TECHNICAL SUBARU SERVICE

SERVICE HELPLINE UPDATE

APRIL 1995
TOPIC OUTLINE

Index # 041958

HELPLINE UPDATE
APRIL 1995

SHOWERS

Well, we survived another Winter. At least it was a good one here in New Joisey where the Technical Helpline is operating. We know from news reports that some of you really got nailed and are glad to see Winter end.

Spring is finally here and with it comes the seasonal joke. Since we received so many comments from our Santa joke we thought we would send this one along.

If April showers bring May flowers, what do Mayflowers bring?

PILGRIMS OF COURSE!

This one goes out to Bill G. of 07-117. Sorry, it's the best we could do.

TECHNICAL QUOTE

"That which is attached with only two bolts is directly behind something attached with eight."

ENGINE TESTING - BACK TO BASICS

The Technical Helpline continues to get calls concerning rough idles on SUBARU vehicles. If you call the Helpline, the first thing we will ask you is if you have performed a COMPRESSION TEST or a CYLINDER LEAKDOWN TEST. These are two of the most basic tests you can do to determine the internal working condition of the engine.

Just for review purposes, each cylinder must be "turned over" the SAME number of times to see if they are capable of doing the same amount of work. The throttle plate should be fully open and the engine at operating temperature. If three of the four cylinders come up to pressure in three revolutions of the engine and another needs nine revolutions, obviously there is something wrong with that one cylinder. It doesn't matter that it got to the same pressure as the others, it took too long for it to get there. If the difference between the highest and lowest cylinder is greater than 25% then the engine has a problem internally.

NOTE: ALL SPARK PLUGS MUST BE REMOVED PRIOR TO DOING THIS TEST.

The next step would be to follow this compression test with another called a 'WET COMPRESSION TEST' where a SLIGHT amount of oil is added to the cylinders to help the rings seal. If too much oil is added, there is the danger of seizing the engine by HYDROSTATIC LOCK. If compression readings increase

(Continued)

ENGINE TESTING - BACK TO BASICS (Continued)

too much, then this is usually an indication that the rings are bad although it is normal to get slightly increased readings even on a good engine.

If the engine has failed these tests, we recommend you perform a CYLINDER LEAKDOWN TEST where air is put into the cylinders and you look for leakage. The throttle plate should be open, remove the engine oil dipstick/filler cap and radiator cap. Air pressure should be regulated to 100 PSI if possible. Maximum allowable leakage is 10% (as per SUN Corporation). The cylinder being tested should be at Top Dead Center to be certain the valves are closed. With the cylinder pressurized, check for leakage. Air out the throttle body indicates a bad intake valve, out the tailpipe...a bad exhaust valve, out the dipstick tube/oil filler tube...bad rings (some leakage here is normal due to ring design), bubbles in the radiator...head gasket, cracked cylinder wall(s). Once the source of leakage has been determined, it is easy to determine your course of action.

If the engine passes these tests and EVERYTHING involved in the tests has been done correctly, then the cause of the rough idle is elsewhere. Perhaps electrical or fuel related.

NOTE: Sometimes under certain conditions, it is possible for an engine with an internal sealing problem to pass a Compression Test. We recommend that all Compression Tests be followed up with a Cylinder Leakdown Test.

If you have any questions concerning this matter or the tests involved, contact the Technical Helpline.

REPLACING AWD REAR WHEEL BEARINGS ON LEGACY, IMPREZA AND SVX

When replacing rear wheel bearings on All Wheel Drive LEGACY, IMPREZA, and SVX vehicles, be certain not to overtorque the lateral link bolt that secures the two transverse suspension arms to the wheel bearing housing. **DO NOT AIR GUN THE BOLT ON.** The proper torque is probably less than you think. Since the torques are different for the different models and years, refer to the appropriate manuals for the proper specs for the vehicle you are working on. If this bolt is overtorqued, it can deform the housing and may lead to a repeat failure of the wheel bearing.

If you encounter a repeat failure of a rear wheel bearing occurring in an unreasonably short amount of miles, the housing may have been deformed during the first repair. Replacement of the bearing and the housing may be required.

There are some other things to remember when working on the wheel bearings. Never loosen or tighten the axle nut with the weight of the vehicle on the wheel. The vehicle should be in the air with the wheel removed prior to loosening or tightening the axle nut. If this precaution is not taken, damage to the wheel bearing may occur. The axle nuts are NOT reusable. A new nut should be used with the new bearing. Always insure that the new bearing is properly packed with suitable wheel bearing grease. The grease that the bearing is shipped with is NOT sufficient. Always use the proper special tools to install the bearing and torque the axle nut to the correct specifications.

ELECTRICAL DIAGNOSIS, THE HELPLINE AND YOU

When you call the SUBARU Technical Helpline with an electrical problem, it is IMPERATIVE that you tell us if ANY aftermarket electrical device has been installed in the vehicle. This, of course, includes radios, CD players, alarm systems, mobile phones, two-way radios, warning lights, etc.

Without this information, we will assume the vehicle is stock and anything electrical is factory approved and our diagnosis will proceed accordingly.

It is not important who installed it but, it must be looked at as a possible source of the problem.

If the vehicle is equipped this way, locate the power source of the equipment and disconnect it and see if the problem still persists. If not, then the aftermarket device was no doubt the problem. If the problem still exists, the aftermarket device could still be the source of the problem due to it possibly damaging control units during the installation process or during its operation. This, of course, is not a matter for warranty.

So, before you call us about a weird electrical problem, take a look around the vehicle and see if any of these items are there and might be the cause of your problem.

DON'T LET A NON OEM DEVICE MAKE A PROBLEM FOR YOU! (AND US!)

2.2 IMPREZA AWD FUEL SENDERS

The new 2.2 litre AWD IMPREZA vehicles have a dual fuel sending unit configuration similar to the system used in LEGACY vehicles throughout the years. There are main and sub-senders that operate the fuel gauge. The senders are wired in series, just like the LEGACY.

You will find the sub-sender listed in the parts books but not shown in the illustrations.

Thanks to Tom Miller of New Motors, Erie, PA (03-201)

CRUISE CONTROL AND THE USE OF THE SELECT MONITOR

Some SUBARU cruise control modules will communicate with the select monitor. The presence of the C/C option on the select monitor screen when scrolling through "/OTHERS" indicates that communications may be possible. However, as opposed to the other computers on board, the cruise computer can be turned on and off by the main cruise control switch. The cruise main switch must be ON for communications to occur. Also, the cruise control computer must have its powers and grounds and be able to function. This is not to say that the cruise control system must be functional. (If it worked, you wouldn't be working on it!). If communications won't occur, "ERROR 1" will be displayed.

1995 LEGACY CRUISE CONTROL CORRECTIONS

Enclosed in this Technical Helpline Update, are some corrections to the 1995 Subaru Legacy Service Manual Volume 3, Section 6-2 diagnosing procedures for the 1995 Subaru Legacy Cruise Control.

We Suggest that you review these and make the necessary corrections to your service manuals to avoid any problems in the future.

If you have any questions concerning this information, contact the Technical Helpline.

LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	• Brake switch • Clutch switch (MT)	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10

1. CHECK THE SIGNAL USING A SELECT MONITOR.

1) Turn ignition switch to ON.
2) Turn cruise control main switch to ON.
3) Set select monitor in "FA0" mode.
4) Check signals for proper operation.
   (1) When pushing the SET switch:
   LED No. 1 [illegible]— lights.
   (2) When pushing the RESUME switch:
   LED No. 2 [illegible]— lights.
   (3) When pushing the CANCEL switch
   LED No. 1 and 2 Light

2. CHECK THE CRUISE CONTROL COMMAND SWITCH. KEY ON

1) Disconnect connector from command switch. at B68.
2) Measure voltage between command switch connector and body.

Terminals / Specified voltage:
No. 1 — Body / 10 V, or more Harness Side

3) Check for harness short circuit between command switch and cruise control module. - Disconnect Cruise Control Module.

Terminals / Specified resistance:
No. 2 — Body / 1 MΩ, min.
No. 3 — Body / 1 MΩ, min.

4) Measure resistance between each terminal of switch side connector to check the switch operation. at B68.

Terminals:
No. 1 — No. 2 (SET/COAST SWITCH)
No. 1 — No. 3 (RESUME/ACCEL SWITCH)
No. 1 - No. 2 & 3 (cancel)
Specified resistance:
10 Ω, max. (ON)
1 MΩ, min. (OFF)

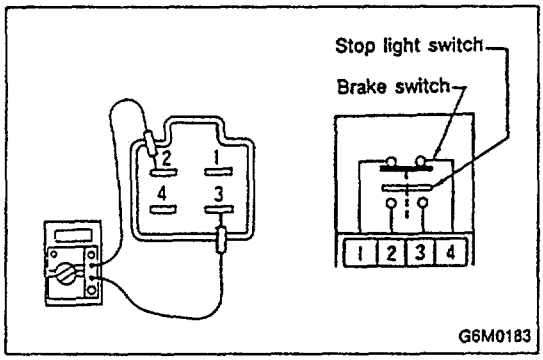
LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	• Brake switch • Clutch switch (MT)	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10

1. CHECK THE SIGNAL USING A SELECT MONITOR.

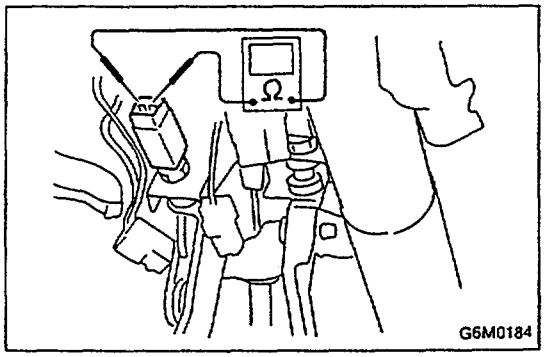
1) Turn ignition switch to ON.
2) Turn cruise control main switch to ON.
3) Apply parking brake securely.
4) Set select monitor in "FA0" mode.
5) Release the clutch pedal. (MT model)
6) Depress the brake pedal and check signals for proper operation.
   Stop light switch: LED No. 3 goes out — lights.
   Brake switch : LED No. 4 goes out — lights.
7) Release the brake pedal. LED No. 3 & 4 Go Out.
8) Depress the clutch pedal and check signal for proper operation. (MT model)
   Clutch switch: LED No. 4 goes out — lights.
9) Set the selector lever from D to N position and check signal for proper operation. (AT model)
   Inhibitor switch: LED No. 5 goes out — lights.



2. CHECK BRAKE SWITCH AND STOP LIGHT SWITCH.

1) Remove connector of stop and brake switch.
2) Check circuit between each terminal.

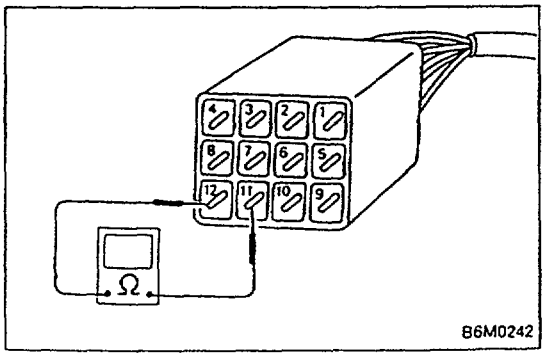
Pedal operation	Brake switch between No. 1 — No. 4	Stop light switch between No. 2 — No.
Depressing the brake pedal.	Circuit failure (open)	Circuit normal (closed)
Without depressing the brake pedal.	Circuit normal (closed)	Circuit failure (open)



3. CHECK CLUTCH SWITCH. (MT MODEL)

1) Disconnect connector from clutch switch.
2) Check continuity of the clutch switch.

Terminals / Specified resistance:
No. 1 — No. 2 / 10 Ω, max. (Without pedal depressing.)
/ 1 MΩ, min. (Pedal depressing.)



4. CHECK INHIBITOR SWITCH. (AT MODEL)

1) Set the selector lever to N position.
2) Disconnect connector of inhibitor switch.
3) Check continuity of the inhibitor switch.

Terminals / Specified resistance:
No. 11 — No. 12 / 10 Ω, max. (Selector lever is in P or N.)
Does car start in 'P' or 'N' ? ***/ 1 MΩ, min. (Selector lever is not in P or N.)***

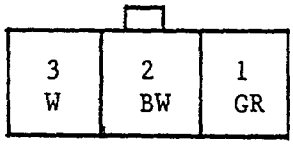
1. CHECK SHORT CIRCUIT OF CRUISE CONTROL COMMAND SWITCH.

1) Separate connector of cruise control command switch.
2) Measure resistance between each terminal of cruise control command switch.

Terminals / Specified resistance:

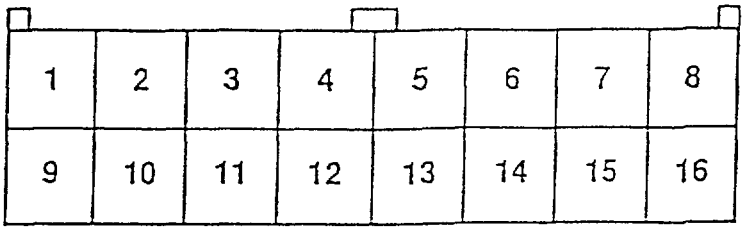
SET switch ON No. 1 — No. 2 / 10 Ω, max.
RESUME switch ON No. 1 — No. 3 / 10 Ω, max.
CANCEL switch ON No. 1 — No. 2 / 10 Ω, max.
No. 1 — No. 3 / 10 Ω, max.

Sub Switch Connector in Steering Wheel



Steering Column Connector to B68

SECURITY SYSTEMS MODULE



Connector B93 - 16 Pin/Black
Location - Right side of dash to right of glovebox

TERMINAL NUMBER	CONNECTED TO	WIRE COLOR	VALUE
1	Door lock/unlock switch (united with door lock actuator)	L	supplies ground when unlocked
2	Key cylinder lock switch	GY	supplies momentary ↓ when locked
3	Tamper switch	GL	supplies ↓
4	Door switch (room light circuit)	YR	closed = 12.8 / open = 1.5
5	Starter interrupt relay	BW	12.8
6	ignition switch (ACC)	GR	12.8
7	Security indicator light "DO NOT GROUND"	PB	11.6
8	Power supply (back-up)	LR	12.8
9		B	Ground
10	Hood switch (supplies ground NO - Armed, Hood closed)	GW	
11	Trunk lid switch (trunk room light circuit Rear gate switch (luggage room light switch)	LgY	12V trunk closed / .11 trunk open
12	Headlight alarm relay	BG	12.8
13	Horn relay	RG	12.8
14	Key cylinder lock switch		
15	Trunk lid unlock switch	WL	momentary ↓ when unlocked
16			