

SECTION 414-01: Battery, Mounting and Cables

VEHICLE APPLICATION: 2011.0 FG Falcon MKII

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SPECIFICATIONS

Battery
All vehicles - 54 A/H 12 Volt 430 Cold Cranking (Amps) 85 Reserve Capacity (Min)
Police/Taxi spec battery - 56 A/H 12 Volt 520 Cold Cranking (Amps) 100 Reserve Capacity (Min)

Torque Specifications

Description	Nm
Battery Hold Down Support Bolt	2 - 4



DESCRIPTION AND OPERATION

Battery and Cables


Vehicles are equipped with a 12 volt maintenance-free battery.


The battery and cable system consists of the following components:


- Battery
- Battery Cable Assembly
- Battery Tray


Ford Motor Company strongly recommends that lead-acid batteries be returned to an authorized recycling facility for disposal.

WARNINGS

 Keep out of the reach of children. Batteries contain sulphuric acid. Avoid contact with skin, eyes, or clothing. Also, shield your eyes when working near batteries to protect against possible splashing of the acid solution. In case of acid contact with skin or eyes, flush immediately with water for a minimum of 15 minutes and get prompt medical attention. If acid is swallowed, call a physician immediately. Failure to follow these instructions may result in personal injury.

 Batteries normally produce explosive gases which can cause personal injury. Therefore, do not allow flames, sparks or lighted substances to come near the battery. When charging or working near a battery, always shield your face and protect your eyes. Always provide ventilation.

 When lifting a plastic-cased battery, excessive pressure on the end walls could cause acid to spew through the vent caps resulting in personal injury or damage to the vehicle or to the battery. Lift with a battery carrier or with your hands on opposite corners.

 To avoid accidental deployment and possible injury, the backup power supply must be depleted before repairing or installing any front or side air bag supplemental restraint system (SRS) components and before repairing, installing, adjusting or striking components near the front or side air bag sensors, such as doors, instrument panel, console, door latches, strikers, seats and hood latches. Failure to follow these procedures may result in personal injury. Refer to the appropriate vehicle shop manual to determine location of the front air bag sensors. To deplete the backup power supply energy, disconnect the battery ground cable and wait at least one minute. Be sure to disconnect auxiliary batteries and power supplies (if equipped). Failure to follow these instructions may result in personal injury.



DIAGNOSIS AND TESTING

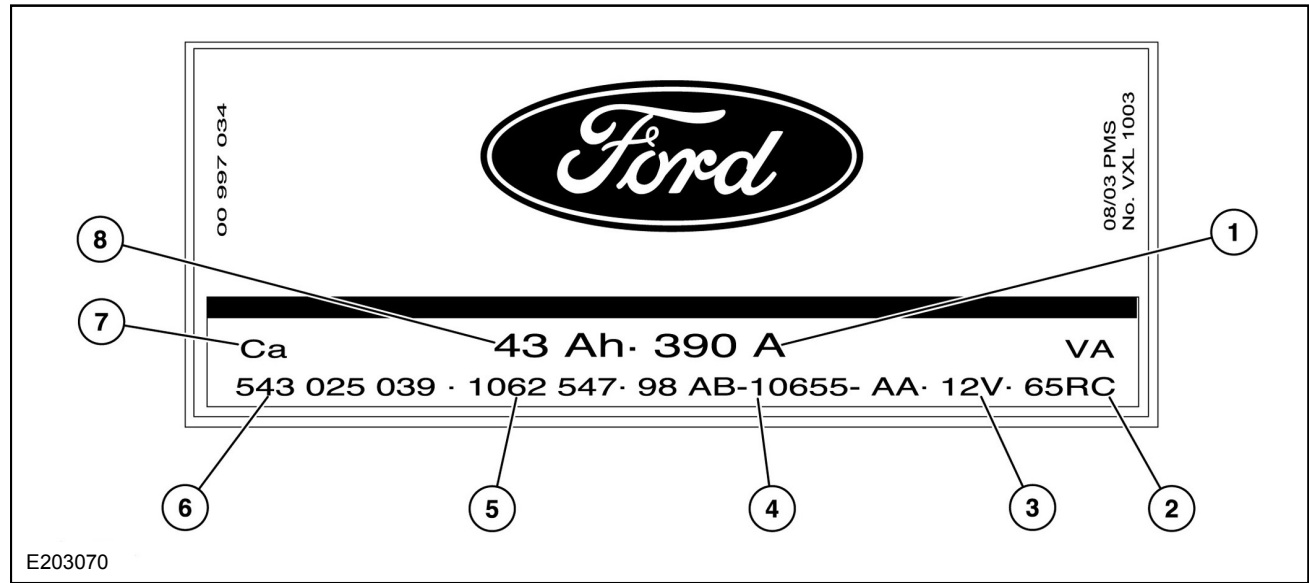
Battery

Battery inspection

REFER to: Battery and Battery Charging Health and Safety Precautions (100-00 General Information, Description and Operation).

1. Inspecting the Battery before starting the test, visually inspect the battery for:
2. Cracked, buckled or leaking case. If you see any of these defects, replace the battery. DO NOT CHARGE THE BATTERY.
3. Corroded, loose or damaged cables and connections. If you see any of these defects, repair or replace as needed.
4. Corrosion on the battery terminals, dirt or acid on the case top. If you see any of these defects, Clean the case and terminals using a wire brush and a mixture of water and baking soda.
5. Low electrolyte level. If the electrolyte level is too low, add distilled water to the level indicated by the battery manufacturer. Do not overfill.

Battery Identification



Item	Description
1	Cold crank amp (CCA) rating
2	Reserve capacity (RC) rating (minutes)
3	Battery voltage
4	Ford Part number
5	FINIS code
6	EN number (European Norm)
7	Battery type: Ca = Calcium; Sb = Lead/Antimony
8	Amp hour rating



DIAGNOSIS AND TESTING (Continued)

Battery Drain Test

This test will determine if there is any external load that would cause unwanted battery discharge. Disconnect the battery ground cable and connect the positive lead of a voltmeter to the cable. Connect the negative leads of the voltmeter to the battery negative post. With all circuits off, the meter should read <50mA. Any battery external load will cause the voltmeter to read full battery voltage.

Battery test equipment

NOTE: Anyone of the Ford approved battery test equipment can be used from the list below.

- Midtronics MDX-650 (Example) or P-300/P-600/490/1050
- Midtronics GRX-3590 (Example) or 3000
- Voltmeter/Hydrometer

MDX-650



E192954

NOTE: Before performing the test disconnect the battery, as the BCM draws current for upto 45 minutes even when the ignition is off and the key is removed from the ignition. Failure to follow the instruction may give an incorrect reading.

- Disconnect the battery ground cable at the battery negative (-) post.

- Connect the positive red clamp of the Midtronics MDX-650 battery tester to the battery positive (+) post.
- Connect the negative black clamp of the Midtronics MDX-650 battery tester to the battery negative (-) post.


A poor connection will prevent testing and the battery tester will display the message CHECK CONNECTION. If this message appears after you have correctly reconnected the clamps, clean the terminals and reconnect.

1. Select BATTERY TEST or START-STOP BATTERY TEST.
 - Press the NEXT key to continue.
 2. Select the BATTERY LOCATION
 - UNDER HOOD
 - UNDER SEAT
 - OUT OF VEHICLE
 - Press the NEXT key to continue.
 3. Select the negative POST TYPE (IN-VEHICLE ONLY)
 - BATTERY POST
 - JUMP START POST
 - JUMP START POST (Battery Monitoring Sensor)
 - Press the NEXT key to continue.
 4. Select the BATTERY RATING from the drop down list.
 - Press the NEXT key to test the battery.
 5. If the battery under test is not listed in the drop down list, it can still be selected with the MANUAL ENTRY mode. This is item 11 of 11 in the list.
- The Midtronics MDX-650 battery tester will display the word TESTING while it evaluates the battery. If battery fails test, charge battery for 2 hours and repeat test. If battery fails a retest replace the battery.
- End of this Diagnosis.



DIAGNOSIS AND TESTING (Continued)

Battery tester results and required actions

Battery Tester Reading	Action
GOOD BATTERY	Return the battery to service
GOOD - RECHARGE	Fully charge the battery and return it to service
CHARGE & RETEST	Fully charge the battery and retest (failure to fully charge the battery before retesting may cause false readings)
REPLACE BATTERY	If the battery initially fails the test, charge the battery for 2 hours, this assures that the battery was not just highly discharged. For example (Lights left on overnight) then repeat the test; if the battery fails a secondary test then replace the battery.
BAD CELL BATTERY	 WARNING: Do not recharge the battery. Make sure that the surface charge was removed. A "REPLACE BATTERY" result could also mean a poor connection between the battery cables and the battery. Check the connections are OK and retest. If the result remains the same, INSTALL a NEW battery.



DIAGNOSIS AND TESTING (Continued)

Midtronics MDX-650 Battery Tester Test Code

At the end of the test, use the arrow keys to scroll down the screens to see additional information.

One of these is the TEST CODE.

The TEST CODE has 11 digits, for example:
0021U-B88WKX will be included in the print out.

Midtronics GRX-3590 (Example) or 3000

Using the GRX-3590



The Midtronics GRX-3590 is both a battery charger and battery tester and automatically removes the surface charge as part of the normal operating procedure.

The Midtronics GRX-3590 can be used on a battery in-vehicle or out-of-vehicle.

- Disconnect the battery ground cable.
- Connect the positive red clamp from the Midtronics GRX-3590 to the battery positive terminal.
- Connect the negative black clamp from the Midtronics GRX-3590 to the battery negative terminal.
- Connect the AC power cable to the mains outlet and switch ON.

- To disconnect the Midtronics GRX-3590, reverse the connection procedure.

The Midtronics GRX-3590 will automatically carry out a charge cycle before giving the resulting test code. It will bring the battery into a serviceable condition and if required can proceed to fully charge the battery.



DIAGNOSIS AND TESTING (Continued)

Diagnostic charging

- Select the battery LOCATION: UNDER HOOD, UNDER SEAT or OUT OF VEHICLE. Press NEXT to continue.
- In case of UNDER HOOD or UNDER SEAT, please enter the TEST LOCATION: BATTERY POST, JUMP START POST or JUMPER POST (BMS). Press NEXT to continue.
- Select the BATTERY RATING. Press NEXT to continue.
- When the charge cycle is completed, the GRX sounds an alarm and displays the results. These results can also be printed (OPTIONAL).

Voltmeter/Hydrometer

TEST PREPARATION

- Battery surface charge has to be removed before battery testing. Turn the headlights on for 5 seconds. Remove the key from the ignition and ensure all electrical items are turned off and that all doors /deck lid / lift gate are closed and allow the key off loads to reach their steady state value.
- Inspecting the battery before starting the test, visually inspect the battery for:
- Cracked, buckled, or leaking case. If you see any of these defects, replace the battery. DO NOT CHARGE THE BATTERY.
- Corroded, loose or damaged cables and connections. If you see any of these defects, Repair or replace as needed.
- Corrosion on the battery terminals, dirt or acid on the case top. If you see any of these defects, Clean the case and terminals using a wire brush and a mixture of water and baking soda.
- Low electrolyte level. If the electrolyte level is too low, add distilled water to the level indicated by the battery manufacturer. Do not overfill.
- Corroded or loose battery terminals, tray and holddown fixture. If you see any of these defects, Tighten or replace as needed.

1. MEASURE BATTERY "IN VEHICLE" CONDITION

Use multi-meter/voltmeter to measure voltage. If the battery voltage is below 12.5 Volts carry out a hydrometer test. If no voltage is measured, do not charge battery, instead replace defective unit.



NOTICE: Remove the battery from the vehicle.

2. BATTERY TEST WITH BATTERY REMOVED FROM VEHICLE



- Remove battery from vehicle, check for damage or leakage. REFER to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation).
- Ensure that the battery temperature is below 40°C.
- Use hydrometer for measuring specific gravity (SG). If difference of SG is more than 0.04 in any of the cells, replace the battery. If the SG measured is within 0.04 of each other then follow the below process.
- Securely connect charger cable clamp to battery post/terminal, please note that battery cell caps have vent feature and do not have to be opened during charging process.
- Initiate battery charge process for duration indicated in table, Referencing results of SG test. (refer to the battery charge procedure within this document)
- During charging process the current will decrease as battery charge acceptance decreases. The battery should be monitored for gassing and leakage during the charging process.
- The charger connection should be disconnected at the end of charging duration.
- When the charging process is complete, allow the battery to rest for 10 minutes to stabilize it.
- Voltage and SG should be measured, voltage should be above 12.5V and the difference in SG between cells <0.04.
- If the battery fails the retest, replace the battery.
- Install the recharged battery into vehicle.
- End of the Diagnosis.




DIAGNOSIS AND TESTING (Continued)


Charging time based on specific gravity (manual charging)

SG. before charging	Charging Time
1.250-1.240	3 Hrs.
1.239-1.230	4 Hrs.
1.229-1.200	5 Hrs.
1.199-1.180	7 Hrs.
1.179-1.160	8 Hrs.
1.159-1.140	9 Hrs.
1.139-1.120	10 Hrs.
1.119-1.000	12 Hrs.

Battery Charging

NOTICE:

 **Batteries contain sulphuric acid, avoid contact with skin, eyes or clothing. Wear safety goggles when working near the battery to protect against possible splashing of the acid solution.**

 **Batteries normally produce explosive gases. Do not allow naked flames, sparks or lighted substances to come near the battery.**

 **When charging the battery shield your face and wear safety goggles. Provide adequate ventilation.**

 **Boost charging with excessive current or voltage above 16 volts will damage the battery.**

Using the table below calculate the required charging current.

NOTE: Charging current should be approximately 10% of the battery Ah rating.

Indicative Charge Table

Specification	Charging current
36Ah, 290CCA	3.6 A
43Ah, 390CCA	4.3 A
60Ah, 590CCA	6.0 A
68Ah, 740CCA	6.8 A
70Ah, 680CCA	7.0 A
80Ah, 800CCA	8.0 A

NOTE: Always read the manufacturer's instructions before attempting to charge a battery and ensure you have a good quality approved battery charger. The battery type and its internal components will determine which type of charger is required.

- Using a suitable battery charger, charge the battery.

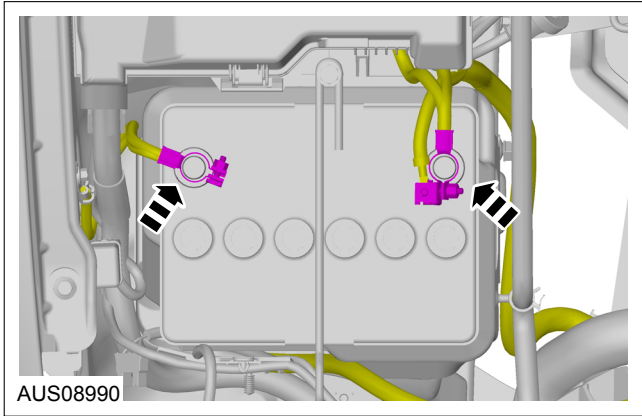


REMOVAL AND INSTALLATION

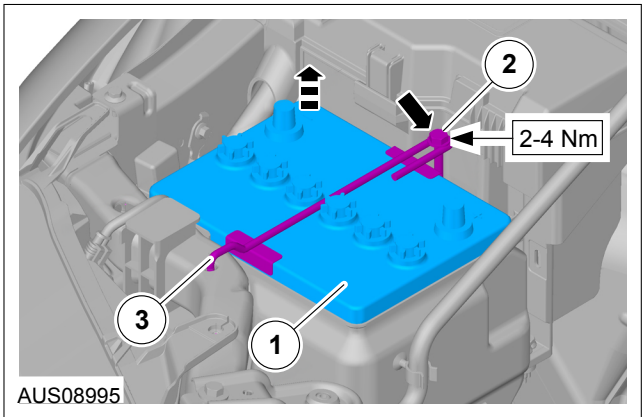
Battery and Cables

Removal

1. Disconnect the battery cables.



2. Remove the hold down bolts.
3. Remove the hold-down.
4. Remove the battery.



Item	Description
1	Battery Assembly
2	Bolt M8x210
3	Battery Hold-Down Clamp

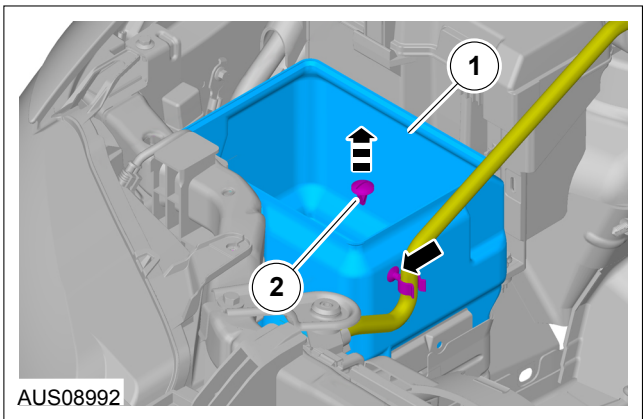
Installation

1. Reverse removal procedure.

Battery Tray

Removal

1. Remove the battery. For additional information, refer to battery procedure in this section.
2. Remove tray as shown in figure.



Item	Description
1	Battery Tray
2	Clip

Installation

1. Reverse removal procedure.

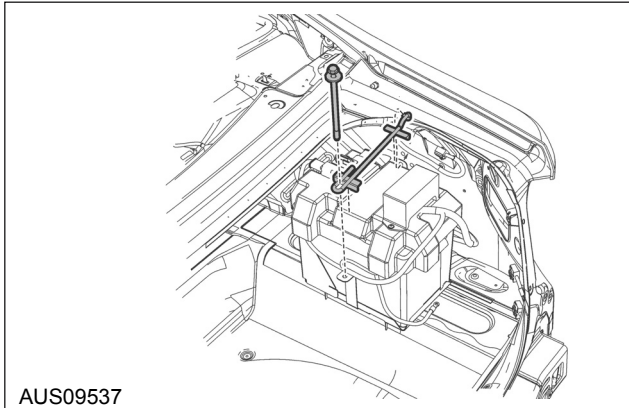


REMOVAL AND INSTALLATION

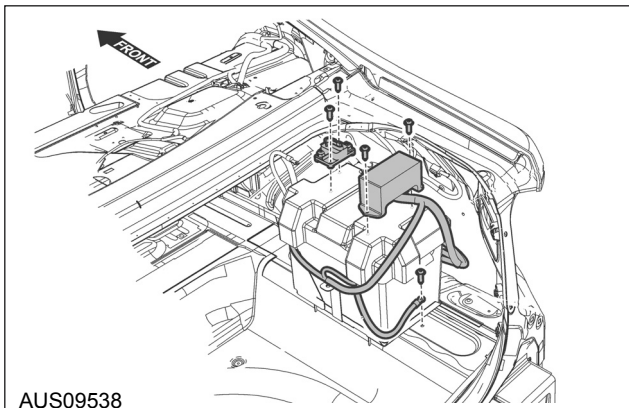
Police Battery

Removal

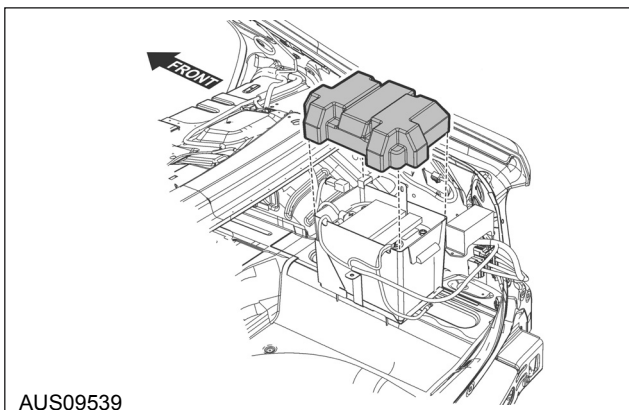
1. Remove the hold down bolt and remove the hold-down.



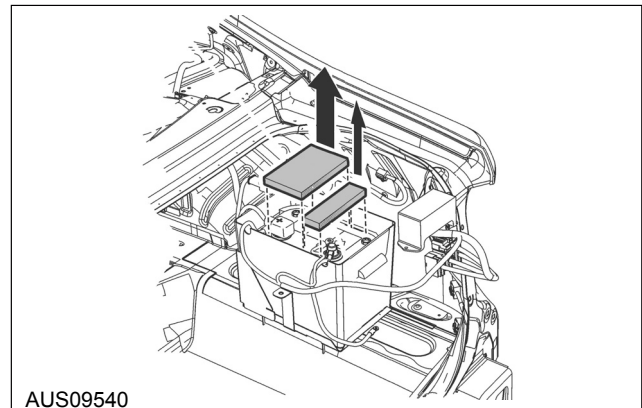
2. Remove the circuit breaker and police battery fuse box retaining screws and position them aside.



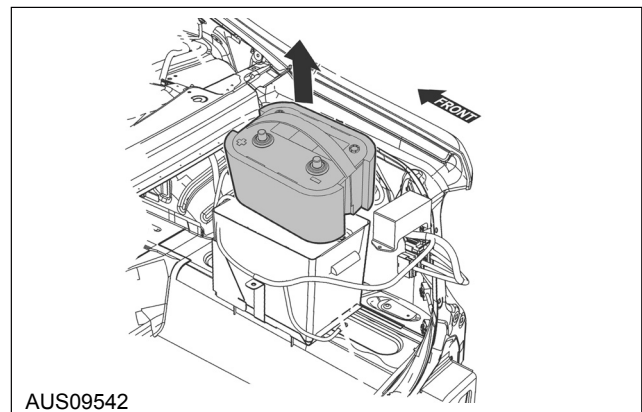
3. Remove the police battery box lid.



4. Remove the insulating foam.



5. Disconnect the battery cables and position aside.
6. Remove the battery.



Installation

1. Installation is reversal of removal procedure.

