Lighting improvement offered by E-code headlights - pg. 2

Technical Articles - Exterior

Factory T84 Export Headlights.
By Scott Mueller.

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If you are disappointed with the headlamps on your Impala, then read on. There is a special factory export headlamp option which offers lamps which are vastly superior to what came on your car.

As many of you know, I have specialized in adding many Police, Export, and other factory options to the Impala. One of the best options I have found which can be added to any '94 - '96 Impala (or '91-'96 Caprice) are the T84 German Export headlamps. They are officially called T84, which stands for "Headlamps, Export, RH Rule of Road".

The Arteb for GMT400 is not constructed of glass like these for the B-body.

These are German specification export headlamp capsules that directly replace the standard US lamps. The T84 capsules are a factory direct fit for the Impala, and are identical in shape to the standard lamps. They are made of glass instead of plastic like the US versions, and have a much better light pattern including a very sharp cutoff. They also include additional 5-watt "positioning" bulbs which are required while parking in certain European cities. The positioning bulbs are mounted in the parabolic reflectors such that they make the reflector look as if it is lit, even though the main headlamps are off. I covered the 5-watt white positioning bulb with factory blue silicone filters as used on some Pontiac dashboard bulbs. These make the reflector glow blue with the parking lamps on, and even adds a "blue dot" effect while the main lamps are on.

The "positioning" bulbs mentioned here are often called "city lights"

The Arteb for GMT400 does not use an H4, it uses HB3 and HB4 bulbs

The T84 lamps also feature H4 halogen bulbs, which I have replaced with 80/100 watt versions for increased brightness. The very sharp light pattern cutoff insures that no light is directed into the eyes of oncoming travelers, so even though they are brighter, nobody is blinded. One interesting feature of the T84 lamps is that the headlamps are moved inboard towards the grille within the glass capsule, and the turn signals are outboard, which is exactly opposite from the US

specification lamps. This gives the car a totally unique front end appearance, and the clear glass lenses add to the effect. There are four really striking differences compared to the standard US headlamps which makes the T84 headlamps immediately noticeable to those both inside and outside of the car.

1. The biggest and most noticeable difference between the US lamps and the Export T84 lamps is the pattern of light they project. The T84 Export lamps have a very sharp cutoff in the light pattern such that the lens directs all of the light on the road, and virtually none of it up above waist level. Also, the pattern rises at a 15 degree angle on the right side, which illuminates the shoulder and any road signs quite clearly.

   The sharp cutoff is very evident if I pull up behind another car. In that case I see the rear of their vehicle bathed in light up to a sharp horizontal line right below their rear window. Above this line there is NO light, which means that nothing hits them in the passenger compartment or rearview mirror. Oncoming drivers think I have my lights aimed down at the road, which in essence I do, except that the road is lit VERY brightly and evenly, to well beyond the distance lit by the normal US lamps. This allows me to use brighter than stock 80/100 watt bulbs without blinding oncoming drivers, or vehicles traveling in the same direction in front of me. Even with the brighter 80/100 bulbs I am rarely if ever flashed by oncoming traffic.

   The very sharp horizontal cutoff line between light and dark angles up at a 15 degree angle to the right of the vehicle, which helps to light objects on the shoulder as well as road signs. The T84 lamps are expressly designed for countries like Germany (and the US), where driving is done on the RIGHT side of the road. As a point of fact, GM also makes different export headlamps for countries where driving is done on the WRONG (i.e. LEFT) side of the road. <g>

   Even with the stock wattage (55/60) bulbs included with the T84 capsules, these headlights seem so much brighter than the US versions. This is because more light is focused and projected on to the road, and less (virtually none) into oncoming traffic or into the rearview mirror of the car in front of you. However, note that when the high beams are lit, the pattern completely changes and the cutoff is completely eliminated. So when I use the factory "flash-to-pass" feature I added from the Cadillac Fleetwood, people DO know I am behind them, especially with 200 watts of high beam halogen light (using dual 80/100 watt bulbs) in their mirror!

   Another thing about the light pattern with the T84 capsules is that below the cutoff, the light is very even and blankets the road with no hot or cold spots like the US versions. In fact the US headlamp pattern on the Impala is so bad that I originally thought that my plastic lenses were somehow cast incorrectly, and I had the dealer order me new ones! When the new ones came, they were just as bad, plus I had since driven a couple of other new Caprices and Impalas and noticed the same poor headlight performance. The T84 lamps produce a clear even blanket of light on the road that is much less distracting.

2. The T84 lamps use H4 halogen bulbs, which are normally used on European auto and virtually all motorcycle headlamps. H4 bulbs are included with the factory T84 capsules in a standard 55/60 watt version. H4 bulbs are also readily available in higher wattage versions including 55/100, 80/100, 90/100 and 100/140 watts. The 80/100 watt version

is probably the most you should use with the stock wiring. Unlike the plastic lenses used on the US headlamps, the T84 headlight lenses are made of glass, which takes the higher bulb heat with absolutely no problems. Replacement 80/100 watt bulbs are only $10, which is cheaper than the US specification 9004 bulbs.

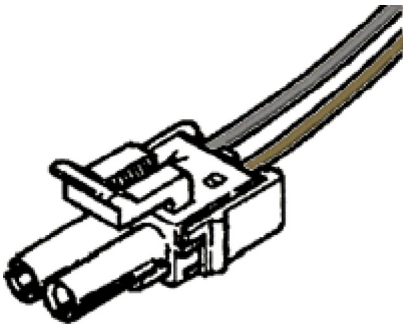
3. The headlamp and turn signal sections of the capsule are inverted compared to the US versions. In other words, the headlamp portion is inboard and the turn signal portion of the lens (with the amber bulb) is outboard. This really changes the look of the Impala from the front, which I really like since it makes my Impala stand out from all the others.
4. There is an additional bulb mounted in the headlight reflector portion of the capsule, called a positioning bulb. This is a 5 watt small wedge type bulb, which is required in Germany to light the headlamps while the vehicle is parked. German law requires that at least the headlight on the street side of a vehicle remain lit while parked on city streets. Using the standard 55 watt low beam headlamp bulb for this purpose would create an unacceptably large drain on the battery, so German specification headlamps include a additional small 5-watt bulb just for this purpose.

The US wiring harness does not have a connector for this bulb, so I made one up and wired it in parallel with the parking light bulb. I then put blue silicone caps (ordered from GM for mid-'80s Pontiac interior bulb use) over the 5 watt bulbs. Now when I turn on my parking lights, the headlight capsules light up in a deep blue next to the amber parking lights which looks really wild! When I turn on the full headlamps, the blue bulbs remain lit, and give the headlight a "blue dot" effect which some people have even mistaken them for HID (High Intensity Discharge) lamps as used on some of the higher end BMWs, Porsches and the Lincoln Mark VIII. Some people have "blue-dot" taillights, but I must be the only person in the country with "blue-dot" headlamps! <g>

Real HID lamps use an actual electric arc type bulb which emits much more blue and UV radiation than a normal incandescent bulb. They look bluish-purplish and due to the UV emissions I think you can get a suntan if you stand in front of them for too long! <g> Real HID lamps cost about $500 each and require a high voltage transformer circuit, but since there is no filament to burn out they apparently last the life of the car. The T84 lamps with blue covered positioning bulbs offer a similar cool blue lighting effect. I now find excuses to drive around at dusk with the parking lights on. As if the Impala does not already get enough stares!

You can't buy the blue caps separately from GM, but they do come on a special #158 bulb (p/n 10031004), sold by GM for Pontiac interior and dashboard lighting applications. Pontiac likes to use special interior lights with blue or orange caps to get the aircraft cockpit style lighting they feature. For example, my '89 Turbo TA (and most newer Pontiacs) feature reddish orange capped bulbs from the factory. Since the 5w positioning bulbs are

To the right here is the connector that exits from the back of the T84's. It goes to the positioning bulb that is a secondary 5 W bulb in the lower outside corner of the Headlight portion of the capsule. Not to be confused with the Turn Signal portion.



Trust me you'll know it when you see it. The connector looks like a male but there are actually two Female sockets inside those two barrels. Now comes the hard part - where to find a mate (C?) for it or do you just cut it off? The color code here is

brighter than the #158 (3w) bulbs (even though they are the same size and shape), I simply remove the blue caps from them and put them on the brighter 5w bulbs.

Using the silicone caps is much better than painting the bulbs, as the silicone is extremely heat resistant, actually helps cushion the bulb from shock which prolongs bulb life, and the color NEVER fades! I have tried painting bulbs, but always found that the paint color would fade or even change over time due to heat, not to mention if the paint is too thick, the light output is severely reduced. There is a company called Sil-Krome that makes these silicone caps for all kinds of different bulbs, and they are used in all types of HD and military applications where colored bulbs are required.

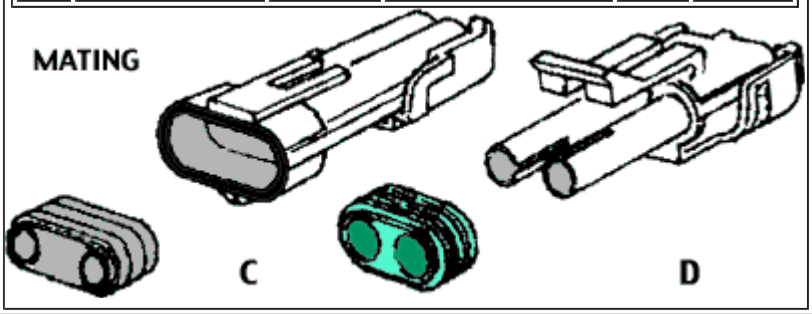
To order these lamps, visit your GM dealer and ask for the following parts:

Export T84 Capsule Headlamps:

correct. My local GM guy said you had to buy the parts separately via a non-Refundable order at something like $20 a connector. I don't think so. So after a post to the LIST Cliff Marano sent me the following info:

For a total investment $10 - $15 (depending on the deal you get at your local NAPA) you're good to go. I have made the female pigtail which I solder into the parking light harness. Makes the T-84 installation totally plug and play.

Try the following parts all made by Belden and available locally at 1000's of NAPA Stores					
(2)	Belden/NAPA	784521	GM Weather Pack Double Female Housing (1 per package)	2.19	4.38
(1)	Belden/NAPA	784515	GM Weather Pack Male Terminal 16-14 Ga. (5 per package)	3.69	3.69
(1)	Belden/NAPA	784517	GM Weather Pack Silicone Cable Seal 20-18 Ga. (makes for a super tight seal on the larger wire) (5 per package)	3.69	3.69
					$11.76



GM PN	GM Desc	Desc	List	Amount
16519237	Capsule Assembly LH	T84 LH Headlight	175.56	
16519238	Capsule Assembly RH	T84 RH Headlight	175.56	
10031004	bulb 158	158 bulb w/blue silicone cap	.94	1.88

If your dealer won't give you good pricing, then contact:

Dal Slabaugh
Parts Manager
Lambert Buick-Pontiac-GMC
2401 Front St.
Cuyahoga Falls, Ohio 44221
(800)711-2793

Note that these lamps require different connectors and sockets for the headlamp and t-signal/park bulbs. The same t-signal/park bulbs are used with the T84 lamps even though the sockets are different. I have listed the factory parts for the connectors and sockets, however they are expensive, and I As an alternative, you can get the headlamp connector and t-signal/park bulb socket for much less money at any auto parts stores. For the t-signal/park bulb socket I used General Auto Specialties (GAS) #34390, and the headlamp connector is a standard H4 or sealbeam three prong connector. If your parts store doesn't carry GAS, try a Motormite #85878 which cross references to the GAS part. These normally come as pigtails, which means the connector or socket includes approximately 6" of wire with the terminals already crimped on inside.

I recommend splicing into the factory headlamp and t-signal/park lamp wires to attach the new connectors and sockets. This way you would have both types of connector and socket ends available should you ever want to go back to stock. The positioning bulb sockets should be spliced directly into the parking lamp socket such that they illuminate with the park lamps.

Installation instructions:

Tools needed:

10mm wrench (or socket and ratchet)	#2 Phillips screwdriver
2.5" Hole Saw	Wire strippers
X-acto knife or razor blade	Electrical tape
Soldering iron and solder	Trim Blackout tape (Trimbrite T-9005 1-3/8")

1. Remove the phillips screw attaching the side marker and cornering lamp housing. Pull the housing forward to remove it from the car. Unplug the bulb sockets by twisting them counterclockwise 1/4 turn. Set the housing to the side.

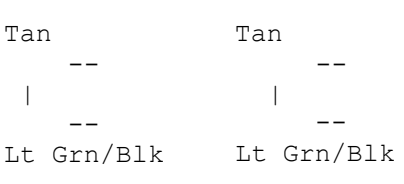
2. Remove the 4 10mm screws holding the headlamp capsule bracket to the vehicle. Pull the capsule forward and disconnect the headlamp connectors and turn signal park lamp bulb sockets. Remove the capsule and set it aside.

3. Locate the 9004 style headlamp bulb connector you just unplugged. It is a 3-pin female connector with Light Green, Tan, and Black wires running to it. Splice the new 3-pin H4 bulb connector maintaining the same color coded wire positions. The best way to do a splice is as follows. Using a razor blade or wire stripper, scribe a cut in the insulation where the splice will be placed. This cut should go through the insulation completely around the wire, but do not cut the wire itself. Scribe another similar cut 1/4" away from the first one. Slit the insulation between the cuts and peel the section away. You should now have an undamaged source wire with approximately 1/4" of insulation

missing from a section. Strip the end of the new wire to be spliced to the source wire. Wrap it around the bared portion of the source wire. Solder the splice junction. Tape the splice thoroughly with electrical tape to insure a weathertight seal.

This method leaves the original wire undamaged and allows the best possible connection with low resistance and high physical strength. Under no circumstances should you use "quick tap" or "Scotch-Lok" type crimp on splice connectors. These will corrode and leave you with an unreliable high resistance connection that will cause problems in the future.

Headlamp bulb female connector pinouts:



H4 Connector	*9004 Connector*	
Tan	Tan	Lt. Green = High Beam
Lt Grn Blk	Lt Grn Blk	Black = Ground

Tan = Low Beam

Many of the generic pigtail connectors will just have three black wires, so in that case just match the position of the terminals as shown with the correct signals.

After wiring up the new connectors and taping all splices, I recommend sealing the original 9004 connectors with black duct tape to protect them from the elements. This will prevent them from corroding should you ever wish to re-install the original lamps.

4. Locate the Turn Signal/Parking lamp sockets. Splice the new sockets to the existing wires, following the standard color coding and pinouts. The following table lists the Turn Signal / Park lamp connector pinouts.

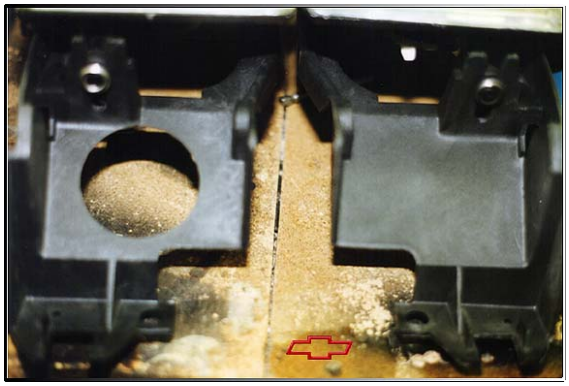
Circuit	**LH T-Sig**	**Park RH T-Sig**	**Park Generic**
Turn	Light Blue	Dark Blue	Yellow Black
Park	Gray	Black Gray	Brown
Ground	Black	Black	Black

The color coding on the generic replacement socket usually differs from the factory sockets. Note that the factory sockets use a slightly different colored turn signal wire on the LH and RH sockets. If you are using the generic replacement socket, then just splice the (light or dark) blue wire to the yellow, gray/black to brown, and black to black.

Solder and tape the turn signal splices on each side, but do not solder and tape the parking and ground splices just yet. You will be adding the positioning lamp to this circuit.

5. Remove the positioning bulb harness section from the new T84 lamps and cut off the connector end. Splice the wire ends of the positioning bulb socket to the parking lamp circuit on each side. I would splice the gray to the gray/black and brown to black but it really does not matter. Now solder and tape the splices on each side. Remove the #2057NA bulb from the original socket and install it in the new socket. Again I recommend taping up the original turn signal/parking lamp sockets with black duct tape to seal them from the elements.

6. Take the new T84 capsules and locate the angled portion of the plastic bracket which would be behind the cornering lamp socket once installed. Use the 2.5" hole saw and cut a 2.5" diameter hole in the bracket centered in this angled portion. This will allow the wire and socket for the cornering lamp to pass through the T84 brackets. Export cars did not get cornering lamps, hence they did not have clearance for the socket.



Drilling the hole for the turn signal wires to clear. - Editor

7. Remove the blue silicone cap from the 3w #158 GM wedge bulbs, and reinstall the cap on the 5w positioning bulbs removed from the T84 lamps.

8. The T84 lamps will not have the upper part of the lens under the hood area painted black like on the Impala SS lamps. I covered the top edge of the T84 lamps with black plastic trim tape and cut it with an Exacto knife to match the appearance of the US Impala lamps.

   Using the original US lamps as a guide, apply black trim tape to the top edge of the T85 lenses, and trim the tape with a razor or knife to mimic the black painted section on the US lenses. I found this to be easy by first applying the blackout tape, and then applying masking tape on top of this along the edge I wished to trim. Using the masking tape edge as a guide, I used an Exacto knife to cut the tape in a smooth curved line even with the front of the lens. After pulling off the excess tape, this left only a portion on the top of the lens similar to the black painted portion on the US lens.

9. Install the new T84 capsules. If you are installing 80/100 high output bulbs, now is the time to put them in. Then connect the new H4 connector to the headlamp bulb, screw in the new turn signal/parking lamp socket with bulb, and insert the positioning lamp socket and bulb. Before mounting the lamps turn on the headlights and test to see that both low and high beams, as well as the parking and turn signal lamps work properly. The positioning lamps should come on with the parking lights.

   If everything is working properly, then mount the T84 capsules and reinstall the 4 10mm screws you removed earlier.

10. Install the original cornering lamp/side marker housings. First plug in the sockets with bulbs, and then install the housing and secure with the phillips screw you removed earlier.

That's it!

Installing the factory T84 lamps has to be one of the most noticeable and significant improvements in both form and function that you can make to your Impala (or 9C1 Caprice)!
- Scott.

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