



# Did You Know?

**NAPA® Echlin®**

## **We've Got You Covered – DIS Control Modules!**

A distributorless ignition system (DIS) control module controls current flow to the coils. The DIS module processes sensor inputs about crankshaft position and engine speed to establish ignition timing and sequence. NAPA Echlin's modules undergo extensive testing ensuring better quality, increased confidence, enhanced performance, and improved durability.

### **The NAPA® Echlin® Advantage**

- The OE chip is assembled to a specially matched ceramic substrate preventing premature failure due to broken connections created by thermal expansion and contraction.
- Double wire bonding creates more durable connections within the module, thus preventing premature failure due to loose or broken connections.
- Multiple front end grounding enhances the module's RFI shielding improving on the original.
- The ESD diode protects the module's delicate circuitry from damage due to electrostatic discharge.

### **Comprehensive Coverage**

NAPA Echlin's comprehensive coverage provides the perfect form, fit and function demanded by today's top technicians.



**NAPA® Echlin®  
Modules are  
Superior to the  
original Inside  
and Out!**

**NAPA® Echlin®  
LOOKS RIGHT. FITS RIGHT. PERFORMS RIGHT.**

**THE BEAR IS BACK**

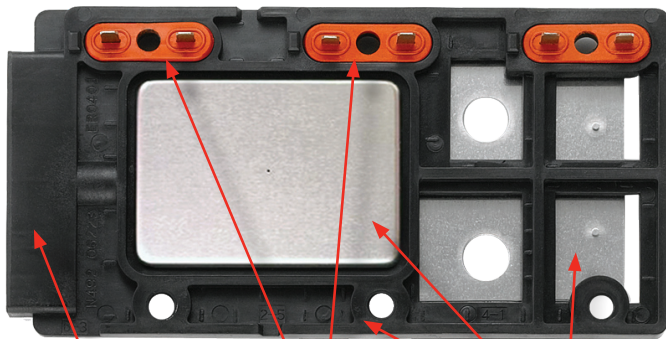




**ECHLIN®**

# Did You Know?

## NAPA® Echlin® Modules – Built Better Inside and Out!



Connectors

Rubber Inserts

Body/Case

### External Components

**Connectors:** Provide connection point between the module and the vehicle wiring harness. With a design that matches OE, NAPA® Echlin® advanced thermoplastics ensure proper connections and resistance to fracture due to heat and thermal cycling for a longer service life.

**Body/Case:** Protects the internal circuitry from damage while providing an electrical connection to the coil in many applications. NAPA® Echlin® manufactures the body of advanced thermoplastics and anti-corrosive metals that resists thermal cycling, moisture, and corrosion leading to improved durability.

**Rubber Inserts (GM):** The inserts are manufactured of silicone rubber which is designed to withstand high voltages and create a waterproof seal to prevent moisture intrusion between the coil terminals which would lead to premature failure.

### Internal Components

**Thick Film Hybrid Circuit Board:** Provides current distribution within the module. NAPA® Echlin® manufactures the circuit board with precious metal conductors and a 0.035" ceramic substrate which is then over-glazed. This provides improved thermal performance over printed circuit board electronics as the over-glaze of ceramic circuitry enhances environmental durability.

**Flip Chip (GM):** Processes the voltage inputs and outputs of the control module. Using the 'Flip Chip' enables the NAPA® Echlin® module to perform identically to original equipment. The OE microprocessor (silicone TCE) is best matched to the thermal expansion properties of our ceramic substrate eliminating failure due to broken connections between the chip and the board.

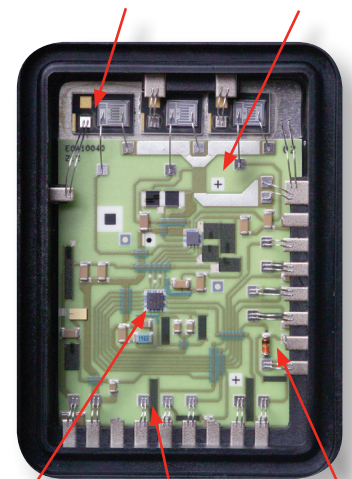
**Double Wire Bonds:** Attaches the substrate to case circuitry. The two 12-mil wires are ultrasonically bonded to the substrate and the case leads. The ultrasonic bonding is a welding process that uses ultrasonic sound to clean the surfaces before making a cold compression weld which then enables welding in small places without damaging sensitive components. The double wire bonding design assures reliability and durability under extreme operating conditions.

**Electrostatic Discharge (ESD) Suppression Diode:** Protects the unit from electrostatic discharge. Designed with a premium quality containment circuitry that suppresses voltage spikes which prevents premature failure.

**Copper Slug Heat Sinks:** Dissipates the heat created within the unit by the power transistors. The heat sinks absorb excess heat and the copper is used for its thermal absorption capabilities. This allows the power components within the module to keep cool and provide peak performance while extending the module's life cycle and reliability.

**Front End Grounding:** Provides effective circuitry grounding and shielding. Multiple circuit grounds are ultrasonically bonded to the module's back-plate which enables the module to have greater resistance to RFI (Radio Frequency Interference) over a wide range of operating conditions. This allows the module to have perfect performance in a difficult underhood environment that has the potential to produce a considerable amount of RFI.

Copper Slug Heat Sinks      Ceramic Substrate



Flip Chip

Double Wire Bonding

ESD Suppression Diode

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