HINO

TECHNICAL TRAINING

HYBRID

BATTERY

Hybrid

300 series

HQS

HINO

HYBRID VEHICLE BATTERY

■ Hybrid Vehicle (HV) Battery Pack.

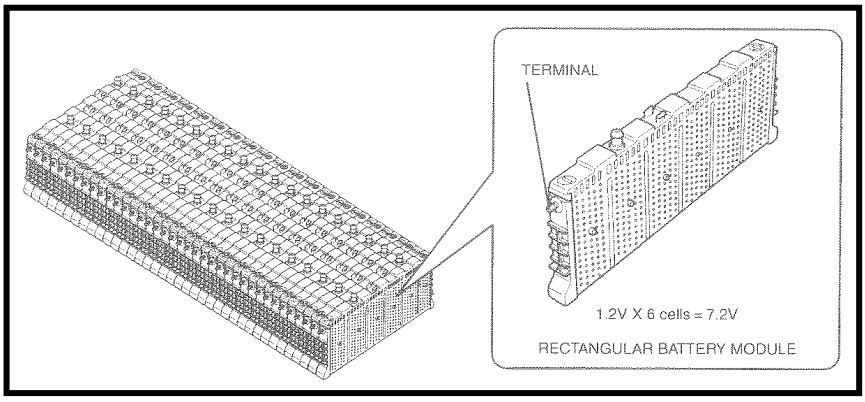
- **Wear Protective safety clothing at all times !**
  The 300 Series Hybrid contains a high voltage battery pack and is totally independent of the 24 Volt vehicle circuit. The Nickel Metal Hydride (NiMH) battery pack contains a number of sealed modules.

- **HV Battery Pack**
  The HV battery pack is enclosed in a metal case and is rigidly mounted to the side of the vehicle (chassis rail). The metal case is completely isolated from the battery pack or any high voltage circuit.

- **The HV battery** pack consists of a number of low voltage (7.2 Volts) modules connected in series to produce approximately 300 Volts. Each module is sealed in a plastic case to avoid it being leaked to the atmosphere.

- **The electrolyte** used in the **Nickel-Metal Hydride** battery modules is an alkaline substance made of Potassium and Sodium Hydroxide. The electrolyte is absorbed into the battery cell plates and will form a gel. This gel is unlikely to leak even in the event there vehicle is involved in an accident.

- **In the unlikely event** the HV battery is overcharged, the battery modules will vent gases produced directly outside the Hybrid battery compartment through a vent hose connected to each battery module.

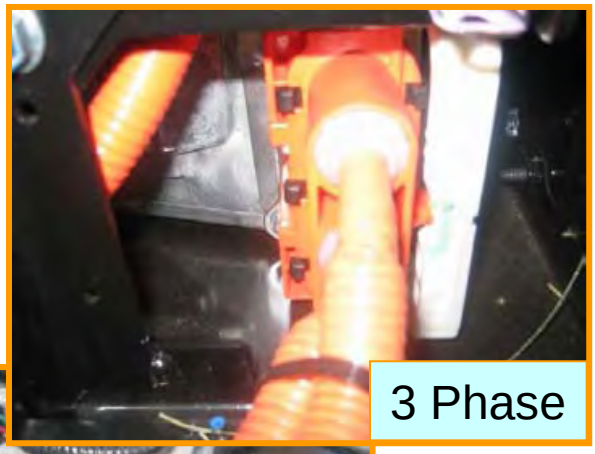


CAUTION
HIGH VOLTAGE - 300 VOLTS

HYBRID VEHICLE BATTERY

■ Hybrid Vehicle (HV) Battery Pack Cont'd.

- **High Voltage Circuit !**
  The HV battery pack powers the high voltage electrical system with "Direct Current". Positive and Negative high voltage power cables are routed from the battery pack, to the Inverter, then outside the battery compartment to the electric motor. Orange colour wires denotes the high voltage circuit.
  The inverter contains a circuit that convert DC current to AC current. The inverter creates 3-phase AC to power the electric motor. Set of 3 high voltage power cables are routed from the inverter to the electric motor.



CAUTION
HIGH VOLTAGE - 300 VOLTS

HYBRID VEHICLE BATTERY

■ Hybrid Vehicle (HV) Battery Pack Cont'd.

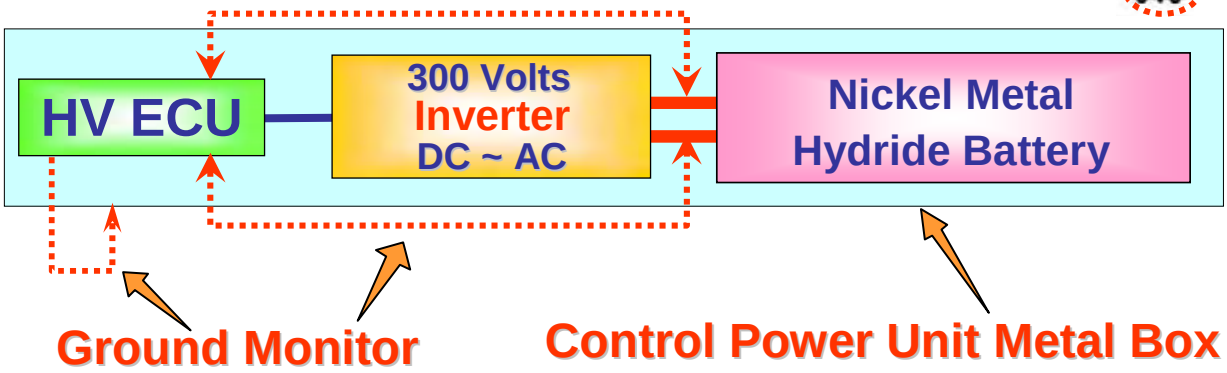
- **High Voltage Safety System**
  A high voltage fuse placed in the Safety Plug provides circuit protection for the HV battery pack (Refer next page).

  Positive and negative high voltage power cables connected to the HV battery pack are controlled by the system main relays. When the ignition key is switched to the "Off" position, the system relays stop electricity flow from the HV battery pack.

> **Warning !**
> •Power remains in the high voltage electrical system for 5 minutes after the HV battery pack is shut off.
>
> •Never touch, cut or open any orange color high power cable or high voltage component.

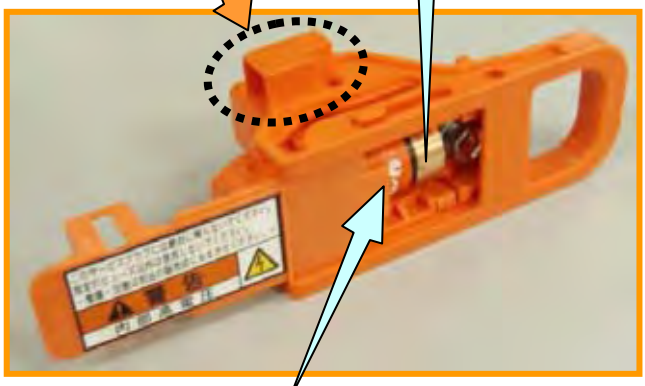
  All three phase high voltage cabling are isolated from the CPU metal box, so there is no possibility of shock by touching the metal box.

  A ground fault monitor continuously monitors for high voltage leakage to the metal chassis while the vehicle is running. If a malfunction is detected, the HV battery computer will **illuminate the warning light** in the combination me



Safety Plug Removed !

System Main Relay Junction Connector



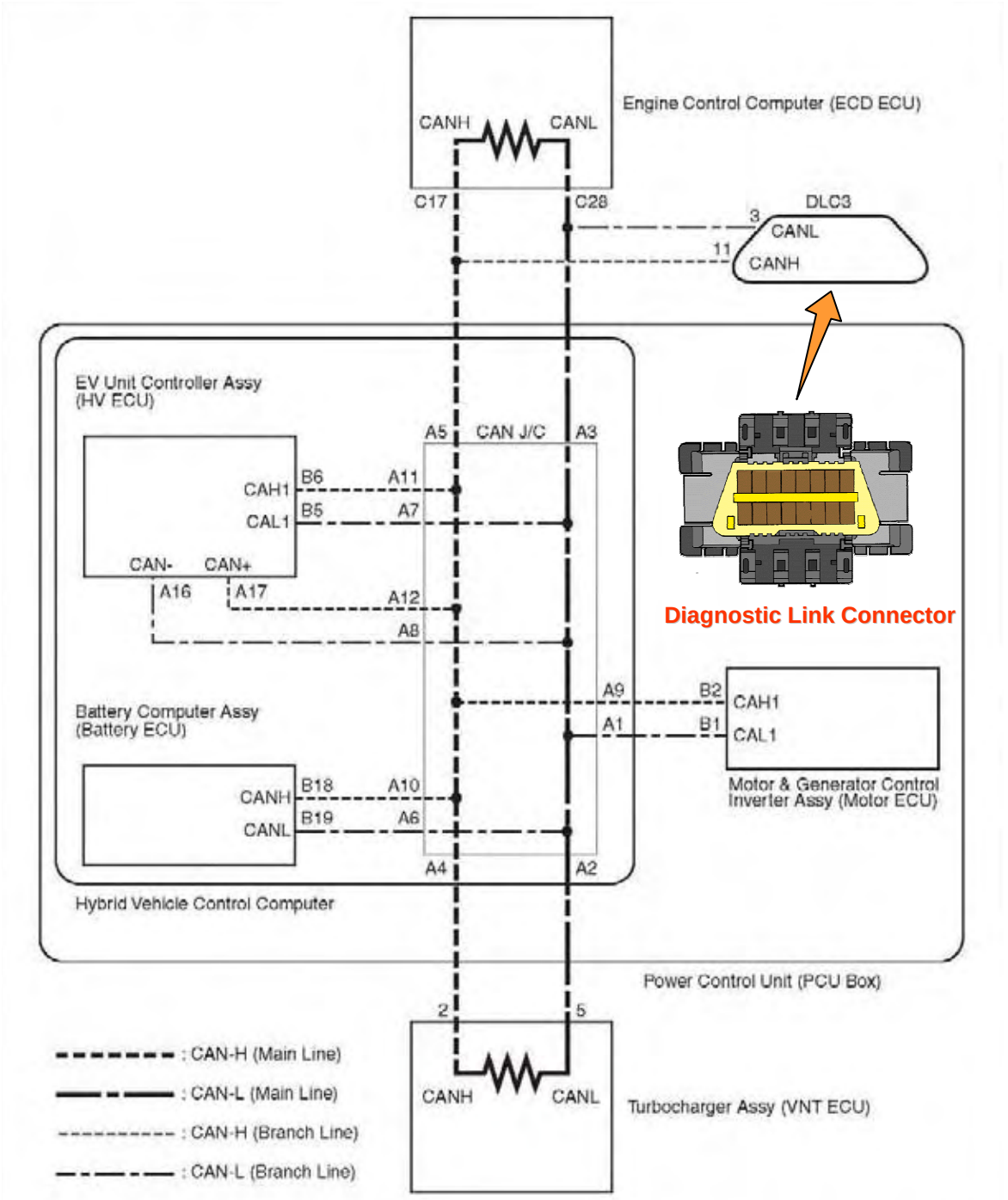
Safety Plug Showing Fuse and System Main Relay Junction Connector

150 A Fuse

System Main Relay Is Disabled when Safety Plug Is Removed !

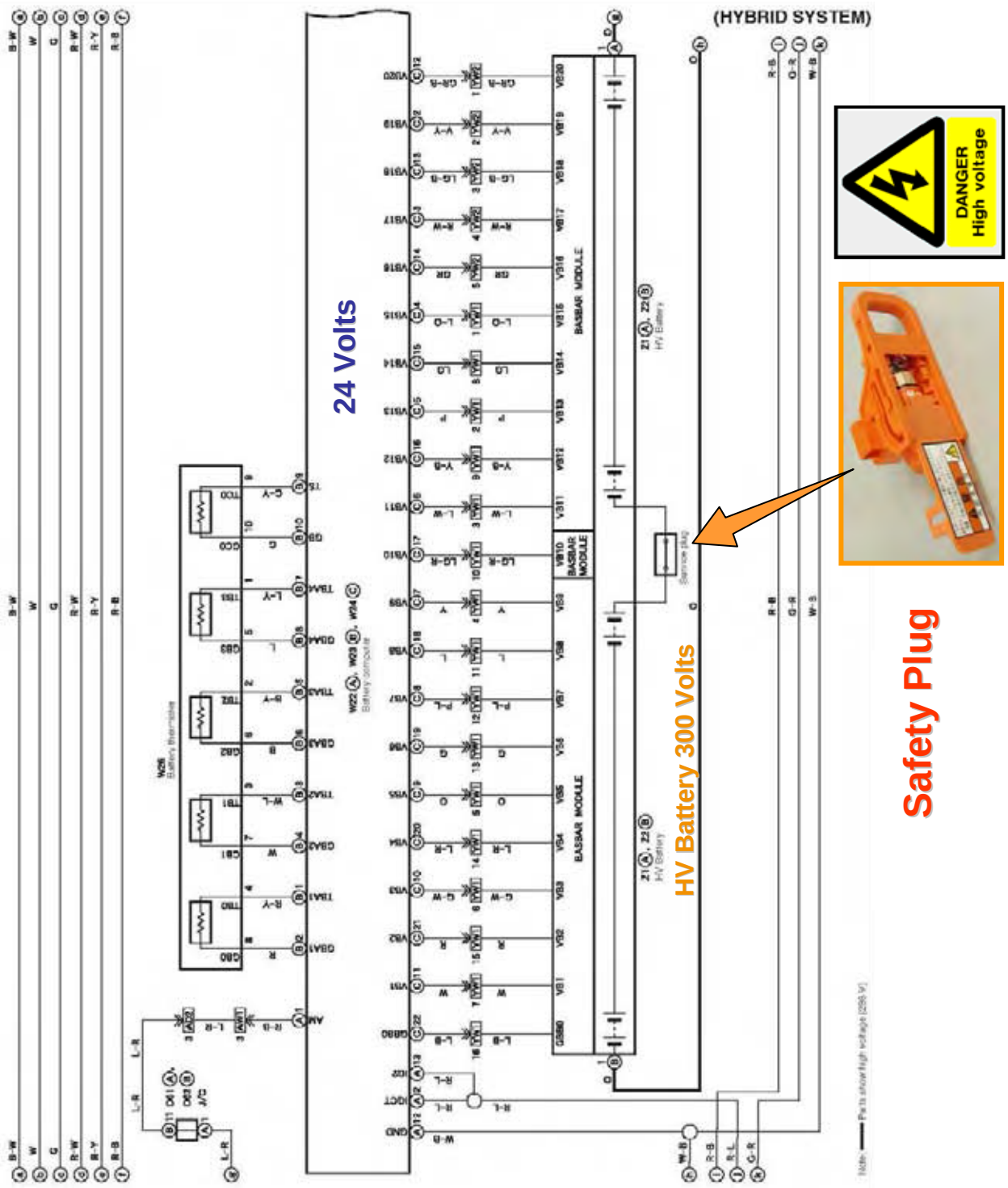
CAUTION
HIGH VOLTAGE - 300 VOLTS

COMMUNICATION NETWORK AMONGST VEHICLE'S ECU



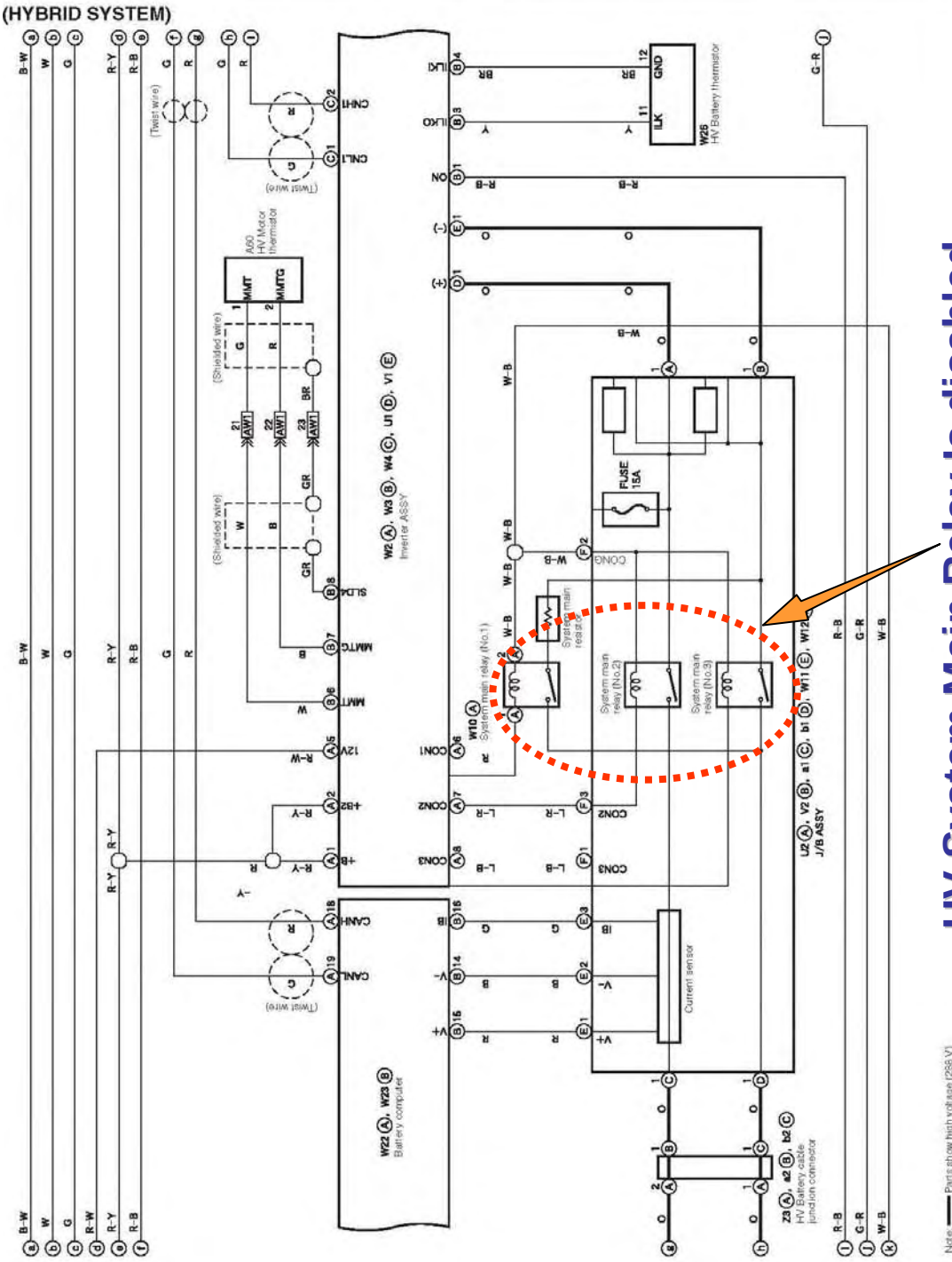
CAUTION

HIGH VOLTAGE - 300 VOLTS



CAUTION

HIGH VOLTAGE - 300 VOLTS



CAUTION

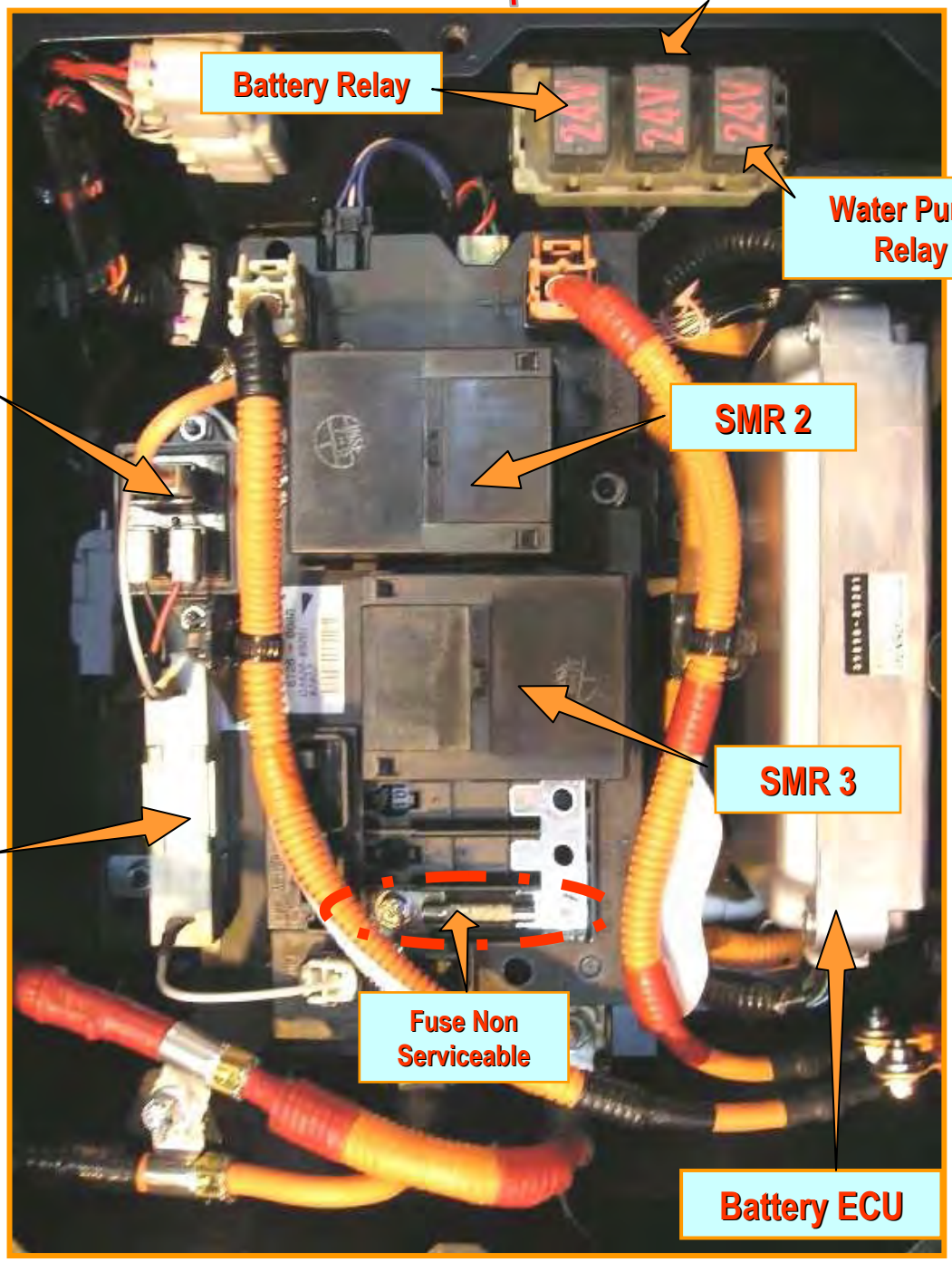
HIGH VOLTAGE - 300 VOLTS

DANGER High voltage

DANGER High voltage

EMERGENCY SERVICE GUIDE	HV INVERTER SYSTEM MAIN RELAY	300 series Hybrid

Refer Workshop Manual!



DANGER High voltage

CAUTION

HIGH VOLTAGE - 300 VOLTS

DANGER High voltage

COMPONENTS POWERED BY HV BATTERY

■ Components Powered By HV Battery

- **AC Synchronous Motor**
- **Inverter Assembly**
- **Power Cables (Orange in colour)**
- **<u>HV Battery Pack Recycling</u>**
  The HV battery pack is totally recyclable. Contact your nearest Hino Dealership or Hino Motor Sales Australia on **(02) 9914 6666**.

Nickel Metal Hydride Battery

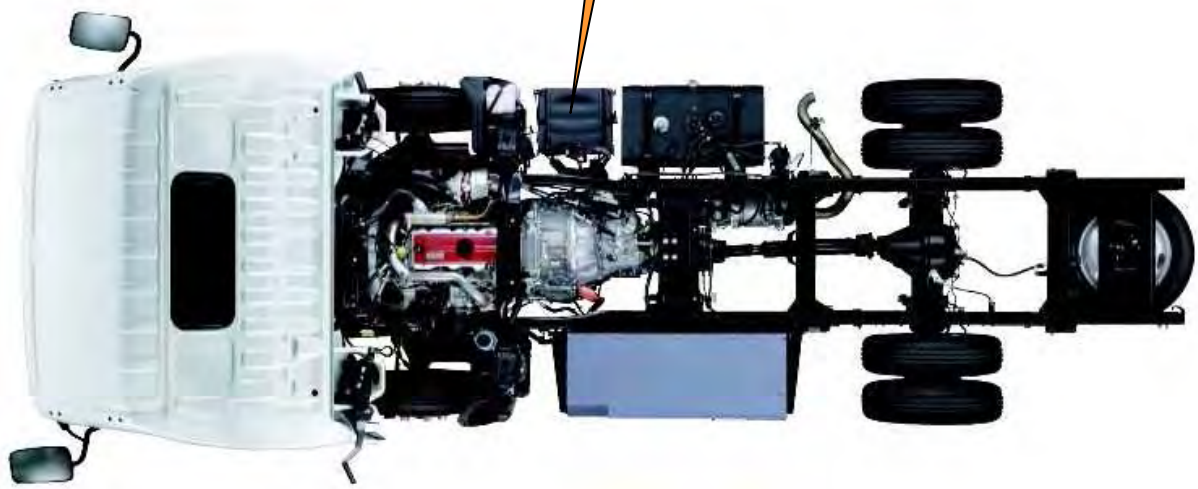
CAUTION
HIGH VOLTAGE - 300 VOLTS

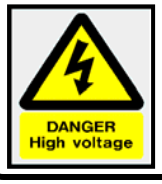
COMPONENTS POWERED BY LEAD-ACID BATTERY

■ Auxiliary Battery - 24 Volt System

- The 300 Series HV vehicle also contains a **2 x 12 Volt battery** system. These auxiliaries batteries powers the vehicle electrical system similar to a conventional vehicle. As with other conventional vehicles, the auxiliary battery is grounded to the metal chassis of the vehicle. The auxiliary batteries are located on the right hand side of the vehicle.

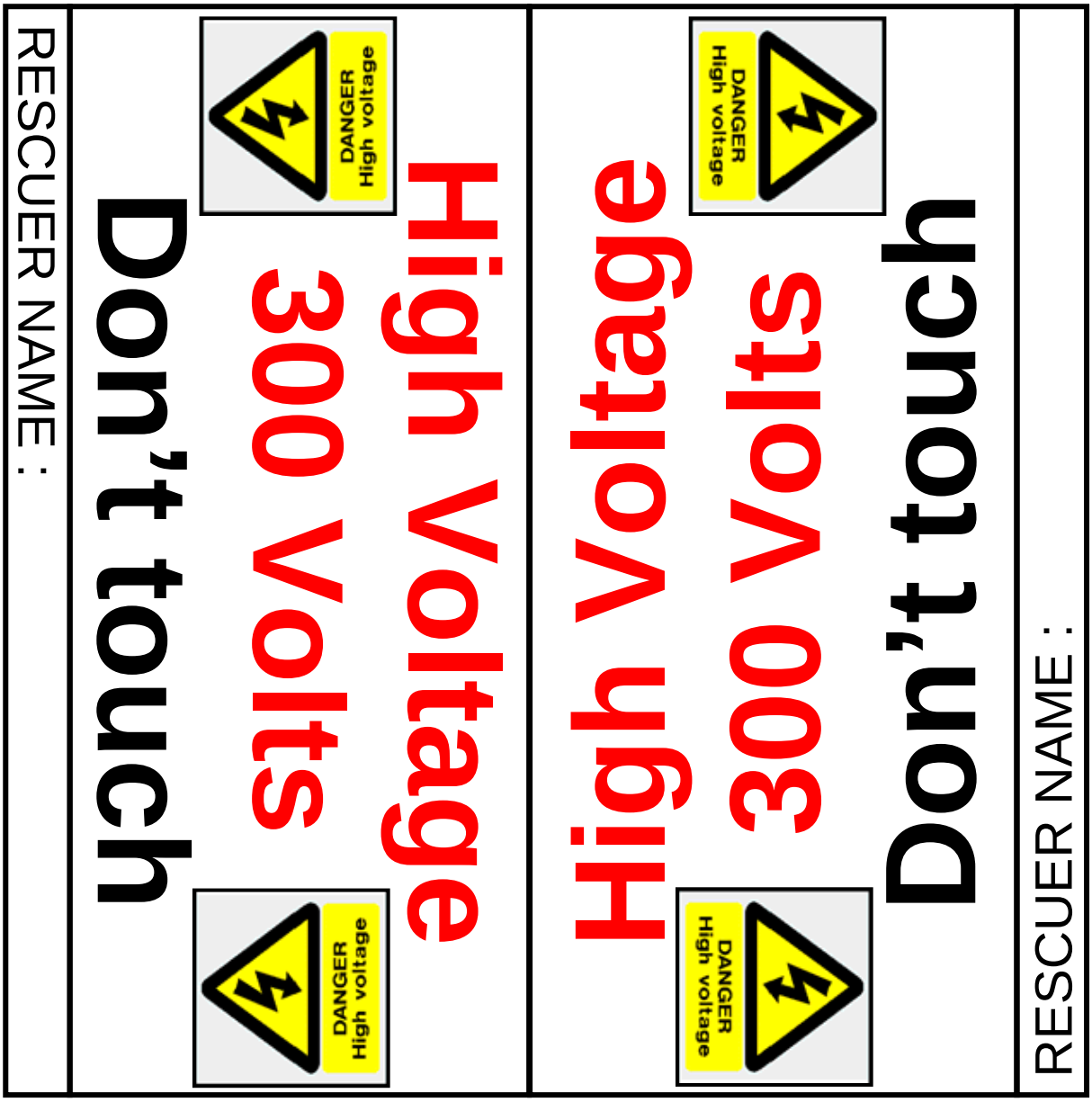
Lead-Acid Battery





CAUTION
HIGH VOLTAGE - 300 VOLTS

High Voltage Sign



TO BE DISPLAYED WHEN THE HIGH VOLTAGE IS EXPOSED

DANGER High voltage

CAUTION
HIGH VOLTAGE - 300 VOLTS

DANGER High voltage

HINO

TECHNICAL TRAINING

SUPPLEMENTARY RESTRAINT

SYSTEM

Hybrid

300 series

HQS HINO QUALITY SERVICE

HINO

AIRBAG SYSTEM

PRECAUTION

CAUTION:

- The HINO 300 Seres is equipped with SRS, which comprises a driver airbag and passenger airbag. Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Further, if a mistake is made in servicing the SRS, it is possible that the SRS may fail to operate when required. Before performing servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedures described in the repair manual.
- Work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery. (The SRS is equipped with a back up power source so that if work is started within 90 seconds from disconnecting the negative (-) terminal cable of the battery, the SRS may be deployed.)
- Do not expose the horn button assy, instrument panel passenger airbag assy, airbag ECU assy or airbag sensor assy No. 2 directly to hot air or flames.

NOTICE:

- Malfunction symptoms of the SRS are difficult to confirm, so the DTCs become the most important source of information when troubleshooting. When troubleshooting the SRS, always inspect the DTCs before disconnecting the battery.
- Even in cases of a minor collision where the SRS does not deploy, the horn button assy, instrument panel passenger airbag assy, airbag ECU assy and airbag sensor assy No. 2 should be inspected (See page RS-3).
- Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.
- Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.
- Never disassemble and repair the horn button assy, instrument panel passenger airbag assy, airbag ECU assy or airbag sensor assy No. 2 in order to reuse it.
- If the horn button assy, instrument panel passenger airbag assy, airbag ECU assy or airbag sensor assy No. 2 has been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace it with new one.
- Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting the system's electrical circuits.
- Information labels are attached to the periphery of the SRS components. Follow the instructions on the notices.
- After work on the SRS is completed, perform the SRS warning light check (See page SR-40).
- When the negative (-) terminal cable is disconnected from the battery, the memory of the clock and audio system will be cancelled. So before starting work, make a record of the contents memorized in the audio memory system. When work is finished, reset the audio systems as they were before and adjust the clock. To avoid erasing the memory in each memory system, never use a back up power supply from outside the vehicle.
- If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

CAUTION
HIGH VOLTAGE - 300 VOLTS

AIRBAG SYSTEM

■ SRS Airbags And Seatbelt Pretensioners

Standard Equipment

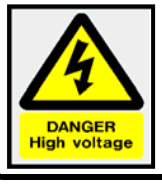
- Airbag Sensor number 2 is mounted in the cabin.
- The Seatbelt pretensioners are mounted on the B-Pillar.
- Frontal driver Airbag is mounted in the steering wheel hub.
- Frontal passenger Airbag is integrated into the dashboard and deploy through the top of the dashboard.
- SRS computer is mounted on the left hand side of the steering column.

Warning !
The SRS computer is equipped with a back up power source that powers the SRS airbags for up to 90 seconds after disabling the vehicle.

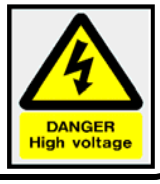
The frontal airbags deploy simultaneously.

Frontal airbags may also deploy even though the reserve power is no longer present, while cutting any of the airbag electrical circuit.

The airbag electrical circuit is denoted by yellow color wiring harness.

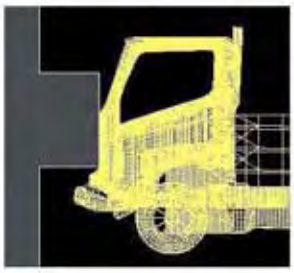


CAUTION
HIGH VOLTAGE - 300 VOLTS



SAFETY FEATURES

The 300 Series is filled with safety features to help you avoid an accident. Its wide front and side windows, and large outside rearview mirrors offer maximum visibility, while the large, specially shaped halogen lamps and bumper-inset fog lamps add an extra measure of safety to night driving. In the event of a collision, the tested high rigidity cab design, sturdy side door impact beams, and energy-absorbing steering wheel and steering column all work to increase driver—and passenger—safety.



High-Rigidity Cab
The 300 Series's high-rigidity cab re-distributes the energy from an impact, making it extremely crush-resistant.

Left: CAE analysis

3-point ELR seat-belt with pre-tensioner
Tension is applied instantly upon collision to improve the belt's restraining performance.

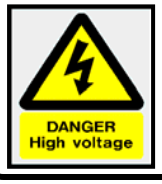
Dual SRS airbags
Airbags operate instantly during a major frontal impact. These, alongside pre-tensioning seat-belts, contribute to driver and passenger safety.

IMPORTANT: Please ensure you read the important reminders regarding SRS airbags in the user's manual.

Energy-absorbing steering wheel

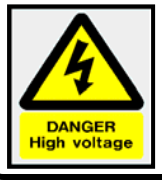
Energy-absorbing steering column

Energy-Absorbing Steering Wheel & Steering Column
In a head-on collision, the steering wheel and support bracket of the steering column deform to absorb some of the shock from the driver.



CAUTION
HIGH VOLTAGE - 300 VOLTS

DRIVER & PASSENGER AIRBAG DEPLOYMENT



CAUTION

HIGH VOLTAGE - 300 VOLTS

EQUIPMENT

Advanced interior with functionality and fine texture

The Hino 300 series' features have been optimized up to the finest details from the user's perspective so that users can carry out their transportation tasks with peace of mind.

Pull-up type power window switches

The switch for the fluorescent cabin lamp is within easy reach of the driver's seat.

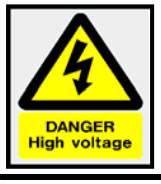
Keyless entry

Fluorescent cabin lamp (with switch within easy reach)

Electrically operated door locks

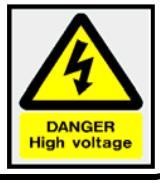
Passenger side sun visor

Power windows



CAUTION

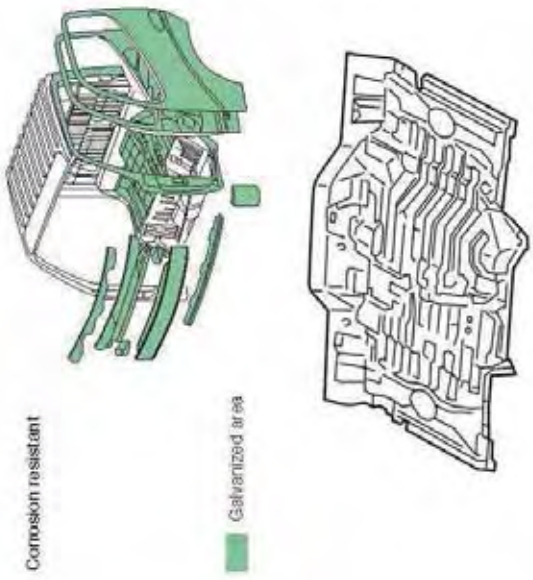
HIGH VOLTAGE - 300 VOLTS



CABIN STRUCTURE

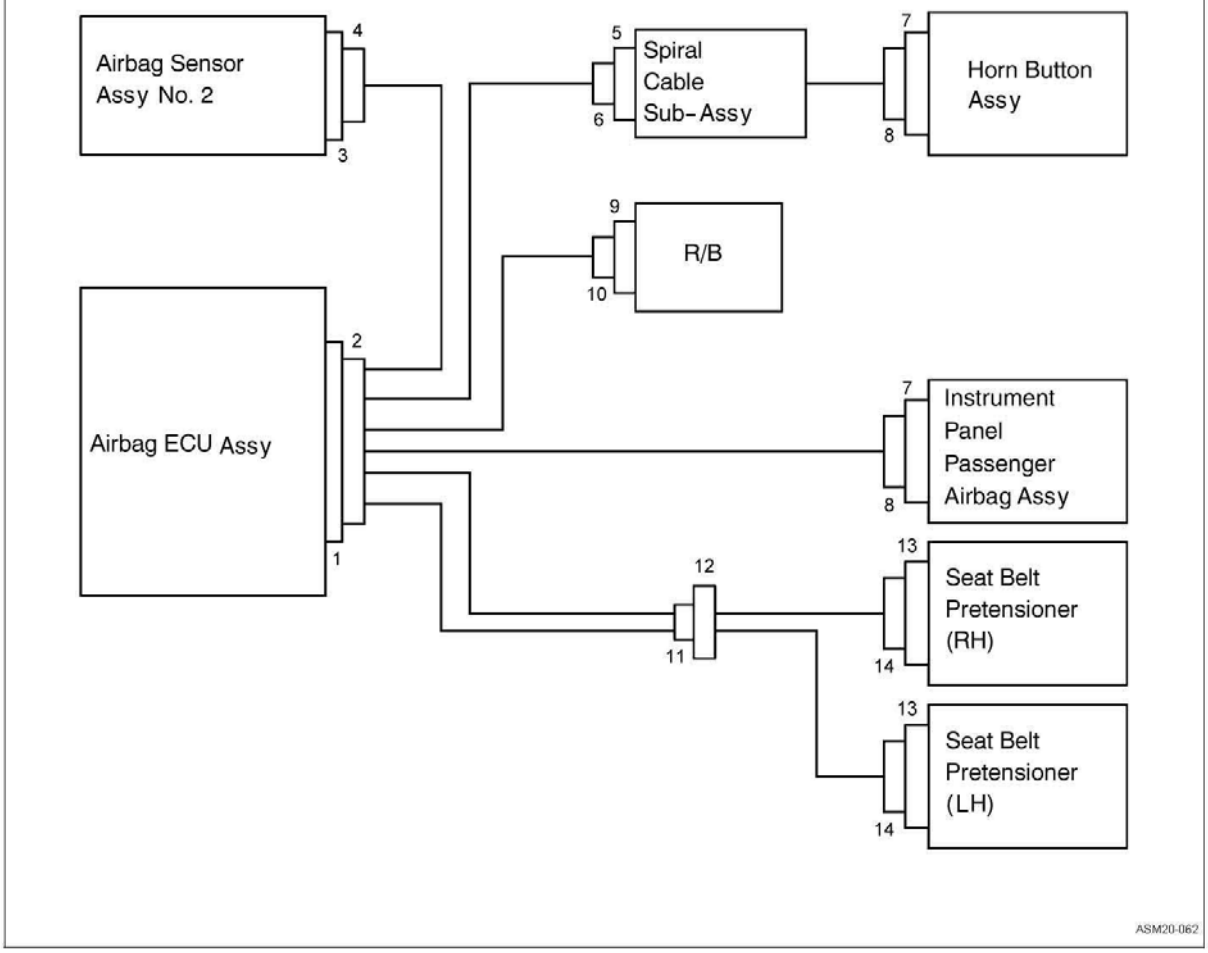
Corrosion Resistant
Much of the 300 Series's cab uses galvanized steel sheeting, for the ultimate in anti-corrosion durability.

Single-Sheet Floor Panel
The 300 Series's floor panel is made of a single sheet, with no panel joints. This also helps to prevent corrosion. The floor panel is equipped with a maintenance hole for easy maintenance (not available with standard cab left-hand drive models).



CAUTION
HIGH VOLTAGE - 300 VOLTS

SRS ARCHITECTURE

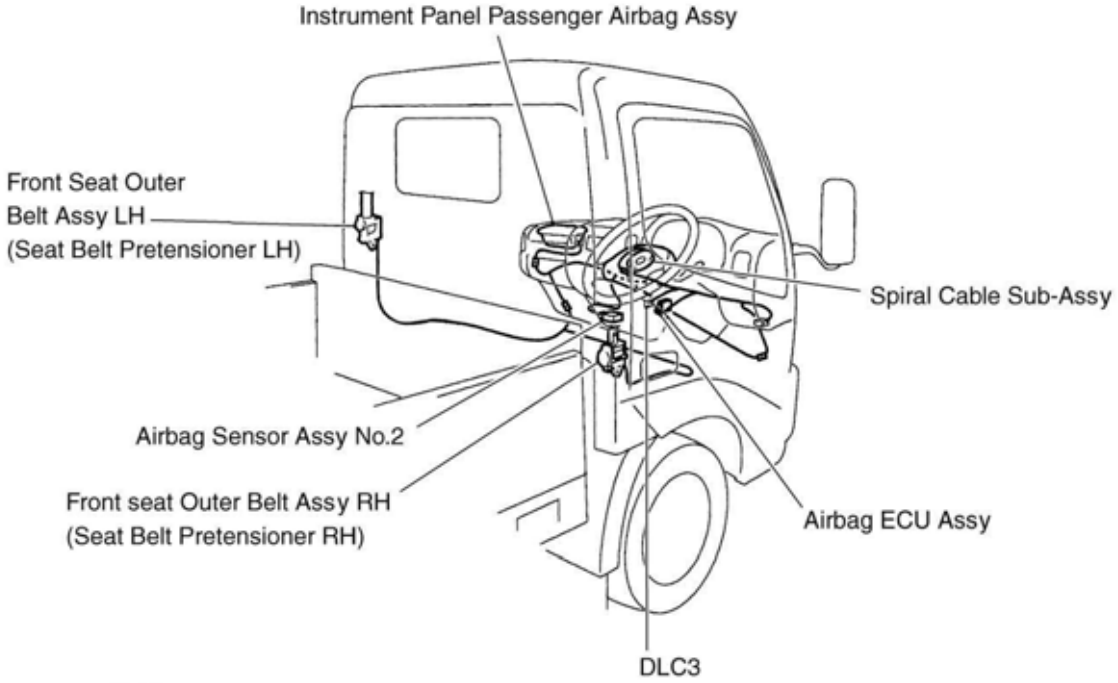


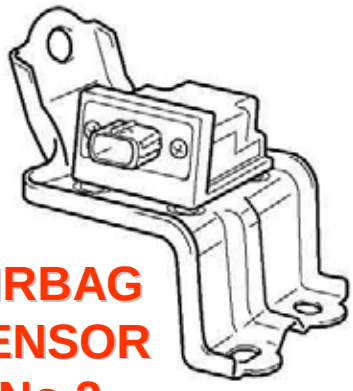
No.	Item	Application
(1)	Terminal Twin Lock Mechanism	Connectors 2, 4, 5, 6, 7, 8, 10, 11, 12, 14
(2)	Airbag Activation Prevention Mechanism	Connectors 2, 6, 7, 13
(3)	Electrical Connection Check Mechanism	Connectors 1, 2
(4)	Half Connection Prevension Mechanism	Connectors 4, 5, 6, 8, 11
(5)	Connector Twin Lock Mechanism	Connectors 9

CAUTION

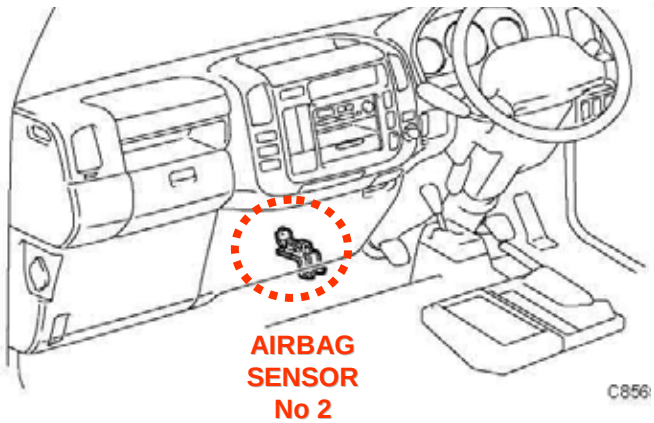
HIGH VOLTAGE - 300 VOLTS

SRS AIRBAG AND SEATBELT PRETENSIONERS ARCHITECTURE



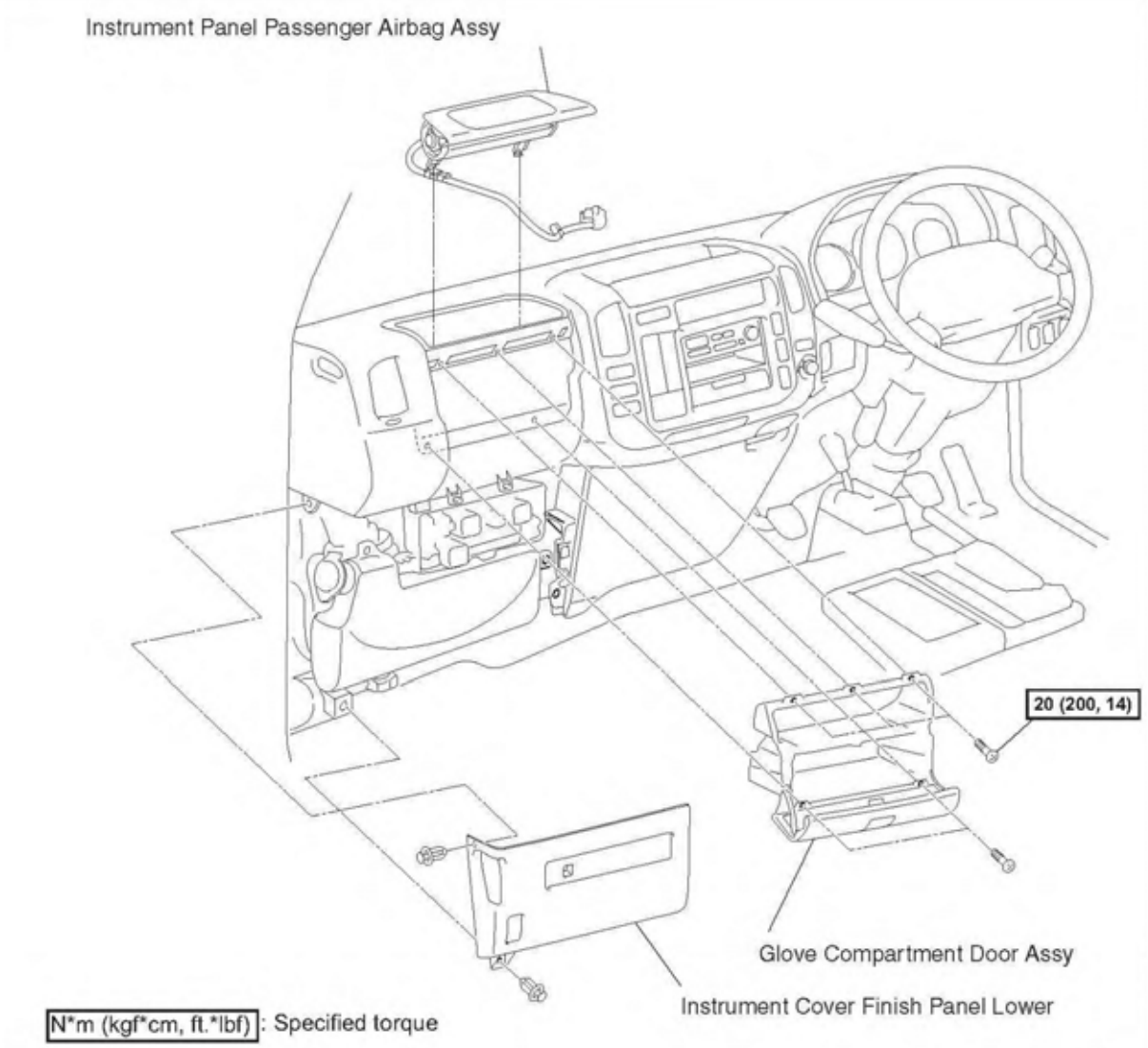


AIRBAG SENSOR No 2



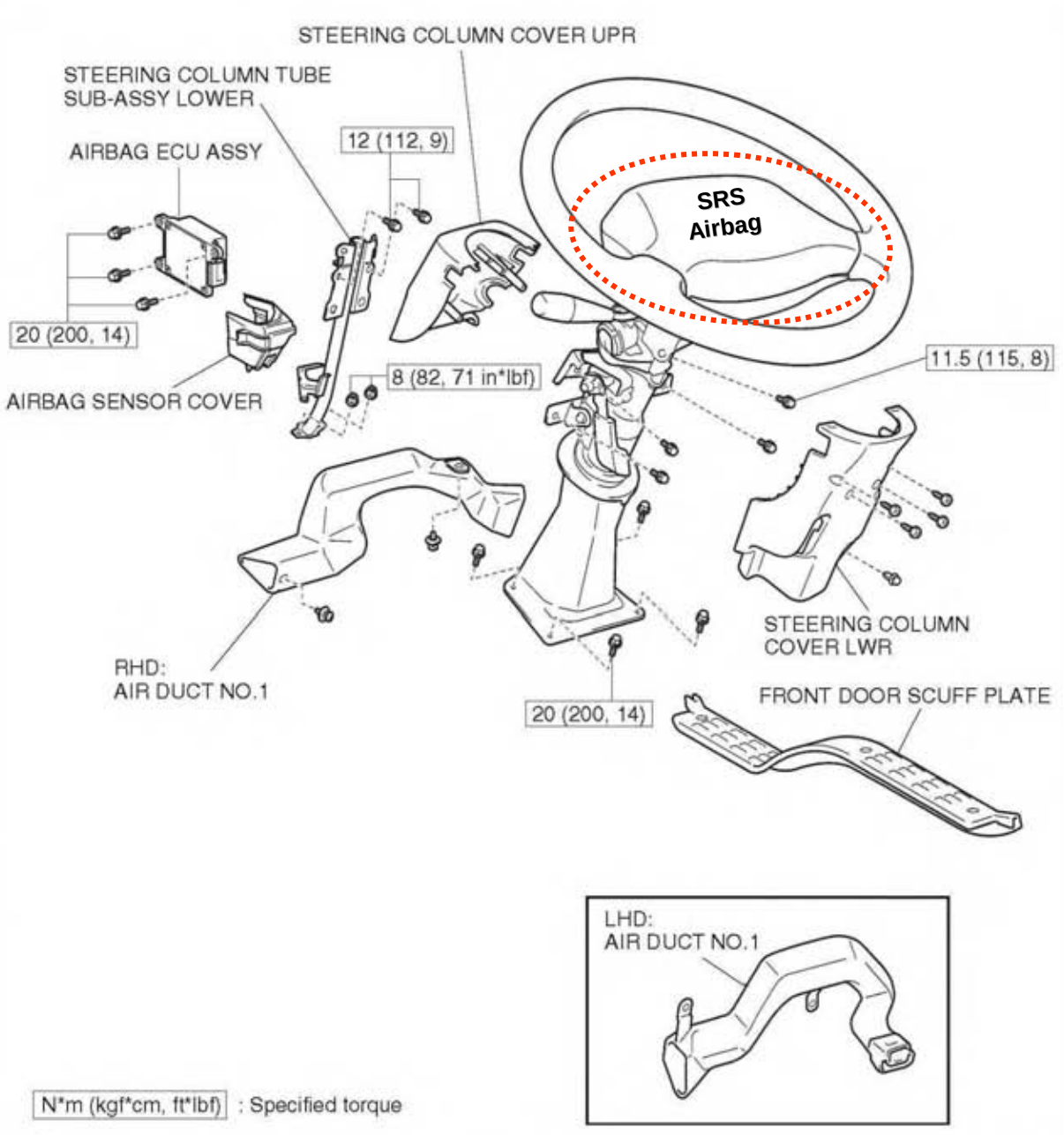
CAUTION
HIGH VOLTAGE - 300 VOLTS

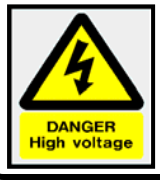
PASSENGER AIRBAG



CAUTION
HIGH VOLTAGE - 300 VOLTS

DRIVER AIRBAG





CAUTION

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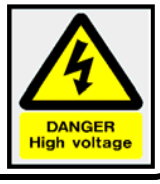
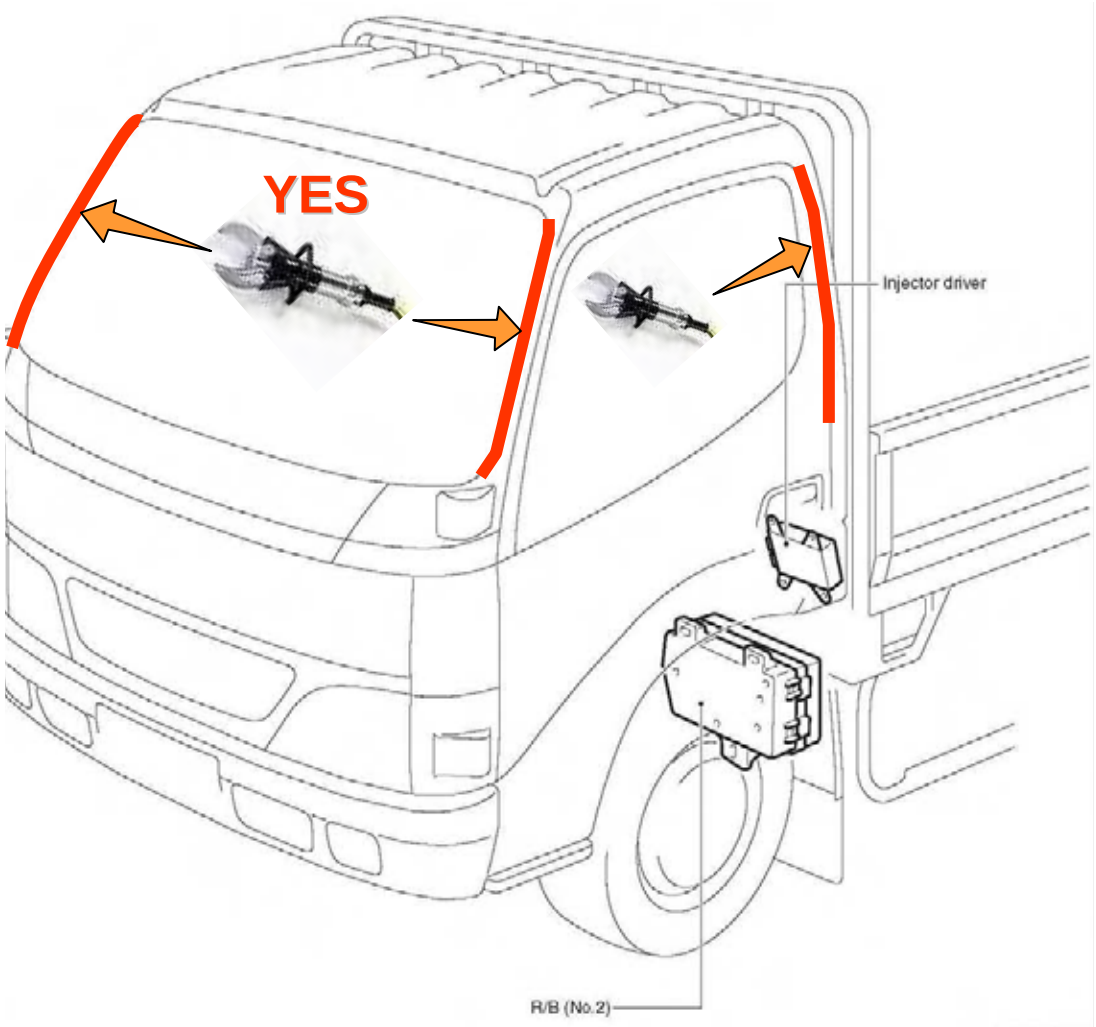


HINO

TECHNICAL TRAINING • TECHNICAL TRAINING •

CABIN



SHEAR

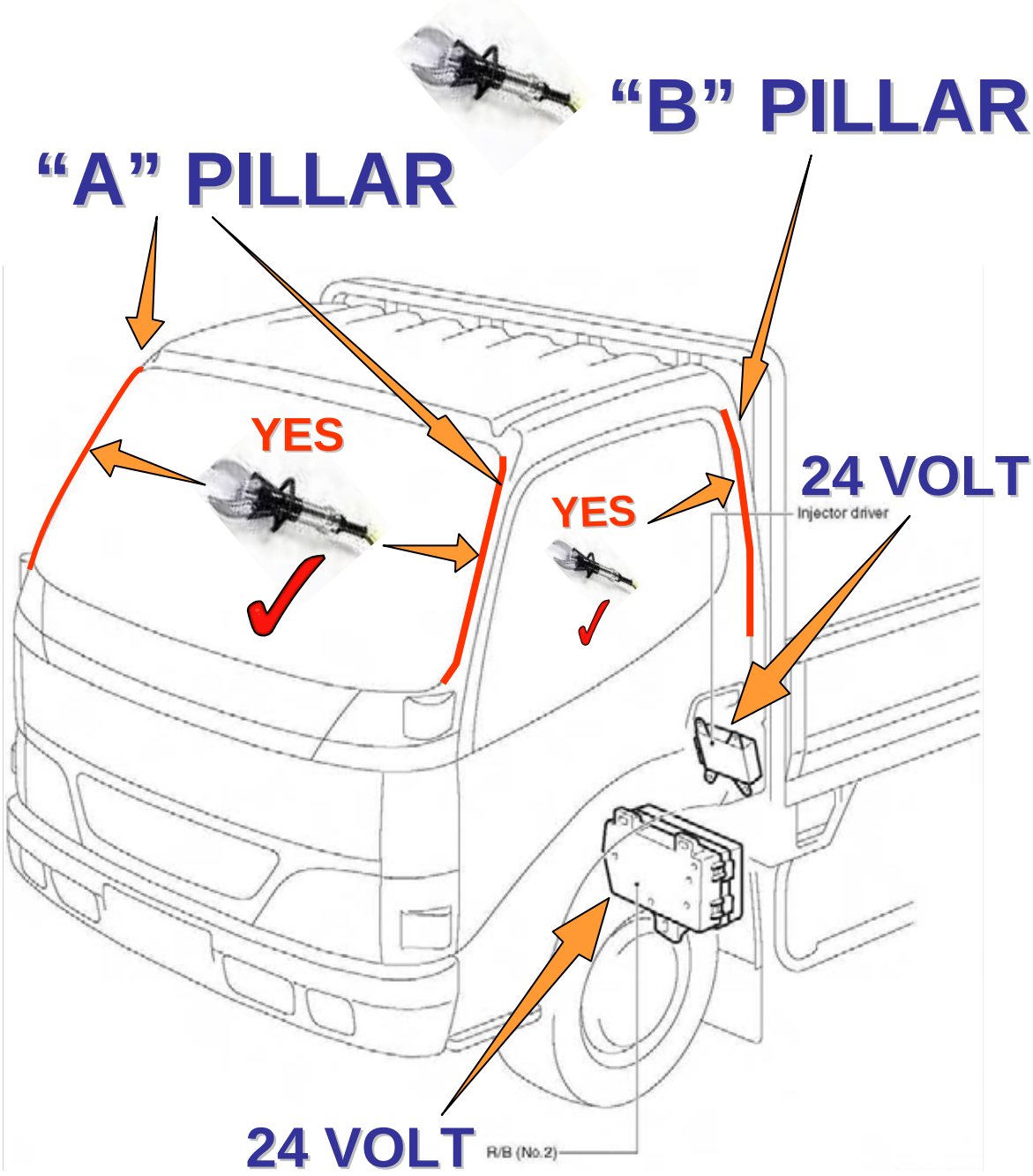
Hybrid

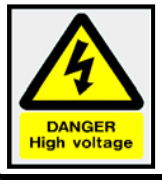
300 series

HQS

HINO

JAWS OF LIFE CAN BE USED WHERE INDICATED





CAUTION

HIGH VOLTAGE - 300 VOLTS

HINO

VEHICLE

RECOVERY GUIDE

Hybrid

300 series

HINO

VEHICLE RECOVERY

■ Method to follow in the event the Hybrid vehicle is involved in an accident.

- **Wear Protective safety clothing at all times !**
  In the event the high-voltage cabling needs to be man handled, wear high voltage (600 Volts) rubber gloves (high wear resistance and with an insulating ability), rubber safety-shoes and safety goggles (an approved chemical vent goggle).

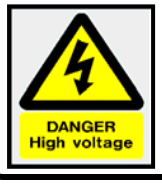
- **Do not touch any high voltage electrical wiring with bare hands !**

- **In the event the vehicle is in on fire, call 000 (fire brigade) !** Do not attempt to extinguish the fire with water ! Water in large quantities may rather be dangerous to the electrical equipment. Please wait for arrival of a fire brigade !

- **If case there is no fire with the vehicle, remove the ignition key followed by the orange service plug located in the Control Power Unit as illustrated in this manual.**

- **In the event a leak is identified near the Nickel-Metal Hydride** battery, please visually inspect the condition and report immediately. The liquid may have also leaked **(Sodium Hydroxide)** from the HV batteries and will require the appropriate safety measure to be followed. As the **Hybrid Battery Electrolyte is similar in colour compared to water**, and is of the same evaporation
  rate, it also has a pungent smell. In the event the Electrolyte has made a direct contact with your eyes, please wash eyes with a lot of water immediately, without rubbing the eyes, and then seek medical advice promptly !

- **When servicing Dutro Hybrid vehicles, it is imperative that a sign provided in this section be displayed at all times !**



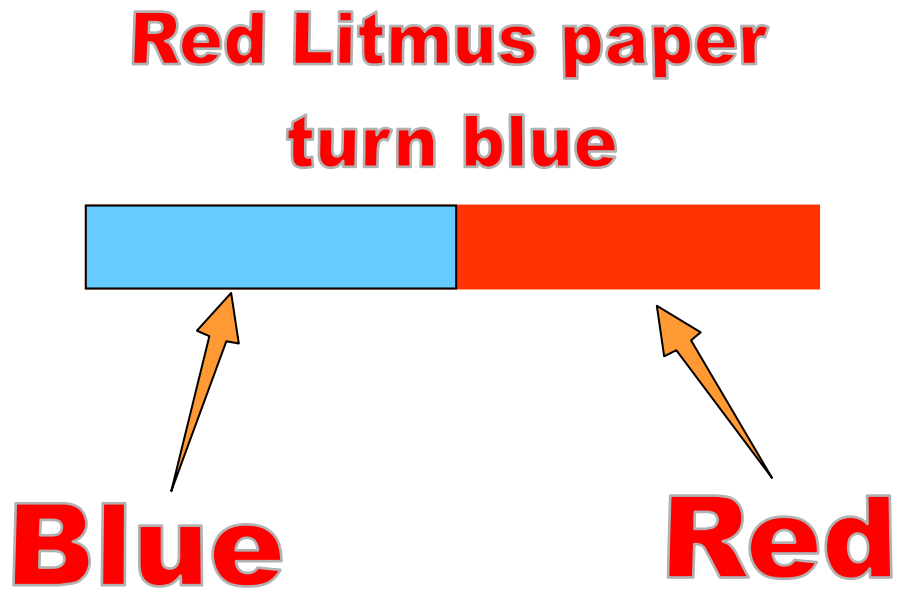
CAUTION
HIGH VOLTAGE - 300 VOLTS

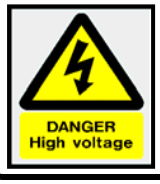
Identifying an Alkaline Solution

1) Identify if a solution is Alkaline, with red litmus paper. If Alkaline the red litmus paper will turn blue.

2) Always wear rubber gloves, safety goggles and safety shoes.

3) To wash off the battery Alkaline solution, prepare a solution of water and Boric acid. The ratio is (40 grams of Boric Acid to 1 Litre of water).





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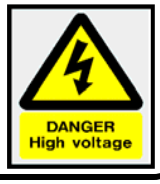
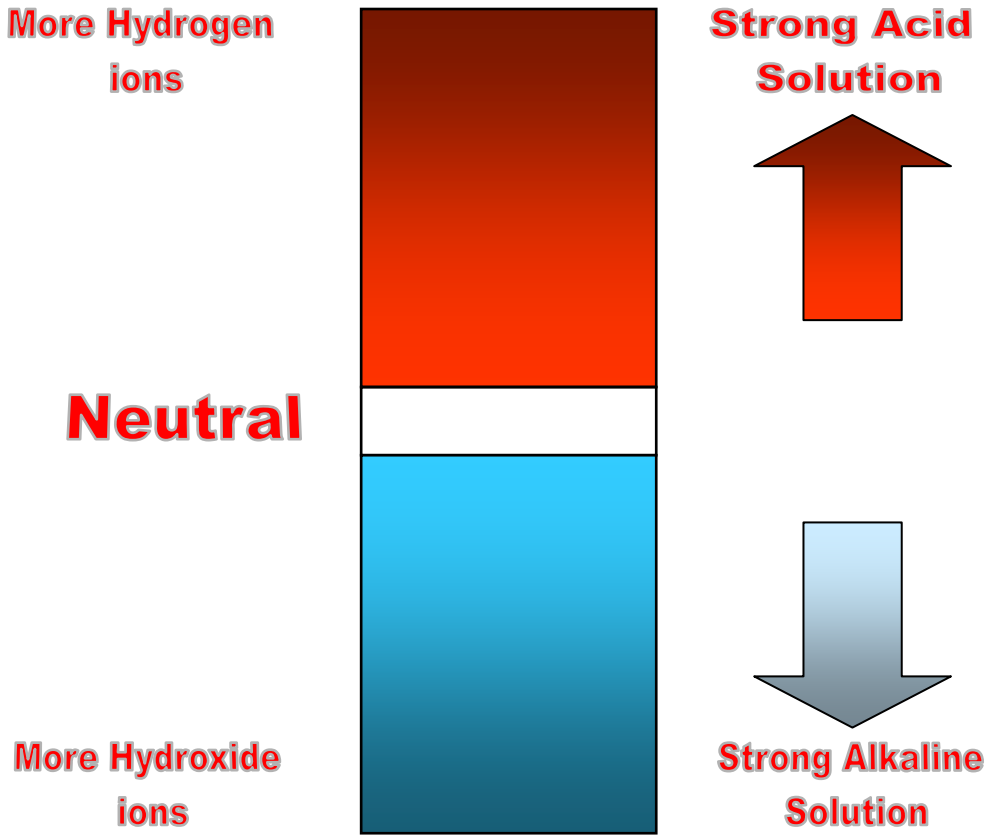


Power of Hydrogen

pH

Power of Hydrogen is a measure of Hydrogen ion concentration in a solution



CAUTION

HIGH VOLTAGE - 300 VOLTS

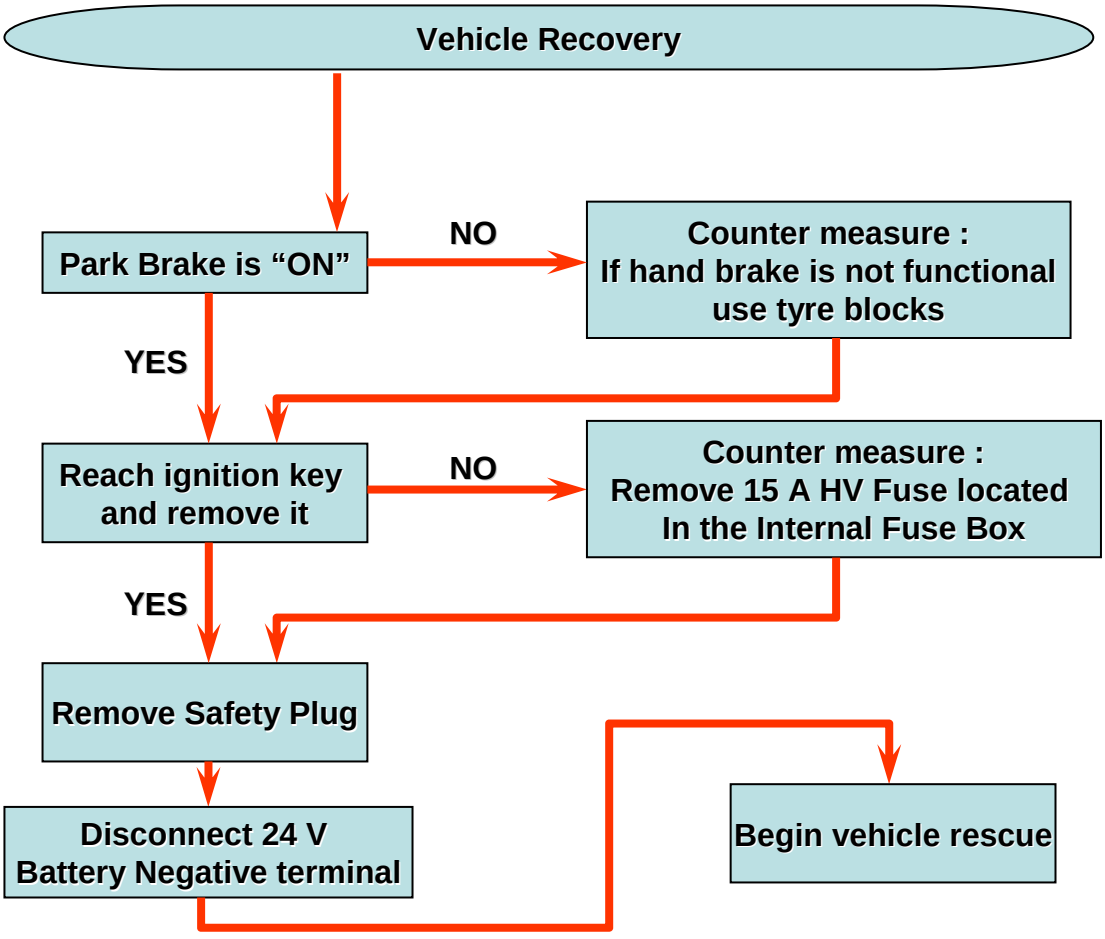
RECOVERY FLOW CHART

In the event the **VEHICLE IS INVOLVED IN AN ACCIDENT** or require towing due to a breakdown, follow the steps below :

a) **Check vehicle** over…General condition; Hybrid components; high voltage orange colour wiring.

b) **Identify**…The high voltage system and isolate the circuit as per recovery flow chart below.

c) **Commence recovery** of vehicle observing the safety guidelines (600 Volts rubber gloves (high wear resistance and with an insulating ability), rubber sole safety-shoes and safety goggles (an approved chemical vent goggle).



Internal Fuse Box

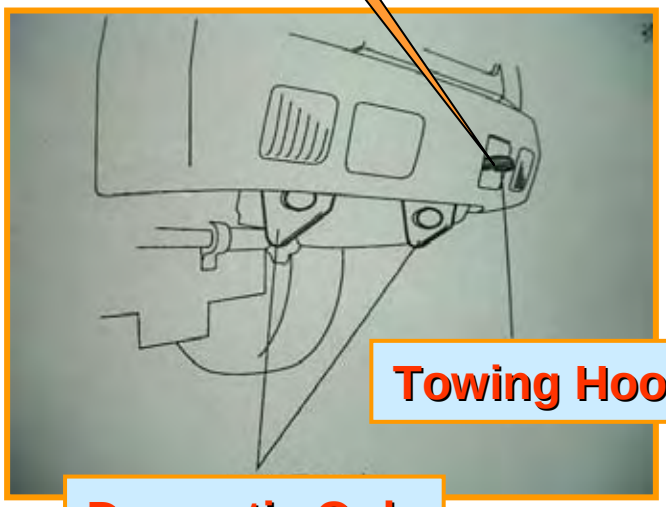
DANGER High voltage

CAUTION

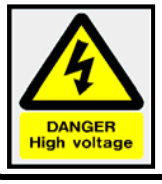
HIGH VOLTAGE - 300 VOLTS

DANGER High voltage

Towing Hook



Domestic Only



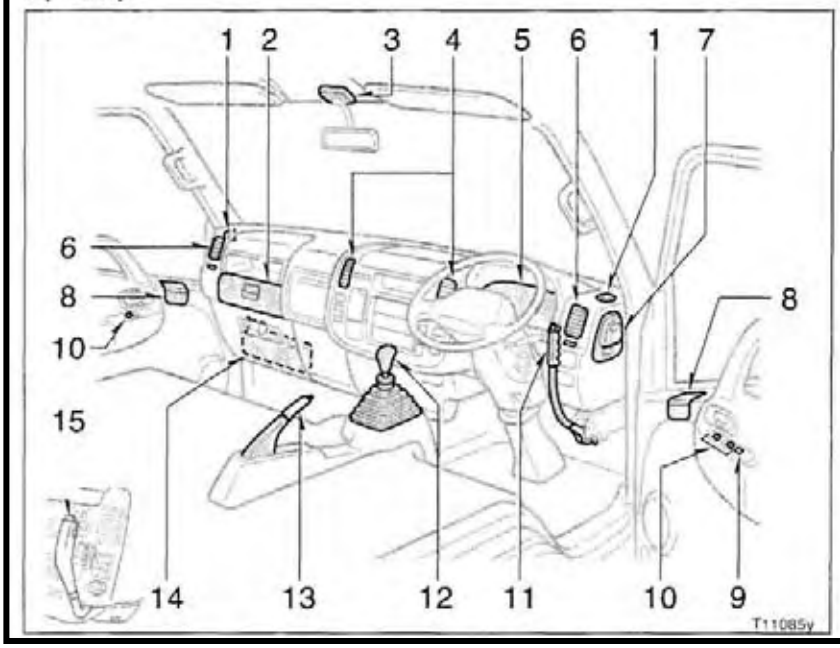
CAUTION
HIGH VOLTAGE - 300 VOLTS

Hybrid Badge, Decal, and Grill

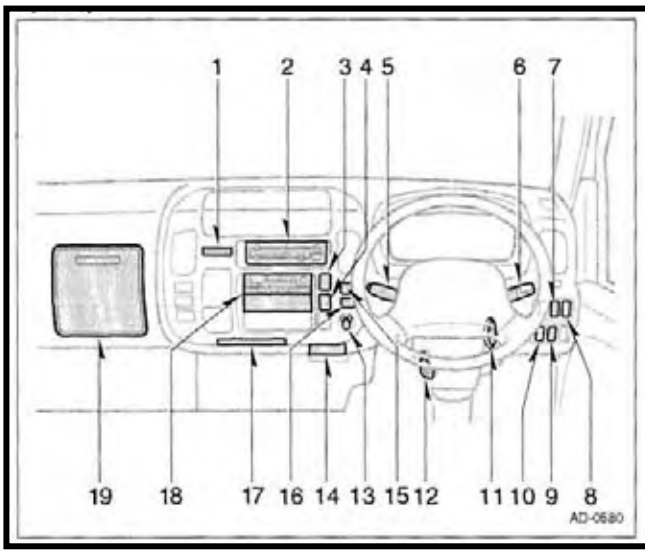
Hybrid Badge White Grill Decal

CAUTION
HIGH VOLTAGE - 300 VOLTS

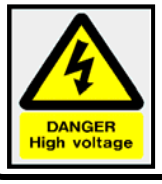
Refer Owner's Manual!



1. Side defroster outlets
2. Glove box
3. Interior light
4. Center vents
5. Instrument cluster
6. Side vents
7. Brake fluid reservoir cover
8. Ashtrays
9. Window lock switch
10. Power window switch
11. Power take-off control lever/ Dump lever
12. Manual transmission gear shift lever
13. Parking brake lever
14. Windshield washer fluid tank
15. Automatic transmission select lever (on some models)

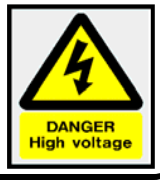


1. Card holder
2. Air conditioning controls
3. Emergency flasher switch
4. Idle stop main switch (model with HV only)
5. Wiper, washer and exhaust retarder (exhaust brake) switches
6. Headlight and turn signal switches
7. Fluorescent light switch
   Power window switch, for left rear side (double cab models only)
8. Power take-off control switch
   Power window switch, for right rear side (double cab models only)
9. ES starting system switch
10. Warm up switch
11. Starter switch
12. Steering lock release lever
13. Cigarette lighter
14. Ashtray (manual transmission models only)
15. Parking light switch
16. DPR switch
17. Cup holder
18. Audio system
19. Auxiliary box (wide cab models only)

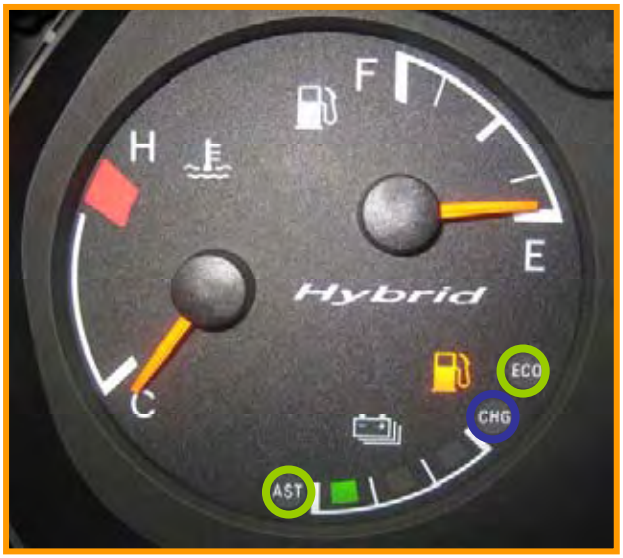


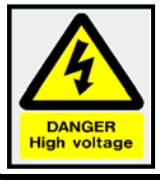
CAUTION

HIGH VOLTAGE - 300 VOLTS



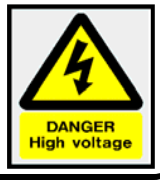
Refer Owner's Manual!



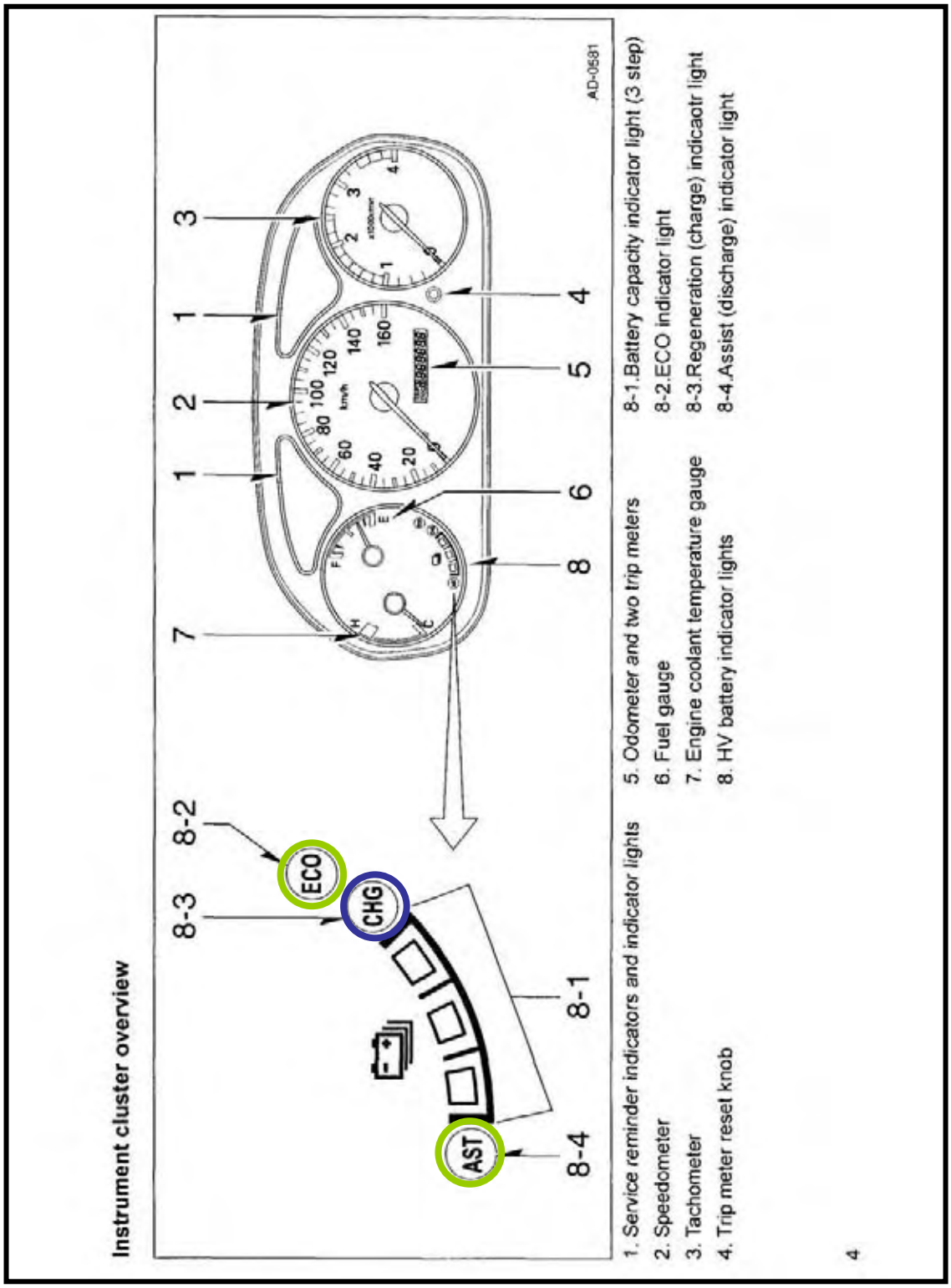


CAUTION

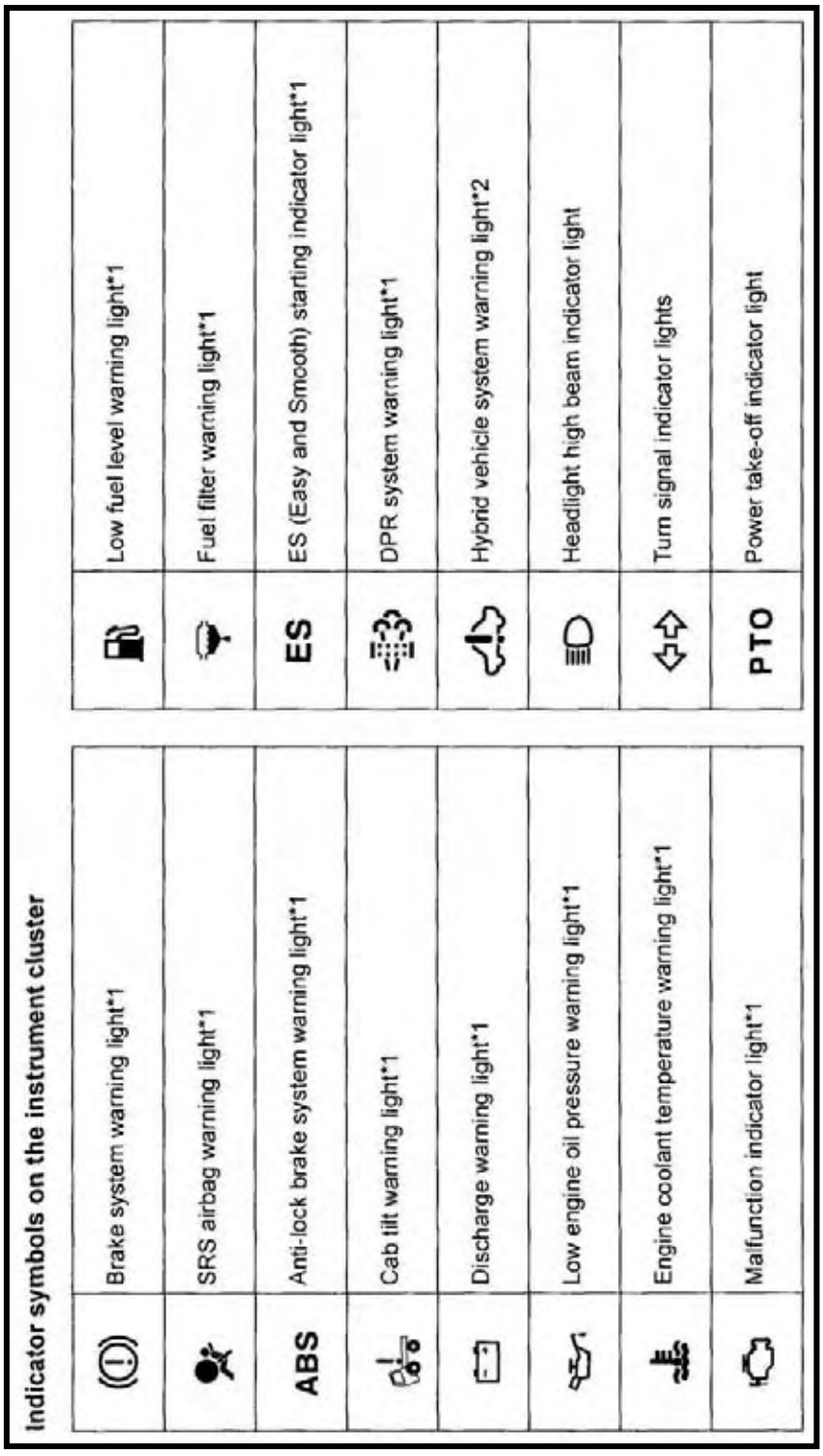
HIGH VOLTAGE - 300 VOLTS



Refer Owner's Manual!



Refer Owner's Manual!



Indicator symbols on the instrument cluster

	Brake system warning light*1		Low fuel level warning light*1
	SRS airbag warning light*1		Fuel filter warning light*1
ABS	Anti-lock brake system warning light*1	ES	ES (Easy and Smooth) starting indicator light*1
	Cab tilt warning light*1		DPR system warning light*1
	Discharge warning light*1		Hybrid vehicle system warning light*2
	Low engine oil pressure warning light*1		Headlight high beam indicator light
	Engine coolant temperature warning light*1		Turn signal indicator lights
	Malfunction indicator light*1	PTO	Power take-off indicator light

Refer Owner's Manual!

Exhaust retarder (Exhaust brake) indicator light	Engine preheating indicator light *Domestic Market Only !*
DC/DC converter indicator light*1	Hybrid battery capacity indicator light *2
Check automatic transmission warning light*1	ECO indicator light *2 GREEN
Automatic transmission fluid temperature warning light*1	Regeneration (charge) indicator light *2 BLUE
Over-drive off indicator light*1	Assist (discharge) indicator light *2 GREEN

*1: For details, see "Service reminder indicators and warning buzzers" on page 55.

*2: These indicators are used for the vehicle with Hybrid system.
For details, see "Service reminder indicators and warning buzzers" on page 55.

6

Refer Owner's Manual!

Service reminder indicators and warning buzzers

If the indicator or buzzer comes on...		Do this.
(a)		Lock the cab securely.
(b)		If parking brake is off, stop immediately and contact HINO dealer.
(c)		Take vehicle to HINO dealer.
(d)		Stop immediately and contact HINO dealer.
(e)		Stop and check.
(f)		Take vehicle to HINO dealer.
(g)		Fill up tank.
(h)	ABS	Take vehicle to HINO dealer. If brake system warning light is also on, stop immediately and contact HINO dealer.

Refer Owner's Manual!

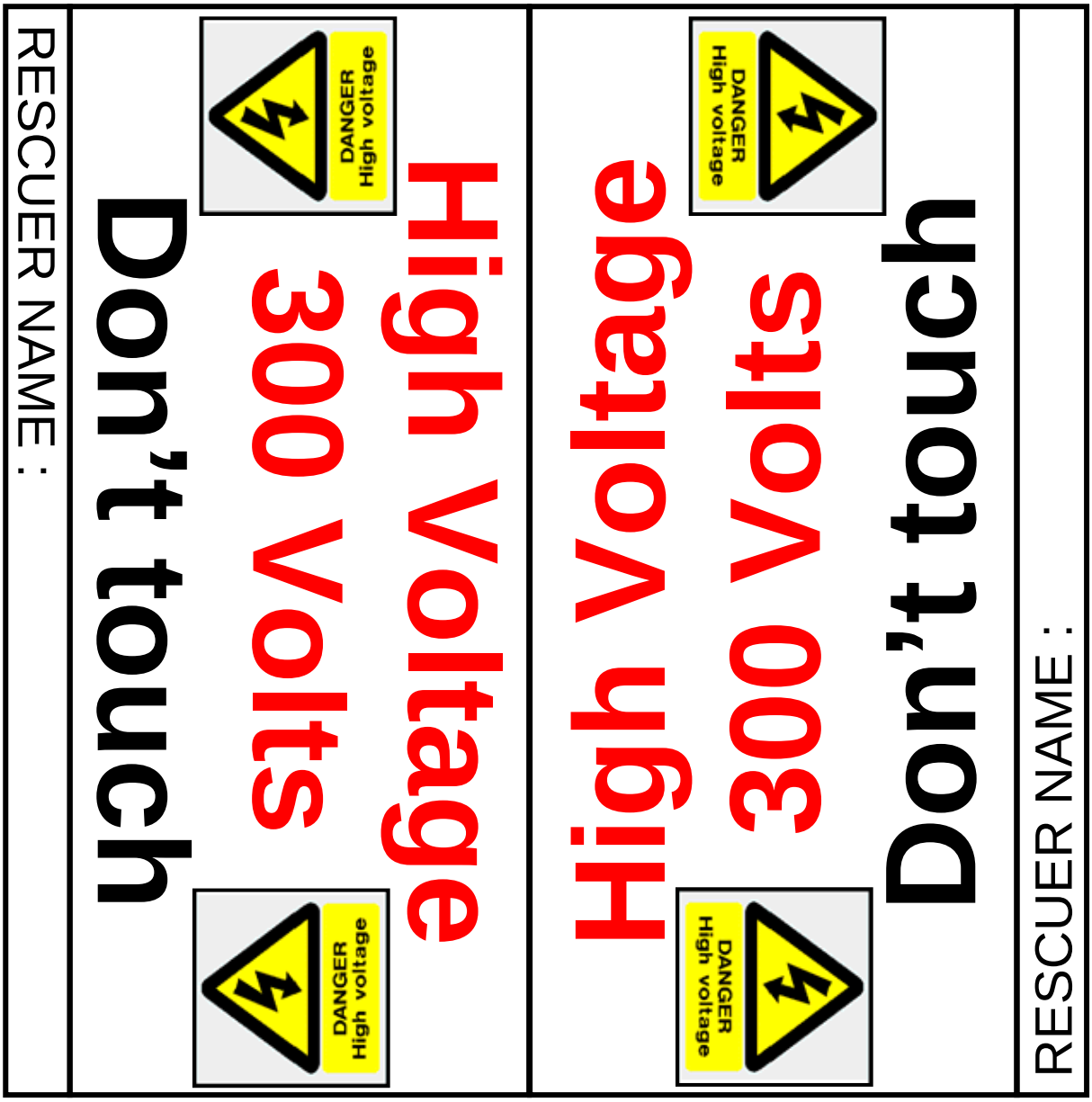
If the indicator or buzzer comes on...		Do this.
(i)		Stop and check.
(j)		Drain water.
(k)	DC/DC CONV	Take vehicle to HINO dealer immediately.
(l)	O/D OFF	The over-drive not being used.
(m)	A/T OIL TEMP	Take vehicle to HINO dealer.
(n)	CHECK A/T	Take vehicle to HINO dealer.
(o)	ES (Indicator and buzzer)	Take vehicle to HINO dealer.
(p)	Low vacuum warning buzzer	Stop and check.

Refer Owner's Manual!

If the indicator or buzzer comes on...		Do this.
(q)		Stop and check.
(r)		Take vehicle to HINO dealer. *
(s)	— (3 green lights)	Hybrid battery capacity * ● 3 lights are lit : upper ● 2 lights are lit : middle ● 1 light is lit : lower
(t)	ECO (Green)	ECO * ● For energy-saving driving ● When the hybrid system is being used effectively
(u)	CHG (Blue)	Regeneration (charge) * At the time of energy regeneration (Blue)
(v)	AST (Green)	Assist (discharge) * At the time of assistance (Green)

*: For the vehicle with Hibrid system only.

High Voltage Sign



TO BE DISPLAYED WHEN THE HIGH VOLTAGE IS EXPOSED

DANGER High voltage

CAUTION
HIGH VOLTAGE - 300 VOLTS

DANGER High voltage

Product Safety Data Sheet

1.Product and Company Identification

Name of Product	Prismatic Nickel Metal-hydride Battery (module)
Model name	EV-MP6R5R02 (GEN Ⅱ)
Company name	Panasonic EV Energy Co., Ltd.
Address	555,Sakaijyuku,Kosai-City,Shizuoka, 431-0452 Japan
Division	Engineering Department
Telephone／Fax	+81-53-577-3112 ／ +81-53-577-3114
Issue date／Revised date	Issue date Oct. 31th,2003
Issue number	P0095

2.Substance Identification(Main substances of Prismatic Nickel Metal-hydride Battery [module])

(1) Positive	Substance	Nickel Hydroxide
	CAS No.	12054-48-7
(2) Negative	Substance	Hydrogen storage alloy
	CAS No.	Not specified
(3)Electrolyte	Substance	Alkaline solution
		Potassium hydroxide (Substance in alkaline solution)
	CAS No.	1310-58-3

3.Hazardous and Toxicity Class

(1) Class Name	Not applicable
(2) Hazard	No hazard in normal situations. However, heat generation and/or alkaline electrolyte leakage may occur in the event of positive/negative terminal short circuiting by metallic or highly conductive objects.
(3)Toxicity	No Toxicity in normal situation. In the event of a burning battery pack, there is a possibility that an alkaline mixed gas may be emitted, which may in turn irritate eyes, nose, and/or throat. If the battery is stored for very long time periods, electrolyte and/or metal materials may leak and result in surface soil pollution.

4.First Aid Measures

In the event of alkaline electrolyte and/or alkaline mixed gas leakage.

(1) Eye contact	Contact may cause corneal injury and blindness. Wash eyes with large amounts of running water for at least 15 minutes. Seek medical treatment immediately. If appropriate actions are not taken, eye disorders may result.
(2) Skin contact	Wash the contact area with plenty of water and seek medical treatment immediately. Clothing, shoes, and socks, etc. which have come into contact with alkaline electrolyte should be taken off immediately. If appropriate actions are not taken,skin inflammation may occur.
(3) Inhalation	Move the exposed person to fresh air area immediately. Cover up the affected person with a blanket. Seek medical treatment immediately.
(4)Swallowing	Do not induce vomitting. Seek medical treatment immediately.

5.Fire Fighting Measures	
(1)Fire fighting measures and extinguisher	(1)Use powder-type ABC extinguisher (2)When corrosive gas could be generated in the event of fire fighting, use appropriate breathing apparatus. (3)Extinguishing a fire with a large amount of water may be an effective method . However, this should be considered as a supplementary means If there are no readily available large amounts of water, use dry sand instead; as the application of only a small amount of water may temporarily act as an accelerant and affect the fire adversely while the hydrogen storage alloy is burning. (4)Remove the flammable materials from the fire. (5)If fire occurs nearby to batteries, move them to a safe place.
(2)Possibility of fire and explosion.	(1)Fire may occur when: Short circuit-induced arcing occurs. A large current is applied to a module or a cell. (2)Explosion may occur when: the battery is contained in a hermetic container, since oxygen and/or hydrogen may be generated by the battery. The battery itself will not explode in normal conditions. (3)Fire and explosion may occur when: The battery is over-charged or over-discharged. The battery is over 100 deg.C. The battery is in a hermetic container with an ignition source nearby and overcharge or overdischarge occurs.
6.Measures for electrolyte leakage	When the alkaline electrolyte leaks from battery.
	1)Wip off with a towel. 2)Keep away from flames. 3)Protective glasses and rubber gloves should be worn
7.Handling and Storage	
(1)No short circuit	Short circuit should be prevented since heat generation and/or fire may result.
(2) No disassembly and reconstruction	The battery should not be disassembled and/or reconstructed for the following reasons If a cell is disassembled, alkaline electrolyte may leak. If a module is disassembled, short circuiting may occur. If a module is disassembled, cells will be damaged and alkaline electrolyte may leak.
(3)No over-charge or over-discharge	Battery should not be over-charged or over-discharged to prevent possible oxygen and/or hydrogen generation.
(4)No usage in hermetic container	Battery should not be used in a hermetic container since the container may explode due to gas generated from the battery.
8.Exposure control	When alkaline electrolyte leakage from the battery occurs, necessary action should be taken as follows:
(1)Acceptable concentration	Not specified in Japanese Industrial Hygienic association and ACGIH.
(2)Facilities	(1)Ventilation should be considered. Limited exhaust device or other ventilation device should be used. (2)Exhaust system or exhaust hole is required when the battery is used in a container.
(3)Prevention measures	Safety glasses, mask, and gloves should be worn.

9.Physical and chemical properties	
(1)Appearance	The nickel hydrogen battery (cell and module) is contained within a plastic resin case. The module geometry is basically a thin rectangular trapezoid. A fixed voltage value cannot be specified.
10.hazardous information	As indicated in sections 3 and 5
11.Toxicological information	In the event of alkaline electrolyte leakage.
(1)Acute toxicity	LD50 2g/kg oral rat (based on material safety data sheet of liquid potassium hydroxide)
(2)Stimulation	Inflammation of the cornea can be caused from scratching/rubbing one's eyes. Exposure for extended time periods can irritate bronchial tubes and eyes.
12.Transportation Information	
	(1)Battery terminal should be packaged to prevent external short circuits. Batteries should not be allowed to contact each other as prevention against short circuiting when packaged. (2)There should be a marking on the package that indicates that Nickel Hydrogen Storage batteries are contained . There should be a "Non-spillable " marking for international shipment. (Refer to Section 14) (3)Packaging should be stable and durable enough to protect batteries from vibration, shock, dropping and stacking. Batteries should not fall down and/or be allowed to be inverted/tilted during shipping. (4)Packaging should not become wet (rain and/or dew etc..) during storage and shipping. (5)Keep away from fire/flame during storage and shipping, and do not store batteries in a hot environment. NOTE: One example of storage in a hot environment is that of exposing a vehicle with a battery installed in a very hot weather for a long time.
13.Disposal	
	(1)Battery should be disposed in accordance with provisions of vehicle manufacturer or dealer. (2)Domestic waste disposal is not allowed.
14.Regulatory information	
(1)Hazardous Materials Transportation (Hazardous shipping transportation and storage regulation)	(1) DOT (Department of Transportation) ·UN Number 2800 ·Classes 8 ·Special Provision 49 CFR 173.159(d) (2) IATA (International Air Transport Association) ·UN Number 2800 ·Classes 8 ·Special Provision A67
15.Others	Not specified.