Trailer wiring harness diagrams

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Not sure which wires attach to what on your trailer connectors? Check out or trailer wiring diagrams for a quick reference on trailer wiring. The below information is for reference and is commonly used throughout the industry, but can vary depending on who built the trailer. You can use a circuit tester to verify connections. Trailer electrical connectors come in a variety of shapes and sizes. The basic purpose remains the same whether your truck and trailer is using a 4-way, 5-way, 6-way or 7-way connector. By law, trailer lighting must be connected into the tow vehicle's wiring system to provide trailer running lights, turn signals and brake lights. This is accomplished by tapping into the tow vehicle's electrical harness to transfer power to the trailer wiring system. Trailer connectors are used between the two to allow disengagement when not towing. Various styles of connectors are available with four to seven pins to allow transfer of power for the lighting as well as auxiliary functions such as electric trailer brake control , backup lights etc. The trailer wiring diagrams listed below, should help identify any wiring issues you may have with your trailer. When shopping for trailer connectors remember that the male end is mounted on the vehicle side and the female on the trailer side. As the name implies, they use four wires to carry out the vital lighting functions. The four wires control the turn signals, brake lights and taillights or running lights. They also provide a wire for a ground connection. They have the same electrical functions, but they do have a few differences. The image below shows the connector from the back side, where the 4-wires are attached with screws. Typically made from die-cast metal construction, they offer a concealed terminal with a dust cover for protection against the elements. They can be purchased as a standalone plug for the truck or trailer, or as a complete loop with both the plug and the socket included. They often use bonded wires for a reliable connection and have rubber construction to protect against the elements. The wiring is very similar, the only difference is the 5-way will have an extra blue auxiliary wire that is often used for backup lights. Having problems with your trailer wiring? Eliminate hours of frustration by using our trailer testing equipment and quickly identify problems in the wiring of the trailer. They also have one wire for trailer brakes and one wire for a battery connection. These additional wires allow a for trailer brake controller to be installed and a connection between the vehicle's power supply and a volt battery for a breakaway kit or an additional auxiliary power source. They supply power to the taillights, turn signals, brake lights, trailer brakes , reverse lights, auxiliary power and include a ground connection. They come in two variations, 7-Way round and 7-way with RV Blades. They look similar, but it is important to verify which one you have before replacing it. The blade style is very common and will have small blades that are used for the connection. The round style has small round pins that are used to connect the two. Trailer End - As viewed from front face of 7-way connector with molded on cable. Below is an image of a trailer wiring diamgram that is very helpful to reference. Be sure to check out our trailer tips on how to wire a trailer and troubleshooting trailer lights. Blog Login Account Cart. Trailer Parts. Trailer Wiring and Electrical. Trailer Wiring Diagram. Trailer Connectors. Trailer Wiring Videos. Car End As viewed from front face of 6 way connector with molded on cable. Car End As viewed from core back side where wires are attached with screws. View Details. Need Help Finding the Right Product? Call for immediate assistance. So many wires. So many colors. And, so many kinds of trailer wiring connectors. Where do I start? I need a trailer wiring diagram. And, a little more information to make sure I get it right! Follow these guidelines and make it right! The approach for you depends on your electrical needs. To start, every trailer needs lights â€" brake lights, turn signals, and tail lights. Some also have side markers and running lights. Brakes probably need electricity too â€" to actuate electric brakes, or to disable hydraulic brakes when backing up. The following trailer wiring diagram s and explanations are a cross between an electrical schematic and wiring on a trailer. We recommend these standards because they are pretty universal. That said, for specific situations, there are industrial standards with different connectors and wire arrangements. The most common 4 wire connector is the 4-Pin Flat Connector as shown here. The 4-Pin connector only has the first 4 items listed. The rest you can ignore. Trailers with capacity over Total Gross Trailer Weight should have brakes. If a trailer has brakes, then it needs a connector with at least 5 pins. The 5th pin, a blue wire, gives power to operate or disable the trailer brakes. If your truck has a built-in 7-pin socket, but you only need 5 of the pins. Use the 7-pin connector anyway see below , and just leave out the last 2 wires. The 5-Pin flat connector above is nice for easy handling, but if your vehicle already has a 7-pin, just use it. For trailers that have a little more going on electrically, we recommend 7-pin connectors. This is the style we recommend. Other styles exist â€" though the pin-outs are often different. Several industrial styles are similar and definately use different pins. It is OK to leave a pin or two blank unused and unconnected. These 2 wire diagrams fit the needs of most trailers. The image above shows a single axle trailer, and the next image shows wiring for Tandem Axles. Only the blue brake and white ground wires are different. Expand the same for additional axles. Use only the needed wires,

and ignore the others. If the axles do not have electric brakes, then no need for the blue wire. Some requirements need them, and some do not. Check local ordinances for requirements. See the section below for more information. Some trailers require 3 center marker lights â€" located central on the back, and maybe high on the front. Check legal requirements to see if they are required in your country or jurisdiction. Also, near the top in the back if taller than a certain amount. An amber 3 light set is required near the top in the front, if taller than a certain amount usually some amount over the height of the tow vehicle. Again, check regional requirements. Typically the 3 center marker lights are at a high point on the trailer â€" like above the back doors for an enclosed cargo trailer. They are fine on the back bumper of a flat bed trailer, even when the load is much higher. There are lots of extras in the laws like top corner markings , so find out what you need for your specific trailer. If you need the more marker lights, connect them on the Brown and White wires just like the side marker lights. See the partial trailer wiring diagram. These do not require additional connections at the hitch, just more wiring within the trailer. Check your jurisdiction so you can mark and light the trailer properly. To some, this is overkill, but even if it is, making it right can save you a ton of legal hassle and trouble. Many trailers are required to have a Breakaway System on board. Basically, this is a way of applying the trailer brakes if the trailer comes disconnected from the tow vehicle. If you have electric brakes or electric over hydraulic or some others , then it will involve the trailer wiring. Here is a partial wiring diagram to include your trailer breakaway system. Since there is a lot to discuss, we have an entire article about breakaway kits with lots more information. In the meantime, use this diagram to guide the wiring of the system. Superimpose this on the images above to see how it all comes together. The breakaway system usually resides in, on, or under the front part of the trailer. The pin pull switch is near the hitch. Again, please see the article about breakaway systems for a lot more information. Where do the wires go? Nestle the wires into and around the frame where practical for protection. We do recommend protecting the wires with a covering of some sort. The cover is not in the trailer wiring diagram, but flexible conduit, plastic conduit, or other approaches are great. A covering does not need to be watertight, but do consider weather protection when splicing into the wires. For tips on wiring, splicing, routing and protecting, see our post on trailer lights and wires. This photo shows an ideal way to handle trailer wires. While the flexible sealed conduit nestles in and secures to the frame, it protects the wires from snags and from weather. Great job on this one. Many different sizes of wires are available. We recommend 16 gage and larger for lighting. Then, for power hungry things like brakes, use a thicker wire size, like 14 gauge or 12 gauge. Same for Auxiliary Power. For lights, a relatively small wire gage works. We still recommend 16 gage and larger, not so much because of the power requirements, but because the wires are stronger, more robust, and have more surface area for splice connections. We recommend sealed and submersible LED lights for just about everything. Yeah, most trailers are never submersed, but almost all get very wet like in heavy rain or when washing. Pay the extra dollar or two and get the higher quality lights. Trouble free operation with higher quality lights make them worth it. The trailer wiring diagram shows this wire going to all the lights and brakes. Also, it must connect with things if included that use the Aux Power and Back-up lights too. Some trailer builders just connect this wire to the frame, then connect the ground from all the other lights and accessories to the frame as well. While this usually works, the ground portion of the circuit is often the root of trailer electrical problems. To avoid some of those issues we recommend running the white wire with all the others and connecting the ground from each light directly to the White. It is a little more work, but it can save big headaches later. If only lights are in the circuit, and the lights are LED low power , then a small white wire is acceptable. However, if you have electric brakes or auxiliary power, this wire must be larger. The Brown Wire goes to the lights that are always ON as you travel. These are the running lights, the low intensity portion of the tail lights, side markers, and corner markers. Also, if used, the sets of 3 lights central in front and back of the trailer. Check local laws for requirements on which lights your trailer needs. While the typical sets of 3 lights central in the trailer are not in the above trailer wiring diagram, they are important in some situations. They are not normal for smallish DIY utility type trailers. However, if you need them or want them, the brown wire feeds them too and the white for ground. Tiny Houses may or may not need the 3 lights, but again, check local laws. For a utility trailer, that is probably not much power, so a smaller gage is OK. For a large enclosed trailer with lots of running lights, consider a larger gage. Certainly that works, but make sure to note it on the trailer because Blue is the color for brakes. Also, some trailers with surge hydraulic brakes use this 5th pin to disable the brakes when the vehicle is reversing. This is not in the trailer wiring diagram above. Better yet, use a purple wire and label it. Please note the 5th pin is not as standard as the first 4. Be careful when using a 5-pin connector. Be sure the car wires match functions of the trailer. On the vehicle side, for electric brakes the blue wire goes to the brake controller. Many styles of brake

controllers are available, so find one that works for your vehicle. It works because the trailer is not big or heavy â€" and with a light load it does not require brakes. I just tell the borrower the load capacity is even though true capacity is Another way is to have an adapter that goes from the trailer 5-pin to a standard 7-pin with 2 wires left blank. That way the trailer brakes are ready, if the tow vehicle has a 7-pin connector. For a single axle, 14 gage is good, but for tandem axles, use 12 gage wire. Whatever the name it connects to the tow vehicle positive, DC power. Typically, auxiliary power is for charging the Breakaway battery, RV batteries, interior lights, power for accessories, etc. The extent of routing for the Red wire is not on the above Trailer Wiring Diagram because it is optional, and different for every trailer. In the Breakaway wiring section, the schematic there shows how the Breakaway battery box connects to the Red. That maintains the battery charge. If you do use it, then be sure you protect the vehicle electric system from shorts use a fuse or circuit breaker. If you do need large amounts of auxiliary power, use a generator or install special wiring from the vehicle alternator. The trailer wiring diagram above gives one flavor for routing direction â€" starting at the tongue connector, then wrapping around the trailer. Other people suggest splitting the wires near the tongue, then routing

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down both sides â€" Right and Left specific. Either approach is fine. It also keeps the wires all in one group as they traverse along the tongue so they are easier to protect. The amount of wire is almost identical for both the split and wrap around approach. Hollow frame members are often the route for wires. On my last trailer, I routed the wires through the tongue tube, then outside the main frame members tubes so they can seal. Wire and light connections are outside of the frame tubes under the trailer bed. When running wires consider the possibility of changes down the road. If you think changes might happen later, then leave access to the wires. By leaving access to the wire routing, running the additional wire is not so difficult. Food for thought. Another really good source of information with a trailer wiring diagram comparing different styles of connectors is at etrailer. Etrailer and JohnsonTrailerParts. How To Wire A Trailer. Trailer Wiring Diagram. And More So many wires.