CR-HD

USER'S MANUAL

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• To take full advantage of the unit, you should be familiar with the engine.
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Safety Precautions and Warnings

To prevent personal injury or damage to vehicles and/or the CR-HD, please read this user's manual first carefully and observe the following safety precautions at a minimum whenever working on a vehicle:

• Always perform automotive testing in a safe environment.
• Do not attempt to operate or observe the tool while driving a vehicle. Operating or observing the tool will cause driver distraction and could cause a fatal accident.
• Wear safety eye protection that meets ANSI standards.
• Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
• Operate the vehicle in a well-ventilated work area: Exhaust gases are poisonous.
• Put blocks in front of the drive wheels and never leave the vehicle unattended while running tests.
• Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running.

v

- Put the transmission in P (for A/T) or N (for M/T) and make sure the parking brake is engaged.
- Keep a fire extinguisher suitable for gasoline/chemical/ electrical fires nearby.
- Don't connect or disconnect any test equipment while the ignition is on or the engine is running.
- Keep the CR-HD dry, clean, free from oil/water or grease. Use a mild detergent on a clean cloth to clean the outside of the CR-HD, when necessary.

Table of Contents

1. INTRODUCTION

The CR-HD is specially developed by LAUNCH for heavy-duty vehicles, which enables users to read DTCs, clear DTCs and view the datastream with a live color graphing. It covers a wide range of vehicles since it offers multiple data bus protocols, such as J1587 and J1939. It can be connected to PC through the USB cable for upgrade to keep updated with the latest software version.

Notice: CR-HD may automatically reset while being disturbed by strong static electricity. THIS IS A NORMAL REACTION.

2. General Information

2.1 About DTC

Diagnostic Trouble Codes (DTC) are codes that are stored by the on-board computer diagnostic system in response to a problem found in the vehicle. These codes identify a particular problem area and are intended to provide you with a guide as to where a fault might be occurring within a vehicle. This section explains the basic elements of fault codes for J1587/J1708 and J1939 data bus protocols, how to view these codes on CR-HD, and what they mean. Each fault code on CR-HD contains three distinct pieces of information, as described below.

J1587/J1708 fault codes consist of the following, in this order:

• Subsystem Identifier (SID) – Indicates what function on the ECU has failed.
• Failure Mode Indicator (FMI) – Indicates in what way the function failed.
• Occurence (OC) – Indicates the occurence times of fault codes.

J1939 fault codes consist of the following, in this order:

• Suspect Parameter Number (SPN) – Indicates what function on the ECU has failed.
• Failure Mode Indicator (FMI) – Indicates in what way the function failed.
• Occurence (OC) – Indicates the occurence times of fault codes.

2.2 J1708/J1587/J1939

SAE J1708, SAE J1587 and SAE J1939 are automotive diagnostic protocol standard developed by the Society of Automotive Engineers (SAE).

SAE J1708

SAE J1708 is a standard used for serial communications between ECUs on a heavy duty vehicle and also between a computer and the vehicle. With respect to Open System Interconnection model (OSI), J1708 defines the physical layer. Common higher layer protocols that operate on top of J1708 are SAE J1587 and SAE J1922.

SAE J1587

SAE J1587 is an automotive diagnostic protocol standard developed by the Society of Automotive Engineers (SAE) for heavy-duty and most medium-duty vehicles built after 1985. The J1587 protocol uses different diagnostic connectors. Up to 1995, individual OEMs used their own connectors. From 1996 to 2001, the 6-pin Deutsch-connector was standard. Beginning in 2001, most OEMs converted to the 9-pin Deutsch. Some OEMs still use the 6-pin Deutsch. It has mostly been used for US made vehicles, and also by Volvo.

SAE J1708 makes up the physical and data link layers while SAE J1587 makes up the transport and application layers with respect to the OSI model. SAE J1587 is used in conjunction with SAE J1708 for automobile communication.

SAE J1939

SAE J1939 is the vehicle bus standard used for communication and diagnostics among vehicle components, originally by the car and heavy duty truck industry in the United States.

SAE J1939 is used in the commercial vehicle area for communication throughout the vehicle. With a different physical layer it is used between the tractor and trailer. This is specified in ISO 11992.

SAE J1939 can be considered the replacement for the older SAE J1708 and SAE J1587 specifications.

SAE J1939 has been adopted widely by diesel engine manufacturers. One driving force behind this is the increasing adoption of the engine Electronic Control Unit (ECU), which provides one method of controlling exhaust gas emissions within US and European standards. Consequently, SAE J1939 can now be found in a range of diesel-powered applications: vehicles (on- and off-road), marine propulsion, power generation and industrial pumping.

Applications of J1939 now include off-highway, truck, bus, and even some passenger car applications.

3. Product Descriptions

3.1 Outline of CR-HD

Figure 3-1

No.	Name	Descriptions
①	**Cable with OBD II CONNECTOR**	Connects the CR-HD to the vehicle's Data Link Connector (DLC).
②	**LCD DISPLAY**	Indicates test results.

③	**ENTER BUTTON**	Confirms a selection (or action) from a menu list.
④/⑥	**UP/DOWN BUTTONs**	Move cursor up or down for selection.
⑤/⑦	**RIGHT/LEFT BUTTONs**	Move cursor right or left for selection; Or turn page up or down when more than one page is displayed.
⑧	**USB PORT**	Connects to computer to update the CR-HD online.
⑨	**EXIT BUTTON**	Returns to previous menu.
A	**RED LED INDICATOR LAMP**	DTC indicator; once DTCs are found, the red indicator lamp will light up.
B	**GREEN LED INDICATOR LAMP**	No DTC indicator; when there are no DTCs, the green indicator lamp will light up.
C	**6 PIN DLC ADAPTOR (For vehicles with 6 PIN DLC)**	Connect 16 pin terminal of the adaptor to OBD II connector, and other end to the vehicle's DLC.
D	**9 PIN DLC ADAPTOR (For vehicles with 9 PIN DLC)**	Connect 16 pin terminal of the adaptor to OBD II connector, and other end to the vehicle's DLC.

3.2 Specifications

• Screen: 2.8" TFT 262K true color, 320*240 QVGA LCD display
• Input voltage range: 8~32V
• Operating current: <100mA@12V (Typical)
• Power consumption: <1.2W (Typical)
• Operating temperature: 32°F~122°F / 0°C~50°C
• Storage tempetature: -4°F~158°F / -20°C ~70°C @ RH60%
• Outline dimension: 4.7'*3.2'*1.0' / 121*82*26 mm LWH
• Weight : <17.6 oz (500g)

3.3 Accessories Included

1. User's Manual -- Instructions on tool operations
2. 6 PIN DLC adaptor
3. 9 PIN DLC adaptor
4. USB cable -- Connect to a computer for upgrading online

3.4 Power supply

The power of the CR-HD is provided via the vehicle's Data Link Connector (DLC). Follow the steps below to power it up:

1. Find DLC on heavy-duty vehicle;
   A plastic DLC cover may be found for some vehicles and you need to remove it before plugging the 6 PIN or 9 PIN DLC diagnostic adaptor.
2. Plug one end of 6pin or 9pin DLC diagnostic adaptor into the included OBD II 16 pin connector, and connect the other end to the heavy-duty vehicle's DLC.

4. OPERATION

4.1 Connection

1. Turn the ignition off.
2. Locate the heavy-duty vehicle's Data Link Connector (DLC).
3. Select the desired diagnostic adaptor according to your vehicle's DLC. Plug one end of 6pin or 9pin DLC diagnostic adaptor into the included OBD II 16 pin connector, and connect the other end to the heavy-duty vehicle's DLC.
4. Turn the ignition on. Engine can be off or running.
5. After finishing, the system will enter the main menu interface, as shown in Figure 4-1.
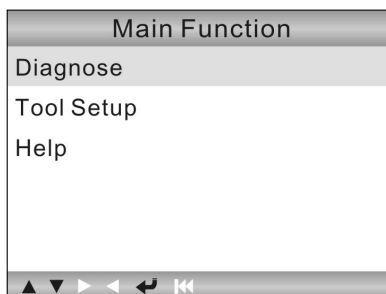
Figure 4-1

CAUTION: *Don't connect or disconnect any test equipment with ignition on or engine running.*

4.2 Diagnose

In Figure 4-1, use [▲] [▼] button to select [Diagnose] and press [↵], the system will switch to the following protocol selection interface:
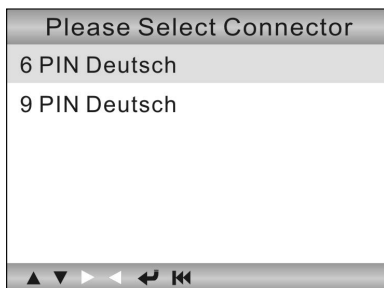
Please Select Connector

6 PIN Deutsch

9 PIN Deutsch

Figure 4-2

A. Selecting SAE J1708 6 PIN Deutsch

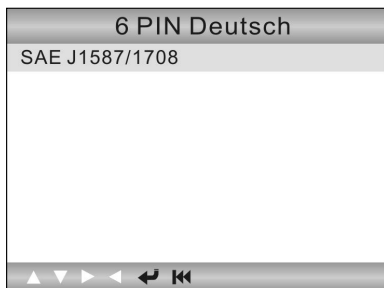Use [▲] [▼] button to select [6 PIN Deutsch] and press [↵], a screen similar to Figure 4-3 will appear:

6 PIN Deutsch

SAE J1587/1708

Figure 4-3

Select one desired item and press [↵], the system will switch to Function selection screen. See Figure 4-7.

B. Selecting SAE J1939 9 PIN Deutsch

If [9 PIN Deutsch] is selected, press [↵], a screen similar to Figure 4-4 will appear:

Figure 4-4

Press [▲] [▼] button to highlight [SAE J1587/1708], and press [↵], the following screen will appear:
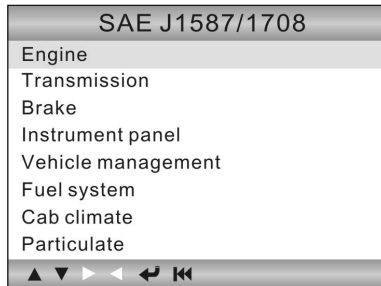
Figure 4-5

If [SAE J939] is selected in Figure 4-4, press [↵], the screen will appear as follows:
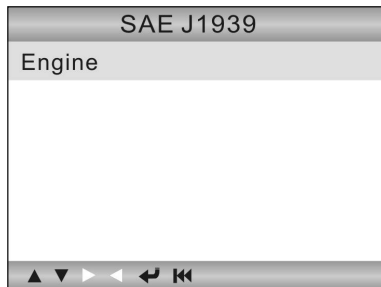

Figure 4-6

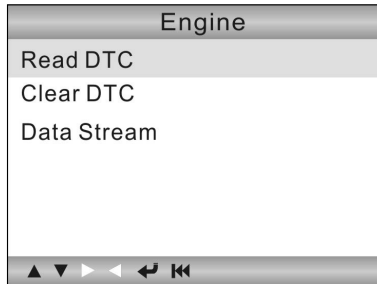After selecting the system item, press [↵], the screen will appear as below:

Figure 4-7

4.2.1 Read DTC

Select [Read DTC] and press [↵] in Figure 4-7, it will jump to the following screen:
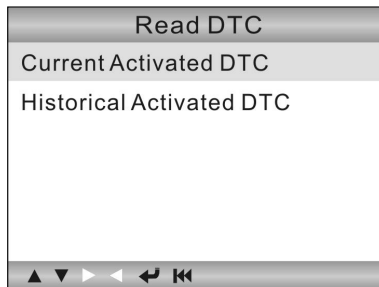

Figure 4-8

Press [▲] [▼] button to highlight one desired item and press [↵], a screen similar to Figure 4-9 will appear:
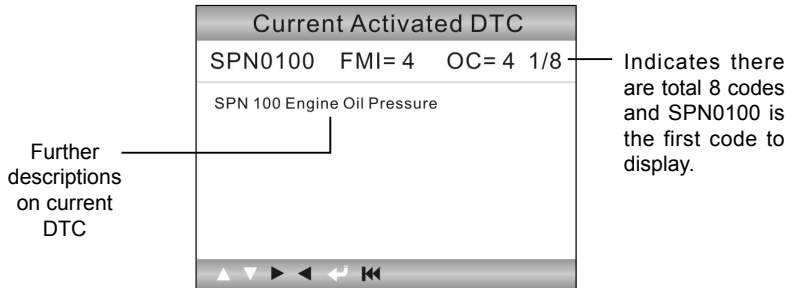
Figure 4-9

Generally, there are three elements displayed on the first row and the second row indicates detailed descriptions on DTC, as shown in Figure 4-9:

- Suspect Parameter Number (SPN) – Indicates what function on the ECU has failed.
- Failure Mode Indicator (FMI) – Indicates in what way the function failed.
- Occurence (OC) – Indicates the occurence times of the current DTC.

Whereas, if we choose [SAE J1587/1708], the faults code will be displayed similar to Figure 4-10:

- Subsystem Identifier (SID) – Indicates what function on the ECU has failed.
- Failure Mode Indicator (FMI) – Indicates in what way the function failed.
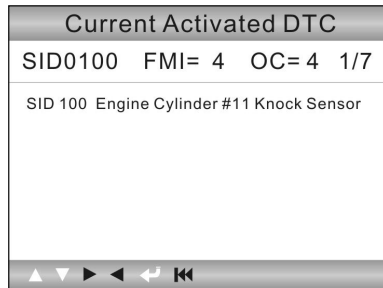- Occurence (OC) – Indicates the occurence times of the current DTC.

Figure 4-10

Press [▶] / [◀] to view the next or previous code; press [◀◀] to exit and return to the Function screen.

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4.2.2 Clear DTC

Select [Clear DTC] and press [↵], the system will switch to the following screen.

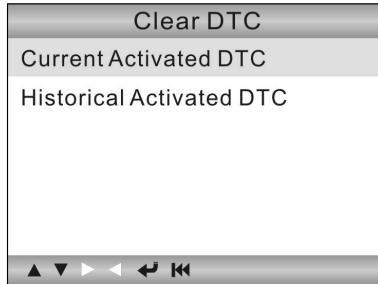<p align="center">Figure 4-11</p>

Select one desired item and press [↵], a prompt message will appear on the screen, as shown in Figure 4-12.
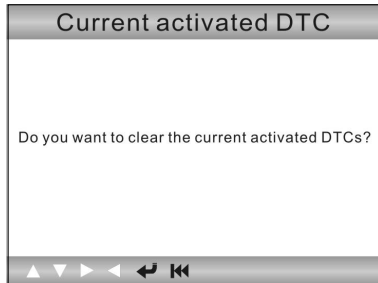

<p align="center">Figure 4-12</p>

Press [↵] to erase DTCs, and if successfully, "Succeed" will be shown on the screen. Press [◄◄] to exit and return to the Function screen.

If it fails to communicate with ECU, a screen similar to Figure 4-13 will appear:
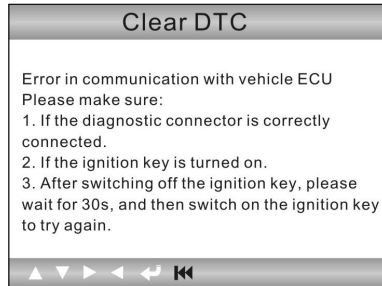
Figure 4-13

Follw the on-screen instructions to check the possible cause. Press [◄◄] to exit and return to the previous screen.

Note: After clearing, you should retrieve trouble codes once more or turn ignition on and retrieve codes again. If there are still some trouble codes in the system, please troubleshoot the code using a factory diagnosis guide, then clear the code and recheck.

4.2.3 Data Stream

Press [▲] [▼] button to select [Data Stream] in Main Menu screen and then press [ ] button to confirm, the screen will display as Figure 4-14:
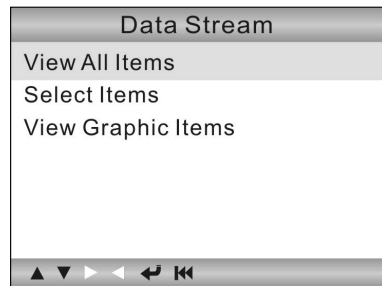

Figure 4-14

4.2.3.1 View All Items

Use [▲] [▼] button to select [View All Items] and press [ ], a screen similar to Figure 4-15 will appear:

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Figure 4-15

Press [▶] [◀] to view other data streams; press [◀◀] to return to the Data Stream menu screen.

4.2.3.2 Select Items

Use [▲] [▼] button to select [Select Items] in Figure 4-14 and press [↵], a screen similar to Figure 4-16 will appear:

Figure 4-16

Press [▲] [▼] button to select datastream items, and press [▶] [◀] to turn page, the screen will appear as shown in Figure 4-17:

Select Items

[✓]	SPN22 Engine Extended Crankcase Blow-by Pressure
[✓]	SPN29 Accelerator Pedal Position 2
[✓]	SPN52 Engine Intercooler
[✓]	SPN81 Engine Particulate Trap Inlet
[✓]	SPN91 Accelerator Pedal Position 1

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View Items

SPN22 Engine Extended Crankcase Blow-by Pressure	12.75kPa
SPN29 Accelerator Pedal Position 2	102%
SPN52 Engine Intercooler	215degC
SPN81 Engine Particulate Trap Inlet	127.5kPa
SPN91 Accelerator Pedal Position 1	101.6%

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Figure 4-17   Figure 4-18

After selecting items and press [↵], it will enter Figure 4-18. See Figure 4-18 shown as above.

4.2.3.3 View Graphic Items

Press [▲] [▼] button to select [View Graphic Items] in Figure 4-14 and press [↵], the system will enter the datastream selection interface. Select one desired item as shown in Figure 4-19 and press [↵], a screen similar to Figure 4-20 will appear:

Select Data Stream

[ ]	SPN22 Engine Extended Crankcase Blow-by Pressure
[✓]	SPN29 Accelerator Pedal Position 2
[ ]	SPN52 Engine Intercooler
[ ]	SPN81 Engine Particulate Trap Inlet
[ ]	SPN91 Accelerator Pedal Position 1

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View Graphic Items

max   77   6852   25   0·950

min   -24   634   24   0·030

SPN23=77°C   SPN23=77°C
SPN94=24°C   SPN94=24°C

Figure 4-19   Figure 4-20

4.3 Tool Setup

Select [Tool Setup] in the main menu and press [↵], the system will enter the following screen:

Figure 4-21

1) Beeper: Turn ON/OFF the Beeper.

Select [Beeper] in the main menu and press [↵] to switch to the screen shown as below:
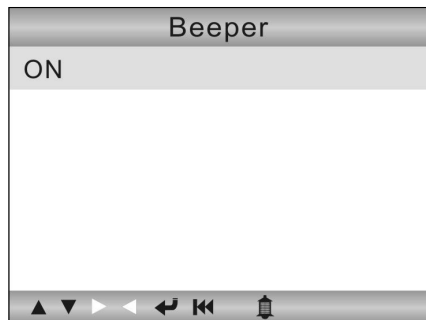
Figure 4-22

The icon 🛎 will appear at bottom of the screen if Beeper is set to ON.

2) Time and Date: Set time and date.

Select [Time and Date] in the main menu and press [↵] to enter the setting screen, as shown in Figure 4-23.

Set Time And Date

01 / 01 / 2012

20: 00 :00

Press [▲] or [▼] to change input, press [▶] or [◀] to
select position, then press [↵] to confirm.

▲ ▼ ▶ ◀ ↵ ⏮ 🛢

Figure 4-23

Use [▲] [▼] button to change the highlighted numbers; press [▶] [◀] to move
the highlight bar to different position; press [↵] to confirm. Press [⏮] to return
to the Tool setup menu screen.

4.4 Help

This function is used to view Tool Information.

Help

Tool Information

▲ ▼ ▶ ◀ ↵ ⏮

Figure 4-24

Tool Information: includes software version, hardware version, serial number,
supported, time and date.

5. Upgrading

5.1 CR-HD upgrading flow

```
          ┌─────────────────────┐
          │      Visit:         │
          │ www.crecorder.com   │
          └─────────────────────┘
                     │
                     ▼
              ╱──────────╲         N    ┌──────────────────────┐
             ╱ Registered? ╲──────────▶ │  Register a new user │
              ╲──────────╱              └──────────────────────┘
                   │ Y
                   ▼
              ╱──────────────╲     N    ┌──────────────────────┐
             ╱ Driver installed? ╲─────▶│  Download & Install  │
              ╲──────────────╱          │        driver        │
                   │ Y                  └──────────────────────┘
                   ▼
          ┌─────────────────────┐
          │ Download the latest │
          │   upgrade package   │
          └─────────────────────┘
                     │
                     ▼
          ┌─────────────────────┐
          │  Connect CR-HD to PC│
          │  through USB Cable  │
          └─────────────────────┘
                     │
                     ▼
          ┌─────────────────────┐
          │ Click "Start" to upgrade │
          └─────────────────────┘
```
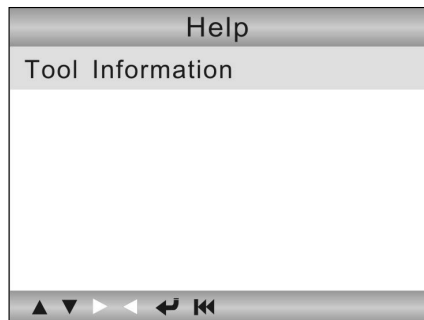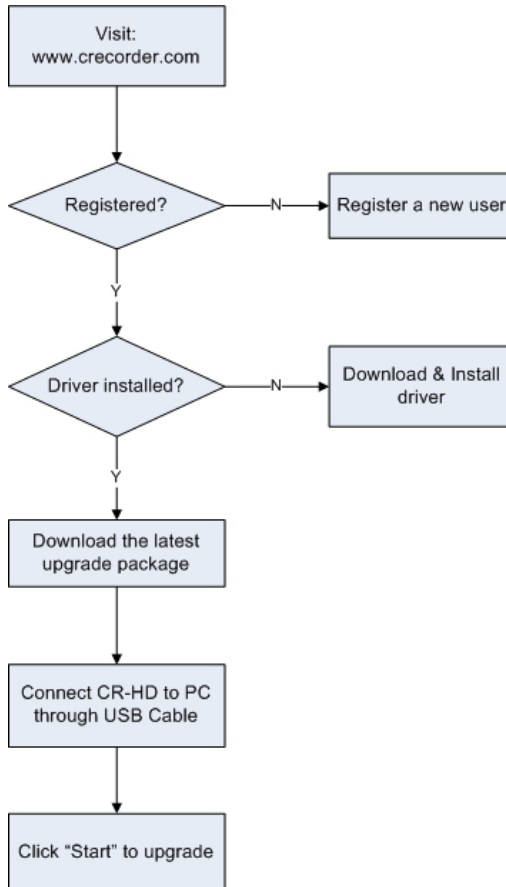
5.2 User registration

As you buy a CR-HD, please visit www.crecorder.com to register, only after successfully registered, you can logon at the site and can download the CR-HD driver & latest version program of CR-HD.

5.3 Upgrading

Log on to www.crecorder.com, download the latest version of the CR-HD upgrade package and decompress the software to local disk.

Connect the CR-HD to computer through USB cable and run the CR-HD Upgrade.exe, The following box will appear:
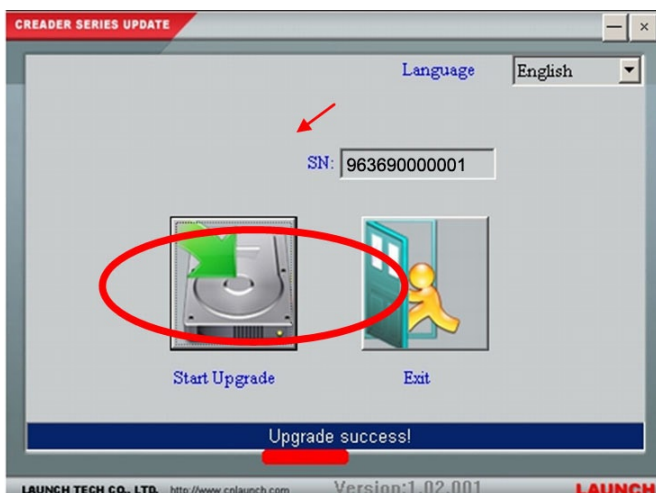

Figure 5-1

Select the language, and then click "Start Upgrade" when a message of upgrading succeed pops out, click "Exit", unplug the USB cable to complete upgrade.

6. FAQ

Here we list some frequently asked questions and answers relating to CR-HD.

Question: System halts when reading data stream. What is the reason?

Answer: It may be caused by a slackened connector. Please turn off the CR-HD, firmly connect the connector, and switch on it again.

Question: Screen of main unit flashes at engine ignition start.

Answer: Caused by electromagnetic disturbing, and this is normal phenomenon.

Question: There is no response when communicating with on-board computer.

Answer: Please confirm the proper voltage of power supply and check if the throttle has been closed, the transmission is in the neutral position, and the water is in proper temperature.

Question: Why are there so many fault codes?

Answer: Usually, it's caused by poor connection or fault circuit grounding.

Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO PERSONS WHO PURCHASE LAUNCH PRODUCTS FOR PURPOSES OF RESALE OR USE IN THE ORDINARY COURSE OF THE BUYER'S BUSINESS.

LAUNCH electronic product is warranted against defects in materials and workmanship for one year (12 months) from date of delivery to the user.

This warranty does not cover any part that has been abused, altered, used for a purpose other than for which it was intended, or used in a manner inconsistent with instructions regarding use. The exclusive remedy for any automotive meter found to be defective is repair or replacement, and LAUNCH shall not be liable for any consequential or incidental damages.

Final determination of defects shall be made by LAUNCH in accordance with procedures established by LAUNCH. No agent, employee, or representative of LAUNCH has any authority to bind LAUNCH to any affirmation, representation, or warranty concerning LAUNCH automotive meters, except as stated herein.

Order Information

Replaceable and optional parts can be ordered directly from your LAUNCH authorized tool supplier. Your order should include the following information:

1. Quantity
2. Part number
3. Item description

Customer Service

If you have any questions on the operation of the unit, please contact local dealer, or contact LAUNCH TECH. CO., LTD:

Tel: 86-755-84528767

E-mail: X431@cnlaunch.com

LAUNCH

www.cnlaunch.com