

A B S Wiring and fitting

If you are a novice with wiring and this kind of installations, it may be best to in list the help of and auto electrician, or some one that has some electrical knowledge before commencing this part of the build!

As mistakes could be very costly indeed, not to mention the damage that could be caused to the ABS control unit or ABS pump unit, there is a serious risk to your own safety! As a “HOT” wire connector to a “GROUND” or the other way round could cause the cable to melt and start a fire before you know it!

That said (and now you are really scared if you was not before) If you follow the basic rules and double check every thing before you connect the battery then it's not beyond most people. You may need to just call in a specialist if you are not 100% sure of your own ability before the power is connected.

RVD are only ever a call or e-mail away and we will do our uppermost to help as much as we can from remote!

A B S system's that can be used on your Python Roadster

There are two main systems that can be used. The easiest one to fit is the older **E28** system as this was an “optional extra” and there for it was not fitted to all models of **E28**'s. This meant that the ABS loom was not part of the main car loom and is separate and can be removed from the donor with out to much problem. If you opt to use the **E28 system** you will need the **whole system pump/control box/loom** (the wheel sender's are the same for **E28** and **E34/E32**).

If you had and **E34 donor with ABS** then you have all the parts that you need to re-install the system, the tricky part is removing the ABS loom from the main loom, as ABS became standard on the **E34/E32**.

E28 or E34/32 you will need to follow the installation instructions the same just skip the section on removing the ABS loom form the main car loom.

E34/E32 only

1. Lay out the car loom that you removed from your donor as described in the dismantling donor section of this manual.
2. Locate the large multi connector that fits into the ABS control unit. now find the plug to the pump unit. This has 12 or 13 wires into it depending on the year. Locate the four wheel sender plugs these are yellow/orange in colour and have two pins sticking out of them, and are on thick black single wire. (if you marked these when dismantling then this will be no problem)
3. From the large control unit plug remove the loom tape and slowly separate the wires that go to the plug from the main loom, as you do this you will come to a point where you find that large RED and BROWN wires connect into the main loom, Cut these off as close to the ring terminal as you can to leave the maximum amount of wire. **Note:** do not cut any thin coloured wires at this point.
4. Continue along the loom towards the pump plug, you should be able to remove the bulk of the loom from the main loom, you will find that there are some wires from the main loom that rap round or cross over the ABS wires it is fine to just cut these **BUT NOT ANY THAT ARE IN THE ABS SECTION!**

5. You should now have the four sender wires free right back to the control unit plug and the pump plug fairly free. There are four or five small wires that still connect into the main loom? Now is the time to sort these one by one and label.
6. There is a small (.5mm) Blue wire on some 535i and M5 this wire is connected to positive output of the Alternator (generator) and senses the voltage (but is not on all models so don't panic if you do not have one) It is connected to pin **15** of the control unit plug. Follow it as far as you can into the main loom it will come to a yellow capped junction with several other blue wires, cut and label at this point.
7. The next that you all should have is a blue and red, this is the brake light switch, and is connected to pin number **25**. Follow this wire and cut and label as the previous.
8. Now follow the (.5mm) gray/black/yellow wire from pin **29** (this will also run to the pump plug) as far as you can and cut and label as ABS Warning lamp.
9. From pin number 1 you should have a Red/Blue/Yellow, this will run to the main ignition and "ON" relay, follow the wire to the relay holder. Once you have located it unclip the holder and relay there should be a second Red/Blue/Yellow wire that runs to the pump plug. There will be THREE other wires coming from the relay holder a Red, a brown and a three coloured wire. Follow these as far as you can into the main loom and cut. **DO NOT CUT THE RED/BLUE/YELLOW WIRES!**
10. The ABS loom should now be free and come away from the main loom, from the control unit plug straighten out the wires and tape at around 12" (300mm) the front wheel sender wires need to leave the main loom at around 6" (150mm) from the plug and tape these together, the rear need to leave to loom at around 3' (1m) from the plug. At around 18" (450mm) the wires that were cut from the main loom (warning light/brake light switch and the ground wires) can also leave the main loom.
11. The main relay wire that runs from the pump plug to the relay is a little short to allow the relay to be mounted under the dash. We use a new relay holder and cut the Red/Blue/Yellow at the base of the old relay holder, then strip and twist the wires together and solder. Tape over or use heatsrink sleeving over the joint move the loop of wire that is left back to the point where the rear sender wires leave the loom. Pull out the wires the same length, cut and fit the new spade connector and fit into the new relay holder in the same position as on the old. (we will cover the other wires later)
12. From the pump plug start to re-tape the loom (it's best to use loom tape and not sticky tape) when you get close to the ends of the Red power in cables leave around 3" (75mm) out of the loom.
13. Tape all of the rest of the loom right up to the control unit plug. It should then look like the picture below.



E28 Loom

If you have chosen to use the **E28** loom and parts you will need to remove some of the tape from the loom to allow the front & rear sender wires to leave the loom as described above. On the E28 system there are

8 wires to connect:

- | | |
|---|---|
| <u>1.</u> Two, Red wires one 2.5mm & a 4mm | = (+) Constant live (Hot at all times) |
| <u>2.</u> One Gray & Red .75mm | = (-) Feed to warning light (dash) |
| <u>3.</u> One Blue wire (some models only) .75mm | = (D+) Alternator (generator) |
| <u>4.</u> One Green & Red .75mm | = (+) Brake light switch |
| <u>5.</u> One Green (to pin #1 control plug) .75mm | = (+) Ignition Hot (hot in run & start) |
| <u>6.</u> Two Brown one 4mm & one 1.5mm | = (-) Ground connection |

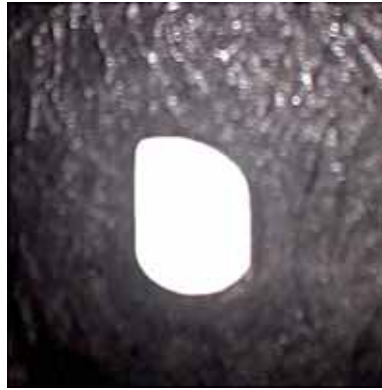
Installing wires and components

- 1.** The wheel senders should be fitted as per the original installation, the only difference will be in the running of the wires.
- 2.** The rear sender wires should run along the top of the outer leg of the swinging arm and “P” clipped in to place as below. Make a hole through the GRP in the position shown in the right hand picture below. Take care not to make it over size for the rubber grommet that is fitted to the end plug, as water may enter your python cockpit if this is not a good fit. Its bests to open up slowly with by hand with a half round 6” file.



- 3.** You may need to move the rubber sleeves on the sender wire to achieve the same as in the picture above; this can be done easily as they are only held in place with a small amount of glue. This comes away with only a small amount of effort. Make sure that the cable is not and will not contact and of the body work or wheel/suspension part to avoid chafing of the cable and failure of the system.
- 4.** The front senders have a moulded end plug that fitted through the donor cars body work, this can be used the same on your python. This plug requires a special shaped hole as it passes through the wheel arch and then rotated 90 deg CLOCKWISE to lock and seal the plug in place. Again take care not to over size the hole and file out by hand to a good tight fit.

- 5.** Once you have the hole to the right shape (as pictured below) sand a camphor around the inner and outer edges to “thin” down the GRP to a thickness that will allow the plug to be turned and locked in position without breaking it, a small amount of grease helps it to turn freely.



- 6.** Below right, shows the position of the hole required for the plug on the right sender wire. It needs to be at around a “10 o’clock” position as you look into the wheel arch and just in from the radius part of the GRP arch, the hole for this plug needs the hole pictured above rotated clockwise 90deg.



- 7.** The above left: shows the running of the wire and the hole position for the plug about 2 ½” (65mm) above the pivot of the front arm for the left side of the car. “P” clip as shown and check that they cannot chafe as with the rear.
- 8.** Now you have all four plugs in position. The next is to mount the control unit, it’s best to mount it inside the cock pit as this will prevent dirt/water entering the plugs or unit. We suggest fitting to the bulkhead just to the left of center to the car just above the top edge of the center tunnel.
- 9.** Hold the unit in place as shown in the next picture and drill through the right hand mounting bolt hole through the GRP of the bulk head **Note:** makes sure there is nothing on the other side that you could damage as the drill breaks through!
- 10.** With a long M6 machine screw and a large penny washer under the bolt head pass it through from the engine side, fit a second penny washer and then a spring washer and a nut and tighten.



- 11.** Add a second nut and then a large plan washer to the stud that is no sticking out, run the nut down until it is at the right height to the bracket on the control unit. Fit the unit onto the stud and add a second large plan washer and nut. Tighten finger tight and twist the left side of the unit down around 20mm $\frac{3}{4}$ " and drill the second hole through the GRP through the hole in the bracket. Fit a second machine screw as with the first. Do not tighten the nuts fully on the unit at this stage as you may want to remove it to have access to fit other components later in the build.
- 12.** **NOTE:** do not mount to far to the Left on Right Hand drive cars as this may obstruct the fitting of the glove box later on in the build! You may think there is lots of room behind the dash, but it will soon be lost to pipes and wires a like.
- 13.** Run the front sender wires across the bulkhead to the right and run through the bulkhead using a suitable grommet through the GRP, depending on the engine that is being used the point at witch you make this hole will be best decided by you the builder. Any area above the pedal box or through the center tunnel side of the bulkhead is fine. **Note:** the front right sender wire is the shortest and there is not much spare cable on ether front sender, as the wheels are now much further forward than on the donor car.
- 14.** The rear sender wires are "over length" as there are now no rear seats. This means that you will need to "lose" some of the spare wire. **Not by "coiling"** the cable as this can make it to a magnetic coil and cause false signals. The best method is to run the cable back and forth a long the floor, close to the inside of the sill, on the left side of the car and fix with tie raps & "P" clip (or use tie rape base fixings). As show below.
- 15.** Now run the front sender wires to the sockets that are now fitted into the inner wings, try not to run the cables over any sharp edges that may be on the servo or any other part of the brakes or clutch assemblies. Fix the wire with "P" clips or cable ties where you can to prevent the cables chafing.



- 16.** The left wheel sender wire is best run across the pivot brace in front of the engine. (this is not supplied as part of the kit as for each engine option there will be different needs, this part can be made by the builder or supplied by RVD)



- 17.** The above picture shows the rear ABS sender wires fixed along the inside of the sill, and tied into place.

- 18.** Now you have to mount the ABS relay in a suitable position that you can gain access once the dash and other parts are fitted. The top of the center tunnel or the side support plates are good places to mount it. There are three wires to connect on the relay **one red, one brown, and a multi colour wire**, the **Red** = "Acc" live 7.5 amp fused(+VE). **Brown** = ground (-VE). **Three Colour** = Ignition hot run + start only Fused.

- 19.** Now you should only be left with: **one Blue** (some models) = D+ alternator
Two RED = constant live at all times (no fuse)
one Brown + one Brown Orange = Ground (-VE)
one Blue black = brake light switch (normally open side.(Side to light))
one Gray black and yellow = negative feed to warning lamp (dash)

- 20.** Now connect the battery, as you do this just touch the wire onto the battery momentarily and see if there is any **"SPARKS"** at all if there is don't connect and re-check all connections and parts. If no sparks then turn the ignition on to **"Acc"** and the warning light should come on, turn to ignition to **"On"** and the light should extinguish. **YOUR ABS SHOULD THEN BE OPERATIONAL!!**