



# AUTODYNAMICS

2 BARNARD ST. (617)631-8500 MARBLEHEAD, MASS. 01945

**1972 SCCA  
Formula Vee National Champion**

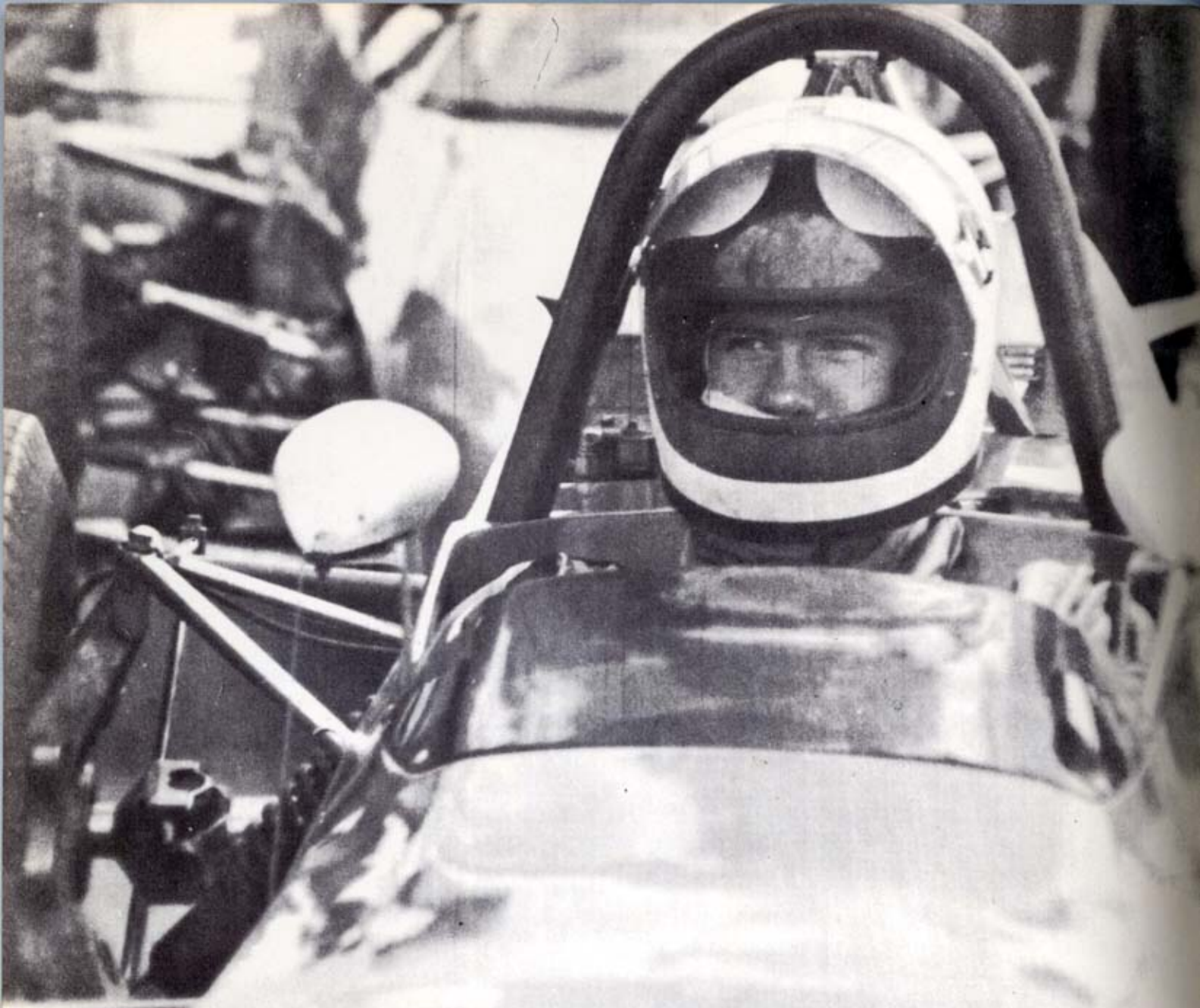
## 1973 CATALOG



Caldwell D-13  
Formula Vee

**America's largest racing car manufacturer**

TWO DOLLARS



### AUTODYNAMICS RACING CARS WIN!

David Loring shown on the grid at Daytona, just before the start of the race. His Caldwell D9B Formula Ford won the race and IMSA Series Championship.

Below is a partial list of drivers who have driven Autodynamics Racing Cars, many began their careers in them.

Tony Adamowicz  
Rafael Aguayo  
Bill Alsup  
Skip Barber  
Roger Barr  
Gary Belcher  
Bob Bondurant  
Walter Boyd  
Ron Bucknum  
Ray Caldwell  
Ernie Cassus  
Jim Clarke  
Pete Conrad  
Bob Cunningham  
Fred Darling

Tom Davey  
Alex Dearborn  
Joe Dodge  
Bob Essex  
John Fitch  
Bob Fletcher  
Charles Fox  
Dan Gurney  
Jerry Hansen  
John Harkness  
Joe Heishman  
John Helming  
Phil Hill  
Dave Kaplan  
Paul Keeler

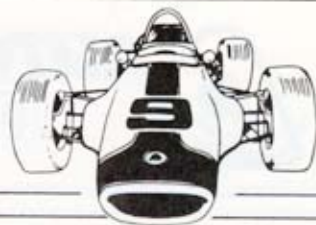
Oscar Koveleski  
Bob Lazier  
David Loring  
Brett Lunger  
John Magee  
Norman Marx  
Bruce McLaren  
Earl Nicewarner  
John Osteen  
David Piper  
Sam Posey  
Tom Reddy  
Peter Revson  
Kurt Rhenhold  
Butch Rice

Bob Russell  
Bill Scott  
Reggie Scullion  
Jim Stevens  
Glen Sullivan  
Al Taschner  
Jim Tharpe  
Eric Traphagen  
Ted Trevor  
Dave Wietzenhoff  
George Wintersteen  
Bob Ziegler  
John Zietler  
Harold Zimdars

*Submittal*



# AUTODYNAMICS, INC.



Ray Caldwell

## **AUTODYNAMICS RACING**

AUTODYNAMICS, INC. • 2 BARNARD STREET • MARBLEHEAD, MASSACHUSETTS 01945 • (617) 631-8500

Dear Customer:

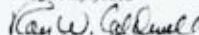
I would like to take this opportunity to tell you why Autodynamics offers its customers more than just cars and accessories. Our extensive experience in professional and amateur racing and high performance car development allows us to service all the needs of the enthusiast or serious competitor by insuring him of straight and accurate information.

Our racing cars have won five National Championships and company cars have completed full seasons in the Trans-Am, Continental, and Can-Am. In a weak moment we even entered a car at Indy. In short, we are enthusiasts (45% of our employees have racing licenses and 36% own Desjers!)

We believe in what we sell! Every part in our catalog is based upon our experience and consequently there are few duplications or discount items - just what we feel is the best car or part for each application.

Feel free to call and take advantage of our experience when you have a problem or parts requirement. Correct information the first time saves you money. We are looking forward to serving you.

Very truly yours

  
Ray W. Caldwell  
President

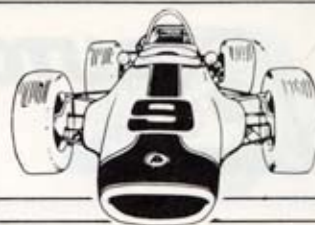
AMERICA'S LARGEST MANUFACTURER OF RACING CARS

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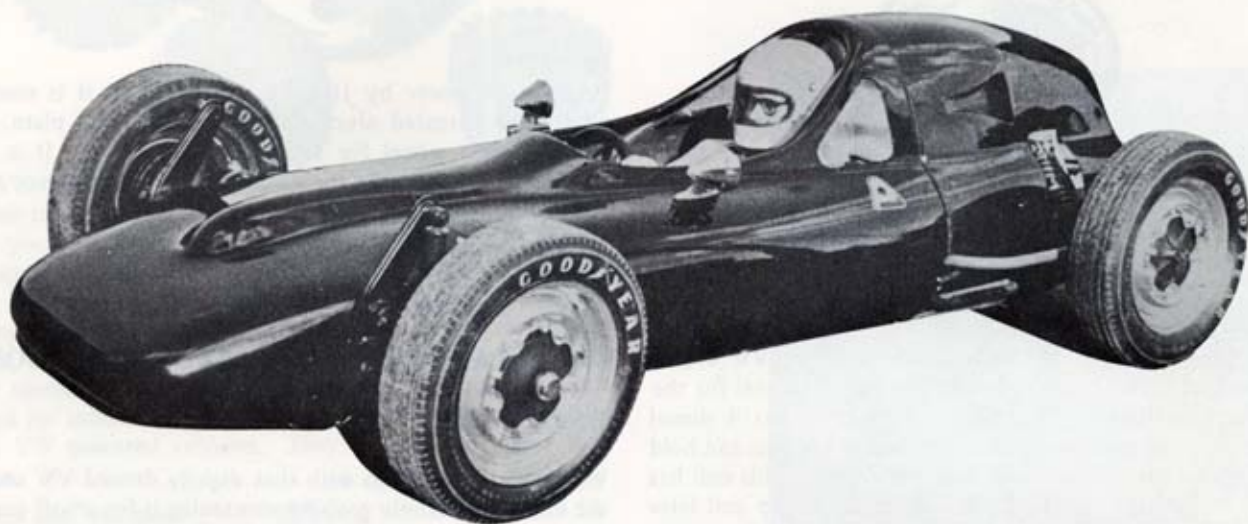


**AUTODYNAMICS, INC.**

RACING CARS



## **CALDWELL D-13 FORMULA VEE**



Autodynamics Corporation has been building Formula Vees longer than any other manufacturer. The intent in creating the Caldwell D13 was to apply this vast experience, as well as the sophisticated engineering and manufacturing techniques used on the D7 Can-Am car and D9 National Championship Formula Ford, to the unique problems of Formula Vee racing.

### **STATE OF THE ART AERODYNAMIC DESIGN**

The single most important development in Vee racing over the past several years has been the evaluation of slipstreaming tactics, especially on the high speed tracks like Daytona. Because of their relatively low power combined with high cornering speeds, Vees spend a large percentage of their racing time at or near top speeds. As a result, aerodynamics is a key factor in Vee performance.

Recognizing this fact, Autodynamics has put a major effort into designing the body shape of the D13. The body configuration was evolved through extensive wind tunnel tests at M.I.T. using a 1/10 scale half model. This program included tests of a number of different factors such as ride height, rake angle, mirror location, etc., and has resulted in a body with a very low drag and lift, excellent stability, and limited downstream turbulence, making it difficult to draft. In addition, careful attention was paid to air ducting, ensuring a supply of cool high-pressure air to the carburetor so that engine horsepower on the track equals or exceeds dynamometer readings.

### **UNIQUE REAR SUSPENSION – OUTHANDLES ANY VEE**

Through our experience both with Vees and racing Deserters, Autodynamics has gained more familiarity than any other organization with the behavior of swing-axle suspension. This knowledge has resulted in the unique rear suspension configuration of the D13, designed to eliminate the inherent oversteer characteristics associated with high rear roll center, as well as to give a positive and adjustable means of controlling rear-end "jacking" without compromising tire-to-road compliance. Again with the aid of the M.I.T. facilities and personnel, a computer program was derived to help analyze the dynamic behavior of the suspension and ensure its stability.

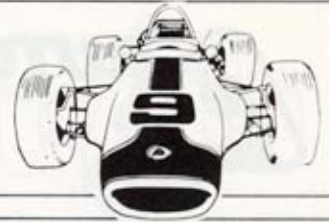
### **THOROUGHLY SORTED OUT DESIGN – WORKS WHEN YOU START IT UP**

In addition to this engineering program, Autodynamics has, through its Can-Am and Trans-Am projects, developed the techniques and skills required for track-sorting its cars, and has put many hours of controlled track testing into the D13. As a result, we believe that the D13 is already the fastest and best handling Vee available.



# AUTODYNAMICS, INC.

## RACING CARS



The D-13 is such an efficient design that the drivers' head doubles as an Aerodynamic device! (Tom Davey, 1972 Daytona Race)



**CHASSIS:** The Caldwell D13 utilizes a twin, large diameter tube chassis with a semi-rollcage fabricated from mild steel tubing and low temperature welded with Eutectic 16 high nickel alloy (100,000 PSI tensile strength). It affords more driver protection while allowing easy engine removal and chassis maintenance. A full bellypan is fabricated from aluminum as is the dashboard, firewall and cold air box. Torsional rigidity is 17,500 lb/ft per degree per foot or three times as rigid as earlier Autodynamics' Vees.

**BODY:** The Caldwell D13 body shape is yet another extension of all the aerodynamic studies made on the Caldwell D7 sports racing car and D8 Formula racing car in the M.I.T. Wind Tunnel. Professor Larabee, who specializes in vehicle dynamics at M.I.T., made a class project of the Caldwell D13 body and ran extensive wind tunnel tests. The nose is removable for easy replacement and the tail has built in cold air ducting. Aerodynamic superiority was proven at Daytona wherein the car had the highest top speed.

**SEAT:** The seat is fiberglass and bolts rigidly in place. Upholstery is standard.

**TANK:** The tank is a 5.4 gallon triangular shaped unit located in the safest possible place, ahead of the metal firewall inside the main chassis tubes and separated from the driver by the seat. It is an Aero Tec Laboratories SCCA approved fuel cell even though fuel cells are not presently required in Formula Vee. The tank is located in the center of gravity so that the weight distribution will not change.

**FRONT SUSPENSION:** Standard Volkswagen lower torsion bars replaced by an alloy steel anti-roll bar located laterally by machined steel spacers which replace the rubber dust covers. Special tie rods incorporate left and right hand aircraft spherical rod ends which remove play and hence front end shimmy. A steering arm extension is employed to increase the steering ratio. Camber, castor and toe-in are adjustable.

**REAR SUSPENSION:** Single tube trailing arms with narrow front pick-ups to minimize toe change. Zero roll stiffness struts which allow the entire suspension to rotate around the transmission. 140 lb. springs and rebound devices incorporating Koni celasto bump rubbers. Zero roll stiffness suspension gives the maximum possible adhesion to the VW swing-axle and controls rear end jacking without compromising tire-to-road compliance.

**BRAKES AND PEDALS:** All racing car pedals with adjustable balance bar, dual master cylinder for the brakes and single cylinder for the clutch.

**EXHAUST SYSTEM:** The exhaust system is a carefully fabricated 4 into 1 collector megaphone system arrived at after many hours of dyno testing.

**INSTRUMENTATION:** 270 degree large tachometer flanked by mechanical oil temperature gauges. The kit includes all parts necessary for a complete race car less standard VW components and racing tires. All parts are bright nickel plated or flash or cadmium plated. The kit also includes seat belts, shoulder harness, rear view mirrors and fire extinguisher, etc. Assembly time is approximately 40 hrs. A standard range of colors is available. Our complete cars utilize engines built from new engines bought from Volkswagen plus rebuilt transmissions, rear ends and front ends. Each engine is dyno tuned and transmissions are rebuilt loose with no preloads. Front ends are rebuilt to give appropriate camber without binding. Complete cars are equipped with Goodyear tires.

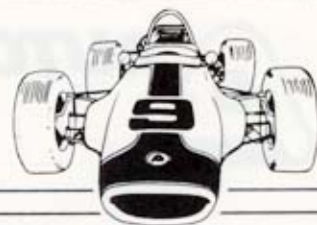
**PRICES:** Kit: \$1700.00; Kit Crate: \$60.00; Complete car: \$4000.00

It is possible to buy parts in complete kit or kits with additional parts by special arrangement.



# **AUTODYNAMICS, INC.**

## **RACING CARS**



### **AUTODYNAMICS CALDWELL D-9B FORMULA FORD**

The Caldwell D-9B is the fastest, best handling Formula Ford available for American racing. It was designed and built by Autodynamics to be just that, and continuously reworked, up-dated and improved to keep it that way. Below is a partial list of the honors that this exceptional car has won since the first models were introduced in 1969.

- 1969 N.E. Division Championship – Skip Barber
- 1969 Central Division Championship – Jim Clarke
- 1969 Southern Pacific Division Championship – Herb Brownell
- 1969 IMSA Inaugural Race Winner – Pocono – Jim Clarke
- 1969 SCCA National Championship – Skip Barber
- 1970 IMSA Daytona Race Winner – Jim Clarke
- 1970 Ontario Division Championship (CASC) – David Loring
- 1971 IMSA Daytona Race Winner – David Loring
- 1971 Shoppers World Pro-Series, Canada – David Loring
- 1971 Canadian East. Zone – Jim Russell Champ. – David Loring
- 1971 IMSA Pro-Series Championship – David Loring
- 1971 Canadian National Championship – David Loring

Some competitors have claimed that our record with the D-9 Formula Ford is a result of the caliber of drivers who have campaigned the car. That is partly true. Many top drivers have driven this and other Autodynamics cars. Did you ever wonder why? It is because they know racing cars, and take the entire business quite seriously, like we do. The D-9B reflects that attitude in many ways.

#### **NOT JUST A CAR – BUT A PROGRAM**

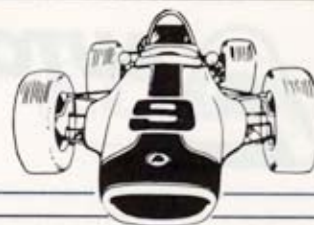
By now you can see that this car is not merely a week-end toy. It is intended for drivers who want to win – Because that is what racing is all about – Winning.

To insure that our drivers have the best possible racing program at the lowest possible cost, the D-9B is now sold as a complete racing package, professionally designed, built, prepared, tested and equipped. You supply good judgment and driving talent, we supply the rest.



# AUTODYNAMICS, INC.

## RACING CARS



### BUILT FOR AMERICAN RACING

The Caldwell D-9 is the first Formula Ford racing car to be specifically designed and constructed for American rules and American track conditions. The Caldwell D-9 has a torsional rigidity of over 1,000 pound feet per degree. This strength, coupled with advanced suspension geometry, is designed to accept the high stresses created by the use of racing tires . . . in that European F's have been designed for street radials and such rigidity is not required. Also, as ambient temperatures are higher in the United States than in England, the Caldwell D-9's high capacity cooling system is an added factor in running reliability. An oil cooler is included in the system. The D-9 has a fully adjustable, independent suspension including the latest adjustable, spherical jointed Armstrong shock absorbers. Goodyear racing tires and belts are standard.

### DEPENDABILITY

'You've got to finish to win' . . . We've all heard that statement a lot. Reliability is a critical factor in Formula Ford, from both the standpoint of finishing and finishing with a car that is as quick as the one you started with. David Loring started 29 races in 1971 in his D-9B, won 26, 2 seconds, 1 DNF. That is the kind of reliability top drivers look for, and get in Autodynamics cars.

To further improve your competitive edge, D-9B's are engineered with greater strength components than other Formula Fords and are easy to maintain. That means less time in the pits, more time on the track. Practice time improves your chances, reliability equals speed.

### PREPARATION

Serious competitors always take their brand new race cars apart and 'prepare' them before racing them. Take a look through any racing newspaper at the cars listed for sale, and you'll see that the winners, ex-championship cars, etc., have a list of 'options' as long as your arm. These 'trick' parts aren't really optional if you want to win consistently, they are necessary. When you buy a D-9B these parts are installed as standard equipment.

### SPECIFICATION

**ENGINE:** 1600 GT Cortina or Uprated Version by DFRE (Customer Choice)

**BHP:** 105 (Minimum Dyno HP)

**CARBURETION:** 1 2-BBL Weber

**IGNITION:** Coil and Distributor

**ENGINE OIL CAPACITY:** 6 Qt. (Dry Sump)

**COOLING CAPACITY:** 10 Qts.

**TRANSMISSION:** Constant Mesh Hewland MK8

**CROWN WHEEL AND PINION:** 9:31

**CHASSIS:** Tubular space frame constructed from 16 gauge mild steel tubing, low temperature welded with Eutectic 16 high nickel alloy (100,000 psi tensile). Main chassis tubes carry coolant from radiator to engine. Torsional rigidity is over 50 percent higher than the leading European design.

**FRONT SUSPENSION:** Independent by lower "A" frame, upper control arm and leading arm, Armstrong adjustable shocks with coil springs.

**REAR SUSPENSION:** Independent by inverted lower "A" frame, upper control arm and trailing arms, Armstrong adjustable shocks with coil springs.

**STEERING:** Modified Triumph Herald Rack and Pinion with 10" diameter Lether covered wheel.

**WHEELS:** 5½ J x 13 Four Bolt Steel (Spun Alum. Wheels Optional)

**TIRES:** Customer Choice

#### DIMENSIONS:

Wheelbase: 90

Track; Front/Rear: 54/55½

Wheelbase: 90.5

Weight: 889

Height (Top of Windscreen): 26"

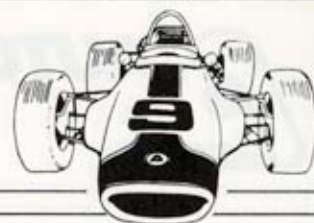
Height (Top of Roll Over Bar): 36½"

Frontal Area, Square Feet: 9.5



# AUTODYNAMICS, INC.

## RACING CARS



### HERE'S WHAT YOU GET

A race-ready (factory prepared) Caldwell D-9B that incorporates every improvement we know about at the time you buy it. (Race-ready means any race, amateur or professional) Standard equipment presently includes:

- o DFRE Engine (See DFRE Section)
- o NMB Rod Ends
- o Aero-Quip Plumbing
- o ATL Fuel Cell
- o Electric Fuel Pump
- o Hewland Gearbox with 'Changeable' 1st Gear
- o Choice of Dry Tires (We can make Recommendations)
- o 4 Extra Wheels with Torino Rain Tires
- o Spare Body Nose Section
- o 4 Extra Gear Sets (Your Choice of Ratio's)
- o Professional Model Autodynamics Trailer (Sprung)
- o Car Cover
- o Sort Out and Familiarization Session at Lime Rock Park with Autodynamics Racing Team

### SAVINGS

If you intend to win, you will end up buying virtually all of this equipment a piece at a time. Until you have it, you will flounder around wishing you did, wasting money on alternatives that lose. Buying it all in the beginning will save a lot of money, time and frustration. As will spending a day at the track getting you familiar with setting-up and driving the car. The technician/driver who goes with you is a D-9B expert, who has built and raced this model. You will learn how to properly inspect and maintain the car to get the longest life out of the engine, gearbox, suspension, etc. It is hard to say how much that will save you in the long run.

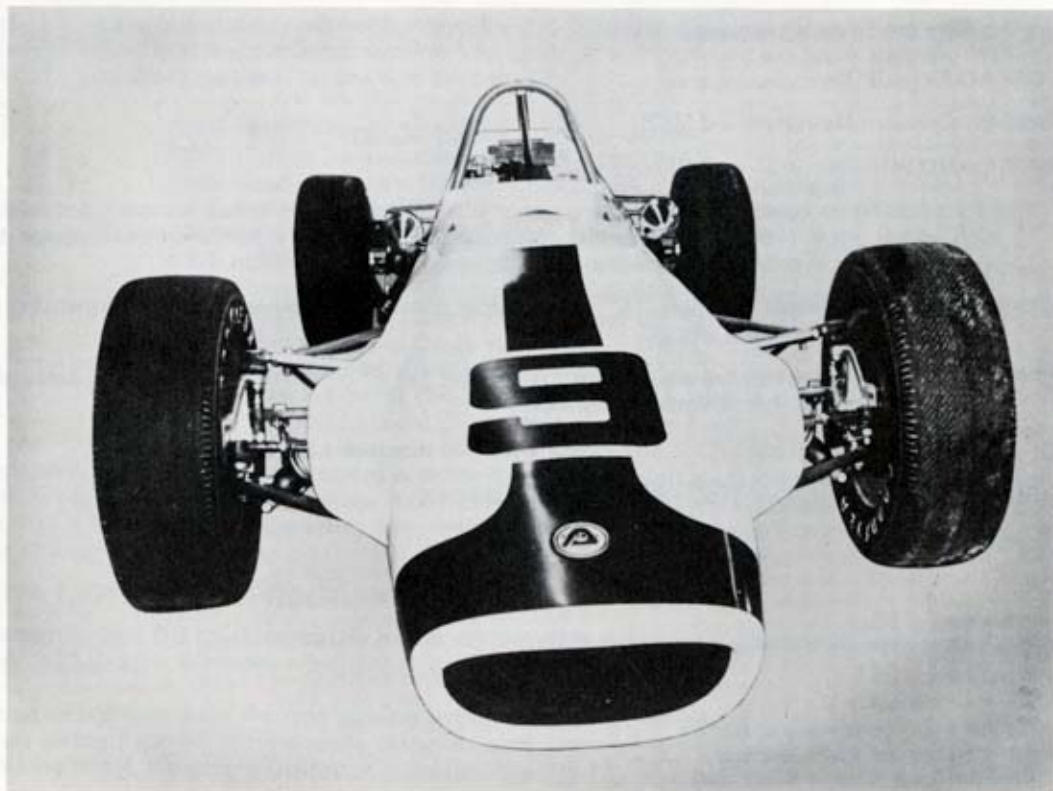
How much? The complete program costs \$7550.

You cannot buy this kind of program anywhere else at any price.

Caldwell D-9B Formula Ford

Car only, Race Ready

\$6500

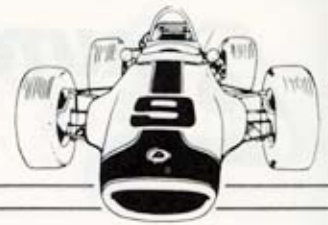






# AUTODYNAMICS, INC.

## RACING ENGINES



### DOUG FRASER RACING ENGINE

### OFFICIAL ENGINE BUILDER FOR AUTODYNAMICS RACING

#### THE WORLD'S BEST FORMULA FORD ENGINES

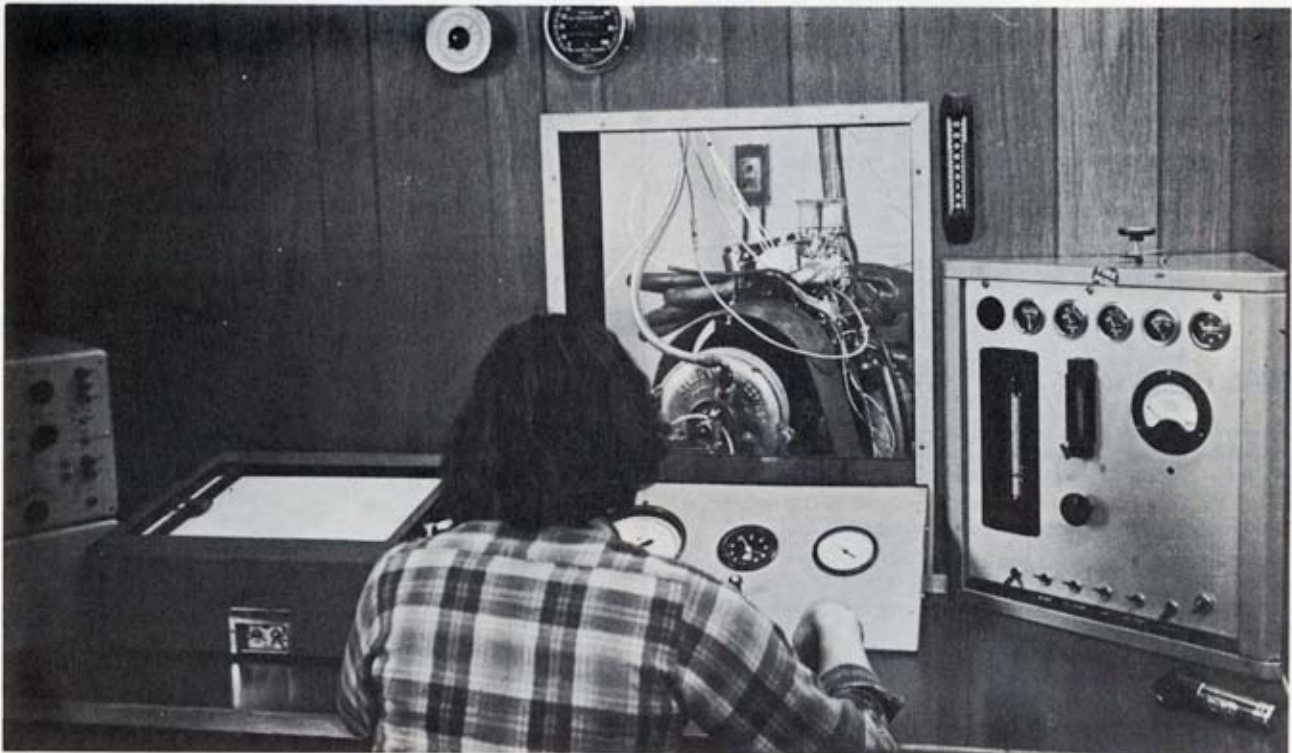
Now that is a strong statement we don't expect you to believe without proof – So why not check the record yourself: (Note SCCA & IMSA F/Ford competition began in 1969)

1969 IMSA Inaugural Race at Pocono	DFRE WON
1969 Central Division Championship	DFRE WON
1969 SCCA – ARRC National Championship	DFRE WON
1970 IMSA Daytona Race	DFRE WON
1970 SCCA ARRC – National Championship	DFRE WON
1971 SCCA ARRC National Championship – Pole Winner	2ND PLACE FINISH
1971 IMSA Daytona Race	DFRE WON
1971 IMSA Formula 100 Pro-Series Championship	DFRE WON
1971 Canadian Shopper World Series Championship	DFRE WON
1971 Canadian National Championship CASC	DFRE WON
1971 Canadian Eastern Zone Championship	DFRE WON
(This is the highly contested Jim Russell School Driver to Europe Series – Toughest F/F racing on the continent)	

DFRE has won more SCCA National Races than any other builder.

Now – Doesn't that mean a lot more than unsubstantiated HP claims?

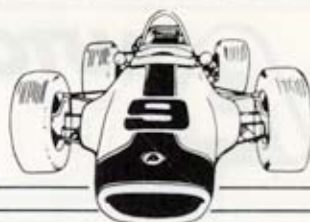
Ray Caldwell says, "Kinda makes you wonder if anyone else is serious about F/F engines".





# AUTODYNAMICS, INC.

## RACING ENGINES



### HORSEPOWER CLAIMS

Autodynamics will guarantee the horsepower figures DFRE supplies with each dyno run. We also will guarantee a minimum of 105 HP on new engines. Some may have more — All will have the largest possible area under the HP curve instead of tuning for narrow, peaky, spectacular numbers.

We cannot tell you how much power you will get by bolt-on our race prepared engine parts — That is simply impossible for anyone to know. You cannot bolt-on serious competitive horsepower in a F/Ford. Engines must be meticulously prepared part by part, precision assembled, dyno break-in and tuned, and reworked until perfect.

Our DFRE F/Ford bolt-on equipment is the best available — But we will not make wild horsepower claims for it. Engines vary a great deal and no engine shop we've seen has a crystal ball Dynamometer.

### RELIABILITY

A complete F/Ford engine by DFRE is very strong and built to go long periods between overhauls. Only the best parts are used throughout. No 'Banzai' engines or 'special' engines for 'special' people. The ones that set the records are off-the-shelf standard engines like we'd be happy to sell you.

### LEGALITY

When you rocket around like Skip Barber, Jim Clarke or David Loring, winning every Formula Ford race in sight — You get torn down a lot. These drivers used DFRE engines and won and were torn down over a dozen times and never found illegal.

### QUALITY

Powerful, responsive, winning engines built to last, nicely finished without leaks, missing parts or hassles — That's DFRE quality. Why buy one you have to fuss with all the time?

**DFRE F/FORD ENGINE** complete, with Test Data, Cortina or up-dated Kent (Pinto). Your choice: **1750.00**

We also have a complete stock of F/Ford engine parts, stock or modified. If you don't see it listed, ask.

Autodynamics is the exclusive distributor for all DFRE engines, parts and services.

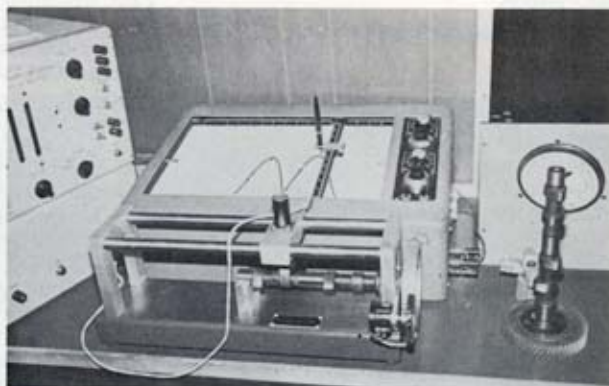


### OTHER DFRE ENGINES AND SERVICES NOW AVAILABLE

DFRE now has complete facilities for engine and component preparation and testing. Call or write for specific info on:

- o Magnaflux Testing
- o Electronic Balancing
- o Size and Weight Grading & Matching
- o All Engine Machine Shop Operations
- o Cylinder Head Modification
- o Component Flow Testing
- o Electronic Dynamometer Testing
- o Electronic Cam Profile Checking

Development programs now underway for VW engines including FV, FSV. Hi-Performance VW engines of all kinds & Corvair Engine work a specialty.

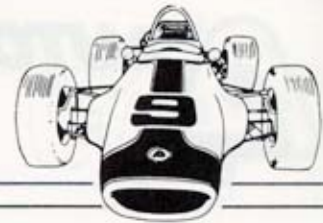


DFRE uses many sophisticated electronic devices to assure accurate measurement. Cam Profile Recorder above was designed and built by Doug Fraser.



# AUTODYNAMICS, INC.

## RACING ENGINES



### DFRE FORMULA FORD ENGINE PARTS

PART NUMBER	DESCRIPTION	PRICE
2737E-6102C	.030 Piston, Rings, Pin	\$ 8.00
116E-6149E	.030 Complete Ring Set	\$ 30.00
2737E-6200B	Connecting Rods	\$ 15.95
116E-6250A	Camshaft, Selected with computer drawn lift plot	\$ 35.00
MJ13H69-41A	Crankshaft, Magnafluxed, shot-peened, balanced, 5-main bearing Tuftrided	\$ 200.00
DFRE - 113	Steel Center Main Cap	\$ 18.00
105E-6270B	Timing Chain	\$ 5.25
105E-6256B	Camshaft Sprocket (Selected)	\$ 5.75
E87-CP-1	Spring Tensioner	\$ 5.50
2737E-6008C	Complete Gasket Set	\$ 15.60
105E-6059B	Machined Front Timing Cover	\$ 18.25
109E-6065A	Long Head Bolts	\$ .55 Each
2733E-6065A	Short Head Bolts	\$ .45 Each
105E-18330A	Standard Rod Bearings (CLEVITE)	\$ 9.50
105E-18330B	Standard Main Bearings (CLEVITE)	\$ 15.00
	Thrust Bearings	\$ 2.00
105E-6258A	Cam Gear Retainer	\$ .20
105E-6261E	Camshaft Bearing	\$ 1.95
105E-6262E	Camshaft Bearing	\$ 1.95
105E-6263E	Camshaft Bearing	\$ 1.95
20326-s78	Camshaft Gear Bolts	\$ .30
2733E-6215B	Rod Bolts	\$ .50
	Eccentric Cam Dowels (Specify 1-4 Deg. Adv.)	\$ 2.00
2730E-6306A	Crankshaft Gear (Selected)	\$ 3.85
105E-6310A	Crank Oil Slinger	\$ .35 Each
2733E-6312A	Crank Pulley	\$ 9.35
2730E-6344E	Rear Seal	\$ .30
2733E-6345A	Crankshaft Bolts	\$ .60
105E-6362D	Front Seal	\$ 1.40
1157-11ES	Flywheel Bolts	\$ .25
105E-6466A	Rocker Arm Locating Spring	\$ .25
105E-6468A	R. H. Rocker Arm	\$ 2.00
105E-6469A	L. H. Rocker Arm	\$ 2.00
105E-6486A	Valve Adjusting Bolts	\$ .40
3392-3S7	Valve Adjusting Nuts	\$ .35
105E6500A	Tappets, Standard	\$ 2.00
105E6500B	Tappets, .004 O/S	\$ 1.65
2737E-6505G	Valves, Exhaust	\$ 4.40
2737E-6507G	Valves, Intake	\$ 2.70
109E-6513A	Valve Spring (Set)	\$ 14.10
105E-6514A	Valve Spring Retainer	\$ .50
2733E-6518A	Valve Spring Keeper	\$ .20
105E-6531B	Rocker Shaft Bolts	\$ .35
13684-ES1	Rocker Shaft Support	\$ 1.80
105E-6563B	Rocker Arm Shaft	\$ 9.10
2737E-6565A	Push Rods	\$ .85
105E-6571A	Valve Stem Seal	\$ .30
DFRE - 114	Prepared Cylinder Head	\$ 240.00
DFRE - 115	Prepared Cylinder Head (Exchange)	\$ 160.00
DFRE - 116	Prepared Intake Manifold (Exchange Only)	\$ 30.00



## **AUTODYNAMICS LOOKS AHEAD**

To apply its experience in vehicle dynamics, automotive systems, and steel and fiberglass fabrication to the problems of mass-transit and pollution. Below, a prototype 6-passenger urban transit system module built by Autodynamics for Alden Self-Transit Systems Corp. Above, a McKee Engineering built electric passenger car prototype which will be the basis for Autodynamics electric cars slated for production in 1973.

