

HOW TO INSTALL AN AMPLIFIER AND SUBWOOFER INTO A WM STATESMAN/CAPRICE

Hi everyone,

After installing several subwoofers with aftermarket head units, I was faced with installing a subwoofer with the OEM head unit of my 2009 WM Statesman. I was hesitant as I fear damaging the vehicles electronics, but after various tests and research I achieved a great result. I am not an auto electrician and have no training or expertise in the field of automotive electronics or sound systems; this is a basic guide to help those who want to do it at home.

Due to the lack of information available regarding sub installs to this specific vehicle, I am sharing what I learnt. This guide will apply primarily to the VE series, including variants of the VE series including the SS, WM Statesman, and Caprice Model. This setup *should* work for all Holden models with parcel shelf speakers.

Assume all steps regard the WM Statesman

Sound System:

- **Subwoofer:** Pioneer [TS-A300B](#) A-SERIES 12" Ported Enclosure (2Ω)
- **Amplifier:** Pioneer [GM-D8701](#) Mono 1600W CLASS-D Amplifier
 - o Stable 1-8Ω at 800W with 500RMS

Other equipment:

- **Wiring Kit:** US-AUDIO 4AWG 2Ch [Amp Install Kit](#) – BZ24
- **14 AWG 'Speed Wire' Speaker Cable**
- **High level input wire** (I believe most amps come with these, or alternatively, a [Line Output Converter](#) (LOC) *for your specific channel: 2 or 4 Channel*)
- **Soldering Iron**
- **Electrical [Terminal Kit](#)**
- **Electrical Tape**
- **Small Zip Ties**

STEPS – HIGH/SPEAKER-LEVEL INPUT (RCA)

Remove back seat:

1. Bottom of the seat has no release-pull mechanism so simply pull it up with a bit of force.
2. Undo the bolts that support the bottom of the seats and pull all of them out (10mm nuts)

Remove carpet from the boot, as well as the plastic:

1. Unscrew bolts holding in the inner-boot plastic lining thing that covers the boot locking mechanism.
2. Undo all plastic carpet plugs from the back walls inside the boot exposing the battery. **The factory amp is located next to the battery.**

Note that only the left side is necessary if you are locating your speaker on the left side of the boot, this regards hiding the leads later.

Soldering Speed wire into parcel shelf subwoofer speaker wire:

I had this written down; however, I lost the sheet...

Note that these wire colours are located in the plug attached to the hidden amplifier at the front facing side of the battery. You can pull the factory amp out by undoing the top screws and pulling upwards. Located at the bottom of the factory amp there is a 'gain' dial which I set to 50%, you will feel it click into place at 50%.

1. Pull the carpet buttons out of the parcel shelf fabric for access to the parcel shelf subwoofers.
2. You will see wire harness plugs connected to the top left side of the speaker. They will have blue and green wires going into the plugs.
3. Cut the green and blue wires connected to both factory subwoofers. I recommend using crimp terminals in case a mistake is made or you wish to remove the wiring in the future. Ensure you use electrical tape to avoid shorting.
4. Solder the 14 AWG speed wire to into the positive and negatives of each wire. *You can also use regular 12-16 AWG speaker wire; you will just need to run four individual lines (i.e., L: (+)(-); R: (+)(-).* If you want to continue using the stock subwoofers alongside the aftermarket subwoofer, ensure the factory speaker wires are joined back together by the *original* plugs. See '**wire details**' below for clarification:
5. With the speed wire, note what colours you are connecting to what factory subwoofer speaker wire, whether positive or negative.
6. Can use female piggy back spades (Bunnings have these) and solder the original circuit back together and run the third wire on the piggy back adapter to your speed wire. You can also just solder them in without any adapter, or use the universal wire tap connectors.

---- Note that the **positive** terminal of each factory parcel shelf subwoofers is the **top input of the plug** ----

WIRE COLOURS:

*I did not write down the corresponding line colour to each side; however, I am certain of the **actual** wire colours themselves.*

****From memory, I have included the corresponding line colours in parentheses '()'**.**

Please see attached photo of the amp plug wiring colours – I realised that one speaker side is adjacent to each other in the plug pictured, whereas the other side speaker is vertical in the plug. These are the four wires you are referring to.

Right side:

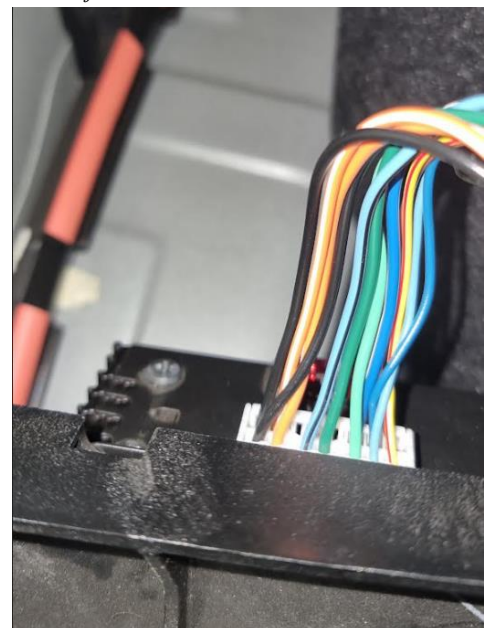
- **Green (+)** ... (dark green)
- **Blue (-)** ... (black line)

Left Side:

- **Blue (+)** ... (sky/dark blue, white line)
- **Green (-)** ... (light green)

Amp: (see photo) – only **relevant to LOC users**

- Yellow, Red Line: Accessory
- Brown: (+) voltage though unsure of use- maybe **mute?** (powered off with car like accessory wire)
- 2 x Black, both grounds.
- ****UNSURE**** but orange is constant (+)(-) though I did not test these for voltage.



Only necessary if you wish to use the parcel shelf speakers as well, otherwise can simply take the signal from the input factory speaker wire and leave the subwoofers without a signal.

Soldering Speed wire to Speaker/High Level to Low Level input wires:

NOTE: You need to tap into speaker wire that receives bass frequencies, hence parcel shelf being ideal, however, it is common to use the back door speakers. Applies to BOTH HIGH LEVEL INPUT AND LOC.

Some amps high level to low level adapter may be to a *low level RCA amp input* (see photo to the right). Other aftermarket amplifier high level speaker inputs are to a wire harness which has a separate input (not RCA) and therefore require no RCA input. My mono amp high level input was simply an RCA input plug rather than a wire harness plug (as photo on the right)



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High Level Input RCA

1. With high level RCA input wires, solder the corresponding (-) to (+) for both left and right parcel shelf subwoofers into the speed wire left and right (-) and (+) colours.

I used crimp terminal connectors here, as the second picture shows. I can then reuse the RCA input wires without having to shorten them again and again. Ensure you insulate the metal connections with tape or plastic coverings to avoid shorting out. I applied electrical tape regardless.

2. Plug into amplifier.

High Level Input Wire Harness (example)

I am ****unfamiliar**** with this type of high level output harness, though each wire will state the purpose of each wire. You **could** solder these into the factory amp wiring harness. It should include left and right side positive and negative, the remote wire (if included), and 12V power (if included). Refer to above accessory wire colours.

See ‘Keeping it tidy and safe’ after the ‘Connect speaker wire to subwoofer’ step.

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Connect the remote wire (REM wire).

This step was not necessary for my setup. My Pioneer amp recognised when a signal was present with the high to low level input adapter and would turn the amp on and off when the car/accessories was turned on/off.

You could splice and tap into the yellow - red line wire connected to the factory amp. Alternatively, I have read that people connect the remote wire to the cigarette lighter socket in the console. Here is a VE Wiring Diagram photo [#1](#) and [#2](#).

[Another option I have read about](#) is to tap into the smokers pack, which people also use for their GPS/Dashcam. In the VE it is located behind the console, underneath the radio plug, there is a Dealer Option Connector (DOC) harness for accessories.

This [video](#) clearly shows VE constant and accessory power.

Connect amplifier to Power and Ground:

1. Disconnect positive terminal from battery.

2. Ground the amplifier according to amp/wiring kit instructions (ground cable should be as short as practicable) **ON A BARE METAL SURFACE – SAND BACK OR USE WIRE DRILL BIT IF NECESSARY – DO NOT** ground on negative battery terminal, I grounded on the back seat bolts that were undone when removing the seats.
3. Ensure your amp power wire is compliant relative to distance, though if in the boot it is generally very close as that is where the battery is. My amp stated anything shorter than 3.6m should be 6AWG, so I cut mine to 3.7 and kept the 4AWG wire I had.
4. Ensure the 100A fuse (or what your system requires) is within 30cm of the battery positive terminal connection.
5. I cut my positive terminal cover and placed my power wire on the nut that holds the cable on the positive terminal. You **MUST HAVE THE CONNECTION SECURE AND ON A BARE METAL PART OF THE TERMINAL.**



Connect speaker wire to subwoofer:

1. Using the appropriate gauge wire (generally the 16 AWG from the wiring kit is suitable) strip the ends and put them in the speaker wire (+) (-) **output** of your aftermarket amplifier, then into the corresponding (+) (-) input of the sub.

Keeping it tidy and safe:

You are best to keep your wires neat as you progress, rather than retrospectively.

1. You can zip tie your speaker wires together for neatness, otherwise you can use [electrical conduit tubing](#).
 - a. I MUST STRESS THAT YOU SHOULD NOT ZIP TIE POWER WIRE TOGETHER.
2. Consider where you will mount your amp. I mounted mine on the inside of the boot on the back of the chair. Predrill and install with given screws.
 - a. **ENSURE you are not drilling into any wires you have installed, or any existing OEM wiring loom!**
 - b. Ensure that the amplifier will be well ventilated. I may have mounted my subwoofer too close to my amp, restricting airflow. It is **important** that it is not covered by carpet or other material. Most new amps come with safety features to prevent overheating and shorting out.
 - c. I avoid mounting my amplifier on the subwoofer box as it can cause rattle and potential damage to the amp (though I have never had this happen in previous installations).
3. I would avoid direct contact between ground and power wires in case of damaged wires. I have a small section where they are zip tied together, though avoided this overall.



4. AVOID bunching your power wire as they can get hot. I wrapped mine around the empty chassis directly behind the seat (see photo of back seat: [red circle](#))
 5. Where there were manufactured holes in the chassis (uncovered when carpet is removed from the boot), use electrical tape to create a relatively thick layer to prevent damage to the wires. The wiring should not move that much, but this is something that you should do for safety sake.
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***UNFAMILIAR* - *DIFFERENT METHOD* HIGH/SPEAKER-LEVEL INPUT (LINE OUTPUT CONVERTER 'LOC')**

Repeat all steps as previously listed. The only difference is that you need to wire the output converter into the factory stereo.

I did not complete my setup with this method; however, you can pull the kick panel and console side covers to access the back of the head unit. The wiring **should** be the same as the colours listed above. Whether you have a **powered/active** or standard **passive LOC** your install will vary. Many videos outline installation into VE Commodores which can be found on YouTube.

I may be wrong; however, **I do not see why a LOC could not be wired into the factory amp harness**. I do note that when I unplugged the wiring harness for the factory amp, only the front speakers worked. This indicated that the rear door speakers also ran through the boot amplifier.

Notwithstanding, I would wire the:

- **12V *constant* power** for the LOC to the 12V constant output cigarette lighter socket the boot;
- the corresponding (-) (+) **of the left and right side parcel shelf/rear door speakers** (unsure of colours for rear doors); and
- the **remote wire** of the LOC to the yellow-red line accessory wire of the factory amp. I tested this with my multi-meter and both the brown and yellow-red line wires had no voltage when the car was turned off and the doors were opened. I would use the yellow-red line wire.

Complete the remaining steps of 'HIGH LEVEL INPUT (RCA)'

NOTES AND COMMENTS

Firstly, this [video](#) explains a subwoofer set up for a VF Commodore which was helpful. The author outlines that it does not matter if the speakers are 'pre-amped' like they often are now. He states that most amps have a switch, though I cannot locate one. However, I have found no issues so far.

Amplifying an amplified signal:

I am aware that the factory subs are pre-amped and that I am amplifying an amplified signal. LOC / High Level Speaker RCA Input should reduce the amplified signal to a low level input. I have had NO ISSUES running the pre-amped subs contemporaneously with the aftermarket gear.

Query regarding the OEM amp:

One thing that threw me off was the fact the factory amp only had one set of wires, as if it were only an output? I noticed that the factory head unit wires came from a bigger loom, this makes sense as the back speakers also work in conjunction with the parking aid sensor module. Though, considering AC and DC current, I could not understand how that would work. My understanding is that an amplifier will amplify the signal and send it to the requisite speaker, though that infers that it requires an input and output. I tapped into the parcel shelf subs directly before the input plug to the subwoofer, which should provide that I have used an amplified signal. It makes me wonder if there is any difference from the signal directly from the loom out of the OEM amp and the speaker wire directly before the plug. There are factors which evidence amplifying amplified signals, though I have not experienced a lesser sound quality; lacking volume; and I haven't blown any fuses.

Factory head unit settings:

These are subjective; however, I changed a few things to prevent damage to the OEM speakers.

- Bass: +1
- Treble: +2
- Fader: +1 (front of car)
- Balance: STD (Standard – Centre)
- Loudness: OFF
- Equaliser: OFF

Testing the distortion levels of the rear factory subs prior to aftermarket setup, I would have distortion around the 30 volume mark. Running them in sync with the new subwoofer, I did not want to blow them if I was really giving the 12" a run. If I want to hammer the 12" I can put the bass to '+2' and run at high volume of 30+ without parcel shelf sub distortion.

- I can turn the bass up to +3 or +4, and really push the aftermarket sub but it is important to consider the factory subs. Remember that we wired the new sub into the factory subs, controlled by our head unit. That means that our signal the sub receives can **also be determined not ONLY by our bass remote for the Pioneer amp, but the in car OEM head unit settings**. When the head unit is set to anything greater than +2 Bass, the sub works very, very hard, and well. But too much. Use the bass remote to adjust rather than in car bass. Keeps your parcel shelf speakers safe, and you still get plenty of boom out of the aftermarket sub.

Since the bass can overrule the higher frequencies (i.e. lyrics) I turned it to 2, and fade to the front. The fader also prevents the rear speakers being overworked.

Gain and Frequency/LPF:

I left my gain on normal, as it theoretically has a 50% gain already made by the factory amp. I have no distortion at very high levels of bass. See guides on how to adjust gain, I will do no justice explaining it.

I set my Low Pass Frequency (LPF) to roughly 50Hz. I was experiencing cross over in higher HZ bass with some songs so turned it down and may even put it to 40Hz. I noticed that my parcel shelf subs would take over for those higher bass notes that were +50Hz which gave a nice dynamic to the system. I can receive a full range of bass notes, while still getting those deep and heavy >50Hz notes.

Goodluck with your setup!