BMW 600 ENGINE TEST STAND

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I am sure many of you would like to know that your engine is in good condition prior to installing it in the car. There is nothing more frustrating than to complete the installation of an engine and then find out that it needs to be removed for some unforeseen problem.

The 600 engine can be very easily test run on a work bench with relative little difficulty. I have done this many times. In fact whenever I rebuild an engine for anyone, I will test run the engine for at least one hour prior to shipping it back to the customer. This allows me to verify that there are no problems and the carburetor is correctly adjusted.

Most of the equipment you need to construct this stand you probably either have around your shop or can be obtained easily from local suppliers. If you are fortunate enough to have a spare voltage regulator / starter relay you can use it in this setup. If you are like most folks who do not have many of those expensive "jewels", you can easily improvise with a Ford starter solenoid and a VW voltage regulator – available from most parts houses for under $40.00 total.

The voltage regulator I use is for a 1969 Volkswagen Beetle. Advance Auto Parts has a GP Sorensen unit, part number 265002. It is listed on their web site for $25.49. You will also need a starter solenoid. I also got mine from Advance and it is a GP Sorensen 265002. It is for a 1992, Ford, F150 pickup, 4.9 litter engine. The cost of this solenoid is $7.49. You will also need a couple of switches, regular household light switches will do, or you can spring for a more sophisticated ignition switch. I found that $0.89 house switches work fine. Additionally, you will need two 6 volt ignition coils. I have several old coils from my collection of 600s that I use, but if you are not as lucky, purchase two units from your local parts house. Any 6-volt coils should work fine. 1959 or 1960 model Volkswagen Beetle coils should work very well.

Figure 1 - Starter Solenoid

Figure 2 - Voltage Regulator

Before we get into the interesting part – the controls, first build a stand for the engine to set on. I have found that it is unnecessary to bolt the engine down. Although there is some vibration, the engines will set fine on the stand shown below. I used (2) 2" x 8" x 12" long pieces of lumber to make the engine stand. In the photo below, I used (2) pieces of flat steel, 2" x 3/16" x 11" long to fabricate the two "U" brackets. The brackets should be bent so that the outside dimension of the brackets are 6-1/2". I then used 3/8" bolts to fasten the brackets to the 2x8s.

The method above works well, but there is a simpler method. The alternate method would be to take a piece of ¾" plywood, 18" square and attach it to the (2) 2x8s with 3-1/2" deck screws. I would use at least (3) screws in each 2x8. The 2x8s should be placed so that they are 6-1/2" apart and parallel.

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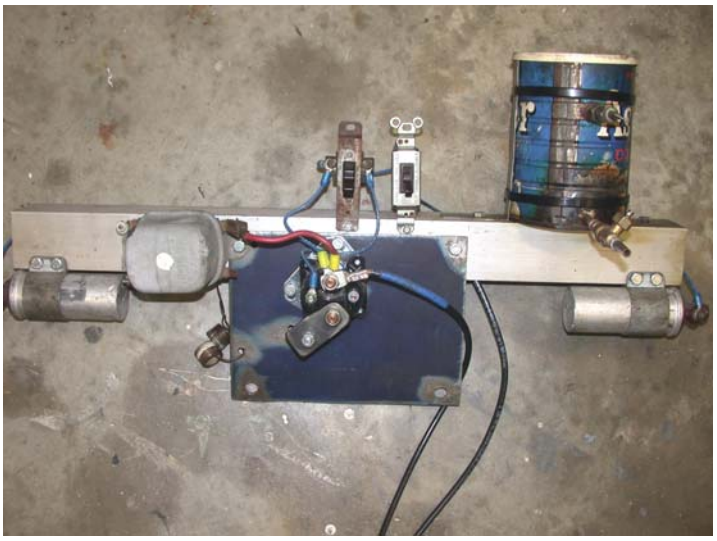
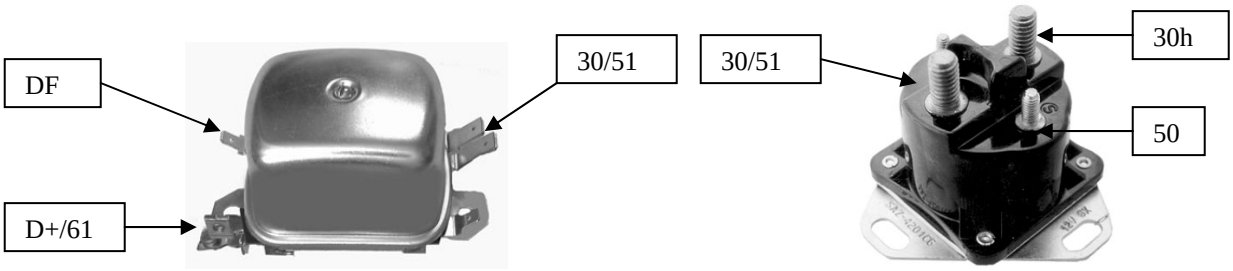
The engine should be placed on top of the stand with the (2) 2x8 supporting the lip of the oil pan. The 2x8 stand should be placed on a stable surface that is not subject to rocking.

In order to support the electrical controls and a small gas tank, I fabricated a metal frame made up of a piece of plate steel and an angle iron. The plate steel was wide enough to span the (2) upper support bolts of the engine and is approximately 8" x 6" high. The angle iron is made from 2" x 2" angle and is approximately 24" long.



The support does not have to be made of metal, but I found it to be very convenient to make it this way. By making it out of metal, a single ground wire can be connected to the support structure that will provides all the ground connections required (dynastart, coils, regulator, and starter solenoid). If you decide to make it out of wood (or another non-conductive material), ground wires will have to be connected to each of the devices mentioned above. The ground to the engine case (for the dynastart) would have to be of the same gauge as the battery connection cables (I used 8 awg wire).

Below is a picture of the regulator and solenoid showing the connection nomenclature. The nomenclature is given as shown on the BMW 600 electrical diagrams.



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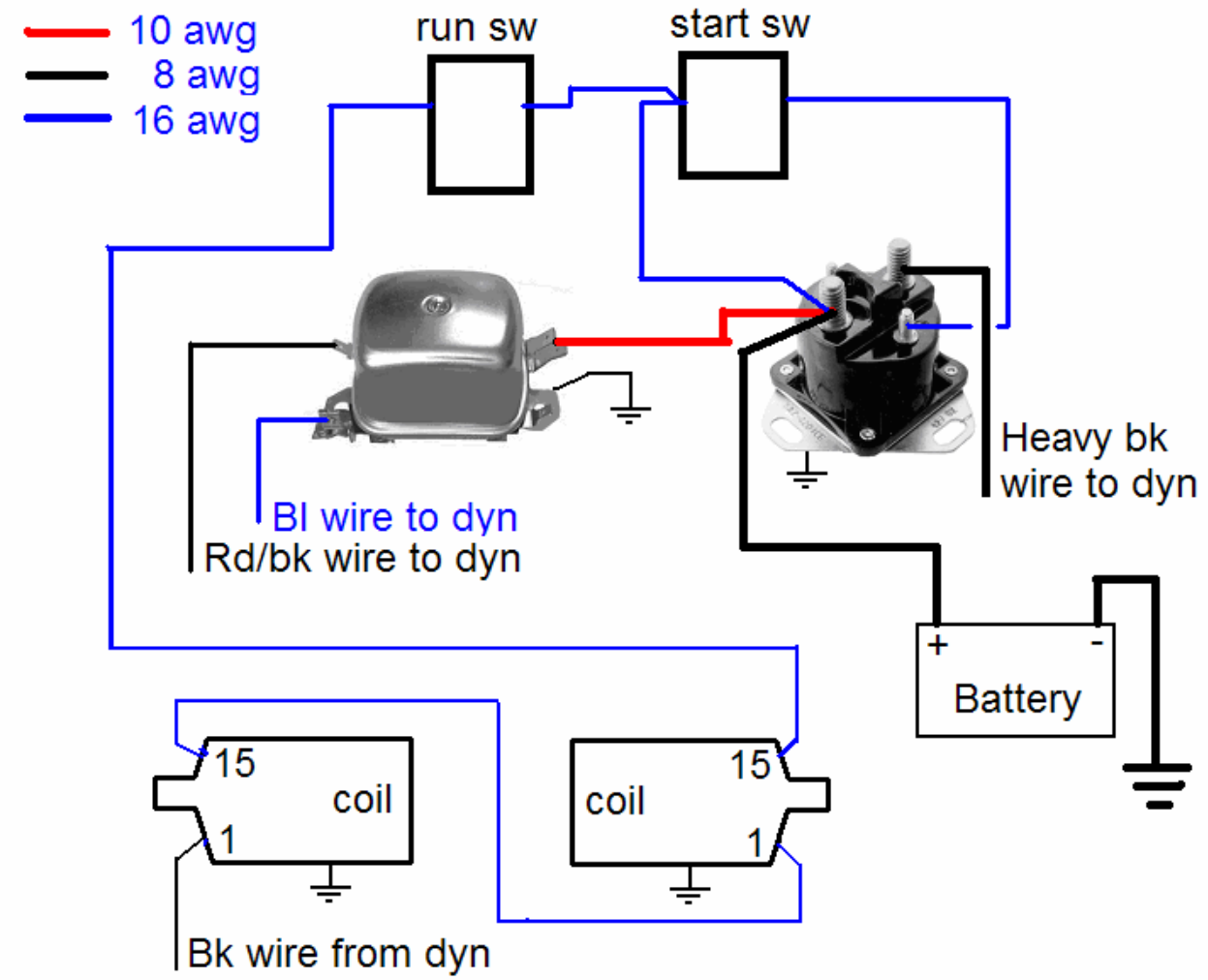
Below is the electrical diagram you should use to connect the components. Pay attention to the color code indicating the size (gauge) of the wire used for the different connections. If you do not have 10-gauge wire available, 12-gauge may be used in its place. The same hold true for the 16-gauge wire – it may be substituted with 14-gauge wire.



You may have notice in the photograph on the previous page that the Ford solenoid has a piece of metal attached to the bottom stud. This was to allow me to attach the heavy black cable from the dynastart without having to drill out the lug on the cable. I used a short piece of metal and drilled a large hole to mount to the Ford solenoid and then a smaller bolt to connect the dynastart cable to the metal plate. See detail photo below:

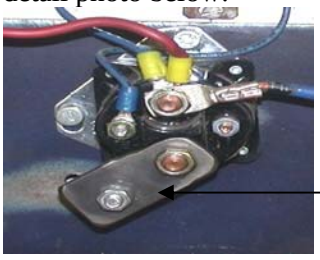


Plate for connecting heavy dynastart cable to starter solenoid.

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If you use a metal frame as I did and bolt the support device to the engine, the ground cable from the battery can be connected to any metal point on the support structure. I used 8-gauge wire for both the positive and negative battery connections (make these cables about 6 – 8 feet long). If, on the other hand, you decide to use a non-conductive support structure, you will have to provide grounds to each electrical device. Be sure to connect the 8-gauge ground cable from the battery to one of the upper mounting studs on the engine case. Then using 16-gauge wire, jumper from that connection to each of the other devices.

The last step is to purchase or fabricate a small gasoline tank. I made one from an old metal coffee can as can be seen in the photograph. It certainly would be easier to purchase a small lawn mower engine gas tank and attach it to the support frame. I would encourage you to install a fuel shutoff valve on the discharge of the fuel tank. This is handy for the following reasons:

- If you have a leak in the carburetor you can shut off the fuel flow immediately
- It will allow you to shut off the fuel to the engine and allow the carburetor to run completely out of fuel (drain the carburetor).
- If you run the carburetor dry, it will create less of a mess when you disconnect the fuel line from the gas tank.

Now you are ready to test run your engine on a stand. First, fill your fuel tank with a small amount of gasoline. Open the fuel shutoff valve and check everything for leaks. If no leaks are found, connect the battery cables to the battery.

You have two switches that control the operation of the test stand. The run switch applies power to the coils and is turned on and remains on as long as you are running the engine. The second switch is use to energize the starter portion of the dynastart and should only be on as long as you are "starting" the engine. **ONCE THE ENGINE STARTS – TURN THIS SWITCH OFF!!! Failure to turn the "start sw" off after the engine starts will result in damage to the dynastart.**

You may have to manually pull the choke or adjust the idle speed to get the engine to start. Once started, it should run smooth enough to sit on the stand as described. I do not suggest you leave the engine running unattended at any time. Do not run the engine in an unventilated place – carbon monoxide will kill you!