Distributor Identification

Jim Craig
San Diego Corvair Club

Fanatic Corvair enthusiasts are continually attempting to improve engine performance, so it seems. In my efforts to do so, I have stumbled onto some interesting things. Take a seemingly simple thing like a distributor. Within it there are a variety of combinations of the three main components, which are: cam, flyweights, and springs. Obviously, one combination is best for a particular engine, cam and carburetor set-up. The Corvair parts manual lists more weights, springs and cams than I thought possible. So, how can I be sure that the innards of a particular distributor are right for the engine I want to put it on? Well, now with the valuable help of David Langsather of Dale Manufacturing and Bob Ballew (SDCC member from 29 Palms, CA), I have put together the following information that may help in solving this problem for those of us who want to do it ourselves.

I must also mention, that Bob Helt's name is linked with David's on some of this data as is Lew Rishel. The simplest way is to send the distributor to David and let him rebuild it for you. He has some other tricks that are not included here.

The main reason for this rather lengthy exercise is this: Recently I purchased a "rebuilt" distributor (actually two, at separate times) from our local discount parts store (you pays yer money and you takes yer chances). In them I found springs that were not the same, a cam that may not have been correct (I had no way of knowing at the time), and a vacuum unit of unknown origin. This led to much experimentation, frustration, book searching, and head scratching. The result is this tech tip, for which I gratefully acknowledge the help of David Langsather and Bob Ballew.

The distributor shaft itself, the vacuum advance unit, and the cam are identifiable by numbers found on them and cross-referenced to engine type in the chart provided by David. See Tables 1 and 2 at the end of this article.

Degrees of mechanical and vacuum advance were measured and list provided by Bob Ballew, and included in the following data sheets. Table 3 contains the mechanical advance data; this is an incomplete list and is included for general information. These degree figures are approximate and vary slightly due to variations in hole diameter. Table 4 contains vacuum advance data which is also an incomplete list, but included for your information. These figures are approximate and vary slightly from unit to unit.

The flyweights are identifiable by shape and cross referenced in Table 5 and Figure 1. Springs cause a real identity problem, and this is discussed more later. David says the only difference in the shaft is the size of the cam stop hole in the mounting plate. This limits the amount of mechanical advance (see Table 3) and can be enlarged to allow additional mechanical advance. I'm not advising that you should do this, or that it's a good idea, only that you can. I did, and it seems to work all right for me.

During all this experimentation, I purchased from a "hot rod store" a "Chevy six mechanical advance kit." This is a pair of slightly heavier flyweights and three pairs of springs of different strengths (#1, 2, 3 in Table 5). There were no instructions about which to use on which engine. Being naturally curious, I decided to try all three and compare results. I found that the light spring with the heavier weights would indeed allow rapid acceleration, (used on a 140 HP engine with two carbs, mild race cam, mechanical advance only, manual tranny) but other problems, such as backfiring when decelerating in gear, and rough running at low speed in high gear, were noted. Successively heavier springs and lighter weights were tried until #3 springs and D weights (see Figure 2 and Table 5) produced acceptable results—not perfect, but acceptable. At that time, I still did not know if I had the correct shaft or cam. About then, I bought a pair of "Blue Dot" springs (#10 in Table 5) and continued to experiment. Mr. Ramsey of Blue Dot Springs has told me that the correct springs should exert 2.6 pounds of force when extended (see Figure 3). Mine measured 3.0 pounds, extended, and do seem to give better results.

To try to identify and better understand springs, I decided to make some measurements. The following measurements were made: wire diameter, coil diameter, overall length (inside and end loops), force exerted (in pounds) at installed and extended length. Additionally, I counted coil turns and identified end type. These results are summarized in Table 5 and Figure 1. David lists his springs as having so many "active coils." He begins counting turns at the point where the attaching loop bends to start the spring turn. Therefore, almost all of his springs have "so many and a half" turns. (Nothing wrong with that). I followed that procedure in my counting. Note that type C end springs have an even number of turns.

As you can see from the data in Table 5, there are a lot of different sizes and strengths of springs. From this data, and by making a few measurements of your own, you could select a pair of pretty closely matched springs, since it begins to appear that their behavior is predictable. For example, the first three pairs are from the "Chevy six kit." You see that spring type #1 has the smallest diameter wire, smallest diameter coil, and most turns. It provides the least amount of extended force. From there, you work up the scale in size and strength. Springs with larger diameter wire and/or fewer turns are stronger as a general rule. Spring pairs #7 and #8 are so strong they allow very little advance, and probably are not intended for Corvair use. (I found one of these in a "rebuilt" distributor.)

It appears that springs with .025″ to .029″ wire usually have 7 to 9 turns, type C ends, and exert up to 2.8 pounds of force extended. Those with .030″ to .035″ diameter wire have 5 or 6 turns, type A ends, and exert 2.8 to 4.5 pounds of force. Springs with .035″ to .042″ diameter wire have 4 or 5 turns, type B ends, and 2.5 to 3.5 pounds of extended force. With this data plus spring length, you should be able to fairly closely select a pair of springs of equal strength.

If Mr. Ramsey is correct, and I have no reason to believe he is not, then 2.6 to 2.8 pounds of force at full unmodified mechanical advance is correct. It seems to me, too, that somewhere around 1.0 to 1.5 pounds of force at zero advance would be desirable to prevent "bouncing" while decelerating, less force might allow bouncing and more might prevent full advance. Ye gads, you can bet Ralphie never worried about all this.

Furthermore, distributor cam profiles vary considerably (see Figure 4). There are only a few I happened to have and they are shown for general information. The curvature of the cam face (on the left as you view the figure) controls the rate of mechanical advance from flyweight action caused by engine RPM. Obviously, having the right one for your engine is necessary to obtain optimum performance. On the chart David provided, you will find distributor cam number for a particular engine. Now with all this data at your fingertips, you should have no trouble making ole Bessie run perfect, right? That's what I thought too, and I'm still experimenting. Bye now.

TABLE 1 Corvair Distributor List-10/80 Helt & Langsather

Year	Engine	Trans.	Dist Number
1960	early 80	MT	1110252
	late 80	MT	1110258
	early 80	AT	1110256
	late 80	AT	1110259
	early 95	MT	1110257
	late 95	MT	1110260
1961	80	MT	1110258
	80	AT	1110259
	84	AT	1110275
	98	All	1110260
1962	80	MT	1110269
	80	AT	1110271
	84	AT	1110278
	102	All	1110272
	150	MT	1110290/298
1963	80	MT	1110294
	80	AT	1110295
	84	AT	1110297
	102	All	1110296
	150	MT	1110298
1964	95	MT	1110310
	95	AT	1110311
	110	All	1110319
	150	MT	1110314

Year	Engine	Trans.	Dist Number	
			without A.I.R.	with A.I.R.
1965	95	MT	1110310	—
	95	AT	1110311	—
	110	All	1110319	—
	140	All	1110330	—
	180	MT	1110329	—
1966	95	MT	1110310	1110368
	95	AT	1110311	1110369
	110	MT	1110319	1110372
	110	AT	1110319	1110389
	140	MT	1110330	1110371
	140	AT	1110339	1110371
	180	MT	1110329	—
1967	95	MT	1110310	1110368
	95	AT	1110311	1110369
	110	MT	1110319	1110372
	110	AT	1110319	1110389
	140	probably same as 1966		
1968	95	MT	—	1110434
	95	AT	—	1110311
	110	MT	—	1110389
	110	AT	—	1110319
	140	All	—	1110371
1969	95	MT	—	1110452
	95	AT	—	1110453
	110	MT	—	1110454
	110	AT	—	1110455
	140	All	—	1110454

TABLE 2 Corvair Distributor Parts List – Actual Markings – 11/82 – David Langsather-Dale Manufacturing

Distributor No.	Paint Code	Point Cam	Shaft No.	Dist. Wt.	Vacuum Advance	Wire Dia.	Coil Dia.	Overall Length	Active Coils
1110252	Cadmium	730A CCW	21	C	152M	.031″	.236″	.708″	5.5
1130256	Black	118A	87	B	177M	.039″	.248″	.741″	6.5
1110257	Copper	122A	27	C	152M	.032″	.235″	.714″	5.5
1110258	Zinc	730A CCW	21 or 87	C	152M	.031″	.236″	.707″	5.5
1110259	Black	122A	87	B	177A	.041″	.255″	.762″	6.5
1110260	Copper	122A CCW	27	D	152M	.035″	.238″	.756″	5.5
1110269	Yellow	21	732	C	217	.031″	.235″	.692″	5.5
1110271	(None?)	87	124	B	200 (951)	.041″	.254″	.747″	6.5
1110272	Pink	27	124	D	199	.036″	.237″	.749″	5.5
1110275	Zinc	118A	03	C	177M	.035″	.232″	.690″	5.5
1110278	(None?)	03	120	C	200 (951)	.035″	.230″	.670″	5.5
1110294	Copper	21	732	C	199/217	.031″	.242″	.702″	5.5
1110295	Mustard	87	124	B	200 (951)	.041″	.254″	.756″	6.5
1110296	Brown	27	124	D	199	.036″	.237″	.761″	5.5
1110297	Black	03	120	C	200 (951)	.035″	.231″	.680″	5.5
1110290/298	Purple	201 (“•” on 290)	12	A	224	.032″	.230″	.648″	5.5
1110310	Mustard	21	532/728	C	229/217	.041″	.250″	.757″	6.5
1110311	Green	03	532	C	230/311	.036″	.230″	.667″	5.5
1110314	Purple	201	12/732	A	218/239	.031″	.230″	.637″	5.5
1110319	Brown	219	720	C	230/217	.047″	.250″	.764″	5.5
1110329	Purple	201	738	A	250	.033″	.260″	.636″	4.5
1110330	Black	21	522	C	248/217	.031″	.245″	.670″	5/5.5
1110339	Orange	84	522	C	230/217	.039″	.240″	.753″	4.5
1110368	?	1967271	1967269	E	217	1967516			
1110369	Red†	156	540	E	230/217	.031″	.245″	.711″	4.5
1110370	Pink/Red†	154	536	E	230/217	.031″	.241″	.697″	4.5
1110371	Black/Red†	157	532	E	248/217	.031″	.254″	.720″	5.5
1110372	Black/Red†	158	540	E	230/217	.035″	.252″	.725″	5.5
1110389	Copper	132	526	E	230/217	.034″	.250″	.721″	4
1110434	Orange	21	532	C	230/217	.031″	.249″	.644″	4.5
1110452	(None?)	21	532(A)	C	230/217	.031″	.249″	.644″	4.5
1110453	Green	03	532	C	230/217	.034″	.245″	.680″	3.5
1110454	(None?)	132	526	E	230/217	.032″	.247″	.689″	4
1110455	Pink	219	720	B	230/217	.047″	.279″	.791″	4.5

Notes

’60-61 paint code located on oiler cap

’62-69 spray painted on housing under vacuum advance arm, approximately ¾ x 1½″.

Purple and red codes are painted with approximate ½″ circular paint spot.

†means painted on housing side near seating base.

TABLE 3 Distributor Shaft Mechanical Advance

Shaft #	Hole dia.	Degrees Advance
12	.255	7
720	.292	12
124	.309	12
732	.330	16
540	.396	22
522	.305	11

TABLE 4 Vacuum Advance Unit Data

Vacuum unit #	Degrees Advance
199	12
217	11
224	0
229	12.5
230	13
248	10.5
370	10
410	12.5

TABLE 5 Distributor Springs

Pair #	End type	Diameter wire	Diameter coil	Number turns	Length relaxed	Length installed	Force inst.	Pounds extend
1	C	.025	.217	9	.640	.745	1.1	1.5
2	C	.029	.220	9	.682	.751	1.6	2.1
3	C	.030	.228	7	.680	.755	1.6	2.8
4	C	.029	.229	7	.665	.751	1.1	1.6
5	B	.037	.234	5.5	.755	.765	0.4	2.7
6	A	.032	.258	5.5	.685	.740	1.1	2.3
7	A	.034	.249	4.5	.715	.760	1.8	4.0
8	A	.042	.252	6.5	.756	.790	1.5	4.5
9	B	.035	.236	5.5	.760	.767	0.3	2.0
10	A	.026	.240	5.5	.750	.800	2.0	3.0
11	A	.030	.245	5.5	.710	.750	1.7	2.7
12	B	.041	.250	6.5	.708	.746	1.0	3.3

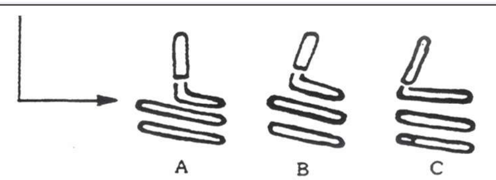

FIGURE 1
TYPES OF
SPRING ENDS

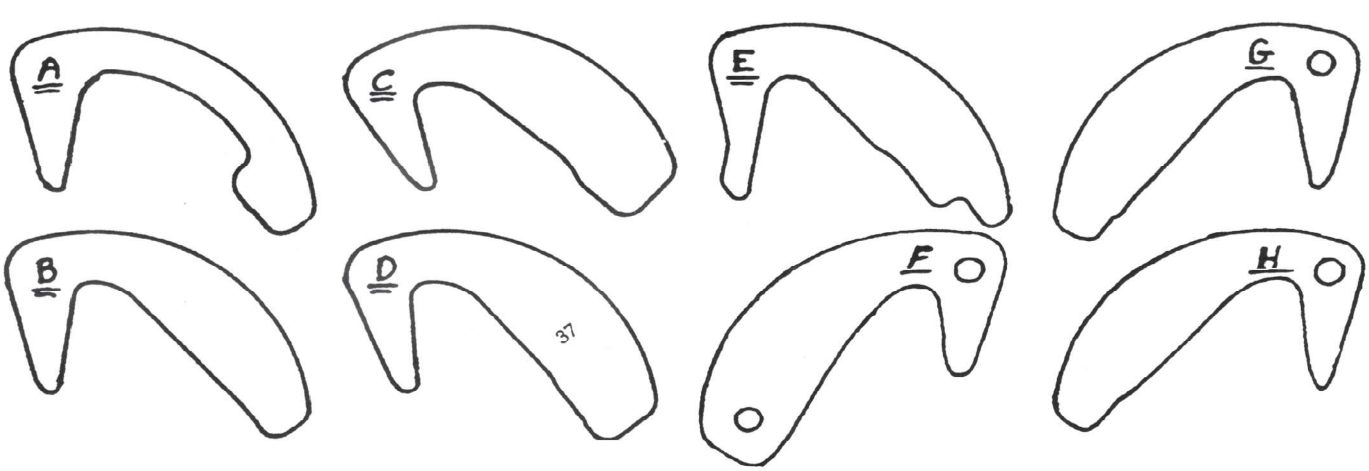

FIGURE 2 FLYWEIGHT PROFILES

Flywheel Weight Types: Types "G" and "H" were found in Corvair distributors but may not be correct.

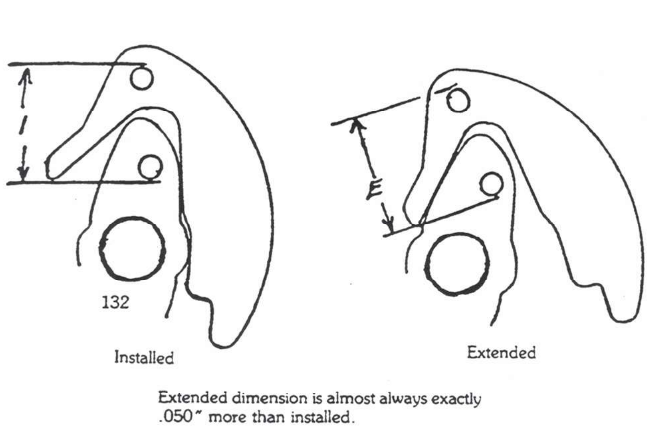

FIGURE 3 FLYWEIGHT INSTALLED/EXTENDED

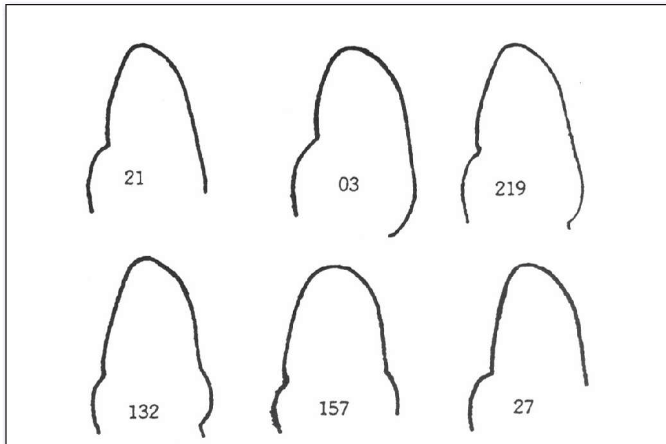

FIGURE 4 DISTRIBUTOR CAM PROFILES

*Contributors: David Langsather (Dale Mfg. & CORSA), Bob Helt (Cactus Corvair Club & CORSA), Bob Ballew (SDCC). Paint codes in Table 2 from Lew Rishel (SDCC).

Finding the Right Distributor

Gary Jarvis, Tucson Corvair Association
Larry Claypool, Chicagoland Corvair Enthusiasts

A distributor is pretty reliable; in fact, most of them will outlast several engines. Because of this, many units have parted company with one engine to find a new home with another. The most popular swap of this type is the '65-66 140 HP distributor used for high-performance applications. The problem is that this distributor will not always be the best choice, and if installed without following certain guidelines, it will actually hurt performance.

The problem of swapping distributors is compounded by the fact that 15 or more different models were used on Corvairs. While they look about identical from the outside, the advance characteristics are entirely different, and some disastrous combinations can result.

Two basic types of distributors were used on Corvair engines. In 1960 and 1961 a General Motors model was used, and it had the mechanical advance located under the distributor cap itself. While the advance mechanism is easier to service on this model, this distributor is the second choice for reliability and performance. It can be quickly identified visually by the longer looking distributor cap and the apparent lack of distributor body. Chevy no longer produces this model and advises replacement with the '62-69, which is a Delco-Remy design.

The Delco-Remy model has the advance mechanism located under the point breaker plate, and is easily identified visually by the short distributor cap and large distributor body. Identifying the many variants of this model is simplified by the Chevy part number stamped on the housing. A list of distributor specifications is attached, and is extremely helpful in identifying the various '62-69 models. By working with these numbers and by knowing the engine you plan to use, it is possible to pick the distributor best suited-to your needs.

Let's look closer at how to use the distributor specifications to aid in the selection of a certain model. The two important numbers are the initial timing and the full centrifugal advance in degrees. The initial timing is set by using a timing light and rotating the distributor itself to the starting point for the distributor's added centrifugal advance. The theory in use here is that as the engine speeds up, the spark plug must provide the spark sooner for maximum mechanical power to result. The springs and weights that make up the distributor's mechanical advance unit automatically advance the timing as the engine speeds up. From these two pieces of information, total advance can be established: initial timing + full centrifugal advance = total advance. A general rule of thumb for Corvair engines is to keep total advance around 34-36 degrees. Some engines will ping at this point, while others will tolerate up to 40 degrees. But 34-36 degrees is a good starting point for experimentation with your engine.

Here are some sample combinations, some that are possible and some that are disastrous. The best solution is to modify a distributor that you have on hand to the specs your engine calls for; it's simple to do, inexpensive, and uses stock Chevy parts that are still available.

Possible Distributor-Engine Combinations and Their Results

1. 1965 110 HP engine, switched from Powerglide to 4-speed:

   No change in timing.

2. 1969 140 HP engine, with a 1965 140 distributor:

   Initial timing spec for the engine is 4 degrees; the distributor provides 18 degrees advance, for a total of 22 degrees. This is too little, and will result in poor power and poor economy.

3. 1963 150 HP turbo, with a 1963 80 HP distributor:

   Initial timing spec for the engine is 24 degrees; the distributor provides 32 degrees advance, for a total of 56 degrees. This is, obviously, far too much total advance for a turbo engine, and would result in a destroyed engine.

4. 1965 110 HP engine, with a 1965 turbo distributor:

   In this case, the distributor's advance occurs at 4,100 RPM, which is about 3,000 RPM too high to be useful in a 110 HP engine.

5. 1969 110 HP Powerglide, with a .1969 110 standard distributor:

   The engine's initial timing spec is 12 degrees: The distributor provides 26 degrees of advance, for a total of 38 degrees. This may cause pinging in an A.I.R. engine such as the '69.

6. 1965 140 HP engine, with 1965 110 distributor:

   This combination will work, but it may cause pinging, with a total advance of 38 degrees. A decrease in the initial timing of 3 degrees or so may be necessary. Also, the 140 HP distributor achieves full advance by 2,800 RPM, while the 110 HP model takes until 4,800 RPM to reach full advance. This can hurt overall performance.

As you can see, merely setting the timing based upon the specs for the engine could cause problems where a different distributor has been installed. Always check the distributor number to see if it is correct for your application. Timing must always be set based upon distributor specs, not engine specs, due to actual amount of advance your distributor provides. All you need is some chalk, a tachometer, and a timing light.

Turn the crankshaft pulley until the original timing mark is at 16 degrees. Make a chalk mark on the pulley at 0 degrees, 4 degrees, 8 degrees, and 12 degrees. Then move the pulley so the mark you made at 0 degrees is at 16. Make another set of marks again at 0, 4, 8, and 12. Move the pulley once more until the mark you added at 0 is at 16. Make two more chalk marks at 8 degrees and 12 degrees. You now have a scale that reads to 40 degrees, in 4 degree increments.

Disconnect the vacuum advance hose, start the engine, and set the initial timing at zero. Then speed up the engine, and observe the amount of advance available and at what RPM it occurs. Compare this with the specification for your particular distributor.

You can lower the RPM at which full advance occurs by using lighter weight springs; or raise it, by using heavier ones.

Corvair Distributor Specifications

Year	Model	Part #	Suggested Initial Timing	Centrifugal Advance Starts	Maximum Degrees of Centrifugal Advance
1962	80 HP std	1110269	4°	0-2°/1200RPM	34°/3600RPM
	80 HP auto	1110271	13°	0-4°/1600	26°/3700
	84 HP all	1110272	13°	0-4°/850	26°/4800
	102 HP auto	1110278	13°	0-4°/1850	22°/4100
	150 HP turbo	1110290	24°	0-2°/3900	12°/4500
1963	80 HP std	1110294	4°	0-2°/600	32°/3600
	80 HP auto	1110295	13°	0-2°/1400	24°/3700
	84 HP auto	1110296	13°	0-2°/700	24°/4800
	102 HP all	1110297	13°	0-2°/1600	20°/4100
	150 HP turbo	1110298	24°	0-2°/3900	12°/4500
1964-67	150 HP std	1110314	24°	2°/4000	12°/4500
	95 HP std	1110310	6°	2°/900	28°/4200
	95 HP auto	1110311	14°	2°/1950	20°/4200
	110 HP all	1110319	14°	2°/1000	20°/4800
	140 HP std	1110330	18°	2°/1000	18°/2800
	180 HP turbo	1110329	24°	2°/4100	18°/4500
1967	95 HP AIR*	1110369	0°	0°/900	40°/4400
	110 HP AIR*	1110389	4°	0°/900	26°/4400
1968	95 HP std	1110434	6°	0°/900	28°/4200
	95 HP auto	1110311	14°	0°/1700	20°/4200
	110 HP std	1110389	4°	0°/900	26°/4400
	110 HP auto	1110319	12°	0°/800	20°/4800
	140 HP all	1110371	4°	0°/900	32°/3000
1969	95 HP std	1110452	6°	0°/900	28°/4200
	95 HP auto	1110453	14°	0°/1700	20°/4200
	110 HP std	1110454	4°	0°/900	26°/4400
	110 HP auto	1110455	12°	0°/800	20°/4800
	140 HP all	1110454	4°	0°/900	26°/4400

*AIR means smog pump equipped, not air conditioned