**Summary of Slant Six Distributor Cap to Rotor Testing** (as of Feb 2017)

**Why Testing Initiated:**

1. MO3000 rotor dragged on Echlin Cap terminal causing Distributor Gear to strip
2. Subsequently short rotor & caps results:
3. Distributor cap center electrode fracturing (6 times in 7000 miles)
4. ECU module failures (4 times in 4000 miles)
5. HEI coil failures (2 times in 4000 miles)
6. Secondary Coil Wire Voltages (20,000 to 25,000)
7. Point Ignition Coil failed (once in 3000 miles)

**Distributor Cap to Rotor Gap Testing Parameters:**

1. Test Engine used only for testing of various caps & rotors (Dec 2016-Feb 2017)
2. Following conditions kept uniform during test:
   1. Operating conditions such as weather, RPM (800-900), & Coolant Temp (Warm)
   2. Engine Components & Settings
   3. Measuring Equipment (jigs, gauges)
3. Limited test variations included:
   1. Cap and rotor types
   2. Cap to Rotor Gaps

**Patterns & Results Observed For 22 cases examined:**

1. Secondary Coil Wire Voltage altered significantly by rotor & cap combos
   1. Double Wide terminal cap or Double Wide rotor tip lowered voltage
   2. Smaller Cap terminal to rotor gaps lowered voltage
2. Early 60’s Mopar cap/rotor had lower voltage than present day stock cap/short rotors
   1. Wider terminals & smaller gaps (.028 versus .1)
   2. Secondary voltage reduced to 2200V (from 22,000V)
3. Combining wide rotor tips & smaller gaps lowered voltage by factor more than 10
   1. Smaller gaps (.025”) dropped voltage from 22,000V to 9000V using MO3000 rotor
   2. Gaps around .018 dropped voltage to 5000V
   3. Small gaps (.022”) & wide rotor tip **when combined** dropped voltage to 1700
4. Rotor can wooble changing gap by.010-.015”
5. Long rotor (MO300) can strike cap terminal when gaps get below .015
6. Eccentricity/offset of cap terminal center versus rotor circle center measured at rotor tip plane; eccentricity ranged from .002” to .017” for first 17 caps measured:
   1. High eccentricity caused rotor gaps to vary by as much as .034” in a cap
   2. High eccentricity caused long rotor to hit one or more cap terminals
   3. 2 in 17 chance of long rotors striking a cap terminal in test group

**Slant Six Distributor Cap Terminal To Rotor Tip Gaps Test Data**

Table shows results with Exchlin MO3000 Rotor (unless noted)

CAP MODEL CAP# MAX MIN ECC (Cap Eccentricity)  
Echlin MO 40 1 .030 .013 .008   
Echlin MO 40 2 .038 .010 .014   
Echlin MO 40 3 .041 .012 .014   
Echlin MO 40 4 .022 .017 .002   
Echlin MO 40 5 .034 .014 .010   
Echlin MO 40 6 .038 .008 .015   
Echlin MO 40 7 .040 .015 .012   
Echlin MO 40 8 .032 .015 .008   
Echlin MO 40 9 .041 .009 .016   
Echlin MO 40 10 .030 .025 .003   
STND CH-410 .030 .008 .011   
STND CH-403X .040 .015 .012   
AIRTX 5D1022A .030 .005 .012   
REMAN. Echlin 9 .018 .012 .001 cap terminals machined to fit rotor  
UNITED CC611X .040 .006 .017   
Echl #10 Wide Rtr .022 .016 .003 cap terminals machined to fit rotor

Echl #2 FD117 Rtr .022 .015 .003 cap terminals machined to fit rotor  
  
**1960's & Early 70's Caps & Rotor**  
ECH MO 6/1838516 .028 .013 .007   
2642986/1838516 .027 .010 .008   
  
**For Different Rotors measured:**   
Echlin MO 13 add .057 to all gaps   
CARQUEST D147P add .056 to all gaps   
MOPAR 1838516 subtract .008 to all gaps (interference fit on Echlin #6 & Standard #1)   
  
**Secondary Coil Wire Voltages** (SV) (All with .035 Plug Gap Unless Noted)

**THE DATA CASE GAP SEC VOLT**  
The Worst Gap .114 22,000   
Medium Gap .025 9,000   
60's Dbl. Width .028 2,200   
Machined Gap .018 5,000   
**Wide Rotor Tip .022 1,700**

**FD117 Rotor Tip .022 1,400**

**FD117 Rotor Tip .022 2,900 (With .045 Plug Gap)**

All dimensions in inches

**Impact of lowering secondary voltage on ignition components being evaluated**

1. Some limited data available:
   1. 25,000 Secondary Volts (SV)- ECU failures (4 in 4000 miles)
   2. 25,000 SV- HEI coil failures (2 in 4000 miles)
   3. 25,000 SV- Distributor cap center electrode fractures (6 in 7000 miles)
   4. 8000 SV- Distributor cap center electrode fractures (1 in 7000 miles)
2. Data points from other vehicles & ignition system combinations needed:
   1. SV
   2. Ignition Component Failure mileage
3. Reliability testing on FD117 extended wide tip rotor with gaps of .022 underway:
   1. One vehicle with points with plug gap at .045 (SV 2900 v)
   2. Another vehicle with HEI with plug gap at .045”
   3. Instructions on building the FD117 tipped rotor:

<http://tinyurl.com/Build-FD117-MO3000-Instruction>

* 1. Instructions on fitting cap terminals toFD117 tipped rotor:

<http://tinyurl.com/Fit-FD117-Rotor-To-Cap>

1. Reliability testing best if no changes to other components during the test period