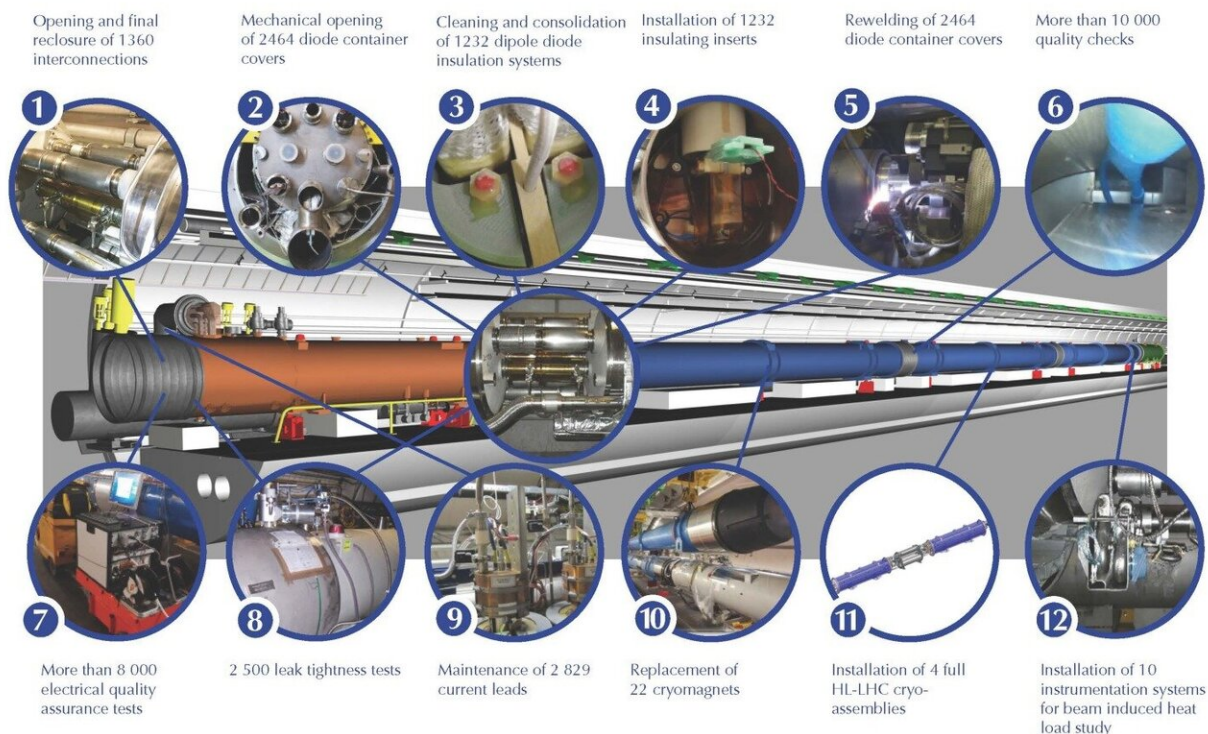


# The waltz of the LHC magnets has begun

June 6 2019



## Main work on the LHC superconducting magnets during LS2 (2019-20)



Credit: CERN

Major endeavors are underway in the Large Hadron Collider (LHC) over the past few weeks, with the extraction of magnets from the accelerator tunnel. The LHC has a total of 1232 dipoles, magnets which bend the particles' trajectories, and 474 quadrupoles, which squeeze the bunches.

All these magnets are superconducting, i.e. they operate at a temperature of  $-271^{\circ}\text{C}$ , are 15 meters long and weigh up to 28 tons. So moving them around is no trivial matter.

During the second long shutdown, 22 of these large components (including 19 dipoles) have to be replaced, especially as several have been showing operating deficiencies. Twelve have already been brought above ground and the last one is scheduled to be dismantled at the beginning of July.

The replacement magnets are arriving one by one. Ten new magnets have been installed, aligned and are being connected in the first sectors of the accelerator (sectors 8-1 and 1-2). This involves reconnecting the beam-pipes, the [superconducting cables](#) that transport currents of up to 13 000 amps, the transfer lines for the helium that cools the magnets, the beam shields that thermally insulate the magnets once they have been cooled down to  $-271^{\circ}\text{C}$ . Care needs to be taken to ensure the tightness of the insulating vacuum, and tests then are carried to check that the new magnets are perfectly interconnected with the neighboring magnets. These operations take several weeks for each magnet ! All 22 magnets should thus be connected at the beginning of 2020.

Provided by CERN

Citation: The waltz of the LHC magnets has begun (2019, June 6) retrieved 9 April 2024 from <https://phys.org/news/2019-06-waltz-lhc-magnets-begun.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.
---