



Articles Contained in this Issue

*Click on a title below to jump to the article.
Click the date located in the footer to return to page 1.*

CODE	ARTICLE.....	PAGE
(00)	STIS New Releases	14-15
(01)	QMR of the Month.....	1-2
(01)	QMR of the Month Award Presentations.....	2
Tech Tips Greatest Tips		
(01)	UNDERSTANDING READINESS CODES.....	3
(07)	Parasitic Draw (Dark Current) Diagnostics	3-8
(10)	HVAC Temperature Sync.....	8-10
(11)	EGR, Evap & AVCS Readiness Monitors 21MY+	10-11
(20)	Solterra Wheel Hanger.....	12
(20)	Solterra AC refrigerant check, use the scan tool!	12-13

SUBARU TECHLINE HOLIDAYS & HOURS OF OPERATION

Mon. - Thurs.	8:30AM - 7:30PM EST
Friday	10:30AM - 5:00PM EST
Saturday	9:00AM - 3:00PM EST

01 TechShare QMR of the Month

We are pleased to announce this month's TechShare QMR of the Month Winner:

Humprey Esguerra from
Sheehy Subaru in Springfield, VA

Humprey created a high quality QMR using TechShare reporting on customer's concern of a clicking noise coming from the left rear cargo area. Humprey's report included detailed diagnostic steps and high-quality photos/ videos.

Please refer to the following link to review the TechShare QMR in detail:

<https://subarutechshare.com/qmrs/TS-226665>

In appreciation for going the extra mile and sharing his experience with us, Humprey will be receiving the following from his District Service Quality Manager:

\$500.00 Snap-On gift card

Continued on the next page

CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

The Subaru TechTIPS newsletter is intended for use by professional Technicians ONLY. Articles are written to inform those Technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained Technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that your vehicle has or will have that condition. Impreza, Legacy, Justy, Loyale, Outback, Forester, Subaru SVX, WRX, WRX STI, Baja, Tribeca, BRZ, XV Crosstrek, Ascent, Crosstrek Hybrid, Solterra and "Quality Driven" are Registered Trademarks.

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ISO 14001 is the international standard for excellence in Environmental Management Systems. Please recycle or dispose of automotive products in a manner that is friendly to our environment and in accordance with all local, state and federal laws and regulations.



QUALITY DRIVEN® SERVICE



Education Foundation

01 QMR of the Month (CONTINUED)

The other Regional winners selected from TechShare QMRs submitted during January 2023 were:

- **Brandon Moller** from **Bill Kolb Jr. Subaru**
- **Dave Jodat** from **Subaru City of Milwaukee**
- **David Callender** from **Kendall Subaru of Marysville**
- **Rodney Albert** from **Reynolds Subaru**

Any Subaru Technician can participate in the TechShare QMR of the Month program. See the November 2022 issues of TechTIPS for full details. You just might see your name and photo in a future issue of TechTIPS!

01 QMR of the Month Award Presentations

As part of our “enhanced” QMR of the Month recognition program, we will include a photo (whenever available) of the recipient’s award presentation in TIPS. The winner selected from QMR of the Month submissions received during January 2023 was Humprey Esguerra, Shop Foreman at Sheehy Subaru, Springfield, VA.



Pictured from left to right is Sheehy Subaru Service Director Ben Ong, Sheehy Subaru Managing Partner Russ Zakeri, Sheehy Subaru Shop Foreman & QMR of the Month winner Humprey Esguerra after being presented with his \$500.00 Snap-On Gift Card, Subaru of America inc District Parts and Service Manager Cory Hiken, Subaru of America inc District Sales Manager Andrew Raszewski, and Subaru of America inc District Service Quality Manager Dan Rockholt.

*Congratulations and **THANK YOU** to our January 2023 QMR of the Month Award recipient!*

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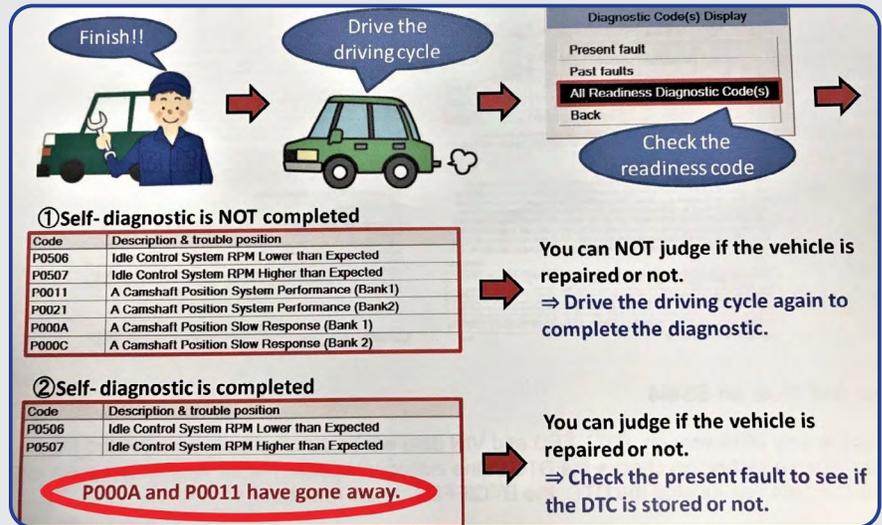
TECH TIPS GREATEST TIPS

This series features TechTIPS articles frequently referred to by Techline. This month's feature is from June 2018.

01 UNDERSTANDING READINESS CODES

The Techline continues to receive calls about readiness codes and their purpose. Readiness codes represent the selfdiagnostic condition on each DTC. If the DTC is displayed, this means the self-diagnostic has not completed. After the selfdiagnostic is completed, the DTC goes away, regardless of the result.

Example: DTCs P000A and P0011 are stored



07 Parasitic Draw (Dark Current) Diagnostics

Techline continues to receive calls with questions regarding Parasitic draw testing and the best practices needed to diagnose these concerns correctly. Refer to the previous TSB's and TechTIPs covering this topic:

[TSB 07-199-21 - Measurement of Dark Current \(Standby Current Draw\)](#)

[TSB 07-85-14 - Measurement of "Dark Current" \(Parasitic Battery Draw\)](#)

[May 2020 TechTIP - Parasitic Draw \(Dark Current\) Testing and Telematics DCM](#)

[October 2021 TechTIP - Parasitic Draw Testing, A Different Approach](#)

It is always recommended to search Flashwrite for possible ECM updates, there are multiple years and models that have ECM charging logic updates available.

Continued on the next page

Tips & Tricks

Interview the customer

It is important to have a clear understanding of how the vehicle is being operated. For example, when does the battery die? How often is the vehicle driven? How is it driven, lots of short trips? Are the hatch/trunk/doors being left open for a long period of time? Where are the keys when the vehicle is not in use? Being able to reproduce the customer's concern can be helped by understanding how they use the vehicle. Perform testing in the same conditions as the customer describes. Having a clear understanding of the customer's concern can also help when no excessive draw is found.

1. How does the customer use the vehicle daily?
 - a. The customer's routine can uncover usage that the retailer was not aware of. For example, the customer opens the power rear gate every night to get their gym bag out of the car.
 - b. Are the door switches working correctly, do they show open/closed on the combination meter?
 - c. Do all the doors lock and stay locked?
 - d. Look at BIU live data, do the door switches show open/closed correctly?
 - e. Based on the customer interview, how often do the doors or PRG get used?

2. Where does the customer park at night?
 - a. Does the customer park in the garage?
 - b. Does the customer leave the key?
 - c. Where is the key kept, inside the house, near the vehicle?

3. How far does the customer drive the vehicle on a regular basis?
 - a. How many miles is the vehicle driven per week?
 - b. How frequently is the vehicle being driven?

4. Is there anything being brought into the vehicle?
 - a. Third party electrical devices can affect the BIU and Central Gateway sleep cycle, make sure all electrical devices are removed and not plugged in. Review the November 2021 Techtip covering aftermarket devices - [2021 November TechTIPS-JUSTIFIED.pdf \(subarunet.com\)](#)
 - b. Was anything removed by the customer at the time of drop off?

Inspect the vehicle

It is recommended to perform a thorough visual inspection of the vehicle. Are there any interior lights that have been left on? Is there anything plugged into the OBD, USB or 12V ports? Is there any aftermarket wiring or devices wired into the vehicle? Look under the dash for aftermarket remote starts, alarm systems or buy here/pay here devices. Is there anything hard wired into the vehicle, such as a dash cam or radar detector? Inspect the battery terminals for added wiring to power aftermarket stereo equipment or trailer hitch wiring.

Test the battery

The first step of parasitic draw testing should begin with a battery charge/test using the Midtronics DCA-8000, refer to [TSB 07-178-21 - Battery Testing and Charging](#) for the correct battery testing procedures.

Understanding the Meter

Are the fuses in the DVOM okay? If the meter leads are in the wrong ports when performing testing it could pop the meter fuses. If those fuses are open, parasitic draw testing will not work. You can check the meter fuses with a simple continuity check. *Always test your DVOM fuses before testing!!*

When performing parasitic draw testing make sure to pay close attention to the meter. Does the meter have auto-ranging, is it turned on? **Where is the decimal point, is the meter set to A or mA?**

Milliamps (mA)	Amps (A)
20mA	.02 A
30 mA	.03 A
40 mA	.04 A
50 mA	.05 A
100 mA	.1 A
250 mA	.25 A
500 mA	.5 A
750 mA	.75 A
1000 mA	1 A

Amp Clamp vs DVOM Testing



Figure 11-29 A) Stand alone low amperage induction clamp
B) Stand alone high amperage inductive clamp
C) DVOM dependent low amperage inductive clamp

Try using an amp clamp when testing for a parasitic draw. The system does not need to be disturbed when using this tool to perform testing. This could also be used in conjunction with a meter, testing at the fuse with the meter for specific draw and the amp clamp providing a total draw. Refer to the [Electrical Theory and Diagnostics TRB](#) for more information on amp clamps.

Using STIS for diagnostic information

There are multiple TSB's and TechTIPs to assist technicians with performing parasitic draw testing. An overlooked resource for information is STIS. It also has the specific procedures for performing this testing. It can be found by following this click path:

TOP Index DTC Search Wiring Diagram Print Search SST R/H New Car Info HE

| General Description | **Engine** | Suspension | Driveline/Axle | Brakes | Transmission/Transaxle | Steering | Heater & Airconditioner/Ventilator | Airbag System & Seat Belt System | Body & Elect

Engine

EMISSION CONTROL DEVICES (H4DO(EXCEPT FOR HEV))

INTAKE (INDUCTION) (H4DO(EXCEPT FOR HEV))

MECHANICAL(H4DO(EXCEPT FOR HEV))

EXHAUST(H4DO(EXCEPT FOR HEV))

COOLING(H4DO(EXCEPT FOR HEV))

LUBRICATION(H4DO(EXCEPT FOR HEV))

SPEED CONTROL SYSTEMS(H4DO(EXCEPT FOR HEV))

IGNITION(H4DO(EXCEPT FOR HEV))

STARTING/CHARGING SYSTEMS(H4DO(EXCEPT FOR HEV))

General Description

Charging System

Starter

Starter Relay

Generator

Battery

REMOVAL

INSTALLATION

INSPECTION

CHARGE

Battery Sensor

Auto Start Stop DC/DC Converter

Auto Start Stop OFF Switch

FUEL INJECTION (FUEL SYSTEMS)(H4DO(HEV))

EMISSION CONTROL (AUX)

5. STANDBY CURRENT

1. Prepare the circuit tester which can measure down to 1 mA.

Note:

For model with keyless access function, the standby current changes regularly. Therefore, prep

2. Using the circuit tester, check the standby current.

Note:

The standby current may be displayed lower than the actual value if the battery is weak, so ch

(1) Check the battery.

Appearance:

[Ref. to STARTING/CHARGING SYSTEMS\(H4DO\(EXCEPT FOR HEV\)\)>Battery>INSPECTION > APPE/](#)

Electrolyte level:

[Ref. to STARTING/CHARGING SYSTEMS\(H4DO\(EXCEPT FOR HEV\)\)>Battery>INSPECTION > ELEC/](#)

Battery voltage:

[Ref. to STARTING/CHARGING SYSTEMS\(H4DO\(EXCEPT FOR HEV\)\)>Battery>INSPECTION > BATTE/](#)

Specific gravity of electrolyte:

[Ref. to STARTING/CHARGING SYSTEMS\(H4DO\(EXCEPT FOR HEV\)\)>Battery>INSPECTION > SPECI/](#)

(2) Check that the fuse is not blown out and is properly inserted.

(3) When non-genuine electrical parts (including parts sold in authorized workshops) are installed, remove all

(4) Check that back-up fuse is inserted. [Ref. to PRE-DELIVERY INSPECTION>PRE-DELIVERY INSPECTION /](#)

(5) Start the engine, and set the switch positions for each system as shown in the following table.

Note:

Some of the listed systems are not equipped depending on the vehicle. Set only the system

System	Position
Headlight	ON or Auto
Fog light	ON
Wiper (front and rear)	ON or Low speed
Audio and navigation system	ON
Rear defogger	ON
Room light	DOOR
Luggage light	DOOR
Map light	OFF
Auto A/C	ON (AUTO)
Manual A/C	ON (Speed 1)
Electronic parking brake	ON
Electrical parts other than listed above (electrical parts that users can confirm the operation with the key removed)	OFF

(6) Turn the ignition switch to OFF.

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A critical piece of information that can be found in the STIS testing procedure:

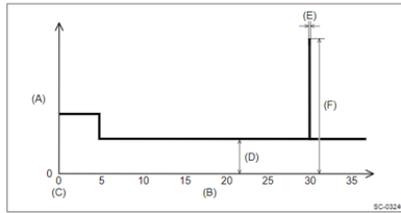
(14) Check the standby current.

Caution:

If the terminals and circuit tester are detached during standby current inspection, reconnect the ground terminal to the battery sensor and repeat the procedure from step (9).

Note:

- For model with keyless access function, the standby current changes periodically because the keyless access system continuously searches the access key (polling).
- When measuring the standby current, the reading of the circuit tester oscillates. Therefore, read the average value (median value).
- The standby current may become large when the vehicle system (ELCM) is activated 5 times at 30-minute intervals or 5 hours after turning the ignition switch to OFF. Therefore, the measurement should be completed in 20 minutes after the ignition switch is turned to OFF.
- If it takes more than 20 minutes, start the engine once, turn the ignition switch to OFF again, then perform the inspection.



(A) Current/mA (C) Ignition OFF (E) 5 seconds (system operation)
 (B) Time/min (D) Less than 70 mA (F) 300 mA or more

Check

- When the maximum measurement value is less than 70 mA → Standby current is normal.
- When the maximum measurement value is 70 mA or more → Go to step (15).

(15) Connect the ground terminal to the battery sensor, and wait for 55 minutes.

Note:

For 55 minutes after turning IG OFF, vehicle system (EPS) may still be active.

(16) Measure the standby current with the same measurement procedures as in steps (10) through (14).

Check

- When the maximum measurement value is less than 70 mA → Standby current is normal.
- When the maximum measurement value is 70 mA or more → Go to step (17).

(15) Connect the ground terminal to the battery sensor, and wait for 55 minutes.

Note:

For 55 minutes after turning IG OFF, vehicle system (EPS) may still be active.

STIS states if the draw is found to be over 70 mA wait for 55 minutes and then continue to monitor the draw. **Performing parasitic draw testing for a short time will often lead to the incorrect diagnosis. Make sure to perform the testing for hours checking the meter frequently.**

Another step in this testing from STIS should also be mentioned:

(17) Remove all fuses one by one to identify which system changes the standby current value significantly.

If the tech chooses to follow this method for diagnosis, make sure NOT to reinstall the fuses after removal. Reinstalling the fuse may wake up modules or effect other circuits which may change the results of the testing.

Once a draw is confirmed on a specific fuse, a Technician could go a step further. Unplug the part the fuse indicates has the draw. Reinstall the fuse, wait 30 minutes to let everything go to sleep again, is the draw on that fuse now gone?

Example 1 - "I pulled all of the fuses and the draw did not change"

All of the circuits in Subaru vehicles are fused. If there is an above 70 milliamp draw, it **must** be on a fused circuit. This is a good opportunity to use the 10/21 TechTIP. Techline recommends following the instructions in the 10/21 TechTIP for initial inspection of a draw concern. Technicians should follow STIS to verify the condition after the initial inspection. The service manual states removing fuses one by one is an acceptable method for diagnosis. Techline would caution to review the Power Supply diagram to verify the power flow of fuses being removed. Removed fuses should not be reinstalled as they could cause a module to "wake up" and disturb the system. This could cause a misdiagnosis while performing draw testing.

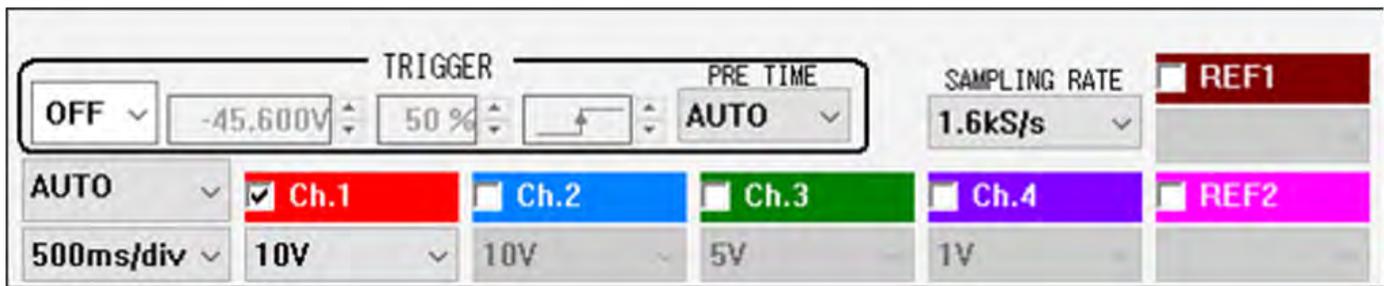
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Example 2 - “I removed the back-up fuse, the draw went to 0 milliamps”

Techline does not recommend removing the back-up fuse when performing draw testing. The back-up fuse powers multiple other fuses/circuits. Using STIS, find the Power Supply wiring diagram. Follow the circuit for the back-up fuse, find what fuses and circuits it powers, then test those for the draw. Once all circuits past the Backup fuse have been eliminated as the source of the draw, it may be necessary to find what the back-up fuse is powering directly and verify that is the cause of the draw. Use the power supply diagram to determine all circuits that the back-up fuse is powering.

Example 3 – “I tested for a draw, it is below 70 milliamps, but the customer’s battery has died multiple times”

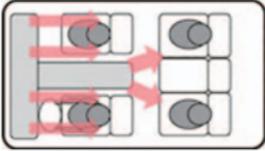
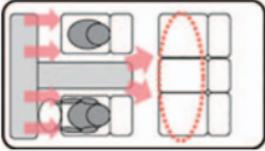
If the parasitic draw seems to be intermittent, set up the vehicle for testing. “Trick” the hood latch and driver door to think they are closed so there is access to both the M/B and F/B fuse boxes. This way the testing can continue undisturbed but there is still access to all the fuses in the vehicle. Try to find a spot in the shop that the vehicle can be left in this state for as long as possible. Ask everyone to keep an eye on the meter when they walk by. If the draw goes above 70 mA, determine where that draw is coming from. Remember the ELCM could be performing an Evap test. If there is still no draw found, try unlocking/locking the vehicle, then let it go back to sleep. Unlock the vehicle, turn the ignition on (do not start the engine), let it sit for a few minutes, turn the ignition off and lock the vehicle again. Continue to monitor the draw trying to “catch” the intermittent draw. The DSTi interface can also be used to record this testing. The DSTi oscilloscope feature could be used with an amp clamp connected to record the draw test. The DSTi can record around 40 hours of testing. Below is a screen shot of the settings needed to get around 40 hours of recording time from the DSTi.



Techline has received calls for concerns of passenger temperature setting automatically syncing with the drivers side. This is a feature that started with the 19MY Forester. When the Occupant Detection System (ODS) identifies the seat as empty, it will automatically sync the HVAC settings to improve usability. This feature also includes increasing/decreasing the air volume/temperature for the front seats based on occupation of the rear seats when applicable. See the images below taken from the 19MY Forester New Car Info.

Continued on the next page

Air conditioning operation 2

Condition	There is a passenger in the rear seat.	There is no passenger in the rear seat.
Control image	<p>The air conditioning is controlled so that passengers feel comfortable on every seat. The newly installed rear seat's vent grille quickly provides comfortable air conditioning to the rear seat's passengers.</p>  <p style="text-align: center;">NC-00821</p>	<p>When the system detects that there is no passenger on the rear seat, it automatically controls the air volume and adjusts the air conditioning so front seats' passengers feel comfortable.</p>  <p style="text-align: center;">NC-00822</p>

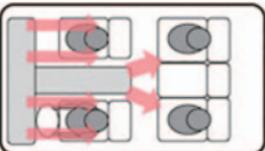
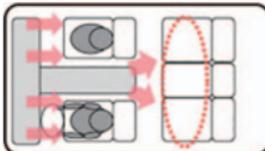
* Since the detection of the presence of the rear seat's passengers is performed using the open and close record, the detection of the passenger's presence may not be correctly determined (such as when the door was opened to load a luggage or a passenger moved inside the vehicle from the front seat to the rear seat).

■ **Air conditioning linked with the passengers on the rear seat* (front seats control/all seats control switching)**

Conventionally, since the air conditioning control (air volume, etc.) was performed to make all seats comfortable, there were cases in which front seats' passengers felt strong air conditioning. If there are no passengers in the rear seat, the system lowers the air volume and prioritizes the front seats to improve comfort and convenience.

- For example, on the existing model vehicle, in order to weaken the air conditioning when passengers are seated on the front seats only, air volume/temperature adjustments were required. However, the system now determines whether the passenger is seated on the rear seat, which realizes air conditioning dedicated to comfort in the front seats without a special operation.

Air conditioning operation 2

Condition	There is a passenger in the rear seat.	There is no passenger in the rear seat.
Control image	<p>The air conditioning is controlled so that passengers feel comfortable on every seat. The newly installed rear seat's vent grille quickly provides comfortable air conditioning to the rear seat's passengers.</p>  <p style="text-align: center;">NC-00821</p>	<p>When the system detects that there is no passenger on the rear seat, it automatically controls the air volume and adjusts the air conditioning so front seats' passengers feel comfortable.</p>  <p style="text-align: center;">NC-00822</p>

* Since the detection of the presence of the rear seat's passengers is performed using the open and close record, the detection of the passenger's presence may not be correctly determined (such as when the door was opened to load a luggage or a passenger moved inside the vehicle from the front seat to the rear seat).

Continued on the next page

10 HVAC Temperature Sync (CONTINUED)

Information about this was also published in the [“Air Condition Season Special Edition Newsletter”](#).

10 FORESTER SYNC OPERATION

The Passenger Link system introduced in the 2019 Forester allows the detection of people occupying the passenger front seat and rear seats. The HVAC control module detects occupants using the passenger Occupant Detection System and the rear door switch operation history. The system automatically switches OFF passenger side settings (set temperature) and engages the SYNC setting when there is no passenger detected in the passenger front seat. The system requires no driver input to change passenger settings improving convenience for the driver efficiency.



11 EGR, Evap & AVCS Readiness Monitors 21MY+

Techline has received reports of Readiness Monitors not completing or setting to “Ready”. This could prevent a vehicle from passing a state mandated emissions test. Technicians have attempted extended test drives with no change to the concern. Starting with '21 MY vehicles, the required conditions for these monitors has changed, the **minimum ambient air temperature has increased**. The “Execution Condition” are listed in the “General Description” section of the DTC. See the example below, after navigating to DTC P0455, select the “GD” tab.

The “Execution Condition” can be found by scrolling down in the General Description section.

Continued on the next page

TOP Index DTC Search Wiring Diagram Print Search SST R/H New Car Info HELP 100%

General Description | Engine | Suspension | Driveline/Axle | Brakes | Transmission/Transaxle | Steering | Heater & Airconditioner/Ventilator | Airbag System & Seat Belt System | Body & Electrical/Wiring SYSTEM | DIAGNOSTICS |

purge

DIAGNOSTICS

DTC P0455 EVAP SYSTEM (GPC) LEAK DETECTED (LARGE LEAK)
 DTC P0456 EVAP SYSTEM (GPC) LEAK DETECTED (VERY SMALL LEAK)
 DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE 'A' CIRCUIT LOW
 DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE 'A' CIRCUIT HIGH
 DTC P0460 FAN 1 CONTROL CIRCUIT
 DTC P0461 FAN 2 CONTROL CIRCUIT
 DTC P046E EVAP SYSTEM PURGE CONTROL VALVE 'B' PERFORMANCE/STUCK OPEN
 DTC P040B CRANKCASE VENTILATION SYSTEM (PCV) DISCONNECTED
 DTC P0409 EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE
 DTC P040F1 EVAP SYSTEM LOW PRESSURE PURGE LINE PERFORMANCE
 DTC P0500 VEHICLE SPEED SENSOR 'A' CIRCUIT
 DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED
 DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED
 DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE
 DTC P050B COLD START IDLE CONTROL SYSTEM PERFORMANCE
 DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT
 DTC P0580 SYSTEM VOLTAGE

COMPONENT DESCRIPTION
 Leak check valve assembly consists of the pressure sensor, the reference orifice (diameter of 0.02 inch), the vacuum pump which introduces the negative pressure into evaporative emission system, and the switching valve which switches the passage to introduce the negative pressure.

(1) Leak check valve ASSY (2) Switching valve (3) Reference orifice (0.02 inch orifice) (4) Pressure sensor (5) Vacuum pump (6) Drain filter (7) Purge control solenoid valve (8) Intake manifold (9) Intake manifold (10) Fuel tank (11) Canister

EN-22510

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Activation of soaking timer	Completed
Intake air temperature	4.4 °C (39.9°F) or more
Engine oil temperature	4.4 °C (39.9°F) or more
Engine coolant temperature	4.4 °C (39.9°F) or more and Less than 45°C (113°F)
Accumulated purge amount during previous driving cycle	Value of Map1 or more

The “Execution Condition” are listed below for EGR, Evap and the AVCS systems. **All the conditions listed under each must be met before the test will run.**

EGR

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.1 kPa (563 mmHg, 22.2 inHg) or more
Ambient air temperature	7°C (44.6°F) or more
Engine speed	Value of Map1 — value of Map2
Vehicle speed	36km/h (22.4MPH) or more
Park/neutral position switch	OFF
Time while the fuel shut-off function is in operation	2000ms or more
Compulsory drive of EGR valve delay time (low flow rate monitor only)	1000ms or more

Evap

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9V or more
Barometric pressure	75.1kPa (563mmHg, 22.2 inHg) or more
Activation of soaking timer	Completed
Intake air temperature	4.4°C (39.9°F) or more
Engine oil temperature	4.4°C (39.9°F) or more
Engine coolant temperature	4.4°C (39.9°F) or more and Less than 45°C (113°F)
Accumulated purge amount during previous driving cycle	Value of Map1 or more

AVCS

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Exhaust AVCS control [Target timing advance change amount (per 64 ms)]	In operation Less than 3.2°C
IVVT target angle	10°C or more
Ambient air temperature	7 °C (44.6°F) or more

Continued on the next page

20 Solterra Wheel Hanger



Since Solterra is not equipped with wheel studs, bolts are used to attach the wheels. This is new to Subaru Technicians but may be familiar to those who have worked on other brands of vehicles. There are “Wheel Stud Pilot Pin” (wheel hanger) tools available which make it easier to service the wheels on the vehicle. ***This will not be an Essential tool.*** One version will be available on the Subaru Equipment website found here:

<https://www.subaruretailersolutions.com/equipment/product/15828>

After removing one of the wheel bolts, this tool is inserted in place of that bolt. Once the other wheel bolts are removed, the wheel will “hang” in place instead of falling to the floor. The wheel hanger makes reinstalling the wheels much easier as the wheel does not need to be balanced while trying to line up the wheel bolts.

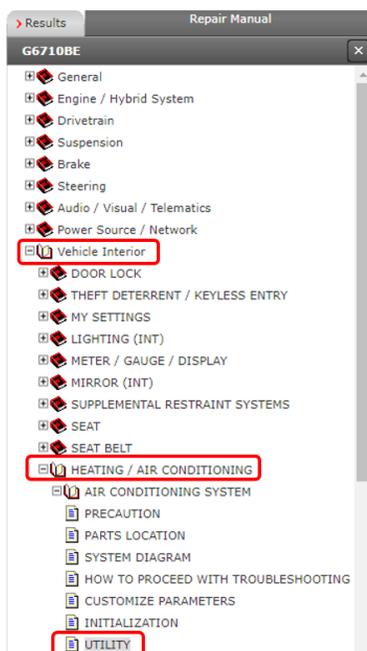
There are numerous options for these tools. The thread size is **M14x1.50**. A quick internet search will return many options:

See 14x1.5 wheel hanger



20 Solterra AC refrigerant check, use the scan tool!

When presented with an AC concern, the first step a Technician may take is to recover the refrigerant to verify the system is not over or under charged. **On all Solterra’s, this check can be performed with the Global Techstream scan tool instead of having to use the dedicated EV/Hybrid AC machine.** This can save time and limit the chances of contaminating the AC system. The Solterra uses the high voltage AC compressor to heat **AND** cool the vehicle, so a technician may be presented with an AC related concern all year round.



Follow the click path shown here to find this information in the Service Manual. After connecting the scan tool, verify all conditions required.

Continued on the next page

Make sure to review the “Hint” in this test.

HEATING / AIR CONDITIONING AIR CONDITIONING SYSTEM UTILITY

REFRIGERANT SHORTAGE CHECK USING GTS

a. Prepare the vehicle according to the table below.

Measurement Condition:

Item	Condition
Vehicle Condition	Ignition switch ON (READY)
A/C Switch	On
Ambient Temperature*1	0 to 49°C (32 to 120°F)
Air Conditioning Air Inlet Temperature*2	25 to 35°C (77 to 95°F)
Set Temperature	MAX COLD
Recirculation/fresh Control Switch	Recirculation
Air Vent Damper Position	FACE
Blower Speed	HI

HINT:
 *1: This inspection can be judged correctly only if the ambient temperature is within a range of 0 to 49°C (32 to 120°F). Therefore, postpone the test if the temperature is low.
 *2: This inspection can be judged correctly only if the air inlet temperature is within a range of 25 to 35°C (77 to 95°F). Therefore, postpone the test if the temperature is out of range.

b. Using the GTS, check the amount of refrigerant.

Body Electrical > Air Conditioner > Utility

Tester Display

Refrigerant Gas Volume Check

Execute

NOTICE:
 If the conditions for the inspection are not met, "Refrigerant incorrect" will be displayed on the GTS. Confirm the conditions of the inspection and perform the check again.

HINT:

- If the amount of refrigerant is insufficient, "Refrigerant shortage" is displayed on the GTS and the indicator light on the A/C switch turns off.
- When performing this inspection, a DTC will not be output even if "Refrigerant shortage" is displayed on the GTS.

Result:

Result	Amount of Refrigerant	Corrective Action
Refrigerant shortage	Insufficient	1. Check for refrigerant leaks using a halogen leak detector, and repair if necessary. 2. Evacuate the air conditioning system and charge it with the appropriate volume of new or purified refrigerant. Click here([i])
Refrigerant correct	Correct	-
Refrigerant incorrect	Incorrect	Confirm the conditions of the inspection and perform the check again.

HINT:
 *1: This inspection can be judged correctly only if the ambient temperature is within a range of 0 to 49°C (32 to 120°F). Therefore, postpone the test if the temperature is low.
 *2: This inspection can be judged correctly only if the air inlet temperature is within a range of 25 to 35°C (77 to 95°F). Therefore, postpone the test if the temperature is out of range.

NOTICE:
 If the conditions for the inspection are not met, "Refrigerant incorrect" will be displayed on the GTS. Confirm the conditions of the inspection and perform the check again.

ITEM CODE	ITEM TYPE	TITLE	CREATED DATE
07-217-23	Technical Service Bulletin	Security & Locks – Additional ...	17-Apr-23
16-132-20R	Technical Service Bulletin	Diagnostic Information for All...	14-Apr-23
15-302-22R	Technical Service Bulletin	2023 Audio/Navigation & Power ...	11-Apr-23
WRH-23	Subaru Product/Campaign Bulletin	Safety Recall/STOP SALE - Tire...	7-Apr-23
J101SFN205	Accessory Installation Guide	2024MY Impreza - SPLASH GUARD ...	6-Apr-23
J101SFN200	Accessory Installation Guide	2024MY Impreza - SPLASH GUARD ...	6-Apr-23
E771SFN100	Accessory Installation Guide	2024MY Crosstrek (Wilderness O...	6-Apr-23
15-266-20R	Technical Service Bulletin	Telematics Function and Operat...	5-Apr-23
12-281-20R	Technical Service Bulletin	Hood Panel Vibration	5-Apr-23
07-189-21R	Technical Service Bulletin	Front Door Window Regulator- E...	5-Apr-23
12-247-23R	Technical Service Bulletin	Rear Gate Stay / Design Change	5-Apr-23
12-320-21R	Technical Service Bulletin	Front Outer Door Garnish -Desi...	5-Apr-23
TKA-20R	Subaru Product/Campaign Bulletin	Takata Front Passenger Airbag ...	4-Apr-23
E4010FL001	Accessory Installation Guide	2017-24MY Impreza and 2018-24M...	30-Mar-23
09-53-12R	Technical Service Bulletin	Judgment Standards for Water P...	29-Mar-23
MSA5B2404A	Owner Manual	2024MY Outback Getting Started...	28-Mar-23
MSA5B2403A	Owner Manual	2024MY Legacy Getting Started ...	28-Mar-23
15-221-18R	Technical Service Bulletin	Harman Audio / Infotainment: H...	28-Mar-23
07-75-13R	Technical Service Bulletin	DTC P0606 after Vehicle Batter...	27-Mar-23
07-219-23R	Technical Service Bulletin	Genuine Alternative Battery Re...	27-Mar-23
WRB-23R	Subaru Product/Campaign Bulletin	Telematics Data Communications...	27-Mar-23
07-218-23R	Technical Service Bulletin	Genuine Alternative Battery Re...	27-Mar-23
15-226-18R	Technical Service Bulletin	Harman Audio / Infotainment: T...	27-Mar-23
L1520BE	Service Manual	2024MY Impreza / Crosstrek Bod...	23-Mar-23
E5610FN000	Accessory Installation Guide	2024MY Impreza (all trims) - S...	23-Mar-23
E2610FN000	Accessory Installation Guide	2024MY Impreza (RS trim only) ...	23-Mar-23
E2410FN000	Accessory Installation Guide	2024MY Impreza (all trims) - S...	23-Mar-23
15-285-21R	Technical Service Bulletin	Gen 2-4 Head Unit Identificati...	23-Mar-23
15-307-23	Technical Service Bulletin	Discontinuation of SUBARU STAR...	20-Mar-23
15-259-20R	Technical Service Bulletin	Denso Gen 4 Cockpit One (CP1) ...	15-Mar-23
16-128-20R	Technical Service Bulletin	DTC P0842 / Transmission Harne...	15-Mar-23
15-270-20R	Technical Service Bulletin	2020-2022 Outback & Legacy FOT...	15-Mar-23
15-268-20R	Technical Service Bulletin	USB Map Data Update Procedure ...	15-Mar-23
15-240-19R	Technical Service Bulletin	New Harman Audio Amplifiers	15-Mar-23
15-273-20R	Technical Service Bulletin	Denso CP1 BASE (Dual 7" Displa...	15-Mar-23

All revised publications are highlighted in yellow.

Continued on the next page

ITEM CODE	ITEM TYPE	TITLE	CREATED DATE
WRK-21/22R	Subaru Product/Campaign Bulletin	CVT Chain Guide Breakage	15-Mar-23
MSA5M2414A	Owner Manual	2024MY Legacy/Outback Eyesight...	13-Mar-23
MSA5M2411A	Owner Manual	2024MY Legacy/Outback Subaru S...	13-Mar-23
MSA5M2403A	Owner Manual	2024MY Legacy Owner's Manual	13-Mar-23
MSA5M2404A	Owner Manual	2024MY Outback Owner's Manual	13-Mar-23
MSA5M2305B	Owner Manual	2020-22MY Legacy/Outback/Outba...	13-Mar-23
E4010SJ001	Accessory Installation Guide	2019-23MY Forester (Excluding ...	13-Mar-23
15-261-20R	Technical Service Bulletin	Reprogramming File Availabilit...	13-Mar-23
WRH-20R	Subaru Product/Campaign Bulletin	Rear Visibility FMVSS 111 Non-...	10-Mar-23
WRI-20R	Subaru Product/Campaign Bulletin	Reprogramming of Denso CP1 Inf...	10-Mar-23
E7210VC210	Accessory Installation Guide	2022-23MY WRX - Trunk Spoiler	10-Mar-23

All revised publications are highlighted in yellow.

This is your chance to offer suggestions for use in future issues of TechTIPS! Make sure that if you e-mail us, you place in the **subject line** of your e-mail **“For TechTIPS Newsletter”**. Thank you!

Model: _____

Year: _____

VIN: _____

Description of situation encountered: _____

Your suggestion for repair procedure, product improvements, etc.: _____

Please attach separate sheets, if necessary. You may also want to include Service Manual diagrams or references, or your own drawings to assist in describing your suggestion. All information submitted becomes the property of Subaru of America, Inc. Permission is granted to Subaru of America, Inc. to print your name and suggestions in TechTIPS and other Subaru of America, Inc. publications. Mail items to: PO Box 9103; Camden, NJ 08101-9877.

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