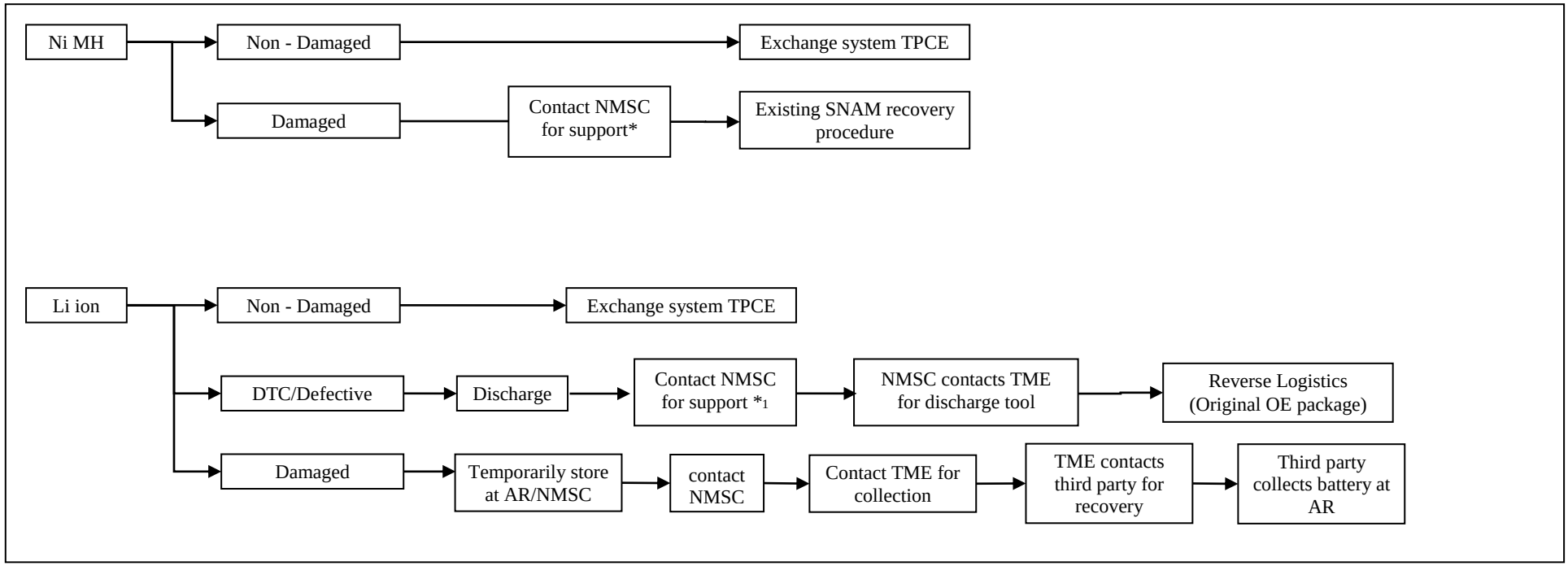
NiMH and Li ion Hybrid batteries recovery procedures and documents

Introduction

Toyota Motor Europe, as part of its on-going commitment to environmental projects, has established a recovery procedure for the sustainable recycling of industrial batteries from Toyota and Lexus full hybrid and electric vehicles in Europe.

Schematic flow of HV batteries recovery for Toyota/Lexus Authorised Retailers and Repairers

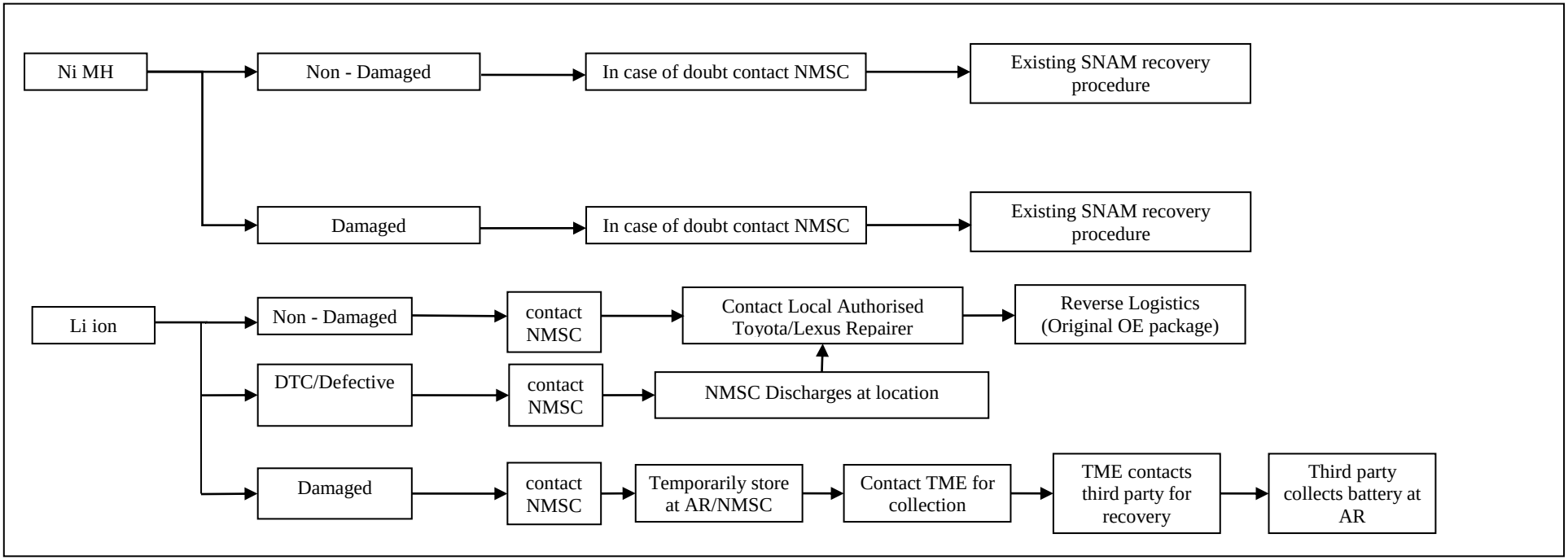


* Contact the NMSC so they can provide you with the legal requirements for your country in order to transport the damaged battery

*1 Check the technician's knowledge to discharge, if the technician does not have the required knowledge to discharge, contact the NMSC for support.

Contact persons at TME are Kevin Schauvaerts (kevin.schauvaerts@toyota-europe.com) and Frédéric Lebrun (frederic.lebrun@toyota-europe.com)

Schematic flow of HV batteries recovery for independent Repairers, insurance companies and authorized end-of-life vehicle treatment facilities



According to the UN regulations for the transport of dangerous goods, Li-Ion batteries can't be shipped to authorized Retailers without a safety diagnosis. Please refer to HV Battery Recovery inspection procedure in TechDoc or to the procedure published in the International Dismantling Information System (IDIS – www.idis2.com).

1) Definition of defective / damaged and non-damaged batteries

1.1) NiMH batteries

A damaged NiMH battery is a battery showing external damages: electrolyte leakage, deformation, discolouration

1.2) Li ion batteries

A defective Li ion battery is battery showing certain DTC (Detection Trouble Code) after initial diagnostic procedure.
Please refer to Repair Manual for complete DTC list that require Battery discharge.
In case of DTC the battery must be discharged using a specific discharge tool.
(see point 2.2 for more details)

A damaged Li ion battery is a battery showing external damages: electrolyte leakage, deformation, discolouration.
Please contact the NMSC for further action.
NMSC will contact TME who will contact a specialised third party recovery company; they will recover the stored battery (at AR).
(see point 2.2 for more details)

For packaging and storage procedures please refer to the document *TPCE - Umicore Flow Empty Packaging (2).xlsx*

Remark:

The repair manual indicates that damaged batteries must be discharged using the salt water method. This method is not authorised in Europe.
If the damaged battery does not permit the use of the discharge tool due to damaged connection poles or any other safety hazard, please store the battery in its current state at a secure location.
For collection please contact TME Afters Sales Cost of Ownership dept. (Kevin Schauvaerts and Frédéric Lebrun) They will arrange proper collection by a third party specialised recovery company.

2) Battery recovery procedure for Authorised Repairers

2.1) NiMH batteries

Non damaged batteries

Batteries will be returned to TPCE from an Authorised Repairer, using the same principle as any other component Exchange system (order new part/return core unit).

Please note that Authorised Repairers have 20 days to submit their claims, and 20 days to return Core Units to TPCE.

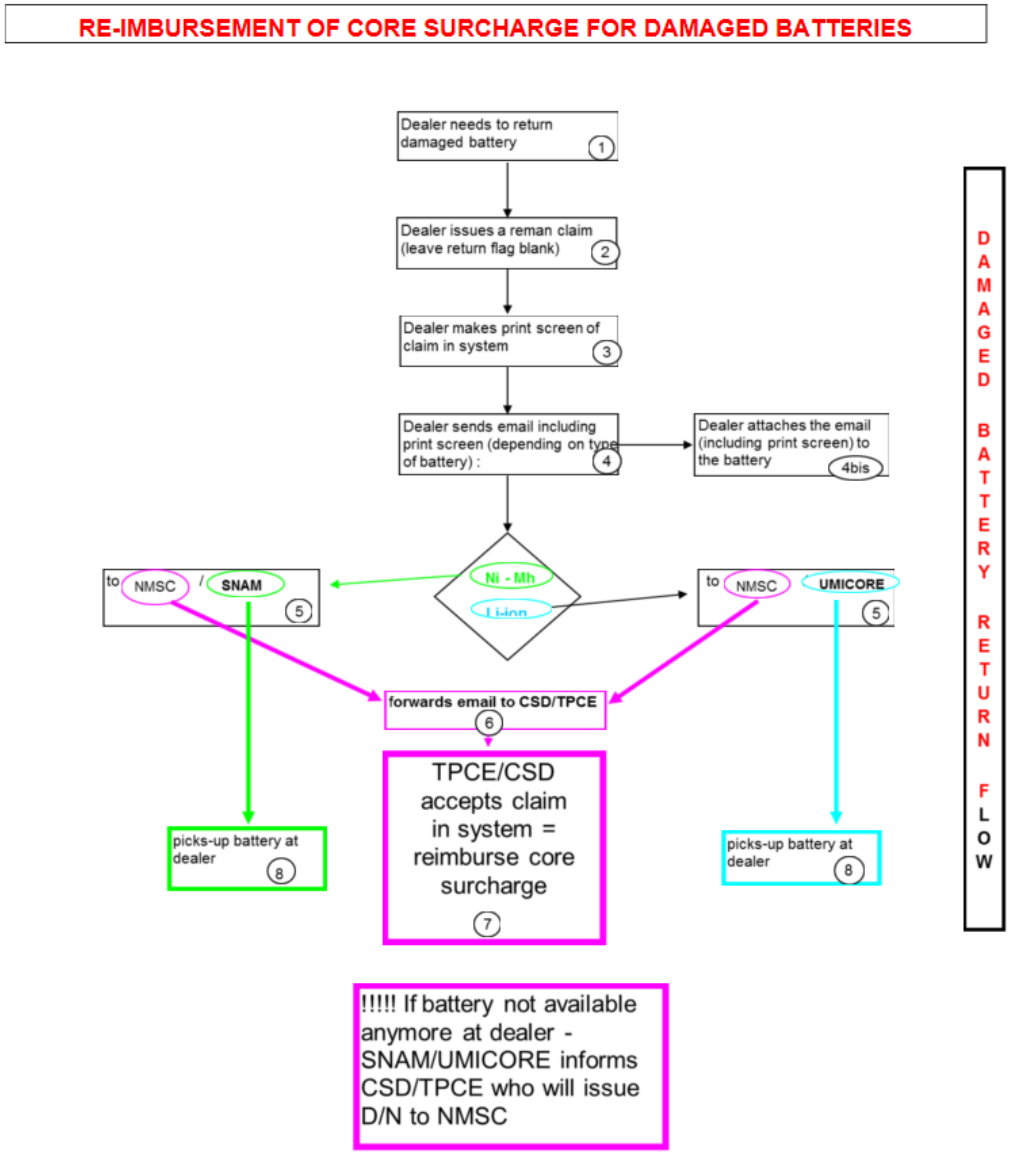
For PL21 countries, please refer to following SOP's:
(HVB PACKAGING INFO & SOP.xls)
(SOP for Hazmat documents for HVB.xls)

For non PL21 countries, Authorised Repairer must liaise with their usual Parts Logistics contact persons at NMSC's.

Damaged Batteries

Please refer to the link hereunder for further details and procedures.
Contact your NMSC as well so they can provide you with additional information regarding legal requirements for transportation of damaged batteries in your country.
http://www.snam.com/auto/toyota/

For the re-imbursement procedure of the recharge please refer to the flow chart:



2.2) Li ion Batteries

Non damaged batteries

Batteries will be returned to TPCE from an Authorised Repairer, using same principle as Component Exchange system (order new part/return core unit).

Please note that Authorised Repairers have 20 days to submit their claims, and 20 days to return Core Units to TPCE.

For PL21 countries, please refer to following SOP's:
(HVB PACKAGING INFO & SOP.xls)
(SOP for Hazmat documents for HVB.xls)

For non PL21 countries, Authorised Repairers must liaise with their usual Parts Logistics contact persons at NMSC's.

The battery then needs to be sent back to TPCE using the reverse logistics procedure: SP188 & packaging instruction P903 (original OE packaging)

Defective Batteries showing particular DTC's **(not to be considered as hazardous waste)**

Please refer to Repair Manual for complete DTC list that require Battery discharge.

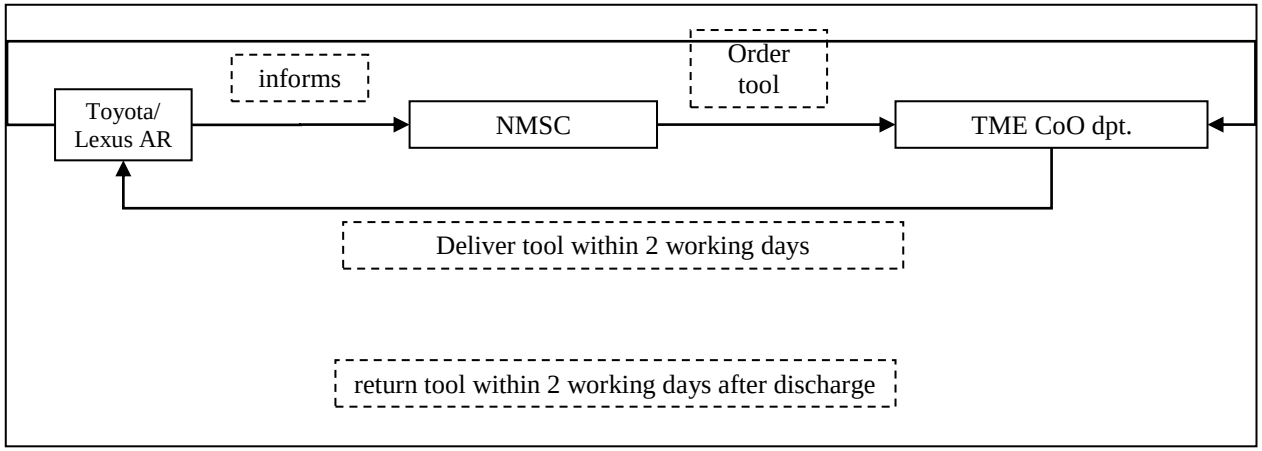
In case of discharge, a Li ion Battery Discharge Tool is needed. As usage will be very low at Authorised Repairer/NMSC side, TME decided to make it available on loan basis.

AR has to inform NMSC about Discharge Tool need, then NMSC informs TME Cost of Ownership dpt. by e-mail or phone.
(kevin.schauvaerts@toyota.europe.com) +32 2 745 2711 or
(frederic.lebrun@toyota-europe.com) +32 2 745 27 42.

TME will send the Discharge tool within 2 working days directly to Authorised Repairer.

Once the operation is finished, Discharge tool will have to be sent back to TME within 2 working days.

The battery then needs to be sent back to TPCE using the reverse logistics procedure: SP188 & packaging instruction P903 (original OE packaging)



Damaged Batteries **(to be considered as hazardous waste)**

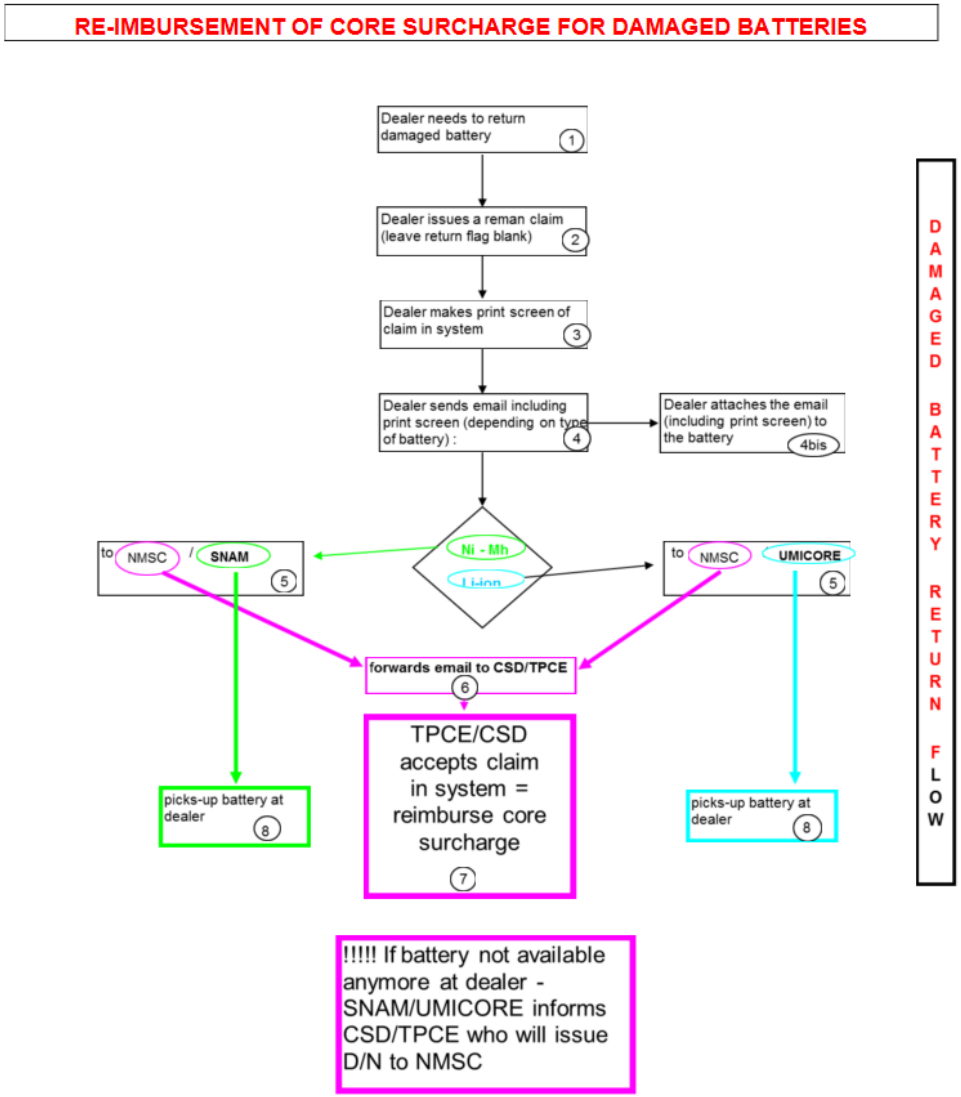
According to EU regulations special packaging is required for transporting damaged or leaking Li ion batteries. **(Please also refer to your local legislation regarding the transport of dangerous goods)**

Third party specialised recovery companies are in possession of such packaging and need to be contacted by TME. Please contact the NMSC who will contact TME.

TME will contact a specialised third party recovery company; they will recover the stored battery (at AR).

Specialised packaging is not directly available for AR's.

For the re-imbursement procedure of the recharge please refer to the flow chart:



3) Battery recovery procedure for Independent Repairers - Insurance Companies and End-of-Life Vehicle treatment facilities

3.1) NiMH batteries

For damaged and non-damaged batteries the recovery procedure via SNAM is used.
Please refer to link hereunder for further details and procedures.
http://www.snam.com/auto/toyota
n all cases, contact your NMSC so they can provide you with additional information regarding legal requirements for transportation of damaged batteries in your country.

3.2) Li-ion Batteries

In case of non-damaged Li ion battery, the independent organisation (independent repairer/authorised treatment facility) has to contact its designated NMSC.
The NMSC will appoint an appropriate Retailer which will take back the HVB. Once retrieved the battery has to follow the reverse logistic procedure.
For packaging and storage procedures please refer to the document *TPCE - Umicore Flow Empty Packaging (2).xlsx*

In case of Defective Batteries showing particular DTC's (**Do not consider as damaged! not to be considered as hazardous waste**)
Please refer to Repair Manual for complete DTC list that require Battery discharge.
Please contact the NMSC to request discharge on location. NMSC will request a discharge tool to TME (within 2 working days). An NMSC will discharge the battery at the IR/ATF.
The discharged battery needs to be sent to a local Authorised Toyota/Lexus Repairer.

In case of damaged battery **(to be considered as hazardous waste)**
Please contact the NMSC for further action.
NMSC will contact TME who will contact a specialised third party recovery company who will come to the IR/ATF with specialised packaging.

Legend:
HV: Hybrid Vehicle
HVB: Hybrid Vehicle Battery
NiMH: Nickel Metal Hydride
Li ion: Lithium Ion
DTC: Detection Trouble Code
SOP: Standard Operating Procedure
CoO: Cost of Ownership