

## Large Electric Motor Repair

Physical size isn't the only thing that makes large electric motors challenging

Not just any repair shop can handle a large electric motor -- and to be honest, the definition of a "large electric motor" isn't really clear. As to repairing these motors, it's not that most electric motor shops aren't skilled enough (but a little extra experience does help) but is usually a matter of limitations involving size and electrical testing. If you're wondering what kind of questions you need to ask before sending your large electric motor off for repairs, here's what you need to consider. And if you're wondering if you have a large motor on your hands, we discuss that, too.

## What Is a Large Electric Motor?

First, let's establish what we mean by a "large electric motor." In general, a large electric motor is a motor that is an Above NEMA regulation frame size, also referred to as an ANEMA motor. However, there are some larger NEMA frames that can be considered a large motor (500, 5000, 8000, etc. frame motors). As you can see, there isn't a clear definition of what constitutes a large electric motor.

Contrary to what you may think, there really isn't a horsepower limit that makes a motor "large" but it is usually safe to assume that anything over 500HP (and especially larger than 1000HP) are large electric motors. Also, note that voltage also comes into play here: medium voltage (2300 volts and above) and high voltage motors (13,000 volts and above) should definitely be considered large electric motors.

## Potential Issues with Large Electric Motor Repair

There can be some serious issues when it comes to working on large electric motors, some related to the sheer physical size involved and others related to electrical testing and voltage. These types of issues are extremely important to be aware of when you need a large electric motor repaired.

## Limits Involving Physical Size and Manipulation

Logistics aside, just trying to get a large electric motor that weighs several tons actually through the repair shop bay doors can be a major challenge without the proper equipment. For a repair shop to be able to work on large electric motors, it should have overhead bridge cranes that are strong enough to move these motors. Also needed is sufficient overhead space for moving these massive motors as well as pulling and manipulating the rotor/stator from these monsters. Especially large vertical machines where you need to lift the rotor up and out of the stator.

## Limits Involving Physical Size and Machining

One of the best examples involves machining equipment (think lathes and milling machines!) that simply aren't the right size to work with rotating components. If your repair shop cannot fit the raw material for a new shaft into their lathe, they will have to send it out to be machined. That's true even if it's just a minor adjustment to correct a tolerance issue-- and sending it out could result in delays, or even a higher price, and possible quality issues that are passed on to you.

## Limits Involving Physical Size and Rewinding

Removing insulation during the rewinding process usually requires a burn off oven. If the repair shop doesn't have an oven large enough for your 55,000 lb pump motor, then they aren't going to be able to remove the existing insulation.

Another potential problem area is **rewinding** if **VPI (Vacuum Pressure Impregnation)** is used as the insulation process. Not all electrical repair shops have a VPI tank large enough to handle the rotor or stator of a very large electric motor, making VPI impractical if not impossible at that particular shop. The same is also true for the curing oven used -- it must be large enough for

the whatever needs curing, including a 35,000 lb stator from a main compressor.

## Limits Involving Electrical Testing

For high voltage motors (13,000+ volts), which are typically large in size, another potential problem lies in testing. Most electric motor shops are limited in the voltage and current to which they can apply to a motor, which means they **can't fully power it** to simulate operation in your plant. This includes load and no-load testing

If you can't run the motor at full voltage, then it is not magnetized fully. Unless you can magnetize it fully, you won't get the full effect of magnetic noise and you'll get less vibration, too. This does not realistically simulate what happens when that motor is actually in use. That means there are problems that might not be recognized until you get the motor back in your plant.

## Why You Should Trust HECO With Your Large Motors

Are you in the market for an electric motor repair service that can handle large motors? At HECO, **we have the equipment needed to work with your large electric motors**. For example, our lathe machining capabilities are up to 96" swing so we can repair the largest of rotating components within an electric motor or generator.

We can also simulate the full-voltage environment of your plant when testing your large motors because our testing capabilities range up to 13.8kV, 4000kVA -- allowing us to fully power it so there are no surprises when you reinstall it and start using it.

Our facilities include dynamometer testing up to (1,200HP) 4,400 ft-lbs that allows us to apply a load to your electric motor, further simulating how the motor will actually run when it is installed at the plant -- again, we don't want you to experience any surprises!

Our Vacuum Pressure Impregnation systems cover from 230v and up to 15,000V. Our largest VPI tank is 10 feet in width and has epoxy resin that is made for high voltage insulation systems.

We provide high quality, EASA accredited repair solutions that will result in lower M&O costs, a longer mean time to failure, and significantly better performance. We follow strict procedures for repair and reconditioning that allow us to provide you with the highest quality repairs. Contact us today to find out how we can help your electric motor powertrain achieve peak performance!