TECHNICAL INSTRUCTIONS

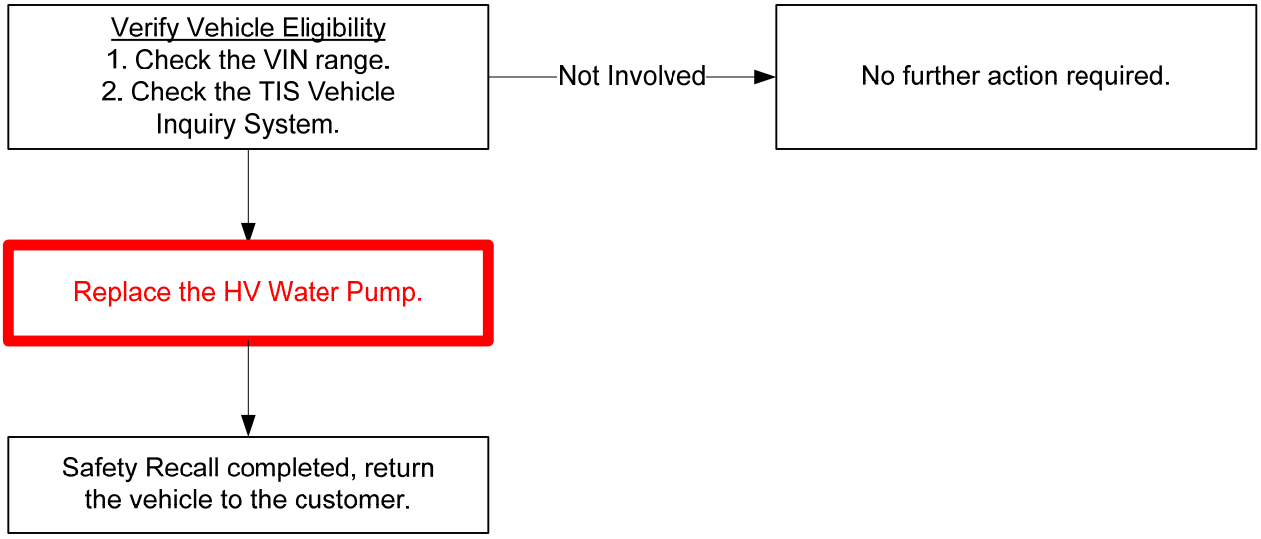
FOR

LIMITED SERVICE CAMPAIGN (LSC) A0N

HV WATER PUMP REPLACEMENT

2004 – 2007 MODEL YEAR PRIUS

I. OPERATION FLOWCHART



II. IDENTIFICATION OF AFFECTED VEHICLES

A. AFFECTED VIN RANGE

Model	WMI	Year	VIN Range	
			VDS	Range
PRIUS	JTD	2004	KB20U	0001086 – 0116870
			KB22U	0001142 – 0116845
		2005	KB20U	0116874 – 0133248
				3000000 – 3128076
				7003414 – 7057937
			KB22U	0116872 – 0133240
				3000008 – 3128067
				7004342 – 7057888
		2006	KB20U	3099688 – 3202428
				7057941 – 7545074
			KB22U	3128082 – 3202418
				7056471 – 7544598
		2007	KB20U	3201067 – 3270051
				7083497 – 7665191

NOTE:

- Check the TIS Vehicle Inquiry System to confirm the VIN is involved in this LSC, 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.

III. PREPARATION

A. PARTS

Part Number	Part Description	Quantity
04000-32528	HV Electric Water Pump Kit *	1

* The kit above includes the following parts:

G9020-47031	HV Water Pump	Quantity 1
90430-18008	Gasket	Quantity 1

B. TOOLS, EQUIPMENT & MATERIALS

- Radiator Cap Tester with Adapter Set C
- Standard Hand Tools
- Torque Wrench

C. TOOLS, EQUIPMENT & MATERIALS

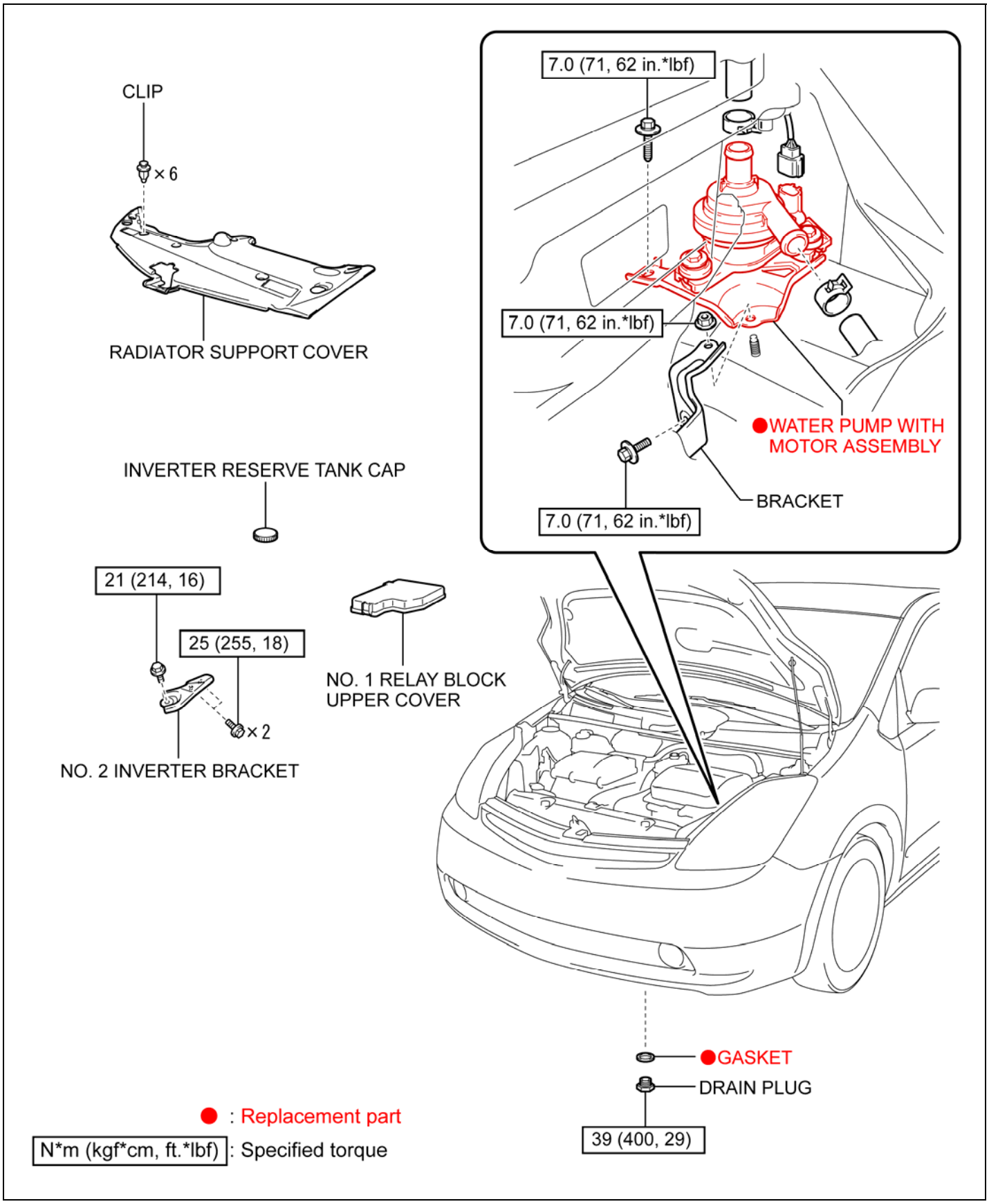
- Transparent Hose (Inner diameter: approx. 6 mm / Length: approx. 450 mm)
- TOYOTA Super Long Life Coolant – 00272-SLLC2: 1.1 liters (1.2 US qts, 1.0 lmp.qts)
- Marker
- Paper Towels or Shop Cloths
- Protective Tape

IV. BACKGROUND

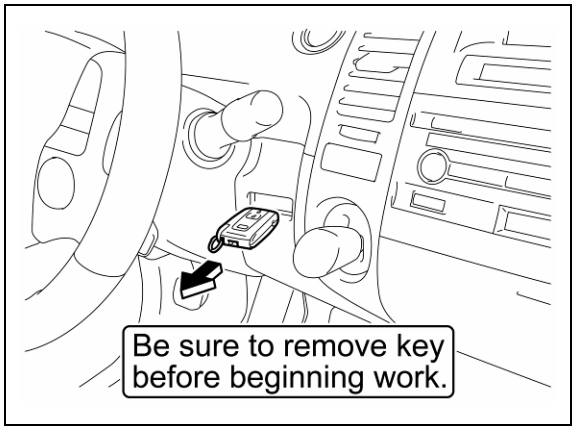
On 2004 through certain 2007 model year Prius vehicles, there is a possibility that air may remain at the bearing of the Hybrid Electric Water Pump (HV Water Pump), causing pump actuation to be slow. In this condition, the temperature of the coolant could rise and become high, which will result in illumination of the Malfunction Indicator Light (check engine light “ON”) for diagnostic code P0A93 with information code 346 (Inverter cooling system malfunction).

V. WORK PROCEDURE

A. COMPONENTS

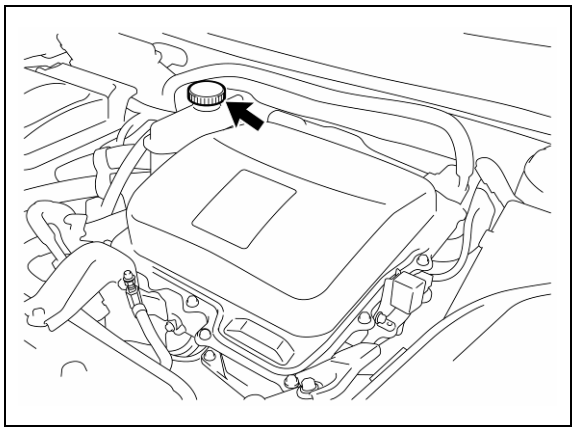


B. HV WATER PUMP REMOVAL



1. REMOVE THE KEY

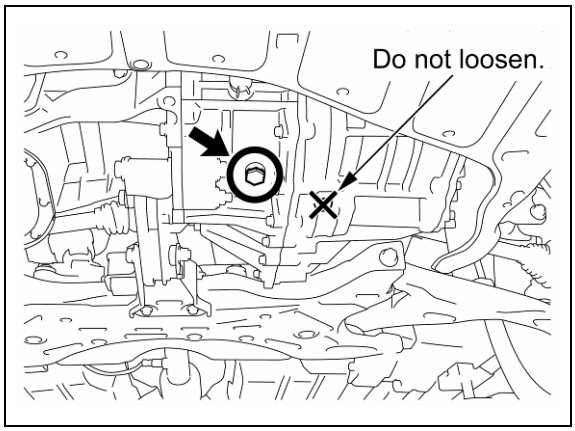
a) Remove the key from the ignition (IG) and keep it in your pocket to prevent others from starting the vehicle while you are working on it.



2. DRAIN THE COOLANT FROM THE INVERTER

a) Remove the 6 clips and the radiator support cover.
b) Remove the inverter reserve tank cap.

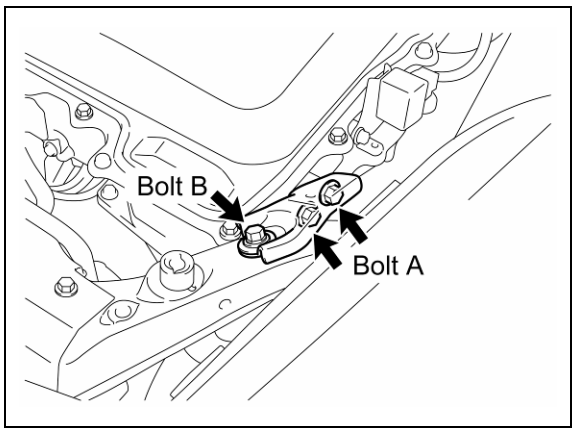
NOTE:
The inverter / coolant may be hot, take precautions when removing the reserve tank cap to prevent potential injuries.



c) Remove the inverter drain plug.
d) Remove and cut the drain plug gasket to prevent it from being reused.
e) Install a ***NEW*** drain plug gasket
f) Reinstall the drain plug and torque to spec.

Torque Spec: 39 N·m (400 kgf·cm, 29 ft·lbf)

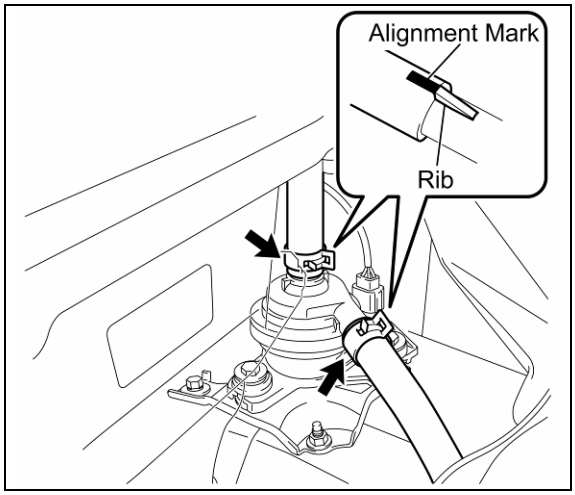
CAUTION:
The inverter / coolant may be hot, take precautions when removing the drain plug to prevent potential injuries.



3. REMOVE THE NO. 2 INVERTER BRACKET

a) Remove the 3 bolts and the No. 2 inverter bracket.

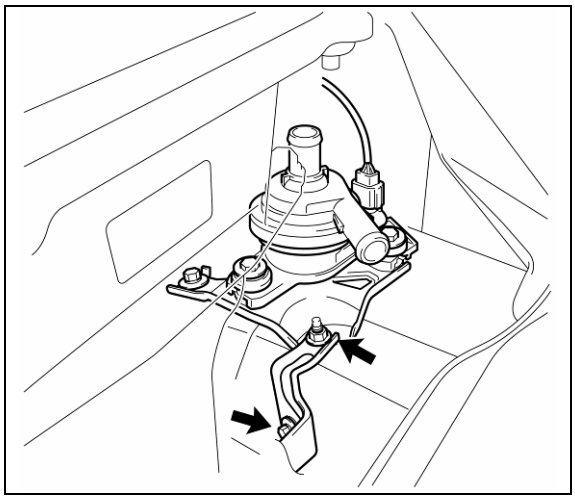
NOTE:
There are 2 different bolt types (A & B) used to secure the No. 2 inverter bracket.



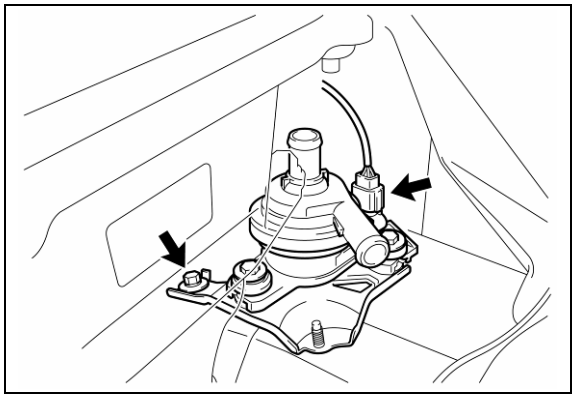
4. REMOVE THE HV WATER PUMP ASSEMBLY

a) Place an alignment mark locating the HV water pump rib on the 2 hoses.
b) Disconnect the 2 hoses by loosening the 2 clamps.

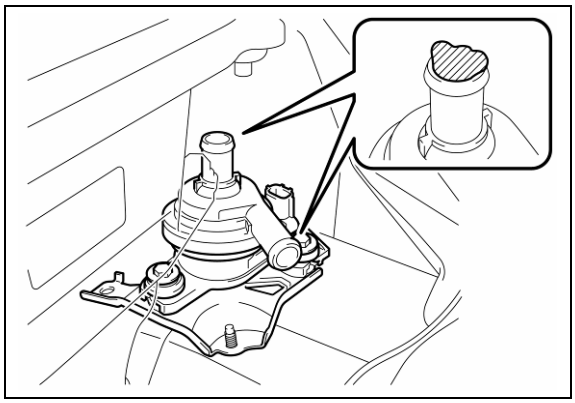
NOTE:
The alignment mark is used to prevent twisting of the hoses during reinstallation.



c) Remove the nut, bolt and bracket.

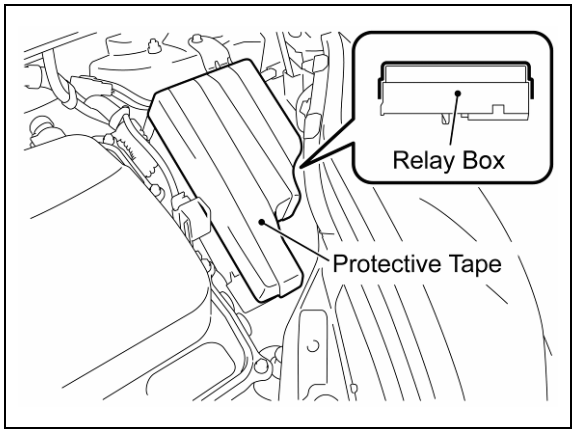


d) Remove the connector and bolt.



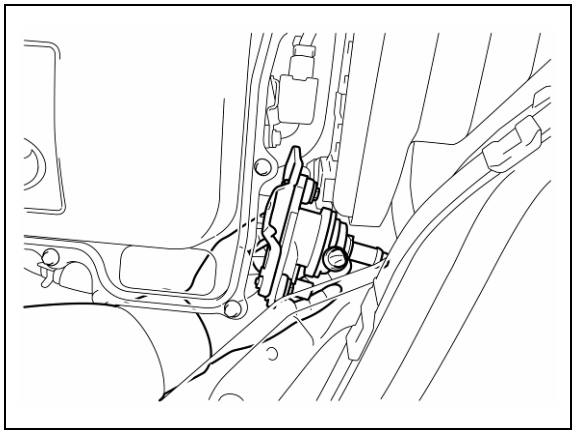
e) Plug the HV water pump ports with paper towels or shop cloths.

NOTE:
- **Make sure the paper towels or shop cloths used DO NOT protrude out of the ports, as they may get caught when removing the water pump from the vehicle.**
- **Protective tape may be used to cover the HV water pump ports.**



f) Remove the relay box cover.
g) Place protective tape over the relay box to prevent water from entering it when removing the HV water pump.

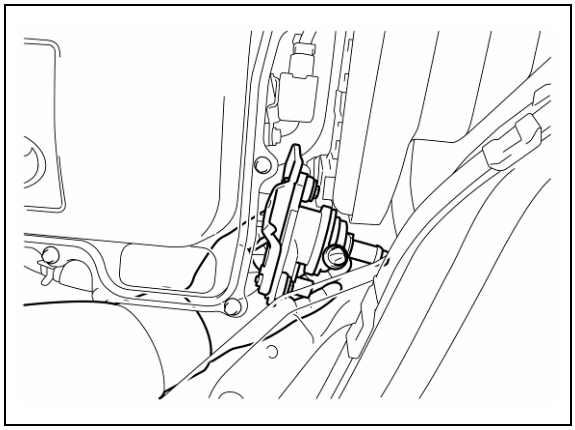
NOTE:
- **DO NOT allow coolant to enter the relay box, doing so will cause it to malfunction.**
- **Place the protective tape so that is covers all the edges of the relay box.**



h) Remove the HV water pump from the vehicle by lifting it out as shown.
i) Place a mark on the original HV water pump to prevent it from being reused.

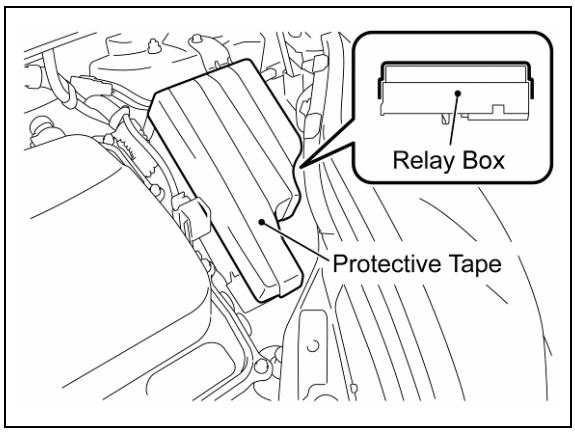
NOTE:
- **DO NOT allow coolant to spill onto the relay box.**
- **As required by Federal Regulations, please make sure all recalled parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused, *unless requested for parts recovery return.***

C. HV WATER PUMP INSTALLATION

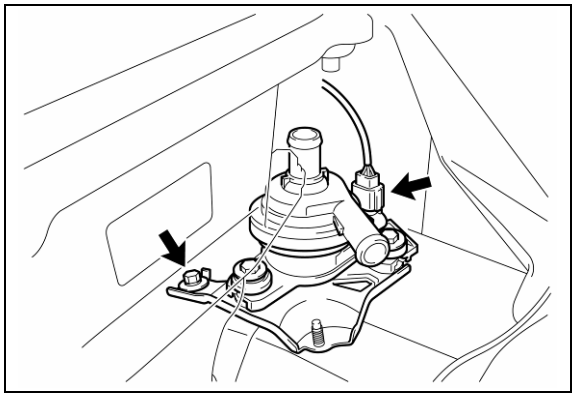


1. INSTALL THE *NEW* HV WATER PUMP

a) Install the ***NEW*** HV water pump by lowering it into the vehicle as shown.



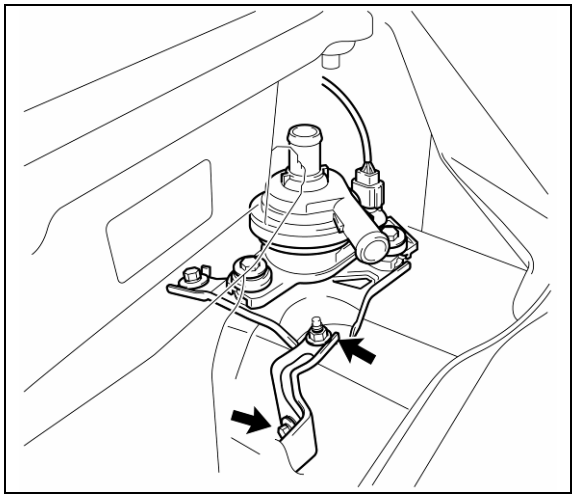
b) Remove the protective tape from the relay box.
c) Reinstall the relay box cover.



d) Reinstall the bolt and torque to spec.

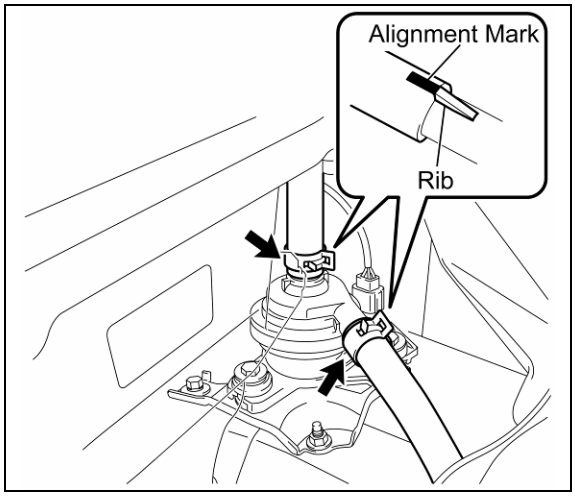
Torque Spec: 7.0 N·m (71 kgf·cm, 62 in·lbf)

e) Reconnect the connector.

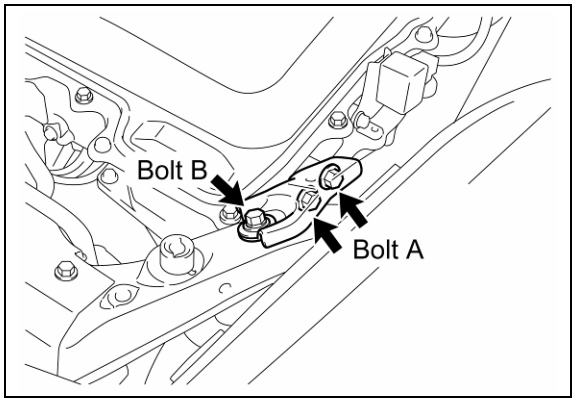


f) Reinstall the bracket with the bolt and nut, then torque to spec.

Torque Spec: 7.0 N·m (71 kgf·cm, 62 in·lbf)



g) Using the alignment marks, reconnect the 2 hoses with the 2 clamps.

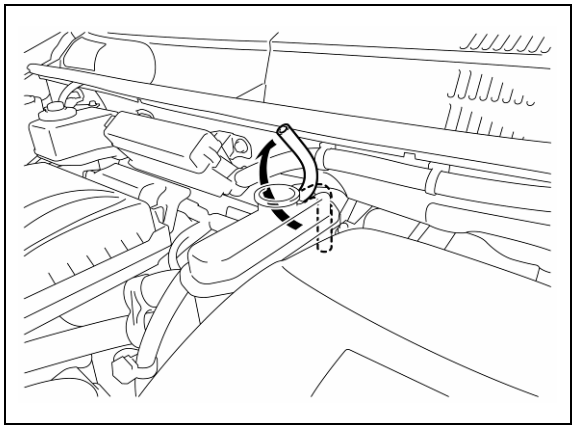


2. REINSTALL THE NO. 2 INVERTER BRACKET

a) Reinstall the No. 2 inverter bracket with the 3 bolts and torque to spec.

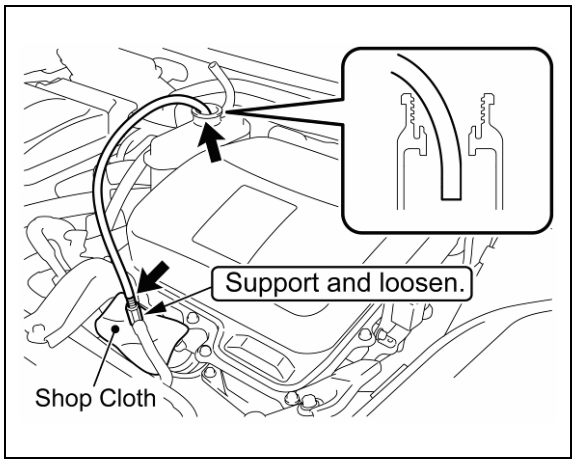
Torque Spec:

- **Bolt A – 25 N·m (255 kgf·cm, 18 ft·lbf)**
- **Bolt B – 21 N·m (214 kgf·cm, 16 ft·lbf)**



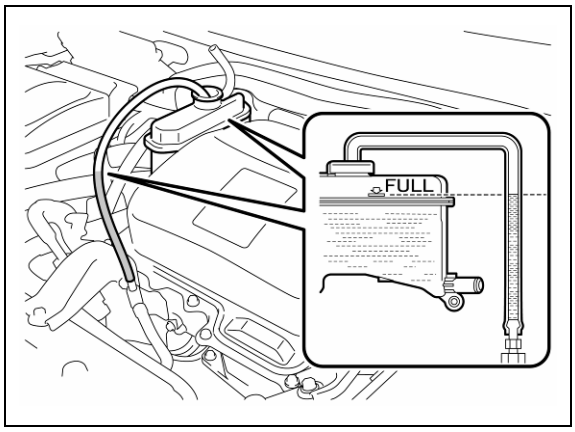
3. ADD COOLANT

a) Place the reserve tank hose in the upward position.



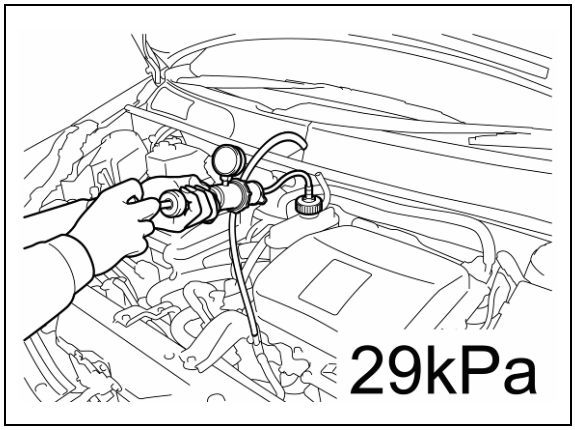
b) Place a paper towel or shop cloth underneath the inverter bleeder plug.
c) Support and loosen the bleeder plug screw, then connect a transparent hose (inner diameter: approx. 6 mm, length: approx. 450 mm) to it and insert the other end into the reserve tank.

NOTE:
Support the base of the bleeder screw when loosening it to prevent deformation or damage to the attachment bracket.



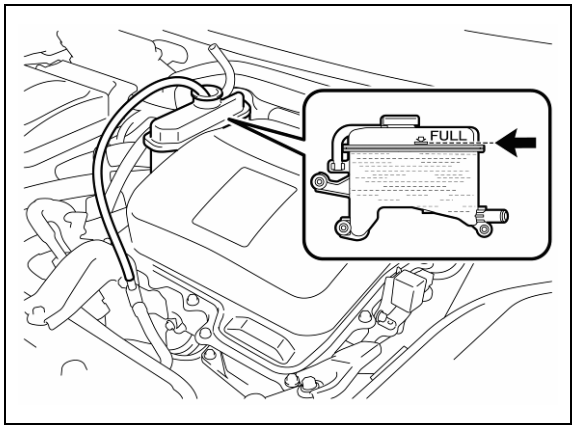
d) Add coolant until the level in the hose is even with the reserve tank FULL marking.
e) Close the bleeder plug and torque to spec.

Torque Spec: 11 N·m (112 kgf·cm, 98 in·lbf)



4. PERFORM A PRELIMINARY COOLANT LEAK TEST

a) Temporarily remove the hose from the reserve tank.
b) Install the radiator cap tester onto the reserve tank.
c) Pump the tester to 29 kPa (0.3 kgf/cm^2, 4.2 psi) and inspect for coolant leaks.
d) Remove the radiator cap tester.



5. BLEED THE INVERTER COOLING SYSTEM

a) Reinstall the hose to the reserve tank.
b) Verify that the reserve tank coolant level if at the FULL mark.

c) Bleeding The Inverter Cooling System – Part 1:

i. Loosen the bleeder screw.
ii. Push the power switch to turn IG ON and operate the water pump for approximately 5 seconds, then switch the IG OFF.
iii. Add coolant to the reserve tank until the level is at the FULL mark.
iv. Repeat steps “ii” and “iii” 3 times, and verify that the coolant level is no longer dropping.

NOTE:

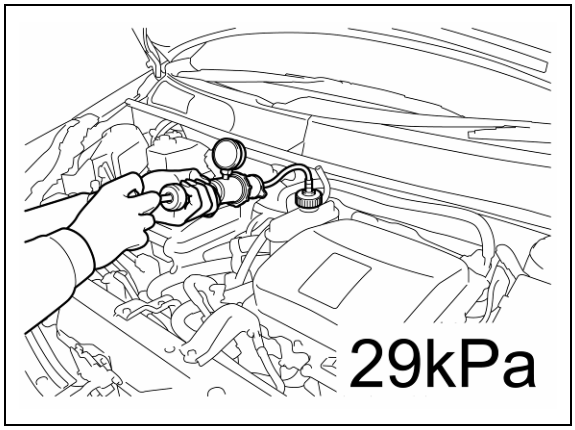
- **The initial sound of the HV water pump will subside and become quieter as the air is bleed from the system.**
- **Make sure to switch the IG OFF after 5 seconds. If the HV water pump is operated for more than 5 seconds the reserve tank may become empty, allowing air to enter the system making the bleeding process more difficult.**

d) Bleeding The Inverter Cooling System – Part 2:

i. With the bleeder plug loosened, switch the IG ON and operate the water pump for approximately 1 minute, then switch the IG OFF.
ii. Wait 1 minute, and then switch the IG ON to operate the water pump for approximately 1 minute, and then switch the IG OFF.
iii. Repeat steps “i” and “ii” a minimum of 3 times in order to bleed the air from the cooling system.
iv. Add coolant to the reserve tank until the level is at FULL mark.

NOTE:
Bleeding is complete when the following criteria are met.

- **Steps “i” & “ii” have been repeated a minimum of 3 times.**
- **Air stops coming out of the bleeder screw.**
- **The initial sound of the HV water pump has subsided and become quieter.**

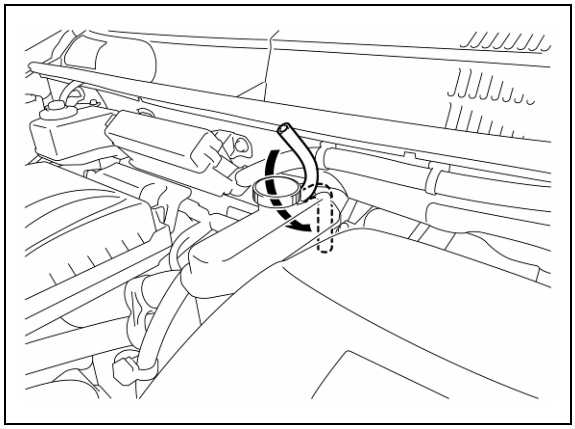


6. PERFORM A FINAL COOLANT LEAK TEST

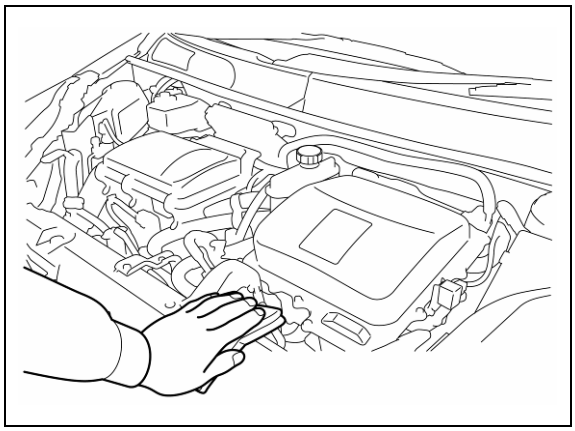
a) Close the bleeder plug and torque to spec.

Torque Spec: 11 N·m (112 kgf·cm, 98 in·lbf)

b) Remove the hose from the reserve tank and bleeder screw.
c) Install the radiator cap tester onto the reserve tank.
d) Pump the tester to 29 kPa (0.3 kgf/cm^2, 4.2 psi) and inspect for coolant leaks.
e) Remove the radiator cap tester.
f) Add coolant to the reserve tank until the level is at the FULL mark.



g) Place the reserve tank hose back in the downward position.



h) Wipe any residual coolant.
i) Reinstall the radiator support cover with the 6 clips.

- CAMPAIGN COMPLETE -