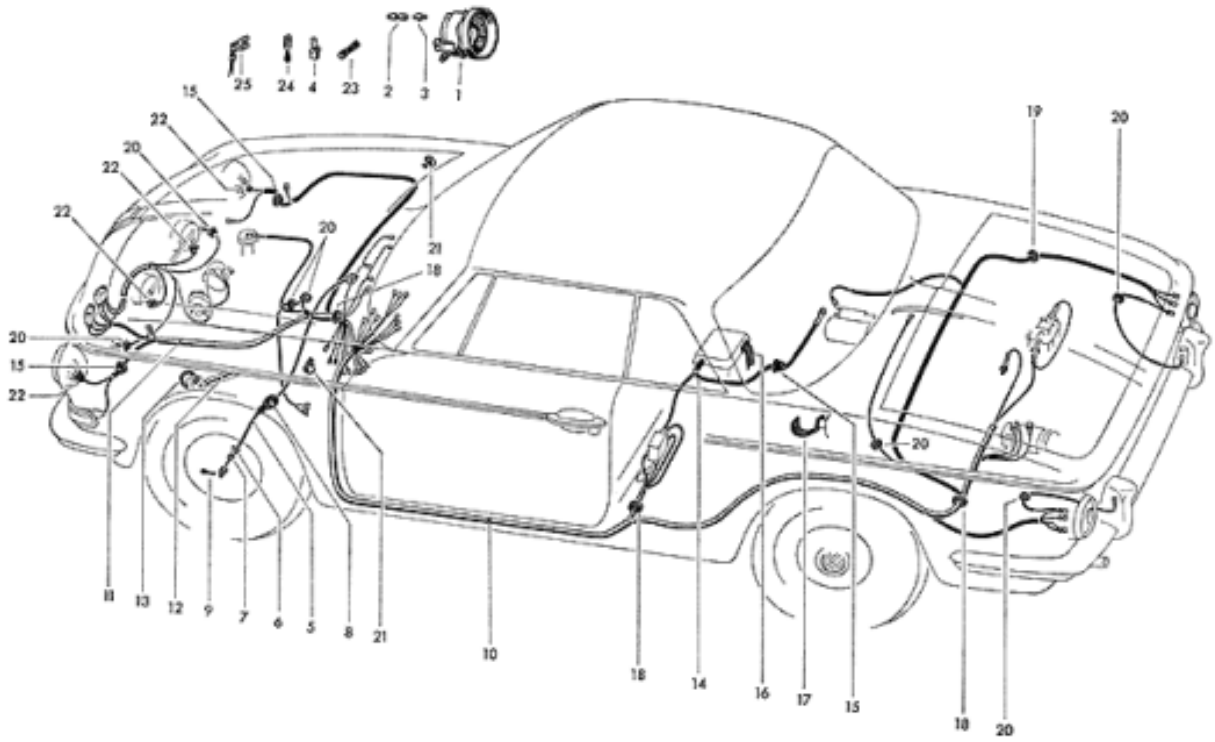
Volkswagen

Karmann Ghia

Type 343



Wiring Harness Kit

Installation Guide

Thank you!

And congratulations for purchasing the Wiring Works Karmann Ghia Type 343 Wiring Harness Kit. Much care was taken to ensure that this kit be as universal as possible to allow for installation in left hand drive cars manufactured for model years '62-'66, and into '67 and possibly later model year cars, with modifications. Both 6V and 12V electrical systems are supported.

This wiring harness kit includes a number of categorized components. Please refer to the Components List to become familiar with the contents. Depending on the year of the car, some parts will not be used and this is normal to allow for a more universal application from a single kit.

IMPORTANT NOTE:

PLEASE READ THROUGH THE OFFICIAL VOLKSWAGEN SERVICE MANUALS PRIOR TO STARTING ANY WORK.

THIS WIRING HARNESS KIT IS PROVIDED FOR USE IN A VOLKSWAGEN TYPE 343 KARMANN GHIA. THIS KIT IS PROVIDED WITHOUT WARRANTY OR SUPPORT OF ANY KIND. INSTALLATION OF THIS WIRING HARNESS KIT IN ANY OTHER MAKE OR MODEL CAR IS NOT RECOMMENDED. PROFESSIONAL INSTALLATION OF THE WIRING HARNESS KIT IS HIGHLY RECOMMENDED. ANY DAMAGE TO ANY PROPERTY OR PERSONS CAUSED BY THE USE OF ANY PART OR PARTS OF THIS WIRING HARNESS KIT IN ANY WAY, PROFESSIONALLY INSTALLED OR OTHERWISE, WILL NOT BE THE RESPONSIBILITY OF THE MANUFACTURER OR VENDOR OR RESELLER. YOU ARE SOLELY RESPONSIBLE FOR THE USE OF THIS WIRING HARNESS KIT AND ITS USE IS AT YOUR OWN RISK. SOME AUTOMOTIVE ELECTRICAL KNOWLEDGE IS A PREREQUISITE. ALWAYS REFER TO OFFICIAL VOLKSWAGEN SERVICE MANUALS FOR THE OFFICIAL WIRING INSTALLATION PROCEDURES.

NOTE:

This wiring harness kit installs in exactly the same way as the original wiring harness, using all the original wiring paths. If your car has been modified or damaged in a way that does not allow the use of the original wiring paths, this kit should not be installed.

This document is provided as courtesy and is simply a series of observations and suggestions aimed at guiding you to a successful wiring harness installation. It is certainly not the only way to install the kit and to some degree you must find your own way through the process. There may even be errors and/or omissions. Take your time and enjoy the process. It's not often that you get a chance to rewire a car like this one.

We are in no way associated with Volkswagen of America, or its affiliates, national or international. We are in no way affiliated with Wiring Works, manufacturer of this wiring harness kit.

Again, thank you--and please be cautious, thorough and careful!

Type 343 Karmann Ghia
Wiring Harness Kit Components List

Ziploc bagged components have been labeled with item #.

Item 1. Main front wiring harness.

a. Of the two large harnesses in the kit, this is the smaller of the two. An easy way to spot the harness is the presence of yellow wires.

Item 2. Main rear wiring harness.

a. Of the two large harnesses in the kit, this is the much larger of the two. An easy way to spot the harness is its size, the presence of white with red stripe wires and that there are two large red wires running through the harness.

Item 3. Small Ziploc bag of hardware components.

a. 2 X headlamp connector sockets
b. 3 X fuse holders
c. 1 X 4-way spade-to-spade junction connector
d. 5 X spade-to-spade junction connector
e. 10 X small gauge crimp on spade connector
f. 5 X large gauge (or 2 wire) crimp on spade connector
g. 5 X over/under piggy-back spade connector.
h. 3 X side-by-side piggy-back spade connector

Item 4. Large Ziploc bag of wiring (interior/side marker lights).

a. Interior light harness (red and brown wires in a harness case)
b. Left side marker light wire (white w/black stripe in a harness case)
c. Right side marker light wire (while w/red stripe in a harness case)

Item 5. Large Ziploc bag of wiring (horn harness and ground).

a. Horn harness, early style, where horns mount within the trunk.
b. Horn harness, late style, where horns mount outside the trunk on the bumper brackets.
c. Ground strap for horn harness, early style.
d. 2 X ground straps for bumper mounted horns, later style.

Item 6. Large Ziploc bag of wiring (miscellaneous under dash and power).

a. 1 X regulator to battery power wire
b. 1 X horn ground through steering column wire
c. 2 X headlamp ground wire
d. 2 X fog lamp ground wire
e. 1 X instrument light power wire
f. 2 X carburetor cutoff solenoid jumper wire
g. 2 X stoplight switch adapter for dual master cylinder conversion
h. 6 X under-dash power wiring, various lengths, some spade-to-spade, and some spade-to-soldered end.
i. 6 X under-dash convention wiper/headlamp switch wiring (non-pushbutton cars)
    1. 9.5” gray, parking light fuse box to control switch wire
    2. 9.5” white w/black stripe, high/low beam relay to control switch wire
    3. 9.5” black wiper power, fuse box to control switch wire
    4. 9.5” yellow, high/low beam relay to fuse box wire
    5. 9.5” white, high/low beam relay to fuse box wire
    6. 9.5” blue w/green stripe, 3 prong turn signal relay to dash signal indicators

Type 343 Karmann Ghia
Recommended Wiring Harness Kit Installation Tools and Supplies

Know-how:

- You or the installer(s) must have a better than basic and applied understanding of automotive electrical systems.

Documentation:

- Robert Bentley Workshop Manual for the Volkswagen Type 3, 1961-1967
  ISBN: 0-8376-1192-X, VW Part No. LPV 800 139

Tools:

- Flashlight
- Leather Gloves
- Eye Protection
- Needle Nose Pliers
- Diagonal Pliers
- #1 Phillips Screwdriver
- #2 Phillips Screwdriver
- 3/16" Flat Blade Screwdriver
- 9/64" Precision Flat Blade Screwdriver
- Battery terminal cleaner or wire brush
- Razor Blade Knife
- 6mm Allen Wrench
- 8mm or 10mm socket or box end wrench, or a 3/16" Flat Blade Screwdriver to remove front turn signal housings, ONLY IF REQUIRED to repair grounding issues.

Optional Tools:

- Blue Point Brand Model PWC47 Open Barrel Crimp Pliers
- Blue Point Brand Model PWC6 Wire Strippers
- Heat Gun (or other intense heat source for shrink tubing)
- 30W Soldering Iron
- 60/40 Rosin core solder (22swg is good)
- De-soldering braid or pump

Supplies:

- 18 Gauge Mechanics Wire
- Duct Tape
- Electrical Tape
- WD40 (small can)
- Penetrating Oil (aka, Liquid Wrench)

Optional Supplies:

- Brake Cleaner (spray can, zero residue, to clean parts)
- Paper Towels
- Rubber gloves
- PVC Pipe Glue and Primer
- The old Type 34 Wiring Harness, if available

Type 343 Karmann Ghia
Wiring Harness Kit Installation Guide

Part 1: Electrical System Components

PLEASE READ THROUGH THE OFFICIAL VOLKSWAGEN SERVICE MANUALS PRIOR TO STARTING ANY WORK.

Parts Requirements

The reproduction wiring harness you have purchased is only a part of the overall Volkswagen Type 34 electrical system. Along with the decision to actually replace your wiring come several additional decisions you must make. An important decision is whether to keep the electrical system 6V, as was originally equipped, or convert to a more modern 12V version. While the wiring harness kit itself will support either a 6V or 12V system, the host of additional electrical components required for a successful wiring installation will typically only support either 6V or 12V--and not both. If you've been collecting parts for a 6V electrical system restoration, you might find it a very expensive and labor intensive operation to suddenly switch gears and convert to a 12V system. The same is true if the decision is made to convert from 12V to 6V.

Another decision that must be made is whether to replace or refurbish electrical components. If new or good used parts cannot be sourced, then the decision is made for you and existing parts must be refurbished. Guidance for refurbishing parts is well beyond the scope of this document. Regardless, a general list of required electrical system components has been compiled to give you and/or the installer a better idea of what really constitutes a complete electrical system and to hopefully help with original replacement parts acquisition. Substitute parts are available from other makes and models of cars, but cannot be recommended for use with this replacement wiring harness.

Each electrical system item should be closely scrutinized and carefully considered prior to starting your wiring installation because failure to use quality electrical components represents a potential risk to your safety and fire damage to your vehicle. There is the real possibility that one or more of the existing electrical components installed in your car actually led to the failed wiring that brought you to the point of consider a wiring harness replacement. These or any other bad parts can cause damage to your new wiring.

It is possible to 'bench test' all electrical components in an isolated and controlled environment. Where feasible, it is recommended that this be done by a qualified automotive repair shop. The process requires a good understanding of the role and function of each part. A thorough understanding of automotive electrical systems is a must and none of that can be covered in a document such as this. It is, however, a presumed prerequisite on the part of the installer(s). Keep in mind that electrical parts can fail at any time and without warning, even if parts are tested and certified functional by a reputable shop. This is why most shops specify that electrical parts are non-returnable.

Parts Identification

The following electrical system related parts are generally required for a complete wiring harness installation.

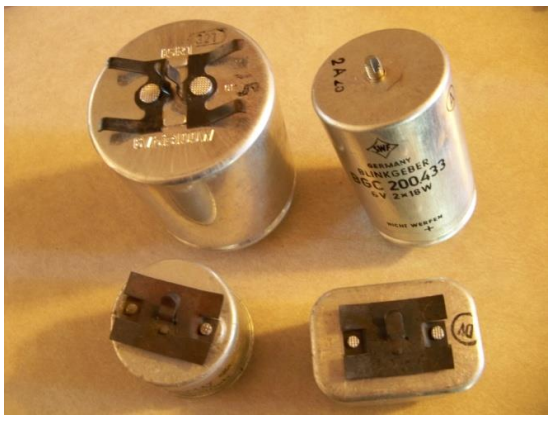
IMPORTANT NOTE: Several components in this list are constructed with their own wiring attached. This wiring is presumed to be present and attached to the respective part and is therefore not included in the wiring harness kit.

1. 6V (or 12V) car battery, and '+' & '-' battery cables, disconnected from the battery.

2. Required relays, in known good condition. Inspect and replace any relay that isn't up to the task. Visually inspect the bottom side of the relay—the side with the contacts. Some relays have been previously repaired and you can see where the metal covers have been pried from the Bakelite bases. Some of these repairs have been done very well, but you must treat them as suspect until they are proven. Warped and discolored Bakelite means overheating or moisture damage—or both. The original Bakelite was a nice uniform shade of brown with bright shiny bronze connectors.

   Non-continuous flashing version of the high-low beam relay is shown below left. A 'continuous flashing' European version is available or can be fabricated from the non-continuous flashing version. Fog lamp relay shown in the picture, below right.

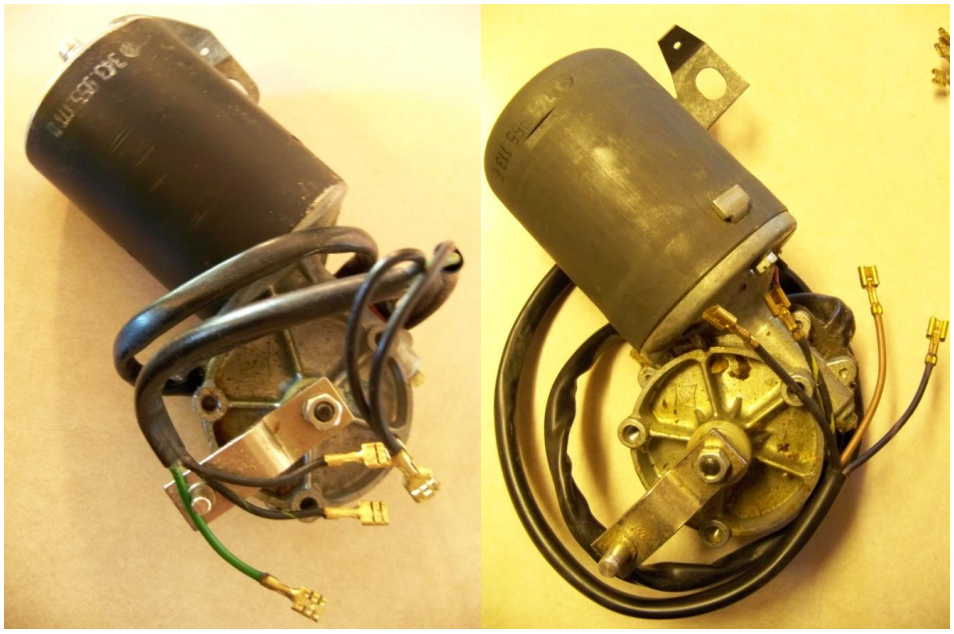
   When dealing with used relay that visually pass the test, carefully clean up the terminals on these parts if necessary using very fine grit sandpaper. The idea is to burnish the finish on each relay connector, not burn through it. As water may have already made its way into your relays, it is recommended that you have good spares on hand.



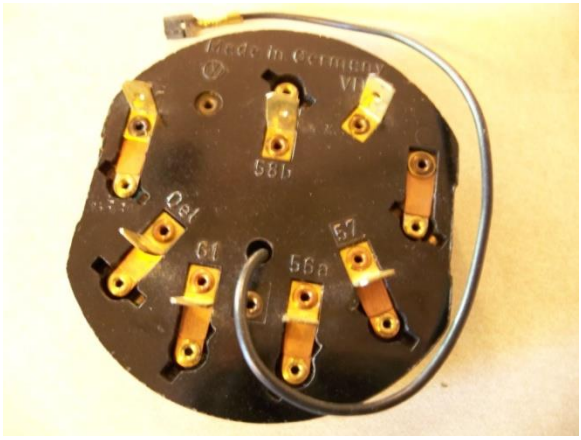
- Headlamp High/Low Beam Relay (top left)
- Turn Signal Relay, either 2-prong or 3-prong (top right)
- Horn Relay (bottom left)
- Fog lamp Relay (bottom right)

NOTE: Mounting prongs and hooks will vary from relay to relay, however it is important to know that regardless of the shape of the relay, if metal the outer canister of the relay must operate at ground potential. Scratch some paint (or rust) to get some clean bare metal to ensure the relay grounds ok at its mounting contact point. Some relays actually dig into the paint and metal to ensure contact, others screw into place. In the picture above, the bottom two relays are very aggressive in digging into the paint, where as the upper two relay connections are a bit more passive and require some assistance to make a good ground.

3. Wiper Motor and wiring, in known good and complete condition. Below, 6V version on left, 12V version on right.

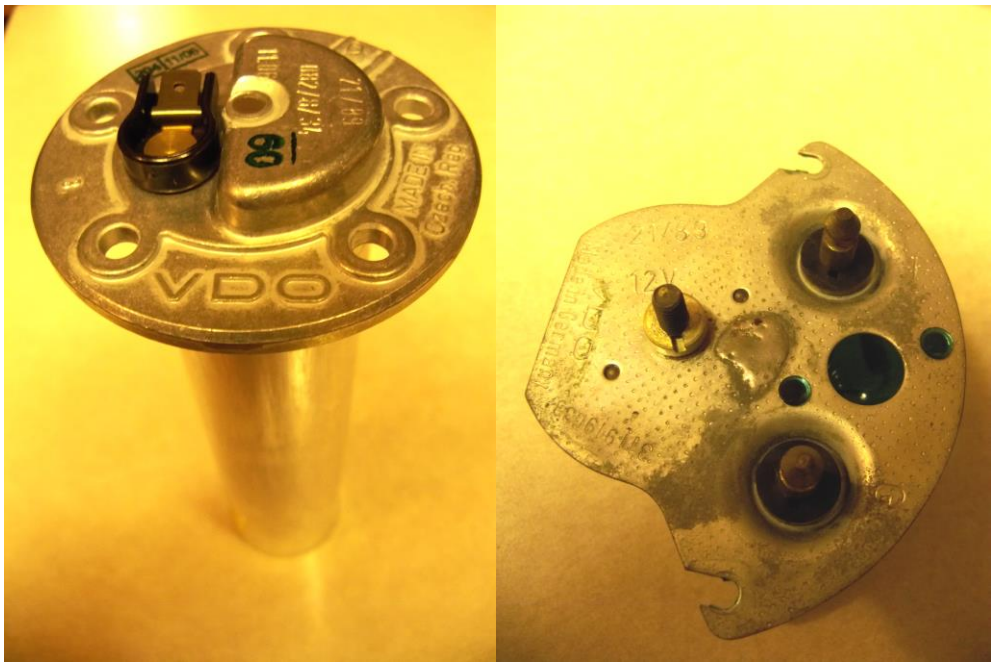


4. Gauges, with all electrical components in known good condition.
- Multifunction Gauge. Shown below is the Bakelite backside electrical connector and ground wire. Ensure that bulbs are installed in this part.



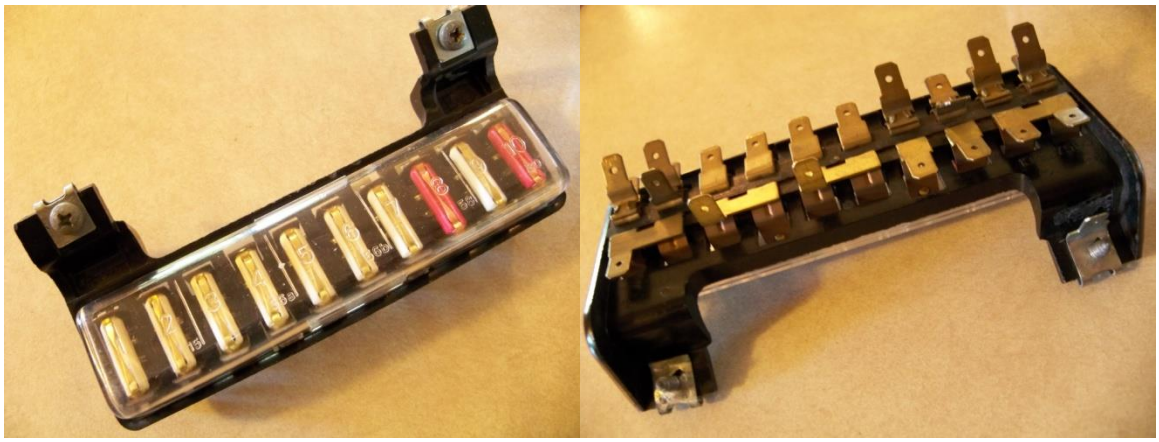
- Speedometer with bulbs and bulb holders installed
- Clock with bulb and bulb holder installed

5. Fuel tank sending unit. This part is the same for both 6V and 12V cars. The difference is in the actual gauge subassembly that's installed in the multifunction gauge housing. This is a swappable sub-assembly, making both repairs and 6V to 12V gauge conversions easily done without having to disturb the fuel tank. 12V version of the fuel gauge subassembly is shown, but the 6V version is visually identical.



6. Fuse Box properly loaded with fuses. In the **left** picture below, note the fuse numbering. Fuse #1 is to the left, Fuse #10 to the right. This fuse box is properly loaded for a '64 model year car, with white 8 Amp fuses in all but #8 and #10 locations, where 16 Amp fuses are used. In the **right** picture below, note the male spade connector connections and the mounting points with the single spade connector at right for grounding the wiring for the high/low beam switch on the turn signal arm.

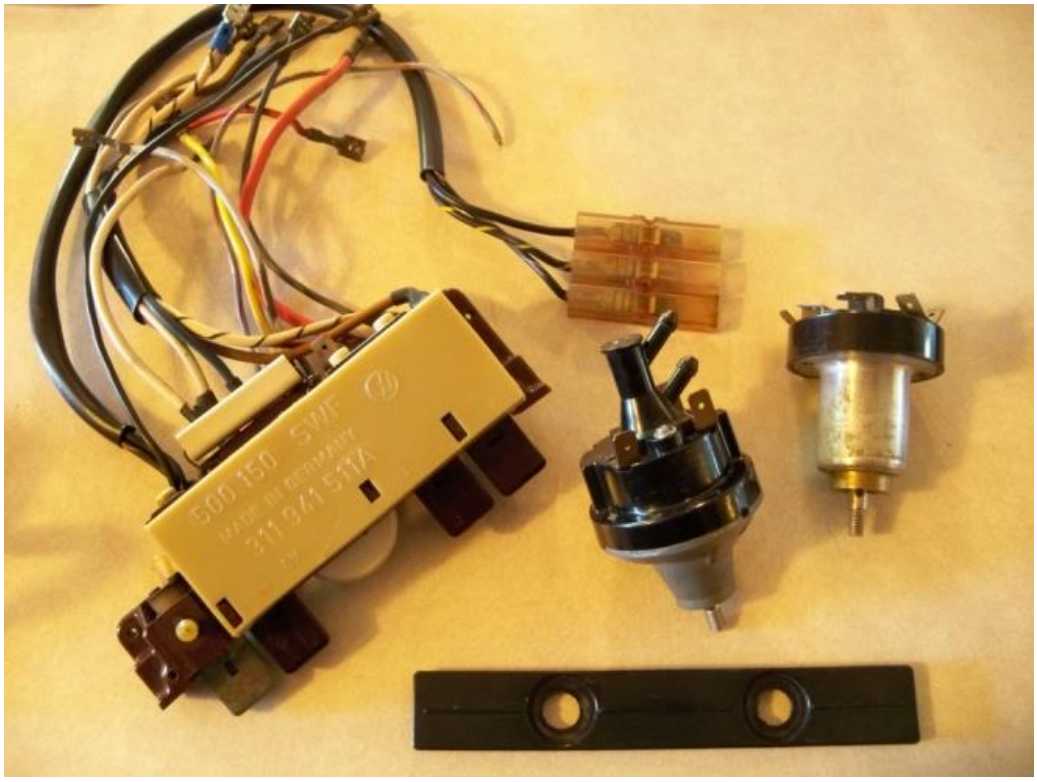
Find a fuse box for your project with mounting pedestals that are not cracked or missing. Clear numbered fuse box covers are available as reproduction parts.



7. Fog lamp switch. This rocker switch seems to be a part unique to the Type 34.

8. Pushbutton Switch Assembly with all wires intact, pictured below to the left, or Conventional Headlamp & Wiper Switches, pictured below to the right. Also pictured below, bottom, is the special Pushbutton Delete plate supplied to omit the Pushbutton Assembly and convert to standard controls.

   Pushbutton controls are generally only found in a 6 Volt configuration. 12V versions were produced, but they are one of the rarest electrical parts known. It is very unlikely you will ever see one. 6V to 12V conversions typically involve the removal of the pushbutton controls, using the adapter plate and conventional controls instead. Using the 6V pushbutton control under 12V conditions may cause it to fail prematurely.



9. Voltage Regulator, 6V version with cabling shown below but the 12V is identical in appearance. The yellow sticker on the side indicates the voltage, so if this identifying label is missing the voltage of the part might be a bit of a mystery and should not be used in your car without being tested first. This part is also used as a replacement part in the Porsche 356, which means that Bosch should keep it available for purchase new.

10. Interior and Rear trunk lights, with contacts and bulbs. At the upper left in the picture below is the currently available reproduction interior light lens, courtesy our Porsche 356 brethren. It varies from the heat cracked original lens, pictured at middle left in the picture below, in that there are two electrical contacts on the switch side of the lens, of which only one of the contacts are used, the other contact unused. The lower left lens is an original trunk light lens, which is the same one used in the Notchback and Fastback trunks and has no switch. This could easily be substituted with a spare interior cabin light lens so this light can be given a proper on/off switch.

11. Left and Right door contact switches, plus the rear decklid contact switch are shown in the picture above, at right. These are only fair reproductions of the original parts and require some rework to fit the car's original mounting holes properly.

12. Headlamp Assemblies, whether European or North American 'SB 13'.

IMPORTANT NOTE: The headlamp assembly type discussed in this section (12.) and turn signal housing type discussed in the next section (13.) are closely tied in the original and unaltered lighting in a Type 34. There is European spec and there is North American spec lighting. European spec is typically the default, as very few cars were originally destined for the North American market with the M274 equipment options list. However, some folks were forced to partially or fully convert lighting as part of the car's importation to North America, resulting in the inconsistencies found on what is otherwise an original car. How you choose to restore your car's equipment is your choice, but there may be laws that drive certain requirements for automotive lighting and safely features. Research this information, first.

Front and back of a European headlamp assembly is shown, below. In the picture at right, note the two male spade connectors for the parking light, aka 'city light'. The decorative headlamp ring used with this adjuster/lens/reflector assembly is different from the ring used with the SB 13 parts, discussed below.

Below is an example of a replacement high/low beam headlamp bulb that might be used with the European headlamp assembly in France, as this bulb uses yellow glass.

NOTE: The 3-prong connector on the backside of the bulb, making it immediately compatible with this wiring harness kit, no modification required.

The North American spec SB 13 headlamp adjuster assembly pictured below and to the left and the large sealed beam bulbs that are used with them to the right. SB 13 is the part numbers Hella actually stamped into both the sealed beam retainer ring in the adjuster assembly and into the decorative headlamp ring used with this adjuster assembly.

NOTE: The 3-prong connector on the backside of the sealed beam bulb, making it immediately compatible with this wiring harness kit, no modification required.

13. Front turn signal housings, left and right, European or North American, dependent on headlamp assemblies, with appropriate bulbs. Pictured below is a European turn signal housing that uses the single filament bulbs.

Pictured below are both types of housings, European and North American. The two element bulb connectors are clearly visible in the lower housing in the photo.

Referring to the picture below, turn signal housings can be easily identified by the 'R' and 'L' next to the leading mounting bolt hole. The housing on the left is a right hand side later European style. The connector cap is white plastic and one of the two terminal mounting connectors is labeled '31', which is electrically **ground** and NOT for use with the grey parking light wire.

The turn signal housing on the right is a left hand side early North American housing. The connector cap is Bakelite and neither terminal is labeled. Instead, the backside of the housing is cast with the numbers '57' or '58' on one side, and a 'BL / L ' on the other side. If this were a right hand housing, the labeling would be the numbers '57' or '58' on one side, with the other connection labeled 'BL / R'. The characters 'BL Po 84' appear on the back of the North American housings.

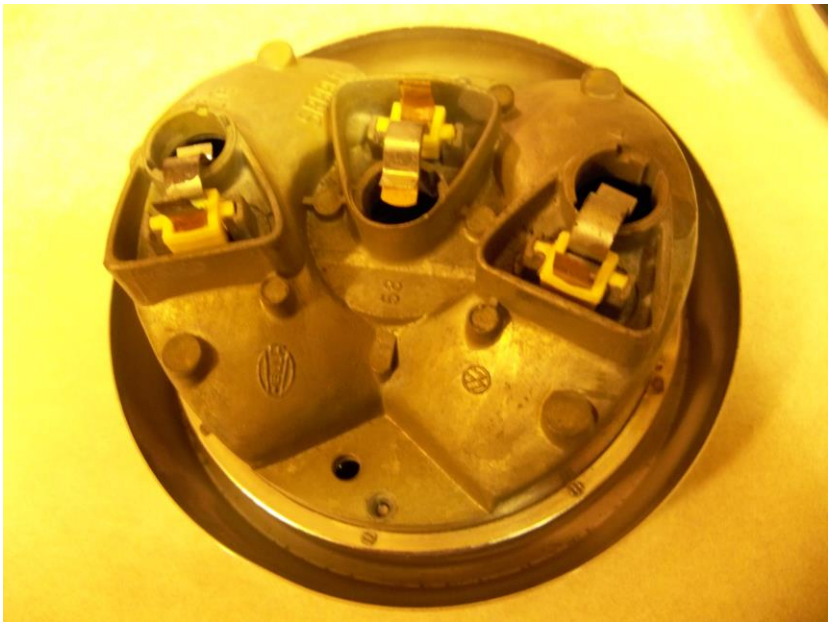
14. Side Marker Housings for left and right sides, with bulbs. Some markets omitted this lighting, replacing them with badges. Other markets changed the lenses to clear or amber versions, converting them to side turn signal indicators.

In the picture below, note the there were originally two different lenses, right and left. Reproductions seem to have been done only for the left hand side, for use on both sides.

Pictured below is the back side of these side marker housings.

15. Tail light Housings for left and right sides, with bulbs.

Once again, there are several versions of the tail light housing. The earliest versions had three small Bakelite boards riveted to the housing with spring contacts riveted to them. Some of these didn't have a riveted exterior chrome ring, being single piece units. Later versions had the connectors pictured below, but no raised sections for the rubber sealing boots and this is where the riveted chrome rings began appearing. The version pictured is the latest replacement style.



All tail light housings are functionally identical. Though not pictured, a later style tail light housing was produced with a narrow chrome exterior ring and a protruding center stop light reflector. Though not correct, these later lenses can be used on the early tail light housings. Also, the later tail light housings can also be used with the early lenses.

16. Left and right fog lamps, with bulbs.

Pictured below is a later replacement fog lamp with the white plastic bulb holder. The early style had a differently shaped retaining spring and Bakelite based bulb holder assembly. There are a variety of different replacement bulbs available, most of which have a more pointed end to them. Fog lamp functionality and performance is far more dependent on reflector mirroring and lens clarity than bulb shape.

17. Upper steering column assembly, correctly and completely wired. It is unlikely that your upper steering column is intact and will probably need some sort of repair. There is also a chance that it has been 'North Americanized' and the side markers have been disabled as part of the importation process. There are several ways that this could have been done, but the two most often seen are 3 wires cut at the turn signal contact plate and/or the 'Pr' and 'Pl' male spade connectors pulled from the upper steering column terminal plate. Both types of intentional damage can be repaired and some parts can even be found as spares. If you are careful and know how to handle a soldering iron, this work is challenging but can be accomplished with patience and care. It is, however, a job best left to an experienced shop, and then only when removed from the car. If parts must be purchased as new, this could be an expensive proposition. Keep in mind that there are 13 wires running through two small channels cast into the metal of the upper steering column housing.

The upper steering column, upper steering column tube and steering wheel are all isolated from ground by the steering column upper rubber mount and steering tube through bulkhead rubber ring. This is normal. The steering column wire included in the kit runs up the hollow center of the steering column, terminating on the upper end at the horn contact ring. On the bottom end, this wire has a female spade connector that terminates in a special bronze washer that has an integrated male spade connector. A special ever so slightly longer zinc plated safety bolt passes through this special bronze washer, retained with a likewise special zinc safety nut, and this is one of the four bolts/nuts that is used with the flexible rubber 'rag joint' that joins the column to the steering box that is mounted to the front beam. The steering box to front beam ground wire completes the circuit to ground by mounting under a special zinc plated bolt that is used to secure the left rear of the steering box top cover, then goes over to the left upper front beam retaining bracket bolt.

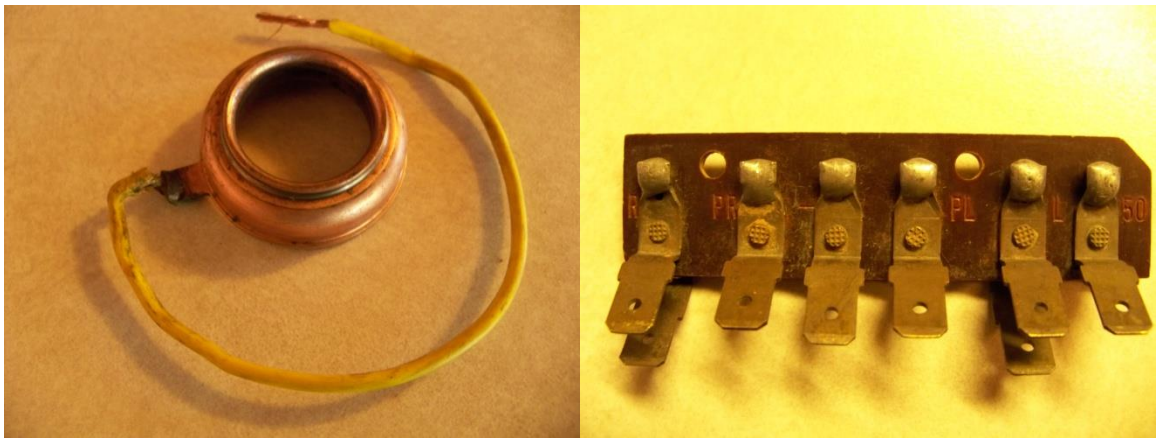
Below left are pictures of two ignition switches. As long as the switch is the generic version, it will be outfitted to work with the European market, with 4 wires. All 4 wires are routed down the left hand side of the inside of the upper steering column assembly. The grey wire on each switch is 'live' and has voltage present only when the ignition switch is turned off, in support of the side markers. North American switches lack both the gray wire, as well as the terminal itself for the gray wire on the back of the switch. The left switch in the picture is an early Volkswagen unit with the writing on the switch face collar, which was used on cars between '61 and '63. The right ignition switch is an OEM SWF '64 and later unit. Towards the back of the picture is the decorative side cover that hides the ignition switch wiring and fits on the left side of the upper steering column.

Above right are pictures of turn signal levers. The lever to the lower left is a regular Type 3 unit for use in the North American market. The lever to the upper right is a Type 34 unit and has the secondary ecomomy parking light contacts present for the European market. Notice the thick collar on the Type 34 turn signal lever, which is extremely unique and very rare. The construction

of this part makes it very fragile, but they can sometimes be repaired. Both levers have the high/low beam switches at the end of the arm and the 2 wires for the switch for each are shown, which when installed in the upper column assembly run down the inside on the left hand side.

Pictured below are turn signal contact plates. They started out life as European versions of these parts, with 6 wires each. Somewhere along the line 3 wires were cut back at the base of the unit shown at the left in both pictures, below, 'North Americanizing' a '64 Type 34 and disabling the side markers. Some wiring and carefull soldering might restore it, but the better idea is to locate a replacement unit with all 6 wires. Though it is a tight fit, the black with white stripe wire is routed down the left hand side of the interior of the upper steering column housing, with the other 5 wires routed down the right hand interior side of the housing.

The picture below and to the left is the upper steering column bearing. The bearing housing and steering column is grounded when the horn button is pressed. The wire runs down the inner right hand side of the upper steering column. It is essential that this bearing be in good condition, so replace as necessary. Though pictured with yellow wiring, the insulation color should be brown.



Pictured above and to the right is a very important component of the upper steering column and your electrical system. It's the terminal block at the top of the upper steering column. It's held in place by two screws, with wires connecting to both sides. Wires coming through the inside of the upper steering column are soldered to the top edge of this block, as the part is displayed in this picture. Wires coming in from under the dash connect to the side with the spade connectors.

Refering back to the terminal block picture above, and starting left to right, the following connections are made:

- Right hand turn signal wires, front and rear.
- Right hand side marker wire.
- Horn wire from the horn relay up front.
- Left hand side marker wire.
- Left hand turn signal wires, front and rear.
- Starter wire, from ignition switch to starter solenoid.

18. Rubber Grommets at nearly every point where the wiring passes through sheet metal. Refer to Appendix A of this document, **Page 57** for the grommet location(s), referenced below in brackets, along with Volkswagen's description of the grommet as taken from the official parts book:

- **[15]** Grommet –Starting motor cable. **3** required. Part number **311 942 189**
- **[18]** Grommet --23.5 x 8.5. **3** required. Part number **141 971 907**
- **[19]** Grommet --16.5 x 4. **1** required. Part number **111 971 911**
- **[20]** Grommet --12.5 x 2. **5** required (**7** for bumper mounted horns). PN **311 971 913**
- **[21]** Grommet --13 x 2. **2** required. Part number **311 949 149A**
- **[22]** Grommet --14.5. **4** required. Part number **141 941 199A**

19. License Plate lights in rear bumper overiders, left and right, with bulbs. These are period Porsche 356 parts and replacement sealing rubber and components can be readily sourced from **NLA Parts**, a Porsche aftermarket parts house.

20. Dual horns, whether located in the front trunk, bumper bracket mounted, or installed on the outboard edges of the top sides of the front bumper. Trunk mounted horns are exactly the same as Type 14 Karmann Ghia horns.

21. Generator, Coil, Oil Sender, Left and Right Dual Carburetor Chokes and optionally Left and Right Dual Carburetor Cutoff Solenoids –or-- single carburetor choke and cutoff solenoid. These are all the same as standard Type 3 parts.

22. Transmission ground strap. Type 1 and Type 3 part.

23. Starter with solenoid. Type 1 and Type 3 part. Match up the voltage and ring gear with the starter being purchased. The Type 3 6V cars use a 6V ring gear, but due to increase engine horsepower output, use a 200mm clutch disk and flywheel surface. Later 12V starter and flywheel are regular 12V parts.

24. Steering box to front beam ground wire, which is required for proper horn functionality. 12 to 16 gauge brown wire, sheathing optional, roughly 12 inches in length. Have seen braided and soldered ground strapping used in the later cars.

25. There are a number of bulbs throughout the car. 6V and 12V are not interchangeable, so keep the Wattages in line with specifications to prevent meltdown of plastic lenses.

Type 343 Karmann Ghia
Wiring Harness Kit Installation Guide

Part 2: Wiring Overview and Orientation

PLEASE READ THROUGH THE OFFICIAL VOLKSWAGEN SERVICE MANUALS PRIOR TO STARTING ANY WORK.

NOTE: When referring to the driver's side of the car, this is the LEFT side of the car, as this wiring harness guide is for installation in a left hand drive (LHD) car. The front of the car is the front; the rear is the backside of the car where the engine lives.

IMPORTANT NOTE: While grommets are not included in this wiring kit, they ***are*** absolutely required. Grommets are used where the wiring passes through the body of the car to prevent long term damage to the outer wiring sheath and wiring insulation. These grommets are critical to the longevity of the harness and electrical components, and most importantly to YOUR SAFETY. There are 18 grommets on early cars, plus 2 more for those with bumper mounted or fanfare horns, for a total of 20. These grommets are standard VW parts and equivalents can be either sourced or created.

The following details the wiring paths the harness takes through an early single carburetor car, as taken from an early Volkswagen Type 34 Parts List and shown on the cover of this installation guide.

The Type 34 wiring system fundamentally consists of a front wiring harness and a rear wiring harness. These two harnesses primarily join or 'hub' together under the dashboard at both the fuse box and at the upper steering column. There are other components under the dashboard that also act as hub and termination points for wiring and we'll get more into that during the actual kit installation.

Starting at the front of the car, head lights, fog lamps and parking/turn signal indicators are all obvious terminations for the wiring; however within the front trunk are also several termination points of note. Facing the car, as you open the hood, peering under the right front lip of the nose, you should see two small box or canister shaped objects and there will be a lot of wiring running to and from them. These objects are relays and they should be connected to a flat metal plate that the factory placed there as a proper mount point for them. Relays should never be left to dangle at the end of a wire.

The wires that connect to the relays are all part of the front wiring harness, but there is also a small horn harness, as well. Up through '64, the two horns were actually mounted in the trunk on a metal bracket that is welded to the inside nose of the car, exactly the same as on a Type 1 Karmann Ghia, with a similar oval hole for the sound to escape through. On '65 and later cars, the two horns are mounted on the outside of the trunk, one on each of the two front bumper brackets. For this reason, there are two different horn harnesses, but they both use the same horn relay. There are also two different horn ground strap arrangements, both of which are included in the kit. The entire steering column acts as a ground circuit for the horn, so there's a long wire included in the kit that goes the main length of the column. Unfortunately, NOT included in the kit is the front beam head

to steering box ground wire. This wire is crucial for proper horn operation, so replace as necessary.

The last front trunk wiring observation I'd like to make is the fuel tank sending unit wire, normally located under two layers of trunk liner, and directly on top of the fuel tank.

Moving a little further back and under the driver's side of the car, there are wires that connect to a switch on the brake master cylinder that activate the brake lights. If a later style master cylinder is used, there may be more wires that just the two originals. This completes the tour of the front wiring harness.

The under dash wiring provides five or six wiring termination points to contend with, depending on the year of the car. The fuse box is the primary termination and connection point for the front and rear wiring harnesses however the upper steering column wiring termination block is nearly as important. The high/low beam relay and turn signal relay are subsystem control circuits that also act to connect wiring. The pushbutton switch assembly is another collection point for wiring, but on the later cars this was broken down by headlamp switch and wiper switch. All of these components must be in good working order for the electrical system as a whole to function correctly.

Let's continue to move towards the back of the car and take a closer look at the rear wiring harness.

The rear wiring harness starts under the dash, travels directly down about 18-20" of metal tubing inside the left hinge pillar area, then makes an abrupt 90 degree turn and heads down about 5 more feet of metal tubing in the left rocker. The harness gracefully exits into an area accessible by removing the left rear interior panel directly below the left quarter window. From here, the wiring harness makes an important deviation that requires the removal of the bottom of the rear jump seat to fully appreciate. The harness travels to the voltage regulator, which is a large box-like object bolted to the back side of the rear jump seat kick panel. There are typically 5 wires connected to the voltage regulator, but of particular note is the large red wire that runs over to the battery. This is part of the recharge path for the battery. NOT included in the kit are the battery ground strap and battery to starter motor power wire, which runs from the battery '+' terminal, through the back of the floor pan and on down to the starter solenoid. Also NOT included is the transmission to front transmission mount ground strap. These three ground wires are nonetheless crucial for proper electrical system functionality. Replace as needed.

Moving back to the area beneath the left quarter window, the main part of the rear wiring harness continues up and over the inner wheel well, through the firewall, and on to the back of the car. There are two small cable runs that run over to the rear trunk light and rear trunk light switch, but the main part of the harness continues on to the left rear tail light and license plate light, and then on through the left wall of the engine bay. In the engine bay, wires connect to the generator, carburetor(s), coil, oil pressure switch, and then branch off to the starter. The main body of the harness then continues through the right wall of the engine bay, then goes on to terminate at the right rear tail light and license plate light.

Despite this, it's important to note that each year had subtle differences in wiring detail and running changes were made throughout the Type 34's production.

Part 3: Front Wiring Harness Removal & Installation

PLEASE READ THROUGH THE OFFICIAL VOLKSWAGEN SERVICE MANUALS PRIOR TO STARTING ANY WORK.

Front Harness Removal

The two main components of the wiring harness kit are the front and rear harnesses, Items 1 and 2, respectively. We are most concerned with Item 1 in this discussion. Please begin the process by disconnecting the battery leads before removing, modifying or installing any wiring. Wear eye protection/safety glasses when working around the battery.

Depending on the condition of your car, removal of the old front wiring harness may also involve the removal of some front trunk lining components, fog lamps and head lights. With the lighting components removed, un-snap the bottom front trunk liner at the left and right hinge areas and carefully roll this liner towards the front of the trunk and then slowly lift the hinged spare tire cover with the rolled trunk liner up about 90 degrees or more and lift it off its left hinge, raising the left side up about 1', then slide the whole thing to the left a little until the cover clears the right hinge, and then lift it all out of the trunk as a single unit and set aside in a safe place. Remove the packing material from the top of the gas tank. This packing is basically a large flat piece of thick tar paper and may or may not be present on your car. Next, carefully lift the lower edges of the left, right and rear front trunk liner material until it clears the harness casing all the way around the front trunk. Make note of the wire paths this harness travels through, taking pictures, if necessary.

The fuse box end of the main front harness passes through the firewall and into the passenger cabin area, under the dash, exiting via a single hole where the harness bunches together. What follows may confuse some of you because your wiring harnesses have been altered, so just work through each connected wire as best you can until all wires are freed. For those of you with stock wiring still intact (unlikely), disconnect all 14 or 15 wires – and this may take some doing and it is highly recommended that you to free the fuse box from its mountings under the dash, by removing the two Phillips screws. All wires are spade connectors, except the one large red wire, which should actually have a fuse holder in its path before it terminates at the fuse box. Separate this fuse holder and leave the other end of the wire on the fuse box for now. Remove the two wires from the fog lamp switch which is right under and behind the fuse box. The gas gauge wire is connected to the back of the left gauge housing and needs to be disconnected. The horn, front left and right turn signal indicator wires, left and right side marker wires, and large power wire all need to be CAREFULLY disconnected from the potentially fragile terminal block at the top rear of the upper steering column. Take your time with this, use a flashlight, and make notes and/or take pictures. Once all wires are disconnected, try to feed the harness bundle back into the trunk, leaving the large grommet in place at the hole where the harness passes through the firewall. Replace this grommet if it disintegrates. Next, move under the car, to the inside and rear of the front left tire, reach up and disconnect the two or more wires from the brake master cylinder. Move back into the passenger compartment of the car and look to the area of the firewall under the dash, but just above the pedal cluster. You may need to move back the top edge of the carpet to see where the wires rise from the master cylinder area and head into the car, and then up through another hole into the front trunk area. There are grommets around each hole, so the wire may be difficult to maneuver through them. Retain the grommets, and reinsert them into the holes, if necessary. Move back to the front trunk; disconnect the gas gauge wire from the sending unit at

the top of the fuel tank. Feed the wires from the head light buckets and fog lamp buckets into the trunk. Disconnect the wiring from backside of each front turn signal housing, removing the rubber rear connector covers from the ends of the wires. Feed the wiring into the trunk, retaining and replacing grommets from the harness, replacing as necessary. Remove the black wires from the horns, whether the horns are mounted on the front bumper or within the front trunk. For front bumper bracket mounted horns, push the horn wires through the 2 small holes in the lower nose of the car and into the trunk. Next, remove the two relays located on a mount plate to the front right of the hood opening at the front of the car. To release the main body of the front harness, carefully bend apart the 9 metal securing clamps located around the perimeter of the trunk, moving the harness out of these clamps. Lastly, lift the entire front harness out of the car.

Front Harness Preparation

Installation of the wiring harness is essentially the reverse of the removal process detailed above. Harness preparation is little more than taking the front harness from the kit and making the decision about which horn harness and ground wires to use from the Ziploc bag labeled Item 5.

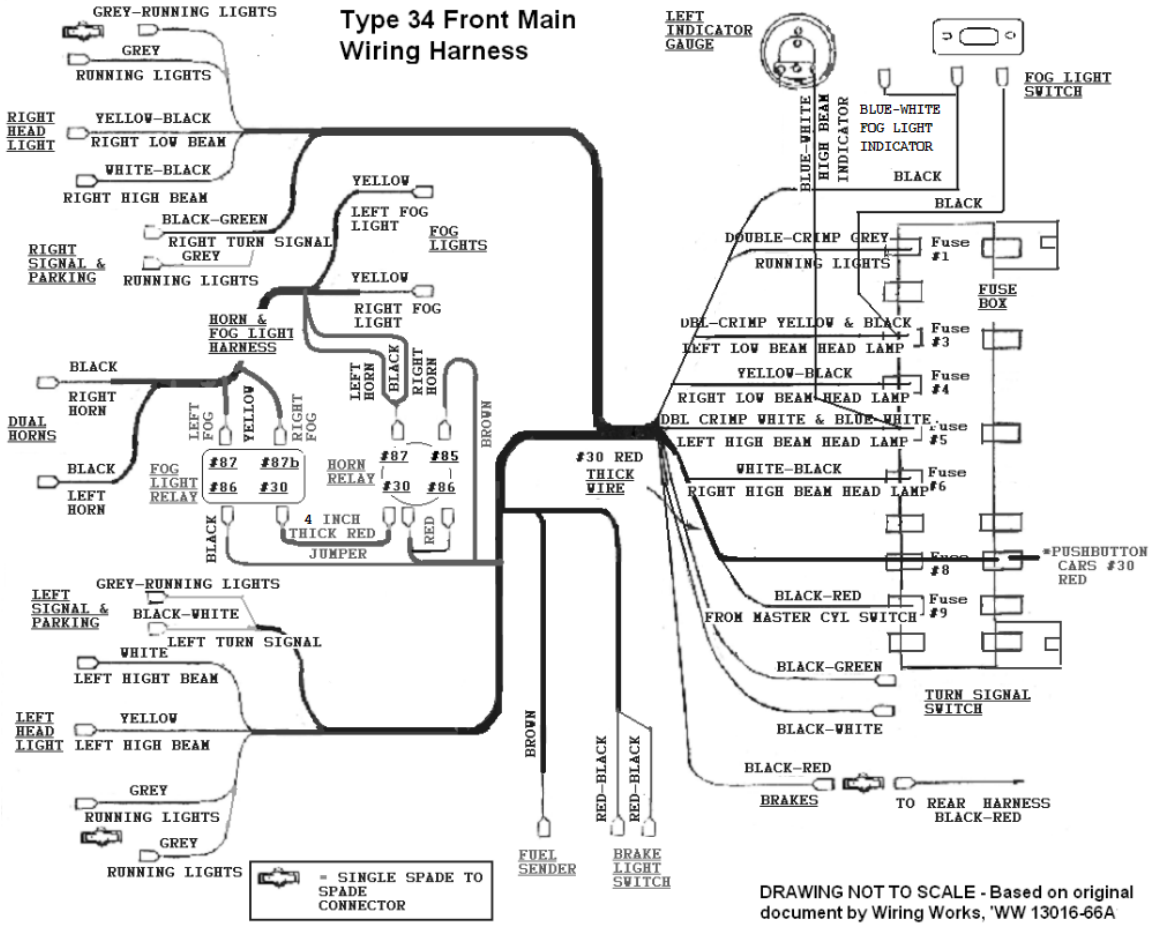
> **IMPORTANT NOTE:** Volkswagen made an early change to the front wiring harnesses of the Type 34. The color wiring diagrams show a green wire that runs from the fuse box, Fuse 9, to the horn relay in the front trunk, Terminal 86. This wire has been omitted entirely. Instead, the main front power wire has received a small jumper wire that is double crimped to the wire that connects to horn relay Terminal 30. The small red jumper than connects to Terminal 86, which is a simplification that results in identical functionality.

The only modification needed for the front harness would be if the car uses the pushbutton switch assembly for the headlamp and wiper controls. There is a black wire with a blue w/white stripe jumper wire that may need modification. While the black wire itself is necessary, the blue w/white stripe jumper will not be used on early cars. Don't initially cut this wire—simply keep it in mind going forward. The reason this wire is potentially unnecessary is that the pushbutton switch has a grey w/black wire that goes over to the indicator gauge to alert the driver that the fog lamps are on. The later cars instead use this blue w/white stripe wire to connect to the indicator gauge for the fog lamp indicator. This can be seen in a quick review of the color wiring diagrams included in the kit. If the wire isn't required, you can cut it back at the base of the spade connector, or you can cover the spade connector at the end of the blue w/white stripe wire with a short length of shrink tubing, which is included in the kit for this purpose. Or, you can just cut that spade connector off the end of the black wire completely and crimp on a fresh one. It's your choice.

Front Harness Installation

Head into the trunk with the front wiring and horn harnesses, the horn and fog lamp relays, one 'over/under piggy back spade connector' and a 10 gauge 4" red spade to spade wire.

> **NOTE:** Refer to the attachments for the wiring diagram for your year of car and the block diagram for the connections that need to be made. Always use the appropriate wiring grommets.



It's easier to connect wiring to the relays when the harnesses have not yet been installed. First, the over and under piggy back connector goes onto connection #30 of the horn relay, followed by the large red wire from the main harness, with the very small gauge jumper wire that jump from this connection goes to terminal # 86 on the horn relay. The second connection on this piggy back connector on the horn relay is used by one end of the 10 gauge 4" red jump wire, with the other end of this wire connected to terminal #30 on the fog lamp relay. Next, take the horn harness and connect the yellow wires to terminals #87 and #87b of the fog lamp relay – and it does not matter which of the yellow wires goes to either of these terminals. The black wire from the horn harness connects to terminal #87 of the horn relay. The final two unconnected wires on the front harness should be brown and black. The brown wire connects to horn relay terminal #85. The black wire connects to terminal #86 of the fog lamp relay. Connect the relays into their receptacles under the

front right hood opening relay mounting plate. The horn relay goes to the center of the car, and the fog lamp relay mounts towards the left side of the car.
Continue stringing the horn/fog lamp harness across the front nose of the car, pushing the yellow fog lamp wires through the grommets in the fog lamp buckets. There are two horn arrangements, one in the trunk and one where a horn is mounted to each of the front bumper brackets, with 2 wire holes drilled through the front nose of the car at bumper level through which these horn power wires pass. There should be grommets around these holes. Either way, the black horn wires connect to one of the two connections on each horn. The second horn connection uses a brown ground wire from the bag labeled Item 5, where the larger ground wire is used for the in-trunk horns and the 2 individual ground wires are used for the bumper mounted horns. Make all of these connections at this time.

Route the rest of the harness wiring through the trunk and through the hole in the rear trunk bulkhead to the under dash area. There should be a grommet around this hole. There are typically 9 clamps located around the front trunk floor that hold the front wiring harness in place. Connect the brown sheathed wire to the male spade connector on the sending unit on the top of the gas tank. There is a hole on the left rear of the trunk floor towards rear of the trunk floor through which the two sheathed brake light wires pass and make sure there is a grommet for this hole. This wiring then passes into the passenger compartment briefly for about 5 inches, and then passes through another hole to the upper left front lower bulkhead, which should have a grommet. For cars with the original single circuit brake master cylinder, these two wires should then be connected to the male spade connectors on master cylinder brake light switch and it doesn't matter which wire goes to which terminal. However, for cars that have been converted to a more modern dual master cylinder with the dual brake light switches, there are two 4 inch black with red stripe double crimped jumpers and extra spade to spade junction connectors included in the Ziploc bag labeled **Item 6** to allow the single brake light circuit to adapt to the dual circuit dual brake switch master cylinder. Their use is fairly straightforward. The dual crimp ends connect to a spade-to-spade junction connector, which in turn connect to either one of the two brake switch wires coming down through the front lower bulkhead from the passenger cabin. The other ends of each jumper pair connect to one of the spade connectors on each of the two brake light switches on the side of the dual master cylinder.

Since these two spade to spade junction connectors sit out in the elements, the voids in each connector should be filled with a little dab of silicone sealer to keep the water out. Take some of the extra shrink tubing from the kit and join wires down to each switch on the master cylinder. Use full rubber boots on the brake switches, so these spade connections will be protected from the elements and give it all a more finished look.

Going back into the front trunk, there are two holes on the left and right walls at the front of the front trunk where the harness passes into each front wheel well. There should be grommets around these holes. There is a hole in each head light bucket that should have a grommet, through which the four head light wires pass. There is also a fork in this wiring, with two wires on each side in their own sheath. These wires connect to the parking light/turn signal housing. Keep in mind that there are at least three different kinds of parking light/turn signal housings available for the Type 34. These differences will be discussed, next.

Front End Lighting – Turn Signals, Parking Lights and Headlamps

Volkswagen created M-Code Options for the Type 3 Karmann Ghia to allow the car to be marketed outside of Germany. These M-Codes were created to accommodate the laws and restrictions of many countries and several variations on lighting and lenses exist to cover the German, Benelux, French, Italian and North American markets. There may well have been others. Of particular interest is the variation on headlamps and turn signal housings, particularly as it applies to the parking lamp location. I will break down the two configurations generally seen on the Type 34, by ***European*** and ***North American***.

> **IMPORTANT NOTE:** Please read on because there are a couple of potential 'gotchas' you should know about before you connect any components or cut any wires. Refer back to Parts Identification for notes and pictures about the parts being discussed.

European: Type 34s bound for this market had the parking lights located within the headlamp assemblies. In a European context, these parking lights are also sometimes referred to as a 'city lights'. Within the headlamp bulb holder in the European headlamp assembly are actually *two* replaceable bulbs. The primary bulb serves the expected role of high & low beam headlamps, but the second bulb is a special small 5 to 15 Watt parking light bulb. In this configuration, when the parking lights are on the headlamp glows VERY dimly. This is the way it's supposed to work. Keeping this in mind then, you can see that there is no need to have turn signal housings on the car with provisions for parking lights. If one removes a turn signal lens and bulb and peers into the bulb holder hole in the turn signal housing, one would see that there is only one electrical connection visible and that the bulb itself is a single element style. What's more, there were actually two versions of this turn signal housing produced for the Type 34 over the years. The early version of the turn signal housing only had one male spade connector terminal on the backside to connect the turn signal wire. The ground for the housing was made by scraping paint around where the housing mounting bolts went through the body of the car. This made the body of the turn signal housing ground, when installed in the car. The later version of this turn signal housing went one step further and added a second male spade connector terminal to the backside of the turn signal housing, labeled '31'. Terminal '31' is tied to ground inside the housing, so don't attempt to connect a grey parking light wire to this terminal. All you will end up doing is popping a fuse, or burning the insulation off your nice new wiring.

> **IMPORTANT NOTE:** Please be careful with these wiring connections. A 'live' parking light or turn signal wire should NEVER get connected to terminal '31' on the European turn signal housings.

North American: Type 34s bound for North America have sealed beam headlamp assemblies fitted. These headlamps are often referred to as the Hella 'SB 13' style because of the obvious part number stampings in both the inner and outer chrome rings. A large replaceable sealed beam headlamp bulb with a standard 3-prong connector is used with this assembly. All of the wiring in this kit is by default set up to be used with these sealed beam headlamp assemblies. These headlamp assemblies would be matched to turn signal housings featuring provisions for **both** parking lights and turn signals. If one removes a turn signal lens and bulb and peers into the bulb holder hole, one would see that there are two electrical connections visible and that the bulb itself is a dual element style. These North American signal housings are somewhat rare because most cars were destined for the European market, so replacement parts production favored this market. One will also see the characters 'BLPo84' on the backside of these housings, along with Terminal

labeling 'BL' for the turn signal connection…and…ready for this? EITHER a '57' or '58' for the parking light connection. It's inconsistent, but thankfully it's also not as crucial as it would be on the European turn signal housing wiring because neither of these terminals are tied to ground. The ground path on these North American turn signal housings is right to ground through the mounting bolts that hold the housings to the car.

European headlamp assemblies and single contact turn signal housings go together as a matching functional set as intended by Volkswagen. Since some Type 34s actually had to go through and pass some sort of inspection during their importation to North America, a lot of weird things could happen and inconsistencies in lighting and wiring introduced. Keep this in mind when rewiring your car. You might be correcting problems created decades earlier.

> **NOTE:** When reinstalling your turn signal housings on a freshly painted car, the rule of thumb is to scrape some paint where the head of the mounting bolt and washer rests. I would follow up with some paint to cover any bare metal, or perhaps smear some silicon sealer over the area to help prevent rust.

Regardless of wiring configuration, the turn signal/parking light wiring passes through a special Type 34 only rubber boot that slips over the end of the turn signal housing. Again, the gray wire is for the parking light and if unused will either need to be cut off at the sheath, or will have to have a short length of shrink tube supplied in the wiring kit slipped over the spade connector, then shrunk into place to prevent accidental grounding.

Headlamp Wiring

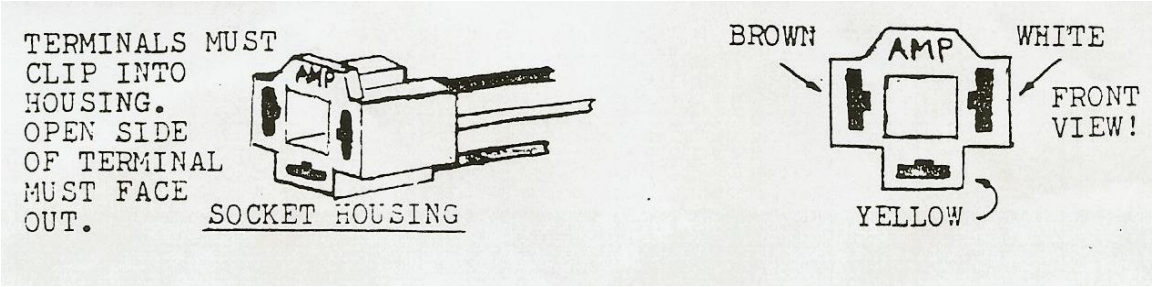
After the headlamp wiring is run up through grommets and into the headlamp buckets determine if you have the European style bulb connector or the North American 3-prong style sealed beam connector. For the North American market, and if the parking lights are to be run at the turn signal housings, use one of the single spade to spade junction connectors to connect the two grey wires together in each headlamp bucket. If the parking light is to be connected to the head light, as in the European market, run a short length of shrink tube over the spade connector for the shorter of the two grey wires and shrink into place to prevent accidental grounding. The other grey parking light wire coming down from the dash will have a spade connector crimped to it. If the European bulb holder has no provision for a spade connector to connect the parking light wire, you will either have to source bulb holders with this provision, or use the bulb holder you have, and cut off the spade connector at the end of the grey wire, strip back ¼" of insulation and insert this wire into its spring loaded receiver.

Again, by default the Type 34 reproduction replacement front wiring harness you have purchased is set up for use with the SB 13 sealed beam headlamp connectors, with parking light wiring in the turn signal housing.

> **IMPORTANT NOTE:** Before cutting and replacing ANY headlamp wiring connectors, triple check everything FIRST. In the United States you should not need to cut any wiring, unless you have some very usual headlamp components, such as Marchal or older VW. No spare large female spade connectors are included as spare parts in this wiring kit, so once these are cut you are on your own to locate replacements.

If you will instead be using the European bulb holder, please note that there are different kinds of bulb holders, one with spring loaded connectors, another with male spade connectors, and a third that uses headlamp bulbs with the 3-prong connector in a configuration that is exactly the same as the US sealed beam connector configuration. By far, the most common is the latter. However, if you have the spring loaded connector style you should be able to convert to the 3 prong style connector by finding the correct bulb holder and bulbs. If these cannot be sourced, you will have to cut the large spade connectors off the large white and yellow headlamp wires at the headlamp buckets, stripping back about ¼" of insulation from each wire end, then inserting each into the spring loaded receivers on the bulb holder itself. Also, remember to similarly remove the large spade connector and strip back some insulation from the headlamp ground wire, whose other end will ground to the car via a sheet metal screw in the back lower side of the headlamp bucket. For the bulb holders that have the small male spade connectors or eyelets, you will have to cut off the large spade connectors with the smaller style spade connectors included in the kit. A crimping tool is a must for this work. For the third type of 3-prong connector, no modifications are required and you can just treat the wiring as you would the 'SB 13s', detailed below.

If you have the sealed beam 'SB 13' headlamp assemblies, use the included 3-prong connector and wiring, as no changes will be required. If you look down the various openings in this connector, you will see three long narrow channels for three wires to run through, forming sort of a squared off 'U'. On the bottom of this 'U', insert the yellow (low beam) wire. From the backside of the connector, the left side of the 'U' is for the white (high beam) wire and the right side of the 'U' is for the brown (ground) wire. These wires should lock into the connector, so make sure you have the wires oriented correctly, then spread out the tiny locking hook in the wire end, then snap each wire into place. You should then be able to test your connector on a real sealed beam unit and all wires should make solid contact and not pop lose. Also, remember to attach the brown ground wires, whose other end will ground to the car via a sheet metal screw in the back lower side of the headlamp bucket.



The new ground wires have been provided to replace the originals for both head lights and fog lamps. Make sure the replacements ground well for the brightest lighting possible.

There are only two fog lamp connections per lamp. One is the new ground connector you just installed and the other is the power connection for the bulb, and is exactly the same on all cars.

> **NOTE:** Refer to the attachments for the wiring diagram for your year of car and the block diagram for the connections that need to be made. Some of the front wiring harness under dash connections and testing is covered in Section 5, Pages 43 – 47. Please refer to the wiring block diagram above and full color wiring diagrams in Appendix A to make these connections, particularly if the front harness is all that is being replaced at this time.

Part 4: Rear Wiring Harness Removal & Installation

PLEASE READ THROUGH THE OFFICIAL VOLKSWAGEN SERVICE MANUALS PRIOR TO STARTING ANY WORK.

Rear Harness Removal

The two main components of the wiring harness kit are the front and rear harnesses, Items 1 and 2, respectively. We are most concerned with Item 2 in this discussion. Please begin the process by disconnecting the battery leads before removing, modifying or installing any wiring. Wear eye protection/safety glasses when working around the battery.

There's a very good chance that you will not be able to remove the old rear wiring harness from your car in one piece – but you can always try. The casing on the old harness has a tendency to become very brittle and there is a place where the wiring has to make a 90 degree bend between the left rocker and the left hinge pillar. As the casing hardens, it can no longer negotiate this tight turn, essentially locking the old wiring harness into place. It's very annoying.

Fortunately there is a little – and I mean little – access hole very near the 90 degree bend. To access it, you will need to remove the trapezoidal shaped carpet section from the area just to the front of the driver's door opening, which is held is place by at least 2 or 3 carpet tacks and a lot of old glue. You will likely need to remove the bottom portion of the windlacing at the front of the door opening, too, as well as moving back the thin carpet section where your left foot would rest normally while driving. All of this is simply to give you the greatest advantage of access to this small wiring port, which you will need access to anyway to install your new rear wiring harness. You will then barely have enough room to cut through the old harness casing and 11 wires to free the old harness in unequal halves. This is the easiest way to get the old wiring out of the way and I have had to use a good set of diagonal cutters and much persuasion to cut it completely through. Once done, the wiring can be slid out from under the dash by pulling very hard on that end of the wire harness and you'll want to wear leather gloves so you don't cut yourself on the many sharp corners under there.

Prior to any of this fun, you will want to disconnect the 11 old rear harness wires from under the dash. Refer to the diagram labeled 'Type 34 Rear Wiring Harness' for details on the wires that need to be disconnected. The factory shop manual also has some excellent advice on the subject. Again, I recommend removing the two Phillips screws that secure the fuse box for best access to the wiring, some of which is very large. If you discover you need to hack your old harness into two pieces to remove it, remove the short end from under the dash and the long end by sitting in the jump seat, after removing the interior trim panel beneath the left quarter window, and disconnecting the regulator wiring and pushing and pulling this short harness into this interior body area beneath the quarter window. You will have good leverage from this position to pull the long length of harness through the wire tube within the left rocker panel. Expect a lot of dust and dirt to be expelled as part of this process. Again, leather gloves and determination are key points, here, and don't be afraid to ask for help.

At this point you should have the old harness pulled into the body cavity beneath the quarter window. I recommend a couple of things, here. Find a roll of mechanics wire. Whatever wire you use needs to be stiff, flexible and cheap. I like mechanics wire. Use a pair of needle nosed pliers to bend the sharp end of the wire around on itself so there's a blunted end to the wire, as you don't

want the wire end snagging on the rough and rusty wiring tubes. Reach down into the area where you pulled the wire out and you will find a ¾" angled tube opening. Run the wire into this opening. If it hangs up, gently pull it back, and then move it in again until you hear the wire emerging at the access port where you had to cut your old harness. Remove your gloves and shine a light down into the opening. You can barely see the opening of the tube as it emerges from the rocker panel. Guide the mechanics wiring up and out of the opening a few inches. Next, you want to guide the wire UP the second wiring tube in the left hinge pillar. You can feel the opening of this ¾" tube with your finger through the access port. Get the mechanics wire started up this tube. Go back to the jump seat and make sure you have enough slack with the mechanics wire. It may be necessary to help feed the wire upwards at the 90 degree bend. Eventually, the mechanics wire will be visible from under the dash, so give yourself about 2 or 3 feet of extra length.

Next, move to the back of the car. Remove the tail light assemblies disconnect the old wiring and set them aside in a safe location. Dropping these on a concrete or asphalt surface will likely crack or scratch the delicate chrome housings, so be careful as nice ones are getting hard to find. Reach around inside the back of each rear bumper overrider and disconnect the license plate light wire. Route this wire either through the bumper bracket grommet or through the special hole drilled in the body for this purpose, remembering the grommet, or installing one if missing. There may be a second grommet at the point where the wire routes into the inner rear fender area beneath the tail light opening. This one is very important to keep dirt and moisture out of this very rust susceptible area.

By this point, if you've forgotten to remove the battery wires you will have produced a shower of sparks numerous times in the harness removal process. However, if you've been extremely lucky due to the wiring having been hacked a lot, and still have forgotten to disconnect the battery wires, this next maneuver COULD KILL YOU under the weight of the car. Double check that your battery cables are completely free of the battery - better yet, remove the battery from the car. THEN, make sure that your jack stands are secure. Only then should you move under the car and remove the small wire from the starter solenoid. It's actually a fairly thick wire, but by comparison with the wire from the battery, it's the smaller of the two.

Open the rear decklid, remove the bottom trunk liner and the engine lid completely from the car. I'd also recommend that at this point you remove three more items from the car, but this is purely at your discretion. You really need good access to the left rear inner fender well and the best way to get the best access is to peel back the left side inner trunk liner, followed by the removal of a cardboard cover, which exposes an access port that should allow you and your forearm more than a reasonable amount of access. Sometimes the cardboard cover sticks to the truck liner, sometimes it's missing altogether. Sometimes the trunk liner is too. It's a shame the way these cars are abused. Anyway, there is one more item that is pretty easy to remove and that is the rear tray drain tube. Actually, there's one in each fender well and they are somewhat flexible, full of dirt, and are in your way for this procedure. Rock the top part away from the metal body tube, then lift the object out from its lower mooring. Hear the dirt flow from the tube? You can actually twist the tube around and bring it completely out of the fender. Knock the dirt out of it and run a shop vac around the inside of your fender to get the rest of it. There may be some rust down there, so shine a light around and see what you've got.

Moving back to the wiring harness removal, we next need to free the trunk light wiring. There's a switch contact next to the rear decklid latch. Remove the single Phillips screw and set it and the

switch aside, for now. In the rear trunk, towards the center and beneath the front lip of the trunk opening is a light. The lens for this light sort of looks like the interior light, but it does not have a switch – and in my opinion it should. Mine will, because there's nothing worse than the rear trunk light running down your battery when you least expect it. Anyway, use a copper penny (or equivalent) on one end edge of this lens to carefully pry one side downwards, and then hinge it out of the opening. There's not much slack on these wires, so disconnect them carefully so you don't shatter the rather rare lens. Actually, if you know you aren't going to re-use the old harness, cut the wires to remove the lens. Condensation has a tendency to corrode the spade connections, sometimes making removal difficult. Once all connections are freed, you will need to finish removing the left inner trunk liner to route the old wire out into the inner left rear fender well. You will also need to carefully lift the rear trunk liner strip to remove the switch wire, again feeding it into the inner fender well. Remember your grommets, too.

From inside the right rear inner fender well, feed the right rear light wiring out through the inner fender side panel, and then through the thin inner engine compartment side panel. The starter solenoid wire should now come through the front engine compartment sheet metal. Carefully remove the harness from hangers on the front engine compartment, and then feed the cable through the left thin inner engine compartment side panel, dropping the harness to the ground. Next, disconnect the coil, choke, cutoff jet and oil sensor wires, then feed this harness end through the left inner fender side panel.

You should now have all of the wiring for the back part of the car in the left inner fender, ready to pull out the left rear tail light hole. Make sure the left tail light hole has some cushioning around it so you don't damage the paint during harness removal. Go back into the passenger cabin and make sure the cable clamps are all lifted for the wiring harness so the removal of the harness doesn't damage them or the rear defroster damper and paper tubing. You want things to flow as freely as possible, so wipe down and straighten out the harness inside the car as much as possible, then move to the back of the car and start carefully and slowly pulling the harness out of the car through the left tail light hole. If something snags, stop. Go back inside the car and help the wiring through the little opening in the firewall within the inner fender well, pushing the cable through. Then, go to the back of the car and pull up the slack, and repeat. Don't bend or scratch anything, or put a desperate strain on anything. Eventually, it will all come out.

With the harness out of the car, go back into the passenger cabin, sit in the jump seat and reel off about 10 or more feet of mechanics wire, then cut it. Use the needle nose pliers to bend back this most recent cut, then reach up into the left inner fender well from under the quarter window and push it through the hole, feeding about 2 or 3 feet of it though. Go to the back of the car and pull the excess out the left rear tail light hole. This is your guide wire – or drag line. Either way, you are going to use this wire to install the replacement harness. Notice that you really don't have to have a harness in the car already to install this wire. You can always do what I did and install one after the old harness is out of the way. The important thing is that you really will want the guide wire in the car when you go to install the new harness.

Rear Harness Preparation

Pull the rear harness out of the kit and stretch it out. Ideally, you want to install a wiring harness after it's had some time to warm up. Orient the harness correctly, preferably stretching it out parallel and behind the car at the left rear taillight body opening. Take a 1 foot length of mechanics wire and a roll of duct tape and go to the end of the harness with the little tag labeled 'Item 2'. This is the end that will go in first and connect to the fuse box. Fold your 1 foot length of mechanics wire in half. Find the two large red wires on your harness. Fold red wires and the mechanics wire around each other so that you have a 2 " loop of mechanics wire at the head, then start wrapping the wires as tightly as possible into a bundle. Not too much duct tape, as you only want to cover the last 3" of the main wiring harness casing, but enough to make sure the large red wires hold to the mechanics wire when it's pulled through the metal wire tubing.

The other harness sections you will want to bind with duct tape are the voltage regulator wires and casing. Keep this in mind as you feed the harness through the first firewall hole.

Next, give yourself about a foot of mechanics wire out the left rear tail light hole, cutting off the excess. Loop this wire around the head of the new wiring harness, then fold back the end of this wire using the needle nose pliers because you don't want that wire end snagging on anything. Again, make sure the left tail light hole has some cushioning around it so you don't damage the paint.

Rear Harness Installation

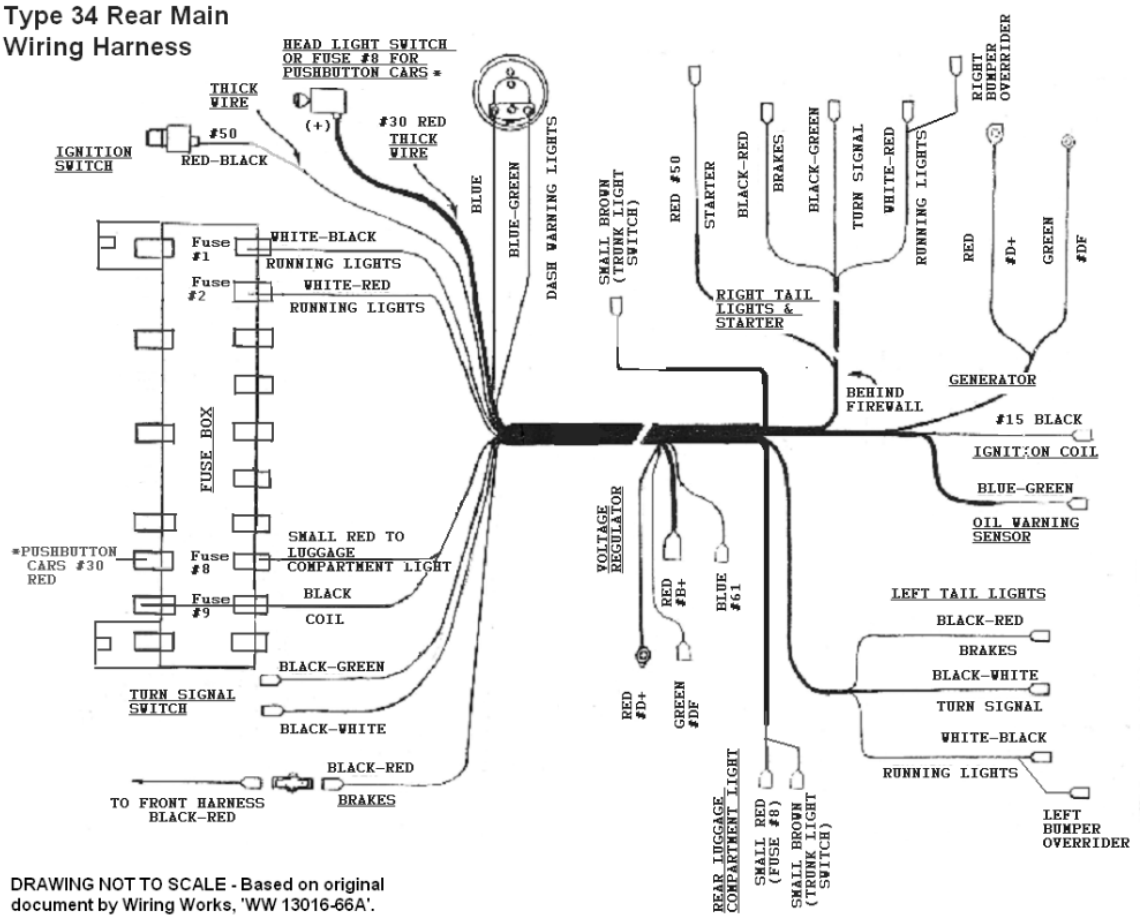
Put on your leather gloves and go under the dash, create a loop in the end of the mechanics wire, and start pulling SLOWLY. There will be a lot of resistance as the wire attempts to find its way through the hole in the rear fire wall in the left rear inner fender well. The harness may need some help as it starts to enter the rocker wiring tube, so feel free to push the wire into this tube, taking up the slack as needed at the front of the car by pulling on the wire from under the dash. Of particular concern are the voltage regulator wires. Do not strip the insulation from these wires in your enthusiasm to get the harness installed. You must go back and help the wires though the hole in the rear firewall. You will need to move from pulling the wire from under the dash to guiding the wiring through the firewall, and back. You can do a lot of this from the jump seat area and once you have the voltage regulator wiring showing, start unwrapping the duct tape for it. Lift the jump seat and push the 4 wires in their sheath through the hole, ensuring that there is a grommet around this hole. It's important! Leave the voltage regulator wires on the floor pan for now and put the jump seat back down.

With luck, the harness will move through the rocker panel with relative ease. Sometimes a rock, some Bondo, or a bunch of rust and dirt works against you. You may need to shoot some WD40 down the tube in both directions to get things moving. You may need to pull the harness out and take another run at it. Regardless, once you are exerting a dying strain on the wiring you are either going to hurt the new wiring, yourself--or both. Take a break. Shoot some compressed air down the tube. Maybe run an old clutch cable through the tube, fray it out like a big wire brush at the access port at the 90 degree bend, then drag it back out. There are things you can do to get it cleaned out enough to run the harness though. Take your time and be safe!

Once the harness passes through the rocker panel wiring tube and starts to enter the access area it will already have started to make the 90 degree bend. All you need to do at this point is guide

the harness through the transition into the second vertical wiring tube. Pushing on the harness back next to the jump seat and pulling on the harness using the guide wire from under the dash will eventually get the harness where it needs to be. You will know you have the harness installed with the wires for the voltage regulator tee off right at the entrance hole to the rocker panel wiring tube and the main harness sheath sticks 4" out of the wiring harness tube under the dash. Remove the duct tape and guide wire from the end of the harness under the dash.

> **NOTE:** Refer to the attachments for the wiring diagram for your year of car and the block diagram for the connections that need to be made. Some of the front wiring harness under dash connections and testing is covered in Section 5, Pages 43 – 47. Please refer to the wiring block diagram below and full color wiring diagrams in Appendix A to make these connections.



IMPORTANT MODIFICATION NOTE FOR SINGLE CARBURETOR CARS:

- Once the rear wiring harness is installed, and ONLY if you are using a single carburetor engine, you will need to modify the rear wiring harness in the engine compartment in the following manner:
    - Slide the supplied 6" length of ½" diameter shrink tube down the wiring to completely cover the left choke wire dual crimp section and spade connector. Heat the shrink tube to lock it into place.

- Modify the coil wire by taking the end lead spade connector over the top rear of the single carburetor and connecting it to the choke connector. Drape this wire alongside the rear of the carburetor, connecting the second spade connector to the idle cutoff solenoid. There should be a bit of flex to the cable, so route it accordingly and gently bend the spade connector on the cutoff solenoid to accommodate. Then, locate the strip of 10 crimp-on spade connectors and cut one off the strip. Route the wire loosely over to the '+' terminal of the coil, routing it in a way that doesn't interfere with the accelerator linkage, then cut the wire here. Trim back 3/16" of insulation. Take the other end of the cut wire and route it next to the coil, giving plenty of slack and take the end of the '+' side of the coil. Cut off any excess wire, removing 3/16" of insulation. Twist the wire ends together, and then use the open barrel crimpers to make a dual-crimp using one open barrel spade connector. Once done, connect this spade connector to the '+' side of the coil. There are no other modifications to make.

Part 5: Interior lighting, side marker lighting and under dash wiring installation

PLEASE READ THROUGH THE OFFICIAL VOLKSWAGEN SERVICE MANUALS PRIOR TO STARTING ANY WORK.

Side Marker Lights

The economy side marker light wiring has been included in this kit. The wiring is located in the Ziploc bag labeled Item 4. The shorter white with black stripe wire runs from the upper steering column terminal block labeled 'Pl', down to a hole with a grommet in the left front wheel house, terminating on the socket housing for the left parking light. The longer white with red stripe wire runs from the upper steering column terminal block labeled 'Pr', along the inside bottom of the dash through clamp downs, and then down to a hole with a grommet in the right front wheel house, terminating on the socket housing for the right parking light.

OPTIONAL: You can change the function of the left and right economy parking lights and set them up as side marker ***blinkers***, instead. To do this, first route the side marker wiring as described above, connecting the wiring to each side marker socket housing out on the sides of the car. What is done differently for this wiring is to use two over and under piggyback spade connectors on the 'L' and 'R' terminal connectors on the upper steering column junction block. Disconnect whatever turn signal wiring is connected to 'L' and 'R' terminals to allow this piggyback connector to be installed, and then reconnect the wiring to one of the connections on the piggyback connector. Connect the white with black stripe wire to one of the now three available 'L' terminal connectors on the upper steering column junction block and connect the white with red stripe wire to one of the three available 'R' terminal connectors. No cutting or other wiring adaptations are required. Connect all other turn signal wiring as usual.

> **NOTE:** Depending on your country and local restrictions, making ***blinkers*** out of the economy side markers may also involve a lens or bulb change. In the US, the side marker lens would probably need to be changed to amber, amber/clear, or clear. It is also possible that an amber bulb would be required if a purely clear lens were to be used. Again, local law drives this requirement so check in advance before making this change.

Interior Light Harness Installation

Of all the components of this wiring kit, the interior light harness is possibly the most difficult to remove and replace, even when a guide wire or drag line is installed to facilitate replacement. If the old interior light harness is in place and you know it works, I'd recommend making do with it. If it's not installed or is known to be bad, the next process might test your patience.

The overhead harness runs from the overhead interior light, down the left hand roof 'A' pillar, exiting through a chamfered hole under the dash. There is no grommet around this hole so when installing the harness please make sure that the wire casing is extended through the hole to protect the wiring from being cut, sawed or stressed over time. These wires then run to the door contact switches on each side and on to the power provided through fuse #8 in the fuse box. Later cars also have a section of wire that runs from the headlamp flasher relay over to the fuse box. By far, the most difficult part of this harness installation is the run up the 'A' pillar because of the sharp bends and rough interior sections at both the top and bottom ends of this pillar. Generally, at the top of the pillar, there are two internal routes the wring wants to take. More often than not, the wiring will want to go towards the front middle of the roof, and you need it to go towards the left roof

edge. It's far easier to install this wiring with the headliner out of the car, but if this is not possible, then please make sure that the guide wire is installed as you pull out the old harness. I recommend installing the guide wire from the interior light lens hole, downwards until it expels from under the dash. When installing the replacement harness, wrap every inch of exposed wiring that runs up the 'A' pillar. As mentioned previously, the paths that this particular wiring travels are very rough and it is very possible that you could nick some wire insulation during installation. A fire in the roof area is the last thing you need, so please be careful.

Once installed, the interior light lens connections in the roof are fairly straightforward, as there are only two connections. The brown wire connects to the side of the lens with the switch. The red wire connects to the side of the lens that does not have a switch. Failure to make these connections correctly will result in a popped fuse—or worse, so make sure you've got it right. Back under the dash, the brown double crimped connector connects to the left door contact switch and the long brown wire is routed alongside the right side marker wire and connects to the right door contact switch. A single Phillips screw holds each contact switch in place. IMPORTANT! Read the NOTE below regarding the connections for power to this harness.

> **IMPORTANT NOTE:** Please refer to the harness with the small red wire that is double crimped to another short red wire, which is subsequently double crimped to a white with black stripe wire, and then to another short red wire. It's a mess! You will either need to use the harness as is, or do some cutting and re-crimping and **the modifications required depend on the model year of car and also depend on whether you have a pushbutton headlamp switch instead of a conventional headlamp switch. Read about all 3 options, then make your decision about which option to use.**

1. If you have a car built from May of '64 and later with the conventional, non-pushbutton controls, no modifications to the overhead interior light harness will be required. Install the harness and observe the '64 and later wiring document for the overhead light harness and headlamp control connections. In short, the four connections you will want to make using the end of this harness are as follows:

a. Starting at the first small red wire to small red wire double crimp, connect this to terminal '30' on the Headlamp Flasher Relay.
b. At the next double crimp, a small short run of red wire double crimps to a white with black stripe wire. This connector goes to terminal 'J' on the Headlamp Flasher Relay.
c. At the next double crimp, the white with black stripe wire double crimps to a small long run of red wire. This is the power line for the overhead light harness, the clock, and the headlamps. Make this very important connection to the best of the available connectors at Fuse #8 on the side of the fuse box towards the front of the car.
d. The last connection involves a long small red wire run over to the back of the clock.

2. If you have an early car up to May of '64 that has been converted to the conventional headlamp and wiper controls, no modifications to the overhead interior light harness will be required. Install the harness and observe the '64 and later wiring document for the overhead light harness and headlamp control connections. In short, the four connections you will want to make using the end of this harness are as follows:

a. Starting at the first small red wire to small red wire double crimp, connect this to terminal '30' on the Headlamp Flasher Relay.

b. At the next double crimp, a small short run of red wire double crimps to a white with black stripe wire. This connector goes to terminal 'J' on the Headlamp Flasher Relay.
c. At the next double crimp, the white with black stripe wire double crimps to a small long run of red wire. This is the power line for the overhead light harness, the clock, and the headlamps. Make this very important connection to the best of the available connectors at Fuse #8 on the side of the fuse box towards the front of the car.
d. The last connection involves a long small red wire run over to the back of the clock.

3. **If you have an early car up to May of '64 with the pushbutton dash switches, wiring modifications will be required.** These modifications simply involve cutting two wires ***correctly***. There are two ways the modification can be done, depending on available tools. Follow one of these two methods:

Method #1 (Involves crimping tools you may not have)

a. Starting at the first small red wire to small red wire double crimp, cut the wires right at the crimped on connector.
b. Strip back 3/8" of insulation at the end of the small red wire that comes down from the overhead light.
c. From the section cut from the end of the over head light harness, cut the double crimped section from between the long red wire and the white with black stripe wire. You will end up with a small gauge red wire about 16" long with a spade connector on one end. Strip back 3/8" of insulation from the other end.
d. Select an open barrel spade connector from the hardware bag in the wiring kit and create a double crimp using striped back ends of the two small gauge red wires.
e. Use the resultant harness. The long end of the harness goes over to the back of the clock.
f. The power line for the overhead light harness is a very important connection made at Fuse #8 on the side/edge of the fuse box that faces towards the front of the car.

Method #2 (Involves simply cutting wires in the right places)

a. Starting at the first small red wire to small red wire double crimp, you want to keep the crimped on connector but break the chain of wiring. About 1/8" past the double crimp, on the very short length of red wire only, make a clean cut. Select a piggyback connector from the hardware bag in the wiring kit and connect the remaining wire to one of the two available connections. Plug the piggy back connector itself into an available location at Fuse #8 on the edge/side of the fuse box that faces towards the front of the car.
b. Take the piece of harness cut from the overhead wiring harness. Starting at the end with the very long small gauge red wire, move along it until you come to the first double crimped section, where this red wire joins the white with black stripe wire. You want to keep the crimp on connector and keep it connected to the red wire. About 1/8" past the double crimp, cleanly cut through the white with black stripe wire. Take this red wire with spade connectors at each end and plug it into the other available piggyback spade connector receiver end on Fuse #8. Connect the other end of this wire to the back of the clock.

Under dash wiring

With the front and rear wiring harnesses run and wires dangling under the dash, the next step is to prepare and install the under dash wiring.

Remove the multifunction gauge, speedometer and clock

If installed, remove them. This will give you much more visibility while working under the dash and give much better access to wiring from above. The only component to have readily available is the Bakelite backside of the multifunction gauge, where many electrical connections will be made.

Install the wiper motor assembly, frame and wiper arm pivots

This is typically a complete assembly, held into place by a bolt through a rubberized buffer with a ground plate. The ground plate might need some paint scraped to make good electrical ground contact. The two wiper pivot arms are fit through the two holes in the front window cowl, and likewise have rubber buffering, held into place with a series of shims, washers and nuts. Make no electrical connections at this time.

Install the turn signal and high/low beam relays

Make no electrical connections at this time. Make sure that each relay canister has good electrical continuity to ground.

> **NOTE: Turn signal relays** are variables, depending on which of the two main types are used. Some have three terminals, some have only two. There are a couple of ways of dealing with this to ensure the turn signal indicators on the left dash gauge work correctly. One of the assumptions made was that the upper steering column wiring is good, which means that for later cars the black with green and white stripe wire has a double crimp at its end with a 4 to 6 inch blue or blue with green stripe jumper wire. The black with white and green stripe wire connects to terminal 'S' on the turn signal relay, and the jumper connects to the turn signal indicator gauge terminal 'K3'. Alternately, this jumper is completely missing, which is typical for the early cars. Either way, a 10" blue with green stripe wire has been included to allow the installation of either 2 or 3 prong turn signal relay. It is used if you have a 3 prong relay. Otherwise, just set it aside in case it is needed in the future.

Install the upper steering column

The upper steering column slides onto the lower steering tube and is secured by one Allen bolt (8mm bolt threads, 6mm Allen wrench required). Thread this bolt, but don't snug it down until the two main Allen mounting bolts are threaded into the upper steering column rubber mounts, and everything is aligned such that the steering wheel is at a proper angle and moving the steering wheel lock to lock produces no scrubbing of the steering column itself inside both the tube and the upper steering column. Also keep in mind that the lower steering tube should also have a rubber buffer around it as it passes through the lower front passenger compartment bulkhead. All of these rubber components electrically isolate the steering column to keep the horn from activating until it is grounded by the operator pressing the horn button. Once aligned, snug up the upper column to steering tube Allen bolt, then install and snug up the two Allen mounting bolts. DO NOT over tighten any of these bolts.

Loosely Install the pushbutton switch, or the conventional headlight and wiper switches
Don't cinch these down, yet. You want them loosely in place to aid with wire routing and will drop each down to work on while making the electrical connections. Depending on the original equipment of your car, you have choices to make. The Ziploc bag labeled **Item 6** has a wealth of wiring that you may need, depending on the condition of your existing wiring and the year of your car.

- **For those with pushbutton switch dash controls**, some of the remaining wiring harness kit wires are not needed because the pushbutton assembly has a lot of this wiring directly attached to it. Make all of these electrical connections at this time, referring to the full color wiring diagrams. Wiper wiring, fuse box connections and multifunction gauge connections need to be made. Leave both the fuse box and the multifunction gauge connector dangling at this time.

  IMPORTANT NOTE: Please refer to the section below entitled '**Dash light wiring**' for some important information on this subject. You can even use this wiring and the **conventional dash control** wiring to repair any damaged wiring on your pushbutton switch.

- **For those with conventional dash controls**, whether originally equipped or converted, six of the remaining 9" wires are very important to you:
  - Red – connects between terminal '30' of the headlamp switch and fuse #8 on the side/edge of the fuse box towards the rear of the car.
  - Grey – connects between terminal '38' of the headlamp switch and fuse #1 on the side/edge of the fuse box towards the rear of the car.
  - Black – connects between terminal '53a' of the wiper switch and fuse #12 on the side/edge of the fuse box towards the front of the car.
  - White with black stripe – connects between terminal '56' of the headlamp switch and terminal '56' of the headlamp flasher relay.
  - Yellow – connects between terminal '56a' of the headlamp flasher relay and fuse #3 on the edge/side of the fuse box towards the back of the car.
  - White – connects between terminal 'F' of the headlamp flasher relay and fuse #5 on the side/edge of the fuse box towards the back of the car.

Dash light wiring included in this kit is intended for use with the conventional headlamp control, as the pushbutton switch has this wiring attached directly to it. This dash wiring takes into consideration that the moving arms associated with the wiper mechanism have the possibility of coming into contact with the clock light connector. A piece of shrink tubing was placed over this spade connector to help mitigate this fire risk, and in accordance with the VW service bulletin issued back in the day. However, one more modification is highly recommended:

IMPORTANT NOTE: Bend the spade connector that is part of the clock dash light bulb holder to 45 degrees from horizontal. Position this bulb holder so that the bend in the connector points downward. Then connect the spade connector with the shrink tubing on it to this bulb holder.

The remaining dash light wiring connections are made as per normal, with the final connector made to terminal '58b' on the conventional headlamp switch.

Connect the upper steering column wiring
There are 7 wires in a short wiring casing emerging from the upper steering column that should now be connected.

- 2 very thin wires from the high/low beam switch in the turn signal arm, one brown and one brown with a white stripe. Run the brown wire to the ground male spade connector at the right fuse box pedestal mount. The other thin brown wire with white stripe wire goes to Terminal 'S' on the high/low beam relay.
- Large 12 gauge red wire goes to the rear side of Fuse 8. This is main, unswitched power right from the battery when connected to the fuse box, so be careful.
- 2 gray wires go to both sides of Fuse 7 and is the power wire for the economy side marker lights, when configured. Does not matter which gray wire goes to which side of the fuse. The gray wire that comes from the ignition switch may have a white stripe. Regardless, this line is only active when the ignition switch is turned OFF.
- Black wire goes to rear of Fuse 10 and is switched power to the coil wire on the engine.
- Black with green AND white stripe goes to Terminal 'S' on the turn signal relay, whether 2-prong or 3-prong version.

Check for grounded wiring and/or electrical components
The front and rear main wiring harnesses terminate under the dash, mostly at the fuse box and the upper steering column, but a few go to the backside of the multifunction gauge. Prior to connecting any wiring from either the front or rear harness, all of the lighting, generator, regulator and other engine connections should be in place—**EXCEPT THE BATTERY**. Those wires that cannot be connected to anything must be fully taped off with electrical tape temporarily to prevent accidental grounding of electrical circuits. Next, test each of the dangling wires under the dash from both the front and rear wiring harnesses to ensure that none of them somehow managed to become 'shorted-out to ground' during installation. Also, as electrical components were connected at the distant ends, and bulbs installed, etc, it's possible an electrical problem was introduced. Testing is needed and you want to do this prior to any power being applied to this wiring for at least two reasons:

- Resistance checks using a **digital** Volt/Ohm Meter should always be done with power removed.
- Power applied to wiring that is dangling means a potential short to ground on a circuit that is not yet fused, which can destroy wiring.

First, turn your digital Volt/Ohm meter to the lowest resistance setting possible. Then, find a good clean ground connection up by the mounting screw holes for your fuse box, and put the black lead of your digital Volt/Ohm there. Touch all 11 wires from the rear harness with the red lead from your VOM, and then repeat the process for the 11 wires from the front harness. As you touch each wire the VOM will show you a reading. In some cases, you will see Infinity Ohms—which is OK—and in other cases you will see the meter dip very low for some of this wiring like to 1 to 3 Ohms, which means you are probably testing a light bulb, somewhere. Regardless, you should never see your digital Volt/Ohm reading nosedive and hold at 0 Ohms (ZERO Ohms) on any of these dangling wires. If you do, first check your meter and make sure it isn't faulty and that its batteries are good.

Then, trace down the problem and figure out what is wrong with that wire or wires. Electrical shorts absolutely kill wiring, so don't apply any power until you get the situation resolved.

Install the Fog Lamp rocker switch
Two screws hold the switch, and two black wires connect to the back of the switch. For the Pushbutton switch folks, the blue jumper wire at the end of one of these wires should be removed, as a gray with black stripe wire takes its place. Depending on dash controls, either this blue or gray with black stripe wire connects to the multifunction gauge connector to provide indication that the fog lamps are turned on.

Connect the rear wiring harness to the fuse box, upper steering column & multifunction gauge connector

> **NOTE:** Use the block diagram from Page 38 of this document and the enlarged full color wiring diagrams provided with this wiring kit and as part of Appendix A in this document to make all rear wiring harness under dash connections at this time.

To complete the brake light circuit, take a spade to spade junction connector and connect one of the black with red stripe wires on the front harness to the black with red stripe wire on the rear harness under the dash using the junction connector. The other black with red strip wire on the front harness should be connected to front of car side of Fuse 9 on the fuse box.

Connect the front wiring harness to the fuse box, upper steering column & multifunction gauge connector

> **NOTE:** Use the block diagram from Page 29 of this document and the enlarged full color wiring diagrams provided with this wiring kit and as part of Appendix A in this document to make all rear wiring harness under dash connections at this time. Note that the front power distribution for horns and fog lamps is covered in the next section and that an inline fuse holder must be installed.

Under dash power distribution wiring to the cigarette lighter, radio and to the front wiring harness for the horns and fog lamps via their respective relays is handled through two additional power paths. This power also includes its own fuse holder and three of these are included in the kit. These fuse holders are preloaded with 16 Amp fuses and are similar to the originals in that they screw on to the 'tinned' ends of large gauge red wiring, also included in the kit. One final part is the 4-way spade connector 'bridge' that cleanly brings this power distribution together.

> **NOTE:** While a fuse holder and a 4-way spade bridge connector are provided for radio support, there is no actual wiring provided for the radio. You will have to supply this wiring.

Three of the four spade connections of the 4-way bridge connector are used, even without a radio. The two short 4" large gauge red spade-to-soldered end wires connect to one side of the bridge connector and the 6" large gauge red spade-to-spade wire connects to one of the two available connections on the other side of the connector, with the other end running to fuse #8 on the side/edge of the fuse box towards the rear of the car. The open connection is for radio power—and again, a fuse holder is included so that the three fuse holders are all the same. The remaining large 11" red wire goes over to the cigarette lighter.

Install the Fuse box
At this point, the fusebox has a lot of wiring attached to it. The block itself is made of Bakelite and can be brittle or fragile, particularly if previously stressed. The idea here is to shape the wiring connected to the fuse box such that the wiring itself basically holds it in place and in the correct position as much as possible. Only then should the two mounting screws be used to firmly hold the unit in place. Replace the fuse box cover.

Install the multifunction gauge, speedometer and clock
Once the wiring is in place and the fog lamp and fuse box wiring is installed and shaped correctly, the gauges can be installed. Gauges have a rubber gasket between the outer chrome bezel and the surface of the dash, but the holding clamps on the backside of each gauge are designed to bite ***through*** the paint to create a ground path for the outer housing of each gauge. Thumbscrews should be thoroughly tightened and paint scraped as needed to ensure this. Gauge lighting will be compromised if this is not done.

Other miscellaneous wiring included in the kit
This is the 'catch-all' category of wiring in the Item 6 Ziploc bag and some of it you will definitely need to complete your kit. The most important part of this category is the large red wire that is sheathed in black, with an eyelet on one end and a large soldered end on the other. This is a critical component of your battery recharging circuit. Connect the soldered end to the voltage regulator under the back seat, preferably **before** you bolt it to the kick panel. The solder end fits under the screw down bracket on the 'B+' terminal on the regulator, alongside the wire that comes back from the generator. The other end connects to the '+' terminal of the battery itself. Cinch it down under the battery terminal bolt, just like a washer.

Also included in the kit are two 13" black sheathed wires with spade connectors on each end. These are used when your car has electric cutoff solenoids on the dual carburetors. Use one of the supplied over and under piggyback spade connectors from the hardware bag in the wiring kit to run this wire from the chokes to the solenoids.

The long brown wire with the black sheathed section that has one end with insulation stripped back and tinned with solder and a female spade connector at the other end is your replacement horn wire. It runs down the center of the steering column and the spade connector end belongs down next to the steering coupler, protected by where it protrudes from the column by the yellow sheathing. Use it if you need it, because there's nothing worse than having a horn go off when it's least desired due to wear and tear on the insulation covering the original horn wiring.

Preliminary electrical system checks and tests
Make sure your battery is good and well charged. Make sure the ignition switch on the steering column is in the OFF position. **Put on your eye protection and leather gloves** and clean both the '-' and '+' terminals on the battery with the terminal cleaner or a wire brush. Then connect the battery '-' ground wire, cinching down this connection. Next, open your eyes and ears to problems, because you are now going to connect the '+' battery wire. You **do not** initially want to cinch down this connection tightly because you want to be able to remove it quickly if there are problems. As you make this battery connection you should hear no whining, snapping, crackling or popping as you make the '+' battery connections. You should not smell any burning or electrical ozone smells. Your battery should not be fizzing or bubbling. If anything strange is happening it's not a good

sign, so remove the '+' battery cable and go back through your wiring and electrical components testing process to clear any problems. Again, make sure your battery is good!

Test drive the electrical system

Methodically test your new electrical system:

1. Check the interior light.
2. Activate the horn.
3. Turn on the ignition switch, but don't start the car.
4. Check the gas gauge.
5. Check the gauge lights, tail lights, parking lights, side marker lights and license plate lights.
    a. Side marker lights can be configured in a variety of ways, so validate accordingly:
        i. 'Economy side marker' lights
        ii. Turn signals
6. Turn on the headlamps and operate the high/low beam switch a few times.
7. With the headlamps on low beam, turn on the fog lamps.
8. With everything on, activate the turn signals, both left and right. They might operate slowly, but they should work.
9. Have someone help you check the brake lights.
10. Turn all lighting off.
11. Activate the wiper motor and turn it off.
12. Turn off the ignition switch.
13. Check for hot wiring, blown fuses and burning smells, particularly under the back seat and in the front and rear trunks. If you have a problem, do not proceed. Fix the issue and repeat the testing process.
14. Once all previous testing is complete, start the car and warm it up. Check the dash lights in the multifunction gauge. The green oil light and red generator lights should **never** be on when the car is running. If either light remains on, turn the ignition off immediately. The root causes for these lights can be more than just wiring, so investigate the root causes fully.
15. If all tests ok in the driveway, then take the car for a short drive. Make sure to test everything a few times while underway. Always use your senses to detect problems before hitting heavy traffic!
16. After the return trip, testing for damaged or burnt wiring and blown fuses should again be done. It may be obvious, but you must fix anything that doesn't work.

A few notes about wiring casings:

The plastic sleeves encasing your new wiring harness are made of PVC material and are there for protective reasons. Please understand that this casing material is NOT shrink tubing! None of the PVC casing material should be subjected to the inferno from a heat gun or flame from a torch, lighter or match because the material will simply melt, rather than shrink. This is not to say that PVC is an inferior casing material! PVC casings can endure direct heat from the sun, engine or the outside elements for many years, but do keep in mind that it is normal for them to harden or crack over time, particularly under extreme conditions. The casings will sacrifice themselves on behalf of the wiring within. So, when stringing the wiring, please be cognizant of sharp edges that can nick both the casing and the wiring insulation within. Please try to position the casings, whenever possible, towards the elements. The casings should always be positioned on the wiring within to protect it.

In examining the kit contents, you can see that the new wiring casings are very flexible and are even more flexible when placed out in the sun. Prior to installing your new wiring harness, you may want to consider the ambient temperatures. You do not want to install your new kit in cold or freezing temperatures. The PVC casings tend to harden up in the cold and the work itself will be no fun in these conditions.

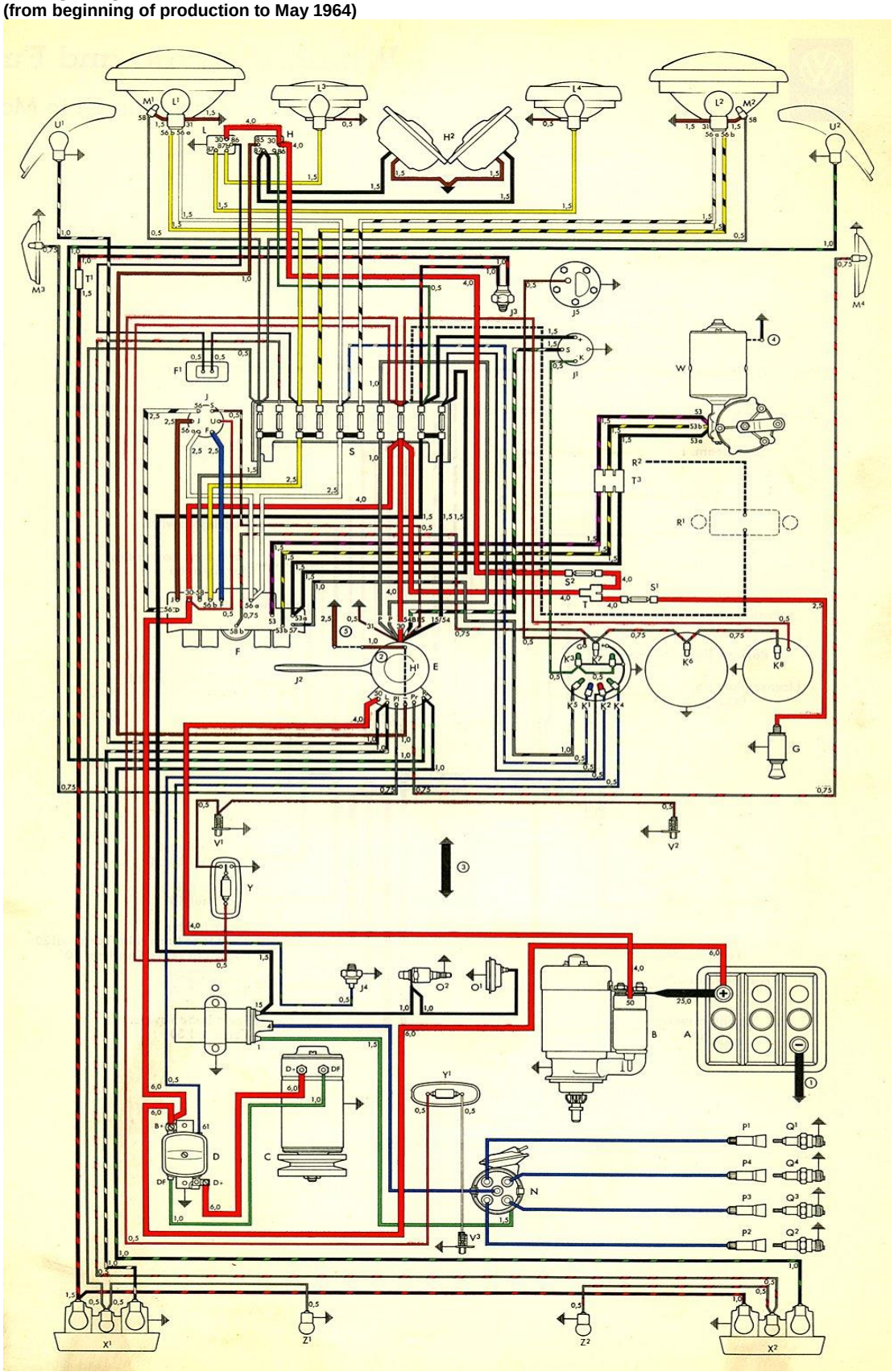
Lastly, please know that you have purchased a quality kit. However, it is possible for the casings to separate from each other at the various junction points in the wiring path, particularly if highly stressed during installation. While unusual, it does happen—but don't panic. If you wish to re-glue any casing that appears to have come undone from a junction point, use PVC pipe glue. A distant second option is to use Super Glue, but it may not hold up well if exposed to water for extended periods.

Appendix A

Wiring Diagrams

European Spec, Only

Wiring Diagram VW 1500 – Karmann Ghia Models
(from beginning of production to May 1964)



Key to Wiring Diagram - VW 1500 Karmann Ghia Models

(From September 1961 — Chassis No. 0 000 001)

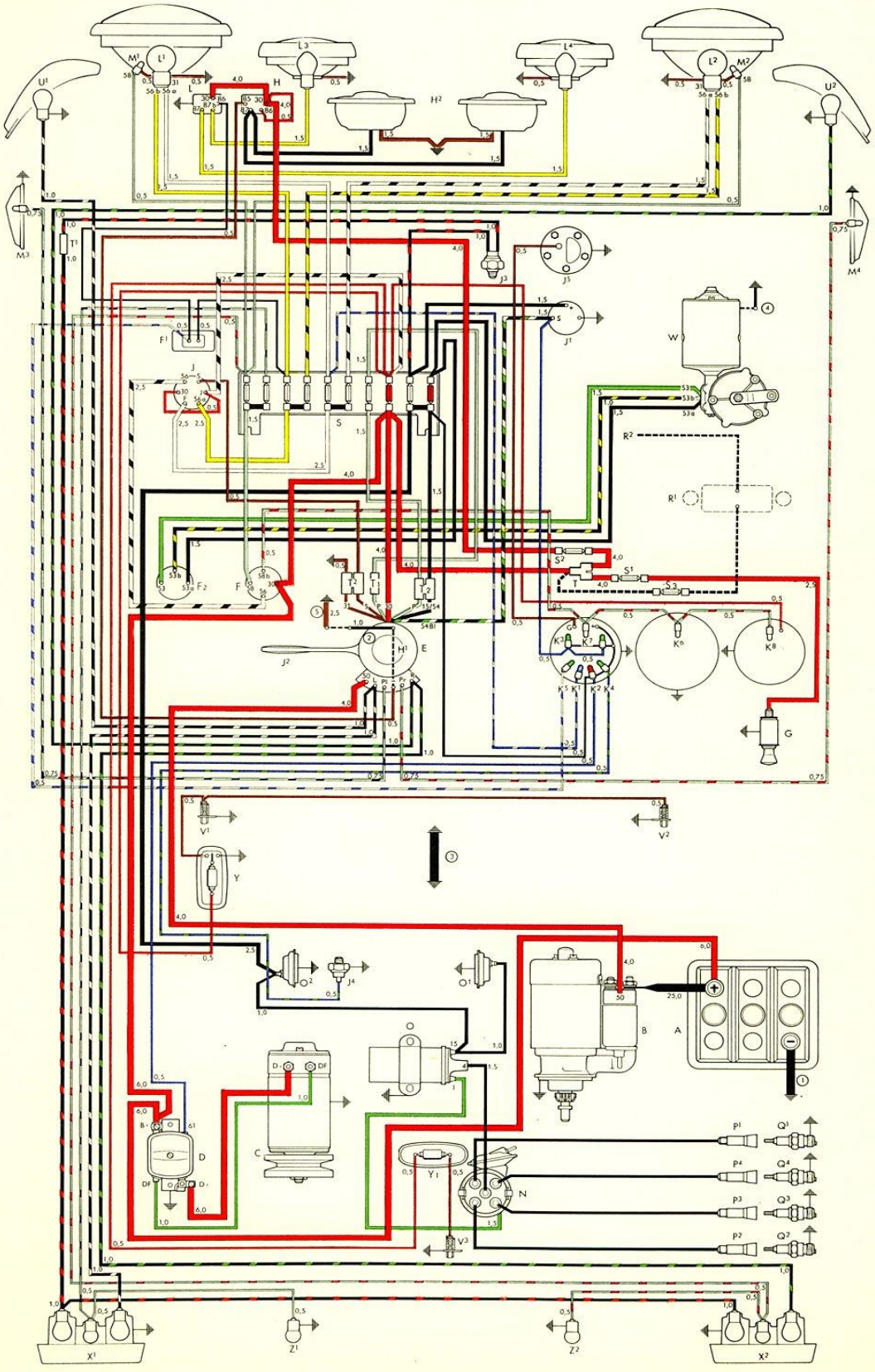
A - Battery
B - Starting Motor
C - Generator
D - Voltage Regulator
E - Turn Indicator Switch with Steering Lock
F - Press Button Switches
F^1 - Fog lamp Switch
G - Twin Tone Horn Relay
H^1 - Horn Half-ring
H^2 - Twin Tone Horn
J - Headlight Flasher Relay
J^1 - Flasher Unit
J^2 - Headlight Flasher Switch
J^3 - Stop Light Switch
J^4 - Oil Pressure Switch
J^5 - Fuel Gauge Sender Unit
K^1 - High Beam Warning Light
K^2 - Generator Control Light
K^3 - Turn Indicator Control Light
K^4 - Oil Pressure Warning Light
K^5 - Parking Light Control Light
K^6 - Speedometer Light
K^7 - Fuel Gauge Light
K^8 - Clock Light
L - Fog Lamp Relay
L^1 - Bifilament Bulb for Headlight, left
L^2 - Bifilament Bulb for Headlight, right
L^3 - Fog Lamp Bulb, left
L^4 - Fog Lamp Bulb, right
M^1 - Front Parking Light, left
M^2 - Front Parking Light, right
M^3 - Side Parking Lamp, left
M^4 - Side Parking Lamp, right
N - Ignition Distributor
O - Ignition Coil
O^1 - Automatic Choke on Carburetor
O^2 - Electro-magnetic Pilot Jet
P^1 - Spark Plug Connector for Cylinder 1
P^2 - Spark Plug Connector for Cylinder 2
P^3 - Spark Plug Connector for Cylinder 3
P^4 - Spark Plug Connector for Cylinder 4
Q^1 - Spark Plug for Cylinder 1
Q^2 - Spark Plug for Cylinder 2
Q^3 - Spark Plug for Cylinder 3
Q^4 - Spark Plug for Cylinder 4
R^1 - Radio
R^2 - Antenna
S - Fuse Box (ten fuses)
S^1 - Cigar Lighter Fuse
S^2 - Fog Lamp and Twin Tone Horn Fuse
T - Cable Adaptor
T^1 - Connector, single
T^3 - Connector, triple
U^1 - Front Turn Indicator Light, left
U^2 - Front Turn Indicator Light, right
V^1 - Door Contact Switch, left
V^2 - Door Contact Switch, right
V^3 - Luggage Compartment Light Switch
W - Windshield Wiper Motor (3 connections)
X^1 - Tail Light, left
X^2 - Tail Light, right
Y - Interior Light
Y^1 - Luggage Compartment Light
Z^1 - License Plate Light, left
Z^2 - License Plate Light, right

① - Battery Ground Strap
② - Ground Strap from Horn Ring to Column Coupling
③ - Ground Strap from Transmission to Frame
④ - Ground Strap from Windshield Wiper Motor to Body
⑤ - Ground Strap from Front Axle to Frame

Black dotted line = Service Installation

Wiring Diagram VW 1500 — Karmann Ghia Models

(from May 1964, Chassis No. 0 425 853)



Key to Wiring Diagram - VW 1500 Karmann Ghia Models

(From September 1961 — Chassis No. 0 000 001)

A - Battery
B - Starting Motor
C - Generator
D - Voltage Regulator
E - Turn Indicator Switch with Steering Lock
F - Press Button Switches
F^1 - Fog lamp Switch
G - Twin Tone Horn Relay
H^1 - Horn Half-ring
H^2 - Twin Tone Horn
J - Headlight Flasher Relay
J^1 - Flasher Unit
J^2 - Headlight Flasher Switch
J^3 - Stop Light Switch
J^4 - Oil Pressure Switch
J^5 - Fuel Gauge Sender Unit
K^1 - High Beam Warning Light
K^2 - Generator Control Light
K^3 - Turn Indicator Control Light
K^4 - Oil Pressure Warning Light
K^5 - Parking Light Control Light
K^6 - Speedometer Light
K^7 - Fuel Gauge Light
K^8 - Clock Light
L - Fog Lamp Relay
L^1 - Bifilament Bulb for Headlight, left
L^2 - Bifilament Bulb for Headlight, right
L^3 - Fog Lamp Bulb, left
L^4 - Fog Lamp Bulb, right
M^1 - Front Parking Light, left
M^2 - Front Parking Light, right
M^3 - Side Parking Lamp, left
M^4 - Side Parking Lamp, right
N - Ignition Distributor
O - Ignition Coil
O^1 - Automatic Choke on Carburetor
O^2 - Electro-magnetic Pilot Jet
P^1 - Spark Plug Connector for Cylinder 1
P^2 - Spark Plug Connector for Cylinder 2
P^3 - Spark Plug Connector for Cylinder 3
P^4 - Spark Plug Connector for Cylinder 4
Q^1 - Spark Plug for Cylinder 1
Q^2 - Spark Plug for Cylinder 2
Q^3 - Spark Plug for Cylinder 3
Q^4 - Spark Plug for Cylinder 4
R^1 - Radio
R^2 - Antenna
S - Fuse Box (ten fuses)
S^1 - Cigar Lighter Fuse
S^2 - Fog Lamp and Twin Tone Horn Fuse
T - Cable Adaptor
T^1 - Connector, single
T^3 - Connector, triple
U^1 - Front Turn Indicator Light, left
U^2 - Front Turn Indicator Light, right
V^1 - Door Contact Switch, left
V^2 - Door Contact Switch, right
V^3 - Luggage Compartment Light Switch
W - Windshield Wiper Motor (3 connections)
X^1 - Tail Light, left
X^2 - Tail Light, right
Y - Interior Light
Y^1 - Luggage Compartment Light
Z^1 - License Plate Light, left
Z^2 - License Plate Light, right

① - Battery Ground Strap
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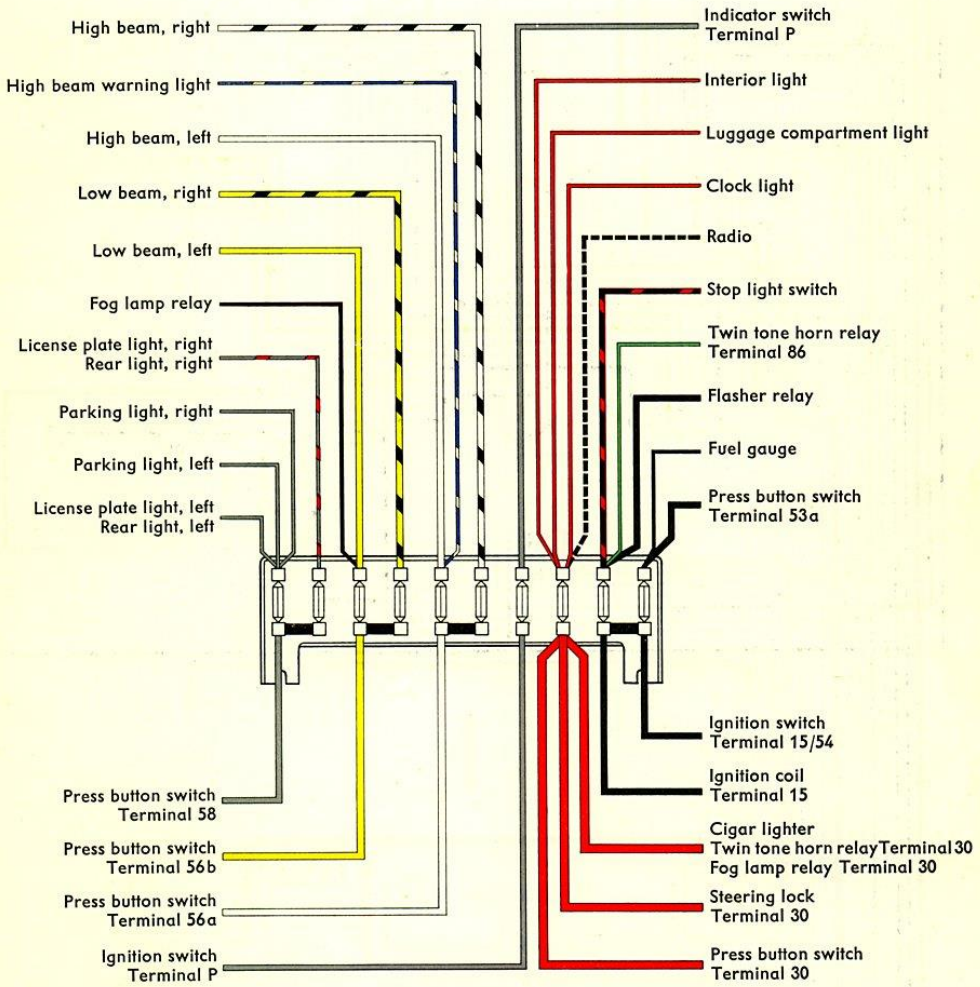
④ - Ground Strap from Windshield Wiper Motor to Body
⑤ - Ground Strap from Front Axle to Frame

Black dotted line = Service Installation

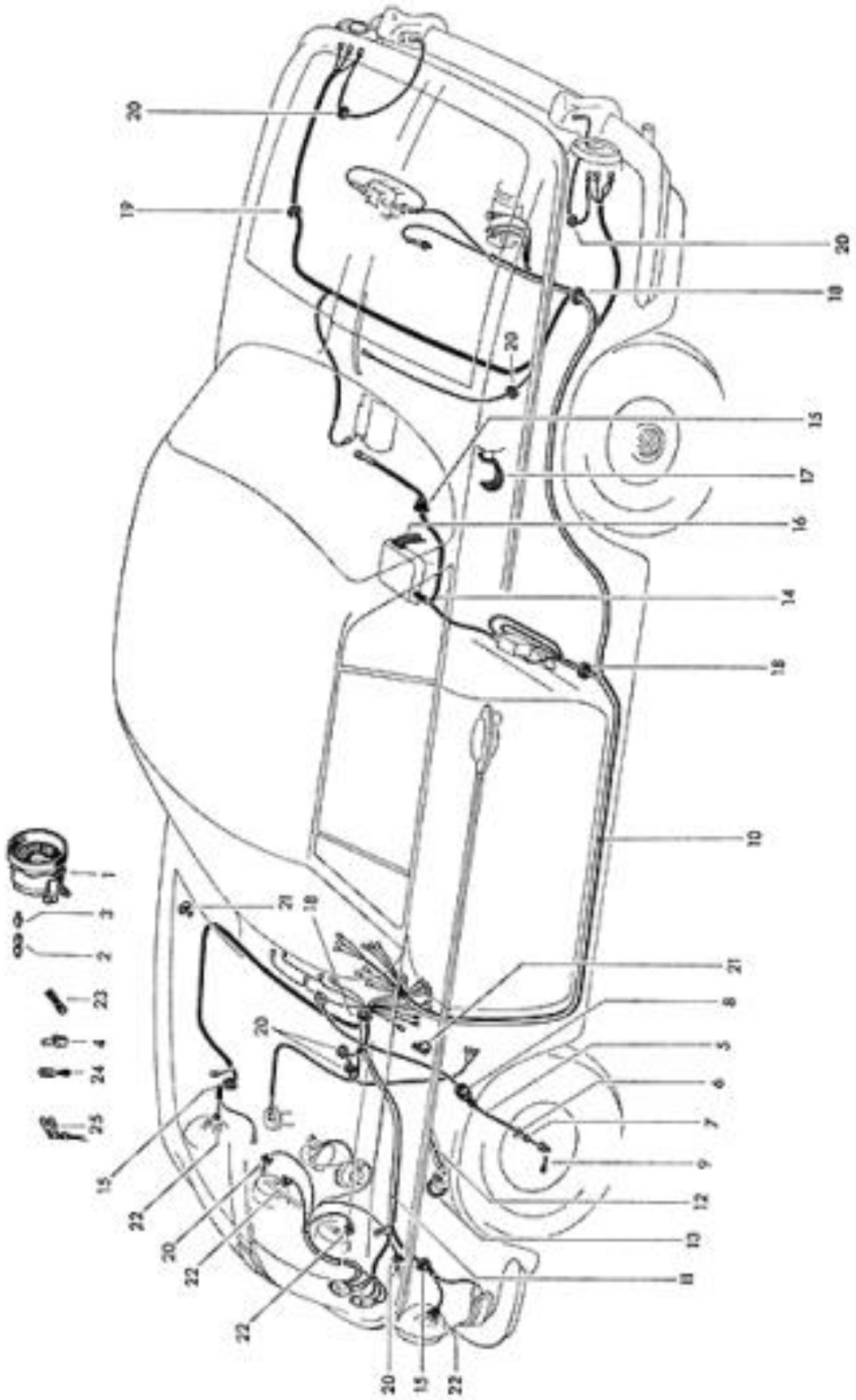
Wiring Diagram and Fuses

VW 1500 — Karmann Ghia Models

Fuses



Fuse box below instrument panel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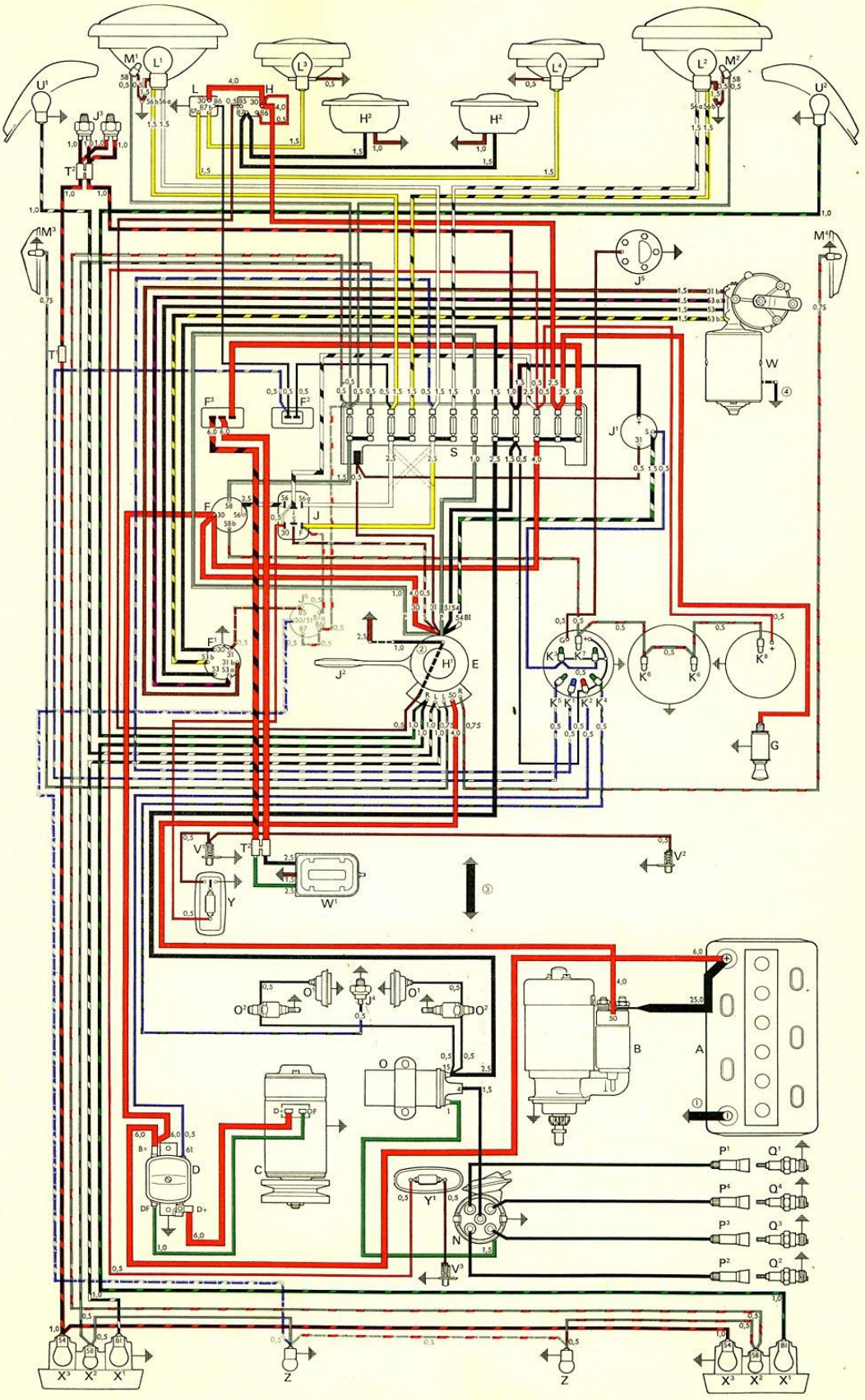
Wiring Diagram VW Karmann-Ghia-Models (from August 1966, Chassis No. 347 000 001)



A - Battery
B - Starting Motor
C - Generator
D - Voltage Regulator
E - Turn Indicator Switch with Steering Lock
F - Light Switch
F^1 - Windshield Wiper Switch
F^2 - Fog Lamp Switch
G - Cigar Lighter
H - Twin Horn Relay
H^1 - Horn Lever
H^2 - Twin Horns
J - Headlight Flasher Relay
J^1 - Flasher Unit
J^2 - Headlight Flasher Switch
J^3 - Stop Light Switch
J^4 - Oil Pressure Switch
J^5 - Fuel Gauge Sender Unit
K^1 - High Beam Warning Light
K^2 - Generator Control Light
K^3 - Turn Indicator Control Light
K^4 - Oil Pressure Warning Light
K^5 - Parking Light Control Light
K^6 - Speedometer Light
K^7 - Fuel Gauge Light
K^8 - Clock Light
L - Fog Lamp Relay
L^1 - Bifilament Bulb for Headlight, left
L^2 - Bifilament Bulb for Headlight, right
L^3 - Fog Lamp Bulb, left
L^4 - Fog Lamp Bulb, right
M^1 - Front Parking Light, left
M^2 - Front Parking Light, right
M^3 - Side Parking Lamp, left
M^4 - Side Parking Lamp, right
N - Ignition Distributor
O - Ignition Coil
O^1 - Automatic Choke, left
O^2 - Automatic Choke, right
P^1 - Spark Plug Connector for Cylinder 1
P^2 - Spark Plug Connector for Cylinder 2
P^3 - Spark Plug Connector for Cylinder 3
P^4 - Spark Plug Connector for Cylinder 4
Q^1 - Spark Plug for Cylinder 1
Q^2 - Spark Plug for Cylinder 2
Q^3 - Spark Plug for Cylinder 3
Q^4 - Spark Plug for Cylinder 4
R^1 - Radio
R^2 - Antenna
S - Fuse Box (ten fuses)
S^1 - Fuse for Cigar Lighter
S^2 - Fuse for Fog Lamps and Twin Horns
T - Cable Adaptor
T^1 - Connector, single
T^3 - Connector, triple
U^1 - Front Turn Indicator Light, left
U^2 - Front Turn Indicator Light, right
V^1 - Door Contact Switch, left
V^2 - Door Contact Switch, right
V^3 - Luggage Compartment Light Switch
W - Windshield Wiper Motor
X^1 - Tail Light, left
X^2 - Tail Light, right
Y - Interior Light
Y^1 - Luggage Compartment Light
Z^1 - License Plate Light, left
Z^2 - License Plate Light, right

① - Battery Ground Strap
② - Ground Strap from Horn Ring to Column Coupling
③ - Ground Strap from Transmission to Frame
④ - Ground Strap from Windshield Wiper Motor to Body
⑤ - Ground Strap from Front Axle to Frame

Black dotted line = Service Installation

Karmann Ghia coupe in 1500 version has been extensively restyled but retains flavor of 1200 model.