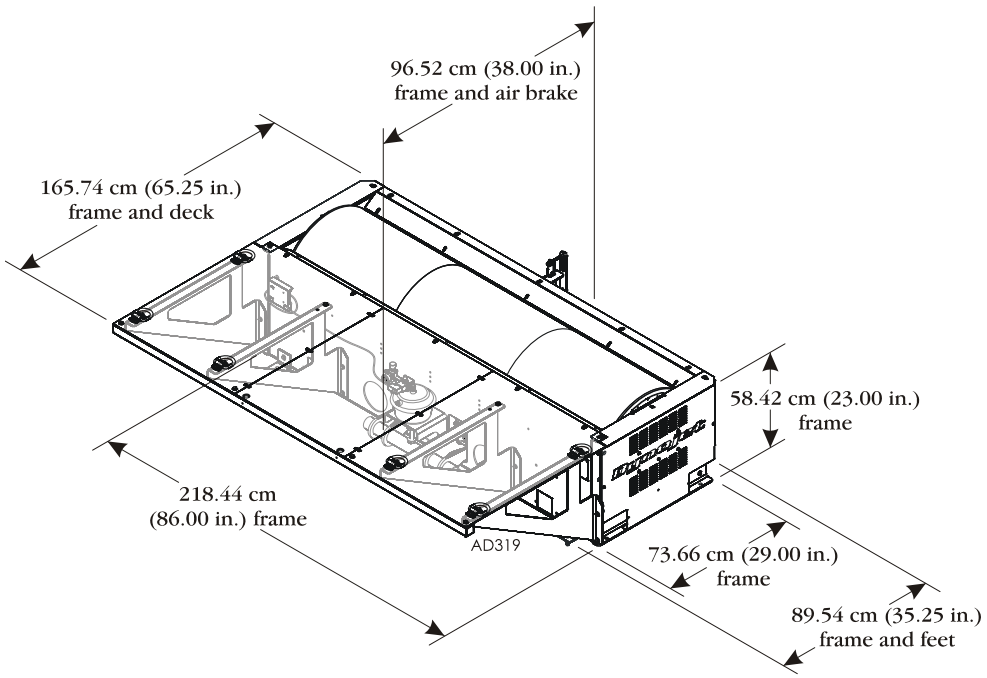

Figure 2: Above Ground Model 224x Dyno Dimensions

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.

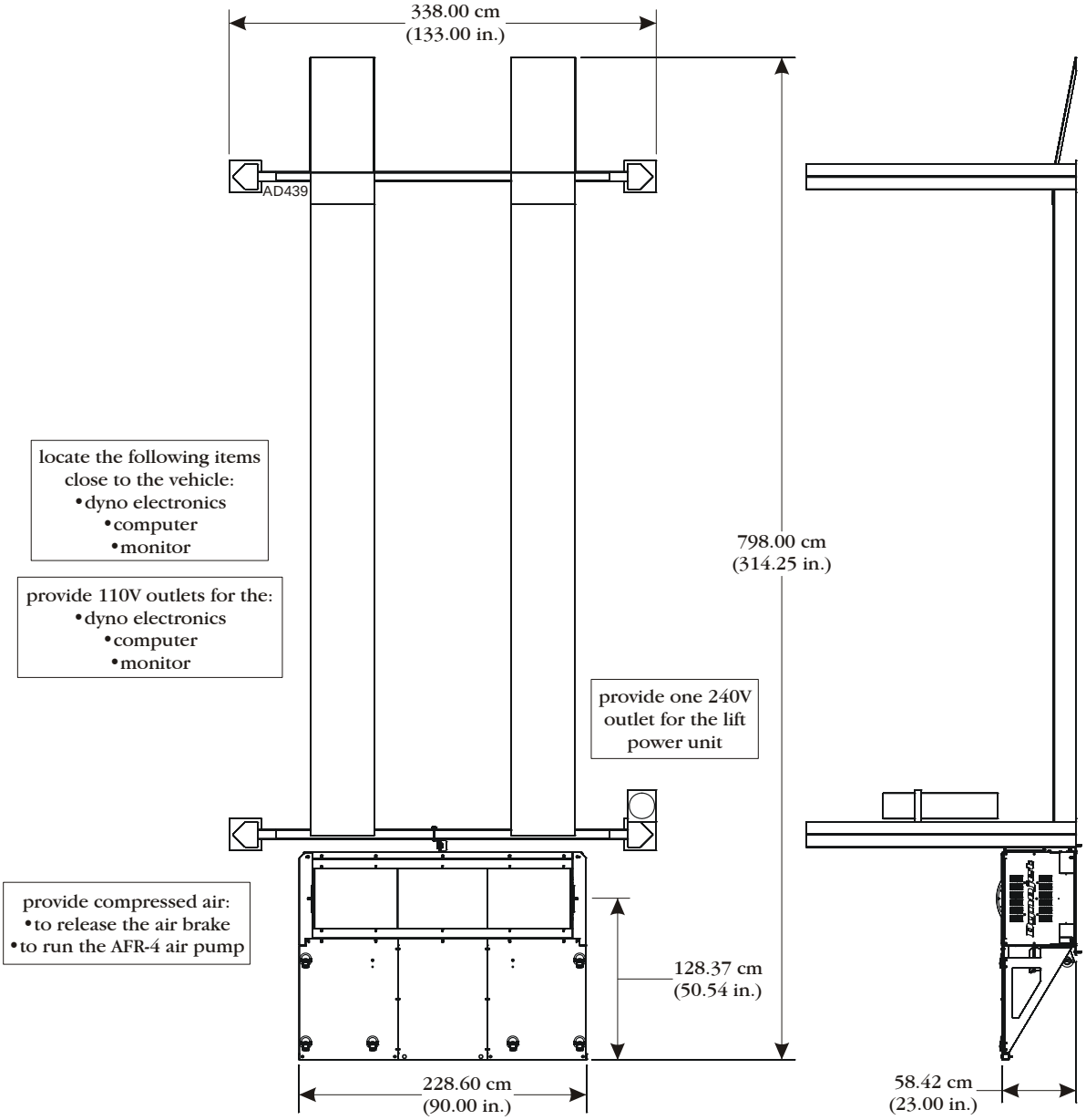

Figure 3: Room Layout—Above Ground Model 224x with Lift

IN GROUND MODEL 224X DYNO

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.

PIT SPECIFICATIONS

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.

CHASSIS SPECIFICATIONS

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
including pit covers	279.40 cm (110.00 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
Width	
of frame	73.66 cm (29.00 in.)
including feet	89.54 cm (35.25 in.)
including air brake	96.52 cm (38.00 in.)
frame with pit covers	144.78 cm (57.00 in.)
Weight	
224 dyno/crated dyno	1588 kg (3500 lb.)/ 2087 kg (4600 lb.)
Drum	
diameter	60.96 cm (24.00 in.)
width	205.74 cm (81.00 in.)
Frame	structural steel plate and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

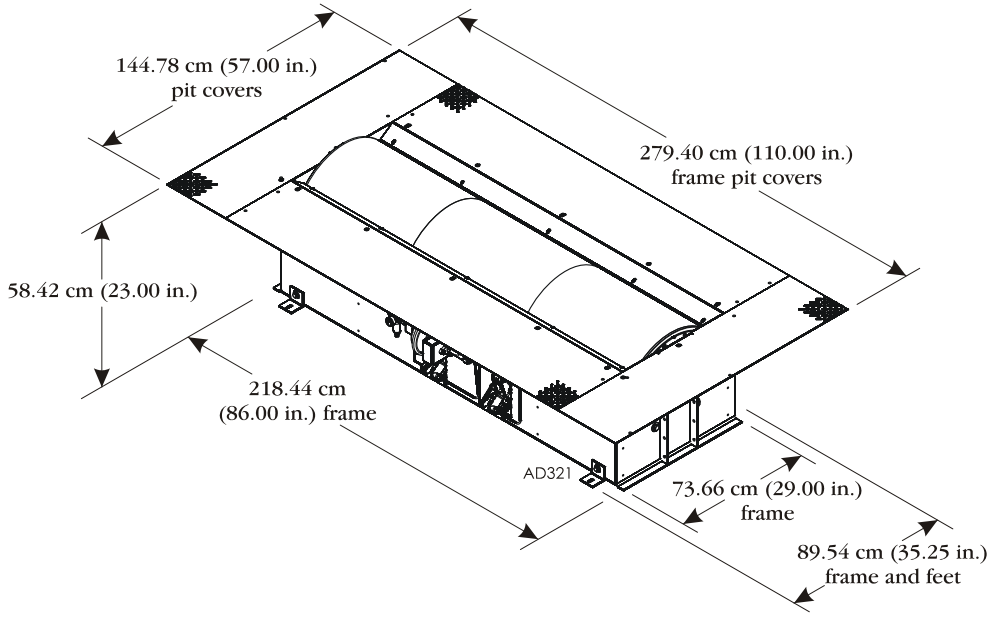

Figure 4: In Ground Model 224x Dyno Dimensions

ROOM LAYOUT—IN GROUND MODEL 224X DYNO

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

For more detailed information about the pit requirements, refer to the pit specifications (P/N 98219103) you received from your salesman.

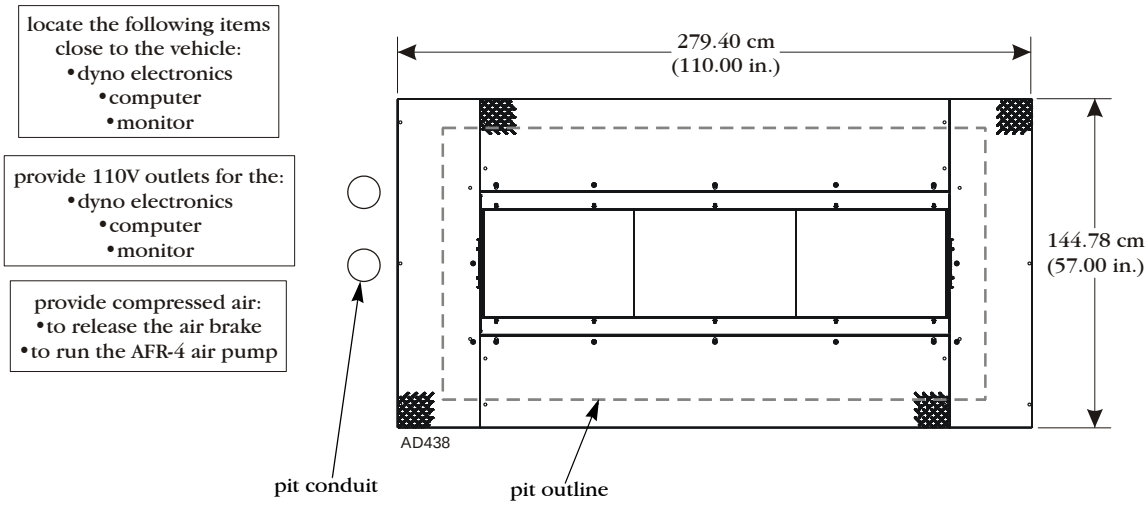

Figure 5: Room Layout—In Ground Model 224x Dyno

ABOVE GROUND MODEL 224XLC DYNO

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

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
including eddy current brake	321.23 cm (126.47 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
to top of eddy current brake	65.58 cm (25.82 in.)
Width	
of frame	73.66 cm (29.00 in.)
including feet	89.54 cm (35.25 in.)
including air brake	96.52 cm (38.00 in.)
including eddy current brake	74.83 cm (29.46 in.)
frame and deck	165.74 cm (65.25 in.)
Weight	
224 dyno/crated dyno	1588 kg (3500 lb.)/ 1905.09 kg (4200 lb.)
eddy current brake	635 kg (1400 lb.)
Drum	
diameter	60.96 cm (24 in.)
width	205.74 cm (81 in.)
Frame	structural steel channel and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

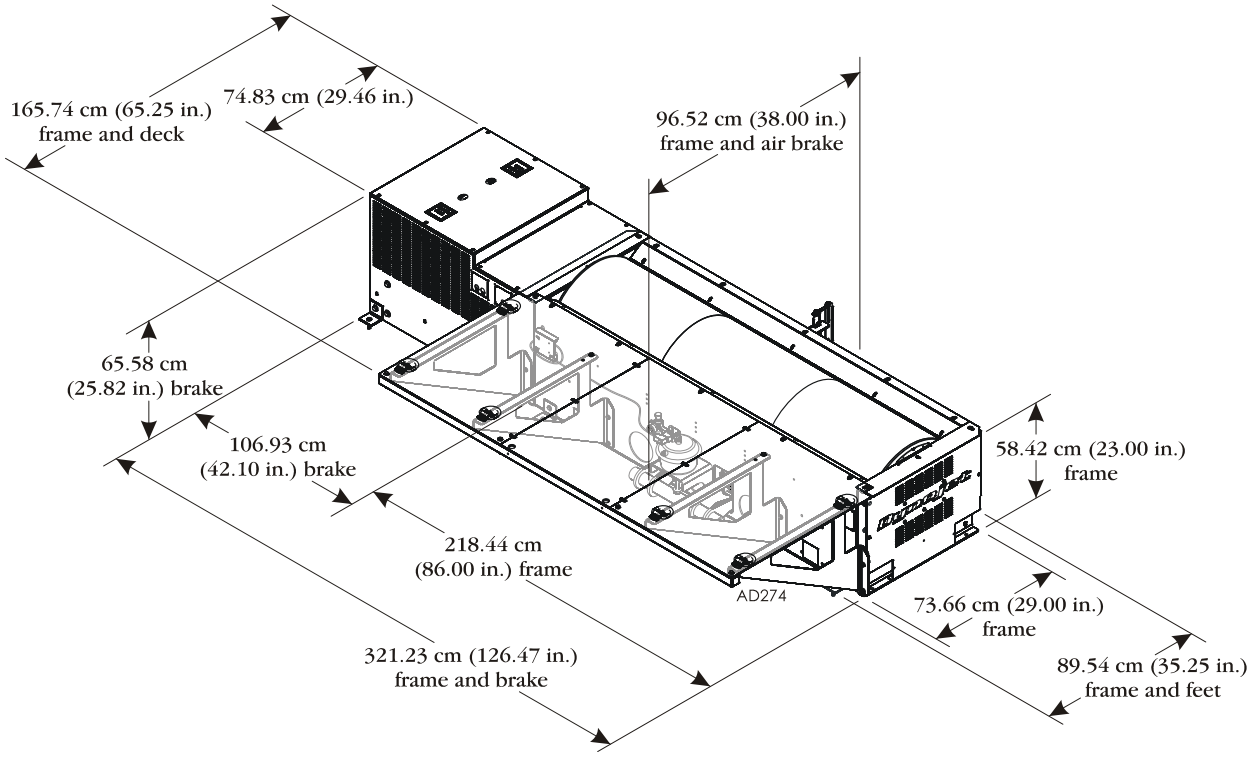

Figure 6: Above Ground Model 224xLC Dyno Dimensions

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 7 shows a front wheel drive setup.

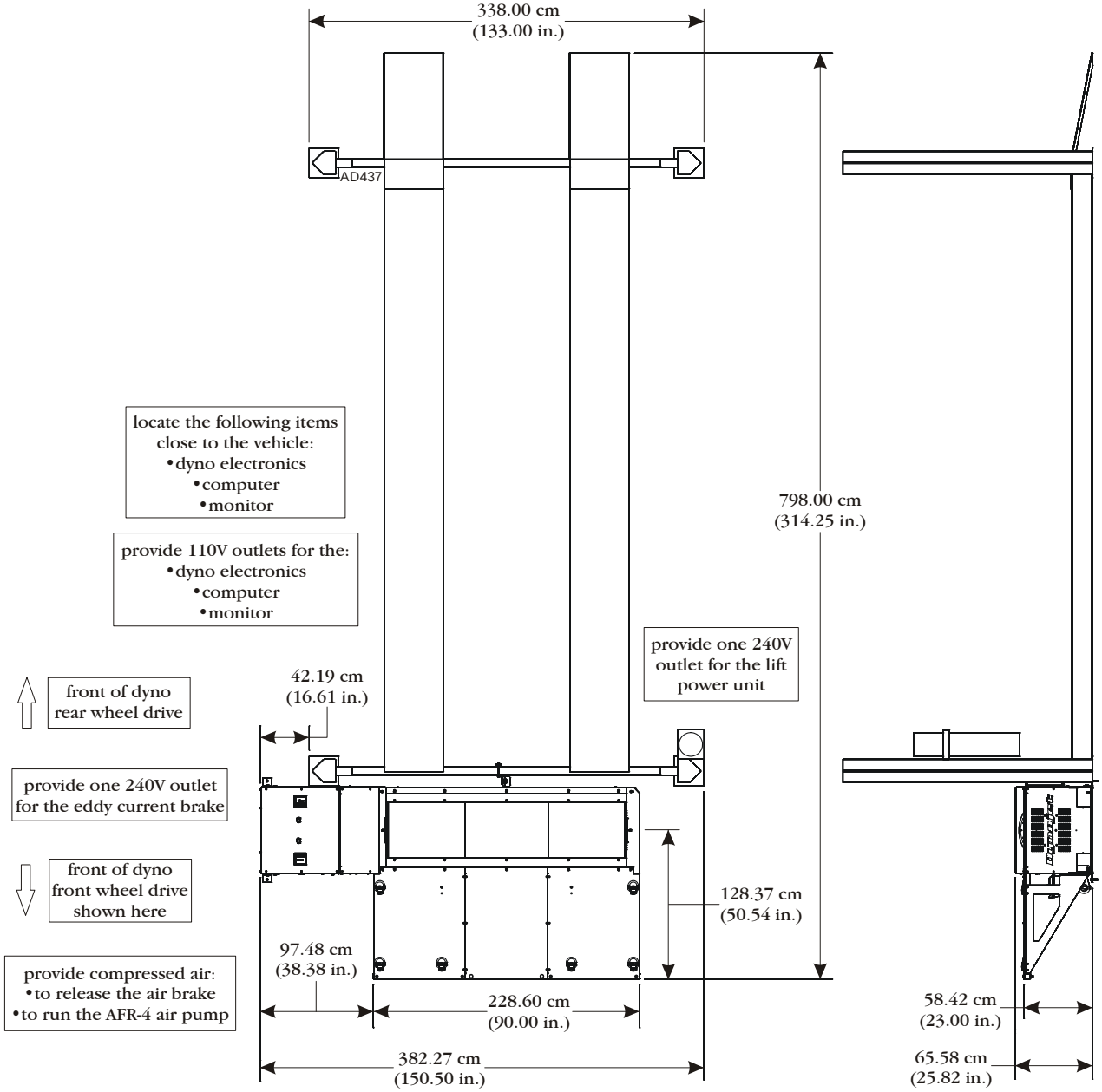

Figure 7: Room Layout—Above Ground Model 224xLC with Lift

IN GROUND MODEL 224XLC DYNO

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.

Pit Specifications

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.

Chassis Specifications

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
including eddy current brake	321.23 cm (126.47 in.)
including pit covers	381.00 cm (150.00 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
Width	
of frame	73.66 cm (29.00 in.)
including feet	89.54 cm (35.25 in.)
including air brake	96.52 cm (38.00 in.)
frame with pit covers	144.78 cm (57.00 in.)
Weight	
224 dyno/crated dyno	1588 kg (3500 lb.)/ 2087 kg (4600 lb.)
eddy current brake	635 kg (1400 lb.)
Drum	
diameter	60.96 cm (24.00 in.)
width	205.74 cm (81.00 in.)
Frame	structural steel plate and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

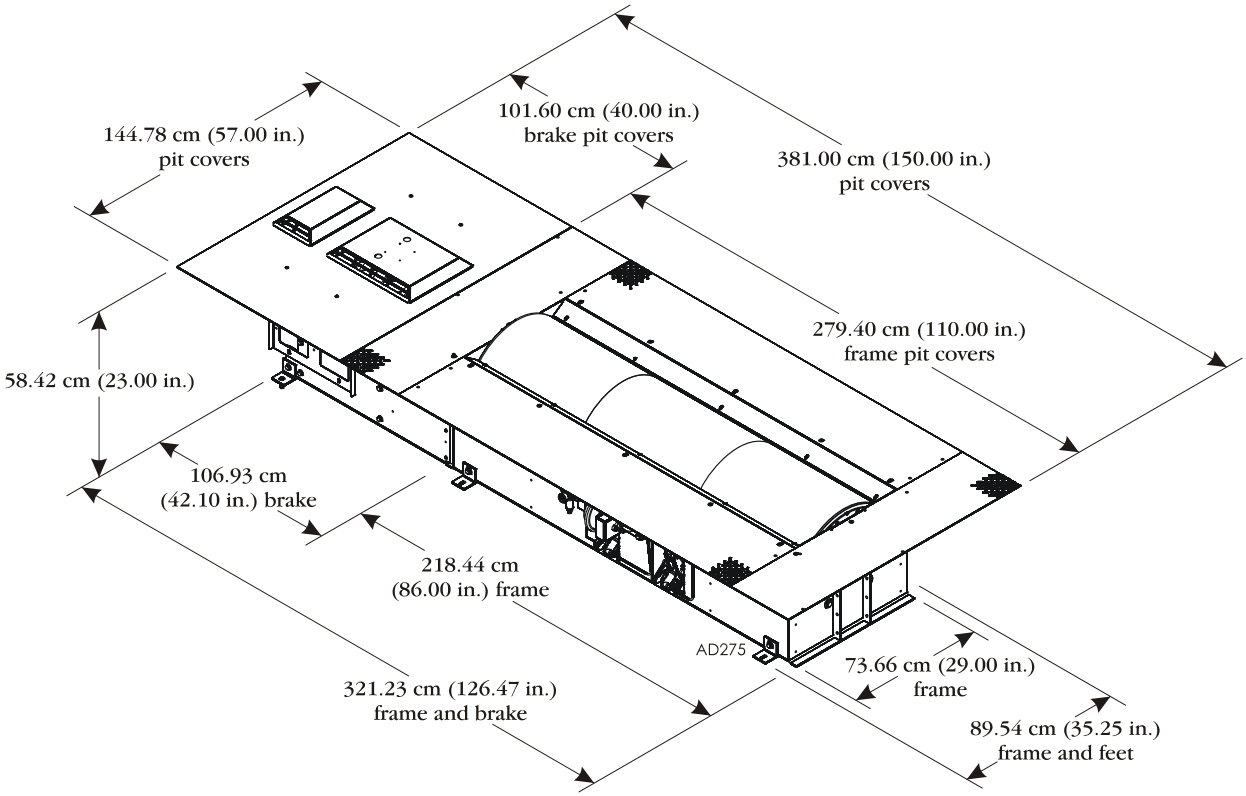

Figure 8: In Ground Model 224xLC Dyno Dimensions

ROOM LAYOUT—IN GROUND MODEL 224XLC DYNO

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

For more detailed information about the pit requirements, refer to the pit specifications (P/N 98219103) you received from your salesman.

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 9 shows a front wheel drive setup.

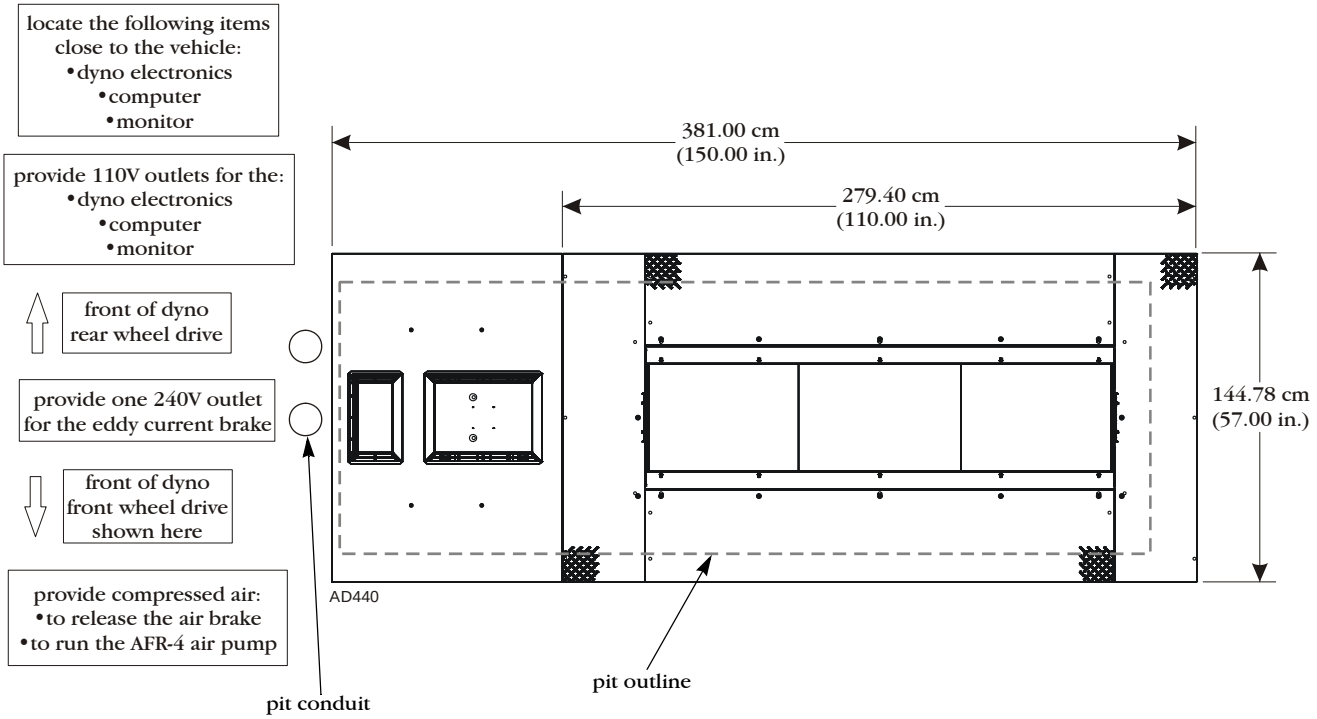

Figure 9: Room Layout—In Ground Model 224xLC Dyno

ABOVE GROUND MODEL 424X DYNO

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

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
of deck	228.60 cm (90.00 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
to top of frame with feet/track assembly	72.07 cm (28.375 in.)
Width	
of frame	73.66 cm (29.00 in.)
including cradle assembly	130.18 cm (51.25 in.)
including air brake	93.83 cm (36.94 in.)
both frames, deck, bridge—full in	388.62 cm (153.00 in.)
both frames, deck, bridge—full in with extension kit	414.02 cm (163.00 in.)
both frames, deck, bridge—full out	495.30 cm (195.00 in.)
both frames, deck, bridge—full out with extension kit	520.70 cm (205.00 in.)
Track Assembly	
length	218.44 cm (86.00 in.)
width	224.15 cm (88.25 in.)
Weight	
stationary crated dyno	2,114 kg (4,660 lb.)
4WD crated dyno	2,495 kg (5,500 lb.)
Drum	
diameter	60.96 cm (24.00 in.)
width	205.74 cm (81.00 in.)
Frame	structural steel channel and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

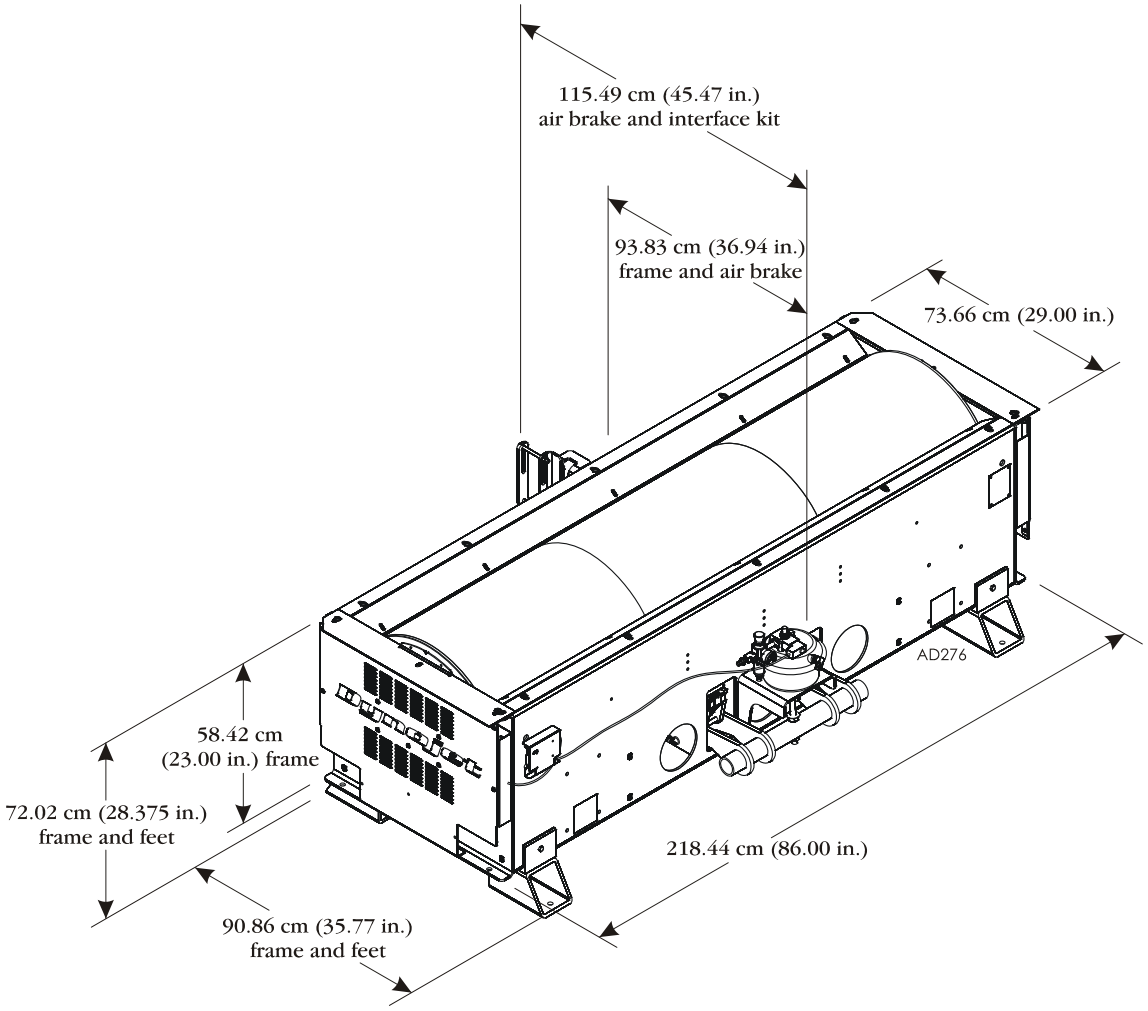

Figure 10: Above Ground Model 424x Stationary Dyno Dimensions

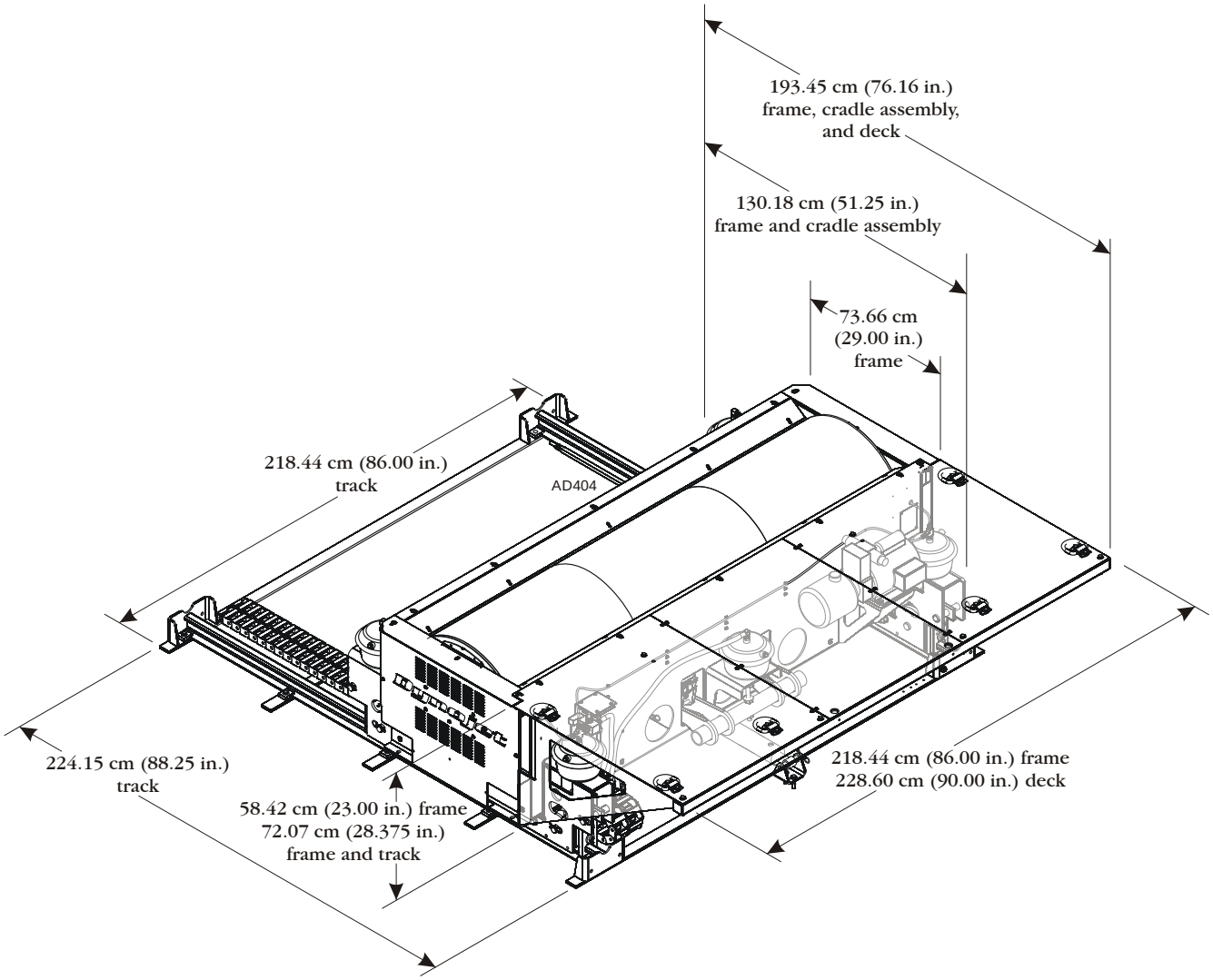

Figure 11: Above Ground Model 424x 4WD Dyno with Track Assembly Dimensions

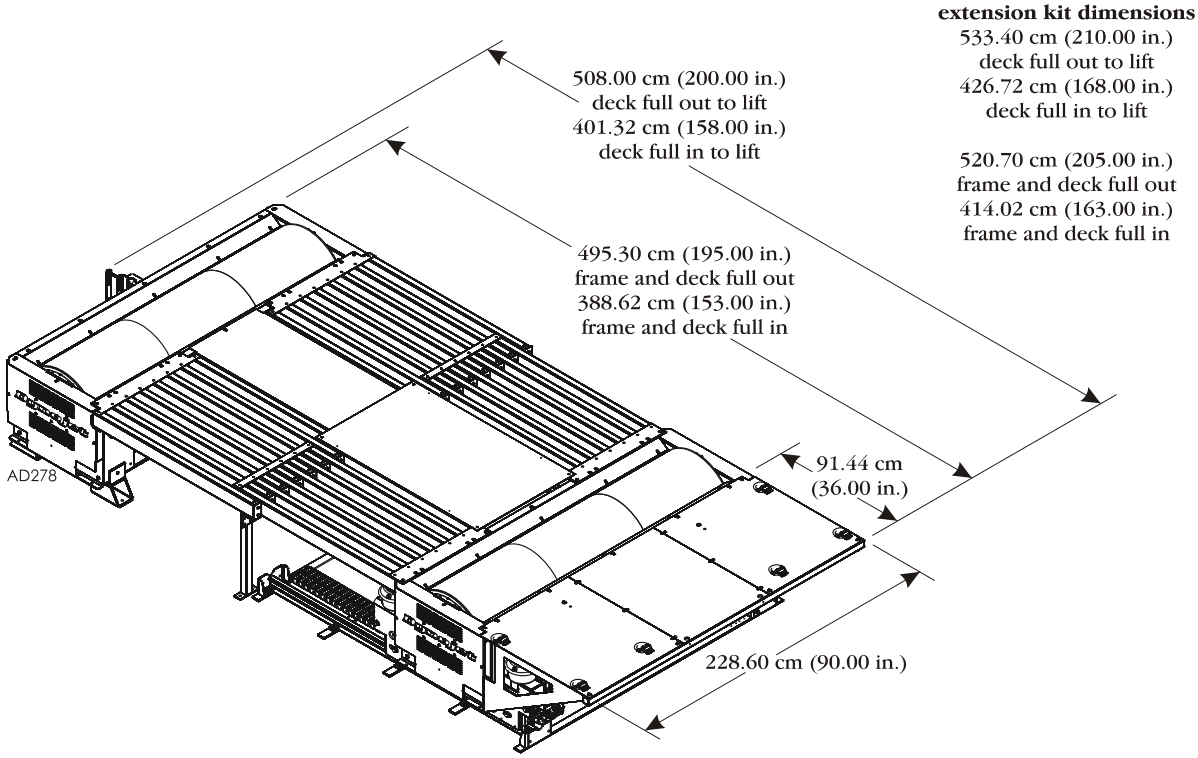

Figure 12: Above Ground Model 424x Dyno with Bridge and Deck Dimensions

ROOM LAYOUT—ABOVE GROUND MODEL 424X DYNO WITH LIFT

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

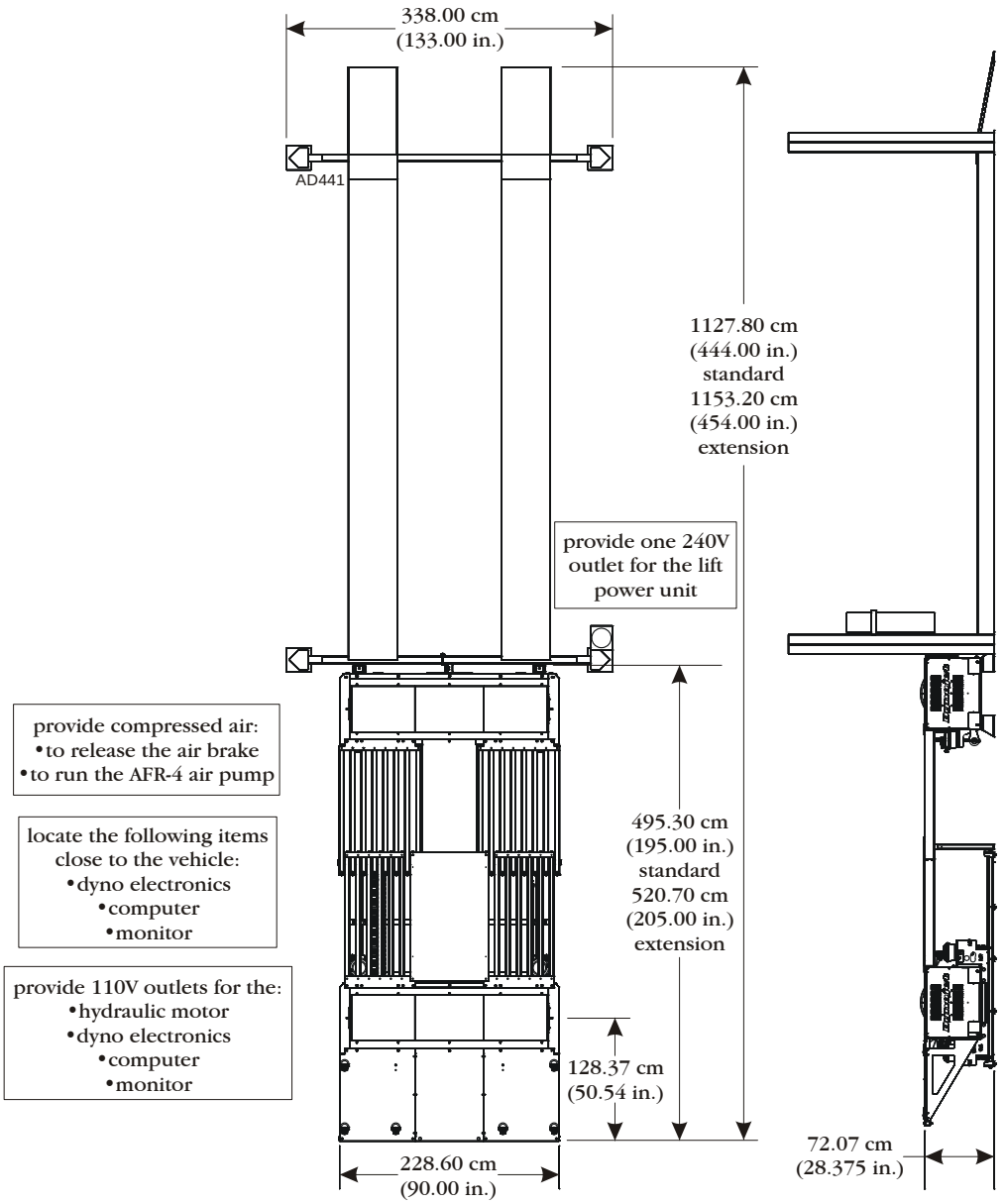

Figure 13: Room Layout—Above Ground Model 424x Dyno with Lift

IN GROUND MODEL 424X DYNO

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.

PIT SPECIFICATIONS

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.

CHASSIS SPECIFICATIONS

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
to top of frame with feet/track assembly	72.07 cm (28.375 in.)
Width	
of frame	73.66 cm (29.00 in.)
including cradle assembly	130.18 cm (51.25 in.)
including air brake	93.83 cm (36.94 in.)
both frames, bridge, covers—full out	584.20 cm (230.00 in.)
both frames, bridge, covers—full out with extension kit	609.60 cm (240.00 in.)
both frames, bridge, covers—full in	469.90 cm (185.00 in.)
both frames, bridge, covers—full in with extension kit	495.30 cm (195.00 in.)
Track Assembly	
length	218.44 cm (86.00 in.)
width	224.15 cm (88.25 in.)
Weight	
stationary crated dyno	2,114 kg (4,660 lb.)
4WD crated dyno	2,495 kg (5,500 lb.)
Drum	
diameter	60.96 cm (24.00 in.)
width	205.74 cm (81.00 in.)
Frame	structural steel channel and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

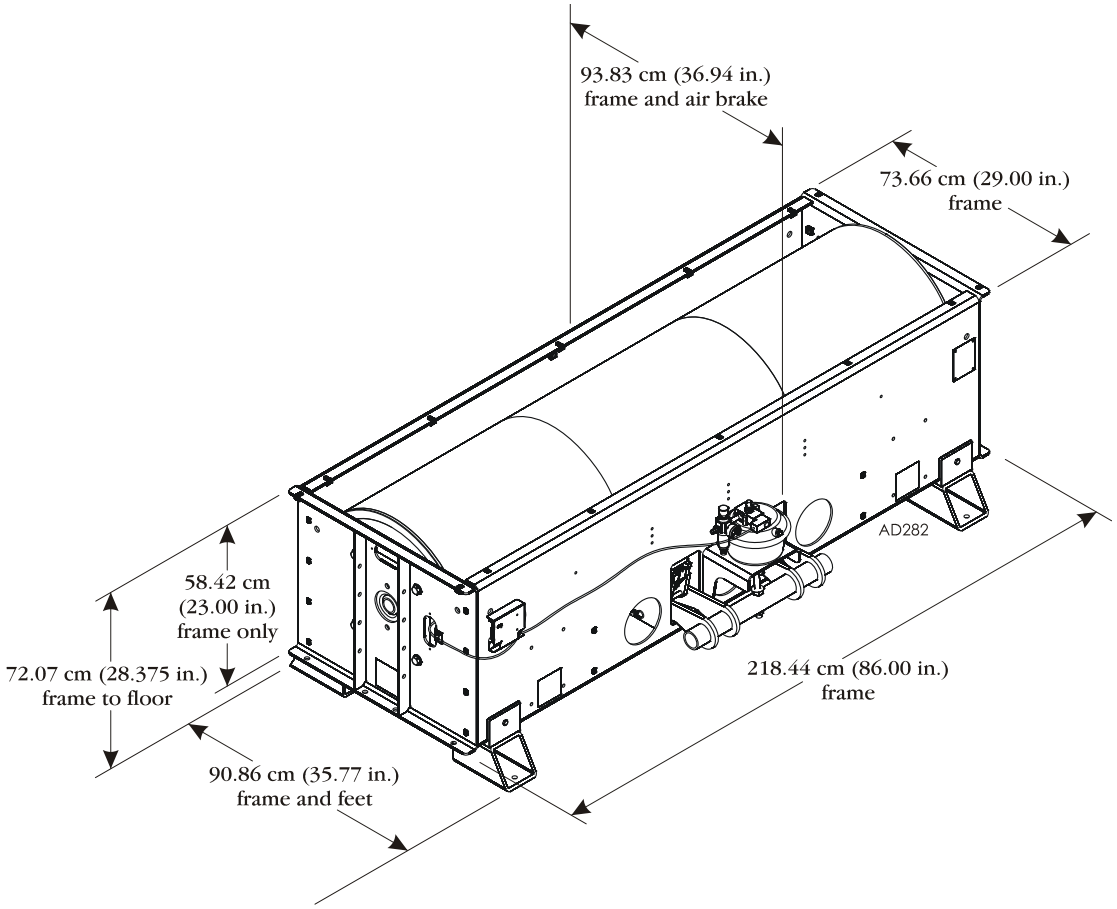

Figure 14: In Ground Model 424x Stationary Dyno Dimensions

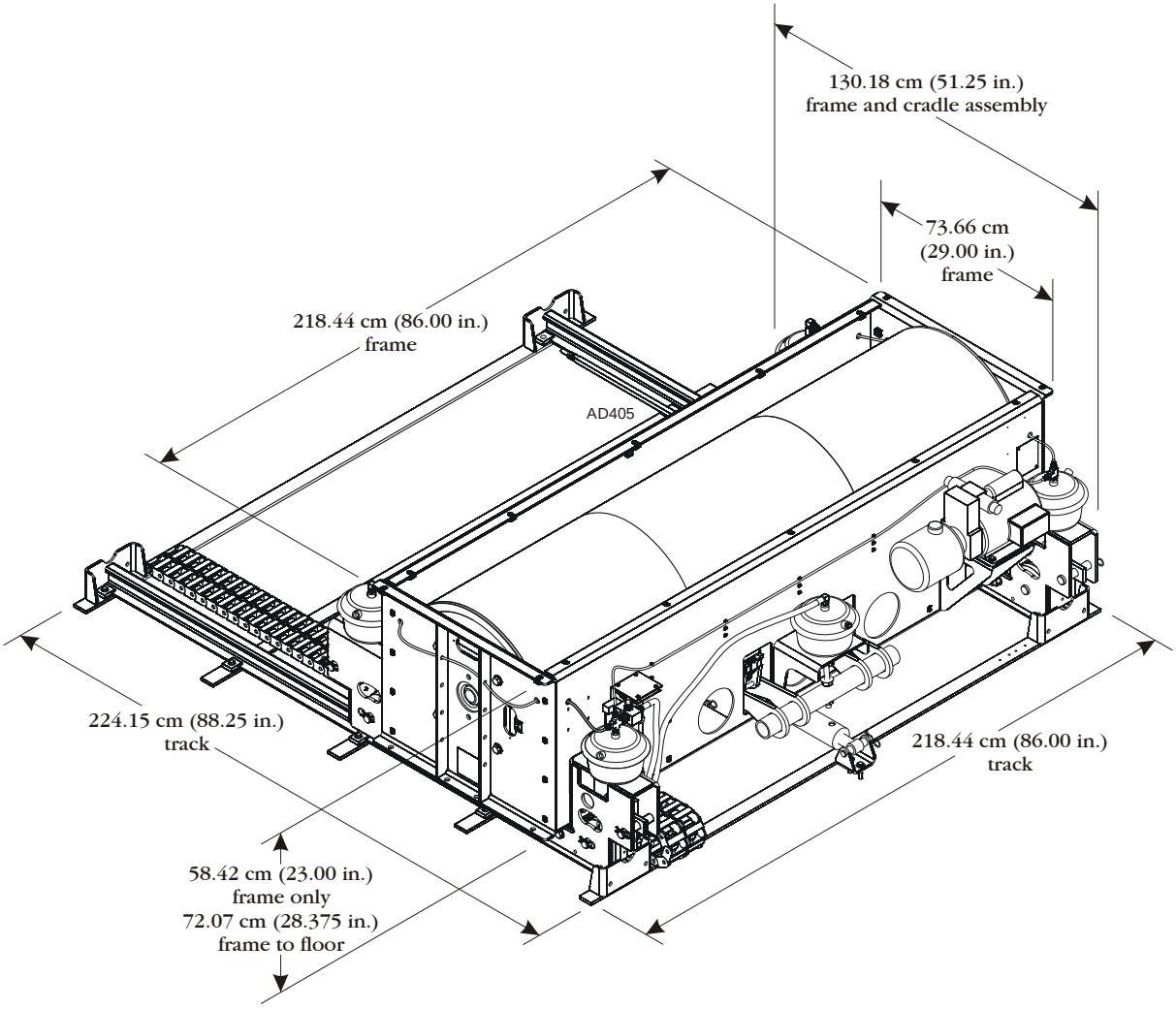

Figure 15: In Ground Model 424x 4WD Dyno with Track Assembly Dimensions

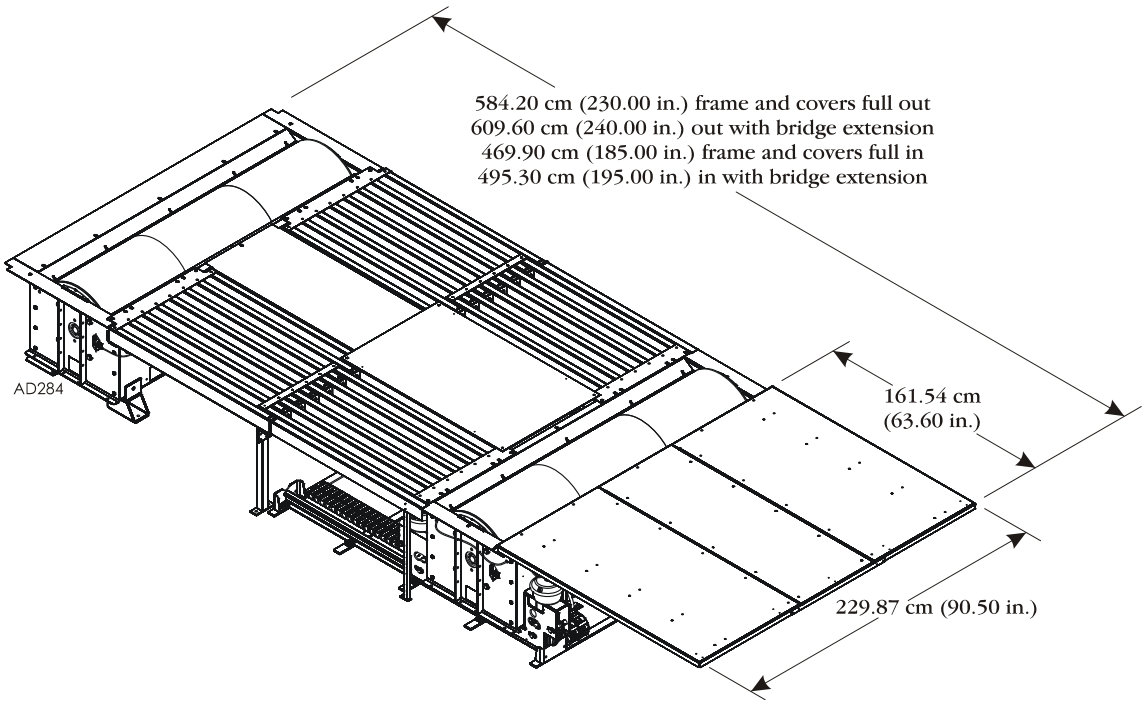

Figure 16: In Ground Model 424x Dyno with Bridge and Pit Covers Dimensions

ROOM LAYOUT—IN GROUND MODEL 424X DYNO

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

For more detailed information about the pit requirements, refer to the pit specifications (P/N 98219111) you received from your salesman.

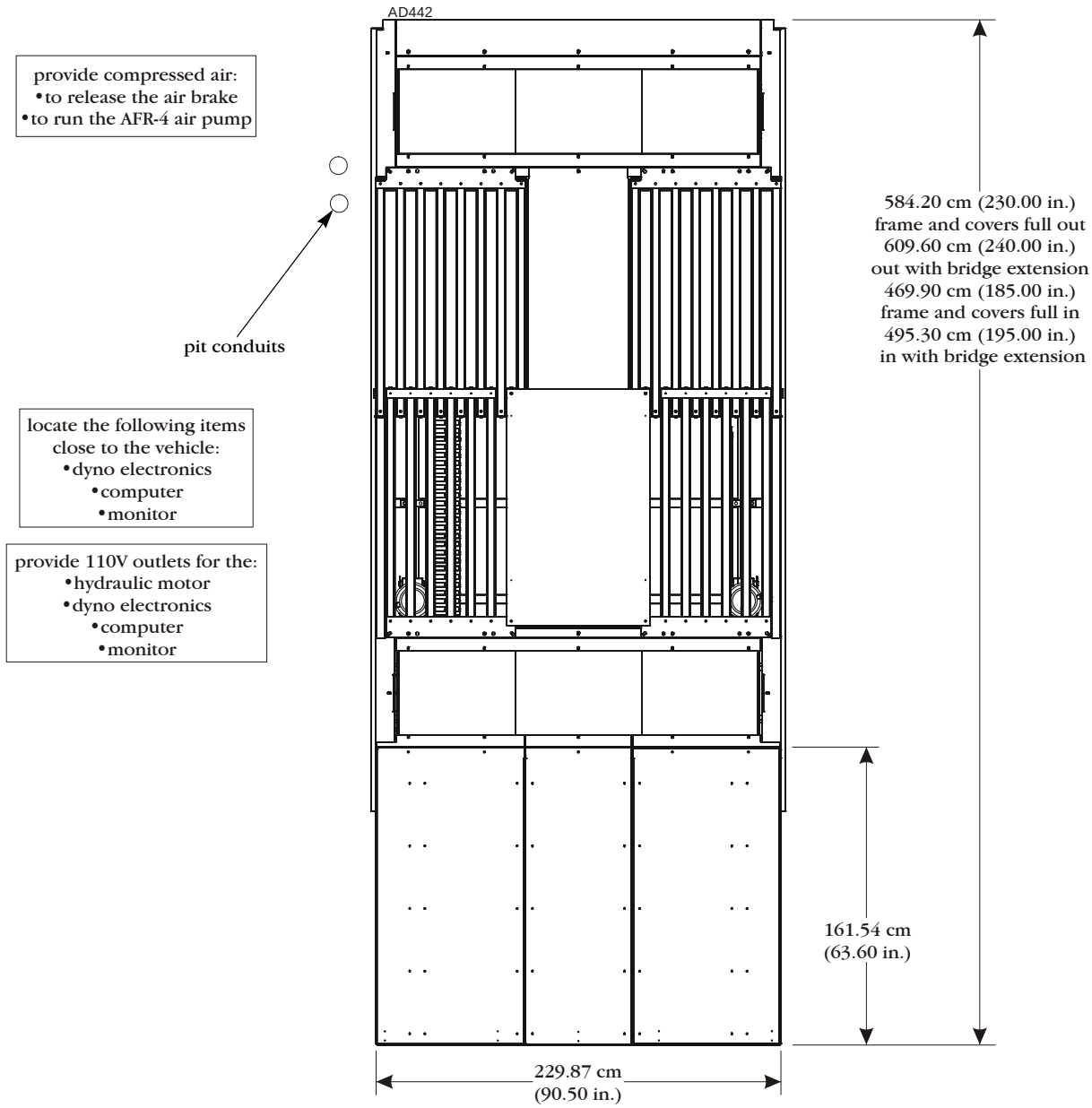

Figure 17: Room Layout—In Ground Model 424x Dyno

ABOVE GROUND MODEL 424XLC² DYNO

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

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
of frame with eddy current brake	321.23 cm (126.47 in.)
of frame with eddy current brake and Linx option	372.03 cm (146.47 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
to top of frame with feet/track assembly	72.07 cm (28.375 in.)
floor to top of eddy current brake	80.01 cm (31.50 in.)
Width	
of frame	73.66 cm (29.00 in.)
including cradle assembly	130.18 cm (51.25 in.)
including air brake	93.83 cm (36.94 in.)
both frames, deck, bridge—full in	388.62 cm (153.00 in.)
both frames, deck, bridge—full in with extension kit	414.02 cm (163.00 in.)
both frames, deck, bridge—full out	495.30 cm (195.00 in.)
both frames, deck, bridge—full out with extension kit	520.70 cm (205.00 in.)
Track Assembly	
length	218.44 cm (86.00 in.)
width	224.15 cm (88.25 in.)
Weight	
stationary crated dyno	2,114 kg (4,660 lb.)
4WD crated dyno	2,495 kg (5,500 lb.)
eddy current brake	635 kg (1400 lb.)
Drum	
diameter	60.96 cm (24.00 in.)
width	205.74 cm (81.00 in.)
Frame	structural steel channel and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

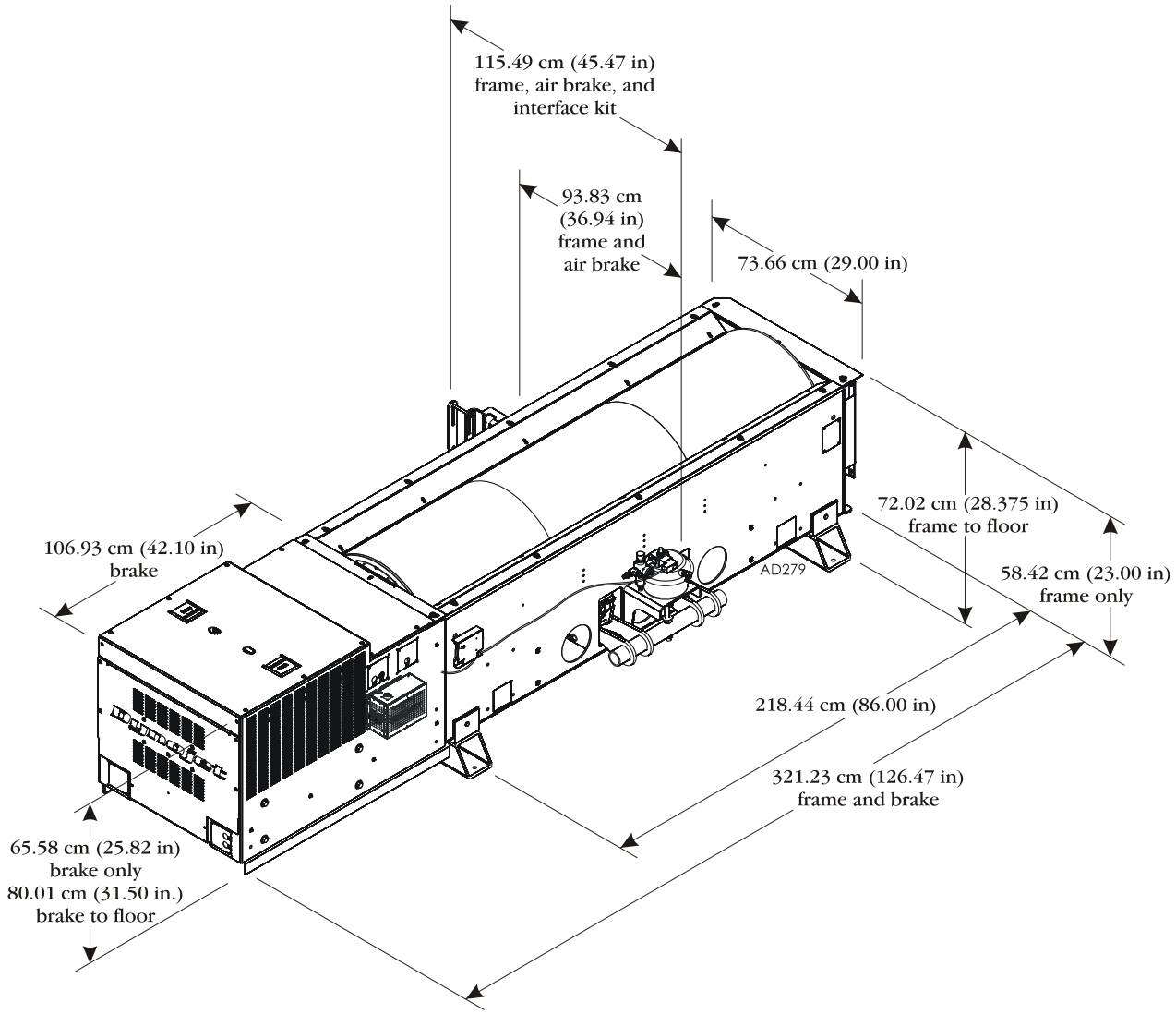

Figure 18: Above Ground Model 424xLC² Stationary Dyno Dimensions

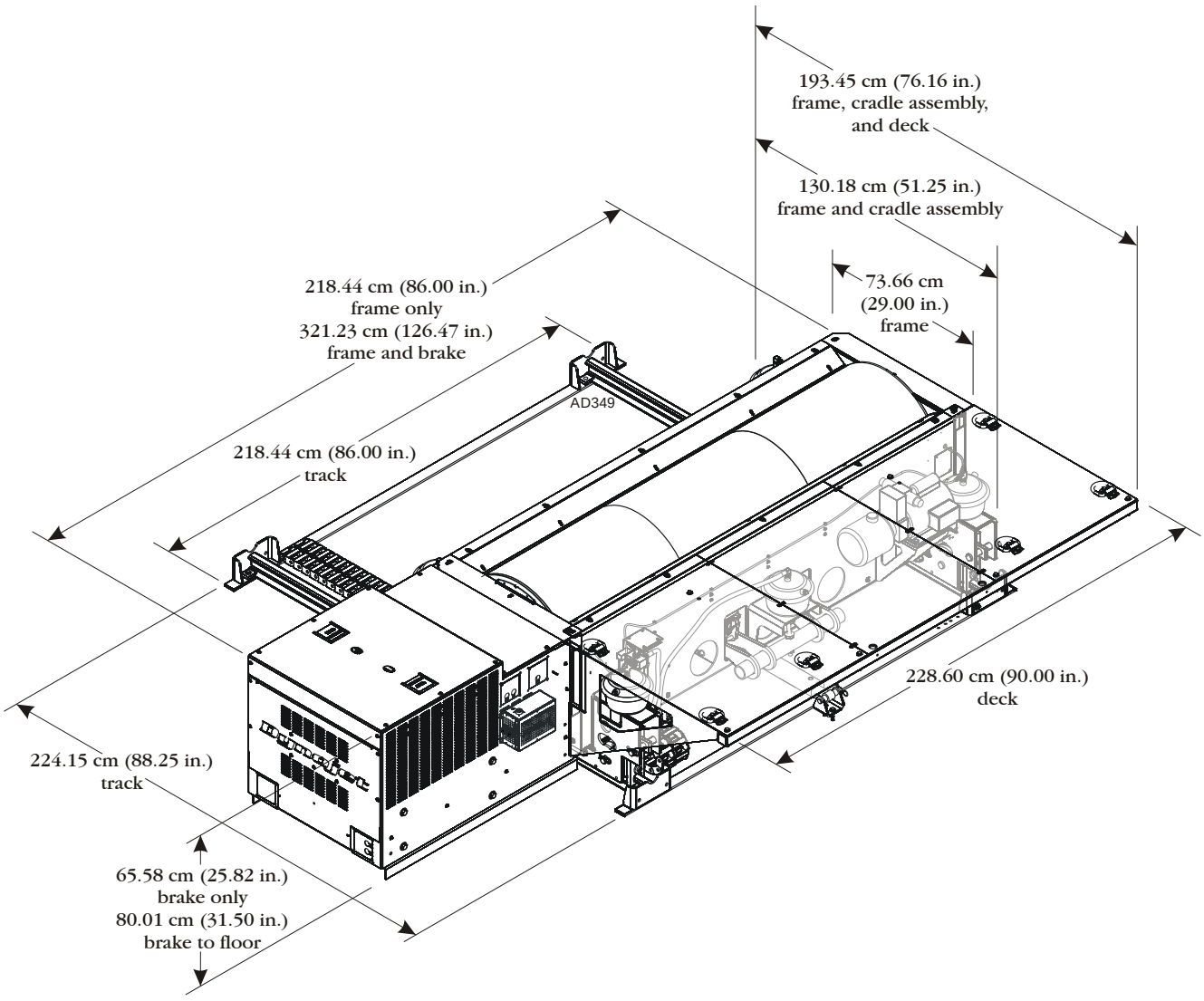

Figure 19: Above Ground Model 424xLC² 4WD Dyno with Track Assembly Dimensions

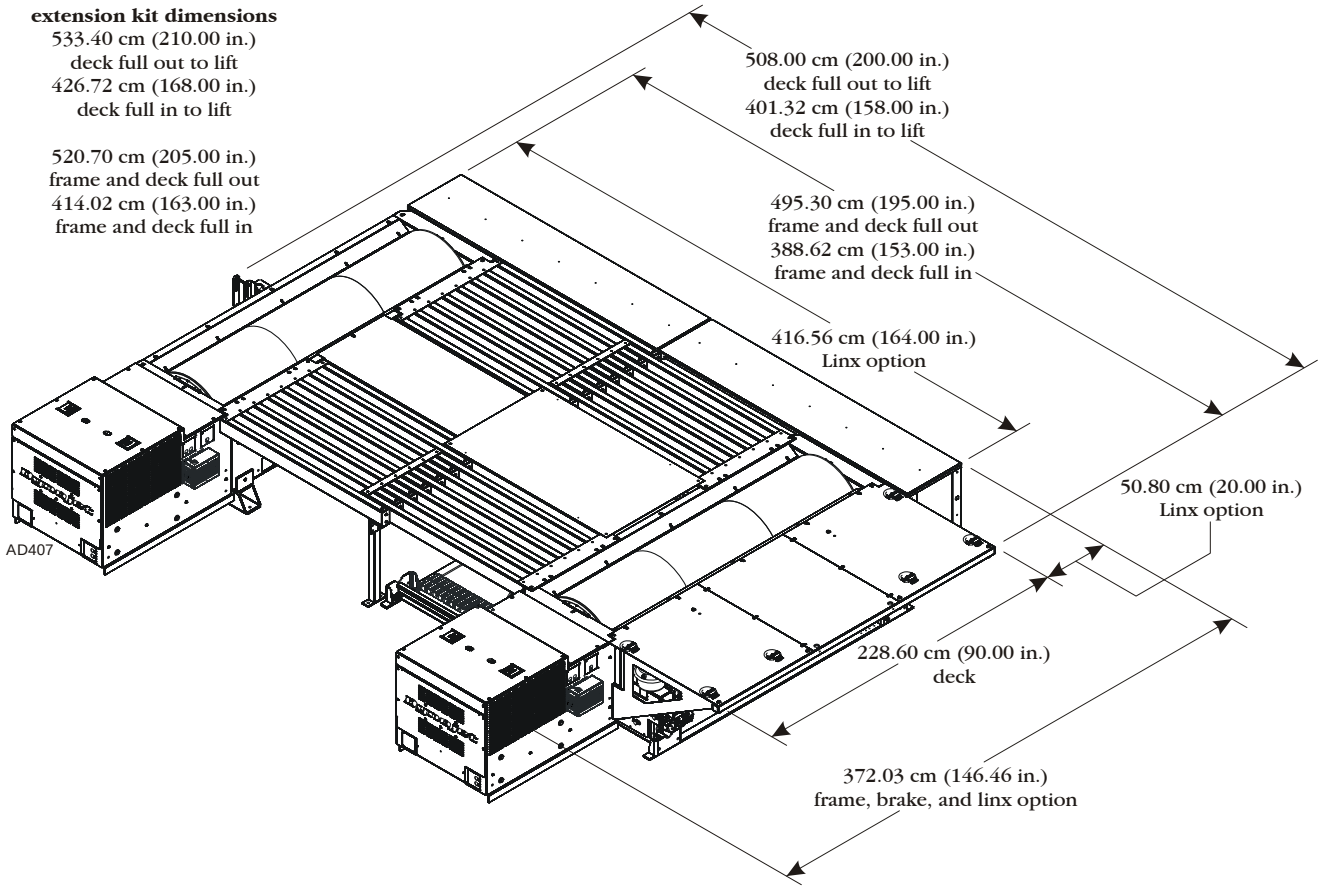

Figure 20: Above Ground Model 424xLC² Dyno with Bridge and Deck Dimensions

ROOM LAYOUT—ABOVE GROUND MODEL 424XLC² DYNO 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.

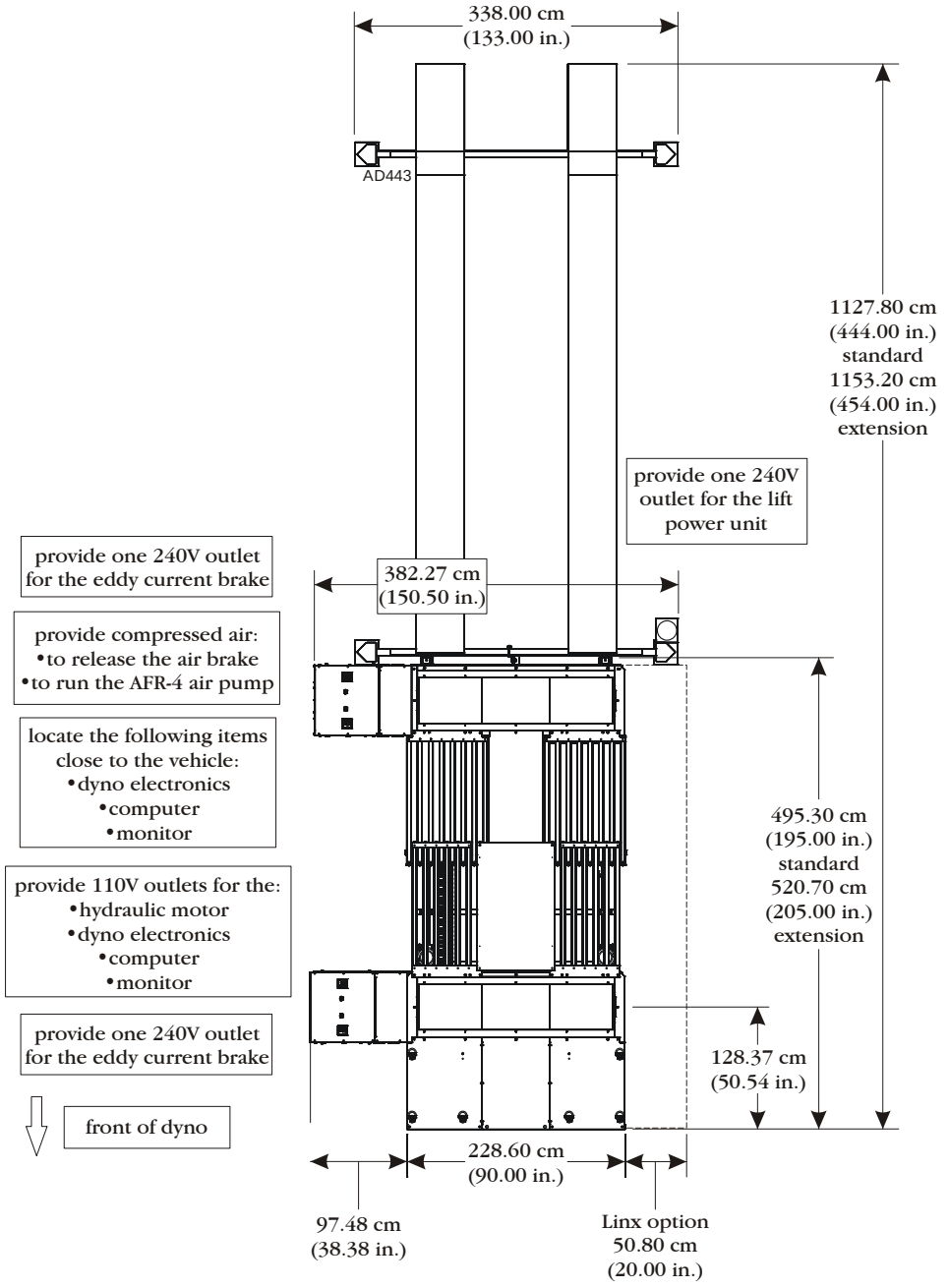

Figure 21: Room Layout—Above Ground Model 424xLC² Dyno with Lift

IN GROUND MODEL 424XLC² DYNO

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.

PIT SPECIFICATIONS

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.

CHASSIS SPECIFICATIONS

description	specifications
Length	
of frame	218.44 cm (86.00 in.)
of frame with eddy current brake	321.23 cm (126.47 in.)
including eddy current brake and covers	345.44 cm (136.00 in.)
of frame with eddy current brake and Linx option	436.80 cm (171.97 in.)
Height	
to top of frame	58.42 cm (23.00 in.)
to top of frame with feet/track assembly	72.07 cm (28.375 in.)
Width	
of frame	73.66 cm (29.00 in.)
including cradle assembly	130.18 cm (51.25 in.)
including air brake	93.83 cm (36.94 in.)
both frames, bridge, covers—full out	584.20 cm (230.00 in.)
both frames, bridge, covers—full out with extension kit	609.60 cm (240.00 in.)
both frames, bridge, covers—full in	469.90 cm (185.00 in.)
both frames, bridge, covers—full in with extension kit	495.30 cm (195.00 in.)
Track Assembly	
length	218.44 cm (86.00 in.)
width	224.15 cm (88.25 in.)
Weight	
stationary crated dyno	2,114 kg (4,660 lb.)
4WD crated dyno	2,495 kg (5,500 lb.)
eddy current brake	635 kg (1400 lb.)
Drum	
diameter	60.96 cm (24.00 in.)
width	205.74 cm (81.00 in.)
Frame	structural steel channel and angle
Maximum Speed	322 kph (200 mph)
Maximum Axle Weight	1361 kg (3000 lb.)
Remote Switches	remote software control

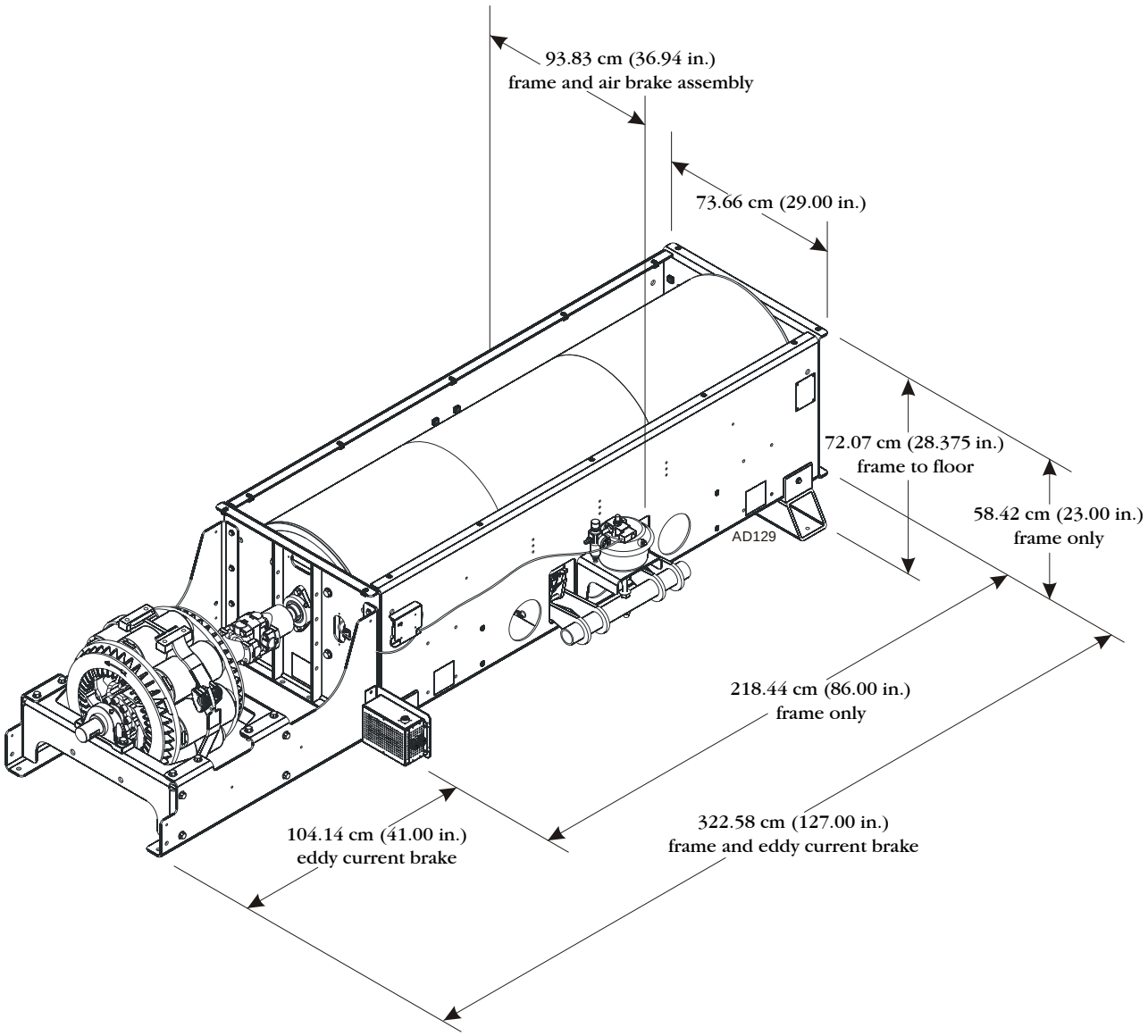

Figure 22: In Ground Model 424xLC² Stationary Dyno Dimensions

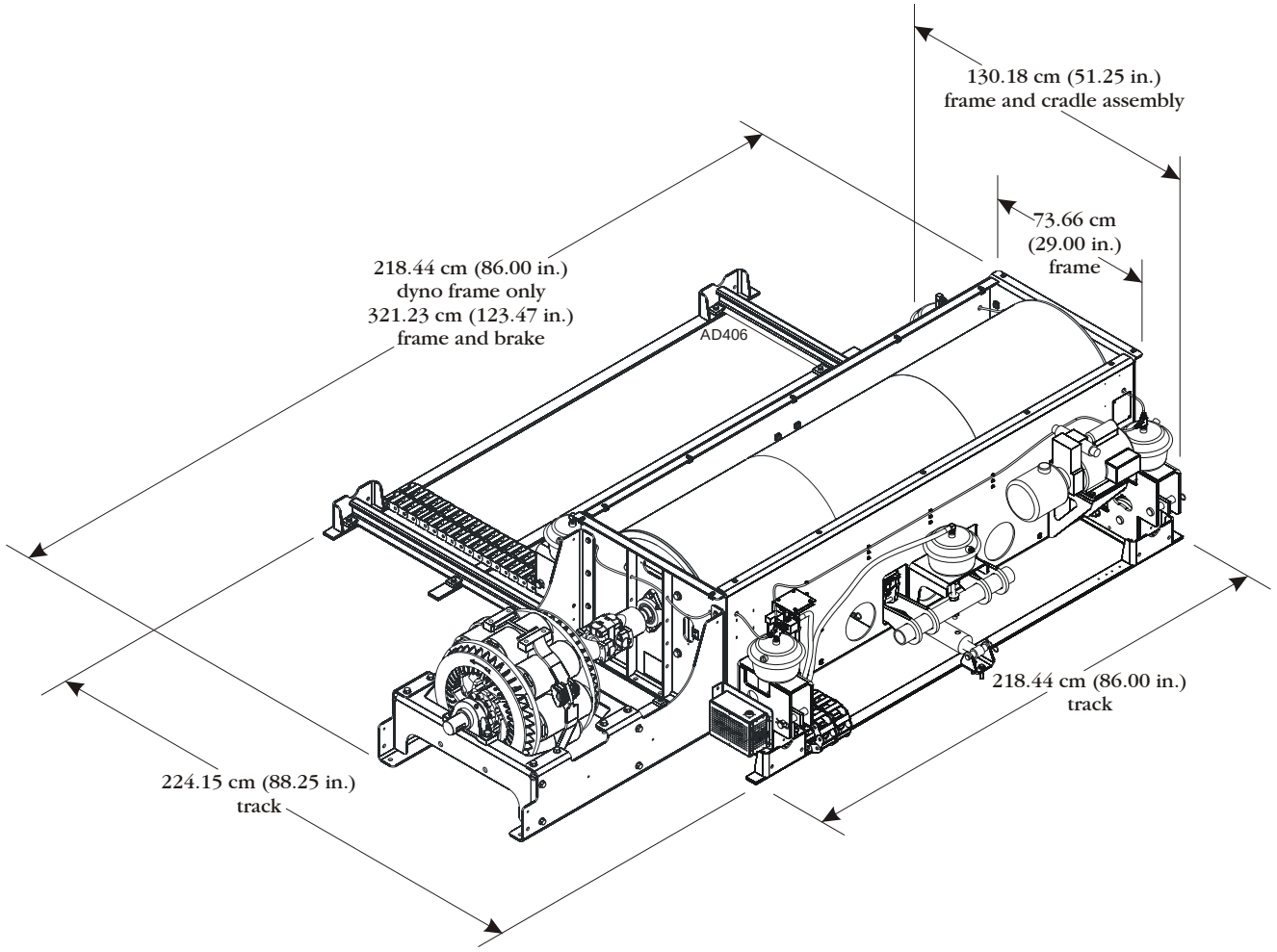

Figure 23: In Ground Model 424xLC² 4WD Dyno with Track Assembly Dimensions

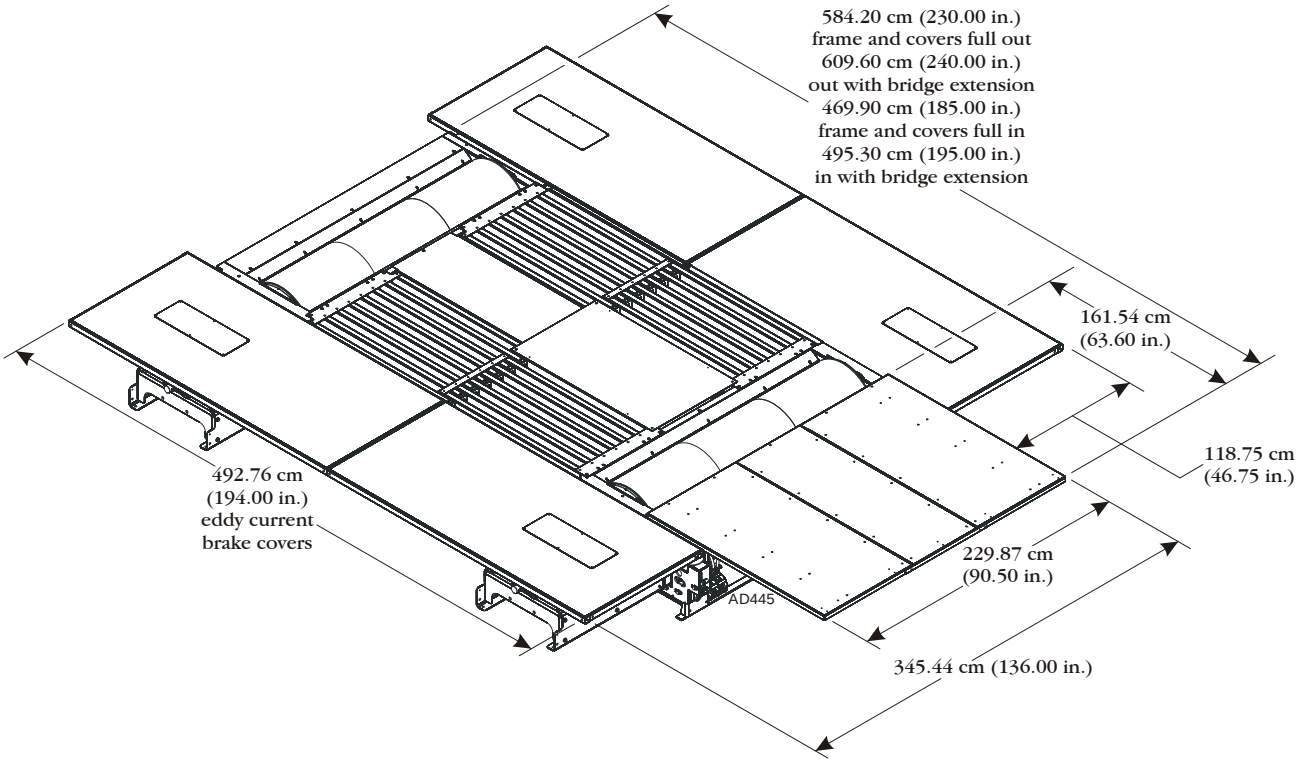

Figure 24: In Ground Model 424xLC² with Bridge and Pit Covers Dimensions

ROOM LAYOUT—IN GROUND MODEL 424XLC² DYNO

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

For more detailed information about the pit requirements, refer to the pit specifications (P/N 98219111) you received from your salesman.

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

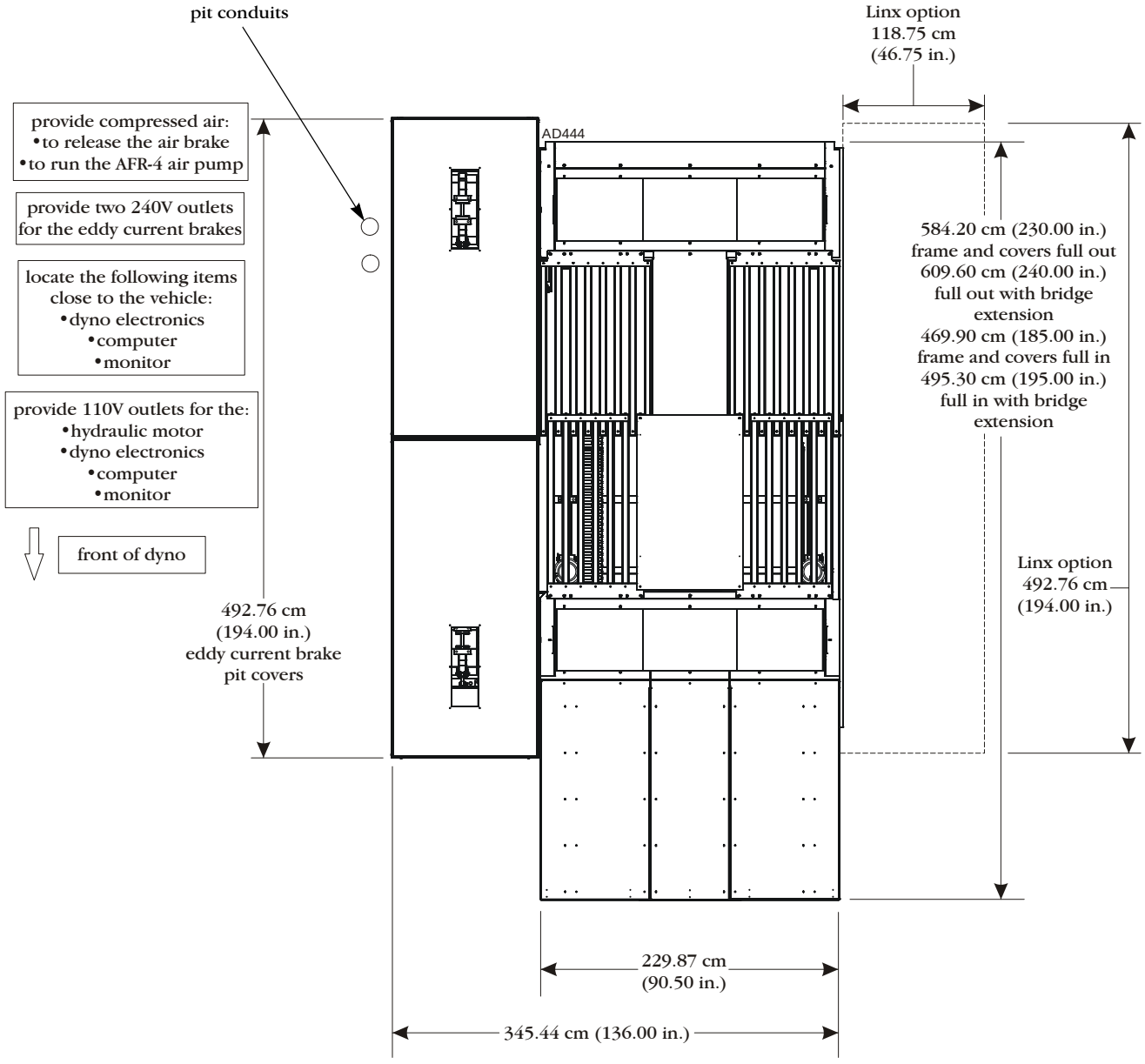

Figure 25: Room Layout—In Ground Model 424xLC² Dyno

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 6 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.

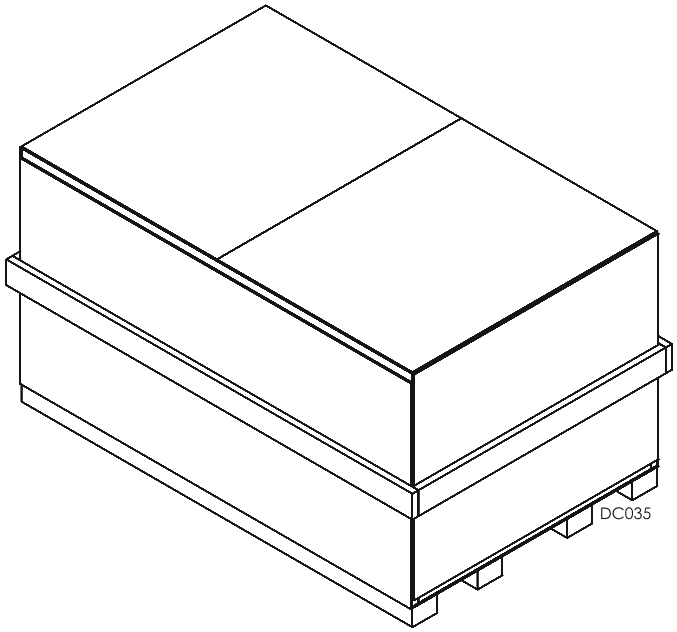

Figure 26: Removing the Crate Top and Sides

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.

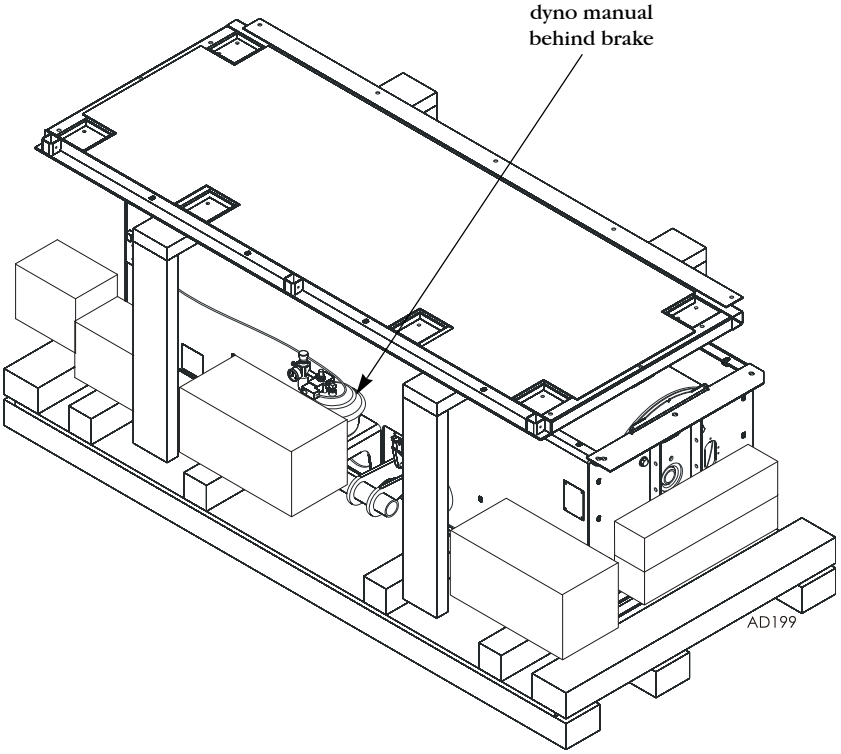

Figure 27: Locating the Installation Guide

APPENDIX

A

RED HEAD ANCHOR INSTALLATION

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

WARNINGS

WARNING

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

CAUTION

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

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

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

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

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

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

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

CONTACT INFORMATION FOR ITW RAMSET/RED HEAD

Contact ITW Ramset/Red Head at 1-630-350-0370, or 1300 North Michael Drive, Wood Dale, IL 60191.

INSTALLATION

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

catalog number	drill bit size	minimum hole depth	setting tool catalog number
Carbon Steel RM-38/RL-38 (9.5 mm)	1/2-inch	1 5/8-inch (41.2 mm)	RT-138

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.

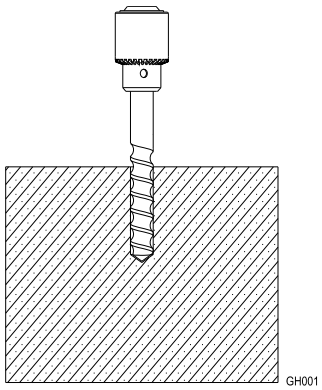

Figure A-1: Red Head Anchor—Drill the Hole

2 Insert the anchor.

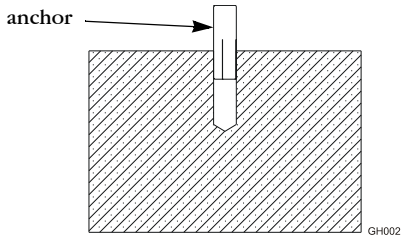

Figure A-2: Red Head Anchor—Insert the Anchor

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.

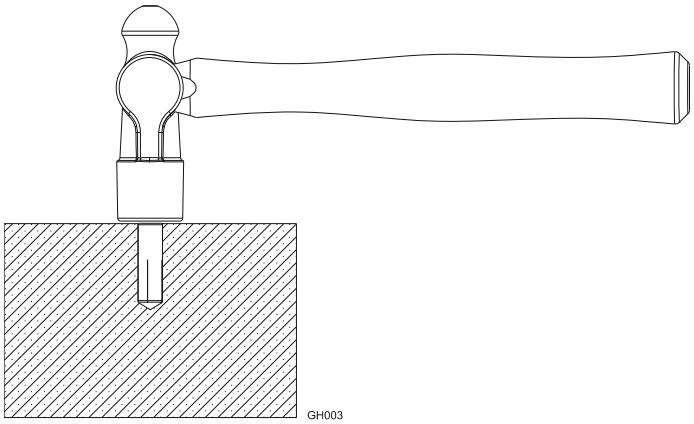

Figure A-3: Red Head Anchor—Drive the Anchor Flush

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 installtion.

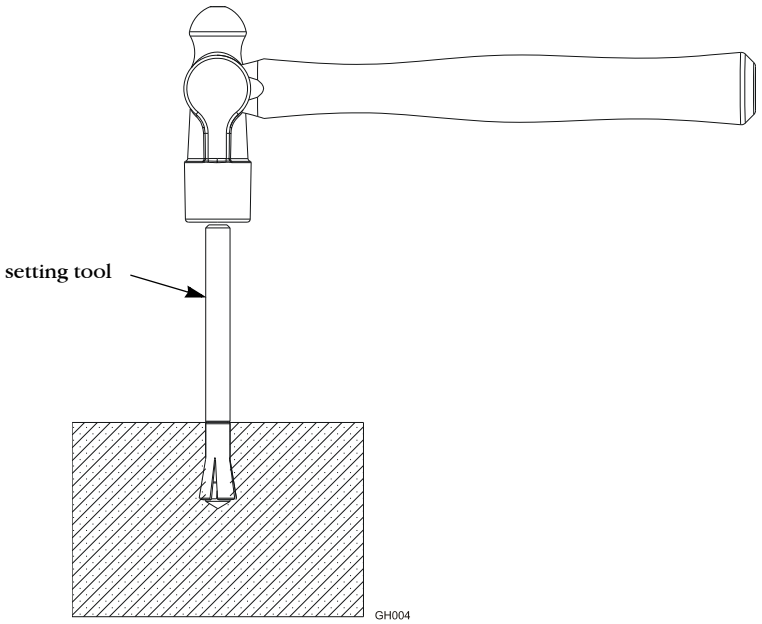

Figure A-4: Red Head Anchor—Expand the Anchor

APPENDIX

B

POWER REQUIREMENTS AND INSTALLATION

This appendix contains power requirements and installation instructions for the eddy current brake. 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.

This Appendix is divided into the following categories:

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 eddy current brake 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 brake.** Connecting the brake to the incorrect voltage will void the warranty. Contact Dynojet with any questions.

Each eddy current brake requires a dedicated wall receptacle which must be wired for operation and is included with the brake or may be shipped in advanced in a separate package. The brake 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 acceptable, but performance of the eddy current brake 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 brake in North American or Japan and the brake is not equipped with twist lock four wire grounded plug, contact Dynojet before attempting to connect the brake.

Local and national electrical codes require a grounded receptacle box.

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

INSTALLING THE WALL RECEPTACLE

The wall receptacle is included with your brake 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 brake, 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 eddy current brake is connected to the outlet.

CAUTION

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

probe 1	probe 2	desired voltage measurement
2	4	216V to 260V*
1	4	108V to 130V
1	2	108V to 130V
3	box	<5V

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

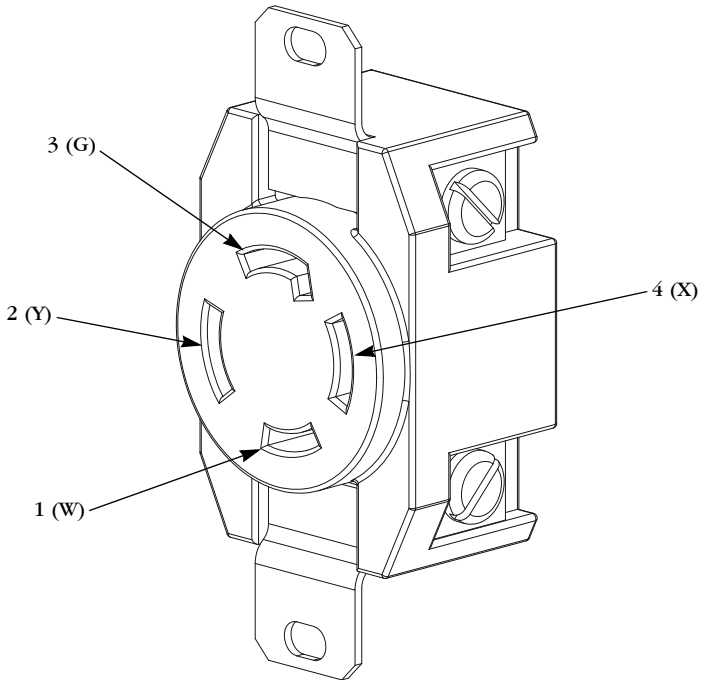

Figure B-1: Dedicated Power Receptacle

HARD WIRING TO THE BUILDING

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

The brake must connect to a two pole disconnect switch to allow the removal of all power to the brake 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 brake has three conductors internally and their colors are white, black, and green.

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

The brake 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 brake.** Connecting the brake to the incorrect voltage will void the brake 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 brake in a location other than North America or Japan and the brake is not equipped with a three pin IEC grounded plug, contact Dynojet before attempting to connect the brake.

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 brake 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 mm^2 (ten gauge) or larger. Check with local building codes for the correct size.

1 Connect one of the 240V legs to the N terminal (no color).
2 Connect the other 240V leg to the L terminal (no color).
3 Connect the ground conductor to the green terminal.

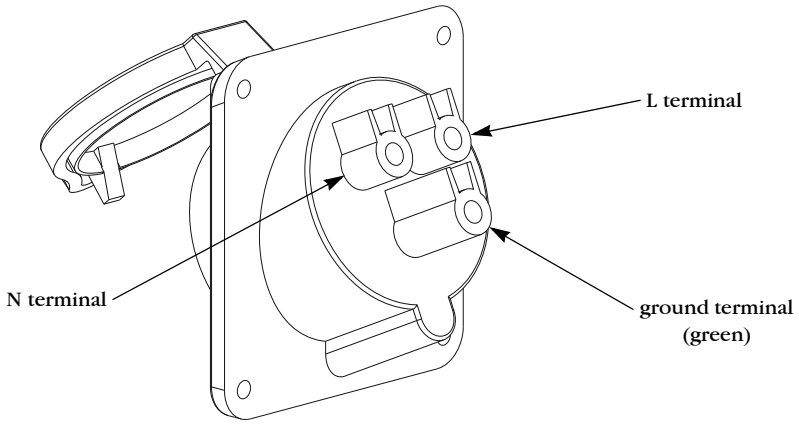

Figure B-2: Wiring the Wall Receptacle

TESTING FOR CORRECT VOLTAGES

You must test the receptacle for proper voltages before the eddy current brake 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.

probe 1	probe 2	desired voltage measurement
1	3	220V to 250V
2	box	<5V

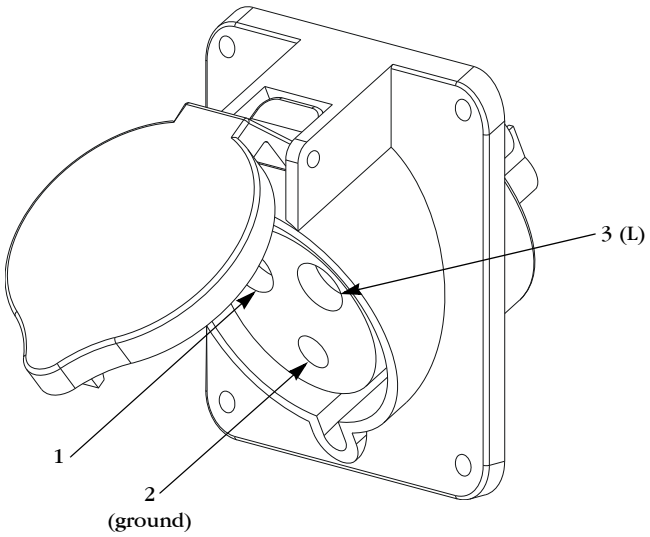

Figure B-3: Testing the Wall Receptacle

HARD WIRING TO THE BUILDING

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

The brake must connect to a two pole disconnect switch to allow the removal of all power to the brake 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 brake has three conductors internally and their colors are white, black, and green.

1 Remove the brake 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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