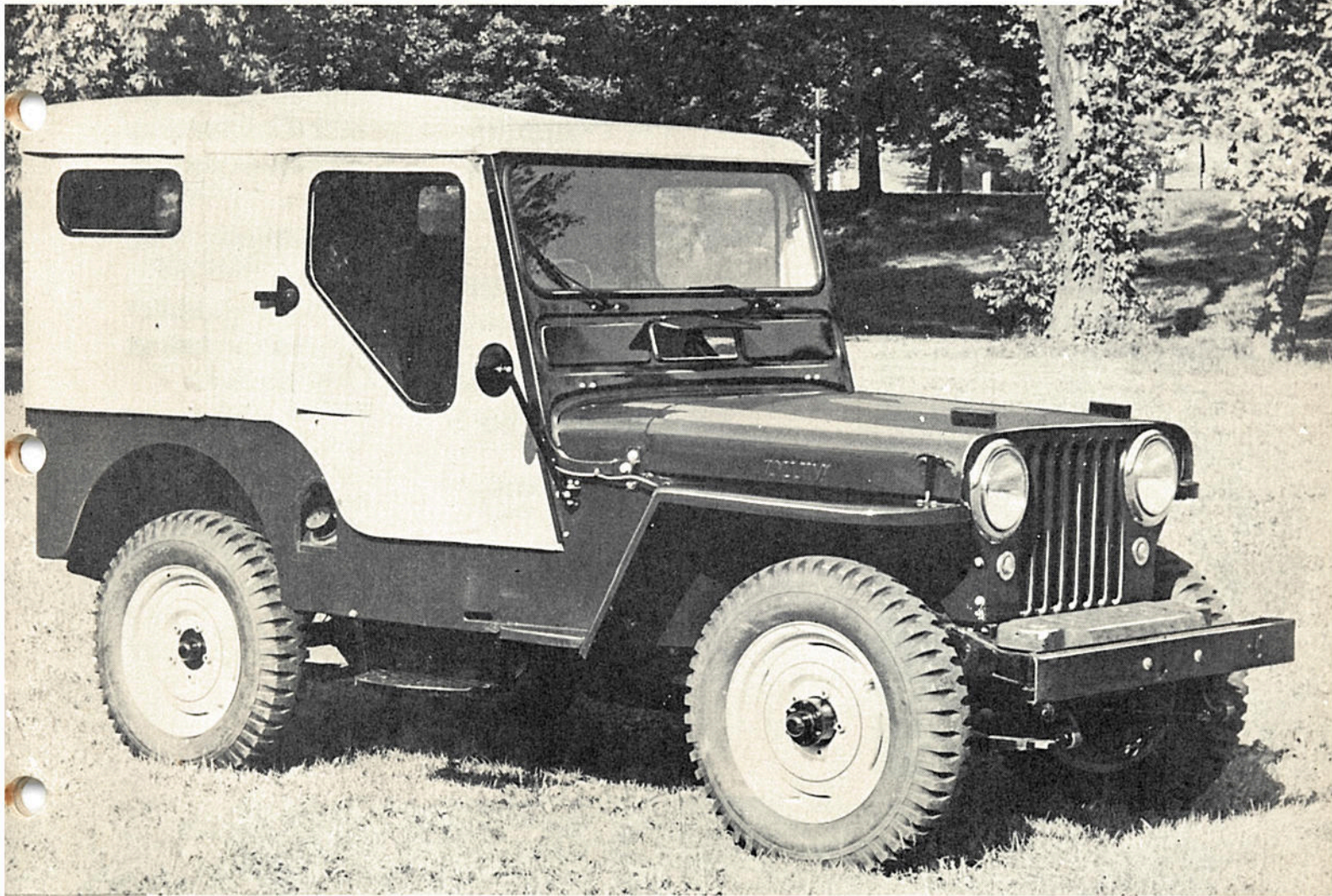


Jeep OPERATION DATA



WILLYS-OVERLAND MOTORS

The Universal **Jeep**

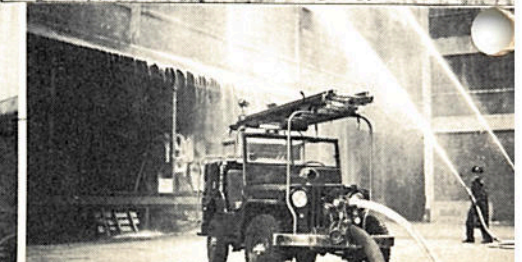
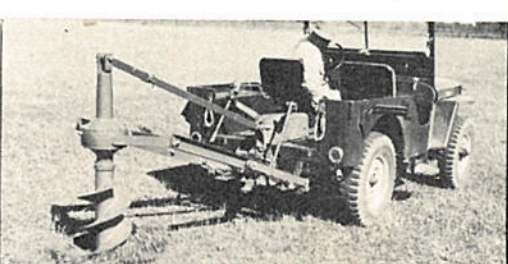
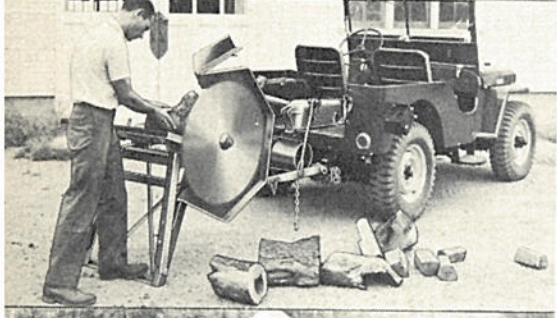


In Industry and on the Nation's Farms, "Jeep working" is coming to mean "BETTER WORKING" and "MORE EFFICIENT WORKING"

'Jeep' USES ARE COUNTLESS

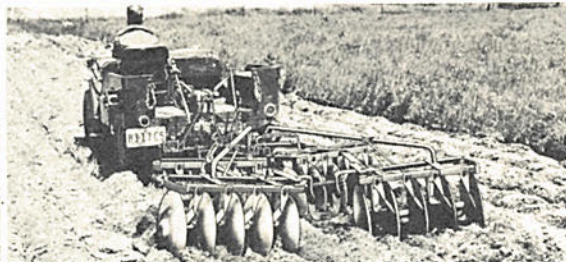
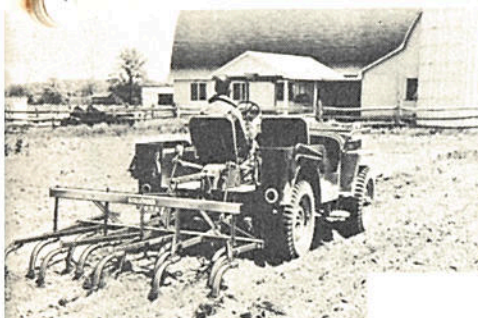
TOW AIRPLANES
SWEEP RUNWAYS
SAWING WOOD
TOW TRUCK
SERVICE CAR
SHRUBBERY CARRIER
CARPENTER TOOLS
AND EQUIPMENT
CEMETERY
MAINTENANCE
PLOWING SNOW
CONTRACTOR'S AIR
COMPRESSOR
PERSONNEL
TRANSPORTATION
MILKING MACHINE
POWER
HAUL MILK CANS
HERDING
RURAL BAKERY
DELIVERY
DRUG STORE
DELIVERY SERVICE

GROCERY STORE
DELIVERY
PHOTO PICK-UP
AND DELIVERY
RURAL DOCTORS
COUNTY NURSES
ELECTRICIANS TOOLS
AND EQUIPMENT
ESTATE MAINTENANCE
POWER FOR LIGHTING
PLOWING
CULTIVATING
DISCING
SPREADING MANURE
SPRAYING ORCHARDS
GAS COMPANY
REPAIR AND
SERVICE
CONSERVATION
DEPARTMENT
RECONNAISSANCE
FIRE FIGHTING
EQUIPMENT
FORESTRY FIRE
PROTECTION



FOREST PATROL
 HIGHWAY DEPARTMENT WRECKER
 PARK MAINTENANCE
 TRAFFIC CONTROL
 HAULING FEED FOR HATCHERIES
 HUNTING CLUB UTILITY CAR
 KENNEL SERVICE
 POWER CO. EMERGENCY CAR
 POWERING SMALL SAWMILL
 MACHINE SHOP DELIVERY
 RURAL MAIL SERVICE
 PULLING SMALL ORE CARS IN QUARRY
 NURSERY MAINTENANCE
 OIL FIELD TOOLS AND EQUIPMENT
 AIR COMPRESSOR FOR QUARRY
 CARRY DYNAMITE
 EMERGENCY POWER

CARRY RADIO BROADCAST EQUIPMENT
 FENCE REPAIR ON RANCHES
 RIDING ACADEMY UTILITY
 SEWER CLEANER TOOLS AND EQUIPMENT
 SHIPYARD RUNABOUT
 WELDING EQUIPMENT
 SURVEYORS TRANSPORTATION
 RURAL TEACHERS
 PHONE CO. EMERGENCY CAR
 LINEMENS FIELD WORK
 TRAILER PULLING
 CHECKING RR TELEGRAPH LINES
 SWITCHING FREIGHT CARS
 TOW OR OPERATE ICE CUTTER
 HAULING ICE CAKES FROM WATER

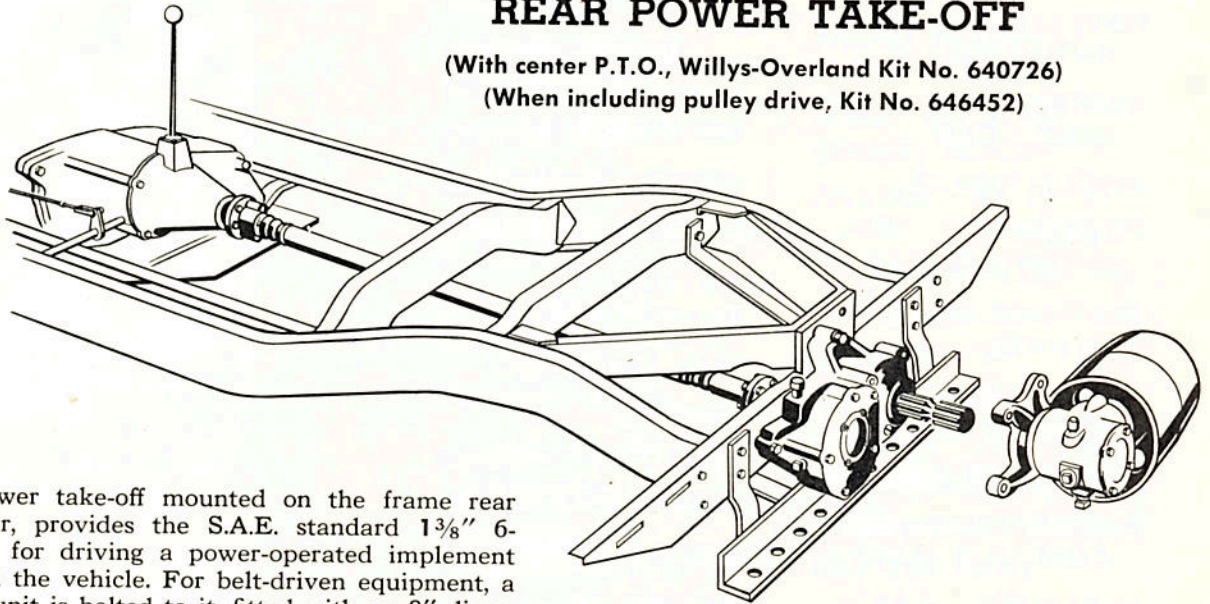


The 'Jeep' can be tailored.

REAR POWER TAKE-OFF

(With center P.T.O., Willys-Overland Kit No. 640726)

(When including pulley drive, Kit No. 646452)



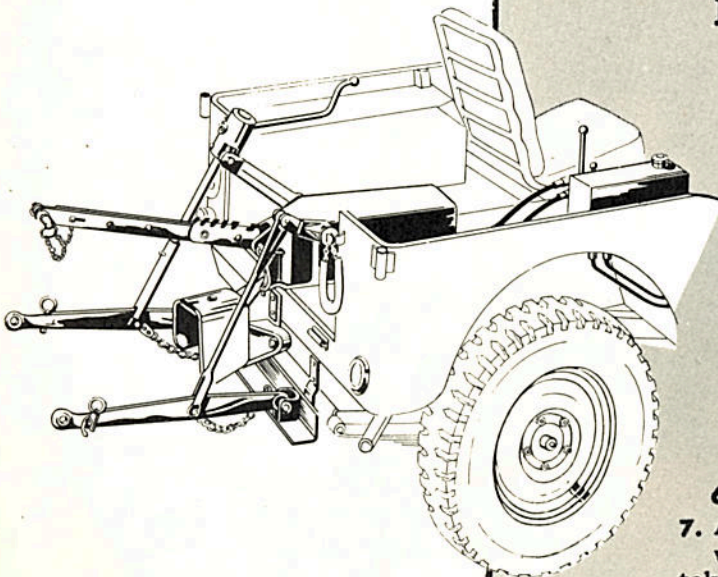
The rear power take-off mounted on the frame rear cross member, provides the S.A.E. standard $1\frac{3}{8}$ " 6-splined shaft for driving a power-operated implement towed behind the vehicle. For belt-driven equipment, a pulley-drive unit is bolted to it, fitted with an 8" diameter pulley with speeds ranging from 255 to 2674 r.p.m., governor controlled.

(Pulley Drive only — W.O. Kit No. 644193)

HYDRAULIC IMPLEMENT LIFT

The "Monroe" hydraulic implement lift now made available by Willys-Overland Motors is the culmination of years of development and experience. It embodies many special features including:

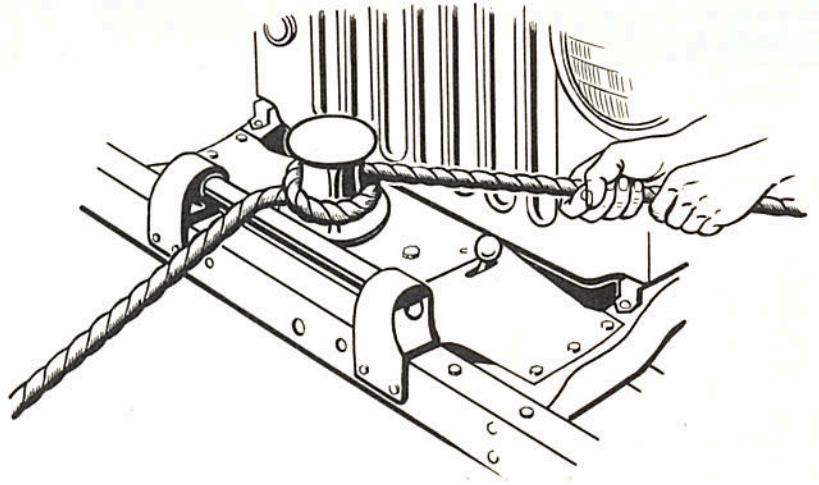
1. Ease of attachment of implements, "3-point system" is used.
2. Quick upward or downward action.
3. Double action hydraulic cylinder for either up or down pressure on the implement. Fingertip control at driver's seat.
4. Good "trailing" or following of plows and other implements.
5. Simplicity and ease of adjustment which can be made from the driver's seat.
6. Easy installation or removal of the lift on the 'Jeep'.
7. Accessibility of all working parts and non-interference with other standard 'Jeep' accessories such as the power take-off and tow bar hitch.



for EVERY job!

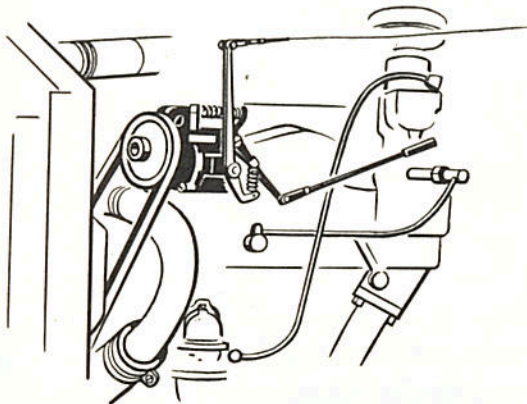
FRONT POWER TAKE-OFF

The front power take-off drives from the front end of the crankshaft directly off the engine and provides plenty of war-proven 'Jeep' power for such useful implements as the capstan or drum winch, suction pumps, booster pumps.



CENTRIFUGAL-TYPE GOVERNOR

(Willys-Overland Kit No. 645313)

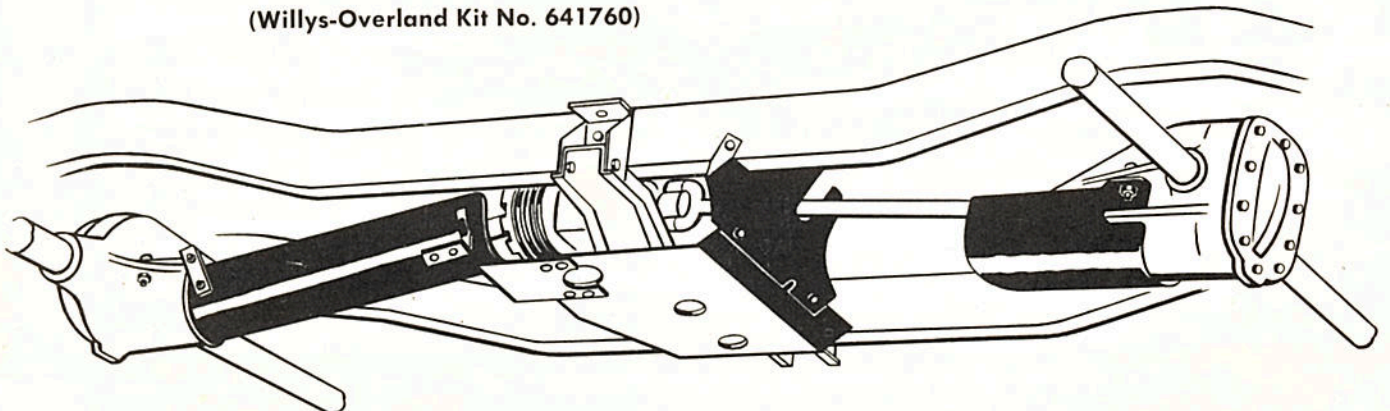


Many farm and industrial operations demand a governor to give precision control of engine speeds. Unit is controlled from driver's seat by control on dash with nine notched positions. Lowest speed is approximately 1000 R.P.M. and each successive notch increases engine speed by 200 R.P.M. until the limit is reached at 2600 R.P.M. These nine different engine speeds in connection with the various transmission and transfer case gear ratios allow 54 controlled forward vehicle speeds.

Definite and valuable protection is gained when these propeller shaft guards are used. Easy to attach, they reduce the chance of grass, hay or weeds matting and bunching up on the forward and rear propeller shafts to cause fire or damage to oil seals. Kit includes full length guard for rear shaft, necessary-length guard for forward shaft and baffle plate.

PROPELLER SHAFT BRUSH GUARDS

(Willys-Overland Kit No. 641760)

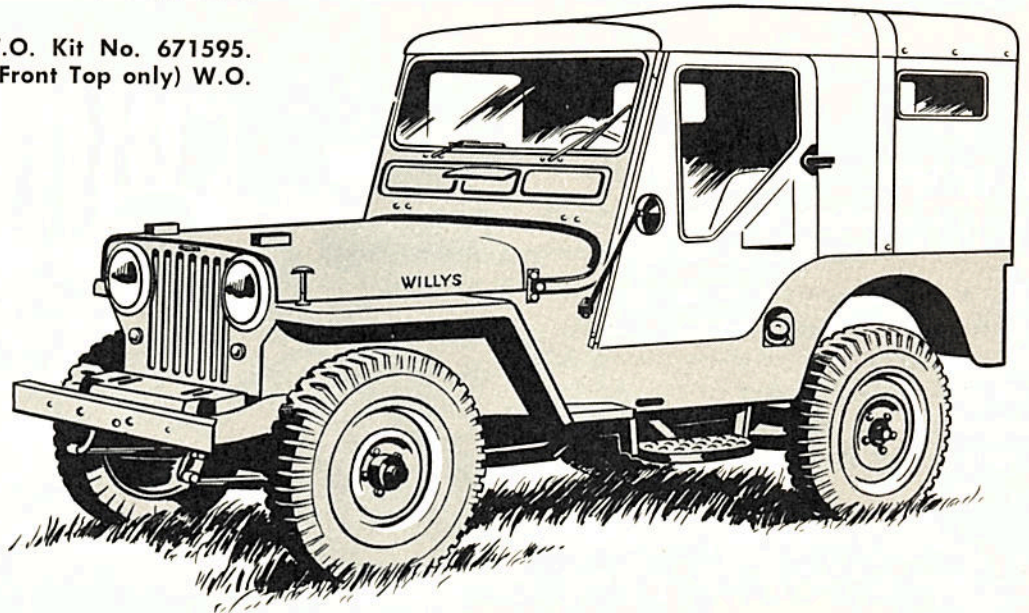


CANVAS TOP

For CJ-2A—Top Front W.O. Kit No. 667888.
Top Rear (to be used with Front Top only) W.O.
Kit No. 667826.

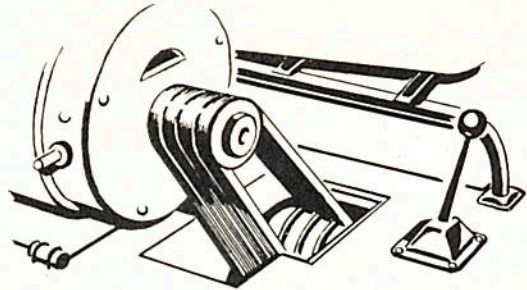
For CJ-3A—Top Front W.O. Kit No. 671595.
Top Rear (to be used with Front Top only) W.O.
Kit No. 671619.

Providing adequate protection from the weather for most climates, the W-O Canvas Top is made of 10 oz. solderized duck, with all seams double-sewn for added wear. Duck has been treated to be mildew-resistant. The top is light and when installed on 'Jeep' has practically no effect on the center of gravity of the 'Jeep' or on the load-carrying ability. Can be easily erected or removed in a few minutes by one person.



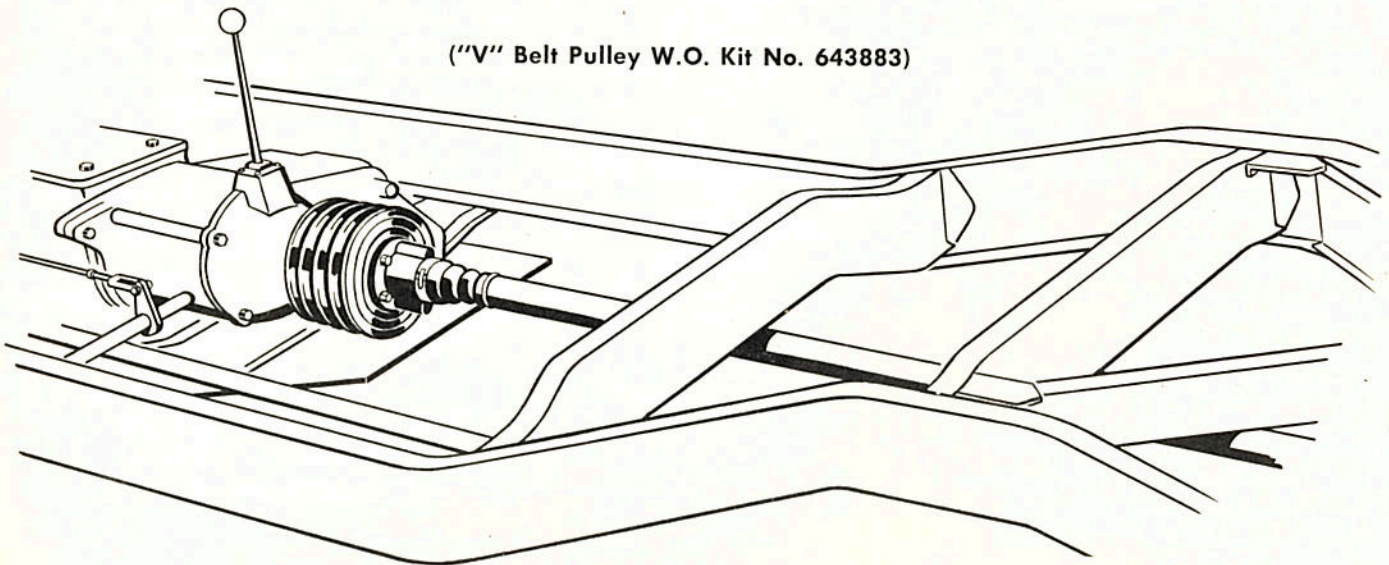
CENTER POWER TAKE-OFF

The center power take-off on the rear of the transfer case can be equipped with a pulley for a V-belt drive of from one to four belts. Air compressors, electric welders, generators, other similar equipment can be powered at this location.

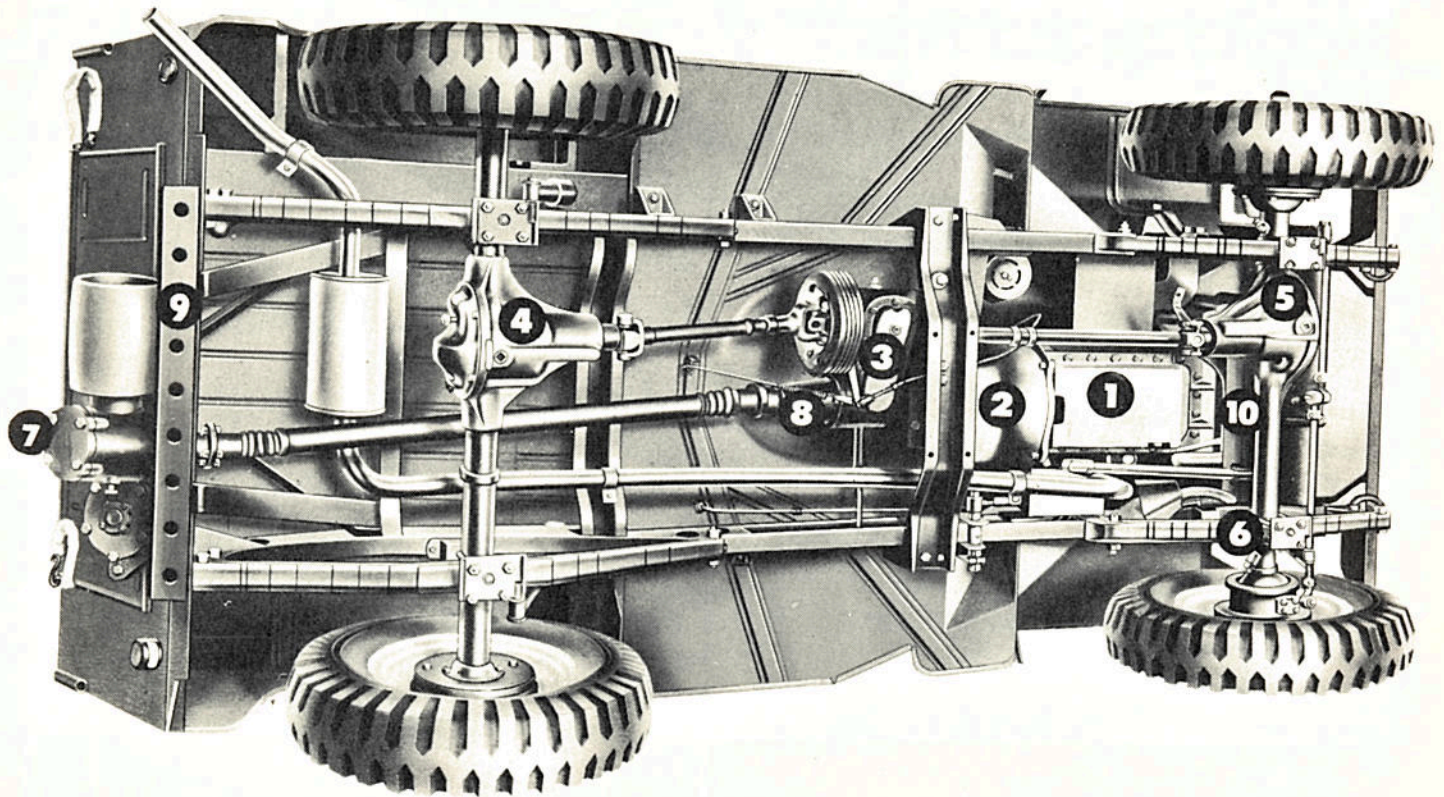


(Center Power Take-Off W.O. Kit No. 640725)

("V" Belt Pulley W.O. Kit No. 643883)



Here is what makes the **'Jeep' SO POWERFUL**



1. **THE 4-CYLINDER, 60 HP UNIVERSAL "JEEP" ENGINE**... which powered the military "Jeep" over millions of miles in all parts of the world has been improved for even greater economy and more versatile performance.
2. **TRANSMISSION**... 3 speeds forward, 1 reverse in 2-wheel drive for economical highway travel.
3. **TRANSFER CASE**... attached to the transmission, engages front-drive axle for 4-wheel drive. Transfer gear ratios give the "Jeep" 6 speeds forward and 2 reverse.
4. **REAR-DRIVE AXLE**... drives the "Jeep" at 60 m.p.h. in 2-wheel drive.
5. **FRONT-DRIVE AXLE**... teams with rear axle in 4-wheel drive for hard pulling in mud, sand or snow.
6. **SPRINGS AND SHOCK ABSORBERS**... newly engineered for easier riding on or off the road.
7. **REAR POWER TAKE-OFF**... furnishes power from spline-shaft drive or pulley drive to operate farm and other spline-shaft or pulley-driven machinery.
8. **CENTER POWER TAKE-OFF**... powers welders, blowers, compressors, and other V-belt-drive equipment.
9. **DRAW BAR**... provides 9 horizontal positions and 2 heights for proper tracing of towed implements.
10. **FRONT POWER TAKE-OFF**... provides engine power for capstan or drum winch, pump, and other front-mounted equipment.

DRAW BAR PULL

The power plant of the Universal 'JEEP' is particularly adapted to the 'Jeep's' great variety of applications. For highway use, at high speeds, the full engine power is available; for the power take-off shaft and pulley drive the full engine torque is available; however, for continuous agricultural work the maximum draw bar pull should be limited to 1,200 pounds, which is the equivalent of two 12-inch plows.

Draw bar pull is the force exerted by a vehicle to tow a trailed load and is expressed in pounds.

Maximum draw bar pulls are encountered in plowing, disking, and harrowing, and it is in these applications where the user of the 'Jeep' should be guided by the following charts of draw bar pull. We have to expect, either on account of soil conditions or implement adjustment, these draw bar pulls will be exceeded. In these instances, natural safeguard in the tire tread slippage takes place.

The Universal 'JEEP' is capable of a much higher draw bar pull which can be used for starting loads or towing loads for short periods on good ground in which case a draw bar pull as high as 1,800 pounds can be used.

SOILS ARE CLASSIFIED AS FOLLOWS:

Soft . . .

- Sandy soil with light sod
- Sandy soil with stubble
- Sandy loam without cover.

Medium . . .

- Sandy loam with sod or stubble
- Sandy clay loam without cover.

Hard . . .

- Sandy clay loam with sod and stubble
- Clay loam with light sod.

DRAW BAR PULL AND PLOWING DEPTH FOR 18" SINGLE AND 12" AND 14" DOUBLE PLOWS

DEPTH IN INCHES	18" SINGLE			12" DOUBLE			14" DOUBLE		
	Soft	Med.	Hard	Soft	Med.	Hard	Soft	Med.	Hard
5.....	570	680	960	740	800	1120	830	900	1200
5½....	630	750	1050	810	870	1220	920	990	1310
6.....	690	820	1150	9900	960	1340	1000	1080	1430
6½....	750	890	1240	960	1030	1450	1080	1170	1550
7.....	800	950	1340	1030	1110	1560	1160	1260	
7½....	860	1020	1430	1100	1190		1240	1350	
8.....	920	1090	1530	1180	1270		1330	1440	
8½....	980	1160		1250	1350		1410	1530	
9.....	1030	1220		1320	1430		1500		

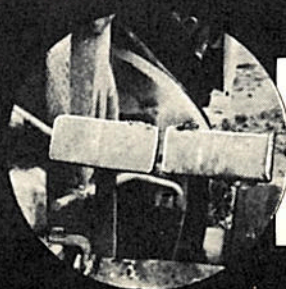
DRAW BAR PULL OF SPRING TOOTH AND SPIKE TOOTH HARROWS

SPRING TOOTH HARROW 3-Section-25 Teeth-8' 6" Wide				SPIKE TOOTH HARROW 3-Section-90 Teeth-13' Wide	
DEPTH IN INCHES	Previously Disked		Winter Packed	Previously Disked	
	Avg.	Hard	Hard	Average	
2.....	400	450	450	175	
2½....	550	670	750	280	
3.....	680	870	1040	380	
3½....	800	1060	1280	460	
4.....	880	1210	1500	540	
4½....	940	1340	1700	600	
5.....	1000	....	....	660	

A 'JEEP' IS EASY TO



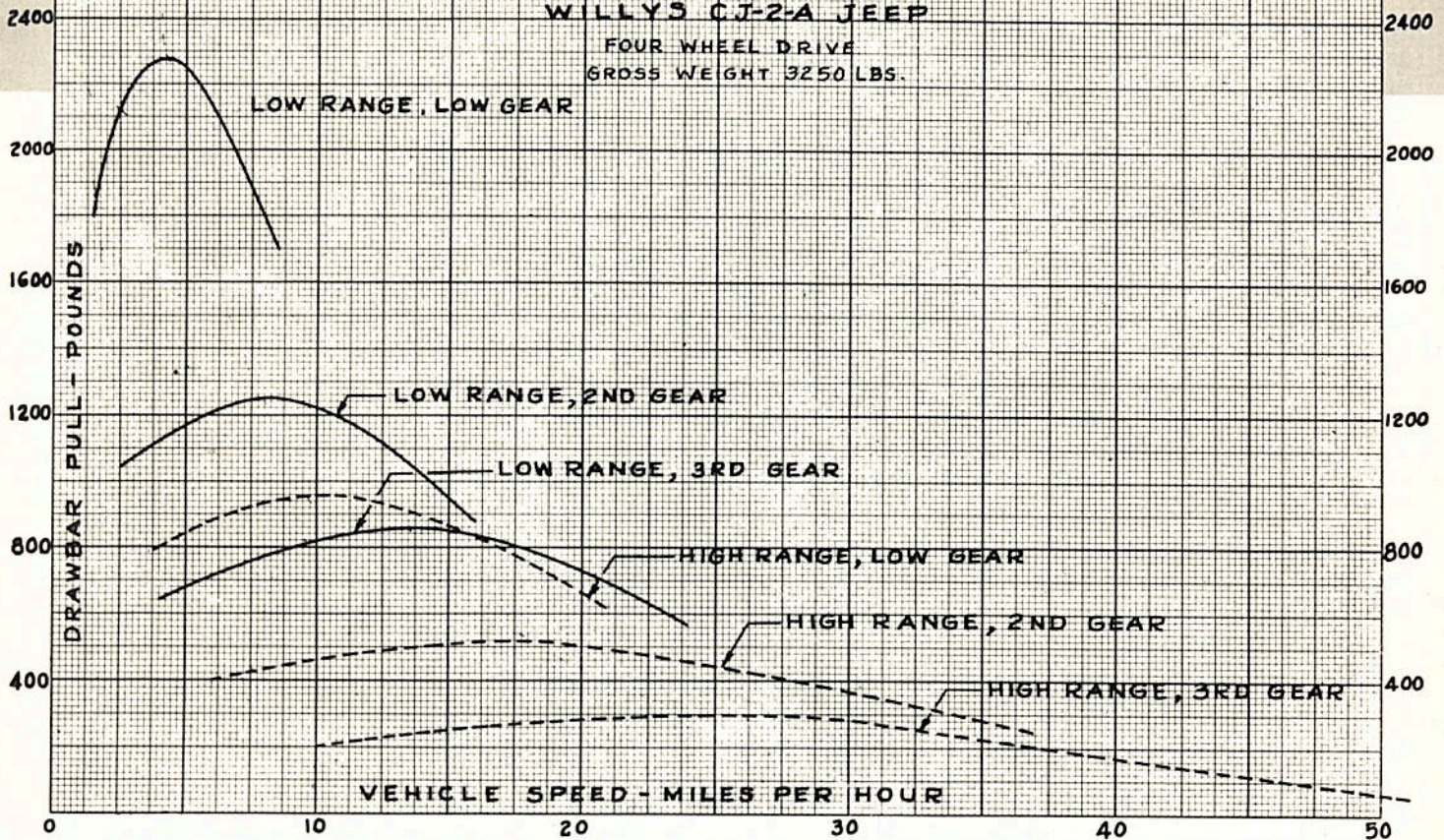
Will he remember your caution of things to do and not to do?



Conventionally operated
spell GREAT

WILLYS-OVERLAND MOTORS, INC.
RESEARCH DEPT.
DRAWBAR PULL
WILLYS CJ-2A JEEP
FOUR WHEEL DRIVE
GROSS WEIGHT 3250 LBS.

RT-214 (PB)



OPERATE!

Anyone who drives a car can drive a 'Jeep'!

four-wheel brakes
SAFETY for the driver

DRAW BAR PULL AND DEPTH FOR 6, 7 AND 8-FT. TANDEM DISK HARROWS

These tests have been run with a 6-ft. harrow having 24 disks of 16" diameter, a 7-ft. harrow having 28 disks of 15" diameter and an 8-ft. harrow having 32 disks of 15" diameter.

The asterisks (*) indicates the depth which gives best results.

DISK SIZE	6-FOOT			7-FOOT			8-FOOT		
CULTI- VATION	Previously Disked		Winter Packed	Previously Disked		Winter Packed	Previously Disked		Winter Packed
SOIL CON- DITION	Avg.	Hard	Hard ,	Avg.	Hard	Hard	Avg.	Hard	Hard
DEPTH IN INCHES									
2.....	300	350	350	260	300	400	300	360	600
2½	340	400	500	280	330	460	400	470	660
3.....	390	450	600	320	370	590	510	590	790
3½	460	520	700*	410	460	750	640	720	950
4.....	510	600	800	510	600	920*	825	970	1120*
4½	560	700*	900	600	750	1100	950*	1190	1300
5.....	620	800	1000	700	900*	1300	1160*	1490	1500
5½	680	900	1100	800*	1060		1400	1850	
6.....	725	1000	1200	900	1240		1640	2260	

Computation of DRAW BAR PULL REQUIRED FOR PLOWING

The data given in the draw bar pull tables represents actual practice figures. The following information will facilitate computation of problems in specific conditions for general use.

The draw bar pull varies with the size and number

2 plows x 12" width x 8" depth x 6 (soil factor)—1152 pounds
1 plow x 18" width x 9" depth x 4 (soil factor)— 648 pounds

The approximate soil factor may be taken from below:

Sandy soil—3

Sandy loam—moist—3-4

Sandy loam—dry—4-6

Sandy clay loam—moist—5-6

Sandy clay loam—dry—6-7

Clay loam—moist—6-7

Clay loam—dry—7-8

Heavy clay—dry—9-10

Heavy clay sod—10-11

Virgin prairie land—clay moist—12-13

Virgin prairie land—clay dry—14-15

Gumbo—moist—16-18

Gumbo—dry—16-20

Dry adobe—20-25

Presence of cover crop will raise the factor to the next higher factor value.

of plows, the depth of the furrow, and soil conditions. With all of these factors known, the draw bar pull can be calculated. As an example, the draw bar pull of two 12" plows working to a depth of 8" in sandy, moist clay loam will be as follows:

TIRE SLIPPAGE AND TRACTION

Tire slippage limits the useful work which a vehicle can perform and depends on many factors of which the road or soil condition and vehicle weight are of greatest importance.

The road or soil condition permits only a certain percentage of the vehicle weight to be used for traction, as follows:

On Concrete road approximately 70%
On Dry Clay approximately 57%
On Sandy Loam approximately 54%
On Dry Sand approximately 39%
On Green Alfalfa approximately 38%

Increased vehicle weight will reduce tire slippage, but the balanced design of the Universal JEEP makes this unnecessary as explained under the heading, "Front Bumper Weight".

In the table, "Tire Slippage in Percent" is shown how tire slippage is affected by tire tread design, air pressure and surface conditions.

Tire slippage on highways should not exceed 5% and on soils 16%. This slippage table, which is based on many tests shows that the standard, "All-Service" tire fulfills these conditions and that nothing is gained by other tread designs.

Tire slippage can be easily measured by marking one of the tires and counting the revolutions while

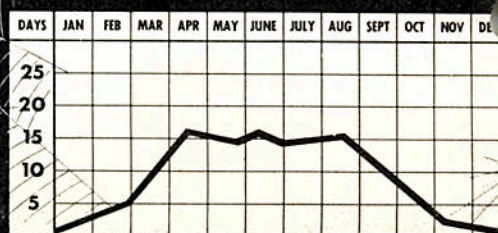
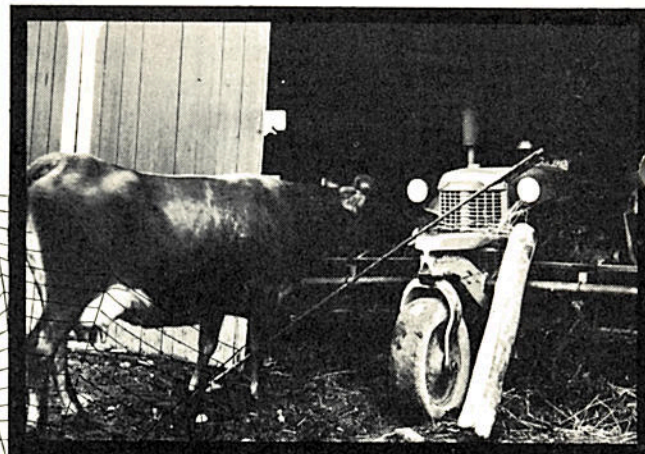
traveling a distance of 184 feet. Twenty-five revolutions indicate that there is no slippage, 25½ revolutions indicate 2% slippage, 26 revolutions 4%, 27 revolutions 8%, etc. These figures are given for 20 pounds tire inflation for agricultural use. Twenty-eight pound inflation is recommended on highways, and the measured distance should be 180 feet for 25 revolutions with the same percentages as above. The slippage table also reveals that in general the draw bar pull permissible under normal slippage is well in balance with the draw bar pull required for various implements. For example, when plowing a stubble field a 1,200-pound draw bar pull is equivalent to 10% slippage. In loose ground, 800 pounds draw bar pull is equivalent to 16% slippage. When consulting the implement tables, it will be found that these draw bar pulls are sufficient for the recommended applications.

TIRE SLIPPAGE IN PER CENT

SOIL OR ROAD SURFACE	AIR PRESS. (PSI)	TREAD DESIGN	DRAW BAR PULL (Pounds)						
			200	400	600	800	1000	1200	1400
Plowed Field...	20	A.S.	7.5	9.5	11	13	16		
Plowed Field...	20	CH.R.	5	7	9	8.5	14		
Stubble & Grass	20	A.S.	3.5	4.5	6	7	8.5	10	13.5
Stubble & Grass	28	A.S.	5	6	6.5	7	8	11	18
Stubble & Grass	20	CH.R.	4.5	5.5	6.5	7.5	9.5	13	20
Stubble & Grass	20	CH.	6	7	8	9	10.5	11.5	13.5
Stubble & Grass	20	D.	5.5	6.5	7	8	9	10	11.5
Gravel Road...	28	A.S.	1.5	2	3	5.5	12.5		
Gravel Road...	28	CH.R.	2	3.5	4.5	10	23		
Paved Road...	28	A.S.	1	1.5	2	2.5	3	3.5	4.5
Paved Road...	28	CH.R.	1	2	2.5	3.5	4.5	4.5	6

Abbreviations: A.S. All Service
CH.R. Chevron Design with Center Rib.
CH. Chevron Design without Center Rib.
D. Diamond Design without Center Rib.
P.S.I. Pounds per Square Inch.

A 'JEEP' WORKS THROUGH



OPERATION TABLE

SPEED IN MILES PER HOUR														
Imple- ment	Width of Cut	2½	2¾	3	3¼	3½	3¾	4	4¼	4½	4¾	5	5½	6
APPROXIMATE ACRES PER 10-HOUR DAY														
Single Bottom Plow	12 in.	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.50	6.00
	14 in.	2.91	3.30	3.49	3.78	4.07	4.36	4.65	4.95	5.24	5.54	5.82	6.40	6.98
	16 in.	3.33	3.66	3.99	4.33	4.66	4.99	5.33	5.66	5.99	6.33	6.66	7.32	7.98
	18 in.	3.75	4.13	4.50	4.88	5.25	5.63	6.00	6.38	6.75	7.13	7.50	8.75	9.00
	20 in.	4.17	4.59	5.01	5.43	5.84	6.26	6.68	7.10	7.57	7.93	8.35	9.18	10.01
Double Bottom Plow	24 in.	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00	11.00	12.00
	28 in.	5.82	6.41	6.99	7.57	8.15	8.73	9.32	9.90	10.48	11.08	11.65	12.83	13.99
Disk	7 ft.	17.50	19.25	21.00	22.75	24.50	26.25	28.00	29.75	31.50	33.25	35.00	38.50	42.00
	8 ft.	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00	40.00	44.00	48.00
	10 ft.	25.00	27.50	30.00	32.50	35.00	37.50	40.00	42.50	45.00	47.50	50.00	55.00	60.00
Har- row	14 ft.	35.00	38.50	42.00	45.50	49.00	52.50	56.00	59.50	63.00	66.50	70.00	73.50	84.00
	15 ft.	37.50	41.25	45.00	48.75	52.50	56.25	60.00	63.75	67.50	71.25	75.00	82.50	90.00
	20 ft.	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00	110.00	120.00
Culti- vator	5 ft.	12.50	13.75	15.00	16.25	17.50	18.75	20.00	21.25	22.50	24.75	25.00	27.50	30.00
	6 ft.	15.00	15.70	18.00	19.50	21.00	22.50	24.00	25.50	27.00	28.50	30.00	33.00	36.00

THE YEAR!



The table given above shows the work which can be accomplished in ten hours at various speeds. This data is computed by multiplying the width of the cut (in feet) by the speed of the implement (in miles per hour), giving the approximate number of acres which can be worked in a ten-hour day. Due consideration is given to lost time for the customary stops and turns at the headlands.

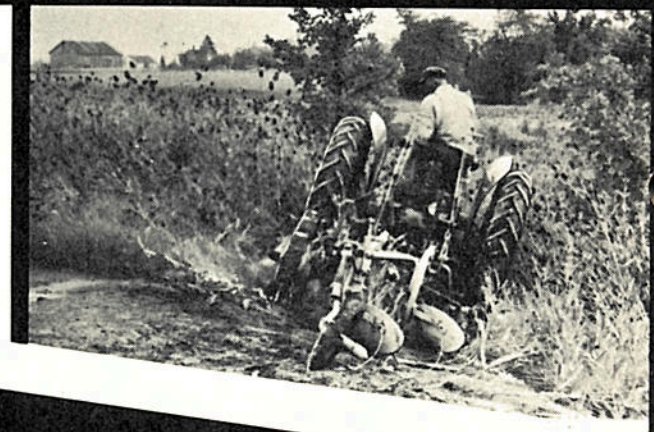
Vehicle Miles on Highway per Gallon of Fuel

(High Gear...Level Road...3250 Gross Weight...Tire pressure, 28 Pounds)

DRIVE	2 or 4			2 or 4			2			4		
TOWED LOAD	NONE			2000 lbs.			4000 lbs.			4000 lbs.		
TYPE ROAD	PAVED	GRAVEL	SAND	PAVED	GRAVEL	SAND	PAVED	GRAVEL	SAND	PAVED	GRAVEL	SAND
Miles per Hr.												
10	23.4	19.9	19.2	19.9	17.2	16.3	18.4	15.2	13.3	18.7	15.7	13.7
20	22.1	19.2	18.4	19.0	16.0	15.0	17.8	14.2	12.3	18.3	14.5	12.6
30	19.8	17.5	16.6	17.0	14.0	13.0	16.1	12.4	10.3	16.9	12.9	11.7
40	16.7	14.8	13.8	13.7	11.2	10.2	12.8	9.0	7.8	14.0	9.6	8.1
50	12.9	11.0	9.8	9.3			7.8			8.6		
60	8.8											

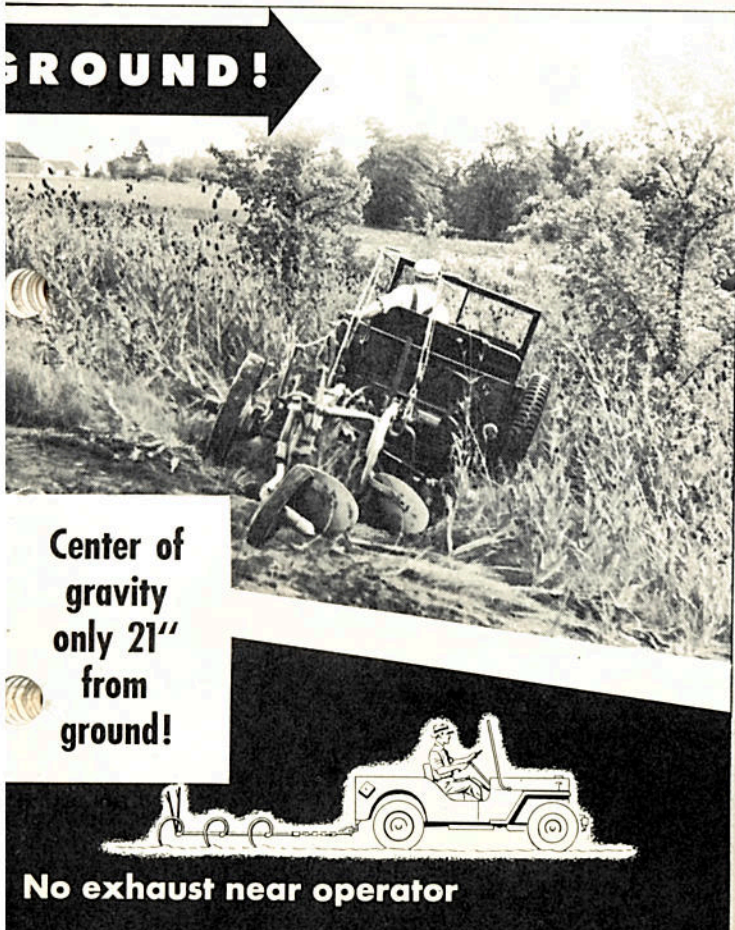
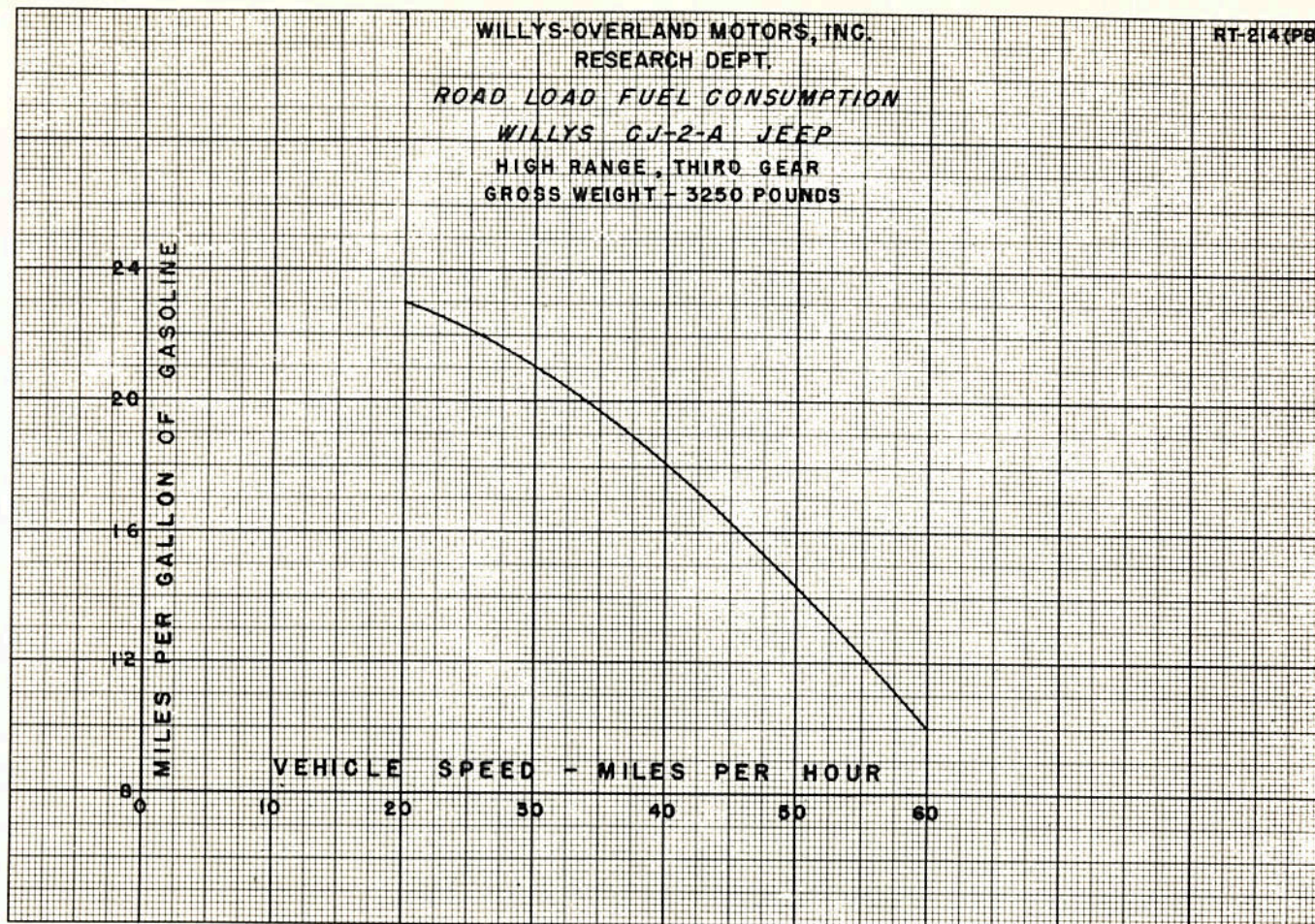
FUEL CONSUMPTION

A 'JEEP' HUGS THE



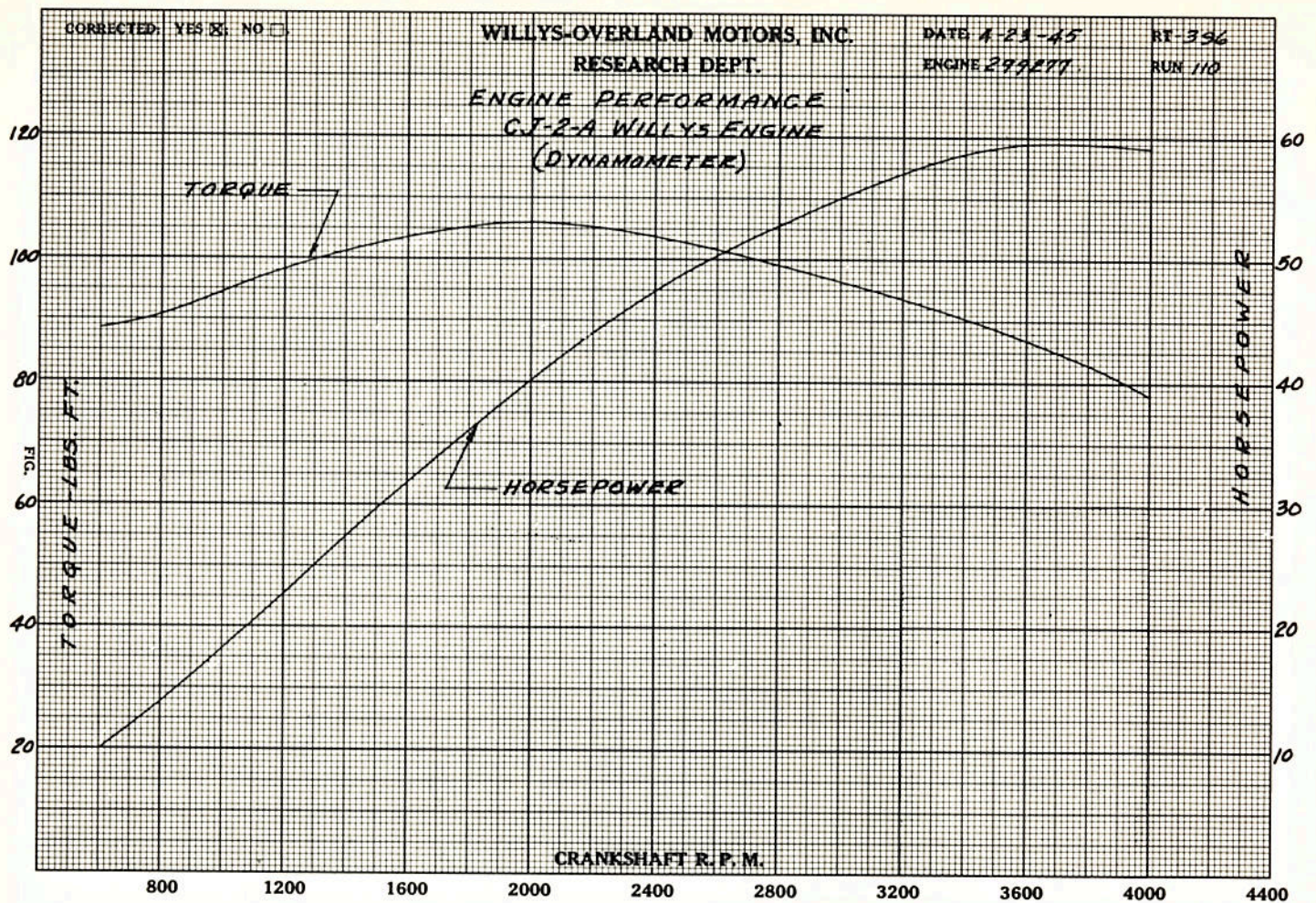
High seat,
high wheels...





**VEHICLE MILES PER GALLON
AT 2,000 ENGINE R.P.M.**

Transmission Gear	MAXIMUM TORQUE SPEED No. 6 GOVERNOR POSITION					
	Low	Inter-mediate	High	Low	Inter-mediate	High
Transfer Gear	Low	Low	Low	High	High	High
Draw Bar Pull	Vehicle Miles Per Gallon					
100	....	....	....	....	12.7	14.2
200	....	....	7.8	8.2	10.7	13.1
250	....	....	....	....	....	11.2
300	3.6	5.6	7.0	7.3	9.4	....
350	....	....	....	....	8.8	....
400	3.4	4.8	6.2	6.6	....	....
600	3.2	4.1	5.0	5.3	....	....
750	....	....	4.1	....	....	....
800	2.8	3.6	....	4.2	....	....
1000	2.6	3.2	....	....	....	....
1200	2.4	....	....	....	....	....



HORSEPOWER and TORQUE

THE 'JEEP' HAS FIELD

"Yes, sir,
it's still raining
...the job must wait

... UNLESS A UNIVER

ROLLING RESISTANCE AND GRADEABILITY

Moving a trailer over a highway or a field requires a draw bar pull corresponding to the trailer weight plus rolling resistance. Rolling resistance consists of vehicle friction in the form of bearings, gears, etc., plus the resistance of the vehicle to move over the road. The rolling resistance for various road conditions are as follows:

Hard surfaced road 30 lbs. per ton
 Rutty roads 75 lbs. per ton
 Sandy roads 75 lbs. per ton
 Mud roads 250 lbs. per ton
 2" of snow 50 lbs. per ton

4" of snow 75 lbs. per ton
 Grass meadow 110 lbs. per ton
 Soy bean stubble 200 lbs. per ton
 Tilled fields 250 lbs. per ton

Dividing the permissible draw bar pull of 1,200 pounds, by the rolling resistance per ton, gives the trailer tonnage which can be moved by the vehicle on level terrain.

GRADE ABILITY CHART

Percent Grade Which Can Be Negotiated

MILES PER HOUR	GEAR RATIO			
	HIGH		LOW-LOW	
	*3250 Lbs.	*9000 Lbs.	*3250 Lbs.	*9000 Lbs.
	PERCENT GRADE ABILITY			
2			59%	21%
3			66%	24%
4			70%	26%
5			70%	25%
6			64%	23%
7			57%	21%
8			53%	20%
9			52%	19%
10	6.5%	2.4%		
15	8%	2.9%		
20	9%	3.2%		
25	9.2%	3.4%		
30	9%	3.2%		
35	7.5%	2.7%		
40	5.5%	2%		
45	3.5%	1.2%		
50	2%	.7%		

*3250 pounds represents the gross weight of this particular vehicle.
 *9000 pounds represents the gross weight of the vehicle with the front bumper weight and a 5500 pound trailed load.
 Note: Air resistance is disregarded. The value of any other gear combinations will stand between the above figures.
 Note: 100 percent grade is 45 degree incline.

COMFORT!

Here's Why:

1. Shock absorbers
2. Springs
3. Seat and back rest...

PLUS*

4. Top, Doors
5. Heater

*OPTIONAL EQUIPMENT

KEEP*, WITH TOP, AND DOORS, TOO, IS DOING YOUR WORK FOR YOU!

POWER TAKE-OFF

CJ-2A POWER TAKE-OFF SHAFT SPEEDS (R.P.M.) AND VEHICLE GROUND SPEEDS (M.P.H.)

POWER TAKE-OFF GEAR RATIOS

Governor Control Positions	Transfer In	POWER TAKE-OFF GEAR RATIOS 20-24						POWER TAKE-OFF GEAR RATIOS 20-24						Engine Speed
		Transmission Gear In						Transmission Gear In						
		Low		Intermediate		High		Low		Intermediate		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	4.01	1200	6.22	1000
	High	298	5.40	537	9.75	833	15.13	428	5.40	773	9.75	1200	15.13	
2	Low	357	2.67	644	4.81	1000	7.47	514	2.67	928	4.81	1440	7.47	1200
	High	357	6.48	644	11.71	1000	18.15	514	6.48	928	11.71	1440	18.15	
3	Low	417	3.11	752	5.62	1166	8.72	600	3.11	1083	5.62	1680	8.72	1400
	High	417	7.56	752	13.66	1166	21.17	600	7.56	1083	13.66	1680	21.17	
4	Low	476	3.56	859	6.42	1333	9.96	685	3.56	1237	6.42	1920	9.96	1600
	High	476	8.65	859	15.61	1333	24.20	685	8.65	1237	15.61	1920	24.20	
5	Low	536	4.00	967	7.22	1500	11.20	771	4.00	1392	7.22	2160	11.20	1800
	High	536	9.73	967	17.56	1500	27.22	771	9.73	1392	17.56	2160	27.22	
6	Low	595	4.44	1074	8.02	1666	12.45	857	4.44	1547	8.02	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	8.83	1833	13.70	942	4.89	1702	8.83	2640	13.70	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	

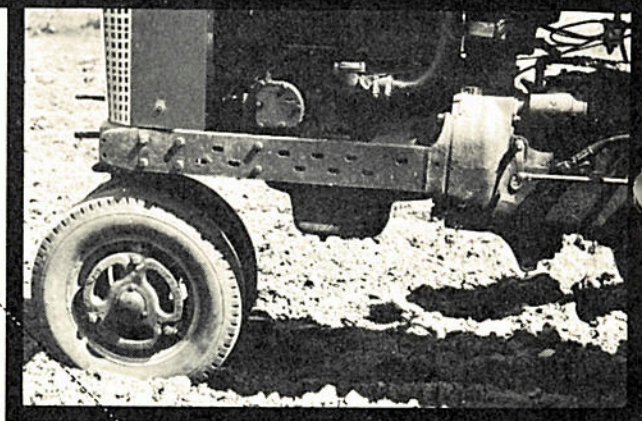
CJ-2A PULLEY SPEEDS (R.P.M.)—8" PULLEY POWER TAKE-OFF GEAR RATIOS.

Governor Control Positions	POWER TAKE-OFF GEAR RATIOS 24-20			POWER TAKE-OFF GEAR RATIOS 24-20			Engine Speeds
	TRANSMISSION			TRANSMISSION			
	Low	Intermediate	High	Low	Intermediate	High	
1	255	460	714	367	663	1028	1000
2	306	552	857	440	795	1234	1200
3	357	645	1000	514	928	1440	1400
4	408	737	1143	587	1061	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

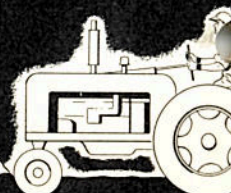
To satisfactorily operate most power driven equipment, the operator should know the speed of the power take-off shaft or the belt pulley as well as the vehicle ground speed. A great variety of speeds are made available by the manual governor control, the gear ratios in the transmission and transfer case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

The tables above 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 a farm combine or grain separator.

ALL FOUR 'JEEP' WHEELS



ARE YOU
CLIMBING HILLS
"ON THE LEVEL"



and VEHICLE SPEEDS

CJ-3A POWER TAKE-OFF SHAFT SPEEDS (R.P.M.) AND VEHICLE GROUND SPEEDS (M.P.H.)

Governor Control Position	Transfer In	POWER TAKE-OFF GEAR RATIO 22-22						Engine Speed
		Transmission Gear In						
		Low		Intermediate		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 Shaft M.P.H.	
1	Low	358	2.22	644	4.01	1000	6.22	1000
	High	358	5.40	644	9.75	1000	15.13	
2	Low	428	2.67	773	4.81	1200	7.47	1200
	High	428	6.48	773	11.71	1200	18.15	
3	Low	500	3.11	902	5.62	1400	8.72	1400
	High	500	7.56	902	13.66	1400	21.17	
4	Low	571	3.56	1031	6.42	1600	9.96	1600
	High	571	8.65	1031	15.61	1600	24.20	
5	Low	643	4.00	1160	7.22	1800	12.08	1800
	High	643	9.73	1160	17.56	1800	27.22	
6	Low	714	4.44	1289	8.02	2000	12.45	2000
	High	714	10.81	1289	19.51	2000	30.25	
7	Low	786	4.89	1418	8.83	2200	13.70	2200
	High	786	11.89	1418	21.46	2200	33.27	
8	Low	857	5.34	1547	9.63	2400	14.94	2400
	High	857	12.97	1547	23.41	2400	36.31	
9	Low	929	5.78	1675	10.43	2600	16.19	2600
	High	929	14.05	1675	25.36	2600	39.33	

CJ-3A PULLEY SPEEDS (R.P.M.)—8" (20.3CM.) PULLEY POWER TAKE-OFF GEAR RATIOS

Governor Control Positions	22-22 Ratio TRANSMISSION			Engine Speeds
	Low	Inter.	High	
1	306	552	857	1000
2	367	662	1028	1200
3	428	774	1200	1400
4	490	884	1372	1600
5	551	995	1542	1800
6	612	1105	1714	2000
7	673	1237	1885	2200
8	734	1326	2057	2400
9	796	1436	2228	2600

V-TYPE PULLEY DRIVE AT REAR OF POWER TAKE-OFF FRONT UNIT

BELT SPEED F.P.M.	PULLEY SPEED R.P.M.	HORSEPOWER RATINGS			
		1 BELT	2 BELTS	3 BELTS	4 BELTS
1667	1000	3.1	6.2	9.3	12.4
2000	1200	3.7	7.4	11.1	14.8
2333	1400	4.2	8.4	12.6	16.8
2667	1600	4.7	9.4	14.1	18.8
3000	1800	5.1	10.2	15.3	20.4
3333	2000	5.4	10.8	16.2	21.6
3667	2200	5.7	11.4	17.1	22.8
4000	2400	5.9	11.8	17.7	23.6
4333	2600	6.0	12.0	18.0	24.0

WORK!



The four-wheel driven "Jeep" uses all of its uniformly distributed weight for tractive effort. None of the "Jeep's" weight is "dead-weight" since **all** weight contributes to the tractive effort of the drive wheels beneath it.

The pulley drive at the rear of the power take-off front unit is used to drive compressors, generators, etc., mounted in the body to the right and behind the driver's seat. The pulley is a four-grooved, 6" pitch diameter pulley which will deliver up to 24 HP.

Tabulated above are the belt speeds in feet per minute, the drive pulley speeds in revolutions per minute and the horsepower ratings of the pulley drive for one, two, three and four belts for speeds from 1000 to 2600 RPM, which range coincides with the governor controlled speeds obtained and with the transmission gear in high gear (direct).

POWER TAKE-OFF and PULLEY DATA

FRONT POWER TAKE OFF

Provision has been made for power take off at the front of the engine, to run at engine speed.

CENTER POWER TAKE OFF

(Willys-Overland Kit No. 640725)

A belt pulley drive (Willys-Overland Kit No. 643883) is available and may be installed behind the transmission, either alone or in connection with the rear P.T.O. Drive will operate at engine speed or through 1.55 or 2.80 transmission reduction and transmit a maximum of 33 H.P.

REAR POWER TAKE OFF

(Willys-Overland center and rear P.T.O. Kit No. 640726)

(Willys-Overland rear P.T.O. Kit No. 640869)

The $1\frac{3}{8}$ " dia. spline shaft (see cut) will run at 536 R.P.M. (clockwise when viewed from the rear) and deliver, with the vehicle in motion, either 26 H.P. at 4.00 M.P.H. (20-24 ratio), 21 H.P. at 3.33 M.P.H. (22-22 ratio) or 17 H.P. at 2.75 M.P.H. (24-20 ratio). Other engine and road speeds are shown below.

BELT PULLEY—REAR

(Willys-Overland Kit No. 644193)

The 8" dia. pulley at 3100 F.P.M. belt speed will deliver 33 H.P. (20-24 ratio), 29 H.P. (22-22 ratio) or 23 H.P. (24-20 ratio) in high transmission gear with vehicle stationary.

REAR POWER TAKE-OFF FUEL CONSUMPTION

OPERATING PULLEY DRIVE AT
1500 PULLEY R.P.M.

CJ-2A 2100 ENGINE R.P.M. . . . 3100 F.P.M. BELT SPEED
20-24 P.T.O. RATIO . . . HIGH TRANS. GEAR

CJ-3A 1750 ENGINE R.P.M. . . . 3100 F.P.M. BELT SPEED
22-22 P.T.O. RATIO . . . HIGH TRANS. GEAR

HORSEPOWER	GALLONS PER HOUR	GALLONS PER HORSEPOWER- HOUR
5	1.36	.272
10	1.60	.161
15	1.87	.127
20	2.22	.111
25	2.75	.111
30	3.31	.113

GOVERNED ENGINE R.P.M.	VEHICLE SPEED M.P.H.*	DRAW-BAR H.P.†	H.P. AT P.T.O. SPLINE SHAFT					
			VEHICLE STATIONARY	3500# VEHICLE MOVING WITH				
				0# D.B.P.	300# D.B.P.	600# D.B.P.	900# D.B.P.	1200# D.B.P.
1000	2.2	7.18	15.4	12.8	11.0	9.3	7.5	5.7
1200	2.7	8.62	19.3	16.2	14.0	12.0	9.8	7.6
1400	3.1	10.06	23.3	19.6	17.1	14.7	12.1	9.6
1600	3.6	11.49	27.1	22.9	20.1	17.4	14.4	11.5
1800	4.0	12.93	30.9	26.3	23.0	19.9	16.7	13.5
2000	4.5	14.38	33.0‡	29.1	25.5	21.9	18.4	14.8
2200	4.9	15.80	33.0‡	31.7	27.8	23.8	20.0	16.0
2400	5.4	17.24	33.0‡	33.0‡	29.7	25.5	21.1	16.9
2600	5.8	18.68	33.0‡	33.0‡	31.4	26.7	22.1	17.5

*Vehicle speed in low transmission and transfer case ratios.

†Based on maximum recommended draw bar pull for continuous service—1200#.

‡Limited to 33 H.P. by the capacity of the bearings in the P.T.O.

Advantages of FOUR-WHEEL DRIVE

SUPERIOR TRACTION

The advantages of 4-wheel drive may be likened to those obtained with 4-wheel brakes. 4-wheel brakes, with added traction between tires and the road, will stop a vehicle in a much shorter distance than 2-wheel brakes. Similarly, 4-wheel drive provides added traction by using all four wheels for driving. This added traction is especially important when driving over slippery or icy ground or through mud, snow, or other difficult terrain. It is also advantageous on very steep grades or for towing heavy loads. It is particularly important when the vehicle is used for farm work, because tires slip more easily on soft ground than they do on hard pavement. It has been found that, in sandy loam, the traction obtained is only 55% of the weight between the tires and the ground, and in some cases, when the ground is wet and soft, this percentage is much lower. The Jeep, by providing traction on both sets of wheels, has an advantage in this work over conventional 2-wheel drive vehicles.

GRADE CLIMBING ABILITY

The grade climbing ability of the Universal 'Jeep' is also increased by 4-wheel drive. It is especially valuable when driving in rutty roads or loose soil since the front wheels pull the vehicle out of the ruts and assist in the steering. It is often said that it literally "claws" its way out.

EQUAL WEIGHT DISTRIBUTION

The Willys-Overland Universal Jeep was carefully designed for 4-wheel drive, and has its weight evenly distributed over its four wheels. This equalizes the work done by each wheel because the tractive force exerted by a vehicle's tires depends on two factors—first, the weight or pressure between each tire and the ground, and, second, the friction between the tire and the ground. The Jeep has its weight distributed equally on all four tires, so whatever the road conditions may be the driving friction will be approximately uniform at all wheels. These factors enable the Jeep to be driven over terrain and to climb hills impassable to conventional 2-wheel drive vehicles.

EXTRA TRACTION WITH FRONT BUMPER WEIGHT

When the Universal Jeep is used for steady drawbar work, the backward pull on the drawbar positioned about 15" from the ground, slightly decreases the effective weight on the front tires and correspondingly increases the effective weight on the rear tires. This transfer of weight because of drawbar load is compensated by using a front bumper weight mounted between the radiator and the bumper. (Willys-Overland Kit Part No. 640724). With the bumper weight, the Jeep handles a drawbar load of approximately 1,200 lbs. with equal effective weight and tractive effort at both front and rear wheels. The use of this weight is recommended when the Jeep is used for agricultural or other service where maximum traction is needed for pulling a load under adverse ground conditions.

SPECIFICATIONS

GENERAL

Wheelbase	80"	(2.032 m.)
Tread—Front and Rear	48 1/4"	(1.226 m.)
Overall Length		
With Bumper	123 1/8"	(3.127 m.)
Width (Max.)	57 1/8"	(1.451 m.)
Height Loaded	CJ-2A-64"	
(Over Windshield)	CJ-3A-66 7/8"	(1.625 m.)
Road Clearance—Front	8 3/8"	(.219 m.)
—Rear	8"	(.203 m.)

ENGINE AND CLUTCH

Number of Cylinders	4	
Valve Arrangement	"L" Head	
Bore	3 1/8"	(79.375 mm.)
Stroke	4 3/8"	(111.125 mm.)
Piston Displacement	134.2 Cu. In.	(2.199 Lts.)
Compression Ratio	6.48 to 1	
SAE Horsepower	15.63	
Max. Brake HP	60 at 4000 RPM	
Max. Torque lb. ft.	106 at 2000 RPM	

Crankshaft

Bearing Length		
Front	1.92"	(48.768 mm.)
Center	1.81"	(45.974 mm.)
Rear	1.75"	(44.450 mm.)
Bearing Diam. All	2.33"	(59.182 mm.)
End Play	.004-.006	(.1016-.1524 mm.)

Connecting Rod

Length—Center to Center	9 3/16"	(233.36 mm.)
Crank Pin Journal		
Diameter	1 11/16"	(49.276 mm.)
Length	1 1/16"	(33.020 mm.)

Pistons, Pins and Rings

Piston Material	Cast Aluminum	
Piston Surface Treatment	Tin or Brass Plated	
Compression Rings—		
Number and Width	2 — 3/32"	(2.381 mm.)
Oil Rings—No. and Width	1 — 1/16"	(4.762 mm.)
Piston Pin Type	Locked in rod	
Piston Pin Diam.	.8118	(20.620 mm.)

Lubricating System

Oil System Capacity (refill)	4 qts.	(3.785 lts.)
Normal Oil Pressure	35 lbs. at 2000 RPM	
Oil Filter Make	Purolator P713 or Fram No. F3W	

Fuel System

Carburetor		
Make	Carter	
Model No.	WO-596S	
Type	Downdraft	
Single or Dual	Single	
Size	1" SAE	(25.40 mm.)
Fuel Tank Capacity	10 1/2 gal.	(39.75 lts.)

Valves

Head Diam.		
Inlet	1 11/16"	(38.894 mm.)
Exhaust	1 1/16"	(37.306 mm.)
Stem Diam.		
Inlet	.37225"-.373"	(9.455-9.474 mm.)
Exhaust	.371-.372"	(9.423-9.449 mm.)
Stem Clearance		
Inlet	.0015"-.00325"	(.038-.083 mm.)
Exhaust	.0025"-.0045"	(.064-.114 mm.)
Lift—Inlet and Exhaust	.351"	(8.915 mm.)
Seat Angle		
Inlet and Exhaust	45°	
Tappet Clearance — Hot or Cold — Inlet and Exhaust	.014"	(.356 mm.)

Camshaft

Material	Cast Steel
Number of Bearings	4
Bearing Material (Front)	Steel Backed Babbitt
Drive—Type	Gear
—Adjustable	No

Clutch

No. of driven plates	1	
No. of facings	2	
Diam. of driven plate	8 1/2"	(215.900 mm.)
Frictional Area	72 Sq. In.	(464.5 sq. cm.)
Torque Capacity	144 lb. ft.	

TOTAL ALLOWABLE GROSS WEIGHT

Max. Total Gross		
Vehicle Weight	3500 lbs.	(1588 kg.)
Max. Front	1600 lbs.	(726 kg.)
Max. Rear	2300 lbs.	(1043 kg.)

TRANSMISSION RATIO

First	2.798 to 1
Second	1.551 to 1
Third	1.00 to 1
Reverse	3.798 to 1

TRANSFER CASE RATIO

Normal	1 to 1
Underdrive	2.43 to 1

LUBRICANT CAPACITY

Transmission	3 pts.	(1.42 lts.)
Transfer Case	4 pts.	(1.89 lts.)

REAR AXLE

Type	Semi-Floating, Hypoid	
Ratio	5.38 to 1	
Lubricant Capacity	2¾ pts.	(1.30 lts.)

FRONT AXLE

Type	Full-Floating, Hypoid	
Toe-in	$\frac{3}{16}$ " - $\frac{3}{32}$ "	(1.19-2.38 mm.)
Caster in Degrees	3°	
Camber in Degrees	1½°	
Kingpin — Crosswise		
Inclination	3°	
Lubricant Capacity	2½ pts.	(1.18 lts.)

CJ-2A, CJ-3A UNIVERSAL 'JEEPS'

SPRING — FRONT

Type	Semi-Elliptic	
Length	36 $\frac{1}{4}$ "	(.921 m.)
Width	1 $\frac{3}{4}$ "	(44.45 mm.)
No. of Leaves — Pack		(41.44 mm.)
Thickness	10 — 2.048"	(52.019 mm.)
Rate	225 lb./in.	(40.2 kg./cm.)

SPRING — REAR

Type	Semi-Elliptic	
Length	42"	(1.067 m.)
Width	1 $\frac{3}{4}$ "	(44.45 mm.)
No. of Leaves — Pack		
Thickness — Standard	9 — 1.973"	(50.11 mm.)
— Heavy Duty	11 — 2.407"	(61.14 mm.)
Rate — Standard	190 lb./in.	(33.9 kg./cm.)
— Heavy Duty	225 lb./in.	(40.2 kg./cm.)

FRAME

Max. Depth Channel	4 $\frac{1}{8}$ "	(104.775 mm.)
Max. Width Channel	1 $\frac{1}{8}$ "	(49.213 mm.)
Stock Thickness	.1495"	(3.797 mm.)
Section Modulus (including Reinforcing Strips)	1.449 in ³	

STEERING

Turning Dia.—Left & Right	36'	(10.973 m.)
Steering Wheel Diam.	17 $\frac{1}{4}$ "	(.438 m.)
Steering Ratio	14-12-14 to 1	
Steering Gear Type	Cam and Lever	

TIRES AND WHEELS

Tire Size — Standard	6.00-16" — 4 ply	
— Optional	7.00-15" — 4 ply	
Rim Size — Standard	4.50E-16"	
— Optional	4.50E-15"	
Bolt Circle Diam.	5 $\frac{1}{2}$ "	(139.7 mm.)
No. of Bolts per Wheel	5	
Bolt Dia. & No. of Thread	$\frac{1}{2}$ " - 20	(12.70)

BRAKES — SERVICE

Drum Dia. — Front & Rear	9"	(.229 m.)
Lining — Length per Wheel		
Front and Rear	16 $\frac{3}{4}$ "	(.427 m.)
— Width per Wheel,		
Front and Rear	1 $\frac{3}{4}$ "	(44.45 mm.)
Thickness—Front and Rear	.206-.216"	(5.232-5.486 mm.)
Total Braking Area	117 $\frac{3}{4}$ " sq. in.	(759.7 sq. cm.)
Master Cylinder—		
Dia. and Stroke	1"x 1 $\frac{1}{8}$ "	(25.40x28.58 mm.)
Wheel Cylinder—Dia.—		
Rear	$\frac{3}{4}$ "	(19.05 mm.)
Front	1"	(25.40 mm.)

ELECTRICAL SYSTEM — All Electric Auto-Lite, unless other Specified.

Generator

Model No. and if	
Ventilated	Model GDZ—Yes
Starting Motor	
Model No.	Model MZ

Distributor

Model	Model IGW (Dustproof)
Spark Advance—Flywheel	
Deg. — Centrifugal	20°-24°
Point Gap	.020" (.508 mm.)
Timing — Points Open	5° B.T.C.
Firing Order	1 — 3 — 4 — 2

Spark Plugs

Model	AN-7 or J-9
Thread	14 mm.
Gap	.030" (.762 mm.)

Battery

Model	PM-15
Capacity at 20 hour rate	100 amp. hrs.
Voltage	6 Volts
No. of Plates	15 Plates
Case Length	9 $\frac{3}{32}$ " (230.987 mm.)
Case Width	7 $\frac{1}{8}$ " (181.0 mm.)
Height over Terminals	8 $\frac{5}{8}$ " (219.1 mm.)
Terminal Grounded	Negative

Power of Bulbs

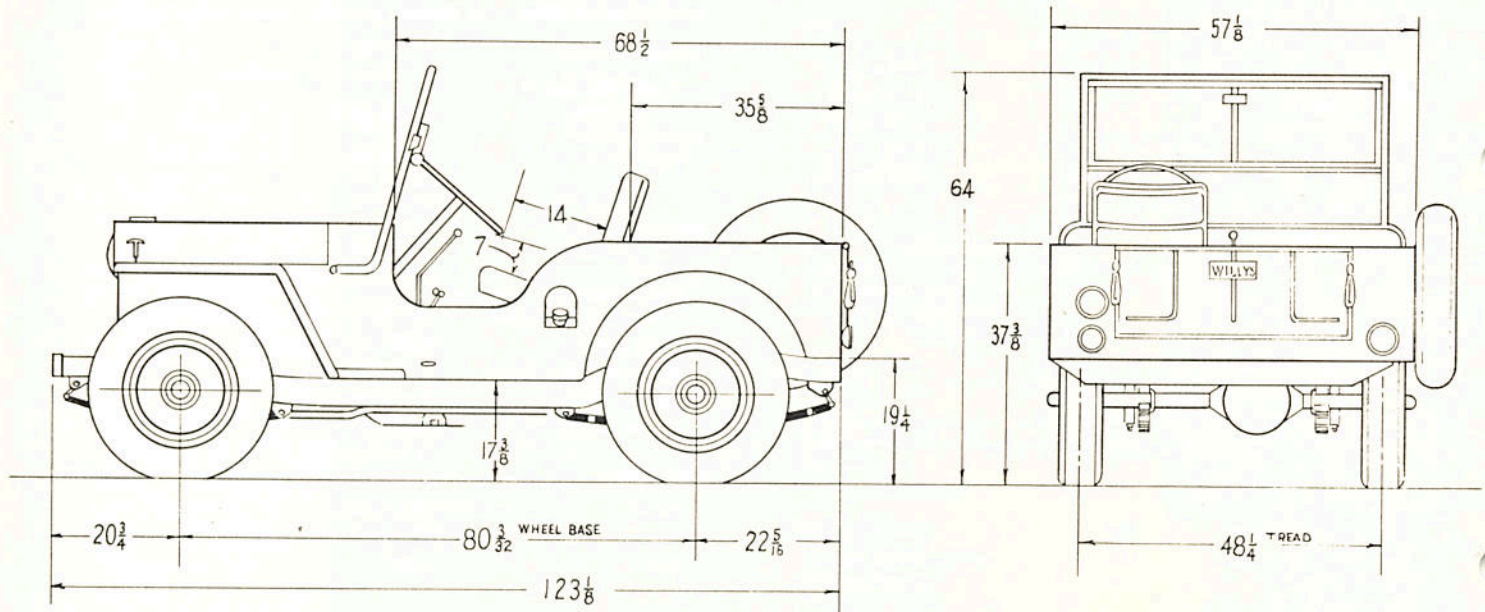
Head Lamps	45-35 Watts
Parking Lamps	3 C.P.
Tail and License Lamp	3 C.P.
Stop Lamp	21 C.P.
Instrument Lamp	3 C.P.
Tell Tale Lamp	1 C.P.
Fuse (Thermal Type)	
On Light Switch	30 Amp. Capacity

COOLING SYSTEM

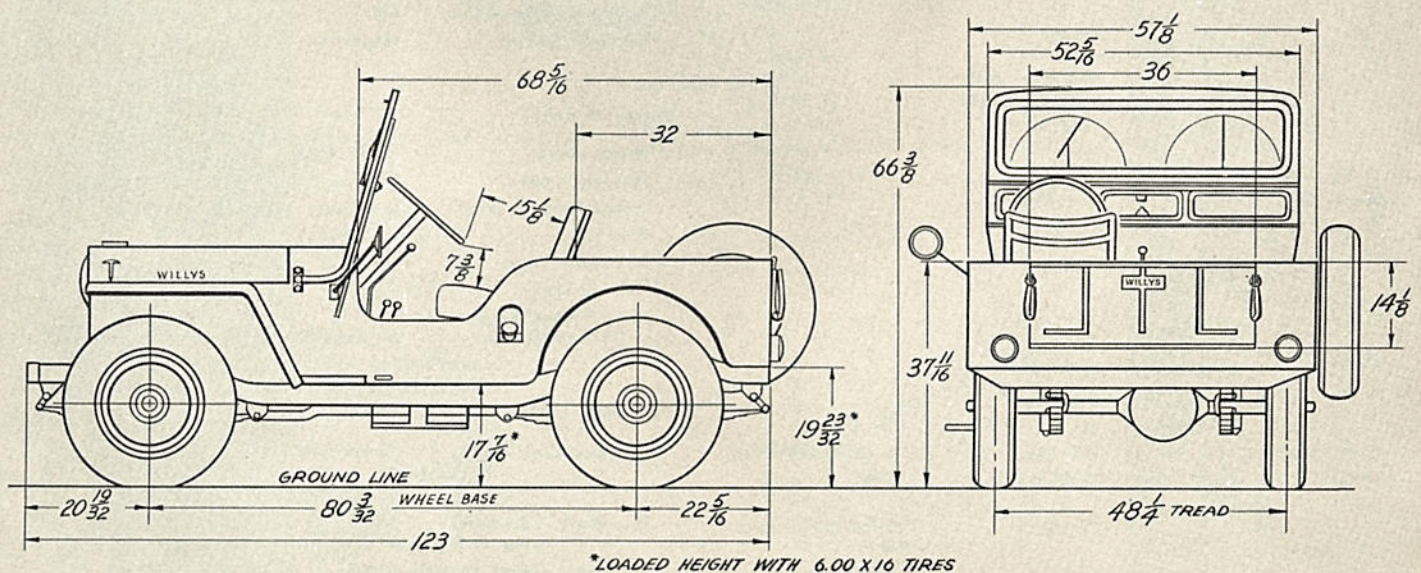
Radiator Core — Type	Heavy Duty
— Thickness	2"
— Area	364 sq. in. (50.800 mm.)
Fan Blade — Diameter	15"
— No. of Blades	4
Fan Belt — Length Outside	42 $\frac{7}{8}$ " (381 m.)
Cooling Capacity	11 qt. (10.41 lts.)

BODY-BUILDER'S DIMENSION DRAWINGS

UNIVERSAL 'JEEP' CJ-2A

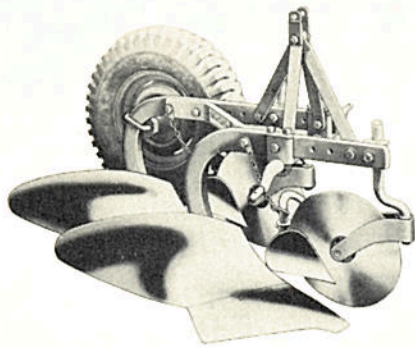


UNIVERSAL 'JEEP' CJ-3A

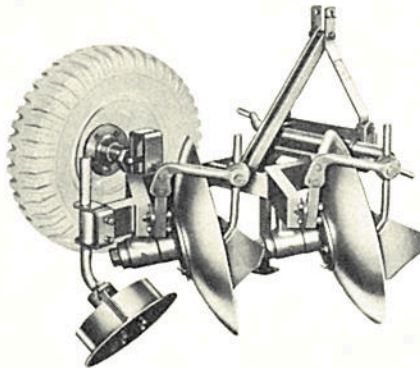


BASIC FARM IMPLEMENTS

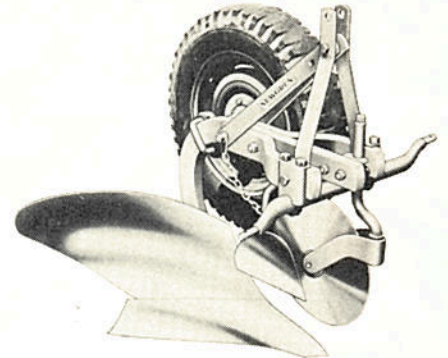
DESIGNED FOR USE WITH THE UNIVERSAL 'JEEP'



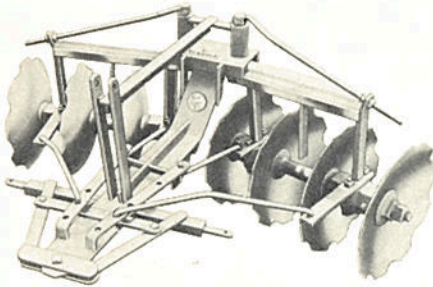
2-BOTTOM 12" GENERAL PURPOSE
MOULDBOARD PLOW



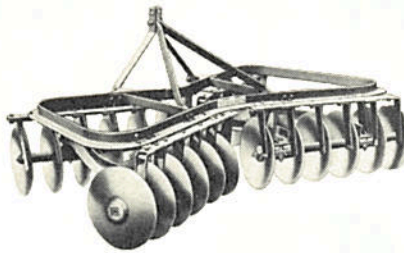
2-26" DISC PLOW



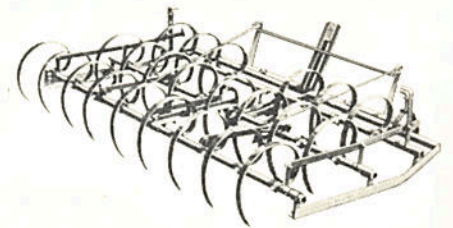
SINGLE BOTTOM 16"
MOULDBOARD PLOW



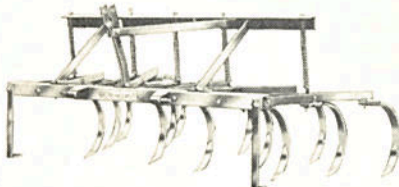
BUSH & BOG HARROW



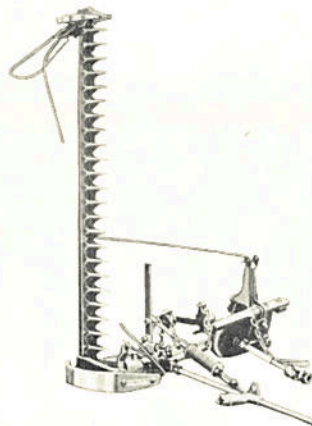
TANDEM DISC HARROW



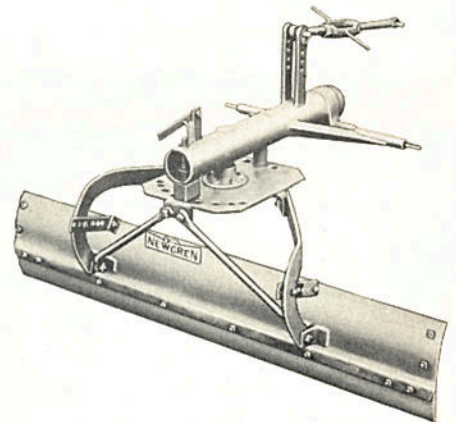
8½' SPRINGTOOTH HARROW



6' FIELD AND PASTURE
CULTIVATOR



6' FARM MOWER

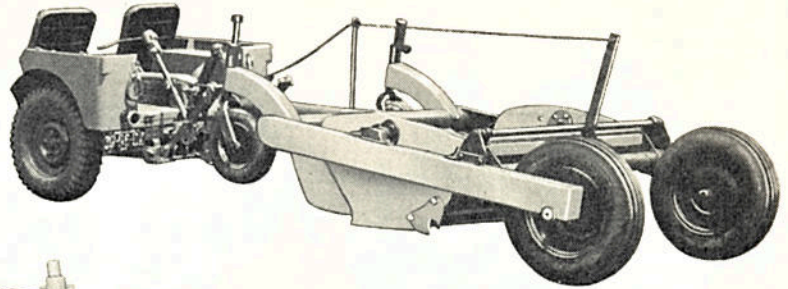
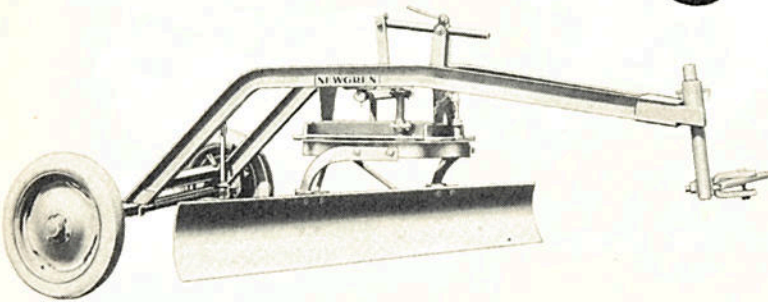


TERRACING BLADE

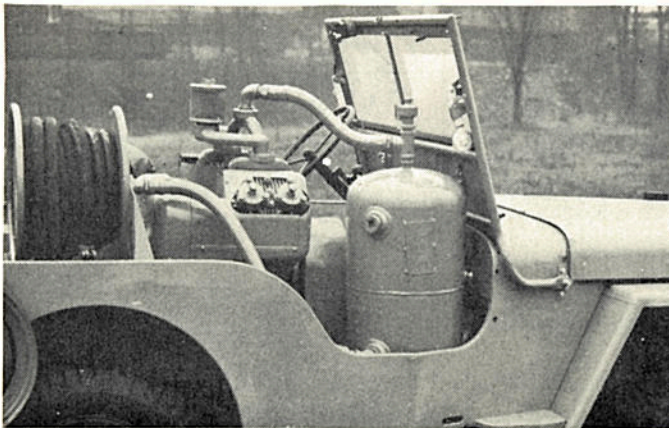
BASIC INDUSTRIAL TOOLS

DESIGNED FOR USE WITH THE UNIVERSAL 'JEEP'

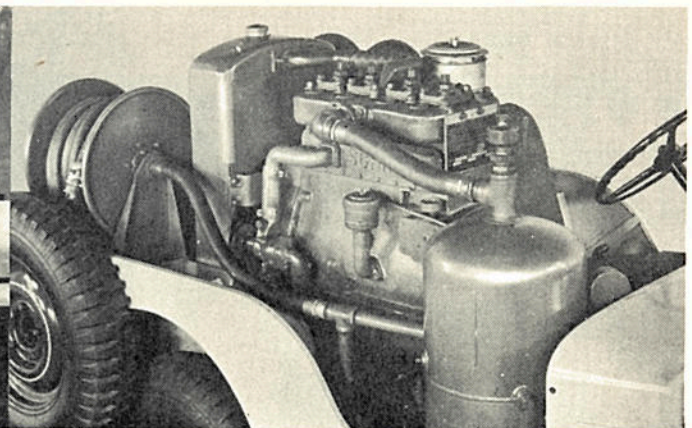
HYDRO-GRADER AND TERRACER



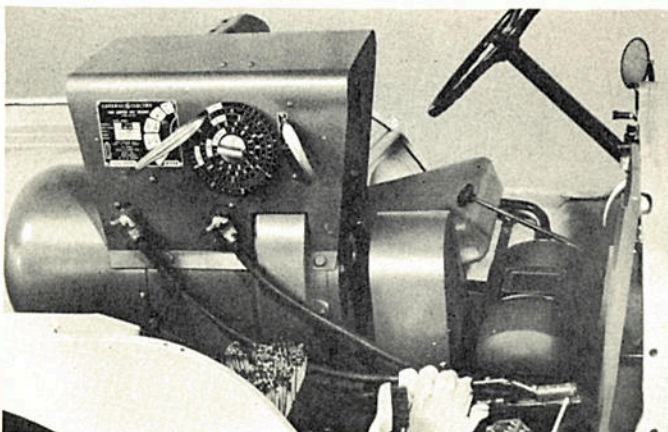
LIFT-TYPE OVERLAND SCRAPER



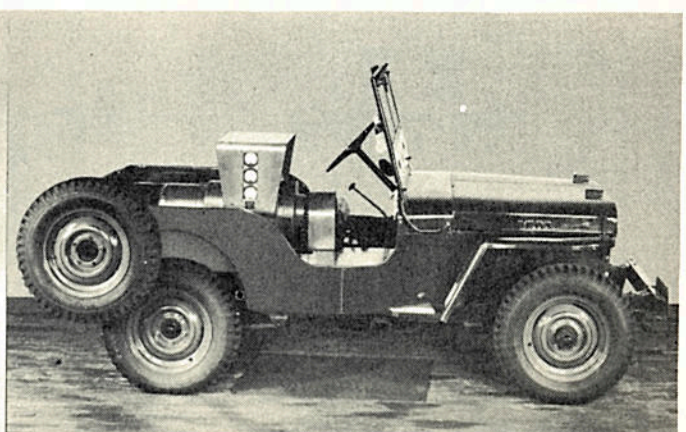
60 C.F.M. COMPRESSOR



105 C.F.M. COMPRESSOR



12.5 K.V.A. GENERATOR



300 AMP. D.C. ARC WELDER



Willys-Overland builds vehicles that meet the actual needs of the motor buying public. This means utility vehicles functionally designed for widest usefulness, operating efficiency, and low cost. This company believes there is a definite need in the world today for transportation that is based on utility rather than fashion. With its many years of experience in producing light weight economical cars, augmented by its war-time production of the famous military Jeep, Willys-Overland is eminently qualified to assume the lead in producing the world's most useful vehicles.

