



Canadian Vehicle
Manufacturers' Association
Association canadienne
des constructeurs de véhicules

call2recycle®
Leading the charge for recycling™

Journey Of An Electric Vehicle Battery



After reading the [“Understanding EV Batteries”](#) Fact Sheet, one may wonder where electric vehicle batteries can be found after they are removed from an electric vehicle.

When considering how any or all batteries at end of life are managed, it is easy to assume that they could potentially pose a risk to the environment. Some small consumer batteries may be discarded from the device they are powering, left behind in a drawer, or thrown out as household waste that may or may not make it to landfill. However, this is not the case for electric vehicle batteries (EVBs*). They are just too big to misplace, transport, or drop off at landfill without notice. Hybrid vehicle battery packs weigh 27 - 120 kg while plug-in EV battery electric packs weigh 200 - 1,200 kg. The trend is towards larger and heavier battery packs

to support longer driving ranges and larger vehicle models while addressing increasing consumer demands and preferences. As a result, most EVBs today are removed from a vehicle by trained professionals at a vehicle manufacturer dealer, through a manufacturer service centre, or at an auto dismantler & recycler at end-of-vehicle-life. These batteries will either be made available for resale, remanufactured, repurposed, or sent for recycling.

*The term EVB may mean the entire battery pack or a module within the battery pack.

WHERE EVB REMOVAL HAPPENS



EVBs under warranty (at time of removal)



EVBs out of warranty (at time of removal)



Source: Call2Recycle®
Illustrations represent estimated proportions for comparison.

The majority of EV batteries under warranty are removed from the vehicle by the vehicle manufacturer dealer or through the manufacturer service centre. A comparatively smaller number are removed by auto dismantlers & recyclers when a vehicle is no longer road worthy prior to the battery warranty expiring (i.e., vehicles involved in crashes).

A vehicle manufacturer dealer is an independent business or dealership associated with a particular manufacturer where vehicles are sold and serviced while a manufacturer service centre is an alternative mobile or designated location that services vehicles on behalf of the manufacturer.

It is unlikely that a repair garage that isn't associated with the vehicle manufacturer would replace an EVB that is still under warranty. New replacement EVBs are generally available through the vehicle manufacturer dealer network, and in order to be covered under warranty, the work must be completed by an approved dealer with the required tools, knowledge and training.

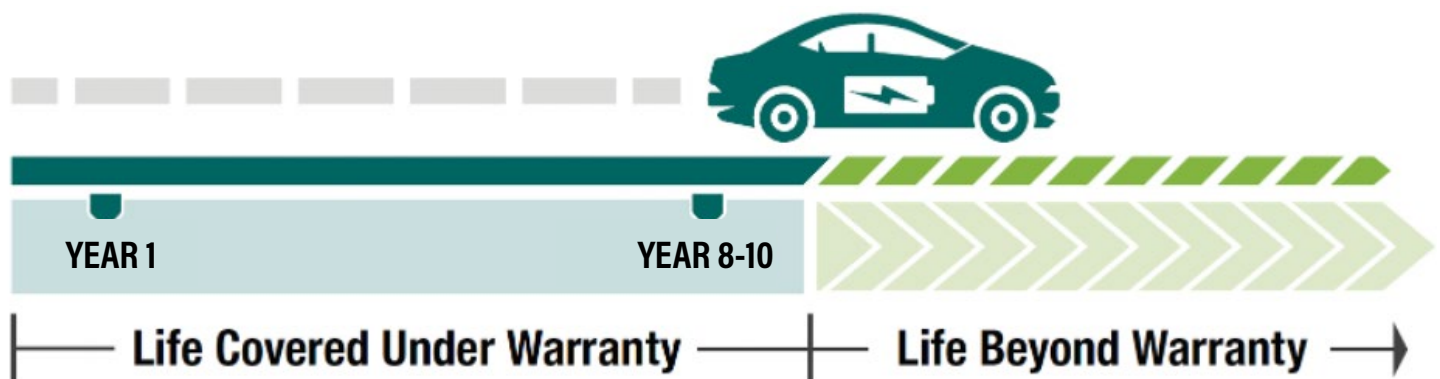
When EVBs are beyond the warranty period, they are generally serviced and replaced by vehicle manufacturer dealers or manufacturer service centres (due to the present limited supply of replacement EV batteries) or by auto dismantlers & recyclers when the vehicle reaches end of life.

Auto dismantlers and recyclers are businesses that specialize in the management of end of life vehicles. In many provinces these businesses are subject to regulations that require the depolluting of vehicles prior to crushing or shredding. This includes the removal of batteries. When an EV is received by an auto dismantler & recycler, various parts including the EV battery, are removed and assessed for revenue potential through resale, repurposing or they are sent for recycling. EVBs are not sent to landfill in part due to existing provincial waste regulations that protect the environment.

Other than vehicle manufacturer dealers, manufacturer service centers, and auto dismantlers & recyclers, the location of additional EV batteries that require end of life management is limited across Canada at this time. There are some independent repair garages servicing electric vehicles that generate a battery for end-of-life management or organizations that manage a large fleet of vehicles that have access to their own garage and trained technicians that will include EV battery maintenance or exchange (particularly as the proportion of EV in the fleet increases and as parts and tooling become more widely available).

WHAT IS THE TYPICAL LIFESPAN OF AN EVB?

There is a lot of dialogue about the lifespan of a typical EVB. Many people mistakenly assume EV batteries last 8 - 10 years. The potential exists for many EV batteries to run for much longer than this - and their full life potential is not yet known. In cases where EV batteries are removed from EVs and replaced this is usually to address concerns that the vehicle is no longer performing to a customer's satisfaction, or the vehicle is damaged such that it is best addressed via replacement. In either circumstance, the removed battery may still have a significant portion of its charging capacity available when it is no longer suitable for use in the vehicle. This has generated great interest and innovation to identify and redeploy EV batteries for secondary life applications such as standby energy storage where they would remain in use for many years before they would need to be managed/recycled.



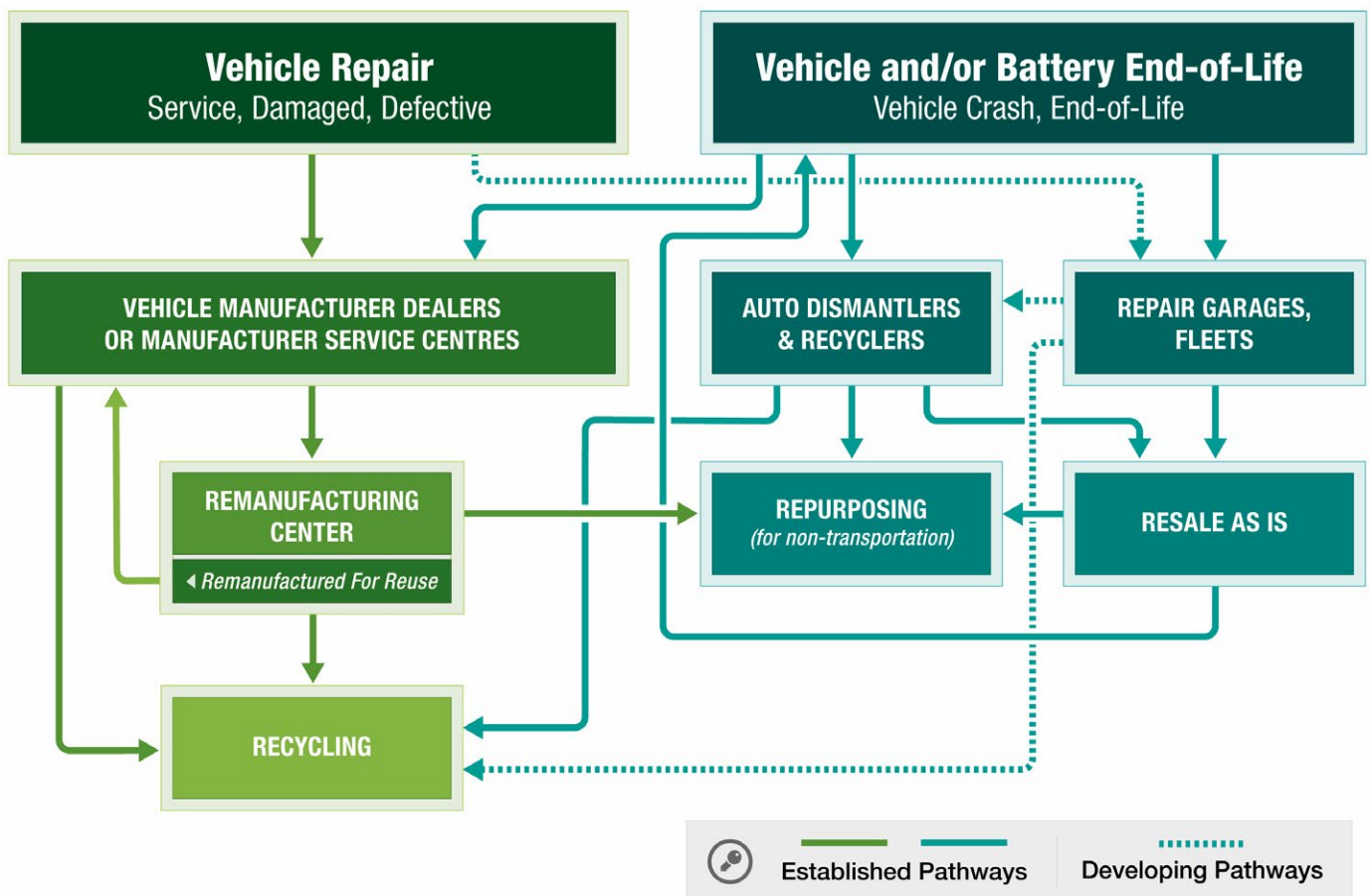
WHAT IS THE WARRANTY FOR EVBS?

Standard EVB warranties are typically 8 – 10 years / 160,000 kilometres, however there are some vehicle manufacturers offering extended warranties of up to twelve years with varying kilometres.

See individual manufacturer's website for details.



EVJ JOURNEY PATHWAY?



Source: Call2Recycle®

What Happens at Vehicle Manufacturer Dealers and Manufacturer Service Centres with EVBs?

Vehicle manufacturer dealers and manufacturer service centres diagnose EVB issues and/or replace batteries needing more in-depth service with new or remanufactured batteries. Batteries requiring additional diagnostics or repair are typically shipped to a location for consolidation and remanufacturing. These remanufacturing centres provide life cycle management of EVBs including remanufacturing, repair, refurbishment, repurpose and if necessary, shipping for recycling.

What are Remanufacturing Centres?

Remanufacturing centres are independent businesses that provide vehicle manufacturers life cycle management of used EVB using a combination of reused, repaired, and new components or modules. There are at least three independent companies working with the various vehicle manufacturers offering these services today in North America. Remanufactured batteries are sent back to vehicle manufacturers for distribution as service replacement parts, while non-useable battery packs and/or modules are either repurposed in a second life application or sent for recycling.

What Happens at Auto Dismantlers & Recyclers with EVBs?

Auto dismantlers & recyclers are businesses that specialize in vehicle recycling. Their primary goal is to maximize the value of the entire end-of-life vehicle in an environmentally responsible manner, irrespective of the type of vehicle. An EV is similar to a traditional internal combustion engine vehicle in that it is made up of parts that can be removed and sold as used parts, sold for a secondary use, or sent for recycling.

Auto dismantlers & recyclers assess how best to realize a return on an EV battery by either selling the battery “as is” for use in another electric vehicle, in a secondary use application such as power for stationary energy storage units, or sending it to a battery recycling processor. Auto dismantlers & recyclers may inventory EVBs if there is no immediate demand for a particular unit.

What do Independent Repair Garages do with EVBs?

A small number of independent repair garages may remove an EV battery from a client’s vehicle and replace it with a used or remanufactured battery purchased on the open market. The battery once removed may similarly be resold “as is” for reuse in an EV, secondary use, sent to an auto dismantler & recycler or sent to a battery recycler for processing.

NEXT STEPS

An additional fact sheet in this series will be published over the coming months.

Expected topics to be covered are:

- **Battery remanufacture/reuse/repurpose**
- **Battery recycling**

If you wish to be added to our distribution list or receive information on this project, please direct any inquiries to ProjectEVbattery@cvma.ca.