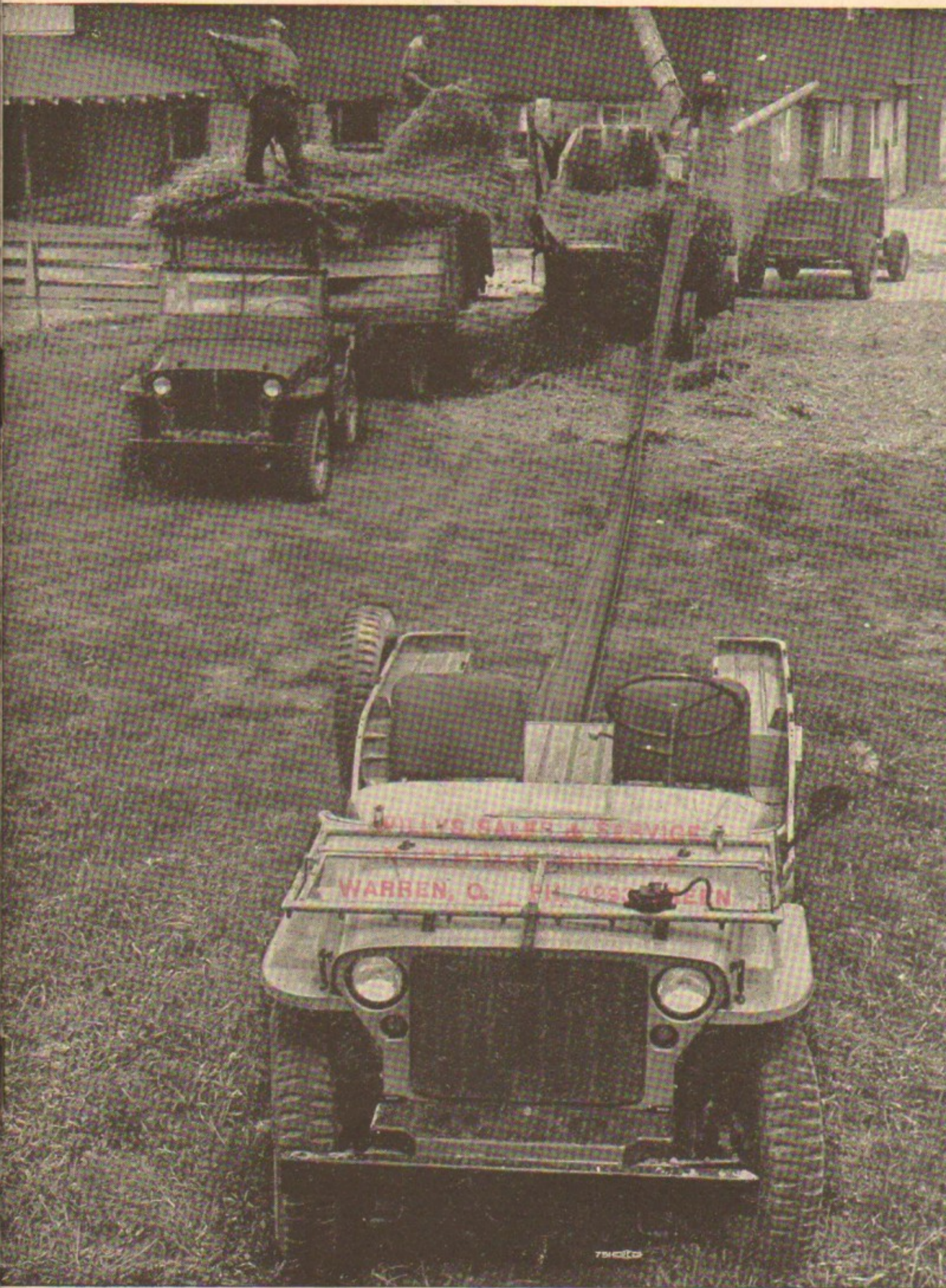


# THE UNIVERSAL 'JEEP', 1946



WILLYS-OVERLAND MOTORS, INC.

**THE UNIVERSAL 'JEEP'**

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TOLEDO, OHIO



A unique balance of power, weight, size, four-wheel drive, dependability and ruggedness, the Universal Jeep embodies the same sound engineering principles which have made these Willys-Overland vehicles famous the world over.



Detachable front and rear tops afford the Jeep driver and passengers all-weather protection. A heater, 3-inch seat cushions, telescopic type shock absorbers and more flexible springs are other comfort features available in the peacetime model.

## THE UNIVERSAL 'JEEP'

A question asked around the world in many tongues—"What about the 'Jeep' in the postwar period?"—has been answered by Willys-Overland Motors on test farms throughout the nation. The answer is: "There not only will be a postwar 'Jeep', but there is one."

The postwar 'Jeep', developed behind closed doors during months of exhaustive research and experimentation, is the first vehicle in history successfully to combine the basic functions of the light truck, tractor, mobile power unit and passenger conveyance.

Although it closely resembles the standard military Jeep, which was developed by Willys-Overland in cooperation with the Army, and embodies the same automotive concept which made this scout car the most versatile weapon in the allied arsenal, the postwar Jeep presents to the public special values of its own for the farm, factory, railroad yards, mines, oil fields, lumber camps and other peacetime pursuits.

The revolutionary concept which the military Jeep represents—a unique balance of power, weight, size, four-wheel drive, dependability and ruggedness—has been adapted for peacetime service to mankind around the clock, around the year and around the world.

The Jeep's unique qualities were balanced for postwar use after exhaustive research and experimentation. The new unit has the same basic Willys 'Jeep' engine, the power plant used in more than 500,000 military Jeeps. This motor has driven Jeeps more than 10 billion miles in the toughest test of all—war. It has, too, many innovations which give the vehicle a character of its own.

## JEEP DEVELOPMENTS

The two principal advantages of the peace Jeep over the war vehicle are a special power take-off which can be used with the spline shaft for direct power or with the belt pulley, thus making it possible to delegate up to 30 H.P. to anything from a buzz saw to a thresher; and the changed gear ratios in the transmission, transfer case and axles. This latter revision results in maximum efficiency while operating at a necessary farm pace of from three to 7.5 miles per hour. A gear ratio is also provided to give a road speed of 60 miles per hour. The developments assure long life for the postwar Jeep.

The power take-off, as far as the Jeep is concerned, is a new development. The postwar Jeep was engineered and designed to take advantage of mobile Jeep power, to carry it over difficult terrain to the job; to transfer it to a long list of stationary tasks; to pull heavy equipment over the highways at a rapid rate; and to perform tractor-type jobs with speed and efficiency.

In the Jeep's transmission, there are now wider gears of more suitable ratios, better lubrication and larger bearings; which, to the public and the new civilian user, means an unusual combination of power and speed.

The changes in the transmission and transfer case, which distribute power to front and rear axles, also were made to gain maximum performance and



Adapted for continuous service in the field, the Universal Jeep is shown operating a two-bottom, 12-inch plow. It is equally effective with the single bottom, 18-inch plow.



The Jeep is equally at home pulling a tandem disc harrow as it was drawing a 75 mm. gun. Unbooked from a harrow or other tillage tools, the vehicle carries on as a light truck, mobile power unit or passenger conveyance.

versatility on civilian jobs. Changes in the rear axle gear, last unit in power transmission, complete the engine-to-road reduction and readjustment necessary to the vehicle now called on for a new spread of diversified uses.

Other differences between the military Jeep and the postwar Jeep are as follows:

1. A new combustion chamber has been designed. By means of altered dimensions in the cylinder head and combustion chamber, perfected in the light of the newest engineering knowledge, the power of the postwar Jeep over the military has thus been increased.
2. A radiator shroud was added to provide more effective cooling for the continued low-gear driving on the farm and in other highly-demanding work. This shroud in tests has effectively proved its capacity for protecting the engine operation from too much heat.
3. A larger clutch was installed. With increased loads, starting is necessarily more difficult, and to provide for this the new clutch has been installed. Once engaged, the capacity of the clutch to transfer the full torque of the engine, makes only a nominal difference, but in the act of starting, additional stress is necessarily put upon it, and the change obviates any difficulties in getting under way.
4. Steering linkage has been redesigned. In order to provide ease of handling and free rolling, and to more safely negotiate sharp turns, the cross steering arrangement has been engineered to the requirements of civilian use.
5. Greater rigidity has been built into the chassis frame. At front and rear and all along the frame, reinforcements have been added to aid in the attachment of implements, and to absorb the loads of heavy draw bar work.
6. Rear shock absorbers were mounted to an angle to provide a level floor. New seats for greater comfort have been installed.
7. The gear shift lever, for greater convenience, was placed on the steering column. This improvement will save wearing effort on the part of men and women of all ages who will drive the peace Jeep.

Additional features have been added to the peace Jeep, either as standard equipment or as accessories. Among these are 7-inch headlights which meet all legal requirements, a tail gate which enables it to function effectively as a pickup truck, an automatic windshield wiper and a large tool box.

The comfort features of the military Jeep have been refined and many new ones added for the peace version of the vehicle. The peace Jeep has improved shock absorbers and springs. Front and rear seats are cushioned, a heater has been made available and there are front and rear tops to give the occupants protection from the weather. Roominess and ease of riding has been provided.

Owners of the vehicle will be able to purchase a list of special accessories which widen the range of the Jeep's usefulness, including snow plow and grader attachments, spray painting equipment, and others.

A belt-driven governor is available and can be installed wherever constant engine speed, regardless of load, is required. Controlled from the instru-



The Universal Jeep provides power to operate silo filler with cutter. With corn bundles being tossed into the cutter from the trailer behind the second Jeep the 40-foot silo was filled to its 125-ton capacity in less than 16 hours.



The Jeep supplies ready and mobile power for use in spray painting barns, fences and other surfaces requiring care and attention on the farm.

ment panel, the governor permits regulated engine speeds from 1,000 to 2,600 R.P.M. in steps of 200 R.P.M.

The capstan winch is a most useful piece of special equipment. It is mounted on the frame between the bumper and the radiator, and is driven through a propeller shaft and two universal joints from the front end of the engine crankshaft. A shift lever is mounted on the assembly for engagement. The unit is designed for 5,000 pounds pull, using either three-quarter inch or one-inch manila rope.

By no means new, but increasingly effective for postwar use, is the four-wheel drive, never before available to civilians in a vehicle of the Jeep's size and weight. This feature, which helped build a world-wide reputation for the military Jeep, promises to play an equally important part in hundreds of peacetime assignments. By spreading the Jeep's drive over four wheels, tremendous tractive power is achieved and the vehicle becomes a glutton for tough terrain. It is particularly effective on uneven or loose soil, where vehicles driven from only one axle frequently push their front wheels into the ground and stall. On the Jeep, the front wheels do not push, they pull.

#### WHAT THE JEEP WILL DO

What are some of the jobs the postwar Jeep will do? The list, which runs into the hundreds, is still in the early stages of compilation. Many have been studied and tested, others will receive attention soon.

Some of these include:

1. Operating a combine on oats and other grain and seed crops.
2. Operating a grain binder.
3. Threshing.
4. Baling, pick-up and stationary.
5. Elevating grain to bin.
6. Shelling corn.
7. Grinding with hammer mill.
8. Cultivating corn and other row crops.
9. Planting corn and other row crops.
10. Plowing.
11. Discing.
12. Dragging.
13. Operating a rotary hoe.
14. Operating a grain drill.
15. Hauling grain and livestock.
16. Mowing hay.
17. Raking hay.
18. Operating wagon with hay loader.
19. Operating a post-hole augur.
20. Operating a manure spreader.
21. Sawing wood.
22. Operating a paint sprayer.
23. Spraying orchards.



Highly useful in logging operations, the Jeep furnishes additional proof of the many-sided versatility it has inherited from its military predecessor.



Pulling a disc harrow through heavy muck soil of Florida was part of the extensive tests devised for the Universal Jeep at agricultural experimental stations throughout the country.

Farm operations which the Postwar Jeep will perform better than the Military Jeep

Plowing	Harrowing
Discing	Combining
Manure spreading	Rolling
Drilling	Cultivating
Binding	Hauling loaded trailers (corn, grain, hay, etc.)
Logging	Wire stretching
Feed hauling	Water hauling
Delivering milk cans	Pulling stone boat
Rounding up cattle	Clearing mesquite and bushes
Mowing hay	Raking hay
Unloading hay at barn	Operating pick-up baler
Digging potatoes	Moving portable buildings
Transporting passengers over muddy and snowy roads	Transporting and covering tile
Hauling tools and equipment	Powering lime and fertilizer spreader

The postwar Jeep is superior to the military Jeep in most of the above operations because of the changed gear ratios and increased pulling power, as well as through the wise use of the power take-off. In addition to the above, the following advantages also apply: Front and rear tops provide better driver protection; heater gives better comfort; chaff screen and brush guard protect radiator; agricultural draw bar provides correct attachment for equipment; front and rear cushioned seats provide greater comfort; front end weight increases tractive power.

#### WHAT THE TESTS SHOW

Tests have been conducted at the University of Saskatchewan; Alabama Technical at Auburn; Texas A and M at College Station; Mississippi A and M at Starkville; at the Universities of Arizona, Texas, Mississippi, Illinois, Minnesota and Penn State; Shawnee Farms, Clewiston, Florida; Agricultural Experiment Station of the State College of Washington; G. L. F. Farms, Ithaca, New York; and at other farms near South Lyons and Farmington, Michigan; Brookneal, Virginia; Clearwater, Florida; and in numerous forest, mining, ranching, governmental and industrial locations.

Tests conducted with the Universal Jeep have supplied on-the-soil records of Jeep performance, gasoline consumption, fuel, speed, engine condition, time required for given tasks, specific cost of each item and overall costs. They also furnish examples of unique and outstanding performance which can be best told in short-sentence narrative form.

Among them:

IN TEXAS—The Jeep in half an hour rode the range, checked up stock. Time ordinarily required; one-half day.



The Jeep is seen pulling an 18-hole rice and fertilizer drill on the acreage of one of the 12 state farm universities, where the civilian model was successfully tested for agricultural potentialities.



Especially effective in hauling trailer loads over the highway, the Jeep can pull 5500 pounds at a rapid rate with sufficient power to meet steep grades and bad road conditions.

IN THE U. S. FOREST SERVICE—Two Jeeps made an ideal team in fire-fighting, one carrying a crew of four or five men, the other carrying water tank, power pump and hand tools.

IN FLORIDA—A Jeep carried out the fruit from among the trees, rows of which were too close for other large conveyances, which brush the fruit from low-hanging limbs.

IN ARKANSAS—The Jeep proved highly effective in the rice fields. In plowing, for instance, the dykes or levees which cross the field in the irrigated lands offered no obstacles; nor did the black "gumbo" soil.

IN NEW YORK—The Jeep in contour plowing on difficult hillsides, maintained equilibrium, lost no time and wasted no gasoline. This was made possible by the four-wheel drive, which prevented the front wheels from jamming into the earth, a frequent occurrence with other mechanized devices.

The results of other tests, as related by those directing the experiments, disclose the following facts about Jeep performance:

#### TESTS BY G.L.F. COOPERATIVE, ITHACA, N. Y. GENERAL

We drove the Jeep 1,796 miles running farm errands and making deliveries at a speed of 15 to 60 miles per hour. The gas consumption was 16.3 miles per gallon.

We then used the Jeep to scrape 8 miles of road at a speed of 4 miles per hour.

Both operations were 100% satisfactory.

#### HAULING AND SPREADING MANURE

The Jeep was used 38.5 hours to haul 157.5 tons of manure at an average speed of 7 miles per hour. The distance traveled was 182.3 miles, the unit work per hour was 4.1 tons. The Jeep performed 100% satisfactory.

On another occasion, it was used to spread 132.5 tons of manure. Four-wheel drive, low low range was used at a speed of 3.8 miles per hour. Twenty-four hours were consumed on this operation. The Jeep traveled 155.2 miles and consumed 22.5 gallons of gasoline.

#### PLOWING

30 hours were consumed to plow 25.5 acres of land at a speed of 3 to 4 miles per hour. The unit work per hour was .85 acres and the fuel consumption was 1.57 gallons per acre.

#### DUMP TRAILER

9.2 hours were consumed hauling a dump trailer to haul stone over rough field. Four-wheel drive was used; low gear and transmission and high gear in transfer case at a speed of 5 to 7 miles per hour.

The engine temperature on the above operation ranged from 160° to 180° and all operations were 100% satisfactory.



Threshing is among the innumerable farm tasks requiring stationary power that the Jeep now takes in its stride as a result of the special power take-off with which the Jeep has been outfitted by Willys engineers.



Able to expend a draw bar pull of 1200 pounds, the Jeep pulls a 7-foot tandem disc harrow with ease. In adapting the military vehicle to the farm, Willys-Overland engineers have installed a larger clutch to step up power in starting.

## HARROWING

One hour was consumed to harrow 1.5 acres at a speed of 5 to 7 miles per hour. Jeep traveled 5.7 miles and consumed three gallons of fuel. This operation was 100% satisfactory.

## DRILLING

Six hours were consumed to drill 13.5 acres of land at a speed of 2 to 6 miles per hour. Unit work per hour was 2.25 acres and fuel consumption was .58 gallon per acre. This operation was 100% satisfactory.

## HAULING

The Jeep was used to tow 14x6-foot wagons to haul seventeen loads of corn from the field. Four-wheel drive, high gear and transfer case; low gear in transmission was used at an average speed of 3 to 5 miles per hour and consumed 6.75 gallons of gasoline. Hauled three cords of wood in 2.5 hours and consumed two gallons of gasoline. All operations were 100% satisfactory.

The Jeeps were used 42.6 hours hauling corn, dirt, rock, sand and wood; 3.5 hours to saw 1,629 board feet of lumber; 50.9 hours husking corn. All operations were 100% satisfactory except husking corn, which was 98%. Ninety-eight per cent satisfactory was recorded because of the moisture content of the corn at the time of the husking operation. The operator remarked that it would have been almost impossible to husk corn in its condition using the tractor as power.

## TESTS MADE BY MANOR FARMS, MARYLAND

The Jeep is being used to tow a New Idea rubber-tired manure spreader over rolling Chester loam land. The Jeep handles 25 loads per an eight-hour day for a total weight of 35 tons. Low-low four-wheel drive is being used at a speed of 7 to 10 miles per hour, for an average of 45 miles per day. The farm superintendent says this operation is being performed 100% satisfactory.

## TESTS BY BROWN FARM, CLEARWATER, FLORIDA

The small trees are watered with the Jeep pulling a 300-gallon water tank mounted on a two-wheel trailer, which is in operation 8 hours per day. They can water about 1,500 trees per day with the Jeep pulling the trailer. With the standard farm tractor, they can water 500 trees per day. The small trees run about 1,100 trees to 20 acres.

When not watering trees, they use the Jeep to pull a 9' Acme harrow to level this rough sandy ground where trees have been removed. They can cover about 20 acres per day with the Jeep.

They fill the gas tank in the A. M. on the Jeep and also on two comparable tractors. In the evening after 8 hours work, the Jeep will have done as much harrowing and leveling as both tractors on just half the gas.

The Jeep equipped with side curtains could be used on cold days, while the standard farm tractor had to stay in.





The Jeep supplies relief in the elimination of back-breaking jobs on the farm as typified by this post hole auger which operates from the power take-off shaft.



The Universal Jeep equipped with the same power plant installed in more than 500,000 military units, is capable of hauling trailed loads weighing as much as 5500 pounds over all types of terrain.

#### TESTS BY TIEDTKE FARM, CLEWISTON, FLORIDA

To determine the Jeep's ability compared with competitive equipment, this farm has been running field tests for the last two weeks with 2 machines, the Jeep, and a tractor of comparable size. The work was done in abnormally dry Everglades Muck. The first test was designed to determine the amount of work which could be done with a uniform drawbar pull. We plowed a furrow 8" deep with a 14" cut. This registered a drawbar pull of 600 lbs. on the dynamometer. Since the drawbar pull for all three units was uniform, this test could be used as a guide for other operations where the vehicles would be using identical equipment.

The Jeep was equipped with 7.50x16" ground grip tires and operated in second gear. The tractor had dual 8x32 tires and operated in second gear. On a straight pull the Jeep pulled the plow two-thirds faster than the tractor. The data on the whole operation reduced to a per acre basis is as follows:

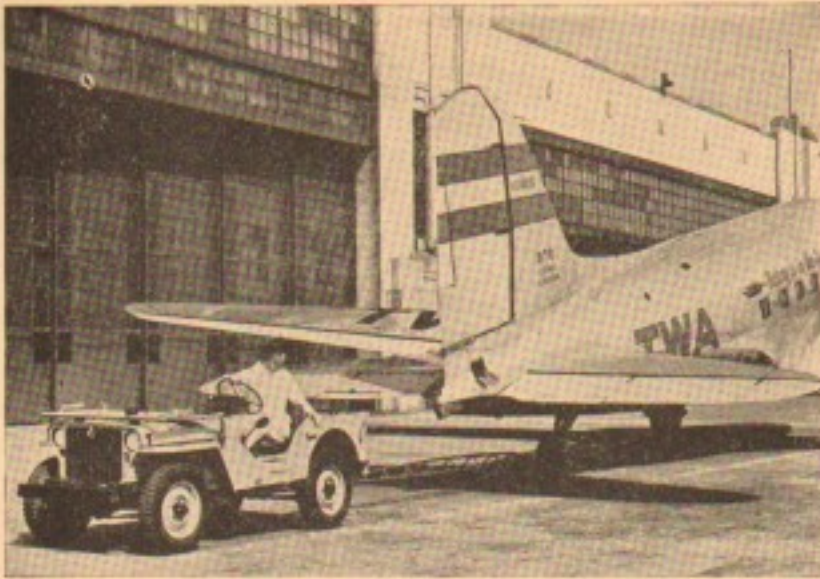
<i>Cost per acre</i>	<i>Jeep</i>	<i>Comparable Tractor</i>
Fuel, gallons.....	3.1	3.6
Time.....	1.04	2.17
Gallons per hour.....	3.6	1.6
<i>Cost per Hour:</i>		
Fuel.....	0.63	0.34
Driver.....	0.50	0.50
Depreciation.....	0.10	0.08
Service and Repair on Plow and Tractor.....	0.20	0.20
Total Cost per Hour.....	\$1.43	\$1.12
Cost per Acre.....	\$1.53	\$2.56

Results of a second test are as follows:

<i>Per Acre</i>	<i>Jeep</i>	<i>Comparable Tractor</i>
Fuel, gallons.....	4.7	3.3
Time.....	1.23	1.50
Gallons per Hour.....	3.4	1.8
<i>Cost per Hour:</i>		
Fuel.....	0.71	0.38
Driver.....	0.50	0.50
Depreciation.....	0.10	0.08
Service and Repairs.....	0.20	0.20
Total Cost per Hour.....	\$1.51	\$1.16
Cost per Acre.....	\$2.09	\$2.13

Several conclusions can be drawn from these tests:

The Jeep greatly outperforms other equipment in getting over a farm for supervision and service. No car or truck with two-wheel drive can go where it can go. The standard pick-ups which are used for this purpose have great difficulty getting through many places and occasionally break



Towing airplanes is another of the Jeep's civilian chores that had their inception on battlefields, thanks to doughboy ingenuity and the rugged stamina built into the vehicle by Willys engineers.



The Jeep with its handy power take-off does a quick and efficient job buzzing wood. Its four-wheel drive and great mobility enables it to carry power to the job over rough terrain.

axles, springs and rear ends when the drivers try to force them through fields which the Jeep can handle without strain.

Another use which might become quite general is hauling trailers. We use this system on our farm for hauling vegetables and in getting men, tools, fertilizer and other supplies to the fields. Unlike a truck, the Jeep can drop the wagon where it is needed and then go on to do other work. Our field roads are packed enough to give the Jeep plenty of traction. It pulls a string of wagons at least twice as fast as the comparable tractor.

#### TESTS BY SHAWNEE FARMS, CLEWISTON, FLORIDA

The Jeep did a fine job with an 18" plow. First we used low-low, then shifted to second gear in transmission that was just right, speed approximately 5 miles per hour. It is better to go faster in this soil, so as to throw the furrow rather than merely turn it over. This leaves a smooth surface. The plow was built special at this farm. It plowed as deep as 10".

The Jeep pulled a disc similar to the Brodrick-Lean around a one-acre field in approximately 1 minute and 17 seconds, as compared with 2 minutes, 5 seconds.

The top and dividing curtain in the back of driver is highly valuable in Florida, since it prevents the dust from settling all over the driver as it does with a standard farm tractor.

#### TESTS BY MISSISSIPPI STATE COLLEGE, STARKVILLE, MISSISSIPPI

The Jeep was used to tow a 6-foot double disc harrow to disc 3.5 acres of Houston soil in 1 hour and 20 minutes at a speed of 3 to 4 miles per hour, using four-wheel drive, low-low range. It traveled 5.9 miles using 2 gallons and 1 pint of gas.

The *military* Jeep stalled on this operation. The *farm* Jeep never hesitated and did a very good job.

#### TESTS BY TEXAS AGRICULTURAL EXPERIMENT STATION, A. & M. COLLEGE OF TEXAS

A trip embracing approximately 60 miles was made about and over pasture lands. It is customary in rice growing along the Texas Gulf Coast area to plant rice lands in rice one year out of every three. During the two years it is not in rice it is used as pasture lands for the growing of cattle. Consequently, a vehicle such as the CJ-2 Civilian Jeep would be useful in going about over the pasture lands and unimproved pasture roads which become very muddy and soft during the winter months and other times when there are several days of rainy weather.

Upon returning from the pasture trip the CJ-2 Jeep was hitched to the 7' tandem tractor disk harrow and a 2.5 acre block of ground was disked. The harrow was set at full cutting angle and the Jeep operated for about one hour to determine whether or not the motor would overheat with the 1,250-lb. drawbar load. The maximum temperature as indicated by the thermometer on the instrument panel was 180 degrees Fahrenheit, a temperature which was well within the safe range of operation.



The Universal Jeep can be used effectively to operate a tree spraying unit. Its low silhouette and great mobility makes it particularly useful in orchard work.



A special power take-off, which can be used with a spline shaft for direct power or with a belt pulley, makes it possible for the Jeep to delegate up to 30 HP to anything from a buzz saw to a corn sheller, such as it is shown operating.

On another test the CJ-2 Jeep was hitched to a peg tooth harrow weighing approximately 500 pounds. The harrow was rigidly constructed and the teeth were slightly forward of the perpendicular for better penetration. The governor was set in the fifth notch and the low gear conventional and low range 4x4 drive used. The 2.5 acre block of ground was harrowed in 30 minutes at a total distance traveled of 2.7 miles. The temperature of the motor as indicated by the thermometer on the instrument panel fluctuated between 170 and 180 degrees. The drawbar pull for this harrow over freshly disked ground was 1,000 pounds.

The Jeep was driven back to the College Station on April 12th. A check of the gasoline consumed over the road showed that the gasoline consumed on this trip was 18.9 miles to the gallon when the vehicle was driven about 40 to 50 miles per hour.

#### TESTS BY THE STATE COLLEGE OF WASHINGTON AGRICULTURAL EXPERIMENT STATION

In talking with several orchardists, it was agreed that a good heavy team will haul out 30 boxes of apples on a sled on level ground. It was felt that this was about the maximum load, provided the distance of the haul was not too great. For longer hauls 25 boxes was considered a good load. It was also recognized that the average team would probably travel with the empty wagon or with a full load at a speed not greater than 1½ miles per hour. The Jeep, therefore, showed a very decided advantage, both in the amount of the load hauled, and the speed of traveling when hauling the apples out from the various parts of the orchard.

#### TESTS BY SEABOARD ROAD CONSTRUCTION, DE MEXICO, S. A.

This vehicle (the Jeep) is being used daily for almost every purpose conceivable, being driven over a most rugged terrain, consisting mostly of rocks and mud clay brush, very fine dust. It has given excellent service and has not once failed or stalled. It made a trip to Meoqui sixty miles south of Chihuahau. This was indeed a rugged trip, 15 miles per hour was top speed, at times it had to creep, no roads, just trails over mountain grades, through canyons dodging sharp rocks and dragging larger ones, expecting at any time to leave bottom of car on the road, not to mention the dust and dirt. You can imagine what the Jeep must go through with so much more expected of it than any other car, never any consideration of tires or any part of it.

#### THE JEEP IS A UNIVERSAL VEHICLE

The Universal Jeep can compete on a basis of economy and performance with vehicles of similar size and, in many cases, has proven itself superior. This is of particular importance since it offers in one vehicle the basic functions of the tractor, light truck, passenger conveyance and mobile power unit with many specific functions in each of these four categories. It was not built specifically to compete with any highly-specialized equipment, limited in function and representing heavy investment. Yet, it compares favorably with all of them. On the other hand, it was designed for constant use, all day the year around. This is in sharp contrast to the astonishingly



Outfitted with a snowplow attachment, the Universal Jeep fulfills the promise of its capacity for around-the-year work by keeping a country road open.



The Universal Jeep has a wide application in industry. Here it performs as a utility vehicle in the oil fields.

limited hours of usefulness provided for the farmer by specialized equipment, which sits idle for many days. The Jeep will rarely be resting.

Stated in another way, the four-fold function of the postwar Jeep is the use of revolutionary mobile power as a tool and in conjunction with other tools. Whether the tool is to be mounted on the front as in the case of a snowplow or sweeper, attached in the rear as in the case of an agricultural implement, a sand leveler or sprayer; or in the body as in the case of a compressor or electric generator, or mounted separately where a belt-drive is necessary, all may be handled equally well.

#### GAS CONSUMPTION

There has been much discussion about the Jeep's gas consumption record. Extensive field tests have proven the postwar vehicle's economy compared with other forms of tractive power. On the highway, it will deliver up to 20 miles per gallon. It is also economical in belt-pulley operations. It is well to remember that gasoline consumption is governed by the weight of the load, the quality of gasoline used, whether time saved is more to be valued than gasoline consumed and whether the vehicle which is being tested is moving over hard-surfaced roads, through mud or sand or loamy soil.

The Jeep, of course, is built for on-the-road, off-the-road use. It is a relatively light vehicle with an even distribution of weight and a center of gravity which prevents overturning. Unlike other vehicles for general use, it pushes no great load in front. The total weight of the Jeep is live and active.

Typical of the Jeep's performance are the results shown in plowing 400 acres with a continuous drawbar pull of 1,200 pounds. On this test a double bottom 12-inch plow was used, the depth being adjusted dependent on soil and weather. These 400 acres were plowed at the rate of  $1\frac{1}{4}$  acres per hour, and a fuel consumption of two gallons per hour.

#### DRAW BAR PULL

In connection with gasoline consumption, it is well to discuss draw bar pull briefly, for draw bar has to do with the load, and that is one of the determining factors in gasoline consumption. Another name for drawbar pull is traction. It expresses the amount of work a vehicle will do.

The Jeep will pull a trailed load of 5,500 pounds over the highway, with adequate reserve power for steep grades.

In the field—where continuous pulling is required for long periods of time—the Jeep has a rated draw bar pull of 1,200 pounds, which has been shown by numerous tests to be adequate for most agricultural tasks and to provide ample reserve as well for unusual conditions which may be encountered. Sudden ascents in grade, for instance, will be taken care of with a rating of this figure; and difficulties entailed in plowing, for another instance, will be adequately met. A layer of hard clay cutting across otherwise soft soil, or a field made hard to plow by weather conditions affecting only its declivities, will prove no obstacle at this figure.



Performing four-fold duty as a tractor, light truck, mobile power unit and passenger conveyance, the Universal Jeep is pictured here picking up freight at the station.



The Universal Jeep, designed by Willys-Overland Motors, furnishes power for corn shelling. A belt-driven governor is available and can be installed wherever constant engine speed, regardless of load, is needed.

Extensive tests have been made to check the life of the chassis unit of the postwar Jeep. Hard plowing equivalent to ten years work has been accomplished without failure. While the rated drawbar pull of 1,200 pounds covers most requirements, it is sometimes exceeded with unavoidably heavy loads or on steep grades. To meet this situation the Jeep chassis was designed to give reasonable life under continuous maximum torque. Actual farm tests, dynamometer tests of the engine, transmission and chassis units have been successfully met. The engine, for instance, has been run at full throttle of 4,000 R.P.M. for 250 hours without indication of failure.

## JEEP ACCESSORIES

### ENGINE GOVERNOR

The engine variable speed governor is mounted at the left front end of the cylinder head and is driven by a "V"-belt from the double pulley on the front end of the crankshaft. It is a centrifugal type governor, connected to the carburetor throttle and controlled by a nine-position manual adjustment on the instrument panel. The engine speed is automatically maintained under variable loads. These nine different engine speeds in connection with the various transmission and transfer case gear ratios allow 54 controlled forward vehicle speeds, power take-off speeds and belt pulley speeds.

The governor is engaged or disengaged by a pin type clutch at the front end of the governor shaft. A spring loaded connection is used between the governor and the carburetor and permits the use of the accelerator without disconnecting the governor.

The governor is equipped with a surge dampener to give even control of the engine speed.

### POWER TAKE-OFF

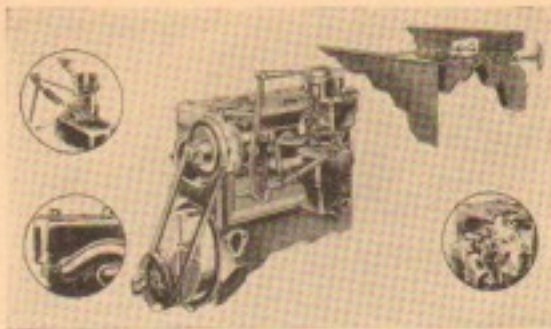
The power take-off drive is mounted on the frame rear cross member and provides the SAE standard  $1\frac{3}{8}$ " 6-spline shaft for driving a power operated implement being towed behind the vehicle. A front unit, on the rear of the transfer case, engages and disengages the drive from the engine. A two universal joint, tubular propeller shaft connects the front and rear units. By interchanging two helical cut gears in the rear unit, two ratios are available, 20 to 24 (5:6) and 24 to 20 (6:5). The two shafts are mounted on four adjustable Timken roller bearings. The power take-off can also be operated with the vehicle at a standstill and in connection with a belt drive unit.

### PULLEY DRIVE AND PULLEY

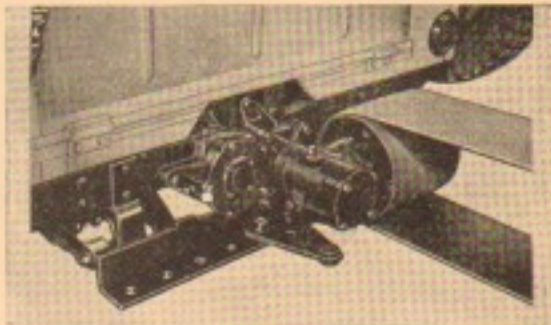
The pulley drive is a self-contained unit which is bolted to the rear power take-off unit and equipped with an 8" diameter pulley, 8" wide. Spiral bevel drive gears are mounted on adjustable Timken roller bearings. Reference is made to the table on page 31 giving the operating characteristics.

### FRONT BUMPER WEIGHT

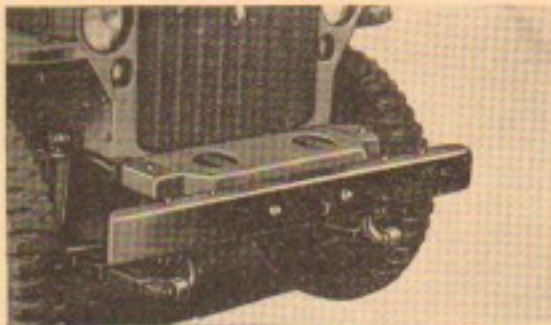
The bumper weight of 265 lbs. is available to give equal traction on front and rear wheels when the vehicle is doing heavy drawbar work.



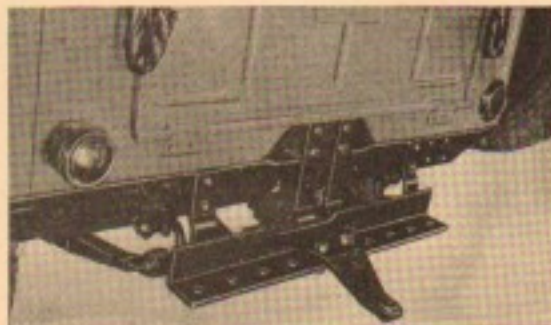
ENGINE  
GOVERNOR



POWER  
TAKE-OFF



FRONT BUMPER  
WEIGHT



DRAW BAR

#### DRAW BAR

The draw bar provides a means of attaching towed equipment which requires an adjustment in the application of pull to trailed load. It is constructed of welded angle iron and braced for maximum strength. Two reinforcement braces from the draw bar to the frame take the strain of pulling the load. The horizontal adjustment of the attaching plate permits nine positions in securing proper tracking of the towed implement. A reversible attaching plate provides four levels for the draw bar pull. Refer to the draw bar pull chart for operating characteristics, Page 31

#### PINTLE HOOK

The pintle hook provides a towing hook having a safety latch to prevent it from opening accidentally. Eye bolts are part of the attaching parts so safety chains can be connected.

#### RADIATOR BRUSH GUARD AND SCREEN

The radiator brush guard and screen keeps brush and chaff from clogging the radiator core. Proper functioning of the cooling system is thereby allowed under adverse and dirty conditions. The screen can be quickly removed for cleaning.

#### HOT CLIMATE RADIATOR

A radiator having greater cooling capacity is available for vehicles which operate in extremely warm climates. This radiator gives the cooling system 15 to 18 degrees increase in cooling ability.

#### OIL FILTER

The oil filter is standard equipment and is mounted at the right front end of the cylinder head. It performs an important duty when the vehicle is used for dirty and continuous heavy-duty work. The filter will remove sludge, metal particles, dirt and carbon. It has a removable element which can be replaced in but a few minutes.

#### BODY FRONT TOP

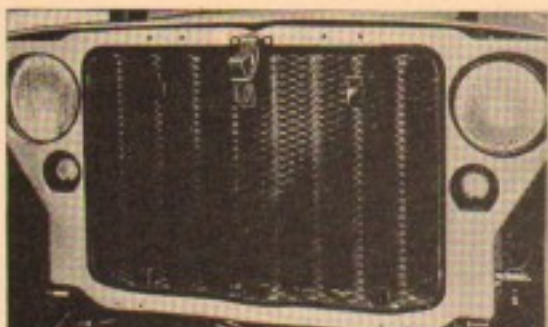
The top over the driver and front compartment is removable and is semi-permanent, having door curtains mounted on steel frames to facilitate opening and closing. A removable back curtain makes the top a complete enclosure. Curtain lights in the rear curtain and doors are mounted in steel frames to protect them against cracking.

#### BODY REAR TOP

The rear top is attached to the rear bow of the front top and provides protection over the rear compartment. It is equipped with separate side and rear curtains each having a curtain light protected by a steel frame.

#### HEATER

The heater is located in the front compartment under the cowl and over the steering column where it throws heat directly down on the driver's feet. It is of the hot water type and connected to the cooling system of the engine.



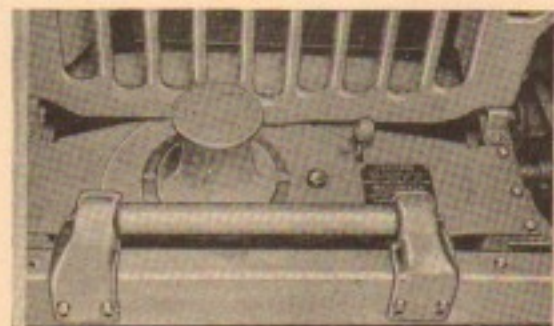
RADIATOR  
BRUSH GUARD  
AND SCREEN



BODY  
ENCLOSURES



PASSENGER  
SEATS



WINCH

#### PASSENGER SEAT

The passenger seat is a removable seat which can be added whenever desired. It is constructed the same as the driver's seat with zig-zag upholstery springs, padded and covered with waterproof duck.

#### REAR SEAT

The two-passenger rear seat is detachable so it can easily be installed or the rear compartment may be used for a loading space. The padded seat and back are mounted on a tubular steel frame for maximum strength and portability.

#### PASSENGER WINDSHIELD WIPER

Passenger windshield wiper is standard equipment and being an auxiliary wiper is of the hand-operated type. It is equipped with  $9\frac{1}{2}$ " laminated wiper blade which cleans an area 22" in diameter.

#### REAR VIEW MIRROR

The rear view mirror is standard equipment and of the round, external type which is mounted on the left side of the cowl.

#### WINCH

The winch is of the capstan type and mounted on the front of the vehicle frame between the front bumper and the radiator grille. It is driven by the engine through a special fan pulley having a pin type engagement controlled by a lever alongside of the capstan hub. The winch is capable of a 5,000-lb. pull limiting the engine speed to 1,200 R.P.M.

#### SPARE WHEEL AND BRACKET

The spare wheel is standard equipment and is mounted on a reinforced bracket attached to the right side of the body near the rear. This location permits the use of the tail gate in the body.

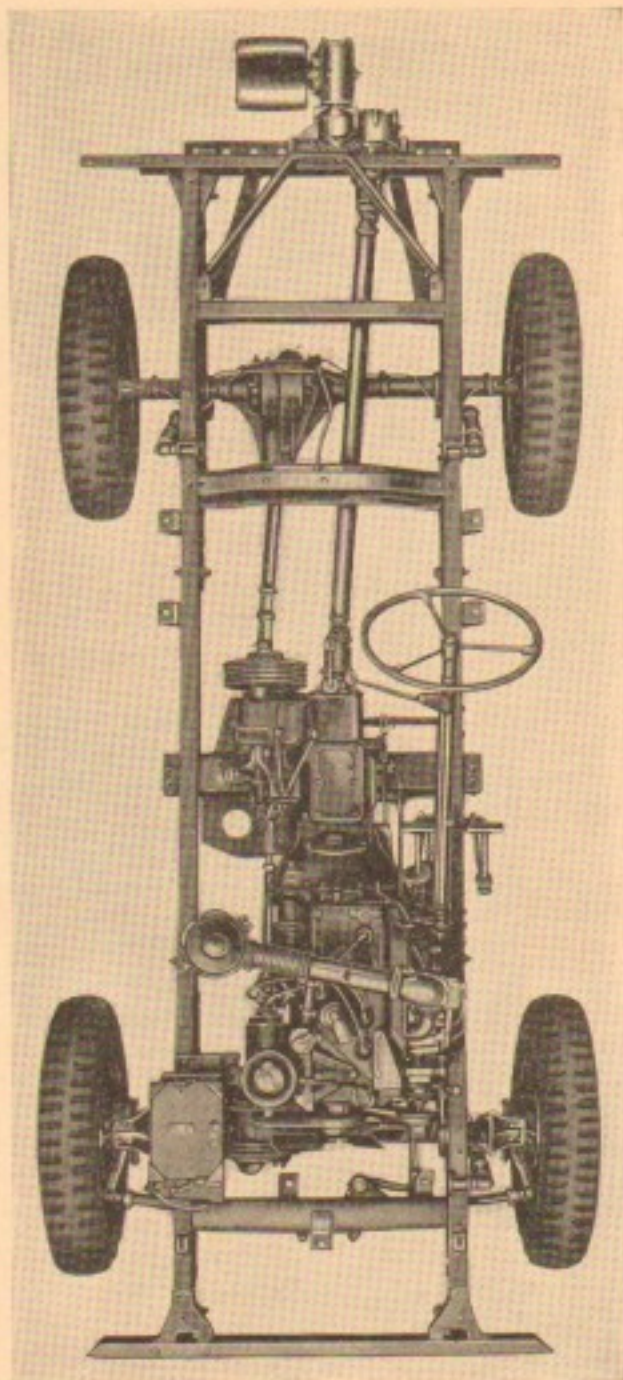
#### STARTING CRANK

The starting crank is made in two pieces so it can be carried in the tool compartment in the floor of the body to the right side of the driver.

#### DRIVING THE JEEP

The Jeep has three levers to control the gearshift system. One—on the steering post functions exactly like the transmission shift in an automobile, with three speeds forward and one reverse. The left hand lever in the front compartment controls the engagement of power to the front wheels; and the right hand lever permits shifting in the normal passenger car ratio or in the auxiliary tractor gear. By placing the transfer case gearshift lever in neutral position, it is possible to drive a power take-off unit, familiar to farmers, for a shaft or belt drive.

The greatest pulling power of the Jeep is obtained when the conventional transmission gearshift lever is in "low," with the left-hand lever shifted so as to direct power to all four wheels; and the right-hand lever in the auxiliary or tractor ratio. When the maximum power is delivered, the motor turns approximately 36 times for each revolution of the wheels.



The various Jeep power units are illustrated by stripping the vehicle down to the reinforced frame. This illustration shows a 60 H.P. engine, front axle, transmission, transfer case, rear axle, power take-off and belt pulley.

## Power Take-off and Vehicle Speeds

To satisfactorily operate most power driven equipment, the operator should know the speed of the power take-off shaft or the belt pulley as well as the vehicle ground speed. A great variety of speeds are made available by the manual governor control, the gear ratios in the transmission and transfer case and by interchanging the gears in the power take-off housing.

The tables below indicate the speeds for each of the nine positions of the manual governor control. Note that the shaft speeds are all computed with the vehicle in four wheel drive, and that of the belt pulley in the transmission drive only. Reference to these tables will be of material assistance especially in the operation of the farm combine or grain separator.

Power Take-Off Shaft Speeds (R.P.M.) and Vehical Ground Speeds (M.P.H.)  
Power Take-off Gear Ratios

Governor Control Position	Vehicle Speed M.P.H.	26-24 RATIO						24-20 RATIO						Engine Speed
		Transmission Gear In						Transmission Gear In						
		Low		Inter.		High		Low		Inter.		High		
		Take-Off Shaft R.P.M.	Vehicle Speed M.P.H.	Take-Off Shaft R.P.M.	Vehicle Speed M.P.H.	Take-Off Shaft R.P.M.	Vehicle Speed M.P.H.	Take-Off Shaft R.P.M.	Vehicle Speed M.P.H.	Take-Off Shaft R.P.M.	Vehicle Speed M.P.H.	Take-Off Shaft R.P.M.	Vehicle Speed M.P.H.	
1	Low	298	2.22	537	4.01	833	6.22	428	2.22	773	4.61	1300	4.22	1000
	High	298	5.40	537	9.75	833	18.15	428	5.40	773	9.75	1300	18.15	
2	Low	357	2.67	644	4.31	1090	7.47	514	2.67	928	4.81	1448	7.47	1200
	High	357	6.48	644	11.71	1090	18.15	514	6.48	928	11.71	1448	18.15	
3	Low	417	3.11	752	5.62	1166	8.72	600	3.11	1083	5.62	1688	8.72	1400
	High	417	7.54	752	13.66	1166	21.17	600	7.54	1083	13.66	1688	21.17	
4	Low	476	3.56	859	6.42	1333	9.96	685	3.56	1237	6.42	1926	9.96	1600
	High	476	8.65	859	15.61	1333	24.20	685	8.65	1237	15.61	1926	24.20	
5	Low	536	4.00	967	7.32	1500	12.08	771	4.00	1392	7.32	2160	12.08	1800
	High	536	9.73	967	17.54	1500	27.22	771	9.73	1392	17.54	2160	27.22	
6	Low	595	4.44	1074	8.81	1666	12.45	857	4.44	1547	8.81	2400	12.45	2000
	High	595	10.81	1074	19.51	1666	30.25	857	10.81	1547	19.51	2400	30.25	
7	Low	655	4.89	1182	9.83	1833	13.79	942	4.89	1702	9.83	2640	13.79	2200
	High	655	11.89	1182	21.46	1833	33.27	942	11.89	1702	21.46	2640	33.27	
8	Low	714	5.34	1289	9.63	2000	14.94	1028	5.34	1856	9.63	2880	14.94	2400
	High	714	12.97	1289	23.41	2000	36.31	1028	12.97	1856	23.41	2880	36.31	
9	Low	774	5.78	1396	10.43	2166	16.19	1114	5.78	2011	10.43	3120	16.19	2600
	High	774	14.05	1396	25.36	2166	39.33	1114	14.05	2011	25.36	3120	39.33	

Pulley Speeds (R.P.M.)—8" Pulley. Power Take-off Gear Ratio.

Governor Control Position	26-24 TRANSMISSION			24-20 TRANSMISSION			Engine Speed
	Low	Inter.	High	Low	Inter.	High	
	1	255	468	714	367	663	
2	306	552	857	440	795	1234	1200
3	357	645	1000	514	928	1440	1400
4	408	737	1143	587	1064	1645	1600
5	459	829	1285	660	1193	1851	1800
6	510	921	1428	734	1326	2057	2000
7	561	1013	1571	807	1458	2262	2200
8	612	1105	1714	881	1591	2468	2400
9	663	1197	1857	954	1723	2674	2600