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2014 NISSAN Altima Coupe OEM Service and Repair Workshop Manual

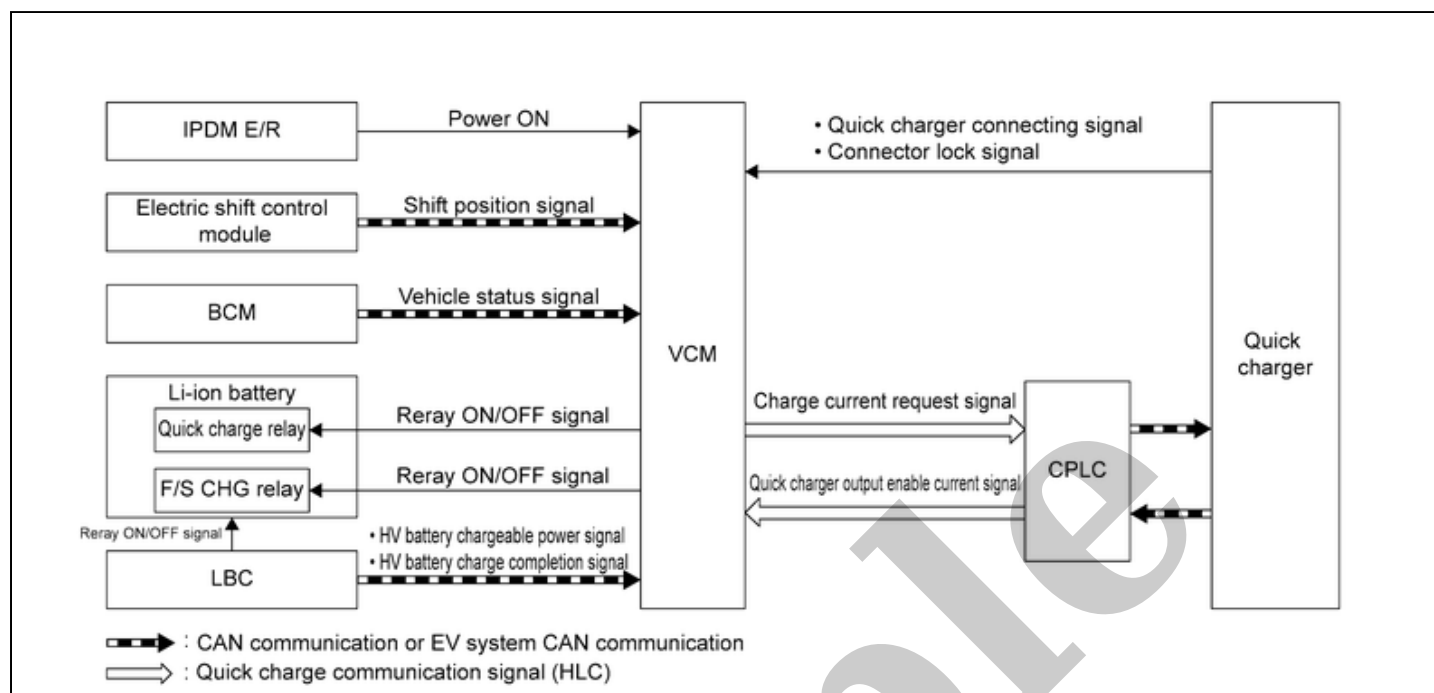
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DESCRIPTION

Charge port control is performed by the VCM. This includes charge connector lock/unlock control which automatically locks charge connector during normal charge and at other times, and charge port light control which automatically turns ON LED illumination inside port to improve charge port visibility when charge connector is inserted or removed. Refer to [System Description](#).

Sample

System Diagram



SIEMD-7198935-01-000377113

Component	Function
VCM	Controls quick charge according to each signal. Connects with quick charger via quick charge port and receives each signal.
LBC	Transmits Li-ion battery status to VCM via CAN communication.
Li-ion battery	Built-in relay is operated according to signal from VCM and LBC
Electric shift	Transmits shift position signal to VCM via CAN communication.
IPDM E/R	Supplies power ON power to VCM.
BCM	Transmits vehicle status signal to VCM via CAN communication.
CPLC	Converts signal of quick charge communication between quick charger and vehicle. For detail Refer to Component Description .

BASIC CONTROL

When quick charge connector is connected to quick charge port and start switch of quick charger is pressed, VCM detects start switch ON by quick charger start/stop signal 1. And then VCM activates F/S CHG relay, system main relay 1, system main relay 2 and quick charge relay to be ready for the quick charge.

—Next, VCM determines charge current request value based on Li-ion battery chargeable power signal received from LBC and quick charger output possible current signal received from quick charger.

Quick charger controls output power according to charge current request signal received from VCM.

When the charge amount reaches the specified amount and VCM receives Li-ion battery charge completion signal from LBC, VCM stops charge.



NOTE:

- Even if Li-ion battery charge level does not reach target level, VCM may stop charge after a certain period of time.

- When Li-ion battery temperature reaches specified temperature or higher, VCM pauses quick charge and enters standby status.
- Charge does not start at power switch ON. If charge is required while power switch is ON, turn power switch OFF and charge starts and then power switch is ON.

QUICK CHARGE MODE

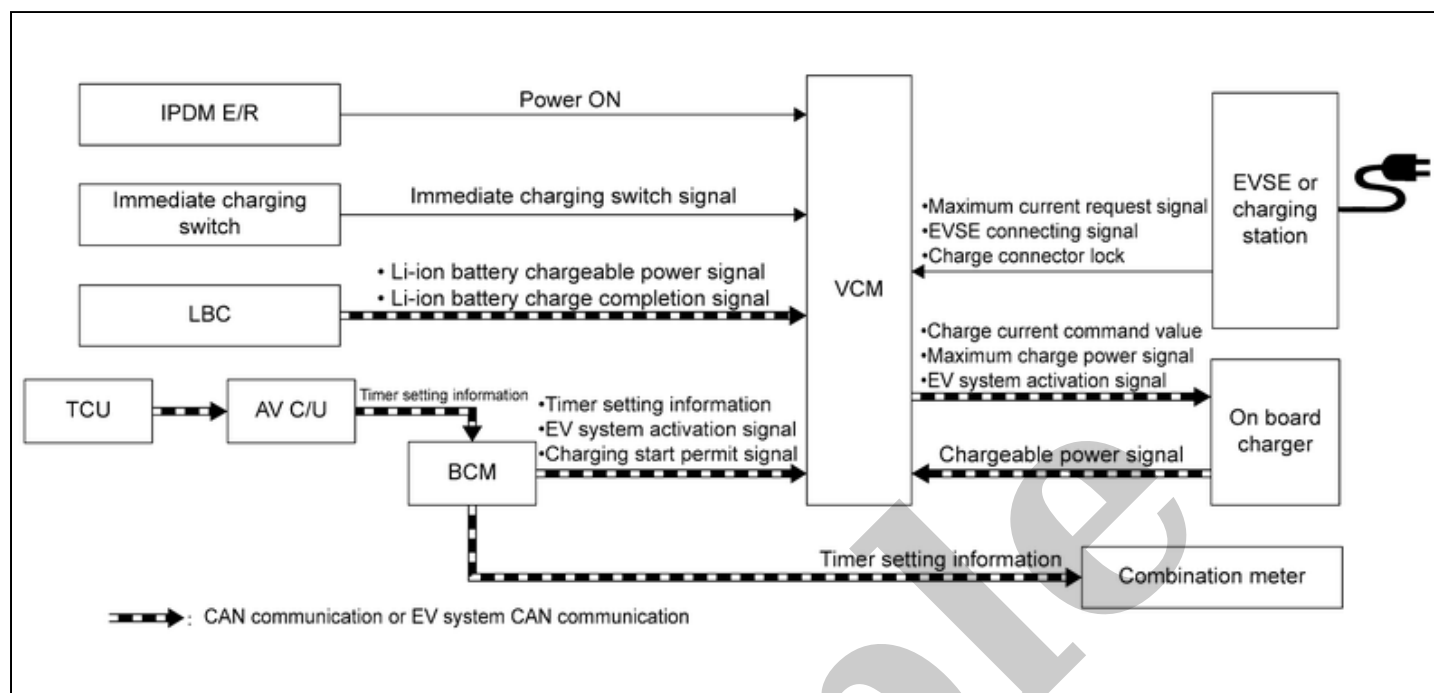
This mode performs charging with quick charger. Even if charge is not completed, when the charge time set on the quick charger or the time-out (maximum 255 minutes) set on vehicle passes, charge is stopped.



NOTE:

- When the battery temperature is low or high, charge is stopped after 255 minutes maximum.
- If charge stopped before charge is completed, additional charge by quick charge can be performed again.

System Diagram



SIEMD-7198934-01-000377109

Component parts	Function
VCM	Controls normal charge according to each signal
On-board charger	Starts normal charge according to VCM command and supplies charge power to Li-ion battery. Refer to Component Description for detail of function.
LBC	Transmits Li-ion battery status to VCM via CAN communication.
IPDM E/R	Supplies power ON power to VCM
TCU	Transmits timer set information to AV C/U
AV C/U	- Transmits timer set information to BCM - Judges vehicle position information and switches timer charge ON/OFF.
Immediate charging switch	Refer to Component Description .
EVSE	Refer to Component Description (120V/240V EVSE) or Component Description (120V EVSE).
Combination meter	When key switch is OFF, displays timer charge set information according to timer set information from BCM.
BCM	Transmits charge permit request or prohibit request to VCM via CAN communication according to timer charge set information

BASIC CONTROL

When EVSE is connected at power switch OFF status, EVSE connection signal is transmitted to VCM. VCM that receives the signal determines as charging mode. VCM also determines the maximum charge power based on the Li-ion battery chargeable power signal received from LBC, the chargeable power signal received from on-board charger, and the maximum current request signal received from EVSE, and transmits the charge current command value to on-board charger determines the charge power based on charge current command value. VCM starts charge by turning ON the system main relays 1 and 2.



NOTE:

When shift position is except P range during READY status and charge connector is connected to charge port, READY is turned OFF and power switch is turned ON and then shift position is N range.

NORMAL CHARGE MODE

This mode performs charging by connecting EVSE (charge cable). Normal charge includes immediate charge mode, timer charge mode, and remote charge mode.

IMMEDIATE CHARGE MODE

This mode performs immediate charge as soon as EVSE is connected. If timer charge is not set, enter charge mode as soon as EVSE is connected. If timer charge is set, immediate charge mode is selected by pressing immediate charge switch.

- When EVSE connection signal is transmitted to VCM, VCM judges that EVSE is connected and turns on-board charger ON to start charge immediately.
- If timer is set, even when EVSE connection signal is transmitted to VCM, charge is not started immediately. If VCM detects immediate charge switch ON signal in this state, VCM judges as immediate charge mode and starts charge.
- When the charge reaches specified amount and VCM receives Li-ion battery charge completion signal from LBC, VCM stops charge.
- When pressing immediate charge switch, immediate charge is performed for 15 minutes. this mode does not reset even if charge connector is unplugged. To return to timer charge after pressing immediate charge switch, press immediate charge switch again during connecting charged connector.

TIMER MODE

BCM starts up automatically and starts charging at the set time.



NOTE:

Timer can be changed by "Timer charge" and "Timer charge at home/Timer charge 1/Timer charge 2/Timer charge 3" of navigation system.

Item	Description
Timer charge 1, Timer charge 2, Timer charge 3	• This mode starts and stops charging according to the timer that is set on VCM. • When VCM receives a Li-ion battery charge completion signal from LBC or at set finish time of timer charge, VCM stops charge.
Timer charge at home	• Timer charge is only possible for normal charge at home. • Immediate charge is automatically selected for normal charge at except home.

REMOTE CHARGE MODE

This mode starts the charge by remote control with mobile tool.



NOTE:

For operation, Refer to [System Description](#).

- When BCM transmits EV system activation request signal to VCM via CAN communication, VCM judges that remote charge mode is selected and starts charge.

- When VCM receives Li-ion battery charge completion signal from LBC, VCM stops charge.

CANCEL CONDITIONS

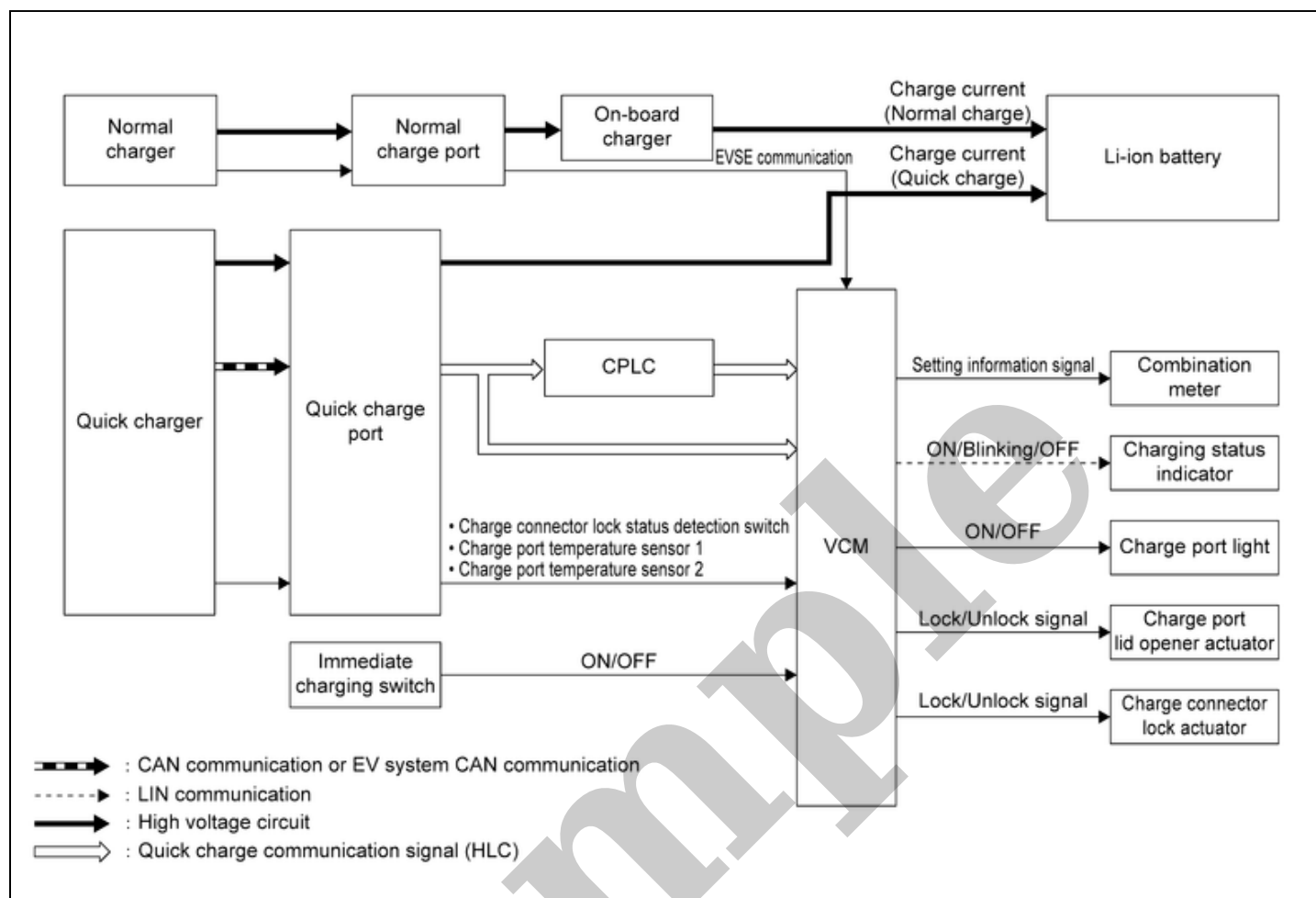
VCM stops normal charge control when VCM detects that EVSE is disconnected.

In addition, when the following conditions are satisfied, VCM pauses normal charge and enters standby status.

- When communication from EVSE and AC voltage are interrupted.
- When EVSE connector release switch is ON.
- When Li-ion battery temperature reaches the specified temperature or higher.

Sample

System diagram



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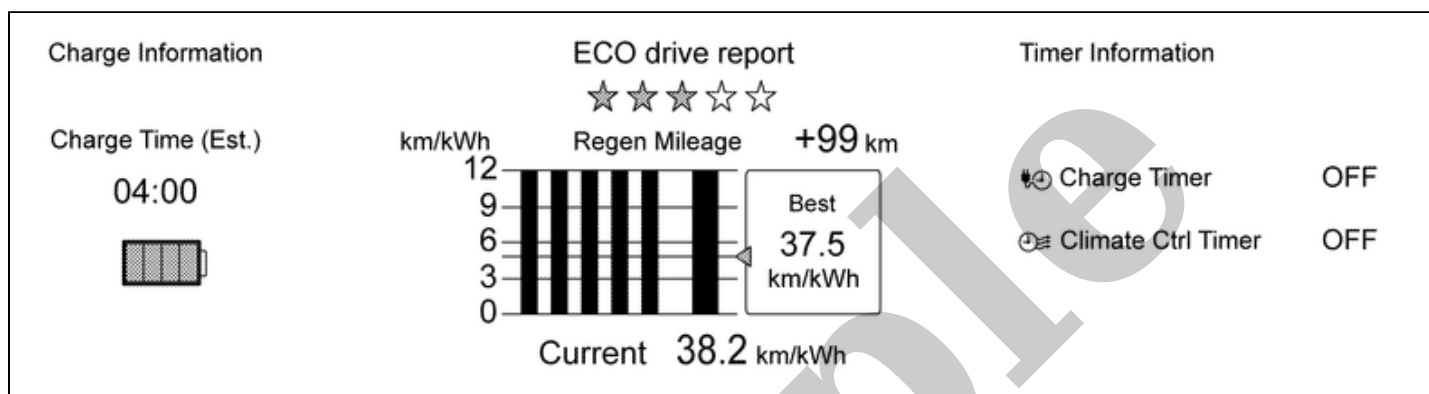
Component	Function
On-board charger	Refer to Component Description .
VCM	Control related to vehicle charging system is integrated. For detail Refer to Component Description .
CPLC	Refer to Component Description .
Combination meter	Charge connector lock system setting can be changed
EVSE (Charge cable)	Refer to Component Description (120V/240V EVSE) or Component Description (120V EVSE).
Charging status indicator	Refer to Component Description .
Immediate charging switch	Refer to Component Description .
Charge port	Refer to Component Description .
Charge port light	Refer to Component Description .
Charge connector lock actuator	Refer to Component Description .
Charge port lid opener actuator	Charge port lid is unlocked according to operation signal from VCM For detail Refer to Charge Port Lid Actuator .

DESCRIPTION

Vehicle charging system is mainly controlled by VCM.

Item	Description	Reference page
Li-ion battery charge control	Automatically selects a charge mode that is suitable for the external power source and controls Li-ion battery charging.	Refer to System Description .
Charge port control	VCM performs comprehensive control to improve efficiency of charge work.	Refer to System Description .
Variable voltage control system	DC/DC converter output is changed according to command from VCM	Refer to System Description .
Automatic 12V battery charge control	DC/DC converter controlled by VCM command and 12 V battery is charged.	Refer to System Description .

Setting information of vehicle charging system can be checked on "Vehicle information" screen of information display in combination meter.



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