

Your Ultimate Source for OEM Repair Manuals

FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

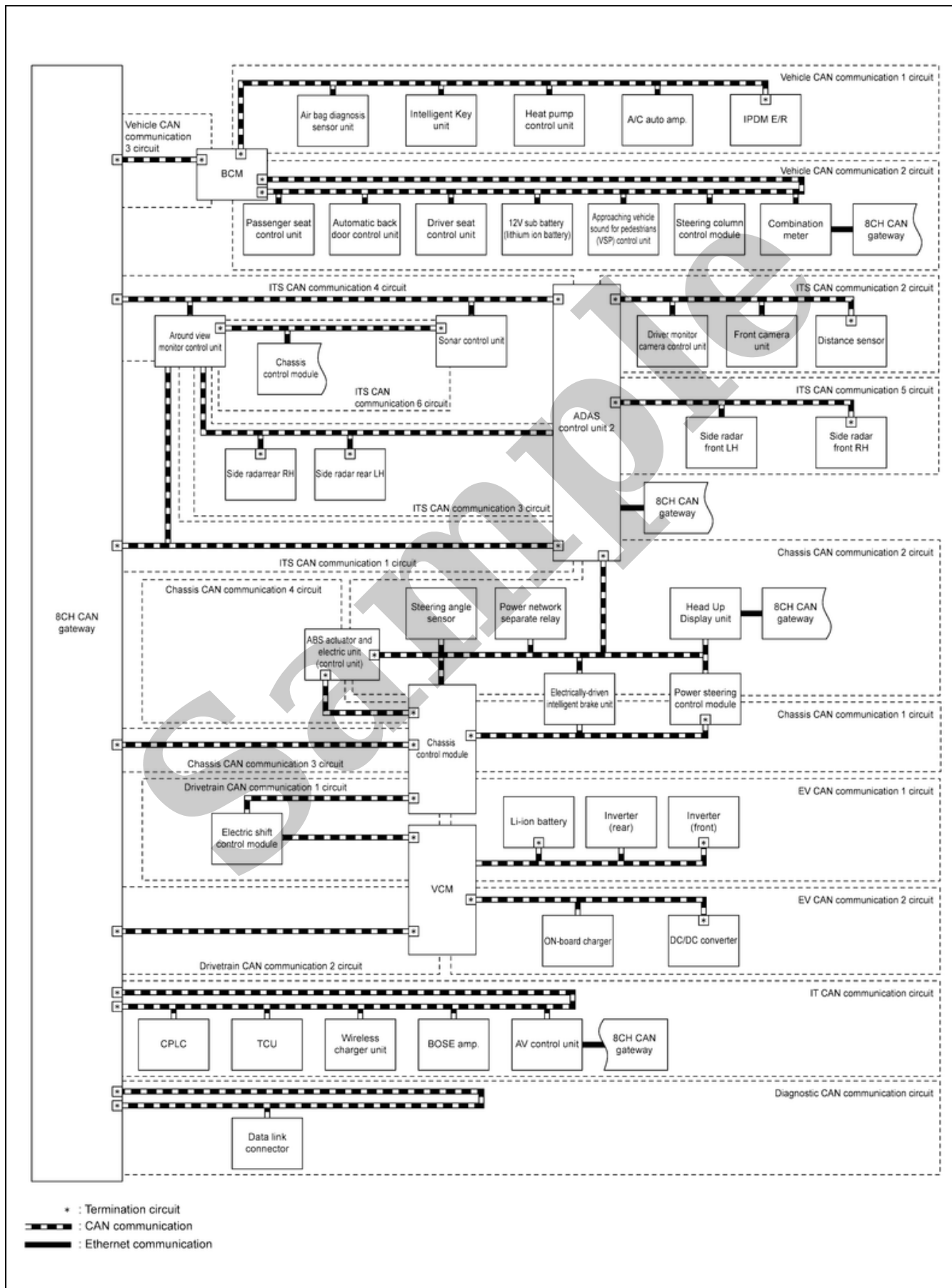
2016 NISSAN Frontier OEM Service and Repair Workshop Manual

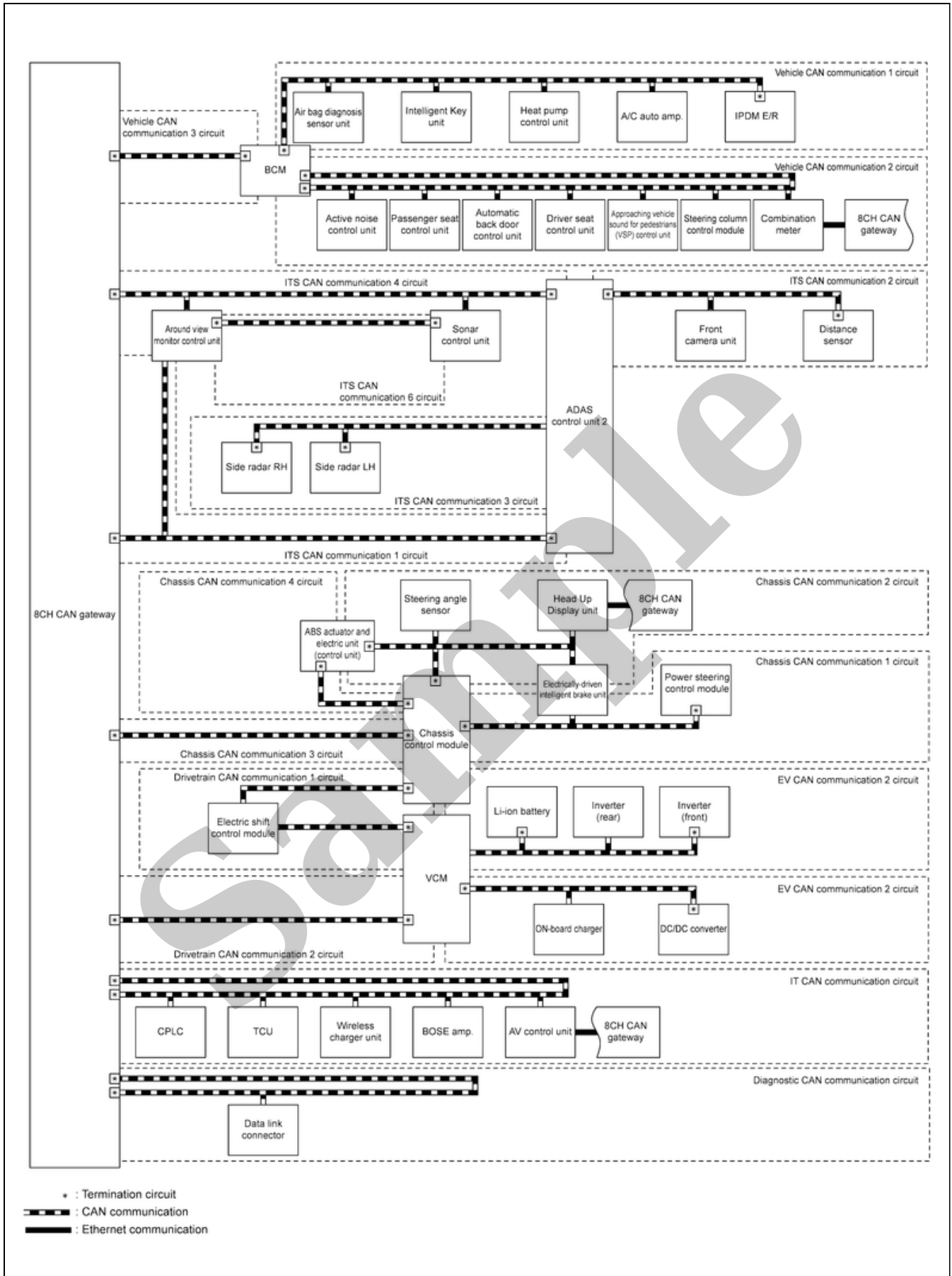
[Go to manual page](#)

Unit name	Major symptom
ECM	<ul style="list-style-type: none"> • Engine torque limiting is affected, and shift harshness increases. • Engine speed drops.
BCM	<ul style="list-style-type: none"> • Reverse warning buzzer does not sound. • The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position. • The room lamp does not turn ON. • The engine does not start (if an error or malfunction occurs while turning the power switch OFF.) • The steering lock does not release (if an error or malfunction occurs while turning the power switch OFF.)
EPS control unit	The steering effort increases.
Combination meter	<ul style="list-style-type: none"> • The tachometer and the speedometer do not move. • Warning lamps turn ON. • Indicator lamps do not turn ON.
ABS actuator and electric unit (control unit)	Normal operation.
TCM	No impact on operation.
IPDM E/R	<p>When the power switch is ON,</p> <ul style="list-style-type: none"> • The headlamps (Lo) turn ON. • The cooling fan continues to rotate.

SYSTEM DIAGRAM

With Pro PILOT Assist 2.0





SIEMD-16479999804521-10-000392202

DESCRIPTION

- CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line)

allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

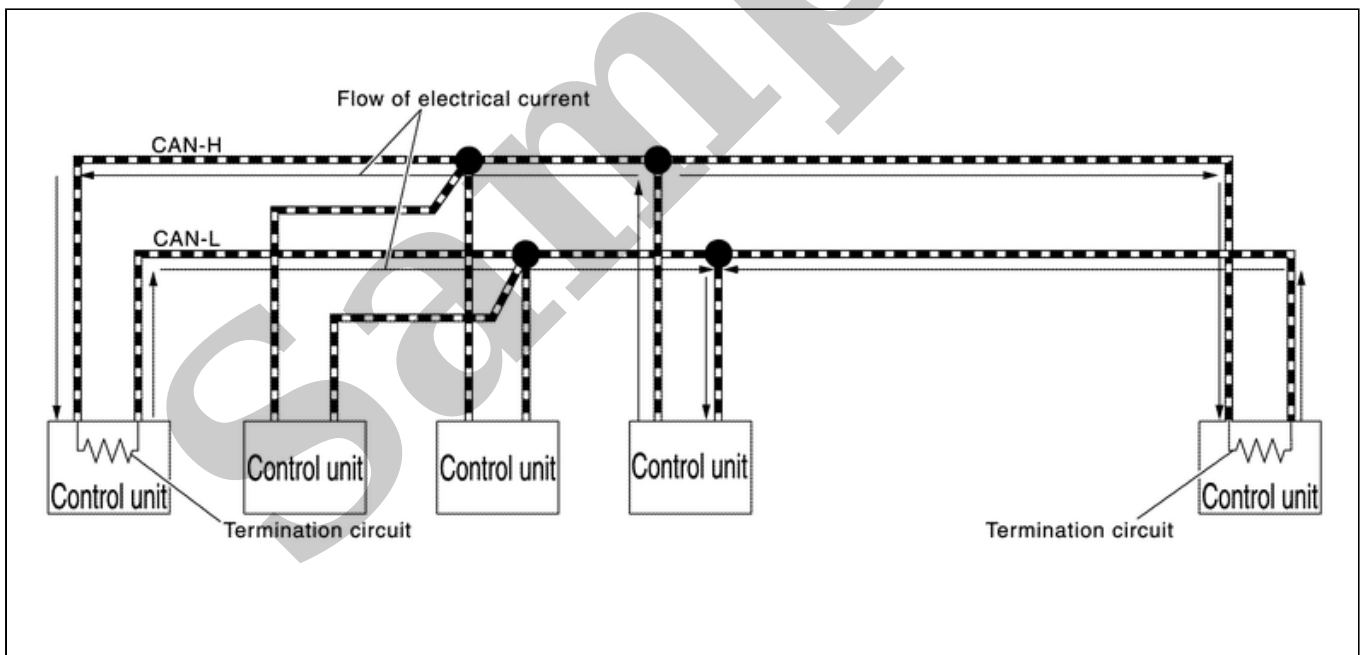
- The following control units connect to CAN communication circuits.

CAN communication circuit	Control unit	Reference
<p>Between the following circuits</p> <ul style="list-style-type: none"> ◦ Vehicle CAN communication 1 circuit ◦ Vehicle CAN communication 2 circuit ◦ Vehicle CAN communication 3 circuit 	BCM	System Description
<p>Between the following circuits</p> <ul style="list-style-type: none"> ◦ Vehicle CAN communication 3 circuit ◦ ITS CAN communication 1 circuit ◦ ITS CAN communication 4 circuit ◦ Chassis CAN communication 3 circuit ◦ Drivetrain CAN communication 2 circuit ◦ IT CAN communication circuit ◦ Diagnostic CAN communication circuit 	8CH CAN gateway	Component Description
<p>Between the following circuits</p> <ul style="list-style-type: none"> ◦ ITS CAN communication 1 circuit ◦ ITS CAN communication 2 circuit ◦ ITS CAN communication 3 circuit ◦ ITS CAN communication 4 circuit ◦ ITS CAN communication 5 circuit (with Pro PILOT Assist 2.0) ◦ Chassis CAN communication 2 circuit (with Pro PILOT Assist 2.0) 	ADAS control unit 2	ADAS Control Unit
<p>Between the following circuits</p> <ul style="list-style-type: none"> ◦ Chassis CAN communication 1 circuit ◦ Chassis CAN communication 2 circuit ◦ Chassis CAN communication 3 circuit ◦ Chassis CAN communication 4 circuit ◦ Drivetrain CAN communication 1 circuit 	Chassis control module	Component Description
<p>Between the following circuits</p> <ul style="list-style-type: none"> ◦ ITS CAN communication 1 circuit ◦ ITS CAN communication 3 circuit (with Pro PILOT Assist 2.0) ◦ ITS CAN communication 4 circuit ◦ ITS CAN communication 6 circuit 	Around view monitor control unit	Around View Monitor Control Unit

CAN communication circuit	Control unit	Reference
ITS CAN communication 4 circuit ↔ ITS CAN communication 6 circuit	Sonar control unit	Component Description
Chassis CAN communication 2 circuit ↔ Chassis CAN communication 4 circuit	ABC actuator and electric unit (control unit)	System Description
Chassis CAN communication 1 circuit ↔ Chassis CAN communication 2 circuit	Electrically-driven intelligent brake unit	Component Description
	Power steering control module (with Pro PILOT Assist 2.0)	System Description
Between the following circuits <ul style="list-style-type: none"> ◦ Drivetrain CAN communication 1 circuit ◦ Drivetrain CAN communication 2 circuit ◦ EV CAN communication 1 circuit ◦ EV CAN communication 2 circuit 	VCM	Component Description

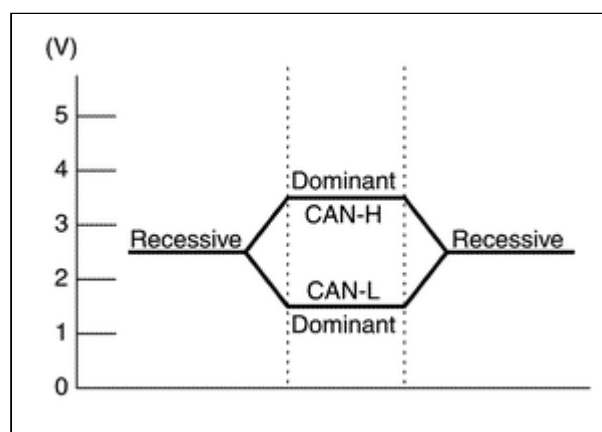
CAN Communication Signal Generation

- Termination circuits (resistors) are connected across the CAN communication system. When transmitting a CAN communication signal, each control unit passes a current to the CAN-H line and the current returns to the CAN-L line.



SIEMD-1647999804521-02-SMIA0450GB

- The current flows separately into the termination circuits connected across the CAN communication system and the termination circuits drop voltage to generate a potential difference between the CAN-H line and the CAN-L line.

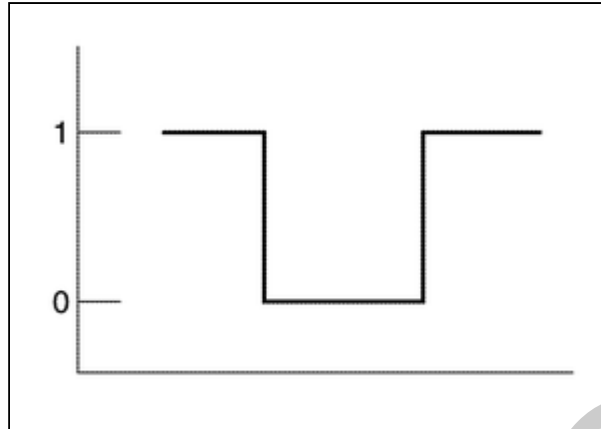


SIEMD-1647999804521-03-SMIA0543GB

**NOTE:**

A signal with no current passage is called “Recessive” and one with current passage is called “Dominant”.

- The system produces digital signals for signal communications, by using the potential difference.



SIEMD-16479999804521-04-SMIA0544ZZ

The Construction of CAN Communication Signal (Message)

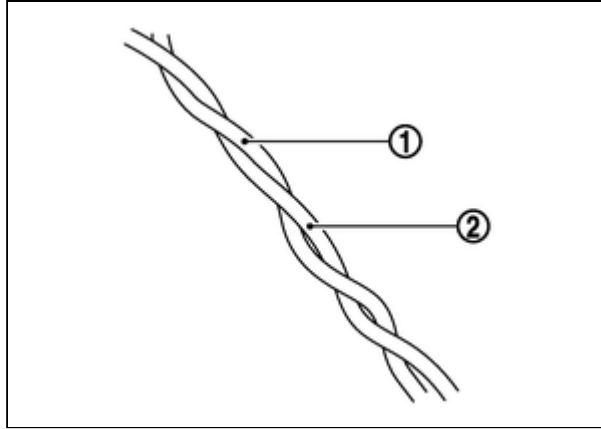


SIEMD-16479999804521-05-SMIA0545ZZ

No.	Message name	Description
1	Start of frame (1 bit)	Start of message.
2	Arbitration of field (11 bit)	Priorities of message-sending are shown when there is a possibility that multiple messages are sent at the same time.
3	Control field (6 bit)	Signal quantity in data field is shown.
4	Data field (0-64 bit)	Actual signal is shown.
5	CRC field (16 bit)	<ul style="list-style-type: none"> The transmitting control unit calculates sending data in advance and writes the calculated value in a message. The receiving control unit calculates received data and judges that the data reception is normal when the calculated value is the same as the value written in the sent data.
6	ACK field (2 bit)	The completion of normal reception is sent to the transmitting unit.
7	End of frame (7 bit)	End of message.

CAN Communication Line

The CAN communication line is a twisted pair wire consisting of strands of CAN-H ① and CAN-L ② and has noise immunity.



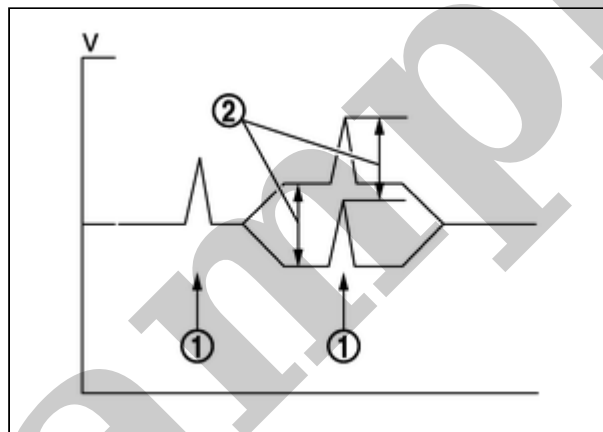
SIEMD-16479999804521-06-SMIA0382ZZ



NOTE:

The CAN communication system has the characteristics of noise-resistant because this system produces digital signals by using the potential difference between the CAN-H line and the CAN-L line and has the twisted pair wire structure.

Since the CAN-H line and the CAN-L line are always adjacent to each other, the same degree of noise occurs, respectively, when a noise ① occurs. Although the noise changes the voltage, the potential difference ② between the CAN-H line and the CAN-L line is insensitive to noise. Therefore, noise-resistant signals can be obtained.

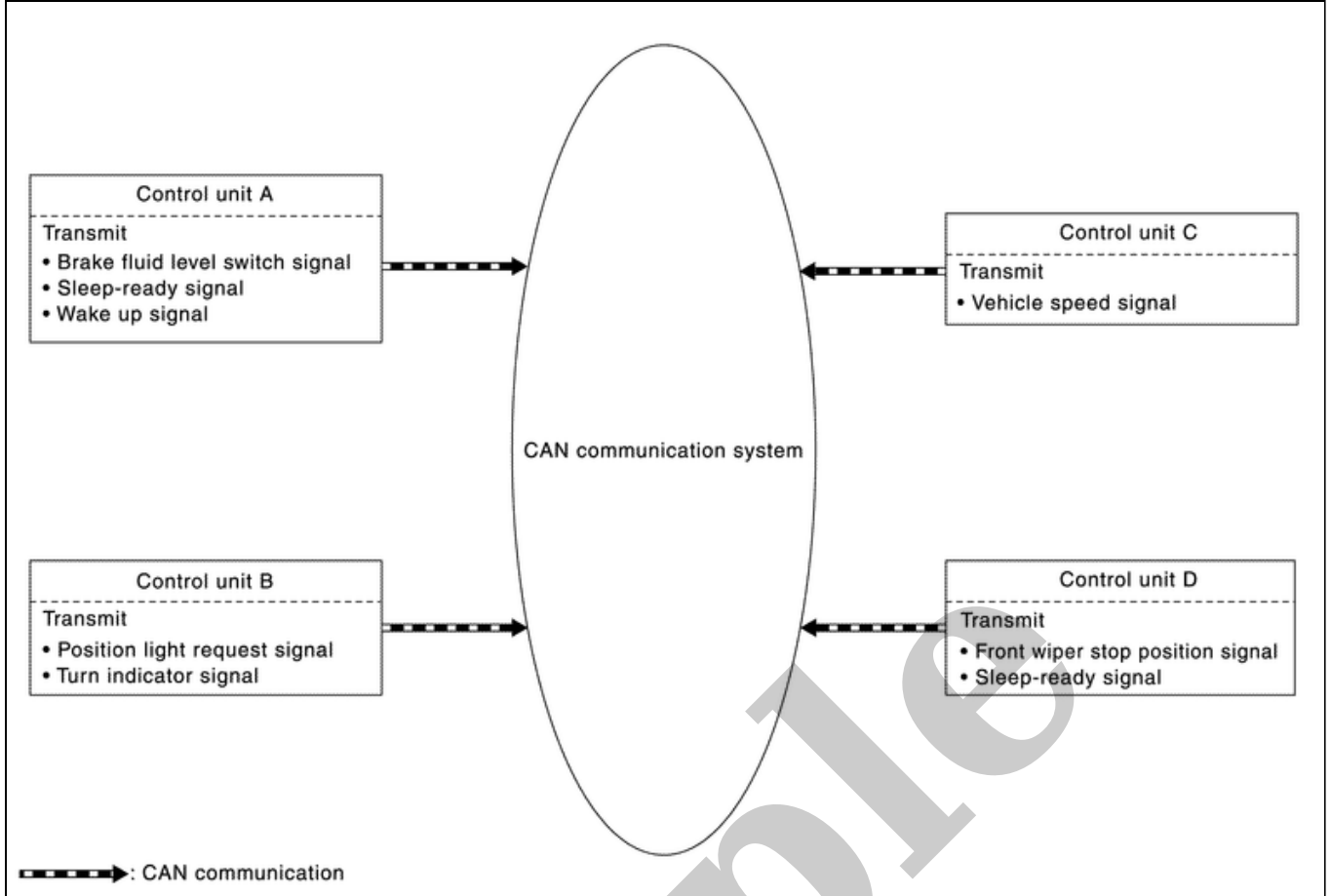


SIEMD-16479999804521-07-SMIA0383ZZ

CAN Signal Communications

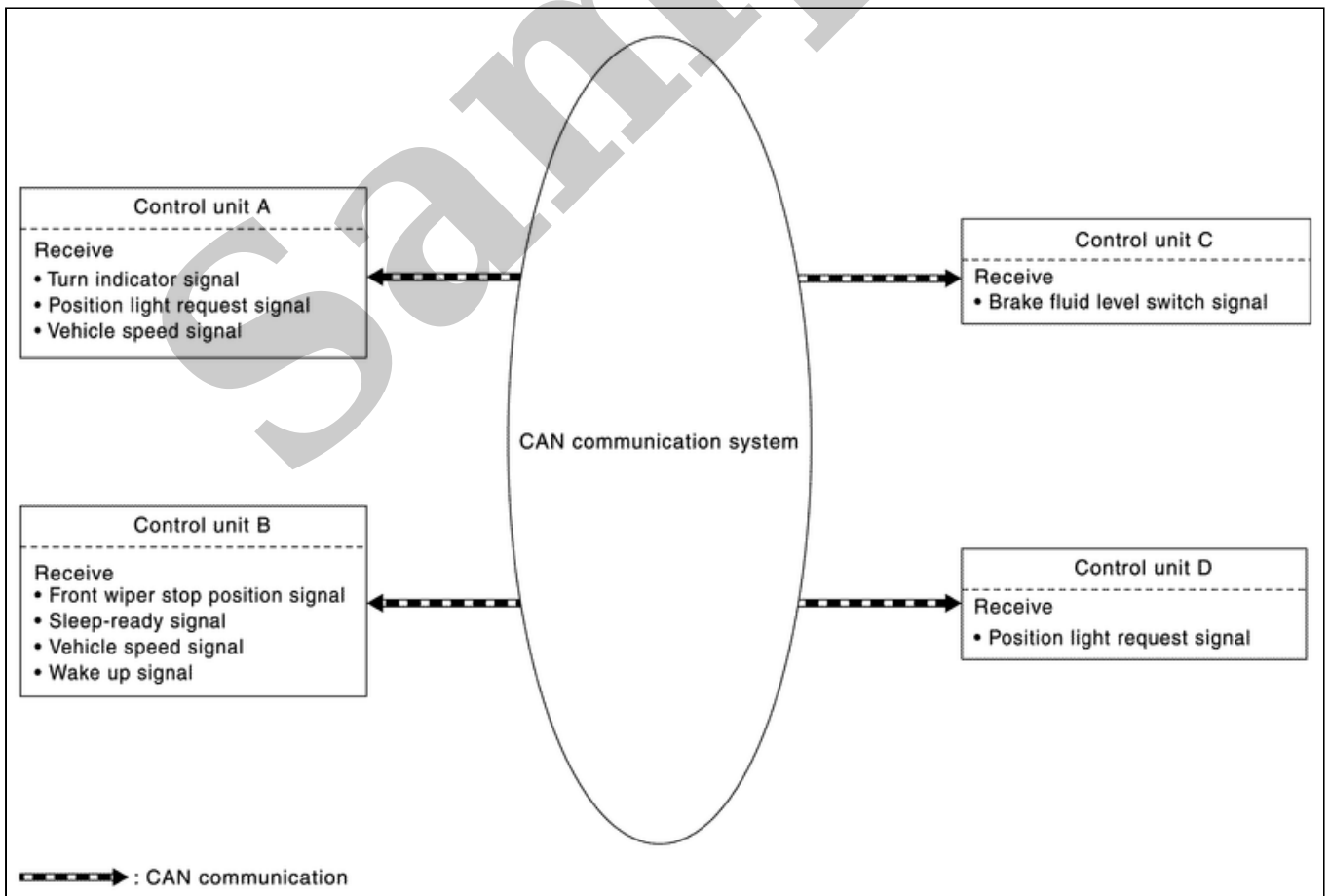
Each control unit of the CAN communication system transmits signals through the CAN communication control circuit included in the control unit and receives only necessary signals from each control unit to perform various kinds of control.

- Example: Transmitted signals



SIEMD-16479999804521-08-SMIA0576GB

- Example: Received signals



SIEMD-16479999804521-09-SMIA0577GB



NOTE:

The above signal names and signal communications are provided for reference purposes. For CAN communications signals of this vehicle, Refer to [CAN Communication Signal Chart](#).

