


I'm not robot  reCAPTCHA

Continue

Dolphin gauges speedometer wiring diagram

Dan has been a licensed electrician for 17 years. It has extensive experience in most areas of the electricity trade. The 3-way switch is really two switches, both of which control one light. This illustration makes it look simple, but this article explains the complexity of burning a three-way switch. Burning a 3-way Switch Wiring 3-way light switch is not a difficult task... after all, only three connections need to be established. Making in a suitable place is a bit heavy, but still within the capabilities of most janitors, if someone shows them how. There, it can help to understand the wire diagram. First of all, what's a three-bedroom switch? When you want to control light from two different locations (for example, you want you to be able to turn on the staircase luminaries from both above and below), this is what electricians call three-sleeeling switches. Is it hard to turn on the 3-way switch? Switching is not difficult: Simply see how to disconnect the old one and then insert the wires back to the new light switch in the same position. Problems can occur when an extra switch is added or if you forget which wire has gone somewhere. That's when it becomes necessary to understand a little more about how the 3-way switch works and how to read the wire diagram. What do I need to know before I start? If you know what the purpose of each wire is, the task will become much simpler. This article will explain everything you need to know to burn a 3-way switch on the wire, with a wired diagram and normal wired mode. What about the four-way switches? Learn How to wire a 4-way guide switch and wire diagrams for burning four-way switches. How to wire a three-bedroom switch On all 3-way switches are the same. Select the configuration you want to track by viewing the diagrams below. If you're starting from scratch, the diagram #3 best place to start, but you can use these methods interchangeably in your old work. They just indicate different ways to implement the necessary cables. The #1 the diagram when several light anchorages are shared by one common circuit breaker and the switches are both on the same wall. The #2 is best when power is available in the ceiling, but the switches on opposite walls are easier to run the cable up into the ceiling light box instead of between the switches. The #3 diagram works best for cases with multiple switches in the same field, since other switches then have power available and can control other lights without having to have separate power in the line running on them. The #4 be useful when the light is near the first switch field. The result is a lot of wires, so it may be necessary to install a larger box. Turn off the power on the power panel before you start working. Make sure you understand which screw terminals and which wires serve what purpose. Below you will find descriptions that guide you. There is plenty of NM type 14-3 cable at hand, which has three insulated wires – white, black and red – and a bare copper earth wire. If you are connecting to a 12-measuring wire or the switcher is 20 amp, you will use 12-3 instead. Most of the home lighting circuit is 15 amp, which requires only 14 measuring wire. Follow the diagram to connect the wires (see instructions below) to the new three-way switch. All white wires used as travellers during three-way switches must have their ends wrapped with black electrical tape or in a plastic wire nut. How the 3-way switch works: Identifying the terminal screwSAus the switch side is three screw terminals and one at the end. Each switch has the same three terminals, and the older one may be missing a fourth terminal. The small, green bolt terminal at the end is the floor terminal. It is usually painted green, although the image does not show this color well. It can often be identified as a screw that is part of the metal frame switch and is not insulated from other metal parts. Green or uninhabited earth wire always goes to this earthly terminal. Older switches often did not have this terrestrial terminal screw, but they are no longer legal to use. All switches must have a ground floor wire attachment. One of the three other terminals has a different color, usually darker, and is called a common terminal. Mechanically and electrically, this common terminal is internally connected to one of the other two honey screws called the travel terminal. When you turn the switch the other way, this connection is disconnected and the common terminal is then connected, internally, to another travel terminal. The common terminal is always internally connected to one (but only one) traveller's terminal. Which depends on whether the switch is up or down. It may be necessary to know that travel terminals are essentially interchangeable. Given that each has to have a traveler's wire attached, and there are two travel wires and terminals, it doesn't matter which travel wire goes to which travel terminal. Identification of terminals for floor, common and crush terminals in the 3-way switchObice terminals is at the top in this respect, with a path at the bottom end. The floor terminal screw is shown as silver-coloured at the bottom. Wilderness And the old switch. This switch does not have a ground terminal/screw and is no longer legal to use. Make sure the switch has a floor terminal. Which wilderness is hot? Which screw is the floor? Identification of screw terminals by colorWgeWs the green terminal screw? The small, green screw terminal at the bottom is the floor terminal. All new switches have to have floors, but some of the older ones don't. What is a darker screw terminal? One of the three screw terminals will different colors, usually darker. It's a common terminal. What are honey screws? Two terminals of the honey bolt are a travel terminal. Color identifying wires What is the green wire? Green or non-sulated (copper) earth wire always goes to the ground terminal. How's the white wire? The white wire is neutral. All neutrals will be connected to the wire nut or with a rotated plastic wire connector. How's the black wire? Black wire is served at all times unless the entire circuit is turned off on the circuit breaker plate. Note on wire colors: The national electrical code requires that each neutral wire be color white, and that the floor wires are color green. Only neutral wires can be white, but the code makes an exception for white wires in the cable that are not used to be neutral. These wires must be coloured black using a magic highlighter or some other method. A lot of electricians will do this, but many will not do so and this can make it difficult to fix problems in the future and can be a safety hazard for everyone else working on the system. I encourage you to take the few seconds needed to paint these neutral wires. The colors shown in these wire diagrams are just common color habits. Not all electricians use the same colour code (except neutral and bases), so the wires can be different colors. Identification of all parts of the 3-way Light SwitchJase traveler and the common have already been clarified, but there are other terms that will be used in this article that also need some explanation. Cable. The term cable refers to a combination of two or more wires assembled together, usually in a map of insulating materials. Each wire is insulated separately, with the possible exception of floor wire. The earth wire can be insulated with green paint or left bare (copper) without insulation. Power in. The power cord is the cable that eventually ends in the switch or the safety box. The cable is the one that provides the power supply to the light system. Neutral. It's a white wire in the power cord. It does not break the switch or connect to the switch, although it may be present in the circuit and ends with the wire nut connecting it to another neutral wire. Floor. Ground wire in each switcher or shiny fixing box. It is either color green or left bare insulation (copper). Hot wire. This is the second black wire contained in the power cord. It's hot all the time unless the entire circuit is turned off on the circuit breaker panel. The circuit intercepts the plate. Commonly called a fuse box, it can contain either switches or fuses. This plate controls all the power in the building, and it's possible to turn that power off there. Two ropes is an indication that is a made cable that has two individual wires, plus earthy wire. These wires will white and black, with green or bare (copper) soil. Three ropes. Three ropes are a cable with three wires, plus flooring. Usually the colors are white, black and red with extra green or bare (copper) melt. Understanding the wired diagramEach will display two three-way switches (but not the wall box in which they are located), the different cables and wires used in the configuration being handled, and the light box and light attachment. How does electricity pass through the switch? To understand the wiring diagram, you should know that the electrical current enters the system on the black wire in the power cable, passes through the switches, through the fixing of the light and returns to the white wire in the power in the cable. If the circuit is broken anywhere (the switch has been turned the wrong way, a broken wire or a bad light bulb), the current will not run and the bulb will not light up. For discussion purposes, each three-seat switch shall be deemed to be connected to the travel terminal at the right hand when it is in the position up and connected to the left terminal when it is in a downward position. This is not necessarily true, but it is simply useful for the needs of the debate. Read the descriptions carefully and compare them with diagrams to understand the diagrams. Each diagram will have a description of how the current travels to light the lamp. Voltage TestersA non-contact voltage pretrim is an invaluable tool here to work on electrical circuits. Fluke and Klein make professional quality testers, and cheaper are often available as well. As a professional electrician for about 20 years, there is always one in my pocket, and anyone who works around electricity should wear one as well. Turn off power before you start working! Installation of the light switchThip the correct location of each wire is determined by means of the wire diagrams below, the light switch is connected to the appropriate wires and placed in the light switch box. Before connecting, make sure the power is off! Older switches vs. newer:Many residential light switches have a small hole in the back of the switch in which wires can be pushed, and all switches have screws on the side. The image of the older switch above has both push holes and screws: The second is an expensive switch that has holes to insert wires, but the screws must also be tightened. A lot of switches only have screws, no holes. There is a strip line on the back of the switch: shows how much insulation needs to be to be dragged if push-in connection mode is to be used. If screws need to be used, a little more insulation should be removed. How to attach wires to screw terminals:If the screws need to be used to connect, bend the end of the towing wire in half circle using needle-nose pliers, and turn the wire around clockwise. Tighten each screw tightly. Switch the wires correctly back into the wall box and push the switch into the box. Normally the floor screw goes downwards towards the ground, but you can insert it into the upward position with 3-way and 4-way switches. 3 Way Wiring Diagram #13-way switch wire diagram with cable to power entry into the light box. Wired Diagram #1, Power in the light boxIn this case, the power cord enters the light box. This method of starting the wire is common when several light anchorages are shared by one common circuit breaker and the switches are both on the same wall. The cables must be 24%, between the two switches and from the light field to only one of the switches. Follow the current when the lamp in the light mounting is lit:The current enters the light field on the black wire, as always. This wire is cut into a white wire in a two-rope cable that goes into the first switch (not the switch), where it is cut into a white wire into a three-rope cable and continues to the second switch on the common terminal. If the switch is up, it will exit the switch at the right travel terminal and proceed with the red wire back to the travel terminal on the first switch. If this switch is also up, it will exit the common terminal on the black wire in a two cable rope from the light switch. If we continue with this black wire, the electricity enters the light field, where it goes on a light fixation. The current will pass through the light, exiting on a white, neutral wire and returning to the power cord. Note on the colour of the wires: In this case, the only neutral wire is the white wire in the power-in cable (which is always white wire) and one of two wires attached to light (also always white). All other white wires must be colored.3-Way Wiring Diagram #23-way ignition switch: Power in the light box with 3 cable cables for each switch. Wire diagram #2. Power in the light box In this 3-way toggle ignition diagram, the ignition line enters the light box, but the 3 cable cables are then placed between the light and each switch. This method can be used when power is available in the ceiling, but the switches on opposite walls – it is often easier to run the cable up into the ceiling light box instead of between switches. If you're following the flow... comes into the light box on the black wire then runs to the common terminal on one switch using a (colored) white wire exiting the switch from the travel terminal then returns to the light box, where it is only cut to another wire that goes to the travel terminal on the other switch going through this switch, exits again from the common terminal, and re-enters the light box where it goes on its way. Neutral goes from the power cable directly to the light 3-way Wiring Diagram #33-directional wiring diagram with the #1.Wiring Diagram #3This time the electrician has brought power to the first switch, through the second switch and on the light attachment. This is a reasonable method for cases with multiple switches in the same field, since other switches then have the power available and can control other lights without having to have separate power in the line running on them. The main difference is that the neutral from the rope must be oused to a light fixation over 3 ropes. A white wire should be used here, as the code requires all neutral wires to be white. After the current... enters the first switch on the black wire and is connected to the common terminal. If the switch is in the down position, it exits the switch on the red wire and enters the second switch at the traveler's terminal. If the switch is also down, it exits to turn on the black, joint, wire and proceed to light. After passing through the light attachments, the current returns to the second switch on the white wire, is cut into another white wire in 3 ropes used between the switchboxes and continues to the first switching field, where it is cut to white power in the wire and back into the fuse. The circuit board's over, and the lamp's going to light. 3-way Wiring Diagram #43-way wiring: Power-in enters the #1 along with the cable to the light box. For example, #4This diagram shows the power cable entering the first switch along with the light fixation cable. This can cause a lot of wires in this box, but it can be useful when the light is near the first switch box. A larger box may be needed for all wires. After the current... enters a switch on the black wire on the common terminal. If the switch is up, it will exit the box on the red traveller's wire and proceed to the travel terminal at the second switch. If the switch is also up, it will exit the switch at the common terminal on a white (color) wire and return to the first switch, where it is cut into black wire in 2 ropes that go to light. Through the lamp, it returns to the first switch on the white (neutral) wire, where it is cut into a white (neutral) wire that returns to the fuse. The circuit board's over and the lamp's on. Commonality In All Wiring DiagramsCommon that all these wiring diagrams is that neutral, white wire from the lamp connects directly to the white, neutral wire from power-in cable without ever terminating on a switch. It may or may not be cut into another white wire in the box, but it never stops on the switch – only on the lamp. The black power wire always goes on joint on the switch, often changing colors through the urgency of splicing on different cables. Regardless of color, one switch will have a total directly to the black wire. The second common terminal on the second switch always goes directly (though perhaps again cut) to a light fix. It doesn't end on the second switch. There are two travel wires; always go directly from one switch to another. Not even a travel wire is interrupted by a luminary fix, power in the cable or on anything other than a travel terminal, even though it can be cut into another cable somewhere. Neutral wires are always white, and white wires that are not connected to white power in wires should be coloured by some other colours. Earth wires are always green or bare insulation (copper). Each switch, as well as the lamp, must have the earth wire switched off. The only exception is older homes, which are not earthy wire in boxes; if there is an earthy wire in the box, it must be disconnected from the switcher and the lights. Final note on building codes:Recent code changes require each switch to have a neutral wire in it. This means not just white wire, but a white wire that is connected to a white wire on the power in the cable. This rule is intended to provide future capacity for the use of a ditterer or other device that may require a neutral wire and prevent the disconnection or use of floor wire for other purposes. New work (for example, adding a new three-seater switch) will need to match this code. Which method or diagram is best to follow? The only wire diagram shown here, which is legal to use, is #3, although you can change this by adding #1 a 2-wire cable from the bottom box to light. The nets in the switch that are unused are either cut together or, in the case of a single neutral one, simply clogged with a wire nut and engraved back in the box. Do I

need to replace all theZigers that don't fit the current code? Simply replacing the switch does not mean that the space needs to be re-wired, as the existing firing grandfather in and is acceptable. To comply with the code, you don't have to re-run the old work, and this article treats unacceptable (under current code) wire diagrams. Other articles and links that can help you In general, switches are not difficult to replace or install, and most homeowners are quite capable of doing so. For more help and instructions, see Install or Replace the light switch. Whether you change the switch or install new switches in a larger rearrange, probably the most useful tool you can own is a non-contact voltage detector. Every time you perform any electrical work, you must first test it with a good voltage detector. This article is accurate and true to the best of the author's knowledge. The content is for entertainment purposes only and does not replace personal advice or professional advice in business, financial, legal or technical matters. Questions & AnswerQuestion: On a three-way switch, can you just tap into the box, or do you have to go into the box and then on the switch? Can it go in the box? My house is only plugged into the box, but I was told I should have switched too. Answer: The current electrical code requires all switches to be grounded. It's easy enough to add a short bat from the box to the switch if the box is metal and already down. Question: My three-seat switch is more than 50 years old. There is a white wire on one side of the box (at the bottom) and a red wire on the same side (above). There's a black wire on the other side (above). The new three-seater switch has a green screw on one side at the bottom and a black screw at the bottom on the other side and two gold-coloured screws on the top. Can I attach wires to a new box in the same place as the old ones, regardless of the colors? Answer: Yes, but you didn't mention the ground wire (on the green screw) for the old switch. It's very doubtful that he does. If not, the new switch must be obtained by the green screw, which will mean finding the source for the earth wire wire and switching it on to that switch. The electrical code requires that each switch has earth wire now, even though the base has not been used for years. Besides, plug in the wires the same way. The worst case scenario is that the switch will not work properly, then you will replace some wires and try again until it works properly. It's always fun to decipher what an electrician or janitor did 50 years ago! Question: Is it possible to install the dimming switch in the three-way switch set? Answer: Yes, but a 3-way dimming switch should be used. Most knockout switches won't work. Question: I have a setting that looks like a 3 Way Diagram #1 based on the configuration of two switches (I haven't yet located the lighthouse), but when I separated the two switches from the wires, all the traveler's lines went hot. The white wire power-in cable remained hot as well. How can this happen? Is it possible that this is 4 way, but I have not been able to identify the additional switch? Answer: Since the travel wires go from one travel terminal to one switch to the travel terminal on the other switch, it is not possible to remove both ends from the switches and keep the wire hot. It has nothing to do with anything and can't be hot. What tester can you use to find out if the wire's hot? The non-contact testers mentioned in the article may be sensitive enough to collect static electricity transferred from one wire to another, even if they do not touch. They're supposed to make sure the wire's dead, and I've never had a false negative. dead wire), but the price is that occasionally you can show hot when the wire is not. If the wires are hot when it's disconnected, then there's another source of power you haven't identified yet, and the wires are going somewhere you're not aware of. It's doubtful it's a four-way switch - those have four terminals (plus floors) on them, all of which are travellers. No power should ever be cut to a 4-way switch. Question: Can you direct me to the diagram of the configuration of the three-way switches? Answer: Near the beginning of the article there is a link to 3-way switches. Here is it again: As I understand it, one - and only one - of the traveler's wires is always hot. If that's true, could someone put an outlet in the middle of every travel wire with the result of one or the other outlet - but not both - ON? Answer: We could do this, but they will only be operated by one switch - the one with the fuse power. You can even set it so that the top or bottom of one socket, but not both, is turned on, depending on how the switch is switched. You must ensure that a neutral wire is running with others and available at each exit. Question: The script I have in the picture in Diagram 1 of this article and countless times I went through the burning and still does not work. I'd be sure I'm right, but it's not working. How can you further diagnose your arson problem? Answer: Is the circuit breaker on and the light bulb good? Is the makeup in the box correct? If you put an incoming black wire on a light bulb, does it light up? If all are good, it is best to guess that black or white from the lighthouse is not connected to a common terminal, but to one of the traveler's terminals. It is always possible that one of the switches is also bad - even brand new switches can be broken. If you have a voltmeter, preferably a non-contact tester, you can fix it as well. Using the wire colours in the diagram, the white wire on the switch must be hot at all times. One or the other passenger at the same switch must be hot, changing when the switch is turned. If all this works, and passengers on the second switch go hot or cold when the first switch overturns, the black wire on the second switch must be hot or not, as this switch is switched. Checking these should tell you where the problem is. Question: Can I use a 3-way switch with only two wires? Answer: No. There must be three wires between the two switches. The switch can only be used with two wires, but it will work as a normal switch, not as a three-sedal switch. Question: I would like to switch from a regular light switch to a light swaying switch. I have two black wires and one red wire - where should they go? Answer: If you just replace the regular light switch with one of the decorative (a square switch that just rocks up and down) then the wires go to the same place as they did on the wall switch. Question: How do I remove some insulation from the wire? Answer: Preferably with a wire removal tool. If it is not available, the knife can also be used with a sharp knife for cooking. Cut around the insulation, very carefully, not to touch the copper wire, and then line down on one side. You can also use cutter wires by twisting them around the top end of the cutting and then using them to push away the insulation you want to remove. Care should be taken again to avoid damaging the wire inside. In any case, if the wire is cut, it must be cut and the process restarted. Question: Is there a diagram of a three-light 3-way switch in a circle? Answer: If you want to add more light anchorages, simply use the same wires that attach to existing attachments and extend them further to hook up to additional anchorages you want. Simply cut the new wire into the wire that goes to the existing light. Everyone will come on and off at the same time. ©2010 Dan Harmon Accord (author) from Boise, Idaho August 30, 2019:You're welcome, Marius. And thanks for the comment - it's always nice to hear that I've been helpful to someone. Marius Tudor on August 30, 2019:Mr. Dan thank you for making time to be on this blog and for the thorough answers and schemes you represent. It helped me think deeper about what was going on in one of the jobs. The answers are always in front of us. Sometimes all we need is instructions. This is a place where I will definitely check occasionally in the future. Dan Harmon (author) from Boise, Idaho on May 12, 2019:@Pierre:Use any of the above diagrams, and simply plug the wires into each other. Black to black, white to white and ground for as many lights as you want. Dan Harmon (author) from Boise, Idaho on January 21, 2019:@George:You have one four-way switch, one with four wires. We should have two more, three directions, three-wire switches on the circuit. When more than 2 switches are required, it requires 2 three-way switches, and everything else is 4 directional switches. Instructions for wire 4 switches modes can be found at: January 21, 2019:I Have 3 directional light switches one switch has 4 wires attached to 4 screws to the ..., the other has 3 wires attached. WhyDan Harmon (author) from Boise, Idaho on Dec 05, 2018:@Bill:You can't do this using just 2 wire guide (12-2) unless you're running two of the earlier than one cable. As shown in the diagrams and as described, you must have 3 wires between the switches, and this means 12-3.Bill on December 05, 2018: am I want to put 2 3way switches es in my garage using 12 2 wire, or I just run the wire between two amon switch on September 14, 2017: I like this site, it was very informative, Marshall on 04, 2017:Thank you Dan for your response again. This is a cheap metal ceiling mounted one bulb type attachment that is closed with a round globe. Now he's got an LED light in it, and I don't use light until it's fixed. The switch's broken. Today I left a message to the electrician calling me, which was recommended by a friend. I expect him to call back on Monday. The reason I stopped all my DIY work is in the hope that the electrician will alert our homes if he agrees that the building was illegally misplaced (without any basis on switches and wiring) in construction. In 1977, all new construction should have all electrical anchorages, sockets and switches grounded. Therefore, I believe that the entire apartment complex was built on a cheap basis (also for other reasons). I would like the Homeowners Association to send letters to other apartment owners that all their units must be electrically inspected and sealed (if necessary). I don't think the Janitors Association will take action if they don't receive a letter from an electrician with the company's correspondent head. Frankly, I doubt they will take any action, even if they have received such a letter. That's why I'm wondering if I should go into town if I have to. Am I doing a lot for nothing? As I see it, there are almost 400 apartments and apartment units in our complex that have unbracketed light anchorages and light switches. If it replaces the lamps or touches the metal screws on the lid of the light switch, it may be electrocuted if the fastener or switch is short. Dan Harmon (author) from Boise, Idaho on August 04, 2017:Probably not. I don't know what this fastening is, but the light anchorages are designed to get rid of the heat from the bulb in mind. You've just shut down any chance to get air on it and it can heat up. If you really want to do this, I suggest an LED bulb as it is not anywhere near the heat bulb. Of course, if you think you've removed the fixture and left the box open behind it, then it's okay to cover it with plastic. Marshall on August 03, 2017:Hi Dan, today I opened my 8 foot high ceiling light fixed with a three-way mechanism. I found out there wasn't punished. After I found so many light switches in my apartment that we didn't low, I came to the conclusion that the original contractor never connected the base! I believe that this ceiling lamp has never been opened before Long Story Short, so I quit my DIY job and I will call the electrician tomorrow. My question is this: because this light fix is so close to the bathroom and I would find it difficult to close back. I put it over this plastic lid to prevent the humidity of the bathroom from shortening this unretreated fixture. The electrician's going to fix it. Is that correct? Dan Harmon (author) from Boise, Idaho on July 30, 2017:Okay. It sounds to me as if your switch too contains hot wire from the plate and switch one contains a foot switch on the light. It doesn't agree with your hot wire designation, or with statement 2 however - I don't quite understand what you see for some reason. At this point, I would turn off all the wires (ground wires) from the switches (marking them somehow as to where they went, just in case) and re-search only what's hot with the breaker on. At the point of switch with hot in this can be wired with a hot go on the joint and both travelers to sing. Then check on the second switch; depending on whether the switch is installed up or down, look for two wires that become hot, one after the other. These are travelers and (only in the case) and the one left is the switches of the leg that goes on the joint on this switch. I'm fairly sure that the hot spur is hot wire from the plate, which would mean that your switch too contains hot and switch one has a foot switch on the light, but I may be missing something. Marshall on July 28, 2017:Thank you for your response again Dan. I've taken care of something. Here are my observations.1... The light is only lit when both switches one (the hallway at the front door) and the switches two (bedroom) in an upward position.2... But when the switch is up, and switch two is down, the light is off.3 ... Even when the switch is down, and switch two is either up or down, the light is off. That's why I recognized the switch in the hallway as switch 1, and the bedroom switch as switch two. Oddly enough, switch 2 (bedroom) is practically next to the panel box. Switch one (corridor) is further than the panel box. Is the switch closest to the panel window on a three-seater connection always identified as switch one? Here are some ac tester observations on switch two wire connections. (Switch 1 was closed while only switch 2 was opened). First, a few notes:NOTE: Switch one is a three-seater switch with a hot one connected to a common terminal and an unmissable traveler connected to one of the travelers. NOTE 2: Switch 2 is an old one-pole switch (which I will replace with a three-pole switch) with a piece of black electric tape on a hot wire, and no strap on a missing passenger.1.... When both switches one and switch two are up (light turns on). Then so hot wire and not missing the passenger on switch two are hot.2... when both switches one and switch two are down (light off). Then it is just a hot wire, and there is no missing passenger is cold = dead.3... when switch one is up, and switch two is down (light off), again, just hot is hot, and no missing passenger is cold/dead.4... but when the switch is one down, and switch two is up (off) then both hot wire and not missing traveler are hot.5... The intransigent traveler (on switch 2) goes into the same Romex cable (2-rope) as the same white neutral wire I found disconnected from the other three neutral wires in this double gang (both sub on double bandama) switch (which yes I think is missing traveler)6... or boiling the wire (on the other switch) is hot spur that's a with 4 other hot wires. (But that you say it should be directly connected to light, and NEVER cut with multiples of other wires). That's why I have the wrong connection! Could you unplug switch one - wrong and replace two? Marshall Dan Harmon (author) from Boise, Idaho on July 28, 2017:You're right - the properly wired setting of both wires can't be hot. One will, the other goes to light, so it can't be hot all the time, or the light would be on all the time. Sounds like it's seriously mixed, maybe with one of the travelers going to the light instead of the other switch. There's some work in front of you to get the wires going. Marshall on July 23, 2017:I have another question about my 3 switch mode. Re: black wires that connect to the common terminal on both switches should be only one, or should the OBE wire be hot when disconnected from the ordinary screw? Hot wire, as I understand it, is a wire that is energized EVEN WHEN disconnected, unless the switcher on that circuit is turned off. What I got on is if both black wires that connect to the common screw on the OBA 3 switch mode are hot (even when disconnected, it would mean that the energy comes both from power in the cable and from the light fastening, that is, the POWER COMES FROM BOTH DIRECTIONS AT ONCE.). Note: This has not caused me to partially install both switches). Do I miss something? Is that a dangerous bad connection? Remember, I said that both original 3 way switches were replaced by 1 way of switch for some mysterious reason years ago. (And I know it's supposed to be a 3-way connection) I wonder if that's the reason. Could any craftsman who is not familiar with 3 burning methods install 1 switch mode after facing problems? Dan Harmon (author) from Boise, Idaho on July 21, 2017:I hope it all helps. No, I didn't disable any printing. But hosting company HubPages dot com may have decided that it's not something they want to see. I'm not sure - I've never tried to print comments and I haven't heard any other complaints about it. Could there be anything about the avatar's images? Marshall on July 21, 2017:Thank you Day for your second response! I think it's going to prove very useful. I managed to print your article re: 3-way switches, but I can't print any of the comments (either all, or just your own, as well as your answers selected). Have you disabled printing Comments? Dan Harmon (author) from Boise, Idaho on July 21, 2017:Okay, it's okay to get 4 hots along with a bat (your spur) on the switch. But this pig's tail should go to a regular screw on the switch, not a traveler. Travel wires only go to another switch. I think you have an idea: use one black traveler (already on the site) and a white wire that isn't included in with other whites as another traveler, after making sure that the other end is where you think it is and that it doesn't work anything else between the boxes. I assume that the second switch has a switch that goes to light, along with a neutral switch, - if both the use of extra white as the traveler (after recording it black at both ends) is fine. Just don't cut extra wires for this traveler (or any other traveler). No wire on a passenger should have more than 2 wires, simply continuing the same wire without adding more. All grounds must always be mixed together, along with the bat tails on any switch, socket or other device. (Only terminology, but the 3-WAY switch is not a 2 or 3 POLE switch. Technically, it's a double THROW switch that connects one wire to one or two other wires, not just one at a time. It has two in positions that the double POLE switch does not have.) Marshall on July 21, 2017:Thanks for the response Dan, you asked: Are you sure that someone in the past hasn't done what was once a traveler to power something else? An outlet or something? I don't believe that. That's what I'm sure... I've got wooden hoses and plastic boxes.2... In the gang switch box in Bedroom 2, one of Romex's neutrals was disconnected from romex's other three neutrals, with a piece of electrical tape covering the bare end.3... In the gang switch box in corridor 2, there were two neutrals on them with white camouflage tape (I've replaced it with a white electric tape ever since). The other two neutrals had no marker tape.4... I know these two switches are three pole connections, but both switches, as I found them, were one pole switch for some reason. Why would someone replace three switches with one switch? Since then, I've replaced one half of the hallway with a new three-pole, and I intend to do it in the bedroom.5... The inherited tenant, who said he was an electrician, lived in a unit in 2000 (I bought the flat in 2000, and rented it out until 2014, when I moved). He said he installed a track lighting in the living room (a different circuit) that was different from the luminous fix that was installed when I lived in this unit before 1985 and 1987. I think for some reason, he's been in a three-flash. Anyway, this track lighting blew up in 2013 when my sister rented a unit from me, in the words of my sister (I now live in a unit as an owner-occupier).6... Two outlets in the living they are part of the same circuit as all bedroom sockets. Is this unusual?7... One of the bedroom 2 gang box Romex is 14-3, but used to power a switch controlled socket in the bedroom, which is the original construction.8... When I lived there before, I didn't have any electrical problems. Since I moved to the unit in 2014, not only 3 pole connector does not work properly, Do 2 gang box in the living room has a polished switches to shut down/excrete (or losu priamun skretnicu, to control the illumination on the stazi, exploding (from how it is filled with ceiling fan from the move from the move pre 2 g, ie odvujek well), zanio sam utica (some su were olabau), i yes dao himself. Or, kamo? Definitely not OJJ 2015. I also connected the terrain in 2 gangs in the bathroom and hallway (the bedroom is next).9... All four black hot wires are together in the bedroom 2 gang box, with black wires connected to the switches. All four wires in corridor 2 gang switch, now connected together. But originally I found them with one that is connected only to one another (times 2). All four earth wires in bedroom 2 gang box are properly connected together, but the switches are not ground-floor (which I intend to fix shortly)11... One path that is pinned to the bedroom 2 gang box is a black spur, which is tethered to all four romex black wires (see #9). If I hook it up to one of romex's four neutrals, I'm going to have to re-mark it with a black power tape to make it hot now. But first I need to do a continuity test to determine the other end of the same wire on the second (corridor) 2 gang switch. For you said that the travel wire must connect directly from one 3 half switches to another 3 half switch (but splicing broken links between OK). But I believe you've said that under no circumstances do you connect travelers spur indirectly to all four white neutrals, or black hot ones, who are piglets together inside the box, if I understand you correctly. I hope this will help you help me with my situation. Thank you so much for what you've told me so far. Dan Harmon (author) from Boise, Idaho on July 20, 2017:I'm sorry, but I can't answer the 1977 code question - it was ahead of my time. If you have between switches 2 14-2 wires, and you have wooden hoses (almost certainly) and plastic boxes (probably) then you can do it with what you have. You will need to determine which cable is made in each switch box and then paint both ends of one of the white wires. Make it any color except white or green. At the moment you have all the wires you need to make 3 mode switches and the light works. But are you sure that someone has not used in the past, which was To power something else? An outlet or something? Marshall on July 20, 2017:I lives in an antique apartment from 1977 in the United States. The bedroom entry light is controlled by two three-way switches, which are in two separate boxes for the double gang switch. As it is now, one switch should be left in the upward position at all times so that the other switch can turn the light on or off. But the switches should be able to work completely independently if they do each other. There is no 14-3 cable to be used for trise. Only 14-2 cables are available for this connection. Black wires are used for the joint and one of the travelers on three switches with a pole, the other traveler is missing. But I suspect he originally had a white neutral switch from the second travel terminal on each switch to four neutral wires, all cut together in both boxes of double gangs. I know this doesn't fit the current code, but it is to meet the latest code back in 1977? My real question is, do I absolutely need to have a new 14-3 wire added to the circuit to have a secure 3 switch switch? Dan Harmon (author) from Boise, Idaho on March 22, 2017:Hi Angela:Sounds like you have a very old home and that can be a problem. If the Romex wires (two or three insulated wires lined in the outside of the envelope) could replace the box with an old part or a carved plastic box - it's not hard to do and it's very cheap. If the wires are not Romex, but the old button and tube, it's not something you really want to deal with, so if you don't see that all these wires are sealed together in a wreath, or each wire enters the box separately, don't try. Outside of that, the only thing left to protect these screws on the side - I'm not familiar with any switches available a day with screws on the back. One option would be to use the electric tape and wrap the entire switches, raise the side, over the top and completely around, completing the circle several times, covering these screws with multiple layers of tape. A lot of electricians will do that, of course. But if the screws are already touching, that's probably not the right solution, as movement over the years could carry a hole in the tape. It would be better to piece the rigid plastic (not a piece of plastic bag) as thick as possible, and push it against the switch, holding the screws away from the wall of the box. Make both sides of the switch. There is also insulating material, similar to what circuits are made of, which will also work and is quite thin. Angela Schmitt on March 21, 2017:We have a 3-way switch in our bathroom for light, fan, and night light. We decided to give a new one when we re-built the bathroom and wanted the colors to match. The old switch had screws on the back and the new one has metal screws on the And they touch the metal box. This causes the spark to spark when the power goes on. What can we do? I hope that made sense. I don't know anything about a burn. Thanks! Dan Harmon (author) from Boise, Idaho on January 11, 2017:You can't do this with three switches. If both are turned off and the light is turned off, you must both turn upwards to turn it on and overcome the purpose of the three-way switches. What you can do is set them so that they must be either up or both down to turn it on - when they are opposite each other the light is turned off. Wire them, try and see what happens. If that's not what you want, either contact one or turn the traveler wire on just one of the them.ddev4l7@gmail.com on January 01, 2017:It's not really a comment more of a question. I think I had a couple of years ago a co-worker showed me a way to wire three ways to switch so that we would always have two three-way switches in the down position when switched off and two in the up position when it's turned on. If he did what seemed to be at the time, I'd like to know how that's not possible. I'm right, but I've never had anyone to even try. Your article was and thanks for all your insight and knowledge. Dan Harmon (author) from Boise, Idaho on November 10, 2016:The best you can do is wire the socket to the common terminal switches rather than the traveler's terminals. If the power coming into the socket will be turned on at all times, if it is a light, the socket will turn on and off. But there's another problem. Unless you can fully ensure that the white wire is neutral (and it may not be), you may wire the socket in the light series and it will not work properly. If I understand it correctly, the white wire is switched off: if so, it's not neutral and what you're trying to do won't work as you burn the socket and light in the series. It is a danger in this way and should not be done. Unless there are additional wires from the three that you mentioned, all in one cable, you can't make the socket work. The box must have an additional cable with white and black wire to make the socket work. Rick on November 10, 2016:Hi Dan, I have a light switch on the wall of my stairs at the top (level 2 of the house) and at the bottom (level 1 of the house). It works like a two-layer switch. Turn it up, turn it up once or down and turn it down once. Anyway... On the opposite side of the wall, I placed a two-sided socket from the light switch at the bottom of the stairs and intended to turn off the light switch. The light switch has 3 wires and an earth connection. One red, one hot black, one white neutral (all wire from the back of the switch) and a ground wire in the screw box. I wired a duplex that expects it to work, but have something when I turn on the switch, it turns off. When I turn off the light, the duplex electricity is turned on. I changed the wires, but I still haven't had success. However, I noticed that if I touch the light switch neutrally on the floor screw everything works as I expected. Can you light this up a little bit? Dan Harmon (author) from Boise, Idaho on March 27, 2016:Piet, you'll need to have an electric line in this box, plus at least 3 wires out; one on each light. It would be possible to take two of them on one 3 romex wires, though, using black and red as leg switches (one for each light) and neutral. Does this answer your question?Piet on March 27, 2016: Have a 3 light switch in 2x4 box and I want every light have a switchmoses on October 11, 2015:good JobDan Harmon (author) from Boise, Idaho on March 29, 2014:Article 404.2(C) is what you're looking for. For the control light load switch supplied by the ground floor of the branch's general purpose, a ground conductor of the controlled lighting circuit and thanks for the saer; 3 way switches really isn't that hard, just a little different than most people are used to thinking about for switches.donald on March 29, 2014:I was just looking if the code called for color-specific wires for travelers and happened on your site. I am pleased to see that there are individuals who take the time to describe the action of the 3-way circle in understandable detail as you have. Pat in the back. I have a question. Which article requires each switch to be neutral? I haven't been in a book in a while, and it makes sense to me. However, it would be important to be able to show the customer that they have to pay more for the job! Thanks. Dan Harmon (author) from Boise, Idaho on March 05, 2014:You will need to install a new 4 mode switch between two 3 directional switch. In between, it means electric, not necessarily physical. You'll need 12-3 to cut the power on 3 directions, 4 and the other 3 directions. Instructions and diagrams can be found here: on March 05, 2014:I have a three-way switch that works properly in my basement. I want to add another switch to make 4 modes between the existing two switches. I have a 12-3 run from switch to switch. Switch 1 with 12-2 to cut the power on the lights. Is that possible without turning off the dry wall? Dan Harmon (author) from Boise, Idaho on March 02, 2014:It doesn't sound like your motion sensors are 3 directions. Are you absolutely sure they are? In addition, they had old switches, if there were three ways, on them three terminals, plus floors that had to have wire. Two black wires is not enough - what other wires/pairs are in the boxes? Jacob on March 02, 2014:I have 3 mode in my way my 2 new motion sensors have 3 red black and floor, but the old switches have 2 black wires I know which one is common, but with only 3 wires how to connect 4. wireDan Harmon (author) from Boise, Idaho on December 27, 2013:Surely it's certain that it's on the wrapper or it's a switches normal wire-crossed with traveler. Check the switch where the power comes from and check that the switch is switched on first and then the second traveler. If not, one of the travelers is changed by the power here. Then, on the second switch, check whether the switch can withstand power or not, no matter which traveler is hot, on the common wire. If not, one of the wires shall be changed by a joint departure to the light attachment. There's a problem with the power switch by your description. This switch should always generate energy for one of the two travelers. Jerry Leviner on December 27, 2013:My problem after burning for a new light with two 3-way switches is that if both switches are down then the light won't turn on both switches. Lose power in the switcher without power! What did I do wrong? Dan Harmon (author) from Boise, Idaho on June 26, 2013:In you place both a black fixed and earth wire on a black wire from the circuit breaker the best that will happen is to blow the circuit breaker. It is more possible that in the residential construction it will cause all the metal to become hot whenever the light comes on. Touch the light and floor source, such as the sink, and you will be shocked. So, absolutely not okay to floor the wire on the black wire. If the house does not have earthy wires, simply attach the floor back to the box. The primary purpose of the floor wire is to blow the blower if the fix is somehow broken and the black wire touches the metal parts of the anchorage somewhere inside the anchorage. As long as the fixture is in good condition (probably a new fixture) there will be no problems.phillip on 26 June 2013:I have a friend who works in my bathroom who has an old wiring coming out of the switch. The new lamp we're adding has earth's wire. He said it would be fine if the earth's wire was wrapped in a black wire. Is that correct?Dan Harmon (author) from Boise, Idaho on April 20, 2013:Yes, this will work fine. See the article about four directional switches for wire diagrams. Just continue adding more 4 ways to switch to diagram, always between two 3 directional switches. There will be 2 three directional switches at each end of the switch line. One 3 mode will have incoming power, the other will have a cable that will power only the light.14 wire is fine as long as it is kept from 15 amp fuse. Do NOT use 14 measuring wires on a circuit with 20 amp breaker. ... Article about 4 way switches.bob on April 20, 2013:I need to power one light from seven or eight different locations using 3 way and 4 way switches using 14/3 wire can I do that manyDan Harmon (author) from Boise, Idaho on November 29, 2012:Amshas, I'm sure you can't say what. If you can be more specific in your needs and what you are trying to achieve, maybe I can help you.amshad on November 27, 2012:it's usual, but I need 3 way 3 switchDan Harmon (author) from Boise, Idaho September 13, 2012:What's missing is that it's not him or off with a three-way switch. When the switcher is up, the common terminal is connected to one of the travelers when the switch down, the common terminal is connected to another passenger. It's not off position. One or the other of the traveler's terminals is always connected to a common terminal. Wire diagrams basically show different methods of physical running of cables; in each and every case, one is connected to incoming power and the other is connected to light. Travel terminals are always connected to the travel terminal on another switch - never to light or incoming power. Robert on September 13, 2012:I'm sorry, but all four of these wire diagrams seem the same to me. This is not an independent connection. If the first switch is on, it works corely if the first switch is off, the second switch does not work. I'm not looking for a solution like this. Dan Harmon (author) from Boise, Idaho on July 11, 2012:Thanks for the compliment. This switch may seem complicated at first, but in the heart it's actually quite simple. The best thing about them is that they are always plugged in electrically the same regardless of the physical reality of the liquid wire. Dan Harmon (author) from Boise, Idaho on February 23, 2012:If you have three white wires to one side then they are all either neutral wires or floors. Any hot, put on the same side as neutral or floor, will immediately blow the fuse or passage. With more information, I can offer more concrete advice. Is this an old (before 1950) bound and pipe wire? Are there cables in the box that contain (or more) wires in each cable? Is there any wire in the box that's cut together? Should it be replaced, one half hot all the time and half replaced? Are the wires old enough to have experienced a change of color, at least to the point that black has become gray or dirty white? So far, I see a box of three neutrals and only one hot wire. I can't conceive of any application where it would be useful, except maybe burning butters and pipes where there were no oss. All normal pet matches have at least black and white in each cable. Or is this other than a house with wires entering a box via a plumbing (pipe)?fe February 23, 2012:re-wire the old 3 white wires on 1 side socket 1 black to hot side-you can only assume that 1 of the white wires should also be hot, because the socket won't work?hank Dan Harmon (author) from Boise, Idaho on January 03, 2012:@stefan - if you spliced the white wire to the hot, it is then a hot, not a neutral, and should be colored at both ends are that no one will mistake it for an actual neutral. The black tape is fine for that purpose. Understand that there is no color that makes it neutral, this is where it eventually ends in the breakdown panel. These wires or electrons that flow into them do not know what color is insulation. People do it, and that's why the NEC decided that every neutral is white - when you cut that white wire on a black hot wire it's no longer neutral and it shouldn't be white. Interestingly, this rule is so important that the NEC will not allow you to paint the wire white. You can change color from white to anything else (except green), but never from say, black, to white. The only exception is #4 and larger wire, which is so large that the only use in most homes is from the street to your home. Stefan on January 03, 2012:Thanks for diagram 4. No other book I've looked at in Home Depot or online has shown Chart 4. When I jammed everything, I had a color code neutral, which was cut into hot with black tape. I hope this was the right action, because the neutral cut to hot acts as hot when the appropriate switch combination is done. Did I do right with the code neutral hot in the second switching window? Thank you.Dan Harmon (author) from Boise, Idaho on January 02, 2012:First, reasons should not be separated. All the reasons in the same box are always bound together (exceptions can be made for special computer circuits). Let me see if I understand what you're trying to do. You have four three-way switches and two lights. There are two light start switches(A) and two light start switches(B). The power supply comes from the fuse plate into the box with the first switch, (call it LA). The same power will then go to the switch (LB). From this point, the ignition shall be the same for each steering circuit. I assume one light needs to be on like a #3. The second light, with its own two switches, is also a wire in the diagram #3. If so, then the power in the wires (black), the power in neutral (white) and the floor (bare or green) must go to both the first two switches, one for each light. Simply run two ropes between the two circuits, cut to power in the cable and treat each set of switches as independent. Please let me know if this answers your question. If not, let me know with another comment here or by email (contact details near the top right, below my profile information). These things are difficult to answer with limited information and only with a written word. We can save her. BradG on January 02, 2012:Do you have any suggestion to burn 2 separate 3 direction switch-attachments from the same power source? I set it on the second switch, and I even separated the neutrals, but it still can't turn off the power. Do I have to separate the floor? Dan Harmon (author) from Boise, Idaho on December 07, 2011:It's really hard to diagnose from a distance, but the power that comes in the second switch will always come (when the first switch has the first power cord) on the traveler. You must have two wires marked as travelers and one as a joint (which will never go hot without this other wire switch in). If the guy with the T tag never goes hot, I'd suspect it's an ordinary, not a traveler. To track wires you can use a volt meter or a voltage detector other than contact. Make sure the wires are clogged and secure in another field and turn on the power supply. Turning the first switch will give you two wires that go hot, and then cold when you turn the switch - these are the travelers on the second switch. There are two wires left from your description; connect one of them to either the traveler and turn that traveler hot; if the light works to keep the wire is then it is common and the fourth wire should be simply clogged with a wire nut. It is possible, however, that the previous owners wired in another switch that never worked properly. If you use #3 and use only two rope wires, the switches may work, but not properly. Is it possible what happened?dr on December 06, 2011:We have an older home and had 3 mode switching between the connected fanlights. The power comes into the #1 and if we only use the #1 switch to the fanlights that work. . . . but we're trying to add #2 switch back in. We had a wire marked as T -- a traveler, but we can't get the switch #2 it works again -- we can't see it getting the power on it. No modern 3 wire used, two separate double wires were originally used. Can you switch the #1 from the #2? Would it be better to implement the new 3 wires on the #2 or can we try to make it work again as it is? Dan Harmon (author) from Boise, Idaho on November 14, 2011:Actually it's pretty simple, isn't it? All these wires and often paint in 3 way light switch look confusing, but once you understand what's actually going on, it's not that bad. I'm glad you've got this very useful, and thank you for the comment. It is always good to hear that I can help.rocco 14. November 2011:thank you very much for more ways,now better understand the terminology and method of wiredDan Harmon (author) from Boise, Idaho September 11, 2011:Good. It's certainly tempting to save some time and effort by cutting corners, but it's not a place. It's just too dangerous now and in the future.wade on September 11, 2011:Thanks for I wouldn't feel good if you did that. But he ran the wire and had his walls up for his room accessory. I thought I could save him time before he got around. Again, thank you. I see it's not worth the risk. Dan Harmon (author) from Boise, Idaho on September 09, 2011:Yes, in more ways than one. Without soil, there is a potential risk of shock. You will not be able to use the legally required earth screw on the switch. It is not legal to do what you propose and any future problems (the house may be burning) that can be traced to this burning will result in liability to whoever did this. In many countries, it is illegal to seal a house with known flaws like this without notifying the buyer, and the sale is unlikely to go through. In short, don't do this. As an electrician, I wouldn't do that, and if the boss ordered it, I'd turn it down. It's just not worth it. These codes are in place for a very good reason and should be considered. Good luck with your project.wade on September 07, 2011:Im helping a friend by burning 3 ways, has already started 2 wires/wth the floor on the switches, or wonder for trouble if we skip the floor? (use the floor for the traveler) Dan Harmon (author) from Boise, Idaho on September 07, 2011:Thank you both for the comment; it helps to know that you find the information useful.imamsaheb on September 07, 2011:when I look the connections to learn simplify,so thanks uManna in the wild from Australia on March 06, 2011:This is useful. Thank you. Dan Harmon (author) from Boise, Idaho January 25, 2011:Thanks for the comment - I hope you're a Nazi utility for information.whitton on January 25, 2011:Thank you at the informative Hub.Dan Harmon (author) from Boise, Idaho on November 29, 2010:Thank you for ping I ping compliment.tamron on November 29, 2010:I pinged you! well done and well written electric article! Dan Harmon (author) from Boise, Idaho on November 17, 2010:That's good to hear. Thanks for the comment - I appreciate when someone tells me that I helped him. Dan Harmon (author) from Boise, Idaho on October 27, 2010:Thank you. I can only hope that someone will find useful in wired 3 way switch.stars439 from Louisiana, Magnolia and Pelican State. October 27, 2010:Excellent information. GBYDan Harmon (author) from Boise, Idaho on October 18, 2010:You are absolutely right in that he can be very frustrated. I once tried to shoot a friend's work and he installed 4 mode instead of 3 mode (which is possible and will work) but the wires were wrong. It looked right if we didn't notice the 4th screw, but it wouldn't work properly. Almost 2 hours from tearing all the switches and 4 little light can break apart before I notice his mistake! Extremely frustrating!digrice from the US on October 18, 2010:That's great! Very common problem and drip 3/way switches up way leads to some interesting and often frustrating experiences. Dan Harmon (author) from Boise, Idaho on October 18, 2010:Thanks for the compliment. Burning a 3-way switch is just different enough for a lot of people to have a problem with it. I hope that the diagrams and explanations will be understandable to those who even have modicum experience there. At least your problem you found; many end up hiring an electrician on a 5 minute job! Dallas W Thompson of Bakersfield, CA on October 18, 2010:As a licensed California Contractor, I thought I knew basic arson. I bought what I thought was a three-way switch. Imagine my frustration, when I checked the ignition three times, I checked the three-way switch to find out it was a normal single pole, two-way switches turned on... Excellent information for those who understand the concept of burning... Wiring...