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Led Retrofitting on Instrument Cluster ~ Dashboard Removal Procedures

By Loyale 2.7 Turbo, September 19, 2012 in Interior / Body Electrical

dash · Loyale 2.7 Turbo · illumination · instrument cluster · Retrofitting · LED · dashboard · JesZeK · cluster · instrument

★★★★★

Loyale 2.7 Turbo

The Mighty "BumbleBeast"

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Roatán, Honduras.

Posted September 19, 2012 (edited)

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This writeup is intended for the **Subaru** Loyale / GL \ **Third Gen Leone**

(1984 ~1994 EA82) models, however...

...many ideas shown here applies to other car's instrument clusters.

I Hope the Procedures that I will explain here, will be Helpful for people who want to remove the Dashboard and instrument Cluster on their Subarus, without breaking the old plastics, nor damaging anything. Also I'll explain how to Clean and Retrofit LED Bulbs on the instrument Cluster and the Dashboard's button panels.

Warning!

The Procedures I'll Explain here are based in my Own experience with my Subaru "**BumbleBeast**" instrument Cluster and Dashboard, My Subie is a 1985 California -USA- version, Carbureted EA82 Wagon with the -almost- Clear (yellowish) instrument Cluster, Newer models has a green tinted clusters.

The procedures I explain here are for the Left Hand Drive Subaru Models, with **analog** Clusters. Despite that different models came with different clusters' designs,the ideas I post here, shall work on the analog clusters...

...those Ideas and Procedures are NOT intended for the
Digital instrument Clusters, that came on the Luxury GL-10 Models...

...but those also can have **LED** lights retrofitted,

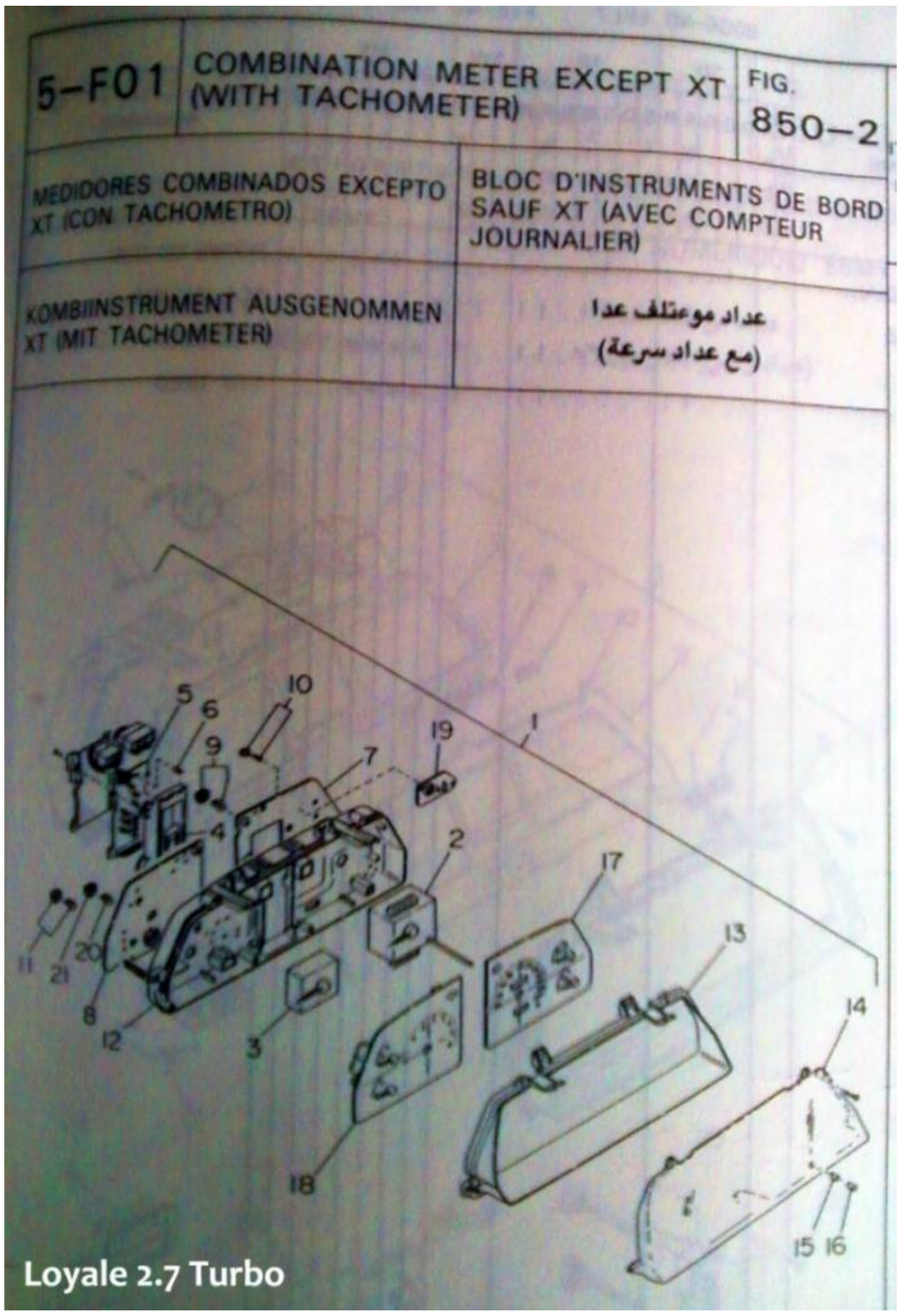
I'll show you photos in further posts of this Writeup.

Important Note: please be careful when applying these ideas, especially the Right Hand Drive Subaru Models, which has Reversed sides. **Disclaimer**: Use this Ideas, and all the ideas I share on the forums, at your Own Risk *!*

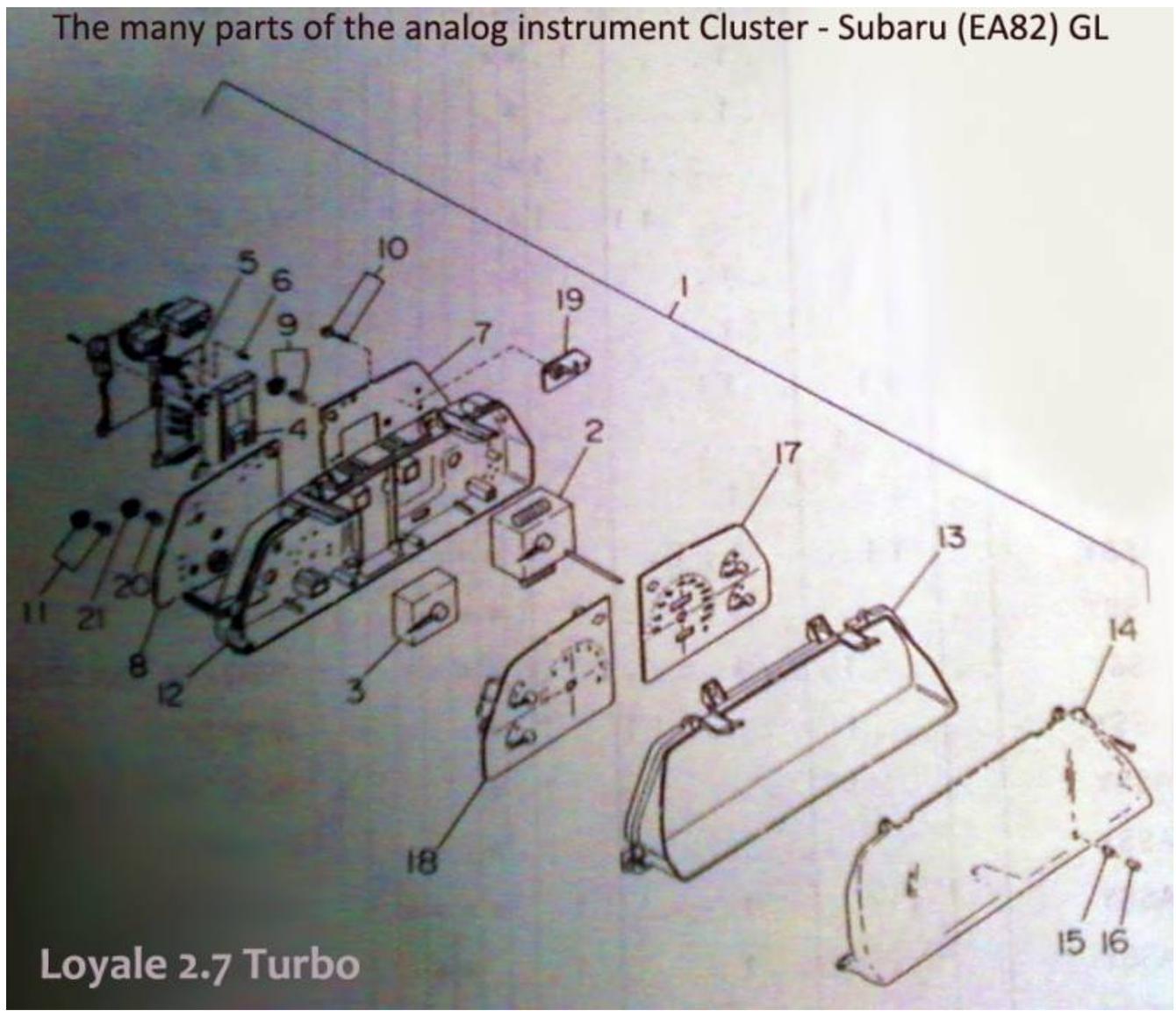
Prior to Remove the Dashboard's Cover and take out the instrument Cluster,
I had sometime Looking for its Parts and Diagrams, Here...

...and here...

...and I Found this...



...Useful Diagrams...



...and Part Numbers...

	85070	GA760	PRINTED PLATE
8	85059	GA890	PRINTED PLATE
9	85066	GA100	BULB & SOCKET
10	85066	GA110	BULB & SOCKET
	85066	GA390	BULB & SOCKET
11	85066	GA120	BULB & SOCKET
	85066	GA330	BULB & SOCKET
12	85067	GA180	CASE
13	85029	GA540	WINDOW PLATE
14	85058	GA410	FRONT ACRYL
15	85056	GA040	GROMMET
			KNOB

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Part of the motivation to do this was also the Oil Pressure Gauge on my Subaru "**BumbleBeast**" because it was reading below the Low Mark. That happened when the Cable that comes from the Sender at the oil pump, accidentally got loose and its plug touched bare matal (Ground) around, it made the needle to go Up more than its Limits, stretching its internal coil, and since then, it Looked like This:

I went to the Local Subaru Dealer to see if they had the Replacement, and they did, but they sell the whole Part from the instrument cluster, and it doesn't have the Oil Pressure Gauge, it was the LADM (Latin American Domestic Market) Specs version for the EA71 engined models, because it had a Lower RPM's range Red line: at 5.5K ...

This is the Part the Local Dealer's salesman showed to me:

and this is its part Number:

So, I had no choice except to figure out how to Fix that Low reading Oil Gauge, and finally I Did it *!* ... ... Continue reading, I'll explain how, in the Followin' Posts.

Since I was at the Dealer, I purchased three new Bulb's with Sockets, just in case I break a Socket, but those where Not needed at all.

However, I posted the above picture just in case anybody needs its part number.

After that introduction, I'll Start to Explain the Procedures

in the Followin' Posts

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To remove the Dashboard's cover is not Rocket Science,

but you must be **aware** of this:

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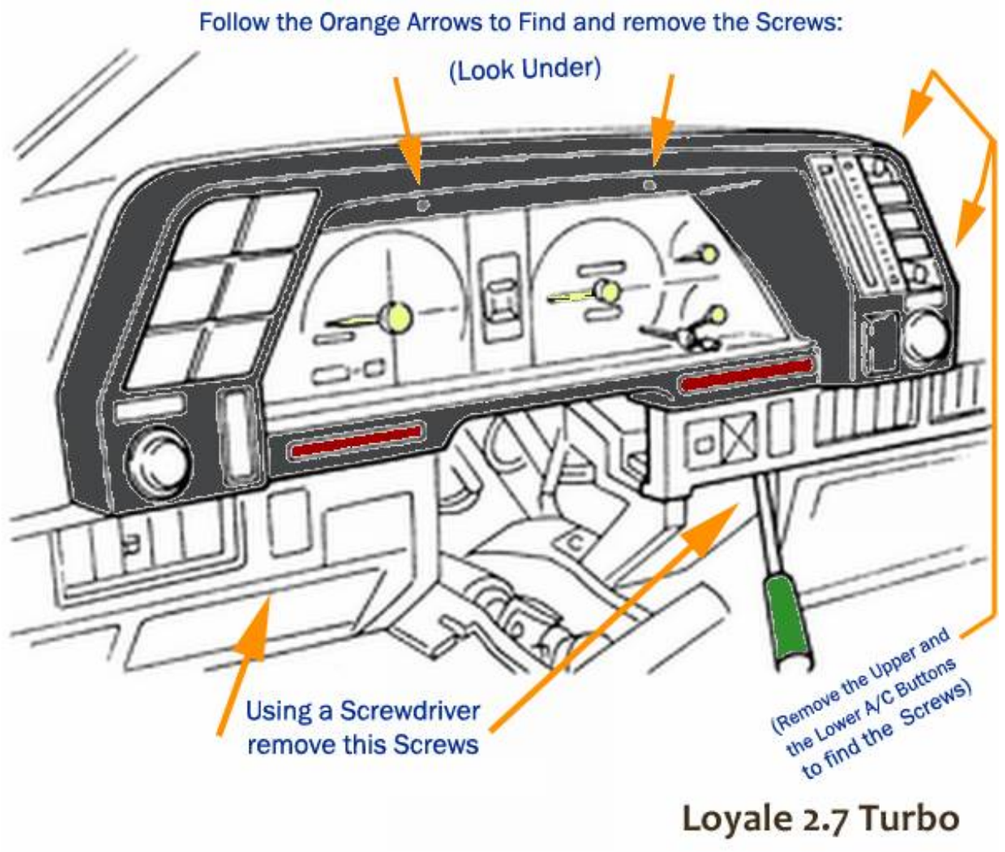
Both sides of the instrument cluster has Button panels, you shall Remove the Screws that holds the one on the Right (A/C control buttons) Before removing the Dashboard or you'll Break the Plastic base on the Dash; but the button panel on the Left (Rear Defroster, Height Control, Cruise Control, ~ on certain Models) could stay in the Dash during the Removal, as long as their wires' plugs are unplugged; those along the rest of the Buttons below and the controls; will come along the dashboard without Damage...



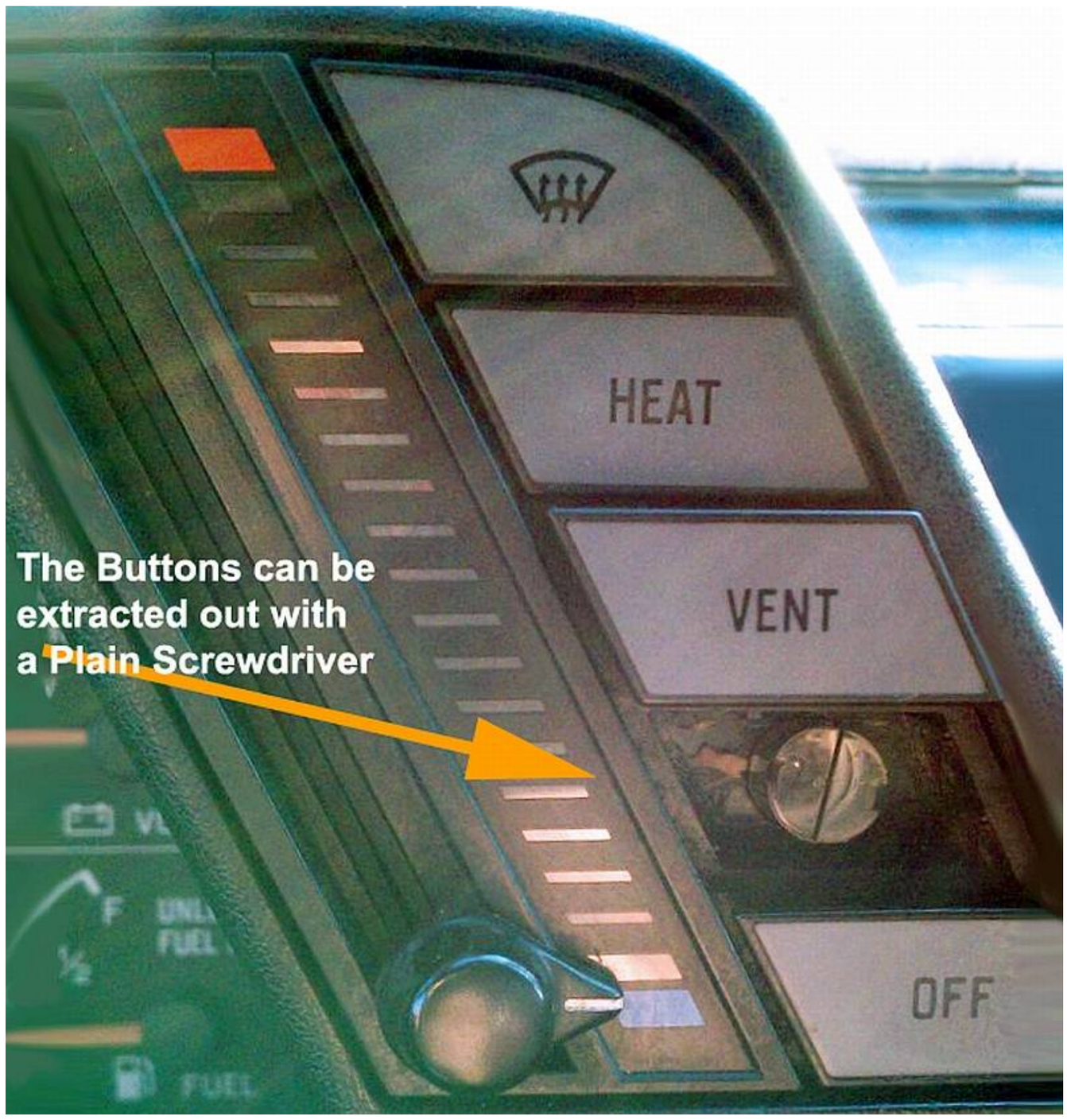
...Remove all the screws that are marked with orange arrows and don't forget to unplug everything. Don't worry about the Lots of Plugs: They're Colour Marked and almost each one has its own shape internally and / or externally, so is hard to mismatch a wiring there.

Caution: Be Careful with Old Plastic, it can Break Easily *!*

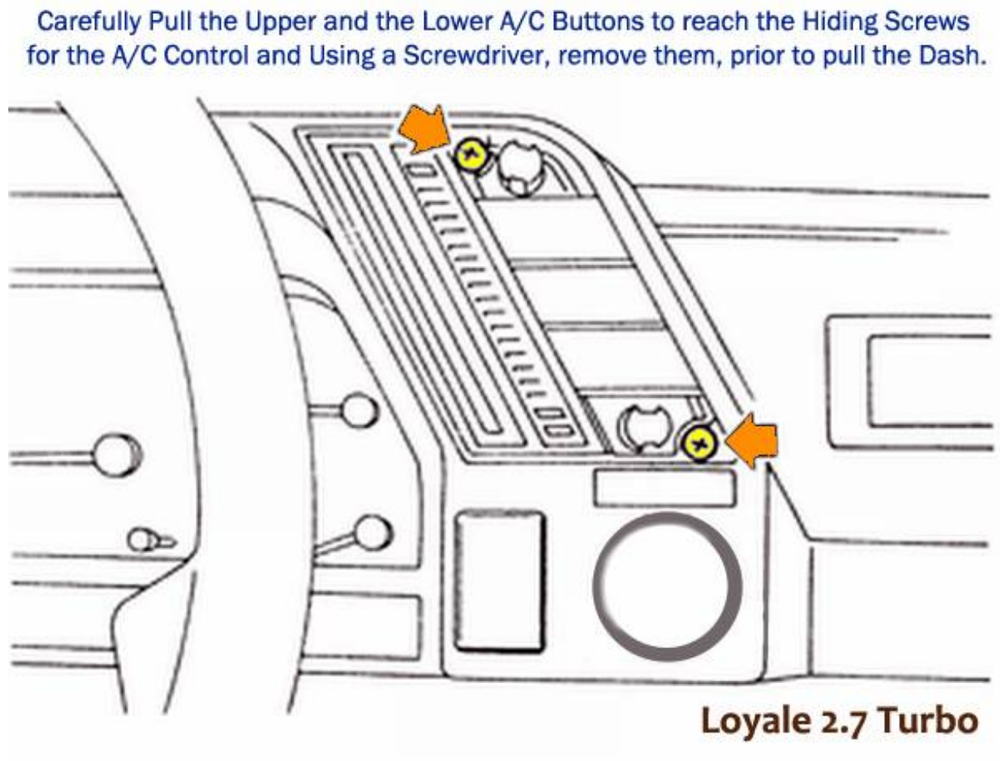
In the **Right** Side
(Where **A/C** Buttons Are)

you remove -pulling carefully- the Lower and the Upper Buttons...

...and You'll see a Screw behind each one...



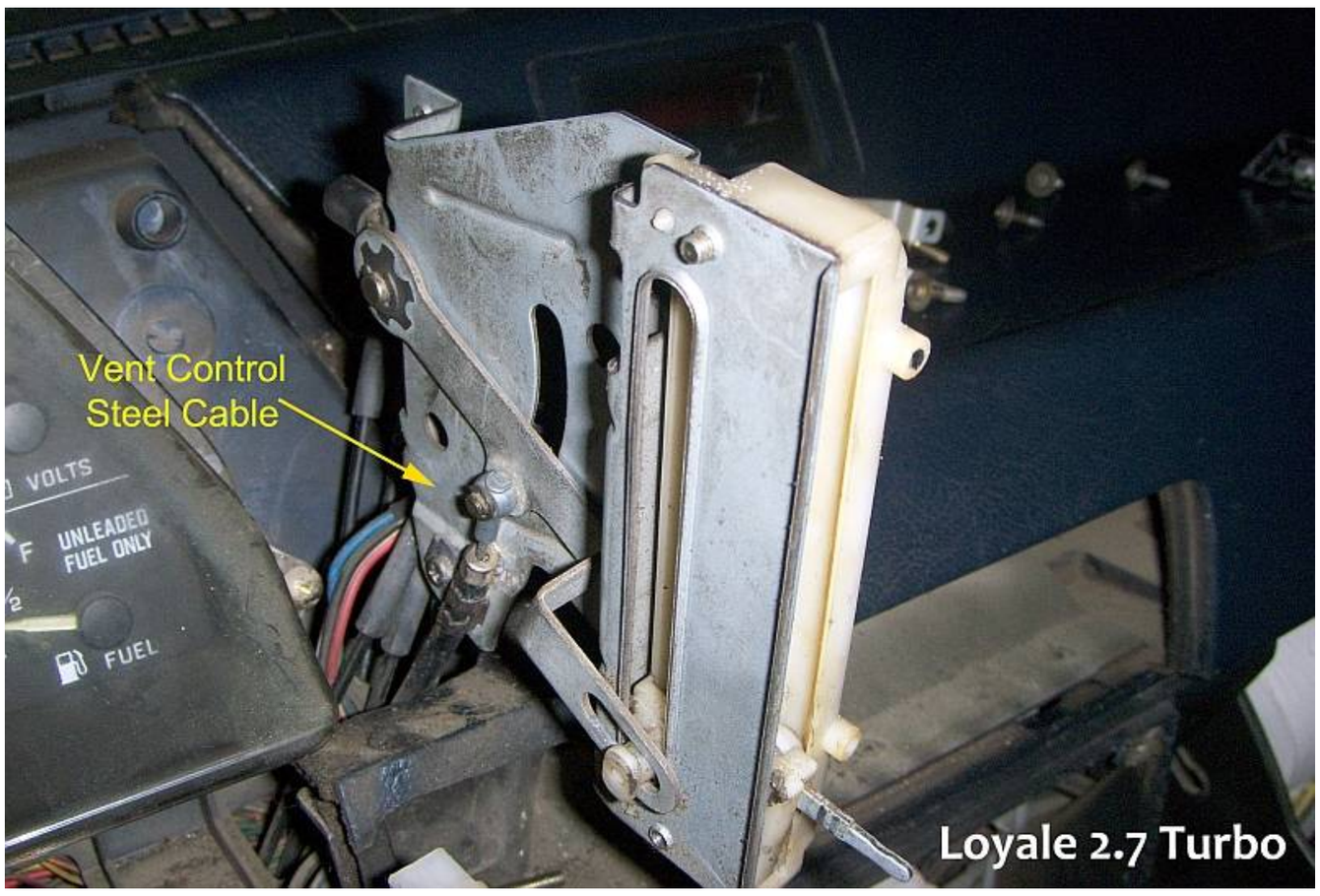
...you Must Unscrew them both...



Why you Must Remove the Right Side Button Panel's screws, **First***?*

Because the metal box with the A/C buttons, its vacuum Hoses, and the Steel Cable for the Temp Selector, are attached to the plastic dashboard with those two screws, and trying to pull a plastic dashboard attached to a metalic box + steel cable, is *a very Bad idea*.

Subaru designed that A/C Buttons Panel to stay hanging there while the Rest of the Dashboard is Removed...



...because it is attached to the Dashboard from Behind with front screws, unlike the other side's buttons panel:

In the **Left** Side

(Height Control, Cruise, etc.)

It is Not necesary to remove this buttons panel, because it will come out along the rest of the Dashboard and its buttons, as long as its wiring plugs are disconnected. But if you want to remove it, there are two screws hiding behind the part which is nearest to the Cluster...

...and, unlike the other side, this panel comes out to the Front.

After unscrewing and unplug everything, you'll be Ready to pull out the Dashboard cover, Unless your Subaru model version, features a Manual Choke Lever, in such case, you'll need to detach the lever first:

> ... the manual choke, there's a small screw in the bottom.
>
> Pull the lever out as far as you can, and then look up from underneath. Should see it from there.

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Misspelled Word.

1

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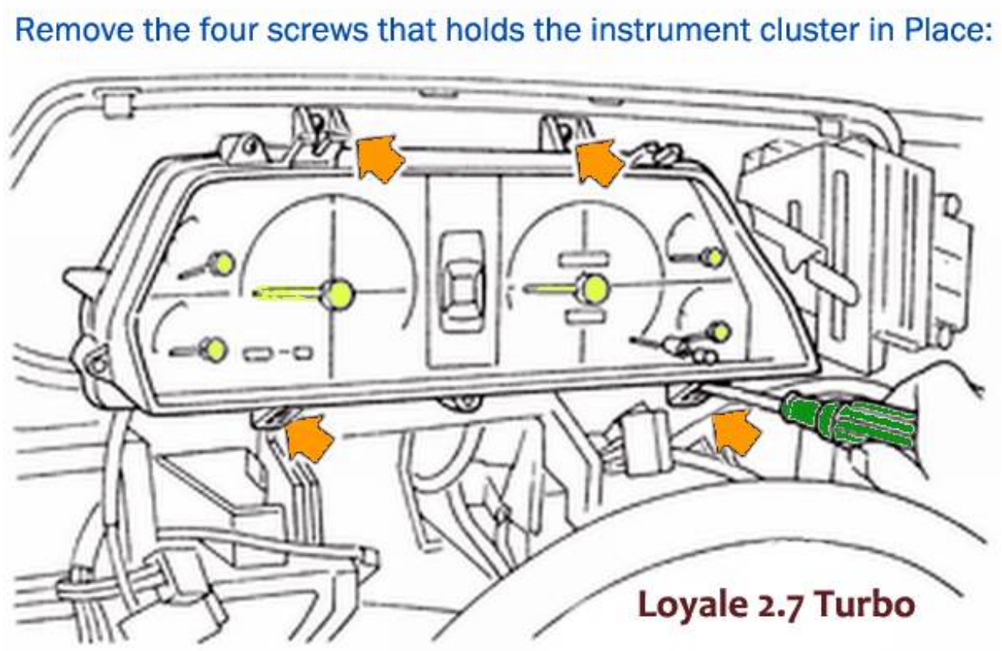
The rest of the Screws are visible and are easy to access with the Dash cover Removed



Unplug the wires at the cluster's top, remove the Screws and Carefully Pull the Speedometer Cable twisting its plug, you'll find a pair of Round connector plugs with wires, one at each side of the instrument cluster's back, those have a Release Lever in the middle, that sticks out from the conector's center, following the wires.

You only need to push that lever stick to one side and that will release the connector; pull them carefully, and your Subie's instrument cluster will be free to take out from the Car.

so, I Removed the Instrument Cluster from my "**BumbleBeast**" as you can See:

There was Much Dirt & Dust hidding behind the Dashboard:

But I Cleansed it all ! 😉

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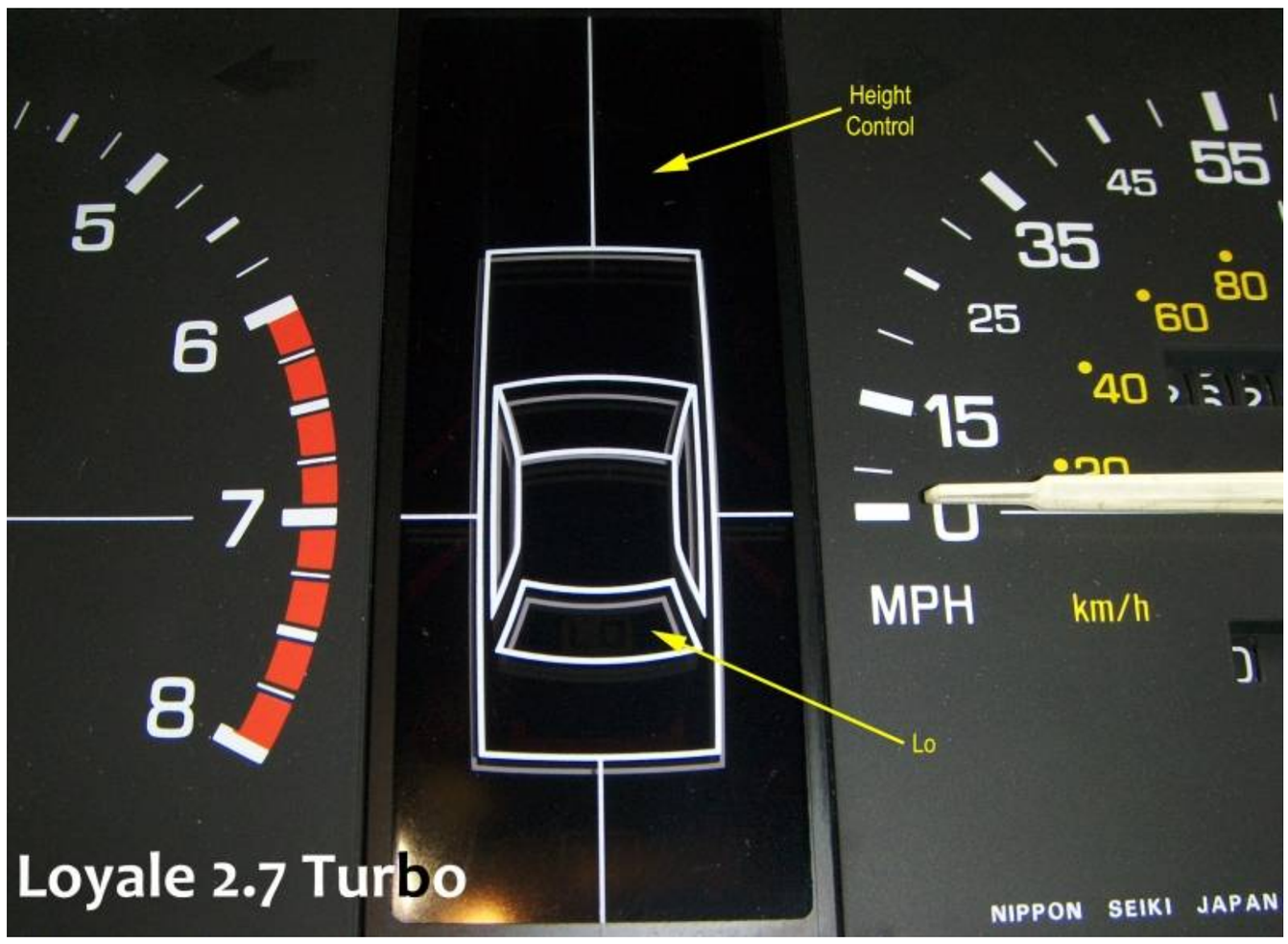
Then I Removed the Front Plastic Lens and Used a Soft cotton cloth,
Damped in Carnauba plus Teflon (PTFE) and Silicone **Wax** to Polish it, inside and outside:

Hard & Fast movements with the said Wax, Removed Dirt
and also removed the Scratches it had, letting it Shiny like New *!* 🙂

Then I cleaned the Cluster's interior using a soft cloth, damped on vinyl cleaner.

Now you can see the words inside the Center Panel:



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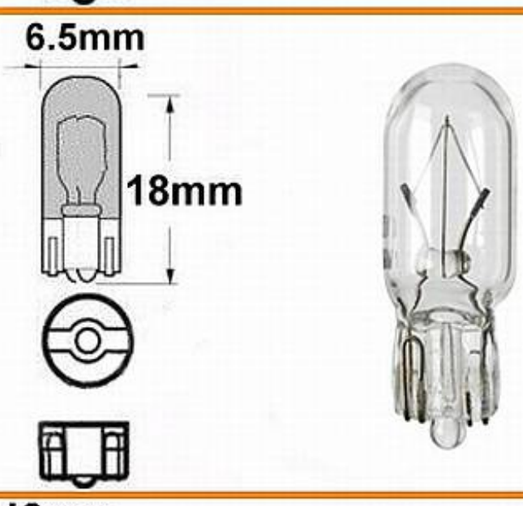
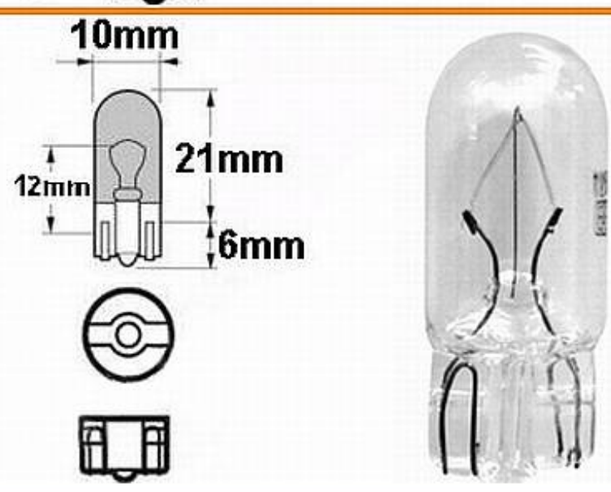
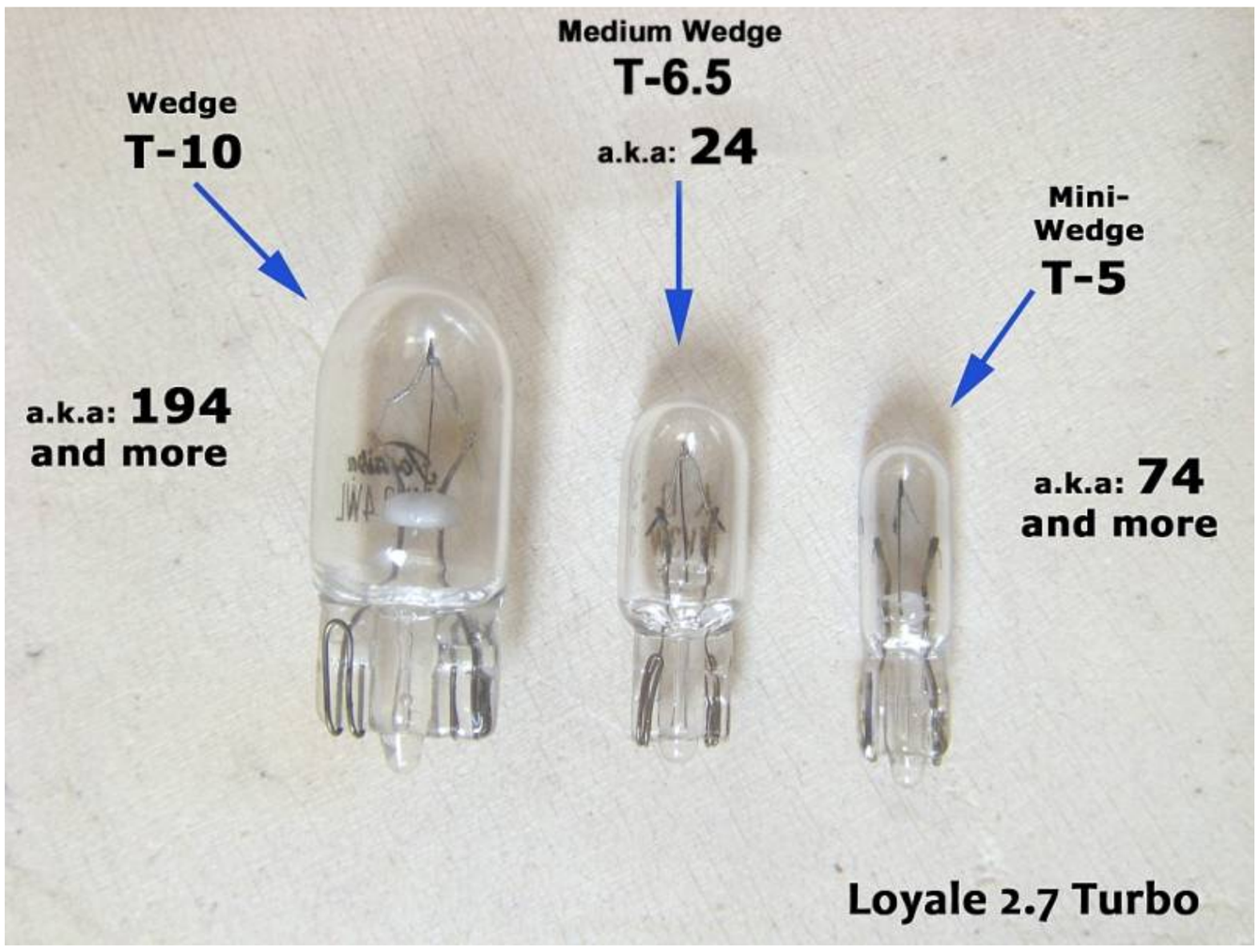
The Usual Bulbs for instrument Clusters / Dashboard panels are: The **T-10** (10 mm base) and the smaller **T-5** (5 mm base) wedge-like Bulbs. These Subarus only use those two, but other car brands uses an intermediate sized bulb, known as the **T-6.5** (6.5 mm base) bulbs.

Common Bulbs for Cars' Instrument Clusters

Comparison, Photos, Measurements and Cross Reference List, by: JesZeK a.k.a: Loyale 2.7 Turbo

Bulb's Name	Bulb's Measurements / Photo	a.k.a: (cross reference)
T-5 Wedge		17 18 37 70 73 74 79 85 86 2721 **T-1 ¾** (T-1.75) Usually Known as **74**
T-6.5 Wedge		**T- 6 ½** **T- 2 ¼** Usually Known as **24**
T-10 Wedge		W5W W3W 147 152 158 159 161 168 184 192 193 194 259 280 285 447 464 501 555 558 585 655 656 657 1250 1251 1252 2450 2652 2921 2825 2886X PC 175 **T- 3 ¼** (T-3.25) Usually Known as **194**



Here you can see a Comparison between Standard (incandescent Bulbs) and two type of LED Bulbs:

► Round tip LED Bulbs: Points the Light pattern and doesn't spread it very much.

► Inverted Tip LED Bulbs: Spreads the Light in a +/- 120º wide angle pattern.

► Multiple Tip LED Bulbs: Spreads the Light all-around, similar to a Standard Bulb.

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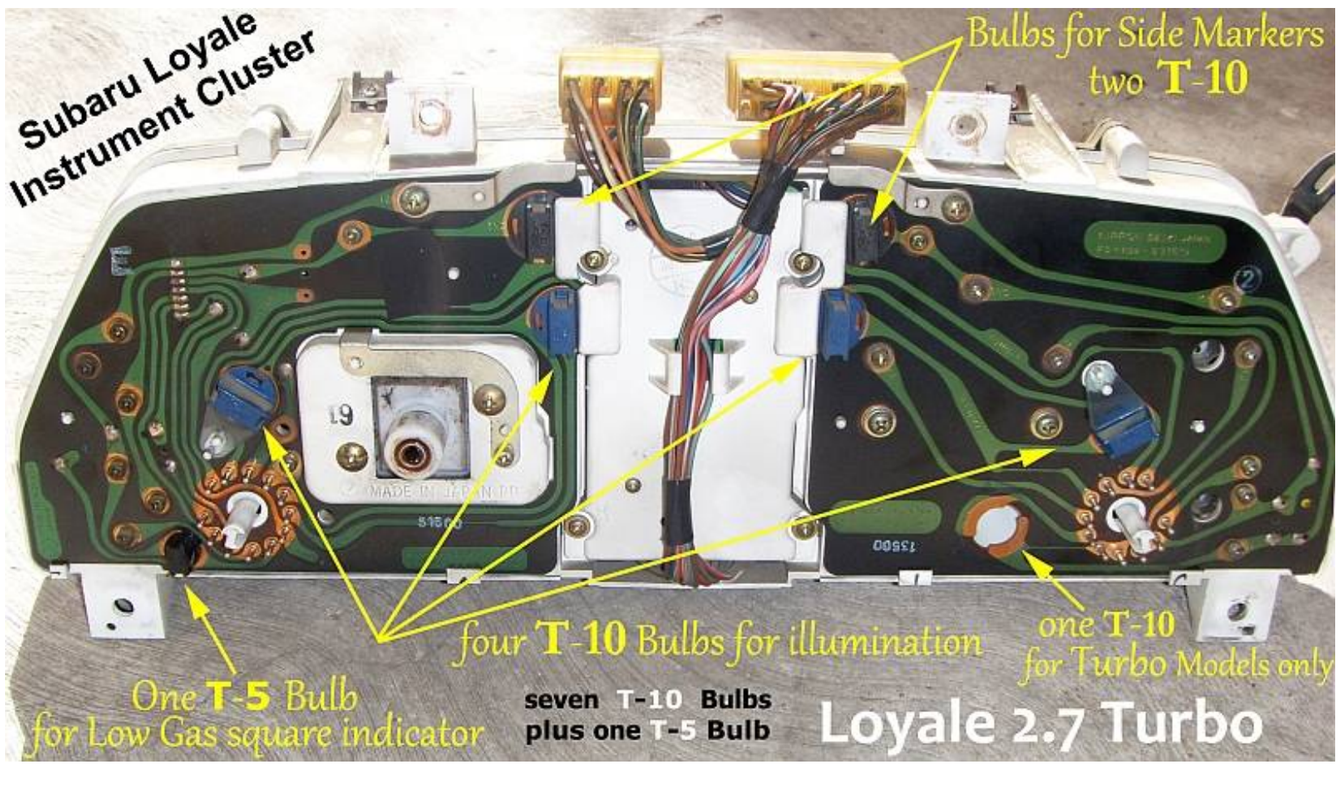
In the Followin' Photo, I show you Where are the Bulbs Located,
what are they use, and the Kind of Bulb used, for the Instrument Cluster:



As I already wrote, the Different Models uses different instrument Clusters, so the Quantity and the Bulb's placement should vary for the different clusters' designs, and only the ones with the **EA82T** engine has the Turbo Light...

So, despite that there are seven slots for seven **T-10** Bulbs, Usually only six are used 😉

► I Used the Multiple Tip **T-10** LED bulbs on the Background illumination (The ones with Blue Socket) so they will Spread the Light and cover all the cluster's area.

► I Used the Round Tip **T-10** LED bulbs for the Turn Signal's Arrows (side markers) because there is no need to spread the Light there. Multiple Tip LEDs there would be a Waste.

I Chose the "Purest" White [5000K] Colour, because it is not completely Warm (Yellowish) nor Cool (Blueish) Colour, just plain White.

The Instrument Cluster on my 1985 "**BumbleBeast**" was Dark Amber Colour, and that colour was due to the Incandescent Bulb's Colour itself [3500K] because the Cluster's interior Plastic that conducted the Light everywhere, is almost Transparent, but has a small layer of **Yellow** tint. Be aware that the 1987+ models, came with **Green** tinted instrument clusters.

► I left the **T-5** bulb for the Low Gasoline squared Sign, "Standard" (Incandescent), in order to let it be "Different" and More Noticeable in low readings 😉

As I wrote above, on the Newer Models, the instrument clusters are Green... I Disassembled their Side Buttons' Panels, and their **T-5** Bulbs only had a Green Rubber, "Condom-Like" Covering the Bulb, so you can easily change the Button Panels' Light Colour, using LEDs.

But the Instrument Cluster on those Newer Models has a Green Tint Painted behind the Numbers. You can Use White LED Bulbs on the Green-Tinted Clusters and that green will look Cool*!* 🙂 But also you Might Use Green LED Bulbs to enhance those Cluster's Colour, it will be Nice*!*

But other Colours will somehow *"Fight"* the Green Tint on those Clusters and could have weird Results. In Example: Red LED Bulbs behind a Green Tint, should still look Red but with some kind of Brown tint. So, use coloured LEDs at your own discretion.

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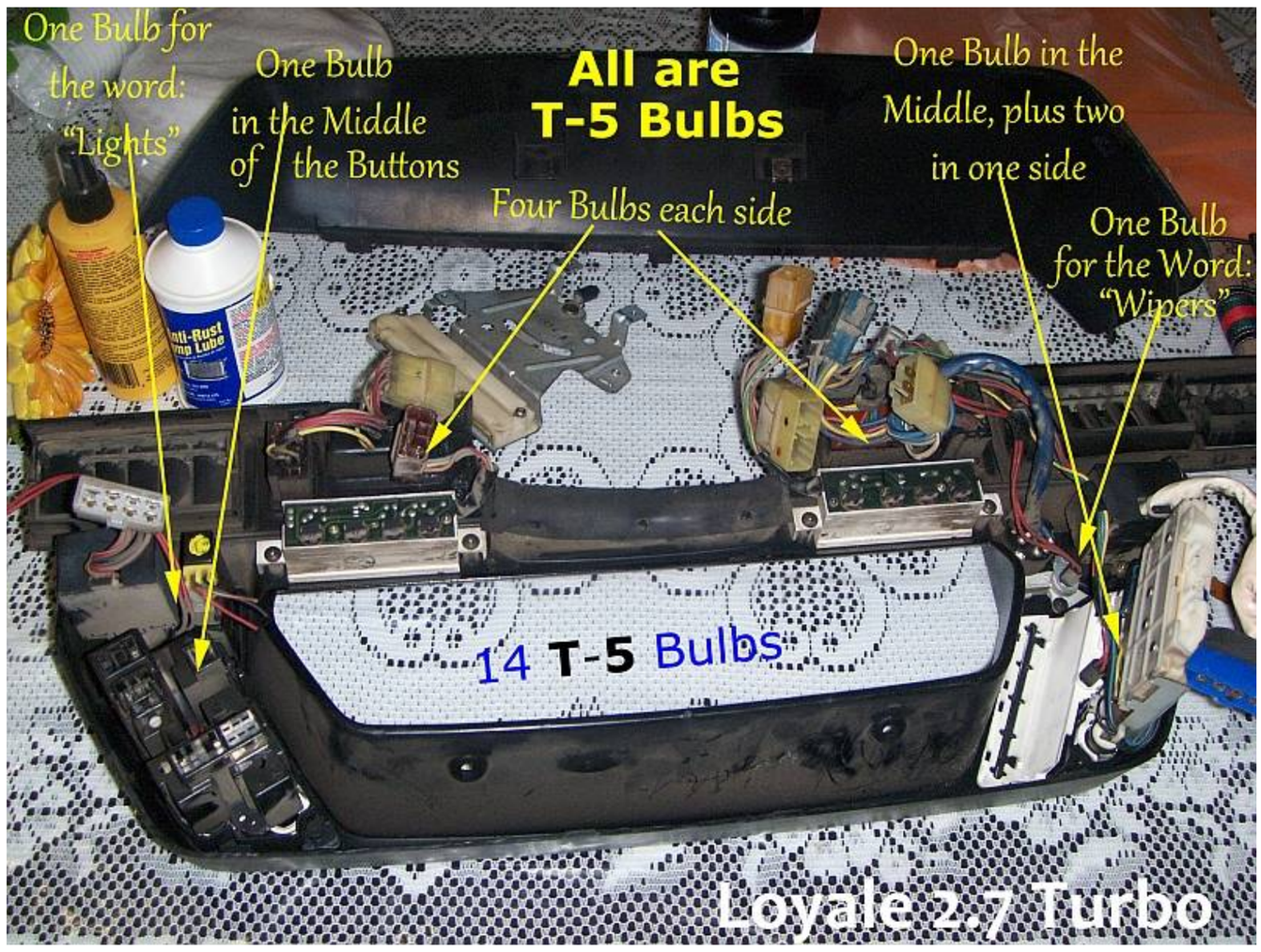
The Followin' Photo, shows you the Places where the Dashboard has Bulbs:



All of them are **T-5** except the Illuminated Buttons and Controls themselves, like "**Rear Gate**" Button, "**Mirrors**" Control, "**Rear Wiper**" button, which have a Micro *"neo-wedge"* **T-3** incandescent Bulb.

Also each of the Upper-left panel's Buttons, such as "**Height**", "**Cruise**" and "**Defrost**" had the same Micro "neo-wedge" **T-3** Bulbs, besides their Background illuminating **T-5** Bulb.

These are the Micro "Neo-Wedge" **T-3** bulbs for those Buttons:

You can Swap / Retrofit a LED **T-3** Bulb,
on the original **T-3** or **T-4** incandescent Bulb's Rubber Base, let me Show ya:

Unwrapping the LED's legs and Removing it from its Base

Unwrapping the Bulb's legs and Removing it from its Base

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Bulb & LED

T-4 and T-3 Bases

T-3 LED onto T-4 Base

Legs Wrapped Again!

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Illumination of the Dashboard's **Two** warning lights' **Red** Stripes

Despite that Each Lower Red warning lights' Stripes on the Dashboard, has Four **T-5** Bulbs, one for each rectangular area; **not all of them are Needed**.

► The **Left-Side** Stripe has in Use: The Rectangular portions for "**Charge**" and "**Oil**" the other two aren't transparent from Factory in my "**BumbleBeast**" so, no more than two **T-5** Bulbs were Needed there. I Placed a pair of Single inverted-tip LED Bulbs.

► The **Right-Side** Stripe has in Use: All four Rectangles, which are: "**Rear Gate Lock**" , "**Stop Lamp**" , "**Brake Fluid**" ... I Placed three **T-5** single inverted-tip LED Bulbs for those and left the fourth rectangle without bulb in purpose: it is the "**Check Engine**" Light. The reason is because I removed all the Pollution Control sensors, etc, when I Swapped a **Weber** Carburetor, it will be **Lit** all the Time ... ... So **No** Bulb there! ... ... Just the Socket as a Dust Shield.

Important Note: the warning light for **Low fuel**, will stay lit all the time, if you use a **LED** bulb on it, not only in these Subarus' instrument clusters, but also on many other brands' cars on which I have done such Led background illumination retrofitting; I bet it has something to do with the grounding they have related with the Fuel Level Gauge, LED's are much sensitive and a slight grounding will lit 'em up, so I kindly suggest you to Avoid using a LED bulb for the low fuel warning light, keep it incandescent and it will work flawlessly.

REMEMBER: LED Bulbs does have Polarity (**+**/**-**) if they are placed inverted, they will not Lit at all, so if your New LED Bulbs doesn't work, simple remove 'em with their Socket, turn the Socket **180º** -Half Turn- and place 'em again... then they'll Lit.

Both Red Stripes shares a Common **Positive** (**+**) Marked as "**Ign**" and the Signal to Lit is given by the **Ground** (**-**) on each bulb.

I Used a six volts transformer to Test each LED Bulb in their place, before assembly everything back together, but you also might Test everything in the car, before reassembling.

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Illumination on the Dashboard's **Left** and **Right** Button Panels

~► On the **Upper-Right Button's Panel**, which Belongs to the **A/C** Control Buttons, you'll see one **T-5** Bulb in the Center Inner Side of the button's panel, for its Background illumination, and this one Lit only when the Lights are On.

► I Placed one multiple-tip **T-5** Bulb there for Background illumination.

But **also** this button's panel has another two **T-5** bulbs in the Outer Side: those were designed for Subaru to be a "Permanent" low illumination: They Lit when the Key is on the Ignition in " **On**" or "**ACC**" positions, No matter if the Lights are On or Off. Many Subaru Owners doesn't know that, because that pair of almost-Permanent lit **T-5** Bulbs, tend to be the First ones to Burn out, since they're Lit almost all the Time.

I used a Scissors and Cut the Wires for those two, and using my Soldering Gun, I Attached their Wires to the Wires for the Background -center **T-5** Bulb- illumination wires, so now the Three **T-5** LEDS will Lit up along the main Lights only, not with the Ignition.

► I Used a couple of Single inverted-tip LEDs for the Outer Lights, which illuminates indirectly the buttons panel area; because multiple-tip LEDs there would be a Waste.

~► On the Other Side, the **Upper-Left Button's Panel**, which Belongs to the Heigh Control, Cruise Control and Rear Defroster Buttons, (Depending on the Model, others might have Blank spaces or only one or two from those three options); there's One **T-5** Bulb in the Center / Inner Side for its Background illumination, and this one Lit when the Lights are On.

But each Button has a *"Neo-Wedge"* **T-3** incandescent Bulb, as I Described Above.

► I Placed a multiple-tip LED **T-5** Bulb there in the Center Light for the Background illumination, and used the proper "Neo-Wedge" **T-3** LED bulbs for the buttons. You might chose Red, Blue, etc... so you'll notice the Change on the Button's illumination, everytime the button is pressed. Edited June 28, 2016 by Loyale 2.7 Turbo

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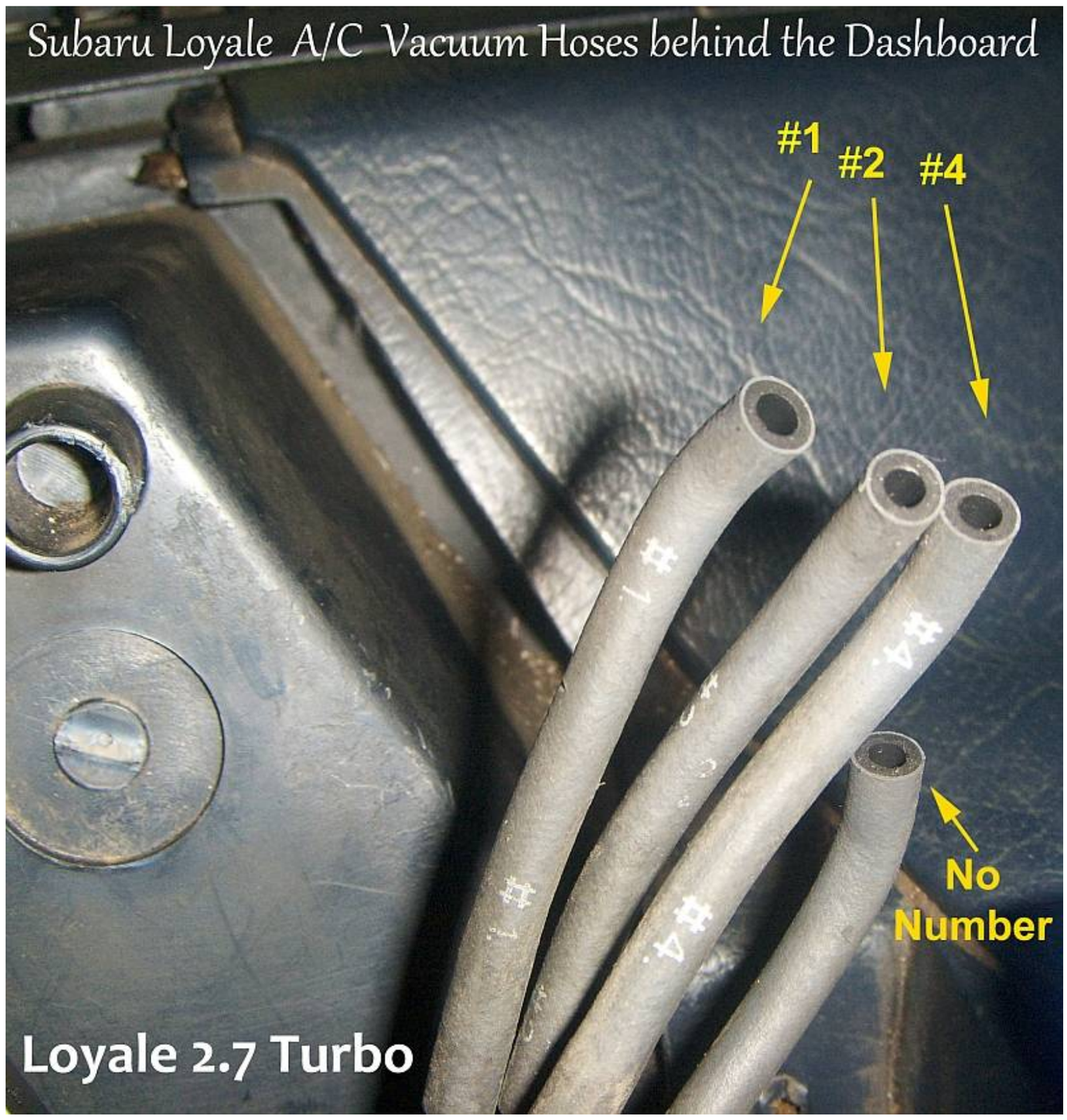
This is How the Instrument Cluster ended up, after the Deep Cleansing

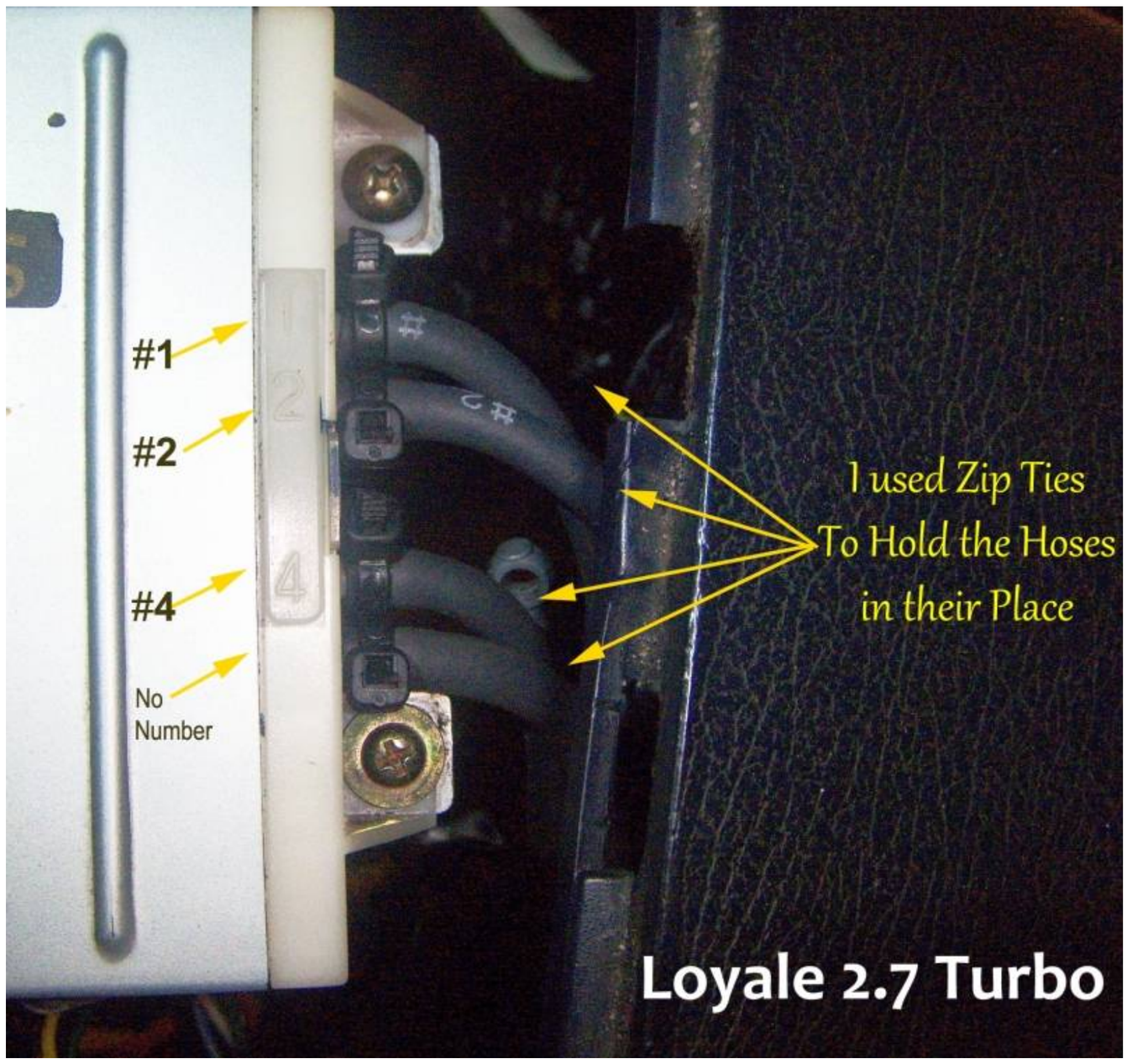
and New LED Bulbs Retrofitted, just Before to put it Back in my **BumbleBeast**:

Now to put everything Back together.

To put Back the Four Vacuum Hoses for the A/C Control Buttons is Easy, because Subaru Marked each one with Numbers... #**1**, #**2** and #**4** ...No Number three*!* ... 😁 ... but the last one is unmarked, as the last Vacuum Plug, so No problem at all.



The Problem is to Keep them in Place, because with Age, those becomes Loose and the Tiny metallic plate that goes in their back, attached to the side's screws, isn't enough to keep 'em Hooked. So, I Used four tiny **Zip ties**, one for each hose and cut their excessive longitude, with scissors:



That shall be More than enough. Now Reassembly everything back together.

Finally, this are the Results:

Somehow I Believe that the Original Designers of this Instrument Cluster, desired that it looked with Great Contrast, white numbers over black background as it looks with daylight... but since the incandescent bulbs emits amber Light, they decided to paint the Numbers with a green tint in the **Newer Models**, that the newer clusters has.

The White illumination gives to the car a Much Modern Feeling, and is not Blinding at all, but Camera Lens tend to exagerate the Glow... it does look as Sharp as a Modern car's LED instrument cluster.

Final Notes:

► You can see that the only part that has Green Tint painted behind the numbers on the instrument Cluster, is the Kilometers per Hour numbers, under the Miles per Hour numbers.

► I managed to Fix the Oil Pressure Gauge, just by sliding it slowly with my Finger, 'till it reached the Real "Top" of the readings, then it sat on the right **0** Mark, not under it as it was. The Gauge reads low, but Low is Better than under-zero (Negative) Readings 😉

► The Dimmer Control does work Fine with LED Bulbs. 😁

I Uploaded a Video and is in High Definition 😉

Let me Know what do you think about the LED instrument Cluster and this Writeup; you can post and comment in the Discussion thread exclusively for this Modification,

Here: ~► http://www.ultimatesubaru.org/forum/topic/69467-ea82-dashboard-backlights-upgrade-to-hid-white-led's/

If you find this writeup, Useful, please let me know by hitting the "**Like**" Button below.

I only ask this as a **Motivation** to continue Sharing my work with you. Kind Regards.

Edited June 28, 2016 by Loyale 2.7 Turbo

Misspelled Word.

5

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