SECTION WW
WIPER, WASHER & HORN

CONTENTS

APPLICATION NOTICE

PFP:00000

How to Check Vehicle Type

EKS00Q9M

Confirm K9K engine type with Model written on identification plate (refer to GI-44, "IDENTIFICATION INFORMATION"), then refer to service information in WW section.

Vehicle type	Engine type
xTKxxxxK12Vxx	Euro3 48kW
xTKxxxxK12Yxx	Euro3 60kW
xTKxxxxK12Txx	Euro4 50kW
xTKxxxxK12Uxx	Euro4 63kW

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

EKS00860

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

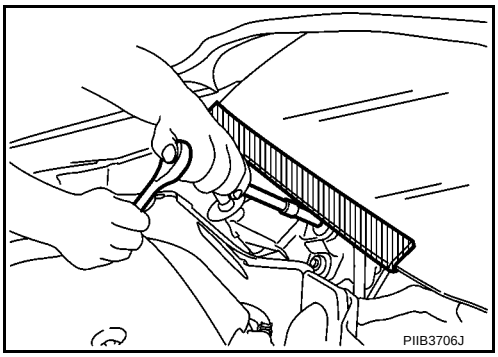
WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Procedures without Cowl Top Cover

EKS00Q9K

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc.



Wiper and Washer System

EKS007AW

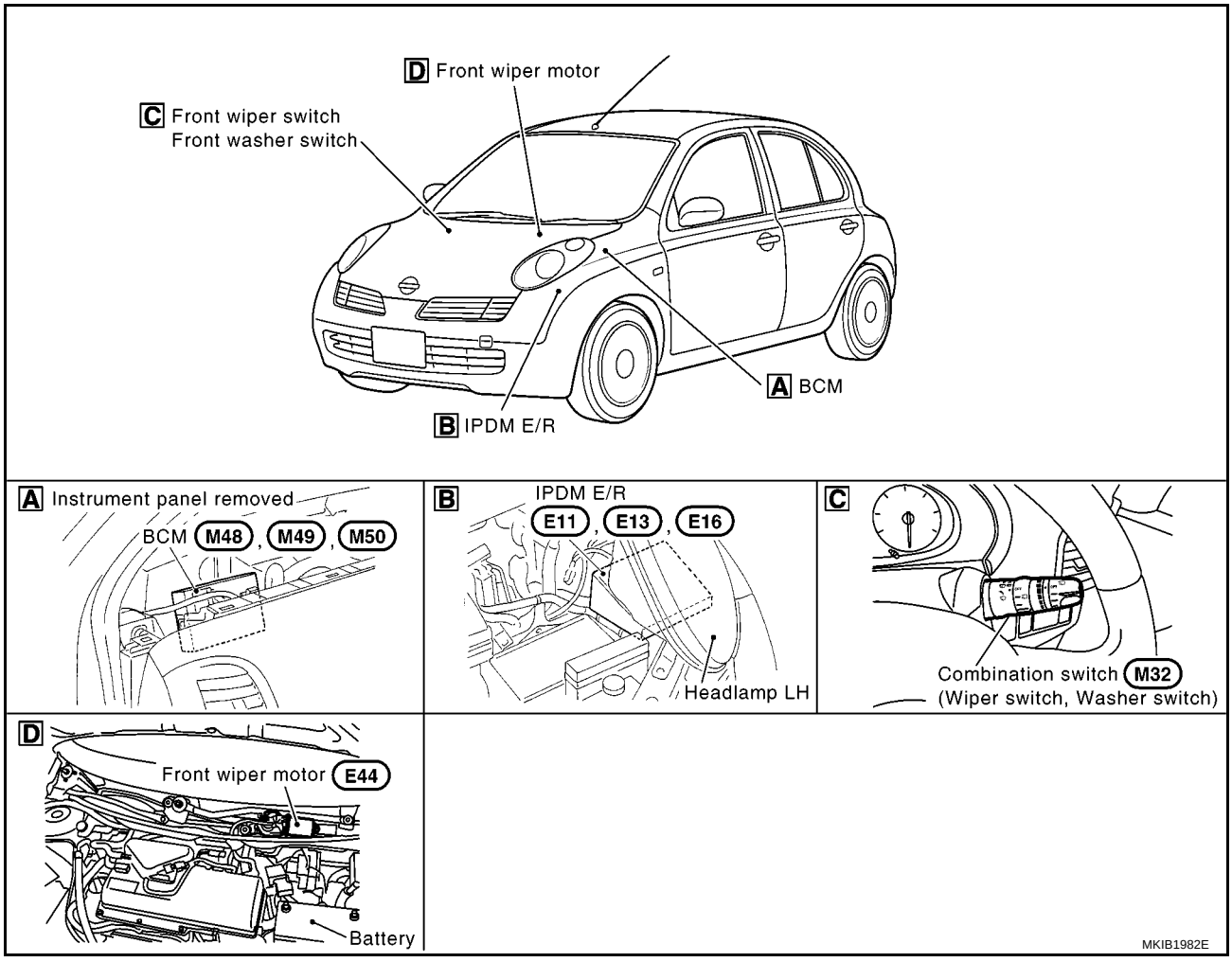
- If snow or other obstacle stops wipers from moving while front wipers are operating, wipers will stop moving to protect motor. In this case, turn the switch OFF and remove obstacle. Wait at least 20 seconds before turning the switch ON again to start front wipers.
- If rear wiper operation is stopped 5 seconds or more due to snow or other reason, the BCM stops rear wiper operation to protect motor. At this time, after removing cause of stoppage, turn rear wiper switch to OFF, wait at least 1 minute, then turn wiper switch to ON or INT to restart wiper.
- The hood may be scratched if opened while front wipers are locked back.
- If there is unevenness or peeling of windshield glass wax, other oil films, or glass coating, wipers may not wipe correctly (juddering or other non-standard conditions may occur).
- Operating the washer pump continuously for more than 1 minute or longer may cause malfunction.

FRONT WIPER AND WASHER SYSTEM

PFP:28810

Components Parts and Harness Connector Location

EKS00861



System Description

EKS00862

- Front wiper HI/LO relay and front wiper main relay are built into IPDM E/R.
- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM when switch is turned ON.
- BCM controls front wiper LO, HI, and INT (intermittent) operation.
- IPDM E/R operates wiper motor according to CAN communication signals from BCM.

Power is supplied at all times

- through 20A fuse (NO.38, located in the IPDM E/R)
- to front wiper main relay.
- through 20A fuse (NO.52, located in the IPDM E/R)
- to IPDM E/R (CPU).
- through 40A fusible link (letter J, located in fuse and fusible link box)
- to BCM terminals 74 and 79.

When ignition switch ON or START position, power is supplied

- through 10A fuse [NO.4, located in fuse block (J/B)]
- to BCM terminal 24,
- through 15A fuse [NO.1, located in fuse block (J/B)]
- to combination switch terminal 11, and
- to front wiper HI/LO relay, front wiper main relay and IPDM E/R (CPU)

Ground is supplied

- to front wiper motor terminal 1 and,
- to IPDM E/R terminals 3 and 54
- through body grounds E25 (CR engine models), E26 and E40, and
- to combination switch terminal 12 and
- to BCM terminals 2 and 70
- through body grounds M19 and M20.

LOW SPEED WIPER OPERATION

When front wiper switch is placed in LO position, BCM read combination switch condition (Refer to WW-8, "COMBINATION SWITCH READING FUNCTION"). And BCM sent front wiper request signal (LO) to IPDM E/R with CAN communication line. When IPDM E/R receives front wiper request signal (LO), it turns ON front wiper main relay (built into IPDM E/R).

Power is supplied

- through front wiper main relay and front wiper HI/LO relay and
- through IPDM E/R terminal 23
- to front wiper motor terminal 3.

Ground is supplied

- to front wiper motor terminal 1,
- through body grounds E25 (CR engine models), E26 and E40.

With power and ground are supplied, the front wiper motor operates at low speed.

HIGH SPEED WIPER OPERATION

When front wiper switch is placed in HI position, BCM read combination switch condition (Refer toWW-8, "COMBINATION SWITCH READING FUNCTION").And BCM sent front wiper request signal (HI) to IPDM E/R with CAN communication line. When IPDM E/R receives front wiper request signal (HI), it turns ON front wiper HI/LO relay and front wiper main relay (built into IPDM E/R).

Power is supplied

- through front wiper main relay and front wiper HI/LO relay and,
- through IPDM E/R terminal 24
- to front wiper motor terminal 2.

Ground is supplied

- to front wiper motor terminal 1
- through body grounds E25 (CR engine models), E26 and E40.

With power and ground are supplied, the front wiper motor operates at high speed.

INTERMITTENT OPERATION

When front wiper switch is toggle to INT position, BCM read the current combination switch condition/position (refer to WW-8, "COMBINATION SWITCH READING FUNCTION") and convert the outputs into 4 stages of wiper speed.

- BCM reads combination switch condition of V/INT 1, 2 and 3, it determines INT volume. (Refer to WW-8, "COMBINATION SWITCH READING FUNCTION")
- BCM receives vehicle speed signal from combination meter with CAN communication line.
- BCM calculates intermittent interval from INT volume and vehicle speed signal.
- BCM sends front wiper request signal to IPDM E/R for every intermittent interval via CAN communication line.

Power is supplied

- through front wiper main relay and front wiper HI/LO relay and
- through IPDM E/R terminal 23
- to front wiper motor terminal 3.

Ground is supplied

- to front wiper motor terminal 1,
- through body grounds E25 (CR engine models), E26 and E40.

With power and ground are supplied, the front wiper motor operates.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach stop position.
When wiper arms are not located at stop position with wiper switch OFF, power is supplied

- from terminal 23 of the IPDM E/R
- to front wiper motor terminal 3, in order to continue wiper motor operation at low speed.

Ground is supplied

- to front wiper motor terminal 1
- through body grounds E25 (CR engine models), E26 and E40.

When wiper arms reach stop position, front wiper motor terminals 1 and 4 are connected.
Then the IPDM E/R sends auto stop operation signal to BCM with CAN communication line.
When BCM receives auto-stop operation signal, BCM sends wiper stop signal to IPDM E/R with CAN communication line.
IPDM E/R stops wiper motor. Wiper motor will then stop wiper arms at the STOP position.

MIST OPERATION

When the combination switch is toggle to the mist position (upward), wiper will wipe once. If the rear wiper switch is turned to mist position, the rear wiper will continue the wiping frequency at low speed.

WASHER OPERATION

When front wiper switch is pulled to washer position, power is supplied

- through combination switch terminal 13
- to washer motor terminal 1.

Ground is supplied

- to washer motor terminal 2
- through combination switch terminals 12 and 14, and
- through body grounds M19 and M20.

With power and ground supplied, the washer motor operates, and at the same time,
When the wiper switch is pulled to the WASH position for 1 second or more. BCM sends front wiper request signal (low) to IPDM E/R with CAN communication line. And the front wiper motor operates in low speed for 3 times to clean wind shield and then an additional wiping action will occur after 3 seconds to remove the moisture appear on the glass shortly after the wash/wipe action.

FAIL-SAFE FUNCTION

When CAN communication with other control units is impossible, IPDM E/R performs fail-safe control. If the fail-safe system is operating, front wiper low speed operates when the ignition switch is turned from OFF to ON or ACC and front wiper are stopped when the ignition switch is turn from ON or ACC to OFF. If the fail-safe system is operating, front wiper does not operate when the combination switch is in any position. After CAN communication recovers normally, it also returns to normal control. (Refer to PG-20, "FAIL-SAFE FUNCTION")

COMBINATION SWITCH READING FUNCTION

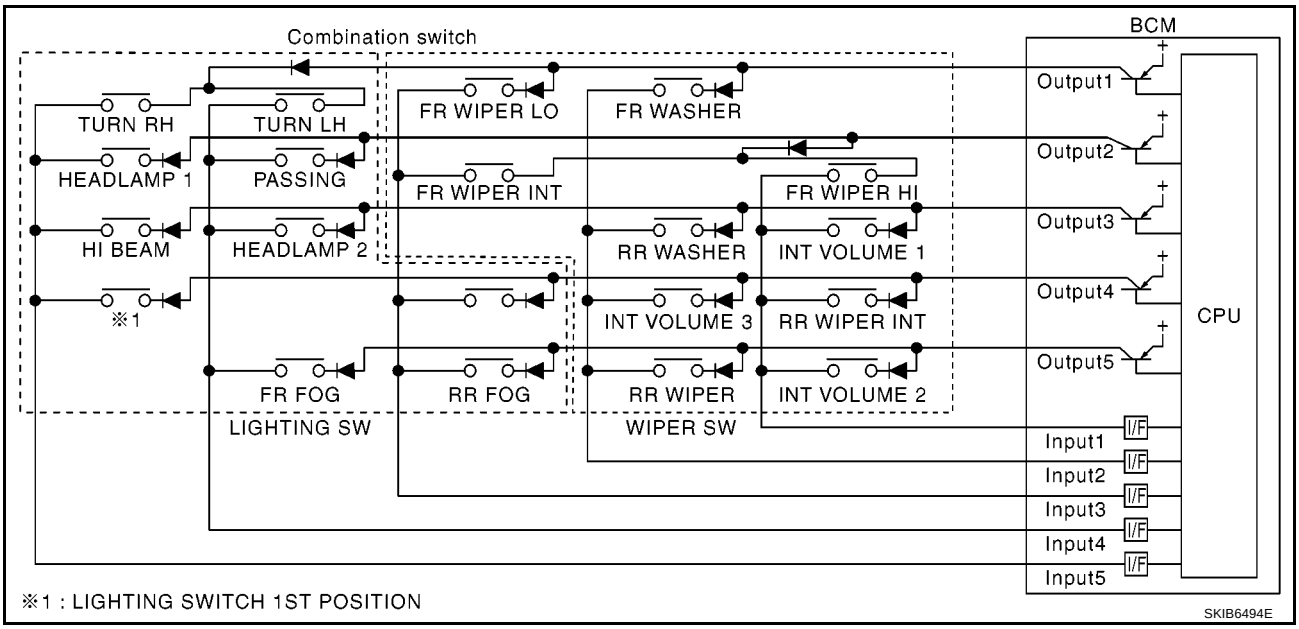
Description

- BCM reads combination switch status, and controls related systems such as headlamps and wipers, according to the results.
- BCM reads information for a maximum of 20 switches by combining 5 output terminals (OUTPUT 1-5) and 5 input terminals (INPUT 1-5).

Operation Description

- BCM activates transistors of output terminals (OUTPUT 1-5) periodically, and allows current to flow in turn.
- If any (1 or more) switches are turned ON, the circuit of output terminals (OUTPUT 1-5) and input terminals (INPUT 1-5) becomes active.

- At this time, transistors of output terminals (OUTPUT 1-5) are activated to allow current to flow. When voltage of the input terminal (INPUT 1-5) corresponding to that switch changes, the interface in the BCM detects a voltage change, and the BCM determines that the switch is ON.



BCM - Operation Table of Combination Switches

- BCM reads operation status of the combination switch using combinations shown in the table below.

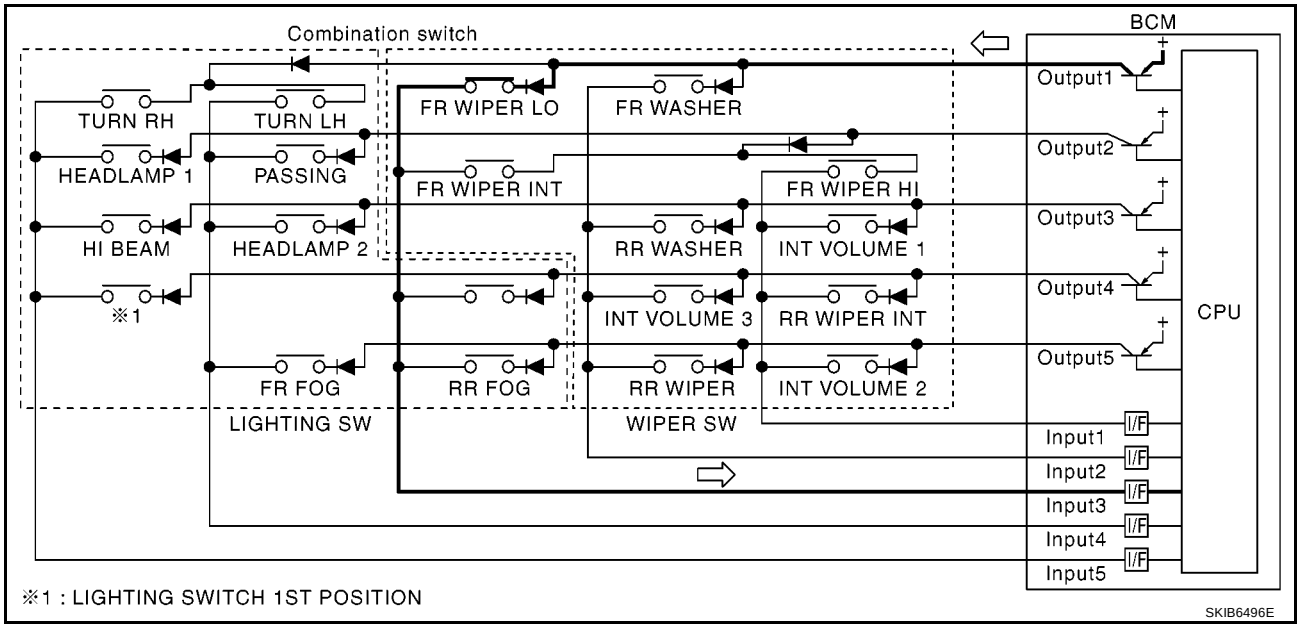
	COMB SW OUTPUT 1		COMB SW OUTPUT 2		COMB SW OUTPUT 3		COMB SW OUTPUT 4		COMB SW OUTPUT 5	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
COMB SW INPUT 1	–	–	FR WIPER HI ON	FR WIPER HI OFF	INT VOLUME 1 ON	INT VOLUME 1 OFF	RR WIPER INT ON	RR WIPER INT OFF	INT VOLUME 2 ON	INT VOLUME 2 OFF
COMB SW INPUT 2	FR WASHER ON	FR WASHER OFF	–	–	RR WASHER ON	RR WASHER OFF	INT VOLUME 3 ON	INT VOLUME 3 OFF	RR WIPER ON	RR WIPER OFF
COMB SW INPUT 3	FR WIPER LO ON	FR WIPER LO OFF	FR WIPER INT ON	FR WIPER INT OFF	–	–	–	–	RR FOG ON	RR FOG OFF
COMB SW INPUT 4	TURN LH ON	TURN LH OFF	PASSING ON	PASSING OFF	HEAD-LAMP 2 ON	HEAD-LAMP 2 OFF	–	–	FR FOG ON	FR FOG OFF
COMB SW INPUT 5	TURN RH ON	TURN RH OFF	HEAD-LAMP 1 ON	HEAD-LAMP 1 OFF	HI BEAM ON	HI BEAM OFF	LIGHTING SW (1ST) ON	LIGHTING SW (1ST) OFF	–	–

SKIB6495E

Sample Operation: (When Wiper Switch is Turned ON)

- When the wiper switch is turned ON, contact in the combination switch turns ON. At this time if OUTPUT 1 transistor is activated, the BCM detects that voltage changes in INPUT 3.
- When the OUTPUT 1 transistor is ON, the BCM detects that voltage changes in INPUT 3, and judges that front wiper low is ON. Then the BCM sends a front wiper request signal (LO) to the IPDM E/R using CAN communication.

- When OUTPUT 1 transistor is activated again, BCM detects that voltage changes in INPUT 3, and recognizes that the wiper switch is continuously ON.



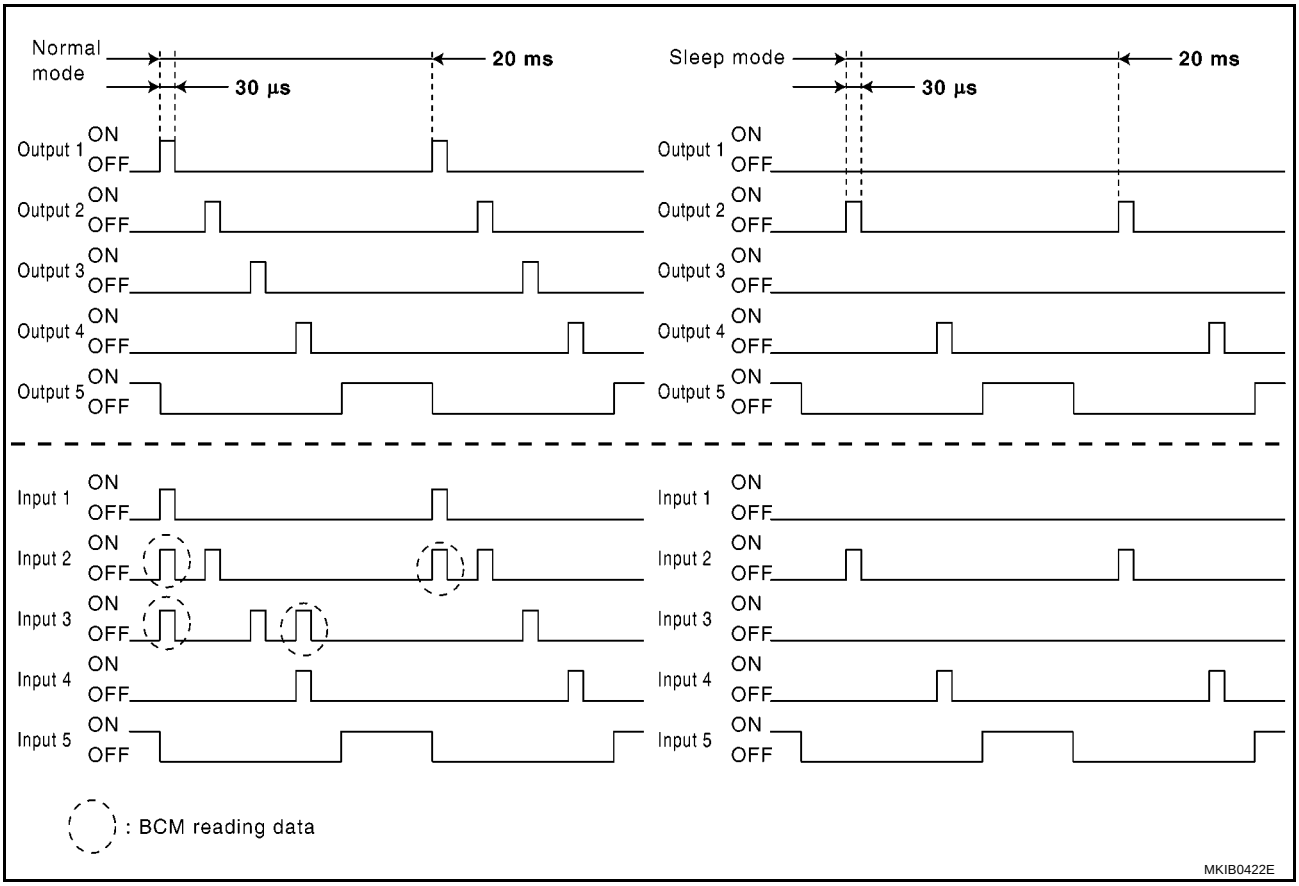
NOTE:
Each output terminal transistor operates at 20 ms intervals. Therefore, after a switch is turned ON, the electrical loads are activate with a time delay, However, this delay is too small to be detected.

Operation Mode

- Combination switch reading function has operation modes shown below.

– **Normal mode**
When BCM is not in sleep mode, each output (1 - 5) terminal turns ON-OFF at 20 ms intervals.

– **Sleep mode**
While BCM is in sleep status, transistors in output 1 and 3 stop their input, with BCM entering a power-saving mode. Input 2, 4 and 5 turn ON-OFF every 20 ms, and accept only output from lighting switch system.



Wiper Volume Position Setting

Wiper dial position	Intermittent interval	Combination switch		
		V/INT 1	V/INT 2	V/INT 3
Wiper volume position 1	Small	ON	ON	ON
Wiper volume position 2		ON	ON	OFF
Wiper volume position 3		ON	OFF	OFF
Wiper volume position 4	↓	OFF	OFF	OFF
Wiper volume position 5		OFF	OFF	ON
Wiper volume position 6		OFF	ON	ON
Wiper volume position 7	Large	OFF	ON	OFF

Example: For wiper volume position 1...
Using combination switch reading function, BCM reads ON/OFF status of V/INT 1, 2, and 3.
When combination switch status is as listed below, BCM determines that it is wiper volume position 1.

- V/INT 1: ON (input 1 and output 3 are performing.)
- V/INT 2: ON (input 1 and output 5 are performing.)
- V/INT 3: ON (input 2 and output 4 are performing.)

BCM determines front wiper intermittent interval from wiper volume 1 and vehicle speed, and sends wiper request signal (INT) to IPDM E/R for every intermittent interval via CAN communication line.

CAN Communication

EKS00K7O

SYSTEM 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.

CAN Communication Unit

EKS00QP0

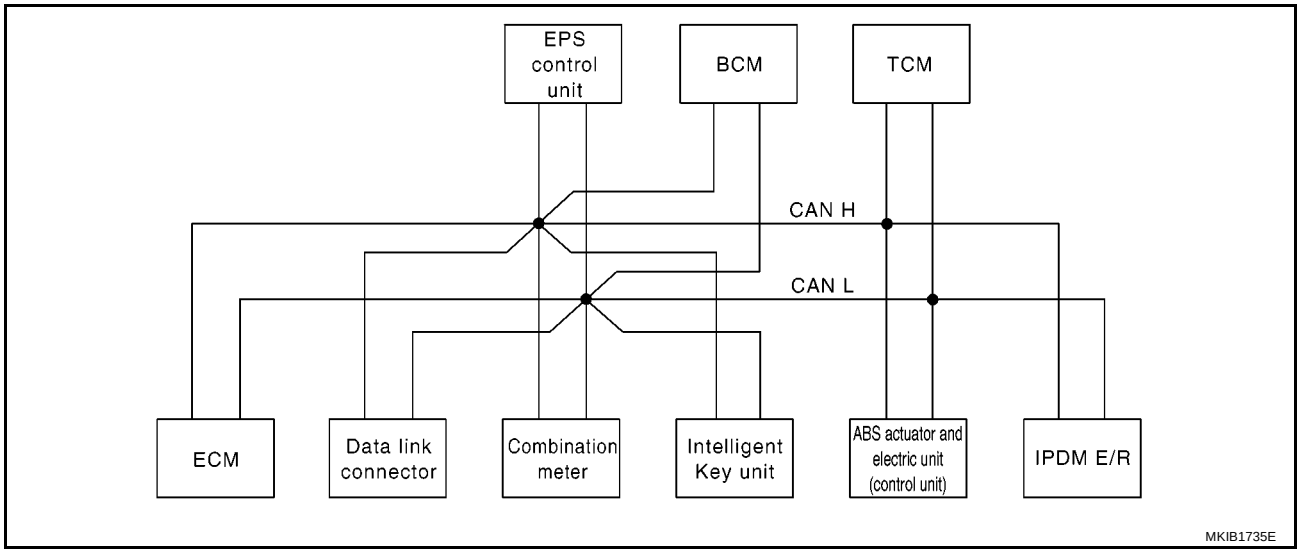
Body type	3door/5door		3door/5door/C+C				3door/5door		3door/5door/C+C				3door/5door	
Axle	2WD													
Engine	CR12DE/CR14DE				HR16DE		CR12DE/CR14DE				HR16DE		K9K	
Handle	LHD/RHD													
Brake control	ABS						ESP						ABS	
Transmission	A/T		M/T				A/T		M/T					
Intelligent Key system	×		×		×		×		×		×		×	
CAN communication unit														
ECM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Data link connector	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Combination meter	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Intelligent Key unit	×		×		×		×		×		×		×	
EPS control unit	×	×	×	×	×	×	×	×	×	×	×	×	×	×
BCM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ABS actuator and electric unit (control unit)	×	×	×	×	×	×	×	×	×	×	×	×	×	×
TCM	×	×					×	×						
IPDM E/R	×	×	×	×	×	×	×	×	×	×	×	×	×	×
CAN communication type	WW-14, "TYPE 1/ TYPE 2"		WW-17, "TYPE 3/TYPE 4/ TYPE 5/TYPE 6"				WW-19, "TYPE 7/ TYPE 8"		WW-22, "TYPE 9/TYPE 10/ TYPE 11/TYPE 12"				WW-24, "TYPE 13/ TYPE 14"	

×: Applicable

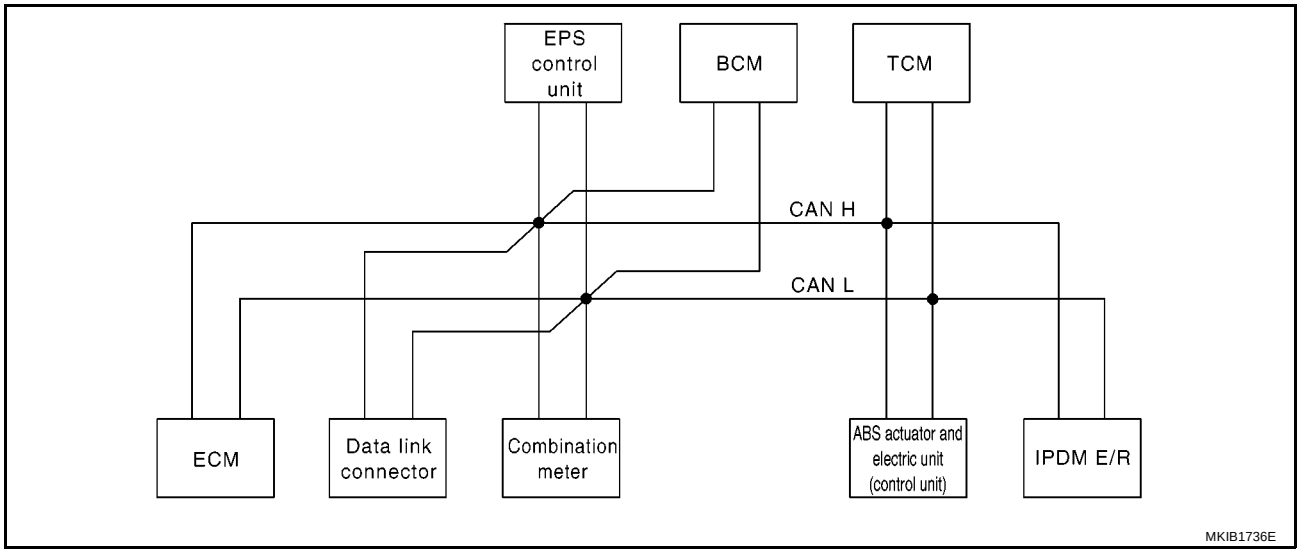
TYPE 1/TYPE 2

System diagram

- Type 1



- Type 2



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R						
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T						R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	

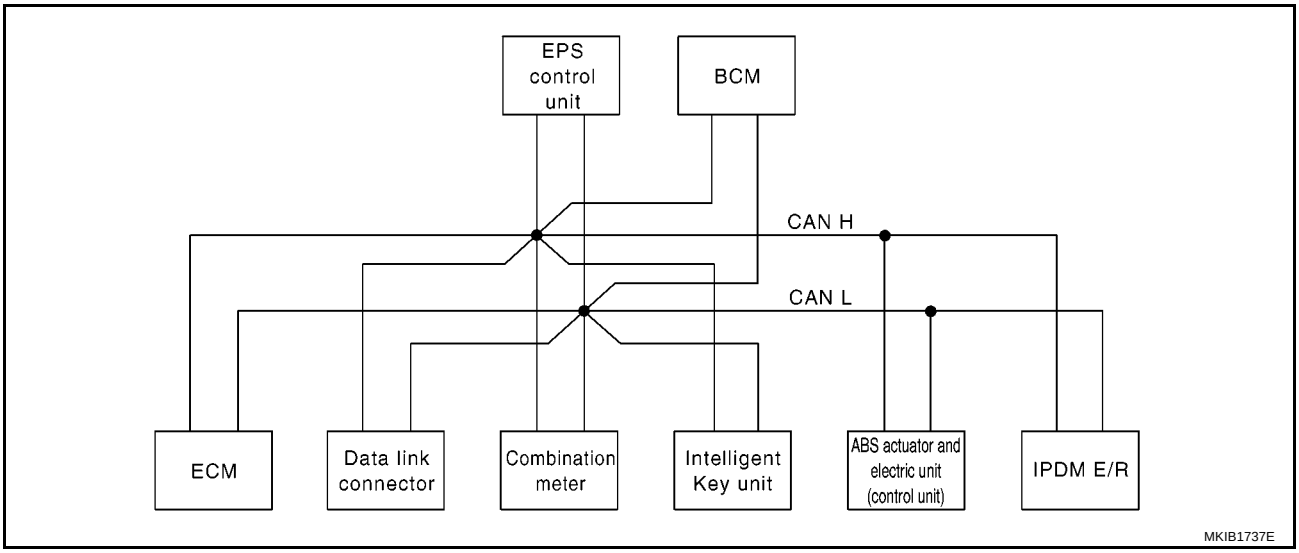
Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
A/T position indicator signal		R					T	
Stop lamp switch signal		T					R	
O/D OFF indicator signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
A/C switch signal	R				T			
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

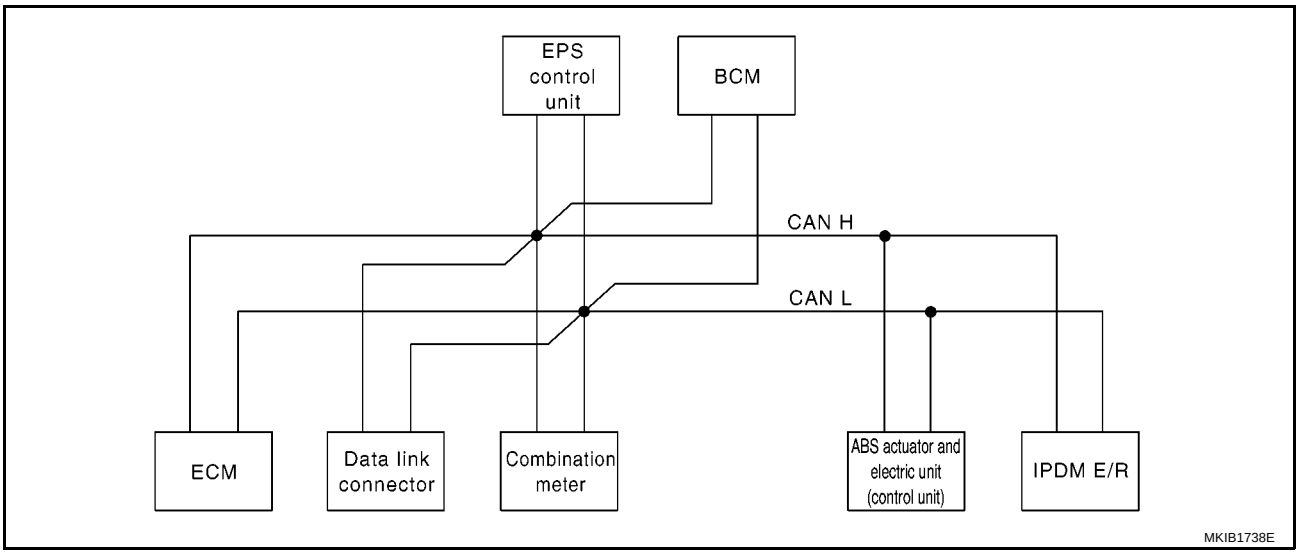
TYPE 3/TYPE 4/TYPE 5/TYPE 6

System diagram

- Type 3/Type 5



- Type 4/Type 6



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R

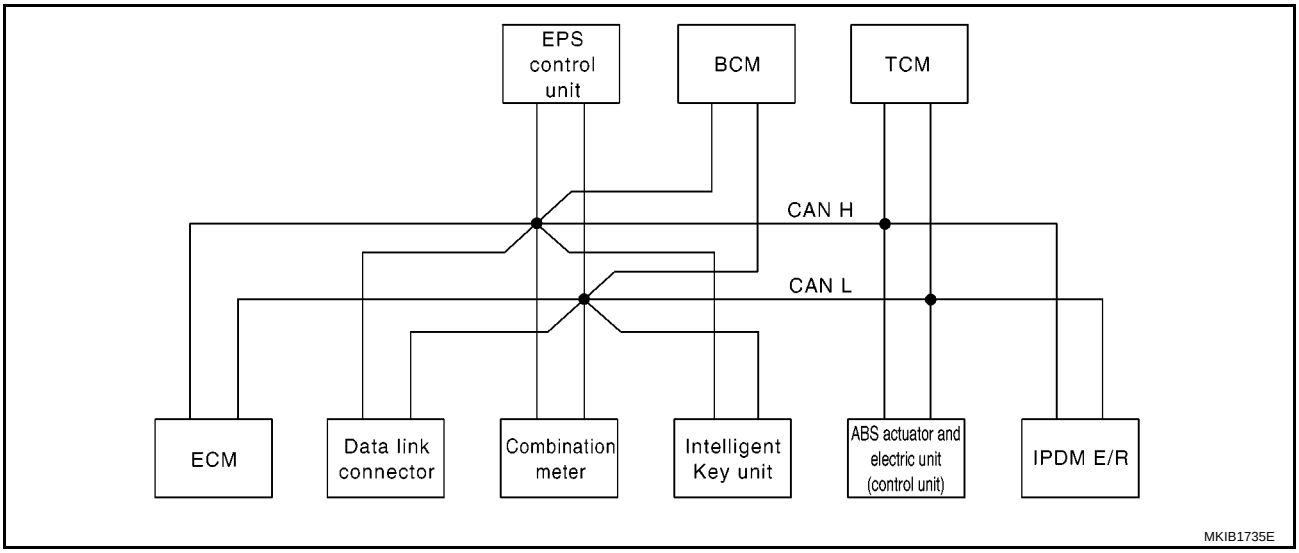
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

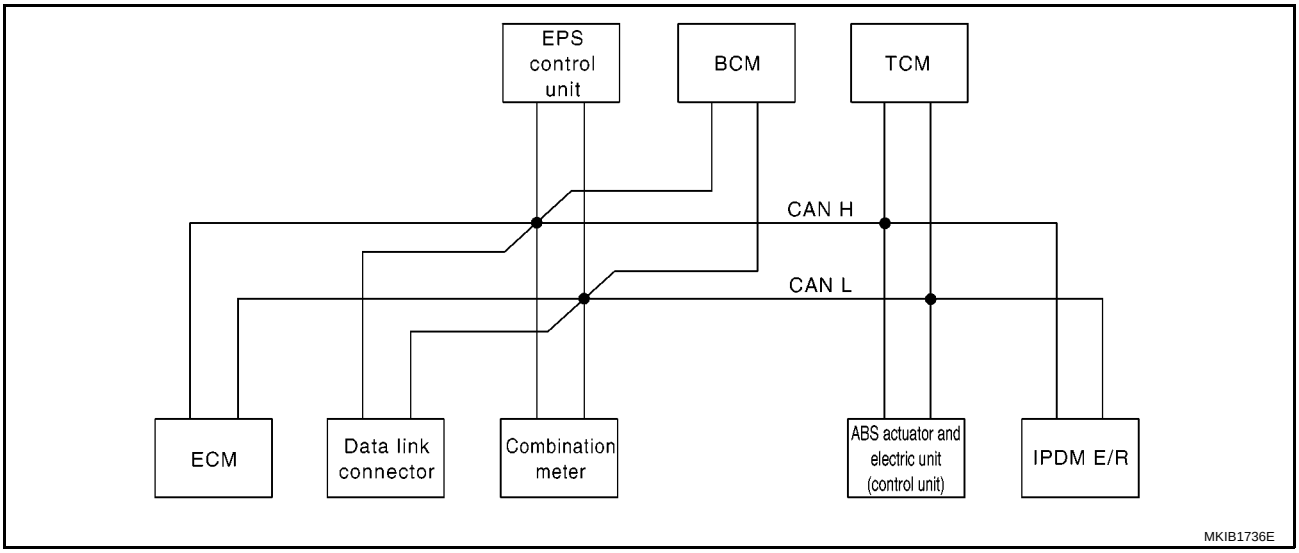
TYPE 7/TYPE 8

System diagram

- Type 7



- Type 8



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R				R		
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T					R	R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	
A/T position indicator signal		R					T	

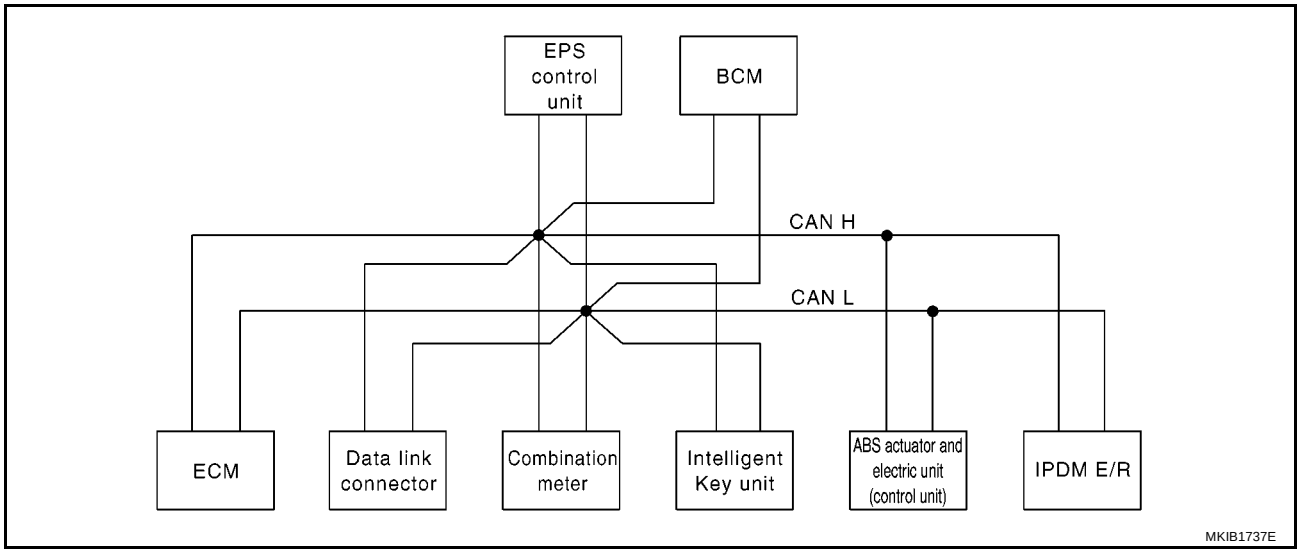
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
A/T shift schedule change demand signal						T	R	
Stop lamp switch signal		T					R	
O/D OFF indicator lamp signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
ESP warning lamp signal		R				T		
ESP OFF indicator signal		R				T		
SLIP indicator lamp signal		R				T		
Steering angle signal				T		R		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				
A/C switch signal	R				T			
A/T torque signal						R	T	
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

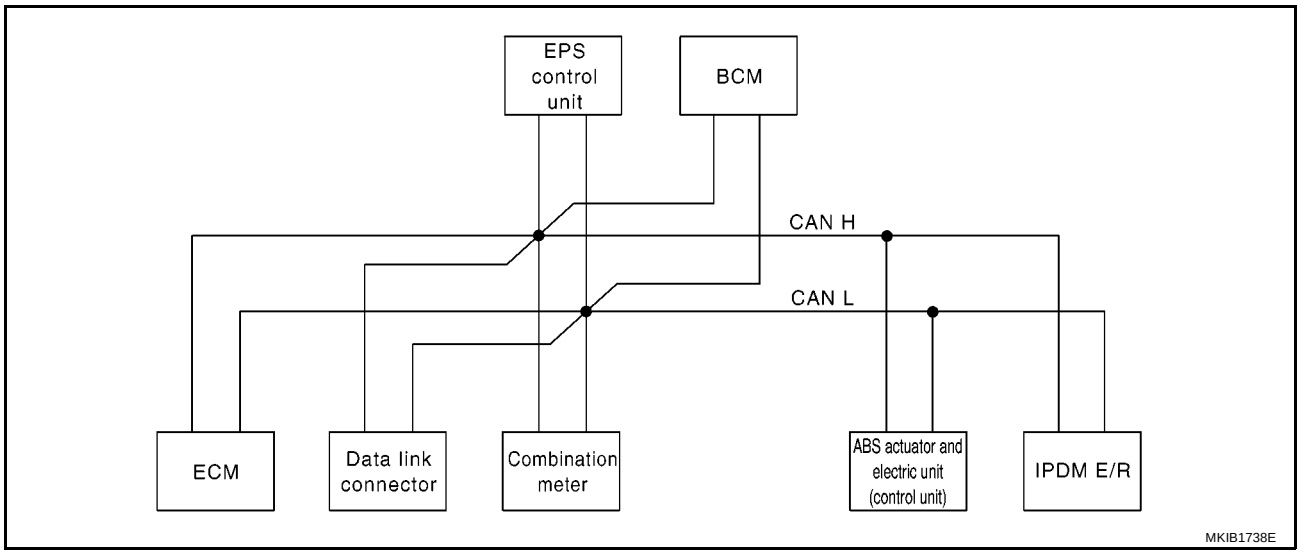
TYPE 9/TYPE 10/TYPE 11/TYPE 12

System diagram

- Type 9/Type 11



- Type 10/Type 12



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R				R	
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Accelerator pedal position signal	T					R	
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R

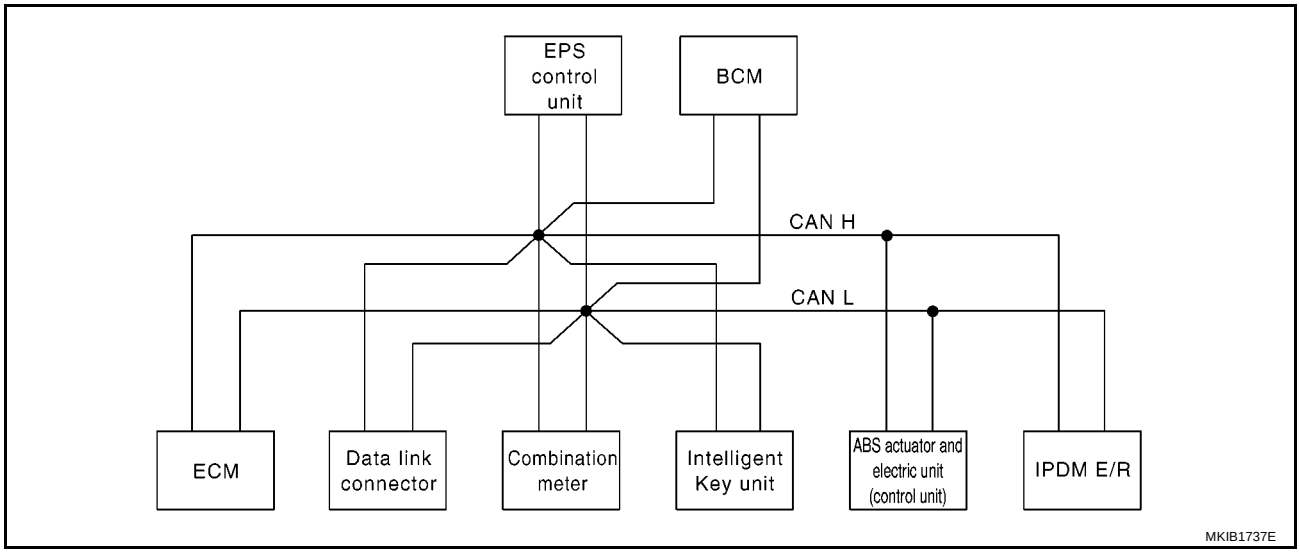
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam request signal					T		R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
ESP warning lamp signal		R				T	
ESP OFF indicator signal		R				T	
SLIP indicator lamp signal		R				T	
Steering angle signal				T		R	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

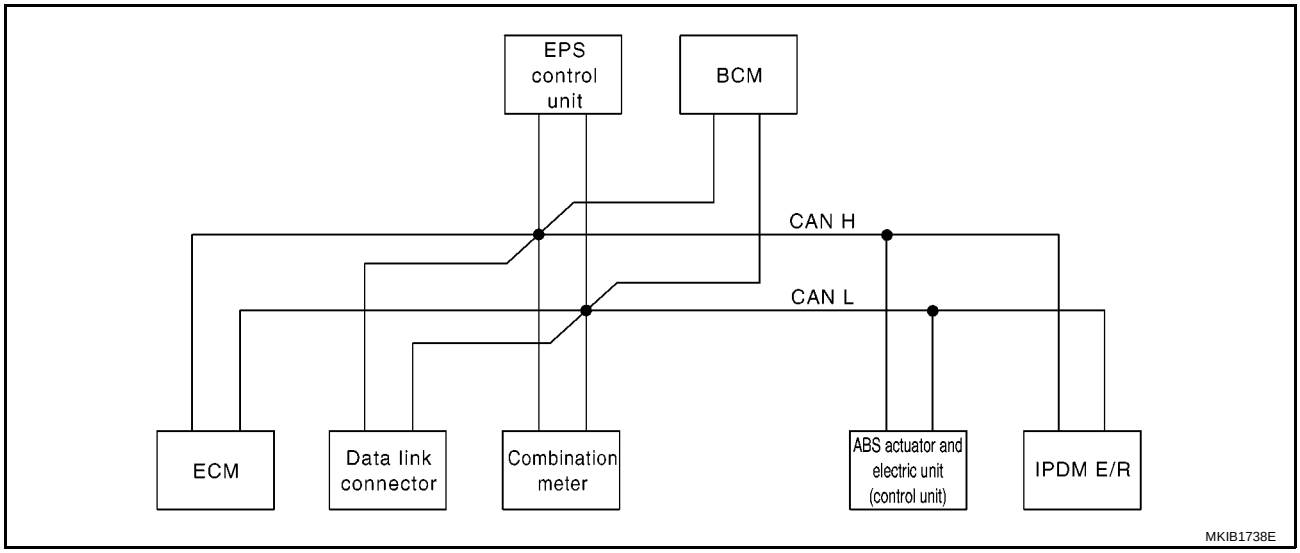
TYPE 13/TYPE 14

System diagram

- Type 13



- Type 14



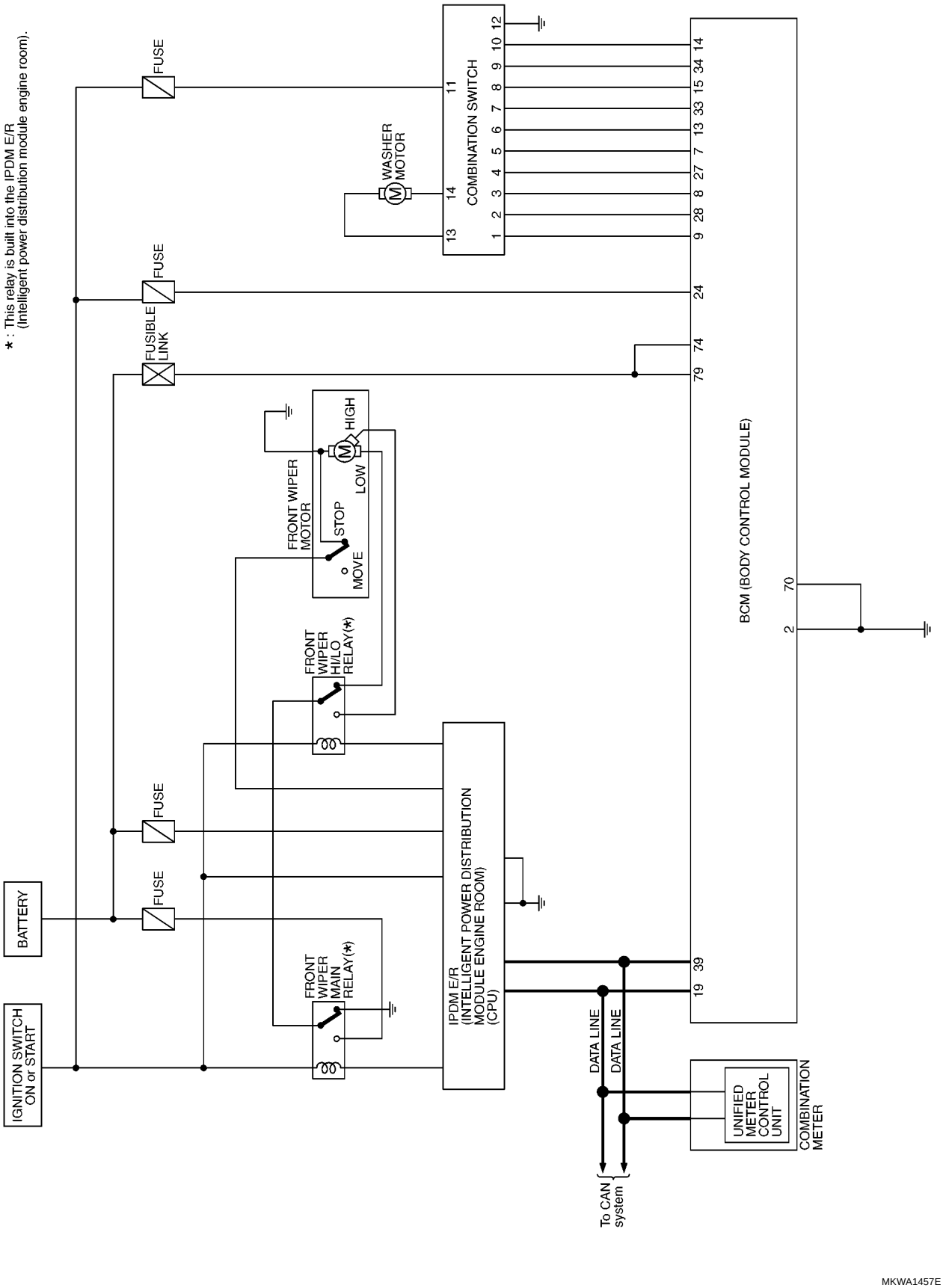
Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R			R		
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R
High beam request signal		R			T		R
Day time light request signal					T		R
Vehicle speed signal	R	R		R	R	T	
	R	T	R	R			
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
Glow indicator signal	T	R					
R range signal					R		T

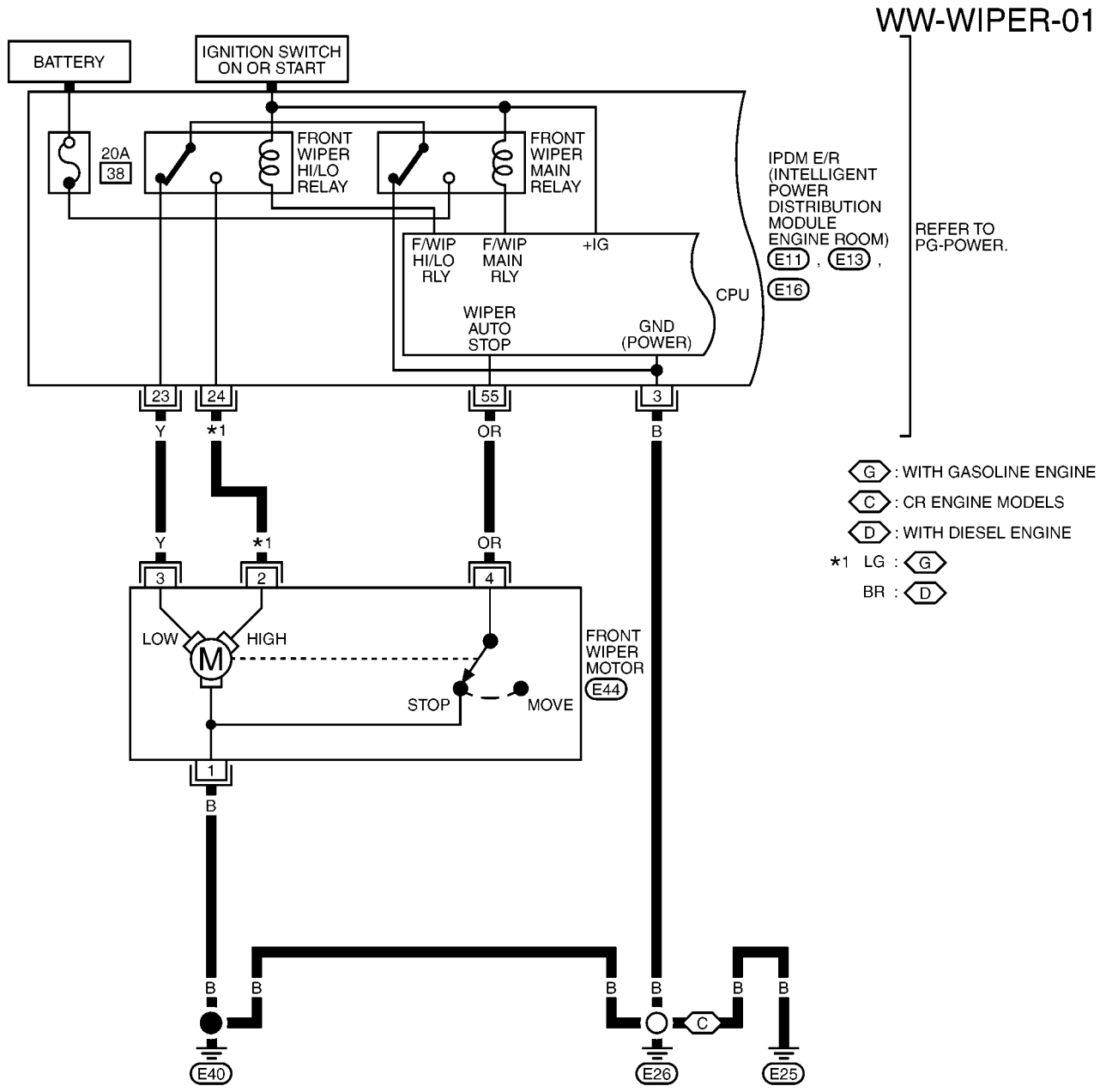
Schematic

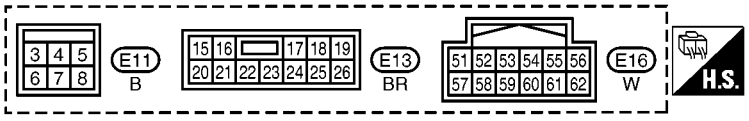
EKS00863

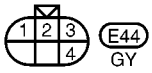


Wiring Diagram — WIPER —

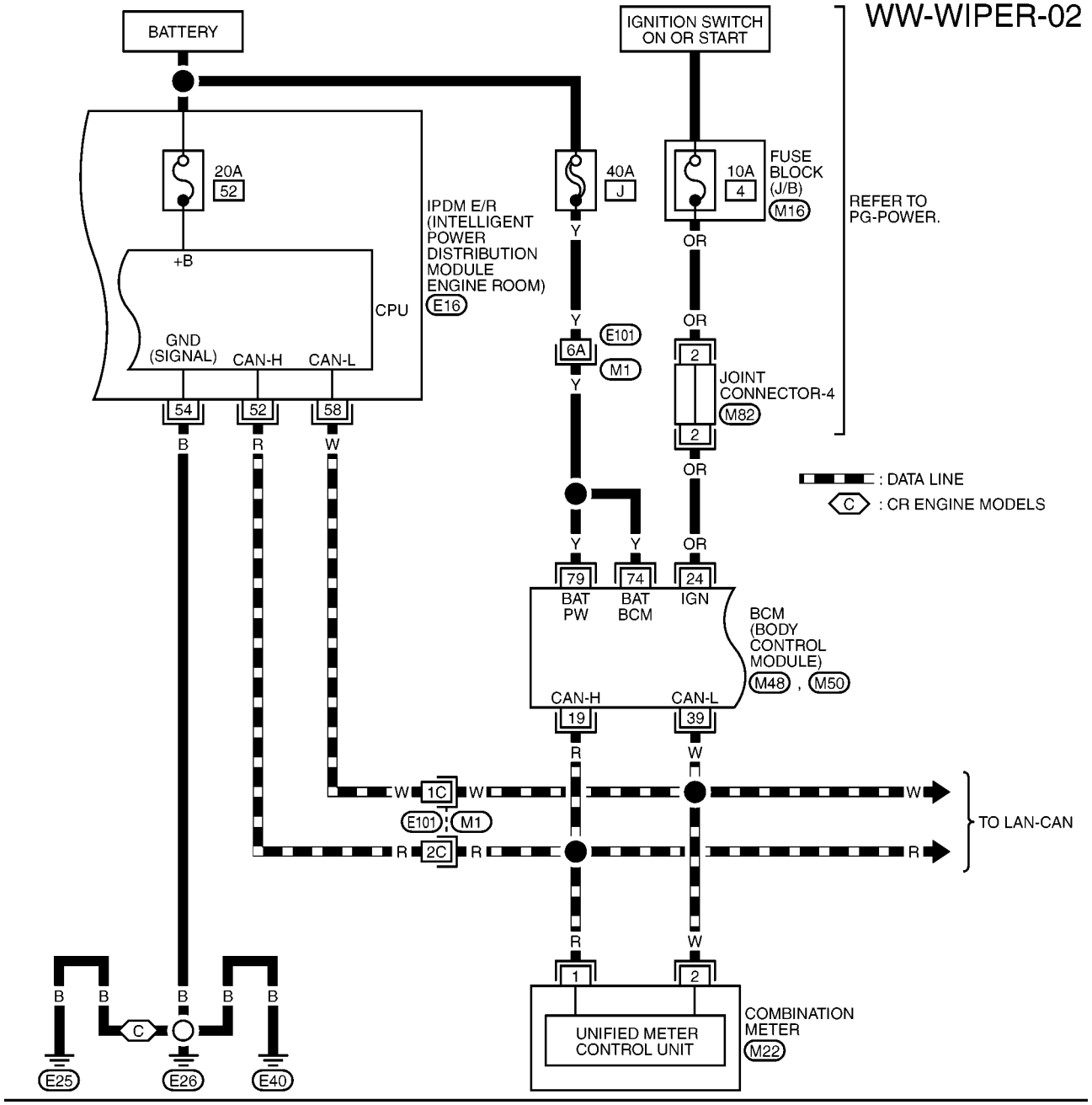
EKS00864

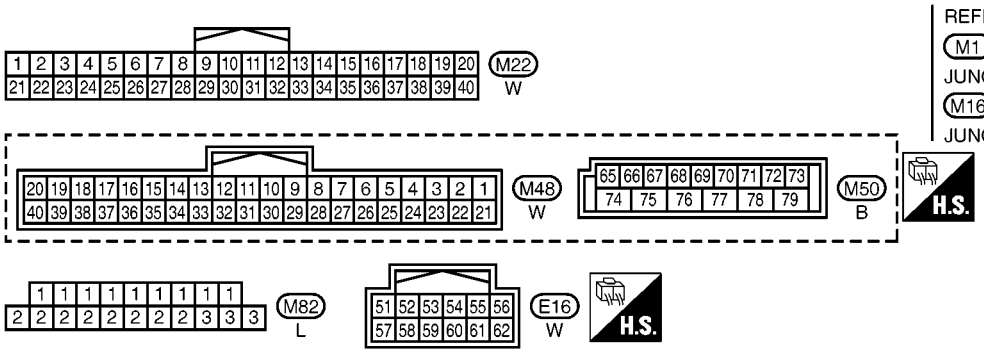






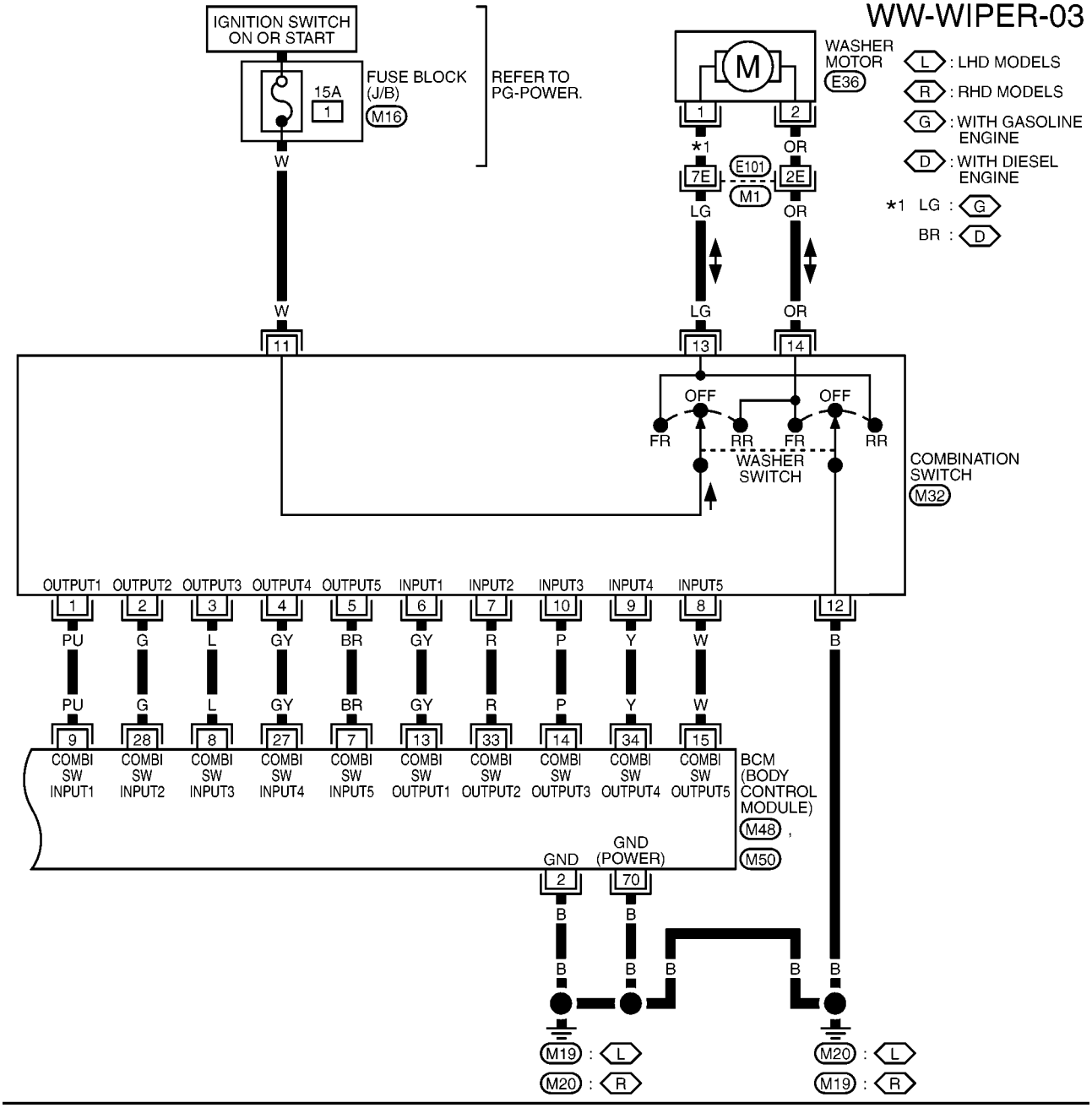
MIWA0424E

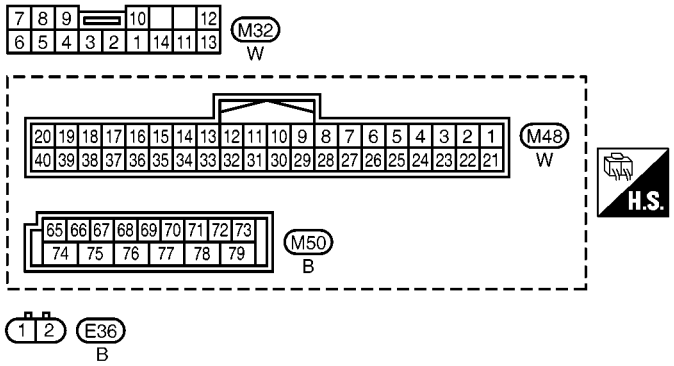




REFER TO THE FOLLOWING.
M1 -SUPER MULTIPLE JUNCTION (SMJ)
M16 -FUSE BLOCK- JUNCTION BOX (J/B)

MIWA0425E



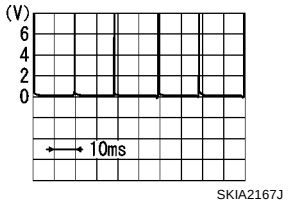
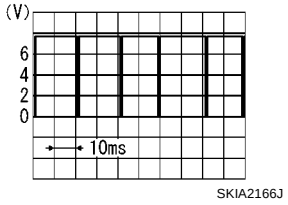
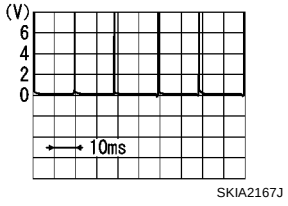


REFER TO THE FOLLOWING.
M1 -SUPER MULTIPLE JUNCTION (SMJ)
M16 -FUSE BLOCK-JUNCTION BOX (J/B)

MKWA1460E

Terminals and Reference Values for BCM

EKS00865

Terminal	Wire color	Signal designation	Measuring condition		Voltage [V] (Approx.)
			Ignition switch	Operation or condition	
2	B	Ground	ON	—	0
7	BR	Combination switch input 5	ON	Headlamps, turn signal, wipers OFF	 SKIA2167J
8	L	Combination switch input 3			
9	PU	Combination switch input 1			
27	GY	Combination switch input 4			
28	G	Combination switch input 2			
13	GY	Combination switch output 1	ON	Headlamps, turn signal, wipers OFF (wiper volume is 1 or 7)	 SKIA2166J
14	P	Combination switch output 3			
15	W	Combination switch output 5			
33	R	Combination switch output 2		Headlamps, turn signal, wipers OFF (wiper volume is other than 1 or 7)	 SKIA2167J
34	Y	Combination switch output 4			
19	R	CAN H	—	—	—
24	OR	Ignition power supply	ON	—	Battery voltage
39	W	CAN L	—	—	—
70	B	Ground	ON	—	0
74	Y	Power source (Fusible link)	OFF	—	Battery voltage
79	Y	Power source (Fusible link)	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

EKS00866

Terminal.	Wire color	Signal designation	Measuring condition			Voltage [V] (Approx.)
			Ignition switch	Operation or condition		
3	B	Ground	ON	—		0
23	Y	Low speed power source	ON	Wiper switch	OFF	0
					LO	Battery voltage
24	*1	High speed power source	ON	Wiper switch	OFF	0
					HI	Battery voltage
52	R	CAN H	—	—		—
54	B	Ground	—	—		0
55	OR	Wiper auto stop signal	ON	Wiper operating		Battery voltage
				Wiper stopped		0
58	W	CAN L	—	—		—

*1: Gasoline engine models (LG), Diesel engine models (BR)

How to Proceed With Trouble Diagnosis

EKS00867

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-6, "System Description" .
3. Carry out the Preliminary check. Refer to WW-31, "Preliminary Inspection" .
4. Confirm front wiper does not operate by fail-safe control of IPDM E/R. Refer to PG-20, "FAIL-SAFE FUNCTION" .
5. Check symptom and repair or replace the cause of malfunction.
6. Does the front wiper operate normally? Yes: GO TO 7. No: GO TO 5.
7. Inspection end.

Preliminary Inspection

EKS00868

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSE

- Check fuse and fusible link for blown-out.

Unit	Power source	Fuse No.
Front washer motor	Ignition ON or START	1
Front wiper main relay	Battery	38
BCM	Battery	J
	Ignition switch ON or START position	4

Refer to WW-27, "Wiring Diagram — WIPER —"

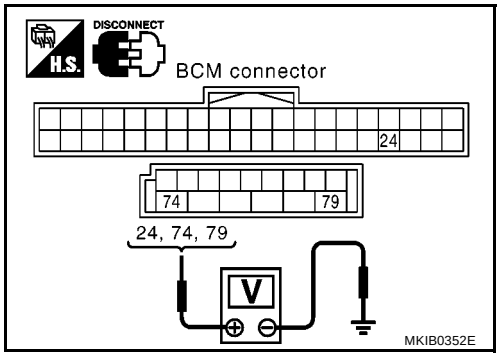
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse Refer to PG-5, "POWER SUPPLY ROUTING"

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



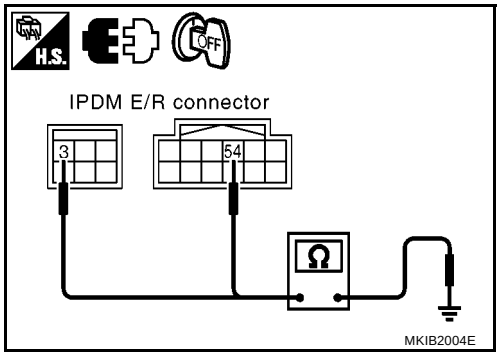
Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M50	74 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
M50	79 (Y)		Battery voltage	Battery voltage	Battery voltage
M48	24 (OR)		0V	0V	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

1. Disconnect IPDN E/R harness connector.
2. Check continuity between IPDM E/R harness connector and ground.



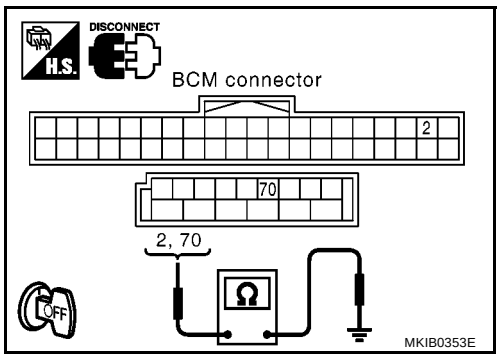
Connector	Terminal (Wire color)	Ground	Continuity
E11	3 (B)	Ground	Yes
E16	54 (B)		

OK or NG

OK >> GO TO 4.
NG >> Harness for open ground circuit.

4. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



Connector	Terminal (Wire color)	Ground	Continuity
M48	2 (B)	Ground	Yes
M50	70 (B)		

OK or NG

OK >> INSPECTION END.
NG >> Check harness ground circuit.

CONSULT-II Function (BCM)

EKS007B0

CONSULT-II can display each diagnostic item using the diagnostic modes shown following.

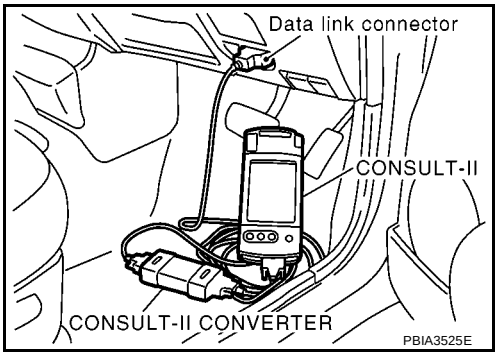
BCM diagnosis operation	Inspection Item, Diagnosis Mode	Description
Wiper	Work support	Change the setting for each function.
	Data monitor	Displays BCM input data in real time.
	Active test	Device operation can be checked by applying a drive signal to device.

CONSULT-II OPERATION

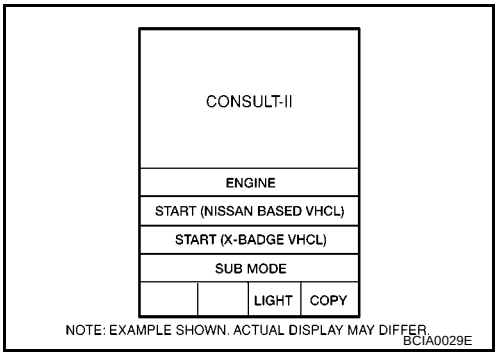
CAUTION:

If CONSULT-II is used without CONSULT-II CONVERTER connected, malfunction may be detected by self-diagnosis in control units that use CAN Communication.

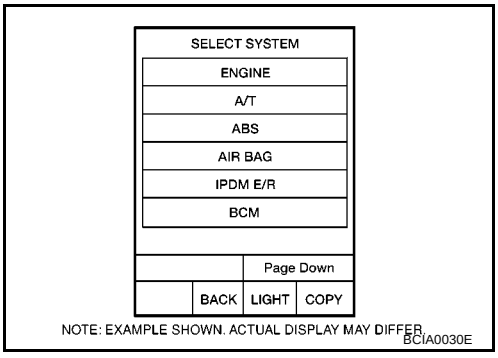
1. Turn ignition switch OFF.
2. Connect “CONSULT-II” and “CONSULT-II CONVERTER” to data link connector.
3. Turn ignition switch ON.



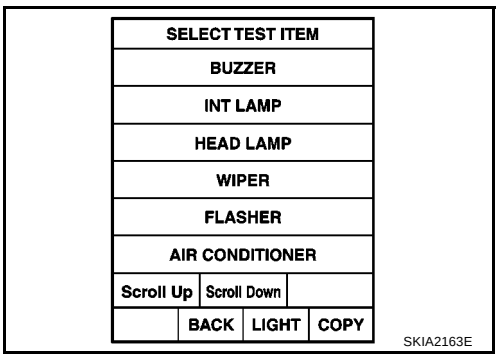
4. Touch “START (NISSAN BASED VHCL)”.



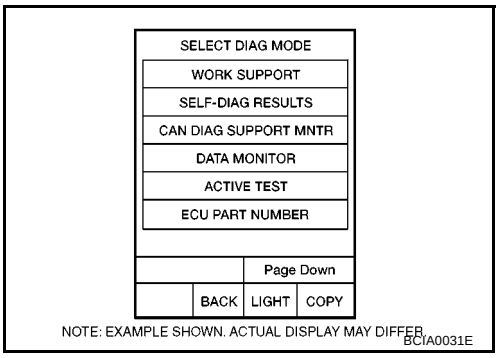
5. Touch “BCM” on the “SELECT SYSTEM” screen.
   If “BCM” is not indicated, go to GI-36, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Touch “WIPER” on the “SELECT TEST ITEM” screen.



7. Touch “WORK SUPPORT”, “DATA MONITOR”, or “ACTIVE TEST” on “SELECT DIAG MODE”.



WORK SUPPORT

Operation Procedure

1. Touch “WIPER” on “SELECT TEST ITEM” screen.
2. Touch “WORK SUPPORT” on “SELECT DIAG MODE” screen.
3. Touch “RR WIP RVRS SET” on “SELECT WORK ITEM” screen.
4. Touch “START”.
5. Touch “CHANGE SETT”.
6. The setting will be changed and “CUSTOMIZING COMPLETED” will be displayed.
7. Touch “END”.

Display Item List

Supported item	Description
RR WIP RVRS SET	Rear wiper reverse range operation setting can be changed.

DATA MONITOR

Operation Procedure

1. Touch “WIPER” on the “SELECT TEST ITEM” screen.
2. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
3. Touch “ALL SIGNALS” on the “DATA MONITOR” screen.
4. Touch “START”.
5. When “ALL SIGNALS” is selected, items will be monitored.
6. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

Display Item List

Monitor item “UNIT”		Contents
IGN ON SW	[ON/OFF]	Displays “ignition switch ON (ON)/Other OFF or ACC (OFF)” status as judged from ignition switch signal.
FR WIPER HI	[ON/OFF]	Displays “Front Wiper HI (ON)/Others (OFF)” status as judged from wiper switch signal.
FR WIPER LOW	[ON/OFF]	Displays “Front Wiper LOW (ON)/Others (OFF)” status as judged from wiper switch signal.
FR WIPER INT	[ON/OFF]	Displays “Front Wiper INT (ON)/Others (OFF)” status as judged from wiper switch signal.

Monitor item “UNIT”		Contents
FR WASHER SW	[ON/OFF]	Displays “Front Washer Switch (ON)/Others (OFF)” status as judged from wiper switch signal.
INT VOLUME	[1 - 7]	Displays intermittent operation dial position setting (1 - 7) as judged from wiper switch signal.
FR WIPER STOP	[ON/OFF]	Displays “Stopped (ON)/Operating (OFF)” status as judged from the auto-stop signal.
VEHICLE SPEED	[km/h]	Displays vehicle speed status as judged from vehicle speed signal.
H/L WASHER SW	[ON/OFF]	Displays (Headlamp washer switch: ON/Others: OFF) as judged from headlamp washer switch signal
H/L SW POS	[ON/OFF]	Displays (Headlamp switch: ON/Others: OFF) as judged from lighting switch signal
RR WIPER ON	[ON/OFF]	Displays “Rear Wiper ON (ON)/Others (OFF)” status as judged from wiper switch signal.
RR WIPER INT	[ON/OFF]	Displays “Rear Wiper INT (ON)/Others (OFF)” status as judged from wiper switch signal.
RR WASHER SW	[ON/OFF]	Displays “Rear Washer Switch (ON)/Others (OFF)” status as judged from wiper switch signal.
RR WIPER STOP	[ON/OFF]	Displays “Rear Wiper Stop (ON)/Others (OFF)” status as judged from wiper switch signal.
REVERSE SW CAN	[ON/OFF]	Displays “Reverse position (ON)/Others (OFF)” status as judged from reverse signal.
R/WIP MTR SIG	[ON/OFF]	Displays “Rear wiper motor signal (ON)/Others (OFF)” status as judged to rear wiper motor output signal.

ACTIVE TEST

Operation Procedure

1. Touch “WIPER” on the “SELECT TEST ITEM” screen.
2. Touch “ACTIVE TEST” on the “SELECT DIAG MODE” screen.
3. Touch item to be tested, and check operation.
4. During operation check, touching “BACK” deactivates operation.

Display Item List

Test item	Indication CONSULT-II display	Description
Front wiper output (HI, LOW)	FR WIPER	Front wiper can be operated by ON (HI, LO)–OFF operation.
Rear wiper output	RR WIPER	Rear wiper can be operated by any ON-OFF operation.
Head lamp washer output	HEAD LAMP WASHER	Head lamp washer can be operated by any ON-OFF operation.

CONSULT-II Function (IPDM E/R)

EKS007B1

CONSULT-II can display each diagnostic item using the diagnostic modes shown following.

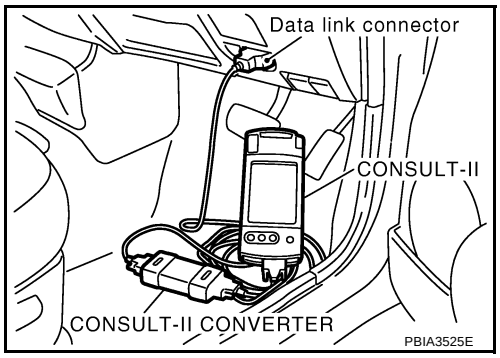
IPDM E/R diagnosis mode	Description
SELF-DIAG RESULTS	Refer to PG-35, "SELF-DIAG RESULTS" .
DATA MONITOR	Displays input/output data of IPDM E/R in real time.
ACTIVE TEST	IPDM E/R sends a drive signal to components for electric load operation check.

CONSULT-II BASIC OPERATION

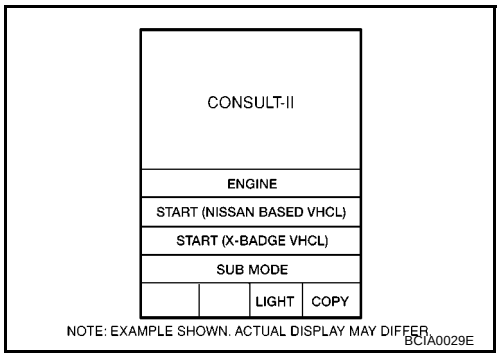
CAUTION:

If CONSULT-II is used without CONSULT-II CONVERTER connected, malfunction may be detected by self-diagnosis in control units that use CAN Communications.

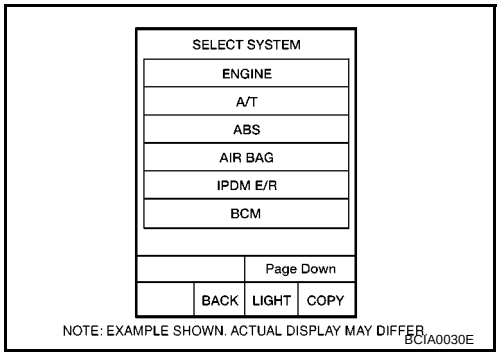
1. Turn ignition switch OFF.
2. Connect “CONSULT-II” and “CONSULT-II CONVERTER” to data link connector.
3. Turn ignition switch ON.



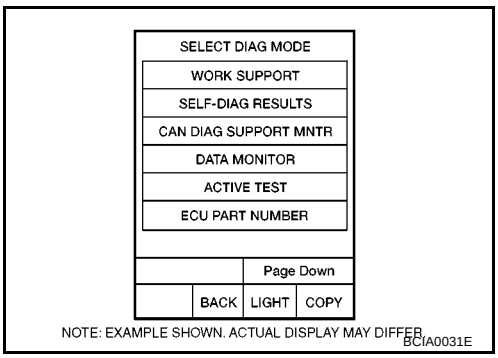
4. Touch “START (NISSAN BASED VHCL)”.



5. Touch “IPDM E/R” on “SELECT SYSTEM” screen.
   If “IPDM E/R” is not indicated, go to GI-36, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select required diagnosis mode on “SELECT DIAG MODE”.



DATA MONITOR

Operation Procedure

1. Touch “DATA MONITOR” on “SELECT DIAG MODE” screen.
2. Touch “ALL SIGNALS”, “MAIN SIGNALS”, or “SELECT FROM MENU” on “DATA MONITOR” screen.

ALL SIGNALS	All items will be monitored.
MAIN SIGNALS	Monitors preselected items.
SELECT FROM MENU	Monitors items optionally selected.

3. Touch “START”.
4. When “SELECT FROM MENU” is selected, touch items to be monitored. When “ALL SIGNALS” is selected, all items are monitored. When “MAIN SIGNALS” is selected, only preselected items are monitored.
5. Touch “RECORD” while monitoring to record the status of the item being monitored. To stop recording, touch “STOP”.

All Signals, Main Signals, Select From Menu

Item name	Display or unit	Monitor item selection			Description
		All signals	Main signal	Select from menu	
HEADLAMP WASHER REQUEST	ON/OFF	×		×	Signal status input from BCM
FR WIPER REQUEST	OFF/LO/HI	×	×	×	Signal status input from BCM
WIPER AUTO STOP	ON/OFF	×	×	×	IPDM E/R output status
WIPER PROTECTION	OFF/LS/HS/Block	×		×	IPDM E/R control status (LS: low speed operation/ HS: high speed operation/ BLOCK: wiper arm is locked)

CAUTION:

- **Perform IPDM E/R data monitor with ignition switch ON. Monitoring with ignition switch in ACC position may cause an improper display.**

ACTIVE TEST

Operation Procedure

1. Touch “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Touch item to be tested, and check operation.
3. Touch “START”.
4. Touch “STOP” during a test to stop the operation.

Test item	Indication on CONSULT-II display	Description
Front wiper (HI, LOW)	FRONT WIPER	With a certain operation (HI, LO, OFF) front wiper relay can be operated.
Headlamp washer	HEADLAMP WASHER	Headlamp washer relay can be operated by switching (ON and OFF) optionally.

Front Wiper Does Not Operate

EKS00872

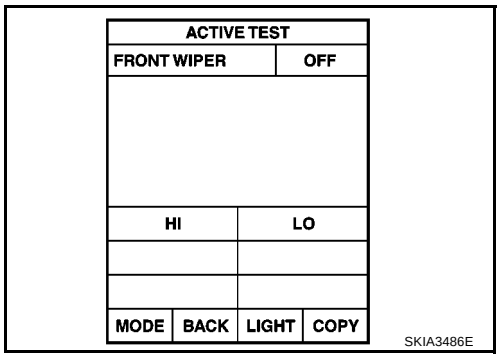
CAUTION:

During IPDM E/R fail-safe control, front wipers may not operate. Refer to PG-20, "FAIL-SAFE FUNCTION" to make sure that it is not in fail-safe status.

1. CHECK FRONT WIPER OPERATION

With CONSULT-II

1. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
3. Make sure that front wipers operate normally.



Without CONSULT-II

1. Start up auto active test. Refer to PG-43, "Auto Active Test" .
2. Make sure that front wipers operate normally.

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

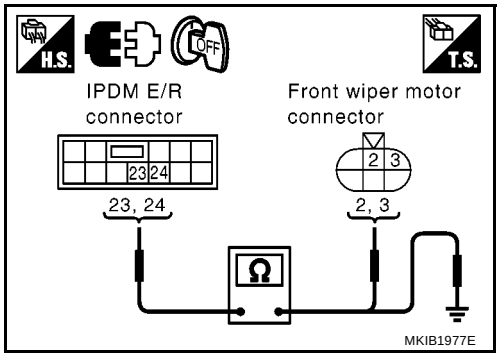
2. CHECK IPDM E/R TO FRONT WIPERS

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connectors and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E13 terminals 23 (Y), 24 (LG or BR) and front wiper motor harness connector E44 terminals 2 (LG or BR), 3 (Y).

   23 (Y) - 3 (Y) : Continuity should exist.
   24 (LG or BR) - 2 (LG or BR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E13 terminals 2 (LG or BR), 3 (Y) and ground.

   23 (Y) - Ground : Continuity should not exist.
   24 (LG or BR) - Ground : Continuity should not exist.



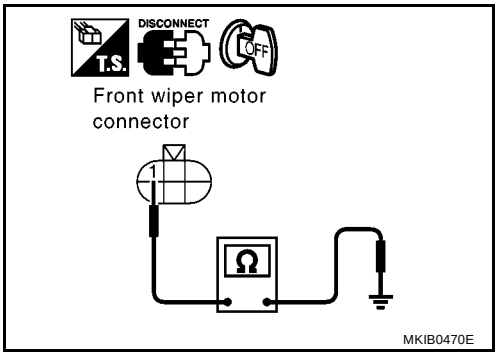
OK or NG

OK >> Connect connectors. GO TO 3.
NG >> Repair or replace harness.

3. FRONT WIPER TO GROUND INSPECTION

Check continuity between front wiper motor harness connector E44 terminal 1(B) and ground.

1 (B) - Ground : Continuity should exist.



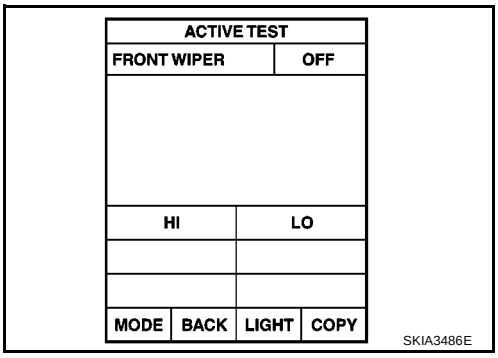
OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

4. IPDM E/R INSPECTION

With CONSULT-II

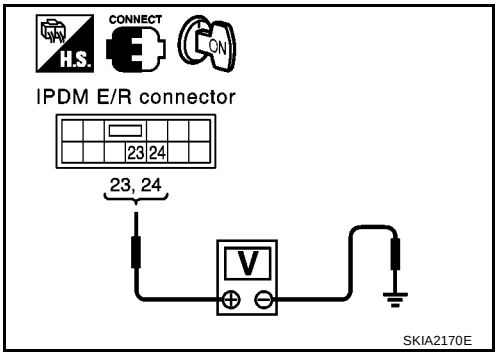
1. Connect IPDM E/R connector.
2. Using active test, check voltage between IPDM E/R connector terminals 23, 24 and ground while front wiper relay (HI/LO) is operating.



Without CONSULT-II

1. Connect IPDM E/R connector.
2. Start up auto active test, and check voltage between IPDM E/R connector terminals 23, 24 and ground while front wiper relay (main, HI/LO) is operating.

Terminals			Measuring condition	Voltage [V] (Approx.)
(+)		(–)		
Connector	Terminal (Wire color)			
E13	23 (Y)	Ground	Stopped	0
			LO operation	Battery voltage
	24 (LG or BR)		Stopped	0
			HI operation	Battery voltage



OK or NG

OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

5. CHECK CAN COMMUNICATION CIRCUIT

Select “IPDM E/R” by CONSULT-II, and perform self-diagnosis for “IPDM”.

Are self-diagnosis results displayed?

NO DTC>>GO TO 6.
CAN COMM CIRCUIT>>Check CAN communication line. GO TO BCS-30, "CAN Communication Inspection With CONSULT-II (Self-Diagnosis)" .

SELF-DIAG RESULTS	
DTC RESULTS	TIME
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	

LKIA0073E

6. CHECK COMBINATION SWITCH OPERATION

With CONSULT-II

Select “BCM” on CONSULT-II. With “WIPER” data monitor, confirm that “FR WIPER INT”, “FR WIPER LOW”, and “FR WIPER HI” turn ON-OFF according to wiper switch operation.

Without CONSULT-II

Refer to LT-219, "Check Combination Switch" .

OK or NG

OK >> Replace BCM.
NG >> Refer toLT-212, "COMBINATION SWITCH" .

DATA MONITOR	
MONITOR	
IGN ON SW	ON
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	1
FR WIPER STOP	ON
RR WIPER ON	OFF
RR WIPER INT	OFF
	Page Down
	RECORD
MODE / BACK / LIGHT / COPY	

SKIA2175E

Front Wiper Does Not Return to Stop Position

EKS00873

1. CHECK AUTO STOP INPUT SIGNAL

With CONSULT-II

Select “IPDM E/R” on CONSULT-II. Check “FR WIPER STOP” in “DATA MONITOR” mode with CONSULT-II.

When front wiper is operating : FR WIPER STOP OFF
When front wiper is stopped : FR WIPER STOP ON

Without CONSULT-II

GO TO 2.

OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 2.

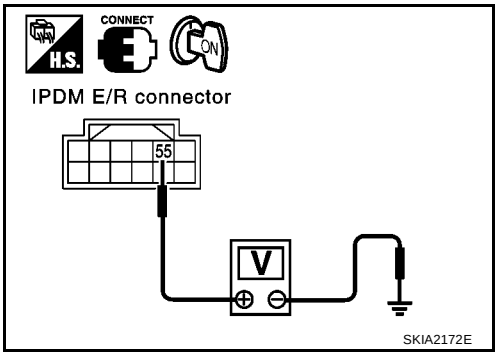
DATA MONITOR	
MONITOR	
IGN ON SW	ON
FR WIPER HI	OFF
FR WIPER LOW	OFF
FR WIPER INT	OFF
FR WASHER SW	OFF
INT VOLUME	1
FR WIPER STOP	ON
RR WIPER ON	OFF
RR WIPER INT	OFF
	Page Down
	RECORD
MODE / BACK / LIGHT / COPY	

SKIA2175E

2. CHECK IPDM E/R OUTPUT SIGNAL

Check voltage between IPDM E/R harness connector E16 terminal 55(OR) and ground while front wiper motor is stopped and while it is operating.

Terminals			Condition	Voltage [V] (Approx.)
(+)		(-)		
Connector	Terminal (Wire color)			
E16	55 (OR)	Ground	Wiper operating	Battery voltage
			Wiper stopped	0



OK or NG

OK >> GO TO 3.
NG >> Replace front wiper motor.

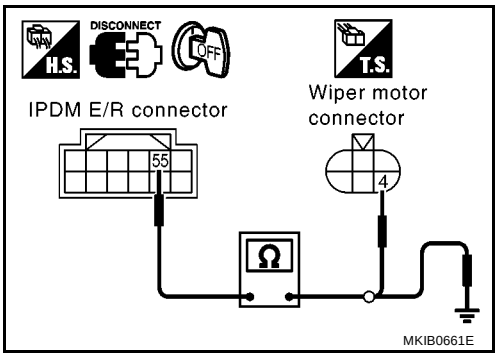
3. CHECK AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E16 terminal 55(OR) and front wiper motor harness connector E44 terminal 4(OR).

55 (OR) – 4 (OR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E16 terminal 55 (OR) and ground

55 (OR) – Ground : Continuity should not exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

Front Wiper Low Speed Operation Does Not Operate

EKS00874

1. CHECK FRONT WIPER MOTOR LOW SPEED OPERATION

With CONSULT-II

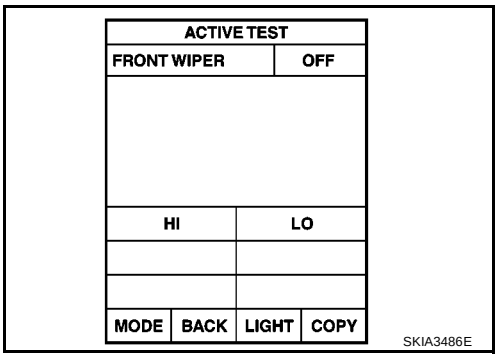
1. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
3. Make sure that front wiper (low speed) operates normally.

Without CONSULT-II

1. Start up auto active test. Refer to PG-43, "Auto Active Test" .
2. Make sure that front wiper (low speed) operates normally.

OK or NG

OK >> GO TO LT-219, "Check Combination Switch" .
NG >> GO TO 2.



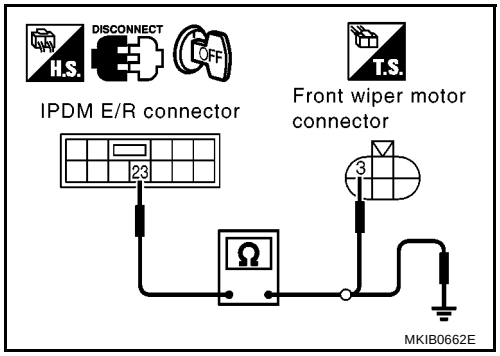
2. CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E13 terminal 23(Y) and front wiper motor harness connector E44 terminal 3(Y).

23 (Y) – 3 (Y) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E13 terminal 23 (Y) and ground.

23 (Y) – Ground : Continuity should not exist.



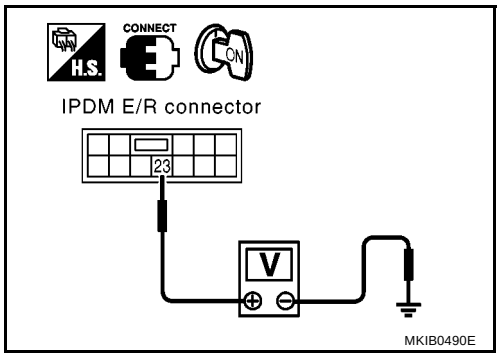
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R OUTPUT SIGNAL

1. Connect IPDM E/R connector.
2. Turn ignition switch ON.
3. Front wiper switch turn to LO position.
4. Check voltage between IPDM E/R harness connector E13 terminal 23(Y) and ground.

23 (Y) - Ground : Battery voltage



OK or NG

OK >> Replace from wiper motor.
NG >> Replace IPDM E/R.

Front Wiper High Speed Operation Does Not Operate

EKS00875

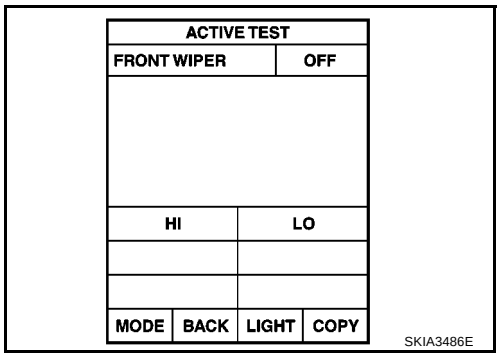
1. CHECK FRONT WIPER MOTOR HIGH SPEED OPERATION

With CONSULT-II

1. Select “IPDM E/R” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “FRONT WIPER” on “SELECT TEST ITEM” screen.
3. Make sure that front wiper (high speed) operates normally.

Without CONSULT-II

1. Start up auto active test. Refer to PG-43, "Auto Active Test" .
2. Make sure that front wiper (high speed) operates normally.



OK or NG

OK >> GO TO LT-219, "Check Combination Switch" .
NG >> GO TO 2.

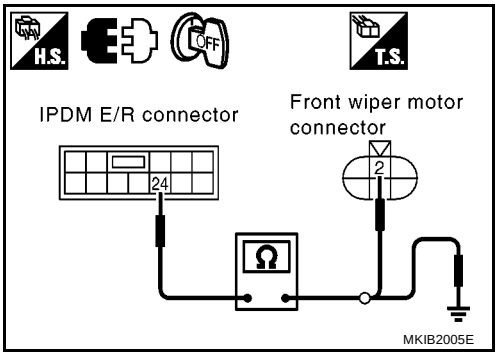
2. CHECK FRONT WIPER MOTOR CURCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E13 terminal 24(LG or BR) and front wiper motor harness connector E44 terminal 2(LG or BR).

   24 (LG or BR) – 2 (LG or BR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E13 terminal 24(LG or BR) and ground.

   24 (LG or BR) – Ground : Continuity should not exist.



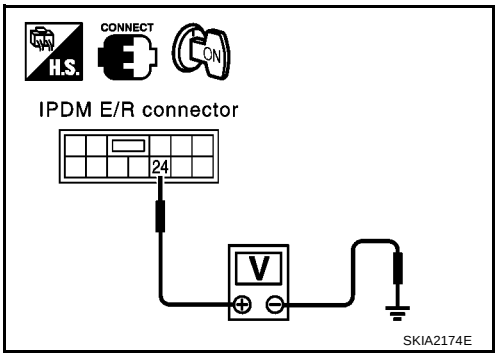
OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

3. CHECK IPDM E/R OUTPUT SIGNAL

1. Connect IPDM E/R connector.
2. Turn ignition switch ON.
3. Front wiper switch turn to HI position.
4. Check voltage between IPDM E/R harness connector E13 terminal 24(LG or BR) and ground.

   24 (LG or BR) - Ground : Battery voltage



OK or NG

OK >> Replace front wiper motor.
NG >> Replace IPDM E/R.

Front Wiper INT Does Not Operate

EKS00876

Refer to LT-219, "Check Combination Switch" .

Front Wiper Interval Time Is Not Controlled by Vehicle Speed

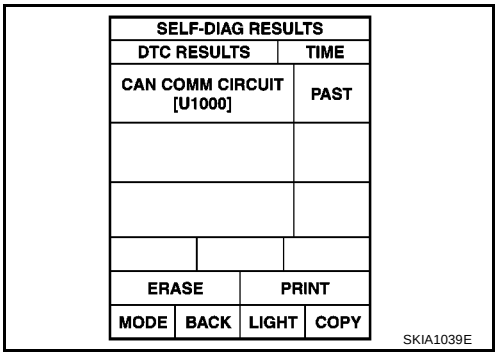
EKS00879

1. CHECK CAN COMMUNICATION LINE

Select “BCM” by CONSULT-II, and perform self-diagnosis for “BCM”.

Are self-diagnosis results displayed?

NO DTC>>GO TO 2
CAN COMM CIRCUIT>>Check CAN communication line of BCM. GO TO BCS-30, "CAN Communication Inspection With CONSULT-II (Self-Diagnosis)" .



2. CHECK COMBINATION METER

Confirm that speedometer operates normally.

OK or NG

OK >> Replace BCM.
NG >> Combination meter vehicle speed system malfunction. GO TO DI-33, "Inspection/Vehicle Speed Signal" .

After Front Wipers Operate for 10 Seconds, They Stop for 20 Seconds

EKS0087A

CAUTION:

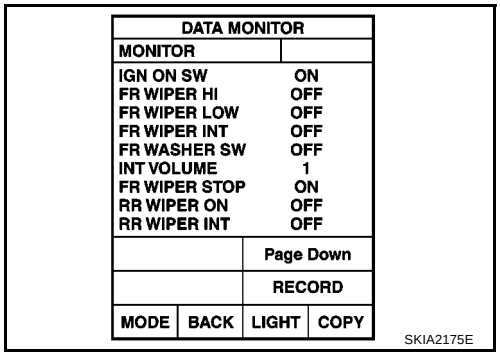
- **When auto-stop signal has not varied for 10 seconds or longer while IPDM E/R is operating front wipers, IPDM E/R considers that front wipers are locked, and stops wiper output. That causes this symptom.**
- **This status can be checked by IPDM E/R DATA MONITOR on which “WIPER PROTECTION” item shows “Block”.**

1. CHECK IPDM E/R INPUT SIGNAL

With CONSULT-II

Select “IPDM E/R” on CONSULT-II. Check (“FR WIPER STOP”) in “DATA MONITOR” mode with CONSULT-II.

When front wiper is operating : FR WIPER STOP OFF
When front wiper is stopped : FR WIPER STOP ON



Without CONSULT-II

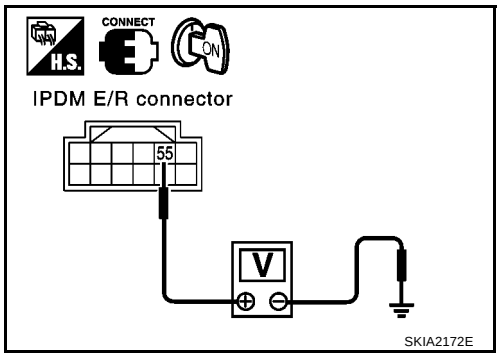
GO TO 2.

OK or NG

OK >> Replace IPDM E/R.
NG >> GO TO 2.

2. CHECK IPDM E/R OUTPUT SIGNAL

1. Turn ignition switch ON.
2. Front wiper switch turn to INT position.
3. Check voltage between IPDM E/R harness connector E16 terminal 55(OR) and ground.



Connector terminal			Condition	Voltage [V] (Approx.)
(+)		(-)		
Connector	Terminal (Wire color)			
E16	55 (OR)	Ground	Wiper operating	Battery voltage
			Wiper stopped	0

OK or NG

OK >> GO TO 3.
NG >> Replace front wiper motor.

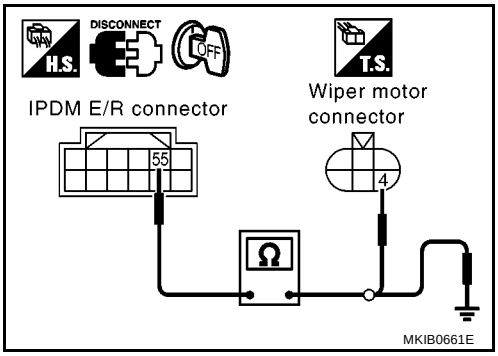
3. CHECK FRONT WIPER MOTOR CURCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and front wiper motor connector.
3. Check continuity between IPDM E/R harness connector E16 terminal 55 (OR) and front wiper motor harness connector E44 terminal 4 (OR).

55 (OR) – 4 (OR) : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E16 terminal 55 (OR) and ground.

55 (OR) – Ground : Continuity should not exist.



OK or NG

OK >> Replace IPDM E/R.
NG >> Repair harness or connector.

Front Wipers Do Not Stop

EKS0087B

Refer to PG-52, "Diagnosis of IPDM E/R Integrated Relay" .

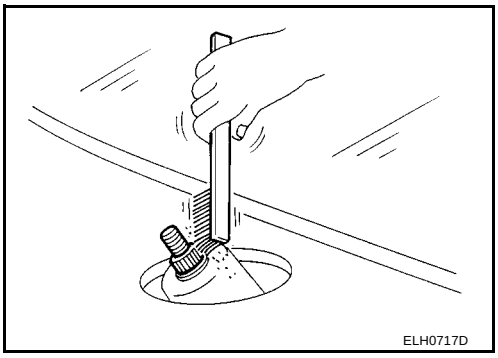
Removal and Installation of Front Wiper Arm

EKS007B3

REMOVAL

1. Turn the wiper switch ON to operate the wiper motor, then turn it OFF (auto stop).
2. Open hood, remove nut cover, and remove wiper arm nut.
3. Lift up driver wiper arm and remove wiper arm from vehicle.
4. Close hood, lift up passenger wiper arm, and remove wiper arm from vehicle.

Before attaching the front wiper arm, clean the arm mount shown in the figure to prevent nuts from being loosened.



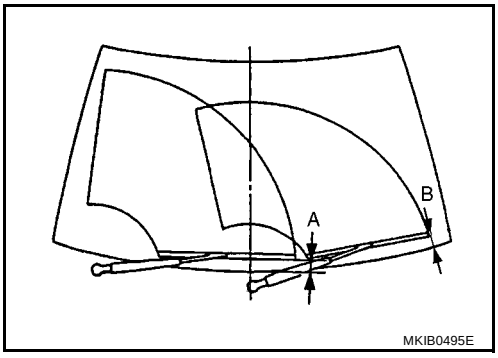
INSTALLATION

1. Lower wiper blade to glass so that center end of blade comes to the position shown in diagram. Align blade end with marking set within blade set position black print.)
2. Tighten wiper arm nuts.

Wiper arm nut:

: 20.6 - 26.5 N·m (2.1 - 2.7 kg-m, 15 - 20 ft-lb)

3. Spray washer fluid. Turn wiper switch ON to operate wiper motor, then turn it OFF (auto stop).
4. Make sure wiper blade stops at the position shown in the figure.



Stop position A : 33.7 - 48.7 mm (1.327 - 1.917 in)
Stop position B : 33.7 - 48.7 mm (1.327 - 1.917 in)

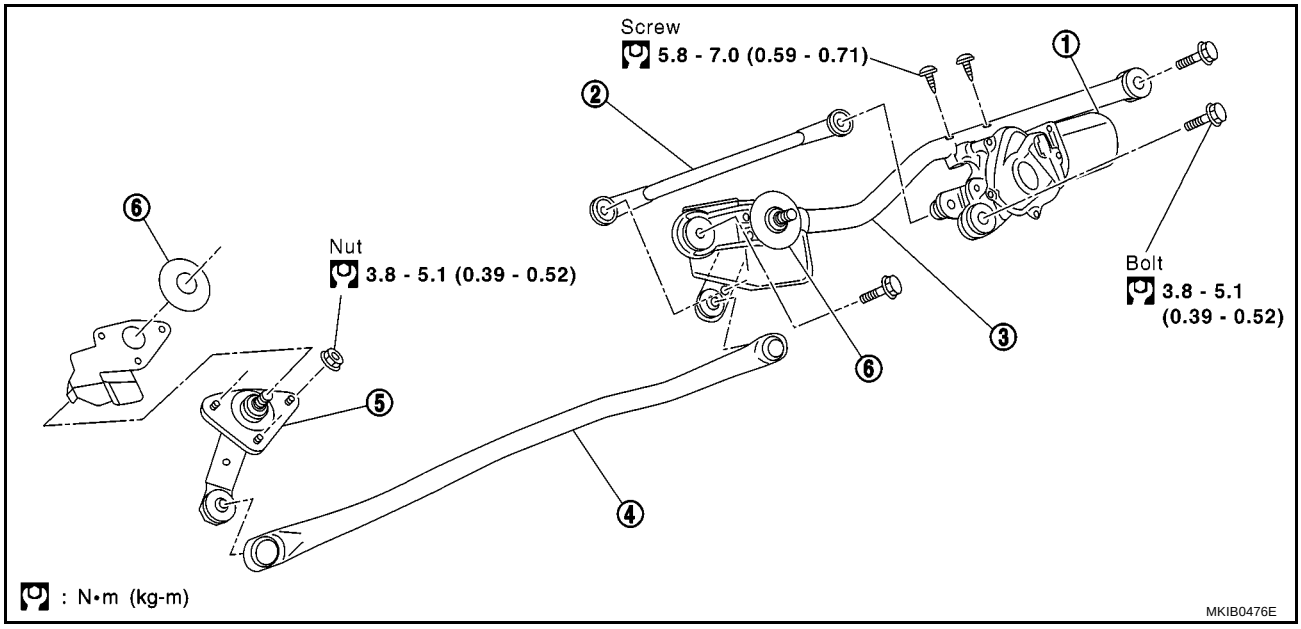
Adjustment of Front Wiper Arm Stop Position

EKS007B4

Refer to WW-45, "Removal and Installation of Front Wiper Arm" .

Removal and Installation of Front Wiper Motor and Link

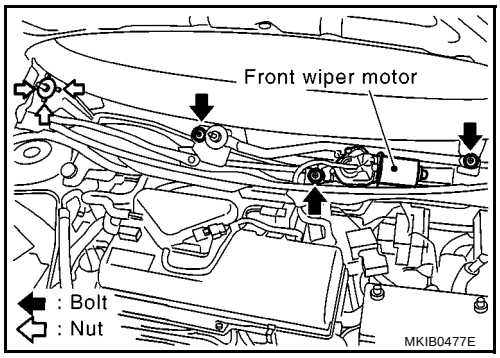
EKS007B5



1. Wiper motor
2. Wiper link
3. Wiper frame
4. Wiper link
5. Pivot
6. Shaft seal

REMOVAL

1. Operate the wiper motor, and stop it at the auto stop position.
2. Remove wiper arm nuts, and remove wiper arm from vehicle.
3. Remove cowl top cover. Refer to EI-13, "COWL TOP" .
4. Remove wiper motor connector.
5. Remove shaft seal.
6. Remove wiper motor assembly bolts and driver pivot nuts, and then remove wiper motor assembly from vehicle.
7. Remove the wiper link from the wiper frame and the motor arm.
8. Remove wiper motor screws, and then remove wiper motor from wiper frame.



INSTALLATION

1. Connect the wiper motor to the vehicle-side connector. Turn the wiper switch ON to operate the wiper motor, then turn the wiper switch OFF (auto stop).
2. Disconnect wiper motor connector.
3. Install wiper motor to wiper frame.

Wiper motor screw

: 5.8 - 7.0 N·m (0.59 - 0.71 kg-m, 51 - 62 in-lb)

4. Install wiper link to wiper frame and motor arm.
5. Connect wiper motor assembly to the connector. Turn wiper switch ON to operate wiper motor, then turn wiper switch OFF (auto stop).
6. Install the wiper motor assembly to the vehicle.

Wiper motor assembly bolt

: 3.8 - 5.1 N·m (0.39 - 0.52 kg-m, 34 - 45 in-lb)

Pivot nut

: 3.8 - 5.1 N·m (0.39 - 0.52 kg-m, 34 - 45 in-lb)

7. Install shaft seal.
8. Install cowl top cover. Refer to EI-13, "COWL TOP" .
9. Attach wiper arms.

CAUTION:

- **Do not drop the wiper motor or cause it to contact other parts.**
- **Check the grease conditions of the motor arm and wiper link joint (at retainer). Apply grease if necessary.**
  NISSAN MP special grease No. 2 (KRB0012025)

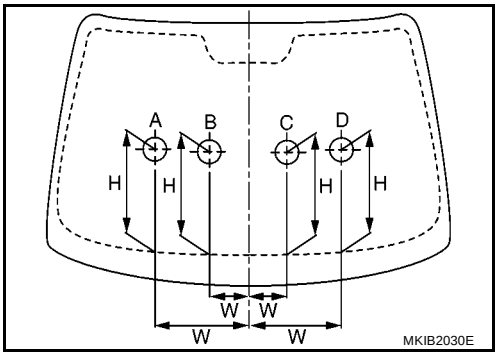
Adjustment of Spray Positions of Front Washer Nozzle (Hatchback)

EKS007B6

Adjust spray positions to match the positions listed below.

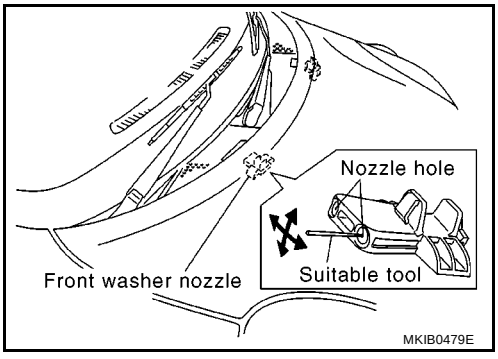
Unit: mm (in)

Spray position	H (hight)	l (width)	ϕ (spray point area)
A	325 (12.79)	300 (11.81) / 292 (11.51)*1	80 (3.15)
B	325 (12.79)	125 (4.92) / 118 (7.40)*2	80 (3.15)
C	325 (12.79)	125 (4.92) / 118 (7.40)*2	80 (3.15)
D	325 (12.79)	300 (11.81) / 292 (11.51)*1	80 (3.15)



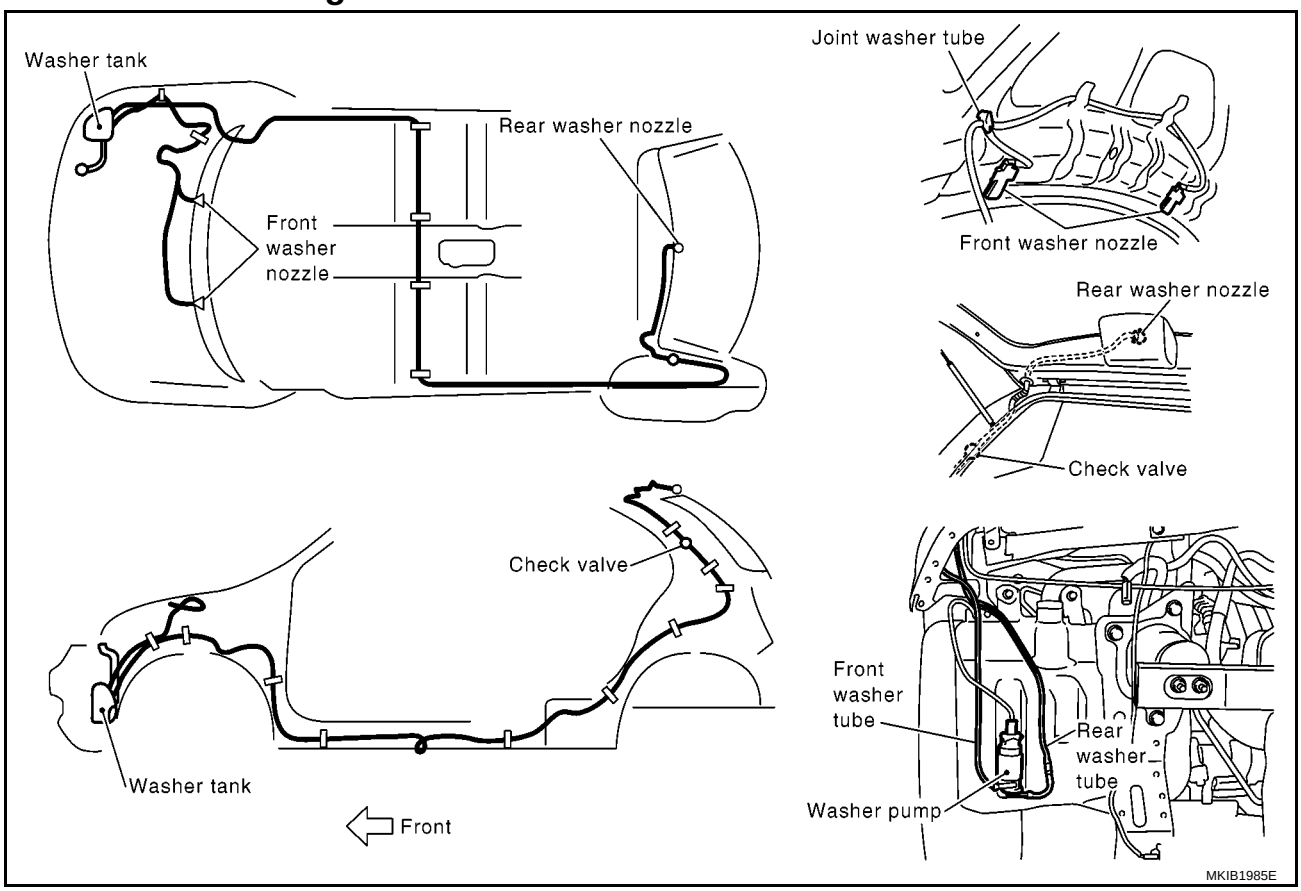
*1/ *2 : For (C+C) models.

Insert a needle or oin into the nozzle orifice to adjust the spray position.
NOTE: Do not insert any abject larger than 0.8 mm diameter into the nozzle.



Washer Hose Routing

EKS007B7

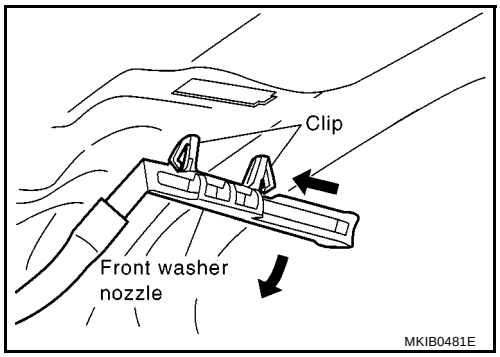


Removal and Installation of Front Washer Nozzle

EKS007B8

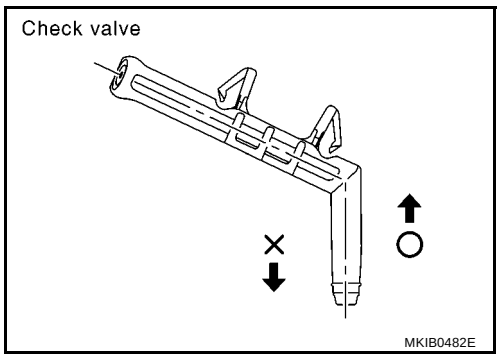
REMOVAL

1. Open hood.
2. While pushing nozzle spray point side along body, use the nozzle stop point as the support point and rotate nozzle to remove it from body.
3. Remove washer tube.



CHECK VALVE INSPECTION

Make sure air can pass through the hose by blowing forward (toward the nozzle) and air cannot pass through by sucking.



INSTALLATION

1. Install washer tube in nozzle.
2. Install nozzle to body.

3. Adjust nozzle spray location.

CAUTION:
The spray points differ, so be sure to install left and right nozzles correctly.

Removal and Installation of Front Wiper and Washer Switch

EKS007BA

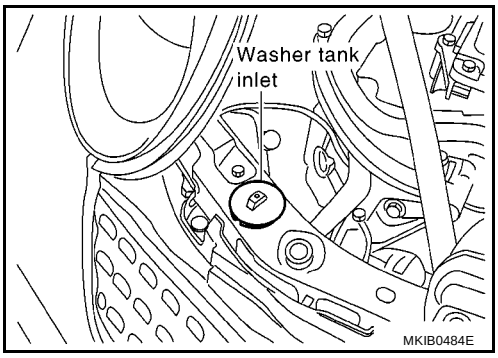
Refer to LT-222, "Removal and Installation" .

Removal and Installation of Front Wiper and Washer Tank

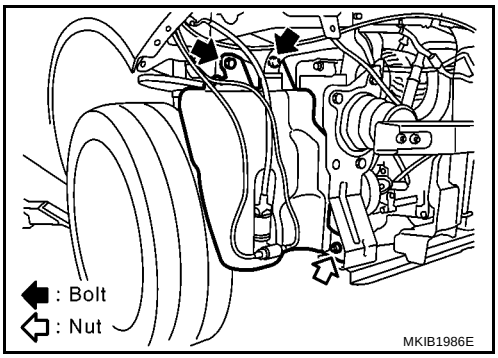
EKS007BB

REMOVAL

1. Remove cap, with pushing down fill opening, remove washer tank inlet from radiator core support upper.



2. Remove fender protector. Refer to EI-14, "FENDER PROTECTOR" .
3. Remove front bumper.EI-5, "FRONT BUMPER" .
4. Remove washer pump connector.
5. Remove washer tank bolts.



6. Remove the washer hose, and remove the washer tank from the vehicle.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:
After installing, add water up to the top of the inlet washer tank. Make sure there is no leakage.

Washer tank mounting screw

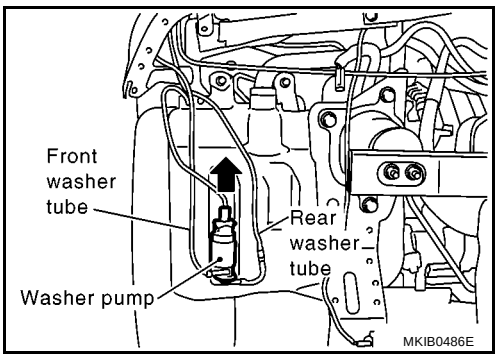
: 3.8 - 5.1 N·m (0.39 - 0.52 kg-m, 34 - 45 in-lb)

Removal and Installation of Front Wiper and Washer Pump

EKS007BC

REMOVAL

1. Remove fender protector. Refer to EI-14, "FENDER PROTECTOR" .
2. Remove washer pump connector and hose.
3. Pull out the washer pump in the direction shown by the arrow, and remove the washer pump from the washer tank.



INSTALLATION

Paying attention to the items listed below, install in the reverse order of removal.

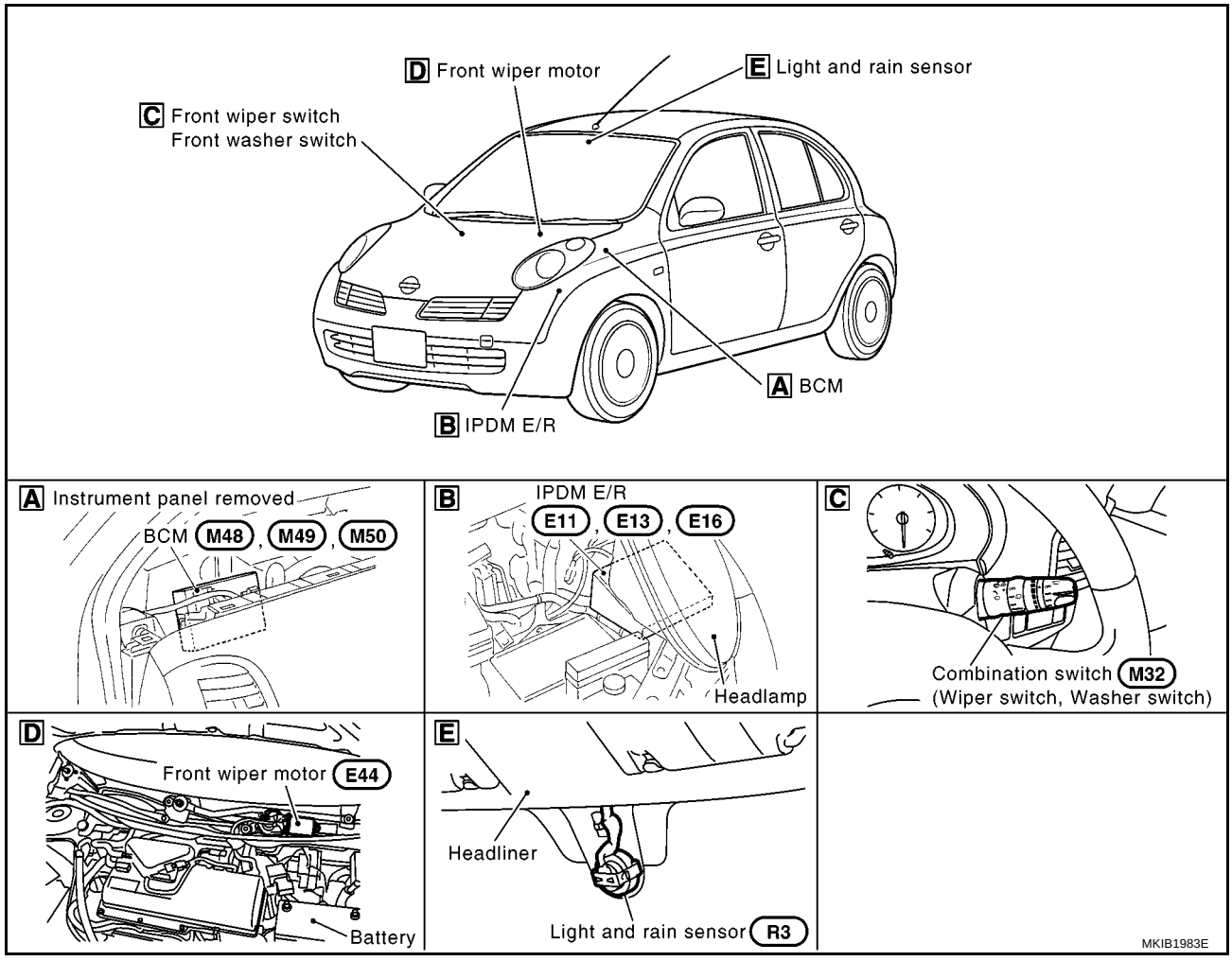
CAUTION:
When installing the washer pump, there must be no twisting or other unusual stress on the packing.

FRONT WIPER AND WASHER SYSTEM (WITH RAIN SENSOR)

PFP:28536

Components Parts and Harness Connector Location

EKS0087Y



System Description

EKS008WD

- Front wiper HI/LO relay and front wiper main relay are built into IPDM E/R.
- Wiper switch is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM when switch is turned ON.
- BCM controls front wiper LO, HI, and AUTO operation.
- IPDM E/R operates wiper motor according to CAN communication signals from BCM.

Power is supplied at all times

- through 20A fuse (NO.38, located in the IPDM E/R)
- to front wiper main relay.
- through 20A fuse (NO.52, located in the IPDM E/R)
- to IPDM E/R (CPU).
- through 40A fusible link (letter J, located in fuse and fusible link box)
- to BCM terminals 74 and 79.

When ignition switch ON or START position, power is supplied

- through 10A fuse [NO.4, located in fuse block (J/B)]
- to BCM terminal 24,
- through 15A fuse [NO.1, located in fuse block (J/B)]
- to combination switch terminal 11, and
- to front wiper HI/LO relay, front wiper main relay and IPDM E/R (CPU)

Ground is supplied

- to front wiper motor terminal 1 and,
- to IPDM E/R terminals 3 and 54
- through body grounds E25 (CR engine models), E26 and E40, and
- to combination switch terminal 12
- to light and rain sensor terminal 3, and
- to BCM terminals 2 and 70
- through body grounds M19 and M20

LOW SPEED WIPER OPERATION

When front wiper switch is placed in LO position, BCM read combination switch condition (Refer toWW-53, "COMBINATION SWITCH READING FUNCTION"). And BCM sent front wiper request signal (LO) to IPDM E/R with CAN communication line. When IPDM E/R receives front wiper request signal (LO), it turns ON front wiper main relay (built into IPDM E/R).
Power is supplied

- through front wiper main relay and front wiper HI/LO relay and
- through IPDM E/R terminal 23
- to front wiper motor terminal 3.

Ground is supplied

- to front wiper motor terminal 1,
- through body grounds E25 (CR engine models), E26 and E40.

With power and ground are supplied, the front wiper motor operates at low speed.

HIGH SPEED WIPER OPERATION

When front wiper switch is placed in HI position, BCM read combination switch condition (Refer toWW-53, "COMBINATION SWITCH READING FUNCTION"). And BCM sent front wiper request signal (HI) to IPDM E/R with CAN communication line. When IPDM E/R receives front wiper request signal (HI), it turns ON front wiper HI/LO relay and front wiper main relay (built into IPDM E/R).
Power is supplied

- through front wiper main relay and front wiper HI/LO relay and,
- through IPDM E/R terminal 24
- to front wiper motor terminal 2.

Ground is supplied

- to front wiper motor terminal 1
- through body grounds E25 (CR engine models), E26 and E40.

With power and ground are supplied, the front wiper motor operates at high speed.

AUTO WIPER OPERATION

When front auto wiper switch is toggled to AUTO position (light and rain sensor equipped), BCM reads the current combination switch condition/position (refer to WW-53, "COMBINATION SWITCH READING FUNCTION") and change light and rain sensor into 4stages of wiper sensitivity level.
When light and rain sensor detect rain with ignition switch ON and auto wiper switch in AUTO position the front wiper will wipe the screen.
(Light and rain sensor will not react, if no raindrop is detected.)

- from light and rain sensor terminal 2
- to BCM terminal 63.

BCM send wiper request signal to IPDM E/R with CAN communication line. IPDM E/R operate front wiper.
Change the wiper speed by rainfall.
The light and rain sensor sensitivity is controlled by the wiper volume switch combined with front wiper and washer switch and BCM.

AUTO STOP OPERATION

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach stop position.
When wiper arms are not located at stop position with wiper switch OFF, power is supplied

- from terminal 23 of the IPDM E/R
- to front wiper motor terminal 3, in order to continue wiper motor operation at low speed.

Ground is supplied

- to front wiper motor terminal 1
- through body grounds E25 (CR engine models), E26 and E40.

When wiper arms reach stop position, front wiper motor terminals 1 and 4 are disconnected.
Then the IPDM E/R sends auto stop operation signal to BCM with CAN communication line.
When BCM receives auto-stop operation signal, BCM sends wiper stop signal to IPDM E/R with CAN communication line.
IPDM E/R stops wiper motor. Wiper motor will then stop wiper arms at the STOP position.

MIST OPERATION

When the combination switch is toggled to the mist position (upward), wiper will wipe once. If the rear wiper switch is turned to mist position, the rear wiper will continue the wiping frequency at low speed.

WASHER OPERATION

When front wiper switch is pulled to washer position, power is supplied

- through combination switch terminal 13
- to washer motor terminal 1.

Ground is supplied

- to washer motor terminal 2
- through combination switch terminals 12 and 14, and
- through body times M19 and M20.

With power and ground supplied, the washer motor operates, and at the same time,
When the wiper switch is pulled to the WASH position for 1 second or more. BCM sends front wiper request signal (low) to IPDM E/R with CAN communication line. And the front wiper motor operates in low speed for 3 times to clean wind shield and then an additional wiping action will occur after 3seconds to remove the moisture appear on the glass shortly after the wash/wipe action.

FAIL-SAFE FUNCTION

When CAN communication with other control units is impossible, IPDM E/R performs fail-safe control. If the fail-safe system is operating, front wiper low speed operates when the ignition switch is turned from OFF to ON or ACC and front wiper are stopped when the ignition switch is turn from ON or ACC to OFF. If the fail-safe system is operating, front wiper does not operate when the combination switch is in any position. After CAN communication recovers normally, it also returns to normal control. (Refer to PG-20, "FAIL-SAFE FUNCTION"
)

COMBINATION SWITCH READING FUNCTION

Refer to WW-8, "COMBINATION SWITCH READING FUNCTION" .

CAN Communication

EKS00K7Q

SYSTEM 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.

CAN Communication Unit

EKS00QP1

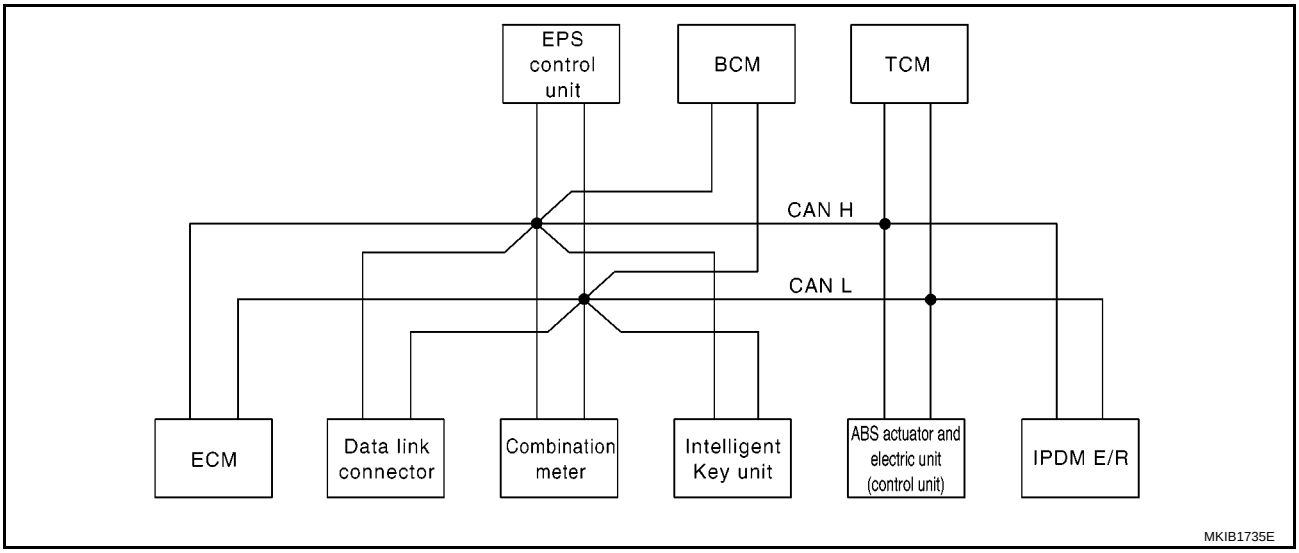
Body type	3door/5door		3door/5door/C+C				3door/5door		3door/5door/C+C				3door/5door	
Axle	2WD													
Engine	CR12DE/CR14DE				HR16DE		CR12DE/CR14DE				HR16DE		K9K	
Handle	LHD/RHD													
Brake control	ABS						ESP						ABS	
Transmission	A/T		M/T				A/T		M/T					
Intelligent Key system	×		×		×		×		×		×		×	
CAN communication unit														
ECM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Data link connector	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Combination meter	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Intelligent Key unit	×		×		×		×		×		×		×	
EPS control unit	×	×	×	×	×	×	×	×	×	×	×	×	×	×
BCM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ABS actuator and electric unit (control unit)	×	×	×	×	×	×	×	×	×	×	×	×	×	×
TCM	×	×					×	×						
IPDM E/R	×	×	×	×	×	×	×	×	×	×	×	×	×	×
CAN communication type	WW-55, "TYPE 1/ TYPE 2"		WW-58, "TYPE 3/TYPE 4/ TYPE 5/TYPE 6"				WW-60, "TYPE 7/ TYPE 8"		WW-63, "TYPE 9/TYPE 10/ TYPE 11/TYPE 12"				WW-65, "TYPE 13/ TYPE 14"	

×: Applicable

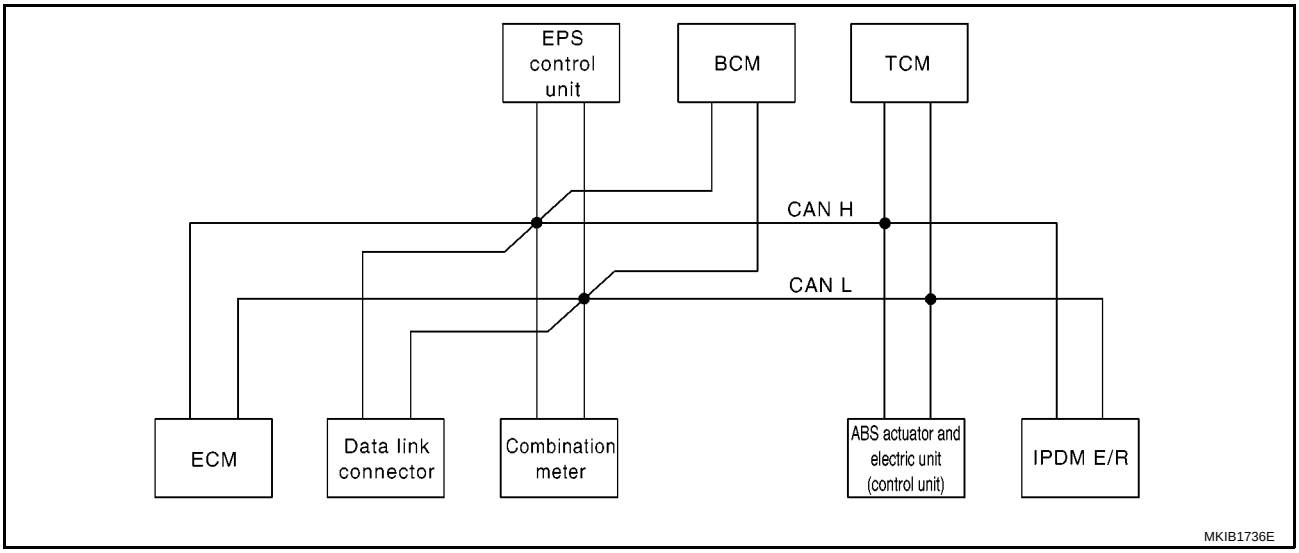
TYPE 1/TYPE 2

System diagram

- Type 1



- Type 2



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R						
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T						R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	

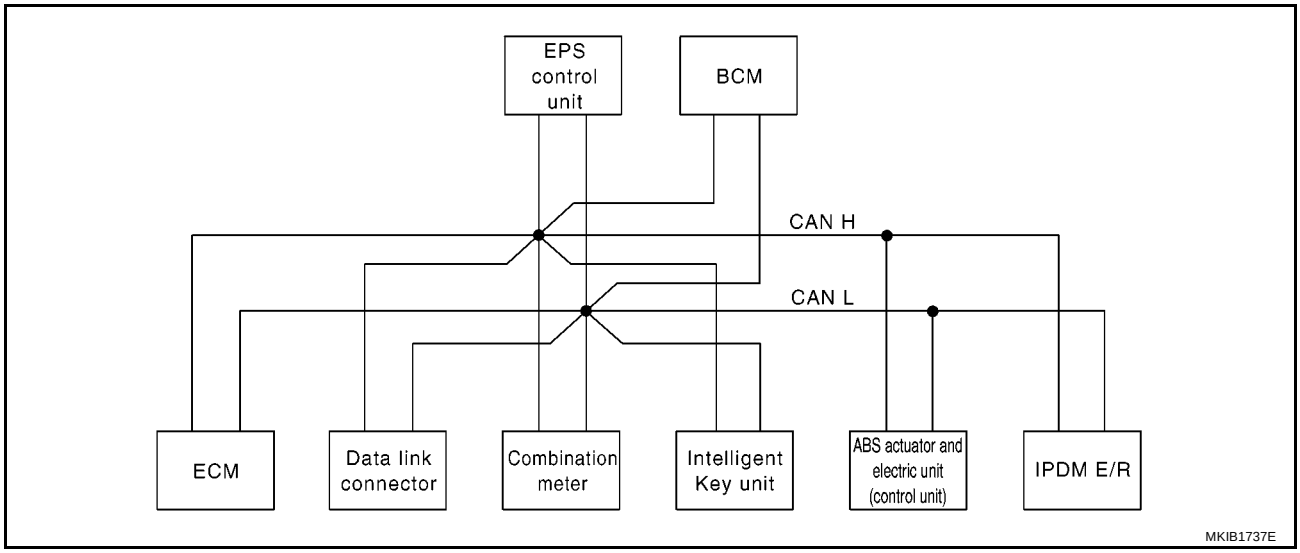
Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
A/T position indicator signal		R					T	
Stop lamp switch signal		T					R	
O/D OFF indicator signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
A/C switch signal	R				T			
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

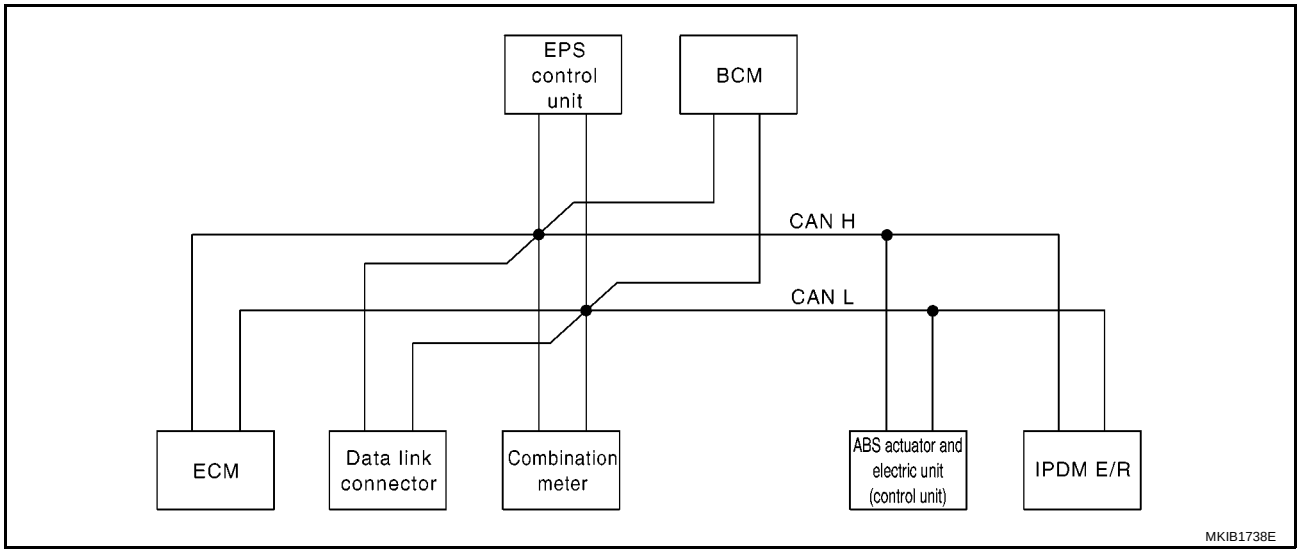
TYPE 3/TYPE 4/TYPE 5/TYPE 6

System diagram

- Type 3/Type 5



- Type 4/Type 6



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R

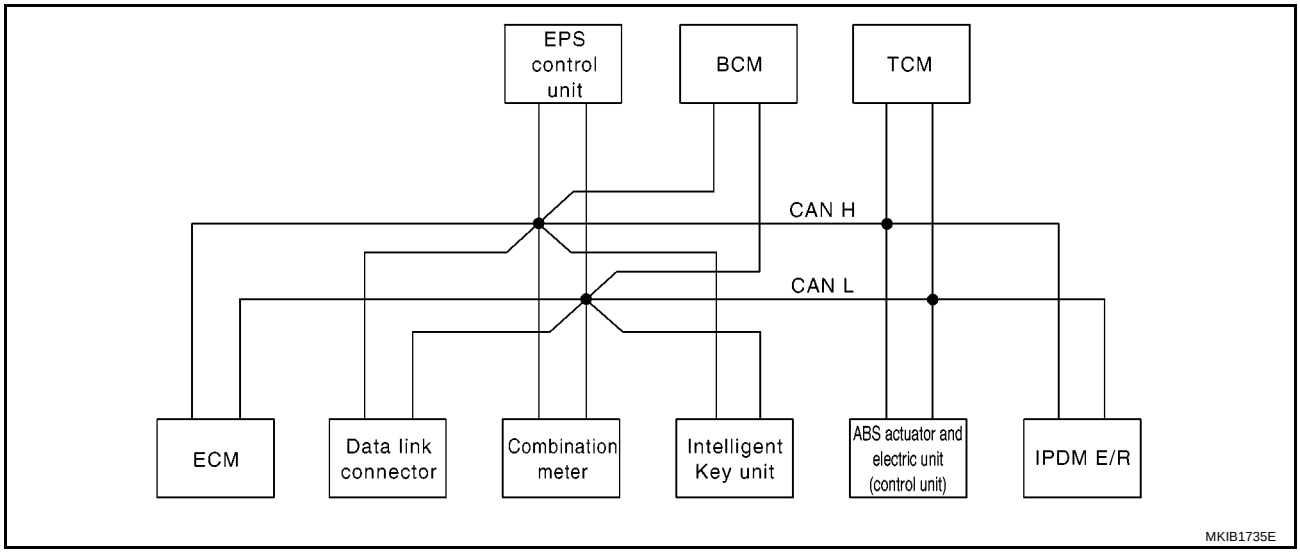
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

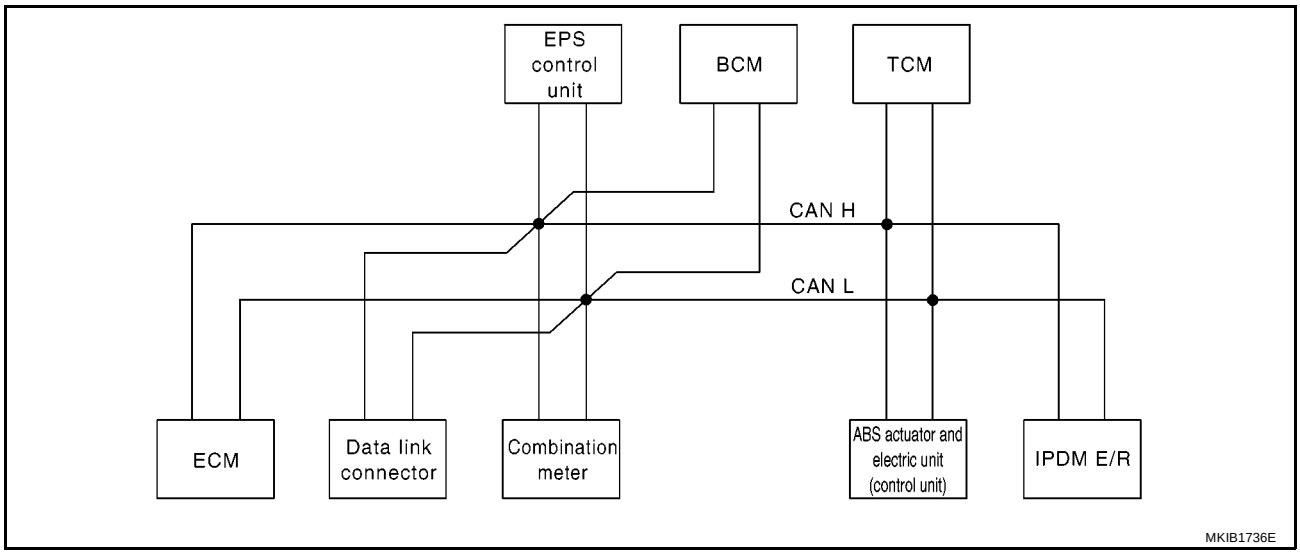
TYPE 7/TYPE 8

System diagram

- Type 7



- Type 8



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R				R		
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T					R	R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	
A/T position indicator signal		R					T	

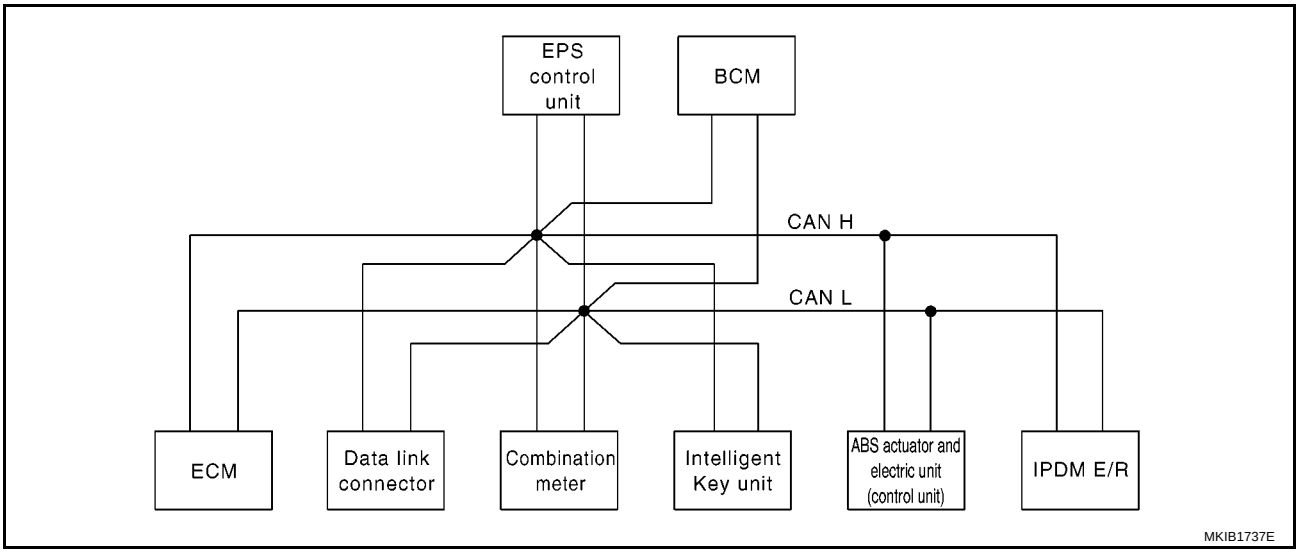
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
A/T shift schedule change demand signal						T	R	
Stop lamp switch signal		T					R	
O/D OFF indicator lamp signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
ESP warning lamp signal		R				T		
ESP OFF indicator signal		R				T		
SLIP indicator lamp signal		R				T		
Steering angle signal				T		R		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				
A/C switch signal	R				T			
A/T torque signal						R	T	
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

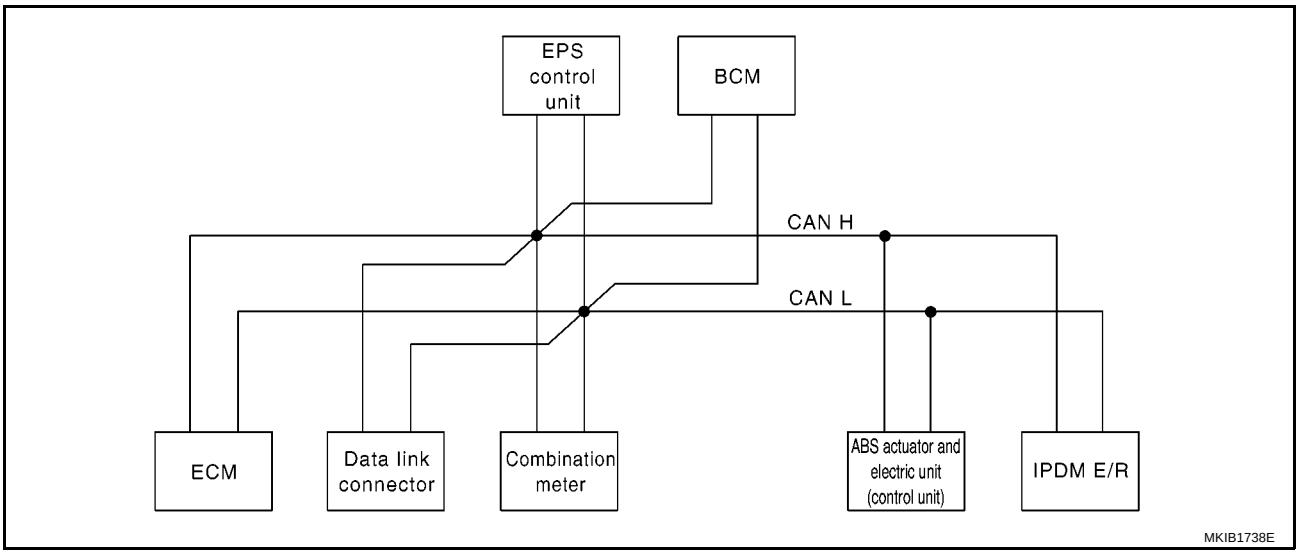
TYPE 9/TYPE 10/TYPE 11/TYPE 12

System diagram

- Type 9/Type 11



- Type 10/Type 12



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R				R	
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Accelerator pedal position signal	T					R	
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R

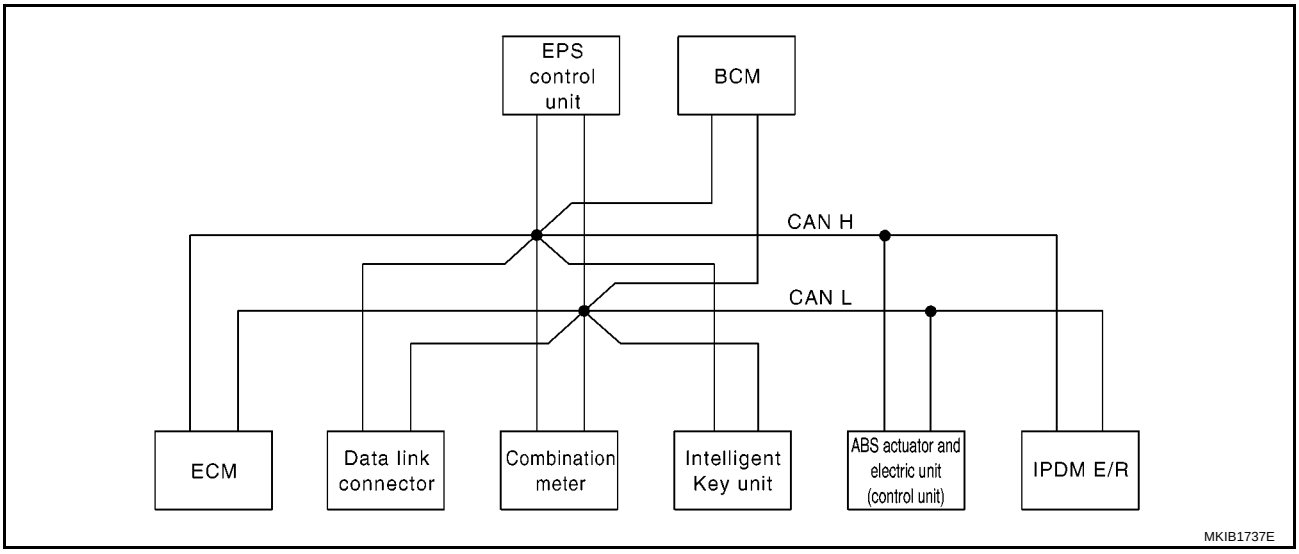
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam request signal					T		R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
ESP warning lamp signal		R				T	
ESP OFF indicator signal		R				T	
SLIP indicator lamp signal		R				T	
Steering angle signal				T		R	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

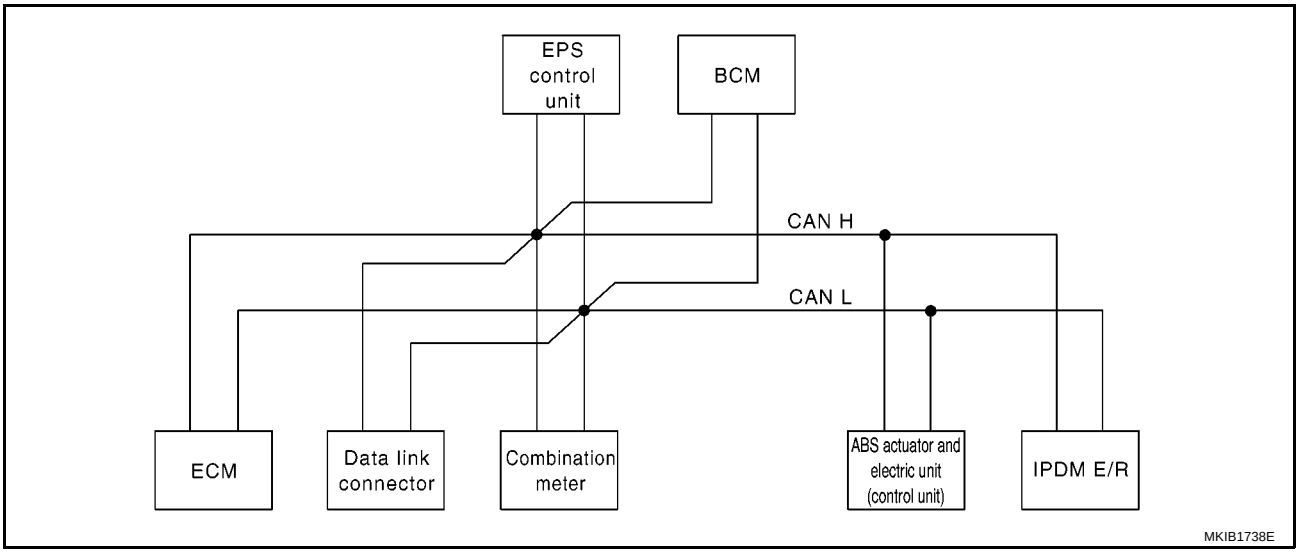
TYPE 13/TYPE 14

System diagram

- Type 13



- Type 14



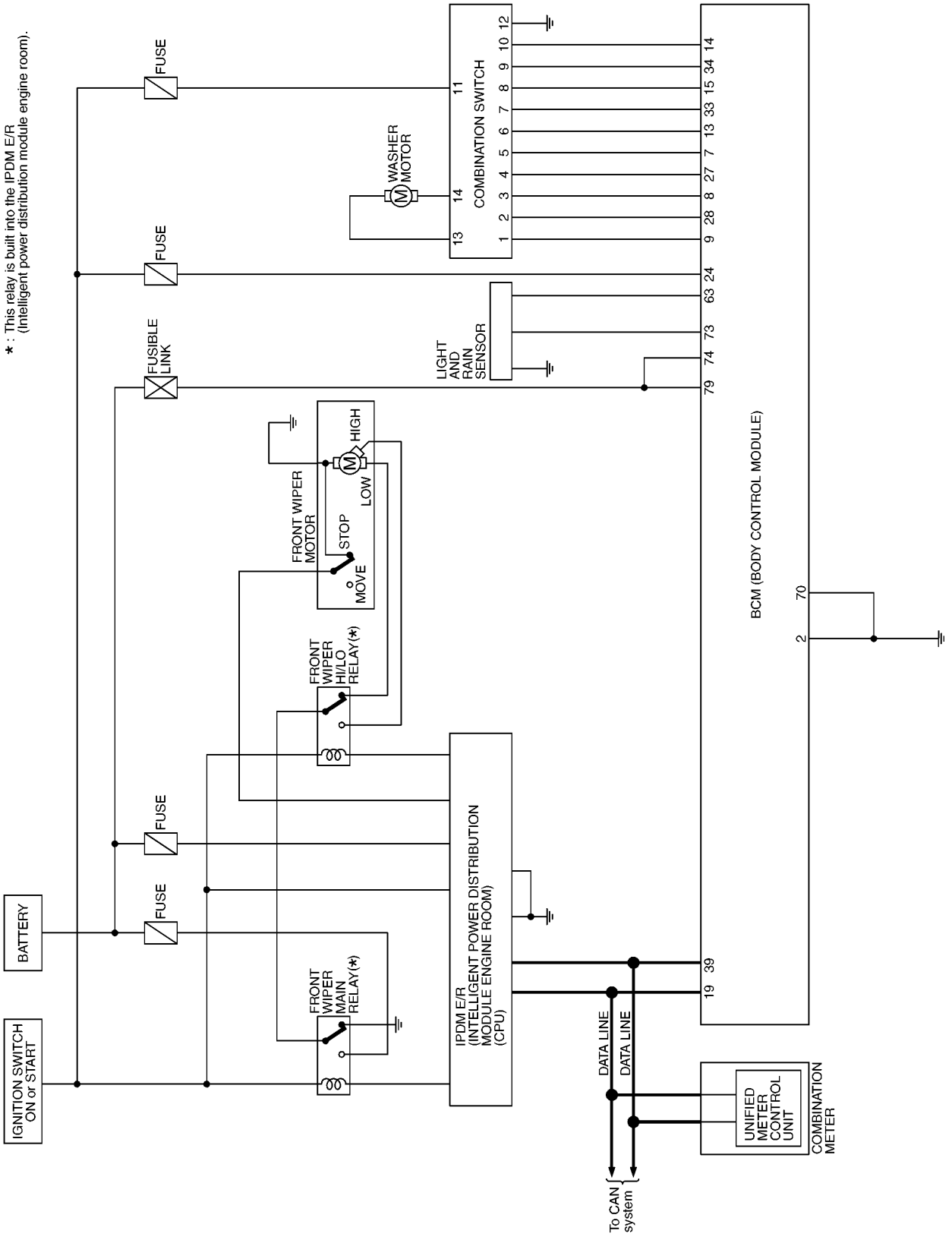
Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R			R		
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R
High beam request signal		R			T		R
Day time light request signal					T		R
Vehicle speed signal	R	R		R	R	T	
	R	T	R	R			
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
Glow indicator signal	T	R					
R range signal					R		T

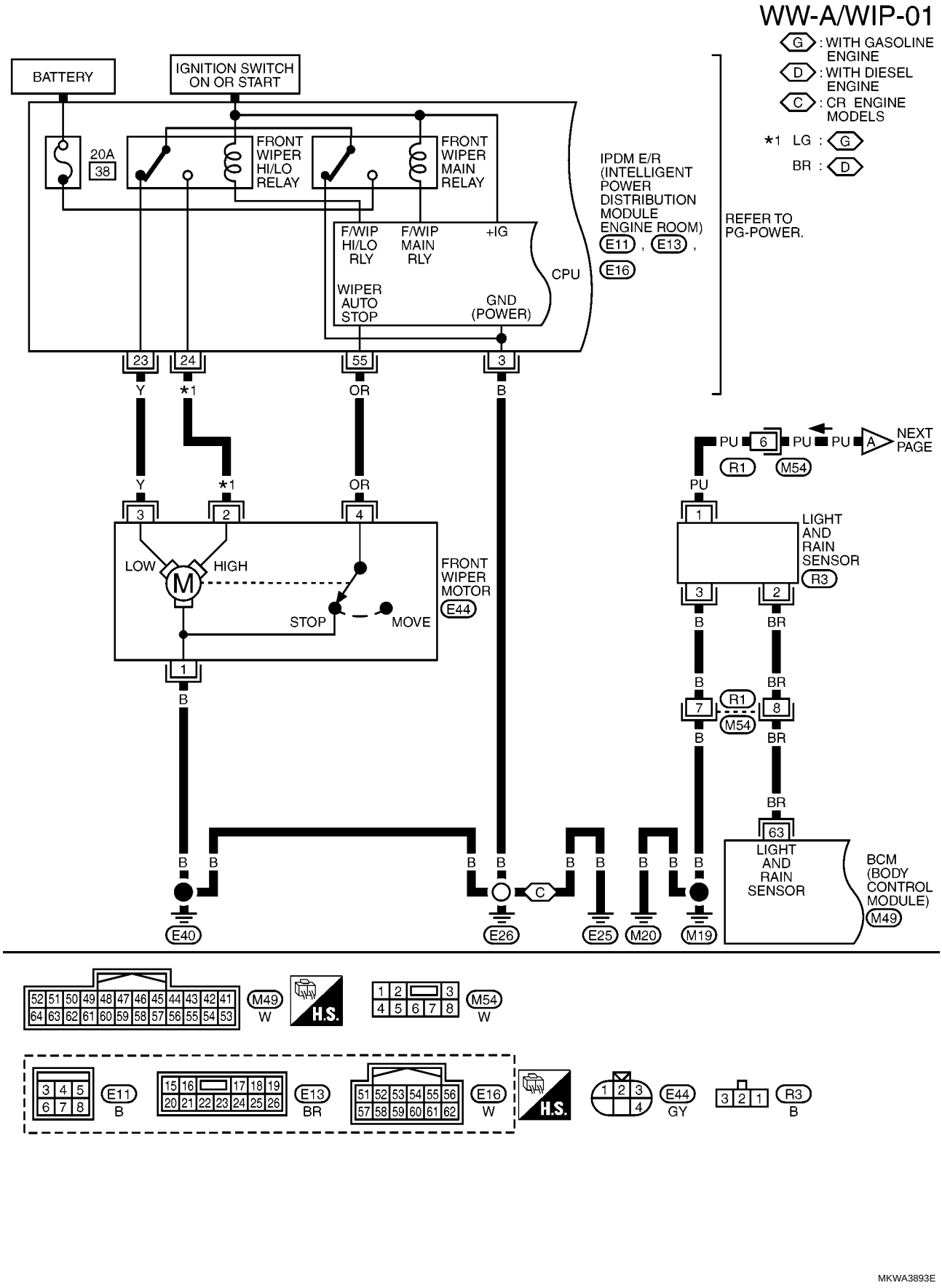
Schematic

EKS00880

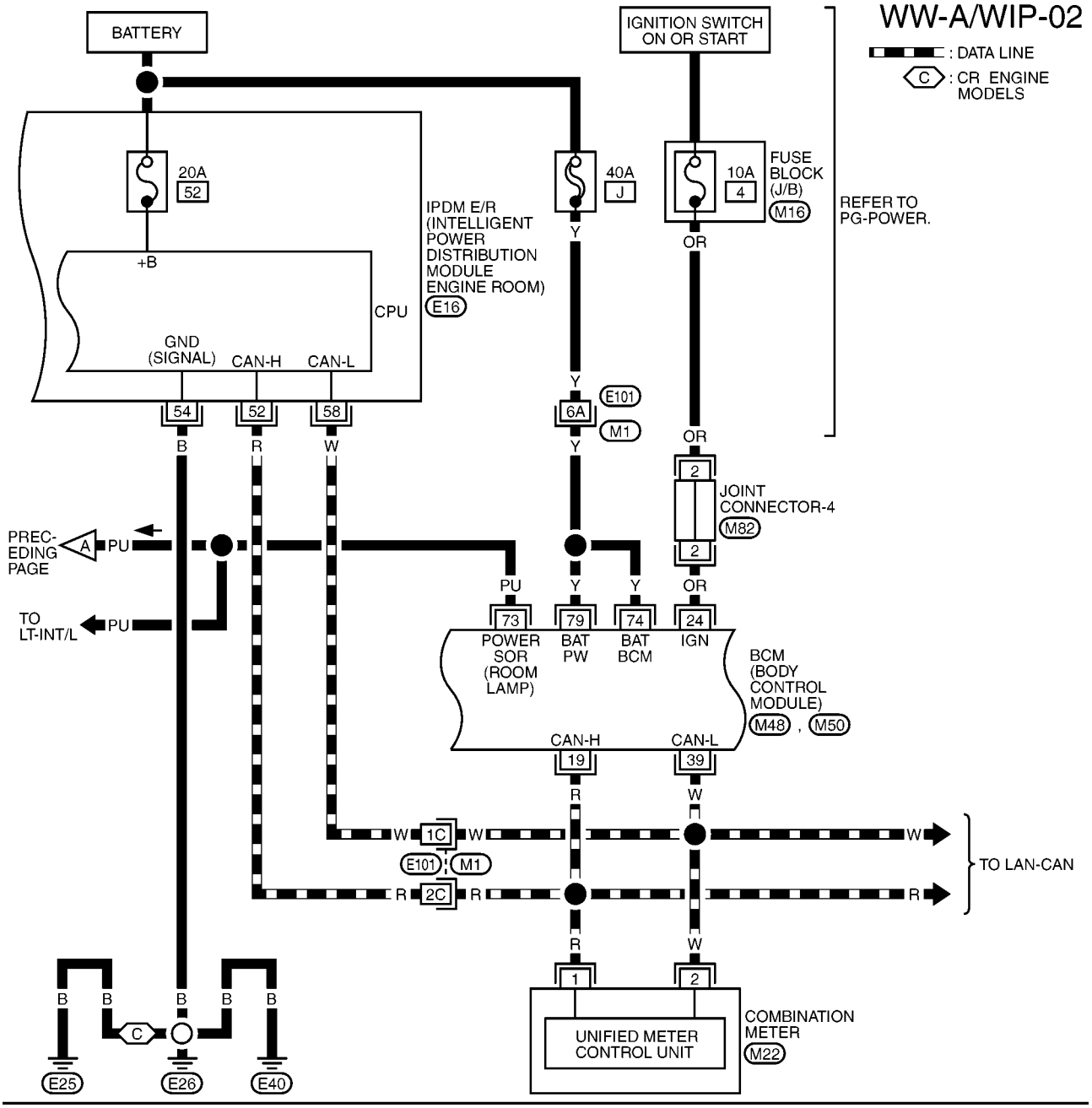


Wiring Diagram — A/WIP —

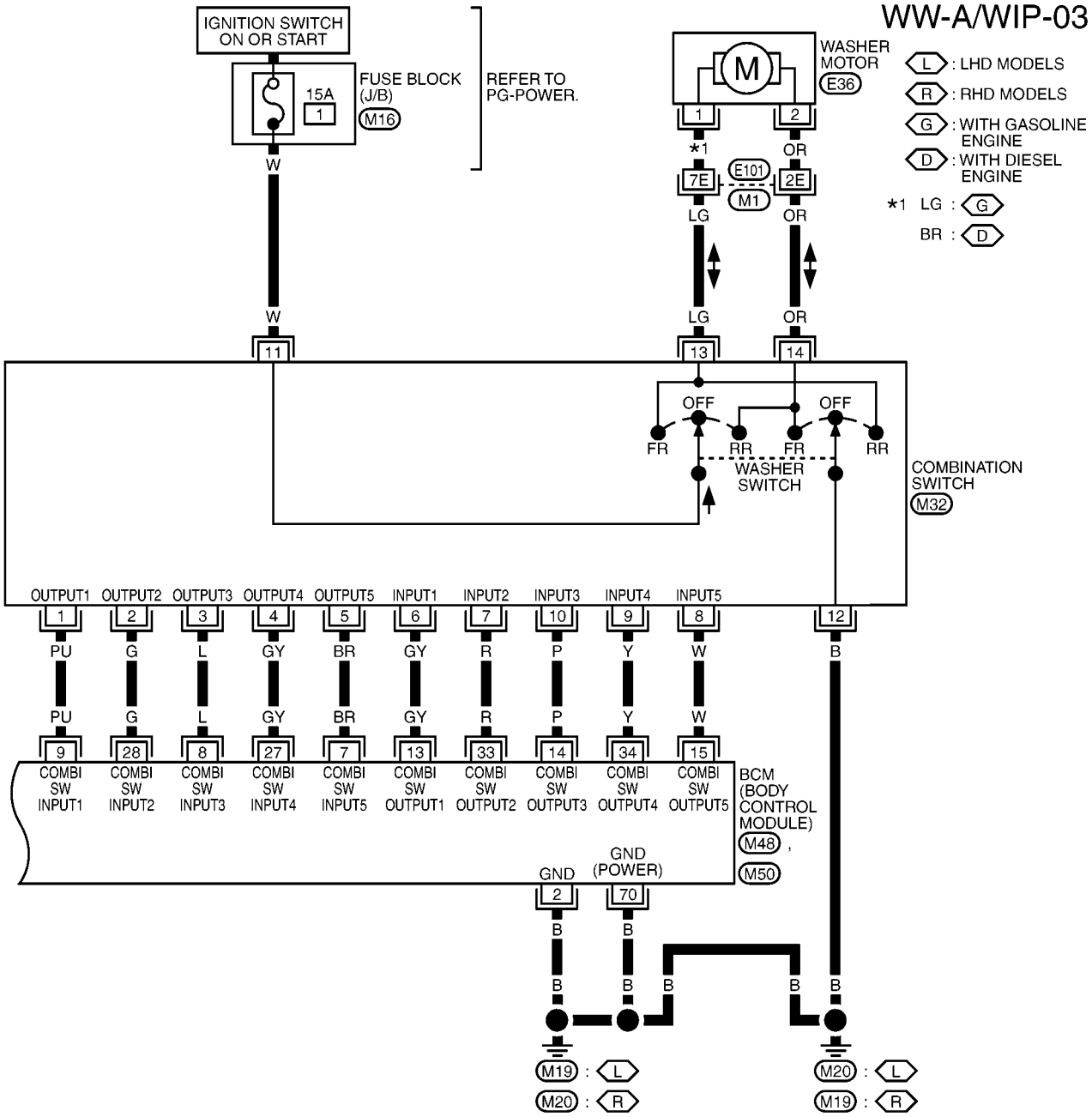
EKS00881

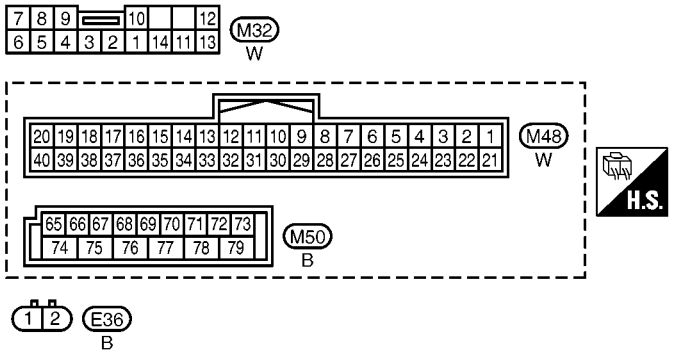


MKWA3893E


WW-A/WIP-02
: DATA LINE
C : CR ENGINE MODELS
BATTERY
IGNITION SWITCH ON OR START
20A 52
40A J
10A 4
FUSE BLOCK (J/B) M16
REFER TO PG-POWER.
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E16
+B
CPU
GND (SIGNAL)
CAN-H
CAN-L
54
52
58
B
R
W
Y
E101
6A
M1
OR
2
JOINT CONNECTOR-4 M82
PREC-EDING PAGE
A
PU
TO LT-INT/L
PU
73
79
74
24
POWER SOR (ROOM LAMP)
BAT PW
BAT BCM
IGN
BCM (BODY CONTROL MODULE) M48 , M50
CAN-H
CAN-L
19
39
R
W
1C
E101
M1
2C
TO LAN-CAN
1
2
UNIFIED METER CONTROL UNIT
COMBINATION METER M22
C
E25
E26
E40
REFER TO THE FOLLOWING.
M1 -SUPER MULTIPLE JUNCTION (SMJ)
M16 -FUSE BLOCK- JUNCTION BOX (J/B)
M22 W
M48 W
M50 B
M82 L
E16 W
H.S.

MIWA0428E



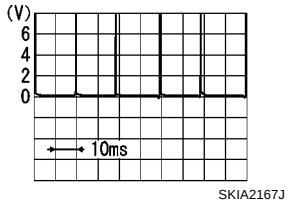
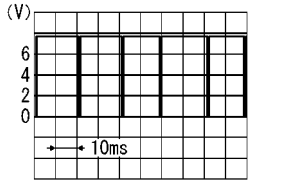
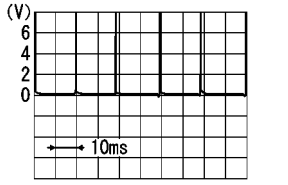
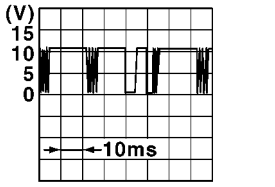


REFER TO THE FOLLOWING.
M1 -SUPER MULTIPLE JUNCTION (SMJ)
M16 -FUSE BLOCK-JUNCTION BOX (J/B)

MKWA1464E

Terminals and Reference Values for BCM

EKS00882

Terminal No.	Wire color	Signal designation	Measuring condition		Voltage [V] (Approx.)
			Ignition switch	Operation or condition	
2	B	Ground	ON	—	0
7	BR	Combination switch input 5	ON	Headlamps, turn signal, wipers OFF	 SKIA2167J
8	L	Combination switch input 3			
9	PU	Combination switch input 1			
27	GY	Combination switch input 4			
28	G	Combination switch input 2			
13	GY	Combination switch output 1	ON	Headlamps, turn signal, wipers OFF (wiper volume is 1 or 7)	 SKIA2166J
14	P	Combination switch output 3			
15	W	Combination switch output 5			
33	R	Combination switch output 2		Headlamps, turn signal, wipers OFF (wiper volume is other than 1 or 7)	 SKIA2167J
34	Y	Combination switch output 4			
19	R	CAN H	—	—	—
24	OR	Ignition power supply	ON	—	Battery voltage
39	W	CAN L	—	—	—
63	BR	Light and rain sensor signal	ON	—	 MKIB2017E
70	B	Ground	ON	—	0
73	PU	Room lamp power supply	—	—	Battery voltage
74	Y	Power source (Fusible link)	OFF	—	Battery voltage
79	Y	Power source (Fusible link)	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

EKS00883

Terminal No.	Wire color	Signal designation	Measuring condition		Voltage [V] (Approx.)
			Ignition switch	Operation or condition	
3	B	Ground	ON	—	0

Terminal No.	Wire color	Signal designation	Measuring condition			Voltage [V] (Approx.)
			Ignition switch	Operation or condition		
23	Y	Low speed power source	ON	Wiper switch	OFF	0
					LO	Battery voltage
24	*1	High speed power source	ON	Wiper switch	OFF	0
					HI	Battery voltage
52	R	CAN H	—	—		—
54	B	Ground	—	—		0
55	OR	Wiper auto stop signal	ON	Wiper operating		Battery voltage
				Wiper stopped		0
58	W	CAN L	—	—		—

*1: Gasoline engine models (LG), Diesel engine models (BR)

How to Proceed With Trouble Diagnosis

EKS00884

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer toWW-51, "System Description" .
3. Carry out the Preliminary check. Refer to WW-72, "Preliminary Inspection" .
4. Confirm front wiper does not operate by fail-safe control of IPDM E/R. Refer to PG-20, "FAIL-SAFE FUNCTION" .
5. Check symptom and repair or replace the cause of malfunction.
6. Does the front wiper operate normally? Yes: GO TO 7. No: GO TO 5.
7. INSPECTION END.

Preliminary Inspection

EKS008WE

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSE

- Check fuse and fusible link for blown-out.

Unit	Power source	Fuse No.
Front washer motor	Ignition ON or START	1
Front wiper main relay	Battery	38
BCM	Battery	J
	Ignition switch ON or START position	4

Refer to WW-68, "Wiring Diagram — A/WIP —"

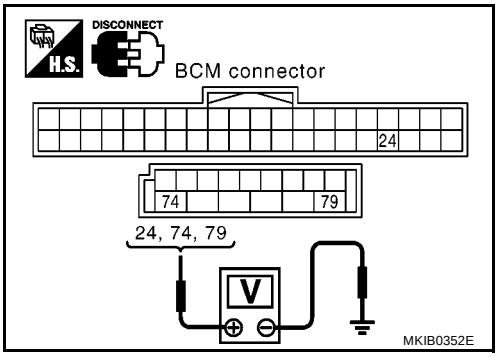
OK or NG

OK >> GO TO 2.

NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse, Refer to PG-5, "POWER SUPPLY ROUTING" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



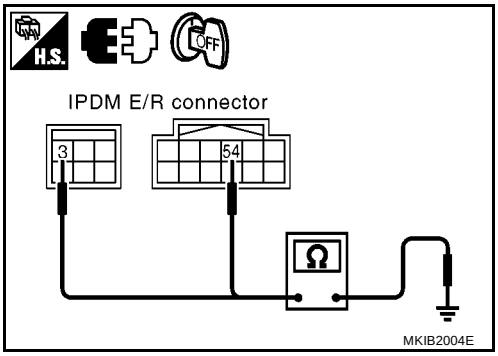
Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M50	74 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
M50	79 (Y)		Battery voltage	Battery voltage	Battery voltage
M48	24 (OR)		0V	0V	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

1. Disconnect IPDM E/R harness connector.
2. Check continuity between IPDM E/R harness connector.



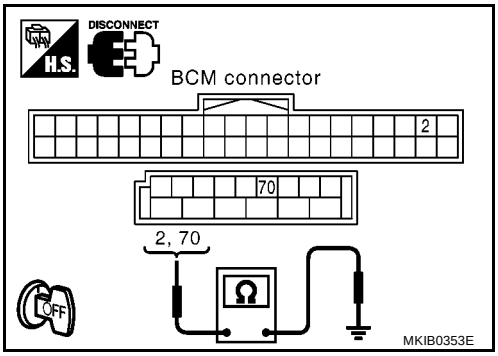
Connector	Terminal (Wire color)	Ground	Continuity
E11	3 (B)		Yes
E16	54 (B)		

OK or NG

OK >> GO TO 4.
NG >> Harness for open ground circuit.

4. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.



Connector	Terminal (Wire color)	Ground	Continuity
M48	2 (B)		Yes
M50	70 (B)		

OK or NG

OK >> INSPECTION END.
NG >> Check harness ground circuit.

CONSULT-II Function (BCM)

EKS00886

Refer to WW-33, "CONSULT-II Function (BCM)" .

CONSULT-II Function (IPDM E/R)

EKS008W1

Refer to WW-36, "CONSULT-II Function (IPDM E/R)" .

Front Wiper Does Not Operate

EKS00889

Refer to WW-38, "Front Wiper Does Not Operate"

Front Wiper Does Not Return to Stop Position

EKS0088A

Refer to WW-40, "Front Wiper Does Not Return to Stop Position"

Front Wiper Low Speed Operation Does Not Operate.

EKS0088B

Refer to WW-41, "Front Wiper Low Speed Operation Does Not Operate"

Front Wiper High Speed Operation Does Not Operate

EKS0088C

Refer to WW-42, "Front Wiper High Speed Operation Does Not Operate"

Front Wiper INT Does Not Operate

EKS0088D

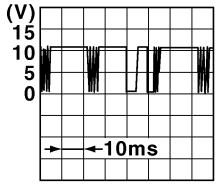
Refer to LT-219, "Check Combination Switch" .

Auto Wiper Dose Not Operate

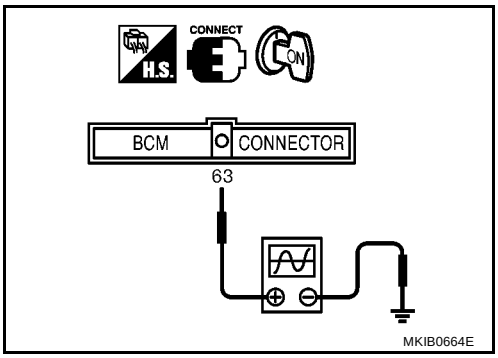
EKS00Q78

1. CHECK LIGHT AND RAIN SENSOR SIGNAL

1. Turn ignition switch ON.
2. Check signal between BCM connector and ground with oscilloscope.

(+)		(-)	Condition	Signal (Reference value.)
Connector	Terminals (Wire color)			
M49	63 (BR)	Ground	IGN ON	

MKIB2017E



MKIB0664E

OK or NG

OK >> Check combination switch. Refer to LT-219, "Check Combination Switch" .
NG >> GO TO 2.

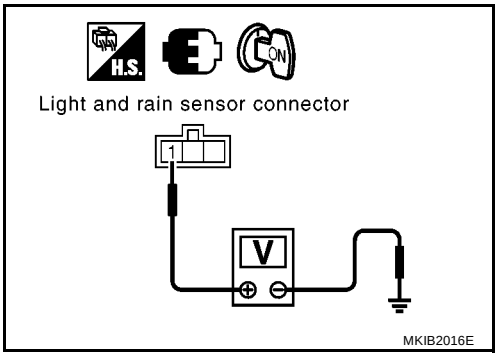
2. CHECK LIGHT AND RAIN SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect light and rain sensor connector.
3. Turn ignition switch ON.
4. Check voltage between light and rain sensor connector R3 terminal 1 and ground.

1 (PU) - Ground : Battery voltage

OK or NG

OK >> GO TO 3.
NG >> GO TO 5.



MKIB2016E

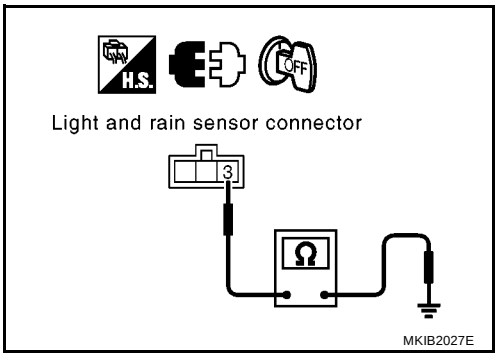
3. CHECK LIGHT AND RAIN SENSOR GROUND CIRCUIT

Check continuity between light and rain sensor connector R3 terminal 3 and ground.

3 (B) - Ground : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness.



MKIB2027E

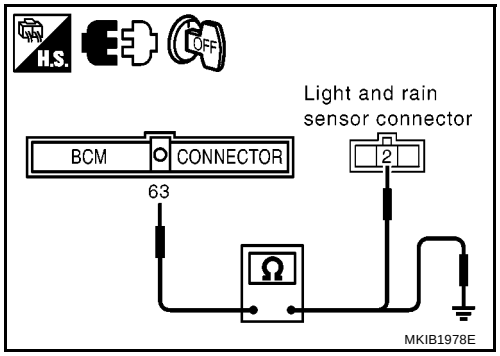
4. CHECK LIGHT AND RAIN SENSOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM connector M49 terminal 63 and light and rain sensor connector R3 terminal 2.

63 (BR) - 2 (BR) : Continuity should exist.

4. Check continuity between BCM connector M49 terminal 63 and ground.

63 (BR) - Ground : Continuity should not exist.



OK or NG

OK >> Replace light and rain sensor.
NG >> Check the condition of the harness and the connector.

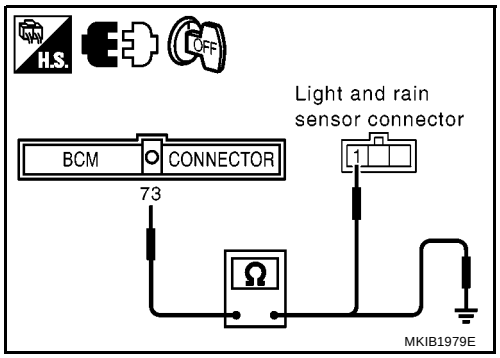
5. CHECK LIGHT AND RAIN SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between BCM connector M50 terminal 73 and light and rain sensor connector R3 terminal 1.

73 (PU) - 1 (PU) : Continuity should exist.

4. Check continuity between BCM connector M50 terminal 73 and ground.

73 (PU) - Ground : Continuity should not exist.



OK or NG

OK >> Check the condition of the harness and the connector.
NG >> Repair or replace harness.

After Front Wipers Operate for 10 Seconds, They Stop for 20 Seconds

EKS0088F

Refer to WW-44, "After Front Wipers Operate for 10 Seconds, They Stop for 20 Seconds"

Front Wipers Do Not Stop

EKS0088G

Refer to PG-50, "IPDM E/R Terminal Inspection" .

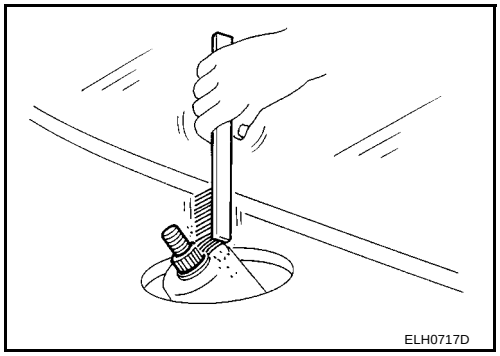
Removal and Installation of Front Wiper Arm

EKS008WF

REMOVAL

1. Turn the wiper switch ON to operate the wiper motor, then turn it OFF (auto stop).
2. Open hood, remove nut cover, and remove wiper arm nut.
3. Lift up driver wiper arm and remove wiper arm from vehicle.
4. Close hood, lift up passenger wiper arm, and remove wiper arm from vehicle.

Before attaching the front wiper arm, clean the arm mount shown in the figure to prevent nuts from being loosened.



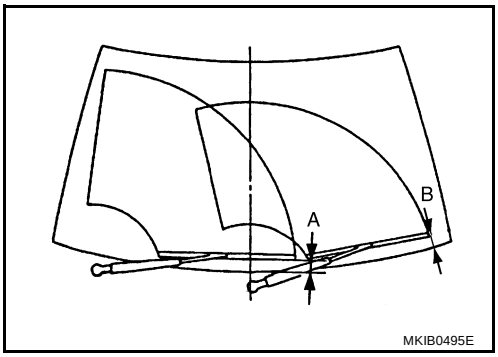
INSTALLATION

1. Lower wiper blade to glass so that center end of blade comes to the position shown in diagram. Align blade end with marking set within blade set position black print.
2. Tighten wiper arm nuts.

Wiper arm nut:

: 20.6 - 26.5 N·m (2.1 - 2.7 kg-m, 15- 20 ft-lb)

3. Spray washer fluid. Turn wiper switch ON to operate wiper motor, then turn it OFF (auto stop).
4. Make sure wiper blade stops at the position shown in the figure.



Stop position A : 33.7 - 48.7 mm (1.327 - 1.917 in)

Stop position B : 33.7 - 48.7 mm (1.327 - 1.917 in)

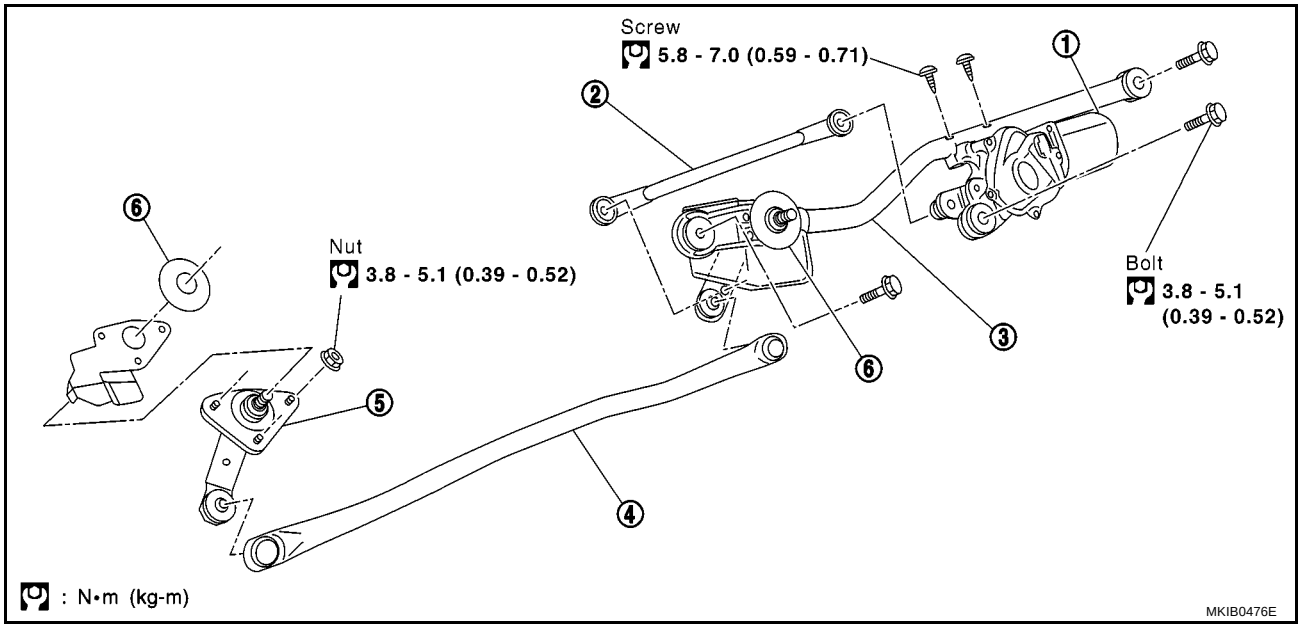
Adjustment of Front Wiper Arm Stop Position

EKS0088I

Refer to WW-76, "Removal and Installation of Front Wiper Arm" .

Removal and Installation of Front Wiper Motor and Link

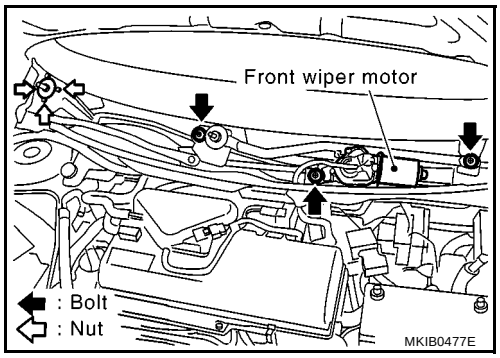
EKS0088J



1. Wiper motor
2. Wiper link
3. Wiper frame
4. Wiper link
5. Pivot
6. Shaft seal

REMOVAL

1. Operate the wiper motor, and stop it at the auto stop position.
2. Remove wiper arm nuts, and remove wiper arm from vehicle.
3. Remove cowl top cover. Refer to EI-13, "COWL TOP" .
4. Remove wiper motor connector.
5. Remove shaft seal.
6. Remove wiper motor assembly bolts and driver pivot nuts, and then remove wiper motor assembly from vehicle.
7. Remove the wiper link from the wiper frame and the motor arm.
8. Remove wiper motor screws, and then remove wiper motor from wiper frame.



INSTALLATION

1. Connect the wiper motor to the vehicle-side connector. Turn the wiper switch ON to operate the wiper motor, then turn the wiper switch OFF (auto stop).
2. Disconnect wiper motor connector.
3. Install wiper motor to wiper frame.

Wiper motor screw

: 5.8 - 7.0 N·m (0.59 - 0.71 kg-m, 51 - 62 in-lb)

4. Install wiper link to wiper frame and motor arm.
5. Connect wiper motor assembly to the connector. Turn wiper switch ON to operate wiper motor, then turn wiper switch OFF (auto stop).
6. Install the wiper motor assembly to the vehicle.

Wiper motor assembly bolt

: 3.8 - 5.1 N·m (0.39 - 0.52 kg-m, 34 - 45 in-lb)

Pivot nut

: 3.8 - 5.1 N·m (0.39 - 0.52 kg-m, 34 - 45 in-lb)

7. Install shaft seal.
8. Install cowl top cover. Refer to EI-13, "COWL TOP" .
9. Attach wiper arms.

CAUTION:

- **Do not drop the wiper motor or cause it to contact other parts.**
- **Check the grease conditions of the motor arm and wiper link joint (at retainer). Apply grease if necessary.**
  NISSAN MP special grease No. 2 (KRB0012025)

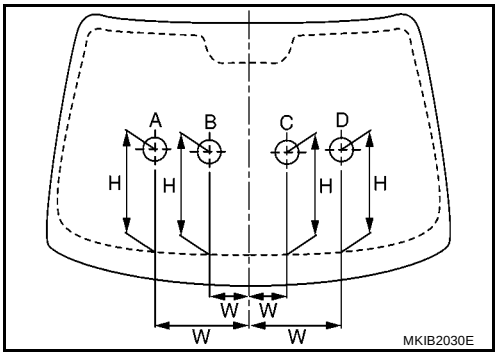
Adjustment of Spray Positions of Front Washer Nozzle (Hatchback)

EKS0088K

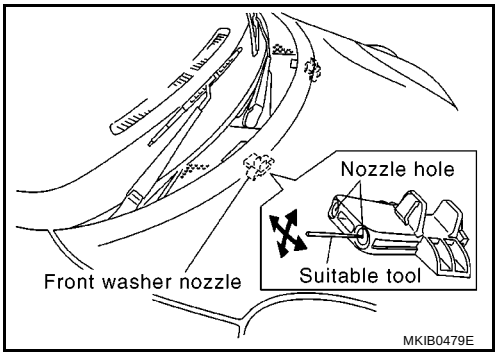
Adjust spray positions to match the positions listed below.

Unit: mm (in)

Spray position	H (hight)	l (width)	ϕ (spray point area)
A	325 (12.79)	300 (11.81)	80 (3.15)
B	325 (12.79)	125 (4.92)	80 (3.15)
C	325 (12.79)	125 (4.92)	80 (3.15)
D	325 (12.79)	300 (11.81)	80 (3.15)

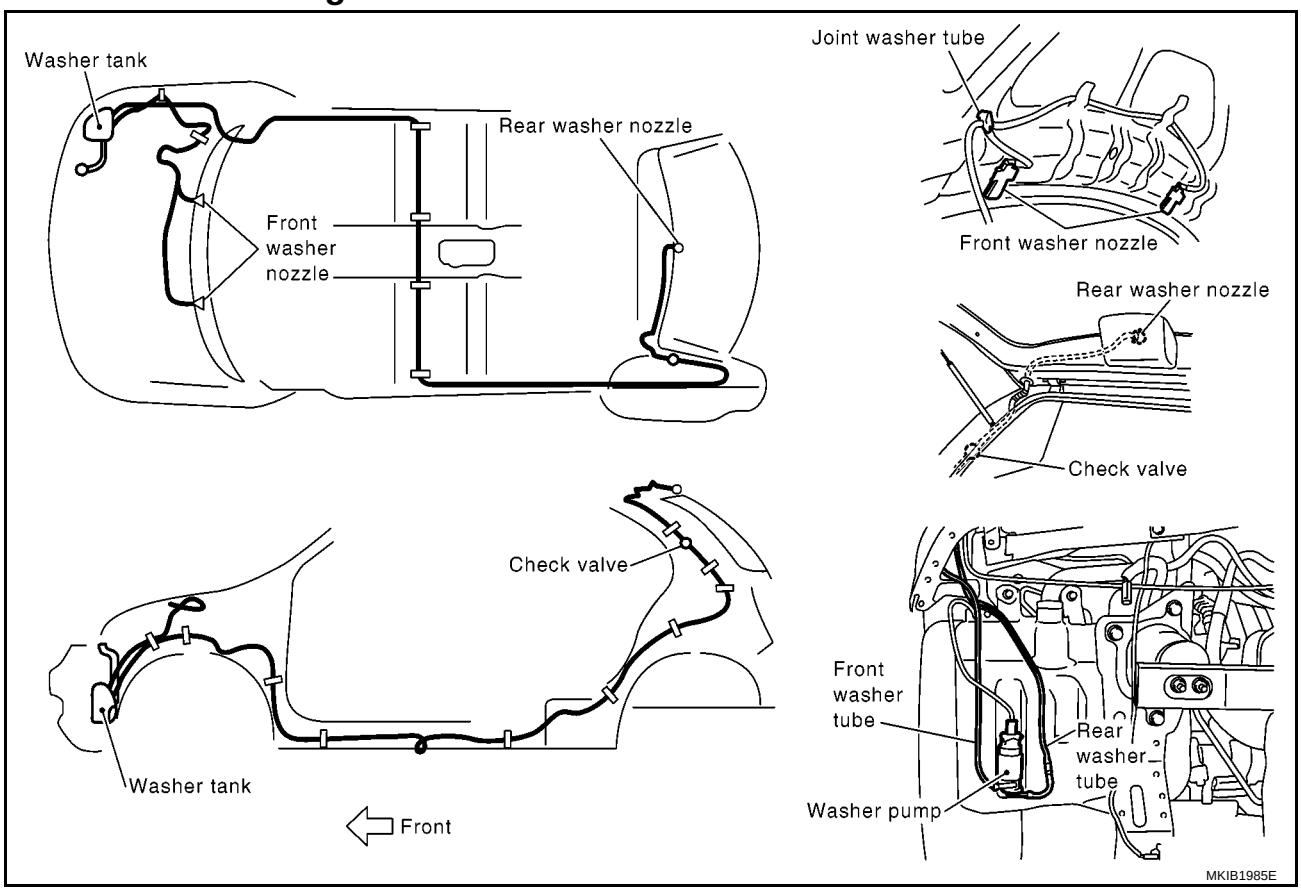


To adjust the spray position, insert a needle or similar object into the spray opening and move up/down and left/right.



Washer Hose Routing

EKS0088L

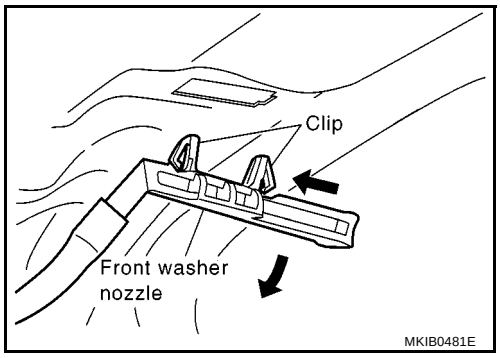


Removal and Installation of Front Washer Nozzle

EKS0088M

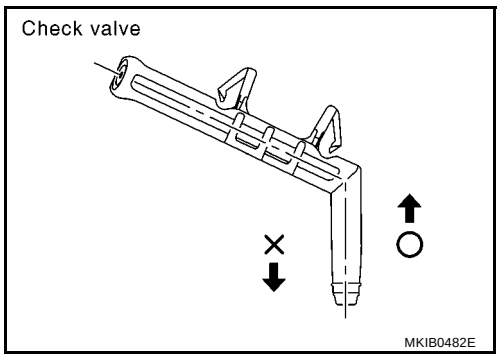
REMOVAL

1. Open hood.
2. While pushing nozzle spray point side along body, use the nozzle stop point as the support point and rotate nozzle to remove it from body.
3. Remove washer tube.



CHECK VALVE INSPECTION

Make sure air can pass through the hose by blowing forward (toward the nozzle) and air cannot pass through by sucking.



INSTALLATION

1. Install washer tube in nozzle.
2. Install nozzle to body.

3. Adjust nozzle spray location.

CAUTION:
The spray points differ, so be sure to install left and right nozzles correctly.

Removal and Installation of Front Wiper and Washer Switch

EKS0088O

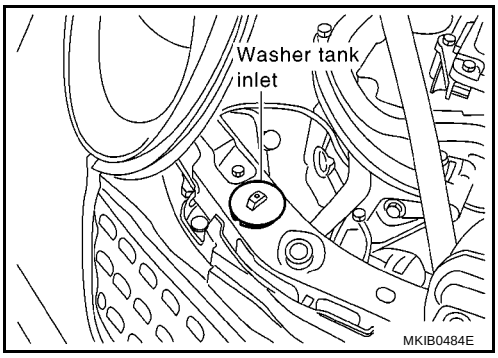
Refer to LT-222, "Removal and Installation" .

Removal and Installation of Front Wiper and Washer Tank

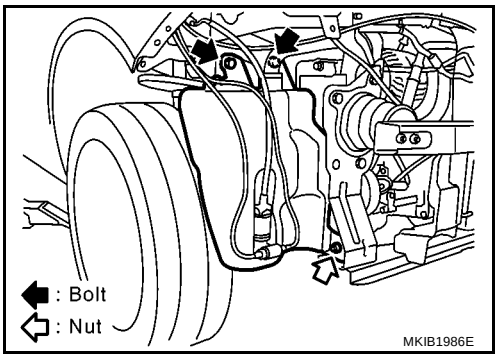
EKS0088P

REMOVAL

1. Remove cap, and while pushing down fill opening, remove washer tank inlet from radiator core support upper.



2. Remove fender protector. Refer to EI-14, "FENDER PROTECTOR" .
3. Remove front bumper. Refer to EI-5, "FRONT BUMPER" .
4. Remove washer pump connector.
5. Remove washer tank bolts and nut.



6. Remove the washer hose, and remove the washer tank from the vehicle.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:
After installing, add water up to the top of the inlet washer tank. Make sure there is no leakage.

Washer tank mounting screw

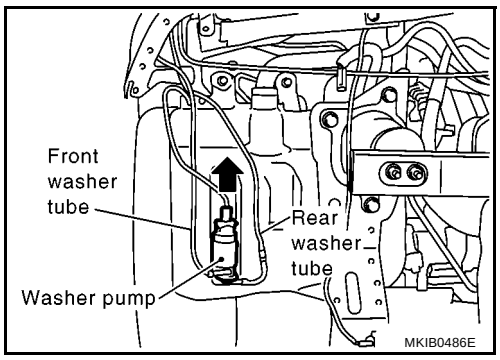
: 3.8 - 5.1 N·m (0.39 - 0.52 kg-m, 34 - 45 in-lb)

Removal and Installation of Front Wiper and Washer Pump

EKS0088Q

REMOVAL

1. Remove fender protector. Refer to EI-14, "FENDER PROTECTOR" .
2. Remove washer pump connector and hose.
3. Pull out the washer pump in the direction shown by the arrow, and remove the washer pump from the washer tank.



INSTALLATION

Paying attention to the items listed below, install in the reverse order of removal.

CAUTION:

When installing the washer pump, there must be no twisting or other unusual stress on the packing.

Removal and Installation of Rain Sensor

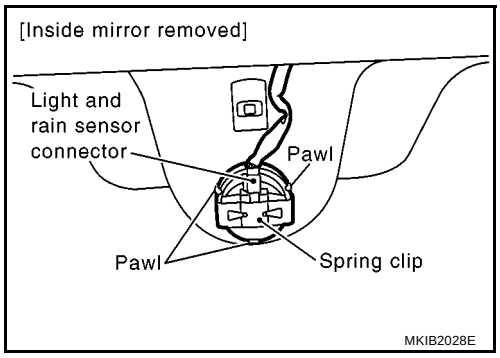
EKS0088V

REMOVAL

1. Remove inside mirror. Refer to GW-85, "INSIDE MIRROR" .
2. Remove clip and pawl.
3. Pull out the rain sensor.
4. Remove rain sensor harness connector.

CAUTION:

Do not touch the electronic circuit board on rain sensor.



INSTALLATION OF RAIN SENSOR

Install in the reverse order of removal.

INSTALLATION OF LIGHT AND RAIN SENSOR HOUSING

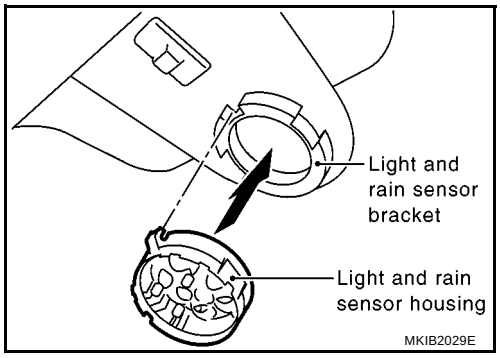
CAUTION:

When windshield is replaced, always replace rain sensor housing.

1. Clean the surface of bonded area on the windshield.
2. Fix rain sensor housing against rain sensor bracket from the top, then press it in a downward motion until it is completely attach together.

   CAUTION:

   Do not touch the adhesive.

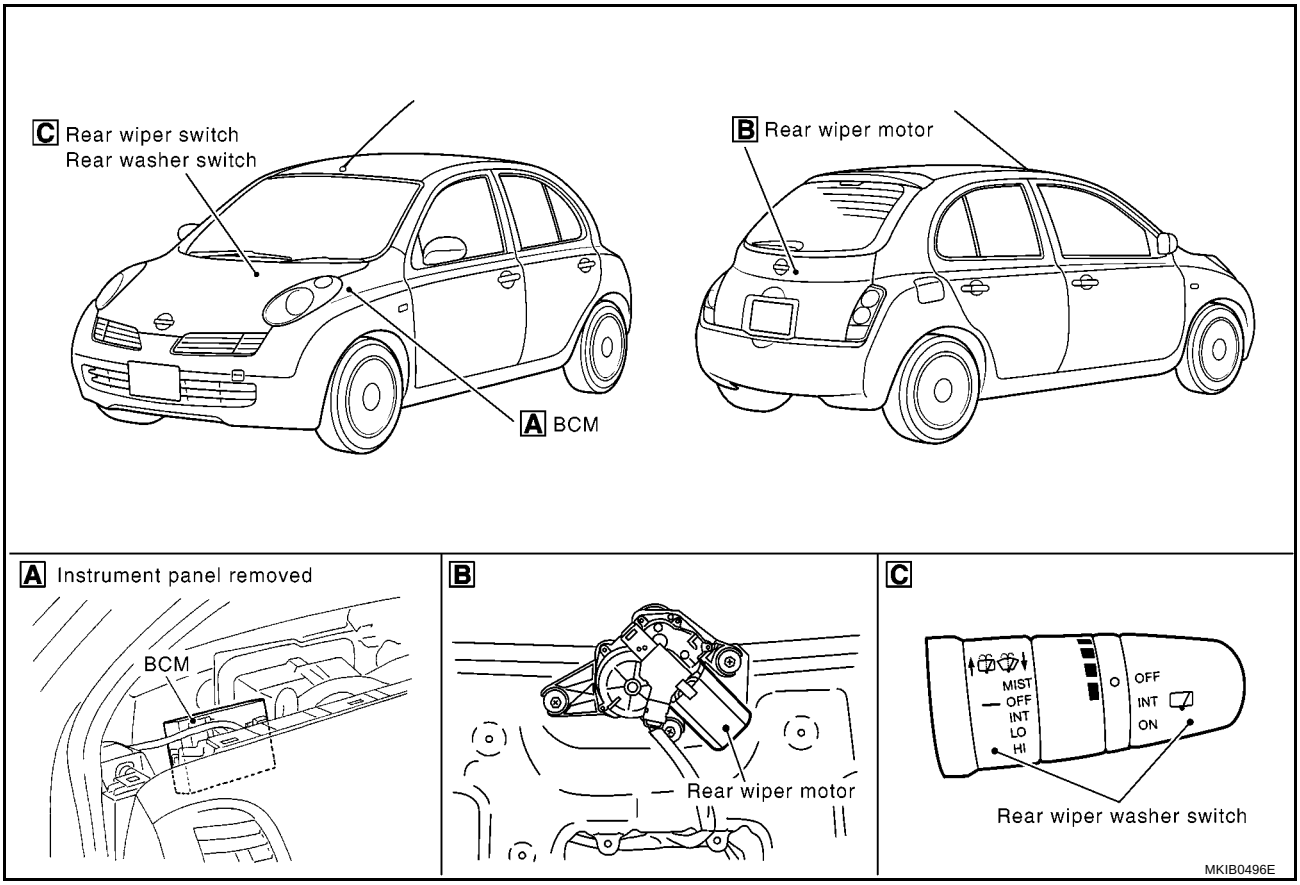


REAR WIPER AND WASHER SYSTEM

PFP:28710

Components Parts and Harness Connector Location

EKS0087E



System Description

EKS0087F

- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM when switch is turned ON.
- BCM controls rear wiper and INT (intermittent) operation.

Power is supplied at all times

- through 40A fusible link (letter J, located in fuse and fusible link box)
- to BCM terminals 74 and 79.

When ignition switch turned ON or START position, power is supplied

- through 10A fuse [No. 4 located in the fuse block (J/B)]
- to BCM terminal 24.
- through 15A fuse [No. 1 located in the fuse block (J/B)]
- to combination switch terminal 11.

Ground is supplied

- to BCM terminals 2 and 70,
- to combination switch terminal 12.
- through body grounds M19 and M20,
- to rear wiper motor terminal 3.
- through body ground B44 and B51

WIPER OPERATION

BCM read combination switch condition (Refer to WW-8, "COMBINATION SWITCH READING FUNCTION"), Power is supplied

- through BCM terminal 71
- to rear wiper motor terminal 1.

Ground is supplied

- to rear wiper motor terminal 3
- through body grounds B44 and B51.

With power and ground supplied, the rear wiper motor operates.

INTERMITTENT OPERATION

When rear wiper switch toggle to INT position, BCM reads the current combination switch condition/position (Refer to WW-8, "COMBINATION SWITCH READING FUNCTION"), and the wiper arms every 7 seconds.
Power is supplied.

- through BCM terminal 71.
- to rear wiper motor terminal 1

Ground is supplied.

- to rear wiper motor terminal 3
- through body ground B44 and B51.

The wiper motor operates at intermittent.

WASHER OPERATION

When rear wiper switch is pushed to WASH position,
Power is supplied.

- through combination switch terminal 14
- to washer motor terminal 2.

Ground is supplied

- to washer motor terminal 1
- to combination switch terminals 12 and 13, and
- through grounds M19 and M20.

With power and ground supplied, the rear washer motor is operated, and at the same time,
When the wiper switch is pushed to the WASH position for 1 second or more, BCM reads combination switch condition (Refer to WW-8, "COMBINATION SWITCH READING FUNCTION"), rear wiper motor is operated by BCM, and the rear wiper motor operates approximately 3 times after wiper switch is released.

REAR WIPER REVERSE RANGE OPERATION (IF AUTO WIPER IS EQUIPPED)

- When front wiper is active in auto operation with shift is in reverse position, front and rear wiping action is synchronous. If front wiper becomes continuous, the rear wiper will intermittent, wiping every 7 seconds.
- When shift is in reverse position then front wiper switch toggle from OFF to AUTO, rear wiping action will occur once.
- When front wiper switch is in auto position with shift is in reverse position, if front washer pull more than 0.4second, front wiper and rear wiper once.

COMBINATION SWITCH READING FUNCTION

Refer to WW-8, "COMBINATION SWITCH READING FUNCTION" .

CAN Communication

EKS00K7S

SYSTEM 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.

CAN Communication Unit

EKS00QP2

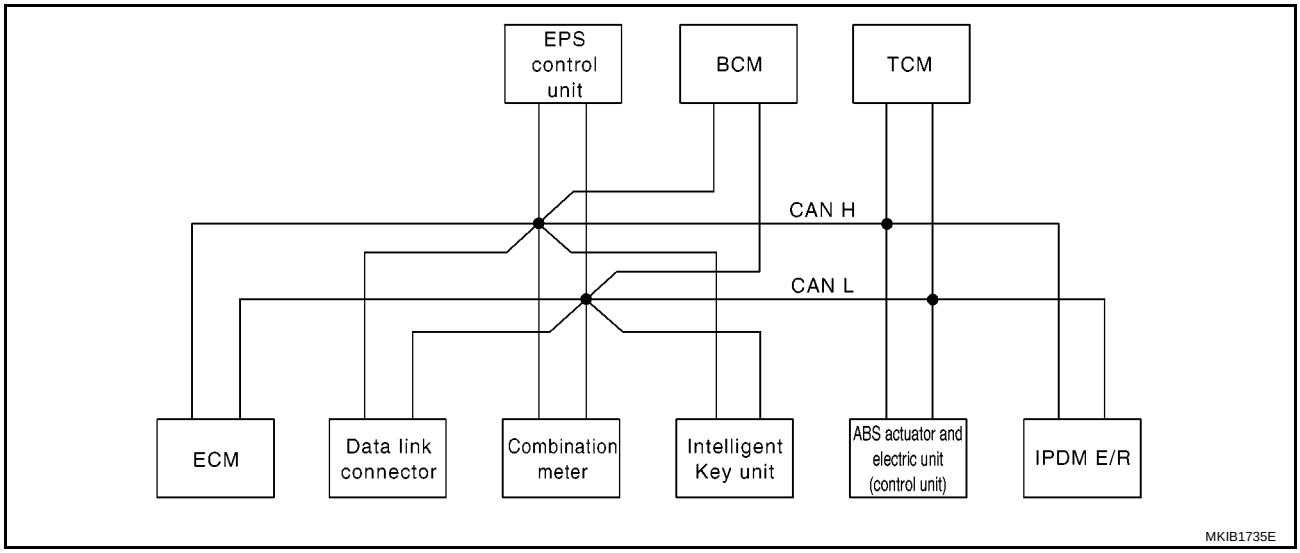
Body type	3door/5door		3door/5door/C+C				3door/5door		3door/5door/C+C				3door/5door	
Axle	2WD													
Engine	CR12DE/CR14DE				HR16DE		CR12DE/CR14DE				HR16DE		K9K	
Handle	LHD/RHD													
Brake control	ABS						ESP						ABS	
Transmission	A/T		M/T				A/T		M/T					
Intelligent Key system	×		×		×		×		×		×		×	
CAN communication unit														
ECM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Data link connector	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Combination meter	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Intelligent Key unit	×		×		×		×		×		×		×	
EPS control unit	×	×	×	×	×	×	×	×	×	×	×	×	×	×
BCM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ABS actuator and electric unit (control unit)	×	×	×	×	×	×	×	×	×	×	×	×	×	×
TCM	×	×					×	×						
IPDM E/R	×	×	×	×	×	×	×	×	×	×	×	×	×	×
CAN communication type	WW-86, "TYPE 1/ TYPE 2"		WW-89, "TYPE 3/TYPE 4/ TYPE 5/TYPE 6"				WW-91, "TYPE 7/ TYPE 8"		WW-94, "TYPE 9/TYPE 10/ TYPE 11/TYPE 12"				WW-96, "TYPE 13/ TYPE 14"	

×: Applicable

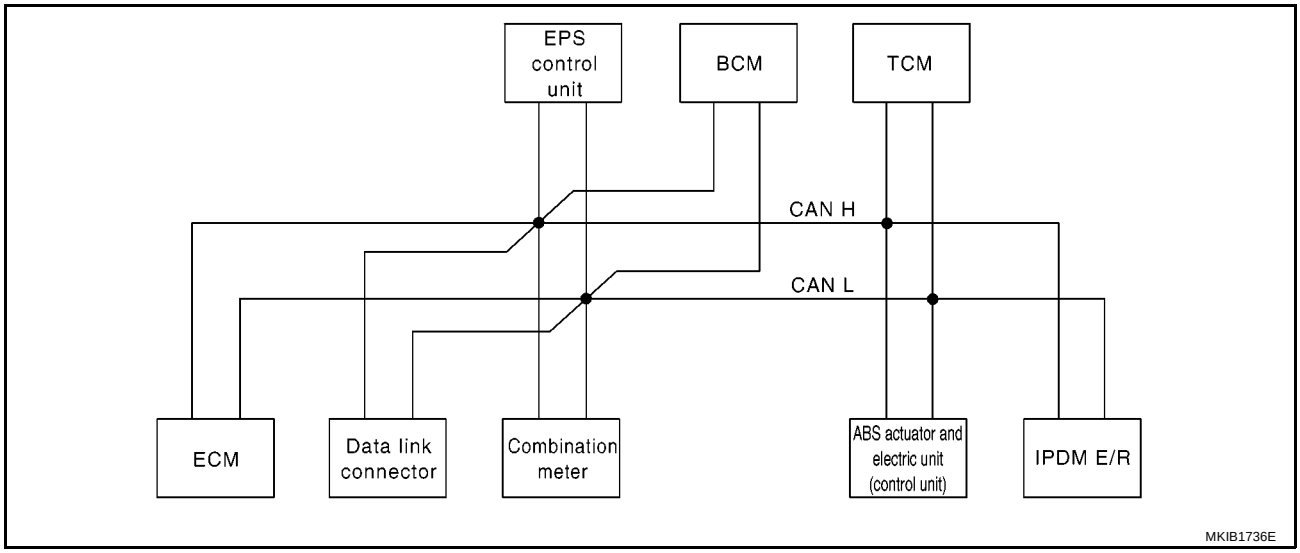
TYPE 1/TYPE 2

System diagram

- Type 1



- Type 2



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R						
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T						R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	

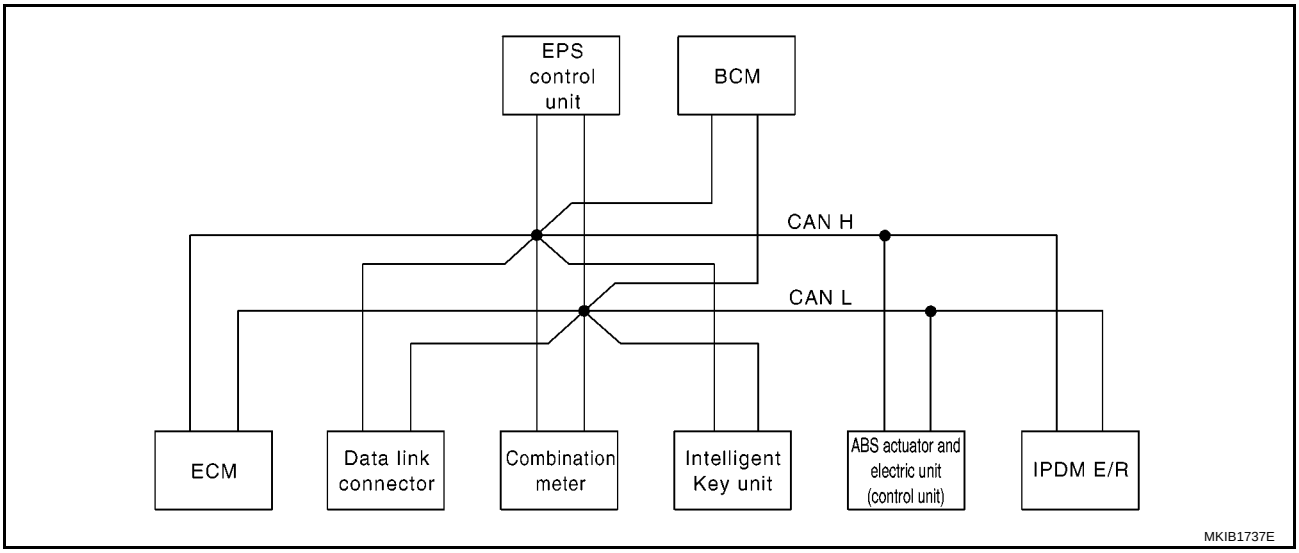
Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
A/T position indicator signal		R					T	
Stop lamp switch signal		T					R	
O/D OFF indicator signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
A/C switch signal	R				T			
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

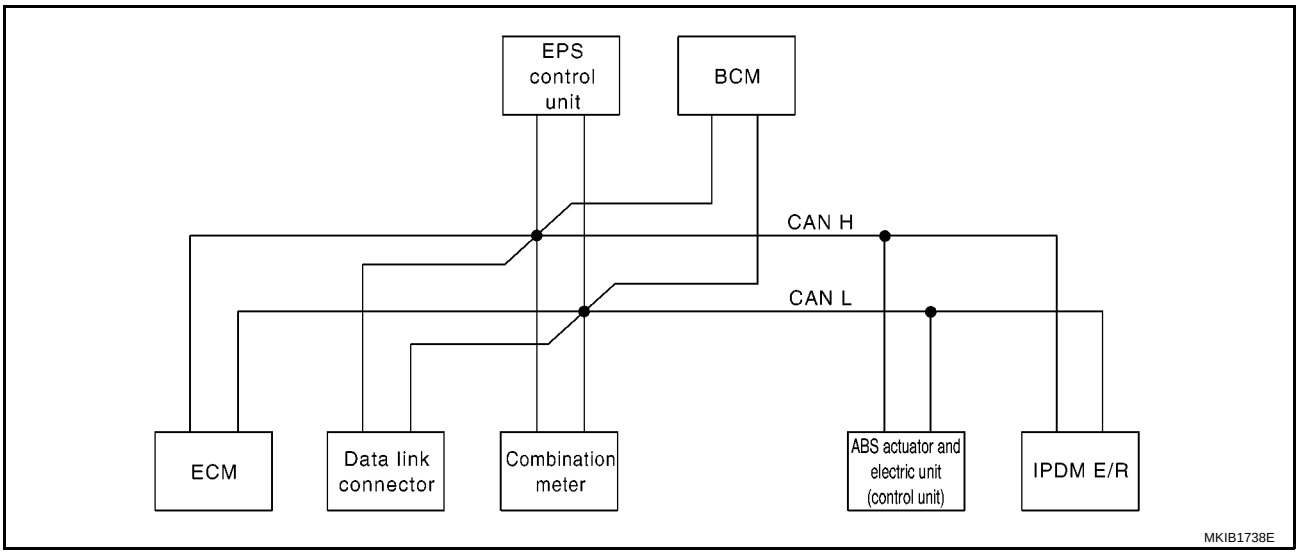
TYPE 3/TYPE 4/TYPE 5/TYPE 6

System diagram

- Type 3/Type 5



- Type 4/Type 6



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R

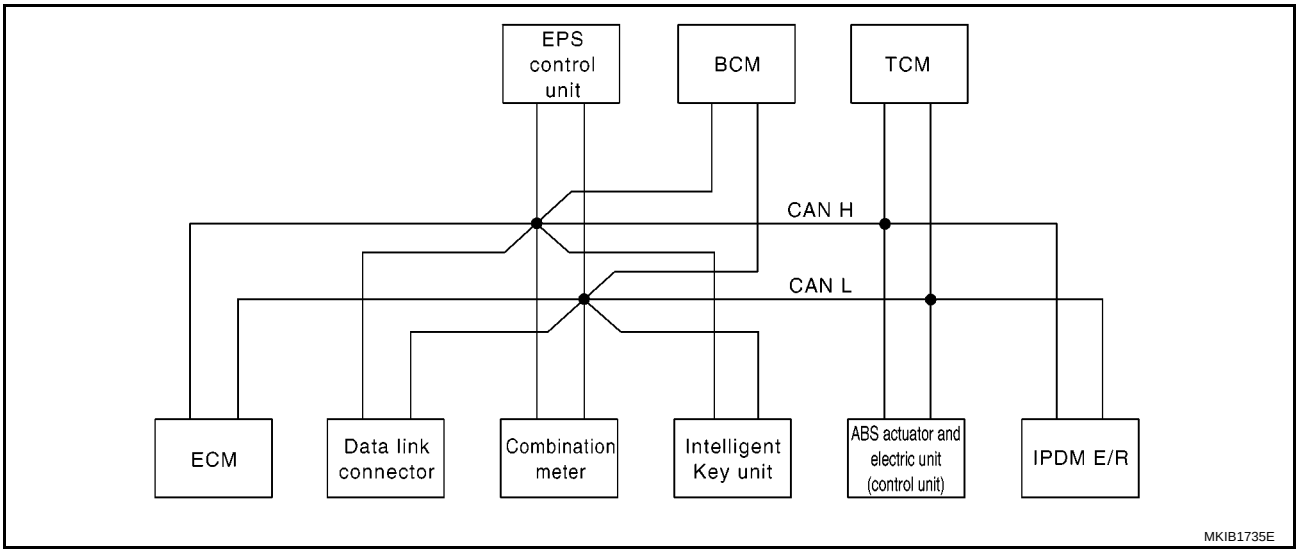
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

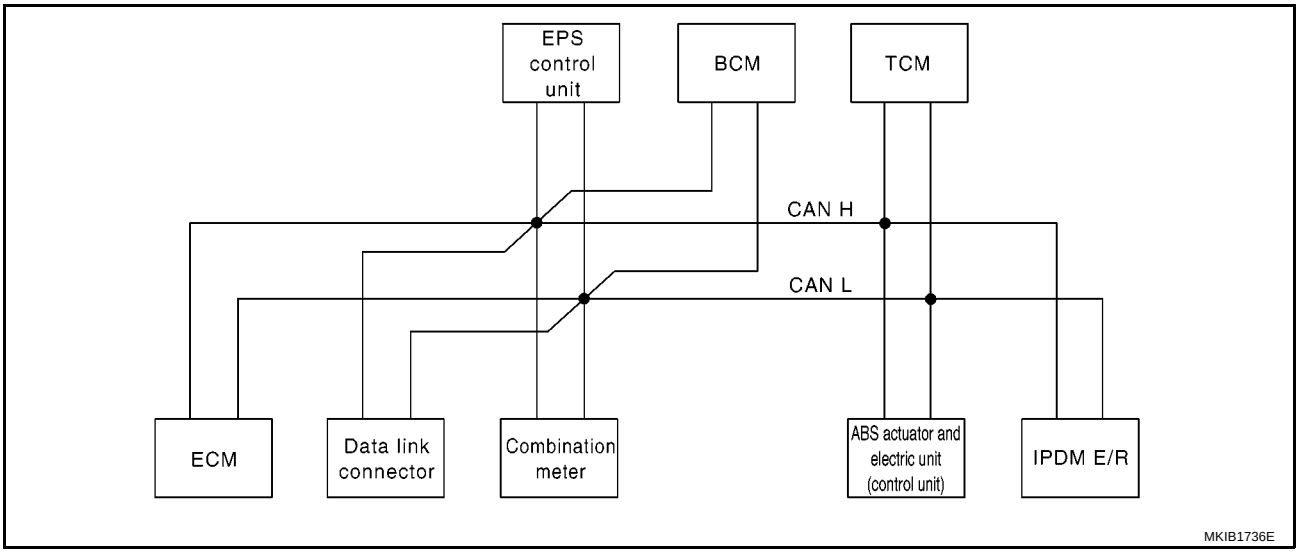
TYPE 7/TYPE 8

System diagram

- Type 7



- Type 8



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R				R		
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T					R	R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	
A/T position indicator signal		R					T	

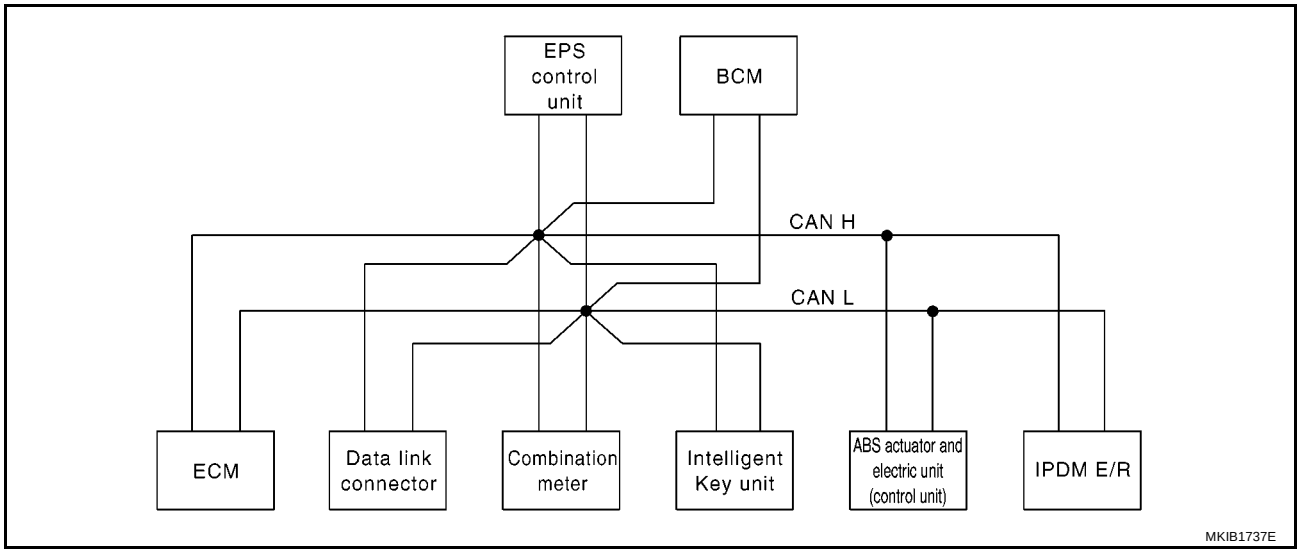
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
A/T shift schedule change demand signal						T	R	
Stop lamp switch signal		T					R	
O/D OFF indicator lamp signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
ESP warning lamp signal		R				T		
ESP OFF indicator signal		R				T		
SLIP indicator lamp signal		R				T		
Steering angle signal				T		R		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				
A/C switch signal	R				T			
A/T torque signal						R	T	
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

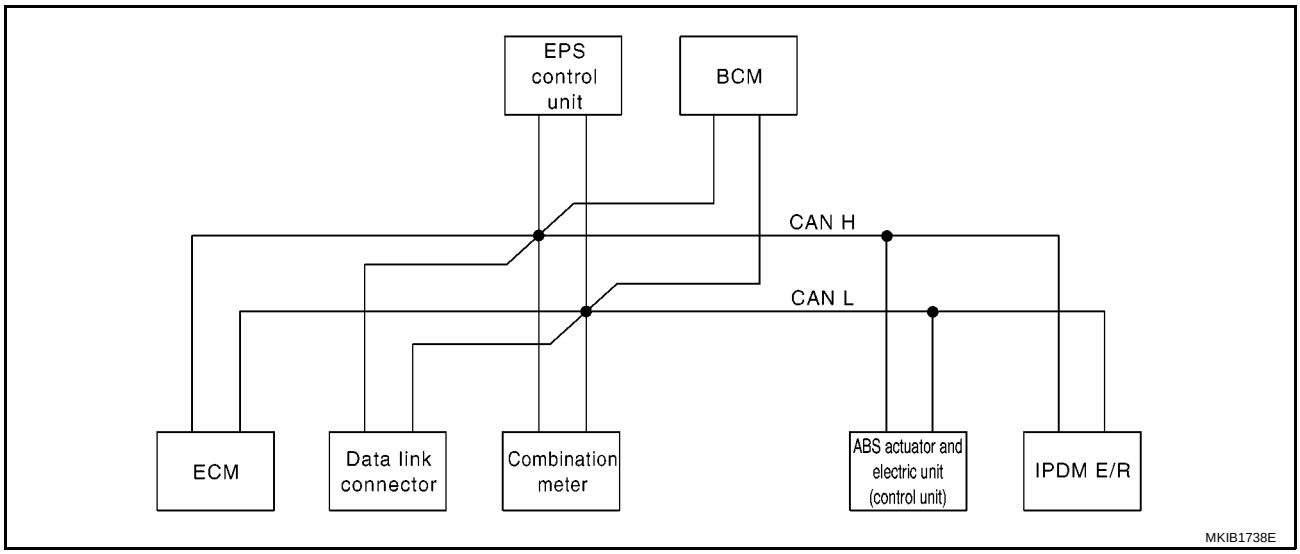
TYPE 9/TYPE 10/TYPE 11/TYPE 12

System diagram

- Type 9/Type 11



- Type 10/Type 12



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R				R	
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Accelerator pedal position signal	T					R	
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R

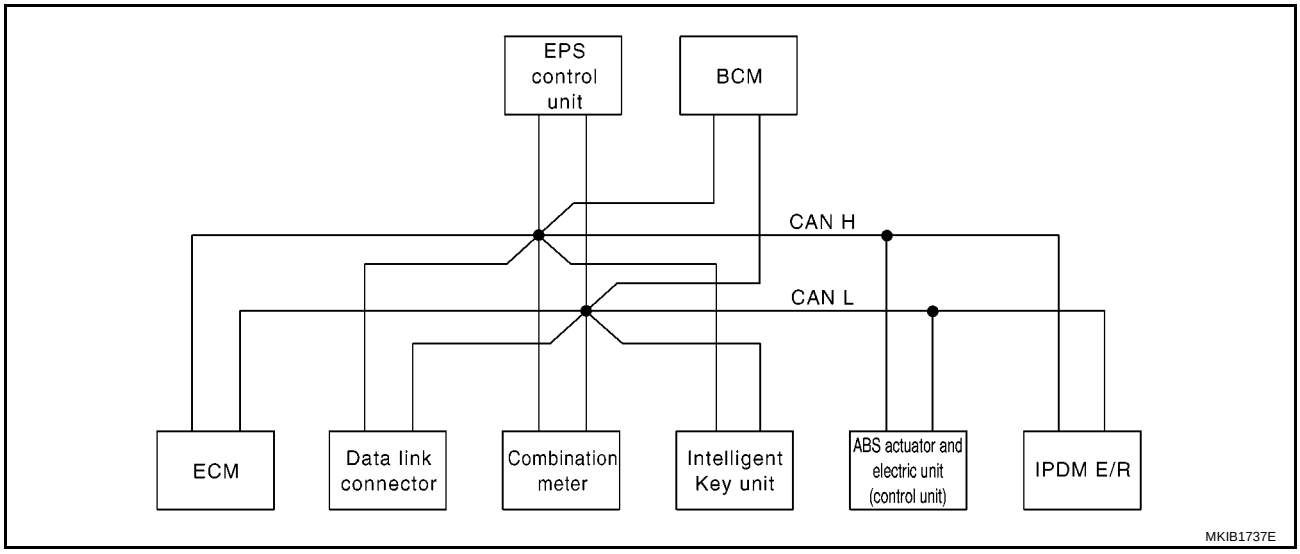
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam request signal					T		R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
ESP warning lamp signal		R				T	
ESP OFF indicator signal		R				T	
SLIP indicator lamp signal		R				T	
Steering angle signal				T		R	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

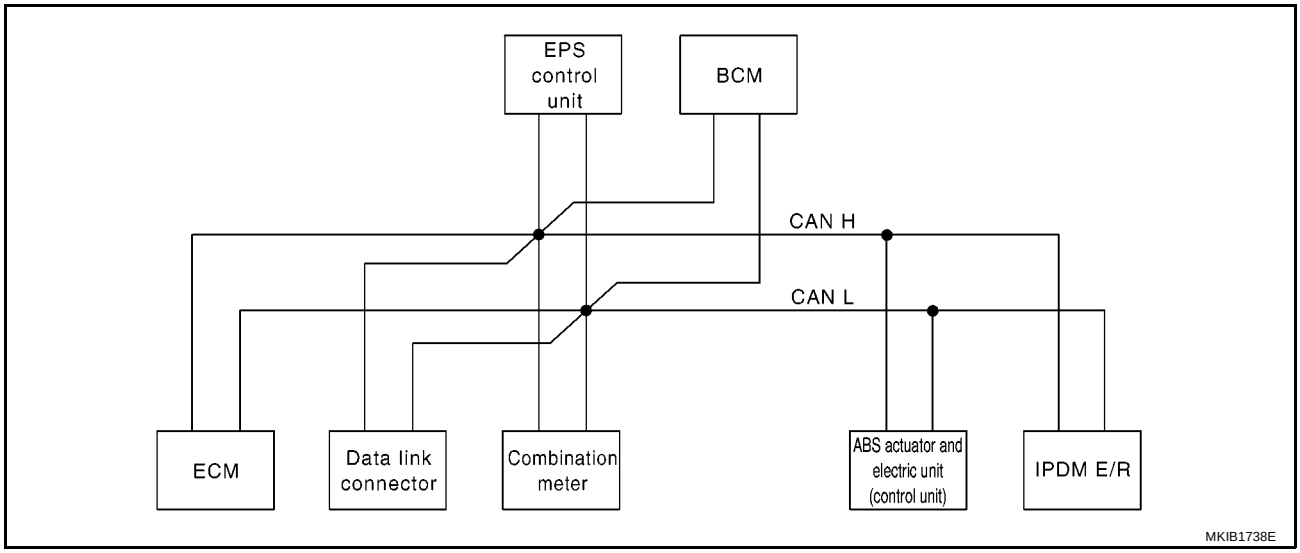
TYPE 13/TYPE 14

System diagram

- Type 13



- Type 14



Input/output signal chart

T: Transmit R: Receive

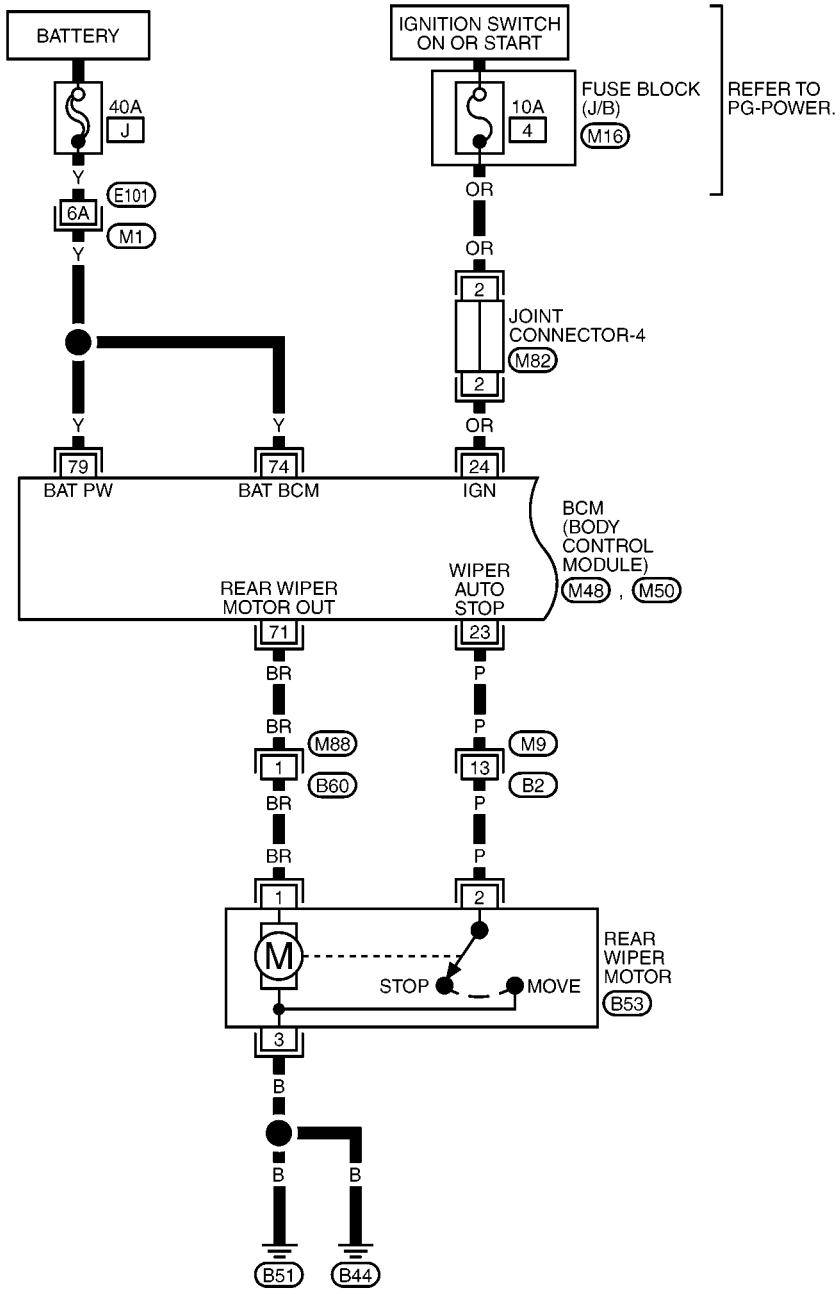
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R			R		
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R
High beam request signal		R			T		R
Day time light request signal					T		R
Vehicle speed signal	R	R		R	R	T	
	R	T	R	R			
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
Glow indicator signal	T	R					
R range signal					R		T

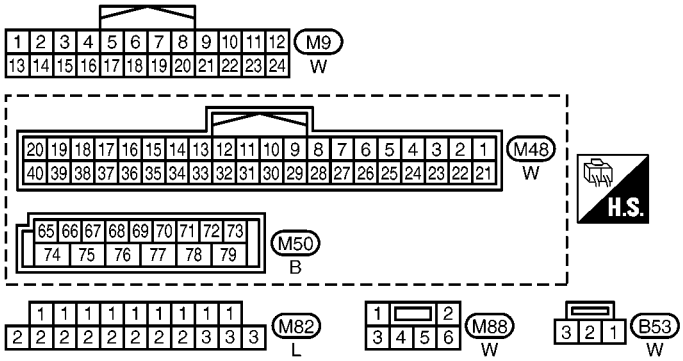
Wiring Diagram — WIP/R —

EKS0087H

WITHOUT RAIN SENSOR

WW-WIP/R-01



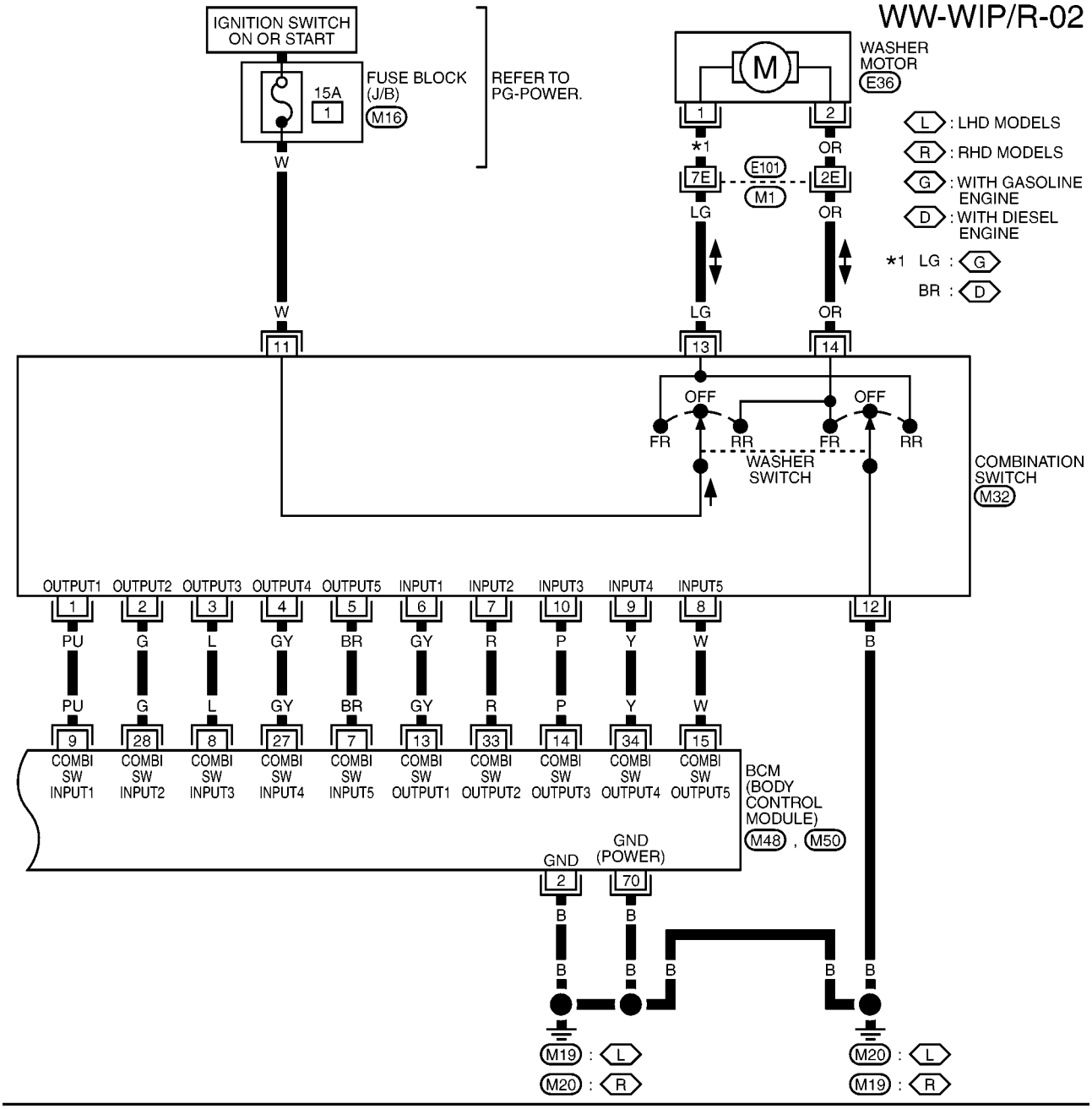


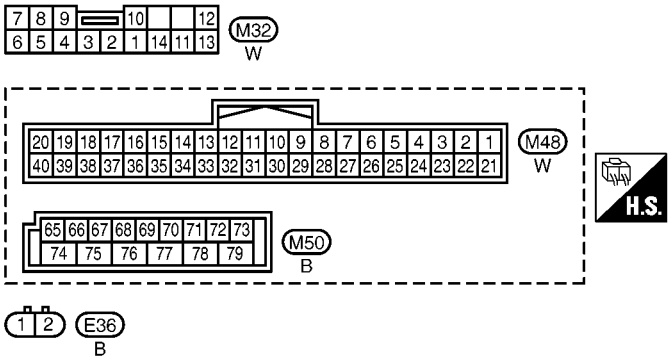
REFER TO THE FOLLOWING.

M1 - SUPER MULTIPLE JUNCTION (SMJ)

M16 - FUSE BLOCK - JUNCTION BOX (J/B)

MKWA4241E





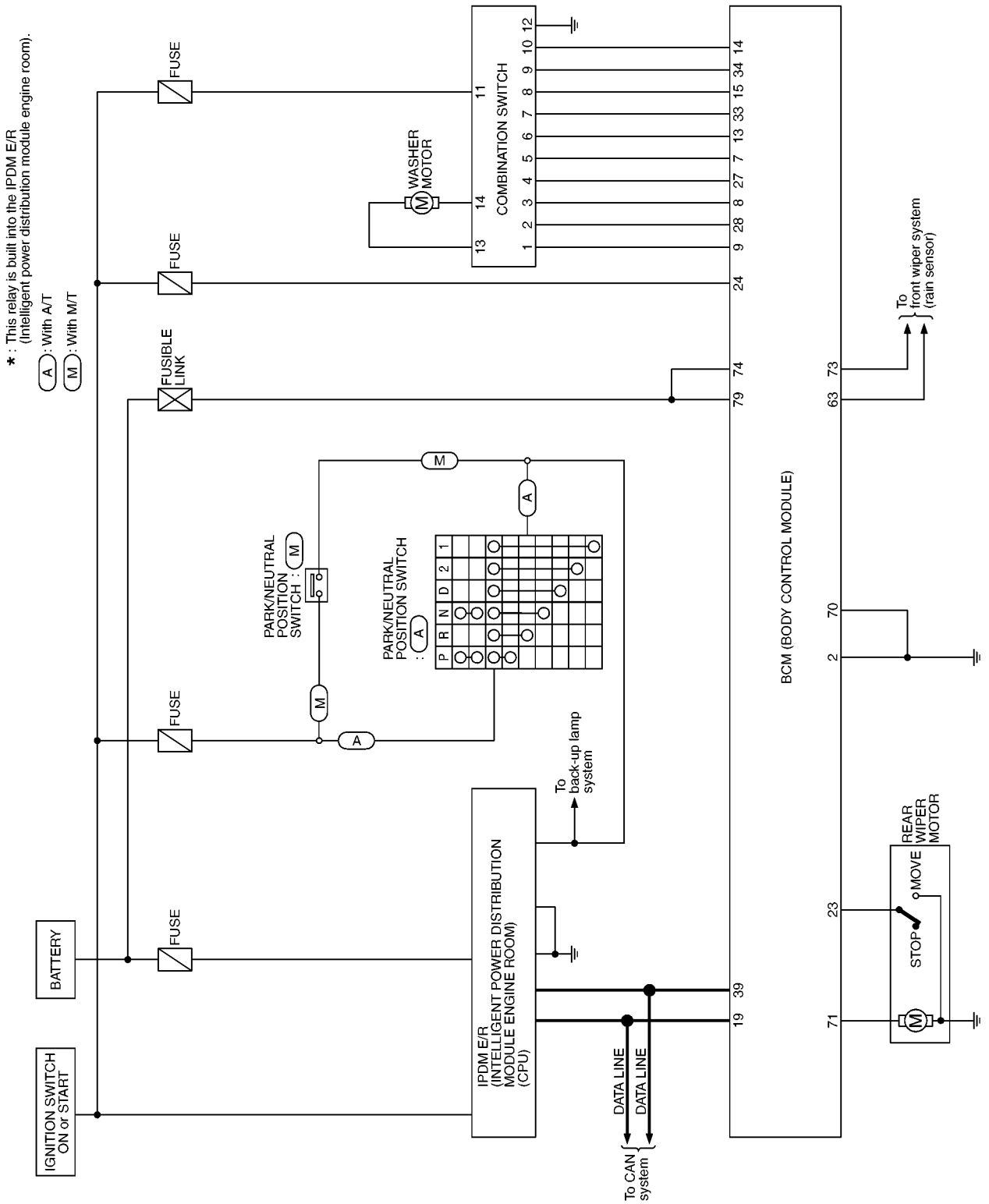
REFER TO THE FOLLOWING.
M1 -SUPER MULTIPLE JUNCTION (SMJ)
M16 -FUSE BLOCK-JUNCTION BOX (J/B)

MKWA1465E

Schematic

WITH RAIN SENSOR

EKS00Q8X

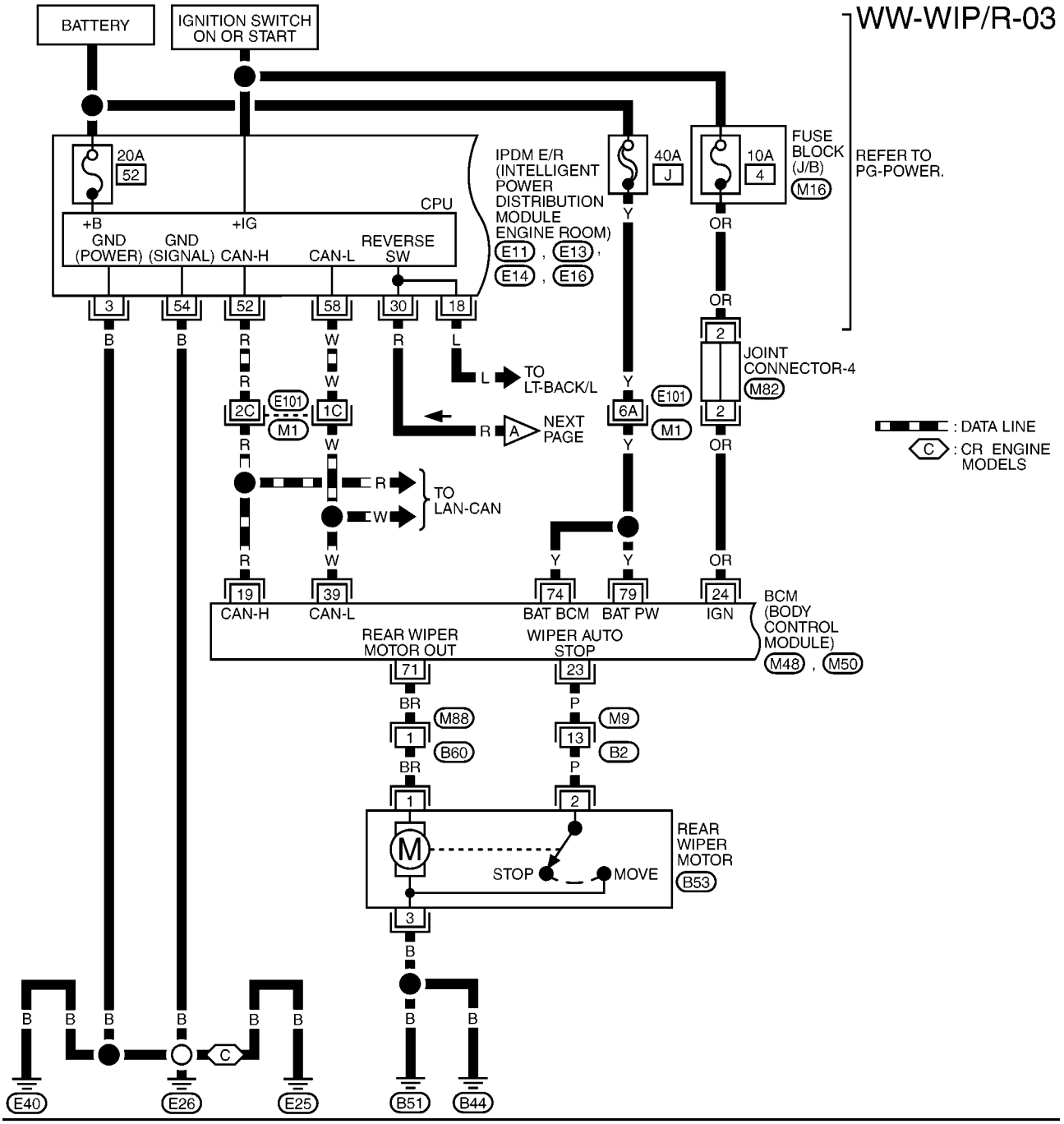


MKWA4242E

Wiring Diagram — WIP/R —

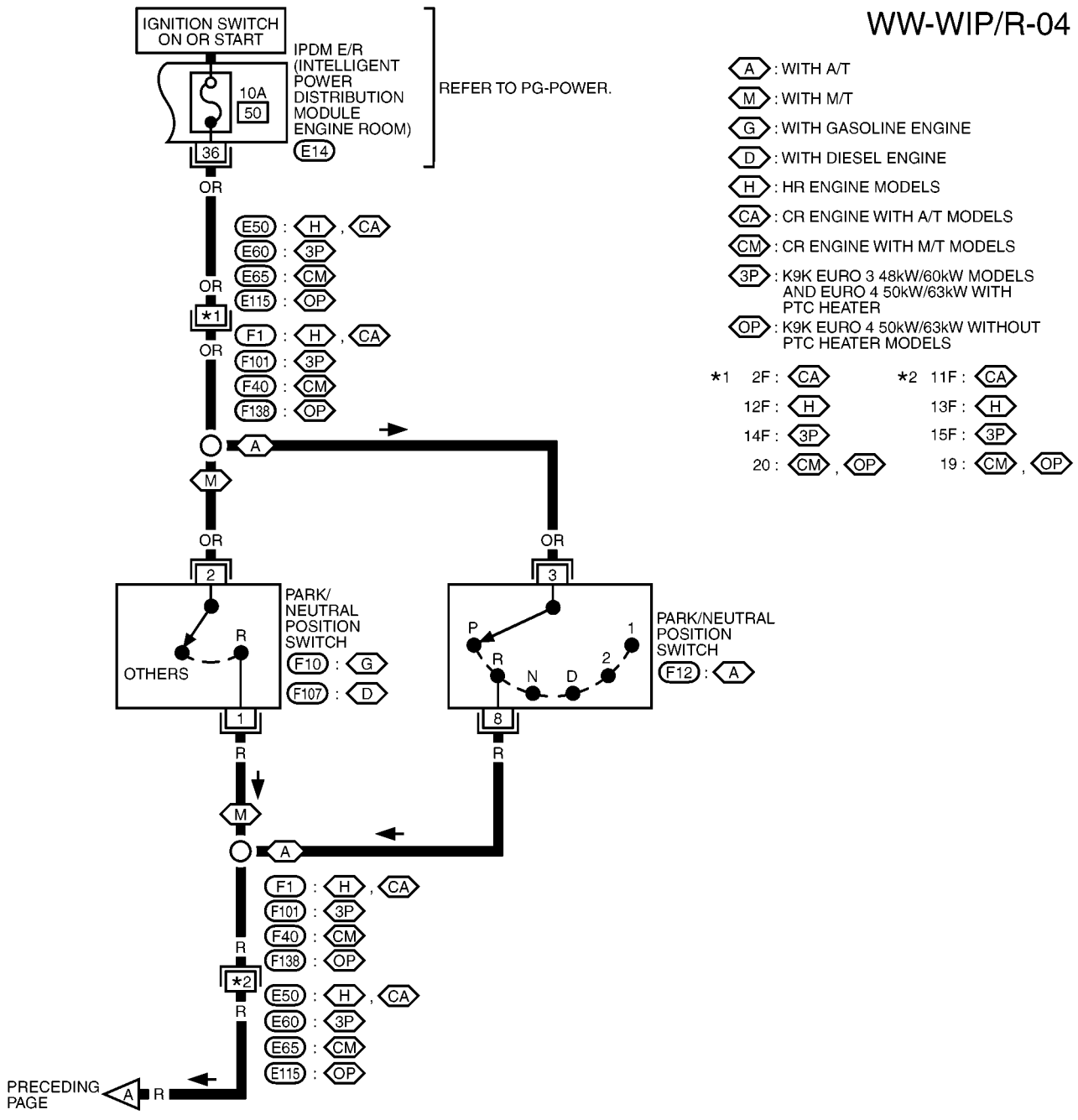
EKS00Q8Y

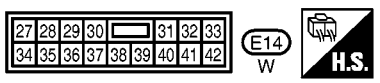
WITH RAIN SENSOR

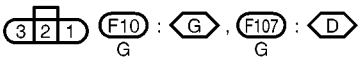


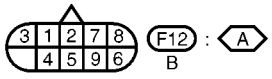
REFER TO THE FOLLOWING.
M1 - SUPER MULTIPLE JUNCTION (SMJ)
M16 - FUSE BLOCK - JUNCTION BOX (J/B)
M48, M50 - ELECTRICAL UNITS

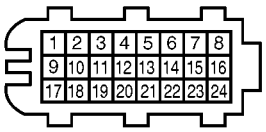
MKWA4243E





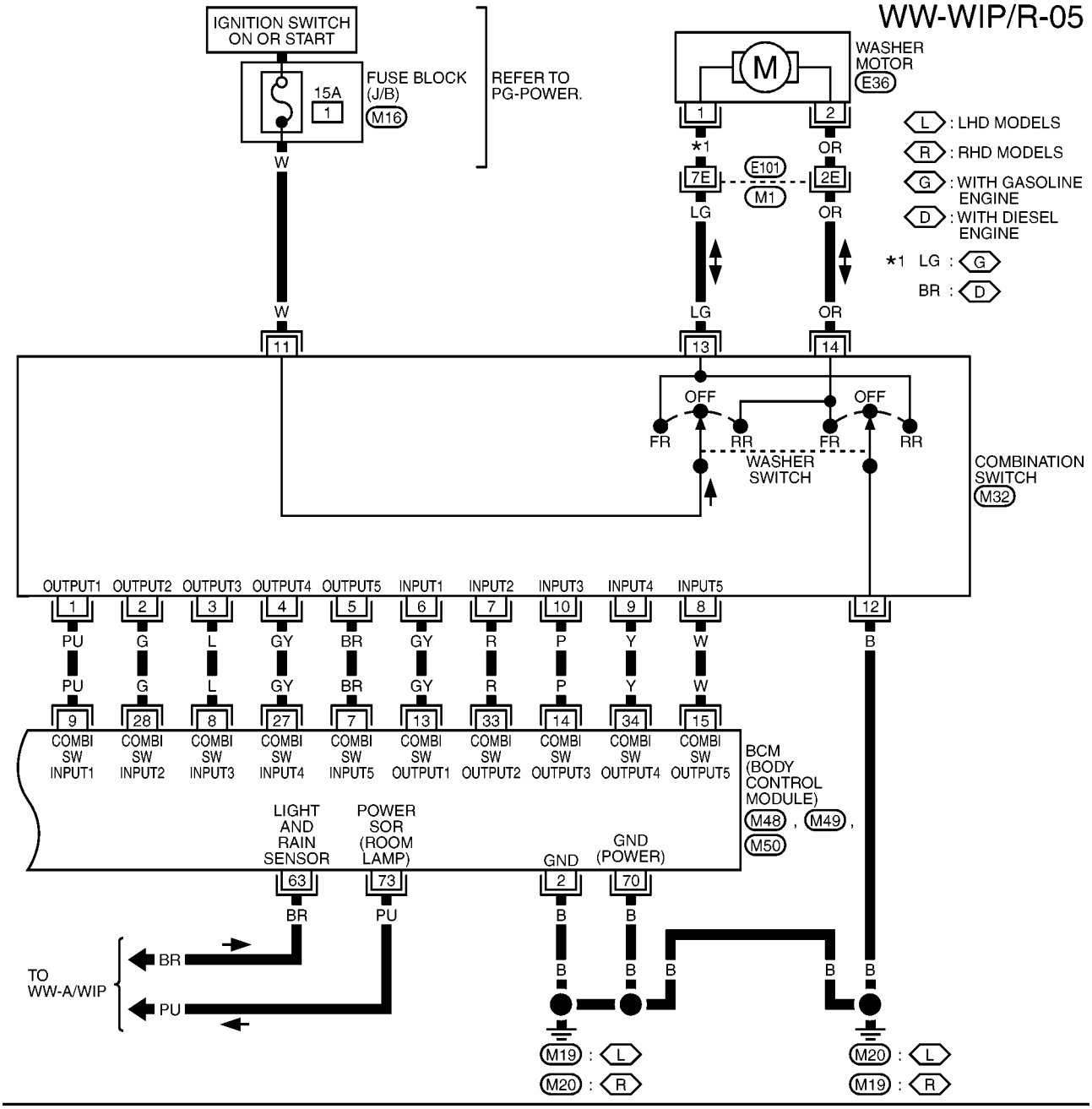


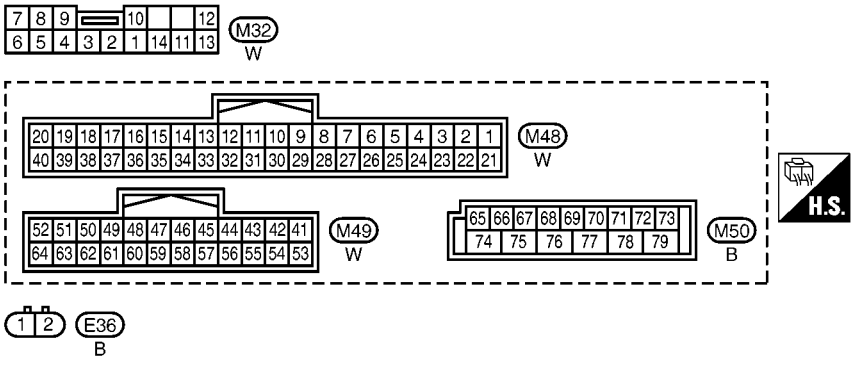




REFER TO THE FOLLOWING.
F1 , F101 - SUPER MULTIPLE JUNCTION (SMJ)

MKWA3896E



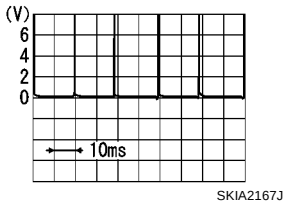
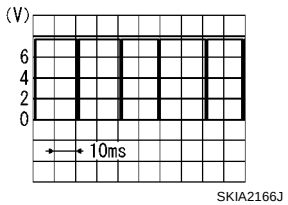
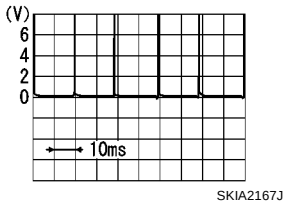


REFER TO THE FOLLOWING.
M1 -SUPER MULTIPLE JUNCTION (SMJ)
M16 -FUSE BLOCK-JUNCTION BOX (J/B)

MKWA3897E

Terminals and Reference Values for BCM

EKS0087G

Terminal No.	Wire color	Signal designation	Measuring condition		Voltage [V] (Approx.)
			Ignition switch	Operation or condition	
2	B	Ground	ON	—	0
19	R	CAN-H	—		—
7	BR	Combination switch input 5	ON	Headlamps, turn signal, wipers OFF	 SKIA2167J
8	L	Combination switch input 3			
9	PU	Combination switch input 1			
27	GY	Combination switch input 4			
28	G	Combination switch input 2			
13	GY	Combination switch output 1	ON	Headlamps, turn signal, wipers OFF (wiper volume is 1 or 7)	 SKIA2166J
14	P	Combination switch output 3			
15	W	Combination switch output 5			
33	R	Combination switch output 2		Headlamps, turn signal, wipers OFF (wiper volume is other than 1 or 7)	 SKIA2167J
34	Y	Combination switch output 4			
39	W	CAN-L	—		—
23	P	Rear wiper position detection signal	ON	Rear wiper operating	0
				Rear wiper not operating	Battery voltage
24	OR	Ignition power supply	ON	—	Battery voltage
70	B	Ground	ON	—	0
71	BR	Rear wiper operation signal	ON	Rear wiper operating	Battery voltage
				Rear wiper not operating	0
74	Y	Power source (Fusible link)	OFF	—	Battery voltage
79	Y	Power source (Fusible link)	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

EKS00Q8D

Terminal No.	Wire color	Signal designation	Measuring condition			Voltage [V] (Approx.)
			Ignition switch	Operation or condition		
3	B	Ground	ON	—		0
30	R	Reverse switch signal	ON	Shift knob	Reverse	Battery voltage
					Other than above	0
52	R	CAN H	—	—		—

Terminal No.	Wire color	Signal designation	Measuring condition		Voltage [V] (Approx.)
			Ignition switch	Operation or condition	
54	B	Ground	—	—	0
58	W	CAN L	—	—	—

How to Proceed With Trouble Diagnosis

EKS00Q8Z

1. Confirm the symptoms and customer complaint.
2. Understand operation description and function description. Refer to WW-83, "System Description" .
3. Carry out the Preliminary check. Refer to WW-105, "Preliminary Check" .
4. Check symptom and repair or replace the cause of malfunction.
5. Does the rear wiper operate normally? Yes: GO TO 6. No: GO TO 4.
6. INSPECTION END.

Preliminary Check

EKS00Q90

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

- Check fuse and fusible link for blown-out.

UNIT	POWER SOURCE	FUSE No.
BCM	Battery	J
	Ignition switch ON or START position	4
Combination switch	Ignition switch (ON)	1

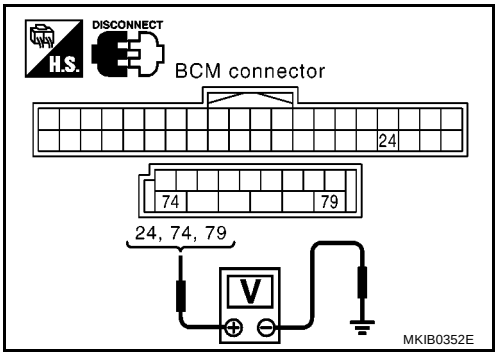
Refer to WW-98, "Wiring Diagram — WIP/R —" (without rain sensor), WW-101, "Wiring Diagram — WIP/R —" (with rain sensor).

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to PG-5, "Schematic" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M50	74 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
M50	79 (Y)		Battery voltage	Battery voltage	Battery voltage
M48	24 (OR)		0V	0V	Battery voltage

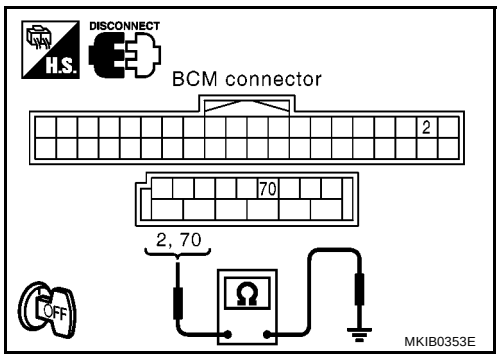
OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

Connector	Terminal (Wire color)	Ground	Continuity
M48	2 (B)		Yes
M50	70 (B)		



OK or NG

OK >> INSPECTION END.
NG >> Check harness ground circuit.

CONSULT-II Function (BCM)

EKS00Q91

Refer to WW-33, "CONSULT-II Function (BCM)" .

Rear Wiper Does Not Operate

EKS00Q92

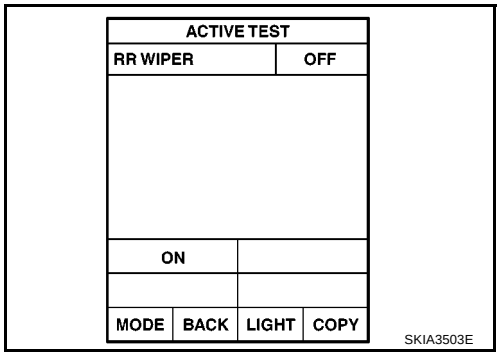
1. CHECK REAR WIPER OPREATION

With CONSULT-II

1. Select “BCM” by CONSULT-II, and select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “REAR WIPER” on “SELECT TEST ITEM” screen.
3. Make sure that rear wipers operate normally.

Without CONSULT-II

1. Start up auto active test. Refer to PG-43, "Auto Active Test" .
2. Make sure that rear wipers operate normally.



OK or NG

OK >> GO TO LT-219, "Check Combination Switch" .
NG >> GO TO 2.

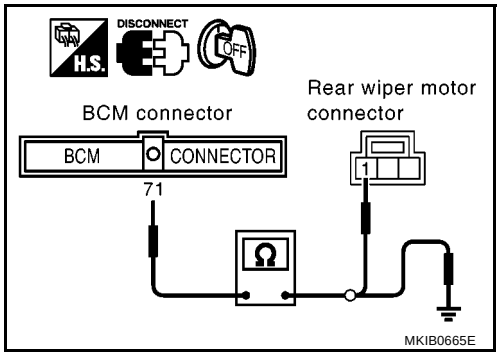
2. CHECK REAR WIPER MOTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM and rear wiper connector.
3. Check continuity between BCM harness connector M50 terminal 71(BR) and rear wiper motor harness connector B53 terminal 1(BR).

71 (BR) – 1 (BR) :Continuity should exist.

4. Check continuity between BCM harness connector M50 terminal 71(BR) and ground.

71 (BR) – Ground :Continuity should not exist.



OK or NG

OK >> GO TO 3.
NG >> Repair or replace harness.

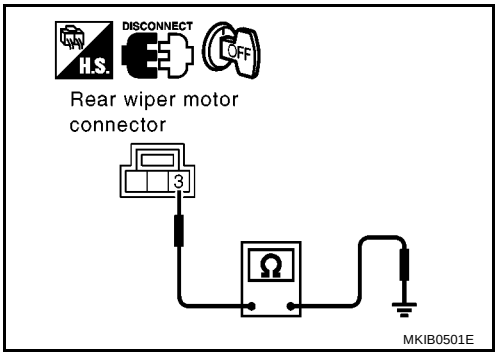
3. CHECK REAR WIPER MOTOR GROUND

Check continuity between rear wiper motor harness connector B53 terminal 3(B) and ground.

3 (B) – Ground :Continuity should exist.

OK or NG

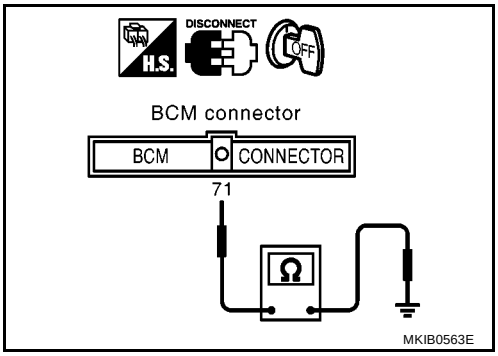
OK >> GO TO 4.
NG >> Repair harness or connector.



4. CHECK BCM OUTPUT SIGNAL

1. Turn ignition switch to ON.
2. Rear wiper switch is in placed in ON position.
3. Check voltage between BCM harness connector M50 terminal 71 (BR) and ground.

Connector terminal			Measuring condition	Voltage [V] (Approx.)
(+)		(-)		
Connector	Terminal (wire color)			
B53	71 (BR)	Ground	Rear wiper stopped	0
			Rear wiper operating	Battery voltage



OK or NG

OK >> Replace rear wiper motor.
NG >> Replace BCM.

Rear Wiper Stop Position Is Not Restored

EKS00Q93

1. CHECK AUTO STOP INPUT SIGNAL

With CONSULT-II

Select BCM on CONSULT-II. Check (“RR WIPER STOP”) in “DATA MONITOR” mode with CONSULT-II.

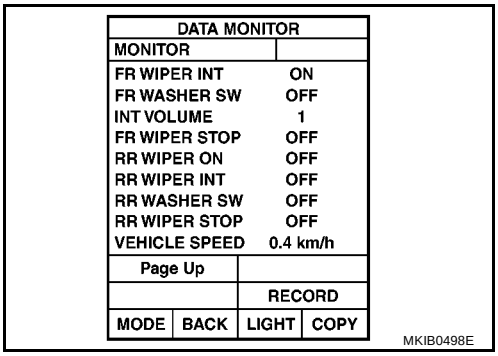
When rear wiper is operating : RR WIPER STOP OFF
When rear wiper is stopped : RR WIPER STOP ON

Without CONSULT-II

GO TO 2.

OK or NG

OK >> Replace BCM.
NG >> GO TO 2.

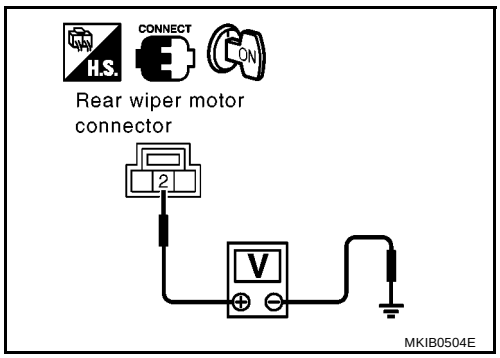


2. CHECK BCM OUTPUT SIGNAL

While rear wiper motor is stopped and while operating, measure voltage between rear wiper motor connector terminal 2 and ground.

1. Turn ignition switch is ON.
2. Rear wiper switch is placed in INT position.
3. Check voltage between BCM and rear wiper motor.

(+)		(-)	Condition	Voltage [V] (Approx.)
Connector	Terminal (wire color)			
B53	2 (P)	Ground	Wiper operating	0
			Wiper stopped	Battery voltage



OK or NG

OK >> GO TO 3.
NG >> Replace BCM.

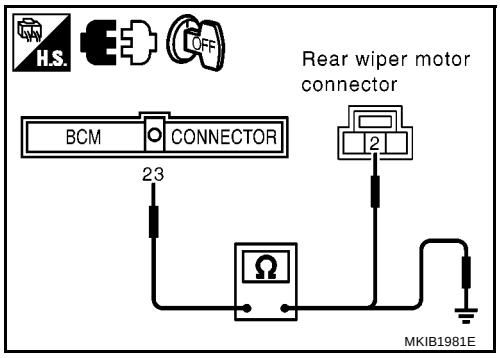
3. CHECK AUTO STOP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the BCM connector and rear wiper motor connector.
3. Check continuity between BCM harness connector M48 terminal 23(P) and front wiper motor harness connector B53 terminal 2(P).

23 (P) – 2(P) :Continuity should exist.

4. Check continuity between BCM harness connector M48 terminal 23(P) and ground.

23 (P) – Ground :Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> Repair harness or connector.

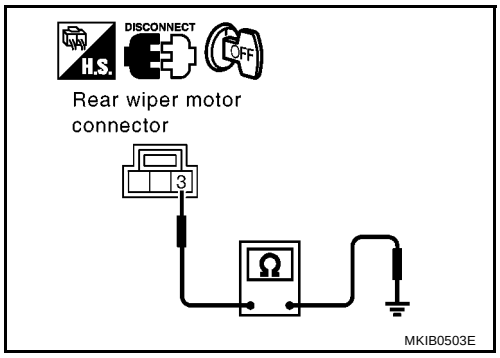
4. CHECK AUTO STOP CIRCUIT

Check continuity between rear wiper motor harness connector B53 terminal 3(B) and ground.

3 (B) – Ground :Continuity should exist.

OK or NG

OK >> Replace rear wiper motor.
NG >> Repair harness or connector.



Only Rear Wiper Reverse Range Operation Dose Not Operate

EKS00Q94

Check CAN communication. Refer to BCS-30, "CAN Communication Inspection With CONSULT-II (Self-Diagnosis)" .

Only Rear Wiper INT Does Not Operate

EKS00Q9I

Check combination switch. Refer toLT-219, "Check Combination Switch" .

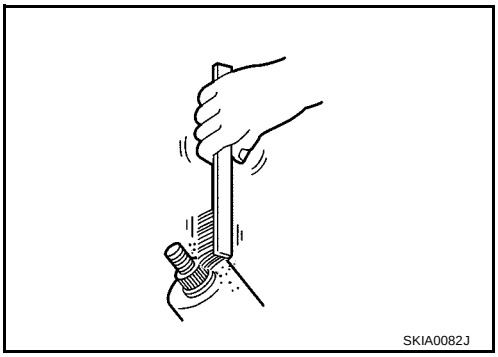
Removal and Installation of Rear Wiper Arm

EKS00Q96

REMOVAL

1. Turn the wiper switch ON to operate the wiper motor, then turn it OFF (auto stop).
2. Lift up nut cover and remove nut.
3. Raise wiper arm, and remove wiper arm from the vehicle.

When attaching rear wiper arm, clean wiper installation location as shown in figure to prevent loosening of nut.



INSTALLATION

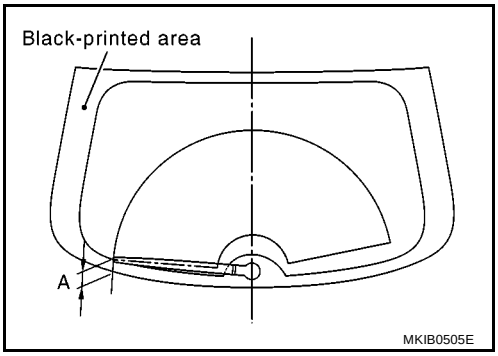
1. Lower wiper blade to glass so that center end of blade comes to the position shown in diagram.
2. Tighten the wiper arm with nuts and install the nut cover.

Wiper arm nut:

: 10.8 - 13.2 N·m (1.1 - 1.3 kg-m, 8- 10 ft-lb)

3. Spray washer fluid. Turn wiper switch ON to operate wiper, then turn it OFF (auto-stop).
4. Make sure wiper blade stops at the position shown in the figure.

Stop position A : 25.5 - 40.5 mm (1.004 - 1.594 in)



NOTE:
Installation is made easier by aligning wiper blade end to line under black printing.

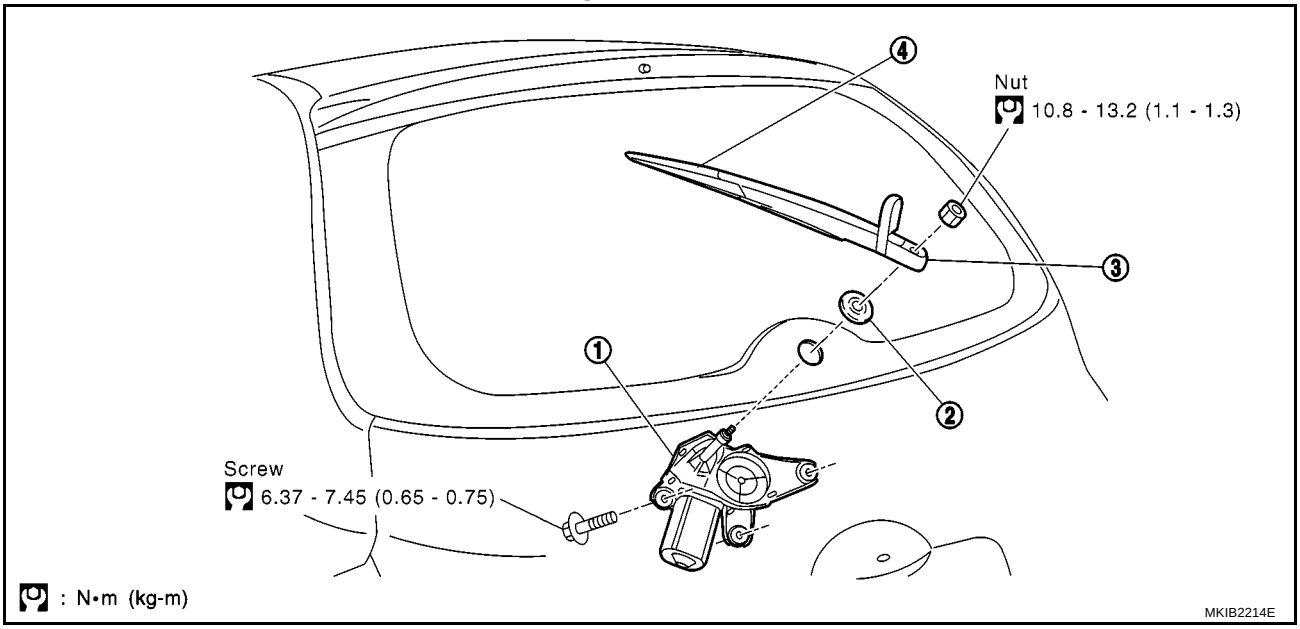
Adjusting Rear Wiper Arm Stop Position

EKS00Q9J

Refer to WW-109, "Removal and Installation of Rear Wiper Arm" .

Removal and Installation of Rear Wiper Motor

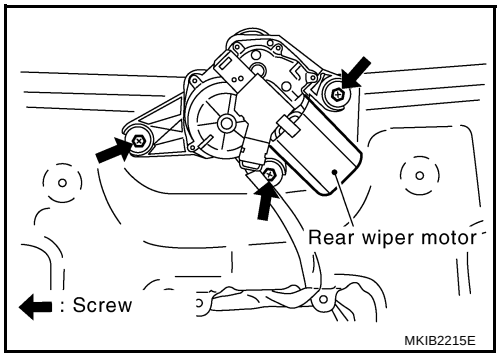
EKS00Q98



1. Rear wiper motor
2. Seal rubber
3. Rear wiper arm
4. Wiper blade

REMOVAL

1. Remove back door finisher. Refer to EI-22, "BACK DOOR TRIM" .
2. Turn wiper switch ON to operate wiper, then turn it OFF (auto-stop).
3. Disconnect wiper motor connector.
4. Lift up nut cover, remove wiper arm nut, and lift up wiper arm to remove it from vehicle.
5. Remove wiper motor screws. Remove wiper motor from vehicle.
6. Remove seal rubber from vehicle.



CAUTION:
Do not drop the wiper motor or cause it to contact other parts.

INSTALLATION

1. Remove seal rubber from vehicle.
2. Attach wiper motor to vehicle.

Wiper motor screw

: 6.37 - 7.45 N·m (0.65 - 0.75 kg-m, 57 - 65 in-lb)

3. Connect the wiper motor to the vehicle-side connector. Turn the wiper switch ON to operate the wiper motor, then turn the wiper switch OFF (auto stop).
4. Attach wiper arm to vehicle.

Wiper arm nut:

: 10.8 - 13.2 N·m (1.1 - 1.3 kg-m, 8 - 10 ft-lb)

5. Adjust wiper arm stop position.
6. Put down nut cover.
7. Install back door finisher. Refer to EI-22, "BACK DOOR TRIM" .

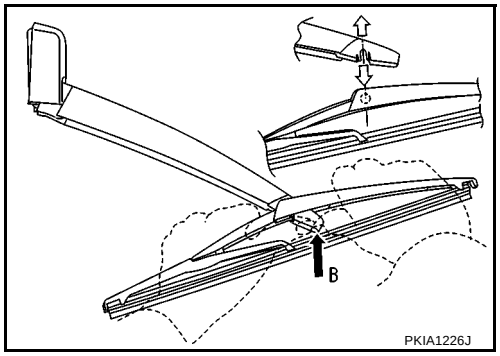
Rear Wiper Blade

EKS00Q99

REMOVAL AND INSTALLATION

1. Hold the wiper blade with both hands, push arm end in arrow B direction, remove lock, and remove blade.

CAUTION:
To replace blade, replace blade assembly.

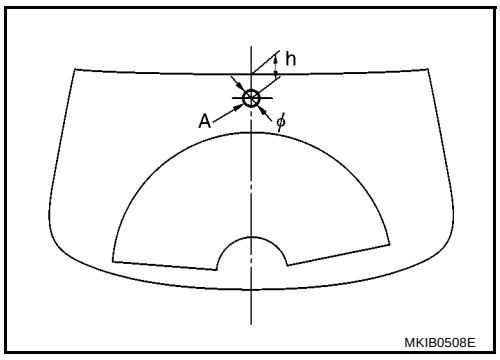


Adjusting Rear Washer Nozzle Spray Position

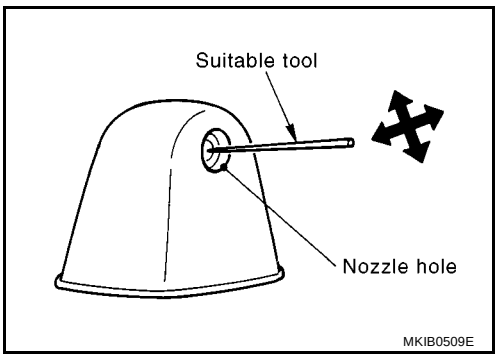
EKS00Q9A

Adjust spray positions to match the positions listed below.

Spray position	H (height)	ϕ (spray point area)
A	20	30



To adjust the spray position, insert a needle or similar object into the spray opening and move up/down and left/right.



Rear Washer Hose Circuit

EKS00Q9B

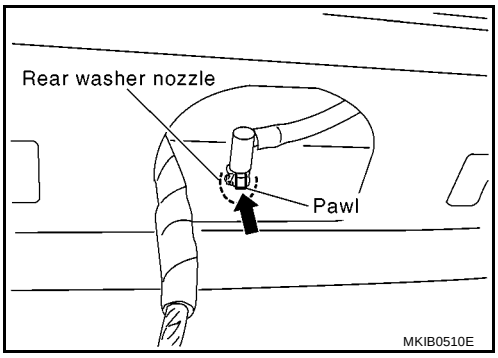
Refer to WW-48, "Washer Hose Routing" .

Removal and Installation of Rear Washer Nozzle

EKS00Q9C

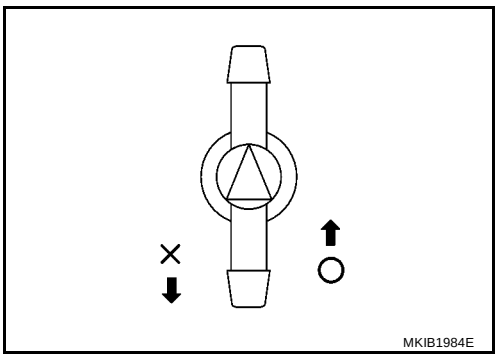
REMOVAL

1. Remove high-mount stop lamp. Refer to LT-203, "Removal and Installation" .
2. Remove washer nozzle from washer hose.
3. Push outward while pushing hooks on back of nozzle.



CHECK VALVE INSPECTION

Make sure air can pass through the hose by blowing forward (toward the nozzle) and air cannot pass through by suction.



INSTALLATION

1. Install in the reverse order of removal.
2. Nozzle spray position must be adjusted.

Rear Wiper and Washer Switch Circuit Inspection

EKS00Q9D

Refer to LT-219, "Check Combination Switch" .

Removal and Installation of Rear Wiper and Washer Switch

EKS00Q9E

Refer to LT-222, "Removal and Installation" .

Removal and Installation of Rear Wiper and Washer Tank

EKS00Q9F

Refer to .WW-49, "Removal and Installation of Front Wiper and Washer Tank"

Removal and Installation of Rear Wiper and Washer Pump

EKS00Q9G

Refer to WW-49, "Removal and Installation of Front Wiper and Washer Pump" .

HEADLAMP WASHER

PFP:28620

System Description

EKS0087R

The control of the head lamp washer system operation is dependent upon the position of the combination switch (headlamp) and head lamp washer switch condition. When the combination switch (headlamp) and headlamp washer switch is placed in the ON position, the BCM (body control module) receives input signal requesting the headlamp washer operates. This input signal is communicated to the IPDM E/R (intelligent power distribution module engine room) across the CAN communication lines.
When ignition switch is ON and daytime light system operation, headlamp operation (low beam) or auto light system operation (low beam), head lamp cleaner can be operated by operating a certain head lamp washer switch in a car.

- Wiper switch (combination switch) is composed of a combination of 5 output terminals and 5 input terminals. Terminal combination status is read by BCM when switch is turned ON.
- BCM controls headlamp washer operation.
- IPDM E/R operates headlamp washer motor according to CAN communication signals from BCM.

Power is supplied at all times

- through 30 A fusible link (letter L, located in fuse and fusible link box).
- to headlamp washer relay terminals 1 and 3.
- through 40 A fusible link (letter J, located in fuse and fusible link box).
- to BCM terminals 74 and 79.
- through 20 A fuse (NO.52, located in IPDM E/R).
- to IPDM E/R (CPU).

When ignition switch ON or START position, power is supplied

- to IPDM E/R (CPU), and
- through 10 A fuse [NO.4, located in fuse block (J/B)]
- to BCM terminal 24.

Ground is supplied

- to IPDM E/R terminals 3 and 54, and
- to head lamp washer motor terminal 1,
- through body grounds E25 (CR engine models), E26 and E40.
- to BCM terminals 2 and 70, and
- to head lamp washer switch terminal 2,
- through body grounds M19 and M20.

HEADLAMP WASHER OPERATION

When lighting switch is placed in 2nd position, BCM read combination switch condition (Refer to WW-8, "COMBINATION SWITCH READING FUNCTION").
And headlamp washer switch ON, ground is supplied.

- to BCM terminal 62, and
- through headlamp washer switch terminal 1 and 2.
- through body grounds M19 and M20.

BCM sends headlamp washer request signal to IPDM E/R with CAN communication line.
And IPDM E/R is grounded to headlamp washer relay terminal 2 through IPDM E/R terminal 56.
Then headlamp washer relay is energized, power is supplied.

- through headlamp washer relay terminal 5
- to headlamp washer motor terminal 2.

Ground is supplied.

- to terminal 1 of headlamp washer motor
- through body grounds E25 (CR engine models), E26 and E40.

With power and ground supplied, the headlamp washer operates.

CAN Communication

EKS00Q8I

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.

CAN Communication Unit

EKS00QP3

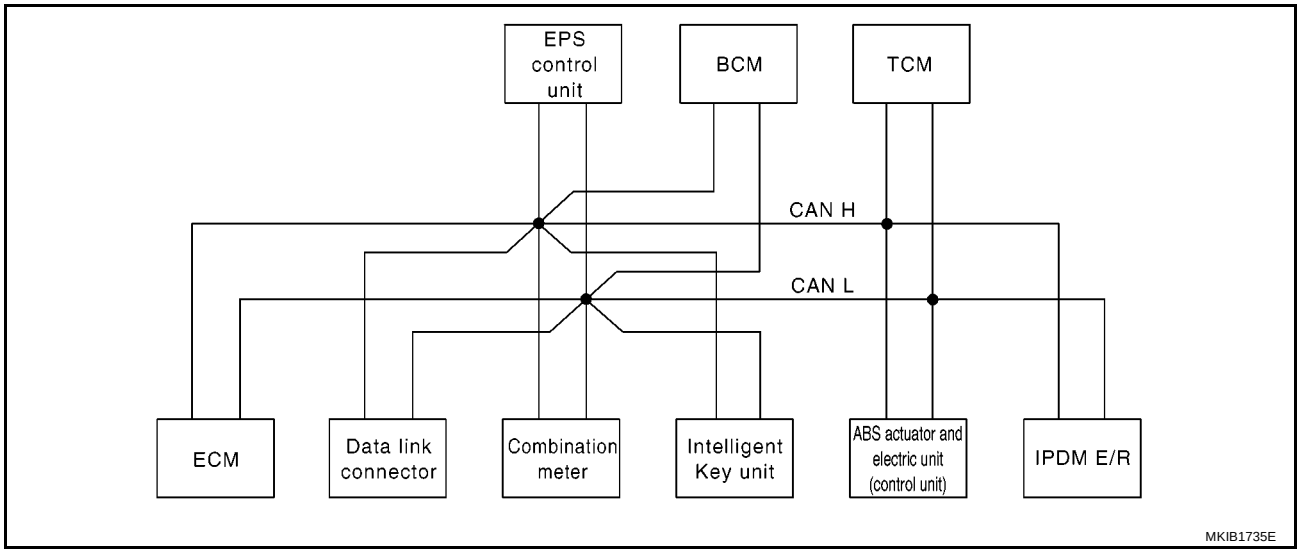
Body type	3door/5door		3door/5door/C+C				3door/5door		3door/5door/C+C				3door/5door	
Axle	2WD													
Engine	CR12DE/CR14DE				HR16DE		CR12DE/CR14DE				HR16DE		K9K	
Handle	LHD/RHD													
Brake control	ABS						ESP						ABS	
Transmission	A/T		M/T				A/T		M/T					
Intelligent Key system	×		×		×		×		×		×		×	
CAN communication unit														
ECM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Data link connector	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Combination meter	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Intelligent Key unit	×		×		×		×		×		×		×	
EPS control unit	×	×	×	×	×	×	×	×	×	×	×	×	×	×
BCM	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ABS actuator and electric unit (control unit)	×	×	×	×	×	×	×	×	×	×	×	×	×	×
TCM	×	×					×	×						
IPDM E/R	×	×	×	×	×	×	×	×	×	×	×	×	×	×
CAN communication type	WW-114, "TYPE 1/ TYPE 2"		WW-117, "TYPE 3/TYPE 4/ TYPE 5/TYPE 6"				WW-119, "TYPE 7/ TYPE 8"		WW-122, "TYPE 9/TYPE 10/ TYPE 11/TYPE 12"				WW-124, "TYPE 13/ TYPE 14"	

×: Applicable

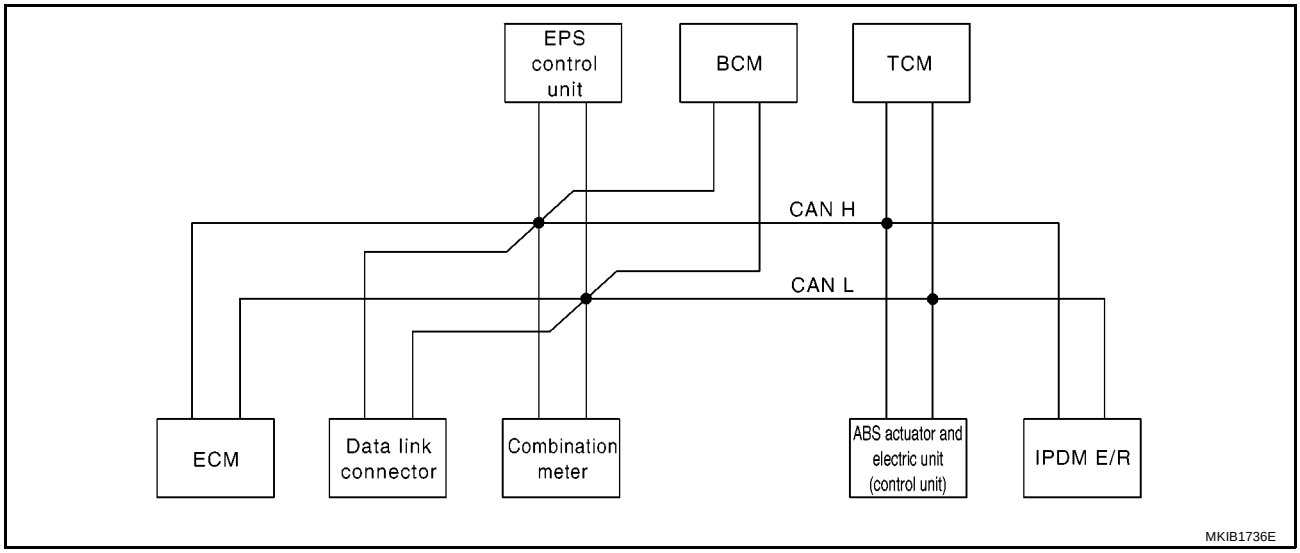
TYPE 1/TYPE 2

System diagram

- Type 1



- Type 2



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R						
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T						R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	

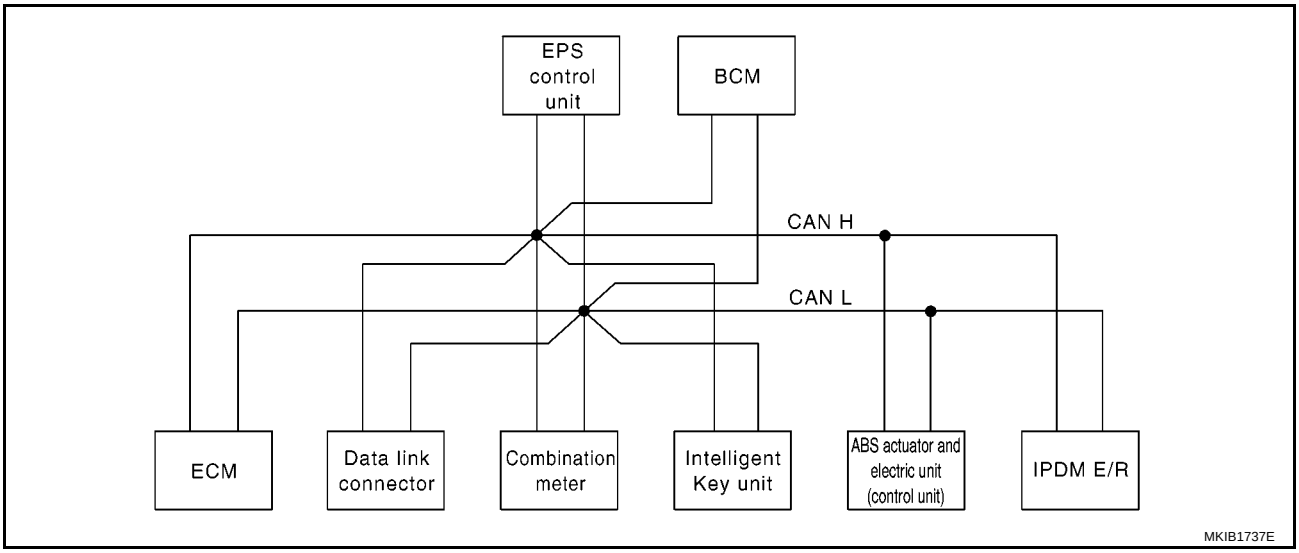
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
A/T position indicator signal		R					T	
Stop lamp switch signal		T					R	
O/D OFF indicator signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				

Signals	ECM	Combi-nation meter.	Intelli-gent Key unit	EPS control unit	BCM	ABS actua-tor and electric unit (control unit)	TCM	IPDM E/R
A/C switch signal	R				T			
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

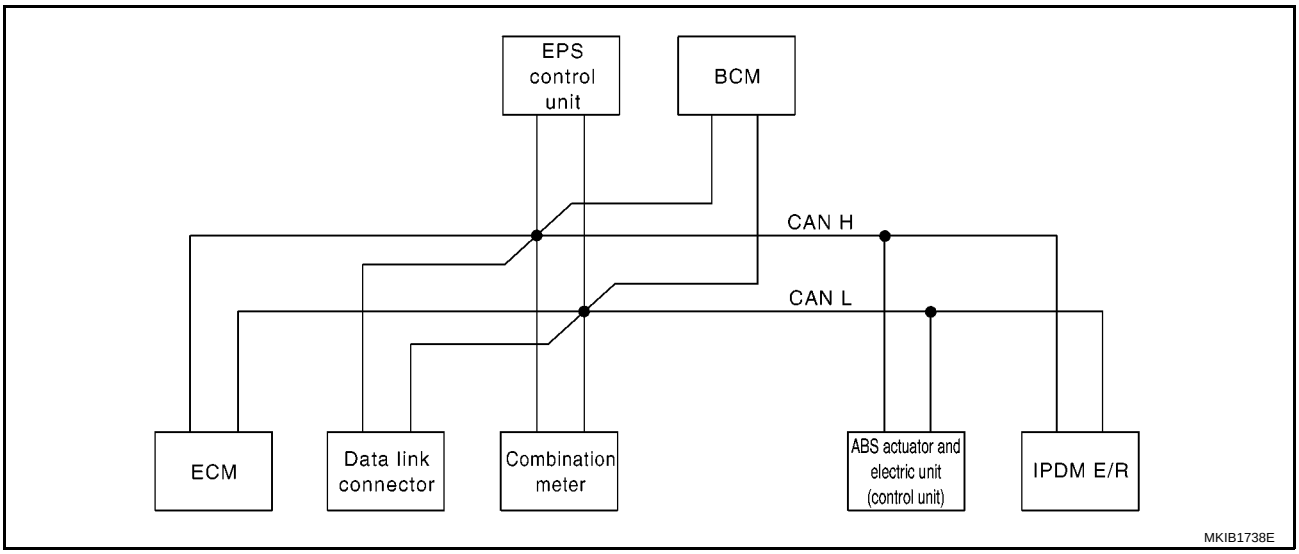
TYPE 3/TYPE 4/TYPE 5/TYPE 6

System diagram

- Type 3/Type 5



- Type 4/Type 6



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R

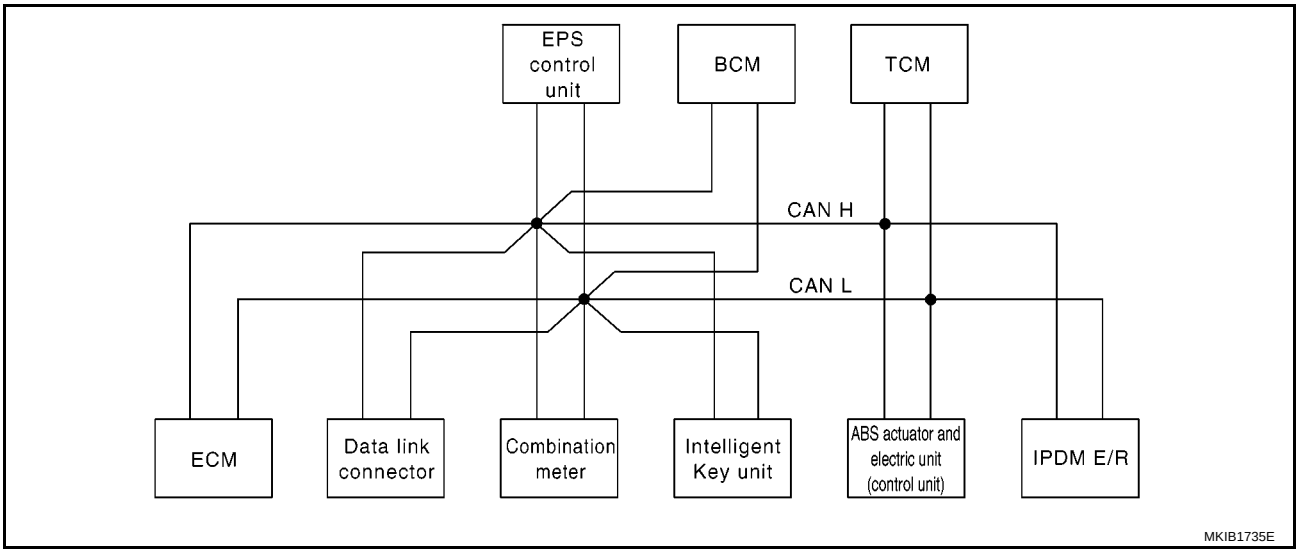
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

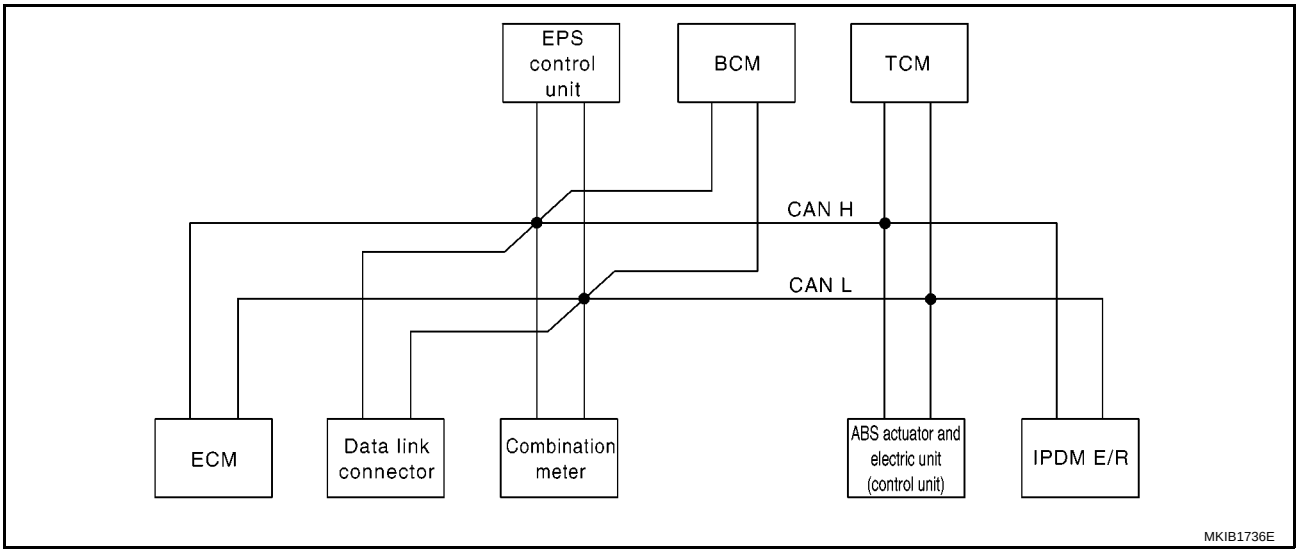
TYPE 7/TYPE 8

System diagram

- Type 7



- Type 8



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Engine speed signal	T	R				R		
Engine coolant temperature signal	T	R						
A/T self-diagnosis signal	R						T	
Output shaft revolution signal	R						T	
Accelerator pedal position signal	T					R	R	
Closed throttle position signal	T						R	
Wide open throttle position signal	T						R	
Overdrive control switch signal		T					R	
A/T position indicator signal		R					T	

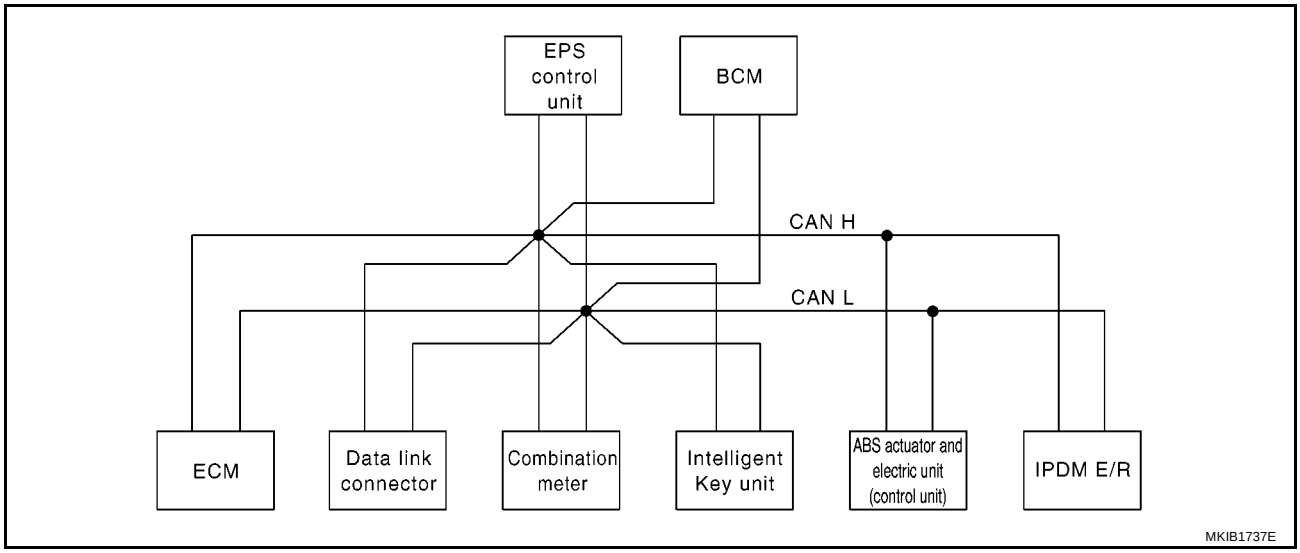
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
A/T shift schedule change demand signal						T	R	
Stop lamp switch signal		T					R	
O/D OFF indicator lamp signal		R					T	
Engine and A/T integrated control signal	T						R	
	R						T	
Fuel consumption monitor signal	T	R						
Oil pressure switch signal		R						T
A/C compressor request signal	T							R
Heater fan switch signal	R				T			
Cooling fan speed request signal	T							R
Position lights request signal		R			T			R
Low beam request signal					T			R
Low beam status signal	R							T
High beam request signal		R			T			R
High beam status signal	R							T
Day time light request signal					T			R
Vehicle speed signal	R	R		R		T		
	R	T	R	R	R			
Sleep/wake up signal		R	R		T			R
Door switch signal		R	R		T			R
Turn indicator signal		R			T			
Buzzer output signal		R			T			
		R	T					
MI signal	T	R						
Front wiper request signal					T			R
Front wiper stop position signal					R			T
Rear window defogger switch signal					T			R
Rear window defogger control signal	R							T
EPS warning lamp signal		R		T				
ABS warning lamp signal		R				T		
ESP warning lamp signal		R				T		
ESP OFF indicator signal		R				T		
SLIP indicator lamp signal		R				T		
Steering angle signal				T		R		
Brake warning lamp signal		R				T		
Back-up lamp signal				R	T			
Front fog lamp request signal		R			T			R
Rear fog lamp status signal		R			T			
Headlamp washer request signal					T			R
Door lock/unlock request signal			T		R			

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	TCM	IPDM E/R
Door lock/unlock status signal			R		T			
KEY indicator signal		R	T					
LOCK indicator signal		R	T					
Engine status signal	T			R				
A/C switch signal	R				T			
A/T torque signal						R	T	
Brake system malfunction signal		T		R				
Parking brake switch signal		T		R				
R range signal					R			T

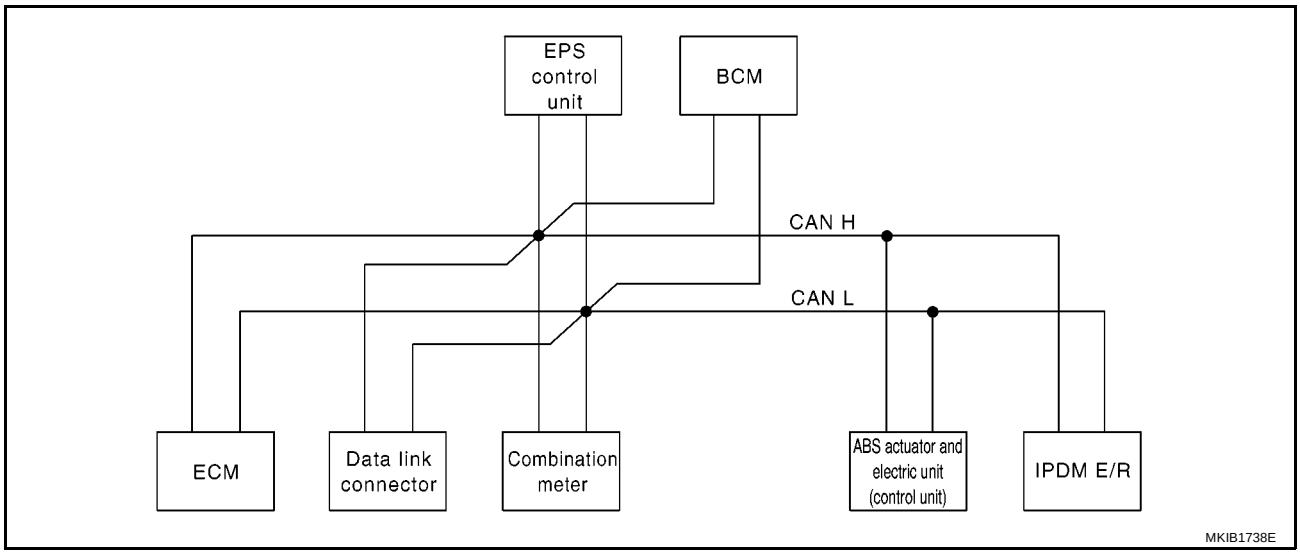
TYPE 9/TYPE 10/TYPE 11/TYPE 12

System diagram

- Type 9/Type 11



- Type 10/Type 12



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R				R	
Engine coolant temperature signal	T	R					
Fuel consumption monitor signal	T	R					
Accelerator pedal position signal	T					R	
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R

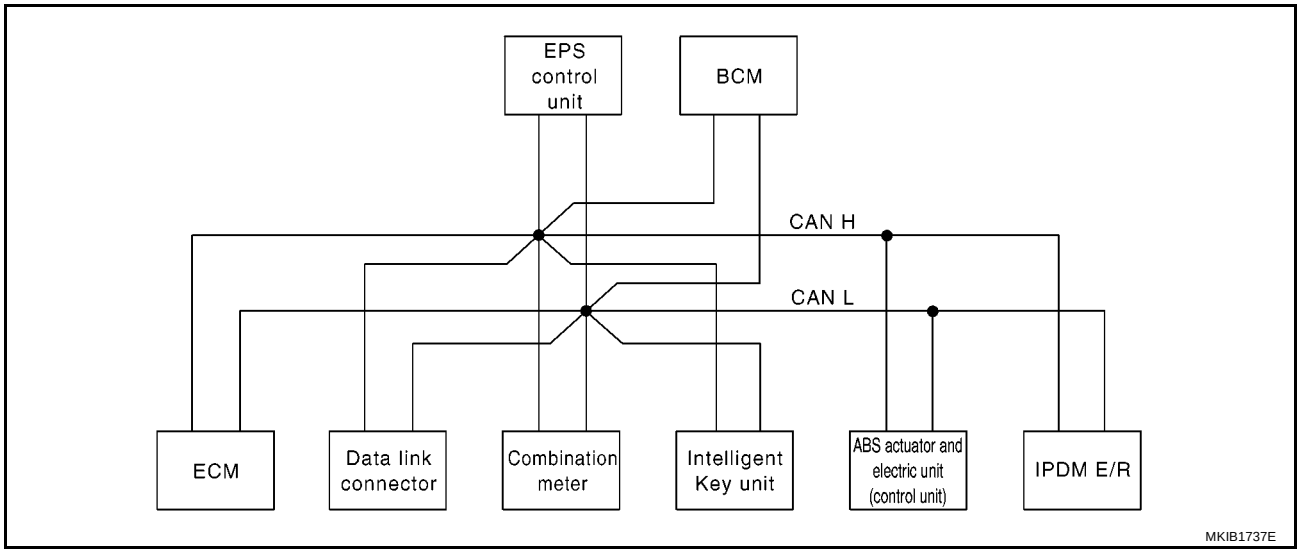
Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Low beam request signal					T		R
Low beam status signal	R						T
High beam request signal		R			T		R
High beam status signal	R						T
Day time light request signal					T		R
Vehicle speed signal	R	R		R		T	
	R	T	R	R	R		
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
Rear window defogger control signal	R						T
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
ESP warning lamp signal		R				T	
ESP OFF indicator signal		R				T	
SLIP indicator lamp signal		R				T	
Steering angle signal				T		R	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
A/C switch signal	R				T		
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
R range signal					R		T
Retractable hard top warning lamp signal*		R			T		

*: C+C only

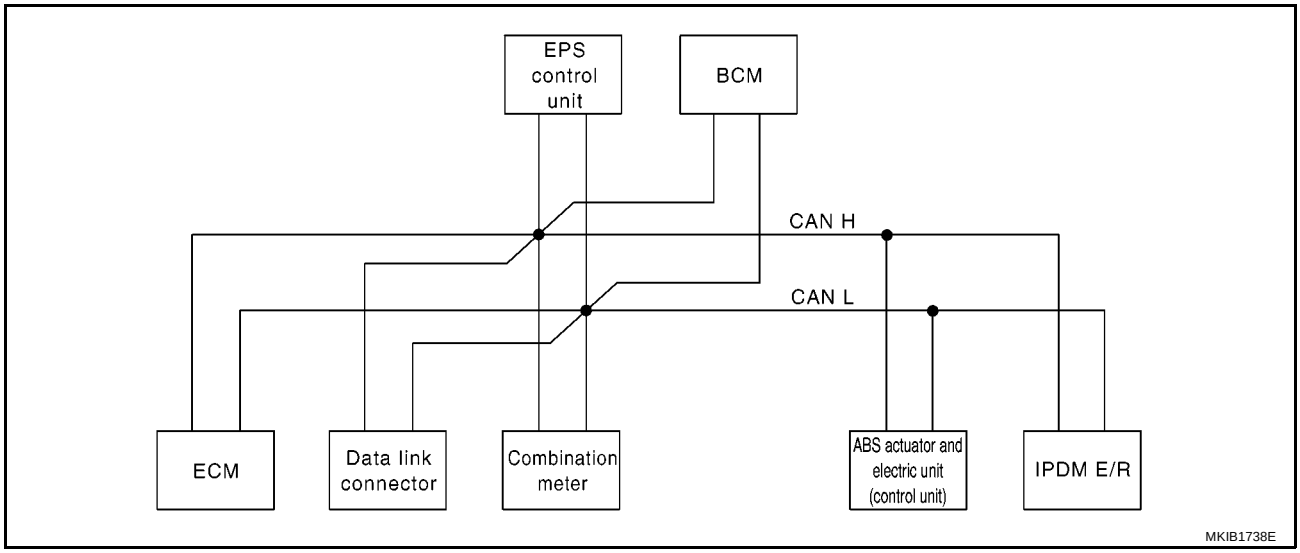
TYPE 13/TYPE 14

System diagram

- Type 13



- Type 14



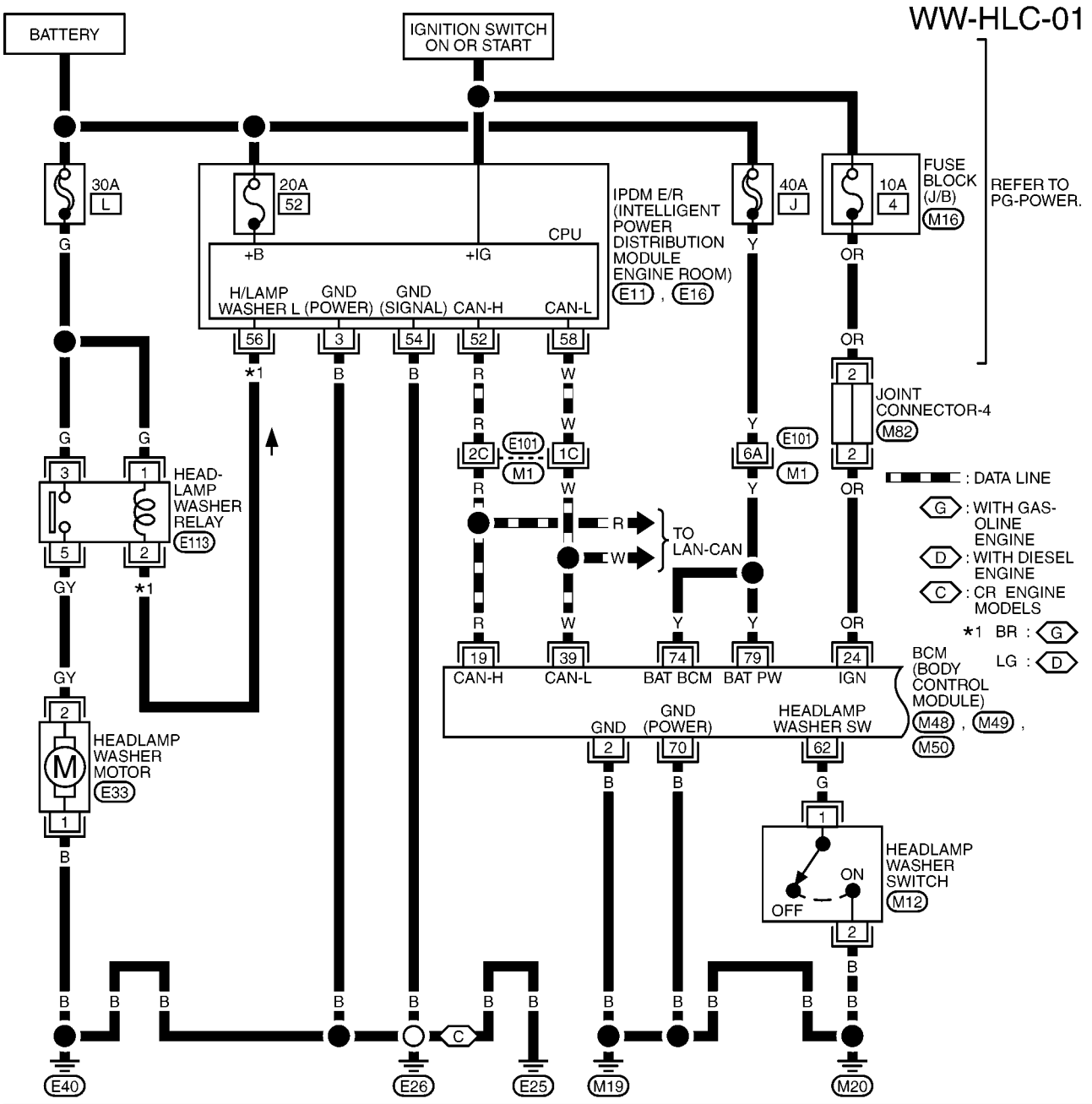
Input/output signal chart

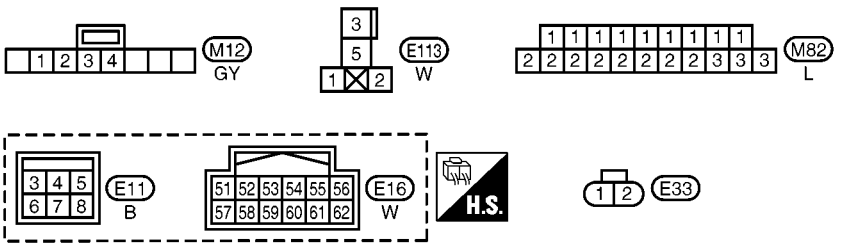
T: Transmit R: Receive

Signals	ECM	Combination meter.	Intelligent Key unit	EPS control unit	BCM	ABS actuator and electric unit (control unit)	IPDM E/R
Engine speed signal	T	R					
Engine coolant temperature signal	T	R			R		
Fuel consumption monitor signal	T	R					
Oil pressure switch signal		R					T
A/C compressor request signal	T						R
Heater fan switch signal	R				T		
Cooling fan speed request signal	T						R
Position lights request signal		R			T		R
Low beam request signal					T		R
High beam request signal		R			T		R
Day time light request signal					T		R
Vehicle speed signal	R	R		R	R	T	
	R	T	R	R			
Sleep/wake up signal		R	R		T		R
Door switch signal		R	R		T		R
Turn indicator signal		R			T		
Buzzer output signal		R			T		
		R	T				
MI signal	T	R					
Front wiper request signal					T		R
Front wiper stop position signal					R		T
Rear window defogger switch signal					T		R
EPS warning indicator signal		R		T			
ABS warning lamp signal		R				T	
Brake warning lamp signal		R				T	
Back-up lamp signal				R	T		
Front fog lamp request signal		R			T		R
Rear fog lamp status signal		R			T		
Headlamp washer request signal					T		R
Door lock/unlock request signal			T		R		
Door lock/unlock status signal			R		T		
KEY indicator signal		R	T				
LOCK indicator signal		R	T				
Engine status signal	T			R			
Brake system malfunction signal		T		R			
Parking brake switch signal		T		R			
Glow indicator signal	T	R					
R range signal					R		T

Wiring Diagram —HLC—

EKS0087S

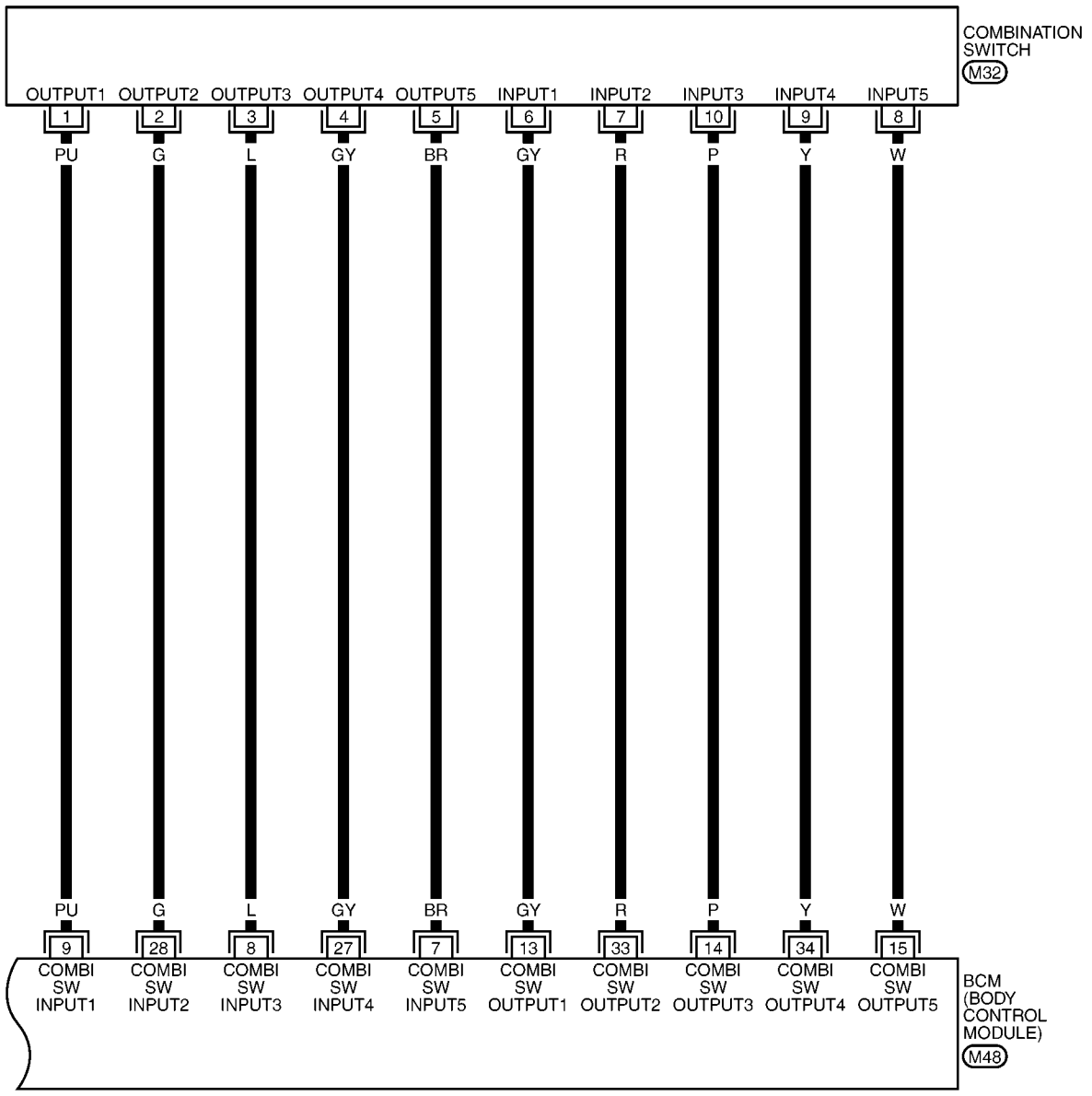


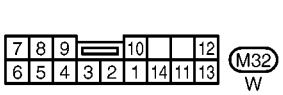


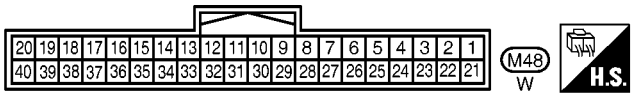
REFER TO THE FOLLOWING.
M1 -SUPER MULTIPLE JUNCTION (SMJ)
M16 -FUSE BLOCK-JUNCTION BOX (J/B)
M48, M49, M50 -ELECTRICAL UNITS

MIWA0430E

WW-HLC-02



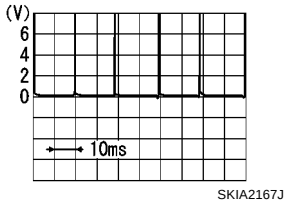
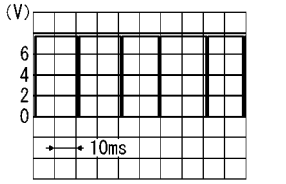
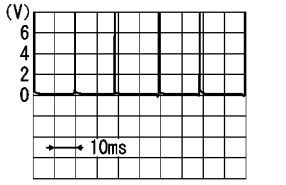




MKWA1817E

Terminals and Reference Values for BCM

EKS00PDW

Terminal No.	Wire color	Signal designation	Measuring condition		Voltage [V] (Approx.)
			Ignition switch	Operation or condition	
2	B	Ground	ON	—	0
7	BR	Combination switch input 5	ON	Headlamps, turn signal, wipers OFF	 SKIA2167J
8	L	Combination switch input 3			
9	PU	Combination switch input 1			
27	GY	Combination switch input 4			
28	G	Combination switch input 2			
13	GY	Combination switch output 1	ON	Headlamps, turn signal, wipers OFF (wiper volume is 1 or 7)	 SKIA2166J
14	P	Combination switch output 3			
15	W	Combination switch output 5			
33	R	Combination switch output 2		Headlamps, turn signal, wipers OFF (wiper volume is other than 1 or 7)	 SKIA2167J
34	Y	Combination switch output 4			
19	R	CAN H	—	—	—
24	OR	Ignition power supply	ON	—	Battery voltage
62	G	Headlamp washer switch	ON	Headlamp washer switch :Operated	0
				Headlamp washer switch :Other than above	Battery voltage
39	W	CAN L	—	—	—
70	B	Ground	ON	—	0
74	Y	Power source (Fusible link)	OFF	—	Battery voltage
79	Y	Power source (Fusible link)	OFF	—	Battery voltage

Terminals and Reference Values for IPDM E/R

EKS00PDX

Terminal No.	Wire color	Signal designation	Measuring condition		Voltage [V] (Approx.)
			Ignition switch	Operation or condition	
3	B	Ground	ON	—	0
52	R	CAN H	—	—	—
54	B	Ground	—	—	0
56	BR or LG	Headlamp washer signal	ON	Headlamp washer : Operating	Battery voltage
				Headlamp washer : Other than above	0
58	W	CAN L	—	—	—

Preliminary Inspection

EKS00PDY

CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSE

- Check fuse and fusible link for blown-out.

Unit	Power source	Fuse No.
Front washer motor	Ignition ON or START	1
Front wiper main relay	Battery	38
BCM	Battery	J
	Ignition switch ON or START position	4

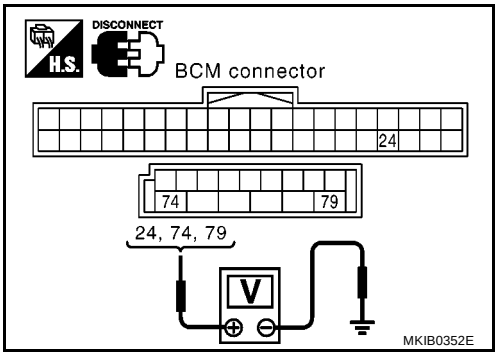
Refer to WW-126, "Wiring Diagram —HLC—"

OK or NG

OK >> GO TO 2.
NG >> If fuse is blown, be sure to eliminate cause of problem before installing new fuse, Refer to PG-5, "POWER SUPPLY ROUTING" .

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check voltage between BCM harness connector and ground.



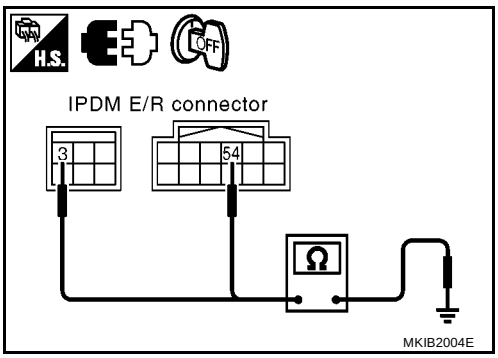
Terminals			Ignition switch position		
(+)		(–)	OFF	ACC	ON
Connector	Terminal (Wire color)				
M50	74 (Y)	Ground	Battery voltage	Battery voltage	Battery voltage
M50	79 (Y)		Battery voltage	Battery voltage	Battery voltage
M48	24 (OR)		0V	0V	Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Check harness for open or short between BCM and fuse.

3. CHECK GROUND CIRCUIT

1. Disconnect IPDM E/R harness connector.
2. Check continuity between IPDM E/R harness connector and ground.



Connector	Terminal (Wire color)	Continuity	
E11	3 (B)	Ground	Yes
E16	54 (B)		

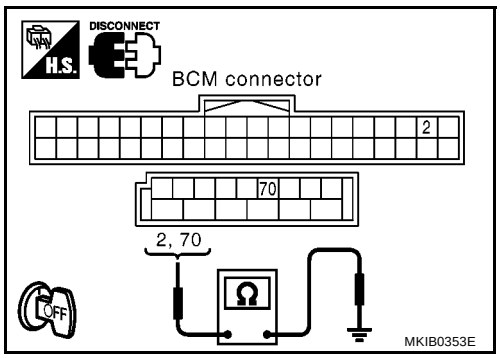
OK or NG

OK >> GO TO 4.
NG >> Harness for open ground circuit.

4. CHECK GROUND CIRCUIT

Check continuity between BCM harness connector and ground.

Terminals		Continuity	
Connector	Terminal (Wire color)		
M48	2 (B)	Ground	Yes
M50	70 (B)	Ground	Yes



OK or NG

OK >> INSPECTION END.
NG >> Check harness ground circuit.

CONSULT-II Function (BCM)

EKS008WJ

Refer to WW-33, "CONSULT-II Function (BCM)" .

CONSULT-II Function (IPDM E/R)

EKS008WK

Refer to WW-36, "CONSULT-II Function (IPDM E/R)" .

Headlamp Washer Does Not Operate

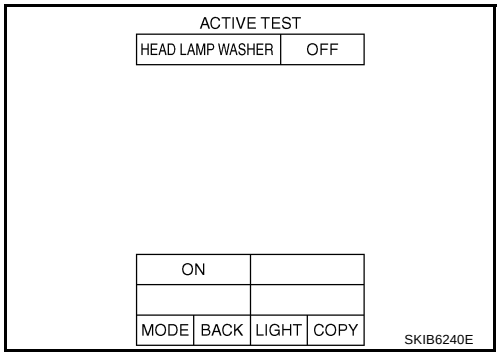
EKS00PDZ

1. ACTIVE TEST

1. Select “BCM” on CONSULT-II. Select “ACTIVE TEST” on “SELECT DIAG MODE” screen.
2. Select “HEAD LAMP WASHER” on “SELECT TEST ITEM” screen.
3. Touch “ON” screen.

Does headlamp washer operate normally?

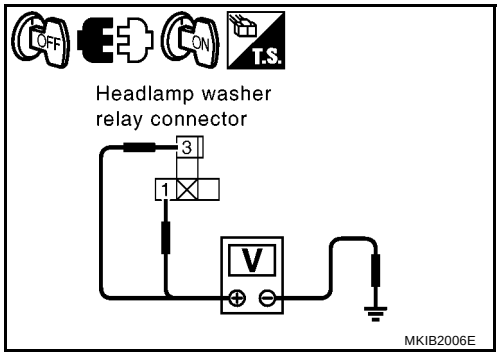
YES >> GO TO 8.
NO >> GO TO 2.



2. CHECK POWER SUPPLY CIRCUIT TO HEADLAMP WASHER RELAY

1. Turn ignition switch OFF.
2. Remove headlamp washer relay.
3. Turn ignition switch ON.
4. Check voltage between headlamp washer relay harness connector E113 terminals 1, 3 and ground.

1(G) - Ground : Battery voltage
3(G) - Ground : Battery voltage



OK or NG

OK >> GO TO 3.
NG >> Repair harness or connector.

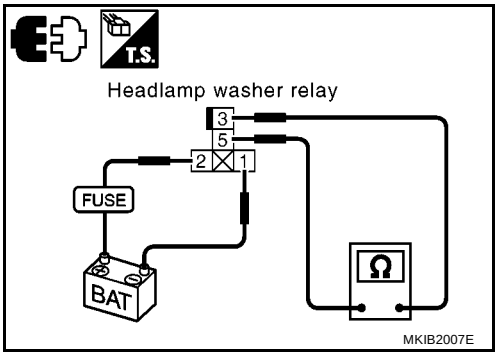
3. CHECK HEADLAMP WASHER RELAY

1. Apply battery voltage to between headlamp washer relay terminal 1 and 2.
2. Check continuity between terminal 3 and 5.

3 – 5 : Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Replace headlamp washer relay.



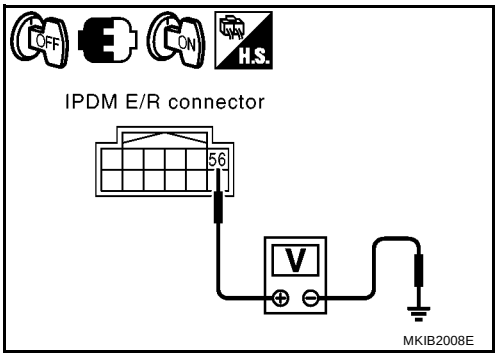
4. CHECK IPDM E/R

1. Install headlamp washer relay.
2. Select “IPDM E/R” on CONSULT-II. Select “HEAD LAMP WASHER” active test. Refer to WW-37, "ACTIVE TEST" . When headlamp washer operating, check voltage between IPDM E/R harness connector and ground.

Terminals				Voltage [V] (Approx.)
(+)		(-)	Headlamp washer condition	
Connector	Terminal (Wire color)			
E16	56 (BR or LG)	Ground	OFF	Battery voltage
			ON	0

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

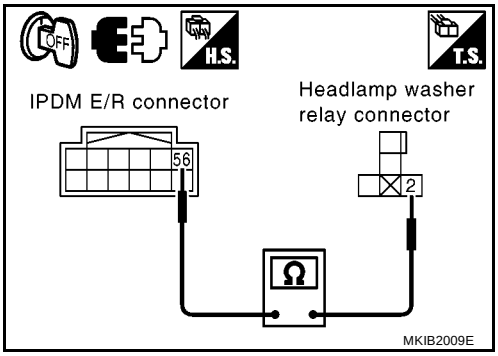


5. CHECK CONTINUITY BETWEEN IPDM E/R AND HEADLAMP WASHER RELAY

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector and remove headlamp washer relay.
3. Check continuity between IPDM E/R harness connector E16 terminal 56 and headlamp washer relay harness connector E113 terminal 2.

56 (BR or LG) – 2 (BR or LG) : Continuity should exist.

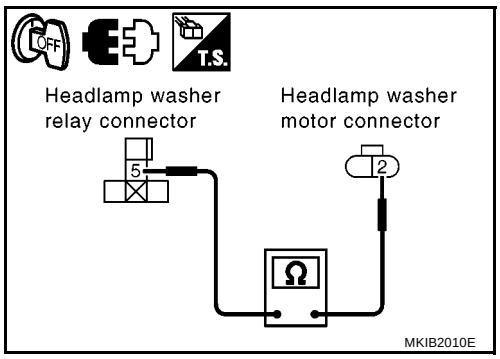
OK >> Replace IPDM E/R. Refer to PG-53, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.



6. CHECK HEADLAMP WASHER MOTOR CIRCUIT

1. Disconnect headlamp washer motor connector.
2. Check continuity between headlamp washer relay harness connector E113 terminal 5 and headlamp washer motor harness connector E33 terminal 2.

5 (GY) – 2 (GY) : Continuity should exist.



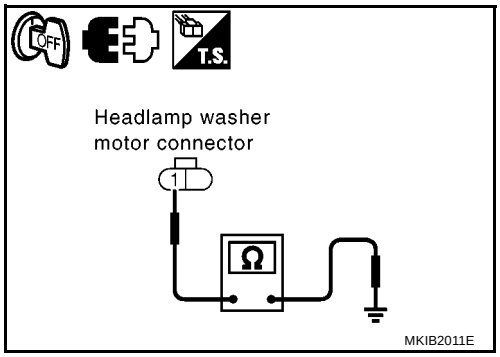
OK or NO

OK >> GO TO 7.
NO >> Repair harness or connector.

7. CHECK HEADLAMP WASHER MOTOR GROUND CIRCUIT

Check continuity between headlamp washer motor harness connector E33 terminal 1and ground.

1 (B) – Ground : Continuity should exist.



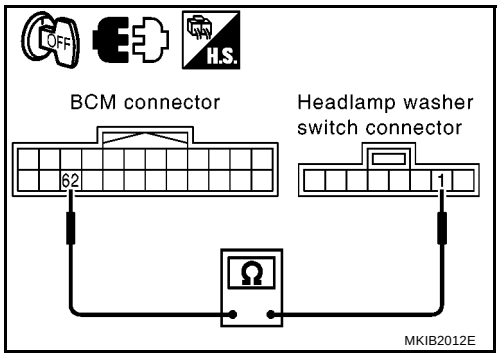
OK or NG

OK >> Replace headlamp washer motor. Refer to WW-133, "Removal and Installation for Washer Pump" .
NG >> Repair harness or connector.

8. CHECK HEADLAMP WASHER SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect BCM connector and headlamp washer switch connector.
3. Check continuity between BCM harness connector M49 terminal 62 and headlamp washer switch harness connector M12 terminal 1.

62 (G) – 1 (G) : Continuity should exist.



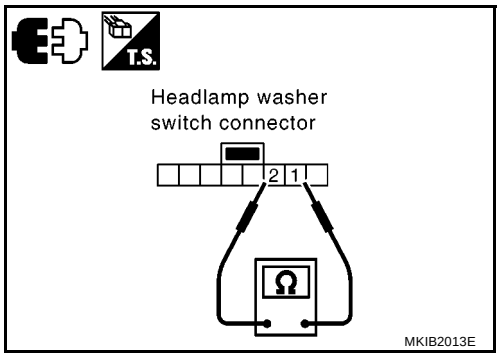
OK or NO

OK >> GO TO 9.
NO >> Repair harness or connector.

9. CHECK HEADLAMP WASHER SWITCH

Check continuity between headlamp washer switch terminals 1 and 2.

Headlamp washer switch terminal		Switch condition	Continuity
1	2	OFF	No
		ON	Yes



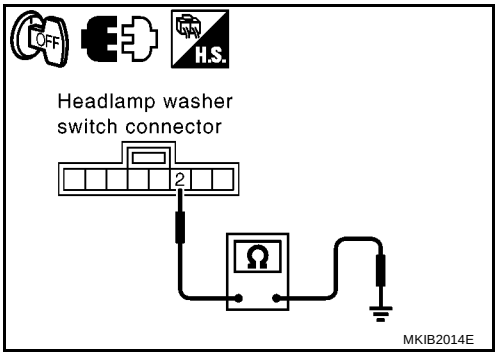
OK or NG

OK >> GO TO 10.
NG >> Replace headlamp washer switch.

10. CHECK HEADLAMP WASHER SWITCH GROUND CIRCUIT

Check continuity between headlamp washer switch harness connector M12 terminal 2 and ground.

2 (B) – Ground : Continuity should exist.



OK or NG

OK >> Replace BCM. Refer to BCS-30, "Removal and Installation of BCM" .

NG >> Repair harness or connector.

Removal and Installation for Washer Nozzle

EKS0087T

REMOVAL

1. Remove front bumper. Refer to EI-5, "FRONT BUMPER"
2. Remove washer tube.
3. Remove washer nozzle from front bumper.

INSTALLATION

Install in the reverse order of removal.

Removal and Installation for Washer Tank

EKS0087V

Refer to WW-49, "Removal and Installation of Front Wiper and Washer Tank" ,

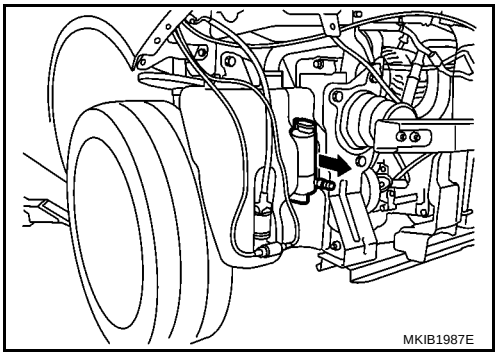
Removal and Installation for Washer Pump

EKS0087W

1. Remove front bumper. Refer to EI-5, "FRONT BUMPER"
2. Remove washer pump connector and hose.
3. Pull out washer pump in the direction of the arrow in the figure, and remove the washer pump from the washer tank.

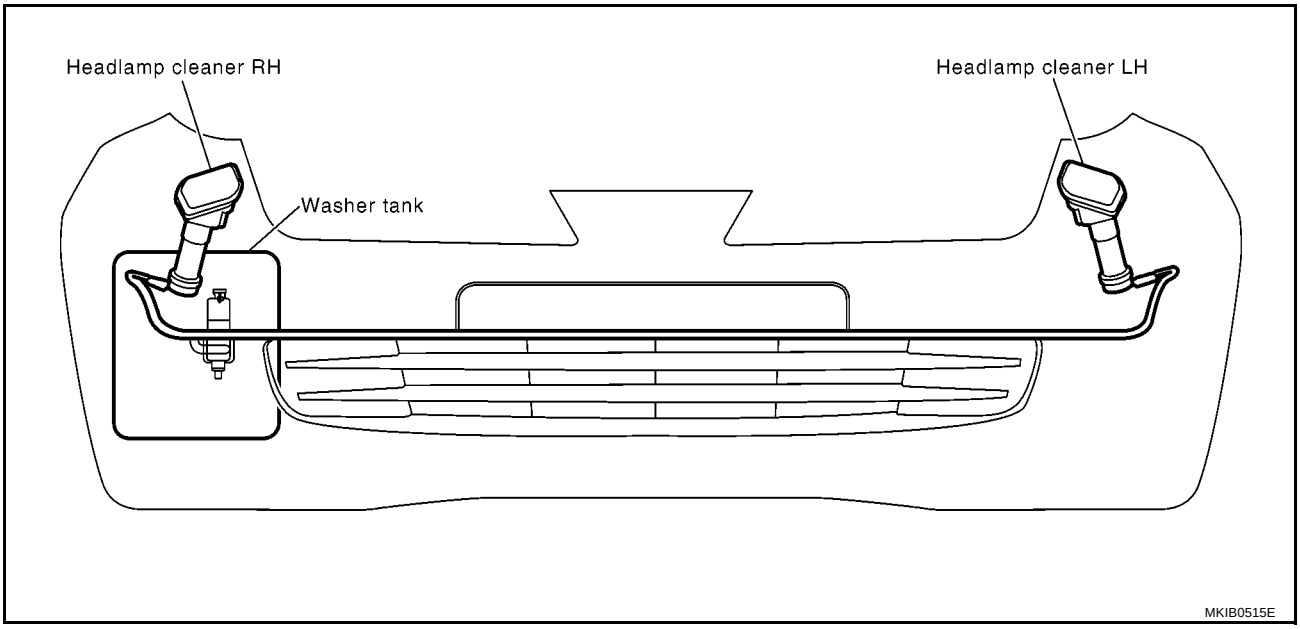
CAUTION:

When installing washer pump, there should be no packing twist, etc.



Washer Tube Layout

EKS0087X

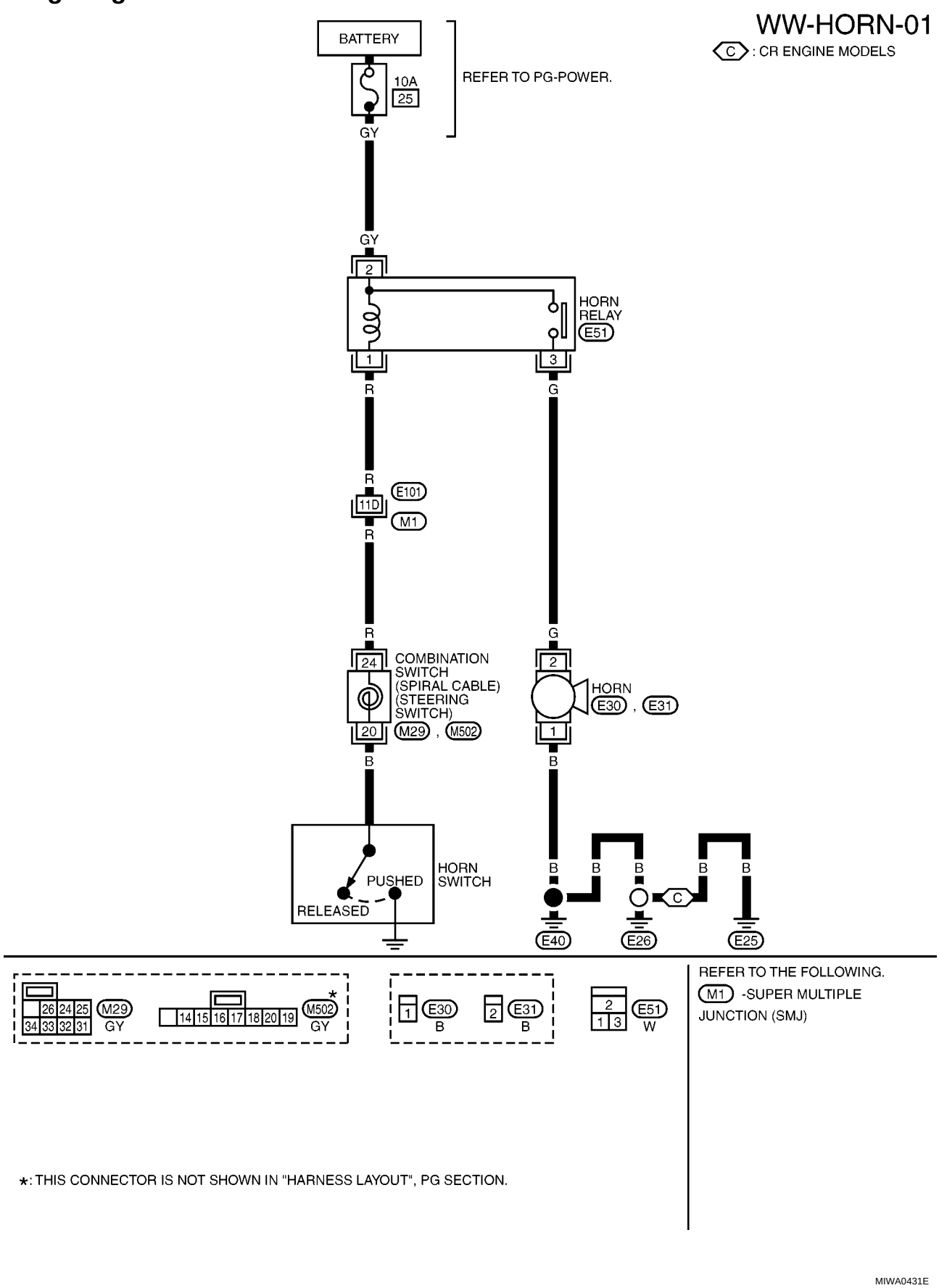


HORN

PFP:25610

Wiring Diagram —HORN—

EKS008IL

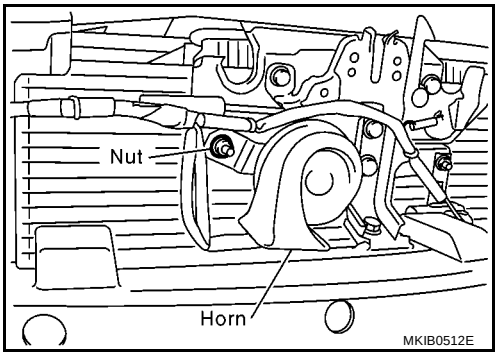


Removal and Installation

EKS007CG

REMOVAL

1. Remove front grille. Refer to EI-11, "FRONT GRILLE" .
2. Remove horn nut.
3. Disconnect horn connectors, and the remove horn from vehicle.



INSTALLATION

Note the following, and install in the reverse order of the removal.

Horn nut

: 15.6 - 18.6 N·m (1.6 - 1.9 kg-m, 12 - 14 ft-lb)

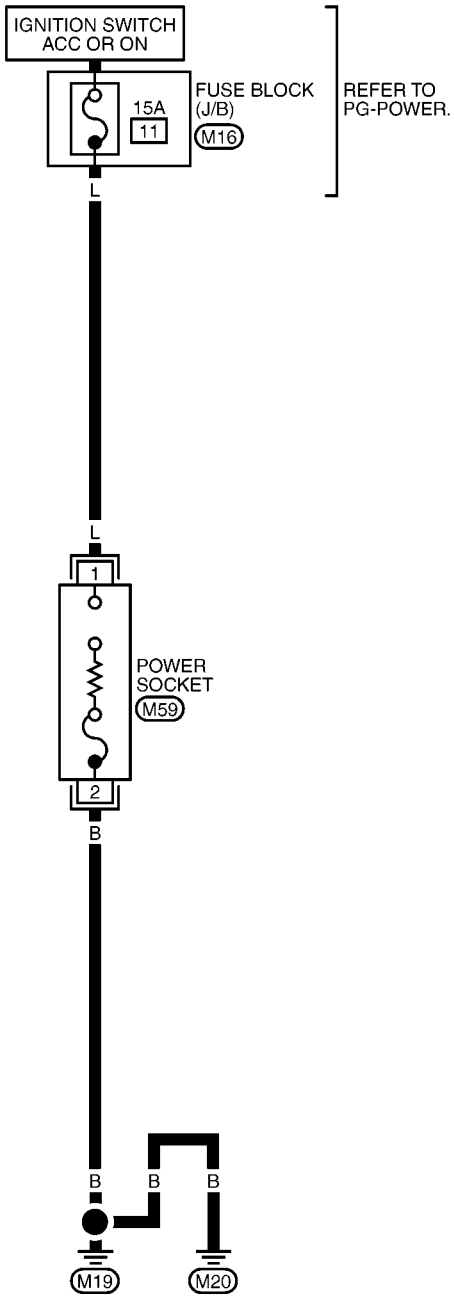
POWER SOCKET

PFP:253A2

Wiring Diagram —CIGAR—

EKS008IM

WW-CIGAR-01



2
1
M59
B

REFER TO THE FOLLOWING.
M16 -FUSE BLOCK-
JUNCTION BOX (J/B)

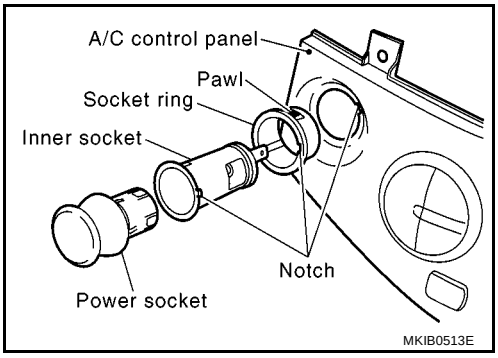
MKWA0805E

Removal and Installation

EKS007CH

REMOVAL

1. Remove air conditioner panel. Refer to IP-7, "M. Air Conditioner Finisher" .
2. Disconnect the power socket connector.
3. Remove inner socket while spreading tabs on the socket ring (2 locations).



INSTALLATION

Note the following, and install in the reverse order of the removal.

CAUTION:

Align inner socket protruding area with socket ring and install.