

## BMW 2002 M42 Swap Notes

This document is to help those that want to install an m42 into a BMW 2002. It is based around an e30 engine, trans, and wiring. You can use the e36 block/head/wiring and maybe trans but you MUST use the e30 oil pan and intake manifold. This can also be used with an e36 automatic transmission as well. All mounting and any measurements are assuming you have a set of mounts Classic Daily, [www.classicdaily.net](http://www.classicdaily.net). If you have any questions along the way feel free to email me at [jake@classicdaily.net](mailto:jake@classicdaily.net). I hope this answers a lot of questions and makes the swap a bit less scary for some. When getting an e30 engine get as much as you can. Here is a short list of what you need from the donor car.

### Parts from Donor e30

- Engine
- Transmission
- All engine wiring
- DME (engine computer)
- chassis side c101 (if car is being parted, This is the round connector where the engine harness plugs into the chassis harness. It is located on the firewall of the e30 Make you you get 6-10" wire past the connect so you can tie into it.
- Driveshaft
- Radiator
- e30 intank fuel pump and sending unit (wiring pigtails, again if car is being parted)
- transmission shifter linkage
- Battery Cable and associated brackets, etc (The battery needs to be moved to the trunk)

### Parts required from us

- Engine/Transmission Mounts
- 4-1 Exhaust header (stock M42 header does not clear the steering linkage)
- Optional Items
  - AFM mount
  - Center Support Bearing relocation brackets
  - Throttle cable with bracket
  - Wiring Kit (adds fuse box with main and fan relay)

### Mount information

My mounts use the stock 2002 rubber mounts. You can also use poly if you want a bit more rigid engine, you also get a bit more vibration in the car. The trans mount uses the e30 rubber mounts and is bolted to the floor of the 2002. The best way to do this is get the engine in and on the engine mounts. Bolt the trans mount to the transmission and raise the trans and mount up so that the mount is touching the floor of the car. Drill through the body and run some bolts through from the top.

## Modify e30 transmission

You will need to cut off the shifter linkage ears from the e30 transmission. This has to be done so the trans will get high enough in the tunnel to miss everything. You could also cut a little hole in the top of the tunnel and recover it from the inside if you don't want to cut the trans.

### Cut Shifter carrer mount off the top

Before



After



## Shave rib off bottom for track rod clearance



## Engine Bay Prep

Once you pull the m10 it is a good idea to get a few things out of the way before putting the m42 in. With the engine out there is a lot more space so do it all now. First...clean the bay. Working in a clean engine bay is so much nicer than dealing with dirt and grease. You need to remove the battery tray from the front and relocate the battery to the trunk. On the early 02s the tray just unbolts but on the older cars you need to cut it out. Now is also a very good time to make the hole for battery cable and engine wiring to the DME (engine computer). I normally use a hole saw around 2". Here is a picture of where to put the hole. When drilling the hole make sure there is nothing on the other side you might drill through. It is also a good time to track down all the 2002 wires, coolant, oil pressure, starter signal, tach, switched 12v, etc (refer to the wiring section below for more information)



## Installing Engine

- Remove the upper and lower intake manifold (it helps a lot)
- You must remove the steering track arm, or at least drop it down while putting the engine in.
- Hang the engine from only the front ring (located at the front of the head)
- Lift the engine as high as you can and have a helper lift the trans up and over the nose of the 02
- Start to lower the engine some, when the oil pan is almost going to hit the front of the 02 you will need to twist the m42 so the oil pan is towards the drivers side. By doing this the head will clear the firewall and the oil pan will clear up front.
- While the engine is twisted lower the m42 some more.
- Once the engine clears the firewall and the front of the 02 you can let the engine twist back to normal.
- Continue to lower the engine and use a jack at the back to level out the engine.
- Just go slow and the mounts will line up.
- To get the trans mount on, I bolt it to trans, jack the trans up so the mount touches the body of the car, drill some holes and use bolts from above with some large fender washers.

## Shifter Install

There are a couple ways you can do this. It all depends on what you have on hand. You can bolt the shifter carrier from a 2002 directly to the shell or modify the trans a bit more to use a early e30 sheet metal carrier as clay did. Here is some info on that process.

**Tap these holes with M10x1.5**





McDairy



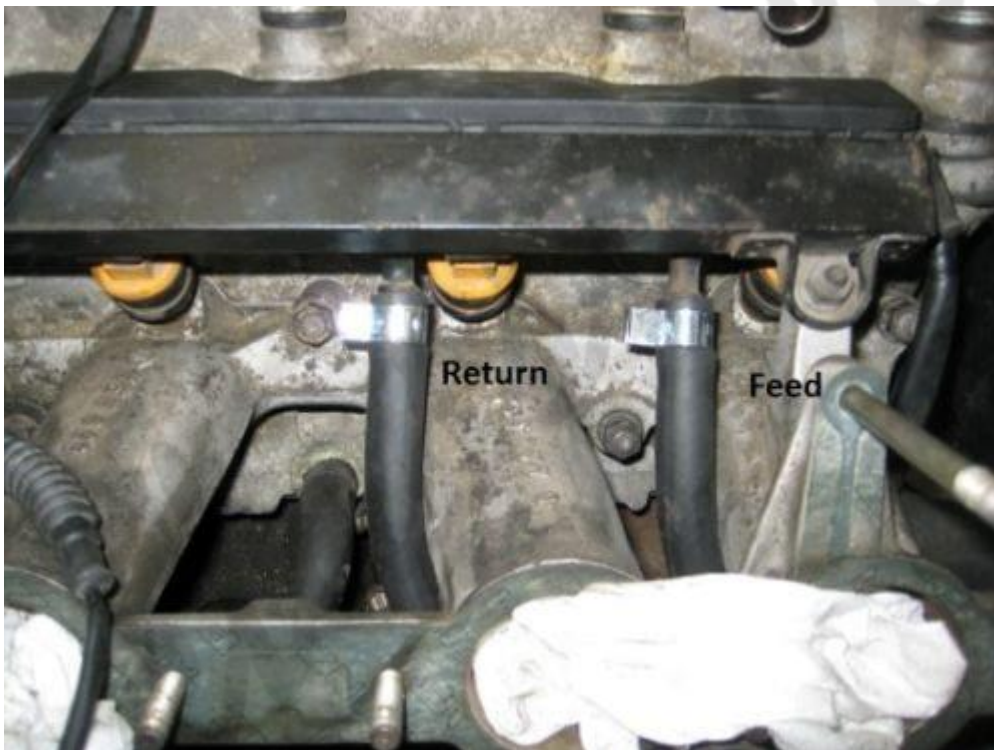
## Driveshaft

The stock BMW E30 M42 Driveshaft will fit perfectly in a 2002 other than the Center support bearing mount needs to be relocated. You can make new mounts or use our method. Some have said this method doesn't work but we have it working in many many cars all over the world with tons of miles on them.



## Fuel System

Use the E30 intank pump with return





## Throttle Cable

An aftermarket Lokar throttle cable works best here. We use the 36" version with part LOK-TC1000U36. A little bracket down off the transmission to mount the bottom and then some stock BMW bits up at the throttle body.

You will NOT use the Lokar end up at the throttle. Use the following BMW parts either bought new or cut the ends off an old throttle cable.

- 13 54 1 288 013 – plastic throttle clip
- 35 41 1 152 372 – metal bar

Then use a cable crimp to secure it.





## Cooling system

The M42 E30 radiator will fit without any issue in an early 02 (non big bumpers). If you have a big bumper car you can fit the M42 radiator if you remove the added frame rails that mount the big bumpers. If you do not want to remove those parts a volvo 240 radiator and external coolant tank will work.

Here is the Hose information

- Heater inlet hose that fits – D86063
- Heater outlet – use the stock hose connector to the stock M42 outlet
- Upper radiator use if using M42 radiator – C71663
- Upper radiator hose if using volvo 240 radiator – E71994
- Lower radiator hose if using M42 radiator – D71314
- Lower radiator hose if using volvo 240 radiator – D71314

## Heater in/out hoses



**E30 M42 Radiator in Early Car**



**Volvo 240 Radiator in late car**



## Gauges

One downside to the M42 swap is that the g240 transmission does not have a mechanical speedometer drive. This isn't THAT big of deal and there are a few options to handle it. The lowest cost (which we will show below) is to use an electronic VDO speedo and sensor on the driveshaft. Next you can use a speedo drive box to run the stock speedo and finally you can get custom gauges. The BEST is a set of speedhut gauges. Contact us if you would like a quote on a set.



## Wiring

Wiring information - E30 M20/M42 into 2002

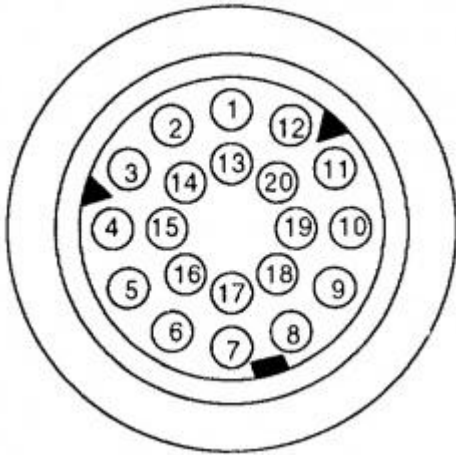
Mounts and other parts available for this swap at [www.classicdaily.net](http://www.classicdaily.net)

Note: This wiring information is NOT for our wiring kits. It use intended to wire yourself directly to the C101

O2 Connection	E30 C101 PIN	FUNCTION
Oil Pressure wire	5	oil pressure light
Wire back to pump	13	fuel pump
D+ wire	1	alternator charge
12v switched	6	DME Switch Power
12v switched	7	Coil/O2 Power
Starter solenoid	18	Starter

Coolant sensor wire	4	Coolant temp
Tach wire	9 (will need adapter)	Tach
To light	12	Check engine light ground

E30 C101 Late (also look at connector for pin numbers) Not all C101s have pin 9 for tach. If yours does not you will need to connect to the c103 pin 1 (flat connector near DME)



Notes:

- If after wiring this your car does not shut off when you turn the key off you need to add a diode in line with the alternator charge wire. Have the stripe towards the engine wiring.
- If installing a 6 cylinder in your E21 you will need a tach adapter or aftermarket tach. Check our site for different options here.