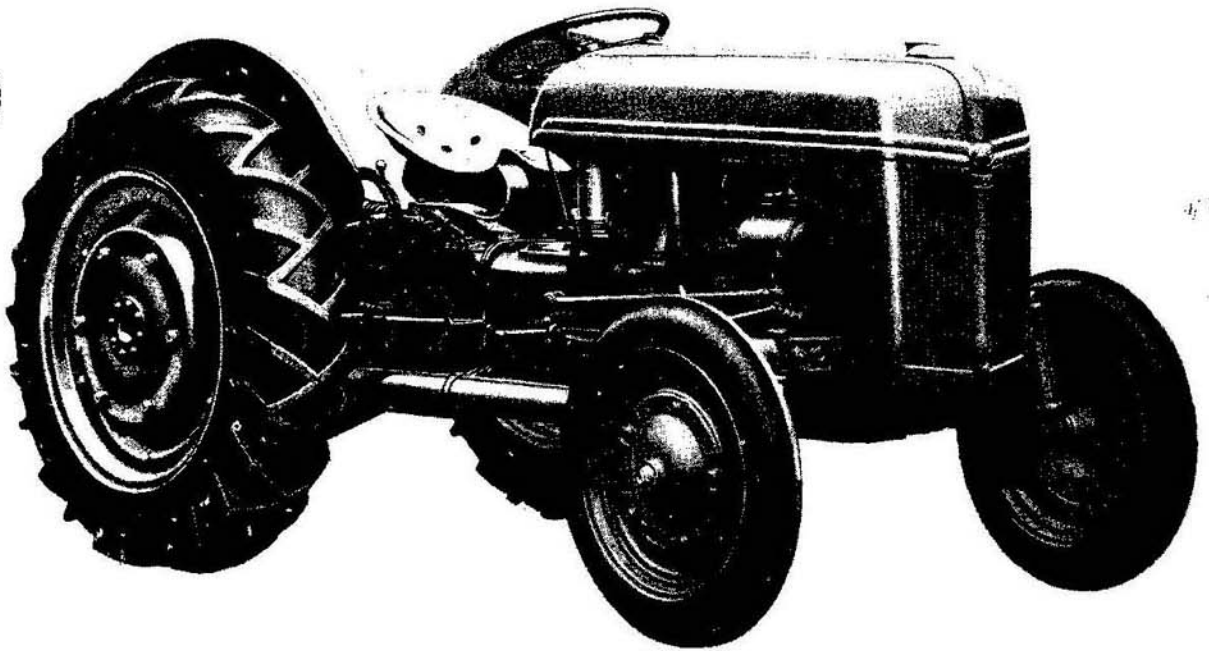


THE FORD - FERGUSON TRACTOR



• The entirely new system of land cultivation made possible by the Ford-Ferguson Tractor was developed to give effect to four fundamental principles:

1. To so cut the cost of farm products that farming can be made prosperous *without increasing the cost to the consumer.*
2. To make farming attractive to youth and stop the drift from the land.
3. To assist all other industries through a prosperous agriculture and *stimulate greater industrial use of farm products* by cutting costs, thus increasing the total farm market.
4. To lay the foundation for a greater National Security.

The present relatively high cost of farm production rests on the fact that, in the main, the nation's farms have not been able to adopt the principles of mechanization which have made other industries prosperous.

It was with this challenge in mind that the manufacturing resources of The Ford Motor Company were placed behind the genius and practical experience of Mr. Harry Ferguson to produce a tractor designed to replace the horse. To replace him because he is a waster of land and time.

A generation of tractor experience has proved the horse cannot be replaced by substituting a good machine in front of the same old tools.

So, all the old ideas about pulling and controlling implements were thrown overboard and a *new principle* was developed.

This new principle is so efficient that the Ford-Ferguson Tractor can work profitably, under the most difficult conditions. It will not only pull tools for which a heavy tractor previously was necessary, but it will go everywhere and do all the work the horse will do . . . and do it *better and cheaper.*

It is a new system of land cultivation that every progressive farmer will take great pride in using on his farm.

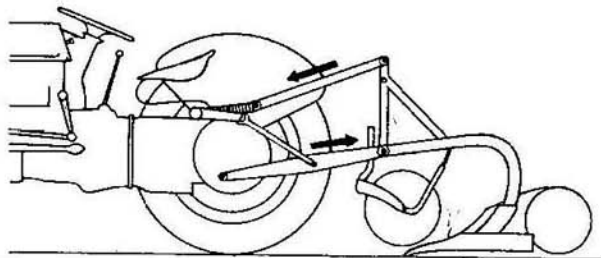
In addition to the many mechanical refinements built into the Ford-Ferguson Tractor, features providing for the comfort and convenience of the operator also are to be found. Features that save his time—such as one-minute implement change. Features that save his strength—such as finger tip implement control. Features that protect his safety—such as an electric starter that will not operate unless the tractor is in neutral gear.

A study of these features, described on the following pages, will clearly show how the Ford-Ferguson Tractor has met the challenge to provide the farmer with a means for reducing costs . . . saving time . . . protecting health . . . and producing greater yields.

THE FORD - FERGUSON TRACTOR

ENTIRELY NEW PRINCIPLES

TOP LINK (PUSHING)



BOTTOM LINKS (PULLING)

• The Ford-Ferguson Tractor, which is built around the Ferguson System—together with its close-coupled lightweight wheel-less plow—is represented in the drawing above.

The plow is pulled by two lower links, which are in tension or *backward pull*. Top link shown in the diagram is in compression, *pushing forward*.

The top link holds the implement in a fixed position, preventing it from rotating and the forward motion of the tractor literally pulls the plow into the ground.

HYDRAULIC CONTROL

• A hydraulic mechanism is provided to control automatically the depth of the plow while it is in the ground.

The manual control is part of the hydraulic mechanism, so that the operator can raise the implement out of the ground or lower it instantly, at the slightest movement.

The top link in compression puts a forward thrust on the tractor that tends to keep the front end down.

NEED FOR WEIGHT ELIMINATED

• The result of this is that excess weight built into the tractor is not needed to hold the tractor in proper balance, while plowing with the unit implement.

Weight is properly distributed over the four wheels by the Ferguson System itself. Consequently, it is now possible to have a lightweight tractor, requiring less power to move its

lighter weight and still do the work of heavier tractors.

PENETRATION WITH A LIGHTWEIGHT PLOW

• Since it is the Ferguson principle and not weight that gives the plow its penetration, the Ferguson plow is a lightweight tool in contrast to pull type plows of the same capacity.

DEPTH MAINTAINED IN UNEVEN GROUND

• Although the plow is held in a fixed position while plowing level ground it is not lifted and lowered each time the front wheels drop into a hollow or climb a high spot as is the case of rigidly mounted implements. With the Ferguson System, the plow automatically works at the depth to which it is set. It is able to do so because any slight variation in the ground which the front or rear wheels must follow, will always cause an extension or compression of the master control spring. This in turn acts on the valve to build up or reduce the solid column of oil that holds the plow to its fixed depth.

Under normal working conditions, the control valve is moving back and forth a slight amount almost continuously to maintain the balance originally set for the operation.

HOW THE FERGUSON SYSTEM SUPPLIES TRACTION

• When plowing tight, heavy soils, weight is automatically built into the Ford-Ferguson Tractor by the texture of the soil to provide the necessary traction. This is because the plow is actually carried by the tractor and therefore any weight on the plow, such as soil and the "suck" of the plow moving the soil, actually adds weight across the rear end of the tractor to provide increased traction. The heavier and tighter the soil texture the greater the weight transmitted and the greater the traction.

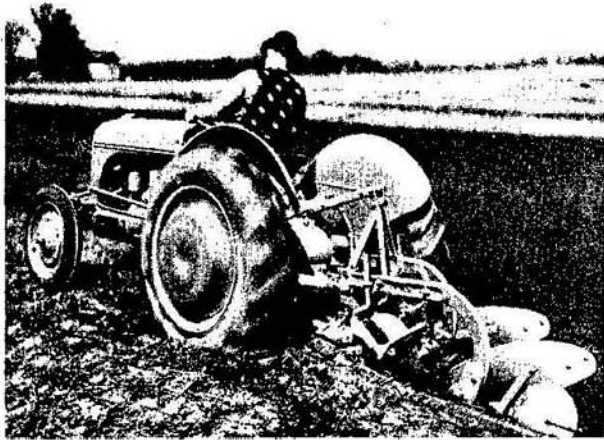
When plowing soft ground where the soil texture is light, the weight is correspondingly light on the rear end of the tractor. This is the reason why the lightweight Ford-Ferguson Tractor can work without difficulty in soil where heavier equipment would soon bog down.

THE FORD - FERGUSON TRACTOR

ACTS AS OWN SAFETY DEVICE

• One of the major advantages of the Ford-Ferguson Tractor is the way it acts when the unit implement meets with a rock, root or other obstruction when plowing. Fields which might otherwise be left unplowed can now be worked with comparative ease.

When the impact takes place the top link instantly reduces weight on the rear wheels by shifting weight to the front wheels. Traction effort is thus relieved on the rear wheels, allowing them to spin so that the strain on both tractor and implement is minimized instantly.



Actual photograph showing how rear wheels can spin as plow hits buried obstruction

With conventional tractors equipped with a conventional draw bar pulling wheel type or drag type implements, the effect is just the opposite of this. When the plow strikes an obstruction, weight is added to the drive wheels and the traction effort is increased. This usually results in damaging the implement or putting an excess strain on all the moving parts of the tractor.

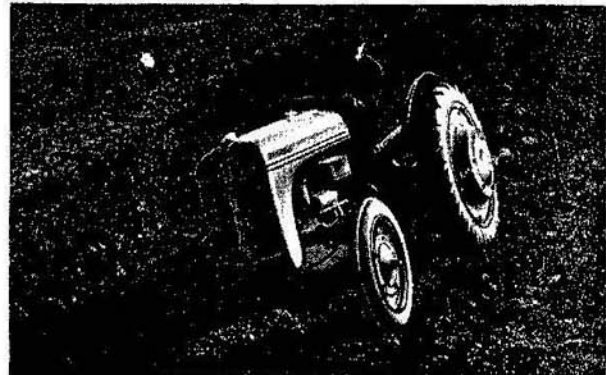
This comparison is even more pronounced when the impact takes place on a hillside. By comparison, the Ford-Ferguson Tractor with Ferguson System establishes new standards of safety for the tractor, implement and operator. Farmers appreciate the increased safety, particularly when the tractor is operated by the younger and inexperienced members of the family.

To explain more fully the action of the Ferguson System when the implement meets an obstruction, the sudden increase of pushing force in the top link shifts the control valve into the lowering position.

This relieves the tractor of the weight of the implement and the soil. Weight is transferred to the front end of the tractor and the spinning of the rear wheels indicates to the operator that he should stop the tractor and prepare to clear the obstruction.

All the operator has to do is back up, clear the obstruction by raising his implement hydraulically and then continue on his way—no unhitching—no circling around to get lined up again.

WORKS ON HILLSIDES WITH GREATER SAFETY AND EASE



• The Ford-Ferguson Tractor is ideal for working on hillside or contour. Easier and more accurate steering are made possible because the front end of the tractor is held down by the action of the Ferguson System.

Its four wheels and compact design give it greater stability and reduce side slip. Then, too, the linkage between tractor and implement results in better control of the implement with less tendency for it to fall away on slopes.

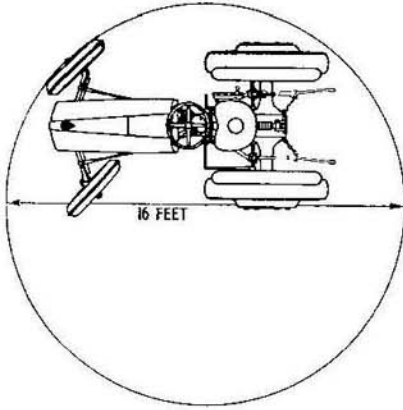
These same principles, plus the fact that extra traction is provided as needed, explain the unusual ability of the Ford-Ferguson Tractor to work up hillsides—although, of course, this is not recommended soil conservation practice.

THE FORD - FERGUSON TRACTOR

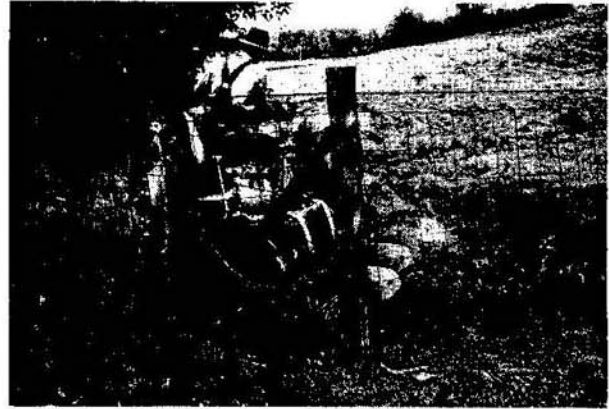
GETS MORE WORK DONE

• The Ford-Ferguson Tractor is so flexible in working various types of soil, different shapes and sizes of fields—so flexible in handling, changing and using implements—so flexible in supplying power with belt, drawbar and power take-off—that it will fit into any change in farming plans which is made to meet today's swiftly changing conditions.

TURNS INTO NEXT ROW

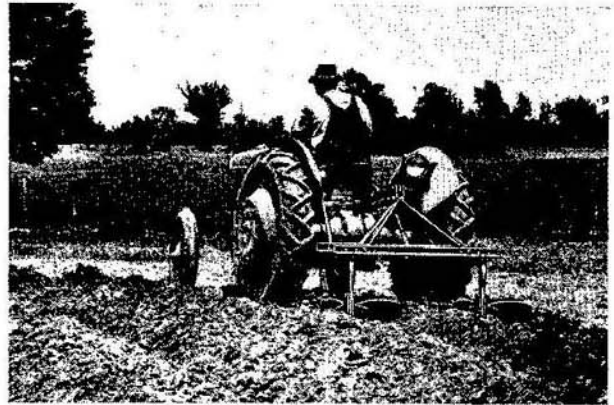


The illustrations above and below show how short you can turn the Ford-Ferguson Tractor using the independent rear wheel brakes. At the end of a row you swing into the next with practically no lost travel. That cuts down on the time it takes to get into the next row—means that more cultivating can be done in a given time.



WORKS IN FENCE CORNERS

Unit type implements and compact design of the Ford-Ferguson Tractor make it possible to plow or cultivate in garden plots and fields too small for equipment of other types, or difficult even with horse-drawn equipment. Also, because of its short turning radius, easy handling and unit design, this tractor will work irregular-shaped fields and fence corners just as readily as it works in large fields.



HAS MORE PULL WITH LESS WEIGHT

Because this new principle provides traction without the use of built-in weight, every ounce of the Ford-Ferguson Tractor is used as muscle, not ballast.

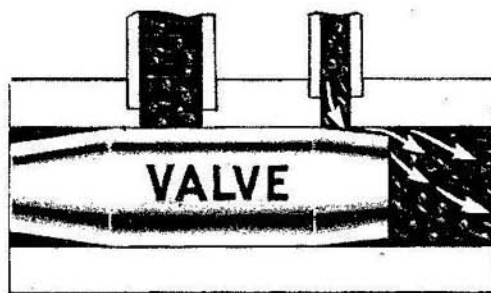
In hard pulling with a unit implement the Ferguson System automatically increases traction. In light pulling, where extra traction is not needed, the fuel that would be used to pull the excess dead weight is saved . . . and soil packing is reduced.

THE FORD - FERGUSON TRACTOR

CONTROLS DEPTH AND RAISES IMPLEMENTS

• The hydraulic mechanism of the Ford-Ferguson Tractor is not just a power lift but a mechanism built into the tractor for regulating the working depth of the implement in the ground. It also provides an easy, simple means for raising and lowering the implements.

In operation, the control lever is moved forward to whatever depth the implement is to operate. This reacts on the valve enabling the implement to drop until the pressure of the top link on the master spring compresses the spring enough to move the valve into neutral position, keeping the implement from going any deeper.



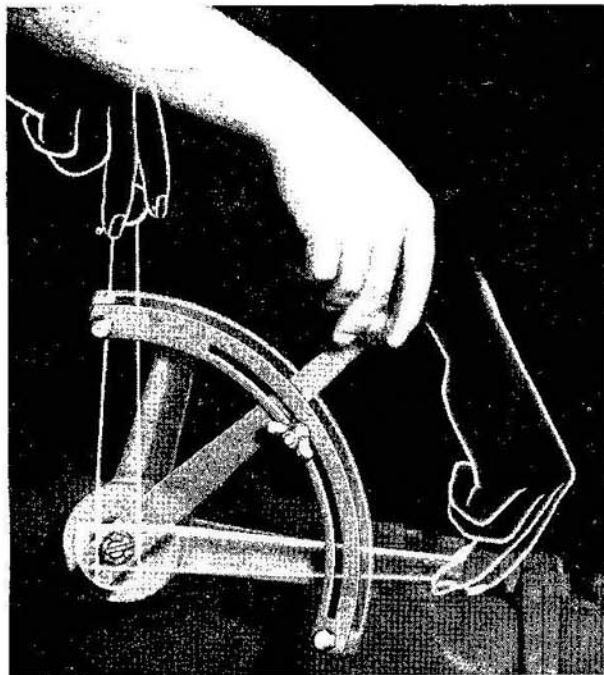
Valve (actual size) is typical of simplicity of Ferguson design.

• By moving back and forth less than 1 inch, this small simple valve automatically controls the implement in the ground.

To demonstrate the ruggedness of the hydraulic mechanism, five men standing on the plow were lifted and lowered with ease.



HYDRAULIC CONTROL LEVER EASY TO USE



• One of the outstanding features of the Ford-Ferguson Tractor is the ease with which the implement can be raised and lowered. The illustration, here, shows the lever, mounted alongside the driver's seat, which controls the implement.

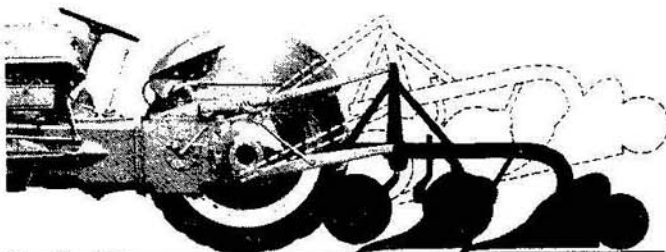
All that's necessary to lower the implement is an easy downward thrust of the lever. This requires hardly more than fingertip pressure. Pulling the lever back, an equally effortless operation, raises the implement for turning or transport.

Wing Nut Fixes Depth

To fix the implement at the desired depth, there is an adjustable stop for the lever. This stop moves on the slotted quadrant, and may be tightened by means of a wing nut.

Once the desired depth is determined, the stop is set and the implement then stays at the fixed depth.

Should greater depth be desired, the lever can easily be moved past the stop and pushed farther down, as indicated by the phantom arm in the drawing.



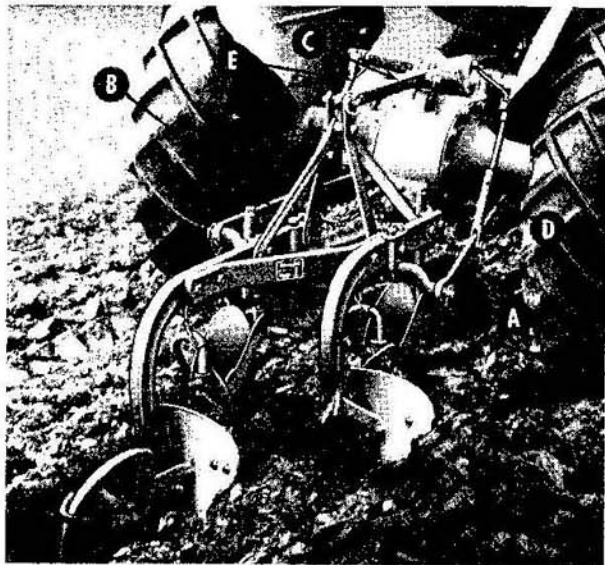
Dotted lines indicate highest position. The simple movement of the manual control lever will adjust to any intermediate position.

THE FORD - FERGUSON TRACTOR

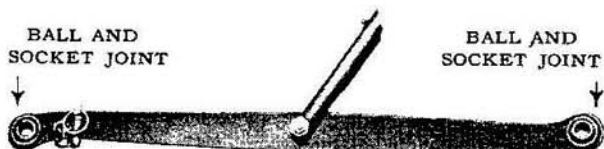
FLEXIBLE LINKAGE

• It was not until the Ferguson System was developed, with complete flexibility of linkage and hydraulic depth control, that the use of the tractor and implement as a unit became completely successful for all purposes.

The illustration at right shows the Ferguson linkage with plow attached to the tractor. All Ferguson unit implements, operate in the same way as the plow. There is no connection between the plow beam and the tractor. The bottom links which pull the implement are lettered A and B. The top link C, pushes against the tractor. The master control spring which can be seen at the front end of the top link, expands or compresses according to the forces transferred to it from the implement through the top link. Rods D and E connect the lower links with lift arms which lower and raise the implement.



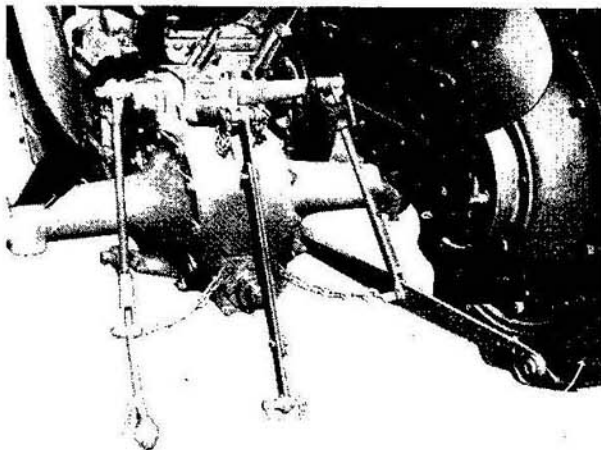
LINKS AND LIFT ARMS—FLEXIBLE AS YOUR WRIST



• To allow free movement and maximum flexibility, the top and bottom links have ball and socket joints. The connections at the lift arms are designed to permit universal action—motion in all directions. Ball and socket joints are hardened to avoid cutting action caused by grit. All parts are ruggedly designed for long hard service.

• In operation, the top link is under pressure at all times, transmitting its load through the master control spring which regulates the automatic control of the Ferguson System. Here again precision made ball and socket joints provide complete freedom of action and immediate response to changes in load.

Close up view showing the yoke connecting top link ball and socket to master control spring plunger.



Simple lynch pin connection at ball and socket joint allows free, unobstructed movement. Chain prevents loss of pin.

Complete freedom of movement is provided by open universal joints at the upper end of each lift arm.



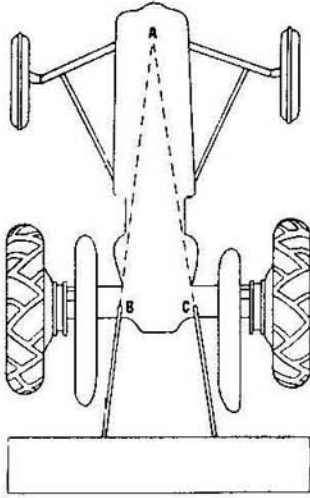
THE FORD - FERGUSON TRACTOR

UNIT IMPLEMENTS FOLLOW FRONT WHEELS

A. B. C. OF REAR CULTIVATION

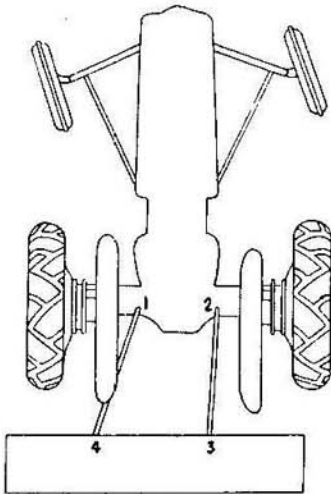
A.

Bottom links which pull cultivator are not parallel. If projected forward beyond attaching points "B" and "C" they would meet at "A"—approximate center of front axle. This causes implement to follow front wheels provided . . .



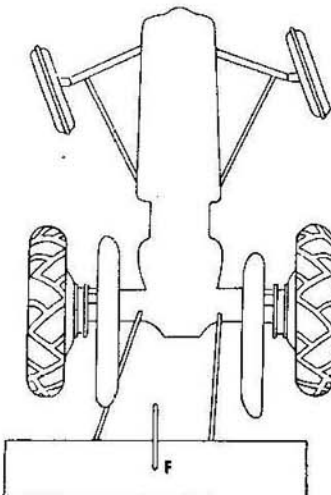
B.

. . . implement is flexibly attached to tractor. The ball and socket joints on ends of bottom and top links permit free action. The implement is kept under perfect control, however, by the . . .



C.

. . . steering fin "F" as it moves through the soil. When the front wheels are steered to right or left, the soil deflects the fin . . . and instantly moves the sweeps in the same direction.



• Flexible linkage of the Ferguson System eliminates the pivot action that makes ordinary rear-mounted implements tend to swing out on turns rather than follow in the direction of the front wheels.

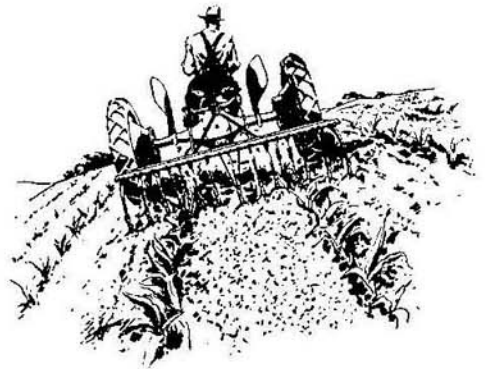
Now cultivation with rear-mounted implements becomes practical for the first time. The Ferguson rear-mounted cultivator moves WITH the front wheels. If the wheels are steered away from the row, the sweeps will move toward the row. Wherever the front wheels go, the Ferguson rear-mounted cultivator follows them like shadow.

The secret of this operation lies in three points;

- A. Angle of attachment of lower links.
- B. Flexibility of linkage system.
- C. Action of special steering fin on cultivator.

In the opposite column, these A-B-C's of rear cultivation are illustrated.

NO SIDE SLIPPING ON HILLS



• Working on the contour or across hillsides is easier—and better—with Ferguson rear-mounted implements. On the cultivator, for example, a semi rigid fin, which runs in the soil, holds the sweeps to their course. They follow the front wheels—not the slope of the hill. Penetration of the fin may be adjusted for use in light or heavy soil.

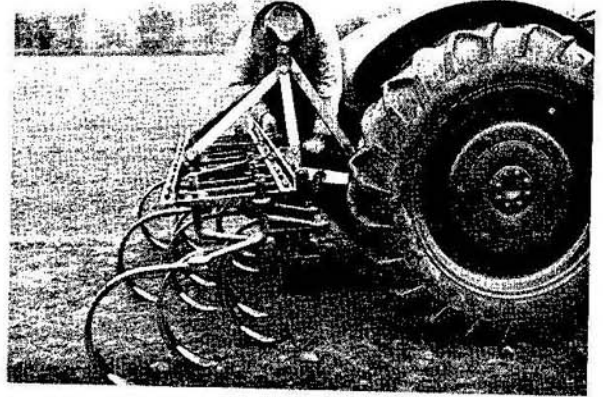
THE FORD - FERGUSON TRACTOR

IMPLEMENTS QUICKLY ATTACHED OR REMOVED

• Another big time and effort-saving feature of the Ford-Ferguson Tractor is the speed and ease with which unit implements can be attached or removed. Reducing attaching time to less than one minute is a big forward stride in tractor and implement design. There are but three links to attach by means of three pins and the job is done. Ball and socket joints at each end of each link make the holes easy to align without placing any strain on the links. No tools are necessary.



Illustration shows the pin being slid into the top link when attaching the link to the plow in the simplified method of attaching any one of the Ferguson implements to the Ford-Ferguson Tractor.



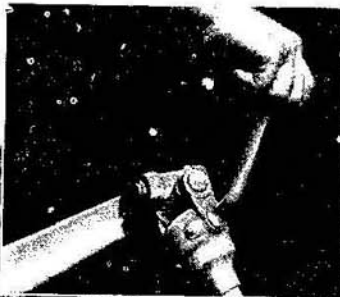
This rear-mounted cultivator attaches to the tractor exactly the same way as the plow. In less than 60 seconds after the operator backs the tractor up to the cultivator he can have it attached—another example of saving time and making farming easier.

EASILY OPERATED LEVELING CRANK

• Turning a crank changes the tilt of the implement. This is done right from the seat. The crank operates a small gear box on top of right lift rod and lengthens or shortens the rod,

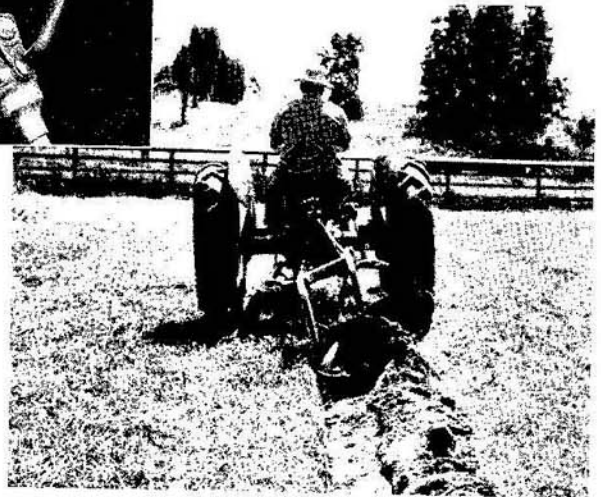
lowering or raising one side of the implement. This makes it easy to adjust plows for headland furrows and to tilt other implements for proper operation under various conditions.

BELOW—Ferguson 7-foot Tiller tilted so that tines next to tree run shallow while others run at normal depth.



LEFT—Easily operated leveling crank is located close to operator.

BELOW—Plow tilted for opening headland furrow.

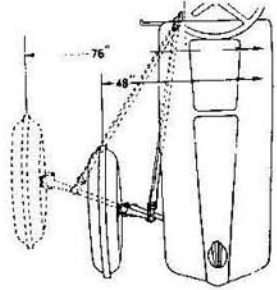


THE FORD - FERGUSON TRACTOR

WHEEL TREADS FROM 48" TO 76" — QUICKLY, EASILY

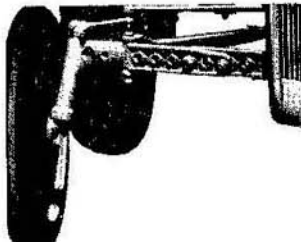
• Fast, easy changes of wheel treads in 4" steps from 48" to 76" makes the Ford-Ferguson Tractor a truly practical row crop tractor with all the advantages of four wheel construction.

One important time saving feature in changing treads is that no adjustment of steering linkage is required when front tread is changed. Diagram shows why. The axle ends move rearward as they are extended—distances between points where ends of radius rods and drag links are attached remain constant. Therefore wheel alignment always remains correct regardless of tread setting. This also makes possible offset front wheel for special work.



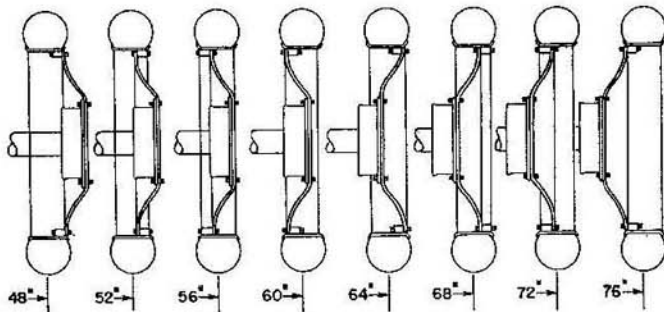
FRONT TREAD

• Center and end sections of the front axle are provided with a series of holes which permit the axle ends to be extended up to 72" in 4" steps. Change from 72" to 76" is made by reversing front wheels so disc is outward.



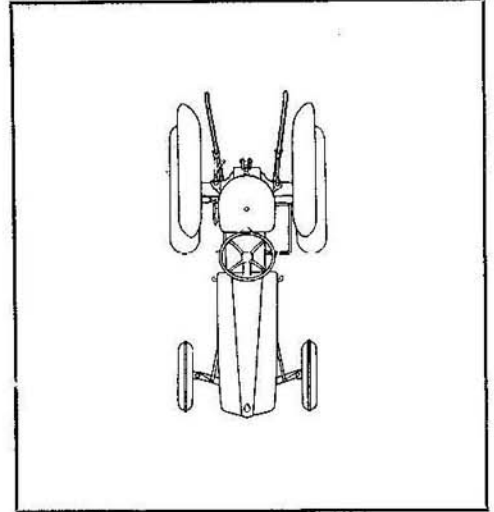
REAR TREAD

• The rear tread is widened by changing the position of the rims on the wheels in combination with changing or reversing the discs of the wheels, as illustrated below. Tread widths are possible from 48" to 76" in 4" steps. Switch wheels, when necessary to permit tire tread to run in right direction.



EIGHT WHEEL WIDTHS IN 4 INCH STEPS

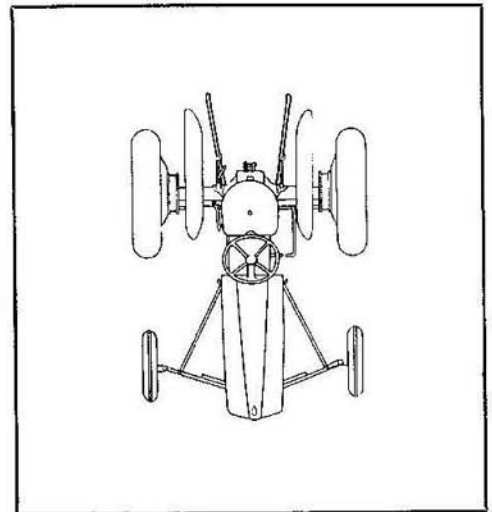
From



NARROW

48" tread (52" rear tread recommended for plowing and general work.)

To

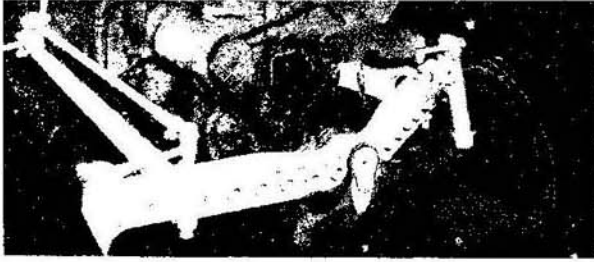


WIDE

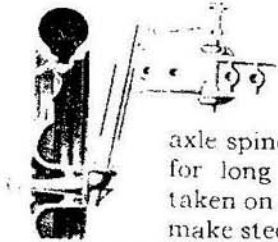
Up to 76" tread for row crop work.

THE FORD - FERGUSON TRACTOR

FRONT AXLE



• The front axle consists of a center section, pivoted directly to the engine, and two axle ends. All three parts are alloy steel, designed for high strength. Axle ends are adjustable on the center section, each being fastened by two bolts. Tubular radius rods extend from the axle ends



to the transmission case to strengthen the axle against thrust forces. Cross section illustration shows the large vertical axle spindle and bushings provided for long wear. Spindle thrust is taken on an anti-friction bearing to make steering easier. Hub spindle is pre-packed for lubrication. Special thrust face seal prevents dust from entering and greases from leaking out.

STEERING

• To reduce steering effort and make the front wheels respond quickly when steering wheel is turned, a bevel pinion and twin bevel sectors are used. Each sector is linked independently to one of the front wheels. To minimize friction, the steering column is mounted on two tapered roller bearings. The 18-in. steering wheel is made of hard rubber with a steel core.



CLUTCH

• This semi-centrifugal clutch has two outstanding advantages. It is capable of transmitting much higher torque than the engine develops, and yet a light pedal pressure is maintained through the use of centrifugal weights.

The clutch is a single plate type and is composed of two major units, the pressure plate and cover assembly and the clutch disc. The pressure plate is arched and triangular shaped so as

to give correct ventilation which is vitally necessary for good clutch operation.

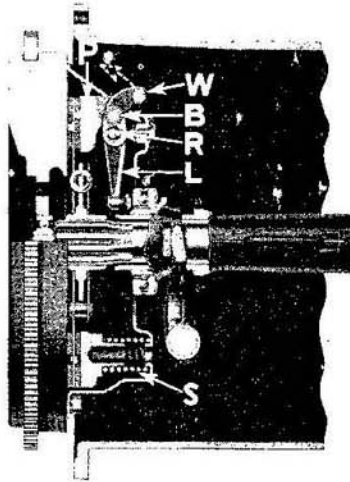
The steel clutch disc has friction facing rings riveted on each side. There are six crimped steel segments interposed between one lining and the disc which give the required amount of cushioning to insure smooth clutch engagement and long life of the friction facing.



A mechanical dampener incorporated in the hub of the driven member serves to insure quiet operation of the transmission and absorbs the shock of sudden clutch engagement.

• In cutaway illustration, *L* is one of the three release levers with weighted outer end *W*. Levers are mounted on pressure plate by needle roller bearings *B* and attached to cover plate by flattened pin and roller *R*. As engine speed increases, centrifugal force causes weighted outer ends of levers to attempt to assume a position in the vertical plane passing through *R*, which increases pressure against the clutch plate *P*. This adds to the pressure exerted by the six clutch springs *S*.

Clutch disc diameter.....	9 inches
Friction area.....	75.3 sq. in.



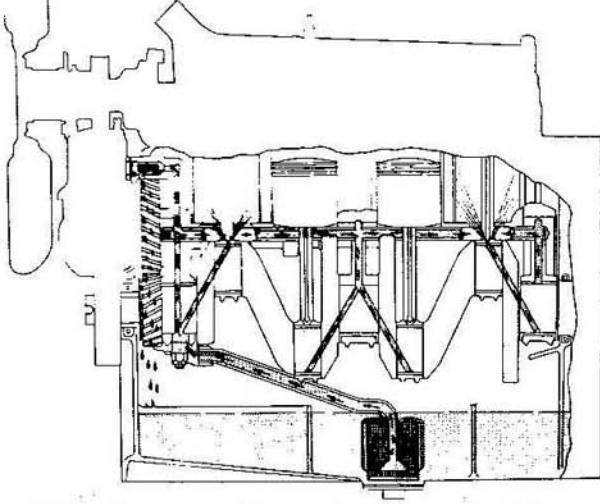
Both the clutch release bearing and pilot bearing are prelubricated type ball bearings and require no further lubrication.

• The clutch pedal works so easily that it can be operated by a small boy or girl. The long pedal provides increased leverage which reduces the pressure required. Clutch pedal and left brake pedal are side by side. The clutch pedal also applies the left brake when it is depressed past the point where clutch is completely disengaged.

No adjustment is required on the clutch other than to maintain a required amount of free travel in the clutch pedal.

THE FORD - FERGUSON TRACTOR

EFFICIENT ENGINE LUBRICATION



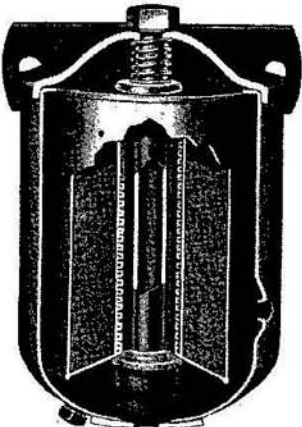
• All main, connecting rod and camshaft bearings are pressure lubricated. A gear type oil pump is driven by a wear-resisting composition gear which meshes with the cast iron gear on the crankshaft. Oil is delivered to the bearings by built-in passageways and holes drilled in the engine casting. These eliminate the conventional tubing. The cross-section illustration shows how the oil is circulated.

Timing gears are continuously lubricated by oil which is by-passed from the pressure regulating valve. A pressure gage is mounted on the instrument panel. Normal oil pressure is 25 pounds at 1400 rpm.

To facilitate cleaning, the oil pump screen is attached to the drain hole nut on the bottom of the oil pan.

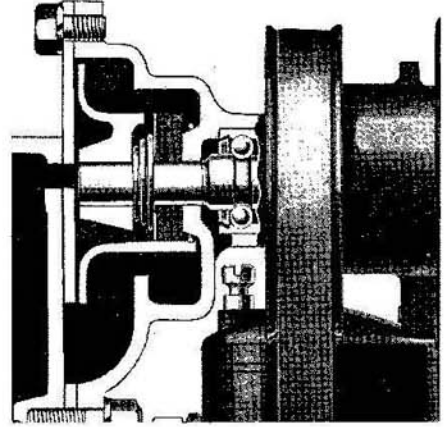
Oil measuring rod on side of crankcase is provided with a gasket to seal against dust. Crankcase oil capacity is 6 quarts.

OIL FILTER



• Cross-section illustration shows oil filter which is a replaceable cartridge type. Filtering abrasives and other foreign substances out of the oil prevents them from getting onto the bearing surfaces of the engine. This reduces wear and increases engine life.

COOLING SYSTEM

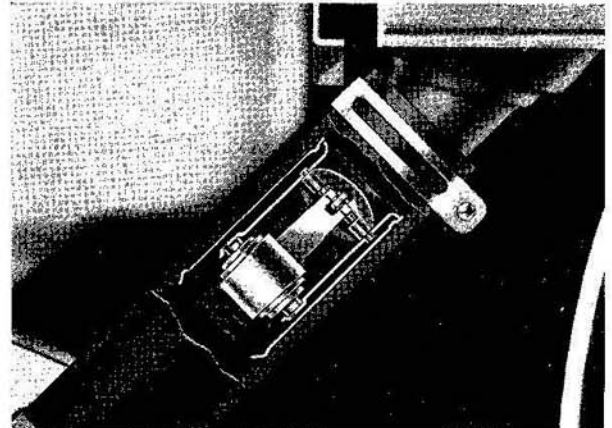


• Water is circulated through the engine and radiator by a centrifugal water pump which is driven by the fan belt. Pump is self-sealing, packless type with shaft mounted on a pre-lubricated, double row ball bearing. By eliminating the conventional, manually tightened packing nut, pump service is minimized. Pumping capacity ranges from 5 gals. per minute at 500 rpm to 25 gals. per minute at 2000 rpm.

Radiator is all copper tube and fin type, mounted on rubber to relieve the core of any twisting strains. Cap. of cooling system is 12 qts.

Air is forced through the radiator by a 16 inch, 6 blade, blower-type fan. This keeps dust and engine heat away from the driver in hot weather. If desired, a suction-type fan can be supplied at extra cost. This type draws air in through the front of the radiator as on an automobile.

THERMOSTAT



Temperature of water in the cooling system is controlled by a thermostat in the upper radiator hose.

THE FORD - FERGUSON TRACTOR

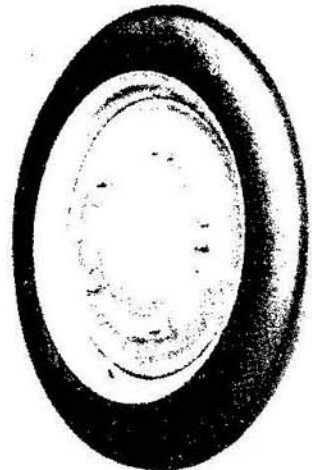
WHEELS AND TIRES

- The rear wheels are pressed steel discs so designed that the tread may be changed by changing the position of the rims on the discs and by reversing the discs on the axle shaft flanges.

Front wheels with drop center are bolted to large diameter flanges cast integral with the hubs.

Because of the way their pressed steel discs are formed, both front and rear wheels possess high strength with comparatively light weight.

Front tires are 4" x 19", single rib type. Rear tires are 10" x 28" with traction tread. Dual rear wheels and tires are available at extra cost.

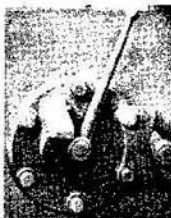
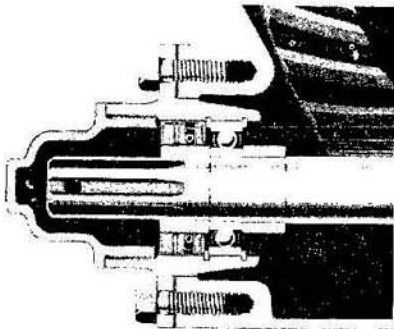


POWER SHAFT

- A power shaft is furnished as standard equipment on the Ford-Ferguson Tractor. In addition to providing a power take off for trailed machinery, this power shaft also drives an easily attached rear-mounted belt pulley. (See Accessories).

Shaft is supported by ball bearings and lubricated by oil from the transmission. An efficient oil seal prevents oil from seeping through the bearing.

Engaging lever for the power shaft is conveniently located on the left side of the tractor below the driver's seat.

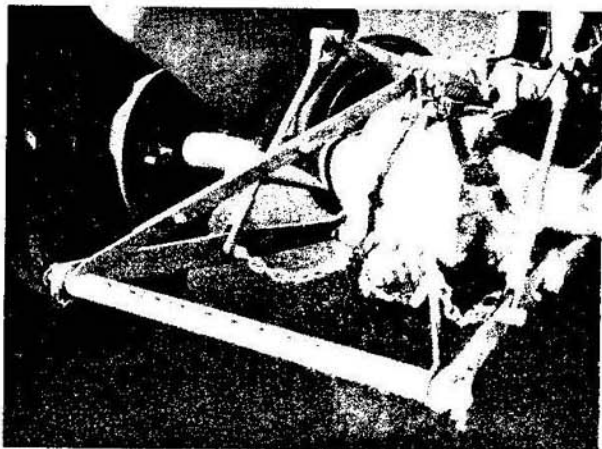
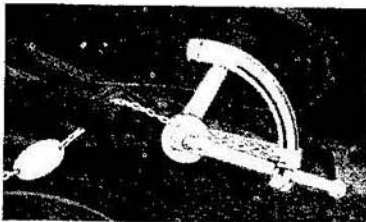


Control lever for engaging Power Shaft.

ADJUSTABLE DRAWBAR

- The drawbar, furnished without extra cost, is supplied with two adjustable braces so it can be set at the most advantageous height for attaching various pull type implements. Farmers who have used tractors will appreciate this feature. A series of holes in the drawbar adapt it for various hitches. Ends of the drawbar fit into the ball and socket joints in the ends of the tension links.

When using the drawbar a safety chain is installed on the quadrant to prevent the operation of the hydraulic lift as is shown.

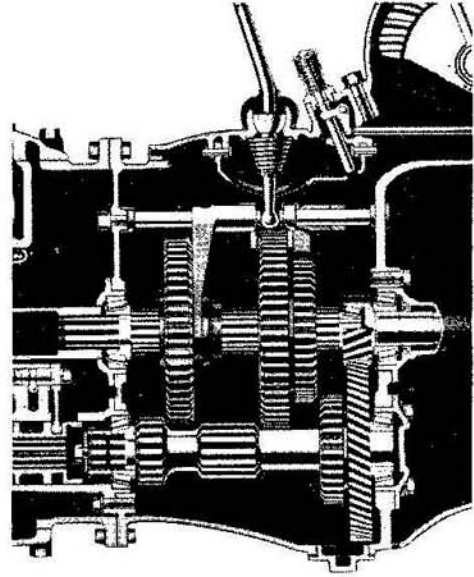


THE FORD - FERGUSON TRACTOR

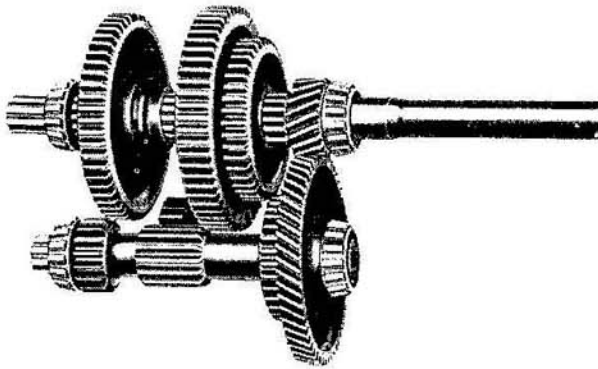
TRANSMISSION

• The Ford-Ferguson Tractor transmission is designed for long, hard service, built to withstand the strain of continuous operation in intermediate gears. Gears are forged alloy steel. The mainshaft is forged from oil-hardening chromium steel. Careful heat treatment provides high strength. The gear teeth are case hardened to obtain an exceptionally hard, wear-resisting surface. Under this hard surface is a strong, tough core to resist shock.

Note that the countershaft, as well as the mainshaft, is mounted on big tapered roller bearings. The use of tapered roller bearings on the countershaft greatly reduces friction and minimizes power loss when the tractor is driven in the intermediate gears.



In cross-section illustration above, the main drive gear has been cut away to show that a tapered roller bearing also is used to support the front of the transmission main shaft.

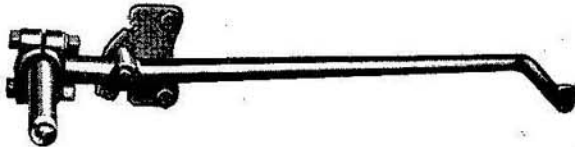
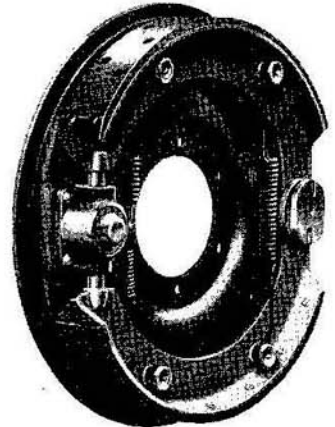


BRAKES

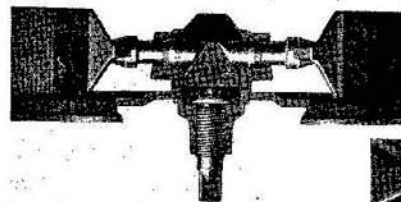
• Big powerful brakes make it easy to stop the tractor with low pedal pressure. Brake drum diameter is 14 inches. Brake shoes are 2 inches wide with total lining area of 186.8 square inches. This exceptionally large lining area means a very low rate of wear so that the average farmer seldom, if ever, has to spend money for new brake lining.

As can be seen in the illustration, brake design is very simple. This is a two-shoe type of brake. Braking force is increased in either direction, an action which reduces the amount of pedal pressure required. The brake shoes are expanded outward against the drum by a cam on the brake cross shaft.

Adjusting the brakes is an easy task and requires only a few minutes time. It is accomplished by turning a single adjusting screw on each backing plate the desired number of notches to compensate for wear.

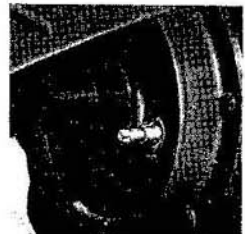


Each of the long brake pedals is provided with a pawl which can be held against a ratchet when the pedal is applied. This will hold the brakes on when the tractor is parked on a grade.



Shown here is the adjusting screw and the wedge which expands the two brake shoes when the screw is

turned clockwise. The wedge floats on the end of the screw so that braking force is transferred from one shoe to the other, depending upon the direction of wheel rotation.



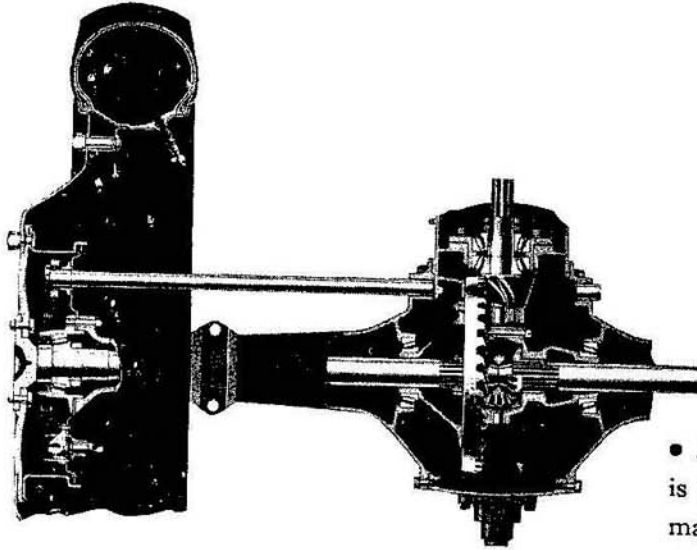
THE FORD - FERGUSON TRACTOR

REAR AXLE

• The massive rear axle is built to handle peak engine power with minimum friction loss. It is semi-quarter floating type with a spiral bevel gear drive. The pinion shaft is straddle-mounted. There are two large tapered roller bearings in front of the pinion and another roller bearing directly in back of the pinion to prevent it from deflecting under severe stress.



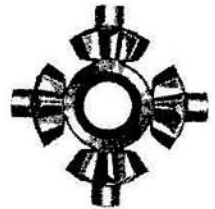
• The differential assembly is supported on two big tapered roller bearings. The ring gear is cut from a forged blank of alloy steel.



In the semi-float type of axle the weight of the tractor is carried by the big diameter axle shaft. This axle shaft is supported by a large tapered roller bearing mounted directly in the axle housing. Axle shaft flanges are made integral with the shafts, eliminating need for splines or keys which would be likely to wear.

PINION

• A four pinion differential is used in place of the customary two pinion type. Since driving force is applied to the axle shafts through the pinions and differential side gears, the use of four pinions reduces tooth pressure on both pinions and gears. Spider pins, the small axle-like projections on each of the four pinions, are center drilled allowing oil to pass through easily and lubricate the ends of the axles.



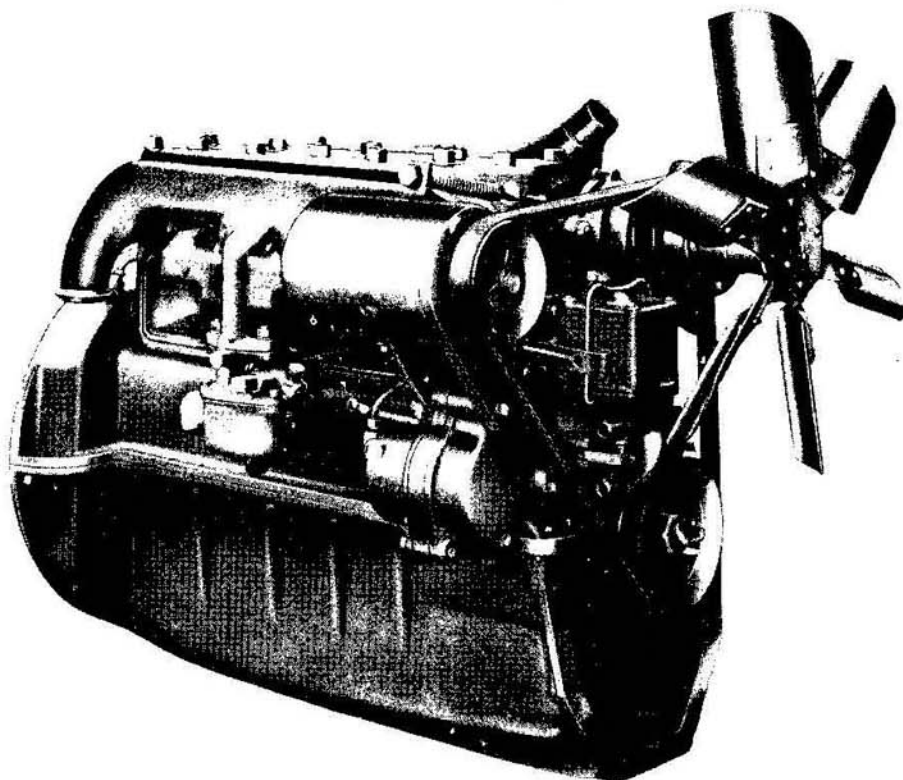
FINAL GEAR REDUCTIONS

Transmission Speeds	Final Gear Reductions	Tractor Speeds	
		at 1500 rpm.	at 2000 rpm.
Low	73.3 to 1	2 ⁵ / ₈ mph.	3 ¹ / ₂ mph.
Intermediate (for plowing) ..	57.0 to 1	3 ¹ / ₂ mph.	4 ⁵ / ₈ mph.
High	24.6 to 1	8 mph.	10 ³ / ₄ mph.
Reverse	68.4 to 1	2 ⁷ / ₈ mph.	

AXLE RATIO 6.66 to 1

THE FORD - FERGUSON TRACTOR

TRACTOR ENGINE



GENERAL SPECIFICATIONS

Bore 3.187 inches

Stroke 3.75 inches

Piston Displacement 119.7 cu. in.

Compression Ratio 6 to 1

Engine Type—4 cylinder L-head

Brake Horsepower 22 at 1500 rpm

Brake Horsepower 28 at 2000 rpm

Torque 84 ft. lb. at 1500 rpm

Load governed at all speeds up to 2200 rpm

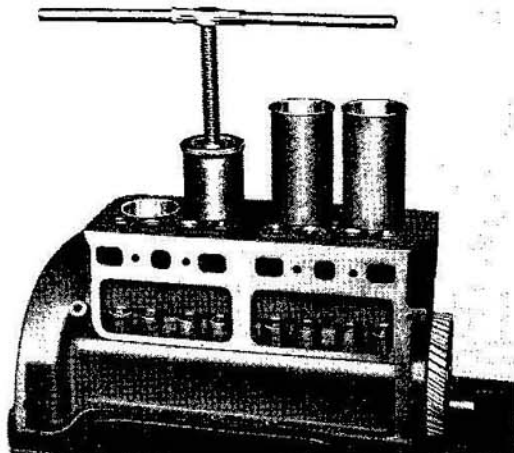
• The tractor engine is built in the Ford Highland Park Plant—a plant noted the world over for its highly developed methods of precision manufacturing. Back of the tractor

engine is the knowledge and experience gained in building millions of Ford car and truck engines. Some of the many quality features of the tractor engine are shown on this and following pages.

ONE-PIECE ENGINE CASTING WITH REMOVABLE CYLINDER LINERS

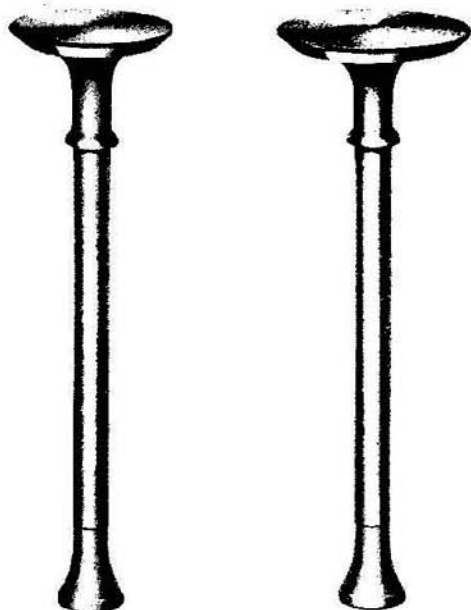
• Conforming to the modern practice originally developed by Ford, the engine casting comprises cylinders, crankcase, flywheel housing, all cast in one piece.

To reduce cylinder wear and increase engine life, liners of hardened steel are used. The cylinder liners are removable and when they become worn, after long service, they can be quickly replaced. This eliminates costly rebor-ing or honing and makes it possible to restore high engine efficiency at low cost to the owner.



THE FORD - FERGUSON TRACTOR

VALVES



• Valves are chrome-nickel alloy steel—a material that withstands corrosion and warping under high exhaust-gas temperatures. Intake valves are of this same costly material that is not affected by the continual pounding action of the valves on their seats. The hardened valve stem ends are enlarged to increase the area in contact with the lifters and thus minimize wear.

SHOCK PROOF VALVE LIFTERS



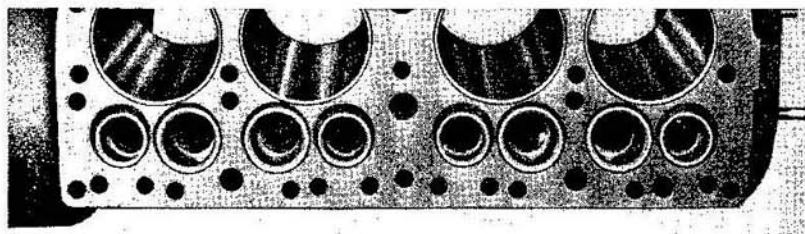
• Because of their design and material, these valve lifters will withstand valve pounding and remain true without cracking or distorting. A single piece head is welded to a base of hard alloy steel. For lightness the lifter is hollow. Being large in diameter, these lifters provide more bearing surface to withstand the side thrust of the cams. This is one of several engine parts that are inspected on machines whose unfailing automatic rejection of parts not meeting the required high standards amazes visitors at the Ford plants.

Valve, Valve Lifter and Timing Specifications

Valve head diameter:

Intake	1.537 inches
Exhaust	1.280 inches
Angle of seat	45 degrees
Diameter of valve stem	0.3105 to 0.3115 inch
Diameter of valve stem end	0.548 inch
Clearance setting	0.0125 to 0.0135 inch
Valve lifter diameter	0.9994 to 0.9996 inch
Valve timing: (Cold at .0100 to .0115 clearance)	
Intake opens	6° before top center
Intake closes	22° after bottom center
Exhaust opens	38° before bottom center
Exhaust closes	6° after top center

TUNGSTEN STEEL VALVE SEAT INSERTS



• Only in the most expensive engines do you ordinarily find valve seat inserts for intake as well as exhaust valves. In the exhaust seats they withstand high temperatures without oxidizing and pitting and retain their hardness. They minimize the need for valve grinding. In the intake seats they also reduce wear. Thus, constant clearance between cam and valve lifter is maintained to assure accurate valve timing throughout long periods of operation.

UNIT VALVE ASSEMBLIES

• To simplify removal and replacement, the valve, valve guide, spring and retainer are assembled as a unit and then installed in the engine. Because of the enlarged valve stem end, the valve guide is made in two halves to permit unit assembly.



THE FORD - FERGUSON TRACTOR

CONNECTING RODS



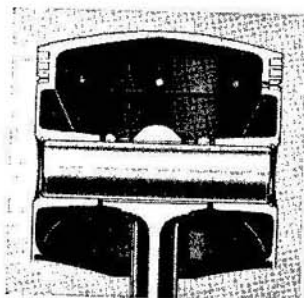
- One feature of Ford connecting rods is that the bolts for the caps are forged integral with the rod. Connecting rod bearings are easy to replace as they are the inserted type with bearing material bonded to a steel backing. Each end of the rod is accurately weighed and they are matched in sets. Piston pin bushings are special bearing bronze.

SPECIFICATIONS

Weight, Rod with Cap	580 grams
Diameter of bearing	2.0935 to 2.0945 inches
Length of bearing	1.120 to 1.130 inches
Diameter of piston pin bushing7503 to .7506 inches
Length of piston pin bushing	1.34 inches

CAST STEEL PISTONS

- A new process was developed by Ford to manufacture steel pistons which are light in weight, strong and wear-resisting. Having approximately the same rate of expansion as the cylinders and sleeves, the pistons can be more closely fitted to reduce oil consumption and increase piston life. Pistons are cadmium plated to prevent scuffing.

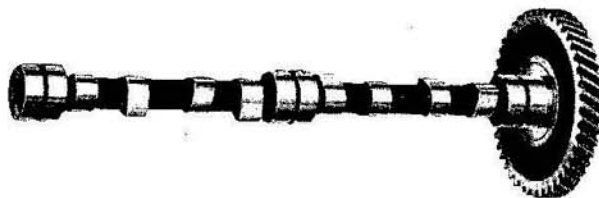


Floating type piston pins have bearing surface in the piston and in the bronze bushing in connecting rod. Each piston is fitted with two compression rings and an oil control ring.

Piston, Pin and Ring Specifications

Weight of piston	360 grams
With pin and rings	482 grams
Piston pin diameter750 inch
Width of compression ring092 inch
Width of oil control ring155 inch

CAST ALLOY IRON CAMSHAFT

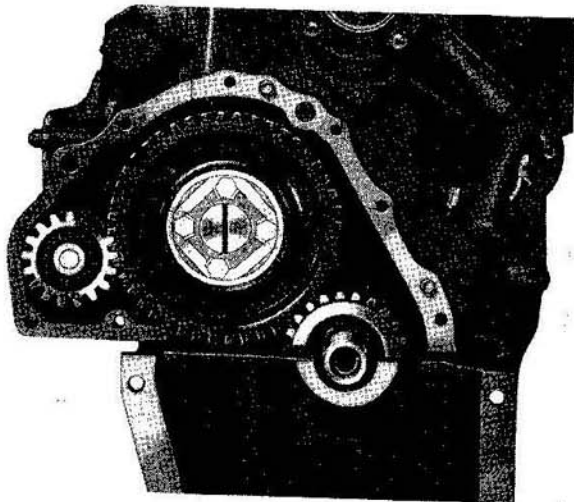


- Made from another Ford developed alloy, camshafts possess cam and bearing surfaces which are exceptionally hard and highly resistant to wear.

SPECIFICATIONS

Camshaft bearing dia.	1.7965 to 1.7970 inches
Bearing length	
Front	1.54 inches
Center	1.48 inches
Rear	1.48 inches

TIMING GEARS



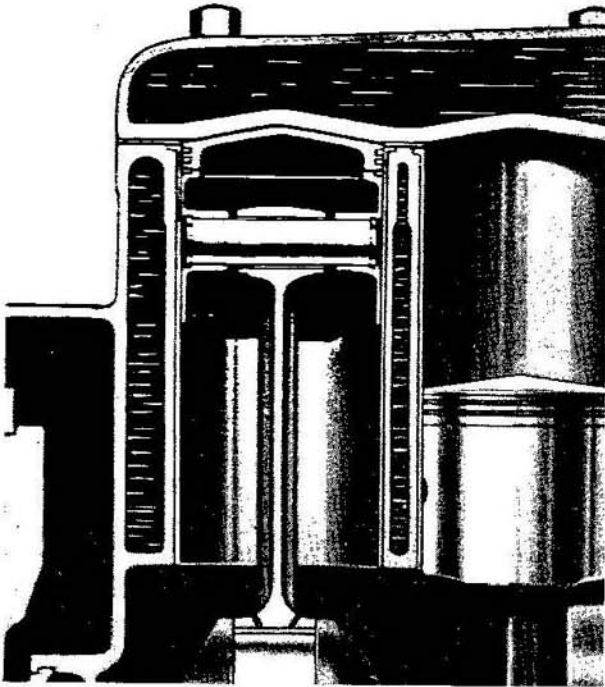
- A cast-iron gear on the crankshaft drives a camshaft gear which is made of cast aluminum.

Timing gears are continuously supplied with oil, by-passed from the pressure regulating valve.

The cast-iron gear to the left of the camshaft gear drives the governor.

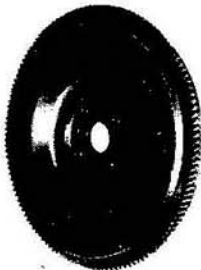
THE FORD - FERGUSON TRACTOR

FULL-LENGTH WATER JACKETS



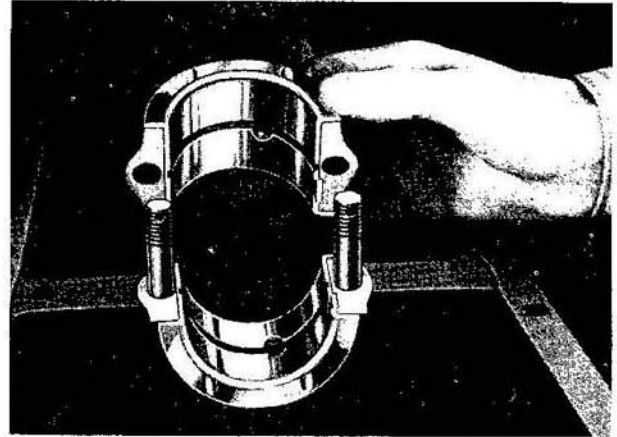
• Water jacketing completely surrounds each cylinder and extends all the way down to the crankcase to insure more even expansion of the cylinders. Ample circulation of water also is provided around the exhaust valves for efficient cooling when the engine is developing maximum power.

STEEL STARTER GEAR ON FLYWHEEL



• To obtain gear teeth of high strength and wear-resistant qualities, a steel starter gear is heated electrically and shrunk onto the flywheel. This reduces the possibility of chipped or broken teeth. The gear fits into a groove machined in the flywheel.

MAIN BEARINGS



• For low replacement cost, the main bearings are removable type with a special anti-friction alloy bonded to a steel backing. New bearings can be installed without removing engine from tractor.

Crankshaft and Main Bearing Specifications

Weight of crankshaft	41 pounds
Diameter of journals	2.25 inches
Diameter of crank pins	2.1 inches
Length of main bearings:	
Front	1.6 inches
Center	1.66 inches
Rear	1.6 inches
Diameter of main bearings	2.25 inches

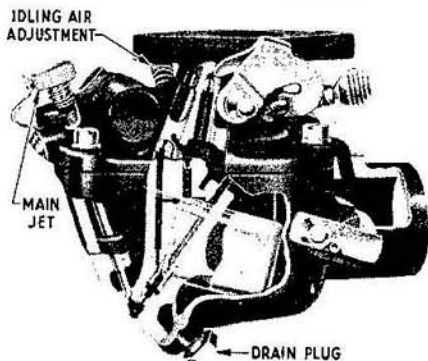
CAST ALLOY STEEL CRANKSHAFT



• A special alloy steel—exceptionally hard and wear-resisting—was developed by Ford metallurgists to increase the rigidity of crankshafts and provide bearing surfaces for the journals and crankpins. Crankshaft is fully counter-balanced by four counter-weights for smooth engine operation. All bearing surfaces are highly polished and crankshaft is accurately balanced within close limit—three-tenths of an ounce inch.

THE FORD - FERGUSON TRACTOR

CARBURETION



- Carburetor is plain tube, up-draft type. It is completely sealed against dust, even to the air intake for idling adjustment. Another feature is that although quite simple in design, it contains all the elements, such as an accelerating well and economizer, which are essential to good carburetion and fuel economy. A main jet adjustment is provided to change the fuel mixture ratio slightly for varying conditions. To prevent incorrect adjustment from causing excessive fuel consumption, a restriction jet limits the maximum amount of fuel used regardless of how far the main jet adjustment screw is opened.

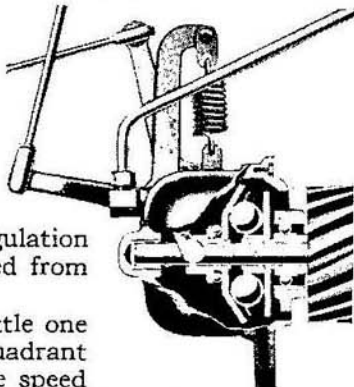
FUEL SYSTEM

- Fuel is carried in a welded steel tank which is formed in the engine hood. It holds 9 gallons plus one gallon in reserve. Sediment and water are filtered out of the fuel. The valve which controls the main and reserve fuel supply is built into the fuel filter casting.



GOVERNOR

- A variable speed, mechanically operated governor, is interconnected with the throttle lever and carburetor which enables the operator to have governed regulation at any desired speed from 800 to 2200 rpm.



Moving the throttle one notch on the quadrant results in an engine speed change of approximately 75 to 80 rpm.

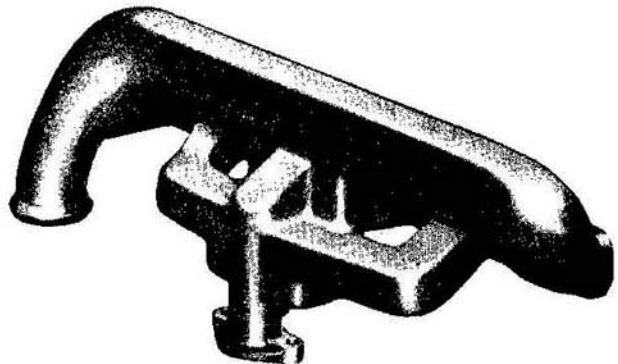
Automatic lubrication and freedom from condensation of crankcase vapors is provided by a constant flow of fresh clean oil returning from the oil filter through the governor housing.

OIL BATH AIR CLEANER

- All air for the sealed intake system must pass through a large oil bath air cleaner, cross-section of which is shown. The pre-cleaner which prevents chaff and leaves from entering the cleaner is included as standard equipment. This cleaner is highly efficient in filtering dust particles out of the air prior to entering the carburetor. It is designed for easy servicing.



INTAKE AND EXHAUST MANIFOLDS



- Intake and exhaust manifolds are cast in one piece and a hot spot is provided for the intake riser to better volatilize the fuel.

MUFFLER



- Exhaust is conducted from the manifold to a muffler of the reverse-flow type and passes out into the air at rear of tractor. The reverse-flow principle utilizes expansion chambers and change of direction of gases, instead of baffles, as a means of reducing back pressure.

THE FORD-FERGUSON TRACTOR

SPECIFICATIONS—FORD-FERGUSON TRACTOR

ENGINE—Four cylinder L-head. Bore 3.187x3.75 stroke. Piston displacement 120 cu. in. Compression ratio—6 to 1. Removable cylinder liners. Steel valve inserts for both intake and exhaust ports. Full floating piston pins. Fully counterbalanced cast alloy steel crankshaft. Replaceable shell type main and connecting rod bearings.

HORSEPOWER—Maximum belt hp—23.87. Rated belt hp (85% of maximum) 20.29.

DRAWBAR CAPACITY—2—14" plows with Ferguson hydraulically operated implements. Maximum drawbar without Ferguson hydraulic system of control—16.90 hp. Rated drawbar hp (75% of maximum) 12.68.

GOVERNOR—Variable speed, mechanically operated, centrifugal type. Lubricated by direct line from oil filter. Governor regulation from 400 to 2000 rpm.

LUBRICATION—By gear pump supplying direct pressure oiling to crankshaft, camshaft and connecting rod bearings, also to timing gears. Crankcase oil capacity—6 quarts. Pressure gauge on instrument panel.

OIL FILTER—Replaceable cartridge type of large capacity.

IGNITION—Direct-driven distributor in unit with coil in water-proof housing. Fully automatic spark advance. Standard 14 m.m. spark plugs.

GENERATOR—6-volt type with third brush control.

STARTER—6-volt conventional type automobile starter. Safety starter switch mechanically interlocked with gear shift lever.

BATTERY—6-volt—85 ampere-hour capacity. 13 high plates.

COOLING—Pump circulation of water through tube and fin type of radiator. Fan—6-blade 16" driven by belt. Pump is packless type with pre-lubricated bearings. Cooling system capacity—12 U.S. quarts. Thermostat temperature control.

FUEL SUPPLY—Welded steel tank carried in engine hood, capacity 10 gallons. By means of a two-way valve on sediment bulb, 1 gallon can be held in reserve for emergencies.

CARBURETOR—Up draft, plain tube type of sturdy, dustproof construction. External adjustments for both main and idling jets.

AIR CLEANER—Oil bath type with dust receptacle easily removable for cleaning.

MUFFLER—Reverse-flow type.

CLUTCH—Single dry plate 9" effective diameter. Clutch plate pressure increased by centrifugal force as engine speed is increased.

TRANSMISSION—Extra heavy duty, easy shifting, sliding gear type. Three speeds forward and one reverse. All shifts mounted on tapered roller bearings. Alloy steel gears with case-hardened teeth for wear resistance and quiet operation.

FINAL DRIVE—Spiral bevel gear drive with straddle-mounted pinion 6.66 to 1 ratio. Four pinion differential mounted on tapered roller bearings. Drive axle of the semi-floating type with integral axle shafts and wheel hubs, also mounted on tapered roller bearings.

Transmission Speeds	Final Gear Reduction	Speeds At 1500 RPM
Low.....	73.3 to 1	2 $\frac{3}{8}$ mph
Intermediate (plowing).....	57 to 1	3 $\frac{1}{2}$ mph
High.....	24.6 to 1	8 mph
Reverse.....	68.4 to 1	2 $\frac{1}{8}$ mph

Note: At top governed speed (2000 rpm) the tractor can be operated at 4 $\frac{5}{8}$ mph in low gear, 3 $\frac{1}{2}$ mph in intermediate, and 10 $\frac{3}{4}$ mph in high.

STEERING—Bevel pinion and twin bevel sectors controlling both front wheels independently. Tread of front axle adjustable without disturbing any steering connections. Rubber covered steel steering wheel 18" in diameter.

POWER SHAFT—Extends from rear of axle housing. Has 1.125" spline end. 545 rpm at engine speed of 1500 rpm—2.75 to 1 ratio.

BRAKES—14"x2" internal expanding, two shoe, fully energizing type. One simple accessible adjustment on each brake. Brakes operate independently on each rear wheel controlled by separate pedals to facilitate short turning.

WHEELS—**Front**—Steel disc fitted with 4x19 single rib pneumatic tires on drop center rim, 26 lbs. tire pressure. **Rear**—Steel disc fitted with 10 x 28 traction tread pneumatic tires on drop center rim, 12 lbs. tire pressure.

HYDRAULIC IMPLEMENT CONTROL—Consists of 4-cylinder pump supplying oil under suitable pressure to ram cylinder. Valve has manual and automatic control. Control lever convenient to the operator's right hand gives him instant control of the implement.

DRAWBAR—Adjustable type. Included as standard equipment.

DIMENSIONS—

Normal Tread—Front 48" and rear 52".

Wheelbase—70".

Over-all length—Front tire fin to end of lower link—115"

Front Tread—Adjustable, by means of extending axle ends and reversing front wheel discs to 76" in 4" steps.

Rear Tread—Adjustable, by means of reversible wheel disc and reversible tire rims to 76" in 4" steps.

Over-all width—64" with normal tread.

Over-all height—52".

Ground clearance—21" under axles—13" under center.

Turning Radius—8 ft. with use of brakes.

Shipping Weight—Approximately 2340 lbs.

STANDARD A.S.A.E. POWER TAKE-OFF ADAPTER (Extra Equipment) with safety shield is a self-contained drive unit quickly attached. Has standard A. S. A. E. spline shaft 1.375". Shaft speed of 545 rpm at 1500 rpm engine speed. Engine to shaft ratio—2.75 to 1.

BELT PULLEY POWER TAKE-OFF ADAPTER (Extra Equipment)—Carried by self-contained drive unit quickly attachable to rear of tractor. Pulley diameter—9"; width—6.5". Speed 1352 rpm, belt speed 3190 ft. per minute at 2000 rpm engine speed. Pulley gear ratio to power take-off shaft—1.86. Rotates in either direction.

The Ford Motor Company, whose policy is one of continuous improvement, reserves the right to change specifications, design or prices without incurring obligation.