

SECTION 6Y

ENGINE ELECTRICAL

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IGNITION SYSTEM

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GENERAL DESCRIPTION

The ignition system used in the Corvette is basically the same as used in the Chevrolet passenger car. For maintenance and trouble-shooting of ignition components, refer to your 1961 Chevrolet Passenger Car

Shop Manual, Section 9, except in the case of the dual-point distributor used with fuel injection system (fig. 1).

SERVICE OPERATIONS

NOTE: Gear case, cross-shaft and cross-shaft drive gear service operations listed below apply to distributor driven tachometer and fuel injection equipped engines only.

Dual-Point Distributor

Removal

1. If vehicle is equipped with radio, remove three bolts securing ignition shield over distributor and coil. One bolt is accessible from the top of shield, the other two are at rear of shield, facing firewall.
2. Disconnect fuel injection pump and tachometer drive cables from distributor housing.
3. Remove distributor gear case oil feed line. Re-

lease distributor cap hold-down screws and remove cap.

4. Scratch or paint a realignment mark on breaker plate and intake manifold in line with rotor segment. Loosen and remove distributor clamp and remove distributor.

CAUTION: Avoid rotating engine with distributor removed as ignition timing will be upset.

Disassembly

With the distributor removed from the vehicle it is advisable to place it in a distributor testing machine or synchroscope. When mounting distributor for tests, first secure the gear in the drive mechanism, then push distributor housing down toward the gear to take

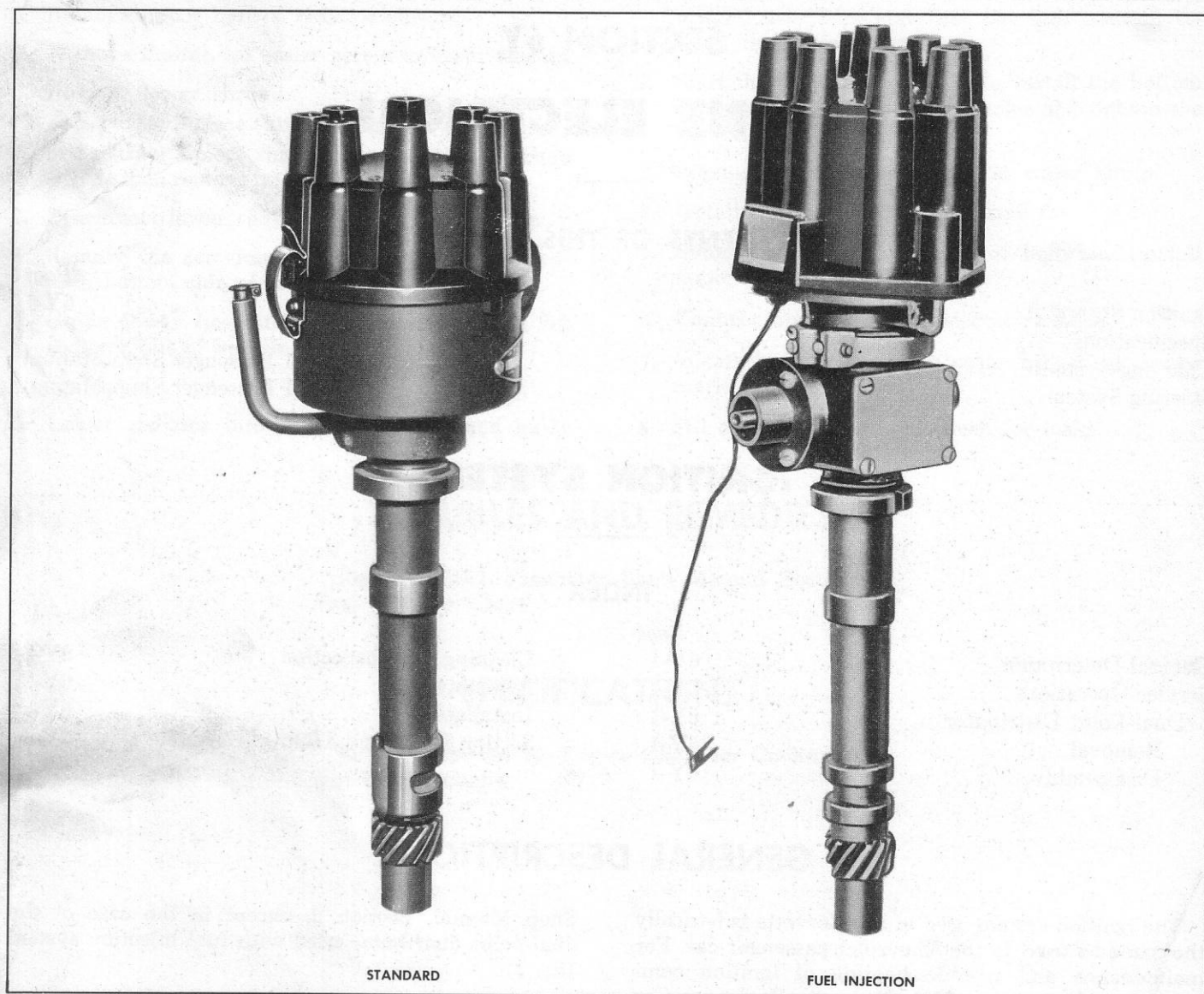


Fig. 1—Dual Point Distributor

up end play between the gear and the housing, and finally secure the housing in the tester.

Test the distributor for variation of spark, correct centrifugal advance and condition of contacts. This test will give valuable information on distributor condition and indicate parts replacement which may be necessary. Check area on breaker plate just beneath breaker points. A smudged line indicates that oil or crankcase vapors have been present between points.

1. Remove two screws securing rotor assembly and remove rotor.
2. Disconnect primary and condenser leads from terminals, remove contact point sets and condenser attaching screws, and remove contact points and condenser from breaker plate.
3. Remove gear cover plate and gasket and tap pin out of cross-shaft drive gear. Tap pin out of distributor drive gear and withdraw mainshaft from housing.

CAUTION: Note position and number of shims and washers used on drive gears.

4. Disconnect weight springs and remove advance weights from cam and slide cam off mainshaft.
5. Loosen and spread breaker plate clamp and slide breaker plate off distributor housing.
6. Remove three cross-shaft retaining cover screws, retaining cover and gasket and pull cross-shaft from housing. If driven gear on cross-shaft is damaged, file peened end of retainer pin and remove gear.

CAUTION: Note location and number of washers used on driven gear.

7. Pry distributor housing seal out of upper housing.

Cleaning and Inspection

1. Wash all parts in cleaning solvent except cap, rotor, condenser and breaker plate assembly. De-

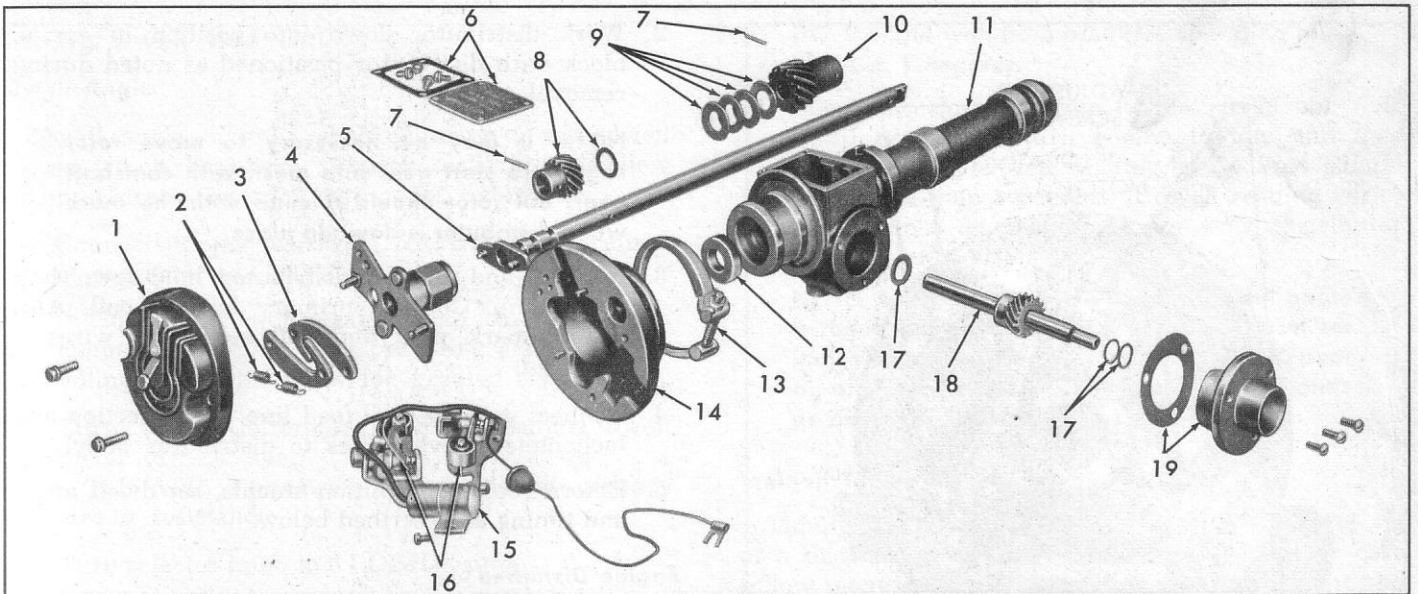


Fig. 2—Dual Point Distributor—Exploded View

1. Rotor
2. Weight Springs
3. Advance Weights
4. Weight Cam
5. Mainshaft
6. Cover Plate and Gasket
7. Roll Pins

8. Cross-Shaft Drive Gear and Washer
9. Distributor Drive Gear Shims
10. Distributor Drive Gear
11. Distributor Housing
12. Seal
13. Clamp

14. Breaker Plate
15. Condenser
16. Ignition Points
17. Cross-Shaft Gear Washer
18. Cross-Shaft and Gear
19. Cross-Shaft Retainer Cover and Gasket

greasing compounds may damage insulation of these parts or saturate the lubricating felt in the case of the breaker plate assembly.

2. Inspect the breaker plate assembly for damage or wear and replace if necessary.

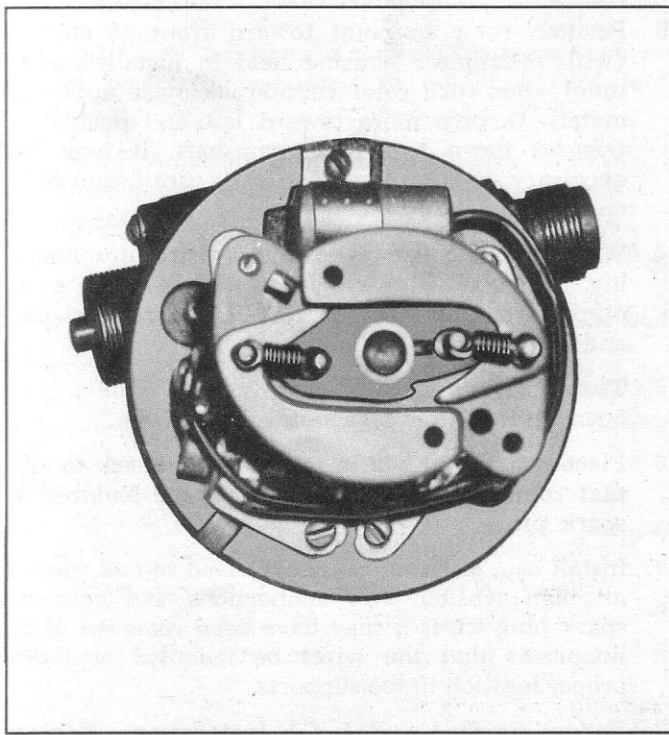


Fig. 3—Advance Weights Installed

3. Inspect the shaft for wear, and check its fit in the bushings in the distributor body. If the shaft or bushings are worn, the shaft and distributor body should be replaced.
4. Mount the shaft in "V" blocks and check the shaft alignment with a dial gauge. The run-out should not exceed .002".
5. Inspect the governor weights for wear or burrs and free fit on their pins.
6. Inspect the cam for wear or roughness. Then check its fit on the end of the shaft. It should be absolutely free, without any looseness.
7. Inspect the condition of the distributor points. Dirty points should be cleaned and badly pitted points should be replaced.
8. Test the condenser for series resistance, microfarad capacity (.18 to .23), leakage or breakdown, following the instructions given by the manufacturer of the test equipment used.
9. Inspect the distributor cap and spark plug wires for damage.

Assembly—Figure 2

1. Press new seal into upper housing using 1" O.D. socket or pipe.
2. Slide cross-shaft into housing, place retaining cover and gasket into position and tighten securely.

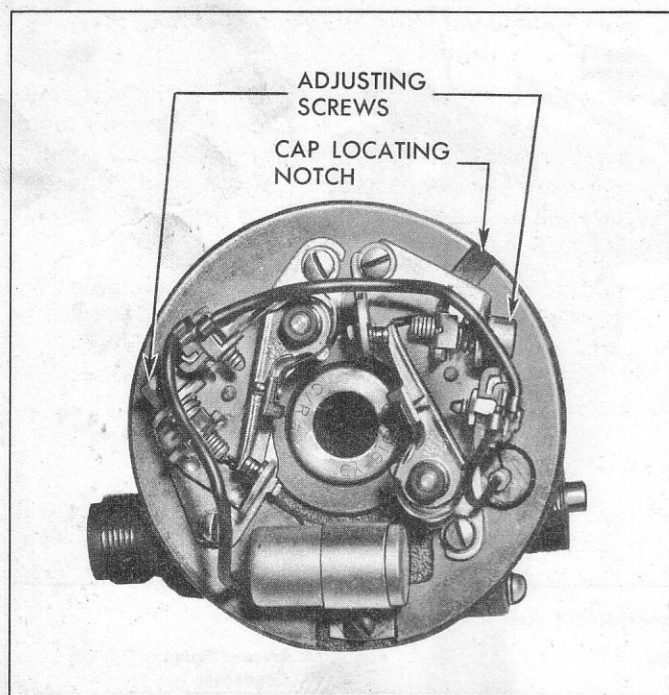


Fig. 4—Contact Points and Leads Installed

3. Install breaker plate into distributor body and tighten retaining ring.
4. Lubricate and slide weight cam over mainshaft and install weights and springs (fig. 3).
5. Drop cross-shaft drive gear and washers into gear case and insert mainshaft into housing, indexing it with drive gear and washers. Tap new pin through gear and mainshaft.
6. Slide distributor drive gear shims and gear over shaft and install new pin. Check shaft for free rotation, install gear case cover and gasket.

NOTE: Mainshaft end clearance should be .002"-.007". Add or remove shims as necessary.

7. Install contact point sets and condenser to breaker plate. Contact point pilot holes must engage matching dowels in breaker plate. Connect leads as shown in Figure 4.

NOTE: Contact point spring tension is factory-set above specifications to assure ease of final adjustment. Correct tension is 19-23 oz.

8. Install rotor to cam assembly, indexing round and square pilot holes.

Installation

Engine not Disturbed

1. Turn rotor approximately $\frac{1}{8}$ turn in a counterclockwise direction past mark previously scratched on distributor housing.

2. Work distributor down into position in engine block with distributor positioned as noted during removal.

NOTE: It may be necessary to move rotor slightly to start gear into mesh with camshaft gear, but rotor should line up with the mark when distributor is down in place.

3. Replace and tighten distributor hold-down bolt and clamp. Connect primary lead to coil. Also install spark plug and coil secondary wires if removed.
4. Connect gear case oil feed line, fuel injection and tachometer drive cables to distributor body.
5. Before replacing ignition shields, set dwell angle and timing as described below.

Engine Disturbed

1. Locate Number 1 piston in firing position by either of two methods described below.
 - a. Remove Number 1 spark plug and with finger on plug hole crank engine until compression is felt in Number 1 cylinder. Continue cranking until pointer lines up with timing mark on crankshaft pulley or . . .
 - b. Remove rocker cover and crank engine until Number 1 intake valve closes and continue to crank slowly until pointer lines up with timing mark on crankshaft pulley.
2. Position distributor to opening in block in normal installed attitude.
3. Position rotor to point toward front of engine (with distributor housing held in installed attitude), then turn rotor counterclockwise approximately $\frac{1}{8}$ turn more toward left and push distributor down to engage camshaft. It may be necessary to rotate rotor slightly until camshaft engagement is felt.
4. While pressing firmly down on distributor housing, kick starter over a few times to make sure oil pump shaft is engaged. Install hold-down clamp and bolt and snug up bolt.
5. Turn distributor body slightly until points just open and tighten distributor clamp bolt.
6. Place distributor cap in position and check to see that rotor lines up with terminal for Number 1 spark plug.
7. Install cap, distributor primary lead to coil, check all high tension wire connections and connect spark plug wires if they have been removed. It is important that the wires be installed in their proper location in the supports.
8. Follow Steps 4 and 5 for Installation — Engine NOT Disturbed.

Setting Dwell and Timing

Dwell Angle

Dwell angle may be checked using a tach-dwell meter which has been properly calibrated. Follow manufacturer's instructions to set calibration.

1. Connect jumper lead from ARMATURE terminal of generator to GROUND.

This prevents generator from charging when engine is running, thus providing stable battery voltage to instruments for greater accuracy.

2. Turn Dwell Calibrator knob to readjust dwell meter to SET line.

This will compensate for allowable primary circuit resistance.

3. Turn selector knob to 8 LOBE position.
4. Start engine, run at idle and read dwell.

Block one set of contact points by placing insulating material at least .025" thick between points. Check dwell, and if necessary, adjust operating set of contact points to read 29 degrees.

NOTE: Allen wrench used to adjust point set through front access door may have to be modified to allow it to pass between fuel injection unit and distributor.

Repeat operation for other set of contact points.

Check TOTAL DWELL ANGLE with both sets of points in operation. Dwell reading should be 34 ± 1 degree.

A "fine" adjustment may be made on each set of points, if necessary, to obtain desired total dwell.

NOTE: Adjusting dwell angle of each breaker individually to 29 degrees should give a point opening of .014"-.018".

Dwell angle with both breakers operating must be 34 ± 1 degrees.

5. Slowly accelerate engine to 1500 RPM and note dwell reading. Return engine to idle and note dwell reading. Dwell reading at no time should vary more than 3 degrees. If dwell reading varies more than 3 degrees, check for worn distributor shaft or bushings.

NOTE: Alternate method of setting dwell angle without tach-dwell meter is to adjust point set until engine stalls and back off $\frac{1}{2}$ turn. Repeat on other point set, insulating one set of points as described above.

Ignition Timing

Timing may be checked and adjusted with the aid of a distributor tester or timing light—in either case follow manufacturer's instructions for adjustment and operation.

1. Start engine and run at idle.
2. Point timing light at harmonic balancer and check degree marks. Refer to Specifications, Section 14, for correct timing data.
3. Adjust timing, if required, by loosening clamp band on distributor body and rotating body until mark on balancer lines up with correct advance mark on timing tab. Tighten clamp screw.

NOTE: For complete distributor advance testing, use distributor testing machine and refer to Specifications, Section 14, for complete timing data.

4. When timing is set, replace ignition shields over distributor and coil. Road test vehicle for performance.

NOTE: On radio equipped vehicles, excessive interference with radio reception will result if shielding is not replaced over distributor, coil, ignition wiring and spark plugs.

SPECIFICATIONS

Refer to Specifications—Section 14.