



## Retrofitting HID Xenon headlights into your E36

By Ben Liaw

UUC Motorwerks has a motto when it comes to its products. No compromise. However, one look at the US spec E36 M3 and it is full of compromises when compared to its European brethren. The euro E36 M3s cars get individual throttle bodies on a more powerful motor, rear fog light, power vent windows, aluminum hat brake rotors and a myriad of other fun toys which the executives at BMW NA decided to eliminate for our US market. Perhaps this was done in the interest of making the US M3 as affordable (as all of the cool options do add up). Fortunately, a majority of the euro-only options can be purchased through BMW dealerships and retrofitted onto US cars without much difficulty, despite the fact that they are technically not DOT approved or legal. Then again, speeding is not legal either, but that doesn't really stop anyone, now does it?

Once area in the "compromise" department is lighting. For some reason, the euro spec cars get ellipsoid lights, with glass lens covers that use H1 bulbs. H1 bulbs are available virtually everywhere in mega-wattage versions higher than the standard 55/60w of the low/high beams. There is no mistaking an oncoming E36 M3 with euro lights and 100/130w bulbs install. It's the way that the US E36 M3s should have come from Germany. Granted that only 55w lows and 60w high beams have been federalized, we'll just keep that little secret to ourselves, ok?

Rather than spending the typical street price of \$400 plus on the euro headlight conversion, I decided to do something a little different. With the new E46 3 series, Xenon headlamps (HID) only adds \$500 to the price tag. I wanted to see the possibilities of retrofitting HID to the existing US spec, plastic lens headlamps. A quick search through various parts supplies show that you have to spend between \$600-\$1000 on a "kit" to convert to HID. At this price, the euro lights seem like a better bargain. However, this article will cover how you can retrofit HID's for around \$400.

The first thing to dismiss is that despite how well the retrofitted HID's work, they are not as advance as the systems that come installed from the factory. Current factory installed HID's have a system referred to as "self-leveling" which can sense if the car is not level, and adjusts the HIDS accordingly. This is a pretty nifty feature since it saves the embarrassment of having lights improperly aimed at oncoming traffic. Additionally, I'm not quite certain of the legality of running HID's on a car not originally designed for HID's, so do this at your own risk.

Other BMW owners can agree that aftermarket upgrades can be frustrating. For \$2000, a Ford Mustang owner can purchase a Paxton supercharger and have 340hp and 450 ft.-lbs. of torque! For an E36 M3 owner, expect to pay over \$10,000 for gains of this magnitude. However, for this project, I decided that is way payback time. Time to dip in the 'Murican car parts bin.

The 1997 Lincoln Mark VII came equipped with HID's as standard equipment. Not bad for a \$40,000 luxury American car. With some research, it was discovered that the Xenon HID lighting equipped in the low beam of this vehicle was the perfect parts to use for the conversion.

There are two types of HID lighting systems from my research. There are AC and DC versions. AC HID versions are more expensive since it typically has to convert the power type to the lighting units. DC versions are perfect for the BMW application since all you need are the ballasts and bulbs (with the built in igniters).

It is recommended that you do this with headlamp assemblies that are the same age. A strange comment, but it will make a difference. For example, if you have a stock US E36 headlamp which

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have not been replaced, chances are, the plastic optics and lens are probably yellowed a bit from age and use, regardless of mileage. This conversion works best on brand new assemblies, since everything is virtually new. Additionally, since this conversion is a permanent modification to the headlamps, it's handy to have a spare set if you ever want to convert back to stock (yuck!).

There are a few parts that you absolutely need for the conversion. Here is a list of the parts:

<b>Qty</b>	<b>Part</b>	<b>Part Number</b>	<b>List Price</b>
1	LH Ballast	Ford # F7LZ13C170BBA	\$208 each
1	RH Ballast	Ford # F7LZ13C170BAA	\$208 each
2	Bulb with Igniter	Ford # F8LZ13466AA	\$128 each
2	O-Rings Size 316		
6	M4 x 20 Socket Cap Screws		
4	Female 2-wire connectors		
2	Male 2-wire connectors (to mate with female connectors)		

Tools and supplies that you will need include:

- Pliers
- 1/8" drill bit
- Cordless drill
- M4 x 0.7 tap and tap holder
- Dremel tool
- 3mm Allen key
- Velcro (Approximately 36 inches)
- 8mm socket and ratchet with extension
- Wire strippers

Note that it is NOT important to have left and right ballast, as two of either one will suffice. The only differences between the two ballasts are the length of wiring (which are both more than sufficient already). However, since we will be modifying the wiring for the BMW anyhow, get two and run before the Ford parts guy figures out what's going on!

First, removal of the headlights is required. There are five 8mm screws that hold in the headlight. Three are easily assessable, above the headlight. Removing the corner blinker helps gaining access to one of the others. The last one is the trickiest one but a necessity for complete headlight removal. Disconnect the high beam and low beam wires and remove the headlamp assembly.

Remove the metallic bulb-retaining ring with some pliers. **MAKE SURE YOU ARE MODIFYING THE LOW BEAM!** Once you remove the metallic ring, you must dremel out a groove for the o-ring to help keep the bulb watertight. You can use a cork to prevent plastic from falling into the headlamp assembly. After you have completed this step, install the o-ring.

Next, fit the new HID bulb into the newly modified hole. Make sure it sits flush and even with the base of the headlamp. You may be required to dremel more material to ensure that no plastic tabs prevent it from sitting flat. The correct orientation of the HID bulb is the small "notch" in the housing needs to point towards the bottom of the headlamp assembly.



Making sure that all 3 holes in the bulb are over the headlamp assembly, drill your first hole using the bulb as the template. You can tap the first hole and install one of the socket cap screws so that it will help keep the other holes lined up as you drill them. Repeat until all 3 holes are drilled and tapped.

Now that the bulbs are securely fastened to the BMW headlamp assemblies, you're ready to modify the Ford ballasts. There are two wire harnesses that come off the ballasts. One is the connector for the HID bulb. Leave this harness alone. We're interested in the other harness, which is where the ballast gets its power.

Cut off the existing Ford power connector and expose the wires. You will see a black (ground) and red (with black stripe) wire. The wire connectors I've used only go on in one way so that the positive and negative wires cannot be mixed up once connected. Be sure of your orientation when you modify this. I used the female connectors for this application.

Next, you need to modify the BMW wiring harness to connect to the ballast. Cut off the 9006-bulb connector off the BMW harness and give yourself about 3 inches from the connector. Using a male wire connector, add this to the end of the BMW harness. Be sure that the power (yellow with green stripe) and ground (brown) on the BMW harness match up with the power and ground from the modified Ford ballast. You can add another female connector to the 9006-bulb connector so that you can always reattach it in the event you want to use stock 9006 bulbs again.

Using strips of Velcro, secure the ballast to the inside of the front bumper. The Ford ballast is the perfect size and shape to fit perfectly. With the weight of the ballast along with the Velcro, it's pretty secure. I've tested it to triple digit speeds without having issues of it coming loose (on a test track most people refer to as the Garden State Parkway).

Connect the ballast harness to the HID bulbs and reinstall the headlamp assembly in reverse order. You may be required to re-aim your headlamps. Once completed, you can help your friend with this conversion in less than an hour.

You will notice that when you first turn on the lights, the ballast needs to "warm up". The lights start dim, but in a matter of seconds, it reaches its full intensity. The appearance of the lights is a slight bluish hue, which is easily recognizable to those who know what HID lights look like. Although other "modified" vehicles out there may appear to have HID lights (by using cheap aftermarket bulbs for the HID-look), there is no mistaking the intensity of these lights by the user. The first thing you will notice is that your fog lights are useless (they always were, in my opinion). The HID lighting adds a tremendous amount of dispersed lighting over the factory wattage bulbs. The high beams are still useful since they're aimed higher, and towards the middle of the field of vision. The high beams are lame by comparison.

Anyone want to buy a set of E36 fog lights?



## **Resources**

McMahon Ford Company  
John O'Sullivan  
4100 Gravois Avenue  
St. Louis, MO 63116  
800-325-9200  
parts@mcmahon.com

McMahon Ford offers a special price of \$400 (not including shipping) for two ballasts and two HID bulbs. Tell them UUC Motorwerks sent you for this super discount price. Thanks, McMahon Ford!



## **Disclaimer**

UUC Motorwerks also does NOT offer any sort of tech support, assistance, or guidance in any way, shape or form for this HID conversion/modification. If you require assistance, seek the advice and services from a automotive professional.

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