

Northstar Chevelle Club

Jan/Feb 2005

www.northstarchevelles.com



“Misty Turquoise” ’70 Malibu 307



Features

- Original 307 V8 with 32,404 miles
- Original TH350 automatic trans.
- Original “Misty Turquoise” Paint
- Original Interior
- Original, Original, Original!

Darren Arnold Lakeville, MN

This is a car that was owned by my next door neighbor. It was actually her dad’s car originally but when he passed away she got the car. I drooled over this car for many years and would only see it occasionally. Her son was actually driving it for a while just for daily transportation when his car was broke down, even though he is a mechanic by trade. He got rear-ended one day so he decided to park the car. It made me sad to see the damage but my neighbor’s husband Bob was going to have the car re-stored. I didn’t hear anything about the car for a long while until Bob mentioned tat they were going to get rid of the car. The car had been sitting in a garage for the last 4 years and when they brought it in for restoration the shop found some rust holes in the frame and Bob decided it was junk.

...Enter Darren...

Bob wanted \$800.00 but I offered him \$500.00 and we made the deal on June 19, 2003. I was one happy Chevelle owner again that day! The brakes went out on me and the gas line leaked so those were my first projects I completed over the winter. Actually, the mold in the interior was nasty so that was the first order of business on the black interior. Bleach water and a sponge was all I needed to clean it up good, thanks to the Team Chevelle website at www.chevelles.com where I did a search on mold and found that answer. When I started it up that next spring the engine had a bad knock in the bottom-end.

Fresh oil and a long warm up did nothing for her so I put a can of Sea Foam in the crankcase. I ran it about 10 minutes,



drained it out and replaced the oil and filter. This doesn’t work for everyone but it did in my case. I am sure there was some sludge build up that just needed a push.

I found a couple people that are willing to weld up the frame plus I checked with a body shop and they said it could be repaired. So when I get a few spare dollars I will get that done so I can take her to church on Sundays. My senior pastor really loves these cars so it will be a lot of fun sharing the history with him and telling him once again, “My car is faster than your car”!



John Delke's LED Tail Lights info for the technogeeks

At the March meeting, John Delke demonstrated his board-mounted LED taillights made for several years of Chevelles and El Caminos. John has put together some detailed information on LEDs for those interested in this type of technology. I've got my fingers crossed that John can get permission from the patent holder to start producing the Chevelle lights for retail sale, but if not, here's what you need to know to make your own.

I started building the LED modules for cars for several reasons:

1. I bought \$40 worth of LED replacement bulbs, and they won't fit my '64 El Camino housings!
2. The above weren't near bright enough for my tastes.
3. I was rear-ended 3 days after getting my car back together in preparation for a Club meeting.
4. Derek was rear-ended on the way to the same Club meeting.
5. Because I think they're cool, and a neat alternative to regular bulbs. I like building electronic circuits and just general "tinkering".

A Light Emitting Diode (LED) is an electronic semiconductor component that emits a single color light when a DC current flows through it in a forward direction. Introduced during the early 1960s by Texas Instruments, the first LED components were dim and only available red in color. Today LEDs produce a far brighter light source, are available in a variety of voltages and sizes, and in a range of colors including red, orange, yellow, green, blue and white. These robust and electrically efficient components (a typical LED requires a DC current of about 10 milliamps to begin emitting light) make them ideal for use as indicator lamps on control panels.

Compared to incandescent lamps, LEDs offer a number of advantages including:

- Robust construction - there is no glass to shatter or filament to break.
- Modern LEDs are extremely efficient - they can emit light equal to a small incandescent lamp while consuming about 10 percent of the electrical power.
- High reliability - modern LEDs have life spans of 100,000 hours (over 11 years) of continuous use.
- Environmental - LEDs can withstand shock and vibration much better than incandescent lamps.

Construction - A discrete LED component consists of the "die" (light emitting semi-conductor material), a lead frame to support the die, and an encapsulation epoxy which surrounds and protects the structure.

Light Output - This parameter specifies the intensity of the light produced by a LED, and is normally quoted in units of "mcd" for a stated Forward Current (I_F) flowing through the component. The unit of light measurement is the "Candela". One Candela (or 1 cd) is defined as the light intensity of a "standard" candle viewed from a distance of 12 inches. This intensity is approximately equal to the light produced by a small 2 watt standard incandescent bulb. One Candela equals 1000 milliCandelas (mcd). Modern LED components are available with wide ranging light outputs from 1 mcd to 8000 mcd (or more).

White LEDs are specified in a different way to single color versions due to the way they work. They are essentially "blue" LED semiconductors where the light excites phosphors in the epoxy casing, resulting in a white light with a bluish tinge. Unlike incandescent bulbs that radiate light in all directions, LEDs emit light in one direction only.

*(Ok guys, so you don't think I'm a **total** techno-geek, you can credit the entire preceding text to the Model Electronic Railway Group in the UK. <http://www.merg.org.uk/led/> lots of info here)*

Circuit notes: Nearly all LEDs require some type of resistor to limit the current they will draw. Due to increasing popularity there are some single units and the aforementioned "bulbs" that have them already built in, valued for use in 12 Volt electrical systems. The safest bet is if you have a raw LED, it'll need a resistor.

An LED must have a resistor connected in series to limit the current through the LED; otherwise it will burn out almost instantly. Generally a ¼ Watt rated resistor will work fine for automotive use.

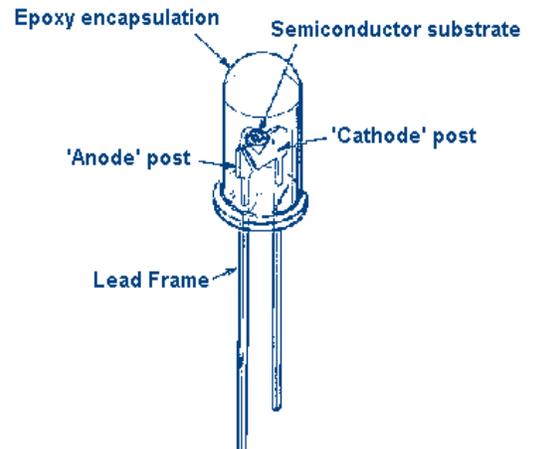
Here's where you should have stayed awake in math class, because you need to do some calculations.

The resistor value, R is given by: $R = (V_S - V_L) / I$

V_S = supply voltage

V_L = LED voltage (usually about 2V, but 4V for blue and white LEDs)

I = LED current (usually 17 to 20mA)



...continued

Connecting LEDs in series: If you wish to have several LEDs on at the same time it may be possible to connect them in series. This prolongs battery life by lighting several LEDs with the same current as just one LED. All the LEDs connected in series pass the **same current** so it is best if they are all the same type. The power supply must have sufficient voltage to provide about 2.2V for each LED (4V for blue and white) plus at least another 2V for the resistor/cushion. You can't just string together 10 LEDs, you'll run out of voltage. To work out a value for the resistor you must add up all the LED voltages and use this for V_L .

Calculations: A red, a yellow and a green LED in series need a supply voltage of at least $3 \times 2.2V = 6.6V$, so a 12V battery would work. I usually use 13.7V in my calculations (for automotive units) for safety.

$V_L = 2.2V + 2.2V + 2.2V = 6.6V$ (the three LED voltages added up).

If the supply voltage V_S is 13.7V and the current is $20mA = 0.020A$,

Resistor $R = (V_S - V_L) / I = (13.7 - 6.6) / 0.020 = 7.1 / 0.020 = 355$,

so choose $R = 390$ (the nearest standard value which is greater).

You can also connect LEDs in parallel, but it is not generally recommended unless:

- They are the same type, same mfg., and identical ratings.
- You can get a resistor with adequate current handling capability (Watts)
- Ventilation – the resistors used will get finger burning, lens melting HOT! (Voice of Experience here)

I wouldn't recommend doing it. It does make for slightly easier circuit design, but not enough to warrant the heavier duty components and heat.

LEDs must be connected the "right" way – they have polarity! Reverse connected LEDs will blow almost instantly or be permanently damaged. Gets expensive at \$1.00 each for white ones! (Voice here again!)

How to identify polarity:

- The shorter of the two leads = Negative
- The case has a "flat" on the base or side = Negative
- The leads are cut off, and no flat = Look inside if you can, the post attached to the larger "guts" is the negative / Cathode lead.
- It's marked with a "-" or a "K" (yes, K for Cathode) on the Cathode / Negative side of the case.

That's about it. There are several really good beginners' books out there. I refer constantly to a book that may still be marketed at Radio Shack. My copy is at least 12 years old, but it is:

Getting Started in Electronics by Forrest M. Mims III. Radio Shack # 276-5003

Buy some parts and start building!

-John Delke

Northstar Chevelle Club News - It's about time! - by Derek Kiefer

"It's about time" While those might have been the exact words you muttered when you found this newsletter in your mailbox, that's not quite what I'm talking about. It's about time that summer is here, shows are starting, tracks are open, and the cruising is good. I've noticed, that when there are more distractions, and fun things to do, I have more ambition, and my quality of life is much better. I also, somehow, manage to get more done. Don't ask how it works, but it does. When I don't have much to do, I don't do much, meaning, I have a definite lack of ambition during the winter months. Just look at my bare frame that hasn't been touched since that week of nice weather we had in January. Now that I've got a million more fun things to do, it's time to play catch-up on all the things I didn't do all winter... it's a vicious cycle I've gotten myself into. Maybe one day I'll learn from it.

Darren and John both stepped up to provide us with some great content for this newsletter. It's great to see another Chevelle like Darren's get saved. Bad frame or not, that's car's a beauty. John's info, while somewhat over my head (and I read it a million times for editing purposes... hope I didn't cut anything too important!) it was a good read, and definitely highlighted the benefits to using LEDs for our taillights. For the members who haven't seen John's LED tail-light creations, it's really incredible, and I guarantee that nobody will miss your brake-lights!

-Derek Kiefer

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