

TMS-NTC-14022  
February 26, 2014

Recall Management Division  
National Highway Traffic Safety Administration  
1200 New Jersey Avenue, SE  
Washington, DC 20590

Re: Toyota Safety Recall 13V-396 Dealer Notification (Remedy)

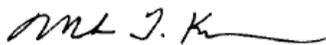
To whom it may concern,

Please find attached the Dealer Notification Letter (Remedy) for Toyota Safety Recall 13V-396 on the following Toyota and Lexus vehicles:

- Certain 2006 through 2010 Model Year Highlander HV
- Certain 2006 to 2008 Model Year RX 400h

If you have any questions regarding this matter, please contact me at (310) 468-5316.

Sincerely,



Quality Compliance Assistant Manager

Attachments:

- Toyota 13V-396 (D0M) Dealer Notification (Remedy)
- Lexus 13V-396 (DLF) Dealer Notification (Remedy)

To: All Toyota Dealer Principals, Service Managers, and Parts Managers

Subject: Safety Recall D0M – **Remedy Available**  
Certain 2006 through 2010 Model Year Highlander Hybrid Vehicles  
Intelligent Power Module (IPM) Replacement

As previously announced on September 3, 2013, Toyota filed a Defect Information Report (DIR) with the National Highway Traffic Safety Administration (NHTSA) informing the agency of our intent to conduct a voluntary Safety Recall on Certain 2006 through 2010 Model Year Highlander Hybrid Vehicles.

**Toyota has completed remedy preparations and will now begin mailing the remedy owner letter.**

### Condition

Inside the Hybrid Inverter Assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Due to variations in operating characteristics of some IPM transistors, the temperature of the transistor(s) can exceed the allowable temperature of the solder underneath the transistor. If this occurs, the solder could degrade and eventually cause heat damage to the transistor(s), illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a “fail-safe” mode, resulting in reduced power under which the vehicle can still be driven for short distances. In limited cases, the fuse of the power supply circuit could blow, causing the hybrid system to shut down. If the Hybrid System shuts down, the vehicle could stop while being driven increasing the risk of crash.

### Remedy

Toyota dealers will replace the IPM at **NO CHARGE** to the vehicle owner. For additional information on repair procedures, please refer to TIS.

The following information is provided to inform you of the owner notification timing and your degree of involvement.

#### **1. Owner Letter Mailing Date**

Toyota has completed remedy preparations and will begin to notify owners in mid-October, 2013. A sample of the owner notification letter has been included for your reference.

*Toyota tries very hard to obtain current customer name and address information when mailing owner letters. In the event your dealership receives a notice for a vehicle that was sold prior to the Safety Recall announcement, it is the dealership's responsibility to forward the owner letter to the customer who purchased the vehicle.*

Please note that only owners of the covered vehicles will be notified. If a dealer is contacted by an owner who has not yet received the notification, please instruct the dealer to **verify coverage by confirming through TIS**. Dealers should perform the procedure as outlined in the Technical Instructions located on TIS.

#### **2. Dealer/Owner Lists**

Summary Reports, containing the number of covered vehicles in your dealership's primary marketing area, have been enclosed in the dealer package. (Please verify eligibility by confirming through Dealer Daily or TIS prior to performing repairs.)

#### **3. Pre-Owned Vehicles in Dealer Stock**

Toyota requests that dealers verify whether their Pre-Owned vehicles in dealer inventory are covered by this Safety Recall. If a vehicle is covered, the dealer should perform the Safety Recall remedy prior to customer delivery.

**4. Number and Identification of Covered Vehicles**

There are approximately 79,600 Toyota Highlander Hybrid covered by this Safety Recall in the U.S.

Model Name	Model Year	Production Period	Number of Vehicles
Toyota Highlander Hybrid	Certain 2006 through 2010	Mid February 2005 through late July 2010	Approximately 79,600 units

Please note that only owners of the covered vehicles will be notified. If your dealership is contacted by an owner who has not yet received the notification, please instruct the dealer to **verify coverage by confirming through TIS**. Dealers should perform the procedure as outlined in the Technical Instructions located on TIS.

A UIO matrix by state is provided to inform your dealership of the number of covered vehicles in your state.

STATE	UIO	STATE	UIO	STATE	UIO	STATE	UIO	STATE	UIO
AK	266	HI	105	MI	1041	NV	586	UT	866
AL	474	IA	615	MN	1515	NY	4090	VA	3583
AR	323	ID	463	MO	934	OH	1588	VT	326
AZ	1459	IL	3108	MS	181	OK	439	WA	3997
CA	14990	IN	1003	MT	325	OR	2093	WI	1209
CO	3822	KS	556	NC	2018	PA	2772	WV	247
CT	1400	KY	631	ND	82	RI	285	WY	157
DC	307	LA	347	NE	321	SC	663		
DE	195	MA	2995	NH	573	SD	167		
FL	2941	MD	2094	NJ	2193	TN	1000		
GA	1427	ME	436	NM	739	TX	3484		

**5. Parts Ordering Process**

Orders can be placed through the dealership’s facing PDC. The kits have been placed on Dealer Ordering Solutions and will be systematically released daily based on dealer ordering criteria.

Please refer to the table below and the Technical Instructions for part ordering information.

Model Application	Part No.	Part Name	Qty/Unit
Highlander HV	04001-29148	TRANSISTER, PWR MODULE INTELLIGENT, NO.2	1
	08887-02409	GREASE G747	2

**IMPORTANT PARTS ORDERING UPDATE**

*All Safety Recall, Service Campaign (SSC/LSC) and Customer Support Program (CSP) parts will be eligible for the Monthly Parts Return Program. Please refer to PANT Bulletin 2011-087 for campaign parts that are currently returnable under the Monthly Parts Return Program and additional details.*

**6. Technician Training Requirements**

The repair quality of covered vehicles is extremely important to Toyota. All dealership associates involved in the recall process are required to successfully complete E-Learning course SC13A. To ensure that all vehicles have the repair performed correctly; technicians performing this recall repair are required to have the following minimum certification:

- **Hybrid Expert**
- **Master Technician**
- **Master Diagnostic Specialist**

It is the dealership’s responsibility to select technicians with the above certification level or greater to perform this Safety Recall repair. Carefully review your resources, the technician skill level, and ability before assigning technicians to this repair. It is important to consider technician days off and vacation schedules to ensure there are properly trained technicians available to perform this repair at all times.

**7. Remedy Procedures**

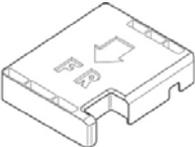
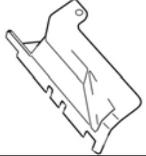
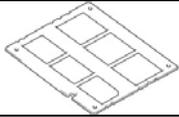
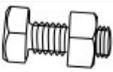
Please refer to TIS for Technical Instructions on repair.

Conduct all applicable, non-completed Safety Recall and Service Campaigns on the vehicle during the time of appointment.

**8. Campaign Special Service Tools**

In a separate shipment scheduled to arrive October 2, 2013, your dealership was sent a package containing special service tools for this campaign. When received, the package will have a fluorescent (green, orange, yellow, or pink) label like the sample shown below for easy identification.

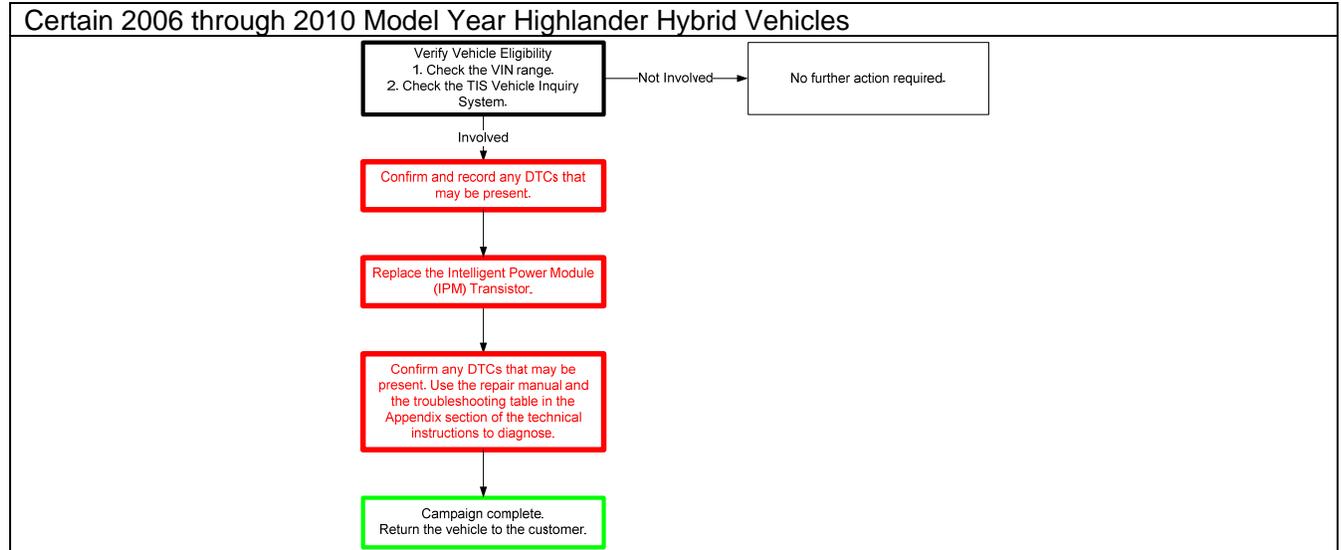
**ATTN: Service Manager**  
**SAFETY RECALL D0M**  
**Campaign Tools**

Part Name	Sample	Qty	Part Name	Sample	Qty
Protective Cover A		1	Protective Cover B		1
Masking Plate		1	Squeegee		1
Stud Bolt		2	Masking Plate Nut/Bolt		4

NOTE: If additional gloves are needed they can be ordered through SPX by calling 800-933-8335 (Gloves are not included in the Campaign Tool Kit)

Part Number	Part Name	Quantity
00002-03100-S	Electrical Insulating Gloves (Small)	1
00002-03200-M	Electrical Insulating Gloves (Medium)	
00002-03300-L	Electrical Insulating Gloves (Large)	

## 9. Warranty Reimbursement Procedure



Model	Op. Code	Description	Flat Rate Hour
06 - 07 MY 2WD	3530HJ	Replace the IPM for 2WD models (DW21A & GW21A)	3.4 hr/vehicle
06 - 07 MY AWD	3530HM	Replace the IPM for AWD models (EW21A & HW21A)	3.5 hr/vehicle
08 – 10 MY	3530HQ	Replace the IPM for AWD models (BW3EH, EW41A, EW44A & JW3EH)	4.0 hr/vehicle

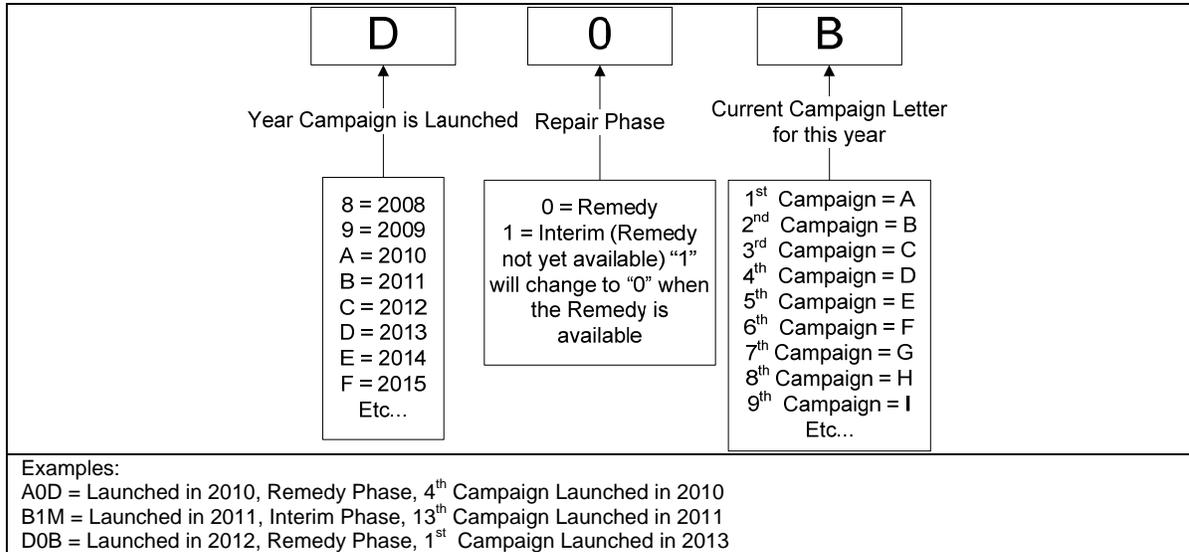
- The flat rate times include 0.1 hours for administrative cost per unit for the dealership.
- Toyota Genuine Brake Cleaner and Toyota Genuine Throttle Plate Cleaner or equivalent can be claimed as sublet type "OF" under OP Code 3530HJ, 3530HM or 3530HQ at a rate of \$5.00 per vehicle (marking pens and electrical tape is also included in the sublet cost)
- Parts replaced under OP code 3530HJ, 3530HM or 3530HQ are subject to warranty parts return, any misuse of these operation codes will result in a warranty claim debit

Safety Recall	Op. Code	Description	Flat Rate Hour
D0M	Contact Region Rep.	Replace the IPM, DTC present after IPM replacement, replace Inverter Assembly on 2WD Models DW21A & GW21A	Contact Region Rep.
		Replace the IPM, DTC present after IPM replacement, replace Inverter Assembly on AWD Models EW21A & HW21A	Contact Region Rep.
		Replace the IPM, DTC present after IPM replacement, replace Inverter Assembly on AWD Models BW3EH, EW41A, EW44A & JW3EH	Contact Region Rep.

- Regional representative will provide available sublets for this operation

**Important Note:** If you have DTCs Present after performing the IPM replacement, please consult the Technical Instruction Appendix and repair manual for DTC diagnosis. In the event you need further assistance diagnosing the current DTCs, please contact the Technical Assistance Hotline – QA Powertrain Department at 800-233-3178. **Do not file a claim for Intelligent Power Module replacement;** you will need to obtain an Op. Code from your regional representative for Inverter Replacement.

**Campaign Designation Decoder**



**10. Repair Quality Confirmation**

The repair quality of covered vehicles is extremely important to Toyota. To help ensure that all vehicles have the repair performed correctly, please designate at least one associate (someone other than the individual who performed the repair) to verify the repair quality of every vehicle prior to customer delivery.

**11. Media Contacts**

If you are a dealership associate and have any questions, please contact your District Service/Parts Manager. ***In the event you are contacted by the News media***, it is imperative that all media contacts (local and national) receive a consistent message. In this regard, all media contacts must be directed to Cindy Knight (310) 468-2170 in Toyota Corporate Communications. (Please do not provide this number to customers)

**12. Customer Contacts**

A FAQ is attached to help respond to any customer concerns. If the customer has any further questions, they are requested to contact the Toyota Customer Experience Center. The Toyota Customer Experience Center can be reached at 1-888-270-9371 Monday through Friday, 5:00 am to 6:00 pm, or Saturday 7:00 am through 4:00 pm Pacific Time.

*Please note the attached FAQ is published on the [www.Toyota.com](http://www.Toyota.com) website for customer viewing.*

***Please review this entire package with your Service and Parts staff to familiarize them with the proper step-by-step procedures required to implement this Safety Recall.***

Thank you for your cooperation.  
 TOYOTA MOTOR SALES, U.S.A., INC.



**Safety Recall D0M - Remedy Available**  
**Certain 2006 through 2010 Model Year Highlander Hybrid Vehicles**  
**Intelligent Power Module (IPM) Replacement**

**Customer Frequently Asked Questions**

Published Late September, 2013

**Background**

As previously announced on September 4, 2013, Toyota filed a Defect Information Report (DIR) with the National Highway Traffic Safety Administration (NHTSA) informing the agency of our intent to conduct a voluntary Safety Recall on certain 2006 through 2010 model year Highlander Hybrid vehicles.

Toyota has completed remedy preparations and will now begin to notify owners.

**Q1: What is the condition?**

A1: Inside the hybrid inverter assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Due to variation in characteristics of transistors in parallel circuits, the temperature of the transistor(s) can exceed the allowable temperature of the solder underneath the transistor. If this occurs, the solder could degrade and eventually cause heat damage to the transistor(s), illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a “fail-safe” mode, resulting in reduced power under which the vehicle can still be driven for short distances. In limited instances, the fuse of the power supply circuit could blow, causing the hybrid system to shut down and resulting in the vehicle stopping while being driven. This can increase the risk of a crash.

**Q1a: What is the Hybrid System Inverter?**

A1a: The hybrid system inverter converts high-voltage DC, stored in the HV battery, into AC for the motor generator. It also converts AC into DC during regenerative braking for storage in the HV battery.

**Q2: Which Warning Lamps are illuminated on the instrument panel when the vehicle enters fail-safe driving mode?**

A2: All of the following warning lights and messages will be illuminated on the instrument panel when the vehicle enters the fail-safe driving mode. The fail-safe driving mode will result in reduced power under which the vehicle can still be driven for short distances.

	<b>Warning lights</b>
	Master Warning Light
	Slip Indicator
	Check Engine Warning Light
	Electronically Controlled Brake System Warning Light (yellow indicator)

	<b>Warning messages</b>
	Malfunction of VSC function is detected.
	Hybrid system malfunction is detected.
	All Wheel Drive system malfunction is detected.

**Q2a: How long and what distance can a vehicle be driven when the vehicle enters fail-safe driving mode?**

A2a: The distance a vehicle will continue to travel in fail-safe driving mode will vary based upon the hybrid battery state of charge and the road conditions. If a vehicle enters fail-safe driving mode, the driver should pull-over and stop the car in a safe area. The driver should immediately contact his/her local Toyota dealer for assistance.

**Q3: What is Toyota going to do?**

A3: In mid-October, 2013 Toyota will send an owner notification by first class mail to owners of vehicles covered by this Safety Recall.

Any authorized Toyota dealer will replace the Intelligent Power Module at **No Charge** to you.

**Q3a: How does Toyota obtain my mailing information?**

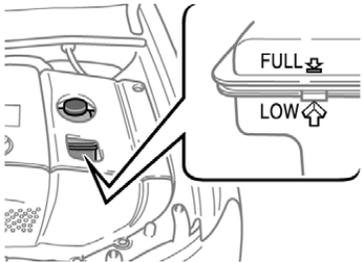
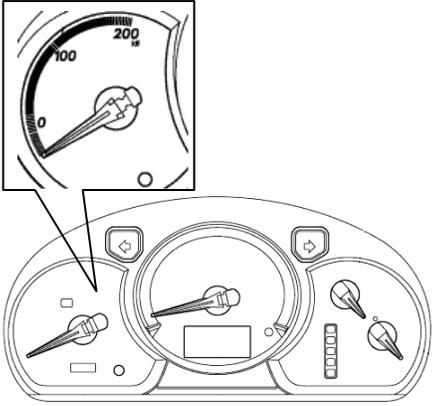
A3a: Toyota uses an industry provider who works with each state's Department of Motor Vehicles (DMV) to receive registration or title information, based upon the DMV records. Please make sure your registration or title information is correct.

**Q3b: Do I need my owner letter to have the remedy performed?**

A23b: You do not need an owner letter to have this recall completed; however, to assist the dealer in confirming vehicle eligibility, we request that you present this notice at the time of your service appointment.

**Q4: What steps can I take to reduce the possibility of this condition from occurring prior to the availability of the remedy?**

A4: You can take the following steps to reduce the possibility of this condition from occurring until the remedy is completed.

 <p>Inverter Coolant Reservoir</p>	<p>(1) Regularly confirm that the coolant level in the inverter coolant reservoir is between FULL and LOW. If the coolant level is below the LOW line, please add coolant up to the FULL line.</p> <p>Toyota dealers will inspect the coolant level, and if necessary, add coolant, at no charge at the customer's request.</p>
 <p>Power Meter</p>	<p>(2) Avoid placing a high load on the Hybrid System. Drivers can do so by refraining from towing with the vehicle until the remedy is completed.</p> <p>(3) Monitor your Power Meter. The Power Meter indicates the immediate output from the Hybrid System in approximate kilowatts. Keep power usage below 100kW as much as possible. Situations where the Power Meter shows output slightly over 100kW for a brief moment should not raise any concerns.</p>

**Q4a: Will this condition occur if the Power Meter shows usage above 100kW?**

A4a: Situations where the Power Meter shows output slightly over 100kW for a brief moment should not raise any concerns. Drivers should refrain from driving conditions where power output exceeds 100kW continuously and/or substantially. Drivers can do so by refraining from towing with the vehicle until the remedy is completed.

**Q5: Which and how many vehicles are covered?**

A5: There are approximately 79,600 Toyota Highlander Hybrid and approximately 53,500 Lexus RX 400h vehicles covered by this Safety Recall in the U.S.

<b>Model Name</b>	<b>Model Year</b>	<b>Production Period</b>	<b>Number of Vehicles</b>
Toyota Highlander Hybrid	Certain 2006 through 2010	Mid February 2005 through late July 2010	Approximately 79,600 units
Lexus RX 400h	Certain 2006 through 2008	Late February 2005 through early December 2008	Approximately 53,500 units

**Q5a: Are there any other Toyota or Lexus models covered by this Safety Recall?**

A5a: No. There are no other Toyota or Lexus models covered by this Safety Recall.

**Q6: What if my vehicle was covered by the previous Safety Recall (B0J) for 2006 and 2007 Model Year Highlander Hybrid (HV) Vehicles Hybrid System Inverter, Intelligent Power Module?**

A6: If you have not had Safety Recall B0J performed, please contact any authorized Toyota dealer to schedule an appointment to have the remedy performed as soon as possible.

**Q7: What if I previously paid for repairs to my vehicle for this condition?**

A7: Reimbursement consideration instruction will be provided in the remedy owner letter.

**Q8: What if I have additional questions or concerns?**

A8: If you have additional questions or concerns, please contact the Toyota Customer Experience Center at 1-888-270-9371 Monday through Friday, 5:00 am to 6:00 pm, or Saturday 7:00 am through 4:00 pm Pacific Time.

**Certain 2006 through 2010 Model Year Highlander Hybrid (HV) Vehicles  
Hybrid System Inverter, Intelligent Power Module  
IMPORTANT SAFETY RECALL**

This notice applies to your vehicle: [VIN]

**URGENT SAFETY RECALL**

This is an important Safety Recall. The remedy will be performed at **NO CHARGE** to you.

Dear Toyota Customer:

This notice is being sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act. Toyota has decided that a defect, which relates to motor vehicle safety, exists in certain 2006 through 2010 Model Year Highlander Hybrid (HV) Vehicles.

You received this notice because our records, which are based primarily on state registration and title data, indicate that you are the current owner.

**What is the condition?**

Inside the hybrid inverter assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Under some conditions, one or more transistors could be damaged, illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a "fail-safe" mode, resulting in reduced power under which the vehicle can still be driven for short distances. However, it is possible that the fuse of the power supply circuit could blow, causing the hybrid system to shut down and resulting in the vehicle stopping while being driven. This can increase the risk of a crash.

**What is Toyota going to do?**

Any authorized Toyota dealer will replace the IPM at **NO CHARGE** to you.

**What should you do?**

***This is an important Safety Recall***

Please contact any authorized Toyota dealer and make an appointment to have the IPM replaced. Replacement of the IPM will take approximately 4 hours. However, depending upon the dealer's work schedule, it may be necessary to make your vehicle available for a longer period of time.

**You do not need an owner letter to have this recall completed; however, to assist the dealer in confirming vehicle eligibility, we request that you present this notice at the time of your service appointment.**

If you would like to update your vehicle ownership or contact information, please go to [www.toyota.com/ownersupdate](http://www.toyota.com/ownersupdate). You will need your full 17-digit Vehicle Identification Number (VIN) to input the new information.

**What if you have other questions?**

***Your local Toyota dealer will be more than happy to answer any of your questions.*** If you require further assistance, you may contact Toyota Customer Experience Center at 1-888-270-9371 Monday through Friday, 5:00 am to 6:00 pm, Saturday 7:00 am through 4:00 pm Pacific Time.

If you believe that the dealer or Toyota has failed or is unable to remedy the defect within a reasonable time, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue S.E., Washington, D.C. 20590, or call the toll free Vehicle Safety Hot Line at 1-888-327-4236 (TTY: 1-800-424-9153), or go to <http://www.safercar.gov>.

**What if you have previously paid for repairs to your vehicle for this specific condition?**

If you have previously paid for repair to your vehicle for this specific condition prior to receiving this letter, please mail a copy of your repair order and proof-of-payment to the following address for reimbursement consideration:

Toyota Motor Sales, U.S.A., Inc  
Toyota Customer Experience, WC 10  
19001 South Western Avenue  
Torrance, CA 90509

Include your name, address, and telephone number(s) in your request. Please allow us 6-8 weeks to process your request.

Please note the dealership will need to complete the Safety Recall remedy before reimbursement consideration requests can be processed.

If you are a vehicle lessor, Federal law requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

We have sent this notice in the interest of your continued satisfaction with our products, and we sincerely regret any inconvenience this condition may have caused you.

Thank you for driving a Toyota.

Sincerely,

TOYOTA MOTOR SALES, U.S.A., INC.

SAMPLE

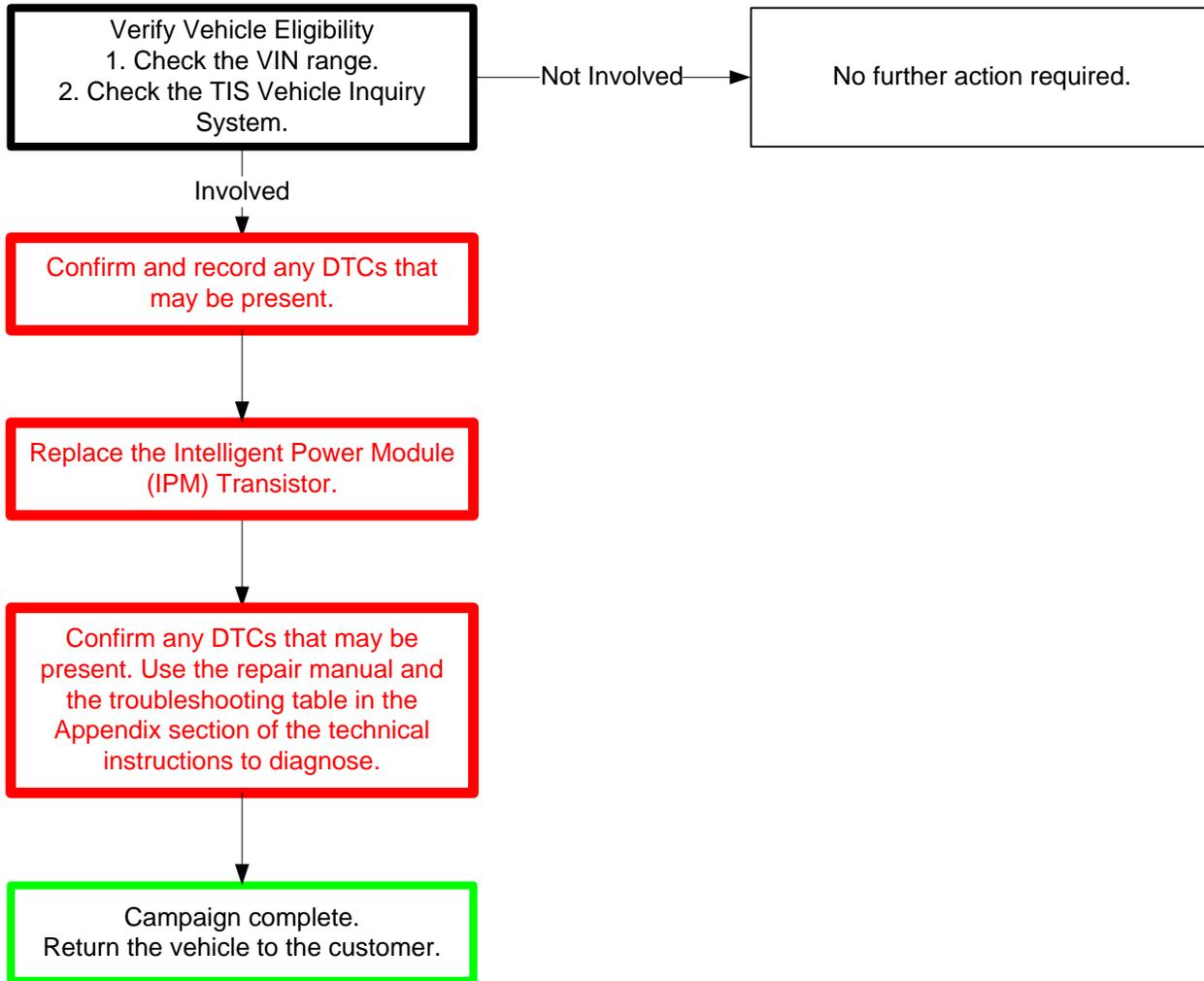
**TECHNICAL INSTRUCTIONS**  
**FOR**  
**SAFETY RECALL D0M**  
**INTELLIGENT POWER MODULE TRANSISTOR REPLACEMENT**  
**CERTAIN 2006 – 2010 MODEL YEAR HIGHLANDER HV**

**[Complete D0M Technical Video Supplement](#)**

**In order to perform this campaign, technician must be Hybrid Certified. If you have questions regarding certification, contact your regional representative.**

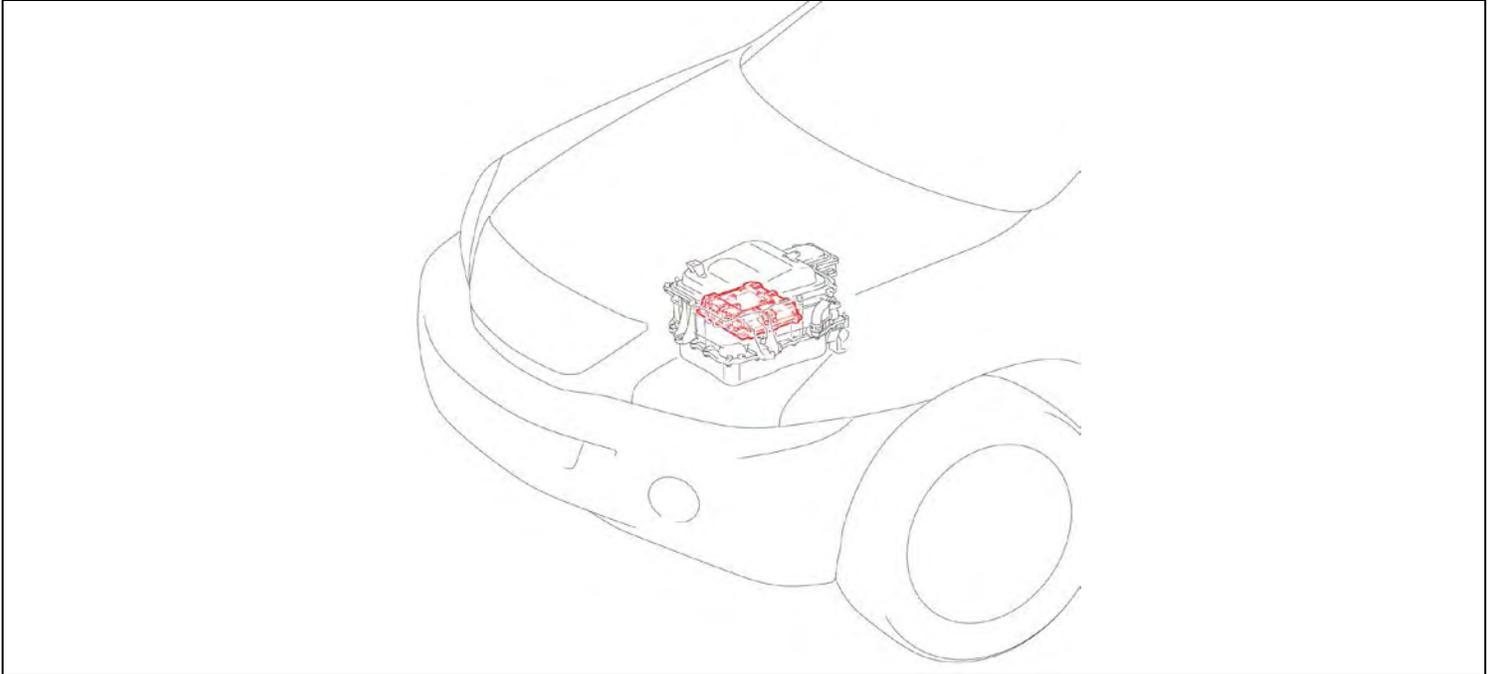
## I. OPERATION FLOW CHART

The flow chart is for reference only. **DO NOT** use it in place of the full technical instructions. Follow **ALL** steps as outlined in the full technical instructions to confirm the campaign is completed correctly.



## II. BACKGROUND

Within the vehicle, inside the inverter assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. The solder underneath these transistors could degrade and eventually cause damage to them, illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a fail-safe mode, resulting in reduced motive power in which the vehicle can still be driven for short distances. In limited instances, the fuse of the power supply circuit could blow, causing the hybrid system to shut down and resulting in the vehicle stopping while being driven.



## III. IDENTIFICATION OF AFFECTED VEHICLES

### A. COVERED VIN RANGE

WMI	Year	VIN Range	
		VDS	Range
JTE	2006	DW21A	0001012-0016473
		EW21A	0001057-0033951
		GW21A	0001612-0012447
		HW21A	0015069-0015069
	2007	DW21A	0016509-0023446
		EW21A	0033956-0050060
		GW21A	0016487-0023445
		HW21A	0033954-0050064
	2008	EW41A	2000108-2025890
		EW44A	2000110-2025892
	2009	EW41A	2025893-2037770
		EW44A	2025894-2037778
	2010	BW3EH	2037781-2048439
		JW3EH	2037352-2048651

#### NOTE:

- Check the TIS Vehicle Inquiry System to confirm the VIN is involved in this Safety Recall, and that the campaign has not already been completed prior to dealer shipment or by another dealer.
- TMS warranty will not reimburse dealers for repairs conducted on vehicles that are not affected or were completed by another dealer.

## IV. PREPARATION

### A. PARTS

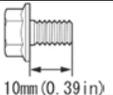
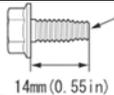
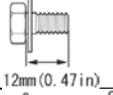
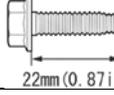
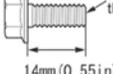
#### Required Parts – Necessary to complete the repair

Part Number	Part Description	Quantity
04001-29148	Intelligent Power Module Transistor	1
08887-02409	Grease G747	2

#### GREASE 747 EXPIRATION DATE EXPLANATION


<p>The expiration date <i>DOES NOT</i> indicate that the grease is not useable. It is <i>OKAY</i> to use grease that is beyond the expiration date. The tube of grease must be kneaded to confirm the grease is properly mixed prior to use.</p>

#### Ancillary Parts – Only necessary if lost during the repair

Part Description	Part Number	Part Description	Part Number
	91551-80610		90105-A0263
	90105-A0096		90080-11255
	91551-80614		

### B. TOOLS, SUPPLIES & EQUIPMENT

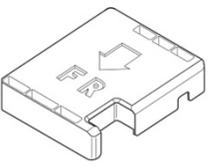
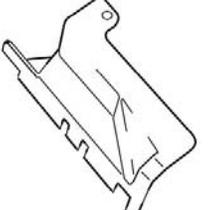
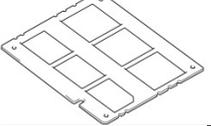
- Standard hand tools
- Torque wrench
- Techstream
- Brake cleaner
- Marking pen
- Air gun
- Throttle plate cleaner 00289-1TP00 (or equivalent)
- Insulating tape
- DVOM

**SST** – These are essential special service tools that the dealership should have.

Part Number	Part Name	Quantity
00002-03100-S	Electrical Insulating Gloves (Small)	1
00002-03200-M	Electrical Insulating Gloves (Medium)	
00002-03300-L	Electrical Insulating Gloves (Large)	

NOTE: If additional gloves are needed they can be ordered through SPX by calling 800-933-8335

**Campaign Tools** – These tools are provided to the dealership.

Part Name	Sample	Quantity	Part Name	Sample	Quantity
Protective Cover A		1	Protective Cover B		1
Masking Plate		1	Squeegee		1
Stud Bolt		2	Masking Plate Nut/Bolt		4

## V. SAFETY PRECAUTIONS

### A. SAFETY CHECKLIST & PRECAUTIONS WHEN WORKING ON THE HIGH VOLTAGE SYSTEM



- Always remember **“SAFETY FIRST”**
- Be extremely careful when handling high voltage components
- Before beginning and while working on the high voltage system, perform the following safety check list.

#### 1. AIR VENTILATION AND FOREIGN MATERIALS

- Perform work in an area that is free of dust and other airborne matter.
- Do not perform the work next to a stall where grinding or spraying of chemicals is performed.
- When not working in the inverter, temporarily install the inverter cover to prevent foreign material entering the inverter.

#### 2. PREVENT STATIC ELECTRICITY

- Static electricity can have an adverse effect on inverter components, discharge static electricity by touching a ground location on the vehicle before starting work.

#### 3. PREVENT ELECTRICAL SHOCKS & SHORTS

- Confirm the auxiliary battery and the service grip have been unplugged for at least 5 minutes before beginning work on the high voltage system.
- Store the service grip in a secure location (in your pocket) to prevent accidental installation.
- To prevent short-circuiting of components, wrap tools with insulating tape before use.
- Do not wear metal; watches, rings, mechanical pencils, etc...
- When working with or around a high voltage circuit (orange connectors and cables) wear the correct electrical insulating gloves.
- Confirm your electrical insulating gloves are not wet, or dirty.
- Confirm your electrical insulating gloves are not punctured or torn.

#### 4. USE OF AIR & POWER TOOLS

- Do not use air tools or power tools on any component once the inverter cover has been removed to prevent damage and foreign materials from entering the inverter.

#### 5. HANDLING OF PARTS

- Keep all removed parts organized and clean.
- Store all removed parts so they are not contaminated or damaged when removed from the inverter.

#### 6. HANDLING OF THE INVERTER & CONNECTORS

- Cover all high voltage connectors with insulating tape immediately after disconnecting the connector.
- Use extreme care to prevent nuts/bolts from falling into the inverter when work is performed. If a part falls into the bottom section of the inverter the entire inverter assembly may need to be removed.
- Use extreme care to not drop any tools in the inverter assembly.

#### 7. CONNECTING HIGH VOLTAGE TERMINALS

- Confirm all terminals are clean before connecting to the inverter.
- Torque specifications are critical, confirm all bolts are torque as described in these instructions.

#### 8. INTERMEDIATE INSPECTIONS

- Perform all intermediate inspections to prevent errors.

#### 9. ASSIGN A SAFETY SUPERVISOR

- Assign a safety supervisor to be in charge of all safety precautions in the work area.
- Put a “Working with high voltage” warning sign on the vehicle during work.

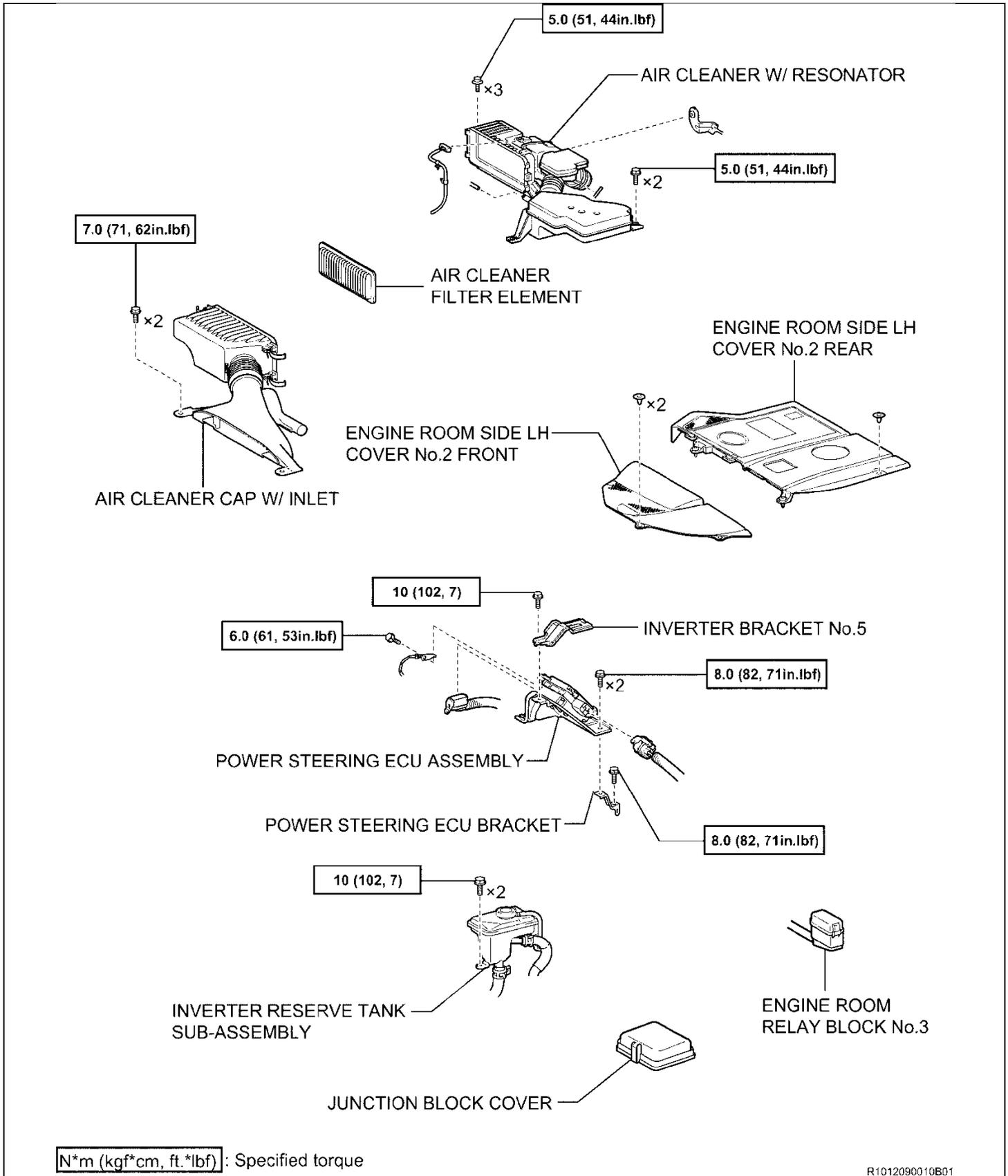
Person in charge: \_\_\_\_\_  
**high voltage system**  
**Working on**  
**CAUTION:**

**CAUTION:**  
**Working on**  
**high voltage system**  
Person in charge: \_\_\_\_\_

Fold this page and place on the roof of vehicle.

# VI. DISASSEMBLY

## A. 06-07MY - COMPONENTS



**B. 08-10MY - COMPONENTS**

AIR CLEANER FILTER ELEMENT

7.0 (71, 62in.lbf)

x2

AIR CLEANER CAP W/ INLET

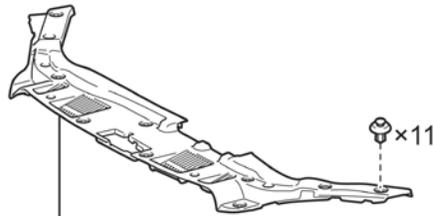
5.0 (51, 44in.lbf)

x3

5.0 (51, 44in.lbf)

x2

AIR CLEANER W/ RESONATOR



COOL AIR INTAKE DUCT SEAL



No. 2 ENGINE ROOM SIDE COVER LH

10 (102, 7)

x2

INVERTER RESERVE TANK SUB-ASSEMBLY



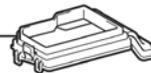
No.2 ENGINE ROOM RELAY BLOCK ASSEMBLY



No.2 UPPER RELAY BLOCK COVER



No.2 LOWER RELAY BLOCK COVER

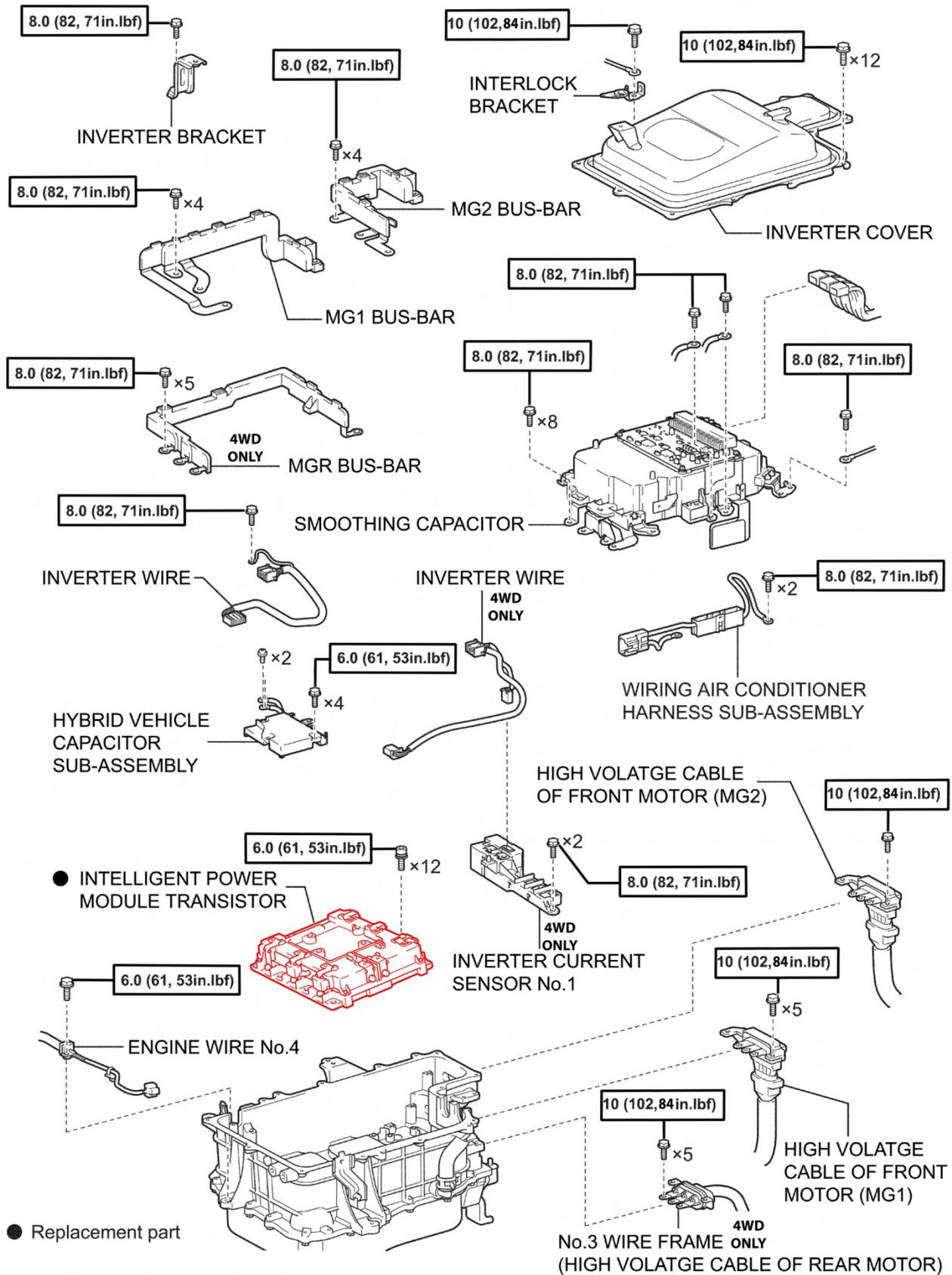


**N\*m (kgf\*cm, ft.\*lbf)**: Specified torque

R1306190002E01

**TORQUE SPECIFICATIONS INSIDE THE INVERTER ARE CRITICAL  
CONFIRM ALL BOLTS ARE TORQUED AS OUTLINED IN THESE INSTRUCTIONS**

**INTERNAL COMPONENTS IN THE INVERTER ARE NOT AVAILABLE AS SERVICE PARTS  
BE CAREFUL WHEN REMOVING, STORING, AND REINSTALLING THESE COMPONENTS**



**C. VEHICLE DISASSEMBLY – There are some slight differences in vehicle disassembly between 06-07MY and 08-10MY, unique steps will be identified in these instructions.**



- It is extremely important that all of the vehicle disassembly steps are followed prior to proceeding to the inverter disassembly steps. Failure to follow all steps could result in inverter damage.
- It is extremely important to prevent contamination of the inverter assembly. Confirm the work area is clean and free from airborne matter.

**1. DETERMINE THE WORK PLACE**

- a) Choose a spot that is free of dust and debris. **DO NOT** work next to a place where grinding or spraying of chemicals is performed.

**2. PLACE THE PROVIDED CAUTION SIGN ON THE ROOF OF THE VEHICLE**

**3. RECORD AUDIO AND AIR CONDITIONING SYSTEM SETTINGS**

**4. CHECK FOR DIAGNOSTIC TROUBLE CODES**

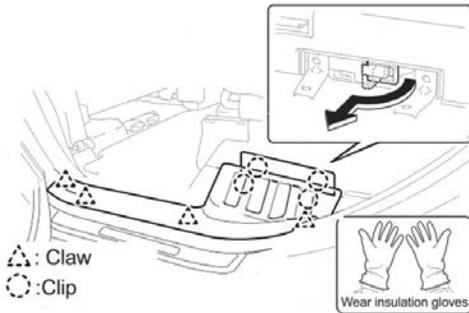
- a) If any DTCs are output record the data.

**5. DISCONNECT THE NEGATIVE BATTERY CABLE**

**6. REMOVE THE SERVICE GRIP**

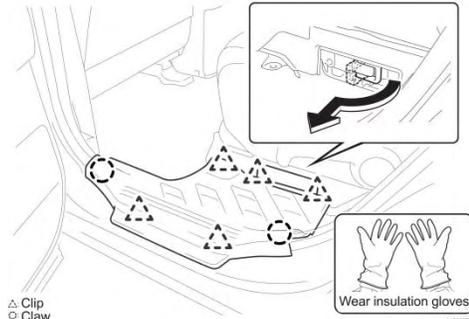
**06-07MY**

- a) Disengage the 4 claws and 2 clips and remove the rear door scuff plate.
- b) Disengage the 2 clips and the service grip access cover.
- c) Wearing insulating gloves, remove the service grip.



**08-10MY**

- a) Disengage the 2 claws and 3 clips and remove the rear door scuff plate.
- b) Disengage the 2 clips and the service grip access cover.
- c) Wearing insulating gloves, remove the service grip.

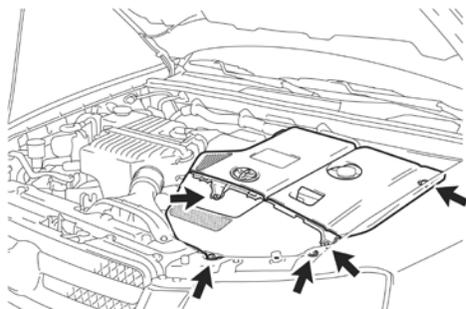


- Store the service grip in a secure location (in your pocket) to prevent accidental installation.
- After removing the service grip, wait at least 5 minutes before working on the high voltage system.
- **DO NOT** attempt to switch the vehicle to READY ON with the service grip removed.

**7. REMOVE THE ENGINE ROOM SIDE COVER LH**

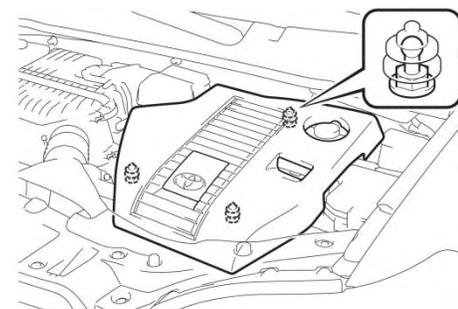
**06-07MY**

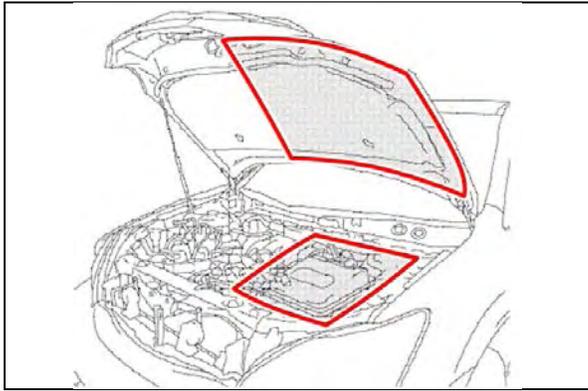
- a) Remove the 5 clips and the two covers.



**08-10MY**

- a) Lift the front of the cover to disengage the 2 front retainers, then continue to lift to disengage the rear retainer.



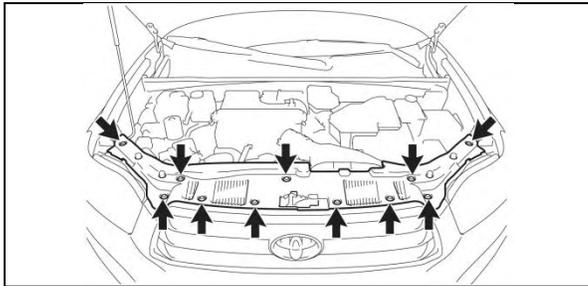


## 8. CLEAN THE AREA AROUND THE INVERTER

- a) Thoroughly remove dust and water from the areas highlighted in the illustration using shop cloths and an air gun.

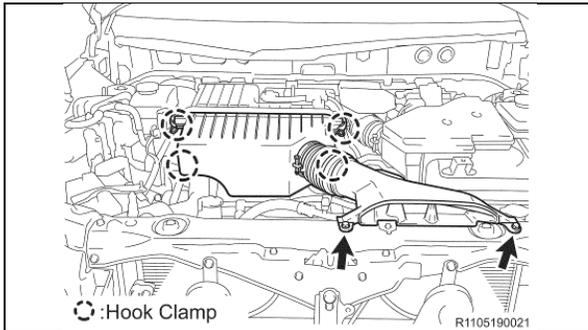


**The inverter is a precision component, contamination can cause a malfunction.**



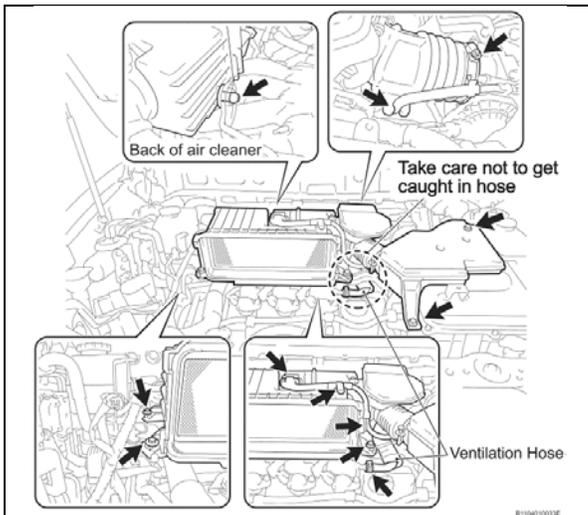
## 9. 08-10MY – REMOVE THE COOL AIR INTAKE DUCT SEAL

- a) Remove the 11 clips and cool air intake duct seal.



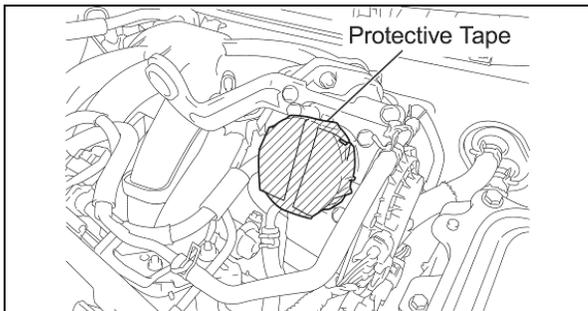
## 10. REMOVE THE AIR CLEANER CAP WITH INLET

- a) Remove the 2 bolts and the 4 hook clamps and the air cleaner.



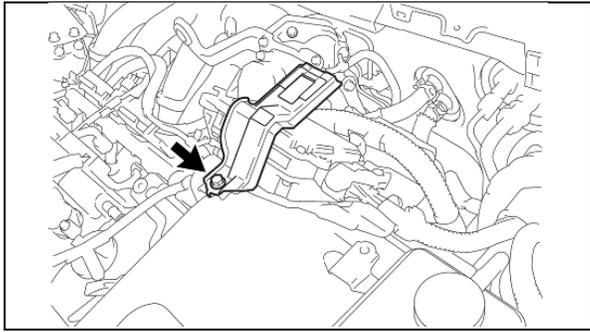
## 11. REMOVE THE AIR CLEANER CASE WITH RESONATOR

- a) Disconnect all hoses and connectors, disconnect the 5 bolts and the air cleaner case.

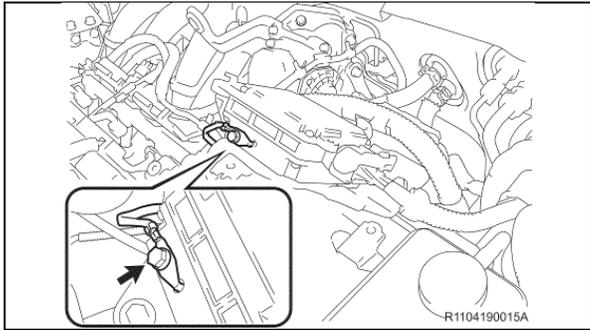


## 12. COVER THE THROTTLE BODY

- a) To prevent foreign material from entering the throttle body, cover with tape.



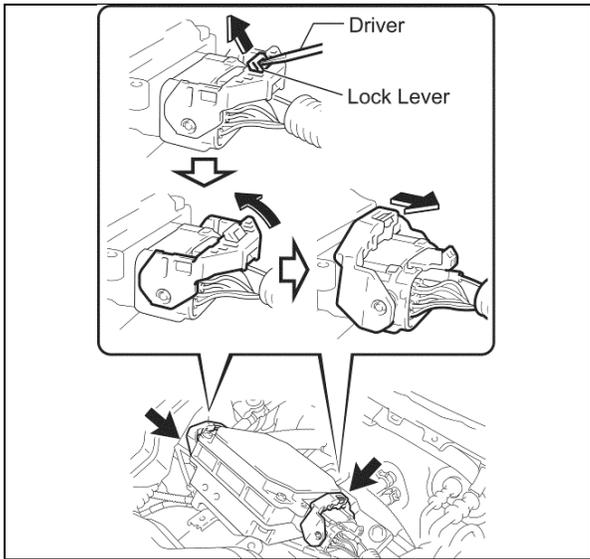
**13. 06-07MY – REMOVE THE INVERTER BRACKET No.5**



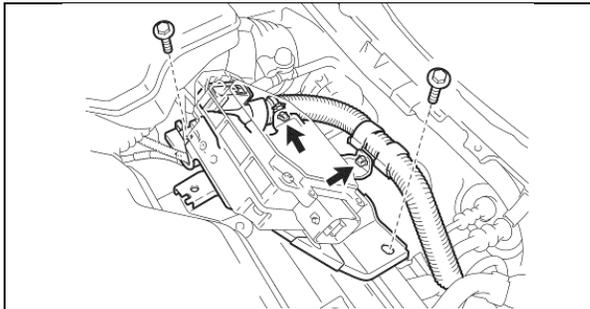
**14. 06-07MY – REMOVE THE POWER STEERING ECU ASSEMBLY**

**STOP** Wear insulating gloves when removing the power steering gear ECU, circuit voltage is approximately 42V.

- a) Remove the ground wire bolt and ground wire.
- b) Wrap the ground terminal with insulating tape.
- c) Remove the 2 connectors as described in the illustration.
- d) Wrap the terminals of the connectors with insulating tape.

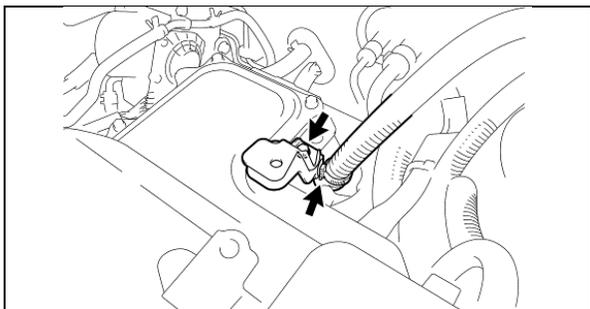


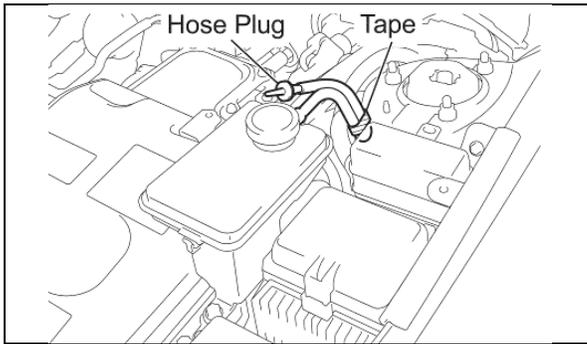
- e) Disconnect the 2 wire harness clamps.
- f) Remove the 2 bolts and the ECU.



**15. 06-07MY – REMOVE THE POWER STEERING ECU BRACKET**

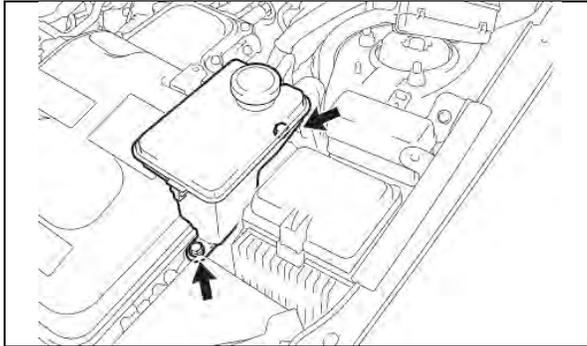
- a) Remove the bolt and bracket.



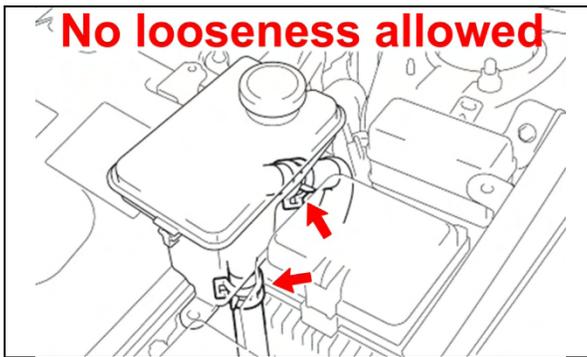


**16. DISPLACE THE INVERTER RESERVE TANK SUB ASSEMBLY**

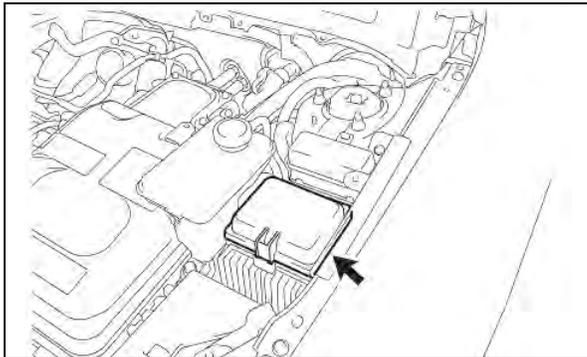
- a) Confirm the tank cap is securely tightened.
- b) Plug the overflow hose, then fix the hose with tape as illustrated to prevent coolant leakage.



- c) Remove the 2 bolts for the reserve tank.

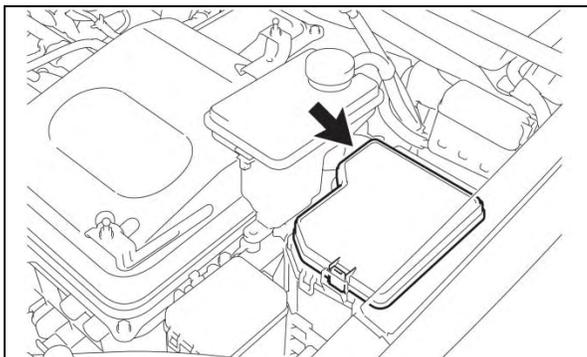


- d) Confirm the 2 hoses connected to the reserve tank are secure.



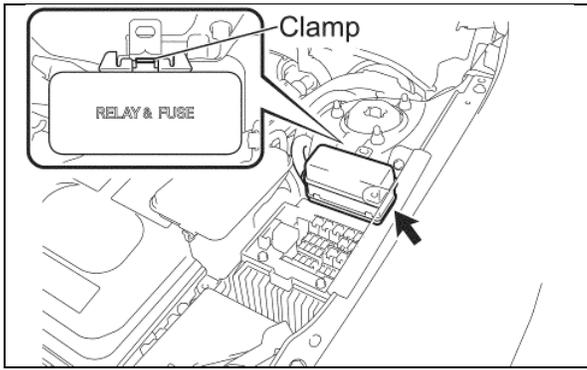
**17. 06-07MY – REMOVE THE JUNCTION BLOCK COVER**

**NOTE:** The reserve tank cannot be displaced unless the cover is removed.

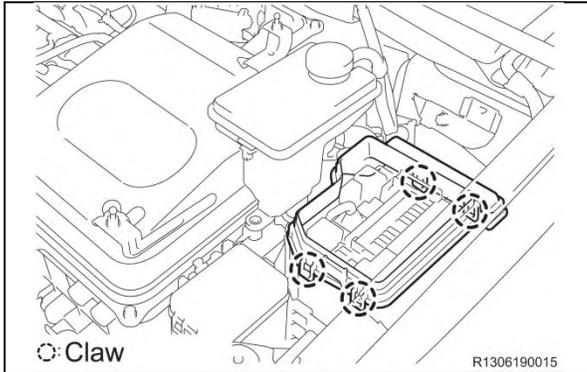


**18. 08-10MY – REMOVE THE No.2 UPPER RELAY BLOCK COVER**

**NOTE:** The reserve tank cannot be displaced unless the cover is removed.

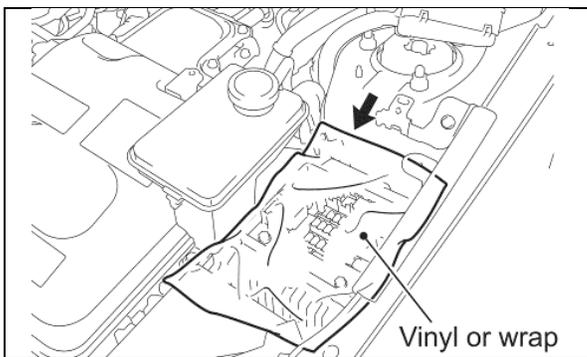


**19. DISCONNECT THE ENGINE ROOM RELAY BLOCK No.3**



**20. 08-10MY – REMOVE THE No.2 LOWER RELAY BLOCK COVER**

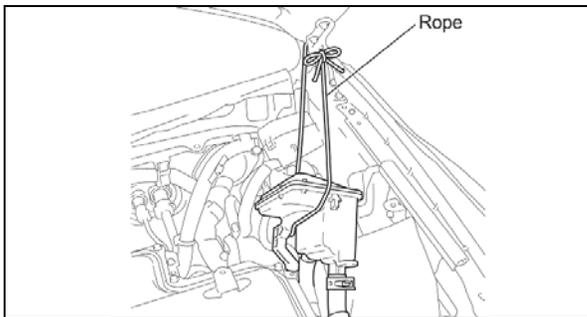
- a) Disengage the 4 claws and remove the cover.



**21. PROTECT THE JUNCTION BLOCK**

- a) Cover the exposed fuses and relays with a waterproof material.

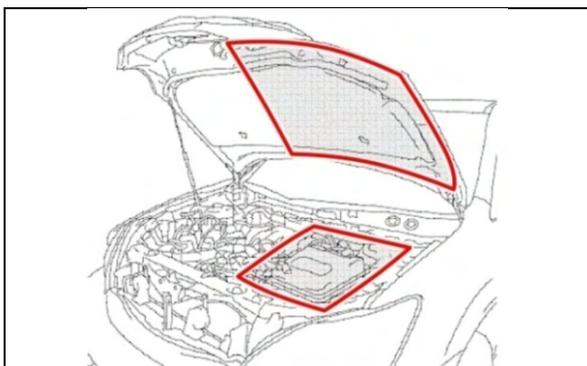
**NOTE: DO NOT** use tape to cover the junction block as relays and fuses may be pulled out when the tape is removed.



**22. DISPLACE THE INVERTER RESERVE TANK SUB ASSEMBLY**

- a) Displace the reserve tank and secure it to the hood hinge to gain access to the inverter cover.
- b) Confirm the reserve tank does not leak coolant when in the displaced position.

**NOTE: DO NOT** put excessive strain on the reserve tank hoses.



**23. CLEAN THE AREA AROUND THE INVERTER**

- a) Confirm all dust and water has been removed from the areas highlighted in the illustration. Clean using shop cloths and an air gun.

**STOP** The inverter is a precision component and any contamination may cause a malfunction.

**THE FOLLOWING CONFIRMATION STEPS ARE VITAL  
CONFIRM THESE STEPS ARE FOLLOWED CLOSELY**

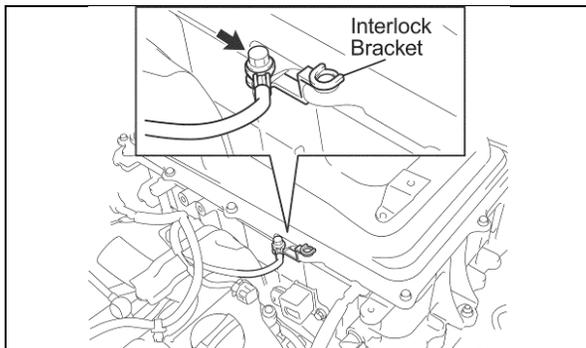
**PERFORM THIS INTERMEDIATE INSPECTION BEFORE BEGINNING WORK ON THE INVERTER.**

1. Is the work space clear of dust and water?
2. Is the "Working with high voltage" warning sign posted?
3. Is the auxiliary battery disconnected and the service grip in a secure location (in your pocket)?
4. Is the inverter reserve tank displaced securely and free of leaks?
5. Are the areas around the inverter and the underside of the hood properly cleaned?
6. Are you wearing electrical insulating gloves that are in good condition?
7. Is the protective cover A clean and available for use?
8. Have you discharged all potential static electricity from your person?

**D. INVERTER DISASSEMBLY**



- It is extremely important to prevent contamination of the inverter assembly.
- Confirm the work area is clean and free from airborne matter.
- Be sure to wear electrical insulating gloves during the entire inverter disassembly procedure.
- DO NOT use any air tools or power tools during the inverter disassembly procedure.
- Confirm all tools used on HV components are insulated or wrapped with insulating tape.
- Internal components in the inverter are not available as service parts, be careful when removing, storing, and reinstalling these components.

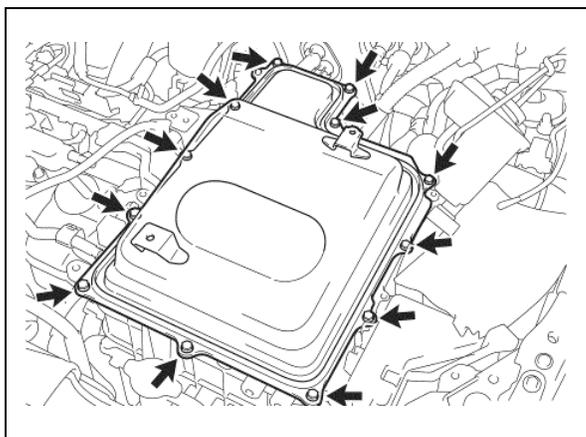


**1. REMOVE THE INVERTER COVER**

- a) Remove the bolt and the interlock bracket.
- b) Wrap the terminal with insulating tape.



Confirm the entire cowl assembly has been removed prior to removing the inverter cover. Failure to do so could result in damage in the inverter.



- c) Loosen the 12 bolts evenly in 2 increments to remove the cover.

**NOTE:**

- DO NOT deform the cover during removal.
- To prevent damage to the insulating gloves, wear work gloves over the insulating gloves.



- Take extra precautions to prevent foreign material from entering the inverter.
- DO NOT touch the circuit board inside the inverter.

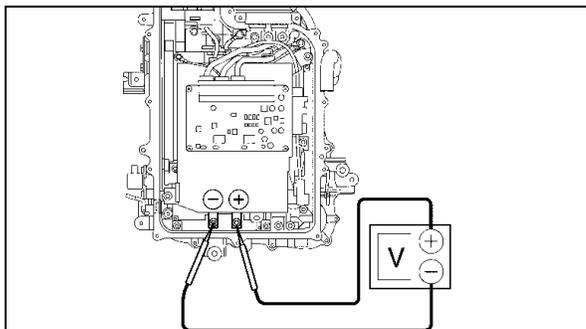
- d) Store the inverter cover in a safe location to prevent damage to the inverter cover gasket.

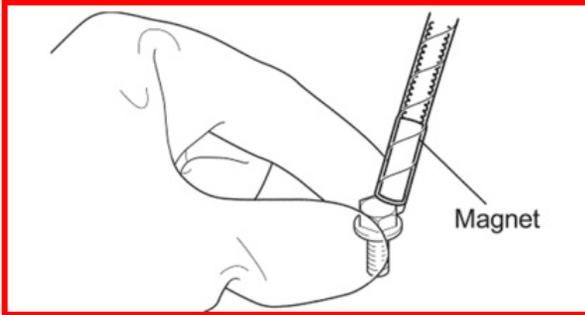
**2. PERFORM A FINAL VOLTAGE CHECK**

- a) Measure the voltage at the points indicated in the illustration.

**Standard Voltage: 0V**

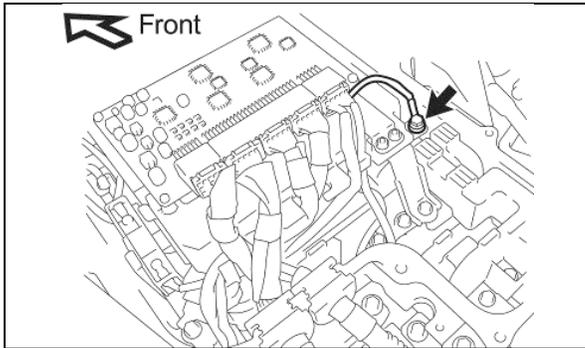
**NOTE:** If voltage is present, confirm all previous steps to disable the high voltage system have been followed.





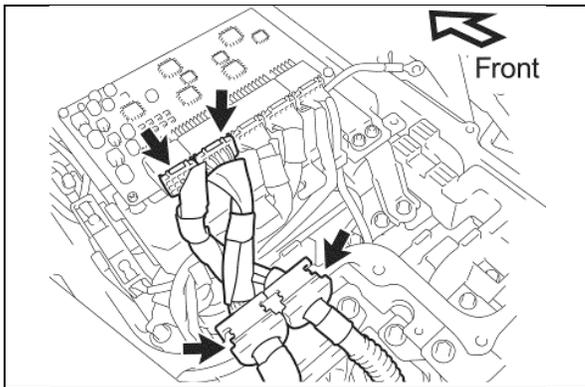
**NOTE:**

- To prevent dropping any bolts into the inverter it may be necessary to use a magnet to pick up bolts as they are loosened.
- If bolts are dropped into the bottom section of the inverter it may be necessary to completely remove the inverter for retrieval.

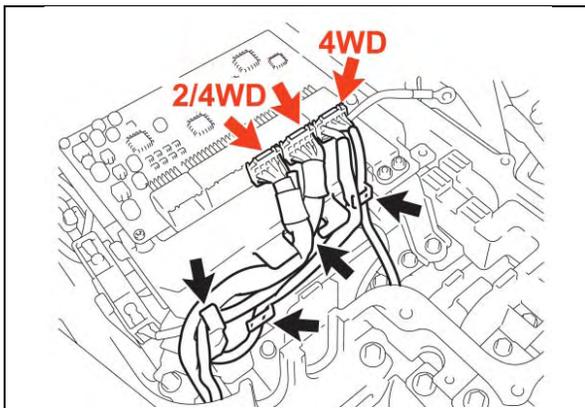


**3. DISCONNECT THE MG ECU CONNECTORS**

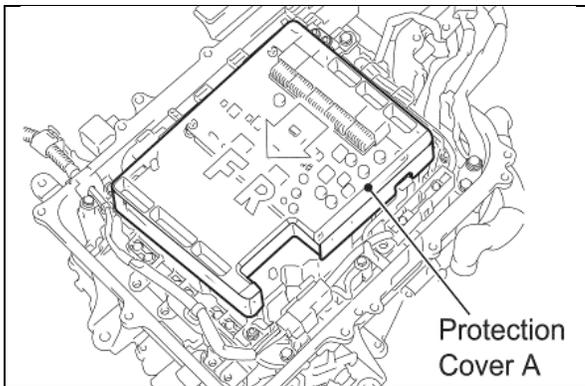
a) Remove the ground bolt.



b) Disconnect the 2 connectors and the 2 grommets.



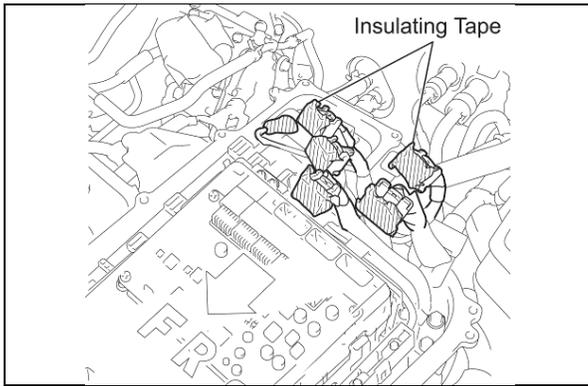
c) **4WD** – Disconnect the 3 connectors and remove the wires from the clamps.  
**2WD** – Disconnect the 2 connectors and remove the wires from the clamps.



**4. INSTALL PROTECTIVE COVER A**

a) Immediately install the cover to protect the circuit board from damage and contamination.

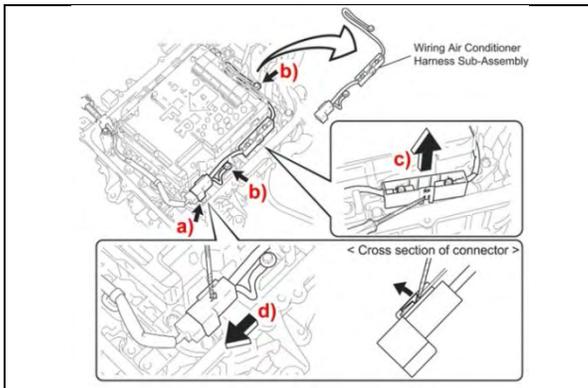
**NOTE: Use caution when installing the cover to avoid damaging the MG ECU.**



### 5. PROTECT THE CONNECTORS AND HARNESS

- a) Cover the disconnected connectors and terminal with insulating tape.
- b) Bundle the harness and secure it away from the inverter.

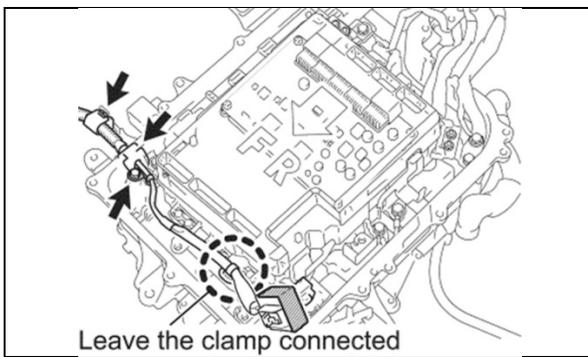
**NOTE:** Confirm the harness is positioned so the sharp edge of the inverter case does not cut the wires.



### 6. REMOVE THE AIR CONDITIONER HARNESS SUB ASSEMBLY

- a) Disconnect the connector.
- b) Remove the 2 ground bolts.
- c) Raise the tab of the fuse box to remove it from the bracket.
- d) Raise the tab of the connector to remove it from the bracket.

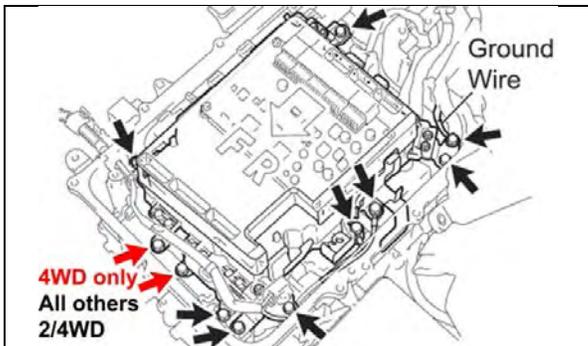
**STOP** **DO NOT** remove the harness until all connectors have been disconnected to prevent damaging components.



### 7. DISCONNECT THE ENGINE WIRE No.4

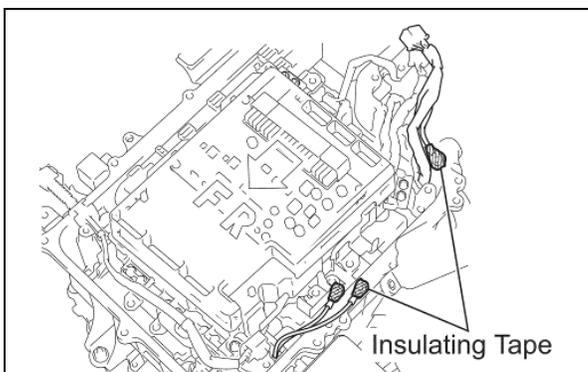
- a) Cover the connector with insulating tape.
- b) Remove the bolt.
- c) Disconnect the grommet.
- d) Disconnect the harness clamp located **outside** the inverter.

**NOTE:** **DO NOT** disconnect the harness clamp located inside the inverter at this time to avoid damaging the clamp or the smoothing capacitor.



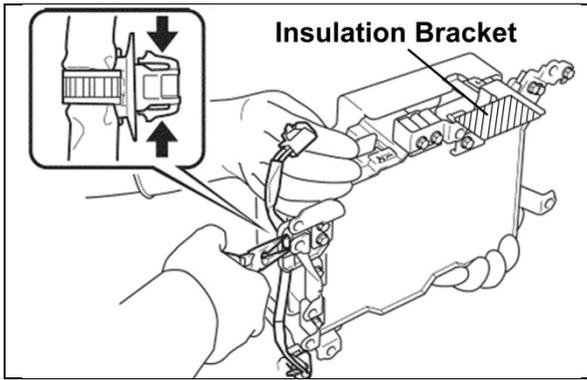
### 8. REMOVE THE SMOOTHING CAPACITOR

- a) 4WD – Remove the 11 bolts.  
2WD – Remove the 9 bolts.



- b) Cover the terminals with insulating tape.

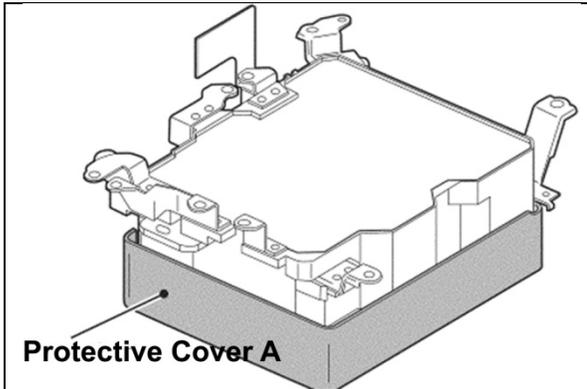
**NOTE:** Confirm protective cover A is fully installed.



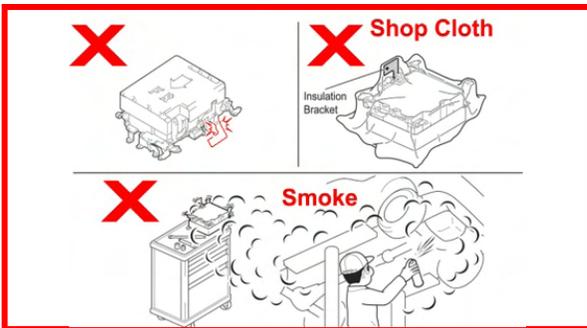
- c) Lift the smoothing capacitor.
- d) Disconnect the wire harness clamp.
- e) Remove the smoothing capacitor.

**NOTE:**

- **DO NOT** bend the insulation bracket.
- **Handle the smoothing capacitor carefully.**

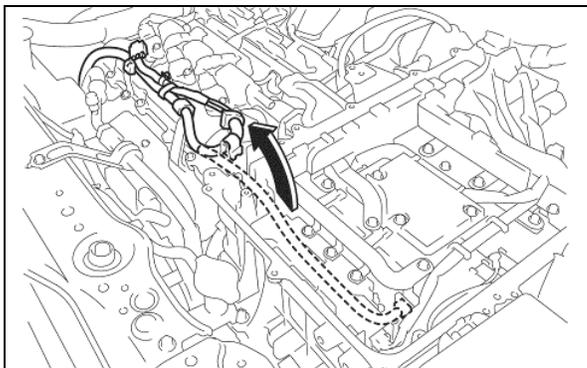


- f) Store the smoothing capacitor with protective cover A down.



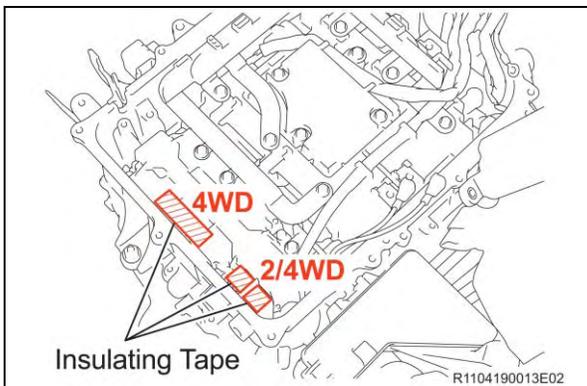
**NOTE:**

- **DO NOT** store the smoothing capacitor with protective cover A facing up.
- **DO NOT** cover the smoothing capacitor with a shop cloth to avoid damaging the insulation bracket.
- **Store the smoothing capacitor in a location that is free of dust and other airborne matter.**

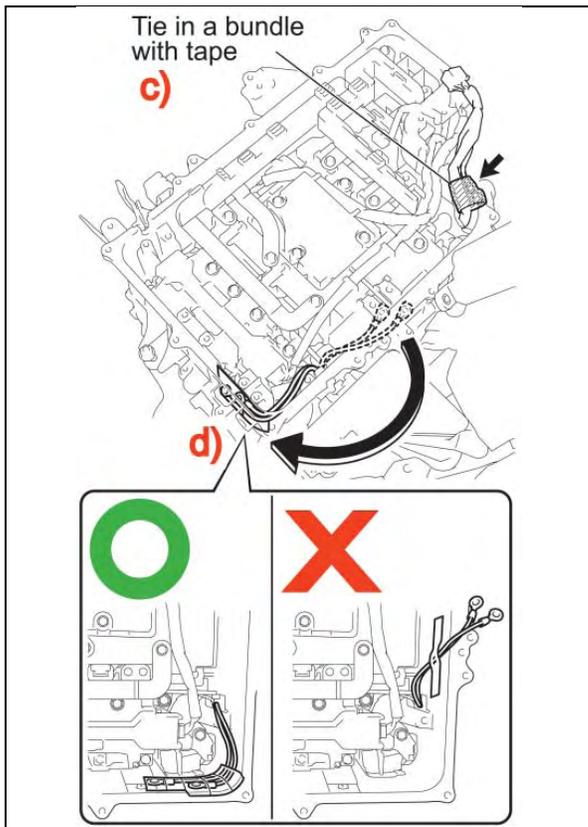


**9. PROTECT THE HARNESSES AND TERMINALS**

- a) Position the disconnected harness outside the inverter so it does not obstruct the work.

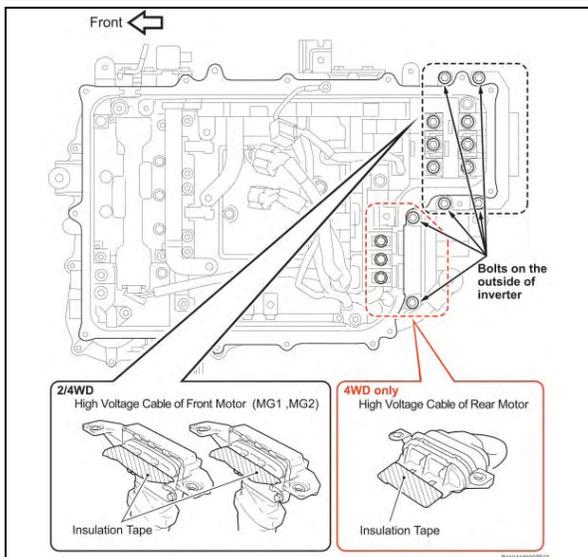


- b) Cover the terminals indicated in the illustration with insulating tape.



- c) Secure the terminal to the other harnesses at the rear of the inverter so it does not obstruct the work.
- d) Secure the 2 forward terminals to the inner wall of the inverter as indicated in the illustration so they do not obstruct the work.

**NOTE: DO NOT** position the terminals in a way that will allow the inverter cover to pinch them when the cover is temporarily installed.

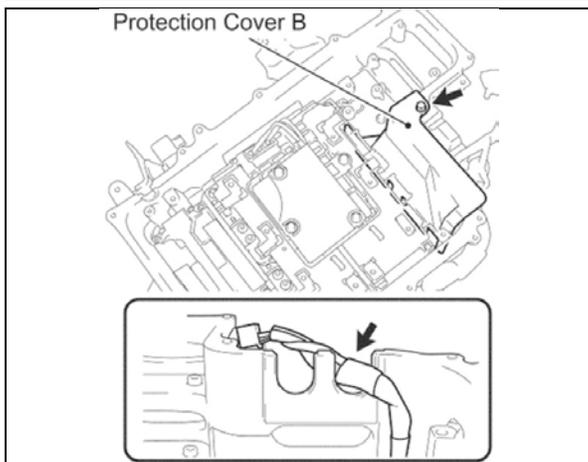


## 10. DISCONNECT THE HIGH VOLTAGE CABLES

- a) **4WD** – Remove the 15 bolts and disconnect the high voltage MG1, MG2, and MGR cables. Cover the terminals with insulating tape.
- 2WD** – Remove the 10 bolts and disconnect the high voltage MG1 and MG2 cables. Cover the terminals with insulating tape.



To prevent contamination, **DO NOT** use the bolts that were removed from the outside of the inverter on the inside.

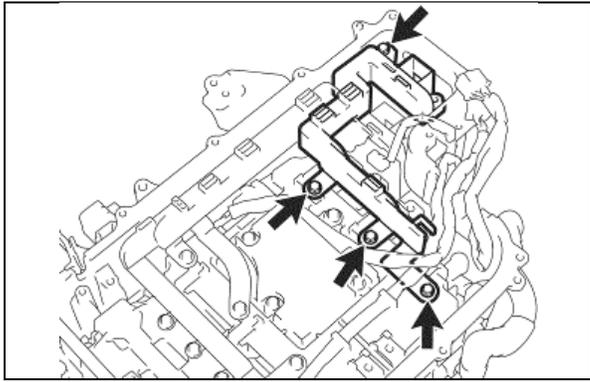


## 11. 2WD ONLY – INSTALL PROTECTIVE COVER B

- a) Position the wire harness in the groove of the inverter case.
- b) Install protective cover B using an inverter cover bolt.

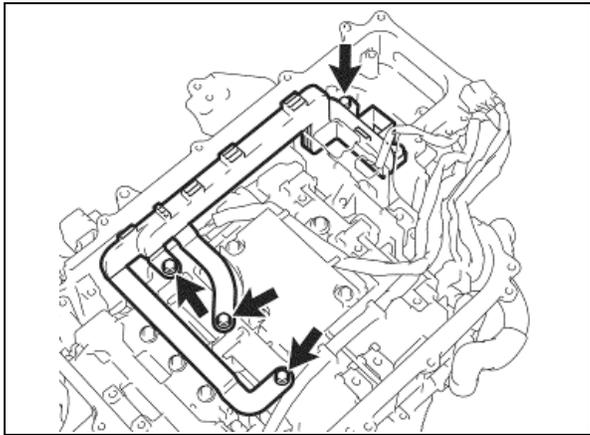
**NOTE:**

- Tighten the bolt by hand **ONLY**.
- Protective Cover B will be installed on 4WD vehicles at step 18.



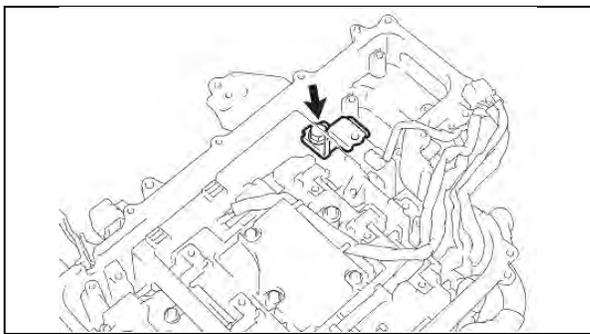
#### 12. REMOVE THE MG2 BUS BAR

- a) Remove the 4 bolts and the bus bar.



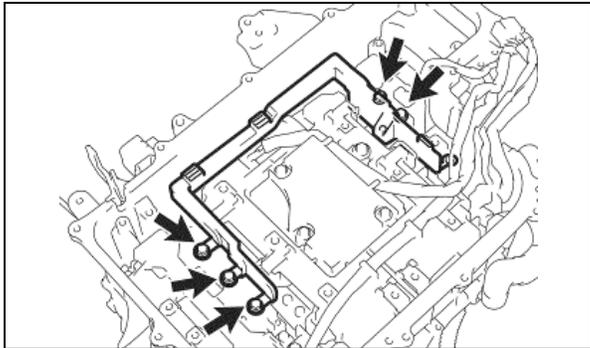
#### 13. REMOVE THE MG1 BUS BAR

- a) Remove the 4 bolts and the bus bar.



#### 14. 4WD ONLY – REMOVE THE INVERTER BRACKET

- a) Remove the bolt and the bracket.

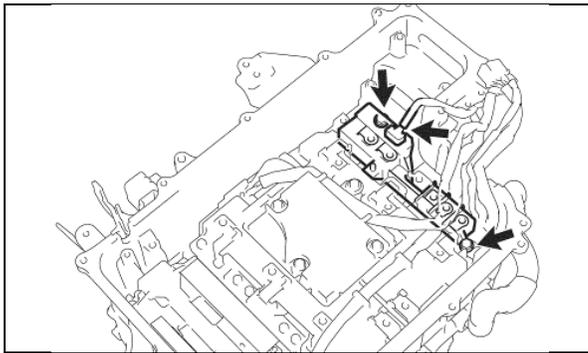


#### 15. 4WD ONLY – REMOVE THE MGR BUS BAR

- a) Remove the 5 bolts and the bus bar.

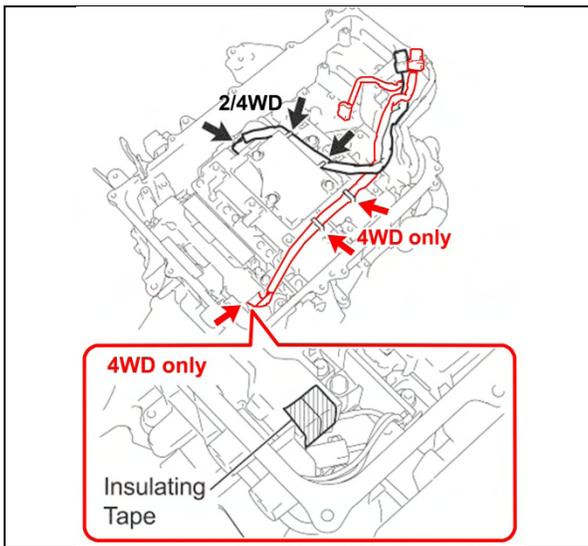


- b) Cover the terminals indicated in the illustration with insulating tape.



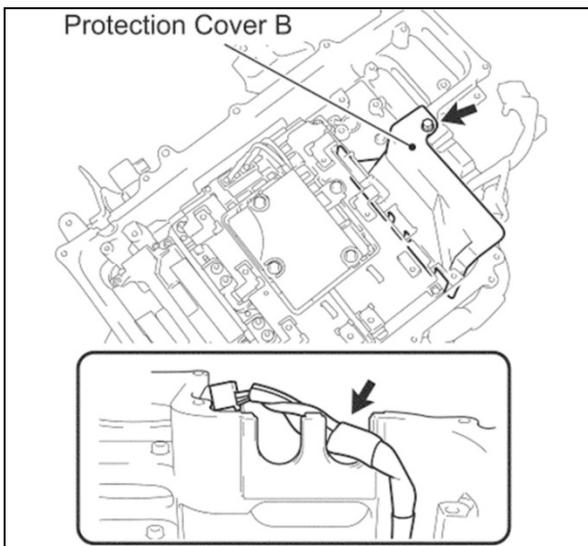
**16. 4WD ONLY – REMOVE THE INVERTER CURRENT SENSOR No.1**

- a) Disconnect the connector.
- b) Remove the 2 bolts and the sensor.



**17. REMOVE THE INVERTER WIRE HARNESSSES**

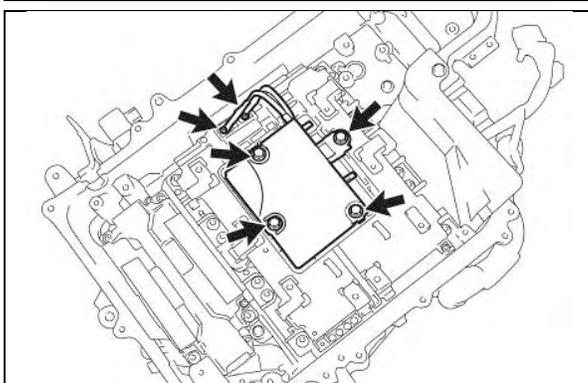
- a) **4WD ONLY** – Disconnect the 2 clamps and the connector and remove the harness. Attach insulating tape to the connector indicated in the illustration.
- 2/4WD** – Disconnect the 2 clamps and the connector and remove the harness.



**18. INSTALL PROTECTIVE COVER B**

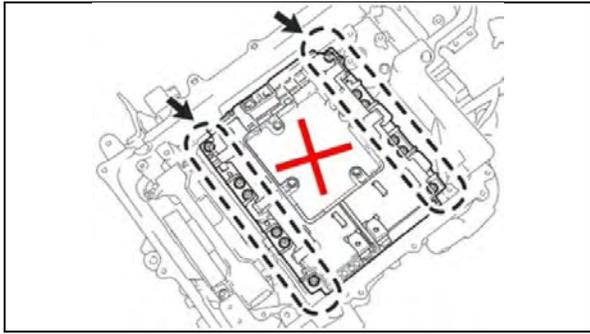
- a) Position the wire harness in the groove of the inverter case.
- b) Install protective cover B using an inverter cover bolt.

**NOTE: Tighten the bolt by hand ONLY.**



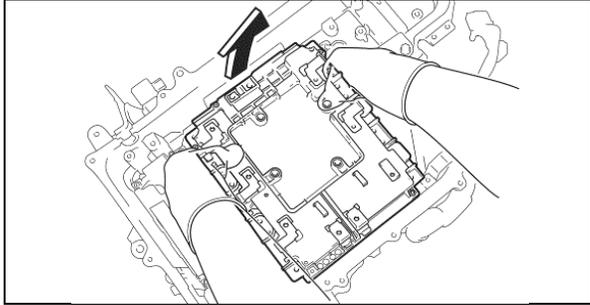
**19. REMOVE THE HYBRID VEHICLE CAPACITOR SUB ASSEMBLY**

- a) Remove the 2 terminal screws.
- b) Remove the 4 bolts and the capacitor.



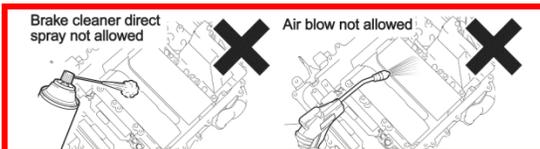
## 20. REMOVE THE INTELLIGENT POWER MODULE (IPM) TRANSISTOR

- a) Mark the IPM transistor so that it is not reused.
- b) Remove the 12 bolts.
- c) Lift one side of the IPM transistor to release the connection caused by the heat conductive grease.
- d) Remove the IPM transistor.



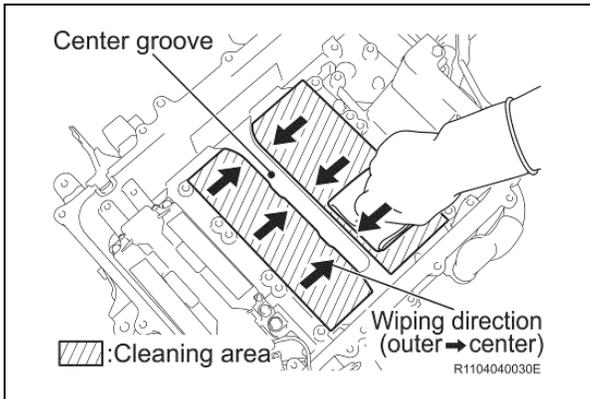
**DO NOT** use any pry tools when removing the IPM transistor, this may damage the inverter case.

## E. INVERTER CLEANING



### NOTE:

- **DO NOT** spray brake cleaner directly in the inverter.
- **DO NOT** use an air gun in the inverter.

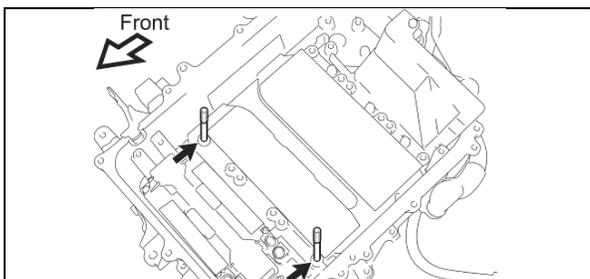


## 1. CLEAN THE INVERTER CASE

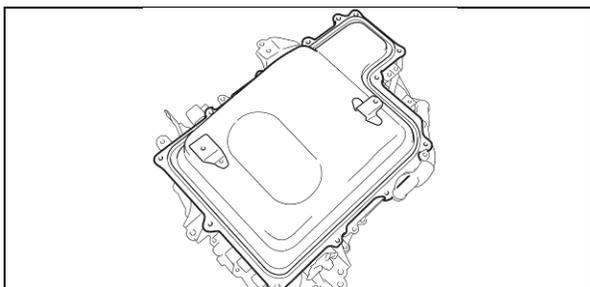
- a) Use a shop cloth soaked with brake cleaner to remove the grease.
- b) Wipe the grease toward the center groove in the case to avoid getting the grease in the bolt holes.



- **If grease is in the bolt holes clean carefully with a shop cloth soaked in brake cleaner.**
- **Confirm no pieces of the shop cloth remain in the inverter.**
- **Confirm all electrical terminals are free from grease.**



- c) Confirm **ALL** grease is removed from the inverter case.
- d) Install the 2 installation studs.



## 2. TEMPORARILY INSTALL THE INVERTER COVER

- a) Install the inverter cover while applying grease to the new IPM transistor to prevent contamination in the inverter assembly.

### NOTE:

- **DO NOT** remove protective cover B
- **DO NOT** pinch any harnesses between the cover and inverter.

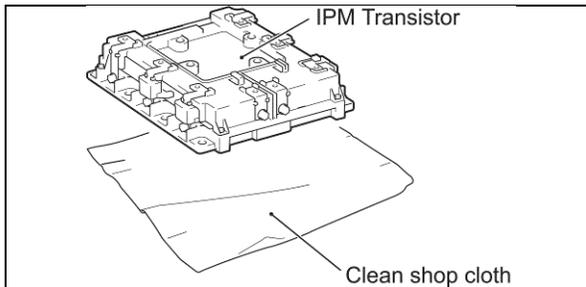
## VII. GREASE APPLICATION

**THE FOLLOWING CONFIRMATION STEPS ARE VITAL  
CONFIRM THESE STEPS ARE FOLLOWED CLOSELY**

**PERFORM THIS INTERMEDIATE INSPECTION BEFORE APPLYING GREASE TO THE IPM TRANSISTOR.**

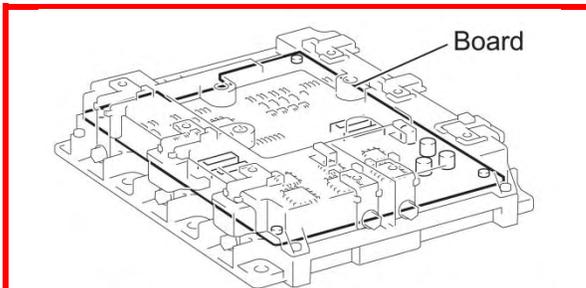
1. Is the smoothing capacitor stored properly with protective cover A installed?
2. Are the disconnected high voltage terminals covered with insulating tape?
3. Has the inverter case been thoroughly cleaned?
4. Is the inverter cover temporarily installed?
5. Is the grease application work space clear of dust, water and other forms of contamination?
6. Is the masking plate and squeegee clean and in good condition?
7. Have you discharged all potential static electricity from your person?

### A. IPM TRANSISTOR ASSEMBLY



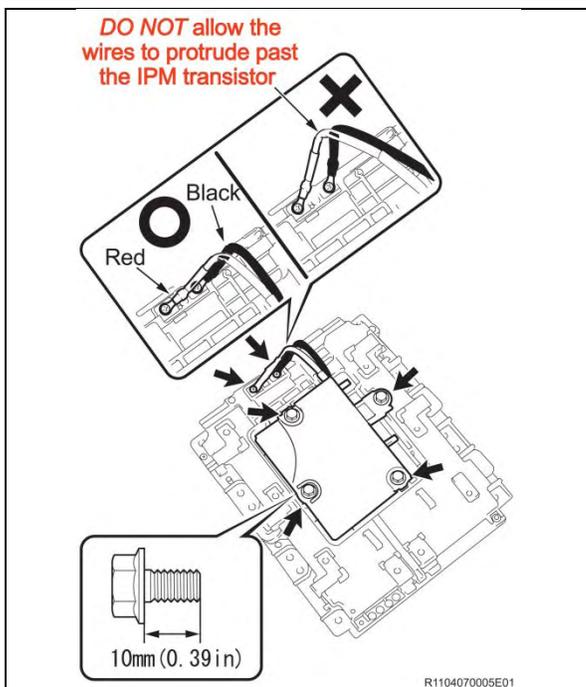
#### 1. ASSEMBLE THE NEW IPM TRANSISTOR

- a) Place the new IPM transistor on a clean shop cloth.



**DO NOT touch the circuit board that is between the upper and lower sections of the IPM transistor.**

**Do not touch the board**



- b) Install the sub capacitor with the 4 bolts.

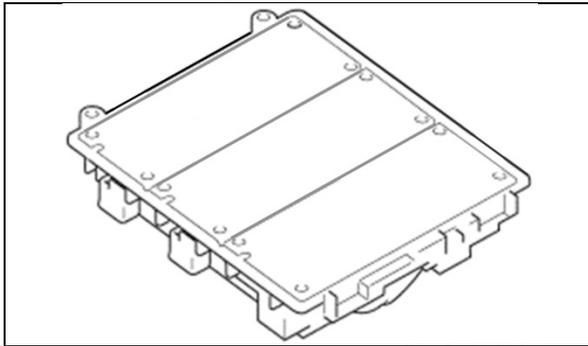
**Torque: 6.0N·m (61kgf·cm, 53in. lbf)**

- c) Install the 2 wires with the 2 screws.

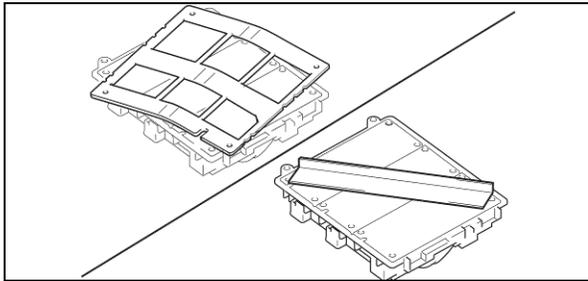
**NOTE:**

- **DO NOT** attach the wires to the incorrect terminals.
- **Position the wires so they do not protrude past the IPM transistor.**

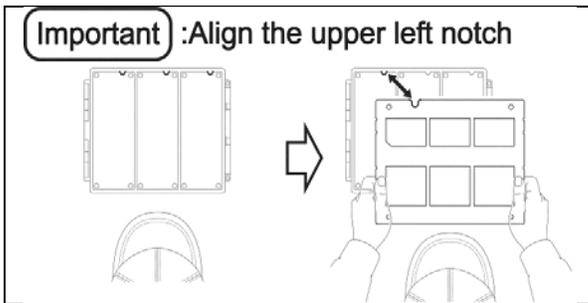
## B. IPM TRANSISTOR GREASE APPLICATION



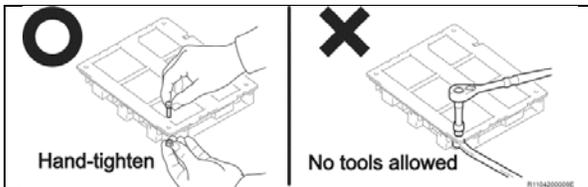
1. PLACE THE IPM TRANSISTOR UPSIDE DOWN ON A CLEAN SURFACE



2. INSPECT THE MASKING PLATE AND SQUEEGEE
  - a) Confirm the masking plate and squeegee are clean.
  - b) Confirm the masking plate and squeegee are not bent or damaged.

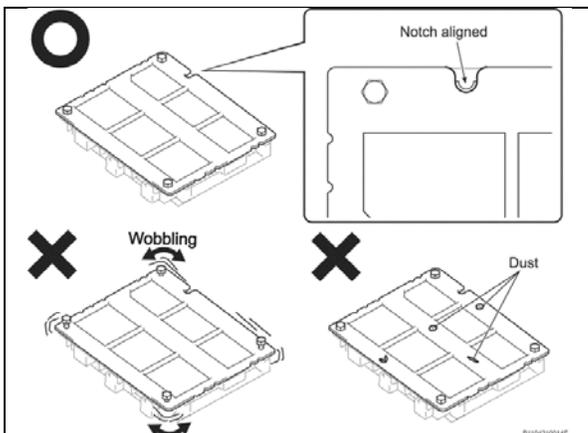


3. INSTALL THE MASKING PLATE
  - a) Place the IPM transistor so the 3 notches are at the top.
  - b) Align the upper left notch in the masking plate with the alignment notch in the IPM transistor.

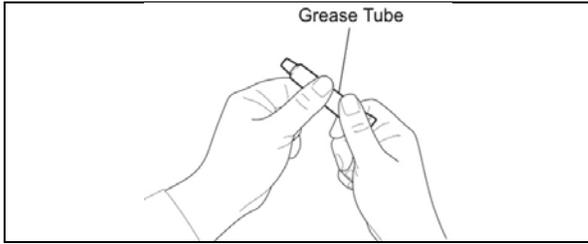


- c) Tighten the masking plate by hand using the 4 nuts/bolts provided.

**NOTE: DO NOT use tools when tightening the masking plate to prevent damage.**



- d) Confirm the masking plate is installed in the correct position.
  - e) Confirm the masking plate is securely attached.
  - f) Confirm the masking plate is clean.



#### 4. PREPARE 2 TUBES OF THERMAL CONDUCTIVE GREASE

- Knead the tubes to confirm the grease is properly mixed.
- Clean the tubes with brake cleaner.

**NOTE:** The tubes may be used to apply the grease, it is critical that they are clean.

**GREASE 747 EXPIRATION DATE EXPLANATION**

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The expiration date *DOES NOT* indicate that the grease is not useable. It is *OKAY* to use grease that is beyond the expiration date. The tube of grease must be kneaded to confirm the grease is properly mixed prior to use.

**NOTE:**

- Two tubes of grease are necessary for each IPM transistor.
- The first tube of grease will cover the upper half of the IPM transistor and the second tube will cover the lower half as indicated in the illustration.

**a) 1st application area**

**b) 1st 5mm of grease should be applied on the masking plate**

**c) Target notches**

**d) Grease cross section**

**e) Grease application**

#### 5. APPLY THE FIRST TUBE OF GREASE

- Confirm the area the first tube of grease will cover.
- Confirm the first 5mm of grease is applied on the masking plate as the initial portion of grease may not be completely mixed.
- Apply the grease by following the target notches on the masking plate.
- The grease should be applied in strips that are approximately 6mm wide and 2.5mm in height. (This is the size of the target notches on the masking plate)
- Confirm grease is applied fully from start to finish in the masking plate windows.

**a) 2nd application area**

**b) 1st 5mm of grease should be applied on the masking plate**

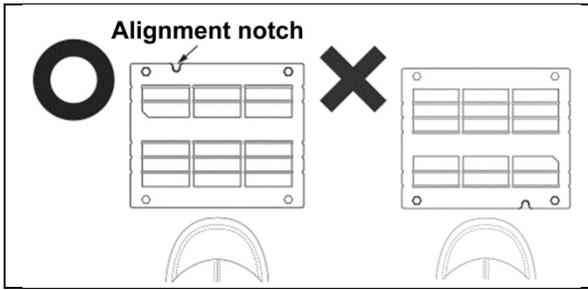
**c) Target notches**

**d) Grease cross section**

**e) Grease application**

#### 6. APPLY THE SECOND TUBE OF GREASE

- Confirm the area the second tube of grease will cover.
- Confirm the first 5mm of grease is applied on the masking plate as the initial portion of grease may not be completely mixed.
- Apply the grease by following the target notches on the masking plate.
- The grease should be applied in strips that are approximately 6mm wide and 2.5mm in height. (This is the size of the target notches on the masking plate)
- Confirm grease is applied fully from start to finish in the masking plate windows.



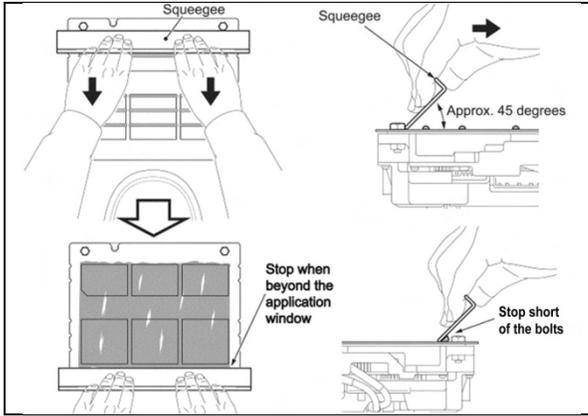
## 7. SPREAD THE GREASE

a) Position the IPM transistor so the alignment notch on the masking plate is in the upper left position.

b) Hold the squeegee at a 45 degree angle.

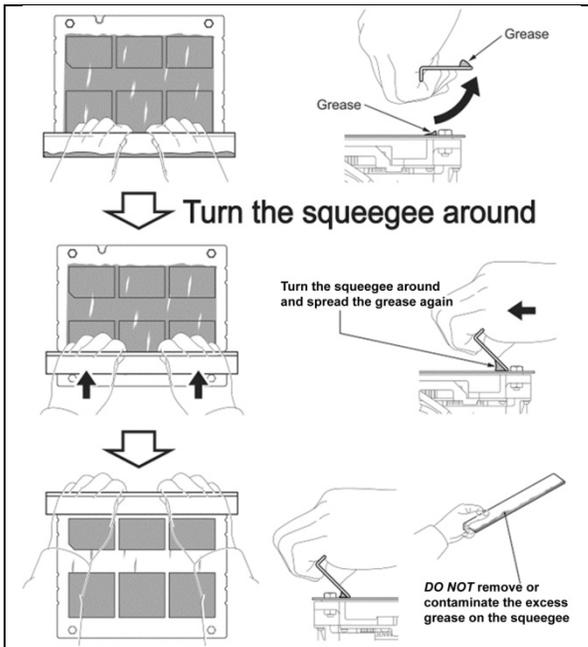
c) Beginning on the upper side of the IPM transistor, slide the squeegee down past the bottom of the application windows.

**NOTE: To ensure all grease is used effectively, *DO NOT* slide the squeegee into the bolts.**



d) Lift the squeegee with the grease.

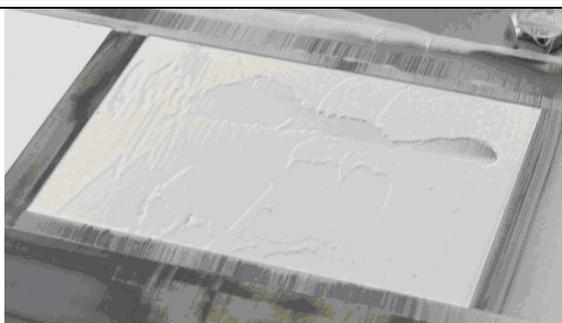
e) Turn the squeegee around and slide it from the bottom of the IPM transistor up past the top of the application windows.



***DO NOT* remove the excess grease from the squeegee until it has been confirmed that the grease has been spread correctly.**

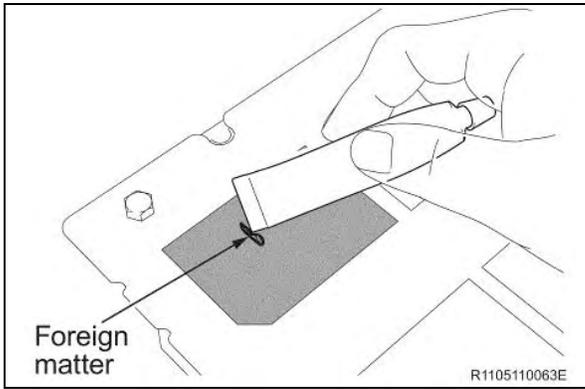
**THE FOLLOWING STEPS ARE VITAL  
CONFIRM THESE STEPS ARE FOLLOWED CLOSELY**

**CONFIRM THE CONDITION OF THE THERMAL CONDUCTIVE GREASE**

SAMPLE	CONDITION & ACTION REQUIRED
	<p><b>CONDITION:</b> Smooth surface and complete coverage.</p> <p><b>ACTION:</b> Proceed to: <b>SECTION VIII. REASSEMBLY</b></p>
	<p><b>CONDITION:</b> Grease unsmooth. Metal surface of the IPM transistor <b>NOT</b> visible through the grease.</p> <p><b>ACTION:</b> Proceed to: <b>SECTION VIII. REASSEMBLY</b></p>
	<p><b>CONDITION:</b> Grease unsmooth. Metal surface of the IPM transistor visible through the grease.</p> <p><b>ACTION:</b> Proceed to: <b>STEP C #2. REAPPLY GREASE TO THE NEEDED AREAS</b></p>
	<p><b>CONDITION:</b> Hole or imperfection in the grease exposing the metal surface of the IPM transistor.</p> <p><b>ACTION:</b> Proceed to: <b>STEP C #2. REAPPLY GREASE TO THE NEEDED AREAS</b></p>
	<p><b>CONDITION:</b> Foreign material in the grease.</p> <p><b>ACTION:</b> Proceed to: <b>STEP C #1. REMOVE FOREIGN MATERIAL FROM THE GREASE</b></p>

### C. GREASE APPLICATION CORRECTION

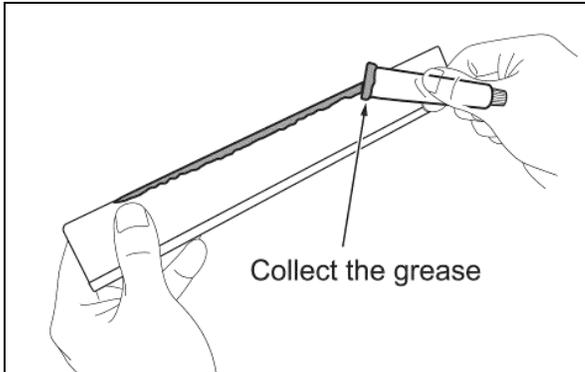
(Only perform these steps if the above inspection determines it is necessary)



#### 1. REMOVE FOREIGN MATERIAL FROM THE GREASE

- a) Use one of the tubes of grease to remove the foreign material from the grease.

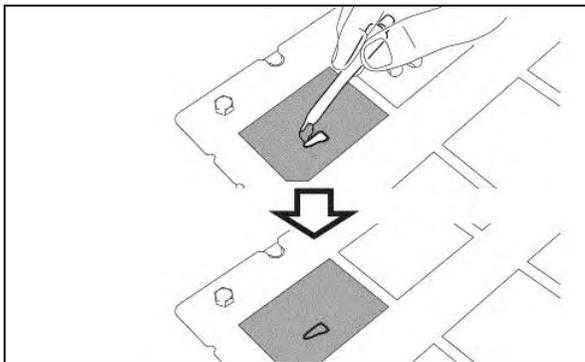
**NOTE: Confirm the tube is clean before use.**



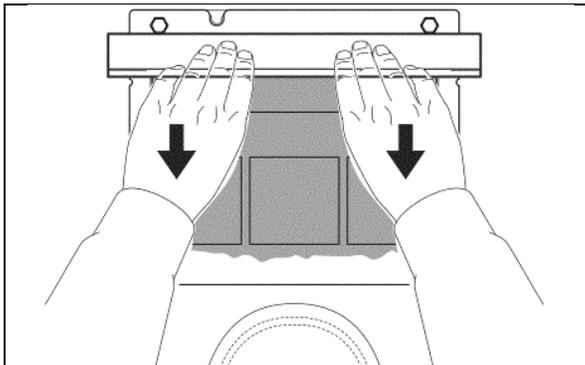
#### 2. REAPPLY GREASE TO THE NEEDED AREAS

- a) Collect the grease remaining on the squeegee using one of the tubes of grease.

**NOTE: Confirm the tube is clean before use.**



- b) Apply the grease the areas with a shortage.



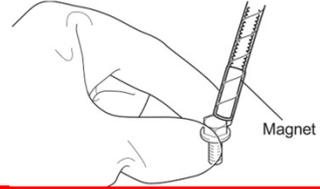
- c) Use the squeegee as before to smooth the grease.

- d) Reconfirm the condition of the grease using the confirmation steps on the previous page.

## VIII. REASSEMBLY

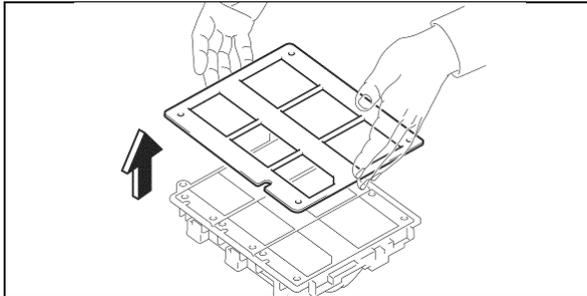
### A. INVERTER REASSEMBLY

**TORQUE SPECIFICATIONS INSIDE THE INVERTER ARE CRITICAL  
CONFIRM ALL BOLTS ARE TORQUED AS OUTLINED IN THESE INSTRUCTIONS**



#### NOTE:

- To prevent dropping any bolts into the inverter it may be necessary to use a magnet to set the bolts as they are installed.
- If bolts are dropped into the bottom section of the inverter it may be necessary to completely remove the inverter for retrieval.

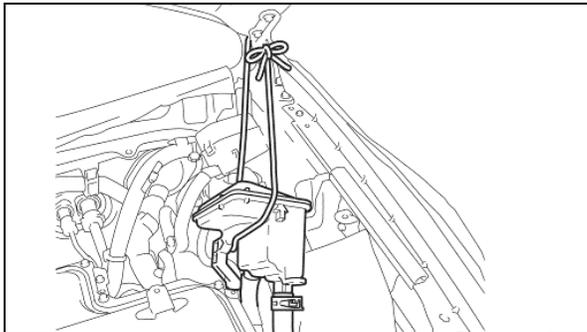


#### 1. REMOVE THE MASKING PLATE

- a) Remove the 4 nuts and bolts.
- b) Slowly remove the masking plate.

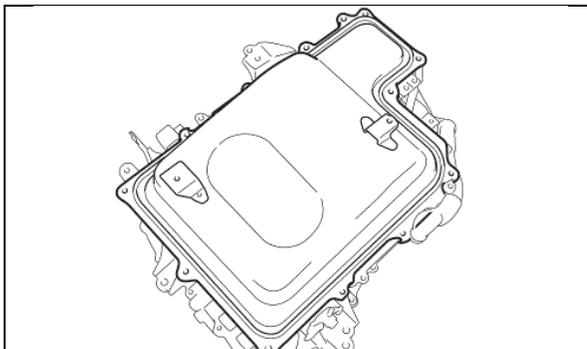


- **DO NOT** displace the grease when removing the masking plate. If the grease is scraped off when removing the plate, return to STEP B. IPM TRANSISTOR GREASE APPLICATION



#### 2. CONFIRM THE INVERTER RESERVE TANK SUB ASSEMBLY IS NOT LEAKING

- a) Before installing the IPM transistor, confirm there is no coolant leaking.

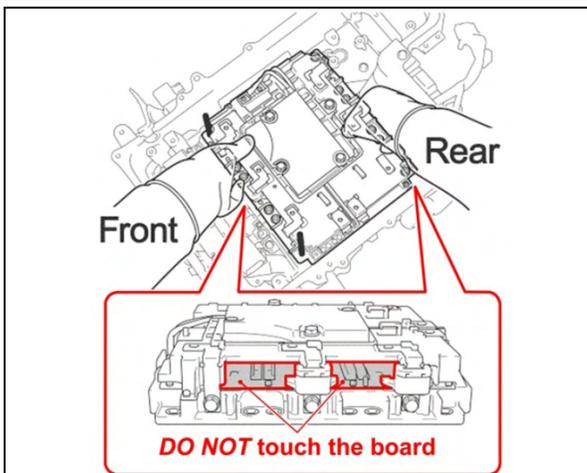


#### 3. INSTALL THE NEW IPM TRANSISTOR



- Be sure to wear electrical insulating gloves during the inverter reassembly procedure.

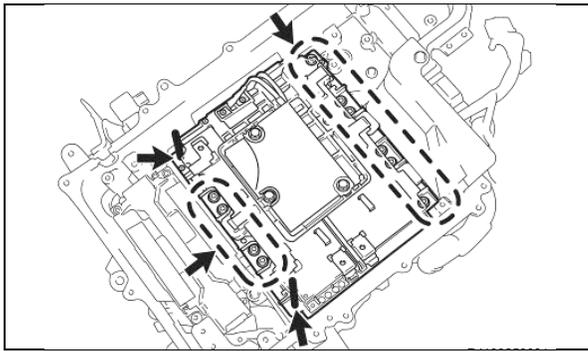
- a) Remove the inverter cover.



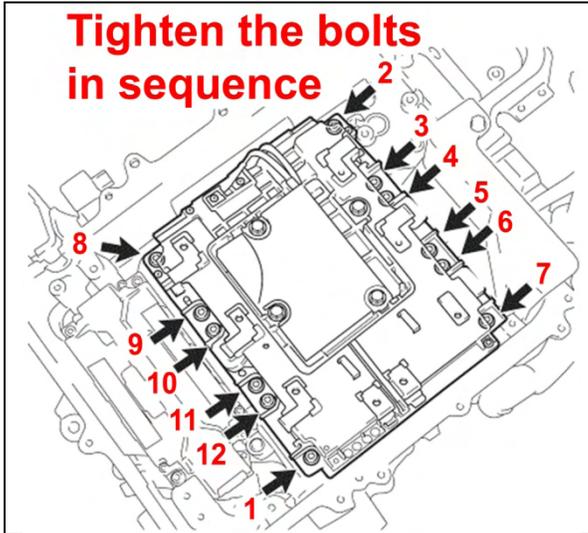
- Confirm the inside of the inverter is clean.
- **DO NOT** touch the circuit board in the IPM transistor.
- Confirm the 2 installation studs are installed.

- b) Hold the front and back of the IPM transistor and place it in the inverter.

**NOTE:** Confirm the IPM transistor is positioned correctly before installation as it can be installed in two different positions.



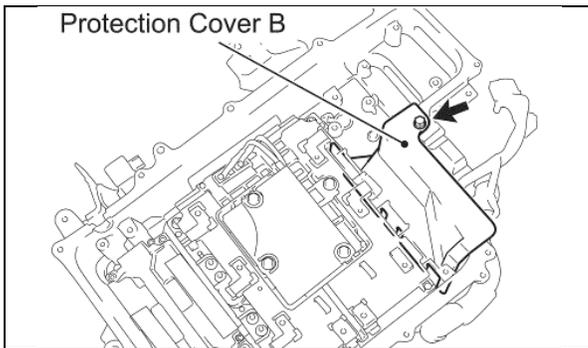
- c) Loosely install 10 bolts.
- d) Remove the 2 installation studs.
- e) Loosely install the 2 remaining bolts.



- f) Tighten the 12 bolts in the sequence shown in the illustration.

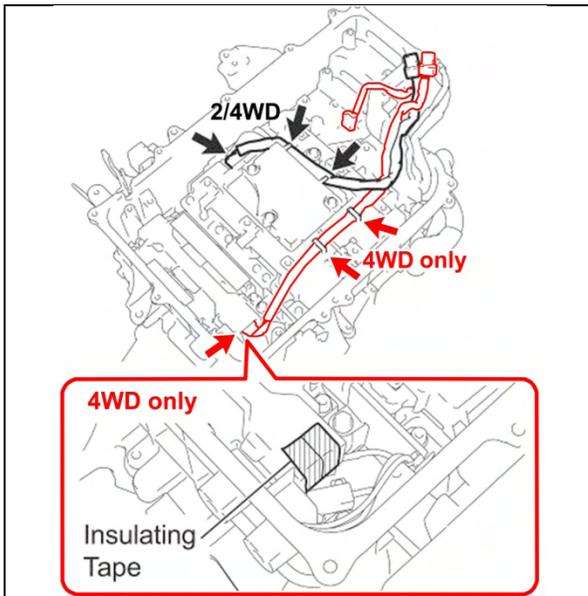
**Torque: 6N·m (61kgf·cm, 53 in.lbf)**

**NOTE: Confirm the 12 bolts are tightened in the correct sequence to ensure the grease contacts correctly.**



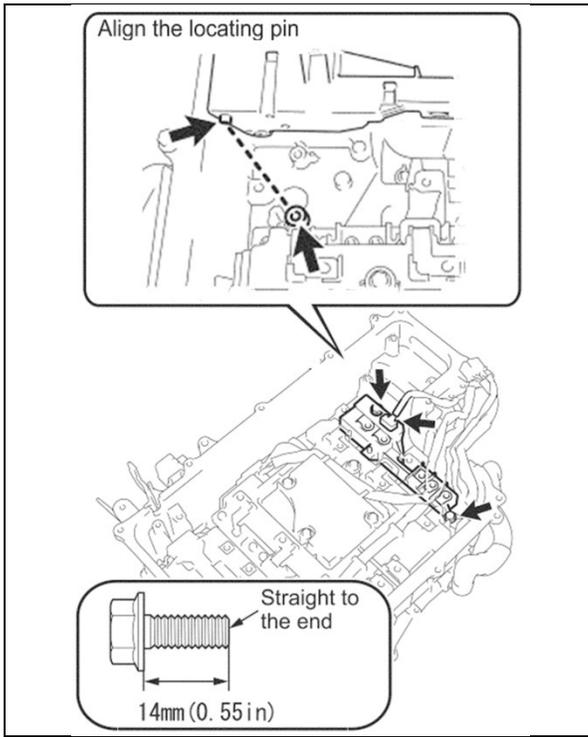
**4. 4WD ONLY – REMOVE PROTECTIVE COVER B**

**NOTE: Protective Cover B will be removed on STEP 11 on 2WD vehicles.**



**5. INSTALL THE INVERTER WIRE HARNESSSES**

- a) **4WD ONLY** – Connect the 2 clamps and 1 connectors.
- 2/4WD** – Connect the 2 clamps and the connector.



**6. 4WD ONLY – INSTALL THE INVERTER CURRENT SENSOR No.1**

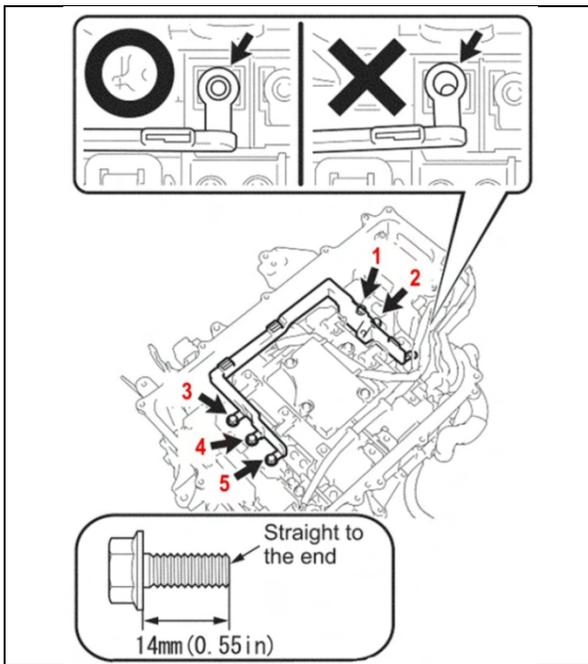
- a) Install the current sensor. Confirm the sensor is installed in the locating pin.
- b) Install the 2 bolts.

**Torque: 8N·m (82kgf·cm, 71 in.lbf)**



**The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.**

- c) Connect the electrical connector.

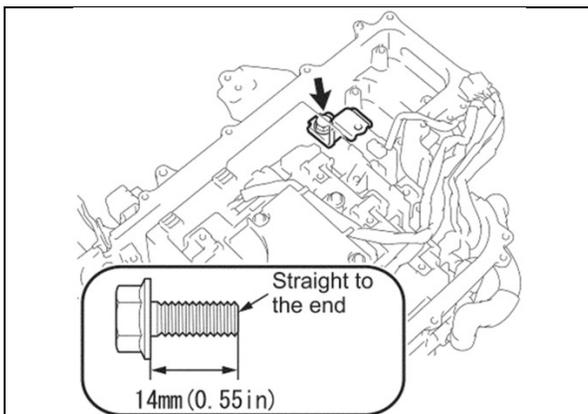


**7. 4WD ONLY – INSTALL THE MGR BUS BAR**

- a) Remove the insulating tape attached to the terminals and confirm they are clean.
- b) Install the bus bar.
- c) Install the 5 bolts in the sequence shown in the illustration.

**Torque: 8N·m (82kgf·cm, 71 in. lbf)**

**NOTE: DO NOT install a bolt in the sixth hole at this time, only confirm the terminal is aligned correctly.**

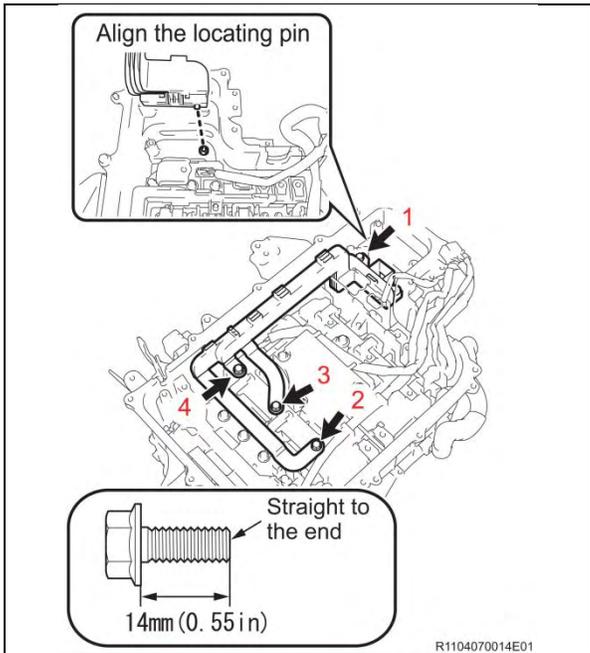


**8. 4WD ONLY – INSTALL THE INVERTER BRACKET**

- a) Install the bracket with 1 bolt.

**Torque: 8N·m (82kgf·cm, 71 in. lbf)**

**NOTE: The inverter bracket should be present on 2WD vehicles, the bracket should not have been removed.**

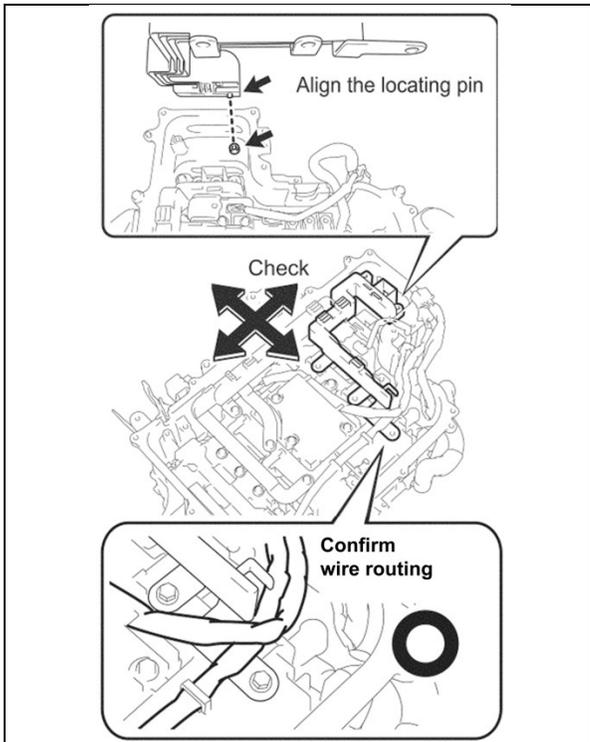


**9. INSTALL THE MG1 BUS BAR**

- a) Confirm the terminals are clean.
- b) Install the bus bar. Confirm the bus bar is installed in the locating pin.
- c) Install the 4 bolts in the sequence shown in the illustration.

**Torque: 8N·m (82kgf·cm, 71in. lbf)**

**STOP** The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.

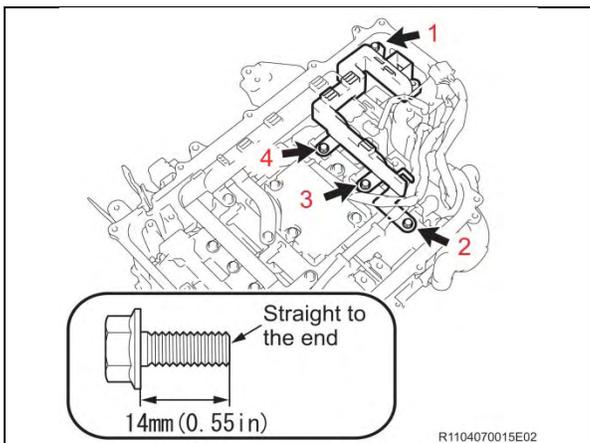


**10. INSTALL THE MG2 BUS BAR**

- a) Confirm the terminals are clean.
- b) Install the bus bar. Confirm the bus bar is installed in the locating pin.

**NOTE: Confirm the harnesses are routed correctly.**

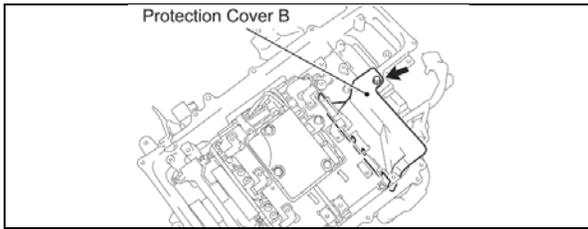
**STOP** The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.



- c) Install the 4 bolts in the sequence shown in the illustration.

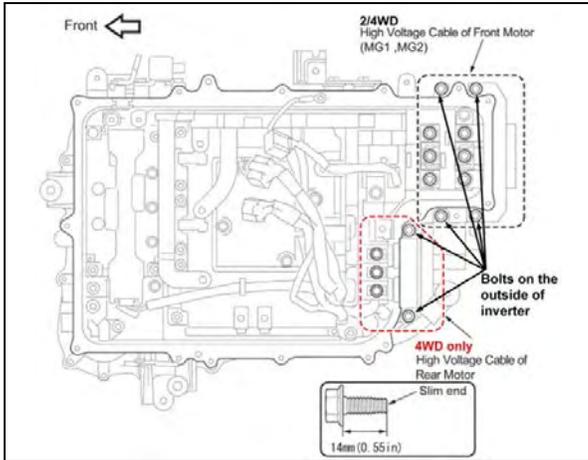
**Torque: 8N·m (82kgf·cm, 71in. lbf)**

**STOP** The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.



### 11. 2WD ONLY – REMOVE PROTECTIVE COVER B

**NOTE:** Protective Cover B was removed on STEP 4 on 4WD vehicles.



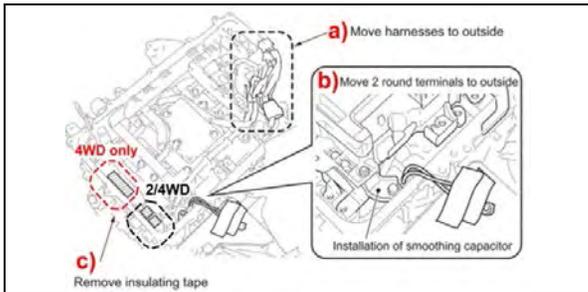
### 12. INSTALL THE HIGH VOLTAGE CABLES

- Remove the insulating tape attached to the terminals and confirm they are clean.
- 4WD – Install the 15 bolts.  
2WD – Install the 10 bolts.

**Torque: 10N·m (102kgf·cm, 84in. lbf)**

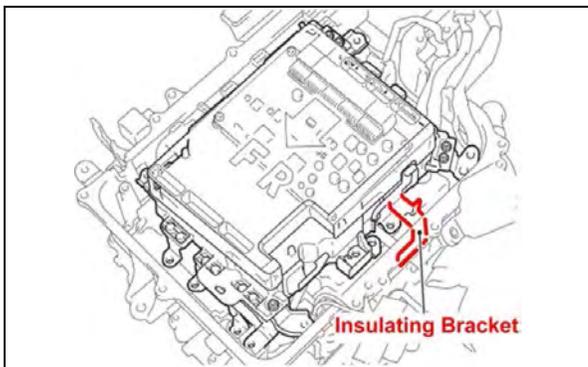
**NOTE:** If there is difficulty installing the high voltage cables, reconfirm the bus bars are installed in their locating pins.

**STOP** To prevent contamination, **DO NOT** use the bolts that were removed from the outside of the inverter on the inside.



### 13. PREPARE THE INVERTER FOR SMOOTHING CAPACITOR INSTALLATION

- Secure the inverter harnesses so they do not interfere when installing the smoothing capacitor.
- Move the 2 terminals that were fixed inside the inverter during the disassembly process to the outside of the inverter.
- Remove the insulating tape attached to the terminals.

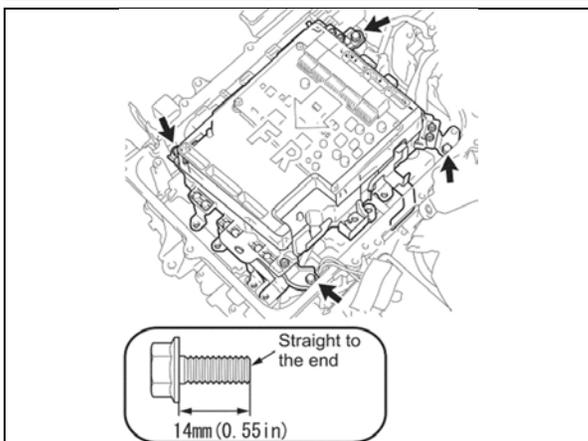


### 14. INSTALL THE SMOOTHING CAPACITOR

- Hold the smoothing capacitor with protective cover A installed.
- Carefully place the smoothing capacitor in the inverter.

**STOP**

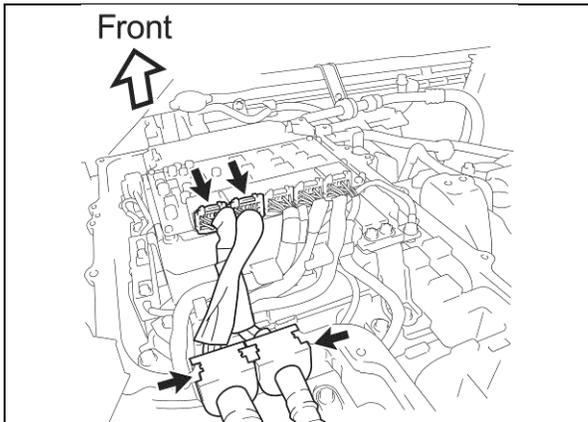
- DO NOT** catch any wires when installing the smoothing capacitor.
- Pay close attention to the insulating bracket, this bracket must not be bent and must be positioned between the inverter case and the IPM transistor.



- Install the 4 bolts.

**Torque: 8N·m (82kgf·cm, 71in. lbf)**





e) Connect the 2 connectors and fit the 2 grommets.

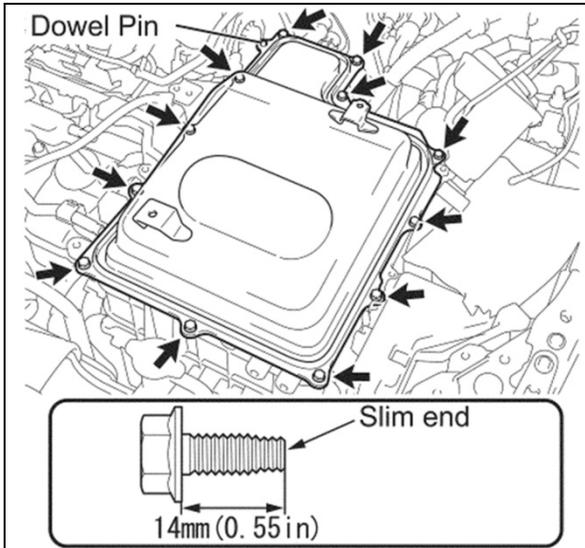


- Cross the 2 harnesses inside the inverter.
- The harnesses can be crossed in either direction.
- Confirm the grommets are clean before installing to prevent leaks.

**THE FOLLOWING CONFIRMATION STEPS ARE VITAL  
CONFIRM THESE STEPS ARE FOLLOWED CLOSELY**

**PERFORM THIS INTERMEDIATE INSPECTION BEFORE INSTALLING THE INVERTER CASE COVER.**

1. Are the high voltage cables (MG1, MG2 and MGR for 4WD) connected correctly?
2. Are all of the MG ECU connectors secured and the ground bolts connected?
3. Have all components been installed correctly in the inverter assembly?

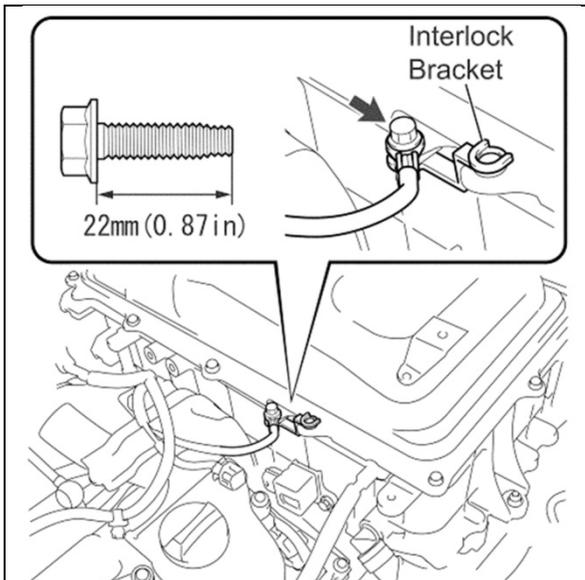


**18. INSTALL THE INVERTER COVER**

- a) Confirm the cover gasket is set in the cover groove.
- b) Confirm the cover gasket and inverter mating surface are clean.
- c) Install the cover using the 12 bolts.

**Torque: 10N·m (102kgf·cm, 84in. lbf)**

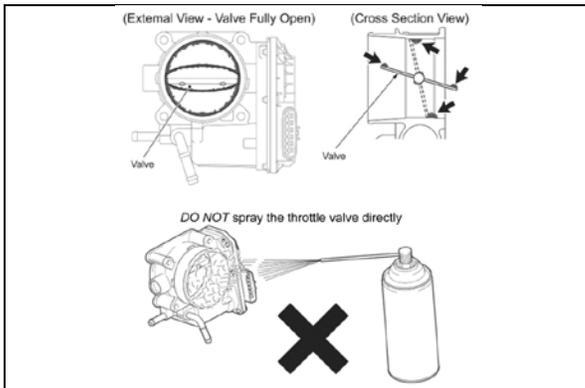
**NOTE: The cover gasket can be reused even if it has come out of the groove.**



- d) Remove the insulating tape from the interlock bracket.
- e) Install the bracket with the 1 bolt.

**Torque: 10N·m (102kgf·cm, 84in. lbf)**

## B. VEHICLE REASSEMBLY



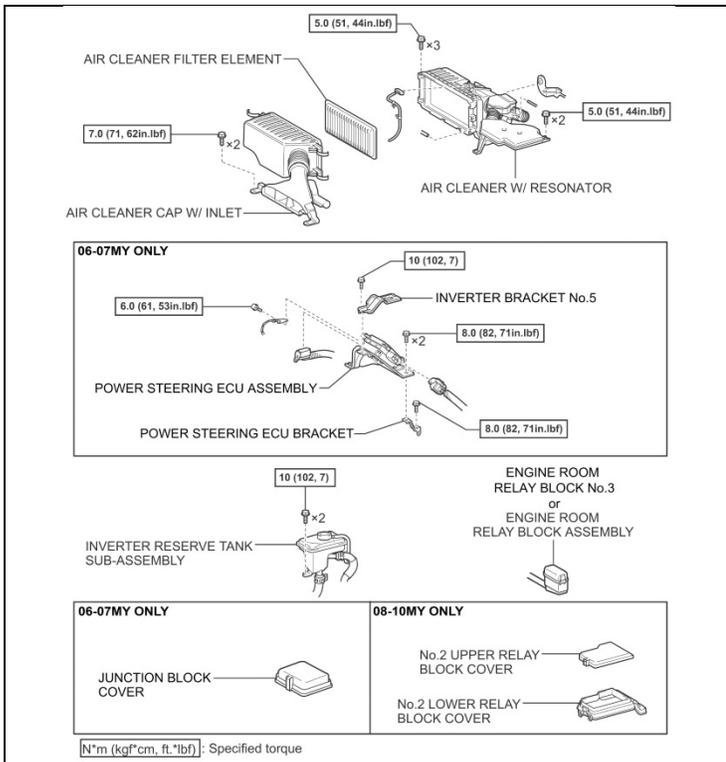
### 1. CLEAN THE THROTTLE BODY

- a) Use a shop cloth soaked in throttle plate cleaner to clean the throttle body.

#### NOTE:

- **DO NOT** spray the throttle valve directly.
- This procedure should be performed to ensure the engine learn values are set correctly.

### 2. INSTALL THE COMPONENTS ILLUSTRATED BELOW



#### NOTE:

- Install **ALL** air intake system components prior to attempting **READY ON**; otherwise, DTCs may occur.
- Wear insulating gloves when installing the power steering ECU components on 06-07MY.
- For detailed installation information, refer to the repair manual.

### 3. INSTALL THE SERVICE GRIP

### 4. INSTALL THE NEGATIVE BATTERY CABLE

### 5. CONFIRM VEHICLE OPERATION

- a) Turn the vehicle to **READY ON**.
- b) Confirm the vehicle is in park.
- c) Turn the air conditioner on high and allow vehicle to run for 3 minutes.
- d) Confirm auxiliary battery voltage.

#### Specification: 13 to 15 V

- e) Check for DTCs. If DTCs are output use the repair manual and the trouble shooting table in the Appendix of these instructions to diagnose.

#### NOTE:

- If DTCs are present after IPM replacement, first confirm IPM replacement was performed correctly, if it is determined that inverter replacement is required you **MUST** contact TAS (800-233-3178) to confirm your diagnosis, then contact your regional representative to obtain operation codes for dealership reimbursement.
- If DTCs that were not present prior to IPM replacement are present after IPM replacement, confirm IPM replacement was performed correctly.

6. INSTALL ALL REMAINING COMPONENTS
7. CHECK FOR DIAGNOSTIC TROUBLE CODES
8. TEST DRIVE THE VEHICLE
9. PERFORM SYSTEM INITIALIZATIONS

## ◀ VERIFY REPAIR QUALITY ▶

- Confirm the work area is very clean before disassembling the inverter
- Confirm *ALL* removal steps are followed, to prevent damage *DO NOT* skip any steps
- Confirm the inverter is cleaned thoroughly and the grease is applied correctly to the IPM transistor
- Confirm *ALL* installation steps are followed

If you have any questions regarding this recall, please contact your regional representative

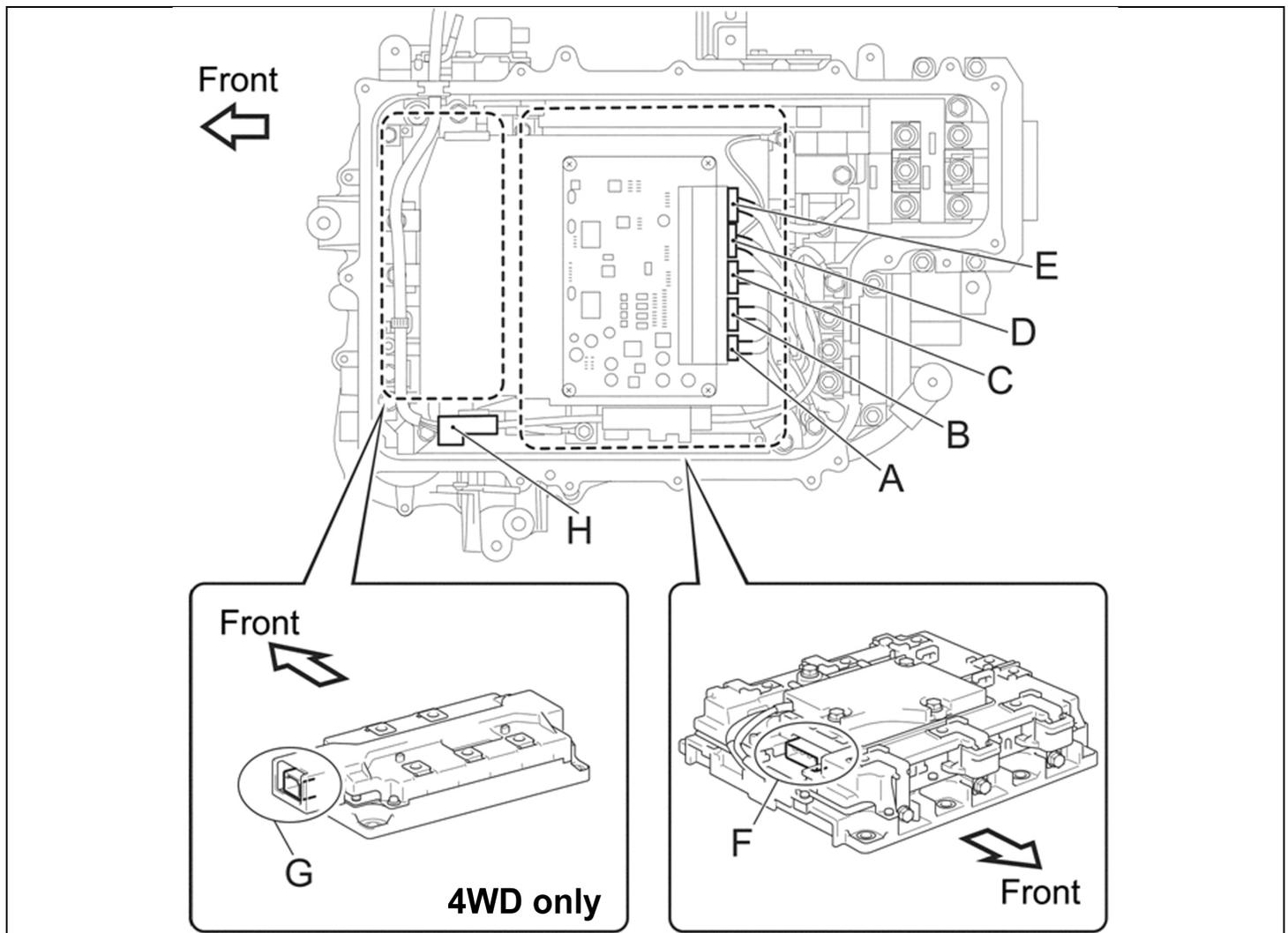
## IX. APPENDIX

### A. RECALL PARTS DISPOSAL

As required by Federal Regulations, please make sure all recalled parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused, *unless requested for parts recovery return.*

### B. TROUBLESHOOTING TABLE

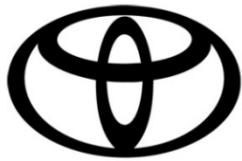
Use this table if any DTCs are output after performing the campaign. If the DTC output is not listed in this table, or checking the connectors does not remedy the condition, refer to the repair manual for additional diagnostic information.



DTC	Connector to inspect							
	A	B	C	D	E	F	G	H
B1477/71								○
B1477/77								○
P0A02-719			○					
P0A03-720			○					
P0A08-264		○						
P0A09-265		○						
P0A10-263		○						
P0A1A-151	○	○	○	○	○			
P0A1A-155	○	○	○	○	○			
P0A1A-156	○	○	○	○	○			
P0A1A-158	○	○	○	○	○			
P0A1A-166	○	○	○	○	○			
P0A1A-200	○	○	○	○	○			
P0A1A-658	○	○	○	○	○			
P0A1A-659	○	○	○	○	○			
P0A1A-791	○	○	○	○	○			
P0A1A-792	○	○	○	○	○			
P0A1A-793	○	○	○	○	○			
P0A1B-163	○	○	○	○	○			
P0A1B-164	○	○	○	○	○			
P0A1B-168	○	○	○	○	○			
P0A1B-192	○	○	○	○	○			
P0A1B-193	○	○	○	○	○			
P0A1B-195	○	○	○	○	○			
P0A1B-196	○	○	○	○	○			
P0A1B-198	○	○	○	○	○			
P0A1B-511	○	○	○	○	○			
P0A1B-512	○	○	○	○	○			
P0A1B-661	○	○	○	○	○			
P0A1B-662	○	○	○	○	○			
P0A1B-781	○	○	○	○	○			
P0A1B-786	○	○	○	○	○			
P0A1B-788	○	○	○	○	○			
P0A1B-794	○	○	○	○	○			
P0A1B-795	○	○	○	○	○			
P0A1B-796	○	○	○	○	○			
P0A1C-706	○	○	○	○	○			
P0A1C-707	○	○	○	○	○			
P0A1C-708	○	○	○	○	○			
P0A1C-709	○	○	○	○	○			
P0A1C-710	○	○	○	○	○			
P0A1C-711	○	○	○	○	○			
P0A1C-713	○	○	○	○	○			
P0A1C-715	○	○	○	○	○			
P0A1C-797	○	○	○	○	○			
P0A1C-798	○	○	○	○	○			
P0A1C-799	○	○	○	○	○			
P0A3F-243	○							
P0A40-500	○							

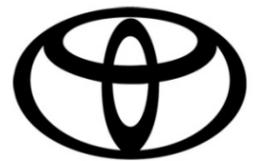
DTC	Connector to inspect							
	A	B	C	D	E	F	G	H
P0A41-245	○							
P0A45-669		○						
P0A46-671		○						
P0A47-670		○						
P0A4B-253	○							
P0A4C-513	○							
P0A4D-255	○							
P0A55-687					○		○	
P0A60-288				○		○		
P0A60-289				○		○		
P0A60-290				○		○		
P0A60-292				○		○		
P0A60-294				○		○		
P0A60-501				○		○		
P0A63-296				○		○		
P0A63-297				○		○		
P0A63-298				○		○		
P0A63-300				○		○		
P0A63-302				○		○		
P0A63-502				○		○		
P0A69-677					○		○	
P0A69-679					○		○	
P0A69-680					○		○	
P0A69-683					○		○	
P0A69-684					○		○	
P0A69-688					○		○	
P0A6C-678					○		○	
P0A6C-681					○		○	
P0A6C-682					○		○	
P0A6C-685					○		○	
P0A6C-686					○		○	
P0A6C-689					○		○	
P0A72-326				○		○		
P0A72-327				○		○		
P0A72-328				○		○		
P0A72-330				○		○		
P0A72-333				○		○		
P0A72-515				○		○		
P0A75-334				○		○		
P0A75-335				○		○		
P0A75-336				○		○		
P0A75-338				○		○		
P0A75-341				○		○		
P0A75-516				○		○		
P0A78-278				○		○		
P0A78-280				○		○		
P0A78-283				○		○		
P0A78-285				○		○		
P0A79-690					○		○	

DTC	Connector to inspect							
	A	B	C	D	E	F	G	H
P0A79-691					○		○	
P0A7A-321				○		○		
P0A7A-323				○		○		
P0A94-545			○					
P0A94-546			○					
P0A94-551			○					
P0A94-552			○					
P0A94-587			○					
P0AA6-526								
P0AA6-613								
P0AA6-614								
P0AA6-655								
P0AEF-275				○				
P0AF0-274				○				
P0AF4-673					○			
P0AF4-674					○			
P3222-313				○				
P3223-312				○				
P3227-583		○						
P3228-584		○						
U0110-159	○	○	○	○	○			
U0110-160	○	○	○	○	○			
U0110-656	○	○	○	○	○			
U0110-657	○	○	○	○	○			
Auxiliary battery voltage error		○						



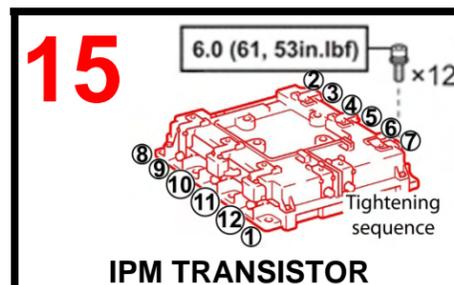
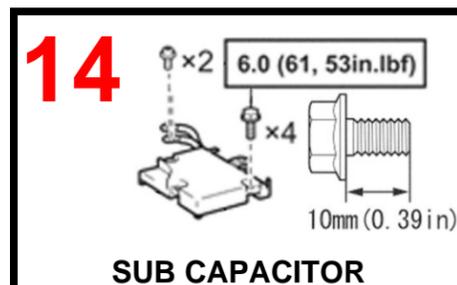
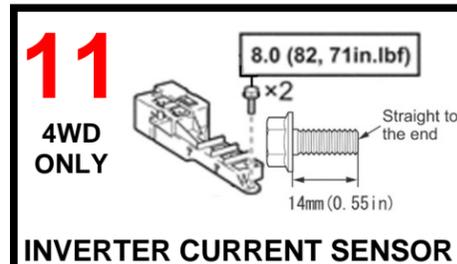
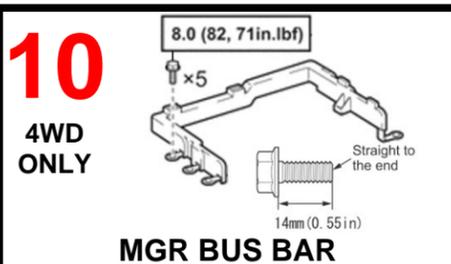
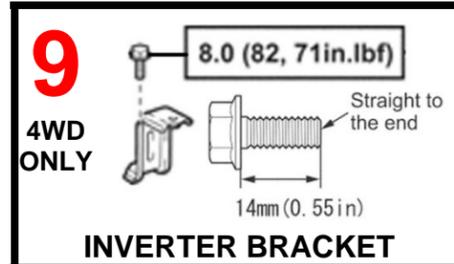
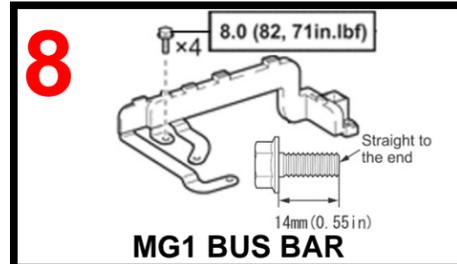
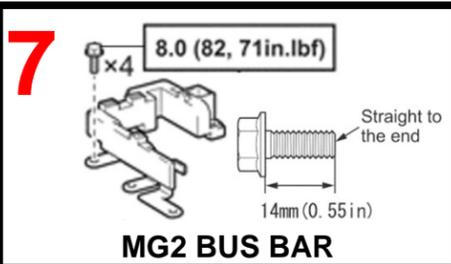
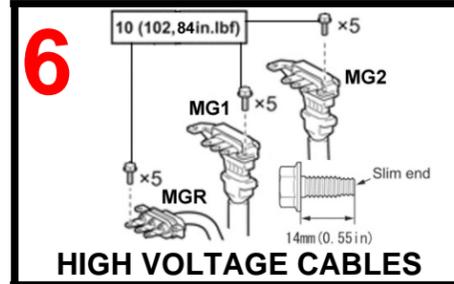
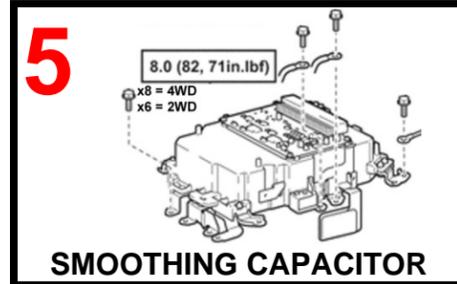
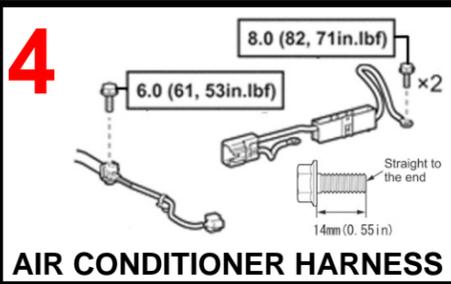
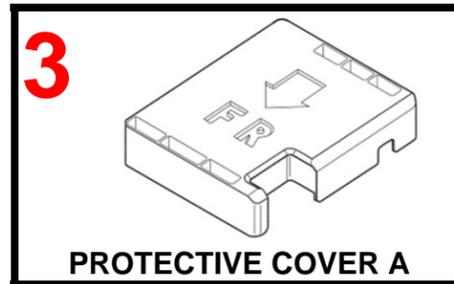
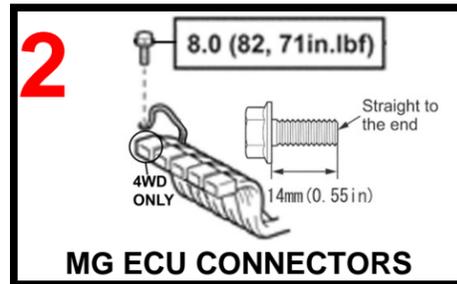
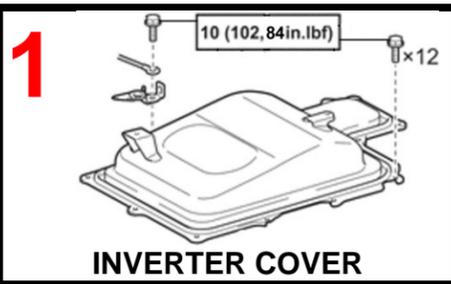
# SAFETY RECALL DOM

## Intelligent Power Module Transistor Replacement



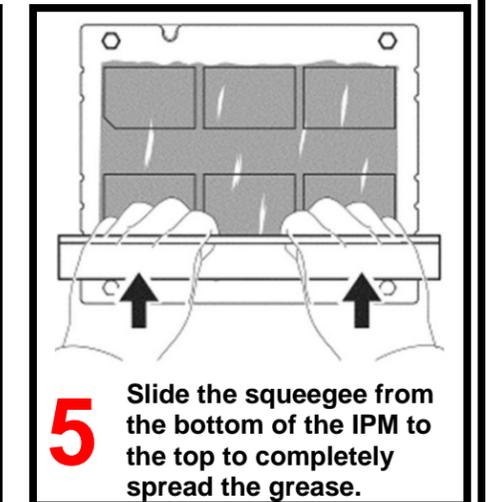
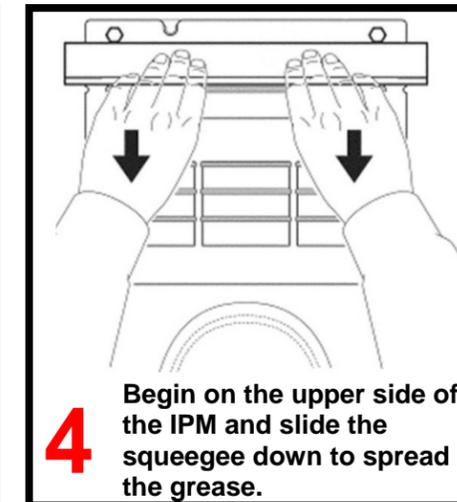
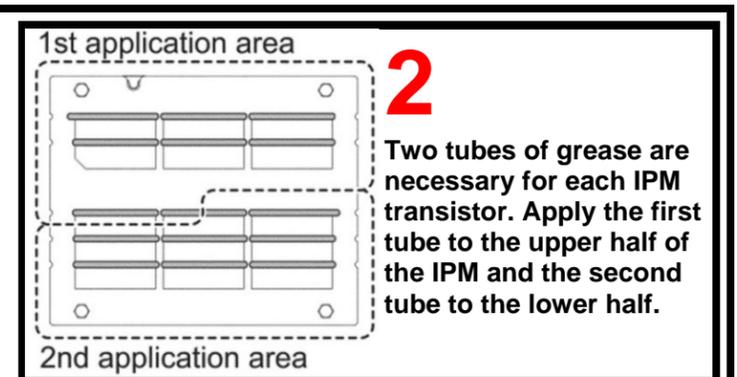
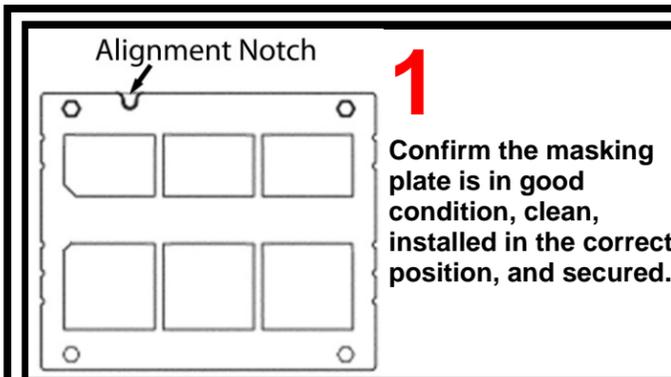
### INVERTER DISASSEMBLY PROCEDURE OUTLINE

- These instructions provide an overview of the disassembly, order for reassembly is reverse
- Torque specifications are critical, confirm all bolts are torqued correctly
- Confirm the IPM transistor is torqued following the correct sequence
- Confirm all safety precautions are followed when working on high voltage components

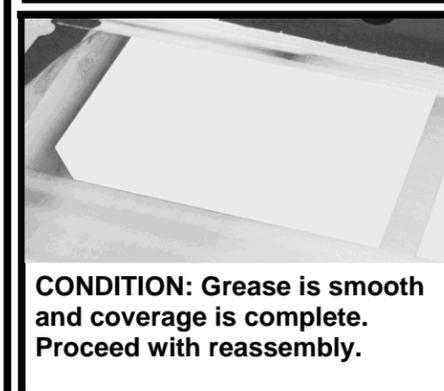


### GREASE APPLICATION PROCEDURE OUTLINE

- Confirm the grease application surface on the *NEW* IPM transistor is clean before applying grease
- Confirm all original grease inside the inverter case has been completely removed
- If the correct amount of grease is not applied the the new IPM, inverter failure may occur
- Knead the tubes of grease before application to confirm the grease is properly mixed



After applying the grease you must confirm the grease coverage is sufficient. Use the sample images below to determine the condition of the grease.





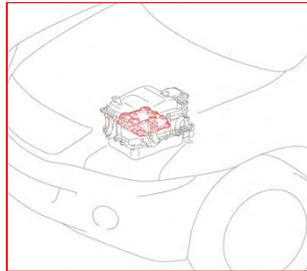
October 1, 2013

**Subject: Safety Recall DLF - Remedy Available**  
Certain 2006 through 2008 Model Year RX 400h Vehicles  
Intelligent Power Module (IPM) Replacement

Dear Dealer Principal:

As previously announced on September 4, 2013, Lexus filed a Defect Information Report (DIR) with the National Highway Traffic Safety Administration (NHTSA) informing the agency of our intent to conduct a voluntary Safety Recall on certain 2006 through 2008 model year RX 400h vehicles.

**Lexus has completed remedy preparations and will now begin mailing the remedy owner letter.**



### Background

Inside the Hybrid Inverter Assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Due to variations in operating characteristics of some IPM transistors, the temperature of the transistor(s) can exceed the allowable temperature of the solder underneath the transistor. If this occurs, the solder could degrade and eventually cause heat damage to the transistor(s), illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a "fail-safe" mode, resulting in reduced power under which the vehicle can still be driven for short distances. In limited cases, the fuse of the power supply circuit could blow, causing the hybrid system to shut down. If the Hybrid System shuts down, the vehicle could stop while being driven increasing the risk of crash.

The following information is provided to inform you and your staff of the remedy phase of this Safety Recall and your degree of involvement.

### Remedy

Lexus dealers will replace the Intelligent Power Module (IPM) at **NO CHARGE** to the vehicle owner. For additional information on the repair procedures, please refer to TIS.

### Owner Notification

Lexus will begin mailing Safety Recall Notices by first class mail in phases beginning in mid-October, 2013. The owner letters will be spread over several weeks consistent with parts availability and service capacity. A sample owner letter is attached.

*Lexus tries very hard to obtain current customer name and address information when mailing owner letters. In the event your dealership receives a notice for a vehicle that was sold prior to the Safety Recall announcement, it is the dealership's responsibility to forward the owner letter to the customer who purchased the vehicle.*

### Pre-Owned Vehicles in Dealer Inventory

Lexus requests dealers to conduct the remedy on any pre-owned vehicles currently in dealer inventory that are covered by this Safety Recall prior to delivery to the customer.

Also, as a reminder, Lexus CPO policy prohibits the certification of any vehicle with an outstanding Special Service Campaign or Safety Recall, such as this Safety Recall DLF. Thus, no affected units may be sold or delivered as a CPO vehicle until the Safety Recall has been completed on that vehicle.

### Number and Identification of Covered Vehicles

There are approximately 53,500 RX 400h (certain 2006 through 2008 model year) vehicles covered by this Safety Recall in the United States.

Model	WMI	Model Year	VDS	Start	Finish
RX 400h	JTJ	2006	GW31U	0001007	0004967
			HW31U	0001106	0049412
			GW31U	2000108	2000971
			HW31U	2000103	2007397
		2007	GW31U	2000995	2005870
			HW31U	2007400	2039945
		2008	GW31U	2005871	2851829
			HW31U	2027573	2867597

Please note that only owners of the covered vehicles will be notified. If your dealership is contacted by an owner who has not yet received the notification, please **verify coverage by confirming through Dealer Daily/TIS**. Dealers should perform the procedure as outlined in the Technical Instructions located on TIS.

### Remedy Procedures

Refer to TIS for the appropriate Technical Instructions (TI). Technical instructions will be posted on TIS on October 2, 2013.

Conduct all applicable, non-completed Safety Recall and service campaigns on the vehicle during the time of the appointment.

### Repair Quality Confirmation

The repair quality of covered vehicles is extremely important to Lexus. To help ensure that all vehicles have the repair performed correctly, please designate at least one associate (someone other than the individual who performed the repair) to verify the repair quality of every vehicle prior to customer delivery.

### Parts Ordering

To assure sufficient availability of parts for scheduled appointments the Intelligent Power Module Transistor and grease have been placed on the Dealer Order Solution process. Please refer to the information sent by the facing PDC to each dealer's parts manager for specific information on daily order limits.

Part Number	Part Description	Quantity Per Vehicle Remedied
04001-29148	Intelligent Power Module Transistor	1
08887-02409	Grease G747	2

**NOTE:** Grease G747 is considered a hazardous material and must be handled appropriately during order processing and shipping. As a result, additional time beyond that normally experienced for dealer parts orders receipt may be incurred. Please plan accordingly when communicating with the service department and when scheduling appointments for your customers.

### **IMPORTANT PARTS ORDERING UPDATE**

*All Safety Recall, Service Campaign (SSC/LSC) and Customer Support Program (CSP) parts are eligible for the Monthly Parts Return Program. Please refer to Service and Parts Operations Communication 2011-20 for campaign parts that are currently returnable under the Monthly Parts Return Program and additional details.*

**Technician Training Requirements**

The repair quality of covered vehicles is extremely important to Lexus. All dealership associates involved in the recall process are required to successfully complete E-Learning course LSC13A. To ensure that all vehicles have the repair performed correctly; technicians performing this recall repair are required to have the following minimum certification:

- Lexus Certified Senior or Master Diagnostic Specialists
- Lexus Certified Senior or Master Service Technicians

and successful completion of Course L071 Lexus Hybrid Systems.

It is the dealership’s responsibility to select technicians with the above certification level or greater to perform this Safety Recall repair. Carefully review your resources, the technician skill level, and ability before assigning technicians to this repair. It is important to consider technician days off and vacation schedules to ensure there are properly trained technicians available to perform this repair at all times

**Tools, Supplies and Equipment**

In a separate shipment scheduled to arrive October 2, 2013, your dealership was sent a package containing special service tools (SSTs) for this Safety Recall. When received, the package will have a fluorescent (green, orange, yellow or pink) label like the sample shown below for easy identification.



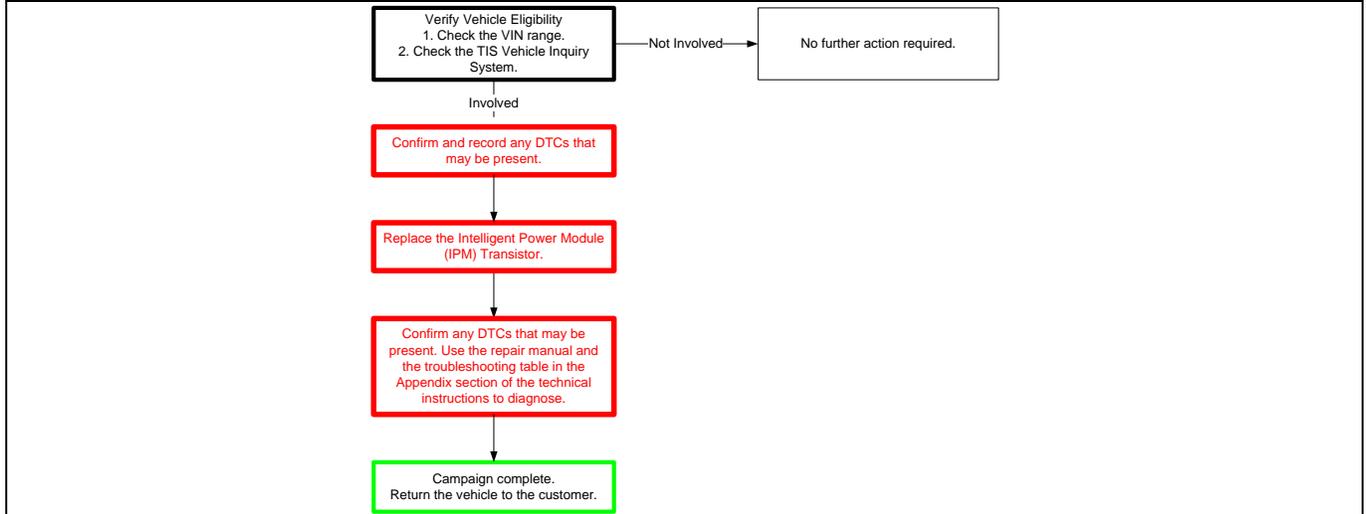
Part Name	Sample	Qty	Part Name	Sample	Qty
Protective Cover A		1	Protective Cover B		1
Masking Plate		1	Squeegee		1
Stud Bolt		2	Masking Plate Nut/Bolt		4

NOTE: If additional gloves are needed they can be ordered through SPX by calling 800-933-8335 (Gloves are not included in the Campaign Tool Kit)

Part Number	Part Name	Quantity
00002-03100-S	Electrical Insulating Gloves (Small)	1
00002-03200-M	Electrical Insulating Gloves (Medium)	
00002-03300-L	Electrical Insulating Gloves (Large)	

## Warranty Reimbursement Procedures

### Certain 2006 and 2008 Model Year RX 400h Vehicles



Safety Recall	Opcode	Description	Flat Rate Hour
DLF	3530HA	Replace IPM for 2WD model GW31U	3.9 hr/vehicle
	3530HD	Replace IPM for AWD model HW31U	4.0 hr/vehicle

- The flat rate times include 0.1 hours for administrative cost per unit for the dealership.
- Toyota Genuine Brake Cleaner and Toyota Genuine Throttle Plate Cleaner or equivalent can be claimed as sublet type "OF" under opcode 3530HA and 3530HD at a rate of \$5.00 per vehicle (marking pens and electrical tape is also included in the sublet cost)
- Parts replaced under opcode 3530HA and 3530HD are subject to warranty parts return, any misuse of these operation codes will result in a warranty claim debit

Safety Recall	Opcode	Description	Flat Rate Hour
DLF	Contact Area Rep.	Replace the IPM, DTC present after IPM replacement, replace Inverter Assembly on AWD Models HW31U	Contact Area Rep.
		Replace the IPM, DTC present after IPM replacement, replace Inverter Assembly on 2WD Models GW31U	Contact Area Rep.

- Area representative will provide available sublets for this operation

**Important Note:** If you have DTCs present after performing the IPM replacement, please consult the Technical Instruction Appendix and repair manual for DTC diagnosis. In the event you need further assistance diagnosing the current DTCs please contact the Technical Assistance Hotline - QA Powertrain Department at 800-233-3178. **Do not file a claim for Intelligent Power Module replacement;** you will need to obtain an opcode from your Area representative for Inverter Replacement.

Lexus' usual customer care amenities of car wash and fuel tank fill apply to this Safety Recall. Additionally, one day of rental vehicle expense (to a maximum of \$45/day) or the cost of pick up and delivery of the customer's vehicle may be claimed if required and subject to the guidelines published in the Safety Recall/Special Service Campaign/Limited Service Campaign General Procedures document on TIS.

### Media Contacts

It is imperative that all media contacts (local and national) receive a consistent message. In this regard, all media contacts must be directed to Cindy Knight (310) 468-2170 in Toyota Corporate Communications. (Please do not provide this number to customers. Please provide this contact to only media associates.)

### Customer Contacts

A Q&A is attached to assist you in responding to any customer questions or concerns. If the customer has any further questions they are requested to contact the Lexus Customer Assistance Center at 1-800-255-3987 Monday through Friday, 5:00 am to 6:00 pm PST, or Saturday, 7:00 am through 4:00 pm PST.

*Please review this notification with your entire service and parts staff to familiarize them with the proper step-by-step procedures required to implement this Safety Recall.*

Thank you for your understanding and cooperation.

Lexus, a Division of Toyota Motor Sales, USA, Inc.

Attachments

Cc: Customer Satisfaction Manager  
General Manager  
Parts Manager  
Pre-owned Manager  
Service Manager  
Warranty Administrator



Safety Recall DLF- Remedy Available  
 Certain 2006 through 2008 Model Year RX 400h Vehicles  
 Intelligent Power Module (IPM) Replacement

**Background**

As previously announced on September 4, 2013, Lexus filed a Defect Information Report (DIR) with the National Highway Traffic Safety Administration (NHTSA) informing the agency of our intent to conduct a voluntary Safety Recall on certain 2006 through 2008 model year RX 400h vehicles.

Lexus has completed remedy preparations and will now begin mailing the remedy owner letter.

**Q1: What is the condition?**

A1: Inside the Hybrid Inverter Assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Due to variations in operating characteristics of some IPM transistors, the temperature of the transistor(s) can exceed the allowable temperature of the solder underneath the transistor. If this occurs, the solder could degrade and eventually cause heat damage to the transistor(s), illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a "fail-safe" mode, resulting in reduced power under which the vehicle can still be driven for short distances. In limited cases, the fuse of the power supply circuit could blow, causing the hybrid system to shut down. If the Hybrid System shuts down, the vehicle could stop while being driven increasing the risk of crash.

**Q1a: What is the Hybrid System Inverter?**

A1a: The hybrid system inverter converts high-voltage DC, stored in the HV battery, into AC for the motor generator. It also converts AC into DC during regenerative braking for storage in the HV battery.

**Q2: Which Warning Lamps are illuminated on the instrument panel when the vehicle enters fail-safe driving mode?**

A2: All of the following warning lights and messages will be illuminated on the instrument panel when the vehicle enters the fail-safe driving mode. The fail-safe driving mode will result in reduced motive power in which the vehicle can still be driven for short distances.

	<i>Warning lights</i>
	Master Warning Light
	Slip Indicator
	Check Engine Warning Light
	Electronically Controlled Brake System Warning Light (yellow indicator)

	<i>Warning messages</i>
	Malfunction of VSC function is detected.
	Hybrid system malfunction is detected.
	All Wheel Drive system malfunction is detected.

**Q2a: How long and what distance can a vehicle be driven when the vehicle enters fail-safe driving mode?**

A2a: The distance a vehicle will continue to travel in fail-safe driving mode will vary based upon the hybrid battery state of charge and the road conditions. If a vehicle enters fail-safe driving mode, the driver should pull-over and stop the car in a safe area. The driver should immediately contact his/her local Lexus dealer for assistance.

**Q3: What is Lexus going to do?**

A3: In mid-October, 2013 Lexus will send an owner notification by first class mail to owners of vehicles covered by this Safety Recall.

Any authorized Lexus dealer will replace the Intelligent Power Module at **No Charge** to you.

**Q3a: How does Lexus obtain my mailing information?**

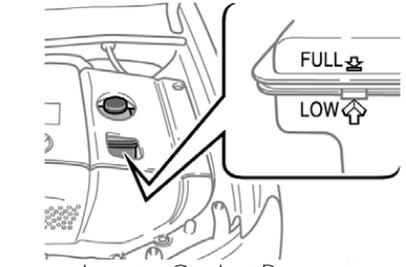
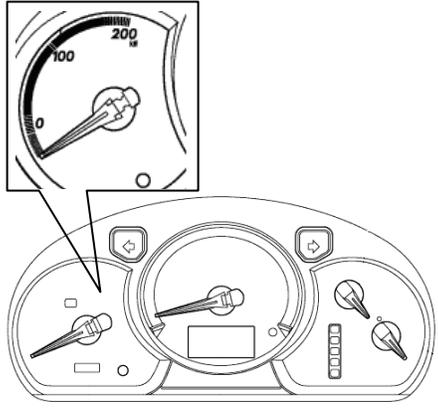
A3a: Lexus uses an industry provider who works with each state's Department of Motor Vehicles (DMV) to receive registration or title information, based upon the DMV records. Please make sure your registration or title information is correct.

**Q3b:** *Do I need my owner letter to have the remedy performed?*

A3b: You do not need an owner letter to have this recall completed; however, to assist the dealer in confirming vehicle eligibility, we request that you present this notice at the time of your service appointment.

**Q4:** *What steps can I take to reduce the possibility of this condition from occurring prior to the availability of the remedy?*

A4: You may take the following steps to reduce the possibility of this condition from occurring until the remedy is completed.

 <p>Inverter Coolant Reservoir</p>	<p>(1) Regularly confirm that the coolant level in the inverter coolant reservoir is between FULL and LOW. If the coolant level is below the LOW line, please add coolant up to the FULL line.</p> <p>Lexus dealers will inspect the coolant level, and if necessary, add coolant, at no charge at the customer's request.</p>
 <p>Power Meter</p>	<p>(2) Avoid placing a high load on the Hybrid System. Drivers may do so by refraining from towing with the vehicle until the remedy is completed.</p> <p>(3) Monitor your Power Meter. The Power Meter indicates the immediate output from the Hybrid System in approximate kilowatts. Keep power usage below 100kW as much as possible. Situations where the Power Meter shows output slightly over 100kW for a brief moment should not raise any concerns.</p>

**Q4a:** *Will this condition occur if the Power Meter shows usage above 100kW?*

A4a: Situations where the Power Meter shows output slightly over 100kW for a brief moment should not raise any concerns. Drivers should refrain from driving conditions where power output exceeds 100kW continuously and/or substantially. Drivers may do so by refraining from towing with the vehicle until the remedy is completed.

**Q5:** *Which and how many vehicles are covered?*

A5: There are approximately 53,500 Lexus RX 400h vehicles and approximately 79,600 Toyota Highlander Hybrid vehicles covered by this Safety Recall in the U.S.

Model Name	Model Year	Production Period	Number of Vehicles
Lexus RX 400h	Certain 2006 through 2008	Late February 2005 through early December 2008	Approximately 53,500 units
Toyota Highlander Hybrid	Certain 2006 through 2010	Mid February 2005 through late July 2010	Approximately 79,600 units

**Q5a:** *Are there any other Lexus or Lexus models covered by this Safety Recall?*

A5a: No. There are no other Lexus or Toyota models covered by this Safety Recall.

Q6: What if my vehicle was covered by the previous Safety Recall (BLD) for 2006 and 2007 Model Year RX 400h Vehicles Hybrid System Inverter, Intelligent Power Module?

A6: If you have still not had Safety Recall BLD performed, please contact any authorized Lexus dealer to schedule an appointment to have the remedy performed as soon as possible.

Q7: What if I previously paid for repairs to my vehicle for this condition?

A7: Reimbursement consideration instruction will be provided in the remedy owner letter.

Q8: What if I have additional questions or concerns?

A8: If you have additional questions or concerns, please contact the Lexus Customer Assistance Center at 1-800-255-3987 Monday through Friday, 5:00 am to 6:00 pm, or Saturday 7:00 am through 4:00 pm Pacific Time.

Certain 2006 through 2008 Model Year RX 400h Vehicles  
Hybrid System Inverter, Intelligent Power Module  
**IMPORTANT SAFETY RECALL NOTICE**

This notice applies to your vehicle: [VIN]

**URGENT SAFETY RECALL**

This is an important Safety Recall. The remedy will be performed at **NO CHARGE** to you.

Dear Lexus Customer:

This notice is being sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act. Lexus has decided that a defect, which relates to motor vehicle safety, exists in certain 2006 through 2008 Model Year RX 400h Vehicles.

You received this notice because our records, which are based primarily on state registration and title data, indicate that you are the current owner.

**What is the condition?**

Inside the hybrid inverter assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Under some conditions, one or more transistors could be damaged, illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a "fail-safe" mode, resulting in reduced power under which the vehicle can still be driven for short distances. However, it is possible the fuse of the power supply circuit could blow, causing the hybrid system to shut down and resulting in the vehicle stopping while being driven. This can increase the risk of a crash.

**What is Lexus going to do?**

Any authorized Lexus dealer will replace the IPM at **NO CHARGE** to you.

**What should you do?**

***This is an important Safety Recall***

Please contact any authorized Lexus dealer and make an appointment to have the IPM replaced. Replacement of the IPM will take approximately 4 hours. However, depending upon the dealer's work schedule, it may be necessary to make your vehicle available for a longer period of time.

**You do not need an owner letter to have this recall completed; however, to assist the dealer in confirming vehicle eligibility, we request that you present this notice at the time of your service appointment.**

If you would like to update your vehicle ownership or contact information, please go to [www.lexus.com/ownersupdate](http://www.lexus.com/ownersupdate). You will need your full 17-digit Vehicle Identification Number (VIN) to input the new information.

**What if you have other questions?**

***Your local Lexus dealer will be more than happy to answer any of your questions and set up an appointment to perform the repair.*** You can find additional information and locate a Lexus dealer in your area by going online and visiting [www.lexus.com](http://www.lexus.com). If you require further assistance, you may contact the Lexus Customer Assistance Center at 1-800-255-3987, Monday through Friday, 5:00 am to 6:00 pm, Saturday 7:00 am through 4:00 pm Pacific Time.

If you believe that the dealer or Lexus has failed or is unable to remedy the defect within a reasonable time, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue S.E., Washington, D.C. 20590, or call the toll free Vehicle Safety Hot Line at 1-888-327-4236 (TTY: 1-800-424-9153), or go to <http://www.safercar.gov>.

What if you have previously paid for repairs to your vehicle for this specific condition?

If you have previously paid for repair to your vehicle for this specific condition prior to receiving this letter, please mail a copy of your repair order and proof-of-payment to the following address for reimbursement consideration:

Lexus, a Division of Toyota Motor Sales, U.S.A., Inc  
Lexus Customer Assistance Center L201  
19001 South Western Avenue  
Torrance, CA 90509

Include your name, address, and telephone number(s) in your request. Please allow us 6-8 weeks to process your request.

Please note the dealership will need to complete the Safety Recall remedy before reimbursement consideration requests can be processed.

If you are a vehicle lessor, Federal law requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

We have sent this notice in the interest of your continued satisfaction with our products, and we sincerely regret any inconvenience this condition may have caused you.

Thank you for driving a Lexus.

Sincerely,

LEXUS, A DIVISION OF TOYOTA MOTOR SALES, U.S.A., INC.



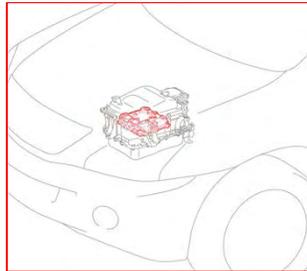
October 1, 2013

**Subject: Safety Recall DLF - Remedy Available  
Certain 2006 through 2008 Model Year RX 400h Vehicles  
Intelligent Power Module (IPM) Replacement**

Dear Dealer Principal:

As previously announced on September 4, 2013, Lexus filed a Defect Information Report (DIR) with the National Highway Traffic Safety Administration (NHTSA) informing the agency of our intent to conduct a voluntary Safety Recall on certain 2006 through 2008 model year RX 400h vehicles.

Lexus has completed remedy preparations and will now begin mailing the remedy owner letter.



### Background

Inside the Hybrid Inverter Assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Due to variations in operating characteristics of some IPM transistors, the temperature of the transistor(s) can exceed the allowable temperature of the solder underneath the transistor. If this occurs, the solder could degrade and eventually cause heat damage to the transistor(s), illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a "fail-safe" mode, resulting in reduced power under which the vehicle can still be driven for short distances. In limited cases, the fuse of the power supply circuit could blow, causing the hybrid system to shut down. If the Hybrid System shuts down, the vehicle could stop while being driven increasing the risk of crash.

The following information is provided to inform you and your staff of the remedy phase of this Safety Recall and your degree of involvement.

### Remedy

Lexus dealers will replace the Intelligent Power Module (IPM) at **NO CHARGE** to the vehicle owner. For additional information on the repair procedures, please refer to TIS.

### Owner Notification

Lexus will begin mailing Safety Recall Notices by first class mail in phases beginning in mid-October, 2013. The owner letters will be spread over several weeks consistent with parts availability and service capacity. A sample owner letter is attached.

*Lexus tries very hard to obtain current customer name and address information when mailing owner letters. In the event your dealership receives a notice for a vehicle that was sold prior to the Safety Recall announcement, it is the dealership's responsibility to forward the owner letter to the customer who purchased the vehicle.*

### Pre-Owned Vehicles in Dealer Inventory

Lexus requests dealers to conduct the remedy on any pre-owned vehicles currently in dealer inventory that are covered by this Safety Recall prior to delivery to the customer.

Also, as a reminder, Lexus CPO policy prohibits the certification of any vehicle with an outstanding Special Service Campaign or Safety Recall, such as this Safety Recall DLF. Thus, no affected units may be sold or delivered as a CPO vehicle until the Safety Recall has been completed on that vehicle.

### Number and Identification of Covered Vehicles

There are approximately 53,500 RX 400h (certain 2006 through 2008 model year) vehicles covered by this Safety Recall in the United States.

Model	WMI	Model Year	VDS	Start	Finish
RX 400h	JTJ	2006	GW31U	0001007	0004967
			HW31U	0001106	0049412
			GW31U	2000108	2000971
			HW31U	2000103	2007397
		2007	GW31U	2000995	2005870
			HW31U	2007400	2039945
		2008	GW31U	2005871	2851829
			HW31U	2027573	2867597

Please note that only owners of the covered vehicles will be notified. If your dealership is contacted by an owner who has not yet received the notification, please **verify coverage by confirming through Dealer Daily/TIS**. Dealers should perform the procedure as outlined in the Technical Instructions located on TIS.

### Remedy Procedures

Refer to TIS for the appropriate Technical Instructions (TI). Technical instructions will be posted on TIS on October 2, 2013.

Conduct all applicable, non-completed Safety Recall and service campaigns on the vehicle during the time of the appointment.

### Repair Quality Confirmation

The repair quality of covered vehicles is extremely important to Lexus. To help ensure that all vehicles have the repair performed correctly, please designate at least one associate (someone other than the individual who performed the repair) to verify the repair quality of every vehicle prior to customer delivery.

### Parts Ordering

To assure sufficient availability of parts for scheduled appointments the Intelligent Power Module Transistor and grease have been placed on the Dealer Order Solution process. Please refer to the information sent by the facing PDC to each dealer's parts manager for specific information on daily order limits.

Part Number	Part Description	Quantity Per Vehicle Remedied
04001-29148	Intelligent Power Module Transistor	1
08887-02409	Grease G747	2

**NOTE:** Grease G747 is considered a hazardous material and must be handled appropriately during order processing and shipping. As a result, additional time beyond that normally experienced for dealer parts orders receipt may be incurred. Please plan accordingly when communicating with the service department and when scheduling appointments for your customers.

### **IMPORTANT PARTS ORDERING UPDATE**

*All Safety Recall, Service Campaign (SSC/LSC) and Customer Support Program (CSP) parts are eligible for the Monthly Parts Return Program. Please refer to Service and Parts Operations Communication 2011-20 for campaign parts that are currently returnable under the Monthly Parts Return Program and additional details.*

**Technician Training Requirements**

The repair quality of covered vehicles is extremely important to Lexus. All dealership associates involved in the recall process are required to successfully complete E-Learning course LSC13A. To ensure that all vehicles have the repair performed correctly; technicians performing this recall repair are required to have the following minimum certification:

- Lexus Certified Senior or Master Diagnostic Specialists
- Lexus Certified Senior or Master Service Technicians

and successful completion of Course L071 Lexus Hybrid Systems.

It is the dealership’s responsibility to select technicians with the above certification level or greater to perform this Safety Recall repair. Carefully review your resources, the technician skill level, and ability before assigning technicians to this repair. It is important to consider technician days off and vacation schedules to ensure there are properly trained technicians available to perform this repair at all times

**Tools, Supplies and Equipment**

In a separate shipment scheduled to arrive October 2, 2013, your dealership was sent a package containing special service tools (SSTs) for this Safety Recall. When received, the package will have a fluorescent (green, orange, yellow or pink) label like the sample shown below for easy identification.



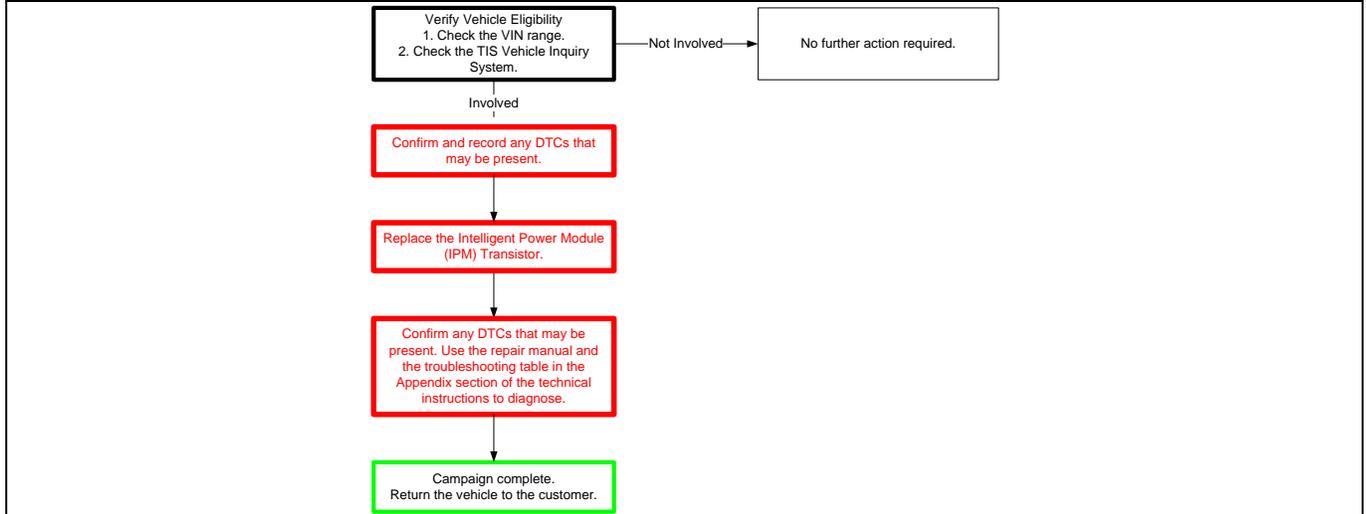
Part Name	Sample	Qty	Part Name	Sample	Qty
Protective Cover A		1	Protective Cover B		1
Masking Plate		1	Squeegee		1
Stud Bolt		2	Masking Plate Nut/Bolt		4

NOTE: If additional gloves are needed they can be ordered through SPX by calling 800-933-8335 (Gloves are not included in the Campaign Tool Kit)

Part Number	Part Name	Quantity
00002-03100-S	Electrical Insulating Gloves (Small)	1
00002-03200-M	Electrical Insulating Gloves (Medium)	
00002-03300-L	Electrical Insulating Gloves (Large)	

## Warranty Reimbursement Procedures

### Certain 2006 and 2008 Model Year RX 400h Vehicles



Safety Recall	Opcode	Description	Flat Rate Hour
DLF	3530HA	Replace IPM for 2WD model GW31U	3.9 hr/vehicle
	3530HD	Replace IPM for AWD model HW31U	4.0 hr/vehicle

- The flat rate times include 0.1 hours for administrative cost per unit for the dealership.
- Toyota Genuine Brake Cleaner and Toyota Genuine Throttle Plate Cleaner or equivalent can be claimed as sublet type "OF" under opcode 3530HA and 3530HD at a rate of \$5.00 per vehicle (marking pens and electrical tape is also included in the sublet cost)
- Parts replaced under opcode 3530HA and 3530HD are subject to warranty parts return, any misuse of these operation codes will result in a warranty claim debit

Safety Recall	Opcode	Description	Flat Rate Hour
DLF	Contact Area Rep.	Replace the IPM, DTC present after IPM replacement, replace Inverter Assembly on AWD Models HW31U	Contact Area Rep.
		Replace the IPM, DTC present after IPM replacement, replace Inverter Assembly on 2WD Models GW31U	Contact Area Rep.

- Area representative will provide available sublets for this operation

**Important Note:** If you have DTCs present after performing the IPM replacement, please consult the Technical Instruction Appendix and repair manual for DTC diagnosis. In the event you need further assistance diagnosing the current DTCs please contact the Technical Assistance Hotline - QA Powertrain Department at 800-233-3178. **Do not file a claim for Intelligent Power Module replacement;** you will need to obtain an opcode from your Area representative for Inverter Replacement.

Lexus' usual customer care amenities of car wash and fuel tank fill apply to this Safety Recall. Additionally, one day of rental vehicle expense (to a maximum of \$45/day) **or** the cost of pick up and delivery of the customer's vehicle may be claimed if required and subject to the guidelines published in the Safety Recall/Special Service Campaign/Limited Service Campaign General Procedures document on TIS.

### Media Contacts

It is imperative that all media contacts (local and national) receive a consistent message. In this regard, all media contacts must be directed to Cindy Knight (310) 468-2170 in Toyota Corporate Communications. (Please do not provide this number to customers. Please provide this contact to only media associates.)

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A Q&A is attached to assist you in responding to any customer questions or concerns. If the customer has any further questions they are requested to contact the Lexus Customer Assistance Center at 1-800-255-3987 Monday through Friday, 5:00 am to 6:00 pm PST, or Saturday, 7:00 am through 4:00 pm PST.

*Please review this notification with your entire service and parts staff to familiarize them with the proper step-by-step procedures required to implement this Safety Recall.*

Thank you for your understanding and cooperation.

Lexus, a Division of Toyota Motor Sales, USA, Inc.

Attachments

Cc: Customer Satisfaction Manager  
General Manager  
Parts Manager  
Pre-owned Manager  
Service Manager  
Warranty Administrator



Safety Recall DLF- Remedy Available  
 Certain 2006 through 2008 Model Year RX 400h Vehicles  
 Intelligent Power Module (IPM) Replacement

**Background**

As previously announced on September 4, 2013, Lexus filed a Defect Information Report (DIR) with the National Highway Traffic Safety Administration (NHTSA) informing the agency of our intent to conduct a voluntary Safety Recall on certain 2006 through 2008 model year RX 400h vehicles.

Lexus has completed remedy preparations and will now begin mailing the remedy owner letter.

**Q1: What is the condition?**

A1: Inside the Hybrid Inverter Assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Due to variations in operating characteristics of some IPM transistors, the temperature of the transistor(s) can exceed the allowable temperature of the solder underneath the transistor. If this occurs, the solder could degrade and eventually cause heat damage to the transistor(s), illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a "fail-safe" mode, resulting in reduced power under which the vehicle can still be driven for short distances. In limited cases, the fuse of the power supply circuit could blow, causing the hybrid system to shut down. If the Hybrid System shuts down, the vehicle could stop while being driven increasing the risk of crash.

**Q1a: What is the Hybrid System Inverter?**

A1a: The hybrid system inverter converts high-voltage DC, stored in the HV battery, into AC for the motor generator. It also converts AC into DC during regenerative braking for storage in the HV battery.

**Q2: Which Warning Lamps are illuminated on the instrument panel when the vehicle enters fail-safe driving mode?**

A2: All of the following warning lights and messages will be illuminated on the instrument panel when the vehicle enters the fail-safe driving mode. The fail-safe driving mode will result in reduced motive power in which the vehicle can still be driven for short distances.

	<i>Warning lights</i>
	Master Warning Light
	Slip Indicator
	Check Engine Warning Light
	Electronically Controlled Brake System Warning Light (yellow indicator)

	<i>Warning messages</i>
	Malfunction of VSC function is detected.
	Hybrid system malfunction is detected.
	All Wheel Drive system malfunction is detected.

**Q2a: How long and what distance can a vehicle be driven when the vehicle enters fail-safe driving mode?**

A2a: The distance a vehicle will continue to travel in fail-safe driving mode will vary based upon the hybrid battery state of charge and the road conditions. If a vehicle enters fail-safe driving mode, the driver should pull-over and stop the car in a safe area. The driver should immediately contact his/her local Lexus dealer for assistance.

**Q3: What is Lexus going to do?**

A3: In mid-October, 2013 Lexus will send an owner notification by first class mail to owners of vehicles covered by this Safety Recall.

Any authorized Lexus dealer will replace the Intelligent Power Module at **No Charge** to you.

**Q3a: How does Lexus obtain my mailing information?**

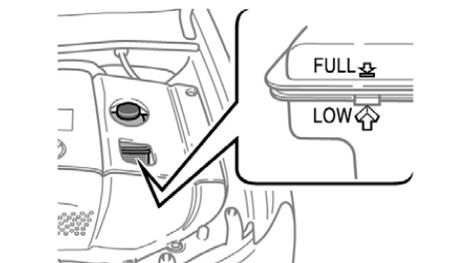
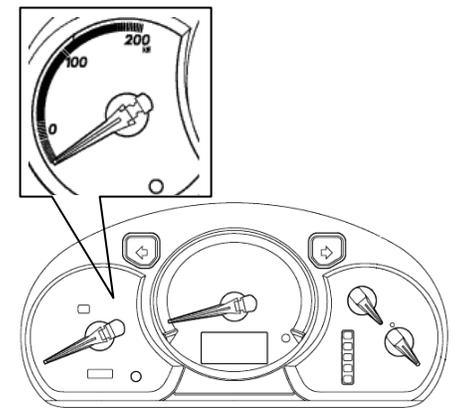
A3a: Lexus uses an industry provider who works with each state's Department of Motor Vehicles (DMV) to receive registration or title information, based upon the DMV records. Please make sure your registration or title information is correct.

**Q3b:** *Do I need my owner letter to have the remedy performed?*

A3b: You do not need an owner letter to have this recall completed; however, to assist the dealer in confirming vehicle eligibility, we request that you present this notice at the time of your service appointment.

**Q4:** *What steps can I take to reduce the possibility of this condition from occurring prior to the availability of the remedy?*

A4: You may take the following steps to reduce the possibility of this condition from occurring until the remedy is completed.

 <p>Inverter Coolant Reservoir</p>	<p>(1) Regularly confirm that the coolant level in the inverter coolant reservoir is between FULL and LOW. If the coolant level is below the LOW line, please add coolant up to the FULL line.</p> <p>Lexus dealers will inspect the coolant level, and if necessary, add coolant, at no charge at the customer's request.</p>
 <p>Power Meter</p>	<p>(2) Avoid placing a high load on the Hybrid System. Drivers may do so by refraining from towing with the vehicle until the remedy is completed.</p> <p>(3) Monitor your Power Meter. The Power Meter indicates the immediate output from the Hybrid System in approximate kilowatts. Keep power usage below 100kW as much as possible. Situations where the Power Meter shows output slightly over 100kW for a brief moment should not raise any concerns.</p>

**Q4a:** *Will this condition occur if the Power Meter shows usage above 100kW?*

A4a: Situations where the Power Meter shows output slightly over 100kW for a brief moment should not raise any concerns. Drivers should refrain from driving conditions where power output exceeds 100kW continuously and/or substantially. Drivers may do so by refraining from towing with the vehicle until the remedy is completed.

**Q5:** *Which and how many vehicles are covered?*

A5: There are approximately 53,500 Lexus RX 400h vehicles and approximately 79,600 Toyota Highlander Hybrid vehicles covered by this Safety Recall in the U.S.

Model Name	Model Year	Production Period	Number of Vehicles
Lexus RX 400h	Certain 2006 through 2008	Late February 2005 through early December 2008	Approximately 53,500 units
Toyota Highlander Hybrid	Certain 2006 through 2010	Mid February 2005 through late July 2010	Approximately 79,600 units

**Q5a:** *Are there any other Lexus or Lexus models covered by this Safety Recall?*

A5a: No. There are no other Lexus or Toyota models covered by this Safety Recall.

Q6: What if my vehicle was covered by the previous Safety Recall (BLD) for 2006 and 2007 Model Year RX 400h Vehicles Hybrid System Inverter, Intelligent Power Module?

A6: If you have still not had Safety Recall BLD performed, please contact any authorized Lexus dealer to schedule an appointment to have the remedy performed as soon as possible.

Q7: What if I previously paid for repairs to my vehicle for this condition?

A7: Reimbursement consideration instruction will be provided in the remedy owner letter.

Q8: What if I have additional questions or concerns?

A8: If you have additional questions or concerns, please contact the Lexus Customer Assistance Center at 1-800-255-3987 Monday through Friday, 5:00 am to 6:00 pm, or Saturday 7:00 am through 4:00 pm Pacific Time.

Certain 2006 through 2008 Model Year RX 400h Vehicles  
Hybrid System Inverter, Intelligent Power Module  
**IMPORTANT SAFETY RECALL NOTICE**

This notice applies to your vehicle: [VIN]

**URGENT SAFETY RECALL**

This is an important Safety Recall. The remedy will be performed at **NO CHARGE** to you.

Dear Lexus Customer:

This notice is being sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act. Lexus has decided that a defect, which relates to motor vehicle safety, exists in certain 2006 through 2008 Model Year RX 400h Vehicles.

You received this notice because our records, which are based primarily on state registration and title data, indicate that you are the current owner.

**What is the condition?**

Inside the hybrid inverter assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. Under some conditions, one or more transistors could be damaged, illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a "fail-safe" mode, resulting in reduced power under which the vehicle can still be driven for short distances. However, it is possible the fuse of the power supply circuit could blow, causing the hybrid system to shut down and resulting in the vehicle stopping while being driven. This can increase the risk of a crash.

**What is Lexus going to do?**

Any authorized Lexus dealer will replace the IPM at **NO CHARGE** to you.

**What should you do?**

***This is an important Safety Recall***

Please contact any authorized Lexus dealer and make an appointment to have the IPM replaced. Replacement of the IPM will take approximately 4 hours. However, depending upon the dealer's work schedule, it may be necessary to make your vehicle available for a longer period of time.

**You do not need an owner letter to have this recall completed; however, to assist the dealer in confirming vehicle eligibility, we request that you present this notice at the time of your service appointment.**

If you would like to update your vehicle ownership or contact information, please go to [www.lexus.com/ownersupdate](http://www.lexus.com/ownersupdate). You will need your full 17-digit Vehicle Identification Number (VIN) to input the new information.

**What if you have other questions?**

***Your local Lexus dealer will be more than happy to answer any of your questions and set up an appointment to perform the repair.*** You can find additional information and locate a Lexus dealer in your area by going online and visiting [www.lexus.com](http://www.lexus.com). If you require further assistance, you may contact the Lexus Customer Assistance Center at 1-800-255-3987, Monday through Friday, 5:00 am to 6:00 pm, Saturday 7:00 am through 4:00 pm Pacific Time.

If you believe that the dealer or Lexus has failed or is unable to remedy the defect within a reasonable time, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue S.E., Washington, D.C. 20590, or call the toll free Vehicle Safety Hot Line at 1-888-327-4236 (TTY: 1-800-424-9153), or go to <http://www.safercar.gov>.

What if you have previously paid for repairs to your vehicle for this specific condition?

If you have previously paid for repair to your vehicle for this specific condition prior to receiving this letter, please mail a copy of your repair order and proof-of-payment to the following address for reimbursement consideration:

Lexus, a Division of Toyota Motor Sales, U.S.A., Inc  
Lexus Customer Assistance Center L201  
19001 South Western Avenue  
Torrance, CA 90509

Include your name, address, and telephone number(s) in your request. Please allow us 6-8 weeks to process your request.

Please note the dealership will need to complete the Safety Recall remedy before reimbursement consideration requests can be processed.

If you are a vehicle lessor, Federal law requires that any vehicle lessor receiving this recall notice must forward a copy of this notice to the lessee within ten days.

We have sent this notice in the interest of your continued satisfaction with our products, and we sincerely regret any inconvenience this condition may have caused you.

Thank you for driving a Lexus.

Sincerely,

LEXUS, A DIVISION OF TOYOTA MOTOR SALES, U.S.A., INC.

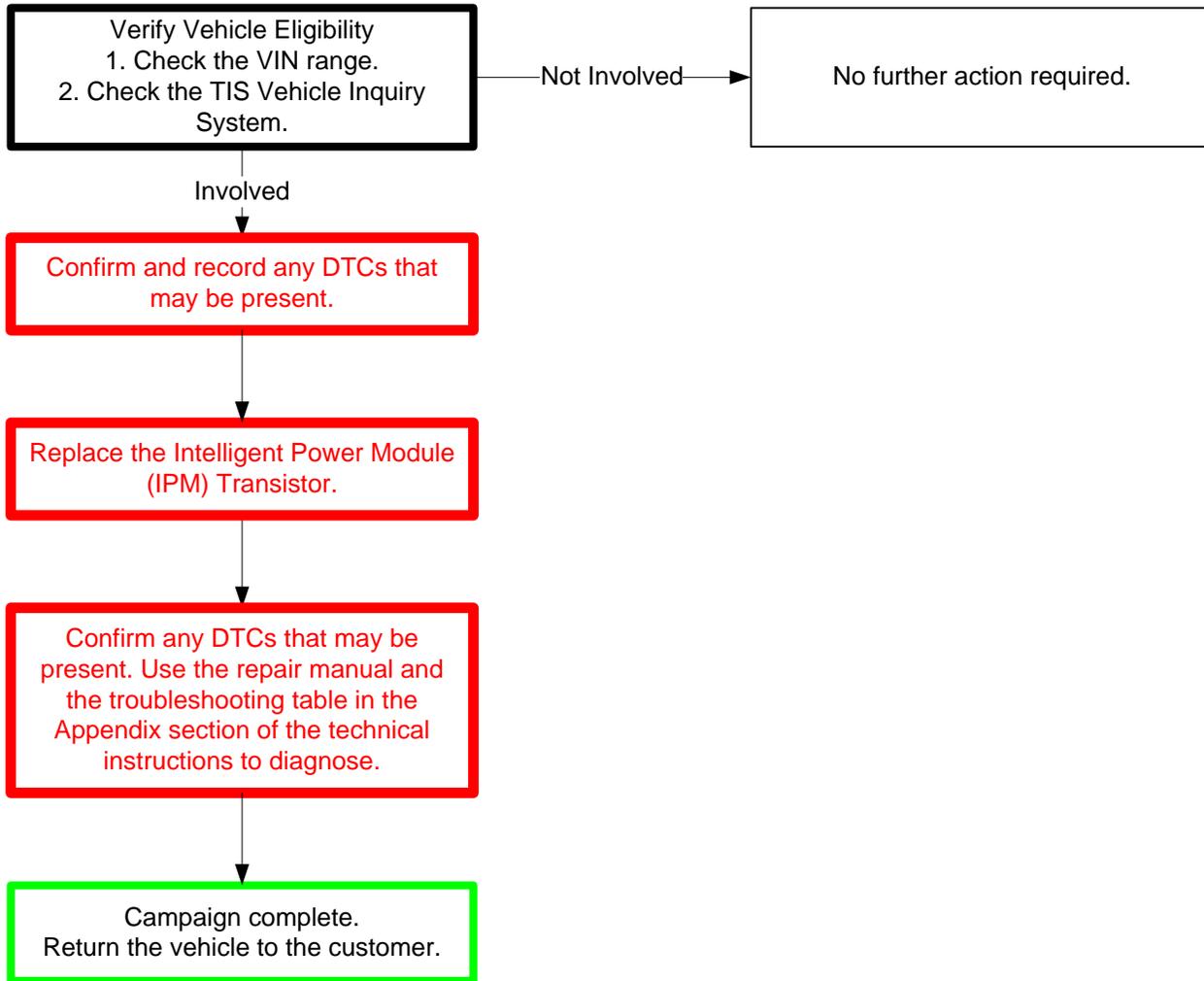
**TECHNICAL INSTRUCTIONS  
FOR  
SAFETY RECALL DLF  
INTELLIGENT POWER MODULE TRANSISTOR REPLACEMENT  
CERTAIN 2006 – 2008 MODEL YEAR RX400h**

**[Complete DLF Technical Video Supplement](#)**

**In order to perform this campaign, technician must be Hybrid Certified. If you have questions regarding certification, contact your area representative.**

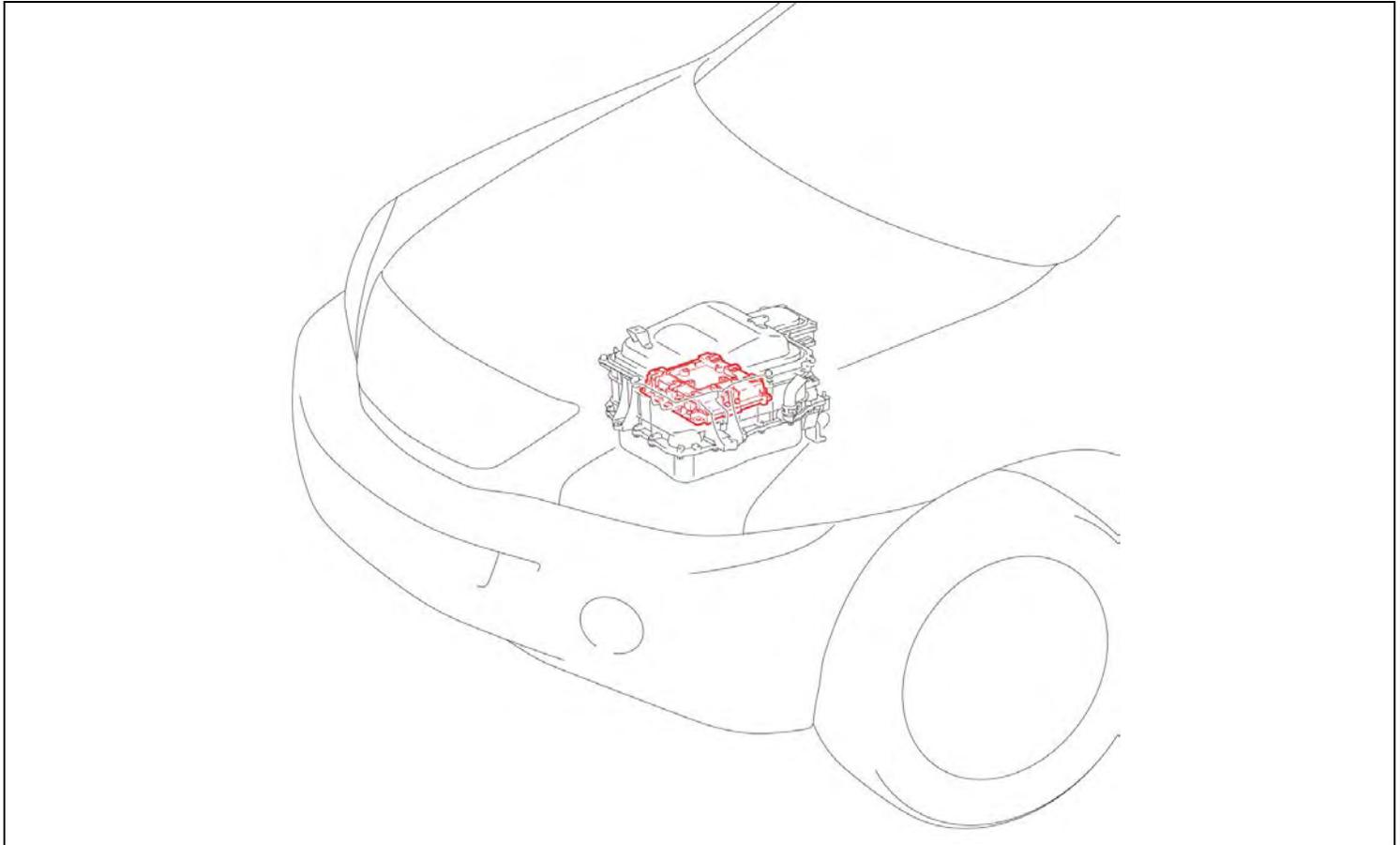
## I. OPERATION FLOW CHART

The flow chart is for reference only. **DO NOT** use it in place of the full technical instructions. Follow **ALL** steps as outlined in the full technical instructions to confirm the campaign is completed correctly.



## II. BACKGROUND

Within the vehicle, inside the inverter assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. The solder underneath these transistors could degrade and eventually cause damage to them, illuminating various warning lights on the instrument panel. In most cases, the vehicle will enter a fail-safe mode, resulting in reduced motive power in which the vehicle can still be driven for short distances. In limited instances, the fuse of the power supply circuit could blow, causing the hybrid system to shut down and resulting in the vehicle stopping while being driven.



## III. IDENTIFICATION OF AFFECTED VEHICLES

### A. COVERED VIN RANGE

WMI	Year	VIN Range	
		VDS	Range
JTJ	2006	GW31U	0001007-0004967
			2000108-2000971
	HW31U	0001106-0049412	
		2000103-2007397	
	2007	GW31U	2000995-2005870
		HW31U	2007400-2039945
2008	GW31U	2005871-2851829	
	HW31U	2027573-2867597	

#### NOTE:

- Check the TIS Vehicle Inquiry System to confirm the VIN is involved in this Safety Recall, and that the campaign has not already been completed prior to dealer shipment or by another dealer.
- TMS warranty will not reimburse dealers for repairs conducted on vehicles that are not affected or were completed by another dealer.

## IV. PREPARATION

### A. PARTS

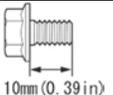
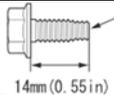
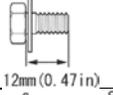
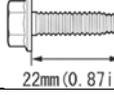
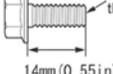
#### Required Parts – Necessary to complete the repair

Part Number	Part Description	Quantity
04001-29148	Intelligent Power Module Transistor	1
08887-02409	Grease G747	2

#### GREASE 747 EXPIRATION DATE EXPLANATION


<p>The expiration date <i>DOES NOT</i> indicate that the grease is not useable. It is <i>OKAY</i> to use grease that is beyond the expiration date. The tube of grease must be kneaded to confirm the grease is properly mixed prior to use.</p>

#### Ancillary Parts – Only necessary if lost during the repair

Part Description	Part Number	Part Description	Part Number
	91551-80610		90105-A0263
	90105-A0096		90080-11255
	91551-80614		

### B. TOOLS, SUPPLIES & EQUIPMENT

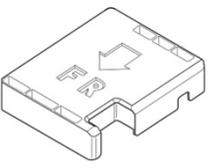
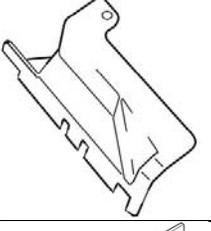
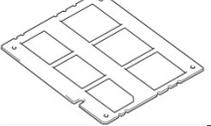
- Standard hand tools
- Torque wrench
- Techstream
- Brake cleaner
- Marking pen
- Air gun
- Throttle plate cleaner 00289-1TP00 (or equivalent)
- Insulating tape
- DVOM

**SST** – These are essential special service tools that the dealership should have.

Part Number	Part Name	Quantity
00002-03100-S	Electrical Insulating Gloves (Small)	1
00002-03200-M	Electrical Insulating Gloves (Medium)	
00002-03300-L	Electrical Insulating Gloves (Large)	

NOTE: If additional gloves are needed they can be ordered through SPX by calling 800-933-8335

**Campaign Tools** – These tools are provided to the dealership.

Part Name	Sample	Quantity	Part Name	Sample	Quantity
Protective Cover A		1	Protective Cover B		1
Masking Plate		1	Squeegee		1
Stud Bolt		2	Masking Plate Nut/Bolt		4

## V. SAFETY PRECAUTIONS

### A. SAFETY CHECKLIST & PRECAUTIONS WHEN WORKING ON THE HIGH VOLTAGE SYSTEM



- Always remember **“SAFETY FIRST”**
- Be extremely careful when handling high voltage components
- Before beginning and while working on the high voltage system, perform the following safety check list.

#### 1. AIR VENTILATION AND FOREIGN MATERIALS

- Perform work in an area that is free of dust and other airborne matter.
- Do not perform the work next to a stall where grinding or spraying of chemicals is performed.
- When not working in the inverter, temporarily install the inverter cover to prevent foreign material entering the inverter.

#### 2. PREVENT STATIC ELECTRICITY

- Static electricity can have an adverse effect on inverter components, discharge static electricity by touching a ground location on the vehicle before starting work.

#### 3. PREVENT ELECTRICAL SHOCKS & SHORTS

- Confirm the auxiliary battery and the service grip have been unplugged for at least 5 minutes before beginning work on the high voltage system.
- Store the service grip in a secure location (in your pocket) to prevent accidental installation.
- To prevent short-circuiting of components, wrap tools with insulating tape before use.
- Do not wear metal; watches, rings, mechanical pencils, etc...
- When working with or around a high voltage circuit (orange connectors and cables) wear the correct electrical insulating gloves.
- Confirm your electrical insulating gloves are not wet, or dirty.
- Confirm your electrical insulating gloves are not punctured or torn.

#### 4. USE OF AIR & POWER TOOLS

- Do not use air tools or power tools on any component once the inverter cover has been removed to prevent damage and foreign materials from entering the inverter.

#### 5. HANDLING OF PARTS

- Keep all removed parts organized and clean.
- Store all removed parts so they are not contaminated or damaged when removed from the inverter.

#### 6. HANDLING OF THE INVERTER & CONNECTORS

- Cover all high voltage connectors with insulating tape immediately after disconnecting the connector.
- Use extreme care to prevent nuts/bolts from falling into the inverter when work is performed. If a part falls into the bottom section of the inverter the entire inverter assembly may need to be removed.
- Use extreme care to not drop any tools in the inverter assembly.

#### 7. CONNECTING HIGH VOLTAGE TERMINALS

- Confirm all terminals are clean before connecting to the inverter.
- Torque specifications are critical, confirm all bolts are torque as described in these instructions.

#### 8. INTERMEDIATE INSPECTIONS

- Perform all intermediate inspections to prevent errors.

#### 9. ASSIGN A SAFETY SUPERVISOR

- Assign a safety supervisor to be in charge of all safety precautions in the work area.
- Put a “Working with high voltage” warning sign on the vehicle during work.

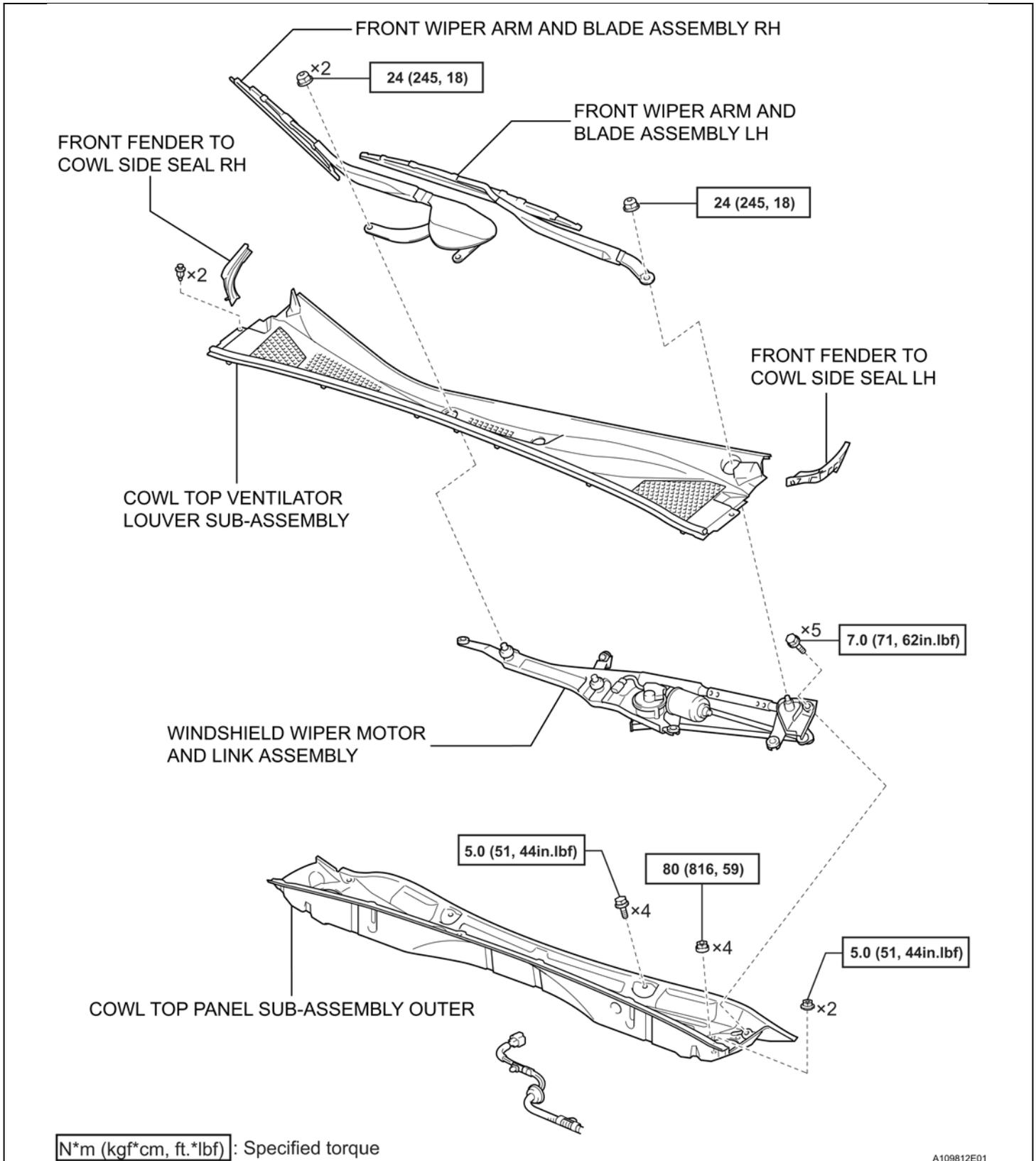
Person in charge: \_\_\_\_\_  
**high voltage system**  
**Working on**  
**CAUTION:**

**CAUTION:**  
**Working on**  
**high voltage system**  
Person in charge: \_\_\_\_\_

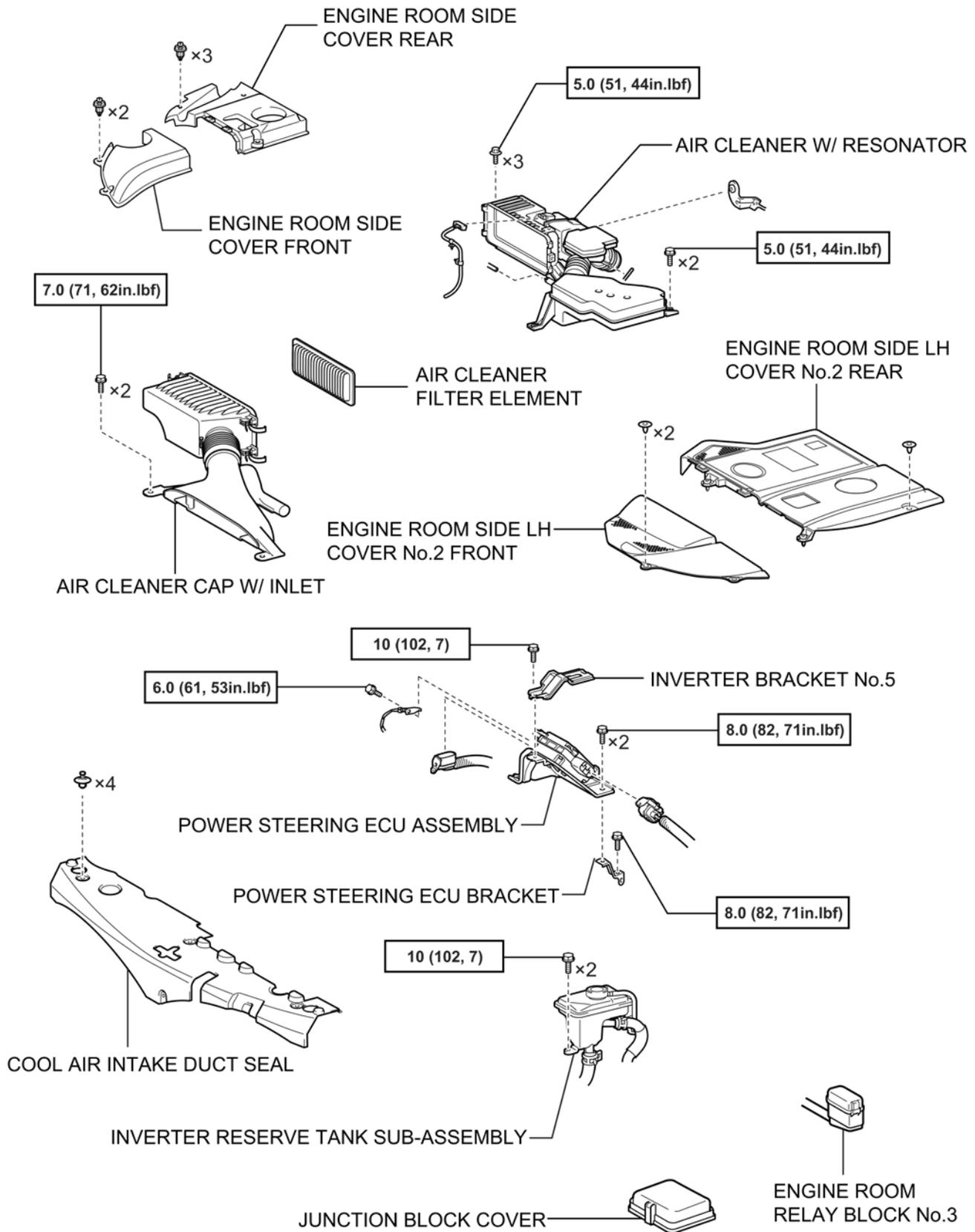
Fold this page and place on the roof of vehicle.

# VI. DISASSEMBLY

## A. COMPONENTS



## B. COMPONENTS

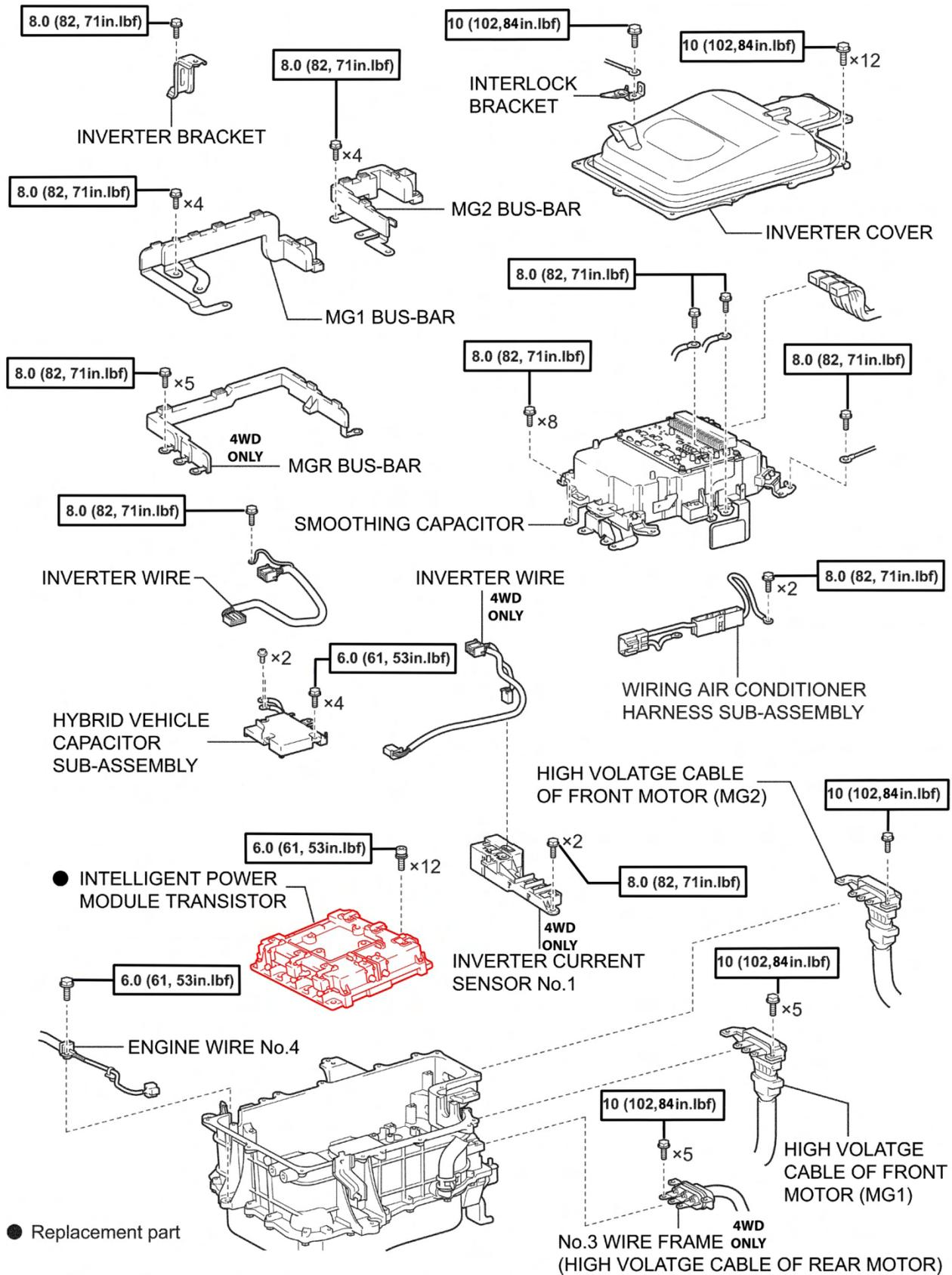


**N\*m (kgf\*cm, ft.\*lbf)**: Specified torque

B1043000010E02

**TORQUE SPECIFICATIONS INSIDE THE INVERTER ARE CRITICAL  
CONFIRM ALL BOLTS ARE TORQUED AS OUTLINED IN THESE INSTRUCTIONS**

**INTERNAL COMPONENTS IN THE INVERTER ARE NOT AVAILABLE AS SERVICE PARTS  
BE CAREFUL WHEN REMOVING, STORING, AND REINSTALLING THESE COMPONENTS**



## C. VEHICLE DISASSEMBLY



- It is extremely important that all of the vehicle disassembly steps are followed prior to proceeding to the inverter disassembly steps. Failure to follow all steps could result in inverter damage.
- It is extremely important to prevent contamination of the inverter assembly. Confirm the work area is clean and free from airborne matter.

### 1. DETERMINE THE WORK PLACE

- a) Choose a spot that is free of dust and debris. **DO NOT** work next to a place where grinding or spraying of chemicals is performed.

### 2. PLACE THE PROVIDED CAUTION SIGN ON THE ROOF OF THE VEHICLE

### 3. RECORD AUDIO AND AIR CONDITIONING SYSTEM SETTINGS

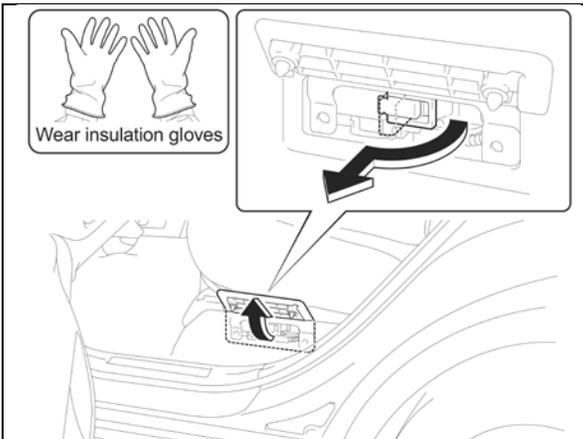
### 4. CHECK FOR DIAGNOSTIC TROUBLE CODES

- a) If any DTCs are output record the data.

### 5. DISCONNECT THE NEGATIVE BATTERY CABLE

### 6. REMOVE THE SERVICE GRIP

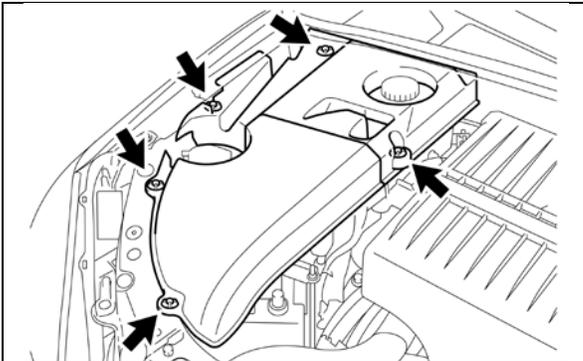
- a) Disengage the 2 clips and open the cover.
- b) Wearing insulating gloves, remove the service grip.



- Store the service grip in a secure location (in your pocket) to prevent accidental installation.
- After removing the service grip, wait at least 5 minutes before working on the high voltage system.
- **DO NOT** attempt to switch the vehicle to READY ON with the service grip removed.

### 7. REMOVE THE ENGINE ROOM SIDE COVER

- a) Remove the 5 clips and the cover.

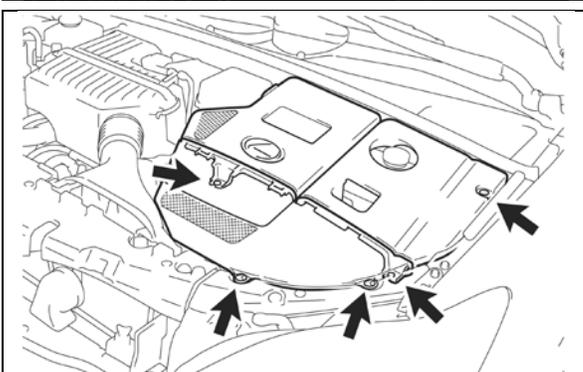


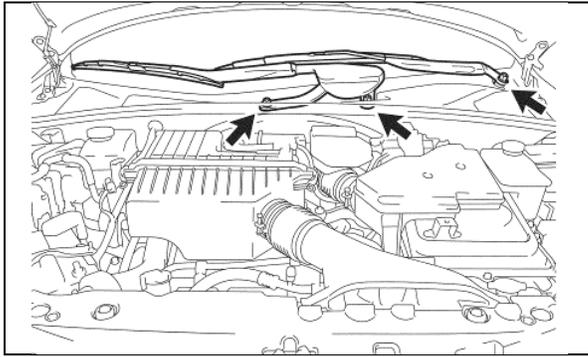
### 8. REMOVE THE ENGINE ROOM SIDE LH COVER

- a) Remove the 2 clips and the engine room cover.

### 9. REMOVE THE ENGINE ROOM SIDE LH COVER No.2 REAR

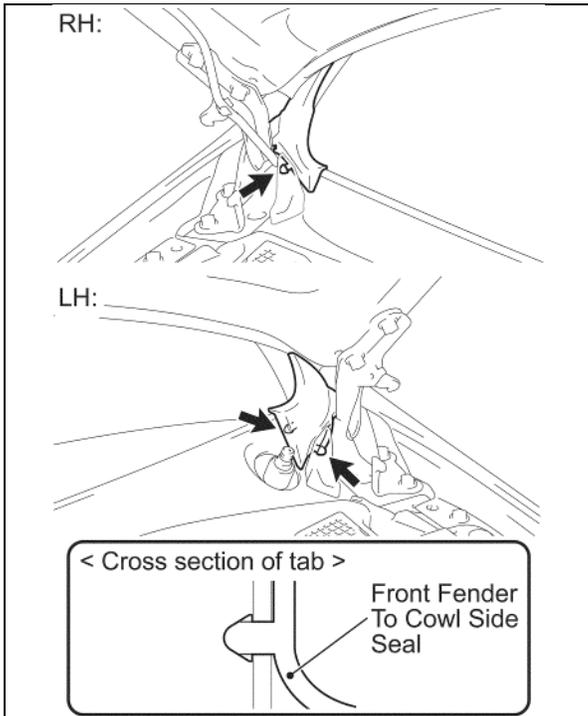
- a) Remove the 3 clips and the cover.





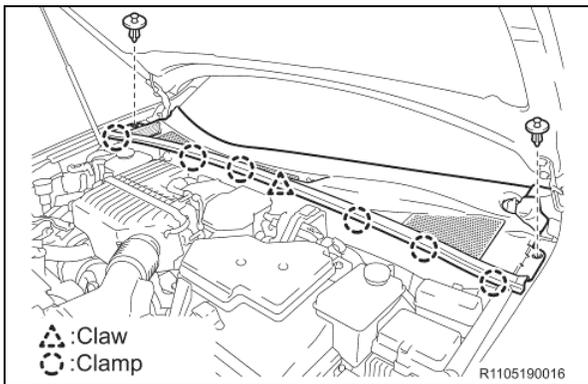
**10. REMOVE THE FRONT WIPER ARMS**

- a) Remove the 3 nuts and the wiper arms.



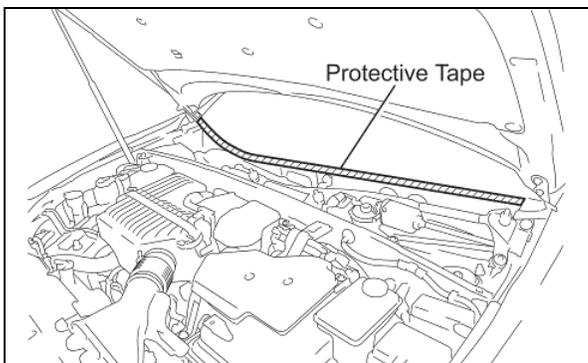
**11. REMOVE THE FRONT FENDER TO COWL SIDE SEALS**

- a) Release the tab molded in the rubber seal from the body and remove the seals.



**12. REMOVE THE COWL TOP VENTILATOR LOUVER SUB ASSEMBLY**

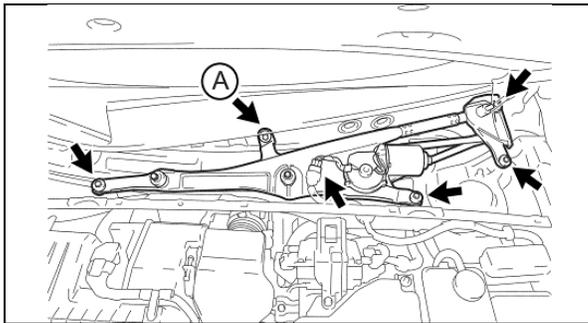
- a) Remove the 2 clips, disengage the 6 tabs and remove the cowl.



**13. PROTECT THE WINDSHIELD**

- a) Attach masking tape thickly to the bottom of the glass to prevent the windshield from being damaged.

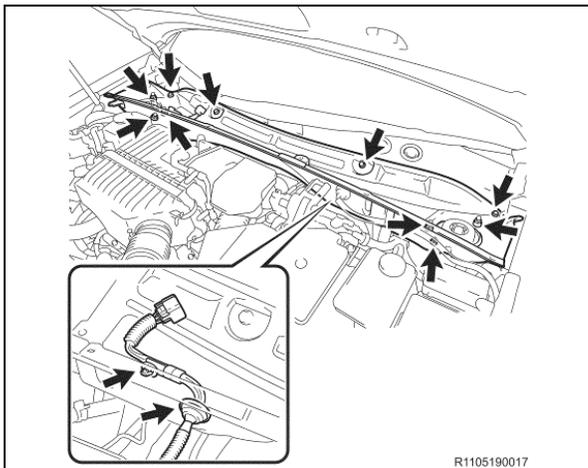
**NOTE: Be extremely careful as laminated glass is easy to break when the edge is impacted.**



#### 14. REMOVE THE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

- a) Disconnect the connector and harness clamps.
- b) Remove the 5 bolts and the assembly.

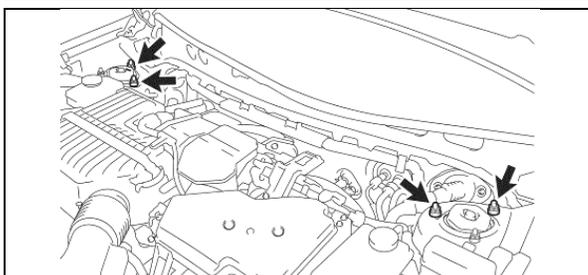
**NOTE:** The bolt labeled 'A' in the illustration may have a temporary washer, there is no problem if the washer is lost or damaged.



#### 15. REMOVE THE COWL TOP PANEL SUB ASSEMBLY OUTER

- a) Remove the clamps and grommet of the wiper harness.
- b) Remove the 4 shock absorber nuts that also attach to the cowl.
- c) Remove the 4 bolts and 2 nuts and the cowl.

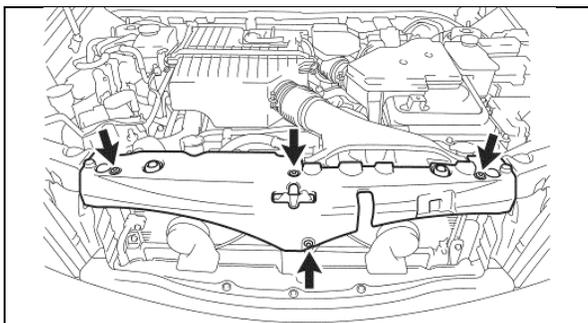
**NOTE:** *DO NOT* contact the windshield with the cowl during removal.



#### 16. INSTALL THE SHOCK ABSORBER NUTS

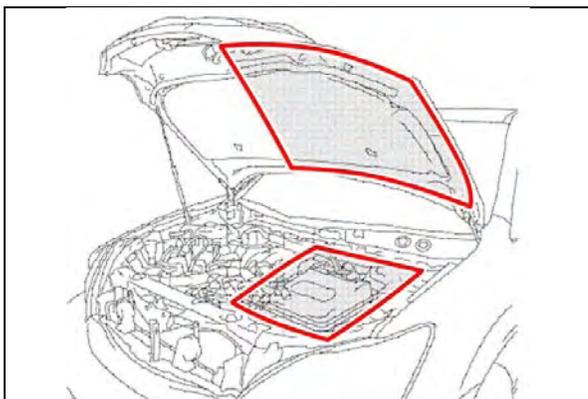
- a) Install the 4 shock absorber nuts that were removed in the previous step.

**Torque:** 80N·m (816kgf·cm, 59ft.·lbf)



#### 17. REMOVE THE COOL AIR INTAKE DUCT SEAL

- a) Remove the 4 clips and the seal.

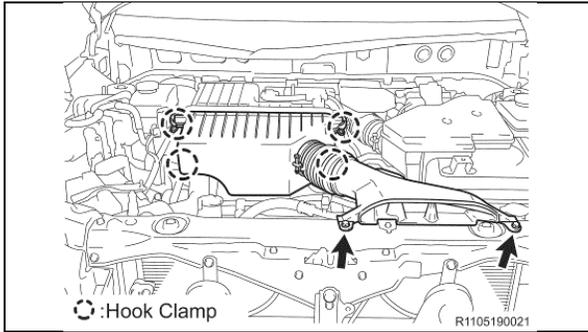


#### 18. CLEAN THE AREA AROUND THE INVERTER

- a) Thoroughly remove dust and water from the areas highlighted in the illustration using shop cloths and an air gun.

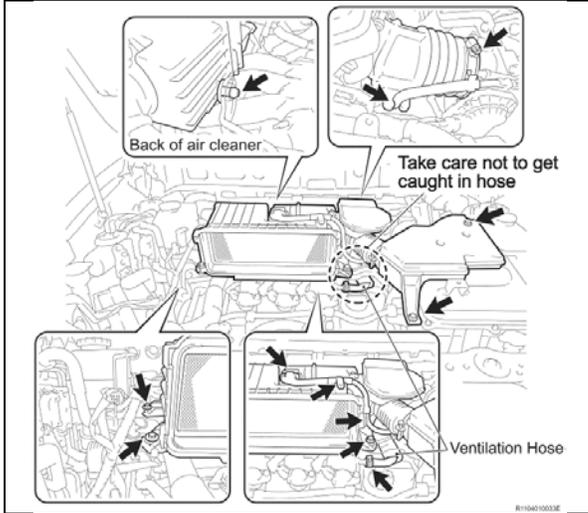


**The inverter is a precision component, contamination can cause a malfunction.**



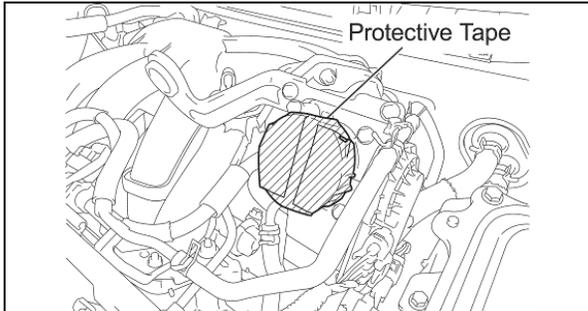
### 19. REMOVE THE AIR CLEANER CAP WITH INLET

- a) Remove the 2 bolts and the 4 hook clamps and the air cleaner.



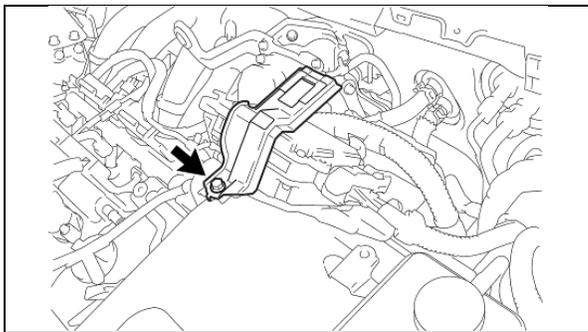
### 20. REMOVE THE AIR CLEANER CASE WITH RESONATOR

- a) Disconnect all hoses and connectors, disconnect the 5 bolts and the air cleaner case.

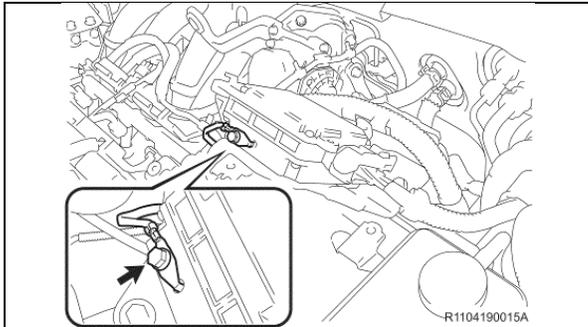


### 21. COVER THE THROTTLE BODY

- a) To prevent foreign material from entering the throttle body, cover with tape.



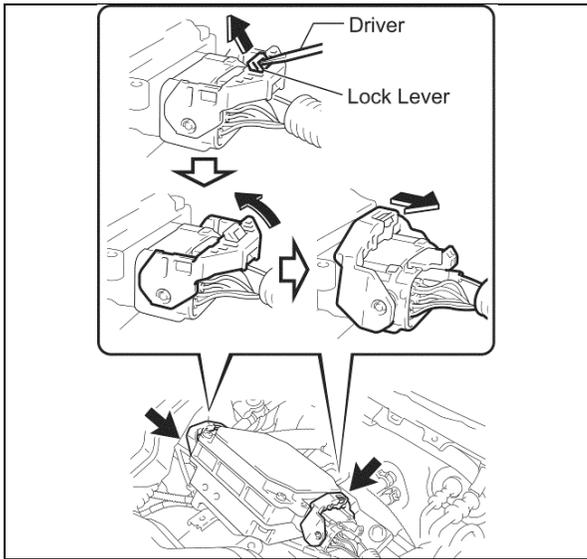
### 22. REMOVE THE INVERTER BRACKET No.5



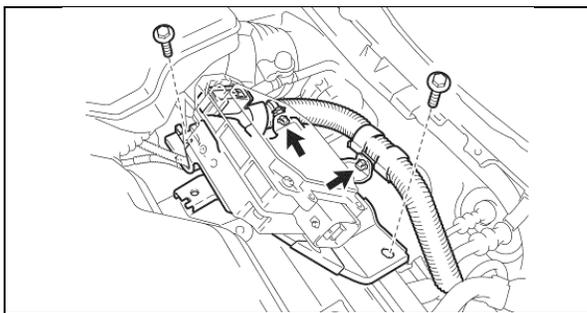
### 23. REMOVE THE POWER STEERING ECU ASSEMBLY

**STOP** Wear insulating gloves when removing the power steering gear ECU, circuit voltage is approximately 42V.

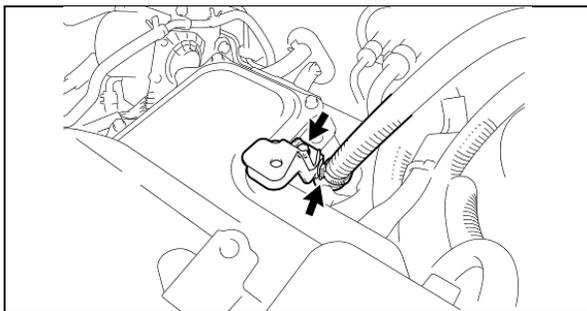
- a) Remove the ground wire bolt and ground wire.
- b) Wrap the ground terminal with insulating tape.



- c) Remove the 2 connectors as described in the illustration.
- d) Wrap the terminals of the connectors with insulating tape.

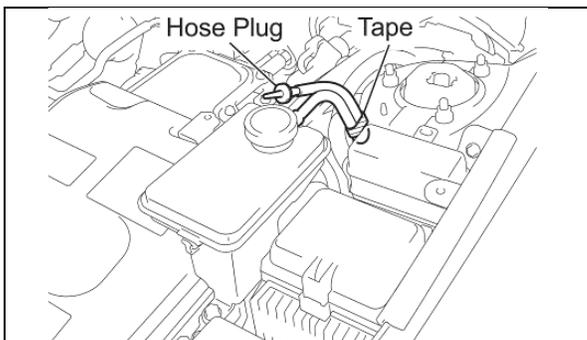


- e) Disconnect the 2 wire harness clamps.
- f) Remove the 2 bolts and the ECU.



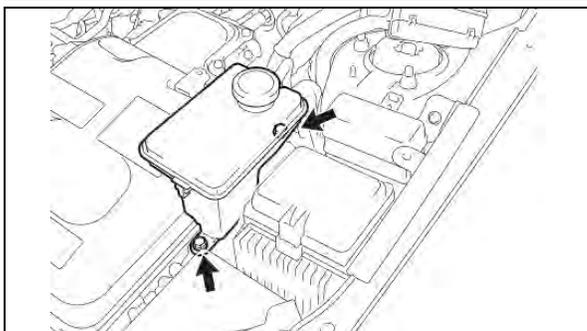
#### 24. REMOVE THE POWER STEERING ECU BRACKET

- a) Remove the bolt and bracket.

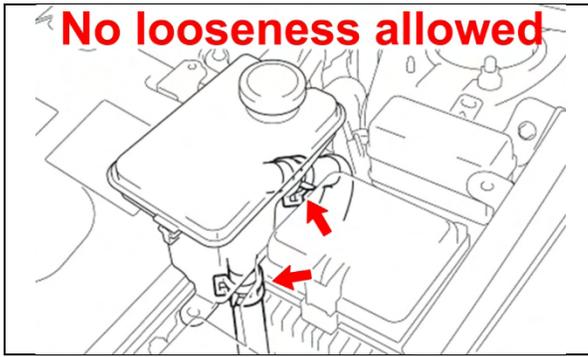


#### 25. DISPLACE THE INVERTER RESERVE TANK SUB ASSEMBLY

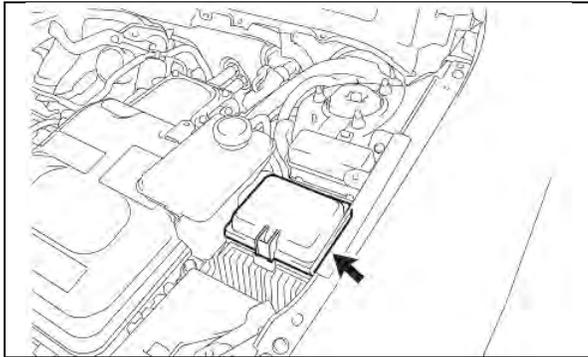
- a) Confirm the tank cap is securely tightened.
- b) Plug the overflow hose, then fix the hose with tape as illustrated to prevent coolant leakage.



- c) Remove the 2 bolts for the reserve tank.

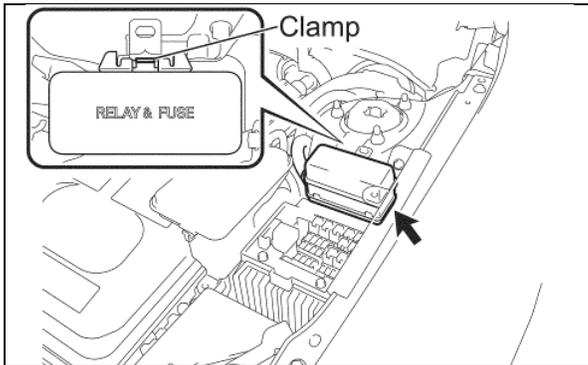


- d) Confirm the 2 hoses connected to the reserve tank are secure.

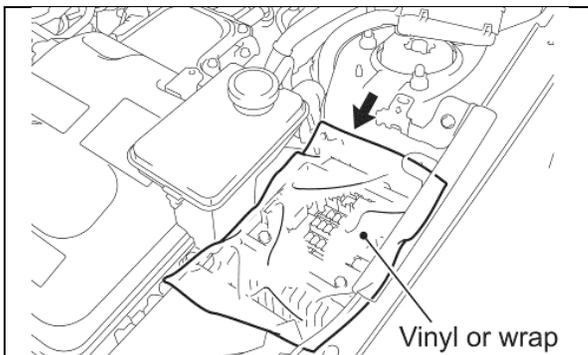


**26. REMOVE THE JUNCTION BLOCK COVER**

**NOTE:** The reserve tank cannot be displaced unless the cover is removed.



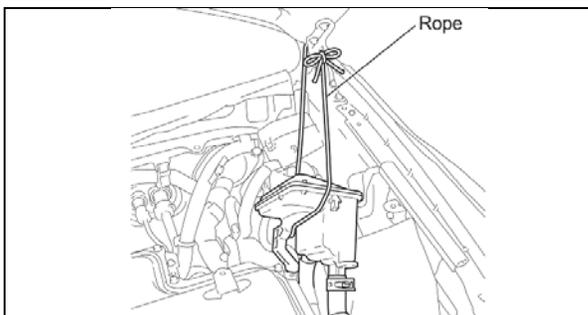
**27. DISCONNECT THE ENGINE ROOM RELAY BLOCK No.3**



**28. PROTECT THE JUNCTION BLOCK**

- a) Cover the exposed fuses and relays with a waterproof material.

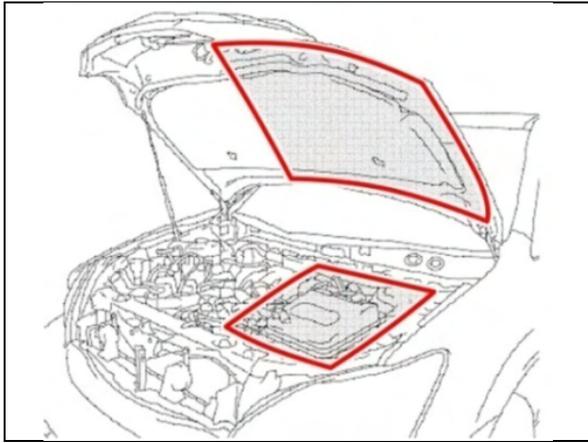
**NOTE: DO NOT** use tape to cover the junction block as relays and fuses may be pulled out when the tape is removed.



**29. DISPLACE THE INVERTER RESERVE TANK SUB ASSEMBLY**

- a) Displace the reserve tank and secure it to the hood hinge to gain access to the inverter cover.
- b) Confirm the reserve tank does not leak coolant when in the displaced position.

**NOTE: DO NOT** put excessive strain on the reserve tank hoses.



### 30. CLEAN THE AREA AROUND THE INVERTER

- a) Confirm all dust and water has been removed from the areas highlighted in the illustration. Clean using shop cloths and an air gun.



**The inverter is a precision component and any contamination may cause a malfunction.**

### THE FOLLOWING CONFIRMATION STEPS ARE VITAL CONFIRM THESE STEPS ARE FOLLOWED CLOSELY

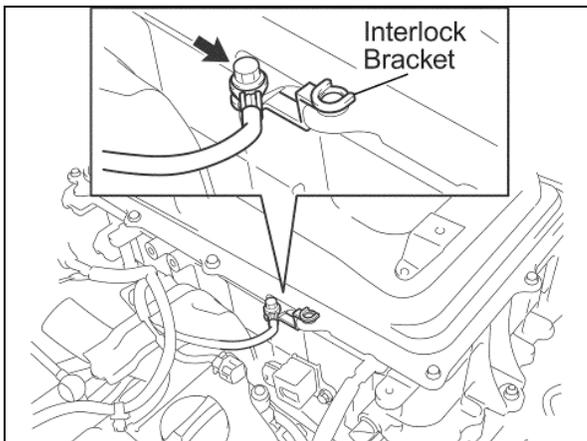
#### PERFORM THIS INTERMEDIATE INSPECTION BEFORE BEGINNING WORK ON THE INVERTER.

1. Is the work space clear of dust and water?
2. Is the "Working with high voltage" warning sign posted?
3. Is the auxiliary battery disconnected and the service grip in a secure location (in your pocket)?
4. Is the inverter reserve tank displaced securely and free of leaks?
5. Are the areas around the inverter and the underside of the hood properly cleaned?
6. Are you wearing electrical insulating gloves that are in good condition?
7. Is the protective cover A clean and available for use?
8. Have you discharged all potential static electricity from your person?

#### D. INVERTER DISASSEMBLY



- It is extremely important to prevent contamination of the inverter assembly.
- Confirm the work area is clean and free from airborne matter.
- Be sure to wear electrical insulating gloves during the entire inverter disassembly procedure.
- DO NOT use any air tools or power tools during the inverter disassembly procedure.
- Confirm all tools used on HV components are insulated or wrapped with insulating tape.
- Internal components in the inverter are not available as service parts, be careful when removing, storing, and reinstalling these components.

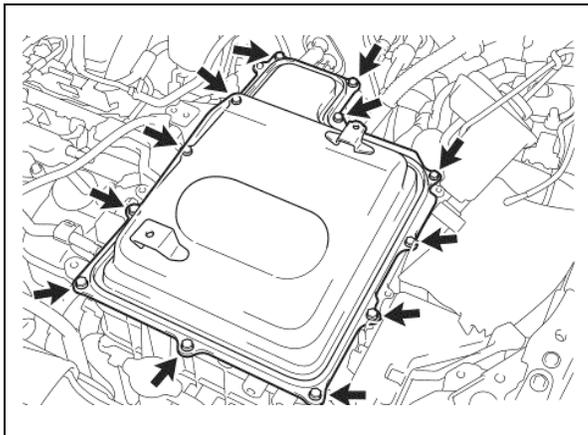


#### 1. REMOVE THE INVERTER COVER

- a) Remove the bolt and the interlock bracket.
- b) Wrap the terminal with insulating tape.



**Confirm the entire cowl assembly has been removed prior to removing the inverter cover. Failure to do so could result in damage in the inverter.**



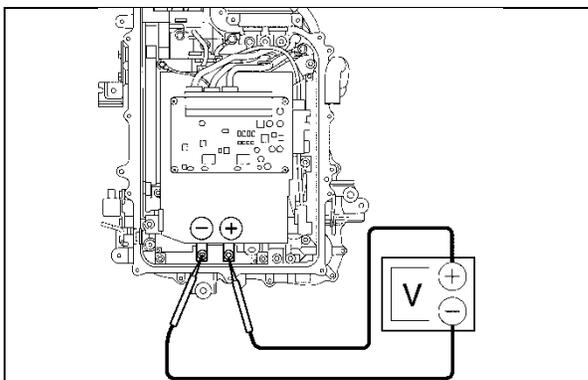
c) Loosen the 12 bolts evenly in 2 increments to remove the cover.

**NOTE:**

- **DO NOT** deform the cover during removal.
- To prevent damage to the insulating gloves, wear work gloves over the insulating gloves.



- Take extra precautions to prevent foreign material from entering the inverter.
- **DO NOT** touch the circuit board inside the inverter.



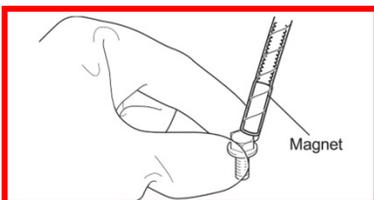
d) Store the inverter cover in a safe location to prevent damage to the inverter cover gasket.

**2. PERFORM A FINAL VOLTAGE CHECK**

a) Measure the voltage at the points indicated in the illustration.

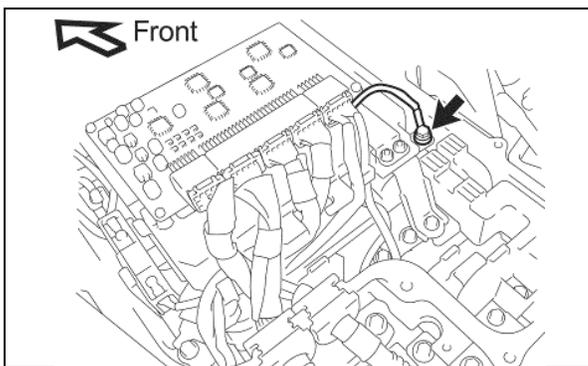
**Standard Voltage: 0V**

**NOTE:** If voltage is present, confirm all previous steps to disable the high voltage system have been followed.



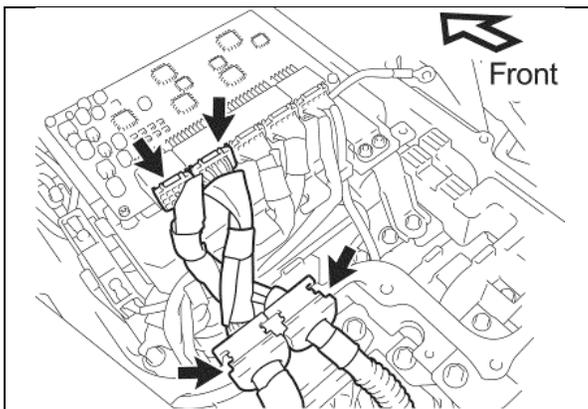
**NOTE:**

- To prevent dropping any bolts into the inverter it may be necessary to use a magnet to pick up bolts as they are loosened.
- If bolts are dropped into the bottom section of the inverter it may be necessary to completely remove the inverter for retrieval.

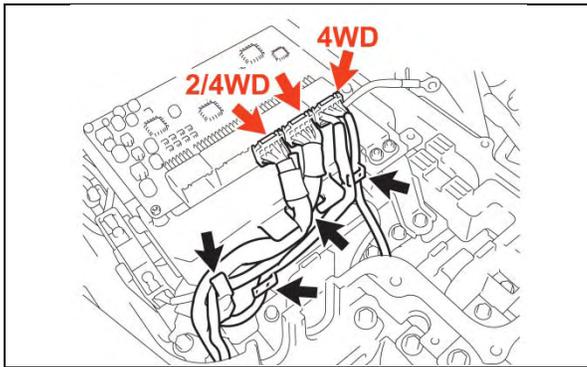


**3. DISCONNECT THE MG ECU CONNECTORS**

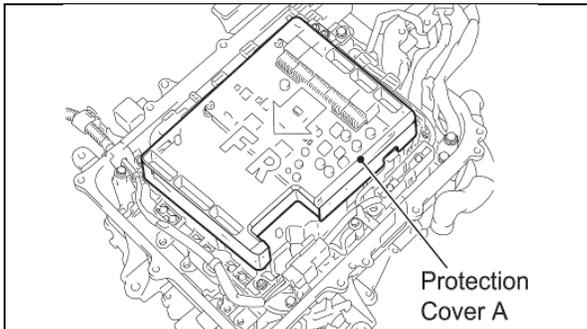
a) Remove the ground bolt.



b) Disconnect the 2 connectors and the 2 grommets.



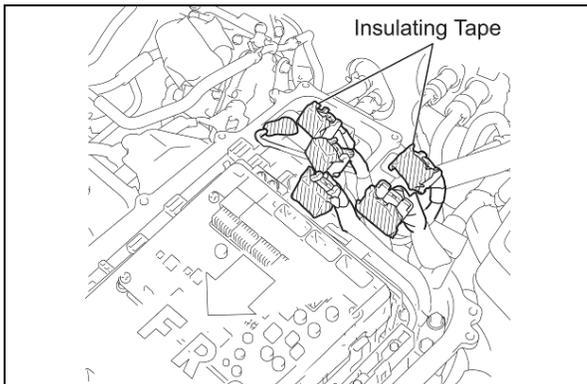
- c) **4WD** – Disconnect the 3 connectors and remove the wires from the clamps.  
**2WD** – Disconnect the 2 connectors and remove the wires from the clamps.



#### 4. INSTALL PROTECTIVE COVER A

- a) Immediately install the cover to protect the circuit board from damage and contamination.

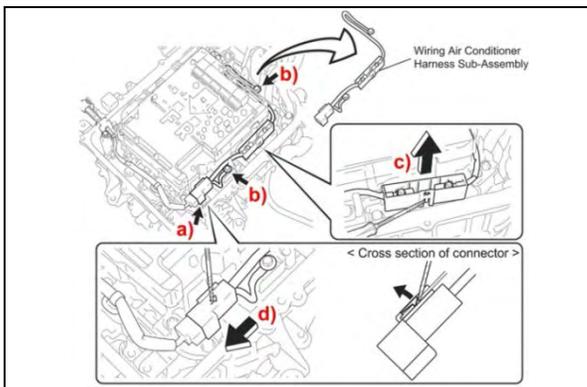
**NOTE: Use caution when installing the cover to avoid damaging the MG ECU.**



#### 5. PROTECT THE CONNECTORS AND HARNESS

- a) Cover the disconnected connectors and terminal with insulating tape.  
b) Bundle the harness and secure it away from the inverter.

**NOTE: Confirm the harness is positioned so the sharp edge of the inverter case does not cut the wires.**

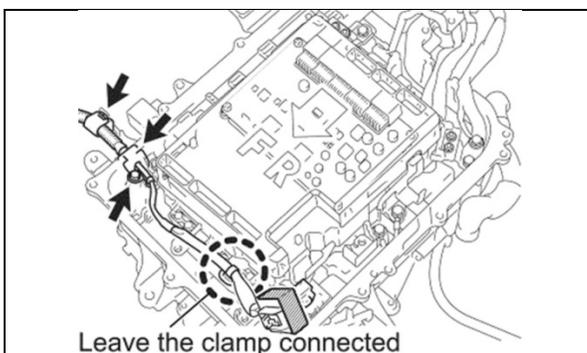


#### 6. REMOVE THE AIR CONDITIONER HARNESS SUB ASSEMBLY

- a) Disconnect the connector.  
b) Remove the 2 ground bolts.  
c) Raise the tab of the fuse box to remove it from the bracket.  
d) Raise the tab of the connector to remove it from the bracket.



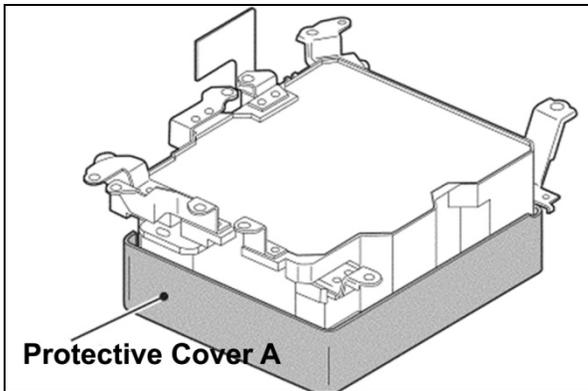
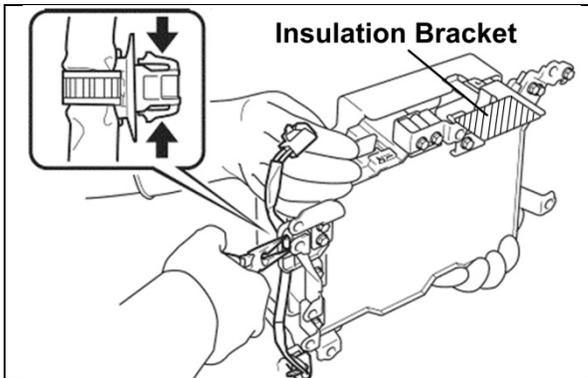
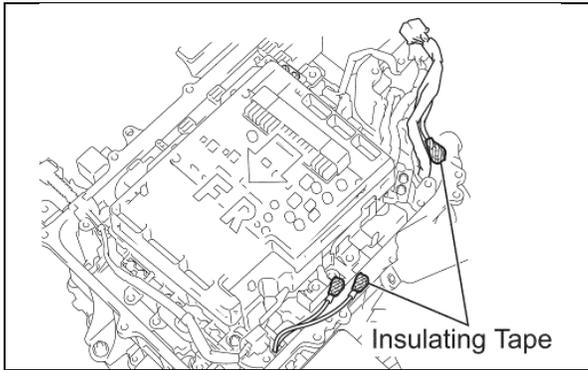
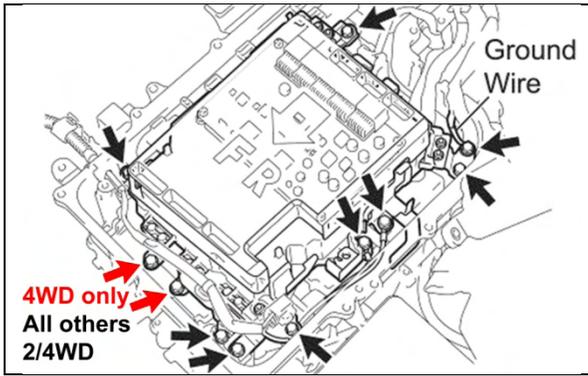
**DO NOT remove the harness until all connectors have been disconnected to prevent damaging components.**



#### 7. DISCONNECT THE ENGINE WIRE No.4

- a) Cover the connector with insulating tape.  
b) Remove the bolt.  
c) Disconnect the grommet.  
d) Disconnect the harness clamp located **outside** the inverter.

**NOTE: DO NOT disconnect the harness clamp located inside the inverter at this time to avoid damaging the clamp or the smoothing capacitor.**



## 8. REMOVE THE SMOOTHING CAPACITOR

- a) **4WD** – Remove the 11 bolts.  
**2WD** – Remove the 9 bolts.

- b) Cover the terminals with insulating tape.

**NOTE: Confirm protective cover A is fully installed.**

- c) Lift the smoothing capacitor.

- d) Disconnect the wire harness clamp.

- e) Remove the smoothing capacitor.

**NOTE:**

- **DO NOT** bend the insulation bracket.
- **Handle the smoothing capacitor carefully.**

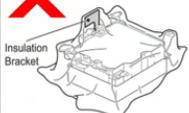
- f) Store the smoothing capacitor with protective cover A down.

**X**



**X**

Shop Cloth

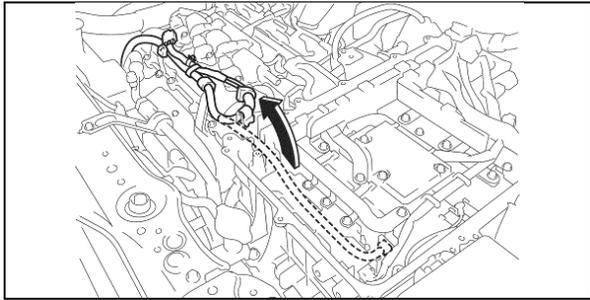


**X**



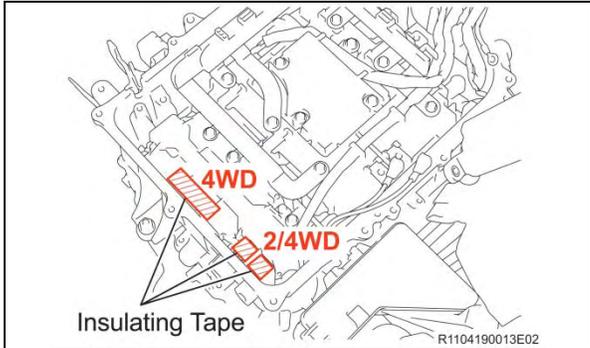
**NOTE:**

- **DO NOT** store the smoothing capacitor with protective cover A facing up.
- **DO NOT** cover the smoothing capacitor with a shop cloth to avoid damaging the insulation bracket.
- **Store the smoothing capacitor in a location that is free of dust and other airborne matter.**

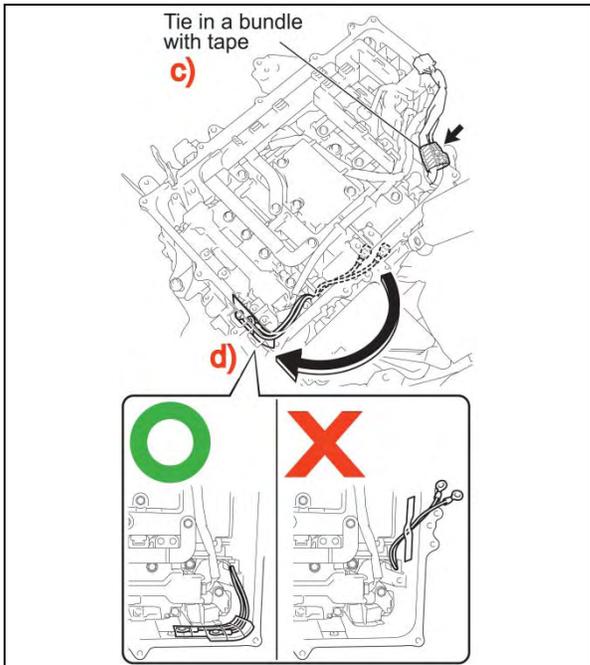


## 9. PROTECT THE HARNESES AND TERMINALS

a) Position the disconnected harness outside the inverter so it does not obstruct the work.



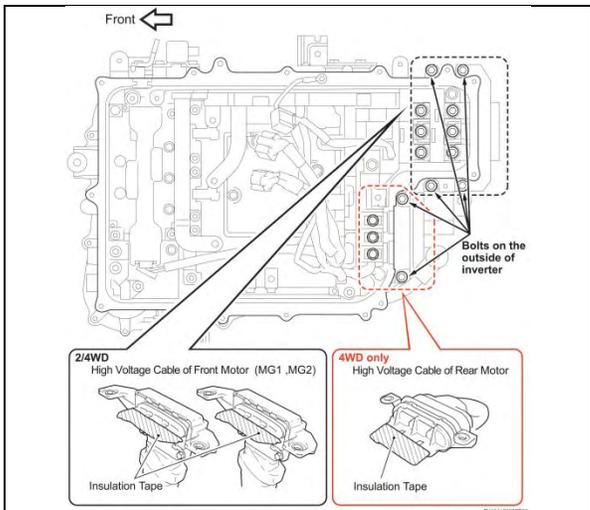
b) Cover the terminals indicated in the illustration with insulating tape.



c) Secure the terminal to the other harnesses at the rear of the inverter so it does not obstruct the work.

d) Secure the 2 forward terminals to the inner wall of the inverter as indicated in the illustration so they do not obstruct the work.

**NOTE: DO NOT** position the terminals in a way that will allow the inverter cover to pinch them when the cover is temporarily installed.



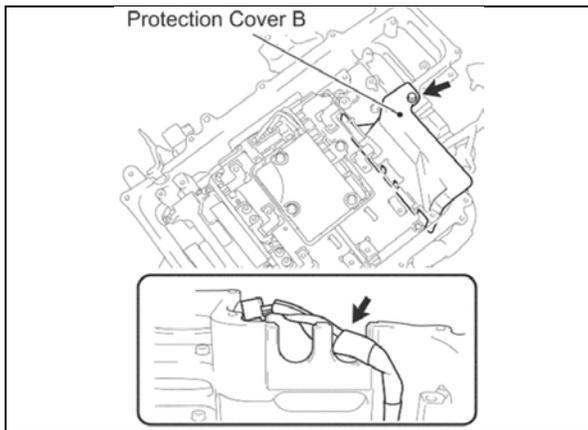
## 10. DISCONNECT THE HIGH VOLTAGE CABLES

a) **4WD** – Remove the 15 bolts and disconnect the high voltage MG1, MG2, and MGR cables. Cover the terminals with insulating tape.

**2WD** – Remove the 10 bolts and disconnect the high voltage MG1 and MG2 cables. Cover the terminals with insulating tape.



To prevent contamination, **DO NOT** use the bolts that were removed from the outside of the inverter on the inside.

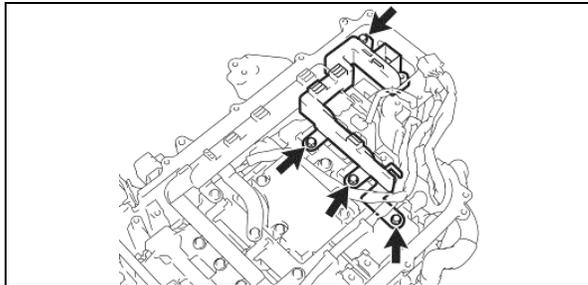


#### 11. 2WD ONLY – INSTALL PROTECTIVE COVER B

- a) Position the wire harness in the groove of the inverter case.
- b) Install protective cover B using an inverter cover bolt.

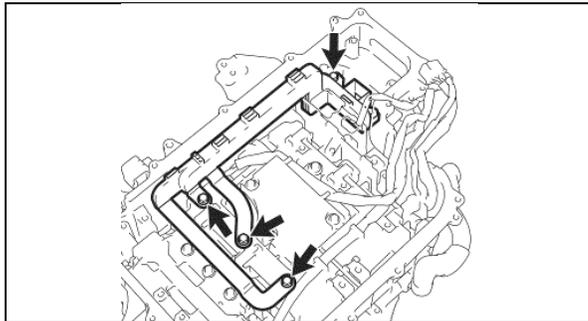
#### NOTE:

- Tighten the bolt by hand **ONLY**.
- Protective Cover B will be installed on 4WD vehicles at step 18.



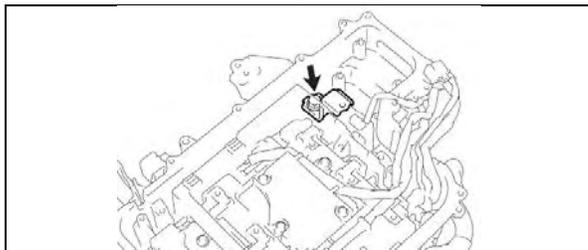
#### 12. REMOVE THE MG2 BUS BAR

- a) Remove the 4 bolts and the bus bar.



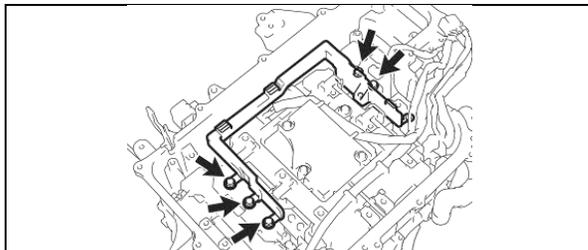
#### 13. REMOVE THE MG1 BUS BAR

- a) Remove the 4 bolts and the bus bar.



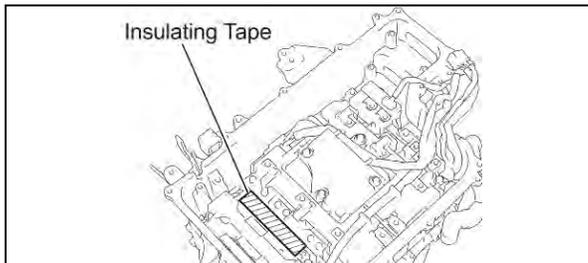
#### 14. 4WD ONLY – REMOVE THE INVERTER BRACKET

- a) Remove the bolt and the bracket.

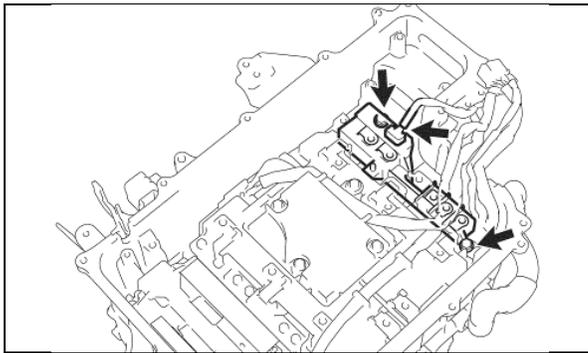


#### 15. 4WD ONLY – REMOVE THE MGR BUS BAR

- a) Remove the 5 bolts and the bus bar.

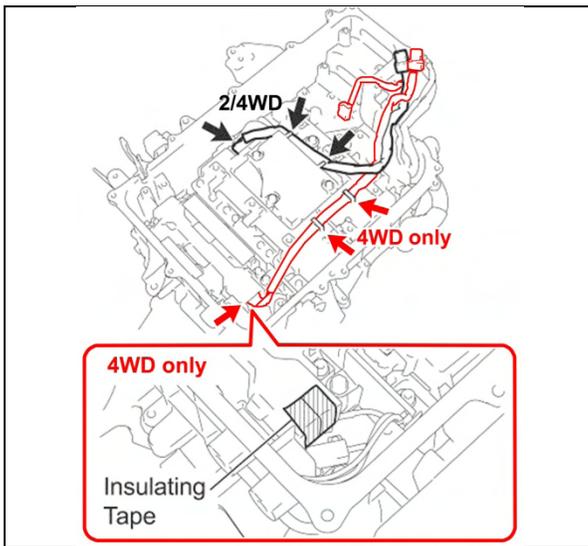


- b) Cover the terminals indicated in the illustration with insulating tape.



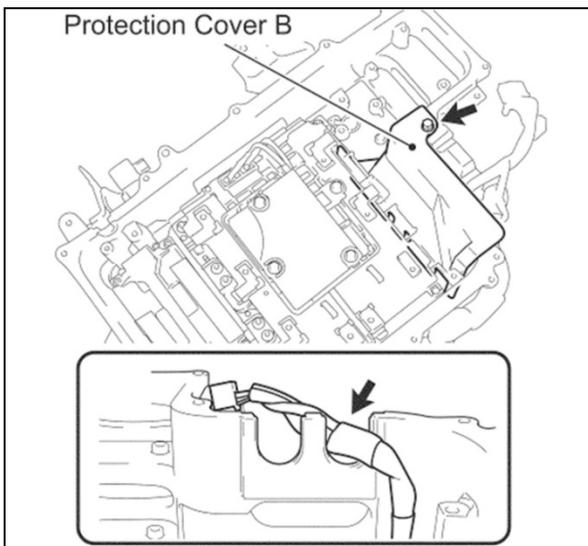
**16. 4WD ONLY – REMOVE THE INVERTER CURRENT SENSOR No.1**

- a) Disconnect the connector.
- b) Remove the 2 bolts and the sensor.



**17. REMOVE THE INVERTER WIRE HARNESSSES**

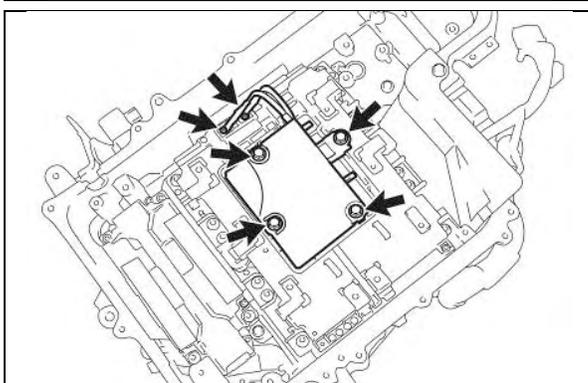
- a) **4WD ONLY** – Disconnect the 2 clamps and the connector and remove the harness. Attach insulating tape to the connector indicated in the illustration.
- 2/4WD** – Disconnect the 2 clamps and the connector and remove the harness.



**18. INSTALL PROTECTIVE COVER B**

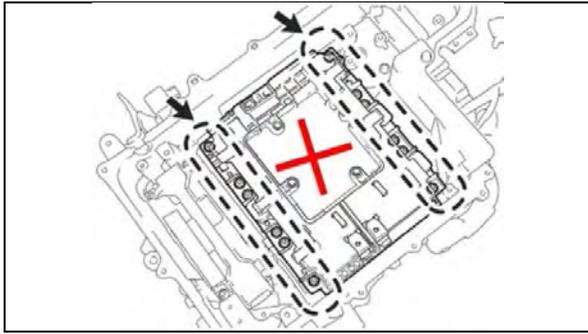
- a) Position the wire harness in the groove of the inverter case.
- b) Install protective cover B using an inverter cover bolt.

**NOTE: Tighten the bolt by hand ONLY.**



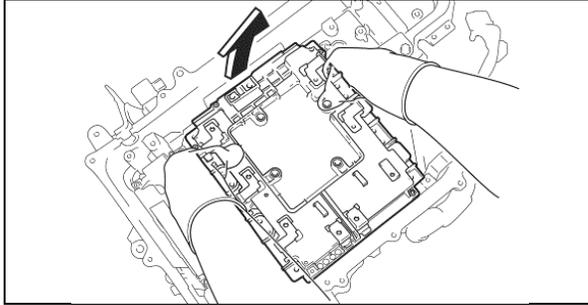
**19. REMOVE THE HYBRID VEHICLE CAPACITOR SUB ASSEMBLY**

- a) Remove the 2 terminal screws.
- b) Remove the 4 bolts and the capacitor.



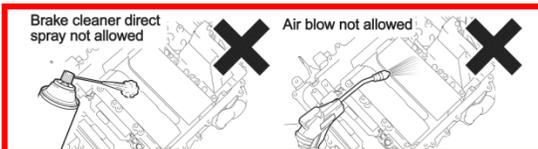
## 20. REMOVE THE INTELLIGENT POWER MODULE (IPM) TRANSISTOR

- a) Mark the IPM transistor so that it is not reused.
- b) Remove the 12 bolts.
- c) Lift one side of the IPM transistor to release the connection caused by the heat conductive grease.
- d) Remove the IPM transistor.



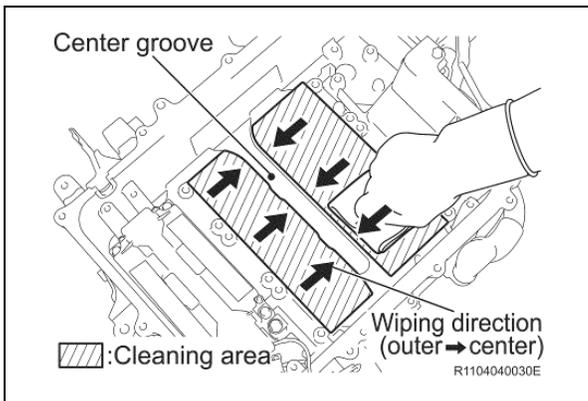
**DO NOT** use any pry tools when removing the IPM transistor, this may damage the inverter case.

## E. INVERTER CLEANING



### NOTE:

- **DO NOT** spray brake cleaner directly in the inverter.
- **DO NOT** use an air gun in the inverter.

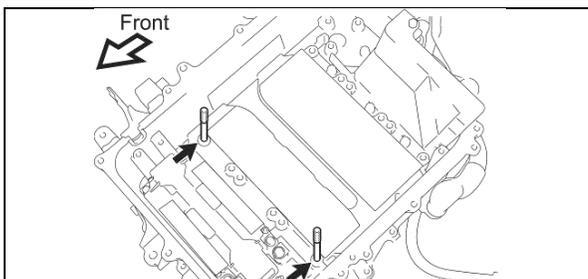


## 1. CLEAN THE INVERTER CASE

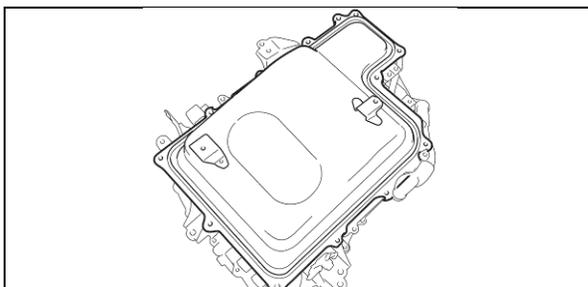
- a) Use a shop cloth soaked with brake cleaner to remove the grease.
- b) Wipe the grease toward the center groove in the case to avoid getting the grease in the bolt holes.



- **If grease is in the bolt holes clean carefully with a shop cloth soaked in brake cleaner.**
- **Confirm no pieces of the shop cloth remain in the inverter.**
- **Confirm all electrical terminals are free from grease.**



- c) Confirm **ALL** grease is removed from the inverter case.
- d) Install the 2 installation studs.



## 2. TEMPORARILY INSTALL THE INVERTER COVER

- a) Install the inverter cover while applying grease to the new IPM transistor to prevent contamination in the inverter assembly.

### NOTE:

- **DO NOT** remove protective cover B
- **DO NOT** pinch any harnesses between the cover and inverter.

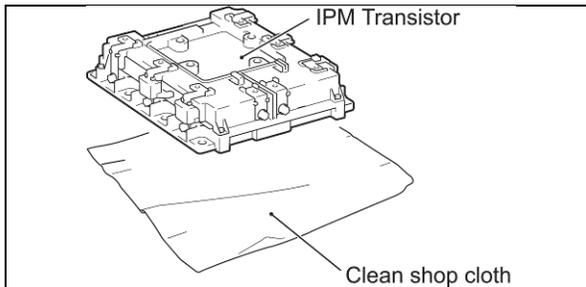
## VII. GREASE APPLICATION

**THE FOLLOWING CONFIRMATION STEPS ARE VITAL  
CONFIRM THESE STEPS ARE FOLLOWED CLOSELY**

**PERFORM THIS INTERMEDIATE INSPECTION BEFORE APPLYING GREASE TO THE IPM TRANSISTOR.**

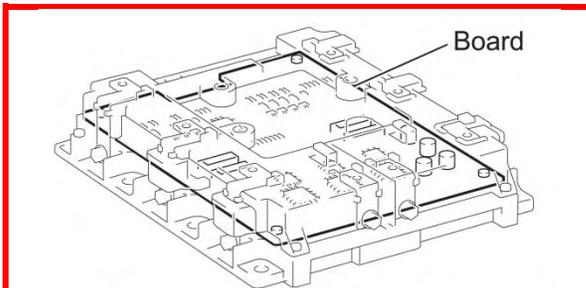
1. Is the smoothing capacitor stored properly with protective cover A installed?
2. Are the disconnected high voltage terminals covered with insulating tape?
3. Has the inverter case been thoroughly cleaned?
4. Is the inverter cover temporarily installed?
5. Is the grease application work space clear of dust, water and other forms of contamination?
6. Is the masking plate and squeegee clean and in good condition?
7. Have you discharged all potential static electricity from your person?

### A. IPM TRANSISTOR ASSEMBLY



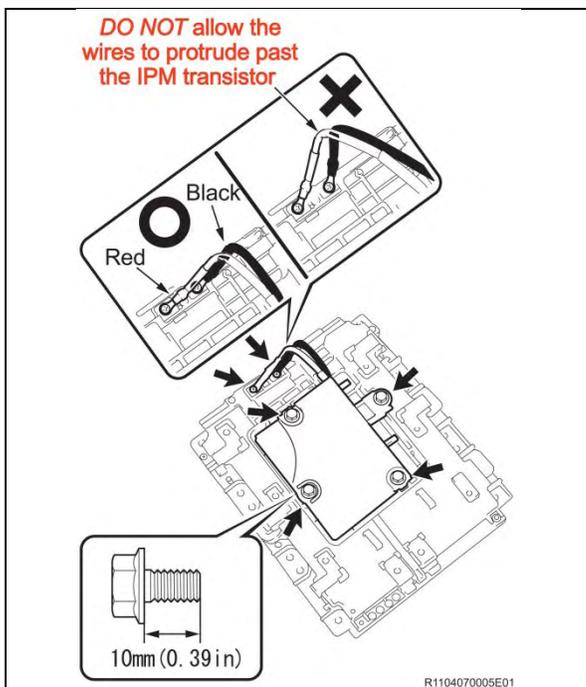
#### 1. ASSEMBLE THE NEW IPM TRANSISTOR

- a) Place the new IPM transistor on a clean shop cloth.



**DO NOT touch the circuit board that is between the upper and lower sections of the IPM transistor.**

**Do not touch the board**



- b) Install the sub capacitor with the 4 bolts.

**Torque: 6.0N·m (61kgf·cm, 53in. lbf)**

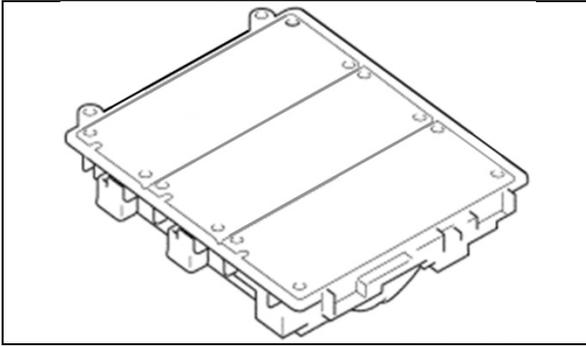
- c) Install the 2 wires with the 2 screws.

**NOTE:**

- **DO NOT** attach the wires to the incorrect terminals.
- **Position the wires so they do not protrude past the IPM transistor.**

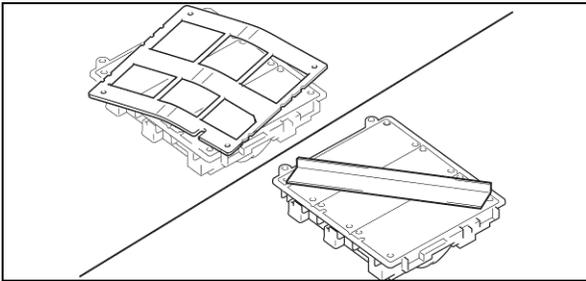
## B. IPM TRANSISTOR GREASE APPLICATION

1. PLACE THE IPM TRANSISTOR UPSIDE DOWN ON A CLEAN SURFACE



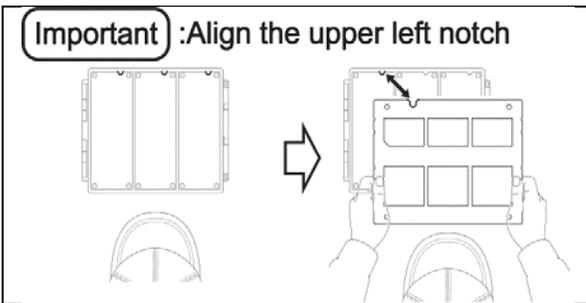
2. INSPECT THE MASKING PLATE AND SQUEEGEE

- a) Confirm the masking plate and squeegee are clean.
- b) Confirm the masking plate and squeegee are not bent or damaged.



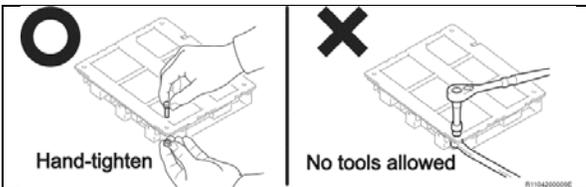
3. INSTALL THE MASKING PLATE

- a) Place the IPM transistor so the 3 notches are at the top.
- b) Align the upper left notch in the masking plate with the alignment notch in the IPM transistor.

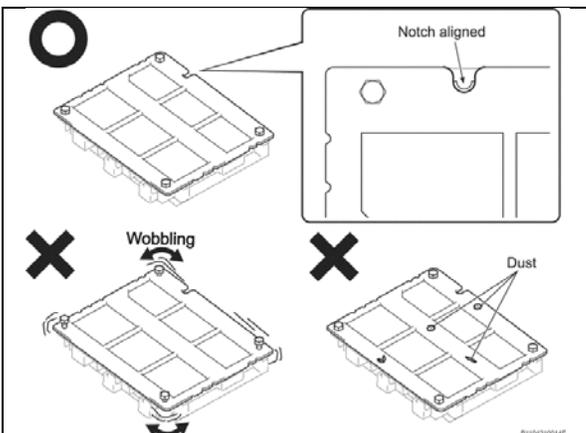


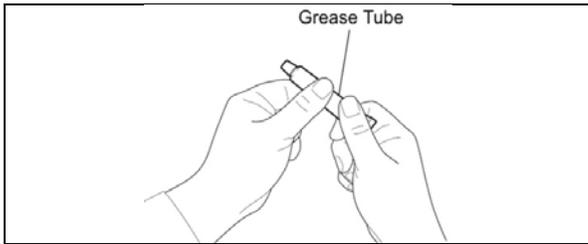
- c) Tighten the masking plate by hand using the 4 nuts/bolts provided.

**NOTE: DO NOT** use tools when tightening the masking plate to prevent damage.



- d) Confirm the masking plate is installed in the correct position.
- e) Confirm the masking plate is securely attached.
- f) Confirm the masking plate is clean.





#### 4. PREPARE 2 TUBES OF THERMAL CONDUCTIVE GREASE

- Knead the tubes to confirm the grease is properly mixed.
- Clean the tubes with brake cleaner.

**NOTE:** The tubes may be used to apply the grease, it is critical that they are clean.

**GREASE 747 EXPIRATION DATE EXPLANATION**

The expiration date **DOES NOT** indicate that the grease is not useable. It is **OKAY** to use grease that is beyond the expiration date. The tube of grease must be kneaded to confirm the grease is properly mixed prior to use.

**NOTE:**

- Two tubes of grease are necessary for each IPM transistor.
- The first tube of grease will cover the upper half of the IPM transistor and the second tube will cover the lower half as indicated in the illustration.

**a) 1st application area**  
**b) 1st 5mm of grease should be applied on the masking plate**  
**c) Target notches**  
**d) Grease cross section**  
**e) Grease application**

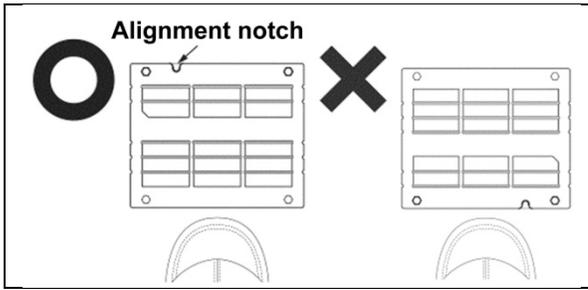
#### 5. APPLY THE FIRST TUBE OF GREASE

- Confirm the area the first tube of grease will cover.
- Confirm the first 5mm of grease is applied on the masking plate as the initial portion of grease may not be completely mixed.
- Apply the grease by following the target notches on the masking plate.
- The grease should be applied in strips that are approximately 6mm wide and 2.5mm in height. (This is the size of the target notches on the masking plate)
- Confirm grease is applied fully from start to finish in the masking plate windows.

**a) 2nd application area**  
**b) 1st 5mm of grease should be applied on the masking plate**  
**c) Target notches**  
**d) Grease cross section**  
**e) Grease application**  
 Shortage of grease to the window end

#### 6. APPLY THE SECOND TUBE OF GREASE

- Confirm the area the second tube of grease will cover.
- Confirm the first 5mm of grease is applied on the masking plate as the initial portion of grease may not be completely mixed.
- Apply the grease by following the target notches on the masking plate.
- The grease should be applied in strips that are approximately 6mm wide and 2.5mm in height. (This is the size of the target notches on the masking plate)
- Confirm grease is applied fully from start to finish in the masking plate windows.



## 7. SPREAD THE GREASE

a) Position the IPM transistor so the alignment notch on the masking plate is in the upper left position.

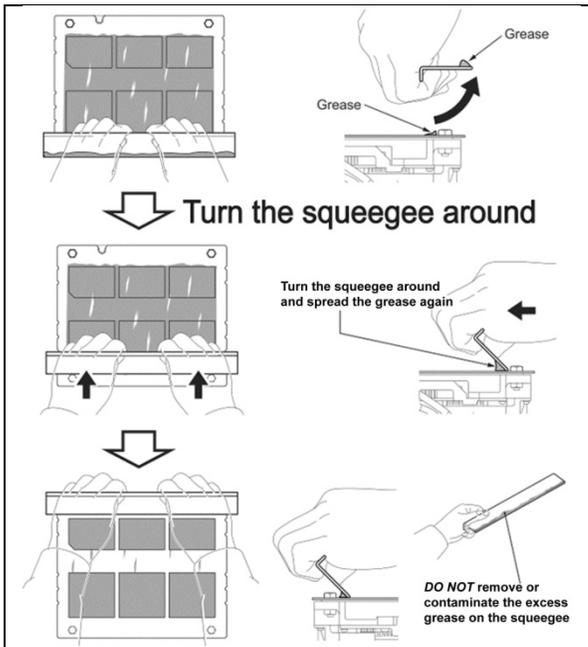
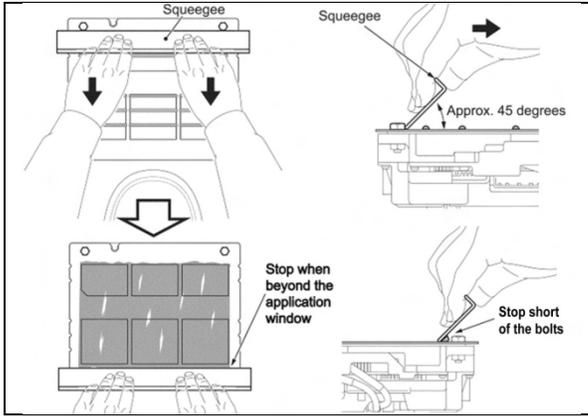
b) Hold the squeegee at a 45 degree angle.

c) Beginning on the upper side of the IPM transistor, slide the squeegee down past the bottom of the application windows.

**NOTE: To ensure all grease is used effectively, *DO NOT* slide the squeegee into the bolts.**

d) Lift the squeegee with the grease.

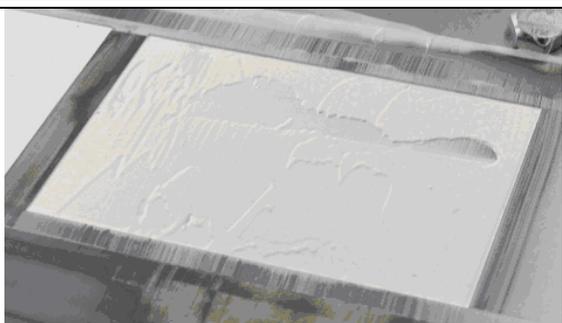
e) Turn the squeegee around and slide it from the bottom of the IPM transistor up past the top of the application windows.



**STOP** *DO NOT* remove the excess grease from the squeegee until it has been confirmed that the grease has been spread correctly.

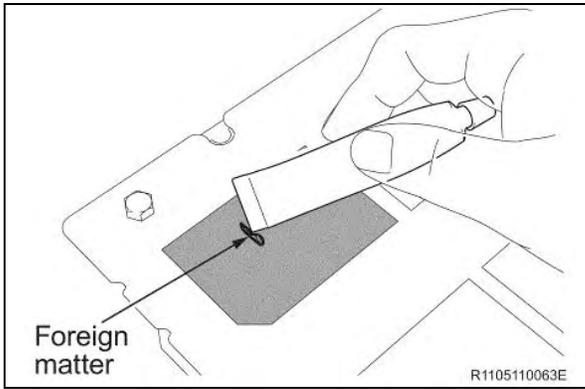
**THE FOLLOWING STEPS ARE VITAL  
CONFIRM THESE STEPS ARE FOLLOWED CLOSELY**

**CONFIRM THE CONDITION OF THE THERMAL CONDUCTIVE GREASE**

SAMPLE	CONDITION & ACTION REQUIRED
	<p><b>CONDITION:</b> Smooth surface and complete coverage.</p> <p><b>ACTION:</b> Proceed to: <b>SECTION VIII. REASSEMBLY</b></p>
	<p><b>CONDITION:</b> Grease unsmooth. Metal surface of the IPM transistor <b>NOT</b> visible through the grease.</p> <p><b>ACTION:</b> Proceed to: <b>SECTION VIII. REASSEMBLY</b></p>
	<p><b>CONDITION:</b> Grease unsmooth. Metal surface of the IPM transistor visible through the grease.</p> <p><b>ACTION:</b> Proceed to: <b>STEP C #2. REAPPLY GREASE TO THE NEEDED AREAS</b></p>
	<p><b>CONDITION:</b> Hole or imperfection in the grease exposing the metal surface of the IPM transistor.</p> <p><b>ACTION:</b> Proceed to: <b>STEP C #2. REAPPLY GREASE TO THE NEEDED AREAS</b></p>
	<p><b>CONDITION:</b> Foreign material in the grease.</p> <p><b>ACTION:</b> Proceed to: <b>STEP C #1. REMOVE FOREIGN MATERIAL FROM THE GREASE</b></p>

### C. GREASE APPLICATION CORRECTION

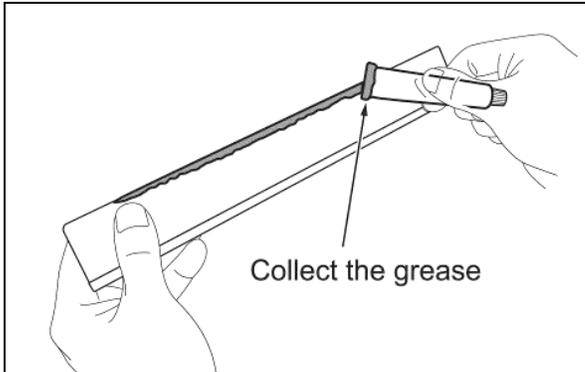
(Only perform these steps if the above inspection determines it is necessary)



#### 1. REMOVE FOREIGN MATERIAL FROM THE GREASE

- a) Use one of the tubes of grease to remove the foreign material from the grease.

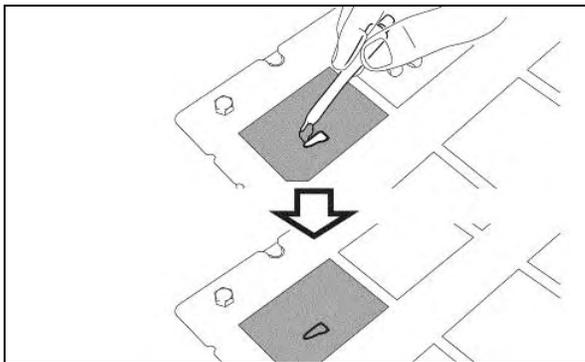
**NOTE: Confirm the tube is clean before use.**



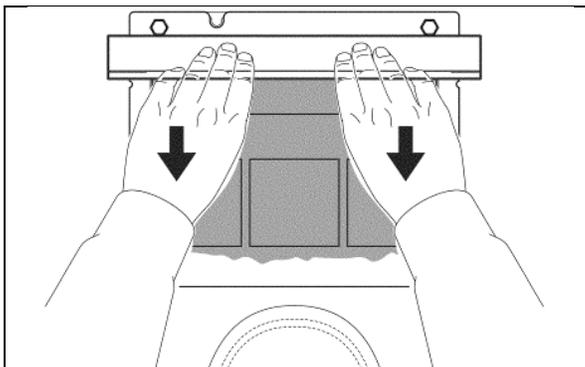
#### 2. REAPPLY GREASE TO THE NEEDED AREAS

- a) Collect the grease remaining on the squeegee using one of the tubes of grease.

**NOTE: Confirm the tube is clean before use.**



- b) Apply the grease the areas with a shortage.



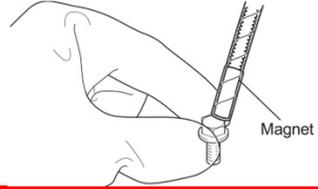
- c) Use the squeegee as before to smooth the grease.

- d) Reconfirm the condition of the grease using the confirmation steps on the previous page.

## VIII. REASSEMBLY

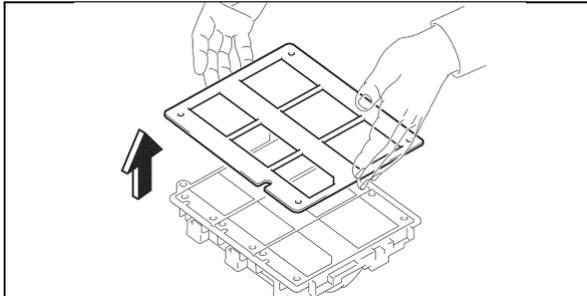
### A. INVERTER REASSEMBLY

**TORQUE SPECIFICATIONS INSIDE THE INVERTER ARE CRITICAL  
CONFIRM ALL BOLTS ARE TORQUED AS OUTLINED IN THESE INSTRUCTIONS**



#### NOTE:

- To prevent dropping any bolts into the inverter it may be necessary to use a magnet to set the bolts as they are installed.
- If bolts are dropped into the bottom section of the inverter it may be necessary to completely remove the inverter for retrieval.

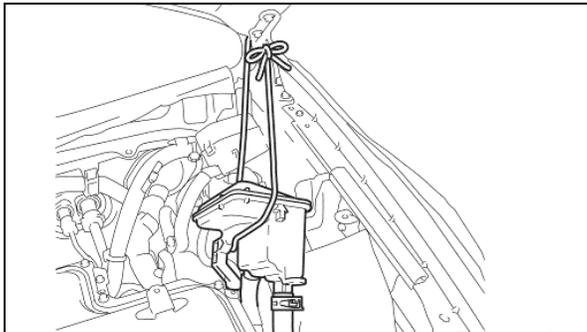


#### 1. REMOVE THE MASKING PLATE

- a) Remove the 4 nuts and bolts.
- b) Slowly remove the masking plate.

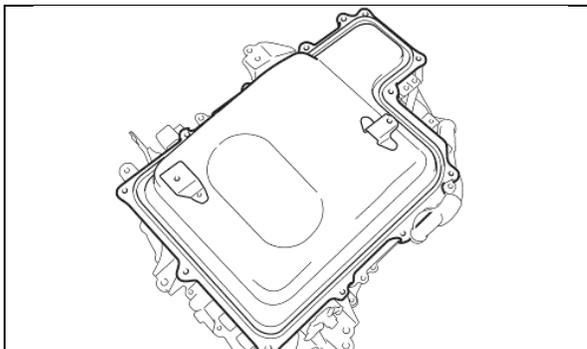


- **DO NOT** displace the grease when removing the masking plate. If the grease is scraped off when removing the plate, return to STEP B. IPM TRANSISTOR GREASE APPLICATION



#### 2. CONFIRM THE INVERTER RESERVE TANK SUB ASSEMBLY IS NOT LEAKING

- a) Before installing the IPM transistor, confirm there is no coolant leaking.

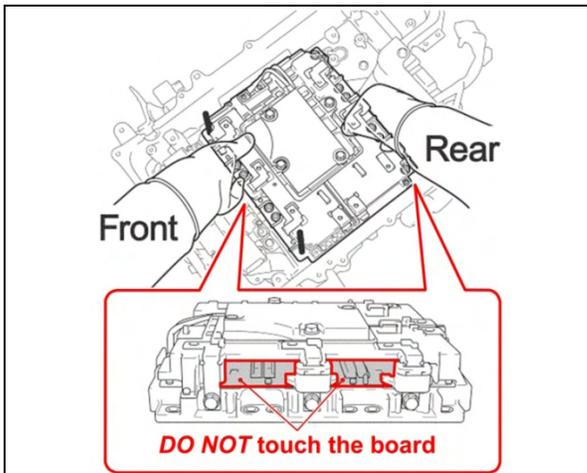


#### 3. INSTALL THE NEW IPM TRANSISTOR



- Be sure to wear electrical insulating gloves during the inverter reassembly procedure.

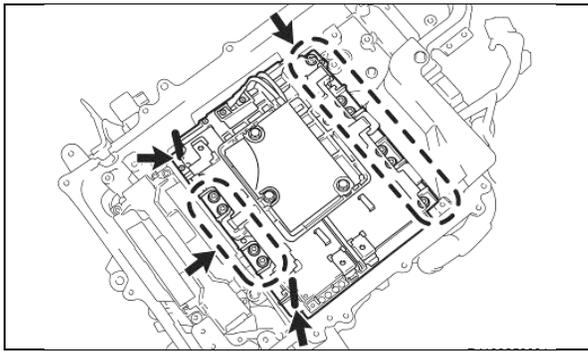
- a) Remove the inverter cover.



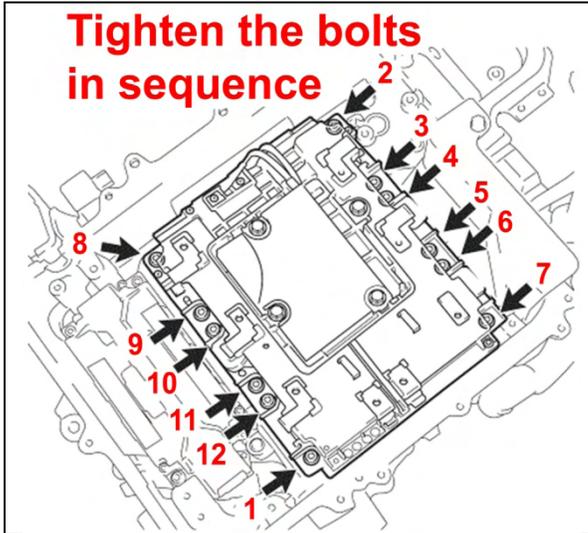
- Confirm the inside of the inverter is clean.
- **DO NOT** touch the circuit board in the IPM transistor.
- Confirm the 2 installation studs are installed.

- b) Hold the front and back of the IPM transistor and place it in the inverter.

**NOTE:** Confirm the IPM transistor is positioned correctly before installation as it can be installed in two different positions.



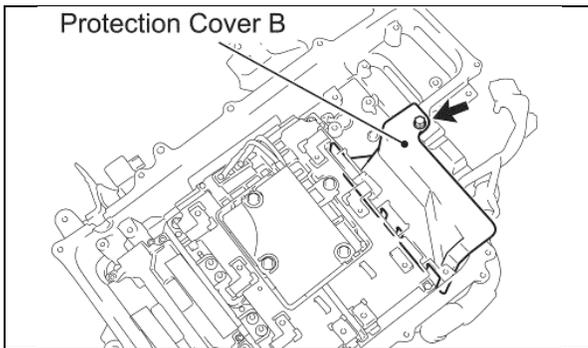
- c) Loosely install 10 bolts.
- d) Remove the 2 installation studs.
- e) Loosely install the 2 remaining bolts.



- f) Tighten the 12 bolts in the sequence shown in the illustration.

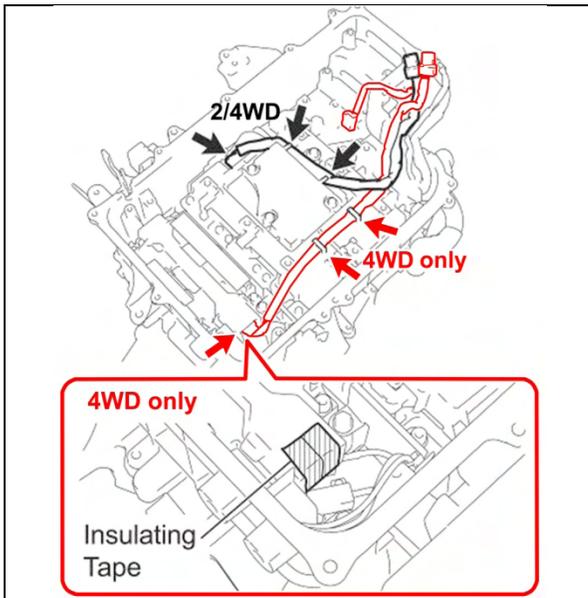
**Torque: 6N·m (61kgf·cm, 53 in.lbf)**

**NOTE: Confirm the 12 bolts are tightened in the correct sequence to ensure the grease contacts correctly.**



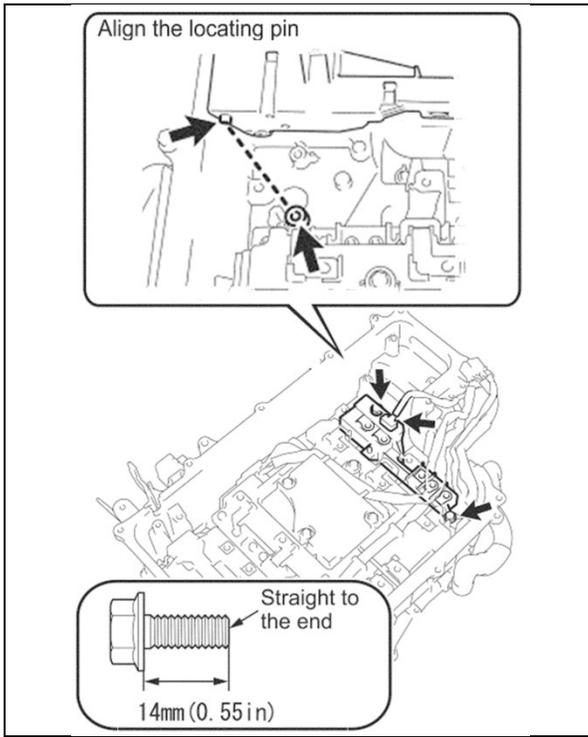
**4. 4WD ONLY – REMOVE PROTECTIVE COVER B**

**NOTE: Protective Cover B will be removed on STEP 11 on 2WD vehicles.**



**5. INSTALL THE INVERTER WIRE HARNESSSES**

- a) **4WD ONLY** – Connect the 2 clamps and 1 connectors.
- 2/4WD** – Connect the 2 clamps and the connector.



**6. 4WD ONLY – INSTALL THE INVERTER CURRENT SENSOR No.1**

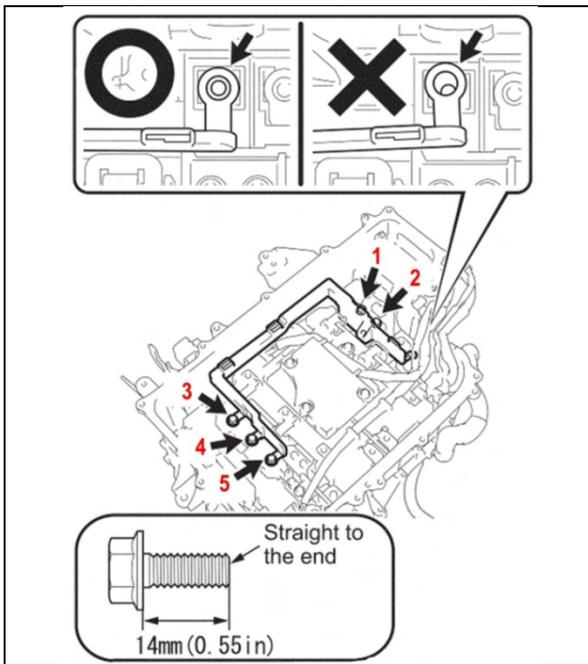
- a) Install the current sensor. Confirm the sensor is installed in the locating pin.
- b) Install the 2 bolts.

**Torque: 8N·m (82kgf·cm, 71 in.lbf)**



**The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.**

- c) Connect the electrical connector.

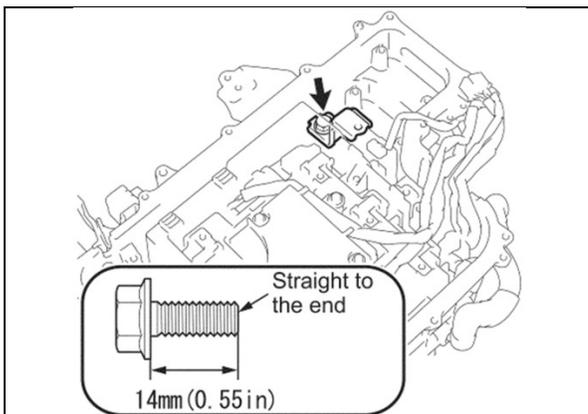


**7. 4WD ONLY – INSTALL THE MGR BUS BAR**

- a) Remove the insulating tape attached to the terminals and confirm they are clean.
- b) Install the bus bar.
- c) Install the 5 bolts in the sequence shown in the illustration.

**Torque: 8N·m (82kgf·cm, 71 in. lbf)**

**NOTE: DO NOT install a bolt in the sixth hole at this time, only confirm the terminal is aligned correctly.**

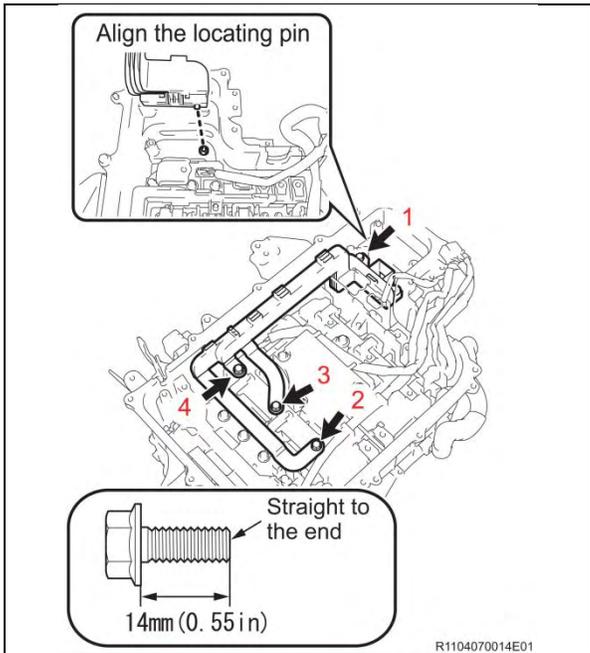


**8. 4WD ONLY – INSTALL THE INVERTER BRACKET**

- a) Install the bracket with 1 bolt.

**Torque: 8N·m (82kgf·cm, 71 in. lbf)**

**NOTE: The inverter bracket should be present on 2WD vehicles, the bracket should not have been removed.**

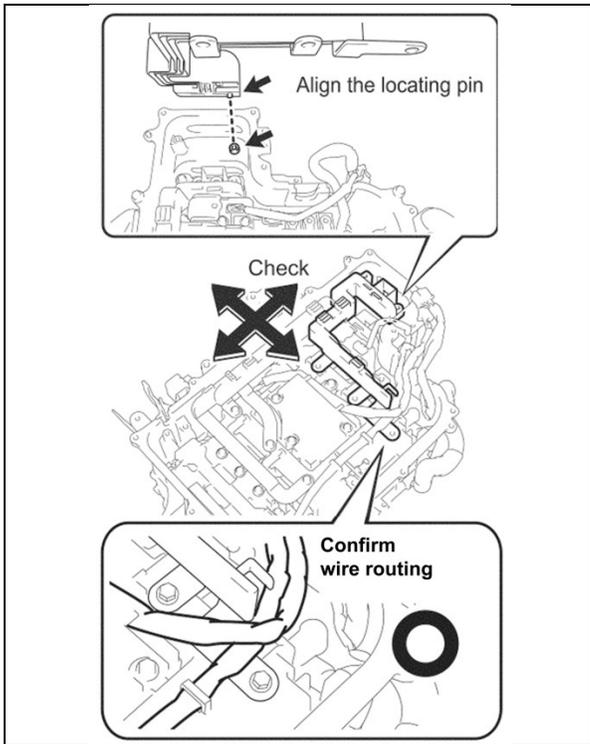


**9. INSTALL THE MG1 BUS BAR**

- a) Confirm the terminals are clean.
- b) Install the bus bar. Confirm the bus bar is installed in the locating pin.
- c) Install the 4 bolts in the sequence shown in the illustration.

**Torque: 8N·m (82kgf·cm, 71in. lbf)**

**STOP** The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.

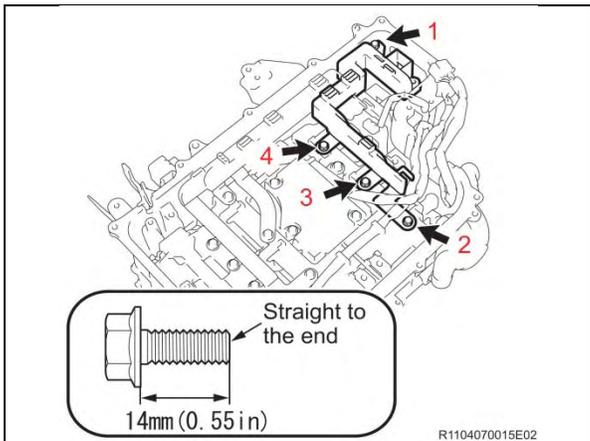


**10. INSTALL THE MG2 BUS BAR**

- a) Confirm the terminals are clean.
- b) Install the bus bar. Confirm the bus bar is installed in the locating pin.

**NOTE: Confirm the harnesses are routed correctly.**

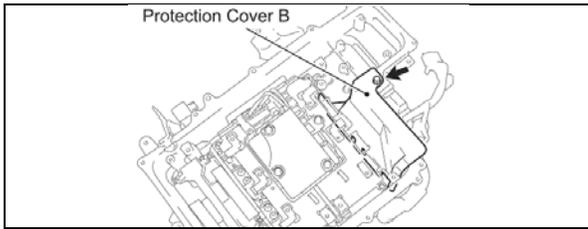
**STOP** The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.



- c) Install the 4 bolts in the sequence shown in the illustration.

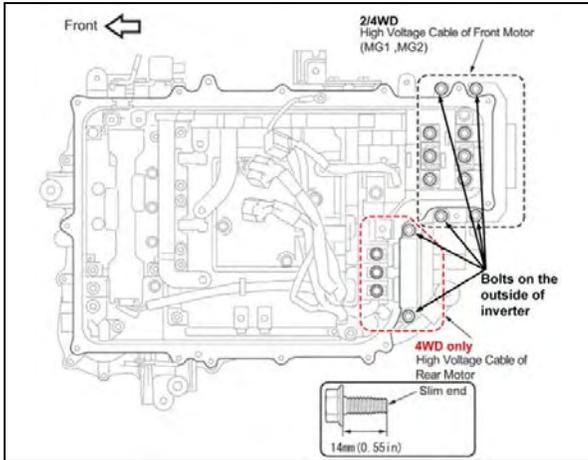
**Torque: 8N·m (82kgf·cm, 71in. lbf)**

**STOP** The bolts can be installed even if the locating pin is not aligned. Confirm the sensor is installed in the locating pin.



### 11. 2WD ONLY – REMOVE PROTECTIVE COVER B

**NOTE:** Protective Cover B was removed on STEP 4 on 4WD vehicles.



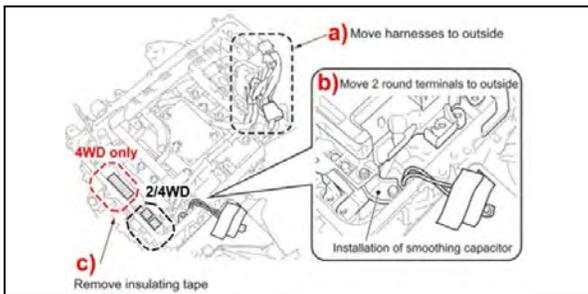
### 12. INSTALL THE HIGH VOLTAGE CABLES

- Remove the insulating tape attached to the terminals and confirm they are clean.
- 4WD – Install the 15 bolts.  
2WD – Install the 10 bolts.

**Torque: 10N·m (102kgf·cm, 84in. lbf)**

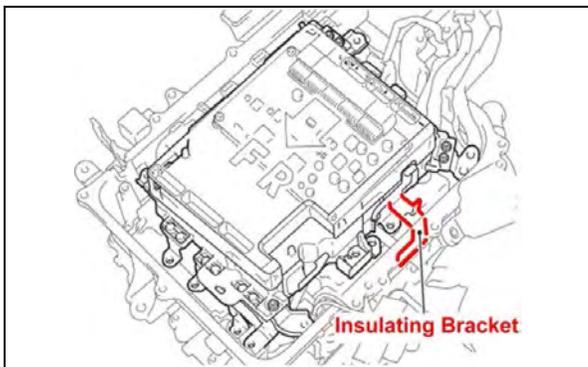
**NOTE:** If there is difficulty installing the high voltage cables, reconfirm the bus bars are installed in their locating pins.

**STOP** To prevent contamination, **DO NOT** use the bolts that were removed from the outside of the inverter on the inside.



### 13. PREPARE THE INVERTER FOR SMOOTHING CAPACITOR INSTALLATION

- Secure the inverter harnesses so they do not interfere when installing the smoothing capacitor.
- Move the 2 terminals that were fixed inside the inverter during the disassembly process to the outside of the inverter.
- Remove the insulating tape attached to the terminals.

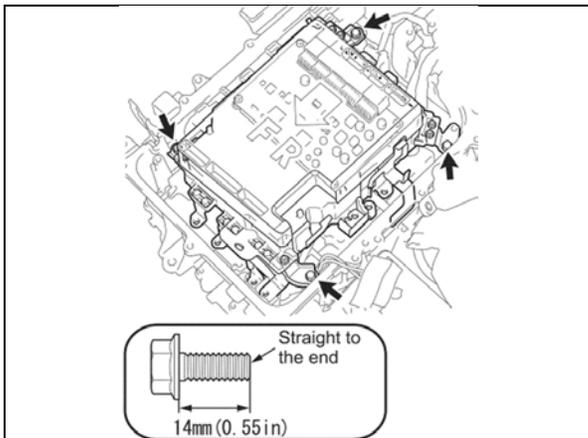


### 14. INSTALL THE SMOOTHING CAPACITOR

- Hold the smoothing capacitor with protective cover A installed.
- Carefully place the smoothing capacitor in the inverter.

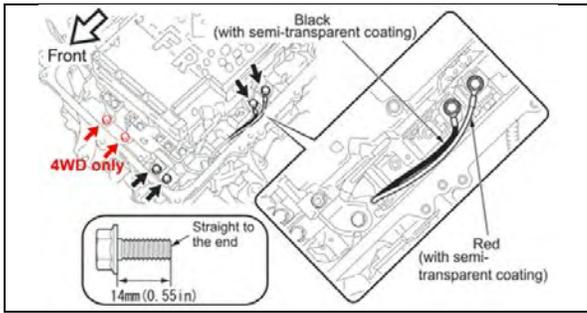
**STOP**

- DO NOT** catch any wires when installing the smoothing capacitor.
- Pay close attention to the insulating bracket, this bracket must not be bent and must be positioned between the inverter case and the IPM transistor.



- Install the 4 bolts.

**Torque: 8N·m (82kgf·cm, 71in. lbf)**



d) Remove the insulating tape on the 2 wires.

e) Install the bolts.

**4WD** – Install the 6 bolts.

**2WD** – Install the 4 bolts.

**Torque: 8N·m (82kgf·cm, 71in. lbf)**

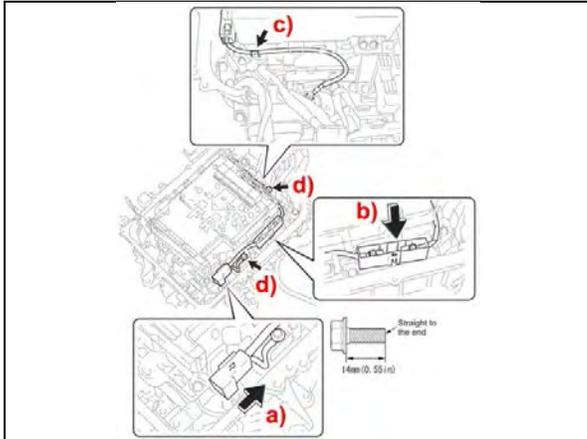
**NOTE: DO NOT** mistake the connection points of the terminals.

## 15. INSTALL THE AIR CONDITIONING HARNESS SUB ASSEMBLY

a) Install the connector.

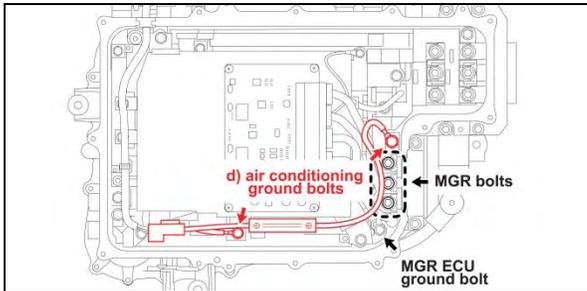
b) Install the fuse box.

c) Confirm the harness is routed correctly.



d) Confirm the terminals are clean and install the 2 ground bolts.

**Torque: 8N·m (82kgf·cm, 71in. lbf)**



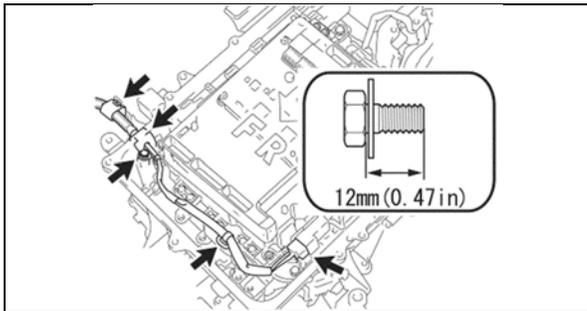
## 16. CONNECT THE ENGINE WIRE No.4

a) Remove the insulating tape from the terminal.

b) Connect the connector, the harness clamps, and the grommet.

c) Install the bolt.

**Torque: 6N·m (61kgf·cm, 53in. lbf)**



## 17. CONNECT THE MG ECU CONNECTORS

a) Remove the insulating tape from the connectors.

b) Remove protective cover A.

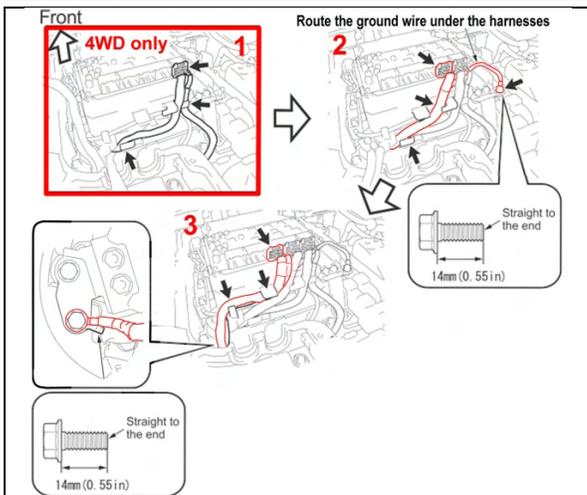
c) Connect the connectors following the sequence in the illustration.

**4WD** – 3 connectors

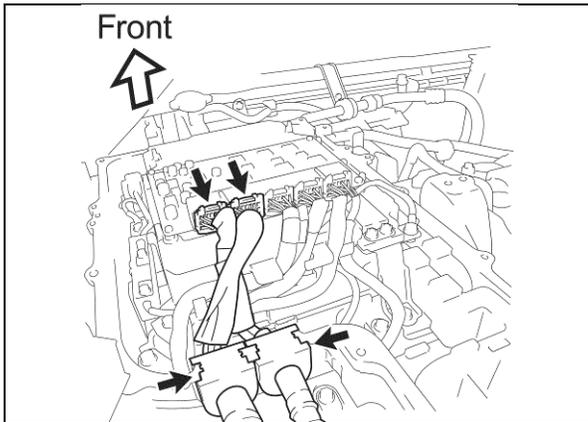
**2WD** – 2 connectors

d) Connect the 2 ground bolts.

**Torque: 8N·m (82kgf·cm, 71in. lbf)**



- Confirm that all harnesses are routed correctly and all connectors and ground bolts are secure.
- **DO NOT** touch the MG ECU.



e) Connect the 2 connectors and fit the 2 grommets.

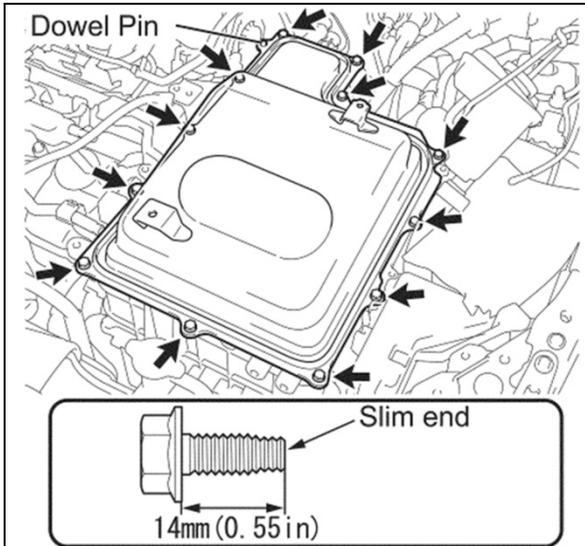


- Cross the 2 harnesses inside the inverter.
- The harnesses can be crossed in either direction.
- Confirm the grommets are clean before installing to prevent leaks.

**THE FOLLOWING CONFIRMATION STEPS ARE VITAL  
CONFIRM THESE STEPS ARE FOLLOWED CLOSELY**

**PERFORM THIS INTERMEDIATE INSPECTION BEFORE INSTALLING THE INVERTER CASE COVER.**

1. Are the high voltage cables (MG1, MG2 and MGR for 4WD) connected correctly?
2. Are all of the MG ECU connectors secured and the ground bolts connected?
3. Have all components been installed correctly in the inverter assembly?

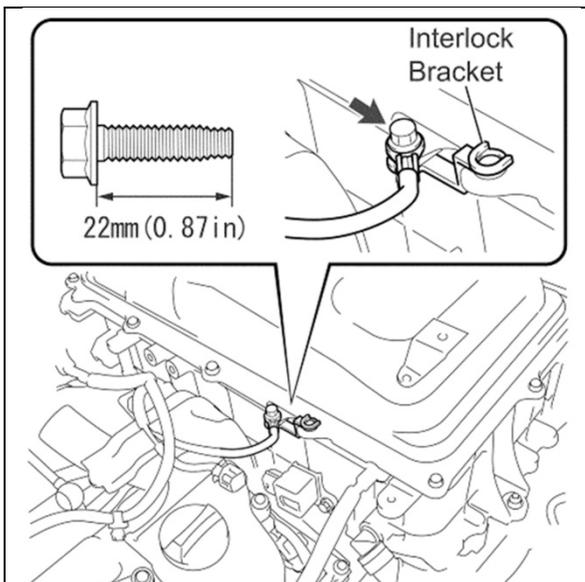


**18. INSTALL THE INVERTER COVER**

- a) Confirm the cover gasket is set in the cover groove.
- b) Confirm the cover gasket and inverter mating surface are clean.
- c) Install the cover using the 12 bolts.

**Torque: 10N·m (102kgf·cm, 84in. lbf)**

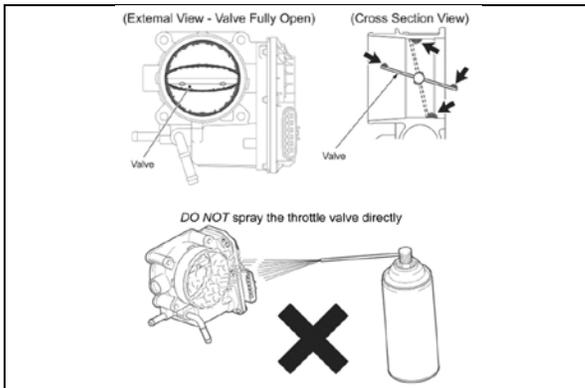
**NOTE: The cover gasket can be reused even if it has come out of the groove.**



- d) Remove the insulating tape from the interlock bracket.
- e) Install the bracket with the 1 bolt.

**Torque: 10N·m (102kgf·cm, 84in. lbf)**

## B. VEHICLE REASSEMBLY



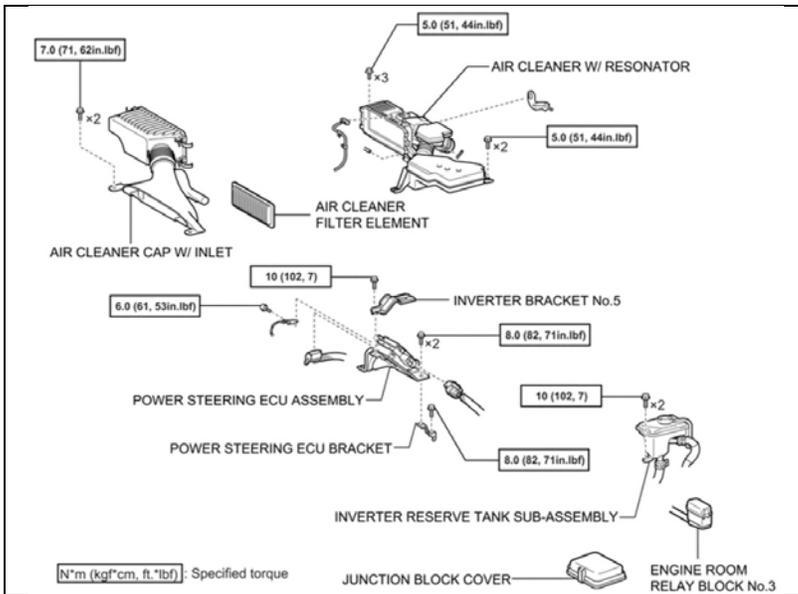
### 1. CLEAN THE THROTTLE BODY

- a) Use a shop cloth soaked in throttle plate cleaner to clean the throttle body.

#### NOTE:

- **DO NOT** spray the throttle valve directly.
- This procedure should be performed to ensure the engine learn values are set correctly.

### 2. INSTALL THE COMPONENTS ILLUSTRATED BELOW



At this time, **DO NOT** install:

- Cool air intake duct seal
- Engine room covers
- Cowl assembly
- Windshield wiper assembly

#### NOTE:

- Install **ALL** air intake system components prior to attempting **READY ON**; otherwise, DTCs may occur.
- Wear insulating gloves when installing the power steering ECU components.
- For detailed installation information, refer to the repair manual.

### 3. INSTALL THE SERVICE GRIP

### 4. INSTALL THE NEGATIVE BATTERY CABLE

### 5. CONFIRM VEHICLE OPERATION

- a) Turn the vehicle to **READY ON**.
- b) Confirm the vehicle is in park.
- c) Turn the air conditioner on high and allow vehicle to run for 3 minutes.
- d) Confirm auxiliary battery voltage.

#### Specification: 13 to 15 V

- e) Check for DTCs. If DTCs are output use the repair manual and the trouble shooting table in the Appendix of these instructions to diagnose.

#### NOTE:

- If DTCs are present after IPM replacement, first confirm IPM replacement was performed correctly, if it is determined that inverter replacement is required you **MUST** contact TAS (800-233-3178) to confirm your diagnosis, then contact your regional representative to obtain operation codes for dealership reimbursement.
- If DTCs that were not present prior to IPM replacement are present after IPM replacement, confirm IPM replacement was performed correctly.

6. INSTALL ALL REMAINING COMPONENTS
7. CHECK FOR DIAGNOSTIC TROUBLE CODES
8. TEST DRIVE THE VEHICLE
9. PERFORM SYSTEM INITIALIZATIONS

## ◀ VERIFY REPAIR QUALITY ▶

- Confirm the work area is very clean before disassembling the inverter
- Confirm *ALL* removal steps are followed, to prevent damage *DO NOT* skip any steps
- Confirm the inverter is cleaned thoroughly and the grease is applied correctly to the IPM transistor
- Confirm *ALL* installation steps are followed

If you have any questions regarding this recall, please contact your regional representative

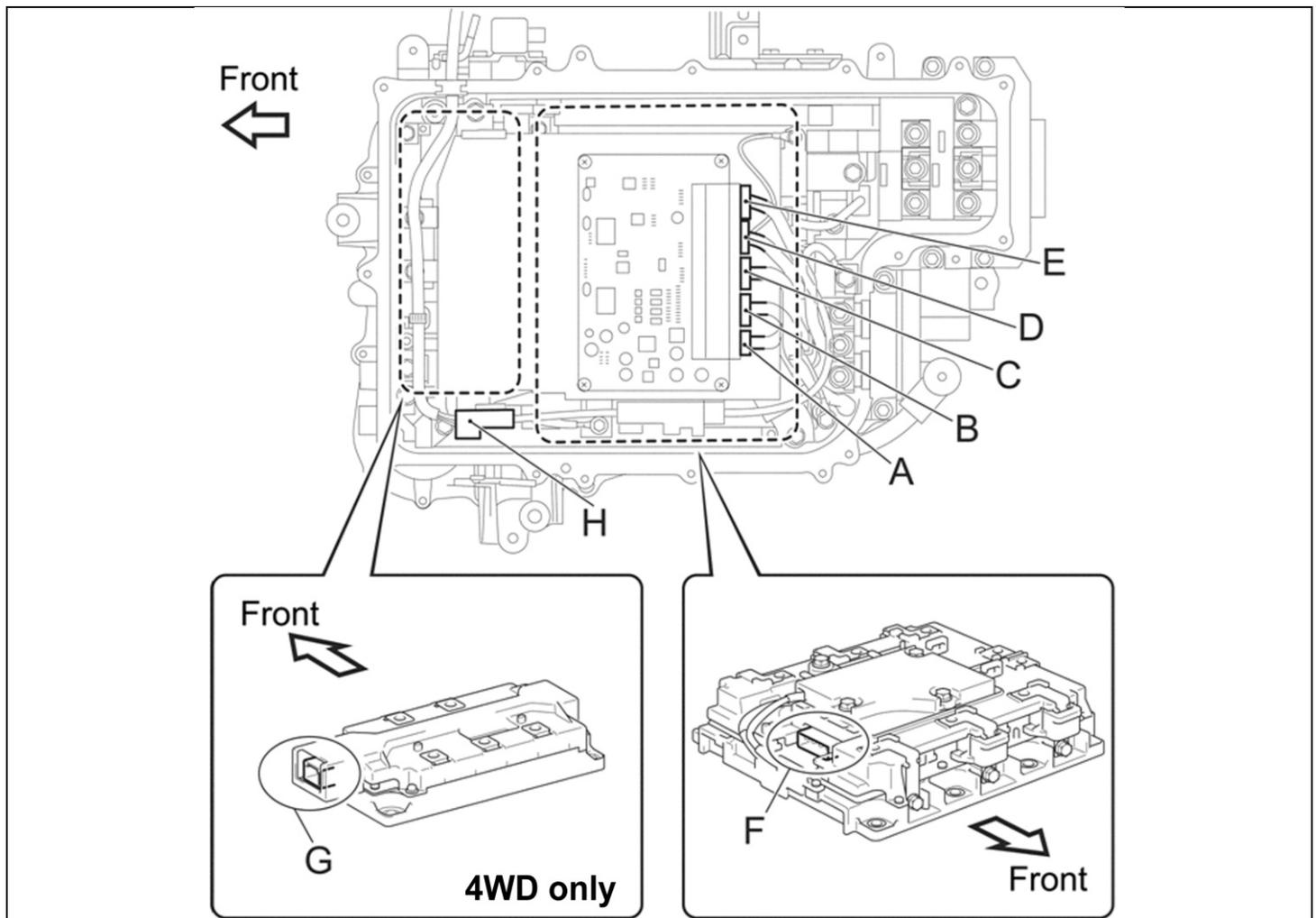
## IX. APPENDIX

### A. RECALL PARTS DISPOSAL

As required by Federal Regulations, please make sure all recalled parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused, *unless requested for parts recovery return.*

### B. TROUBLESHOOTING TABLE

Use this table if any DTCs are output after performing the campaign. If the DTC output is not listed in this table, or checking the connectors does not remedy the condition, refer to the repair manual for additional diagnostic information.



DTC	Connector to inspect							
	A	B	C	D	E	F	G	H
B1477/71								O
B1477/77								O
P0A02-719			O					
P0A03-720			O					
P0A08-264		O						
P0A09-265		O						
P0A10-263		O						
P0A1A-151	O	O	O	O	O			
P0A1A-155	O	O	O	O	O			
P0A1A-156	O	O	O	O	O			
P0A1A-158	O	O	O	O	O			
P0A1A-166	O	O	O	O	O			
P0A1A-200	O	O	O	O	O			
P0A1A-658	O	O	O	O	O			
P0A1A-659	O	O	O	O	O			
P0A1A-791	O	O	O	O	O			
P0A1A-792	O	O	O	O	O			
P0A1A-793	O	O	O	O	O			
P0A1B-163	O	O	O	O	O			
P0A1B-164	O	O	O	O	O			
P0A1B-168	O	O	O	O	O			
P0A1B-192	O	O	O	O	O			
P0A1B-193	O	O	O	O	O			
P0A1B-195	O	O	O	O	O			
P0A1B-196	O	O	O	O	O			
P0A1B-198	O	O	O	O	O			
P0A1B-511	O	O	O	O	O			
P0A1B-512	O	O	O	O	O			
P0A1B-661	O	O	O	O	O			
P0A1B-662	O	O	O	O	O			
P0A1B-781	O	O	O	O	O			
P0A1B-786	O	O	O	O	O			
P0A1B-788	O	O	O	O	O			
P0A1B-794	O	O	O	O	O			
P0A1B-795	O	O	O	O	O			
P0A1B-796	O	O	O	O	O			
P0A1C-706	O	O	O	O	O			
P0A1C-707	O	O	O	O	O			
P0A1C-708	O	O	O	O	O			
P0A1C-709	O	O	O	O	O			
P0A1C-710	O	O	O	O	O			
P0A1C-711	O	O	O	O	O			
P0A1C-713	O	O	O	O	O			
P0A1C-715	O	O	O	O	O			
P0A1C-797	O	O	O	O	O			
P0A1C-798	O	O	O	O	O			
P0A1C-799	O	O	O	O	O			
P0A3F-243	O							
P0A40-500	O							

DTC	Connector to inspect							
	A	B	C	D	E	F	G	H
P0A41-245	O							
P0A45-669		O						
P0A46-671		O						
P0A47-670		O						
P0A4B-253	O							
P0A4C-513	O							
P0A4D-255	O							
P0A55-687					O		O	
P0A60-288				O		O		
P0A60-289				O		O		
P0A60-290				O		O		
P0A60-292				O		O		
P0A60-294				O		O		
P0A60-501				O		O		
P0A63-296				O		O		
P0A63-297				O		O		
P0A63-298				O		O		
P0A63-300				O		O		
P0A63-302				O		O		
P0A63-502				O		O		
P0A69-677					O		O	
P0A69-679					O		O	
P0A69-680					O		O	
P0A69-683					O		O	
P0A69-684					O		O	
P0A69-688					O		O	
P0A6C-678					O		O	
P0A6C-681					O		O	
P0A6C-682					O		O	
P0A6C-685					O		O	
P0A6C-686					O		O	
P0A6C-689					O		O	
P0A72-326				O		O		
P0A72-327				O		O		
P0A72-328				O		O		
P0A72-330				O		O		
P0A72-333				O		O		
P0A72-515				O		O		
P0A75-334				O		O		
P0A75-335				O		O		
P0A75-336				O		O		
P0A75-338				O		O		
P0A75-341				O		O		
P0A75-516				O		O		
P0A78-278				O		O		
P0A78-280				O		O		
P0A78-283				O		O		
P0A78-285				O		O		
P0A79-690					O		O	

DTC	Connector to inspect							
	A	B	C	D	E	F	G	H
P0A79-691					O		O	
P0A7A-321				O		O		
P0A7A-323				O		O		
P0A94-545			O					
P0A94-546			O					
P0A94-551			O					
P0A94-552			O					
P0A94-587			O					
P0AA6-526								
P0AA6-613								
P0AA6-614								
P0AA6-655								
P0AEF-275				O				
P0AF0-274				O				
P0AF4-673					O			
P0AF4-674					O			
P3222-313				O				
P3223-312				O				
P3227-583		O						
P3228-584		O						
U0110-159	O	O	O	O	O			
U0110-160	O	O	O	O	O			
U0110-656	O	O	O	O	O			
U0110-657	O	O	O	O	O			
Auxiliary battery voltage error		O						



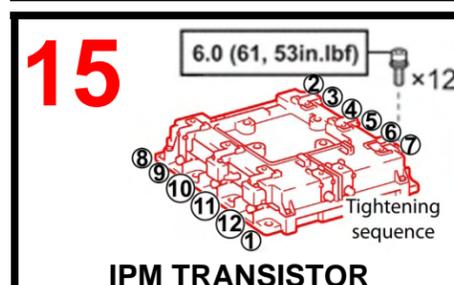
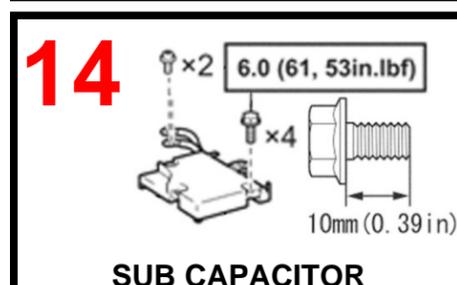
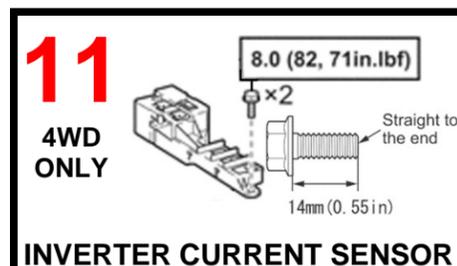
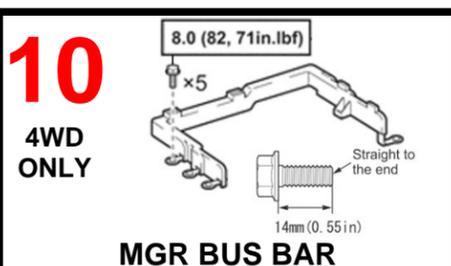
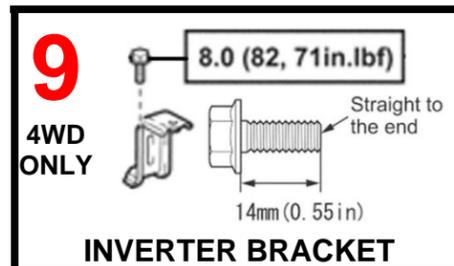
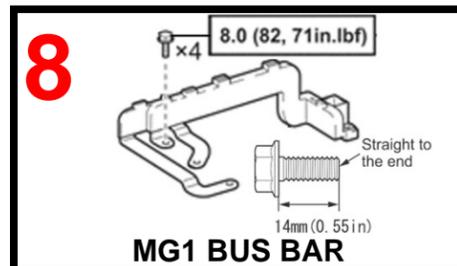
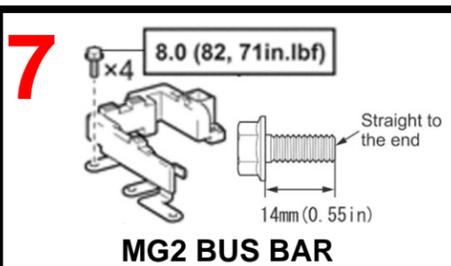
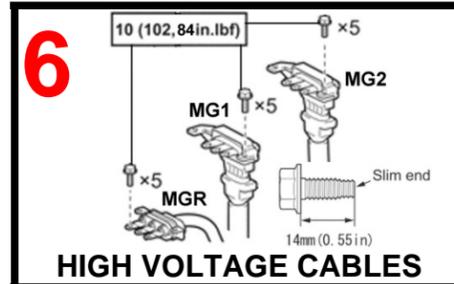
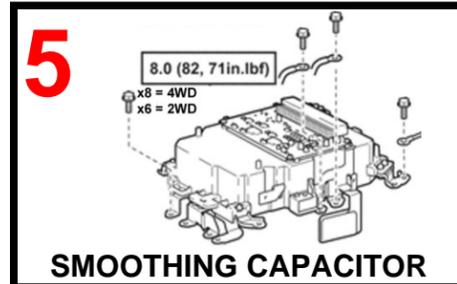
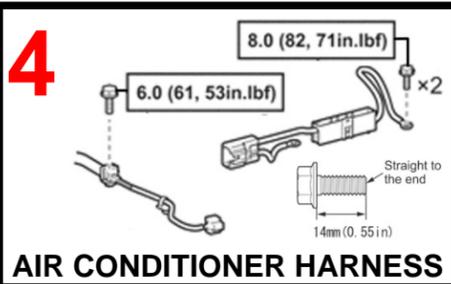
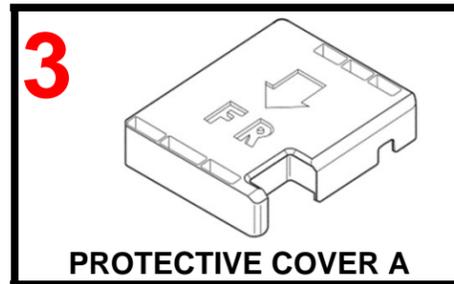
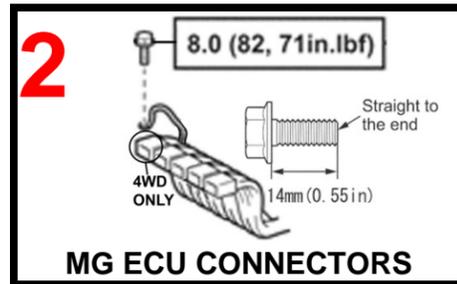
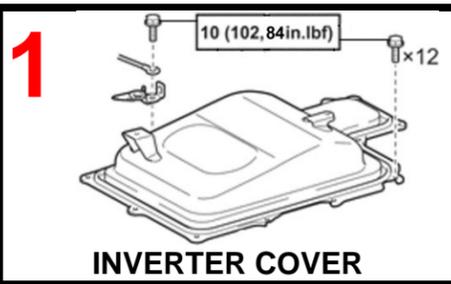
# SAFETY RECALL DLF

## Intelligent Power Module Transistor Replacement



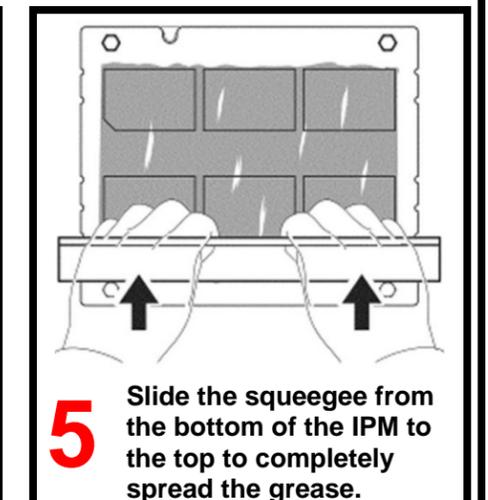
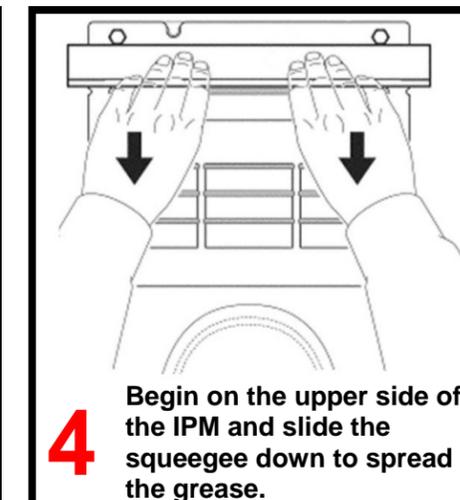
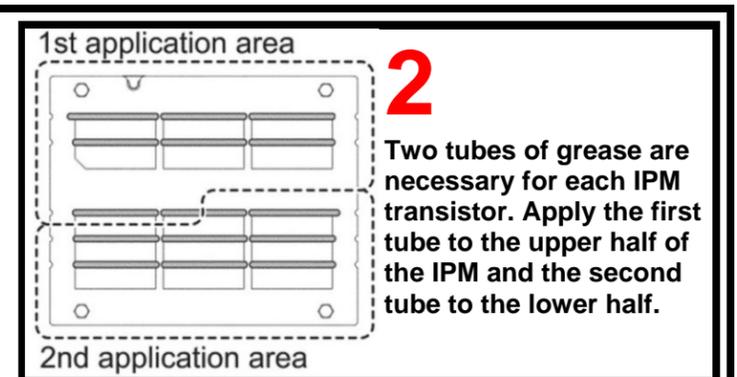
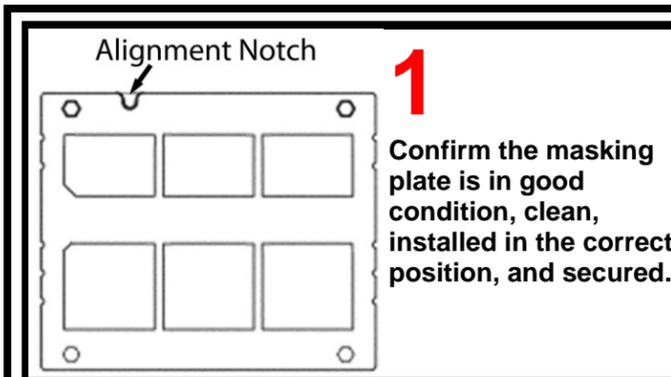
### INVERTER DISASSEMBLY PROCEDURE OUTLINE

- These instructions provide an overview of the disassembly, order for reassembly is reverse
- Torque specifications are critical, confirm all bolts are torqued correctly
- Confirm the IPM transistor is torqued following the correct sequence
- Confirm all safety precautions are followed when working on high voltage components



### GREASE APPLICATION PROCEDURE OUTLINE

- Confirm the grease application surface on the *NEW* IPM transistor is clean before applying grease
- Confirm all original grease inside the inverter case has been completely removed
- If the correct amount of grease is not applied the the new IPM, inverter failure may occur
- Knead the tubes of grease before application to confirm the grease is properly mixed



After applying the grease you must confirm the grease coverage is sufficient. Use the sample images below to determine the condition of the grease.

