

History of the Dayton General Motors Divisions

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INTRODUCTION

Of the myriad histories and narratives written about the early days of General Motors I found that a lot of information had been left out. Of particular interest to me and others in the Dayton, Ohio area is the stories and background of the Delco and the other Dayton divisions. Generally, historians tell of Dayton Engineering Laboratories Company, Charles Kettering and the self starter and then digress into the history of the major car divisions. There is much more to tell about early General Motors and associated companies in Dayton, Ohio. This is what I will endeavor to do here.

My mother started work with Delco Light some time in 1924 or 1925. She later worked at Frigidaire until she quit in 1931. During her time at Frigidaire, she worked in the tool design area as a clerk and typist. She worked for Russell Polen whose home has been developed into Polen Farm in Kettering, Ohio.

When I first started with Delco Products in 1949 I became acquainted with a couple of toolmakers who had worked with Charles Kettering and Bill Chryst. One of these fellows had Chryst's old workbench.

Delco Products was full of stories of Kettering, Delco Light and the happenings of many years past.

Mr. Frank Ireland who was the General Manager of Delco Products, made a habit of making a walking tour of the three plants of Delco Products a day or two before Christmas and wishing everyone a good holiday. One story tells of him going up and slapping an employee on the back and wishing him a Merry Christmas. The employee who was leaning over his machine and evidently trying to get it set just right, did not know Frank Ireland from Santa Clause. He stood up and cussed him out royally, saying that he was trying to get his machine adjusted and to go away and leave him alone. Mr. Ireland commended the employee on his dedication. Frank Ireland with his western style hat and a big smile was a common sight around Delco Products.

One of these toolmakers, that I was acquainted with, tells of the time that Kettering and some other GM Dignitaries were making a visit to Delco Products. It was dictated that the place should be cleaned up, spotless for the tour. Mr. Kettering who had worked with Johnny said to him during his tour of the department, "Well John, you can get your bench all cleaned up but if it is a little messy you can get some work done too."

Deeds had a large clear area just west of his home on West Stroop Road. This clear field was kept cut as part of his front lawn. It stretched from his house all the way to Dixie drive to the west. In the 1920's and 1930's he used this as his own private flying field.

Following is a brief history of the various Dayton Divisions and how they came into existence. It is not generally known that Delco Radio and Delco Appliance began in Dayton, prompting the inclusion of these histories also.

Aeroproducts Division

The Aero prop aircraft propeller was developed by Werner J. Blanchard and Charles J. MacNeil, founders of Engineering Products Inc. established in 1937. Engineering Products performed the engineering designs, but having no manufacturing facilities necessitated utilizing Steel Products Engineering Company, of Springfield, Ohio, for production to fulfill US Army Air Force contracts.

The advanced propeller design featured a hollow hub and hollow rib-reinforced steel blades featuring new principles of pitch control, which offered simplicity and precision of operation. The lightweight Aero prop was a hydraulically controlled, full-feathering, constant-speed propeller.

In June of 1940 the Engineering Products Inc. was acquired by General Motors Corporation, which had been looking for opportunities in the aviation field. Aeroproducts Division was formed with W. Blanchard becoming its General Manager and Charles MacNeil its Chief Engineer. War was imminent and GM was there at an appropriate time. Curtis Wright and Hamilton Standard were producers of controlled pitch propellers but they could in no way supply the needs of the war effort. The Curtis Wright propellers were electrically controlled and the Hamilton Standard and Aeroproducts propellers were hydraulically controlled.

As America was soon to enter WWII, Aeroproducts accelerated construction and development plans. In March 1941, nine months after it was established and five months after breaking ground, the Division moved into its new factory in Vandalia, Ohio. Additional production facilities were acquired at Frigidaire Plant Four in Moraine City. Much of the Aeroproducts machinery was specifically designed to produce the Aero prop. The precision with which these props were manufactured was without precedent in the propeller industry. By December 7, 1941, the day that the Japanese attacked Pearl Harbor, the plant was in its first full month of production. Aero prop production increased dramatically, rising from a total of 730 units in December of 1941 to well over 10,000 units per month two years later.

The Aero props offered many features and much greater simplicity than its competitors, having approximately one half the number of parts. Manufacturing precision was such that maintenance and blade changing could be done without being concerned about blade balance. The hollow hub offered the option of mounting a cannon that fired through the propeller hub. The Aero prop was produced in two, three, four blade designs, plus a six blade contra-rotating version. Use was on the P-39, P-51, P-63, B-26, and B-24 aircraft.

During the height of the war effort some propeller parts were produced by other Dayton GM Divisions and supplied to Aeroproducts.

Following the end of WW II, Aeroproducts produced propellers for peacetime use and for the Korean War (1950-1953), as well as parts for other GM Divisions. In 1961 the Vandalia plant closed with Aeroproducts' activities being transferred to GM Allison Division located in Indianapolis, a producer of the new turbo prop engines. Production of propellers ceased in the early 1970's. Rolls Royce acquired and continues to operate the jet engine operation at that location. General Motors maintains the Allison name and produces heavy-duty automatic transmissions at the Indianapolis site.

Several years after Aeroproducts Division vacated its Vandalia site, GM Inland Division acquired the plant for expansion. In 1989 Inland was merged into Delco Products and soon after became Delphi Chassis Vandalia Plant, as GM spun off its automotive supplier business into an independent company.

Dayton Engineering Laboratories Company

Before the end of Charles F. Kettering's senior year at Ohio State University, a letter was written to the University asking for a young man, with an inventive mind and a good knowledge of electricity, to join the staff at The National Cash Register Company in Dayton, Ohio. The letter was written by E.A. Deeds, a young executive of the company and addressed to Professor A. D. Cole of the Physics Department. Professor Cole could think of no one better suited for that job than Charles Kettering and so he persuaded him to travel to Dayton and talk with Deeds. The outcome of the visit was that Kettering did accept a job and would join The National Cash Register Company upon graduation in June of 1904.

From the time that he joined NCR until he resigned in 1909, Kettering was involved in four major product developments. The application of a high-torque electric motor, to eliminate the hand crank on the cash register, was probably the best known and most widely applied. The other inventions were an "OK Charge Phone" allowing expeditious approval of credit purchases, a low cost printing cash register, and an accounting machine that recorded bank customer transactions.

Deeds, personally, was interested in the emerging automotive industry and, in his private time, constructed an experimental automobile. The realization, that heavy competition already existed in the automotive manufacturing arena, diverted his attention toward improved automotive components. A "moon lighting" operation soon ensued as Deeds recruited Kettering and others to assist in his quest. The work took place on the second floor of the barn existing at Deed's residence on Central Avenue. The "Bang Gang" became a full time endeavor in 1908, when both Kettering and Chyrst resigned NCR to work on their projects. Other members of the Barn Gang, in the order of joining, were: William Anderson, Zerbe Bradford, William Mooney, John Reece, Ralph Todd, A. I. Phillips, John Lipos, Albert Koffer, John Sheats, Robert Demaree and W. G. Jones. Kettering's Inventions 3 Department at NCR had become depopulated.

Their first challenge was to improve the automobile ignition system, responding to the suggestion of Earl Howard, a former NCR associate, now working for the Cadillac Motor Car Company of Detroit. The eventual solution, sketched out by Kettering, was the breaker point ignition system consisting of a battery powered high-tension coil, condenser and breaker points. This system, demonstrated to Cadillac, proved to provide easier starting and better reliability compared with the conventional magneto system. In July 1909 Henry Leland of Cadillac requested the fledging firm supply 8000 ignitions sets for the upcoming model year. The Kellogg Switchboard Company of Chicago, having previously been involved with NCR's OK Charge Phone product, was engaged to build the systems.

The endeavor proved successful prompting the Dayton Engineering Laboratories Company to be formed, by Deeds and Kettering in 1909, to carry on the work. Bill Chyrst is credited with coining the acronym DELCO, which ultimately became known the World over. The high-torque cranking motor developed earlier for the cash register, may have helped with the Barn Gang's next challenge, an electrical cranking system for the automobile engine. The Delco self starter was patented in 1911 and first appeared on the 1912 Cadillac.

It is told that an associate of Henry Martin Leland of Cadillac was assisting a woman who had stalled her Cadillac on the Belle Isle Bridge in Detroit. An attempt to hand crank the engine resulted in a backfire, seriously injuring the gentlemen who later died from complications. Henry Leland later proclaimed "The Cadillac Car will kill no more men if we can help it". This story has been refuted but it certainly was illustrative of the many injuries incurred by hand cranking accidents. Henry Leland and Cadillac did support the development of a practical and safe self starter for automobiles, which undoubtedly encouraged more woman to become drivers.

William C. Durant formed the United Motors Corporation in 1916 to buy a number of existing automotive parts and accessory manufacturers. These were Hyatt Bearings, New Departure Manufacturing Company, Remy Electric Company and Dayton Engineering Laboratories Company (DELCO), Perlman Rim Company, Harrison Radiator Company and Jaxon Steel Products Company. Kettering remained with Delco and joined United Motors. Another talent to be gained from Hyatt was Alfred Sloan.

Three long-time Dayton, Ohio companies were the Domestic Engineering Company, Dayton Metal Products Company and the Dayton Fan and Motor Company. Over time these companies become under the control of Kettering and/or the Dayton Engineering Laboratories Company. In August 1919 Kettering and Talbot met with Messrs. Haskell, Sloan, and Durant, to discuss the possibility of General Motors acquiring the assets of Domestic Engineering, Dayton Metal Products and Dayton Wright Airplane Co., these companies being owned by Talbot and Kettering. Although the Day Fan Company wasn't a part of this meeting, it eventually also found its way into the General Motors organization.

Delco also became part of General Motors Corporation in 1919 when United Motors Corporation joined GMC. The next year Kettering departed Delco as GMC separated R & D functions from manufacturing activities. At this time Kettering became President of General Motors Research Corporation, located in Moraine City in a building originally used by the Dayton Wright Company producing aircraft for WWI. In 1925 the GM Research Corporation was moved to GM Detroit headquarters making Kettering Vice President of Research & Development, a position he retained until his retirement in 1947.

Some of the early contributions, by Kettering and his Dayton Engineering Laboratories Company as well as the General Motors Research staff, can be noted as follows:

Breaker point ignition system	Self Starter	Ethyl gas
High-speed diesel engines	Fast drying paints	Freon refrigerant
Parts standardization	Lubricants	Metals and alloys
High compression gas engines	Lightweight engines	Materials
Body construction	Suspensions	Vehicle ventilation
Home refrigeration	Dehumidifiers	Air conditioning

There were many more research contributions, not only related to automobiles, but more far reaching such the medical field.

Deeds remained with the National Cash Register until 1915 when he finally joined Delco. Then during WWI he served as a colonel in the US Army Signal Corps managing military aircraft procurement. Although he was a principle in the formation of the Dayton Wright Company, he divested all holdings in the company before assuming the military assignment. Substantial military contracts did find their way to Dayton Wright. The title of Colonel Deeds would remain. He returned to NCR for the third time in 1931, becoming its third president. Retirement came in 1957. His mansion on Stroop Road, now owned by NCR Corp., still exists. South Field, Deed's private airport extending from his home west to South Dixie Highway, was also used by the Dayton Wright Company. Deeds is remembered for his leadership in the creation of the Miami Valley Conservancy District flood control project for Dayton, begun shortly after the disastrous 1913 flood and completed in 1922. Gifts to the community include Carillon Park and the Engineers Club of Dayton building, the latter jointly contributed by Kettering.

Kettering, although working in Detroit, maintained residence in Dayton. His mansion still exists and is owned by Kettering Hospital. Aviation was also important to Kettering. The Dayton Wright Brothers airport on Springboro Pike, now owned by the City of Dayton, was established and used by Kettering. The City of Kettering, Kettering Hospital, plus the Kettering Center and the Kettering Tower Building in downtown Dayton, are some of the Kettering legacies. Charitable gifts from Kettering foundations continue to benefit the Dayton and worldwide community.

Delco Appliance Division

In October 1908 Edward A. and Joseph C. Halbleib established the Rochester Coil Company. The business began manufacturing coils and repairing electric motors and later progressed into the manufacture of generators for automotive lighting systems. Reorganized in 1909 as the North East Electric Company, the first new product was a combined starter and generator available in 1911.

A significantly important patent issued in July of 1912 to North East was for an electric pneumatic starting device. However, one of the most successful products was a single unit starter-generator unit used by Dodge, Franklin and Reo from 1913 to 1925.

North East had an extensive service organization with 1800 service stations throughout the World. Manufacturing and sales outlets were also maintained in several foreign countries. The list of products had expanded to include starters, generators, ignition systems, horns, speedometers, and an electrically operated typewriter.

On October 11, 1929, North East Electric Company was acquired by the General Motors Corporation and a year later was consolidated with the Delco Light Company of Dayton to form Delco Appliance Corporation. The Delco line of farm power and light plants was transferred to Rochester and certain lines of automotive products were moved to Anderson, Indiana. Edward A. Halbleib became the first president and general manager of Delco Appliance. Some of the sales organization for Delco Appliance operated out of the third floor of the Day Fan Building on Wisconsin Blvd., which also housed Frigidaire and Delco Conditioning offices.

From this time many new products were being introduced in addition to Delco Light electric power and light plants. The list of domestic products were Delco water pumps, Delco individual gas-producing units, Delco fans, Delco radios, Delco vacuum cleaners, clocks and copper tank washing machines, plus Delco and North East blowers and small motors for commercial purposes. Included also were Delco oil and gas furnaces. For the automotive market were Delco radio speakers, Delco "B" power units, Delco radio dynamotors and Delco steam automobile heaters. Added to the list were North East speedometers and automobile heaters.

A second plant for the Delco Appliance Division was constructed, opening in 1938. A few years later, this plant was converted 100 percent to the manufacture of products for the war effort. At the conclusion of the WWII it would be used to begin development of automotive fuel system components. Initially produced were carburetors steel tubing for fuel and brake lines, followed by early fuel injection systems for Chevrolet and Corvette. This produce line became Rochester Products Division.

Delco Appliance produced home radio-phonographs and televisions through the 1950's. In addition larger generators for locomotives were manufactured. More recent automotive products were heater and air conditioning fans, power seat actuators, power window actuators, and windshield wiper motors.

In 1963 much of the appliance motor production was moved to Delco Products Division in Dayton and Delco Appliance Division, as such, ceased operations. The locomotive generator job was sold to an employee organization and the automotive motor, actuator and wiper operation was sold to ITT.

A Rochester newspaper from June 2003 contains a news report of a massive fire destroying an abandoned six-story Delco factory building at the corner of Lyell Ave. and Whitney St. Remaining operations are now a part of Delphi Automotive Systems.

Delco Moraine Division

The Speedwell Motor Car Company was established in 1907 by Pierce Schenck. The initial factory was a one-story brick building previously occupied by the Dayton Machine Tool Company which stood on a four-acre plot situated on the east side of Essex Avenue, later to be renamed Wisconsin Boulevard. By 1909 the company expanded to a six-acre factory site consisting of nine buildings and a 12,000-gallon water tower. 1420 Wisconsin Blvd., the official address, was located in the City of Dayton's Edgemont district. Principal vehicles, built at this location, were a roadster or touring car for \$2500 and a limousine for \$3500. The Speedwell car enjoyed a reputation as a good durable car at a reasonable price. Two years later, much of Speedwell's inventory and machinery would be damaged by the 1913 flood. Unfortunately, like other Dayton firms, Speedwell was unable to recover from its loss and went out of business in 1915.

A portion of this Speedwell plant site had been rented by the Wright Brothers to begin manufacture of airplanes. The Wright Company operated at this location from February 1910 to November of that year, when its new plant became available on Home Avenue. In these temporary quarters the Wrights built two new prototype aircraft, the Model "B" and the smaller Model "R".

Another firm to occupy the Speedwell complex was the Dayton Metal Products Company, founded by Deeds and Kettering along with the Talbots. The time was about 1914 and the company manufactured munitions for the Russian Revolution. 1926 saw another company occupy the site, the Day Fan Electric Company, principally owned by Deeds and Kettering. Day Fan produced radios and radio components.

In February 1936 Delco Brake, previously a department at Delco Products Division located on East First Street, was relocated to the Wisconsin Blvd. site, becoming a new General Motors Division. It had come into being as GM developed hydraulic brakes for all of its car lines. Delco Brake occupied one half of the three-story old Day Fan office building. Occupying the other half of this building was Delco Frigidaire Conditioning Corporation, formed just the previous month.

The previous chronology traces the history of the Speedwell Motor Car Company property that eventually became the initial home of Delco Brake Division on the northern portion of Wisconsin Blvd. bordering on the intersection of Miami Chapel Road. The following will trace what transpired to bring Moraine Products Division to occupy the southern portion of Wisconsin Blvd. approaching the intersection of Nicholas Road.

General Motors Corporation purchased Dayton Engineering Laboratories Company from Charles F. Kettering and Edward A. Deeds, in 1918. Kettering elected to work for GM and subsequently organized General Motors Research Corporation in 1920. The operation was located in Moraine City, Ohio, in a building formerly used by the Dayton Wright Aircraft Company to build WWI military aircraft. GM had purchased Dayton Wright Aircraft Company and the operation continued until 1926.

Moraine Products Company was established in 1923 as the manufacturing arm for the GM Research. The next year saw the introduction of a promising new technology; an oil impregnated self-oiling bearing carrying the trade name Durex. Delco Remy in Anderson, Indiana, became the first customer for this new bearing applying it to an automotive generator.

Bearing production remained at the Moraine City location until 1925, at which time GM Research operations were moved to Detroit and Moraine Products was moved to the seventh floor of the Delco Products building on East First Street. Research continued in the powder metallurgy field with Moraine Products leading the way. Another new product was a porous bronze filter assigned a trade name of Porex.

Business eventually outgrew the Delco Products site. Moraine Products relocated operations to the Wisconsin Blvd. location, becoming a neighbor of Delco Brake Division. Moraine Products and Delco Brake divisions consolidated operations in 1942 with Moraine Products Division becoming the name

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of the combined division producing engine bearings, transmission parts, powder metal parts and Delco brake components.

The advent of WW II sparked a rapid change over to war related products as Moraine Products experienced a 90 % reduction in demand for civilian products. Moraine Products, being very adept at converting its "Delco Special" production machines, earned awards for low cost and efficiency.

The products produced during WWII included the M-20 booster, a mechanism containing a "booster" powder charge that worked in conjunction with the artillery shell fuse to detonate the explosive at the proper time. Millions of these boosters were produced for 60, 75, 90, 105 and 155mm artillery shells. Also produced were anti-tank mine fuses, tank track parts, propeller spinner hub parts for Aeroproducts, oil pump gears, machine gun retractor slide assemblies (no doubt for Frigidaire), brake parts for military vehicles, aircraft disc brake shoes for Bendix, engine bearings, and powdered metal filters and powdered iron parts.

Following the war, the brake business of Moraine Products resumed production of drum brakes, power brake boosters, master cylinders, brake system parts and brake linings for GM and other customers. The bearing business likewise resumed and expanded product line to include engine bearings as well as other engine parts, transmission plates and parts, and powder metal parts for automotive and appliance use. In 1946, the physical separation of the two distinct operations of brakes and bearings were joined with the addition of a new building, increasing the total floor space for Moraine Products Division to 500,000 square feet. Then in 1960 the name was changed to Delco Moraine to simplify merchandising programs.

Delco Moraine's Dayton Edgemont complex continued to expand, spreading across the railroad to the east, bordering Cincinnati Street. Expansion included new boiler plant, waste treatment plant and manufacturing space in excess of one million square feet. The final addition would be a new office building on the Cincinnati Street side. In 1965 a new complex was begun in North Dayton on Wagner Ford Road, which has grown also to exceed one million square feet. The first non-Dayton plant location was created in 1978 at a site acquired in Fredericksburg, VA. to build converter clutches.

Recent years have seen the development torque converter clutches, disc brakes, anti skid brake systems and other advanced brake control systems. Research into advanced computer controlled vehicle systems is continues today. However, the once extensive business of powdered metal parts and engine bearings has been lost to competition or sold/transferred to other manufactures.

The 1980's brought more changes to Delco Moraine:

- Creation of the Delco Moraine New Departure Hyatt Division with the merger of the two respective divisions.
- A joint venture in Taegu, Korea, with Daewoo Corporation.
- A joint venture in Elizabethtown, Kentucky, the Japanese firm Akebono
- Numerous non-US manufacturing ventures

Then in 1991 the Division was merged with Delco Products, a return to original roots. Ten years later would see the spin off of automotive component divisions by General Motors Corporation into a stand-alone new corporation, Delphi. The old Delco Moraine operations are now part of Delphi Automotive Systems Chassis Division, the grand old name Delco mostly being retired.

During the summer of 2003, the entire group of buildings existing along Wisconsin Blvd. from Miami Chapel Rd. to Nicholas Rd., including the boiler house and the waste treatment plant were razed. That portion of the facility east of the railroad tracks along Cincinnati St. still remains, but may soon face the same fate.

The name had been changed in 1960 to Delco Moraine and then the Division was merged with Delco Products in 1991. It is now part of Delphi Automotive Systems Chassis Division. Delphi Corporation is currently in Chapter 11 bankruptcy proceedings and what was once Delco Moraine Division of General Motors Corporation is now in jeopardy.

Delco Products Division

Edward A. Deeds and Charles F. Kettering incorporated the Dayton Engineering Laboratories Company in 1909. At this time Kettering left NCR to devote full time to running the business. Deeds, however, remained with NCR to later join Delco in 1915. The company's first product was automobile ignition systems, which first appeared on the 1910 Cadillac. The following year work started on the self starter for cars and this product first appeared on the 1912 Cadillac. The first manufacturing building (currently a warehouse for Mendelson's surplus company) was constructed at 329 East First Street in downtown Dayton.

Dayton Engineering Laboratories Company (DELCO) also became associated with two existing Dayton, Ohio companies. Domestic Engineering Company produced small home appliances and home lighting plants, Kettering working to apply diesel engines to the latter. Dayton Metal Products Company, among other endeavors, produced munitions and later was involved in early refrigeration systems.

United Motors Corporation, set up in 1916, subsequently purchased Dayton Engineering Laboratories Company, in its move to acquire automotive component manufacturers. Two years later General Motors Corporation acquired United Motors, at which time Delco became a division of GMC. The Domestic Engineering Company became known as Delco Light, incorporated December 26, 1919. Guardian Frigerator was moved to Dayton and became the Frigidaire department of Delco Light. By 1927 Frigidaire had become profitable, prompting the separation from Delco Light and creation of a new G. M. Division. The North East Electric Company, of Rochester, New York, was acquired by General Motors in 1929 becoming Delco Appliance Division. At this time, Delco Light ceased to exist with its operations being transferred to Rochester. The Beaver Power Building at the northwest corner of 4th and St. Clair Streets, in downtown Dayton, once housed a portion of the Delco Light operation.

Upon the removal of automotive electrical equipment work to the Remy plant in Anderson, Indiana, yet another name was introduced from what had started with the Barn Gang. Delco Products was incorporated in 1927, its remaining products being Lovejoy (lever type) shock absorbers and numerous types of fractional horsepower and larger electric motors.

General Motors first offered "knee action" on its cars in 1934, Delco Products producing these cast iron units. This design incorporated a hydraulic shock absorber integral with the front suspension upper control arm. Many forms of these units were produced during the 1930's, some of which included an inertial sensing ride control valve. Another design available on Cadillac, Buick and Packard cars, offered remote control from the dash for selection of a firm or soft ride. Lever action shock absorbers, for the rear, were also produced. Four shock absorbers per vehicle made for a substantial business. The lever action shock absorber continued to be used on some G.M. vehicles until the 1958 model year.

Meanwhile Delco Brake began as a department at Delco Products in 1935, producing hydraulic automotive brake components for G.M. cars and others. It manufactured master cylinders, wheel cylinders and brake assemblies patterned after Bendix designs. Delco Brake also grew into a sizeable operation, prompting separation from Delco Products in 1936. The old Speedwell automobile plant complex on Wisconsin Blvd. in southwest Dayton became the location for the newly independent G. M. Division.

Delco Products non-automotive business produced a complete line of electric motors, from fractional HP units to industrial motors in excess of 100HP. General Motors, in itself a large consumer of industrial motors, gave Delco Products rights to be the exclusive supplier. The production, of component rotors and stators for inclusion in hermetically sealed refrigeration compressor units, became significant with Frigidaire being the largest customer.

During WW II Delco Products produced landing struts for the B-24 bomber. Other wartime related products were fuel booster pump motors, bomb tail fuses, shafts and gears for Allison aircraft engines, 37mm shells and 20mm projectiles for ack-ack guns. At the same time the war effort increased demand for certain industrial motors and generators, in addition to the need for the hydraulic shock absorbers used on all types of military vehicles. An assortment of smaller hydraulic devices was also produced for ground vehicles and aircraft.

In addition to the wartime products produced in Dayton, Delco Products took over the GM Plant in Norwood, Ohio (a Cincinnati suburb), retooling it to produce B-26 landing gears.

In the years following WWII major production shifted back to motors and hydraulic shock absorbers. Other electrical products were:

- Large generators
- Large crop-drying fans for farm use
- Starting relays for hermetically sealed motors
- Electric actuators for tilt cab trucks, ships hatches, etc.
- Refrigeration condenser coil cooling fans
- Electrolytic motor starting and running capacitors
- Misc. relays & controls
- Garage door openers, including wireless control

While Plant II (present home of Mendelson's surplus store) was devoted to the electrical products, Plant III (the present location of Fifth Third baseball field, home of the Dayton Dragons) was dedicated to automotive tubular shock absorber production. The tubular direct acting shock absorber replaced the cast iron lever type shocks during the 1950's. Nevertheless four shocks per vehicle continued to be a major business, with GM and non-GM customers. At this time it has been said Delco Products was the world's largest producer of welded steel tubing.

The Korean conflict brought military production. An item produced by the millions was the anti-personnel bomblet. This solid steel missile was about one half inch in diameter, pointed on one end, and slightly tapered toward the other end with sheet metal fins welded on. There was no explosive associated with this. The bomblets were dumped out of aircraft at altitude and left to penetrate whatever they hit, with no explosive charge required. Delco Products also made landing gears for F 84 and F 86 aircraft, plus hydraulic blade dampers for helicopters. Landing gear production began in a rented building (now occupied by Ohio Metal Company) at the railroad on Findlay Street in east Dayton.

As sales increased, the downtown location became inadequate, prompting an expansion to the suburbs in 1957. The Forrer Blvd. complex in Kettering, Ohio, eventually absorbed all Delco Products operations, leading to decommissioning of the downtown plants.

In later years Delco Products produced automobile air suspension parts, bumper energy absorbers, suspension struts and many other items related to suspension and chassis requirements. A product line, inherited from the closing of the Delco Appliance Division in Rochester, NY, consisted of windshield wiper motors, seat adjustment motors, and electric window actuators. This products line was eventually sold to ITT Corporations, which in turn sold it to Valeo, a French concern. About this same time all motor/generator production was ceased.

Delco Products was merged with Delco Moraine in 1991 and later became part Delphi Chassis Systems, when G.M. spun off its component manufacturing operation to an independent corporation. Delphi Corporation is currently in Chapter 11 bankruptcy proceedings and what once was Delco Products Division of General Motors Corporation is now in jeopardy.

DELCO RADIO DIVISION

The Dayton Fan and Motor Company was established in Dayton, Ohio in 1889. The company made ventilating and fly retardant fans, both electric and water powered, for hotels, restaurants and stores. In 1921 Maurice Larkin, owner of the M.D. Larkin Co., an electric component and mill supply distributor, elected to become a manufacturer of radio components, prompted by success in distributing parts in support of this emerging technology.

Also being the current president of The Dayton Fan and Motor Co., Larkin hired Orin Marvel away from the US Army's McCook Field Radio Laboratory to design a line of radio components. These were much like their Atwater Kent counterparts and could be mounted on breadboards and panels. No complete receivers were produced initially, but in September 1924 the first receivers made their appearance. Being modestly priced, sales proved to be fairly successful.

At this point a new president entered the scene. Charles F. Kettering, co-founder of the Dayton Engineering Laboratories Company (Delco) and current vice president of General Motors and General Manager of its research organization, also sought involvement in this emerging business. He invested new capital in Day-Fan, and in 1926 moved operations to an existing 400,000 square foot plant at Miami Chapel Road and Wisconsin Blvd. It is reported that this building, constructed in 1914, originally housed a factory manufacturing munitions for the Russian government. At this time the name was changed to Day-Fan Electric Company.

Day-Fan manufactured radios and distributed them as General Motors Radios through various retail outlets of GM including Delco Remy, Frigidaire, and United Motors Service.

General Motors Corporation purchased the assets of Day-Fan in 1929, creating the General Motors Radio Corporation, owned 51% by GM and 49% by GE, RCA, and Westinghouse. Day-Fan had been losing money, but GM was interested in an RCA-licensed company that could be acquired without arousing the suspicion the Department of Justice. RCA was already under fire for its monopolistic practices. However, the government did file an anti trust suit in May 1930 and, as part of the response, RCA and GM liquidated the General Motors Radio Corp late in 1931.

An advertisement in the January 1930 issue of MOTOR magazine stated a Delco Radio five-tube radio would be offered in Cadillac and LaSalle cars for that year, being manufactured by General Motors Radio Corporation, Dayton, Ohio. Some design work had been done in Anderson, Indiana, but was later transferred to Dayton. All closed body Cadillac cars were wired for radios with an antenna mounted in the fabric roof. No factory installations were offered.

Following the liquidation of General Motors Radio Corporation, Delco Remy took over the development of the car radios, initially in a lab on the 6th floor of the General Motors Research Building in Detroit. Preliminary work was ongoing to develop a radio, which could be mounted in the instrument panel of the automobile. Prior to 1935 radios were only designed to be mounted on the firewall of the automobile with a control unit mounted on the dash and connected by flexible cables. One of the early inventors, whose designs were purchased, was William Lear, later of Lear Radio and Lear Jet fame.

The Colonial Radio Company of Buffalo, NY was building automobile radios, for Chevrolet and other GM car divisions. RCA also had established a manufacturing plant and made radios for Buick. Wells Gardner was making sets for Cadillac. The Crosley Radio Corporation was manufacturing home radios and auto radios for United Motor Service, as well as, auto radios for Chevrolet. Because of a threatened strike at Crosley's Cincinnati, Ohio, plant, the Chevrolet production facilities were moved, in the dark of night, to a Crosley plant in Kokomo, Indiana.

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Since 1929, the Delco Radio label had been applied to radios manufactured by various sources, such as, Delco Remy, General Motors Radio, Crosley and Wells-Gardner. After 1931 the radios produced only by Delco Remy bore the name of Delco Radio. Although Delco Remy had been GM's "automobile radio" division in the formative years, in June of 1936 Delco Radio assumed this responsibility, becoming a Division of General Motors. Their first large contract was from Chevrolet for 15,000 radio sets to be delivered by September 1936 for the 1937 model year. Meeting this deadline solidified the Delco Radio Division as a major manufacturer in the industry.

Delco Radio's home in Kokomo, Indiana, spawned from another early automobile manufacturer. The Haynes-Apperson automobile was first built in 1894 at that location, the plant closing in 1925. It was, subsequently, purchased by General Motors in 1936 for automobile radio production, following a short occupancy by Crosley Corp. building radios for Chevrolet. Delco Radio went on to produce radios for all GM automobiles, plus a myriad of other electronic products at this location.

During WWII all of Delco Radio's facilities were engaged in the production of electronic equipment in support of the war effort. Returning to peacetime production saw steady growth and, with the advent of solid-state electronics, Delco Radio for a time was noted for being the World's largest producer of early transistors and dedicated computers, plus other electronic components.

In 1970 Delco Radio Division merged with AC Electronics Division of Milwaukee, Wisconsin, to form Delco Electronics Division, thus becoming involved with military and space systems. Delco Electronics was later merged with portions of Hughes Electronics following General Motors Corporation acquisition of the non-aviation assets of Hughes Aircraft Corp.

Delco Electronics, a major supplier of automotive electronics, is now part of Delphi Automotive Systems with manufacturing facilities throughout the World.

Frigidaire Division

In 1915, Alfred Mellowes, an engineer originally from Dayton and working in Ft. Wayne, Indiana, engineered and built an electric refrigeration unit. In 1916, the Guardian Refrigerator Company was established by the Murray Auto Body Company in Detroit to build Mellowes refrigerators, a pioneering project in the almost unheard of field of electric refrigeration. The going was slow and during the next two years less than a hundred units were produced. The company was losing money prompting the elderly Mr. Murray to seek additional capital from Mr. Durant. The request for investment was denied, but in 1918 Durant privately purchased Guardian and shortly afterward coined the name "Frigidaire".

Guardian became the Frigidaire Corporation on February 8th, 1919. On March 21st, the directors of General Motors Corporation authorized the purchase of the capital stock of Frigidaire for \$56,366.50, which was the amount Durant had paid for it. Manufacturing continued in Detroit until 1920 when the business was turned over to the Delco Light Company of Dayton, Ohio, which had been created out of Domestic Engineering Company. R. H. Grant was President of Delco Light at the time.

Frigidaire grew rapidly as a result of the expertise existing in Dayton and the availability of Charles Kettering and his research organization, plus the fact that by this time Delco Light had developed an extensive sales organization for their home lighting plants. Sales for Frigidaire refrigerators were as follows: 1921-365 units, 1922-2000 units, 1923-4700 units, 1924-20,000 units, and 1925-63,500 units.

By 1926 Frigidaire had so far outstripped Delco Light in sales that a separation was advisable. Frigidaire Corporation became independent and in 1930 the remaining Delco Light operations were transferred to the North East Electric Company plant in Rochester, New York, which became Delco Appliance Corporation. Other Domestic Engineering Company products were also moved to Rochester. Elmer G. Biechler was president and general manager of Frigidaire at this time.

Sales boomed with the introduction of porcelain cabinets and improved compressors. The addition of coolers and ice cream cabinets increased business even more. A new manufacturing plant, incorporating some of the buildings of Domestic Engineering Company, was completed in Moraine City, Ohio, in 1933, at this time Frigidaire became a division of General Motors Corporation.

In 1928 Charles Kettering addressed the problem of finding a new refrigerant to replace the corrosive and toxic sulfur dioxide. He commissioned one of his former associates, Mr. Thomas Midgley Jr. to this task. Midgley had previously assisted in the development of tetraethyl lead, the anti-knock additive for gasoline. Albert Henne and Robert McNary also became involved in the search for the improved refrigerant. A chlorofluoro derivative of methane was soon identified as having possibilities. By the end of 1928 dichloro-difluoro methane was developed and given the trade name of Freon 12. A pilot plant, located in Dayton to produce Freon 12, was placed in operation during the fall and winter of 1929-1930. During this same period the famous Meter-Miser hermetically sealed compressor system was also developed.

In January of 1936 Delco-Frigidaire Conditioning Corporation was formed for the national marketing of year around automatic air conditioning and heating equipment. This operation was located in one half of the Day Fan office building on Wisconsin Blvd. It shared this building with the newly formed Delco Brake Division. Competition increased with other manufacturers, such as, Kelvinator, General Electric, Norge and Westinghouse entering the domestic refrigeration business. Some of these competitors were to introduce other domestic appliances in the form of electric ranges, clothes washers, ironers, and dishwashers. Frigidaire added electric ranges in 1937 and, a few years later, window and room air conditioners and dehumidifiers. By the time of the Pearl Harbor attack, Frigidaire had sold more than seven million refrigerators, employing more than 20,000 employees, 12,000 of which were working in the Dayton factories.

Revision 2

In the early stages of the war effort, Frigidaire contacted the U S Army regarding possible military products needs. The Chief of the Cincinnati Ordnance District visited the Dayton factories and later suggested that Frigidaire build the 50 caliber Browning machine gun. This was a new, vitally needed and difficult to produce ordnance item. September 1940 saw the first contract and construction of a new machine gun plant was begun on Taylor Street in downtown Dayton, not far from the first Delco plant. In addition Frigidaire Division received contracts to build hydraulic control devices for the B-25 Mitchell bomber. Production was in swing for both products by May 1941. In July of this same year an order was received from Aeroproducts Division for production of complex parts and assemblies for aircraft propellers. One year later Hamilton Standard propeller parts were being produced at Plant 2 in Moraine City. Then by December of that year the complete propeller was being built. The 100,000th machine gun had been produced by April 1943 and by the following February the 200,000th mark had been set. In June 1943 Frigidaire began production of propellers for the new B-29 super bomber.

Also produced were precision hydraulic controls parts for aircraft, such as, the B-17, B-24, B-25, AT-6, and B-29. Additionally, diesel engine parts for sub chasers and rapid fire cannon parts used on the P-51 were produced..

Returning to civilian production, the following products were introduced:

- 1947 - Home food freezers, automatic clothes washers and clothes dryers
- 1950 - Automatic ice cube makers
- 1955 - Dishwashers, wall ovens and Fold-back cooking units
- 1956 - Built-in cooking units

Automobile air conditioning was reintroduced on Cadillacs in 1953, having suffered a rather unsuccessful first introduction in 1941 – not a Frigidaire system. Cadillac, Frigidaire, and Harrison Radiator collaborated on the 1953 system.

By 1956 Frigidaire had produced its 20 millionth refrigerating unit and ten years later had produced the 50 millionth, coinciding with Frigidaire's 50 anniversary.

Due to rapidly increasing demands, a new GM Division, Delco Air Conditioning, was created in 1975 to assume Frigidaire's automotive air conditioning business. Unfortunately, Frigidaire would be plagued with the economic problems of producing domestic products with manufacturing costs geared to the automotive industry. This noncompetitive climate led to the announcement in January 1979 that Frigidaire Division was being sold to White Consolidated Industries of Cleveland, Ohio. The Frigidaire name, product line, and distribution system would continue under the new ownership.

This enormous General Motors Moraine City complex would go on to experience many changes:
Plant on Dryden Road (west of the railroad tracks)

- Delco Air Conditioning Division
- Harrison Radiator Division
- Delphi Harrison Division
- Demolition completed in 2005

Plant on Springboro Pike (east of railroad tracks)

- Detroit Diesel Allison, later becoming GM Truck & Bus, diesel engine manufacturing plant
- Demolition completed in 2003
- Staging area for Chevrolet truck production

Plant on South Dixie Drive (between Springboro Pike & South Dixie Drive)

- Chevrolet truck assembly
- Continued expansion of Chevrolet truck assembly facilities

The Taylor Street manufacturing complex is currently under demolition, having been used to some extent for warehousing, since production ceased.

Inland Manufacturing Division

In January 1910 ground was broken for a new factory for the Wright Company at 2701 Home Road (now Home Avenue). During a span of five years The Wright's produced ten different models of aircraft. (Models B, C, CH,D, E, EX, F, H & HS). Airplane production continued until the firm was sold in 1915 to east coast investors. A year later, with a subsequent merger with the Glenn L. Martin Company, the company became Wright-Martin Aircraft Company. Wright-Martin shifted production to New Jersey in 1917 and the plant site was leased to Dayton Wright Airplane Company, a company formed by Edward Deeds and Charles Kettering to manufacture airplanes for WW I. The Home Road facilities, known as Plant #3, manufactured small parts, such as, steering wheels and metal fittings in support of the aircraft production and assembly taking place in Moraine City.

Over four thousand British-designed de Havilland DH 4 aircraft and 400 Standard J-1 trainers were produced for the war effort. Following the war, General Motors bought the Dayton-Wright Company in 1919 and kept it going until 1923 when the aircraft part of the business was sold to Consolidated Aircraft Company a forerunner of today's General Dynamics Corporation. During this time fourteen civilian aircraft models were designed and manufactured, such R B Racer and the XPS-1.

General Motors also formed the Inland Manufacturing Company at the Home Road site, in January of 1923, to continue the post war business as an automotive supplier of steering wheels. Dayton Wright had developed a method of manufacturing a steering wheel that consisted of a strip of wood veneer wrapped around in a circle to form the wood rim. This had the advantage of increased strength and a lower manufacturing cost. It was also safer since a steering wheel rim made from solid wood would splinter, causing injury in case of a collision. In December of 1921 Chevrolet had ordered 1000 steering wheels followed in April by an order from Cadillac. The name "Inland Manufacturing" was selected since this Division was located in the middle of the country and not close to any coast, North, South, East or West.

During the first full year of operation, Inland Manufacturing Company produced over 400,000 automotive steering wheels that had been adapted from the airplane control wheel. Within a few years the Company became the largest manufacturer of steering wheels in the World.

Anticipating the gradual obsolescence of the wood steering wheel, the manufacturing process was transformed from a woodworking plant to a rubber and plastic molding plant. The first order for hard rubber steering wheels was in 1926. Other products of hard and soft rubber were running boards, Inlox motor supports, Inlox spring eye bushings, ice trays for refrigerators, and battery containers and covers.

For the WW II war effort Inland designed and developed an inexpensive, lightweight pistol. These small cheap pistols, named "The Liberator", were dropped by air in large quantities to the Allied underground forces in Europe. Although Inland was the innovator, the pistol was produced by Guide Lamp Division in Anderson, Indiana, due to its available stamping facilities. Inland, however, produced over two million .30-caliber carbines for use by American soldiers. Although there were several manufacturers of these weapons, Inland was the largest by far.

In addition to the weapons for the war effort, Inland also produced many rubber parts, helmet liners, tank tracks, vehicle clutches, gun sights, and rifle shoulder rests.

Inland's post war automotive products included brake lining, motor mounts, suspension parts, seat and interior parts, and flexible bumpers.

Revision 2

Inland was at one time the largest refrigerator ice cube tray maker in the country and probably the World. Produced were both rubber and metal ice trays, plus the patented self-ejector ice cube tray. Ironically a Dayton sister Division, Fridgidaire, did not utilize Inland trays, but did apply the magnet strip refrigerator door seal developed and produced by Inland.

More recent developments were the fiberglass composite suspension spring for cars and trucks, as well as, air bags for vehicle occupant protection.

Manufacturing needs at the Home Avenue location eventually exceeded the space available and Inland expanded into the Vandalia, Ohio facilities vacated by AeroProducts Division. Brake lining manufacturing initially went this location, followed by automotive interior and eventually air bag production.

In 1989 Inland Manufacturing Division was merged with Guide Lamp Division and Fisher Body and later the Delco Products Division which, in turn, evolved into the present day Chassis Division of Delphi Automotive Systems, as GM spun off its automotive supplier business into an independent company. Delphi Corporation is currently in Chapter 11 bankruptcy proceedings and what once was Inland Manufacturing Division of General Motors Corporation is now in jeopardy.