

Adapting to Changes in Regulator Applications

DuBois Marketing Technical Dept.

Charles Darwin wrote: "It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change."

The Model T Ford was thought of as a highly complex machine in its time—a big change from the horse and buggy. The addition of a generator, and later a starter motor, made the mechanical understanding of this vehicle very difficult in the early part of the last century.

In the 1930s and 1940s when the three-unit voltage regulator was put into common production, it was thought of as overly complicated. "What is wrong with the cut-out?"

In the 1960s as alternator systems became popular those who understood generator systems thought these new systems were too complicated. Some vehicles were converted back to generator systems to make them less complicated!

As integrated regulators became more common in the 1970s, there was a lot of distrust of them—probably because one could no longer see the individual working parts. There were no longer any points, coils and resistors to service and understand. The electricity flowed through the mysterious transistors and diodes that were thought of as overly complicated.

After a quarter of a century of integrated charging systems, most of us are comfortable with their operation, but the new computer controlled systems make us nervous. The thought of working on a "simple generator system" makes many rebuilders nervous also. Change is inevitable—we have seen a tremendous change in vehicles in the last century—and more changes are on the horizon. The Model T Ford was a very simple vehicle from our perspective, but you would not be happy driving one today. We enjoy the luxury of our modern vehicles even if they are more complicated.

As charging systems have progressed over the last 100 years, those who kept up with the changes as they occurred have been rewarded with more business. Those who refused to change saw less and less customers, as they had to refer

these prospective customers to other shops or the manufacturer's dealers that serviced the newer units.

So, what is new on today's and tomorrow's vehicles? The biggest change to our industry will be the external control of the internal voltage regulator. We are seeing this being used on more and more vehicles. The engine control module (ECM), powertrain control module (PCM) or whatever the manufacturer designates as the main control computer in the vehicle, is taking more control of the other functions of the vehicle, such as the charging system. In most cases so far, the main computer simply slightly modifies the charging characteristics while the internal voltage regulator does most of the work.

As time goes on, we may see more control of the charging system being given to the main computer. As an example, Chrysler has never used an internal voltage regulator on most of their domestic vehicles but over the last few years have tied in more of the charging functions to the main system computer. Ford's "PCM controlled" voltage regulators and the RVC system used on a few GM vehicles are other examples of the new systems being developed by the vehicle engineers. In addition, there is the Mazda P-D split regulation system and the Honda C-terminal system that have been in use for some time.

How should a rebuilder handle these new systems? What regulator should you select for replacement when rebuilding a unit? That will depend on the type of customers you are servicing. What we mean by that is if you are only doing remove, rebuild and reinstall work on an individual unit, you may be able to reuse the customer's old voltage regulator, if that was not the reason for failure. However, many rebuilders replace the voltage regulator with a new one even then, because of the damage that can be done to the electronic circuits over the years by the high under hood temperatures. In this case, the same model of regulator or any later version can be used.

If, on the other hand, you are supplying units for replacement to jobbers, warehouses or for your own shelf stock, a universal fit unit can save on inventory costs. In these instances, using the latest version of a voltage regulator will ensure that your unit will function in all of the earliest and latest applications of that unit.

Our color chart will help you identify the latest version of each of the new Ford regulators. Ford makes identification of most of their regulators easy because they cast a part number into each regulator and use a certain color for the body of the regulator. When that is not enough, they make the chip cover a significant color also. As you study our chart, you will see how easy it makes identification. If you

4G, 6G Regulator Chart

4G SERIES				
MOTORCRAFT #	BODY		NOTE	LESTER
F6DU-10C359AA	Gray		Non Soft Start	7781,7787,8251
			OEM version of above	
F50U-10C359-AA	Black		Soft Start (6 sec LRC)	7773,7780,7786, 8308
			OEM version of above	
YF1U-10C359-AA	White	White	PCM	8269, 8312, 8313,8314
VP3F1U-10C359-AA	White	Blue		
VP6L8U-10C359-AA	White	Blue		
6G SERIES				
MOTORCRAFT #	BODY	COVER	NOTE	LESTER
F8WU-10C359-AB	Gray	Gray	1st production, non SS, non PCM	7795-99,8252,8266,8307 8306,8310,8311,8316,8317
VP3C3U-10C359-AA	Gray	Green	2nd production, non SS, non PCM	
XS7U-10C359-AC	White	White	SS (1st production) 7 sec LRC	8250,8254,8259,8263, 8265,8309,8305
XS7U-10C359-AB	White	Orange	SS (2nd production)	
XR2U-10C359-AB	White	White	SS (Mainly Australian application)	
VP4L1U-10C359-AA	Black	Black	SS (Latest production) 7 Sec LRC	
XW4U-10C359-AB	White	Black	PCM (1st production)	7788,8253,8255,8260, 8261,8264,8268,8315, 8318
VP4L3U-10C359-AA	White	Blue	PCM (2nd production)	
7L4E-10C359-AA	White	Gray	PCM (3rd production)	

wish to make your unit universal to fit the latest applications, it is best to always use the latest original equipment version.

We also have available the latest versions of the new GM regulators for the DR44 or AD300 series alternators, both the conventional four-wire version for the Lester 8489 (145A) and the newer RVC two-wire version. At present, the RVC two-wire regulator is used in the Lester 8301 (160A) and 8302 (145A). There is also a 160A Bosch interchangeable version, Lester 11075.

The manufacturers of all late model vehicles have been very quiet about any service information for all of the newest units. They would, of course, like a replacement to be purchased through their parts channels. If you go on their pay Web sites, you will find vehicle service information to diagnose a charging system problem, but very little information on the regulator strategy as applied to the internal workings of the complete unit. There are some aftermarket test kits that you can use on your test stand to simulate some of the functions that the computer in the vehicle will send to the regulator. Many rebuilders choose to replace all late model regulators of this type with the latest original equipment version regulator to ensure all operating parameters are met.

So remember Darwin's wisdom when devising your business strategies. Do not fear change, as it is our key to survival in an ever-changing marketplace.