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TOYOTA

# Technical Service Bulletin

Subject:

**Battery maintenance procedures at Authorised Repairers/Retailers/Vehicle Stockyards TME/NMSC**

Models:

All models

Model codes:

All model codes

Body Electrical

BE-0099T-0714

**Please be informed that this TSB supersedes all previous TSB's and any other document (such as PDS) in which 12V Battery maintenance is explained.**

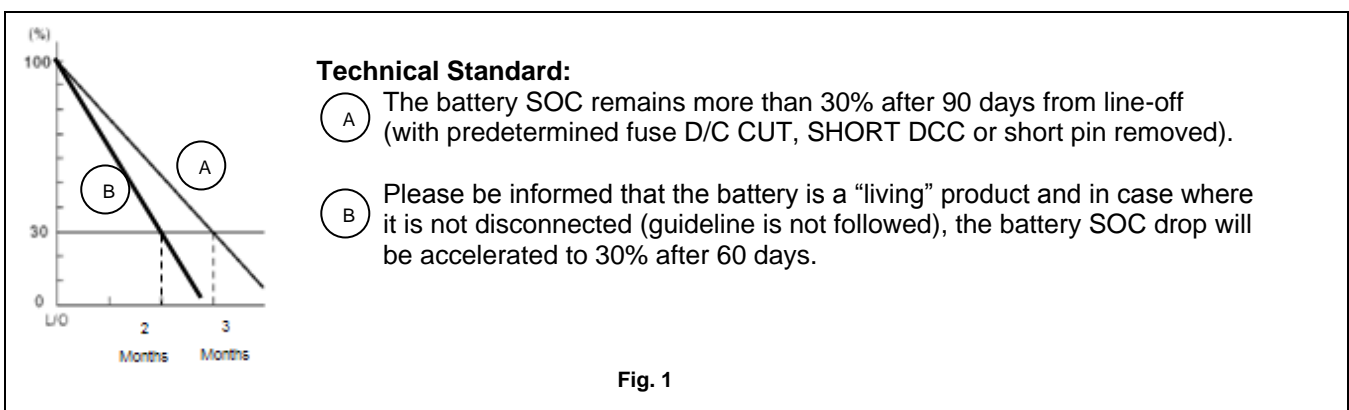
## Introduction:

This Technical Service Bulletin is intended for Authorised Repairers & Retailers and Vehicle Stockyards (including NMSC yards) in order to reconfirm and clarify the process to maintain the battery charge on all new vehicles and used vehicles under warranty and prevent a shortened lifetime of the battery.



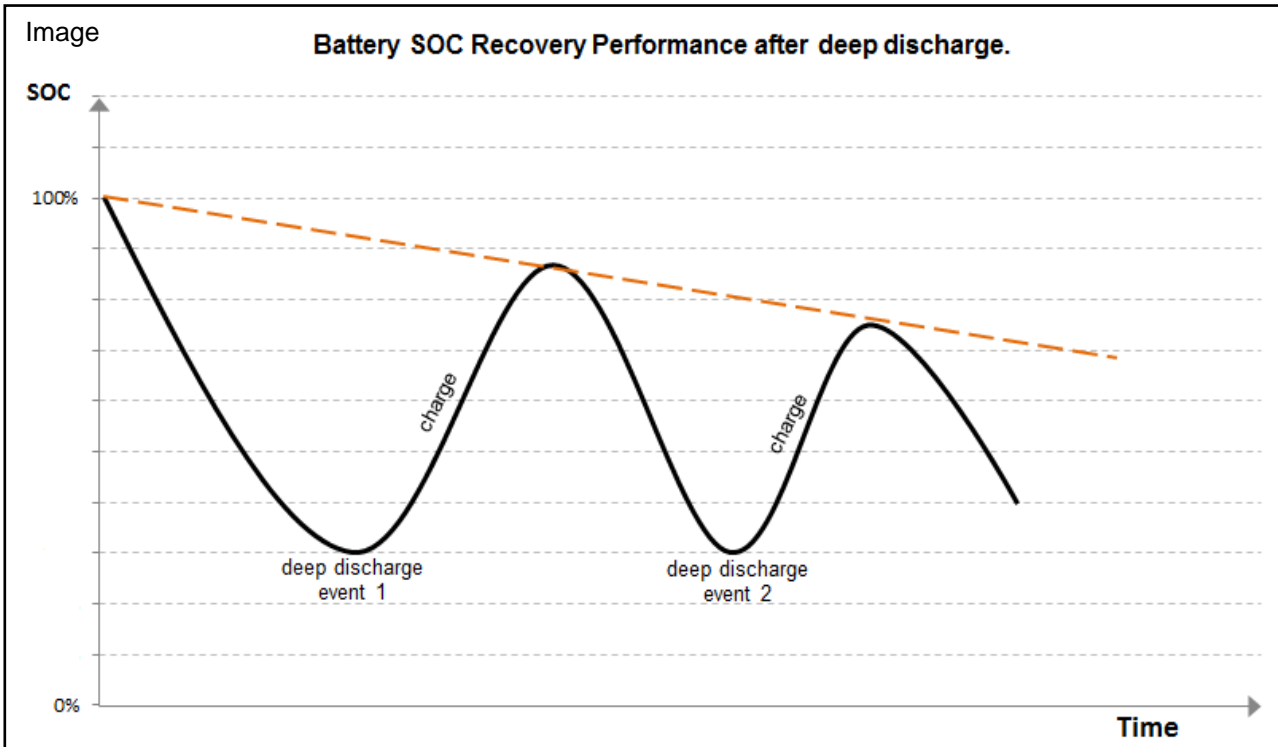
**Inadequate battery maintenance can cause a flat battery early in the vehicle's life, resulting in high customer inconvenience.**

The battery State of Charge (SOC) drops by the parasitic current drawing while the vehicle is not used in transit and storage (see Fig. 1). This is a normal condition due to the current consumption from ECU (memory) and other consumables such as clock, etc.



If the battery State Of Charge drops below 30% the battery capacity is permanently reduced, i.e. the battery lifetime will be shortened; therefore, the battery requires maintenance on a regular basis to ensure optimum performance (see Fig. 2).

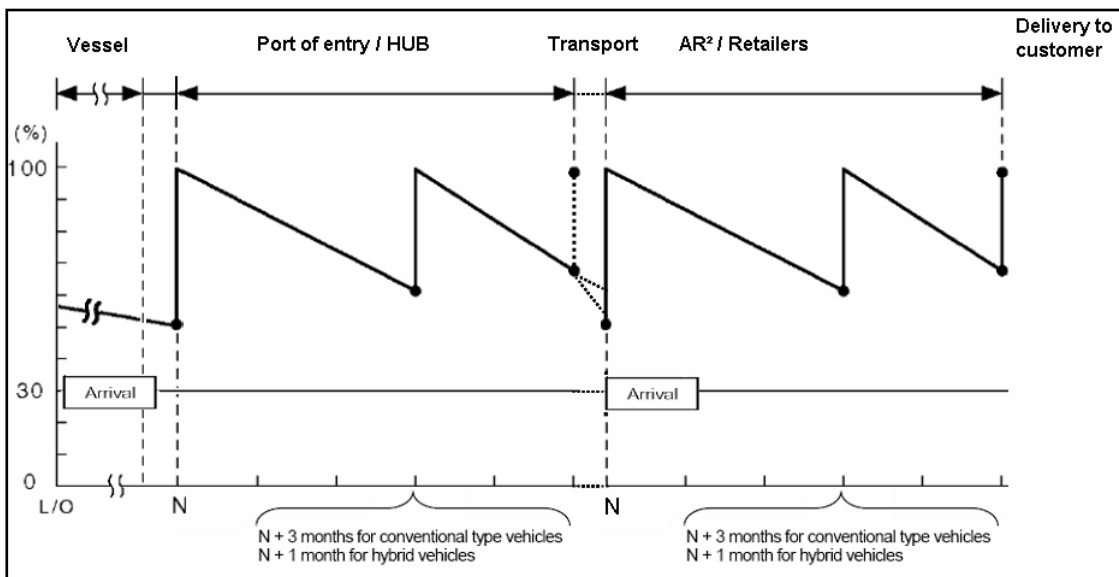
Once the battery is deeply discharged it will not recover its full SOC potential (see Fig. 2).



**IMPORTANT:**

1. During storage or after installing an accessory, please remove the 30A fuse (D/C Cut, Short DCC or short pin) AND disconnect the negative battery terminal.
2. To assure correct battery measurement & to remove surface charge:  
 It is necessary to measure the battery charge:
  - Before starting the engine (cold engine)
  - Or if the engine has run, wait 10 minutes after the engine has stopped with headlights (low beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.
  - Or if the engine has run, wait at least 20 to 30 seconds after the engine has stopped with headlights (high beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.

**Overall battery maintenance schedule:**



To assist in the use of the TSB we have made two chapters, depending on your operation.

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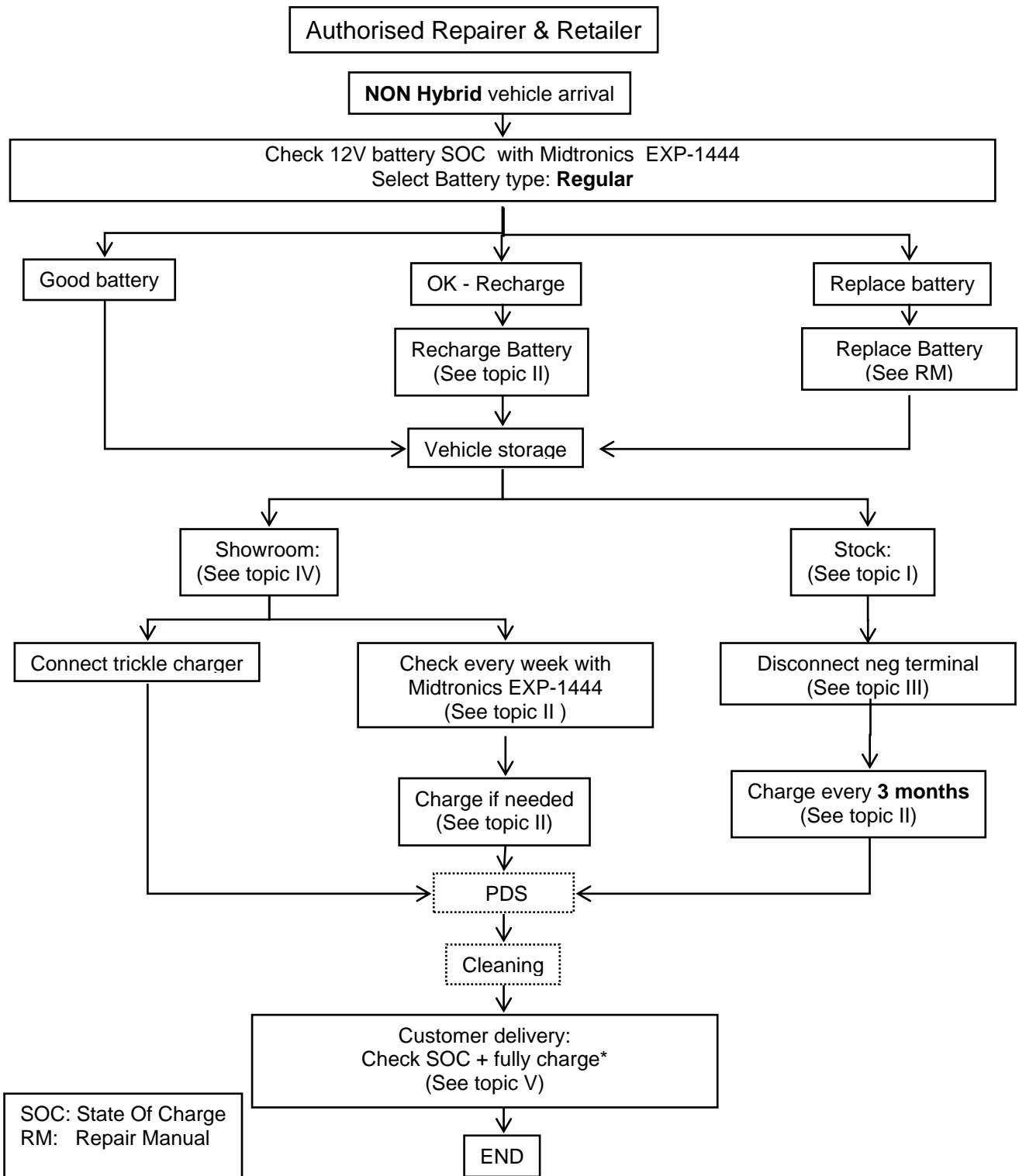
CHAPTER 1:  
Authorised Repairers & Retailers  
Operations Procedures.

## **A. Non Hybrid vehicles.**

### **I : Maintenance Procedure.**

It is necessary to measure the battery charge:

- Before starting the engine (cold engine)
- Or if the engine has run, wait 10 minutes after the engine has stopped with headlights (low beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.
- Or if the engine has run, wait at least 20 to 30 seconds after the engine has stopped with headlights (high beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.



\* Battery recharge should be the LAST procedure before vehicle delivery (after accessory installation, Navi Map update, cleaning, PDS, etc) in order to hand over the vehicle with maximum battery SOC.

**Note:**

If the vehicle has two batteries (e.g. Land Cruiser, Dyna, Hilux, ...) the batteries have to be checked one by one. This means you have to disconnect at least one battery when testing the batteries. When disconnecting the negative battery terminal on one battery, use the "OUT-OF-VEHICLE" test. The other battery you can check by using the "IN-VEHICLE" test in case the terminals are not disconnected.

For details on battery diagnosis with Midtronics EXP-1444, please refer to the related document on usage (see TechDoc).

## II : Charging Procedure.

The mentioned charging procedure can be used during storage and normal vehicle maintenance. The charger and Midtronics EXP-1444 battery tester can give you an indication of the necessary recharging time for a selected recharging current (A).



**To check SOC of 12V battery select “REGULAR” battery type on Midtronics EXP-1444 battery tester. Charging procedures are the same for charging with recommended charger or general charger.**

a) By using a recommended charger or equivalent.

Fronius Activa Professional 35A or Deutronic DBL1200-14.



**The recommended chargers or equivalent can be used for non hybrid vehicles 12V battery charging AND for hybrid vehicles 12V AUX battery charging.**

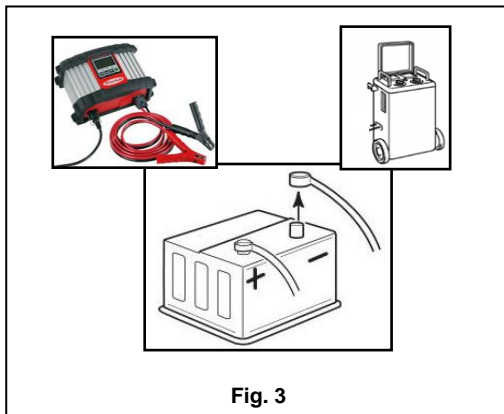
b) By using a general battery charger.



For the correct use of any charger, please refer to the related manufacturer's manual.

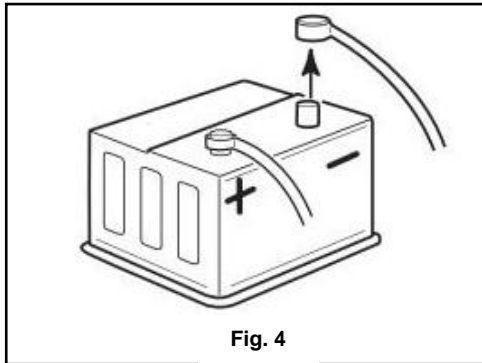
### **NOTICE:**

- The recharge could affect other electronic components if negative terminal is connected.
- Do NOT switch on the charger before connecting the charger cables to the battery terminals.
- Always charge the battery in a well ventilated area
- Do not allow fire or sparks near the battery



- Always disconnect the negative battery terminal before charging (see Fig. 3).
  - Connect the charger cables to the correct battery terminals.
  - Switch the charger on to recharge and refer to the battery charger manual.
  - Switch off the charger when charging is completed.
  - Disconnect the charger cables from the battery terminals.
  - Stock: **Leave negative terminal disconnected.**
  - Before starting the engine (move to stock) and vehicle delivery to customer: **Connect negative terminal.**
- Tightening torque: See vehicle PDS.

### III : Storage Procedure.



- Disconnect the negative terminal (see Fig. 4).
- **Charge at least EVERY 3 MONTHS.**

#### **NOTICE:**

- Make sure that the negative wire is not touching the terminal or vehicle body.
- Keep in mind that due to the shape and "learned" position, the wire will have a "natural" tendency to return to its position and contact the negative terminal – this must be avoided.
- In case you need to start the engine connect the negative battery terminal.  
Tightening torque: See vehicle PDS  
(to prevent risk of sparks and high currents causing possible damages to ECU's, etc).

### IV : Showroom Maintenance Procedure.

Since vehicles in the showroom are "used" to demonstrate certain applications and features (such as radio, navigation, interior lamps, airco, etc) to the customer, it's very important to maintain the battery SOC constantly. This can be done in 2 ways as described below:

a) By connecting a trickle charger.

The vehicle battery is constantly charged.

b) By NOT connecting a trickle charger – Every week.

**To check SOC of 12V battery select "REGULAR" battery type on Midtronics EXP-1444 battery tester.**

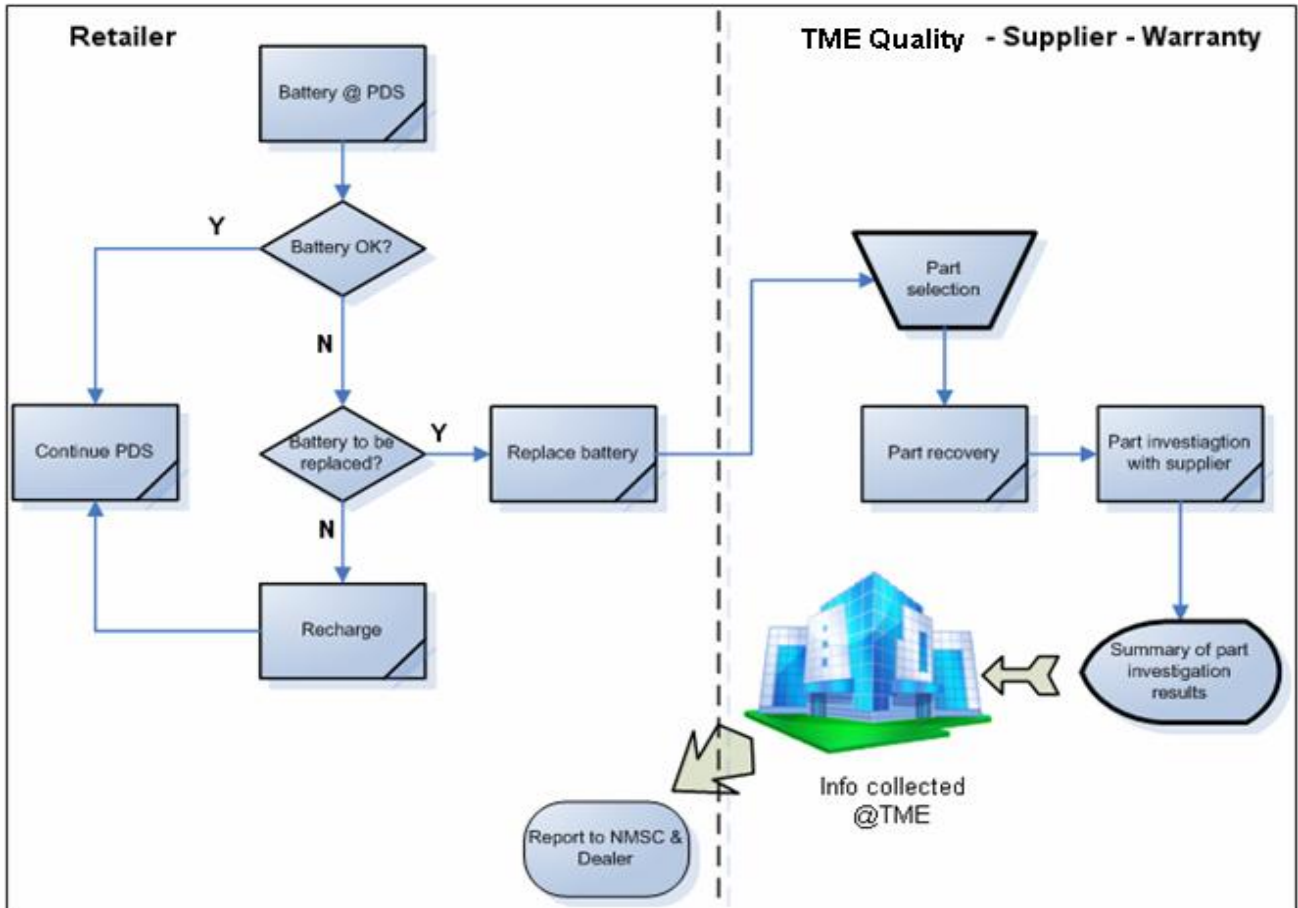


- Check the battery EVERY week with the Midtronics EXP-1444 (see Fig. 5)
- Charge the battery if needed\*.

\* Midtronics EXP-1444 battery tester judges "OK-Recharge"

**V : Procedure prior to customer delivery.**

- Check the battery SOC by selecting "REGULAR" battery type on Midtronics EXP-1444 battery tester.
- Make sure that the terminals are correctly connected (Tightening torque: See vehicle PDS)
- Make sure that the 30A fuse (D/C Cut, Short DCC), short pin, etc is in place.
- Power windows etc should be initialized, please refer to the related TSB.
- LAST step is to fully charge the battery before delivery to the customer (see topic II).
- Rejected batteries will be investigated as indicated in below flowchart.



**Required tools:**

1. Battery tester Midtronics EXP-1444 (Mandatory)
2. Battery charger recommendations:
  - 2.1. Fronius Acctiva Professional 35A
  - 2.2. Deutronic DBL1200-14
3. Trickle charger recommendations: CTEK MXS3.8 (12V/3.8A)

**NOTE: The example chargers or equivalent can be used for non-hybrid vehicles 12V battery charging AND for hybrid vehicles 12V AUX battery charging.**

**As for the supplier of the mentioned equipment please refer to below contact list:**

Midtronics:

Midtronics b.v.  
 P.O. Box 262  
 3400 AG IJsselstein  
 Lage Dijk-Noord 6  
 3401 VA IJsselstein  
 The Netherlands  
 Phone: +31 306 868 150  
 Fax: +31 306 868 158  
 Email: [info-europe@midtronics.com](mailto:info-europe@midtronics.com)

Fronius or Deutronic:

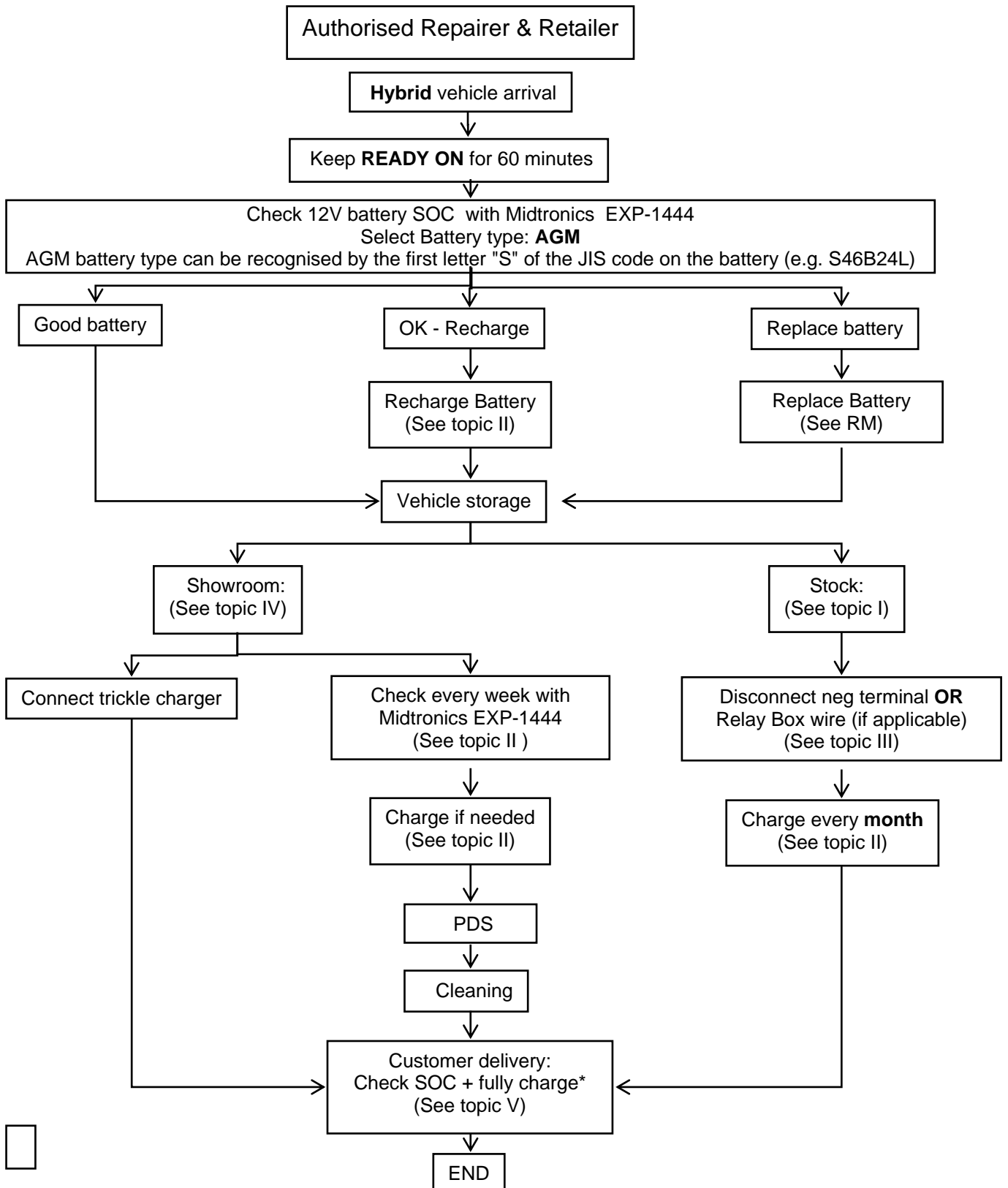
Please contact the local representative.

## **B. Hybrid vehicles.**

### **I : Maintenance Procedure.**

It is necessary to measure the battery charge:

- Before starting the engine (cold engine)
- Or if the engine has run, wait 10 minutes after the engine has stopped with headlights (low beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.
- Or if the engine has run, wait at least 20 to 30 seconds after the engine has stopped with headlights (high beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.



\* Battery recharge should be the LAST procedure before vehicle delivery (after accessory installation, Navi Map update, cleaning, PDS, etc) in order to hand over the vehicle with maximum battery SOC.

For details on battery diagnosis with Midtronics EXP-1444, please refer to the related document on usage (see TechDoc).

## **II : Charging Procedure.**

The mentioned charging procedure can be used during storage and normal vehicle maintenance.  
The charger and Midtronics EXP-1444 battery tester can give you an indication of the necessary recharging time for a selected recharging current (A).



**To check SOC of 12V AUX battery select “AGM” battery type on Midtronics EXP-1444 battery tester. AGM battery type can be recognised by the first letter "S" of the JIS code on the battery (e.g. S46B24L). Depending on the HYBRID model maximum 3.5A or maximum 4.5A charging current (see addendum 1).**

**Quick charge is PROHIBITED!**

### **NOTICE:**

#### Park break.

Before you disconnect the 12V auxiliary battery negative terminal, confirm the shift indicator is showing that the vehicle is in parking "P" position and apply the parking brake completely.

#### Back door – trunk.

With the battery disconnected (when performing the 12V auxiliary battery charging procedure) if the back door or trunk is closed, the door will be locked.

To unlock the door, pull the security opener in the luggage storage box. For details, refer to Owner's Manual.

#### Hybrid "READY" condition.

If the negative terminal of the battery is reconnected, even if the “POWER” switch is pressed once, the hybrid system may not start. At this time the “READY” light is 'off'. In this case, press the “POWER” switch again to start the hybrid system (the “READY” light is 'on'). If the hybrid system still does not start (the “READY” light is 'off'), refer to the Repair Manual.

#### Method a) By “READY ON” (60 minutes every month) for 12V AUX and HV battery charging.

When the remaining capacity of the HV battery is low, the gasoline engine automatically starts and the HV battery is charged by the generator.

The 12V auxiliary battery is charged by the HV battery regardless whether the gasoline engine is operating or not.

### **NOTICE:**

Before starting the charging procedure by "READY ON", make sure that the vehicle does not run out of fuel !

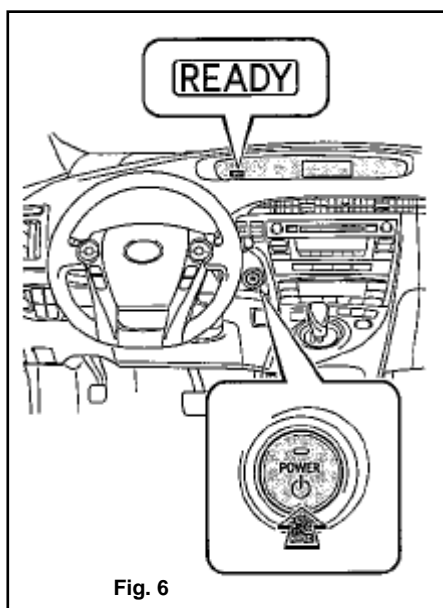


Fig. 6

- Park the vehicle in open air or connected to the exhaust extraction hose to the exhaust pipe.
- Apply the parking brake. With the brake pedal depressed, press the “POWER” switch and check that the “READY” light illuminates when the hybrid system starts. The “READY” light is 'on' (see Fig. 6).
- Turn off all lights and accessories.
- Check if the shift indicator is in the “P” position.
- Keep the “READY” light 'on' and charge the 12V AUX battery for 60 minutes.

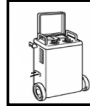
Method b) By using a recommended charger or equivalent.

Fronius Activa Professional 35A or Deutronic DBL1200-14.



**The recommended chargers or equivalent can be used for hybrid vehicles 12V AUX battery charging AND for non hybrid vehicles 12V battery charging.**

Method c) By using a general battery charger.



**NOTICE:** In case of AGM battery



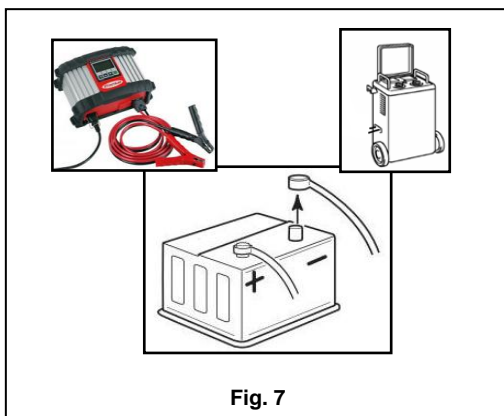
- \* Minimum requirements for 12V AUX battery charger:
- maximum 3.5A or maximum 4.5A
  - maximum (constant) charging volt: less than 14.4V
  - maximum charging time: within 10 hours

**Charging procedures are the same for charging with recommended charger or general charger. However, if you use a general charger make sure it fulfils the minimum requirements as listed above.**

For the correct use of any charger, please refer to the related manufacturer's manual.

**NOTICE:**

- The recharge could affect other electronic components if negative terminal is connected.
- Do NOT switch on the charger before connecting the charger cables to the battery terminals.
- Always charge the battery in a well ventilated area
- Do not allow fire or sparks near the battery



- Always disconnect the negative battery terminal before charging (see Fig. 7).
  - Connect the charger cables to the correct battery terminals.
  - Switch the charger on to recharge and refer to the battery charger manual.
  - Switch off the charger when charging is completed.
  - Disconnect the charger cables from the battery terminals.
  - Stock: **Leave negative terminal disconnected.**
  - Before starting the engine (move to stock) and vehicle delivery to customer: **Connect negative terminal.**
- Tightening torque: See vehicle PDS.

### III : Storage Procedure.

During stocking period there are 2 ways to disconnect negative battery terminal.  
The recommended way is to disconnect the actual negative battery terminal (method a), but due to difficult accessibility of the battery in some vehicles, an alternative way is to disconnect the wire in the Relay Box (method b).

Note: For certain vehicles it is possible to disconnect the wire in the Relay Box: see addendum 2.

Method a) Disconnect negative battery terminal : recommended procedure.

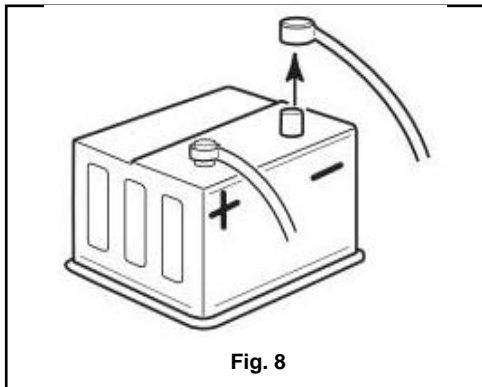


Fig. 8

- Disconnect the negative terminal (see Fig. 8)
- **Connect again the negative terminal before charging by "READY ON" at least EVERY MONTH.**

Tightening torque: See vehicle PDS (to prevent risk of sparks & high currents causing possible damages to ECU's, etc).

- Disconnect again the negative terminal.

#### **NOTICE:**

- Make sure that the negative wire is not touching the terminal or vehicle body.
- Keep in mind that due to the shape and "learned" position, the wire will have a "natural" tendency to return to its position and contact the negative terminal – this must be avoided.
- In case you need to start the engine connect the negative battery terminal.  
Tightening torque: See vehicle PDS  
(to prevent risk of sparks and high currents causing possible damages to ECU's, etc).

Method b) Relay Box wire disconnection if applicable (see addendum 2) : alternative procedure.



Fig. 9

- Disconnect carefully the wire cable in the Relay Box (see Fig. 9)
- **Connect again the wire in the Relay Box before charging by "READY ON" at least EVERY MONTH.**
- Disconnect again the wire in the Relay Box.

#### **NOTICE:**

- Make sure that the wire cable is kept inside the Relay Box.
- Keep in mind that the Relay Box must be closed again after disconnecting the wire cable to avoid water ingress.
- In case you need to start the engine connect the wire in the Relay Box.

## **IV : Showroom Maintenance Procedure.**

Since vehicles in the showroom are "used" to demonstrate certain applications and features (such as radio, navigation, interior lamps, airco, etc) to the customer, it's very important to maintain the battery SOC constantly. This can be done in 2 ways as described below:

a) By connecting a trickle charger.

The vehicle battery is constantly charged.

b) By NOT connecting a trickle charger – Every week.

**To check SOC of 12V battery select "AGM" battery type on Midtronics EXP-1444 battery tester. AGM battery type can be recognised by the first letter "S" of the JIS code on the battery (e.g. S46B24L)**



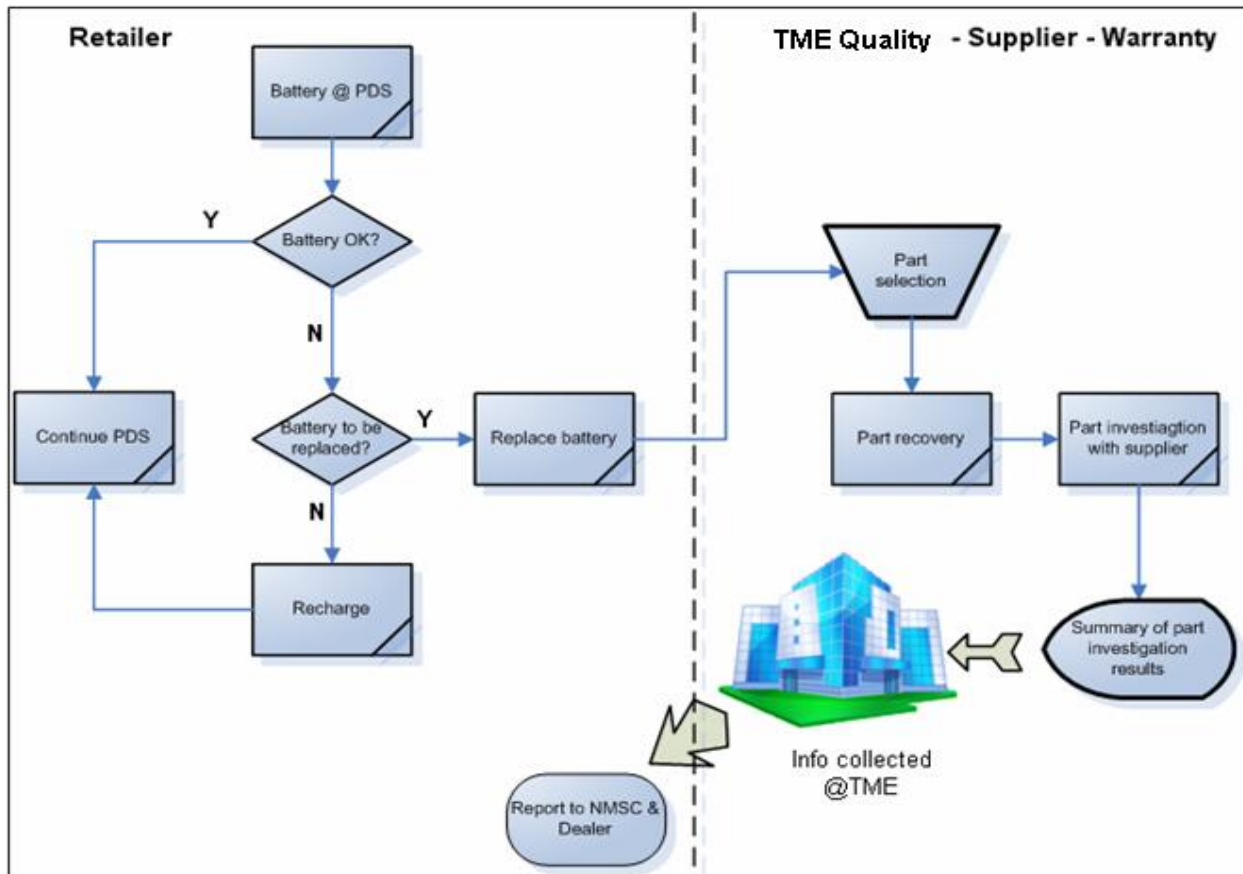
Fig. 10

- Check the battery EVERY week with the Midtronics EXP-1444 (see Fig. 10)
- Charge the battery if needed\*.

\* Midtronics EXP-1444 battery tester judges "OK-Recharge"

## V : Procedure prior to customer delivery.

- Check the battery SOC by selecting "AGM" battery type on Midtronics EXP-1444 battery tester.  
AGM battery type can be recognised by the first letter "S" of the JIS code on the battery (e.g. S46B24L)
- Make sure that the terminals are correctly connected (Tightening torque: See vehicle PDS)
- Make sure that the 30A fuse (D/C Cut, Short DCC), short pin, etc is in place.
- Power windows etc should be initialized, please refer to the related TSB.
- LAST step is to fully charge the battery before delivery to the customer (see topic II).
- Rejected batteries will be investigated as indicated in below flowchart.



### Required tools:

1. Battery tester Midtronics EXP-1444 (Mandatory)
2. Battery charger recommendations :
  - 2.1. Fronius Acctiva Professional 35A
  - 2.2. Deutronic DBL1200-14
3. Trickle charger recommendations: CTEK MXS3.8 (12V/3.8A)

**NOTE: The example chargers or equivalent can be used for non-hybrid vehicles 12V battery charging AND for hybrid vehicles 12V AUX battery charging.**

### As for the supplier of the mentioned equipment please refer to below contact list:

Midtronics:  
 Midtronics b.v.  
 P.O. Box 262  
 3400 AG IJsselstein  
 Lage Dijk-Noord 6  
 3401 VA IJsselstein  
 The Netherlands  
 Phone: +31 306 868 150  
 Fax: +31 306 868 158  
 Email: [info-europe@midtronics.com](mailto:info-europe@midtronics.com)

Fronius or Deutronic:  
 Please contact the local representative.

CHAPTER 2:

TME & NMSC Stockyards

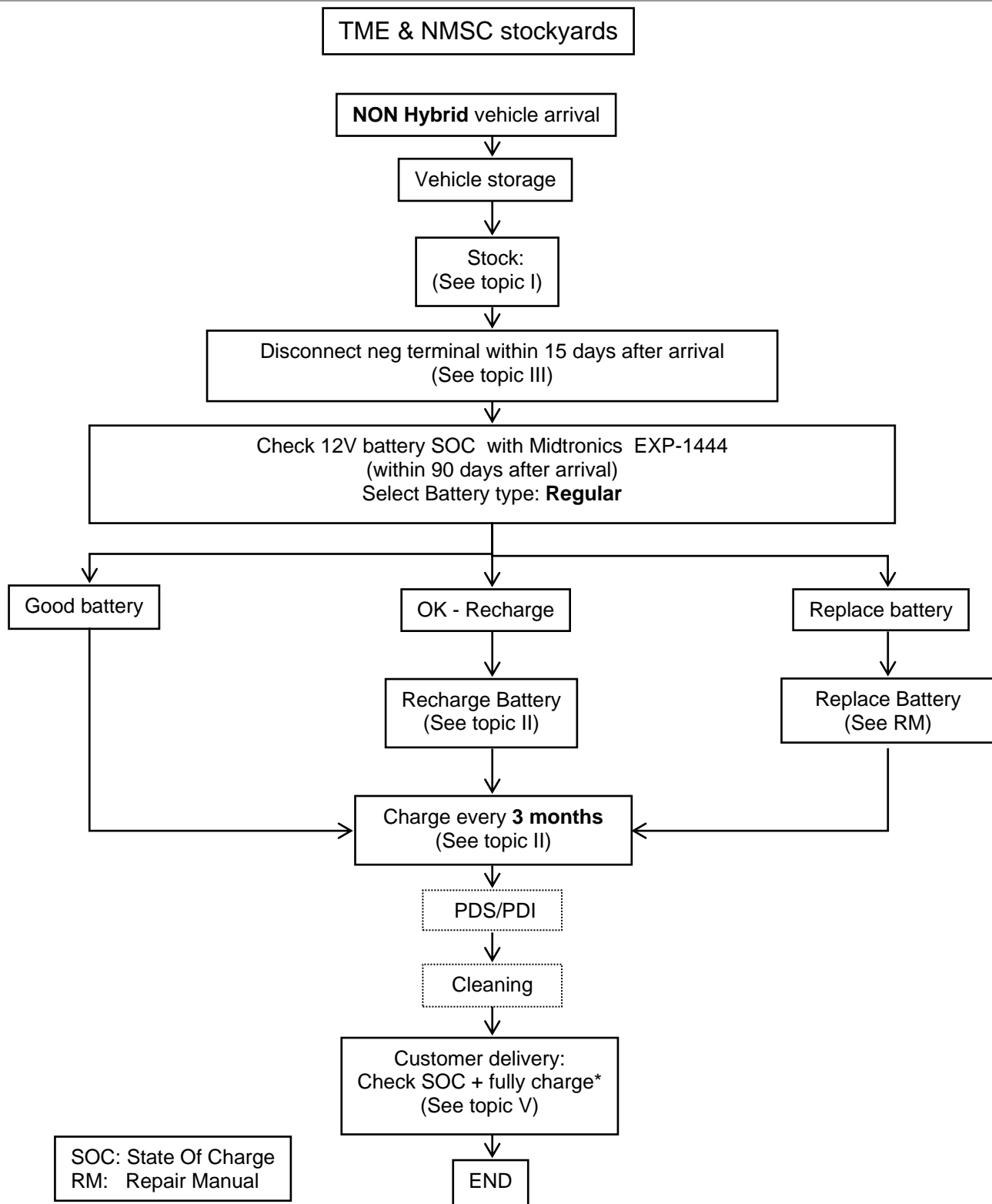
Operations Procedures.

## **A. Non Hybrid vehicles.**

### **I : Maintenance Procedure.**

It is necessary to measure the battery charge:

- Before starting the engine (cold engine)
- Or if the engine has run, wait 10 minutes after the engine has stopped with headlights (low beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.
- Or if the engine has run, wait at least 20 to 30 seconds after the engine has stopped with headlights (high beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.



\* Battery recharge should be the LAST procedure before vehicle delivery (after accessory installation, Navi Map update, cleaning, PDS, etc) in order to hand over the vehicle with maximum battery SOC.

**Note:**

If the vehicle has two batteries (e.g. Land Cruiser, Dyna, Hilux, ...) the batteries have to be checked one by one. This means you have to disconnect at least one battery when testing the batteries. When disconnecting the negative battery terminal on one battery, use the "OUT-OF-VEHICLE" test. The other battery you can check by using the "IN-VEHICLE" test in case the terminals are not disconnected.

For details on battery diagnosis with Midtronics EXP-1444, please refer to the related document on usage (see TechDoc).

## II : Charging Procedure.

The mentioned charging procedure can be used during storage and normal vehicle maintenance. The charger and Midtronics EXP-1444 battery tester can give you an indication of the necessary recharging time for a selected recharging current (A).



**To check SOC of 12V battery select “REGULAR” battery type on Midtronics EXP-1444 battery tester. Charging procedures are the same for charging with recommended charger or general charger.**

a) By using a recommended charger or equivalent.

Fronius Acctiva Professional 35A or Deutronic DBL1200-14.



**The recommended chargers or equivalent can be used for non hybrid vehicles 12V battery charging AND for hybrid vehicles 12V AUX battery charging.**

b) By using a general battery charger.



For the correct use of any charger, please refer to the related manufacturer's manual.

### **NOTICE:**

- The recharge could affect other electronic components if negative terminal is connected.
- Do NOT switch on the charger before connecting the charger cables to the battery terminals.
- Always charge the battery in a well ventilated area
- Do not allow fire or sparks near the battery

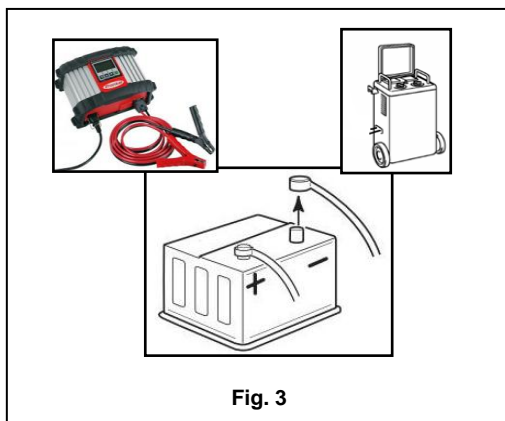
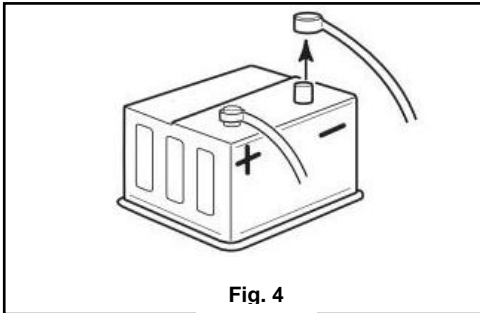


Fig. 3

- Always disconnect the negative battery terminal before charging (see Fig. 3).
- Connect the charger cables to the correct battery terminals.
- Switch the charger on to recharge and refer to the battery charger manual.
- Switch off the charger when charging is completed.
- Disconnect the charger cables from the battery terminals.
- Stock: **Leave negative terminal disconnected.**
- Before starting the engine (move to stock) and vehicle delivery to customer: **Connect negative terminal.**

Tightening torque: See vehicle PDS.

### **III : Storage Procedure.**



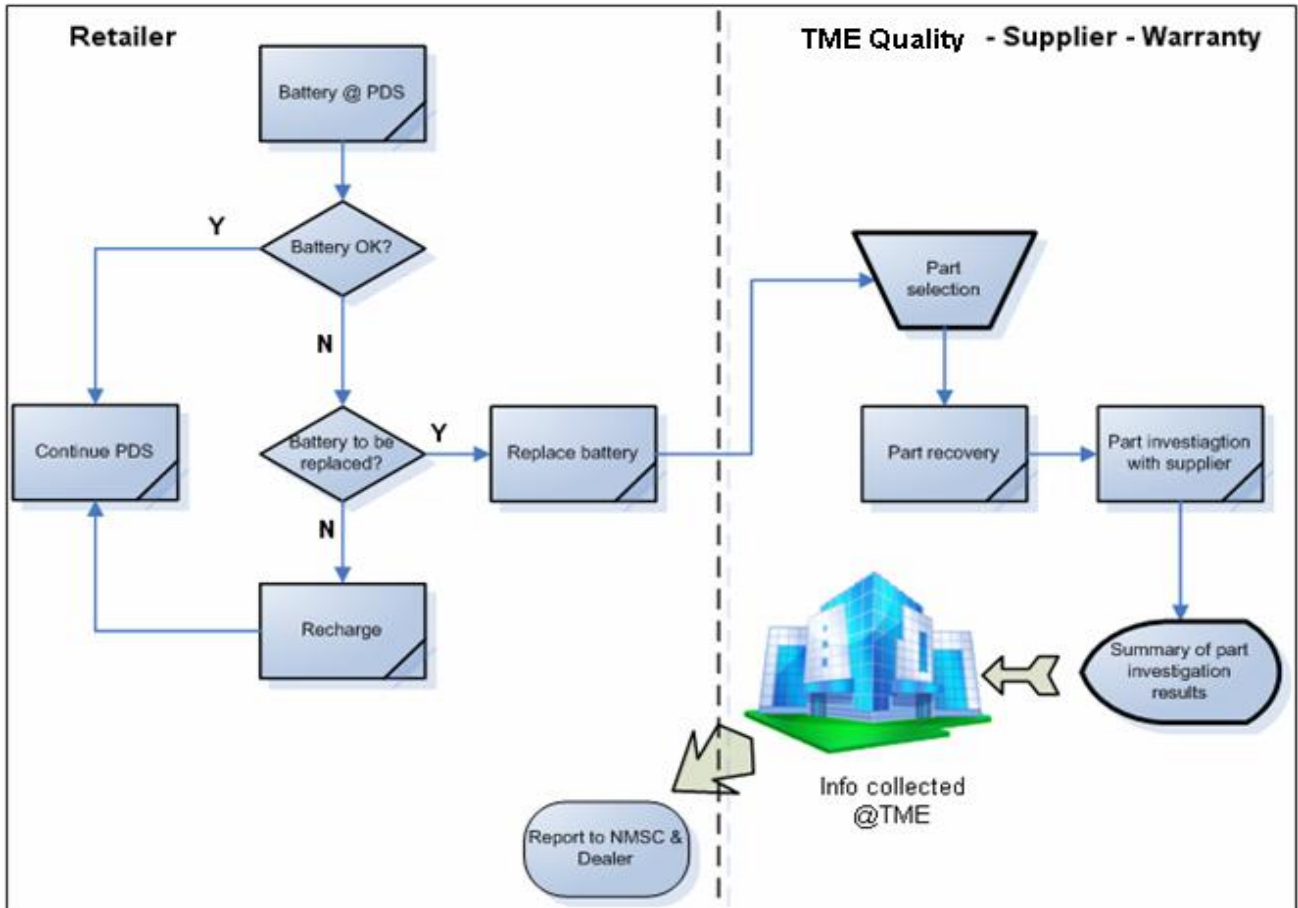
- Disconnect the negative terminal (see Fig. 4).
- **Charge at least EVERY 3 MONTHS.**

#### **NOTICE:**

- Make sure that the negative wire is not touching the terminal or vehicle body.
- Keep in mind that due to the shape and "learned" position, the wire will have a "natural" tendency to return to its position and contact the negative terminal – this must be avoided.
- In case you need to start the engine connect the negative battery terminal.  
Tightening torque: See vehicle PDS  
(to prevent risk of sparks and high currents causing possible damages to ECU's, etc).

**IV : Procedure prior to customer or Retailer delivery.**

- Check the battery SOC by selecting "REGULAR" battery type on Midtronics EXP-1444 battery tester.
- Make sure that the terminals are correctly connected (Tightening torque: See vehicle PDS)
- Make sure that the 30A fuse (D/C Cut, Short DCC), short pin, etc is in place.
- Power windows etc should be initialized, please refer to the related TSB.
- LAST step is to fully charge the battery before delivery to the customer or Retailer (see topic II).
- Rejected batteries will be investigated as indicated in below flowchart.



**Required tools:**

1. Battery tester Midtronics EXP-1444 (Mandatory)
2. Battery charger recommendations :
  - 2.1. Fronius Acctiva Professional 35A
  - 2.2. Deutronic DBL1200-14

**NOTE: The example chargers or equivalent can be used for non-hybrid vehicles 12V battery charging AND for hybrid vehicles 12V AUX battery charging.**

**As for the supplier of the mentioned equipment please refer to below contact list:**

Midtronics:

Midtronics b.v.  
 P.O. Box 262  
 3400 AG IJsselstein  
 Lage Dijk-Noord 6  
 3401 VA IJsselstein  
 The Netherlands  
 Phone: +31 306 868 150  
 Fax: +31 306 868 158  
 Email: [info-europe@midtronics.com](mailto:info-europe@midtronics.com)

Fronius or Deutronic:

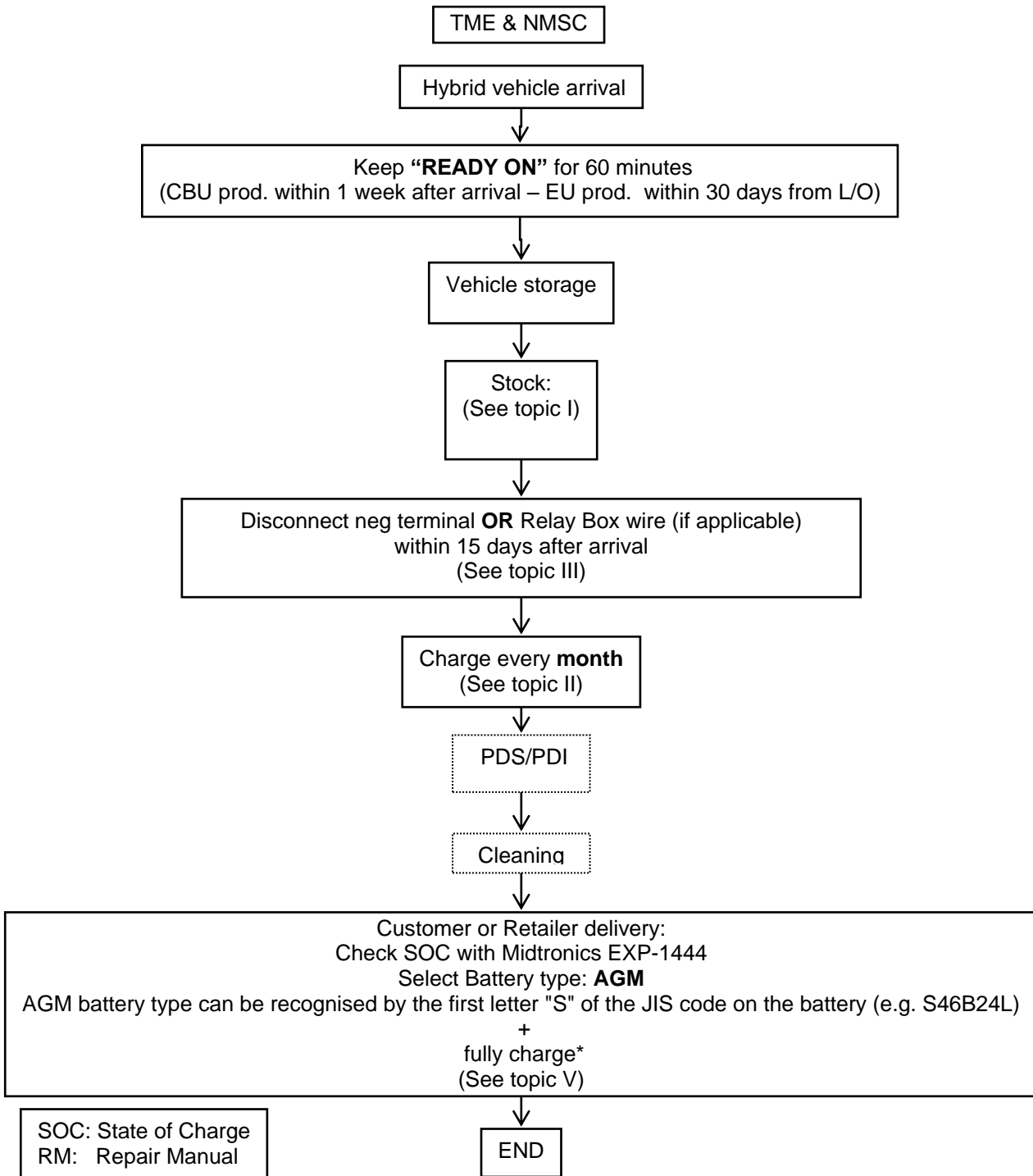
Please contact your local representative.

**B. Hybrid vehicles.**

**I : Maintenance Procedure.**

It is necessary to measure the battery charge:

- Before starting the engine (cold engine)
- Or if the engine has run, wait 10 minutes after the engine has stopped with headlights (low beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.
- Or if the engine has run, wait at least 20 to 30 seconds after the engine has stopped with headlights (high beam) switched 'on'. Switch 'off' the headlights again before measuring the battery charge.



\* Battery recharge should be the LAST procedure before vehicle delivery (after accessory installation, Navi Map update, cleaning, PDS, etc) in order to hand over the vehicle with maximum battery SOC.

For details on battery diagnosis with Midtronics EXP-1444, please refer to the related document on usage (see TechDoc).

## **II : Charging Procedure.**

The mentioned charging procedure can be used during storage and normal vehicle maintenance.  
The charger and Midtronics EXP-1444 battery tester can give you an indication of the necessary recharging time for a selected recharging current (A).

**!** To check SOC of 12V AUX battery select “AGM” battery type on Midtronics EXP-1444 battery tester. AGM battery type can be recognised by the first letter "S" of the JIS code on the battery (ex S46B24L). Depending on the HYBRID model maximum 3.5A or maximum 4.5A charging current (see addendum 1).

**Quick charge is PROHIBITED!**

### **NOTICE:**

#### Park break.

Before you disconnect the 12V auxiliary battery negative terminal, confirm the shift indicator is showing that the vehicle is in parking "P" position and apply the parking brake completely.

#### Back door – trunk.

With the battery disconnected (when performing the 12V auxiliary battery charging procedure) if the back door or trunk is closed, the door will be locked.

To unlock the door, pull the security opener in the luggage storage box. For details, refer to Owner's Manual.

#### Hybrid "READY" condition.

If the negative terminal of the battery is reconnected, even if the “POWER” switch is pressed once, the hybrid system may not start. At this time the “READY” light is 'off'. In this case, press the “POWER” switch again to start the hybrid system (the “READY” light is 'on'). If the hybrid system still does not start (the “READY” light is 'off'), refer to the Repair Manual.

#### Method a) By “READY ON” (60 minutes every month) for 12V AUX and HV battery charging.

When the remaining capacity of the HV battery is low, the gasoline engine automatically starts and the HV battery is charged by the generator.

The 12V auxiliary battery is charged by the HV battery regardless whether the gasoline engine is operating or not.

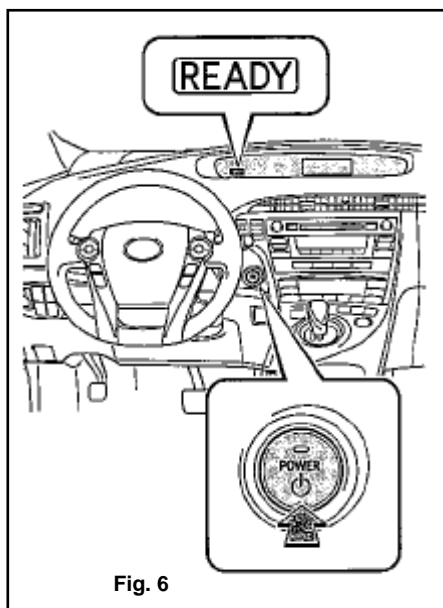


Fig. 6

### **NOTICE:**

Before starting the charging procedure by "READY ON", make sure that the vehicle does not run out of fuel !

- Park the vehicle in open air or connected to the exhaust extraction hose to the exhaust pipe.
- Apply the parking brake. With the brake pedal depressed, press the “POWER” switch and check that the “READY” light illuminates when the hybrid system starts. The “READY” light is 'on' (see Fig. 6).
- Turn off all lights and accessories.
- Check if the shift indicator is in the “P” position.
- Keep the “READY” light 'on' and charge the 12V AUX battery for 60 minutes.

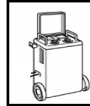
Method b) By using a recommended charger or equivalent.

Fronius Activa Professional 35A or Deutronic DBL1200-14.



**The recommended chargers or equivalent can be used for hybrid vehicles 12V AUX battery charging AND for non hybrid vehicles 12V battery charging.**

Method c) By using a general battery charger.



**NOTICE:** In case of AGM battery



\* Minimum requirements for 12V AUX battery charger:

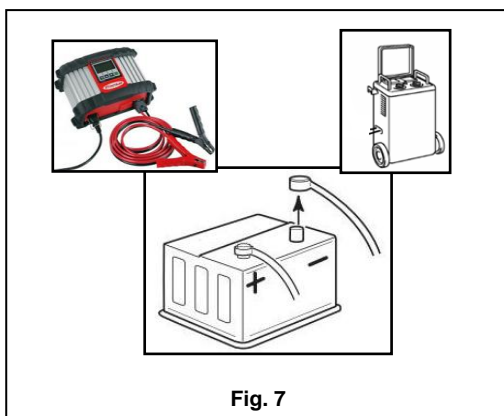
- maximum 3.5A or maximum 4.5A
- maximum (constant) charging volt: less than 14.4V
- maximum charging time: within 10 hours

**Charging procedures are the same for charging with recommended charger or general charger. However, if you use a general charger make sure it fulfils the minimum requirements as listed above.**

For the correct use of any charger, please refer to the related manufacturer's manual.

**NOTICE:**

- The recharge could affect other electronic components if negative terminal is connected.
- Do NOT switch on the charger before connecting the charger cables to the battery terminals.
- Always charge the battery in a well ventilated area
- Do not allow fire or sparks near the battery



- Always disconnect the negative battery terminal before charging (see Fig. 7).

#### Connect the charge

- r cables to the correct battery terminals.
- Switch the charger on to recharge and refer to the battery charger manual.
- Switch off the charger when charging is completed.
- Disconnect the charger cables from the battery terminals.
- Stock: **Leave negative terminal disconnected.**
- Before starting the engine (move to stock) and vehicle delivery to customer: **Connect negative terminal.**

Tightening torque: See vehicle PDS.

### III : Storage Procedure.

During stocking period there are 2 ways to disconnect negative battery terminal.

The recommended way is to disconnect the actual negative battery terminal (method a), but due to difficult accessibility of the battery in some vehicles, an alternative way is to disconnect the wire in the Relay Box (method b).

Note: For certain vehicles it is possible to disconnect the wire in the Relay Box: see addendum 2.

Method a) Disconnect negative battery terminal : recommended procedure.

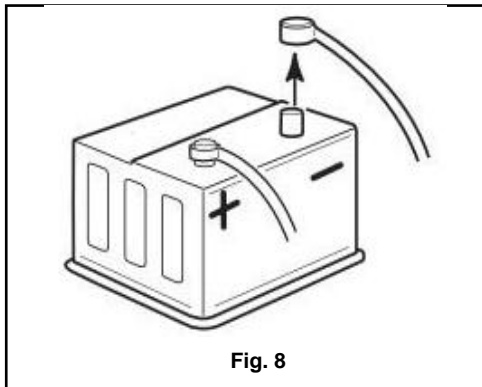


Fig. 8

- Disconnect the negative terminal (see Fig. 8)
- **Connect again the negative terminal before charging by "READY ON" at least EVERY MONTH.**

Tightening torque: See vehicle PDS (to prevent risk of sparks & high currents causing possible damages to ECU's, etc).

- Disconnect again the negative terminal

#### **NOTICE:**

- Make sure that the negative wire is not touching the terminal or vehicle body.
- Keep in mind that due to the shape and "learned" position, the wire will have a "natural" tendency to return to its position and contact the negative terminal – this must be avoided.
- In case you need to start the engine connect the negative battery terminal.  
Tightening torque: See vehicle PDS  
(to prevent risk of sparks and high currents causing possible damages to ECU's, etc).

Method b) Relay Box wire disconnection if applicable (see addendum 2) : alternative procedure.



Fig. 9

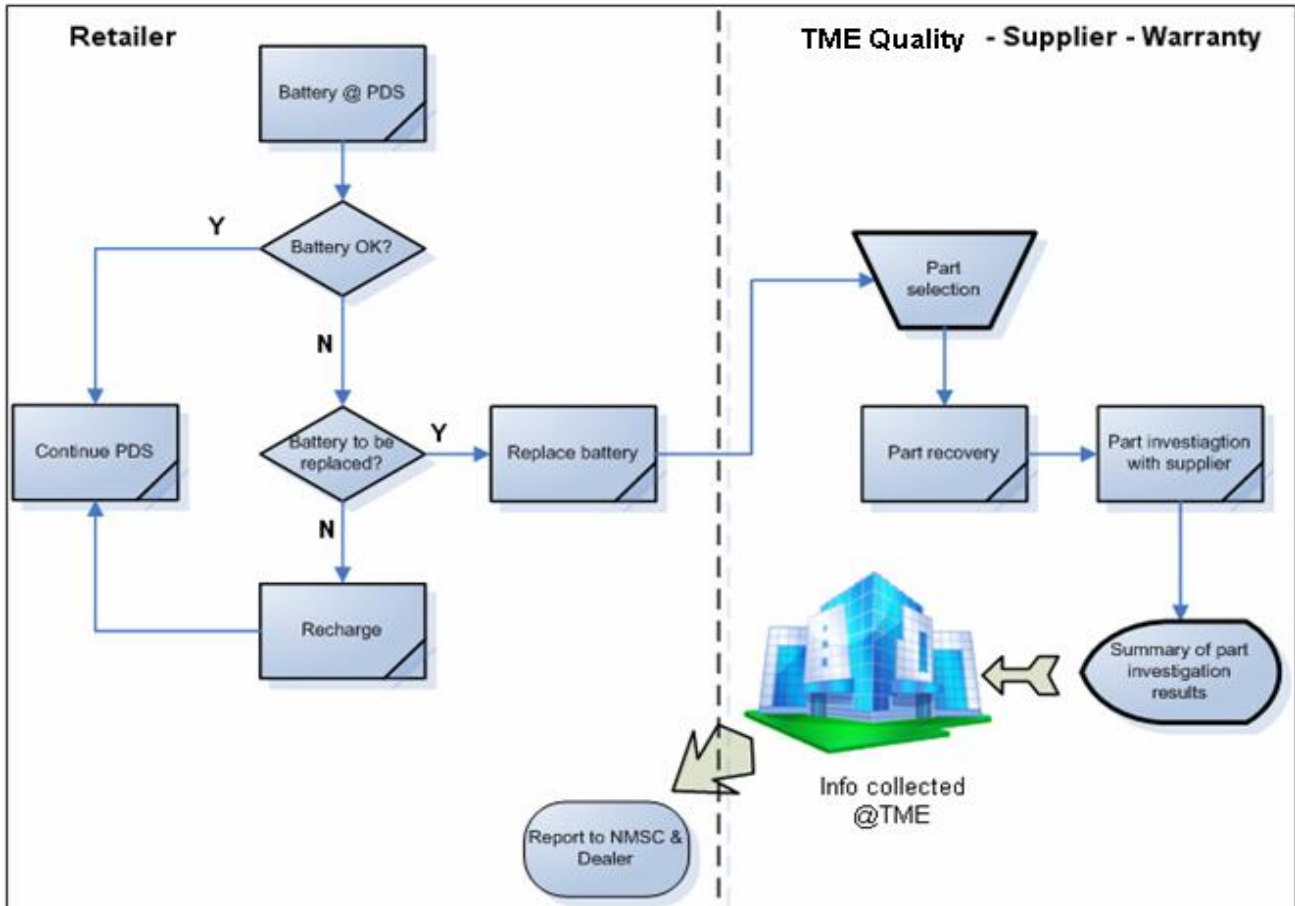
- Disconnect carefully the wire cable in the Relay Box (see Fig. 9)
- **Connect again the wire in the Relay Box before charging by "READY ON" at least EVERY MONTH.**
- Disconnect again the wire in the Relay Box.

#### **NOTICE:**

- Make sure that the wire cable is kept inside the Relay Box.
- Keep in mind that the Relay Box must be closed again after disconnecting the wire cable to avoid water ingress.
- In case you need to start the engine connect the wire in the Relay Box.

**IV : Procedure prior to customer or Retailer delivery.**

- Check the battery SOC by selecting "REGULAR" battery type on Midtronics EXP-1444 battery tester. AGM battery type can be recognised by the first letter "S" of the JIS code on the battery (e.g. S46B24L)
- Make sure that the terminals are correctly connected (Tightening torque: See vehicle PDS)
- Make sure that the 30A fuse (D/C Cut, Short DCC), short pin, etc is in place.
- Power windows etc should be initialized, please refer to the related TSB.
- LAST step is to fully charge the battery before delivery to the customer or Retailer (see topic II).
- Rejected batteries will be investigated as indicated in below flowchart.



**Required tools:**

1. Battery tester Midtronics EXP-1444 (Mandatory)
2. Battery charger recommendations :
  - 2.1. Fronius Acctiva Professional 35A
  - 2.2. Deutronic DBL1200-14

**NOTE: The example chargers or equivalent can be used for non-hybrid vehicles 12V battery charging AND for hybrid vehicles 12V AUX battery charging.**

**As for the supplier of the mentioned equipment please refer to below contact list:**

Midtronics:

Midtronics b.v.  
 P.O. Box 262  
 3400 AG IJsselstein  
 Lage Dijk-Noord 6  
 3401 VA IJsselstein  
 The Netherlands  
 Phone: +31 306 868 150  
 Fax: +31 306 868 158  
 Email: [info-europe@midtronics.com](mailto:info-europe@midtronics.com)

Fronius or Deutronic:

Please contact your local representative.



**Addendum 1: TMC maximum charging current per battery type.**

AGM Battery (Hybrid vehicles)	
Battery Size	Charging Current
B20	3.5A
B24	4.5A
D23	
D26	
D31	

**Addendum 2: Relay Box disconnection per model.**

Model	Model code	Disconnect via Relay Box	Connector
Yaris HV	NHP130	Y	1E
Auris HV (NEW)	ZWE186	Y	1N
Auris HV (PRE)	ZWE150	Y	1E
Auris Touring Sports HV	ZWE186	Y	1N
Prius	ZVW30	Y	1E
Prius +	ZVW40	Y	1E
Prius PHV	ZVW35	Y	1E