





When Herrington returned that October, he was reportedly furious that the company had expended funds for such a project. However, Wallace talked the veteran engineer into trying it out himself at a local gravel pit. The story goes that just an hour later, Herrington returned with a big smile on his face as he drove through the gate into the Marmon-Herrington factory—he knew they had a winner.

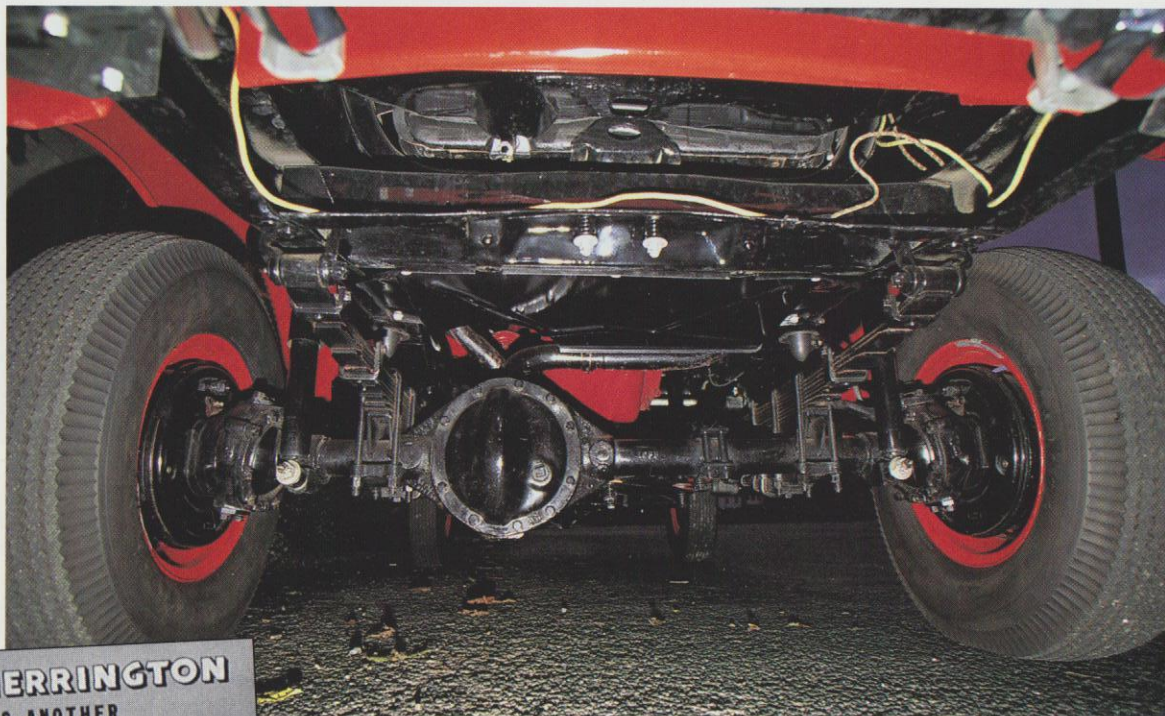
Herrington, Marmon and other company directors then approached Ford Motor Company. They brought along the prototype 1936 Ford conversion to show Ford execs.

Reportedly, Henry Ford thought the conversions would slow the assembly line and reduce production volumes. He could not see the day when 4WD could be incorporated into a high-speed assembly line and therefore, with a “handshake,” gave Marmon-Herrington FoMoCo’s approval to convert Ford Trucks to AWD. Ford also ensured that Ford engineers would make available all information that Marmon-Herrington would need to design the various components and modifications.

The agreement stayed in effect until Henry Ford II and his “whiz kids” analyzed the number of trucks Marmon-Herrington was converting and brought that function onto the Ford assembly line in 1959.

By September 1936, the Marmon-Herrington group looked to be on a roll. The company had completed the first Ford 4x4 conversions of light trucks, and they proved to be an immediate success. The timing, pricing and design of the Ford conversions hit the mark. Monthly production numbers now ran into the hundreds.

Orders came in from a variety of customers. New cars and pickups destined for AWD were supplied from Ford’s assembly plants. Dealers also shipped vehicles or, after World War II, converted vehicles in their own service departments. In at least a few cases, used vehicles were also sent to Indianapolis for conversion. The operation quickly outgrew Marmon’s single building plant.



**MARMON-HERRINGTON**  
INTRODUCES ANOTHER  
**GREAT ACHIEVEMENT**  
IN *All-Wheel-Drive*  
TRANSPORTATION



**THE FORD V-8 112-INCH WHEELBASE CHASSIS WITH EVERY WHEEL DRIVING**

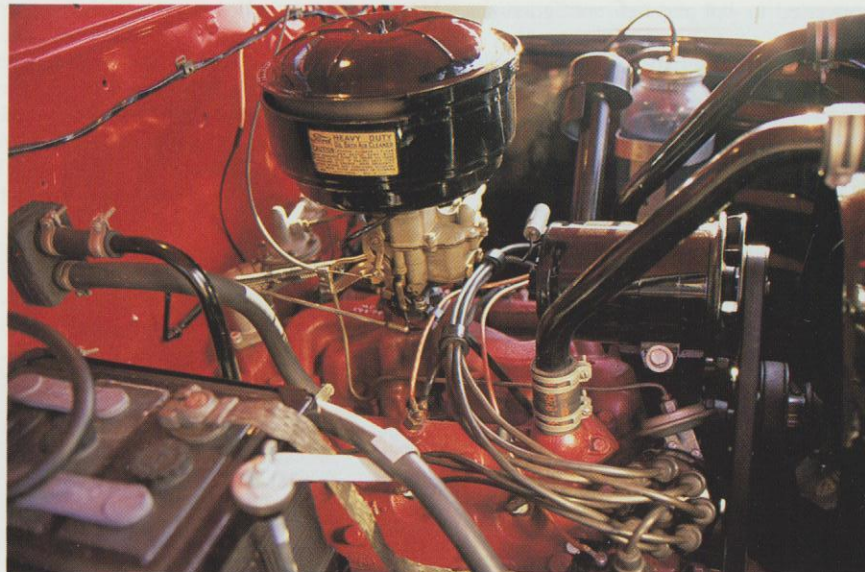
HERE is an entirely new all-wheel-drive vehicle. It is specially designed to cover an entirely new transportation field. The Ford V-8 passenger, light delivery or commercial car chassis (112-inch wheelbase) is used. Marmon-Herrington has engineered this development and builds into these all-wheel-drive units a driving front axle, truck clutch with four-speed transmission, transfer case and a three-point spring suspension. This is the first time that a light, powerful, all-wheel-drive passenger carrying or delivery vehicle has ever been offered. This unit is known as Marmon-Herrington Model LD1-4. It has a factory list price of less than \$1,400.00. It has a permissible gross load of 1500 pounds on 7.25 x 15 tires.

This new model is backed by the long experience of the Marmon-Herrington organization in designing vehicles of this type. The Model LD1-4 is produced only in the Marmon-Herrington factory at Indianapolis, U. S. A. It combines with the normal power and speed of a light delivery chassis all of the advantages of all-wheel-drive performance and safety. Make your demonstration appointment.

TO TRANSPORT PASSENGERS, HAUL FREIGHT OR  
PULL TRAILERS WHERE THE GOING IS HARDEST

ALL-WHEEL DRIVE

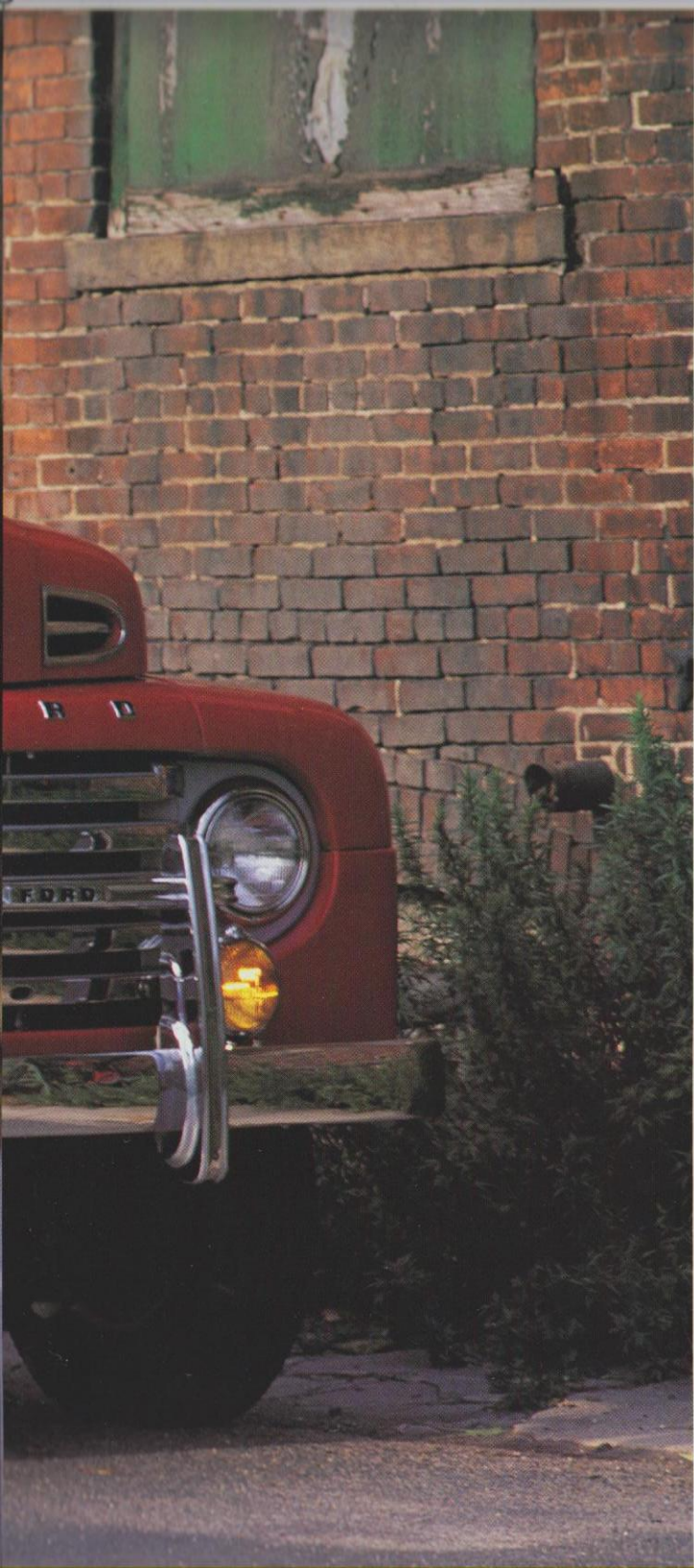
From 1937, when the first light truck brochure (left) for M-H Ford conversions was published, until several years after this 1950 F1 was built, the basic formula of sturdy all-wheel drive (above) and the tough flathead Ford V-8 (below) remained constant.











# The FORDS That MARMON Built

IN SOME WAYS, THEY WERE THE STRANGEST OF BEDFELLOWS. Walter C. Marmon, a well-known auto executive, and Arthur C. Herrington, a mechanical engineer, marched in from opposite ends of the automotive universe and, in 1931, formed the Indianapolis-based Marmon-Herrington Company, Inc., a manufacturer specializing in all-wheel-drive trucks and AWD conversions. They also formed an allegiance with Ford Motor Company that lasts to this day.

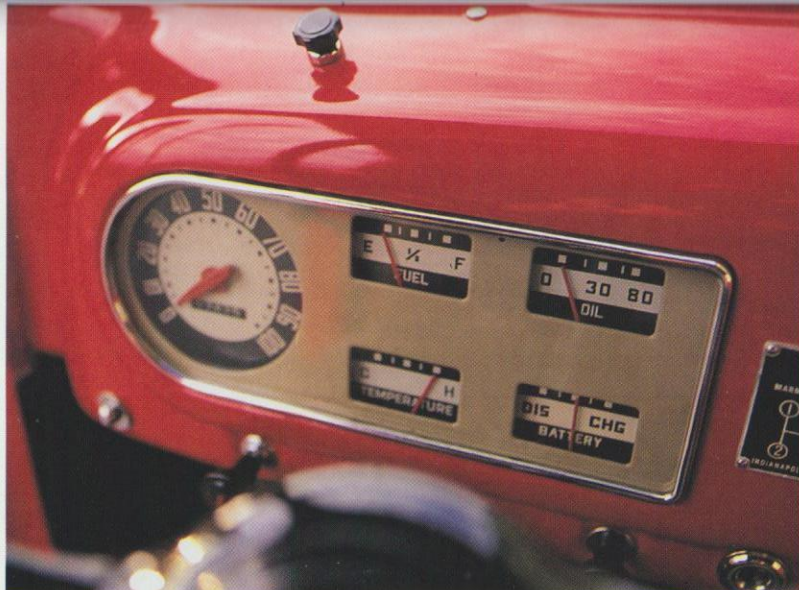
BY DON CHEW AND D. RANDY RIGGS

COLOR PHOTOGRAPHY BY D. RANDY RIGGS









Today, Marmon-Herrington converts large trucks to all-wheel drive. Heavy Marmon trucks (above) are built by Marmon Motors, a subsidiary of The Space Corp., which shares no common ownership with Marmon-Herrington.



options on Mantiglia's Ford include a Fresh Air heater (\$65), radio (\$95), V-8 engine (\$31), road lamps (\$19) and turn indicators (\$17). Unusual options include a fire extinguisher (\$12), starting crank (\$2), twin highway horns (\$15) and an engine compartment lamp (\$2.50). And believe it or not, in 1950, one had to pay extra for a right-hand windshield wiper (\$4), right-hand sun visor (\$3) and a right-hand tail lamp (\$6).

As rare as the 4x4 pickup is, the AWD Ford Ranger panel truck was even rarer, with fewer than 50 converted in 1950. One such Ranger, which is similar to the F1 under the skin, is Mantiglia's current personal project.

Engaging four-wheel drive in the converted Ford was a simple operation. The driver came to a complete stop, put the transmission into neutral and pushed the transfer case lever on the floor forward. The procedure was reversed to go back into two-wheel drive. The extra ground clearance and traction enabled the truck to go many places that would have been off limits to most vehicles.

Production quantities for the half-ton pickups generally hovered between 100 and 200 units per year during the Fifties. However, the Marmon-Herrington conversions are extremely scarce today due to the rough service life they encountered.

In 1963, Art Herrington sold his 25 percent of stock to the Fritzker family of Chicago, who later acquired a majority interest. Walter Marmon had passed away years earlier. Marmon-Herrington then became a private holding company for a diverse group of enterprises. The long-haul tractor assembly line and parts were sold to their southwest distributor, Adrian Roop, who later sold his holdings to the Space Corp. The company continues to produce trucks under the Marmon name in Denton, Texas.

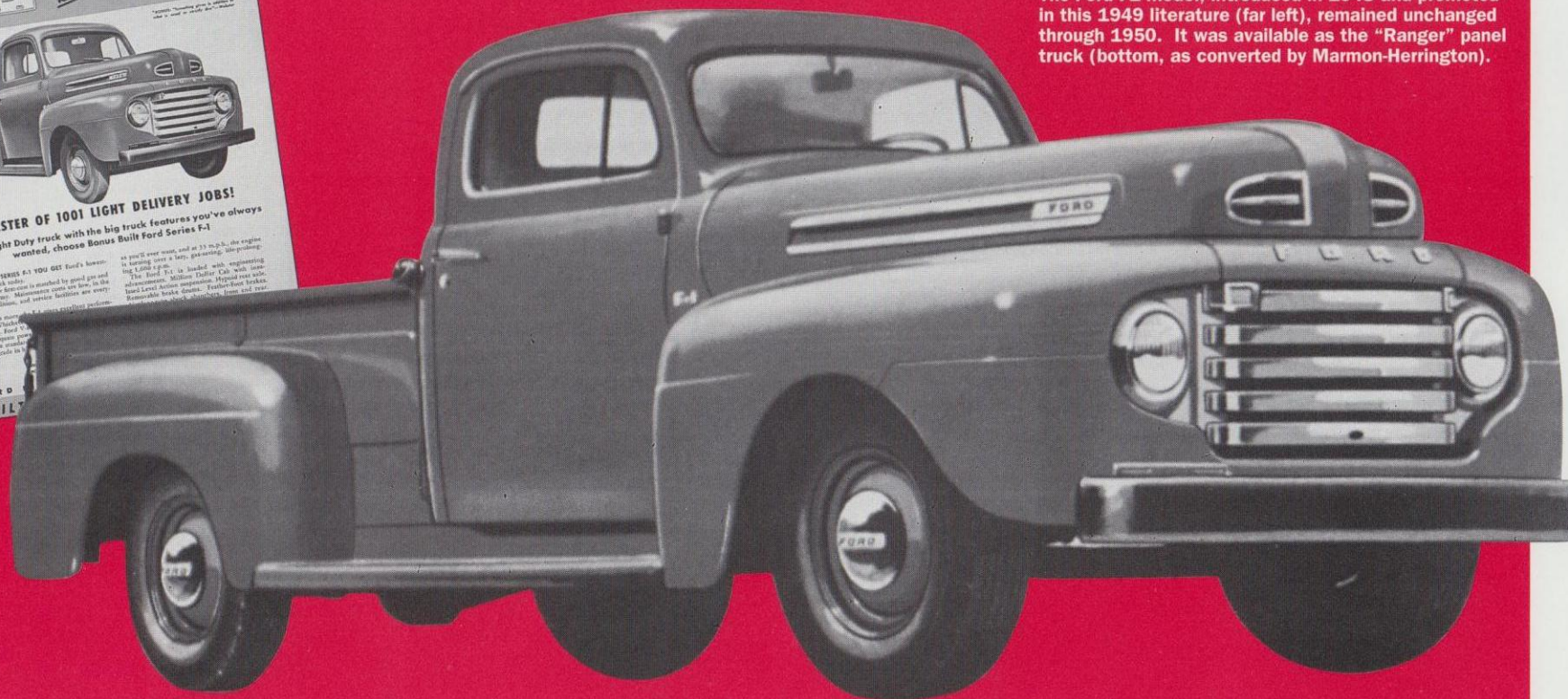
Marmon-Herrington exists independently, encompassing the Marmon Group of Companies—about the fourth largest holding company in the United States, supplying many auto components. Marmon-Herrington is just one division of the conglomerate. Today, they convert most makes of large trucks to all-wheel drive, but their business remains predominantly Ford-based.

Sixty years ago, Marmon-Herrington pioneered a market that now runs into the hundreds of thousands of units a year. Today, Marmon-Herrington's factory is adjacent to the Ford truck plant converting Ford's larger trucks and those units requiring special engineering features. "Transportation Unlimited" is just as fitting a description today as when Marmon-Herrington began using it over 40 years ago, long before 4x4 was a household word. ☼





The Ford F1 model, introduced in 1948 and promoted in this 1949 literature (far left), remained unchanged through 1950. It was available as the "Ranger" panel truck (bottom, as converted by Marmon-Herrington).



haust system required alteration to clear some of the new components. Spacers were fitted to the rear axle to level out the ride height.

The 239cid flathead Ford V-8, rated at 100 hp at 3,800 rpm, was a popular choice for Ford light-duty truck owners in 1950. Torque was rated at 180 lb./ft. at 2,000 rpm. Beginning in 1948, the standard power unit was the inline Rouge-built 226cid six-cylinder engine. Rated at 95 hp, the six had more torque than the V-8 at low rpm. It became a favorite with many economy-minded operators.

**T**he rare Marmon-Herrington conversion on these pages is owned by Chuck Mantiglia of Chuck's Trucks in Hamden, Connecticut. It was purchased new by his father, and the truck kindled Mantiglia's interest in the 1948-52 models. Moreover, Mantiglia has made Marmon-Herrington Ford conversions a specialty—and his 100-point example epitomizes his devotion to the breed.

Mantiglia restored his F1 from the frame up, with either original or new-old-stock parts. Though the cab was not rusty, the fenders, doors, running boards, hood, grille and tailgate were pretty rough. All were replaced with NOS pieces. The bed, rusted beyond repair, was replaced with a rust-free bed which required extensive metal-work.

This particular Ford F1 is equipped with a flathead V-8 and Marmon-Herrington OT5 single-speed transfer case. The odometer shows just over 57,000 miles, and because the engine was maintained properly, it has yet to be rebuilt.

Over the years, the owner has also collected and installed every option available that model year on the Vermilion Red truck. Most of these extras would have been dealer installed.

Adding a Marmon-Herrington conversion typically added a cost of about 90 percent of the base price of the vehicle. This 1950 F1's list price was \$1,334—the 4WD conversion was \$1,200 extra. A few of the more expensive





**M**ARMON WAS HEAD of the parent company of the Marmon Motor Car Company, a luxury automotive manufacturer born out of one of the world's largest machinery manufacturing enterprises, Nordyke & Marmon, makers of flour milling equipment. Style, reliability, performance and prestige were a Marmon automotive tradition.

Engineer Art Herrington had worked a time for Harley-Davidson motorcycles in the engine department. As a consultant for various manufacturers and the American government, he spent most of his early working years developing and trouble shooting all-wheel-drive trucks in the dust and sand of the desert and on muddy battlefields. His experience in the dirt of the trenches would later prove a boon to his future.

Marmon certainly knew the business side of things automotive. However, the stock market crash of 1929 and a growing, deepening economic depression had taken all the steam out of the luxury car market. By the end of 1930, the carmaker was in serious financial straits. Marmon's order book was empty. But even bad luck can lead to a positive turn of events, and it turned out that the company's difficulties allowed it to take advantage of a business collaboration with Art Herrington.

In late 1930, Herrington had succeeded in selling his ideas to the Army Air Corps for a new type of airplane refueling truck that featured a 4WD chassis. Herrington had no manufacturing facility, no employees or tooling, and virtually no financial backing, but his order book held commitments for 33 vehicles. And, thanks to perennial Indianapolis automotive executive Fred Moscovics, he was introduced to Walter Marmon at the right time.

The timing couldn't have been more fortuitous. Walter Marmon needed Herrington, and Herrington needed Marmon. And by another stroke of good luck, Ford Motor Company would soon play a part in the success of Marmon-Herrington.

Indianapolis was a town where Arthur Herrington certainly felt at home. He had spent considerable time in the area and, during 1911, he had watched the Marmon Wasp win the first Indianapolis 500. In the Twenties, he had assisted Jimmy Murphy and Pete De Paolo in the pits and aided the Duesenberg brothers in finishing one of their cars in time for the 1926 race.

The Marmon-Herrington Company, Inc., was formed in March 1931, and although the Marmon Motor Company did initially own the majority of stock, the two firms remained separate corporations. In May 1931, Marmon-Herrington leased the Marmon Plant Number 2 and started assembling trucks; within two years, Marmon was in receivership and automobile production had ceased.



Walter Marmon (above) and Arthur Herrington (above right) formed Marmon-Herrington in 1931. Walter and brother Howard (below) won the 1911 Indy 500, with Ray Harroun driving their Wasp (right), and continued to build luxury cars like the 1931 Marmon 16 (above far right).



**H**errington brought much experience to the company. His years in the Army as an engineer and skilled mechanic exposed him to many different types of off-road vehicles. Convoys numbering in the hundreds of both two- and four-wheel-drive trucks provided him with many opportunities to analyze what worked and what didn't in severe service and over rough terrain.

He gained knowledge of both the FWD and Jeffery vehicles, used by the Army for military duty during World War I (see *AQ*, vol. 35, no. 3). Herrington transferred to France and was made a captain in the Army's newly formed Motor Transportation Corps. Assigned to the job of design and operation of military trucks, he later became Chief of Engineering, overseeing the construction and design of the

American Army's own 4x4 and 6x6 vehicles.

Marmon engineers and draftsmen sat down with Herrington and—using many Marmon parts, including Herrington's new front axle and transfer case—soon had 4x4 truck parts going together.

Work began on the order for 33 T-1 4x4 refueling trucks, powered by six-cylinder Hercules engines. All were delivered by the end of the year. The units incorporated many new ideas in multiple-wheel drive design, resulting in improved stability, performance and reliability.

Military vehicles followed, but it was not the welfare of the country that caused the men who founded the company to originate, design and build such vehicles. The company could not have existed on the payment received in those early days from military sources alone. As these AWD





In 1934, Marmon-Herrington produced trucks for Iran in Marmon Plant Number 2.

**W**ith the Cord automobile operation heading into bankruptcy, a deal was struck with Cord's receivers, and Marmon-Herrington purchased the old 16-acre Duesenberg factory (where Cords were built) located on U.S. Highway 40 in Indianapolis for expansion.

Marmon-Herrington incorporated design improvements to the Ford conversions as necessary. Wider wheels, high flotation tires and front hydraulic brakes were just a few of the advancements the company made in the field.

By 1939, no less than 56 different Ford models could be converted to 4x4 and 6x6 configurations. Marmon-Her-

ington brochures described the company's conversion of Ford trucks to four-wheel or all-wheel drive for use on or off the highway.

Unfortunately, "on the highway" was one of the trouble spots for owners of earlier Marmon-Herrington AWD vehicles. The fact that the AWD arrangement kept the vehicle continually locked in four-wheel drive meant increased tire wear, poor fuel mileage and difficult steering in maneuvering.

Marmon-Herrington went to work on the problem and developed a compensator or ratcheting clutch device to allow two-wheel-drive operation. Initially the system worked automatically, but later, a manual "Locking-Unlocking" control was introduced on all models.

World War II created a variety of business and manufacturing jobs for Marmon-Herrington's operations. They built 4x4 cab-overs to an Autocar design, 4x2 slope-nosed tractors to an International design, and a variety of half-tracks, snow plows and eight-wheeled armored cars.

**Work horse Marmon-Herrington 4x4s were used by the American military (below), as well as for commercial purposes.**



**W**ith World War II hostilities behind them, it took American automobile and truck manufacturers a few years to introduce their newest designs. The public was more than starved for fresh styling and the latest in engineering. Marmon-Herrington went into production of Ford-designed trolley buses and multi-stop delivery vans, and continued conversion work.

Most automotive manufacturers had entered the postwar market with slightly restyled versions of their 1942 models. Consumers, who had been unable to purchase new vehicles for most of the war's duration, snapped up whatever they could get their hands on.

During this period, like rival Chevrolet, Ford Motor Company was hard at work on its all-new passenger cars for the 1949 model year. Yet, Ford was beaten to market on the truck side of the business, as Chevrolet introduced its all-new "Advanced Design" models mid-year in May 1947, nearly six months ahead of Dearborn.

Ford customers were pleased with the company's totally redesigned truck line when it arrived later that year—the wait had been worth it. The 1948 Ford trucks were completely restyled and hosted a number of new features and improvements. Ford ads touted the company's "Million Dollar" truck cab with its "easy chair comfort" and level action cab suspension. Also noted was the "picture window" one-piece windshield with no center obstruction (Chevy's truck had a two-piece windshield).

For the next three years, Ford used the slogan "Bonus Built" when referring to its truck line, virtually ignoring references to model years.

Marmon-Herrington's engineers kept pace with the new models. Now, some dealers opted to do the conversion work themselves rather than to send vehicles to Indianapolis, but it was not the easiest of service department jobs. The company supplied very complete instructions with every kit.

For half-ton models such as the featured 1950 Ford F1 truck, Marmon-Herrington required that trucks to be converted be supplied from Ford with the following heavy-duty components: front springs, four-speed transmission, eleven-inch clutch and the 4.27:1 rear axle ratio. During the conversion, the front axle was removed and replaced by the driven Spicer 41 front axle with constant velocity joint steering ends to provide uniform front wheel motion. The new axle was suspended by the stock Ford springs with the addition of stabilizer springs. Other additions included the transfer case and 15-inch Kelsey Hayes wheels (instead of the 16-inch Ford parts) to accommodate commercial 15-inch tires.

The conversion required precise measurements, welding and other diverse mechanical skills. The front and rear shock absorber mounts were modified, as were the mounting arrangements for the emergency brake cables. The ex-



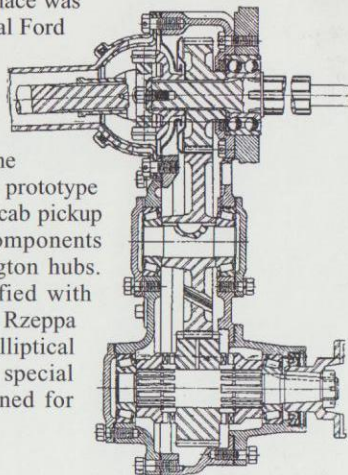
military units were developed, adaptations were made for civilian use and offered for sale through established commercial channels. Several models and sizes offered buyers a selection for varied uses. A few even featured four-wheel steering. A great number of Marmon-Herrington AWD vehicles were sold to oil, logging and mining operations, road building and maintenance departments, public utilities, etc.

Along with a number of foreign government contracts for vehicles, Marmon-Herrington occasionally built special-order units for specific purposes, such as huge multiple-wheel truck and trailer units for work on the Iraq pipeline in 1932. Work also began on a special vehicle for a passenger and freight bus line that ran from Damascus to Baghdad. This articulated desert coach was 66 feet long with luxury accommodations for 36 and, of course, featured AWD.

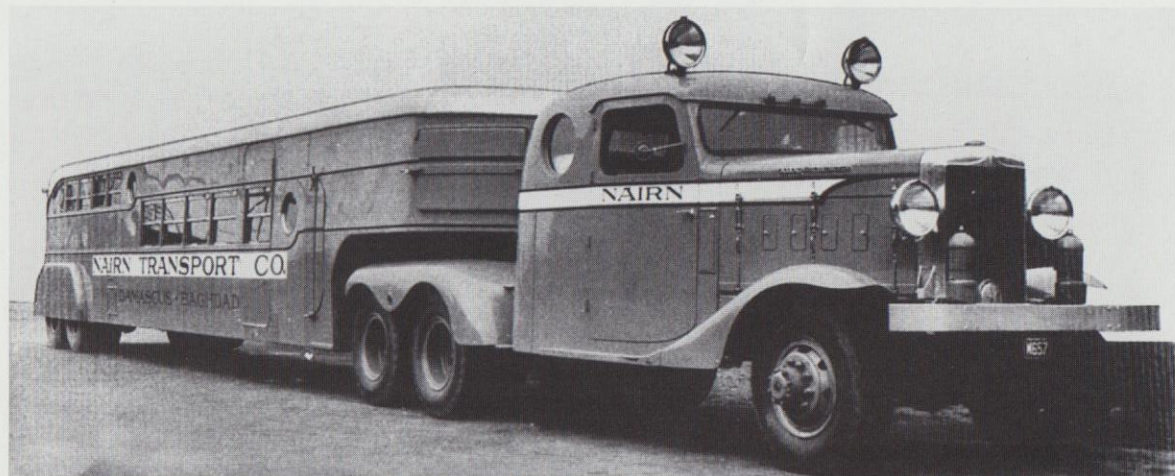
The amazing ability of the AWD vehicles enabled them to conquer deep sand, mud and snow and to climb unusually steep grades. These capabilities awakened military authorities around the world to the tremendous possibilities of such vehicles in the mechanization of modern armies. Marmon-Herrington vehicles were the forerunners of many of the military vehicles in use around the globe today.

**D**uring 1935, as Art Herrington traveled throughout the Middle East overseeing various projects, Walter Marmon conceived a plan to enter the medium-duty market with a lower-priced vehicle. The FWD Corporation had introduced a \$2,500 truck that Marmon felt was vulnerable to a viable competitor. Marmon-Herrington rose to the competition by converting a Ford 1½-ton truck to all-wheel drive. The Indianapolis company also offered a version of the Ford truck with ten driven wheels, which virtually doubled its payload.

Meanwhile, ex-Stutz engineer and Marmon-Herrington Vice President Robert C. Wallace was instructed to go down to a local Ford dealership in Indianapolis and see if a half-ton Ford Truck could be converted to a 4WD arrangement. When he reported back favorably, the engineers went to work on a prototype 1936 Ford V-8 half-ton open cab pickup by adapting a number of components including Wisconsin-Herrington hubs. A Ford rear axle was modified with Marmon-Herrington hubs and Rzeppa joints and fitted with semi-elliptical springs for use up front. A special transfer case was also designed for the Ford.



The key to all Marmon-Herrington all-wheel-drive conversions was the transfer case (left), which mated to the Ford's Warner T9 four-speed transmission, and the Ford rear axle modified for use up front. The converted Ford light truck prototype (right) was complete by 1936.



Marmon-Herrington built this articulated bus (above) for Damascus to Baghdad service. By the time this 1937 Ford was built, the firm had converted large Ford trucks (below right) to all-wheel drive for two years. Vice President Robert C. Wallace (below left) determined the feasibility of converting Ford half-ton trucks to four-wheel drive.

