FORD

2000
3000
4000
5000

ALL PURPOSE and LCG

PLAINTIFF'S EXHIBIT

FD-2236a

OPERATOR'S MANUAL

Reprinted

foreword

This manual has been prepared to assist you in the proper break-in, daily care, and operation of your new Ford Tractor. It also contains specific information on the many built-in features of the tractor, the accessories and options that are available, general specifications of the tractor, safety precautions, instructions for making minor adjustments, and your tractor service policy.

Although every tractor is carefully inspected before leaving the factory and also by your Ford Tractor-Equipment Dealer, prior to delivery, it is important to follow regularly scheduled service periods as recommended in this manual.

The information in this manual applies to the Ford 2000, 3000, 4000, and 5000 All Purpose Tractors, and to the Ford 2110 and 4110 LCG Tractors. Where differences exist, specific information is presented for each model.

Read this manual carefully before operating your tractor, and keep it in a convenient location for later reference. If, at any time, you have a service problem concerning your new tractor, remember that your Ford Tractor-Equipment Dealer has factory-trained service personnel, Genuine Ford Parts, and the necessary tools and equipment to best satisfy your service needs.

FORD TRACTOR OPERATIONS

FORD MOTOR COMPANY

ISSUED TO:	ISSUED BY:
OWNER'S NAME	FORD TRACTOR-EQUIPMENT DEALER
MAILING ADDRESS	CITY
CITY	STATE — ZIP CODE
STATE — ZIP CODE	DELIVERY DATE

PLEASE READ CAREFULLY:

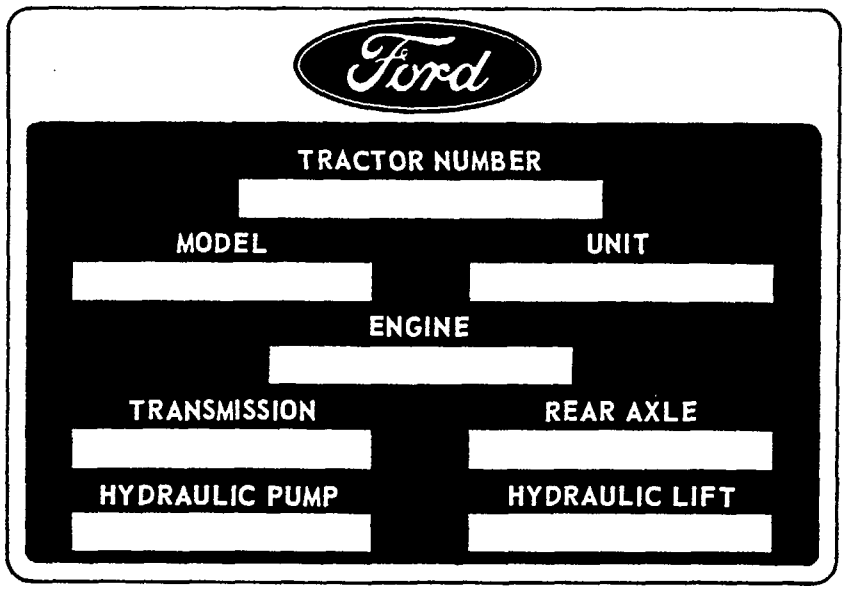
The TRACTOR SERVICE POLICY on page ii is your assurance that your Ford Tractor-Equipment Dealer has properly inspected and prepared your new tractor for delivery. Because the policy must be used whenever you request authorized service, we recommend that you keep this manual in a safe, convenient place.

The WARRANTY on page iii explains the coverage which is extended to your tractor during the warranty period. After you read the warranty ask your dealer to explain any points which you do not understand.

For a complete list of the pre-delivery service checks performed by your dealer, refer to the PRE-DELIVERY Service Report on the upper portion of pages 85 and 87. The copy on page 85 is your record of the service performed, and the copy on page 87, which is to be removed from the manual, is your dealer's record. MAKE SURE THAT YOU AND THE DEALER SIGN BOTH COPIES.

After you have operated your tractor for fifty hours, take this manual and your tractor to your dealer. He will then perform the factory recommended 50-HOUR SERVICE as listed on the lower portion of pages 85 and 87 — without charge — except for lubricants, hydraulic oil, or filters replaced as part of normal maintenance. MAKE SURE THAT YOU AND THE DEALER SIGN BOTH COPIES.

A VEHICLE IDENTIFICATION PLATE is located on the inside of the right-hand hood panel. The numbers on the plate are important should your tractor require future service. For your convenience, have your dealer record the numbers in the appropriate space below.



AUTHORIZED TRACTOR-EQUIPMENT DEALER'S





Service Policy

PROPER CARE OF YOUR TRACTOR

Your new Ford has been properly inspected and prepared for delivery in the manner recommended by Ford Motor Company. Continued efficiency as well as economy in operation, however, depends upon the care received. Systematic attention to lubrication, regular inspection, and necessary mechanical adjustments by a Ford Tractor-Equipment Dealer, usually will result in greater satisfaction to you.

INSTALLATION OF PARTS FURNISHED UNDER WARRANTY

Should the replacement of any part become necessary under the warranty, the selling dealer will make the replacement without any charge for the part or for the labor required to replace the part.

If you move to another location during the duration of the warranty period, the warranty service to which you are entitled under this policy will be performed by the nearest authorized Ford Tractor-Equipment Dealer without charge for material or labor when the tractor is brought into his shop. In order to obtain this service, you must present this policy to the servicing dealer before the warranty period expires.

AFTER THE WARRANTY PERIOD HAS ELAPSED

The selling dealer will at any time inspect your tractor using factory-recommended equipment, and the experience of trained mechanics and service analysts. We will advise you concerning the most economical and efficient maintenance procedures. Any repair or maintenance operations authorized by you will be charged for at our regular prices for such work.





Warranty

FORD MOTOR COMPANY warrants to the owner each part of this Ford Tractor and/or Ford Implement or Ford Equipment to be free, under normal use and service, from defects in material and workmanship for a period of six months from the date of sale to the original retail purchaser. This warranty shall be fulfilled by the Dealer (or, if the owner of the tractor is traveling or has become a resident of a different locality, by any authorized Ford Tractor-Equipment Dealer) by replacing or repairing at his place of business, free of charge including related labor, any such defective part.

This warranty shall not apply to (1.) vendor-warranted items such as tires and tubes, (2.) to normal maintenance services (such as engine tune-up, fuel system cleaning and wheel, brake and clutch adjustments), or (3.) to normal replacement of service items (such as filters, spark plugs, ignition points, brake or clutch linings), or (4.) to deterioration of belts and exterior finish due to normal use or exposure, or (5.) to parts of any tractor or equipment that has been subject to negligence, alteration or accident, or which has been used with parts or equipment not made or supplied by FORD MOTOR COMPANY if, in the reasonable judgement of the Company and/or its authorized Dealers, such use affects its performance or reliability, or (6.) to parts of any tractor that have been altered or repaired outside of the Dealer's place of business in a manner so as in the reasonable judgement of the Company to affect its performance or reliability.

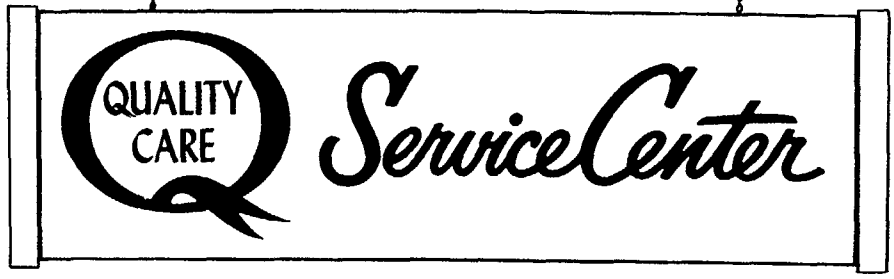
This warranty is expressly IN LIEU OF any other express or implied warranty, including any implied WARRANTY OF MERCHANTABILITY or FITNESS and of any other obligation on the part of the Company and/or its authorized Dealers.

FORD MOTOR COMPANY reserves the right to make changes in its products at any time and without prior notice. When such changes are made, neither FORD MOTOR COMPANY or its Dealers assume any obligation to make these changes in products previously manufactured.

This warranty covers Ford Tractors and Equipment sold for use within the continental boundaries of the United States only.

whatever your service needs...
whatever your parts or accessories
requirements...your Ford Tractor-
Equipment Dealer is equipped
to serve you better...for less!

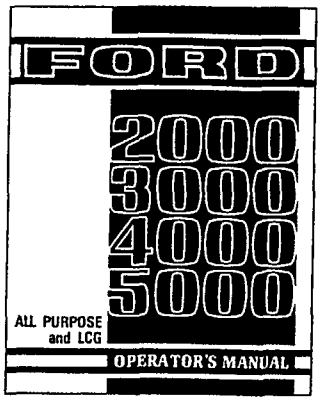
When you see this "sign of service" it means that your Ford Tractor—Equipment Dealer is prepared to give you top quality service for your tractor and implements. Whether it's in the shop or emergency service in the field, he's using factory approved methods to keep your equipment in top operating condition . . . to keep you "on the go."



Genuine Ford Tractor and Equipment parts are made better . . . to fit better . . . to last longer. Because they are designed specifically for Ford Equipment these parts will give you top value in long, dependable service. Always insist on genuine Ford parts for dependability.



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safety precautions

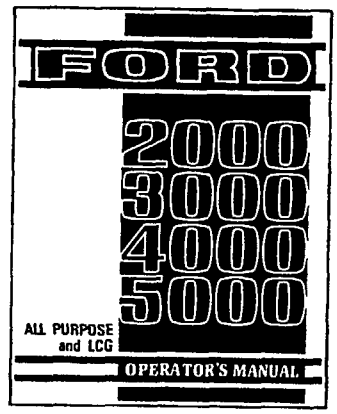
The following precautions are suggested to help prevent accidents.



1. Do not permit anyone to ride on the tractor with the operator.
2. Always shut off the engine before getting off the tractor.
3. The operator should never get off the tractor when the tractor is in motion.
4. Use care when operating on steep grades to maintain proper stability.
5. Always drive the tractor at speeds compatible with safety, especially when operating over rough ground, near ditches, or turning.
6. Keep the tractor in gear when going downhill.
7. When operating P.T.O.-driven equipment, always shut off the engine and wait for the P.T.O. to stop before disconnecting the equipment.
8. Make sure the parking brakes are set when parking the tractor and place the Select-O-Speed selector lever in the park (P) position. Lock the parking brake when the drive line disengagement lever is in the disconnect position.
9. Always keep the tractor brakes in proper operating condition.
10. Never run the tractor engine in a closed building without adequate ventilation, as fumes from the exhaust system are very dangerous.
11. Never install or remove a belt while the belt pulley is in motion.
12. Never wear loose clothing when operating the power take-off, or around equipment being driven by the P.T.O.
13. Always use the standard drawbar for pull-type work. Pulling from the upper link or rear axle is extremely dangerous.
14. If the front end tends to rise, check for proper weight distribution.
15. Always make sure the engine is shut off and the P.T.O. drive disengaged before cleaning or adjusting P.T.O.-driven equipment.
16. Never leave equipment in the raised position.
17. If the tractor is stuck, always attempt to back out. If logs are used, always put them behind the rear wheels and back out.
18. Never try to start the engine while standing beside the tractor. Start the engine only while sitting in the tractor seat.
19. Do not bypass the safety starter switch with "homemade" wiring. Consult your Ford Tractor-Equipment Dealer if your safety starter controls are malfunctioning.
20. Always install the P.T.O. shield when using P.T.O.-driven equipment.



controls and instruments



Before attempting to start or operate your new tractor, familiarize yourself with the location and function of all controls and instruments as described on the following pages.

The instruments and warning lights are centrally located so that you can tell at a glance whether the tractor is operating properly. The warning lights also warn you of possible trouble before it becomes serious.



Know your controls and instruments to assure Safe Operation.

SEAT, LIGHT, AND ENGINE CONTROLS

TRACTOR SEAT

Your new Ford Tractor is equipped with either a pan seat, Figure 1, or deluxe contoured seat, Figure 2.

Pan Seat: If the seat is not in the most comfortable position, it can be moved closer to, or farther from, the steering wheel by removing the attaching nuts, Figure 1, and repositioning the seat as desired. The seat can also be tilted back, permitting you to stand.

Deluxe Contoured Seat: If the seat is not in the most comfortable position, it can be moved closer to, or farther from, the steering wheel by loosening the attaching nuts. The seat can also be tilted back, permitting you to stand. Tilt the seat back when not in use to help protect it from the weather.

Flotation of the seat can be adjusted to accommodate your individual weight. Adjustment is made by turning the crank, Figure 2, until the indicators align when you are in the seat. If softer or stiffer flotation is desired, turn the crank accordingly.

FLASHING SAFETY LAMP

The flashing safety lamp is located on top of the left rear fender and is shown in Figure 3. The spring-loaded push-type switch on the lamp housing is used to turn the flasher on or off. The light switch, Figure 4, must be in its intermediate or full out position before the flasher will operate.

For your protection, use the flashing safety lamp when traveling on public roads, day or night, unless prohibited by law in your state.

LIGHT SWITCH

The light switch is located on the right side of the dash panel and is shown in Figure 4. The switch is a push-pull type switch. Its positions are:

- Full in ..... Off
- Intermediate ..... Instrument lights, tail lamp, flashing safety lamp, and accessory lights
- Full out ... Headlamps, tail lamp, flashing safety lamp, instrument lights, and accessory lights

KEY-STARTER SWITCH

The key-starter switch is located on the left side of the dash panel and is shown in Figure 4. Turning the key clockwise to the "ON" position will energize the warning light circuit, thereby activating the instruments. Turning the key further clockwise will activate the starting motor. Upon release, the key will automatically return to the "ON" position; it must then be turned counterclockwise to the "OFF" position to deactivate the instruments and stop the engine. On diesel tractors, the diesel engine stop control must also be pulled out to stop the engine.

The starting motor can only be used when the transmission shift lever is in Neutral, Park (P) on Select-O-Speed tractors. Refer to page 14 for complete starting instructions.

DIESEL ENGINE STOP CONTROL

The diesel engine stop control is located directly above the light switch on the right side of the dash panel, Figure 4. The control is used in conjunction with the key-starter switch to stop and start the engine. The control must be pushed in before the engine will start. The control must be pulled out to stop the engine. The key-starter switch should then be turned to the "OFF" position.

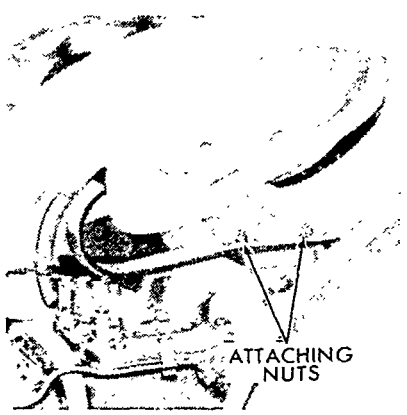


Figure 1
Pan Seat

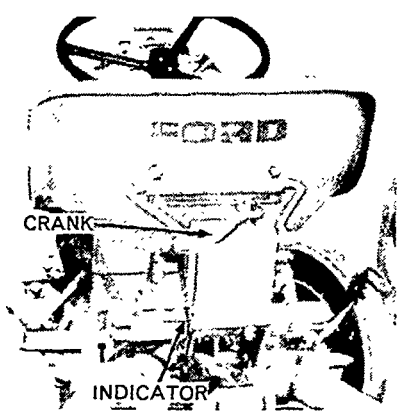


Figure 2
Deluxe Contoured Seat

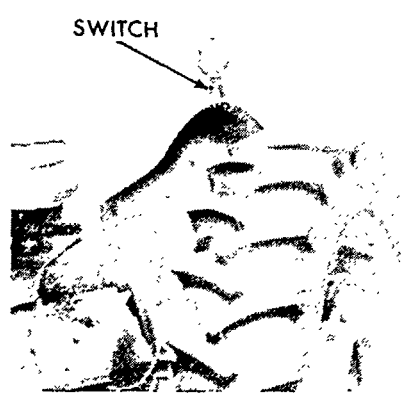


Figure 3
Flashing Safety Lamp

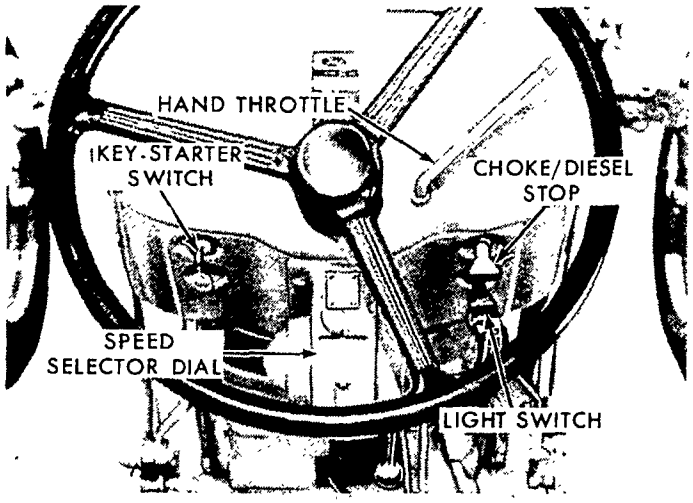


Figure 4
Engine Controls

GASOLINE ENGINE CHOKE CONTROL

The gasoline engine choke control is located directly above the light switch on the right side of the dash panel, Figure 4. The control is used to "choke" the engine for easier starting during cold weather. Maximum choking occurs when the control is pulled all the way out. Refer to "Cold Weather Starting" on page 14 for use of the choke.

HAND THROTTLE

The hand throttle is located under the right edge of the steering wheel and is shown in Figure 4. Pull the throttle rearward to increase engine rpm. Push the throttle forward to decrease engine rpm.

FOOT THROTTLE

Ford 2110 and 4110

The foot throttle is located at the right-hand platform and is shown in Figure 5. The throttle can be operated independently of, or in conjunction with, the hand throttle throughout the full engine speed range. With the hand throttle set at a selected engine rpm, the foot throttle can be used to increase engine rpm up to the maximum engine speed. On release of the foot throttle, the engine speed will return to the rpm determined by the hand throttle.



Figure 5
Foot Throttle — Ford 2110 and 4110

FUEL GAUGE

The fuel gauge is located in the left side of the instrument cluster, Figure 6. The relationship of the needle to the quarter marks on the gauge indicates the amount of fuel in the tank.

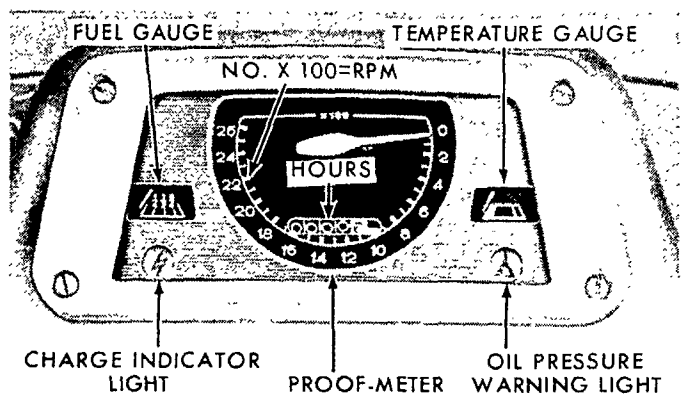


Figure 6
Instrument Cluster

TEMPERATURE GAUGE

The engine coolant temperature gauge is located in the right side of the instrument cluster, Figure 6. When the needle is between the blue (cold) and red (hot) marks the engine coolant is at its normal operating temperature.

ENGINE OIL PRESSURE WARNING LIGHT

The engine oil pressure warning light is located directly below the temperature gauge in the right side of the instrument cluster, Figure 6. When the key-starter switch is turned "ON," the oil pressure warning light should come on, indicating that the light is functioning. When the engine is running, the light should go out as engine speed is increased. If the light does not go out, immediately stop the engine and investigate the cause. It is important to remember that this light indicates only oil pressure. The operator must still check the crankcase for proper oil level.

CHARGE INDICATOR LIGHT

The charge indicator light is located directly below the fuel gauge in the left side of the instrument cluster, Figure 6. When the key-starter switch is turned "ON," the charge indicator light should come on, indicating that the light is functioning. When the engine is running, the light should go out as engine speed is increased. If the light remains on when the engine is running above idle speed, it is an indication that the generator is not charging the battery. This should be investigated as soon as possible, otherwise the battery may become fully discharged.

PROOF-METER

The Proof-Meter is the large instrument in the center of the instrument cluster, Figure 6. The Proof-Meter indicates:

- The hours and portions of hours your tractor has operated, based on an average engine speed of 1666 rpm. Engine speeds below 1666 rpm accumulate hours at a slower rate than clock hours. Engine speeds above 1666 rpm build up hours faster than clock hours. Use the Proof-Meter as a guide to determine hourly service and maintenance intervals.
- The engine revolutions per minute. Use the Proof-Meter in conjunction with the transmission shift decal to determine the tractor ground speed. The Proof-Meter also is helpful when operating P.T.O. equipment. Additional P.T.O. and ground speed information can be found on pages 18 and 23.

DIESEL ENGINE EXCESS FUEL BUTTON

In-Line Injection Pump

The excess fuel button is located on the fuel injection pump of Ford 3000 and 5000 Tractors equipped with the In-Line type pump, Figure 7. The button should be pushed in before starting the engine at temperatures below 40° F. Refer to "Cold Weather Starting" on page 14 for use of the button.

FUEL SHUT-OFF VALVE

The fuel shut-off valve is located on the right side of the tractor under the fuel tank, Figure 8. Turning the valve clockwise will stop the flow of fuel from the tank.

BRAKE AND REAR AXLE CONTROLS

BRAKE PEDALS

The brake pedals, shown in Figure 9, are provided on the right side of the tractor. To brake one wheel independently of the other, depress the left pedal for left wheel braking, and the right pedal for right wheel braking. Depress both brake pedals simultaneously to brake both rear wheels and stop the tractor.

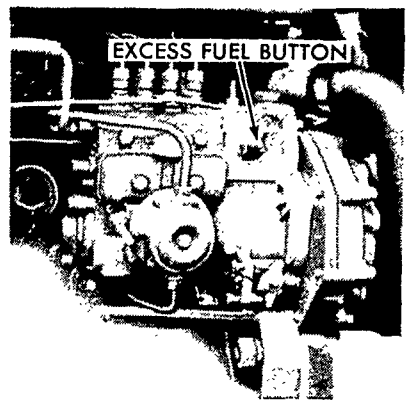


Figure 7
Excess Fuel Button — In-Line Injection Pump

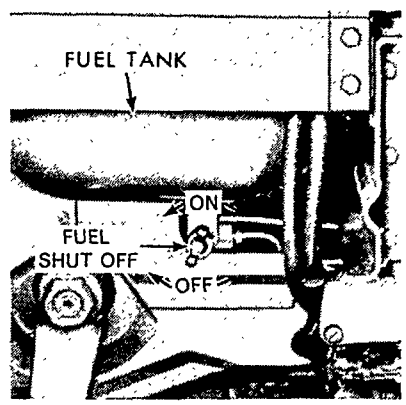


Figure 8
Fuel Shut-Off Valve

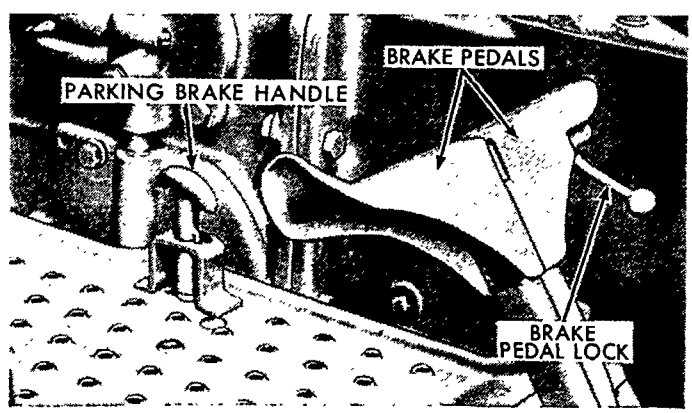


Figure 9
Brake Controls

To assist in making sharp turns at slow-to-moderate speeds, depress the right or left brake pedal as required.



CAUTION: *When operating the tractor at high speeds, never attempt to make sharp turns by using the brakes.*

BRAKE PEDAL LOCK

The brake pedal lock, shown in Figure 9, is used for locking the brake pedals together. It is recommended that the brake pedals be locked together when the tractor is operated at high speeds or at any time the tractor is used on the highway.

PARKING BRAKE HANDLE

The parking brake handle, shown in Figure 9, is used for locking the brake pedals in the applied position. The parking brake should be applied whenever the tractor is parked.

To apply the brake:

- Lock the brake pedals together with the brake pedal lock.
- Pull up on the parking brake handle and turn it ¼ turn.
- Depress both brake pedals. A ratchet mechanism under the platform will hold the pedals in the applied position.

To release the parking brake:

- Turn the handle ¼ turn so the tabs will enter the slot in the handle guide.
- Depress the brake pedals to release the ratchet.
- Unlock the brake pedals.

DIFFERENTIAL LOCK PEDAL

The differential lock pedal, shown in Figures 10 and 11, provides a means of locking the rear axle shafts together, providing for additional traction in wet or loose soil. Refer to page 25 for differential lock operating instructions.

SELECT-O-SPEED TRANSMISSION AND P.T.O. CONTROLS

SELECT-O-SPEED GEAR SELECTOR LEVER

The Select-O-Speed gear selector lever, shown in Figure 12, is used for selecting ten forward speeds (indicated by numerals 1 to 10), two reverse speeds (R_1 and R_2), a park (P), and a neutral position (N). The selector dial is illuminated when the key-starter switch is turned on. Refer to "Operating Select-O-Speed Tractors and P.T.O." on page 16 for additional gear selector lever operating information.

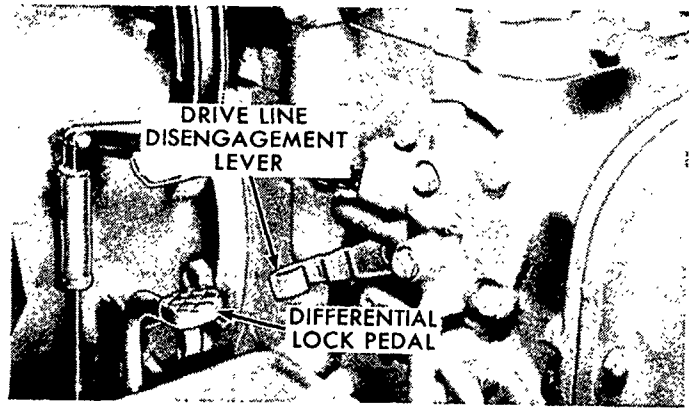


Figure 10
Rear Axle Controls — Ford 2000, 2110, 3000, 4000, and 4110 (Ford 4000 Shown)

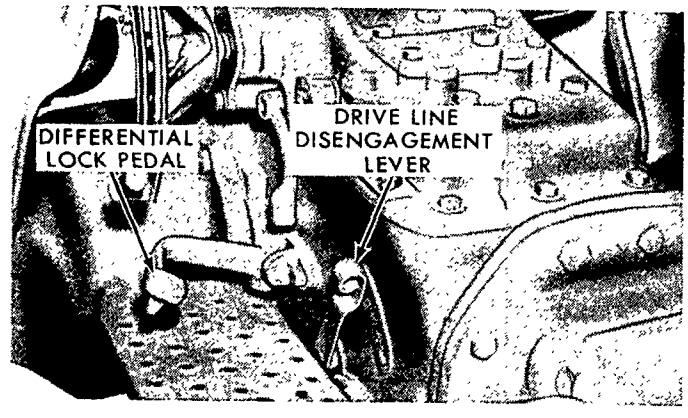


Figure 11
Rear Axle Controls — Ford 5000

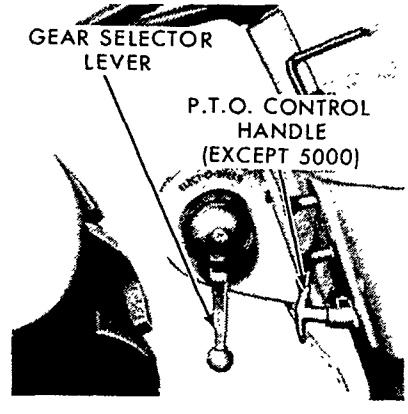


Figure 12
Select-O-Speed Controls

SELECT-O-SPEED INCHING PEDAL

The Select-O-Speed inching pedal, shown in Figure 13, provides for quick disengagement of power to the rear wheels, and permits you to ease the tractor into equipment for easy attachment. Always depress the pedal when starting the tractor, then ease it up to get the tractor moving. Refer to "Operating Select-O-Speed Tractors and P.T.O." on page 16 for additional inching pedal operating information.

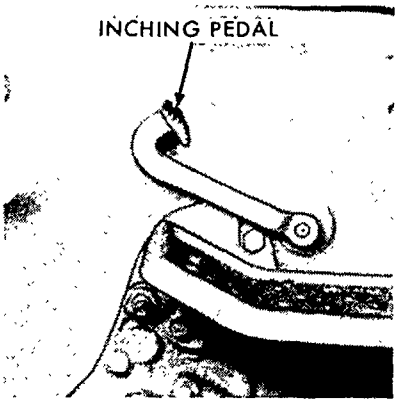


Figure 13
Select-O-Speed Inching Pedal

SELECT-O-SPEED INDEPENDENT P.T.O. CONTROL HANDLE/LEVER

Ford 2110, 3000, 4000, and 4110: The Select-O-Speed P.T.O. control handle, shown in Figure 12, is used to engage and disengage the P.T.O. on Ford 2110, 3000, 4000, and 4110 Tractors. To engage the P.T.O., pull the handle all the way out. To disengage the P.T.O., push the handle all the way in.

If your tractor is equipped with the Deluxe Select-O-Speed transmission, the ground speed P.T.O. shift lever, Figure 14, must be in the "OFF" position before the P.T.O. control handle can be moved. Refer to "Select-O-Speed Independent P.T.O. Operation" on page 19 for detailed operating instructions.

IMPORTANT: *Make sure the P.T.O. control handle is always fully in or fully out to prevent excessive wear to the P.T.O. clutch.*

Ford 5000: The Select-O-Speed P.T.O. control lever, shown in Figure 15, is used to engage and disengage the P.T.O. on Ford 5000 Tractors. To engage the P.T.O., move the lever sharply rearward. To disengage the P.T.O., move the lever sharply forward. Refer to "Select-O-Speed Independent P.T.O. Operation" on page 19 for detailed operating instructions.

IMPORTANT: *Make sure the P.T.O. control lever is always fully rearward or fully forward to prevent excessive wear to the P.T.O. clutch.*

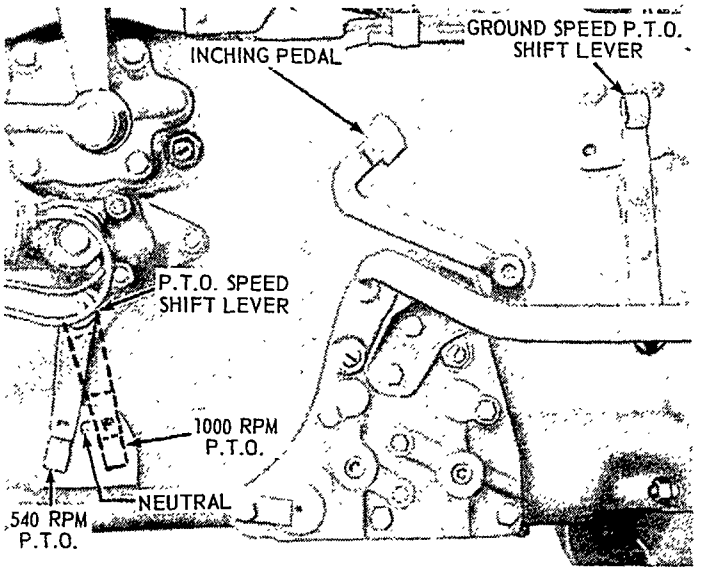


Figure 14
Deluxe Select-O-Speed Controls

DELUXE SELECT-O-SPEED P.T.O. SPEED SHIFT LEVER

Ford 3000, 4000, and 4110

When the P.T.O. is not in use, the P.T.O. speed shift lever, shown in Figure 14, should be in the neutral position. When operating 540 rpm P.T.O. equipment, move the lever forward. When operating 1000 rpm P.T.O. equipment, move the lever rearward. Never move the lever when the tractor engine is running. Also, when operating the Deluxe Select-O-Speed P.T.O., make sure the correct P.T.O. shaft is used as outlined on page 18, "P.T.O. Shafts."

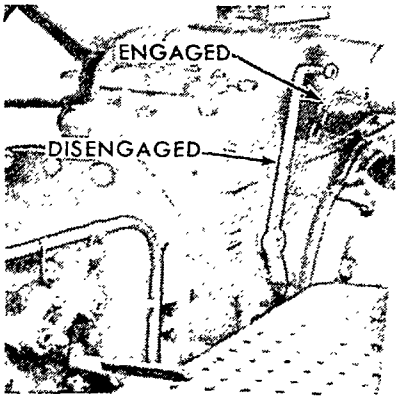


Figure 15
Independent P.T.O. Control Lever — Ford 5000

DELUXE SELECT-O-SPEED GROUND SPEED P.T.O. SHIFT LEVER

Ford 3000, 4000, and 4110

The ground speed P.T.O. shift lever, shown in Figure 14, permits the operating speed of P.T.O. equipment to be in direct proportion to forward travel, regardless of tractor engine speed. To operate in ground drive P.T.O., move the lever forward to the "ON" position. Make sure the P.T.O. control handle, Figure 12, is pushed all the way in, otherwise the ground speed P.T.O. shift lever cannot be moved. Refer to page 20 for additional ground speed P.T.O. information.

IMPORTANT: *Do not move the ground speed P.T.O. shift lever while the tractor is in motion. Also, before backing the tractor, the lever must be moved to the "OFF" position. Failure to do this may result in serious damage to the equipment.*

SELECT-O-SPEED DRIVE LINE DISENGAGEMENT LEVER

Because the Select-O-Speed transmission automatically "locks up" whenever the engine is not running, the tractor cannot be towed or pushed unless the drive line disengagement lever, shown in Figures 10 and 11, is moved:

- Up ..... Ford 2110, 3000, 4000, and 4110
- Forward ..... Ford 5000



CAUTION: *The drive line disengagement lever should only be used when towing or pushing the tractor or when operating in ground drive P.T.O. for stationary P.T.O. applications. Moving the lever to the positions listed above will allow the tractor to roll. Always apply the parking brake or block the wheels if the lever is moved for reasons other than towing. Refer to page 22 for additional towing information and page 21 for operation of stationary P.T.O. equipment.*

MANUAL SHIFT TRANSMISSION AND P.T.O. CONTROLS

4-SPEED TRANSMISSION GEARSHIFT LEVER

The 4-speed transmission gearshift lever is shown in Figure 16. A diagram of the shift pattern is provided on a plate directly below the Proof-Meter. Always depress the clutch pedal fully before moving the lever. Refer to "4-Speed Transmission" on page 22 for additional operating information.

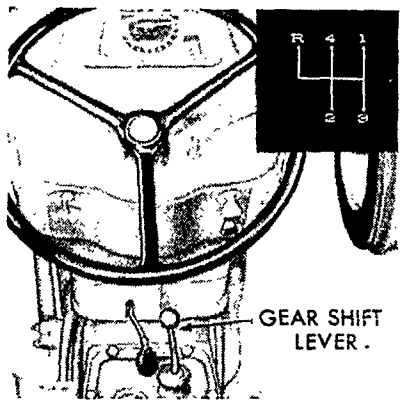


Figure 16
4-Speed Transmission Gearshift Lever

OVER/UNDER AUXILIARY TRANSMISSION GEARSHIFT LEVERS (ACCESSORY)

The over/under auxiliary transmission is available as an accessory for tractors equipped with the 4-speed transmission to provide for twelve forward gears and three reverse gears. The shift levers are shown in Figure 17. A diagram of the over/under shift pattern is provided on a plate directly below the Proof-Meter and to the left of the 4-speed diagram.

The transmission gearshift lever is located on top of the transmission housing and is used in conjunction with the over/under lever on the side of the housing to select one of the forward or reverse gears. Always depress the clutch pedal before moving either lever. Refer to "Over/Under Auxiliary Transmission (Accessory)" on page 23 for additional operating information.

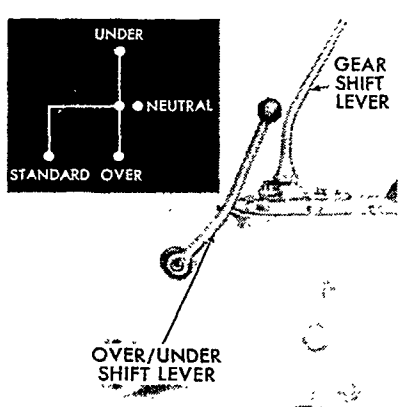


Figure 17
Over/Under Auxiliary Transmission Gearshift Levers

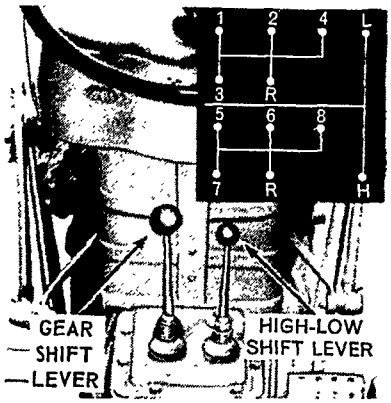


Figure 18
8-Speed Transmission Gearshift Levers

8-SPEED TRANSMISSION GEARSHIFT LEVERS

The 8-speed transmission gearshift levers are shown in Figure 18. A diagram of the shift pattern is provided on a plate directly below the Proof-Meter.

The transmission gearshift lever is the longer of the two levers and is used in conjunction with the high-low shift lever to select one of the forward or reverse gears. Always depress the clutch pedal before moving either lever. Refer to "8-Speed Transmission" on page 23 for additional operating information.

CLUTCH PEDAL

On manual shift transmission tractors, a foot-operated clutch pedal, Figures 19 and 20, is provided on the left side of the transmission housing. The pedal must be completely depressed to stop forward travel and P.T.O. shaft rotation. Always depress the pedal when changing gear ratios. On tractors with live P.T.O., the clutch pedal has three positions as shown in Figure 20. Depressing the pedal halfway will stop the tractor, but the P.T.O. shaft will continue to rotate. Depressing the pedal completely will stop the tractor and the P.T.O. shaft. Refer to "Transmission and Live P.T.O. Operation (Manual Transmission)" on page 23 for use of the clutch pedal when operating the P.T.O.

TRANSMISSION AND LIVE P.T.O. CONTROL LEVER (MANUAL TRANSMISSION)

Transmission P.T.O. means the P.T.O. shaft will turn only when the clutch is engaged and will stop turning when the clutch pedal is depressed to stop the tractor. Live P.T.O. operates basically in the same manner except that an intermediate clutch pedal position, Figure 20, stops the tractor without stopping the P.T.O. shaft.

The P.T.O. control lever used with 4-speed transmission tractors is shown in Figure 19, and in Figure 20 for 8-speed transmission tractors. The lever engages and disengages the P.T.O. If the tractor engine is running, always depress the clutch pedal fully before moving the lever. The lever positions are listed below. Refer to "Transmission and Live P.T.O. Operation (Manual Transmission)" on page 23 for detailed operating instructions.

TRANSMISSION	P.T.O. CONTROL LEVER POSITION	
	Engaged	Disengaged
4-Speed	Forward	Rearward
8-Speed	Rearward	Forward

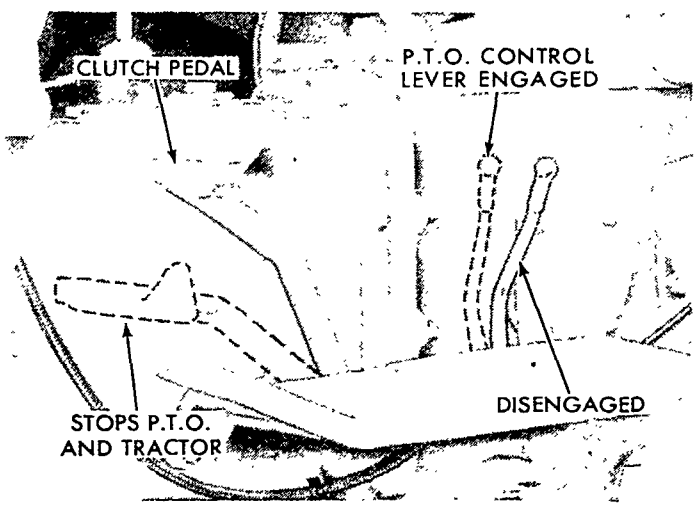


Figure 19
Transmission P.T.O. Control Lever and Clutch Pedal — 4-Speed

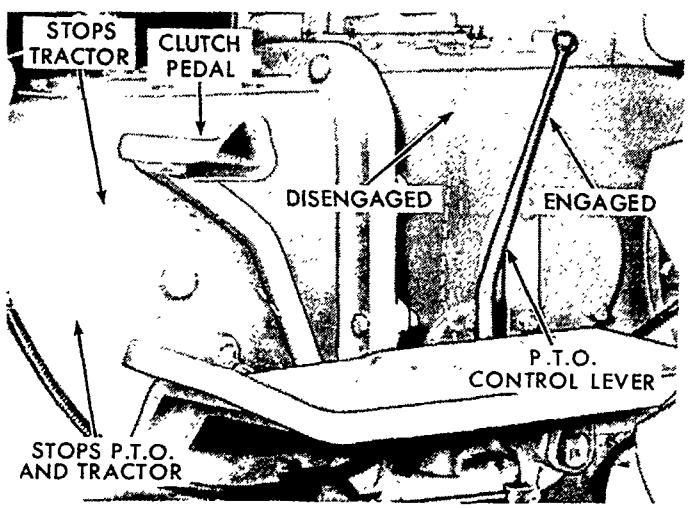


Figure 20
Transmission and Live P.T.O. Control Lever and Clutch Pedal — 8-Speed

INDEPENDENT P.T.O. CONTROL LEVER (MANUAL TRANSMISSION)

Ford 4000 and 5000

The independent P.T.O. control lever is shown in Figure 21 for the Ford 4000 Tractor and in Figure 15 for the Ford 5000 Tractor. Move the lever sharply to engage or disengage the P.T.O. The P.T.O. is "independent," which means that it can be engaged or disengaged while the tractor is either moving or stopped. The lever positions are listed below. Refer to "Independent P.T.O. Operation (Manual Transmission)" on page 25 for detailed operating instructions.

TRACTOR	P.T.O. CONTROL LEVER POSITION	
	Engaged	Disengaged
Ford 4000 Ford 5000	Forward Rearward	Rearward Forward

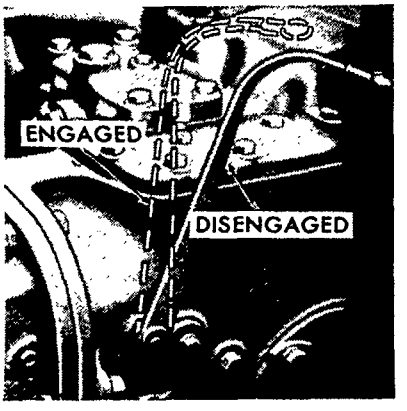


Figure 21
Independent P.T.O. Control Lever — Ford 4000

HYDRAULIC LIFT SYSTEM CONTROLS

HYDRAULIC LIFT CONTROL LEVER

The hydraulic lift control lever, Figures 22, 23, and 24, is located in the quadrant to the right of the tractor seat. To raise the hydraulic lift arms, move the lever to the top of the quadrant. To lower the lift arms, push the lever downward. The adjustable stop is provided for locating the lever at any desired intermediate position.

HYDRAULIC SELECTOR LEVER

The hydraulic selector lever is shown in Figures 22, 23, and 24. The lever has two positions: **down** for constant draft control and **up** for implement position control.

Refer to "Operating Hydraulic Lift System" on page 28 for details pertaining to draft and position control.

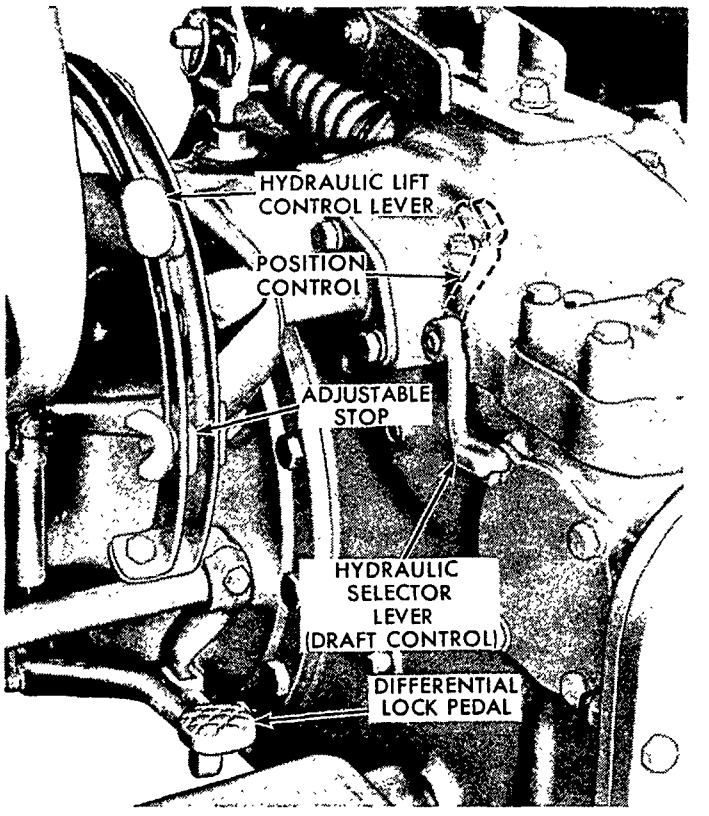


Figure 22
Hydraulic Lift Controls — Ford 2000, 2110, and 4110

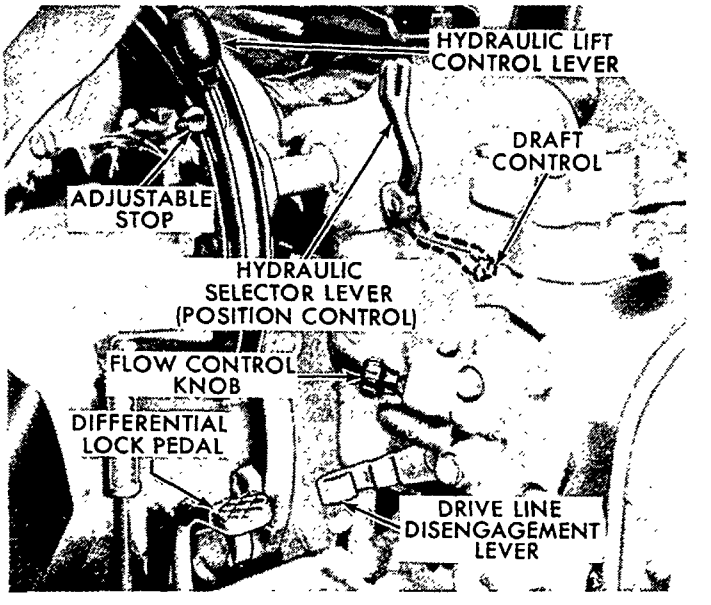


Figure 23
Hydraulic Lift Controls — Ford 3000 and 4000 (Ford 4000 Shown)

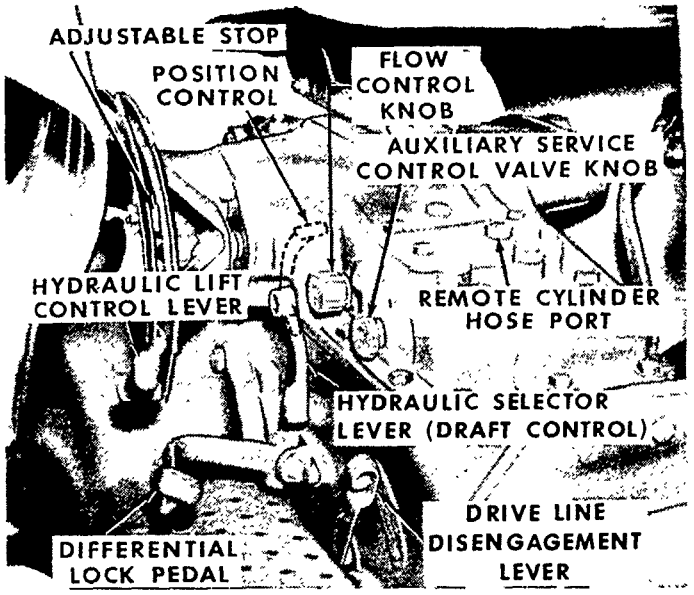


Figure 24
Hydraulic Lift Controls — Ford 5000

FLOW CONTROL KNOB

Ford 3000, 4000, and 5000

The flow control knob is shown in Figures 23 and 24. Turning the knob "in" will speed the response of the tractor hydraulic lift system, and turning the knob "out" will slow the response. Refer to "Flow Control" on page 29 for additional operating information.

AUXILIARY SERVICE CONTROL VALVE KNOB

The auxiliary service control valve knob permits the use of single-acting remote cylinders. The knob, shown in Figure 24, is standard equipment on the Ford 5000 Tractor. The knob, as shown in Figure 25, is an accessory for all other models. The knob positions for various operating conditions are listed at the bottom of this page and the operating instructions are covered on page 29.



Figure 25
Auxiliary Service Control Valve Knob — Ford 2000, 2110, 3000, 4000, and 4110

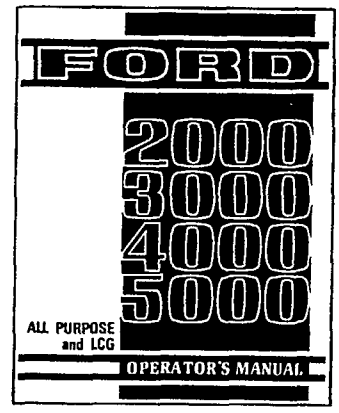
REMOTE CONTROL VALVES (OPTIONAL)

Single and double spool remote control valves are available for use on your Ford Tractor. For further information on remote control valves refer to page 30.

AUXILIARY SERVICE CONTROL KNOB POSITION			
TRACTOR	**Lift Linkage Operation**	**Remote Cylinder Operation**	**Lift and Remote Cylinder Operation**
Ford 2000, 2110, 3000, 4000, and 4110	Full "in"	Full "out"	Half "out"
Ford 5000	Full "in"	Full "out"	*

* *The tractor hydraulic lift system and remote cylinder (single-acting) can be operated simultaneously on the Ford 5000 Tractor by connecting the remote cylinder hose directly into the lift cylinder through the remote cylinder hose port on the accessory cover. See Figure 24. Simultaneous operation does, however, depend on the amount of weight that is to be lifted by the lift links and remote cylinder. If the weight to be lifted by the cylinder is greater than the weight on the lift links, the links will rise to the top of their travel, making the hydraulic system inactive.*

operation



After familiarizing yourself with the controls and instruments, study the information in this section carefully. Give special attention to the correct way to break-in your new tractor. To obtain the most from your new Ford Tractor, follow the instructions provided. This will help you get the job done easier and faster.



A careful operator is the best insurance against accidents.

BREAK-IN PROCEDURES

Your new Ford Tractor will provide long and dependable service if given proper care during the 50-hour break-in period. During the first 50 hours of operation:

1. Avoid "lugging" the engine. Operating in too high a gear under heavy load may cause excessive engine "lugging." Harmful "lugging" occurs when the engine will not respond to a throttle increase.
2. Use the lower gear ratios when pulling heavy loads and avoid continuous operation at constant engine speeds. You will save fuel and minimize engine wear by selecting the correct gear ratio for a particular operation. Operating the tractor in low gear with a light load and high engine speed will waste fuel.
3. Avoid prolonged operation at either high or low engine speeds without a load on the engine.
4. Check the instruments frequently and keep the radiator and oil reservoirs filled to their recommended levels. Daily checks include:
   - Engine oil level
   - Power steering reservoir oil level
   - Transmission oil level
   - Tractor hydraulic lift system oil level (rear axle)

STARTING THE ENGINE

A safety starter switch on Ford Tractors allows the starting motor to be used only when the transmission gearshift lever is in neutral, park (P) on Select-O-Speed Tractors. Therefore, always shift to neutral, park (P) on Select-O-Speed, before starting the engine.

WARM WEATHER STARTING

To start a cold engine in warm weather or to start an engine that is warm:

1. **Select-O-Speed Transmissions:** Depress the inching pedal and move the gear selector lever to the park (P) position.
2. **Manual Shift Transmissions:** Depress the clutch pedal and move the gearshift lever(s) to the neutral position.
3. **Gasoline Engines:** Move the hand throttle to the closed position.
4. **Diesel Engines:** Move the hand throttle to the half-open position. Make sure the diesel engine stop control is pushed all the way in.
5. Turn the starter key clockwise to the "START" position, Figure 26. When the engine starts, release the key. Check to be sure the engine oil pressure and charge indicator warning lights go out.

NOTE: *If the engine fails to start after cranking for approximately 10 seconds, refer to the following "Cold Weather Starting" information.*

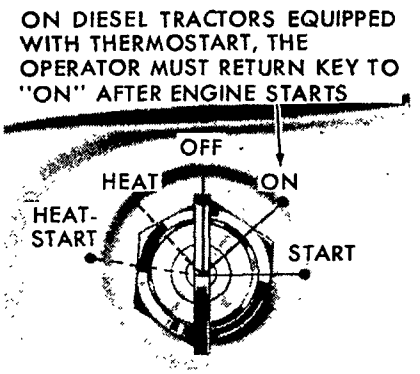


Figure 26
Key-Starter Switch Positions

COLD WEATHER STARTING

Gasoline Engines: If an engine fails to start using the preceding warm weather starting procedure or when starting a cold engine, use the choke as outlined below.

1. **Select-O-Speed Transmissions:** Depress the inching pedal and move the gear selector lever to the park (P) position.
2. **Manual Shift Transmissions:** Depress the clutch pedal and move the gearshift lever(s) to the neutral position.
3. Open the hand throttle slightly and pull the choke all the way out.
4. Turn the starter key clockwise to the "START" position. Release the key when the engine first begins to fire, then partially push the choke in. Check to be sure the engine oil pressure and charge indicator warning lights go out.
5. Run the engine at about 1000 rpm for approximately 30 to 60 seconds before driving the tractor. A faster warm-up can then be achieved if the tractor is placed under a light load.

IMPORTANT: *The choke should be pushed all the way in as soon as possible. Prolonged operation with the choke out will cause high fuel consumption and possibly excessive engine wear due to oil dilution.*

Diesel Engines: If an engine that is equipped with the in-line fuel injection pump, Figure 7, fails to start using the warm weather starting procedure outlined on page 14, use the excess fuel button as outlined below. When temperatures are extremely low, it is recommended that the Automatic Thermostart, the Ether Spray Primer, or the Coolant Immersion Heater be used as a starting aid. Refer to "Cold Weather Starting Aids" below.

1. **Select-O-Speed Transmissions:** Depress the inching pedal and move the gear selector lever to the park (P) position.
2. **Manual Shift Transmissions:** Depress the clutch pedal and move the gearshift lever(s) to the neutral position.
3. Move the hand throttle to the wide-open position. Push the excess fuel button "in" to increase fuel delivery, then reduce the throttle setting to the half-open position.
4. Turn the starter key clockwise to the "START" position. When the engine starts, release the key. Check to be sure the engine oil pressure and charge indicator warning lights go out.

NOTE: *If the engine starts and then stops, make sure the excess fuel button is pushed "in" before attempting to restart the engine. The button automatically "pops out" once the engine is running. To benefit from the device, the button should be pushed in when the hand throttle is in the wide-open position. The throttle should then be returned to the half-open position before starting the engine.*

COLD WEATHER STARTING AIDS

Automatic Thermostart: The automatic thermostart is standard equipment on diesel tractors equipped with a Select-O-Speed transmission, and is optional on diesel tractors with a manual shift transmission.

The unit is effective in temperatures down to:

- +10° F..... Ford 2110 and 3000 w/Select-O-Speed
- 0° F..... Ford 2000, 2110, 3000, 4000, 4110, and 5000 w/Manual Transmission
- 0° F..... Ford 4000, 4110, and 5000 w/Select-O-Speed

The automatic thermostart heating element is installed in the air intake manifold to ignite fuel in the manifold before it enters the combustion chamber. The element is operated by a switch incorporated with the key-starter switch. To start a cold engine with the thermostart:

1. **Select-O-Speed Transmissions:** Depress the inching pedal and move the gear selector lever to the park (P) position.
2. **Manual Shift Transmissions:** Depress the clutch pedal and move the gearshift lever(s) to the neutral position.
3. **In-Line Injection Pump:** Move the hand throttle to the wide-open position. Push the excess fuel button "in" to increase fuel delivery, then reduce the throttle setting to the half-open position.
4. **Distributor Injection Pump:** Move the hand throttle to the half-open position.
5. Turn the starter key counterclockwise to the "HEAT" position, Figure 26, and hold for 30 seconds.
6. Start the engine by turning the key further counterclockwise to the "HEAT-START" position.
7. If the engine fails to start after 25 seconds of cranking, release the key and then return it to the "HEAT" position for an additional 15 seconds.
8. After the engine starts, release the key and reduce the throttle setting. The key will spring return to the "OFF" position. It must then be turned to the "ON" position for the warning lights to function.

NOTE: *If the engine starts and then stops, make sure the excess fuel button is pushed "in" before attempting to restart the engine.*

Ether Spray Primer (Accessory): The ether spray primer, Figure 27, is available as an accessory on Ford 2000, 2110, and 3000 Diesel Tractors. It can also be used on these same tractors in conjunction with the coolant immersion heater covered on page 16. The ether spray primer is effective in temperatures down to:

- 0° F..... Ford 2110 and 3000 w/Select-O-Speed
- -10° F..... Ford 2110 and 3000 w/Coolant Immersion Heater and Select-O-Speed
- -10° F..... Ford 2000, 2110, and 3000 w/Manual Transmission

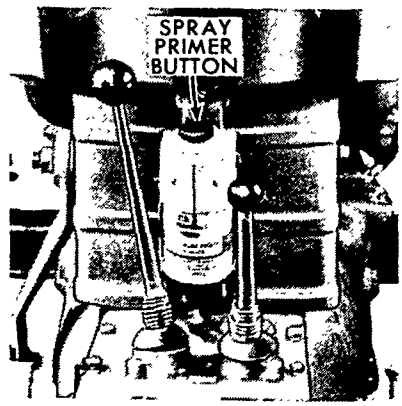


Figure 27
Ether Spray Primer

- -20° F ..... Ford 2000, 2110, and 3000 w/Coolant Immersion Heater and Manual Transmission



CAUTION: *To avoid explosions in the manifold, ether must not be used with the automatic thermostart. Ether is highly combustible and serious personal injury may result.*

The spray primer is activated by the spray primer button, Figure 27. To start a cold diesel engine with the ether spray primer:

1. **Select-O-Speed Transmissions:** Depress the inching pedal and move the gear selector lever to the park (P) position.
2. **Manual Shift Transmissions:** Depress the clutch pedal and move the gearshift lever(s) to the neutral position.
3. **In-Line Injection Pump:** Move the hand throttle to the wide-open position. Push the excess fuel button "in" to increase fuel delivery, then reduce the throttle setting to the half-open position.
4. **Distributor Injection Pump:** Move the hand throttle to the half-open position.
5. Turn the starter key to the "START" position.
6. While the engine is cranking, depress the spray primer button, Figure 27, for one or two seconds.



CAUTION: *Do not hold the primer button down longer than two seconds. If the engine does not start, purge the engine of ether by cranking it for five seconds before again depressing the primer button.*

NOTE: *If the engine starts and then stops, make sure the excess fuel button is pushed "in" on the in-line injection pump before attempting to restart the engine.*

Coolant Immersion Heater (Accessory): The coolant immersion heater, Figure 28, consists of a heating element installed in the engine block. It is designed to operate on 115 A.C. line voltage. The heater provides for easier starting of diesel engines in temperatures down to those listed below by warming the engine coolant and oil. The heater can also be used in conjunction with the ether spray primer on Ford 2000, 2110, and 3000 Tractors as covered on page 15.

- -10° F..... Ford 2110 and 3000 w/Ether Spray Primer and Select-O-Speed
- -20° F..... Ford 2000, 2110, and 3000 w/Ether Spray Primer and Manual Transmission
- -20° F..... Ford 4000 and 5000 w/Select-O-Speed and Manual Transmission

To operate the heater, simply open the spring-loaded cover on the electrical outlet and plug in the electrical connection. Allow the heater to operate for two hours to provide for sufficient warm-up, then start the engine as outlined on page 14, "Cold Weather Starting."

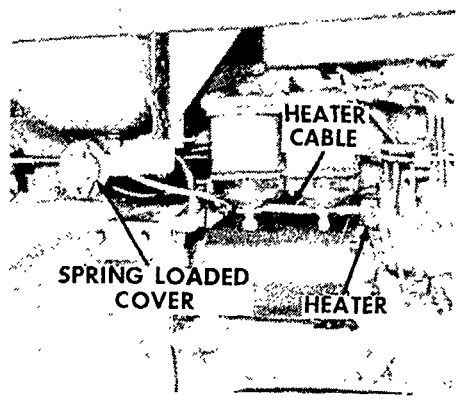


Figure 28
Coolant Immersion Heater

NOTE: *The heater can be plugged in longer than two hours without damage; however, there will be no noticeable increase in its effectiveness.*

STOPPING THE ENGINE

GASOLINE ENGINES

Turn the key-starter switch, Figure 26, to the "OFF" position.

DIESEL ENGINES

Pull the diesel stop control out and hold until the engine stops. Turn the key-starter switch, Figure 26, to the "OFF" position.

IMPORTANT: *Failure to turn the key-starter switch to the "OFF" position after the engine stops will result in the warning lights remaining on, causing the battery to discharge.*

OPERATING SELECT-O-SPEED TRACTORS AND P.T.O.

SELECT-O-SPEED TRANSMISSION OPERATION

Gear ratios 1 through 4 are normally used for slow precise work or extremely heavy pulling; gear ratios 5 through 8 for medium speed field work; and gear ratios

9 and 10 for traveling at higher speeds on improved roads. When changing from the low range to the medium range (shifting from 4th to 5th), the change in speed is greater than from one gear ratio to another within a range.

The ten forward speeds overlap each other and provide speeds from 0.5 mph in first gear at 1000 rpm to approximately 17 mph at the maximum rated rpm in tenth gear (depending on the model tractor). The two reverse gear ratios provide approximately 1.5 mph in R_1 and approximately 5.1 mph in R_2. Refer to the Tractor Ground Speed Charts, page 84.

For added convenience, the selector lever on your tractor can be mounted on either side of the speed selector mechanism to permit right- or left-hand shifting.

To move the selector lever to the opposite side of the mechanism:

1. Remove both covers from the gear selector mechanism, Figure 29.

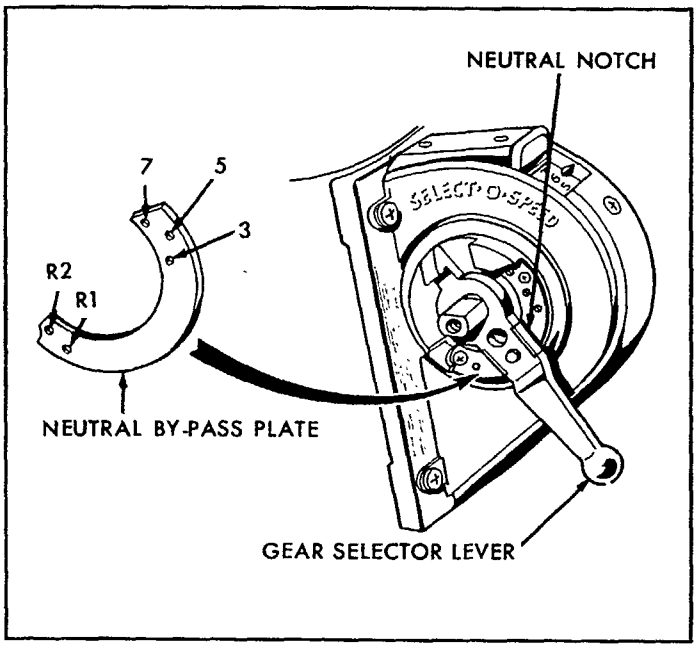


Figure 29
Selector Lever Override Positions

2. Remove the gear selector lever from the shaft and position it on the opposite side of the selector mechanism.

3. Switch the covers and secure with the recessed head screws. Tighten securely.

Starting Forward Travel: With the engine running at low idle and the inching pedal depressed:

1. Shift directly to the desired gear ratio if the operation is anticipated to be in the low speeds (gear ratios 1 through 4). Shift to one gear below the anticipated operating gear for the higher gear ratios.

   NOTE: *When moving the lever through the neutral (N) position, apply light pressure outward on the lever, otherwise it will drop into the neutral locating notch.*

2. Increase the throttle setting to handle the initial load, then let the inching pedal up slowly until the tractor moves off smoothly.

3. Shift on-the-go to the speed ratio that will permit the best performance, then move the throttle to the desired setting.

Shifting Select-O-Speed On-The-Go: The following are suggested operating procedures:

1. Snap the selector lever quickly from gear to gear. **Do not use the inching pedal as a clutch.**

2. Shift up or shift down just as often as your load varies, maintaining a moderate engine speed and highest gear ratio.

3. Always downshift when the engine starts to lug.

4. Use the inching pedal for smooth starts, easy hook-up of equipment, and for emergency stops.

IMPORTANT: *Do not let your foot rest on the inching pedal when operating the tractor and do not "inch" the tractor for extended periods, otherwise serious transmission damage may result.*

Shuttle Shifting Select-O-Speed: The recommended method of controlling the selector lever in shuttle work is quite different from the method suggested for conventional shifting on-the-go.

To assist the operator in this respect, tractors shipped from the factory have selector lever stops installed in the gear selector mechanism on the side opposite the lever. Moving the stops to the lever side of the mechanism enables the operator to establish a predetermined shift pattern between two gears. These stops are especially convenient for shuttle operations.

The stop screws can be positioned in any two of the gear positions, 3, 5, 7, R_1, or R_2, by inserting them in the holes shown in Figure 29. The stops can be overridden to obtain any gear by pulling outward on the spring-loaded gear selector lever and shifting to the desired gear. When the selector stops are not desired, the stop screws should be placed in the holes on the side opposite the gear selector.

The neutral bypass plate, shown in Figure 29, is available as an accessory from your Ford Tractor-Equipment Dealer. When operation of the Select-O-Speed transmission requires constant shifting between forward and reverse gear ratios (shuttle work), the neutral bypass plate can be installed with the stop screws to prevent the gear selector lever from snapping into the neutral position detent. This added convenience makes direction changes virtually a continuous operation.

To install the stop screws and/or bypass plate:

1. Remove both covers from the gear selector mechanism, Figure 29.
2. Remove the gear selector lever from its shaft and the stop screws from the opposite side of the selector mechanism.
3. Install the stop screws in the side of the selector mechanism to which the gear selector lever is to be attached. If the neutral bypass plate is to be installed, attach it with the stop screws.
4. Place the gear selector lever on its shaft and install both covers. Secure the covers with the recessed head screws. Tighten securely.

To shuttle the tractor:

1. To start forward, depress the inching pedal and grasp the selector lever, pulling it quickly towards you until the handle hits the preset stop. Then release the inching pedal smoothly.
2. To reverse the tractor, depress the inching pedal and stop the tractor with the brakes as you push the selector lever forward against the stop with the palm of your hand. Release the inching pedal smoothly. With practice you can improve your coordination and efficiency in all types of shuttle work.

Stopping Select-O-Speed Tractors:

1. When operating in the high gear ratios, reduce the throttle setting and downshift the transmission using intermediate gears to slow the tractor's forward speed.



CAUTION: *Avoid downshifting too quickly through a series of gears. A sudden ratio change will cause the tractor to slow down too abruptly.*

2. Downshift the transmission to the neutral (N) position or depress the inching pedal, if desired.
3. Apply pressure evenly to both brake pedals. When the tractor comes to a complete stop, shift the selector lever to park (P) and shut off the engine before you get off the tractor.



CAUTION: *The park (P) position locks the transmission to prevent movement of the tractor. This feature prevents the tractor from rolling when attaching equipment. However, if the drive line disengagement lever, Figures 35 and 36, is in the disconnect position, the tractor can roll and the wheels should be blocked or the brakes locked.*

SELECT-O-SPEED POWER TAKE-OFF OPERATION

The power take-off (P.T.O.) on your tractor transfers engine power to mounted or pull-type equipment, and to belt-driven equipment when the belt pulley accessory is used. Standard P.T.O. speeds are 540 ± 10 rpm and 1000 ± 25 rpm. Most P.T.O.-driven equipment is designed to operate at these speeds. The speeds are obtained when engine rpm, as read on the Proof-Meter, is set at the speed listed in the following chart.

ENGINE SPEEDS VS. P.T.O. SPEED

Transmission	Engine Speed (rpm)	P.T.O. Speed (rpm)
Standard Select-O-Speed — Ford 2110, 3000, 4000, and 4110 (Independent P.T.O.)	1800	540
Standard Select-O-Speed — Ford 5000 (Independent P.T.O.)	1900	540
Deluxe Select-O-Speed — Ford 3000, 4000, and 4110	1800 1950	540 1000

P.T.O. Shafts: The P.T.O. shaft on your tractor is the standard 6-spline, 1⅜-inch diameter shaft, Figure 30. The 6-spline shaft is used for 540 rpm P.T.O. operation only.

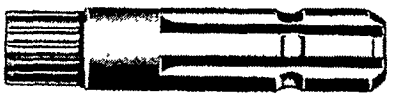
If your tractor is equipped with the Deluxe Select-O-Speed transmission, the 21-spline shaft, Figure 30, is also included as standard equipment for 1000 rpm P.T.O. operation.

To change from one shaft to the other:

1. Remove the P.T.O. shaft cap, Figure 31.
2. Remove the recessed screw from the shaft with the wrench provided.
3. Pull the shaft from the tractor and install the other shaft.



21-SPLINE P.T.O. SHAFT
1000 RPM



6-SPLINE P.T.O. SHAFT
540 RPM

Figure 30
P.T.O. Shafts

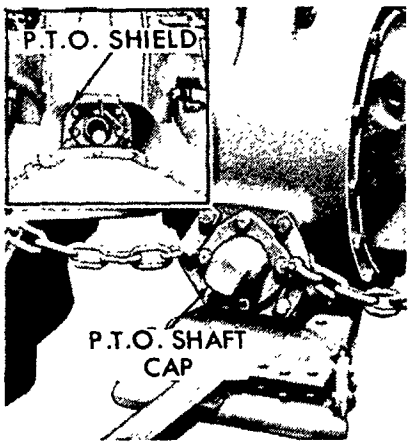


Figure 31
P.T.O. Shaft Cap and Shield

4. Install the recessed head screw and tighten it securely.

IMPORTANT: *The 21-spline shaft should only be used for equipment designed for 1000 rpm P.T.O. operation.*

P.T.O. Shield: The P.T.O. shield, shown in the insert, Figure 31, is available as an accessory from your Ford Tractor-Equipment Dealer. The shield serves as a supporting member for drive line shields used with pull-type P.T.O.-driven equipment, and provides for your safety. Always install the shield when using P.T.O.-driven equipment.

Select-O-Speed Independent P.T.O. Operation: Independent P.T.O. can be engaged, operated and disengaged whether or not the tractor is in motion. To operate the tractor P.T.O. at the standard speed of 540 rpm or 1000 rpm, the engine should be operated at the recommended speeds given in the chart on page 18. On Deluxe Select-O-Speed transmissions, the P.T.O. speed shift lever, Figure 32, should be positioned to give the desired P.T.O. speed. **Do not move the speed shift lever while the engine is running.** After determining the recommended engine speed and moving the speed shift lever:

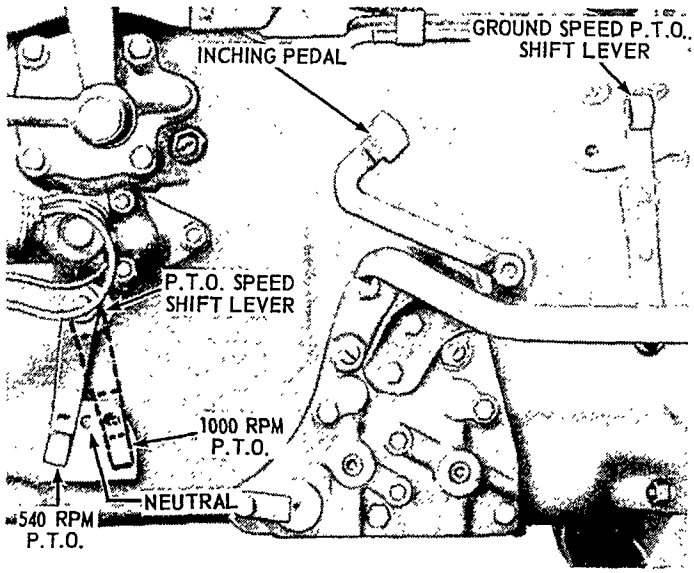


Figure 32
Deluxe Select-O-Speed Controls

1. Stop the engine, set the parking brake, and attach the mounted or drawn equipment. Make sure the equipment-driven shaft is properly aligned and locked to the tractor P.T.O. drive shaft. Also, make sure the 6-spline P.T.O. shaft, Figure 30, is installed when operating the P.T.O. at 540 rpm, or that the 21-spline shaft is installed for 1000 rpm P.T.O. operation.



CAUTION: *To reduce the possibility of personal injury and damage to the equipment, comply with the following before attaching or detaching P.T.O. equipment, and before working on or clearing P.T.O. equipment.*

- *Disengage the P.T.O. with the P.T.O control handle, Figure 33 (Figure 34 on Ford 5000 Tractors).*
- *Move the gear selector lever to the park (P) position.*
- *Shut off the tractor engine.*
- *Wait until the P.T.O. shaft stops turning.*

2. With the P.T.O. disengaged, start the engine and raise and lower mounted equipment to make sure proper clearance exists.

3. With the engine throttle partially open, engage the P.T.O. as follows:
   - Ford 2110, 3000, 4000, and 4110 . . . Pull the P.T.O. control handle, Figure 33, out slowly until the equipment drive shaft begins to turn. Then quickly pull the handle **all** the way out.
   - Ford 5000 . . . Move the P.T.O. control lever, Figure 34, sharply rearward.

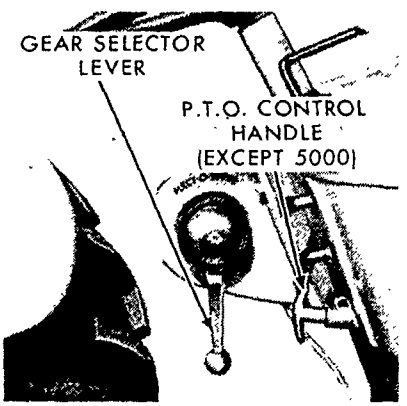


Figure 33
Select-O-Speed Controls

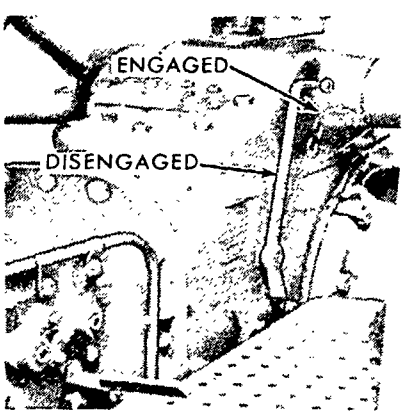


Figure 34
Independent P.T.O. Control Lever — Ford 5000

IMPORTANT: *When operating the P.T.O., make sure the P.T.O. control handle is always fully "out" (fully rearward on Ford 5000 Tractors). Partial engagement will cause the clutch to slip and may result in serious damage.*

4. Operate the P.T.O. at low rpm making sure the P.T.O.-driven equipment is free of obstructions.

5. Before encountering the work, bring the P.T.O. speed up to the recommended rpm.

6. Select 1st gear ratio and enter the work with the P.T.O.-driven equipment at its operating speed as determined by the Proof-Meter. Gradually upshift on-the-go until the desired rate of forward travel is obtained.

7. If plugging, or the threat of plugging occurs, downshift to a lower gear ratio, to neutral if necessary, until the machine clears. If it becomes evident the machine will not clear, comply with the following before attempting to clear the equipment by hand.
   - Disengage the P.T.O. with the P.T.O. control handle, Figure 33 (Figure 34 on Ford 5000 Tractors).
   - Move the transmission gear selector lever to the park (P) position.
   - Shut off the tractor engine.
   - Wait until the P.T.O. shaft stops turning.

   NOTE: *After becoming familiar with the Select-O-Speed transmission, the operator can clear the machine by shifting directly to neutral (N) without depressing the inching pedal. This is done by applying force inward on the selector lever and pushing it hard against the neutral stop.*

8. Disengage the P.T.O. when making sharp turns and with mounted equipment in the fully raised position.

9. Disconnect the P.T.O.-driven shaft at the tractor P.T.O. shaft before traveling on highways or for any great distance. Also, on Deluxe Select-O-Speed transmissions, move the P.T.O. speed shift lever, Figure 32, to the neutral position. Do not move the lever while the engine is running.

Ground Speed P.T.O. Operation (Deluxe Select-O-Speed): In such applications as raking, planting, spreading manure, etc., the ground speed P.T.O. will permit P.T.O.-driven equipment to be operated at a speed directly proportional to the tractor ground speed.

The ground speed P.T.O. is engaged by moving the ground speed P.T.O. shift lever, Figure 32, to the "ON" position. Make certain that the P.T.O. control handle, Figure 33, is pushed all the way in. A lock-out arrangement within the transmission prevents moving the ground speed P.T.O. shift lever if the handle is pulled out.

ENGINE SPEED AND GEAR SELECTION COMBINATIONS FOR GROUND SPEED P.T.O. WITH DELUXE SELECT-O-SPEED TRANSMISSION

Ford 3000 and 4110	540 rpm (Ground Speed, 3.6 mph)				1000 rpm (Ground Speed, 6.7 mph)		
Engine rpm	2067	1608	1398	1086	2011	1243	839
Gear Selection	5	6	7	8	8	9	10
Ford 4000	**540 rpm (Ground Speed, 3.0 mph)**				**1000 rpm (Ground Speed, 5.5 mph)**		
Engine rpm	1708	1331	1154	898	1664	1027	694
Gear Selection	5	6	7	8	8	9	10

NOTE: *Do not move the ground speed P.T.O. shift lever while the tractor is in motion.*

The P.T.O. shaft will turn only when the tractor is in motion; consequently, to ease into P.T.O. loads it will be necessary to use the inching pedal.

IMPORTANT: *Before backing the tractor, the ground speed P.T.O. shift lever, Figure 32, must be moved to the "OFF" position. Failure to do this may result in serious damage to the equipment.*

If the equipment is designed to operate at either 540 rpm or 1000 rpm, the Deluxe Select-O-Speed transmission provides for several combinations of gear ratios and engine speeds for operating in ground speed P.T.O. The chart at the top of this page illustrates the combinations available to obtain the 540 and 1000 rpm P.T.O. speeds with Ford 3000, 4000, and 4110 Tractors.

Stationary P.T.O. Speeds in Excess of 1000 rpm (Deluxe Select-O-Speed): The ground speed P.T.O. can be utilized to obtain P.T.O. speeds above 1000 rpm when the tractor is stationary. This is accomplished as follows:

1. With the engine stopped, block the tractor wheels and move the drive line disengagement lever, Figure 35, upward to disengage power to the rear wheels.
2. Move the ground speed P.T.O. shift lever, Figure 32, forward to the "ON" position.
3. Start the engine.

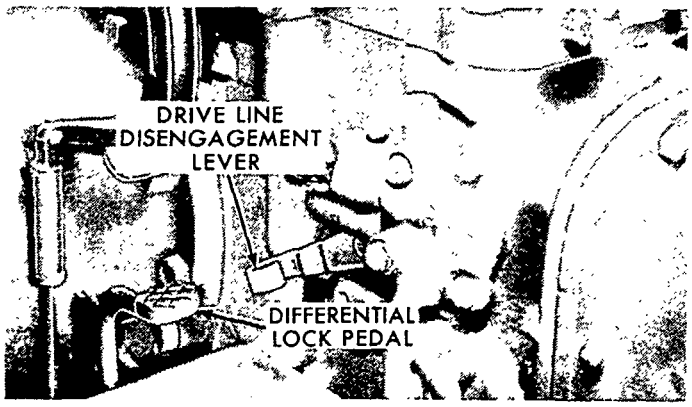


Figure 35
Rear Axle Controls — Ford 2000, 2110, 3000, 4000, and 4110 (Ford 4000 Shown)

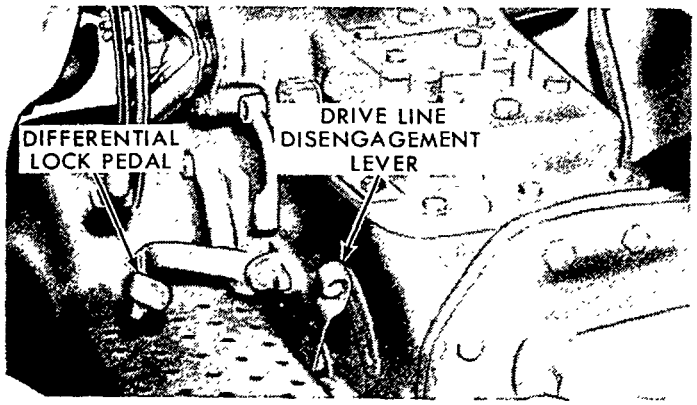


Figure 36
Rear Axle Controls — Ford 5000

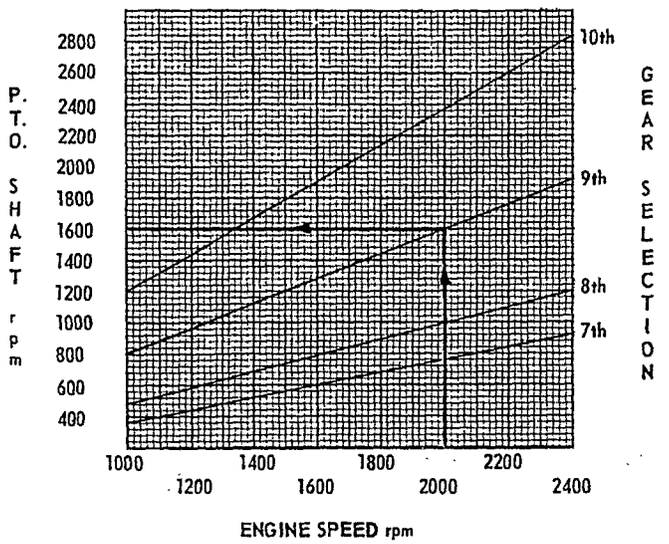


Figure 37
P.T.O. RPM vs. Engine RPM in Ground Speed Drive (Ford 3000)

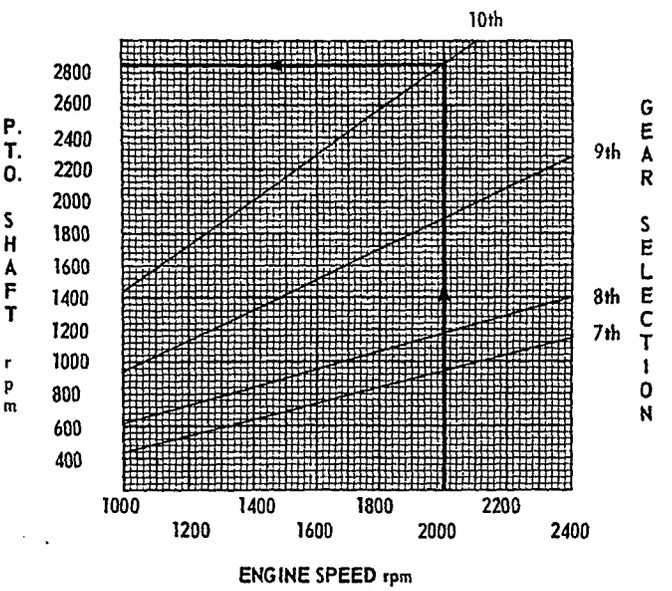


Figure 38
P.T.O. RPM vs. Engine RPM in Ground Speed Drive (Ford 4000)

4. Depress the inching pedal and set the gear selector lever at 7th, 8th, 9th, or 10th. Refer to Figures 37 and 38 for the P.T.O. speeds obtained at various engine rpm's in the above gear selections. Note the example shown in the Figures.

IMPORTANT: *Do not use 1st, 2nd, 3rd, 4th, 5th, or 6th for driving the P.T.O. as described above, as it is possible to overload the P.T.O. in these gear ratios.*

TOWING SELECT-O-SPEED TRACTORS

To tow or push your tractor, the drive line disengagement lever, Figures 35 and 36, must be moved to the disconnect position. To disconnect the drive line, the lever must be moved:

- Up ..... Ford 2110, 3000, 4000, and 4110
- Forward ..... Ford 5000



CAUTION: *If the tractor is on a hill, block the rear wheels or apply the parking brake before moving the lever, otherwise the tractor is free to roll.*

If the tractor is to be moved any distance, use a solid tow bar and pull the tractor at a speed not to exceed 20 mph. When the engine is not running, additional steering effort is required if your tractor is equipped with power assist steering. The engine cannot be started by pushing the tractor.

OPERATING MANUAL SHIFT TRACTORS AND P.T.O.

MANUAL SHIFT TRANSMISSION OPERATION

The 4-speed, 4-speed with over/under auxiliary, and 8-speed transmissions all operate through the use of a clutch pedal and one or two gearshift levers. Figures 16 through 20 illustrate the levers and pedal involved. Ground speeds can be found on page 84.

Always depress the clutch pedal fully and bring the tractor to a complete stop before moving the gearshift levers. **Do not attempt to change gears while the tractor is in motion.**

NOTE: *Avoid using the clutch pedal as a "footrest" (riding the clutch). Prolonged operation in this manner can cause damage to the components.*

4-Speed Transmission

The 4-speed transmission gearshift lever, Figure 16, is the only lever used to select any one of four forward gear ratios and one reverse gear ratio. To change from one gear ratio to another:

1. Depress the clutch pedal completely.
2. Bring the tractor to a complete stop.
3. Shift to the desired gear ratio.

Over/Under Auxiliary Transmission (Accessory)

The over/under auxiliary transmission uses two shift levers: the 4-speed transmission gearshift lever and the over/under shift lever, Figure 17. The 4-speed gearshift lever is used to select any one of four forward gear ratios and one reverse gear ratio. The over/under shift lever is used to select an Over-Range, an Under-Range, and a Standard-Range.

When the over/under lever is in neutral, the tractor will not move even though the gearshift lever may be "in gear." Moving the over/under lever to the "Standard" position permits use of the standard 4-speed transmission gear ratios.

When the lever is in the Under-Range, lower gear ratios are provided than could otherwise be obtained with the standard 4-speed transmission.

When the lever is in the Over-Range, higher gear ratios are provided. To change from one gear ratio to another, or to change ranges:

1. Depress the clutch pedal completely.
2. Bring the tractor to a complete stop.
3. Shift to the desired gear and/or range.

IMPORTANT: *Do not operate the tractor in Over-Range-4th gear at engine speeds higher than 1500 rpm. Also, due to the high P.T.O. speeds (rpm) that can be obtained in the Over-Range, care and proper safety precautions should be taken when operating P.T.O. equipment.*

8-Speed Transmission

The 8-speed transmission incorporates two shift levers: a gearshift lever and a high-low shift lever, Figure 18. The gearshift lever is used to select any one of eight forward gear ratios and two reverse gear ratios, depending on the position of the high-low shift lever.

When the high-low shift lever is in the low range, 1st, 2nd, 3rd, and 4th gear ratios are obtained.

When the lever is in the high range, 5th, 6th, 7th, and 8th gear ratios are obtained. To change from one gear ratio to another, or to change ranges:

1. Depress the clutch pedal completely.
2. Bring the tractor to a complete stop.
3. Shift to the desired gear and/or range.

MANUAL SHIFT POWER TAKE-OFF OPERATION

The power take-off (P.T.O.) on your tractor transfers engine power directly to mounted or pull-type equipment, and to belt-driven equipment when the belt pulley accessory is used. The standard P.T.O. speed is 540 ± 10 rpm. Most P.T.O. equipment is designed to operate efficiently at this speed. The speed is obtained when engine rpm, as read on the Proof-Meter, is set at the speed listed in the following chart.

ENGINE SPEED VS. P.T.O. SPEED

Transmission	Engine Speed (rpm)	P.T.O. Speed (rpm)
4-Speed and 4-Speed with Over/Under Auxiliary		
Standard-Range	1500	540
Over-Range	1000	540
8-Speed Ford 2000 and 3000 (Transmission P.T.O.)	1600	540
8-Speed Ford 4000 (Transmission P.T.O.)	1800	540
8-Speed Ford 2000, 2110, 3000, and 4110 (Live P.T.O.)	1800	540
8-Speed Ford 4000 (Independent P.T.O.)	1800	540
8-Speed Ford 5000 (Independent P.T.O.)	1900	540

NOTE: *On tractors equipped with the Over/Under Auxiliary transmission, the P.T.O. must only be operated when the over/under shift lever, Figure 17, is in the Over-Range or in the Standard position.*

P.T.O. Shaft: The P.T.O. shaft on your tractor is the standard 6-spline, 1⅜-inch diameter shaft, Figure 30. The 6-spline shaft is used for 540 rpm P.T.O. operation only.

P.T.O. Shield: The P.T.O. shield, shown in the insert, Figure 31, is available as an accessory from your Ford Tractor-Equipment Dealer. The shield serves as a supporting member for drive line shields used with pull-type P.T.O.-driven equipment, and provides for your safety. Always install the P.T.O. shield when using P.T.O.-driven equipment.

Transmission and Live P.T.O. Operation (Manual Transmission): To operate the tractor P.T.O. at the standard speed of 540 rpm, the engine should be operated at the recommended speeds given in the above chart. After determining the recommended engine speed:

1. Stop the engine, set the parking brake, and attach the mounted or drawn equipment. Make sure the equipment-driven shaft is properly aligned and locked to the tractor P.T.O. drive shaft.



CAUTION: *To reduce the possibility of personal injury and damage to the equipment, comply with the following before attaching or detaching P.T.O. equipment, and before working on or clearing P.T.O. equipment.*

- *Disengage the P.T.O. with the P.T.O. control lever, Figures 39 and 40.*
- *Depress the clutch pedal completely and move the transmission gearshift lever to the neutral (N) position.*
- *Shut off the tractor engine.*
- *Wait until the P.T.O. shaft stops turning.*

NOTE: *For live P.T.O. operation, the clutch pedal operating rod clevis must be attached to the release arm at the rear holes. See Figure 139. If the clevis is attached to the arm at the front holes, the P.T.O. will not disengage.*

2. With the P.T.O. disengaged, start the engine. In the case of mounted equipment raise and lower the equipment to make sure proper clearance exists.
3. With the transmission in neutral, depress the clutch pedal completely, then engage the P.T.O. by moving the P.T.O. control lever, Figures 39 and 40, as follows:

- 4-Speed ..... Forward
- 8-Speed ..... Rearward

NOTE: *Failure to move the P.T.O. lever through its full range may result in damage to the P.T.O.*

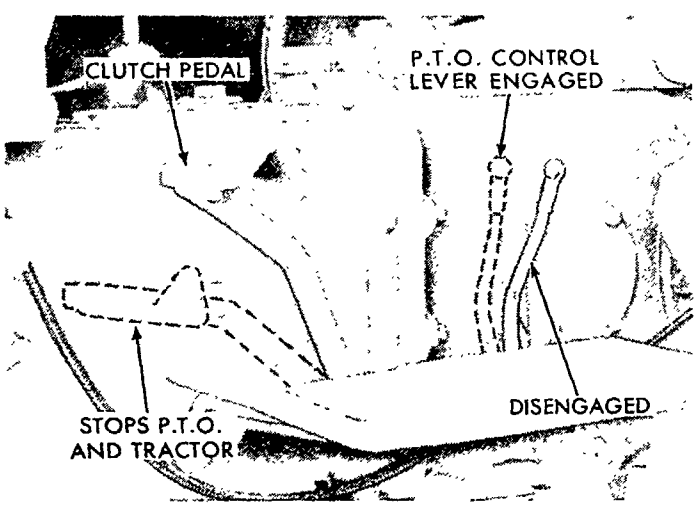


Figure 39
Transmission P.T.O. Control Lever and Clutch Pedal — 4-Speed

4. Check the P.T.O.-driven equipment for proper operation by gradually releasing the clutch pedal and increasing engine rpm.

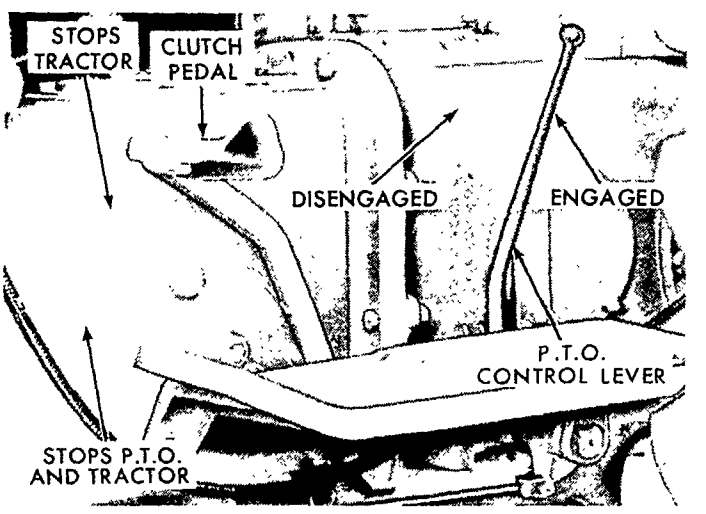


Figure 40
Transmission and Live P.T.O. Control Lever and Clutch Pedal — 8-Speed

5. After determining that the equipment is operating properly, depress the clutch pedal and shift to the desired operating gear. Release the pedal gradually to start the P.T.O. and tractor in motion.

NOTE: *On transmissions with live P.T.O., the required engine rpm can be obtained with the clutch pedal depressed halfway. On transmission P.T.O.-equipped tractors, engage the P.T.O. in advance of the work area so the engine rpm can build up to the required speed.*

6. Control the P.T.O. speed with the throttle. If the tractor speed is too fast for the P.T.O. load, stop the tractor and shift to a lower gear.
7. **Live P.T.O.:** If plugging or the threat of plugging occurs, depress the clutch pedal halfway to stop the tractor. The machine will continue to operate and clear itself. If it becomes evident the machine will not clear, comply with the following before attempting to clear the equipment by hand.
   - Disengage the P.T.O. with the P.T.O. control lever, Figure 40.
   - Depress the clutch pedal completely and move the transmission gearshift lever to the neutral position.
   - Shut off the tractor engine.
   - Wait until the P.T.O. shaft stops turning.
8. Disengage the P.T.O. with the P.T.O. control lever when making sharp turns and with mounted equipment in the fully raised position.

9. Disconnect the P.T.O.-driven shaft at the tractor P.T.O. shaft before traveling on highways or for any great distance.

Independent P.T.O. Operation (Manual Transmission): To use the tractor P.T.O. at the standard speed of 540 rpm, the engine must be operated at the recommended speed given in the chart on page 23.

Independent P.T.O. is hydraulically controlled through a clutch and can be engaged, operated, and disengaged whether or not the tractor is in motion. The P.T.O. is engaged and disengaged by the P.T.O. control lever, Figures 34 and 41.

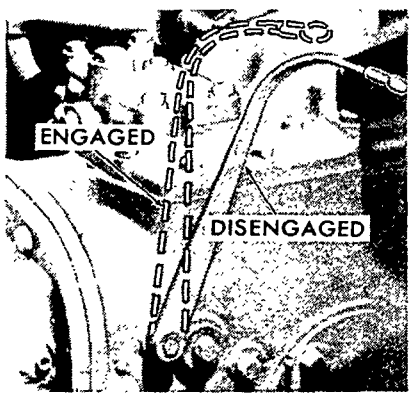


Figure 41
Independent P.T.O. Control Lever — Ford 4000

NOTE: *When the engine is not running or when the P.T.O. is disengaged, a mechanical brake prevents the P.T.O. shaft from turning.*

After determining the recommended engine speed:

1. Stop the engine, set the parking brake, and attach the mounted or drawn equipment. Make sure the equipment-driven shaft is properly aligned and locked to the tractor P.T.O. drive shaft.



CAUTION: *To reduce the possibility of personal injury and damage to the equipment, comply with the following before attaching or detaching P.T.O. equipment, and before working on or clearing P.T.O. equipment.*

- *Disengage the P.T.O. with the P.T.O. lever, Figures 34 and 41.*
- *Depress the clutch pedal and move the transmission gearshift lever to the neutral position.*
- *Shut off the tractor engine.*
- *Wait until the P.T.O. shaft stops turning.*

2. With the P.T.O. disengaged, start the engine. In the case of mounted equipment, raise and lower the equipment to make sure proper clearance exists.

3. Engage the P.T.O. by moving the P.T.O. control lever, Figures 34 and 41, as follows:

   - Ford 4000 ..... Move the lever sharply forward
   - Ford 5000 ..... Move the lever sharply rearward

4. Operate the P.T.O. at low rpm to make sure the P.T.O.-driven equipment is free of obstructions.

5. Before encountering the work, bring the P.T.O. speed up to the recommended rpm.

6. Select the correct gear ratio and enter the work. If plugging or the threat of plugging occurs, depress the clutch pedal to stop the tractor. The machine will continue to operate and clear itself. If it becomes evident the machine will not clear, comply with the following before attempting to clear the equipment by hand.

   - Disengage the P.T.O. with the P.T.O. control lever, Figures 34 and 41.
   - Depress the clutch pedal and move the gearshift lever to the neutral position.
   - Shut off the tractor engine.
   - Wait until the P.T.O. shaft stops turning.

7. Disengage the P.T.O. with the P.T.O. control lever when making sharp turns and with mounted equipment in the fully raised position.

8. Disconnect the P.T.O.-driven shaft at the tractor P.T.O. shaft before traveling on highways or for any great distance.

TOWING MANUAL SHIFT TRACTORS

To tow or push your tractor, place the transmission gearshift lever(s) in neutral. Do not exceed 20 mph, and do not tow or push your tractor to start it.

If the tractor is to be moved any distance, use a solid tow bar and pull the tractor at a speed not to exceed 20 mph. When the engine is not running, additional steering effort is required if your tractor is equipped with power assist steering.

OPERATING DIFFERENTIAL LOCK

On tractors equipped with differential lock, the lock is engaged by depressing the pedal located on the right

side of the center housing, Figures 35 and 36. Depressing the pedal locks both rear axle shafts together, preventing one wheel from rotating independently of the other.

The lock should be used whenever one wheel begins to slip in wet or loose soil to obtain additional traction from the opposite wheel.

To operate the differential lock:

1. Depress and hold the pedal down until the lock is definitely felt to engage, then release the pedal.
2. The lock will remain engaged until the traction of both rear wheels is equal. It will then disengage automatically, and the pedal will return to its original position when traction equalizes.

NOTE: *It is best to engage the differential lock while the wheels are turning slowly. This will minimize shock loads to the drive line.*

The differential lock is intended for use in work operations at ground speeds below 5 mph. It should not be engaged when driving the tractor on the highway, or when the ground speed is above 5 mph. If a wheel spins at high speed, as on ice, the engine speed must be reduced to idle before engaging the lock or damage may occur.



CAUTION: *Do not engage the differential lock when turning the tractor. If the lock is engaged when turning, there could be a loss of steering control and injury to the operator could result.*

OPERATING BELT PULLEY (ACCESSORY)

The belt pulley, shown in Figure 42, is available as an accessory for use on your Ford Tractor that is equipped with a 6-spline, 540 rpm P.T.O. shaft. The pulley can be installed horizontally to the left or right, giving clockwise or counterclockwise pulley rotation. The pulley may also be installed in the downward position.

NOTE: *Never install the pulley in the "UP" position.*

To install the pulley:

1. Remove the P.T.O. shaft safety cap, the drawbar, the drawbar hanger, and the check chains.
2. Position and secure the pulley assembly over the 6-spline P.T.O. shaft with the four bolts previously used to secure the drawbar hanger.

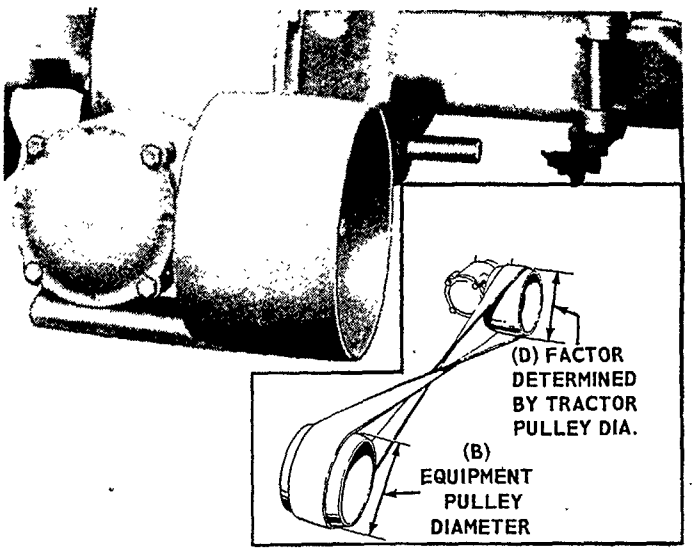


Figure 42
Belt Pulley Installed on Ford 3000 Tractor

NOTE: *A belt pulley guard is available as an accessory from your Ford Tractor-Equipment Dealer.*

For best performance, stationary machinery must be operated at the correct belt speed. The A.S.A.E. has established a standard for belt speeds of 3100 ± 100 fpm. A belt speed within this range is reached for various tractor transmissions using the pulley and engine speeds in the chart on page 27. The last column in the chart lists factors for determining the proper diameter pulley to be used on the driven equipment.

Belt-driven equipment that does not meet A.S.A.E. standards should be operated at the speed recommended by the manufacturer. This speed can be obtained only with the proper equipment pulley diameter as determined by the formula:

$$B = \frac{D \times E}{A}$$

A = Desired equipment rpm (found in Equipment Operator's Manual)

B = Equipment (driven) pulley size in inches (to be determined)

D = Factor determined by tractor (driving) pulley size shown in the chart

E = Tractor engine speed selected

OBTAINING 3100 ± 100 FEET PER MINUTE BELT SPEEDS

Tractor	Transmission	Pulley Size	Engine Speed	Factor*
Ford 2000 and 3000	4-Speed (Transmission P.T.O.)	9 in.	2000	6.12
Ford 2000 and 3000	8-Speed (Transmission P.T.O.)	9 in.	2000	5.70
Ford 3000	8-Speed (Live P.T.O.)	10¼ in.	2000	5.70
	Select-O-Speed	10¼ in.	2000	5.70
Ford 4000	8-Speed (Transmission P.T.O.)	10¼ in.	2200	5.63
	8-Speed (Independent P.T.O.)	10¼ in.	2200	5.63
	Select-O-Speed	10¼ in.	2200	5.63
Ford 5000	8-Speed (Independent P.T.O.)	11 in.	2100	5.75
	Select-O-Speed	11 in.	2100	5.75

* Use only if equipment does not meet A.S.A.E. standards.

For Example:

- A corn sheller is to be operated at 800 rpm.
- Your tractor is a Ford 2000 with a 4-speed transmission.
- From the chart for the 9-inch pulley, the pulley-to-engine speed factor is 6.12.
- Considering the horsepower requirements of the sheller, you decide you want the tractor engine to operate at 1700 rpm while shelling corn.
- Using the formula $\frac{D \times E}{A}$, solve for B (equipment-driven pulley size) as follows:

$$B = \frac{D \times E}{A}$$

$$B = \frac{6.12 \times 1700}{800}$$

$$B = \frac{10404}{800}$$

B = 13-inch pulley size

- Your solution is a 13-inch pulley on the sheller. However, if you do not have a 13-inch pulley but do have a 12-inch pulley, a different approach can be taken to find engine speed.
- Using the formula $\frac{A \times B}{D}$, solve for E (tractor engine speed) as follows:

$$E = \frac{A \times B}{D}$$

$$E = \frac{800 \times 12}{6.12}$$

$$E = \frac{9600}{6.12}$$

E = 1568 tractor engine rpm

- Therefore, you can use the 12-inch pulley on the sheller and set the tractor engine speed at 1568 rpm (under load). You could also use a different size drive pulley on the P.T.O.; however, it would then be necessary to compute the P.T.O. and engine speeds for your particular application.

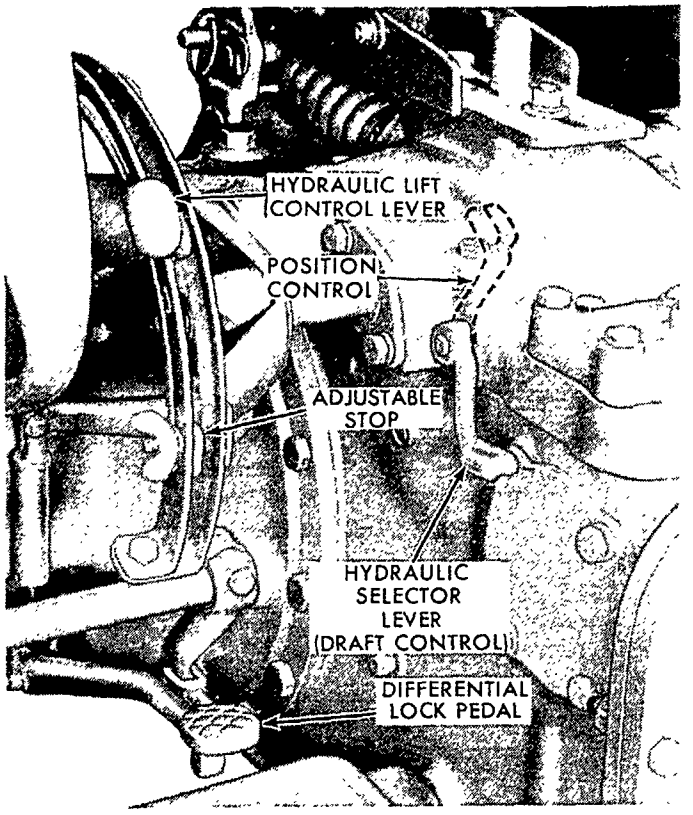


Figure 43
Hydraulic Lift Controls — Ford 2000, 2110, and 4110

OPERATING HYDRAULIC LIFT SYSTEM

By moving the hydraulic lift control lever, Figures 43, 44, and 45, the hydraulic system provides accurate, smooth, and instant hydraulic power for raising a wide variety of equipment whenever the engine is running. The system incorporates both position and draft control to better adapt the tractor to varying types of operating conditions.

POSITION CONTROL

With the hydraulic selector lever, Figures 43, 44, and 45, in position control, the tractor hydraulic system will automatically maintain the selected height or depth of three-point linkage equipment in relation to the tractor.

There is a definite relationship between the position of the hydraulic lift control lever and the position of the equipment. When the hydraulic lift control lever is moved to a higher or lower setting in the quadrant, the system immediately repositions the equipment to a higher or lower position. The system will then automatically maintain the selected position.

Position control provides easy, accurate control of three-point linkage equipment that operates above the ground, such as sprayers, rakes, mowers, etc. It is also an advantage when using blades or similar equipment on level ground, as it will maintain a more uniform depth.

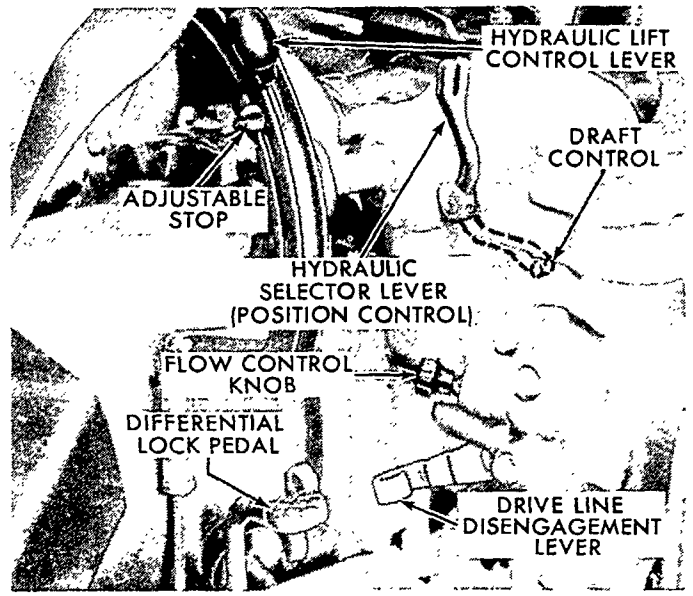


Figure 44
Hydraulic Lift Controls — Ford 3000 and 4000
(Ford 4000 Shown)

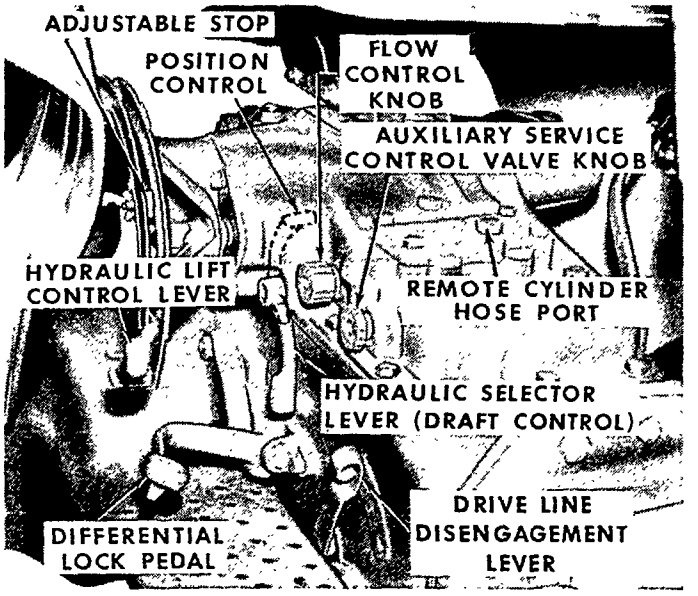


Figure 45
Hydraulic Lift Controls — Ford 5000

DRAFT CONTROL

When the hydraulic selector lever, Figures 43, 44, and 45, is in draft control, the tractor hydraulic system will automatically adjust the equipment's working depth to maintain an even pull on the tractor regardless of the soil conditions.

Upper Link Compression Loads: As the equipment is pulled through the soil, the draft caused by soil resistance has the effect of trying to rotate the equipment around the lower link hitch points. This draft creates a pushing or compressive force on the upper link. When changes in soil resistance cause the draft to increase or decrease, the compression force on the upper link will also increase or decrease. These changes in upper link compression will signal the hydraulic system, through internal linkage, to raise or lower the equipment, thereby maintaining uniform draft.

Upper Link Tension Loads (Ford 3000, 4000, and 5000): When working with long, heavy equipment in light soils or at shallow depths, the soil resistance is not always sufficient to create a compressive force on the upper link. At times the link will be in tension. The hydraulic system on Ford 3000, 4000, and 5000 Tractors will automatically respond to tension as well as compression, thereby controlling working depth, even when using long, heavy equipment.

NOTE: *When grading and backfilling with light equipment, such as a rear blade, it may be necessary to "block out" upper link tension loads on Ford 3000 and 4000 Tractors to prevent the blade from "diving." This is accomplished by installing a spacer (available from your Ford Tractor-Equipment Dealer) between the counterbore in the draft control main spring housing and the spring seat. See Figure 140. Response to upper link tension cannot be "blocked out" on Ford 5000 Tractors. Refer to page 76 for spacer installation instructions.*

FLOW CONTROL

Ford 3000, 4000, and 5000

The flow control knob, Figures 44 and 45, provides an adjustment to regulate the oil flow rate used to move the lift piston in the hydraulic system, thus speeding up or slowing down the rate of lift. Flow control will affect the rate of lift in either draft or position control; it also affects the rate of movement of remote cylinders.

When operating in draft control, the setting of the flow control knob regulates the hydraulic system responses by slowing down the draft reactions. This action permits attached equipment, such as a plow, to respond more quickly or slowly to soil texture changes. Turning the knob "in" speeds up the response. Turning the knob "out" slows down the response and provides more gradual hydraulic system reactions. In hard soils, and at moderate-to-fast tractor speeds, turning the knob "out" will improve quality of the work.

When the hydraulic lift control lever is raised to the top of the quadrant to raise the equipment, flow control is overridden and maximum lift speed is obtained.

AUXILIARY SERVICE CONTROL VALVE

The auxiliary service control valve knob, Figures 45 and 46, permits the use of hydraulic power for single-acting remote cylinder operation. When operating in

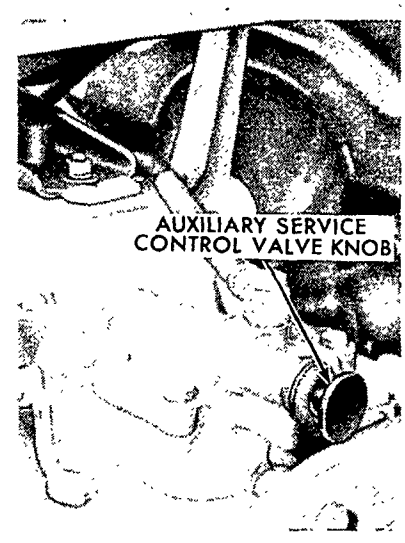


Figure 46
Auxiliary Service Control Valve Knob — Ford 2000, 2110, 3000, 4000, and 4110

auxiliary control, it is recommended that the hydraulic selector lever, Figures 43, 44, and 45, be in draft control. The auxiliary service control valve knob positions are:

- Ford 2000, 2110, 3000, 4000, and 4110 ..... Full "in" to operate lift linkage.
  ..... Full "out" to operate remote cylinders.
  ..... Half "out" to operate lift linkage and remote cylinders simultaneously.
- Ford 5000 ..... Full "in" to operate lift linkage.
  ..... Full "out" to operate remote cylinders.

NOTE: *With the exception of the Ford 5000, the auxiliary service control valve cannot be used with remote control valves. The Ford 5000 Tractor hydraulic lift system and remote cylinder (single-acting) can be operated simultaneously by connecting the remote cylinder hose directly into the lift cylinder through the remote cylinder port on the accessory cover. See Figure 45. Simultaneous operation does, however, depend on the amount of weight that is to be lifted by the lift links and remote cylinder. If the weight to be lifted by the cylinder is greater than the weight on the lift links, the links will raise to the top of their travel, making the hydraulic system inactive.*

The actual operation of the remote cylinder is controlled by the hydraulic lift control lever, Figures 43, 44, and 45. With the engine running:

1. Move the hydraulic lift control lever to the neutral position in the quadrant, where neither raising nor lowering takes place.
2. Position the stop on the quadrant at the front edge of the lever. This will make it easy to quickly locate neutral.
3. Move the auxiliary service control valve knob to the full "out" position.
4. To extend the remote cylinder, move the control lever above its neutral position. When the cylinder is fully extended, return the control lever to the neutral position to avoid "popping" the hydraulic system relief valve.
5. To retract the cylinder, move the control lever below the neutral position on the quadrant. The weight of the implement will retract the cylinder. When the cylinder is fully retracted, return the control lever to neutral.

NOTE: *Remote cylinders are operated by oil initially drawn from the rear axle. Any remote cylinder that is disconnected when extended represents a loss of oil in the rear axle. This oil must be replaced by adding a corresponding quantity of oil. Also, all hoses should be cleaned before connecting, and the open end of all connectors should be covered with dust caps when not in use.*

REMOTE CONTROL VALVES (OPTIONAL)

Your Ford Tractor can be equipped with a single- or double-spool remote control valve, with or without detents. See Figure 47. The detents hold the control handle(s) in the raise or drop position until the remote cylinder reaches the end of its stroke. The control handle then automatically returns to the neutral position.

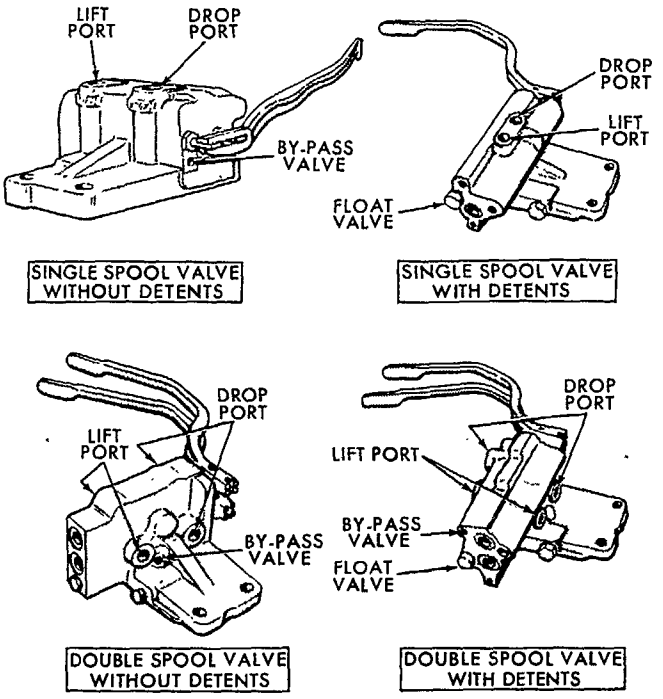


Figure 47
Remote Control Valves

Moving the handle(s) forward will lower the equipment; moving the handle(s) rearward will raise the equipment. See Figure 48.

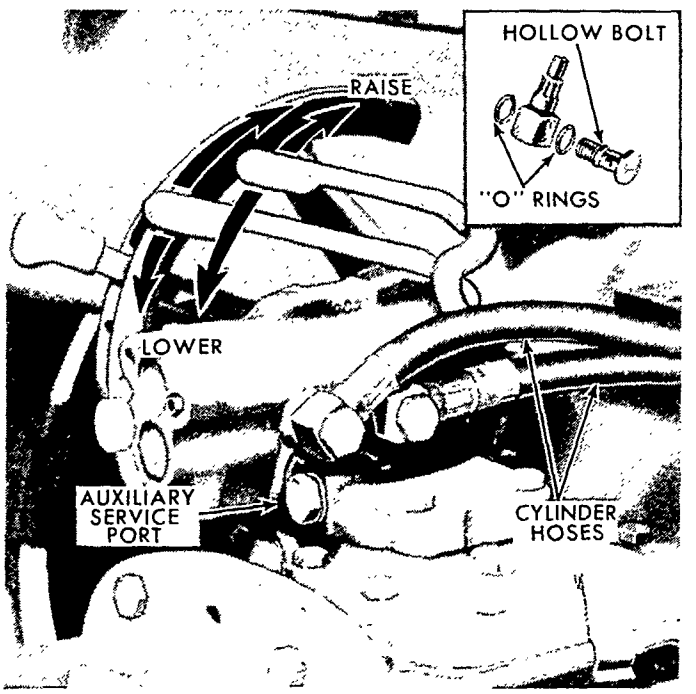


Figure 48
Remote Control Valve Installed

REMOTE CONTROL VALVES

Control Valve Type	Cylinder Application(s)	Float Valve	Bypass Valve	Hose Installation*			
				Single-Spool Valves or Lower Spool of Double-Spool Valves		Upper Spool of Double-Spool Valves	
				Lift Port	Drop Port	Lift Port	Drop Port
Single-Spool Without Detents	One Double-Acting	N/A	Closed	Lift Hose	Drop Hose	N/A	N/A
	One Single-Acting	N/A	Open	Lift Hose	Plug	N/A	N/A
Single-Spool With Detents	One Double-Acting	Closed	N/A	Lift Hose	Drop Hose	N/A	N/A
	One Single-Acting	Open	N/A	Lift Hose	Plug	N/A	N/A
Double-Spool Without Detents	Two Double-Acting	N/A	Closed	Lift Hose	Drop Hose	Lift Hose	Drop Hose
	One Double-Acting One Single-Acting	N/A	Open	Lift Hose	Plug	Lift Hose	Drop Hose
Double-Spool With Detents	Two Double-Acting	Closed	Closed	Lift Hose	Drop Hose	Lift Hose	Drop Hose
	One Double-Acting One Single-Acting	Open	Closed	Lift Hose	Plug	Lift Hose	Drop Hose
	Two Single-Acting	Open	Open	Lift Hose	Plug	Lift Hose	Plug

NOTE: *When installing the hoses to the control valve, install O-ring seals as shown in the insert, Figure 48.*

* *Refer to Figure 47 for port locations.*

N/A — Does not apply.

The remote control valves incorporate bypass and float valves that control the operation of the remote cylinders. These valves are covered in the paragraphs that follow. The chart above lists the cylinder combinations that can be used with the remote valves. The chart indicates when to open or close the bypass valve and/or float valve, and shows which ports to plug or connect hoses to for the various cylinder applications. Use the chart in conjunction with Figure 47.

Bypass Valve: The bypass valve provides an escape for hydraulic oil when a single-acting cylinder reaches the end of its stroke. Close the valve when using a double-acting cylinder. To close the valve, use an Allen wrench and turn the bypass screw clockwise until it "bottoms." To open the valve for single-acting cylinders back the screw full "out."

Float Valve: The float valve should always be open when using a single-acting cylinder to provide an escape for hydraulic oil when the cylinder reaches the end of its stroke. The valve can be either open or closed when using a double-acting cylinder. An open valve allows the equipment to "float," or follow the ground contour. A fully closed valve will hold the equipment in a fixed position determined by the degree of cylinder extension.

To close the valve, turn the adjusting knob clockwise. To open the valve, turn the knob counterclockwise. Various degrees of down pressure or "float" can be achieved by partly opening or partly closing the valve.

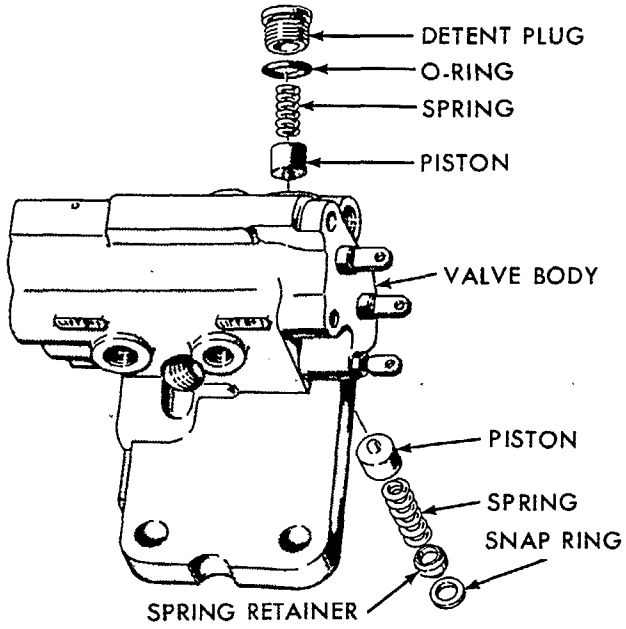


Figure 49
Detent Spring Removal

Detents: Because the detents permit the remote cylinder(s) to extend or retract until they have reached the end of their stroke, it may be desirable to make the detents inoperative. This is accomplished by removing the springs, Figure 49. With the detent springs removed, the remote cylinders will stop their movement when the handles are released.

IMPORTANT: *Do not remove the pistons. Remove only the springs.*

Remote Cylinder Coupling Kits (Accessory): Your Ford Tractor can be equipped with remote cylinder coupling kits (available from your Ford Tractor-Equipment Dealer) which permit easy connection of hoses for remote cylinder applications. Although it is recommended that pressure be relieved before connecting or disconnecting the hoses, the couplings do permit connecting or disconnecting with pressure in the system.

To connect the couplings:

1. Remove the dust cap. Make sure the hose end and the coupling housing are clean.
2. Pull the lever toward the rear. Insert the coupling into the coupling housing and release the lever.

NOTE: *On some couplings with a hex housing, it may be necessary to turn the housing counterclockwise a maximum of six turns before inserting the coupling and then turn the housing clockwise after releasing the lever until the housing seats firmly.*

To disconnect the couplings:

1. Grip the hose firmly and pull the lever toward the rear. Remove the coupling from the coupling housing.
2. Cover the opening in the coupling housing with the dust cap.

LIFT LINKAGE AND DRAWBAR

TRACTOR HYDRAULIC LIFT ROCKER

Ford 2000, 2110, 3000, and 4110: The hydraulic lift rocker, Figure 50, incorporates two holes for attaching the upper link. Attach the link in the top hole, as shown, for light draft loads (cultivating) and in the bottom hole for heavier draft loads (plowing).

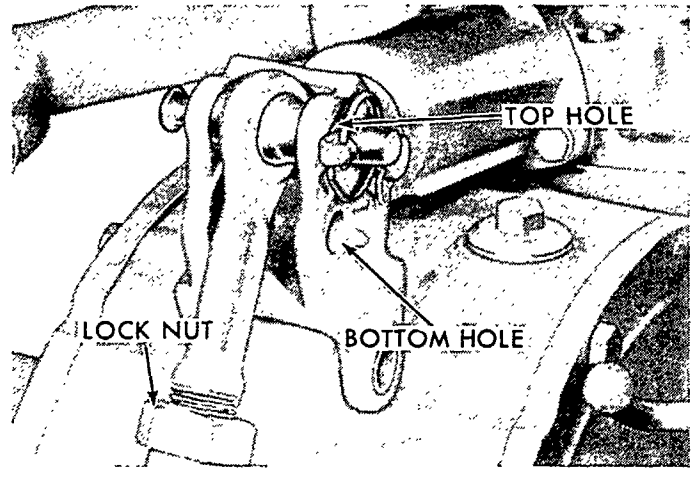


Figure 50
Hydraulic Lift Rocker — Ford 2000, 2110, 3000, and 4110 (Ford 3000 Shown)

Ford 4000: The hydraulic lift rocker, Figure 51, incorporates two pivot pin holes. Install the pivot pin in the bottom hole, as shown, for heavy draft loads (plowing), and in the top hole for light draft loads (cultivating).

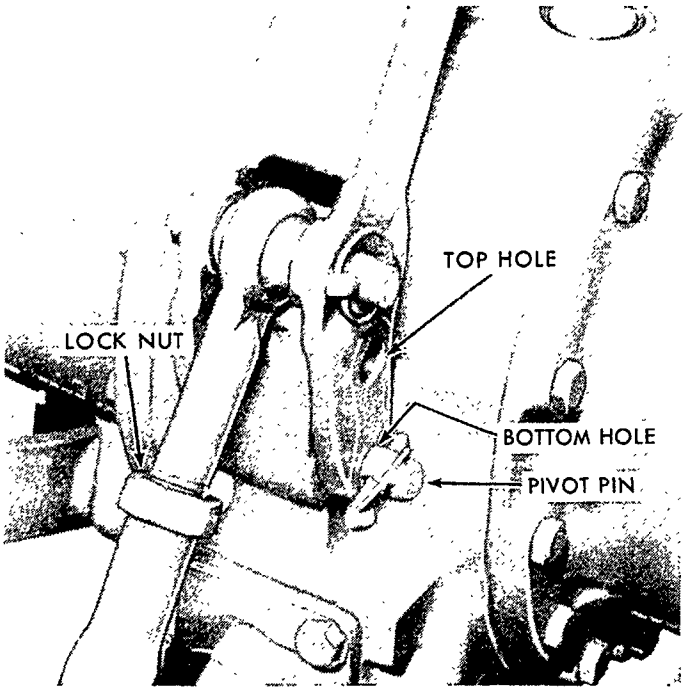


Figure 51
Hydraulic Lift Rocker — Ford 4000

Ford 5000: The hydraulic lift rocker, Figure 52, incorporates three holes for attaching the upper link. Attach the link in the top hole, as shown, for light draft loads (cultivating), and in the bottom two holes for progressively heavier draft loads (plowing).

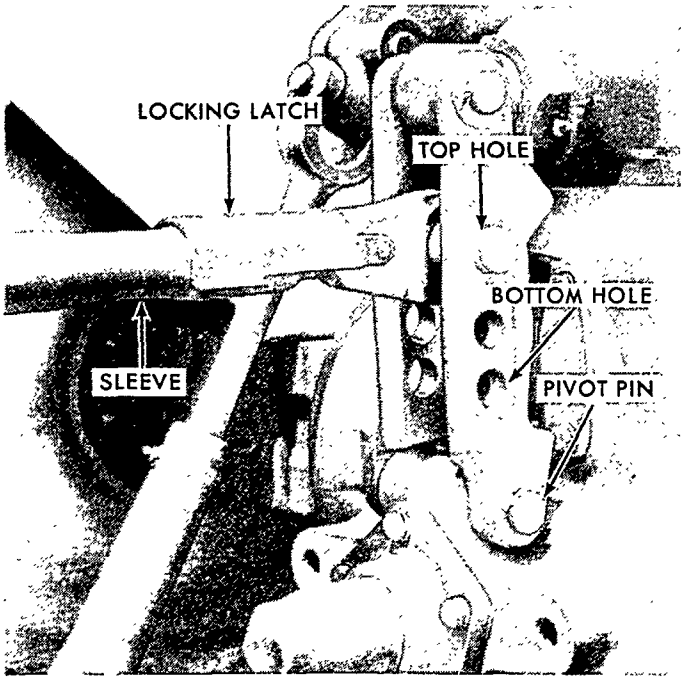


Figure 52
Hydraulic Lift Rocker — Ford 5000

CATEGORY I AND II LINKAGE

Ford 2000, 2110, 3000, 4000, and 4110: These tractors are factory equipped with Category I Linkage, insert, Figure 53. Category II balls are available as an accessory for the Ford 3000 and 4000 only.

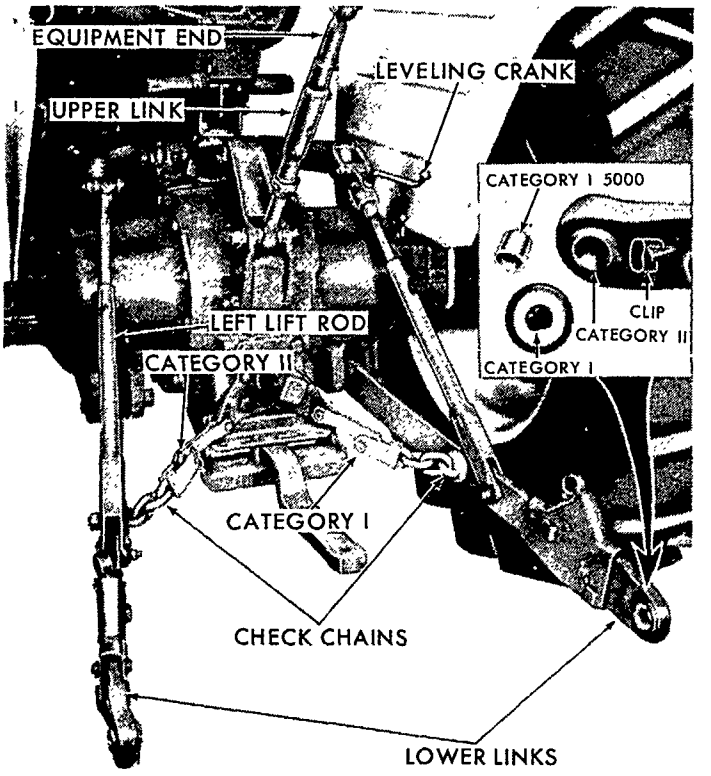


Figure 53
Lift Linkage — Ford 4000 with Flexible Links Shown



CAUTION: *Even though Category II linkage is available for the Ford 3000, it is recommended that only light Category II equipment be used on this tractor. Heavy Category II equipment may impair tractor stability.*

Ford 5000: The Ford 5000 Tractor is factory equipped with Category II Linkage, insert, Figure 53. Category I bushings are available as an accessory.

To change from one category to another:

Ford 3000 and 4000:

1. Remove the equipment end of the upper link, Figure 53, and install the alternate section.
2. Pull the spring-loaded retainer clip, insert, Figure 53, away from the link ball in each link, then rotate the

balls until their holes are in a vertical position. The balls can then be removed and the alternates installed.

3. When Category II linkage is used, adjust the check chains, Figure 53, to give their greatest length by attaching them to the tractor at the Category II hole. When using Category I linkage, shorten the chains by attaching them at the Category I hole as shown.

NOTE: *The chain adjustment on Ford 3000 Tractors is at the opposite end of the chains.*

Ford 5000:

1. Install the Category I bushings, insert, Figure 53, in the equipment end of the upper link and in the lower link balls.
2. Install the new check chains and bracket provided. Adjust the chains to their shortest length for Category I, and to their longest length for Category II operation.

FLEXIBLE LINK ENDS

Ford 4000 and 5000

Flexible link ends, Figure 54, provide for quick and easy attachment of most equipment by permitting the link ends to move "up" and "down," and "in" and "out." Pulling the ring will release the link ends for this movement. Once the equipment is attached, the flexible links will lock in place and become rigid by simply inching the tractor rearward. Refer to page 36 for attaching equipment information.

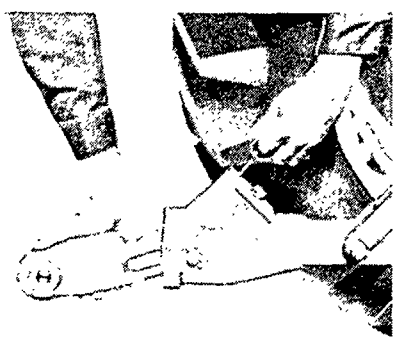


Figure 54
Flexible Link Ends

STABILIZERS (ACCESSORY)

Stabilizer kits are available as an accessory from your Ford Tractor-Equipment Dealer. The stabilizers prevent equipment from swaying side to side which means better control. This is especially important when operating on slopes or near fences, walls, or ditches, and with certain implements. Check your Implement Operator's Manual. The kits are installed as follows:

Ford 2000, 2110, 3000, and 4110: The stabilizer kit is shown in Figure 55. The kit is identical for each tractor with the exception of the stabilizer links. Links 8 and 10 are for Ford 2000, 2110, and 4110 Tractors with Category I linkage, and links 5 and 11 are for Ford 3000 Tractors with Category I or II linkage.

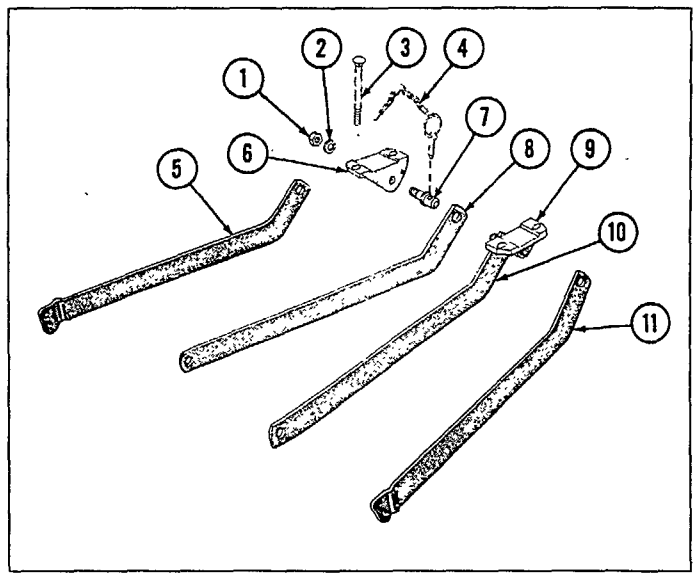


Figure 55
Stabilizer Kit — Ford 2000, 2110, 3000, and 4110 (Accessory)

To install the kit:

1. Replace the existing fender bolts with the carriage bolts in the kit (3). Attach the fenders and stabilizer brackets (6) and (9) with the carriage bolts, nuts, and flat washers. Do not tighten at this time. Make sure the brackets are installed so the vertical side is inboard.
2. Install one pivot pin (7) in each bracket and secure with the nut and lock washer (1) and (2). Do not tighten at this time. Make sure the large end of each pin is inboard.
3. Position the links (8) and (10), or (5) and (11) over the pivot pins and retain them with the linch pins (4).
4. Attach the equipment to the three-point linkage, then tighten all nuts securely.

NOTE: *Use the lower hole in the links (5) and (11), when attaching Category II equipment. The upper hole is for Category I equipment. Adjust the check chains to the shortest length for Category I equipment and lengthen them for Category II equipment.*

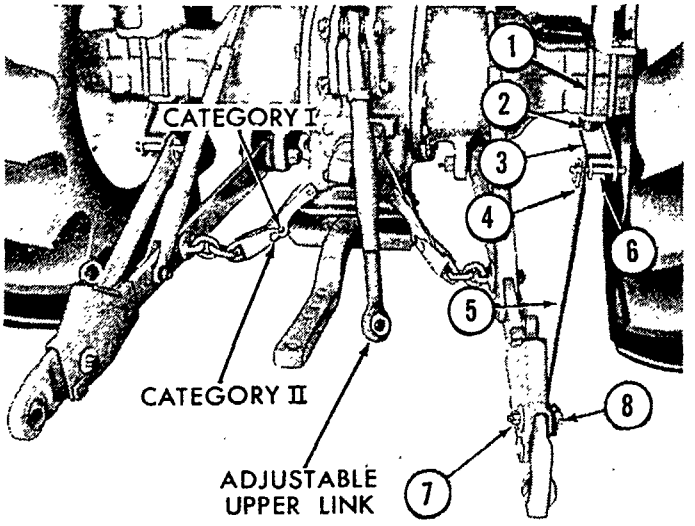


Figure 56
Stabilizer Kit — Ford 4000 with Flexible Links (Accessory)

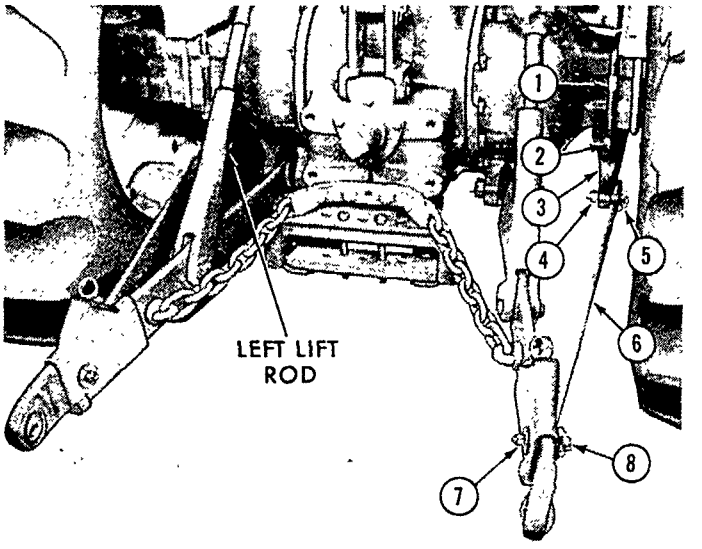


Figure 57
Stabilizer Kit — Ford 5000 with Flexible Links (Accessory)

Ford 4000: The stabilizer kit for the Ford 4000 Tractor with flexible link ends is shown installed in Figure 56. The kit can be used with Category I or II linkage.

To install the kit:

1. Attach the stabilizer brackets (3) to the rear axle with the U-bolts (1), and nuts and lock washers (2). Do not tighten at this time. Make sure the U-bolts are seated in the second groove of the axle and that the brackets angle rearward and toward the tires as shown.
2. Install the stabilizer pins (6), then place the stabilizer links (5) over the pins and install the linch pins (4).

   NOTE: *When Category II equipment is used with the flexible link end stabilizer kit, attach the stabilizer links (5) to the brackets (3) so the pins (6) go through the upper hole in the links. The lower hole is for Category I equipment. Adjust the check chains to the shortest length for Category I equipment and lengthen them for Category II equipment.*
3. Remove the existing pins (8) and attach the stabilizer links (5) to the link ends with the pins (8) and nuts and washers (7) that are provided. Do not tighten at this time. Secure the stabilizer links in place with the linch pins provided.
4. Attach the equipment to the three-point linkage, then tighten all nuts securely.

Ford 5000: The stabilizer kit for the Ford 5000 Tractor with flexible link ends is shown installed in Figure 57. The kit can be used with Category I or II linkage.

To install the kit:

1. Attach the stabilizer brackets (3) to the rear axle with the U-bolts (1), and nuts and washers (2). Do not tighten at this time. Make sure the U-bolts are seated in the first groove of the axle and that the brackets angle rearward as shown.
2. Install one pivot pin (5) in each bracket and secure with the nut and washer (4). Do not tighten at this time. Make sure the large end of each pin is outboard as shown.
3. Position the stabilizer links (6) over the large end of the pivot pins (5) and retain them with the linch pins.

   NOTE: *When Category II equipment is used with the flexible link end stabilizer kit, attach the stabilizer links (6) at the upper hole. The lower hole is for Category I equipment.*
4. Remove the existing pins (8) and attach the stabilizer links (6) to the link ends with the pins (8) and nuts and washers (7) that are provided. Do not tighten at this time. Secure the links in place with the linch pins provided.

   NOTE: *Make sure the longer check chains are used for Category II equipment and the short chains for Category I equipment.*
5. Attach the equipment to the three-point linkage, then tighten all nuts securely.

ADJUSTABLE UPPER LINK

The adjustable upper link, Figure 56, on Ford 2000, 2110, 3000, 4000, and 4110 Tractors can be adjusted to suit attached equipment by loosening the lock nut, Figures 50 and 51, and turning the sleeve as required. The link on Ford 5000 Tractors, Figure 52, is adjusted by lifting the locking latch and then turning the sleeve.

Most equipment will operate at the proper height when the upper link is adjusted to a length of approximately 27 inches as measured to the center of the attaching points.

LEFT LIFT ROD

Ford 2000, 2110, and 4110: The left lift rod, Figure 53, is preset at 21.5 inches and cannot be adjusted.

Ford 3000, 4000, and 5000: The left lift rod, Figure 53, can be adjusted by removing the attaching bolt from the lower end of the rod and then turning the rod as required. For normal operation the rod should be adjusted to a length of:

- Ford 3000 ..... 23 inches
- Ford 4000 ..... 29.8 inches
- Ford 5000 ..... 28.5 inches

LEVELING CRANK

The leveling crank, Figure 53, is used to level attached equipment. Turning the crank clockwise will shorten the right lift rod, raising the equipment. Turning the crank counterclockwise will lengthen the rod, lowering the equipment. The crank is also helpful when attaching equipment.

SWINGING DRAWBAR

The swinging drawbar, Figure 58, permits quick, easy attachment to pull-type equipment. On tractors equipped with the Deluxe Select-O-Speed transmission, it can be used in either the 14-inch or the 16-inch extended position (measured from the end of the P.T.O. shaft). When operating 540 rpm P.T.O.-driven equipment, set the drawbar at the 14-inch position. Set it at the 16-inch position for 1000 rpm P.T.O. operation.

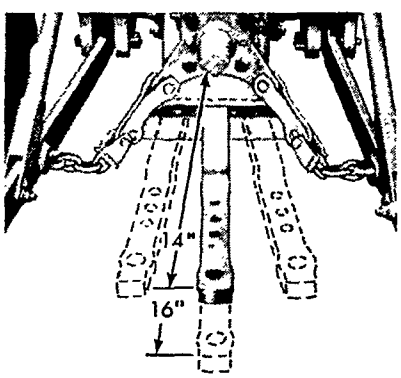


Figure 58
Swinging Drawbar

The drawbar may also be set and used in positions to the left or right of center (seven in all). Figure 58 shows some of the positions at which it can be set.

ATTACHING EQUIPMENT

Most equipment can be easily attached to the three-point linkage of your new Ford Tractor as follows:

1. Back the tractor to a point where the lower link ends are touching, or are near the attaching pins of the equipment.
2. **Flexible Links:** Release the left-hand flexible link end by pulling on the ring, Figure 54.
3. Position the left-hand ball over the attaching pin and secure it with a linch pin.
4. If necessary, use the leveling crank, Figure 53, to position the right-hand link near the attaching pin. Then position the right-hand ball over the pin and secure it with a linch pin.
5. **Flexible Links:** Use the leveling crank and the hydraulic lift control lever to position the links so the link ends and links are properly in line for telescoping.
6. **Flexible Links:** Inch the tractor back until the link ends telescope (shorten) and snap into place, locking themselves.
7. Attach the upper link.

IMPORTANT: *Before transporting or operating the equipment, observe the rear links to make sure the flexible assemblies are locked in the closed position. Also when attaching close-mounted equipment to a tractor, remove the drawbar, Figure 58.*

WHEEL TREAD SETTINGS

FRONT WHEEL TREAD SETTINGS

Ford 2000 and 3000: When equipped with either the standard size 5.50-16 or optional size 6.00-16 tires, the front tread setting is adjustable from 52 to 80 inches in approximately 4-inch increments.

NOTE: *To obtain the 80-inch tread setting, the wheels must be reversed on the hubs and the outer axle sections set at the 72-inch position. See Figure 59.*

Ford 2110 and 4110: When equipped with standard size 6.50-13 tires, the front wheel tread setting is adjustable from 54 to 78 inches in approximately 4-inch increments. When equipped with optional size tires, the front wheel tread setting is:

- 60 to 76 inches with optional 6.00-16 tires
- 56 to 76 inches with optional 9.00-10 tires

Ford 4000 and 5000: When equipped with standard size 6.00-16 tires, the front wheel tread setting is adjustable from 52 to 80 inches in approximately 4-inch increments. When equipped with optional size tires, the front wheel tread setting is:

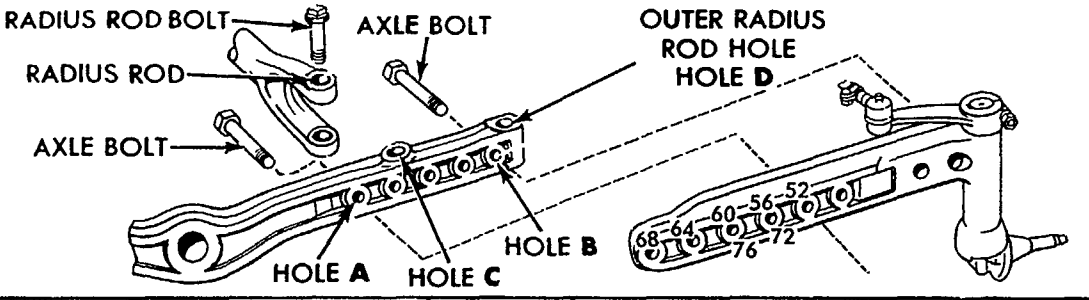
- 53½ to 81½ inches with optional 7.50-16 or -18 tires

CHANGING FRONT WHEEL TREAD SETTINGS

Ford 2000, 2110, 3000, and 4110

1. Raise the front end of the tractor with a jack placed under the center of the front axle.
2. Working on one outer axle section at a time, remove the axle bolts, Figure 59.
3. Move the axle in or out until the desired setting is obtained, then reinstall the axle bolts through the holes according to the chart in Figure 59.

NOTE: *To obtain the 80-inch tread width on Ford 2000 and 3000 Tractors, set the outer axle sections at the 72-inch position and reverse the wheels.*



FOR TREAD WIDTH (INCHES) FORD 2000 & 3000	FORD 2100 & 4100	LINE UP HOLE A AND HOLE NO	LINE UP HOLE B AND HOLE NO	SPACE BOLTS APART (INCHES)	SET RADIUS ROD TO HOLE	RADIUS RODS SPREAD (INCHES)
52	54	52		8-1/2	C	29.08
56	58	56		8-1/2	C	29.08
60	62	60		6-3/8	D	40.82
64	** 66	64		8-1/2	D	40.82
68	70 ***	68		8-1/2	D	40.82
72	74		72	6-3/8	D	40.82
76	78		76	4-1/4	D	40.82
80 *			72	6-3/8	D	40.82

*TO OBTAIN 80 INCH TREAD WIDTH, REVERSE THE WHEELS AND POSITION THE AXLE AXLE AT THE 72 INCH POSITION

** WHEN USING OPTIONAL 9.00-10 TIRES AND WHEELS, SUBTRACT 2 INCHES FROM THE DIMENSIONS LISTED

***WHEN USING OPTIONAL 6.00-16 TIRES AND WHEELS, SUBTRACT 2 INCHES FROM THE DIMENSIONS LISTED

Figure 59
Front Wheel Tread Settings — Ford 2000, 2110, 3000, and 4110

4. If necessary, remove the radius rod bolt and position the rod at hole "C" or "D" as specified in the chart. Reinstall the bolt.
5. Tighten all nuts securely and remove the jack.
6. Check the toe-in as outlined on page 72.

Ford 4000 and 5000

1. Raise the front end of the tractor with a jack placed under the center of the front axle.
2. Working on one outer axle section at a time, remove the positioning bolts, Figure 60.

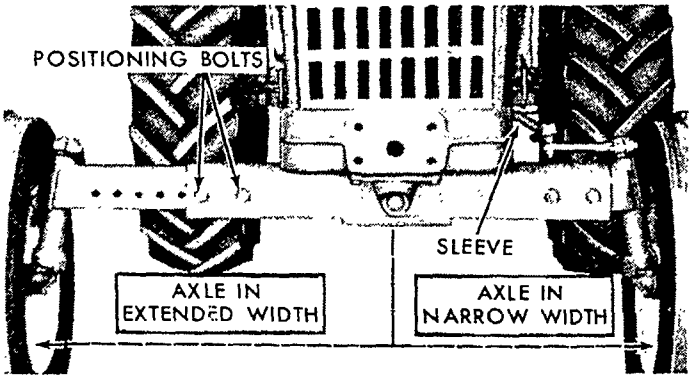


Figure 60
Front Wheel Tread Settings — Ford 4000 and 5000

3. Remove the bolt from the spindle arm rod assembly (tie rod).
4. Move the axle in or out until the desired setting is obtained, then reinstall the positioning bolts.

   NOTE: *If the tread width of Ford 4000 Tractors is set at 52 inches or 56 inches, the drag link should be set to its shortest length. If the tread width is set from 60 to 76 inches, lengthen the drag link one notch for every 4-inch step beyond the 56-inch setting. To obtain the 80-inch tread width, set the axle to the 72-inch position and reverse the wheels. The drag link should be in the 72-inch position for the 80-inch tread width.*

5. Position the front wheels in the straight-ahead position, then reinstall the bolt in the spindle arm rod assembly (tie rod).
6. Tighten all nuts securely and remove the jack.
7. Check the toe-in as outlined on page 72.

REAR WHEEL TREAD SETTINGS — MANUALLY ADJUSTED

Ford 2000 and 3000: The manually adjusted rear wheels are adjustable from 52 to 76 inches. Tread width settings are made by changing the position of the wheel discs and the rims to any of the positions shown in Figure 61.

NOTE: *After changing the rear wheel width settings, the wheel nuts should be torqued to 220-300 lbs. ft.*

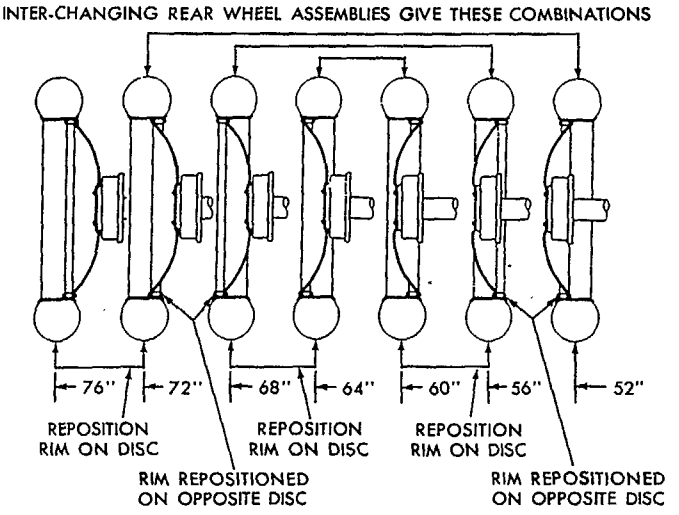


Figure 61
Rear Wheel Tread Settings — Ford 2000 and 3000

Ford 2110 and 4110: When equipped with the standard size 8.3-24 tires, the rear wheels can be set at either 56 or 75 inches. Tread width settings are made by reversing the position of the wheels on the axle as shown in Figure 62. When equipped with the optional 18.4-16A tires, the tread width is set at 75 inches and cannot be adjusted.

NOTE: *After changing the rear wheel width settings, the disc-to-adaptor nuts should be torqued to 90-120 lbs. ft.*

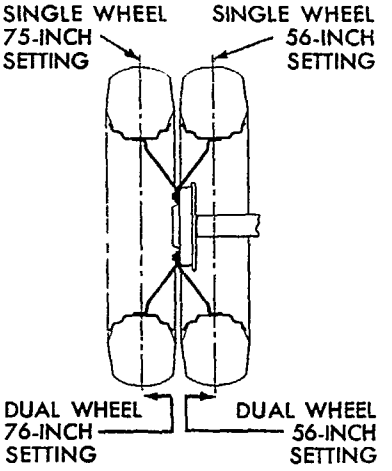


Figure 62
Single and Dual Rear Wheel Tread Settings — Ford 2110 and 4110

Ford 4000 and 5000: The manually adjusted rear wheels are adjustable from 52 to 80 inches. Tread width settings are made by changing the position of the wheel discs and the rims to any of the positions shown in Figure 63.

NOTE: *After changing the rear wheel width settings, the wheel nuts should be torqued to 300-420 lbs. ft.*

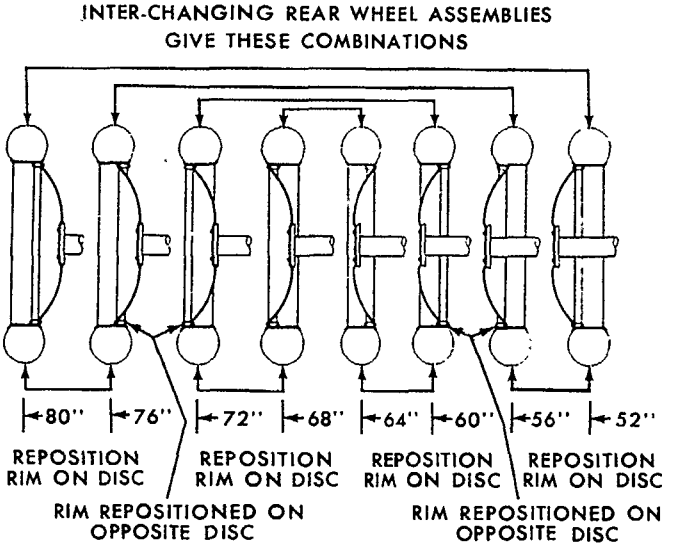


Figure 63
Rear Wheel Tread Settings — Ford 4000 and 5000

REAR WHEEL TREAD SETTINGS — DUAL REAR WHEELS (OPTIONAL)

Ford 2110 and 4110: The dual rear wheels are set at 56 inches for the inner wheels, and at 76 inches for the outer wheels as shown in Figure 62. The tread width setting cannot be adjusted.

Ford 4000 and 5000: Tractors equipped with the optional power adjust rear wheels can be equipped with dual wheels, Figure 64, by purchasing an extra set of tires, tubes, power adjust rims, and rim-to-disc attaching hardware from your Ford Tractor-Equipment Dealer. Both wheels are supported by the same disc. The inner wheels are set at 56 inches and the outer wheels at 90 inches. Although the dual wheels are on power adjust rims, they cannot be adjusted.

REAR WHEEL TREAD SETTINGS — POWER ADJUSTED (OPTIONAL)

Ford 2000 and 3000: The wheels have two width ranges depending upon the position of the wheel discs, Figure 65.

- With the dished side of the disc "in," or toward the tractor as shown, the range is 52 to 72 inches with standard size tires.
- With the dished side of the disc "out," or away from the tractor, the range is 60 to 80 inches with standard size tires.

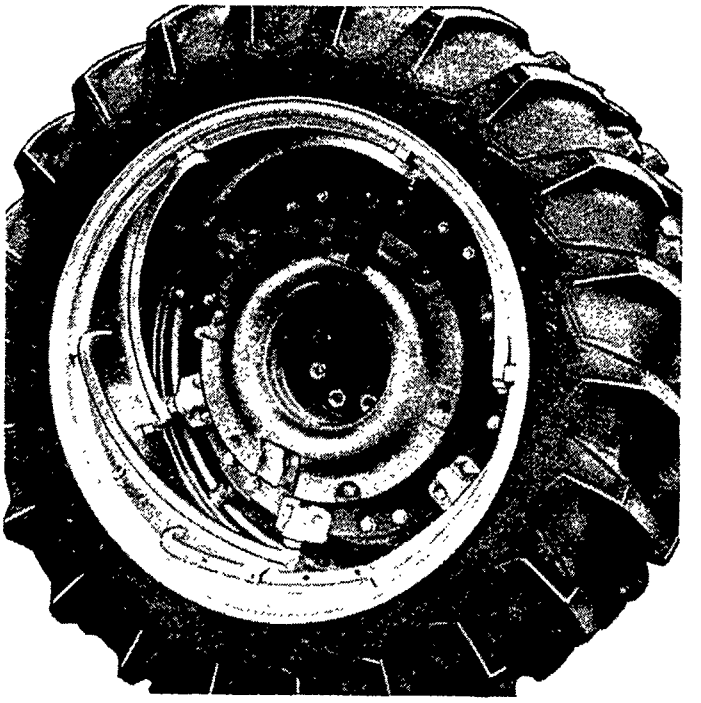


Figure 64
Dual Rear Wheels (Optional) — Ford 4000 and 5000

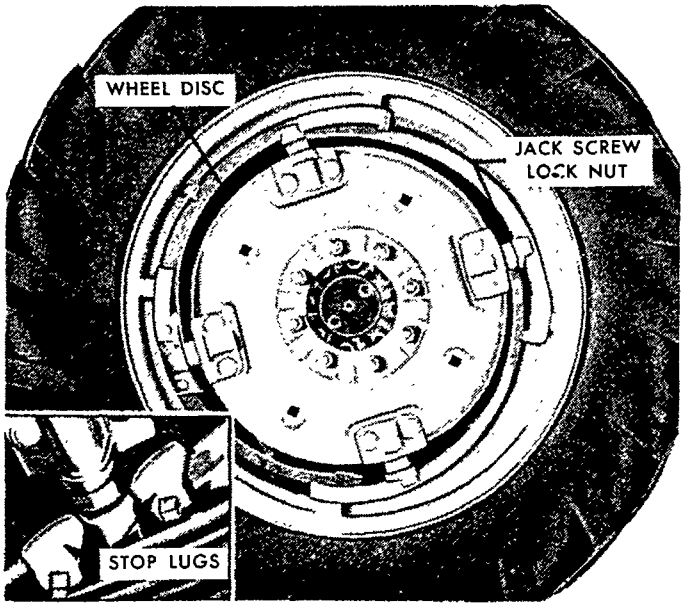


Figure 65
Power Adjusted Rear Wheels (Optional) — Ford 2000 and 3000

To change the tread width range, the wheels must be moved from one side of the tractor to the other. For example: If the dished side of the disc is "in," or toward the tractor as shown in Figure 65 (minimum range), remove the right wheel and install it on the left side so the dished side is "out," or away from the tractor (maximum range). The left wheel is then installed on the right side.

NOTE: *After changing the tread width range, the wheel nuts should be torqued to 90-120 lbs. ft.*

Ford 4000 and 5000: The wheels have two width ranges depending upon the position of the support blocks, Figure 66.

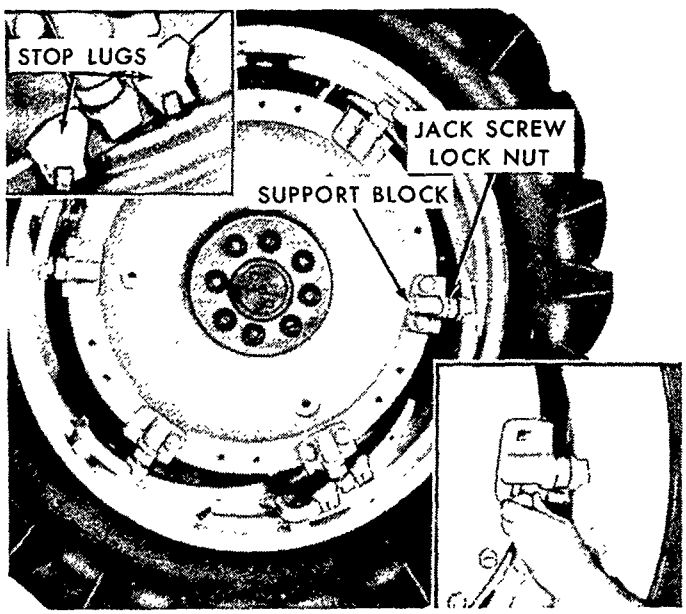


Figure 66
Power Adjusted Rear Wheels (Optional) — Ford 4000 and 5000

- With the support blocks outside the discs, as shown, the range is 66 to 90 inches with standard size tires.
- With the support blocks inside the discs, the range is 56 to 80 inches with standard size tires.

To change the tread width range, the support blocks, Figure 66, must be moved from one side of the disc to the other as follows:

1. Loosen the jack screw lock nuts, Figure 66, an equal number of turns on the four upper support blocks.
2. Remove one block at a time and position it on the opposite side of the disc. Tighten the support block attaching bolt nuts to 125-135 lbs. ft.

IMPORTANT: *Check the support blocks to make sure they are seated against the edge of the disc and the face of the disc. If they are not seated properly, the jack screws may loosen during operation.*

3. After positioning the four upper support blocks, move the tractor so the two bottom blocks are at the top. Position these two blocks on the opposite side of the disc. Tighten the attaching bolt nuts to 125-135 lbs. ft.
4. Tighten all six jack screw lock nuts to 100 lbs. ft., then uniformly increase their tightness 25 lbs. ft. at a time until each has been torqued to 200-250 lbs. ft.
5. Check the exposed thread lengths of the jack screws. The lengths must all be equal for the disc to be centered in the wheel.

Power Adjust Procedure

1. **Ford 2000 and 3000:** Loosen all four jack screw lock nuts, Figure 65, an equal number of turns.
2. **Ford 4000 and 5000:** Loosen the jack screw lock nuts, Figure 66, an equal number of turns on the four upper support blocks. It is not necessary to loosen the two bottom jack screw lock nuts. Identify the loosened nuts by marking the support blocks with chalk or pencil marks. This will help you distinguish the four loose jack screws from the two tight screws after the wheels are adjusted.
3. Remove one of the stop lugs, insert, Figure 65 or 66, from the side of the jack screw to which the wheel will be moved. Position the lug at the desired setting on the rail and tighten it securely. Do not install the stop lug if the wheel is to be adjusted to its minimum or maximum setting. The rail itself will act as a stop. Each hole in the rail represents a 4-inch change in overall width (2 inches per wheel).
4. To move the left wheel out or in:

- Start the engine, depress the clutch or inching pedal and select a low forward gear ratio if the wheel is to be moved out (reverse gear if wheel is to be moved in).
- Depress and hold the right brake pedal.
- With the engine speed at idle, ease the clutch or inching pedal up, then immediately push it down when the jack screw strikes the repositioned stop lug or the end of the rail.

5. To move the right wheel out or in:

- Depress the clutch or inching pedal and select reverse gear ratio if the wheel is to be moved out (low forward gear if wheel is to be moved in).

- Depress and hold the left brake pedal.
- With the engine speed at idle, ease the clutch or inching pedal up, then immediately push it down when the jack screw strikes the repositioned stop lug or the end of the rail.

6. **Ford 4000 and 5000:** Move the tractor so the two unmarked support blocks (not loosened) are at the bottom of the wheel. This will center the disc.
7. Reposition the other stop lug next to the jack screw and tighten it securely.
8. Tighten all of the jack screw lock nuts to 100 lbs. ft., then uniformly increase their tightness 25 lbs. ft. at a time until each has been torqued to 200-250 lbs. ft.
9. Check the exposed thread lengths of the jack screws. The lengths must all be equal for the disc to be centered in the wheel.

TRACTOR WEIGHTING

To obtain sufficient traction for maximum performance in heavy draft operations and to counterbalance your tractor for heavy equipment operations, weight can be added in the form of liquid, cast iron, or a combination of both. For maximum tire wear and drive train life, do not exceed the tire load capacities listed on page 43 and/or the weighting limitations listed on page 42.

NOTE: *In some cases, the tire load capacities will exceed the maximum allowable weight of the tractor. In these instances, never exceed the maximum allowable weight of the tractor including ballast.*

LIQUID BALLAST

It is common practice to add weight by filling the front and rear tires with liquid. A calcium chloride-water solution is recommended because of its low freezing point, and greater weight per gallon than water.

The recommended liquid capacities for tires are shown in the following table. This table is based on a 75% fill of the tires, with five pounds of calcium chloride per U.S. gallon of water. The addition of this amount of calcium chloride will prevent freezing in most locations. To weight tires with a 75% fill of liquid ballast, see your Ford Tractor-Equipment Dealer who has the necessary special equipment.



CAUTION: *Never pour water on calcium chloride. Slowly add the flakes to the water and stir until dissolved.*

RECOMMENDED LIQUID WEIGHT
75% FILL

Tire Size	Pounds Calcium Chloride Per Tire	Gallons of Water Per Tire		Pounds Weight of Solution Per Tire
		U.S.	Imp.	
5.50-16	18	3.5	2.9	47
6.00-16	24	4.8	4.0	64
6.50-13	7.2	1.6	1.3	19.2
7.50-16	37	7.3	6.1	98
7.50-18	40	8	6.7	107
8.3-24	50	10	8.3	133
9.00-10	36	7.2	6.0	96
11.2-28	110	22	18.3	293
12.4-28	140	28	23.3	374
12.4-38	185	37	30.8	494
13.6-24	155	31	25.8	414
13.6-28	175	35	29.2	467
13.6-38	230	46	38.3	614
14.9-24	190	38	31.7	507
14.9-30	230	46	38.3	614
15.5-38	265	53	44.1	707
16.9-24	245	49	40.8	654
16.9-26	265	53	44.1	707
16.9-30	295	59	49.1	787
18.4-16A	165	33	27.5	438
18.4-26	320	64	53.3	854
18.4-30	360	72	60.0	960

The above figures are for individual tires only. For combined front axle and/or rear axle weight, multiply the figures by 2.

CAST IRON WEIGHTS

Cast iron weights are available as accessories from your Ford Tractor-Equipment Dealer. Weights can be mounted on the front wheels, on the front end of the tractor, and on the rear wheels as shown in Figures 67 through 70.

Vari-weights, if available, can also be used on the 24- or 28-inch rear wheels. When the vari-weights are used on the 24-inch wheels, a set of rear wheel flange nuts must be used to extend the weight disc away from the wheel rim.

NOTE: *On 14.9-24 optional tires, the rear wheel weights must be installed with three brackets and the bracket attaching bolts must be tightened after operating 5 hours.*

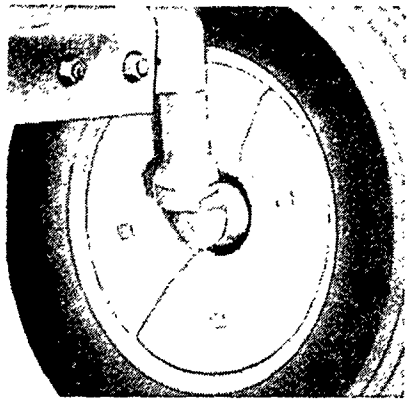


Figure 67
Front Wheel Weights — Ford 2000, 3000, 4000, and 5000

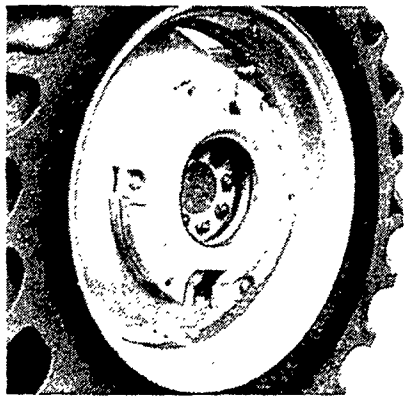


Figure 68
Rear Wheel Weights — Ford 2000, 3000, 4000, and 5000

WEIGHTING LIMITATIONS

When adding liquid ballast and/or cast iron weights, the maximum total weight of the tractor, including liquid ballast, cast iron weight, and mounted equipment is:

- Ford 2000 ... 6000 lbs.
- Ford 2110 ... 5800 lbs.
- Ford 3000 ... 6900 lbs.
- Ford 4000 ... 8250 lbs.
- Ford 4110 ... 5800 lbs.
- Ford 5000 ... 9700 lbs.

Mounted Equipment Limitations: The total rear axle weight, including mounted equipment and ballast, should not exceed the following:

- Ford 2000 ... 4150 lbs.
- Ford 2110 ... 4000 lbs.
- Ford 3000 ... 5000 lbs.
- Ford 4000 ... 6200 lbs.
- Ford 4110 ... 4000 lbs.
- Ford 5000 ... 7350 lbs.

NOTE: *Total rear axle weight is measured with only the rear wheels on the scales, with liquid ballast and/or cast iron weights added, and with mounted equipment in the raised position.*

Straight Drawbar Limitations: If your tractor is used for straight drawbar work, ballast can be added to the front and rear in the amounts shown below, provided that the tire load capacities, as listed on page 43, and the preceding weighting limitations are adhered to.

Tractor	Front Ballast*	Rear Ballast**
• Ford 2000	300 lbs. max.	2300 lbs. max.
• Ford 2110	300 lbs. max.	2300 lbs. max.
• Ford 3000	400 lbs. max.	3000 lbs. max.
• Ford 4000	500 lbs. max.	3400 lbs. max.
• Ford 4110	300 lbs. max.	2300 lbs. max.
• Ford 5000	730 lbs. max.	4000 lbs. max.

*Includes both liquid and cast iron wheel weights, as well as cast iron front end weights.

**Includes both liquid and cast iron wheel weights.

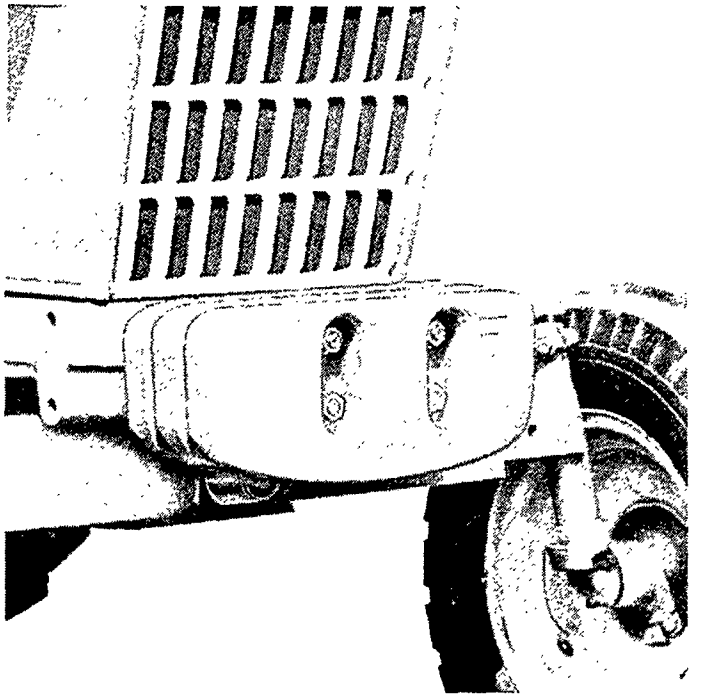


Figure 69
Front End Weights — Ford 4000 and 5000

TIRE PRESSURE

Tire pressure must be considered when adding weight to the tractor. The tire load capacity is affected by inflation pressure.

The following "Tire Inflation Vs. Permissible Load" chart lists the various tires available and shows the maximum load they can carry for a given air pressure.

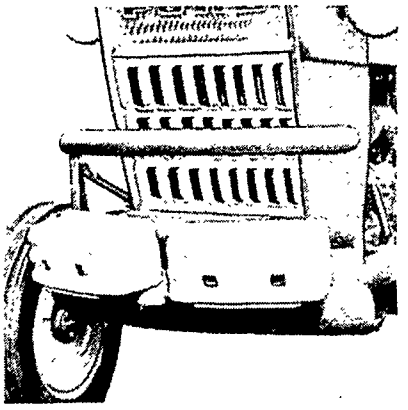


Figure 70
Front End Weights — Ford 2000 and 3000

On soft soils, it is beneficial to use the minimum inflation pressure in order to increase flotation and reduce the rolling resistance. On hard surfaces, near maximum pressures should be used in order to reduce the internal flexing of the tire.

Weight added to the tires, together with the weight of the tractor and rear attached equipment, should not exceed the recommended weight to be carried by the tires as listed in the chart below. In some cases, the tire capacities will exceed the maximum allowable weight of the tractor. In these instances, never exceed the maximum allowable weight of the tractor including ballast.

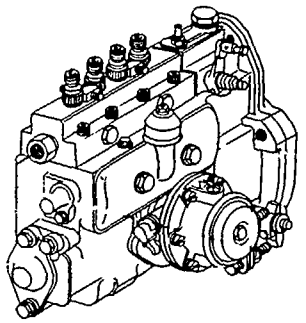
TIRE INFLATION VS. PERMISSIBLE LOAD

Front Tire Size	INFLATION PRESSURES (psi)					
	12	16	20	24	28	32
	MAXIMUM PERMISSIBLE LOAD (lbs.)					
5.50-16 4 ply	—	—	655	725	795	860
6.00-16 4 ply	—	—	750	835	915	990
6.50-13 4 ply	—	—	730	810	885	—
7.50-16 4 ply	—	—	1110	1235	—	—
7.50-18 4 ply	—	—	1205	1340	—	—
9.00-10 4 ply	800	1280	—	—	—	—

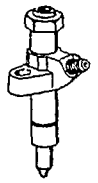
NOTE: *Do not exceed the maximum load listed. Do not under-inflate or over-inflate the tires.*

*18.4-16A 6 ply tires can be used at 10 psi, providing maximum load does not exceed 2180 lbs. per tire.

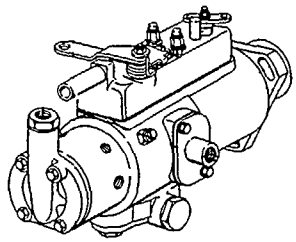
Rear Tire Size	INFLATION PRESSURES (psi)					
	12	14	16	18	20	22
	MAXIMUM PERMISSIBLE LOAD (lbs.)					
8.3-24 4 ply	—	1055	1140	1220	1300	1370
11.2-28 4 ply	1575	1720	1860	—	—	—
12.4-28 4 ply	1890	2070	—	—	—	—
12.4-38 4 ply	2185	2390	—	—	—	—
13.6-24 4 ply	—	2270	—	—	—	—
13.6-28 4 ply	—	2430	—	—	—	—
13.6-38 4 ply	—	2810	—	—	—	—
14.9-24 4 ply	—	2700	—	—	—	—
14.9-30 6 ply	—	2960	3200	3430	—	—
15.5-38 6 ply	—	3160	3420	3660	—	—
16.9-24 6 ply	—	—	3560	—	—	—
16.9-26 6 ply	—	—	3680	—	—	—
16.9-30 6 ply	—	—	3920	—	—	—
*18.4-16A 6 ply	—	2660	2880	—	—	—
18.4-26 6 ply	—	—	4370	—	—	—
18.4-30 6 ply	—	—	4650	—	—	—



IN-LINE PUMP



INJECTOR



DISTRIBUTOR PUMP

Diesel Injection Service

Don't lose diesel power and economy because of dirty or improperly adjusted injectors. Prompt and expert attention can correct excessive pressure buildup which can lead to wasteful fuel consumption, hard starting, loss of power, and possible pump damage.

Let your Ford Tractor–Equipment Dealer give your diesel a complete check-up. He offers a diesel pump and injector exchange service which features:

- **LOW COST** – substantially less than new.
- **FAST SERVICE**
- **WARRANTY** – same as for new pump and injectors.
- **PRECISION WORKMANSHIP** – by Ford diesel specialists for like-new performance.

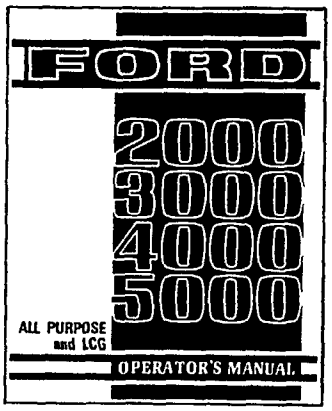
YOU'LL FIND ALL THIS ONLY WHERE YOU SEE THIS SIGN

HEADQUARTERS FOR FORD

QUALITY CARE

DIESEL INJECTION SERVICE

lubrication and maintenance



This section deals with fuels and lubricants. Fuel-lubricant storage and detailed service procedures are included, along with the recommended hourly service intervals listed on the lubrication and maintenance charts. Suggestions on general maintenance, adjustments, and removal and installation procedures are also included. Regular attention at the specified time will pay dividends in maximum efficiency and longer life.

During the first 50 hours of operation, oil levels should be checked every 10 hours. After the first 50 hours of operation, oil levels should be checked at the recommended hourly intervals. For the first 50 hours, check:

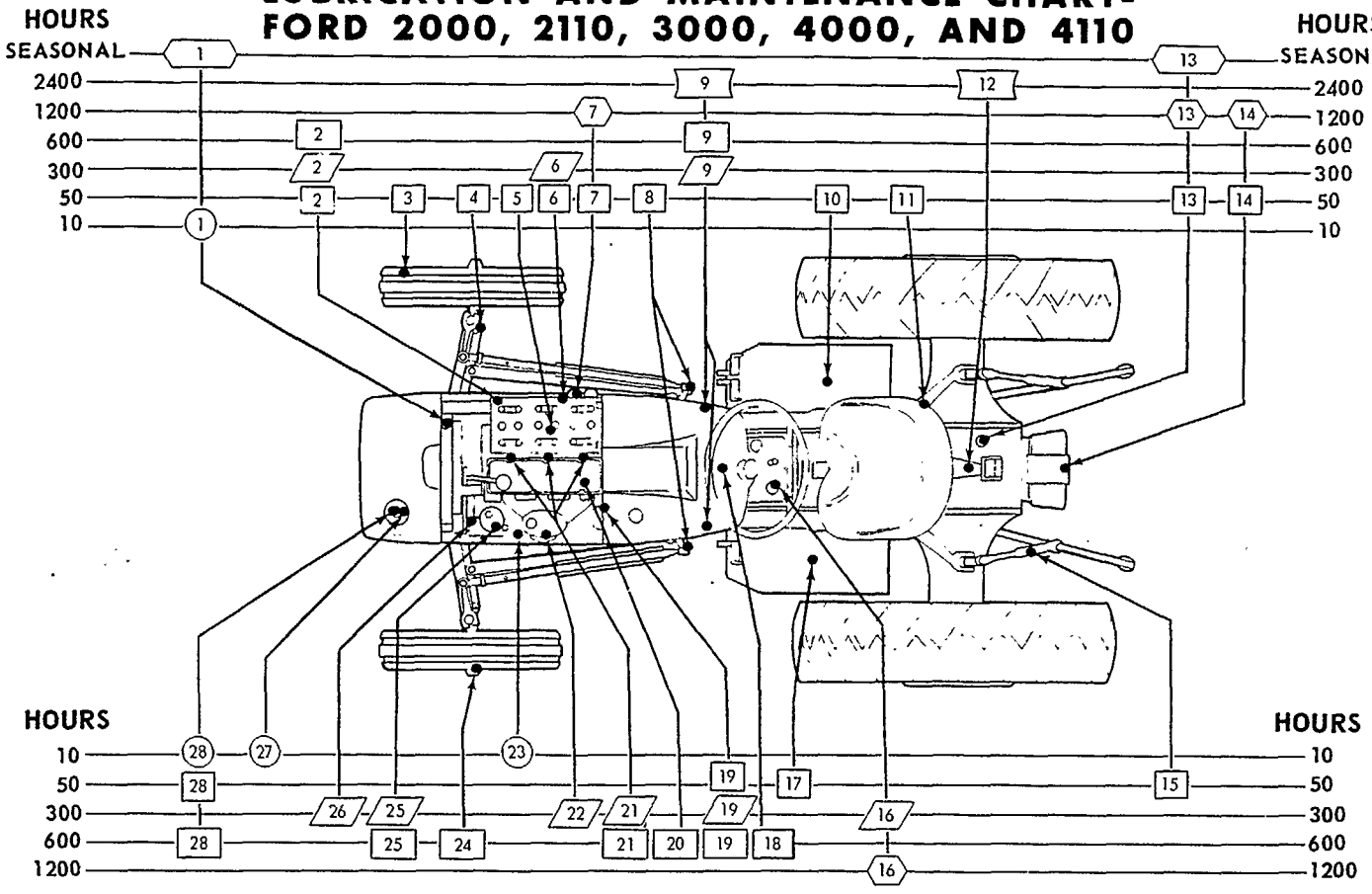
- Engine oil level. See page 50.
- Power steering oil level. See page 60.
- Transmission oil level. See page 57.
- Tractor hydraulic system oil level (rear axle). See page 59.
- To prevent oil contamination when checking or changing lubricants and filters, always clean the area surrounding the level plugs, filler plugs, dipsticks, and filters.



Properly maintained Equipment

is Safe Equipment.

LUBRICATION AND MAINTENANCE CHART- FORD 2000, 2110, 3000, 4000, AND 4110

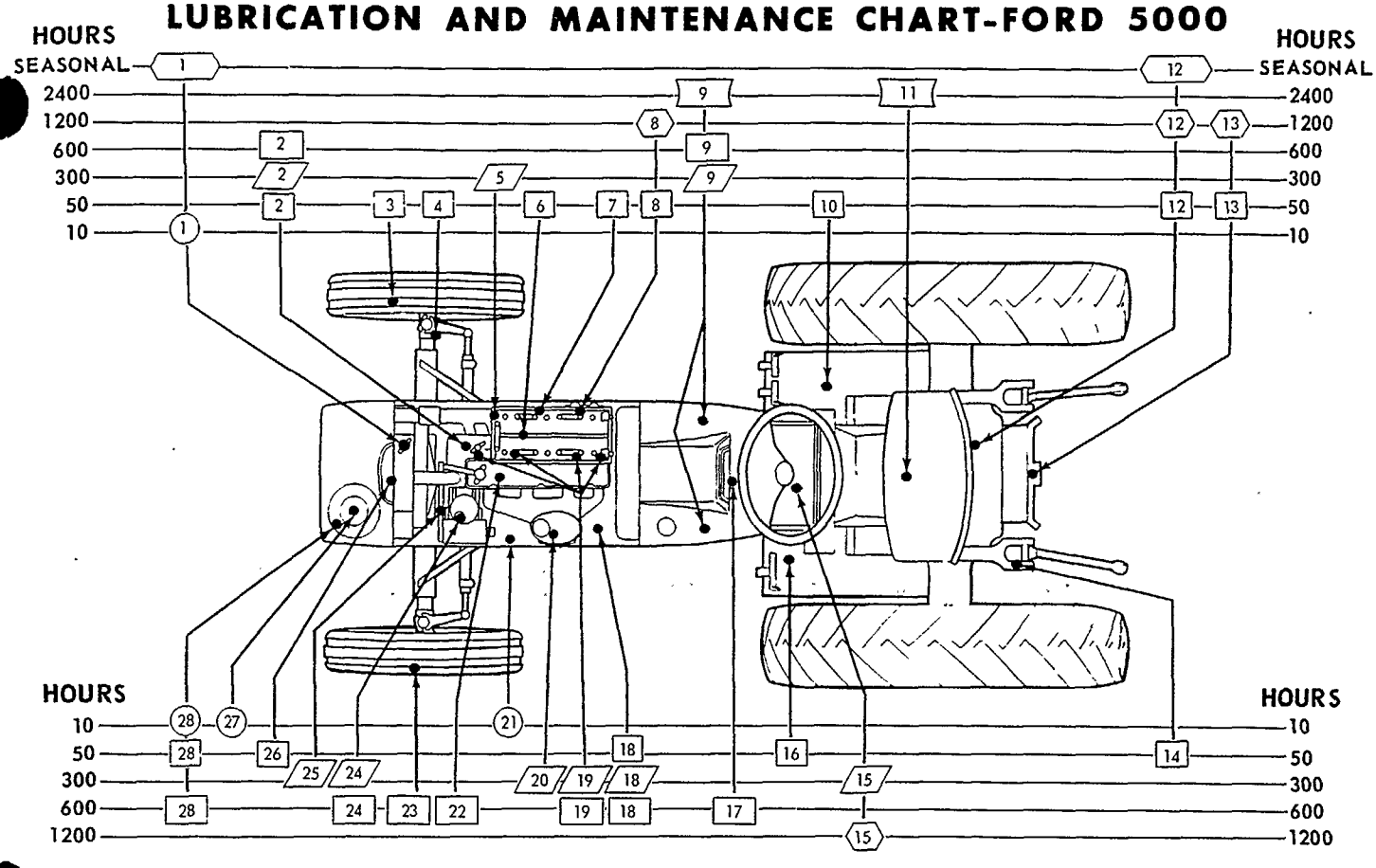


KEY TO LUBRICATION AND MAINTENANCE CHART

SERVICE INTERVAL	NO.	LUBRICATION AND MAINTENANCE ITEMS	CHECK	CLEAN	LUBE	CHANGE	ADJUST	PAGE NO.
Every (10) Hours or Daily	28	Air Cleaner (Oil Bath)	●					55
	27	Pre-Cleaner Bowl (Acc)		●				55
	23	Engine Oil Level	●					50
	1	Radiator (Cooling System)	●					61
Every 50 Hours	19	Air Cleaner (Dry Type)		●				55
	28	Air Cleaner (Oil Bath)		●		●		55
	6	Sediment Bowl		●				54
	7	Fuel Filter		DRAIN				52
	5	Battery	●					70
	2	Distributor			●			51
	–	Lubrication Fittings:						
	4	Front Wheel Spindles			●			61
	10	Brake Pedal Pivots			●			61
	17	Clutch Pedal Pivots			●			61
	8	Power Steering Cylinders			●			61
	11	Diff. Lock Pedal Pivots			●			61
	15	Hydraulic Lift Linkage			●			61
	13	Rear Axle Oil Level	●					59
	14	Belt Pulley Oil Level	●					61
	3	Tires	●					72
	17	Clutch Pedal					●	75
Every 300 Hours	22	Engine Oil and Oil Filter				●		51
	19	Air Cleaner (Dry Type)		●				56
	2	Distributor:						51
	–	Cam			●			51
	–	Cam Center Spindle			●			51
	–	Gov. Weight Mechanism			●			51

SERVICE INTERVAL	NO.	LUBRICATION AND MAINTENANCE ITEMS	CHECK	CLEAN	LUBE	CHANGE	ADJUST	PAGE NO.
Every 300 Hours	–	Breaker Points	●				●	69
	21	Spark Plugs		●			●	70
	26	Fan Belt	●				●	63
	6	In-Line Breather		●				52
	25	Power Steering Reservoir	●					60
	9	Select-O-Speed Trans. Oil Level	●					57
	16	Manual Shift Trans. Oil Level	●					57
Every 600 Hours	19	Air Cleaner (Dry Type)				●		57
	28	Air Cleaner (Oil Bath)		●				55
	21	Fuel Injectors	●				●	65
	2	Distributor Points				●		69
	21	Spark Plugs				●		70
	20	Valve Clearance	●				●	70
	18	Steering Housing Oil Level	●					60
	25	Power Steering Oil & Filter				●		60
	9	Select-O-Speed Bands					●	57
	24	Front Wheel Bearings			●			72
Every 1200 Hours	7	Fuel Filter				●		53
	13	Rear Axle Oil				●		59
	16	Manual Shift Trans. Oil				●		58
	14	Belt Pulley Oil				●		61
Every 2400 Hours	12	Hydraulic Filters				●		59
	9	Select-O-Speed Trans:						
	–	Oil				●		57
	–	Filter		●				57
Seasonal	1	Radiator Coolant				●		62
	13	Rear Axle Oil	Refer to Page 59					

LUBRICATION AND MAINTENANCE CHART-FORD 5000



KEY TO LUBRICATION AND MAINTENANCE CHART

SERVICE INTERVAL	NO.	LUBRICATION AND MAINTENANCE ITEMS	CHECK	CLEAN	LUBE	CHANGE	ADJUST	PAGE NO.
Every 10 Hours or Daily	28	Air Cleaner (Oil Bath)	●					55
	27	Pre-Cleaner Bowl (Acc)		●				55
	21	Engine Oil Level	●					50
	1	Radiator (Cooling System)	●					61
Every 50 Hours	18	Air Cleaner (Dry Type)		●				55
	28	Air Cleaner (Oil Bath)		●		●		55
	7	Sediment Bowl		●				54
	8	Fuel Filters		DRAIN				52
	6	Battery	●					70
	2	Distributor			●			51
	–	Lubrication Fittings:						
	4	Front Wheel Spindles			●			61
	10	Brake Pedal Pivots			●			61
	16	Clutch Pedal Pivot			●			61
	26	Steering-Center Arm			●			61
	14	Hydraulic Lift Linkage			●			61
	12	Rear Axle Oil Level	●					59
	13	Belt Pulley Oil Level	●					61
	3	Tires	●					72
	16	Clutch Pedal					●	75
Every 300 Hours	20	Engine Oil and Filter				●		51
	18	Air Cleaner (Dry Type)		●				56
	2	Distributor:						51
	–	Cam			●			51
	–	Cam Center Spindle			●			51
	–	Gov. Weight Mechanism			●			51

SERVICE INTERVAL	NO.	LUBRICATION AND MAINTENANCE ITEMS	CHECK	CLEAN	LUBE	CHANGE	ADJUST	PAGE NO.
Every 300 Hours	–	Breaker Points	●				●	69
	19	Spark Plugs		●			●	70
	25	Fan Belt	●				●	63
	5	In-Line Breather		●				52
	24	Power Steering Reservoir	●					60
	9	Select-O-Speed Trans. Oil Level	●					57
	15	Manual Shift Trans. Oil Level	●					57
Every 600 Hours	18	Air Cleaner (Dry Type)				●		57
	28	Air Cleaner (Oil Bath)		●				55
	19	Fuel Injectors	●				●	65
	2	Distributor Points				●		69
	19	Spark Plugs				●		70
	22	Valve Clearance	●				●	70
	17	Steering Housing Oil Level	●					60
	24	Power Steering Oil & Filter				●		60
	9	Select-O-Speed Bands					●	57
	23	Front Wheel Bearings			●			72
Every 1200 Hours	8	Fuel Filters				●		53
	12	Rear Axle Oil				●		59
	15	Manual Shift Trans. Oil				●		58
	13	Belt Pulley Oil				●		61
Every 2400 Hours	11	Hydraulic Filters				●		59
	9	Select-O-Speed Trans:						
	–	Oil				●		57
	–	Filter		●				57
Seasonal	1	Radiator Coolant				●		62
	12	Rear Axle Oil	Refer to Page 59					

FUELS AND LUBRICANTS

DIESEL FUEL

Type of Fuel to Use

When operating in temperature above 20° F, use diesel fuel oil No. 2 (No. 2D) with a minimum cetane rating of 45. When operating in temperatures below 20° F, use diesel fuel oil No. 1 (No. 1D) with a minimum cetane rating of 50.

Fuel represents a major portion of your tractor operating costs; therefore, it is important to use it efficiently. Do not let cost tempt you to use inferior diesel fuel. The initial savings is a false economy when you consider the damage poor fuel can do to your tractor engine.

NOTE: *Use only diesel fuel designated for diesel engines. Some heating fuel contains harmful chemicals which can seriously affect tractor efficiency and performance. Refer to the "Engine Oil Recommendations" on page 50 for additional diesel fuel information.*

Storage

Extremely small clearance exists between the fuel delivering elements of the fuel injection pump and the fuel delivering elements of the injectors. Therefore, it is of vital importance that precautions be taken to make sure the fuel is kept free of dirt and water. See Figure 71.

Diesel fuel should be stored in black iron tanks or containers. Do not store diesel fuel in a galvanized tank, as the zinc coating will react with the fuel and form undesirable compounds which may interfere with the proper operation of the fuel injection pump and injectors.

The most satisfactory arrangement is a bulk storage installation with either a tank and pump, Figure 72, or a gravity feed installation located high enough for the tractor tank to be filled direct. The tank should slope downward at the rear to allow sediment to settle away from the take-off point. Whenever the tank is refilled, the fuel should be allowed to settle for 12 hours before being used. A drain valve should be incorporated at the lowest point in the tank so the moisture and sediment may be drained periodically. A fuel outlet filter should be

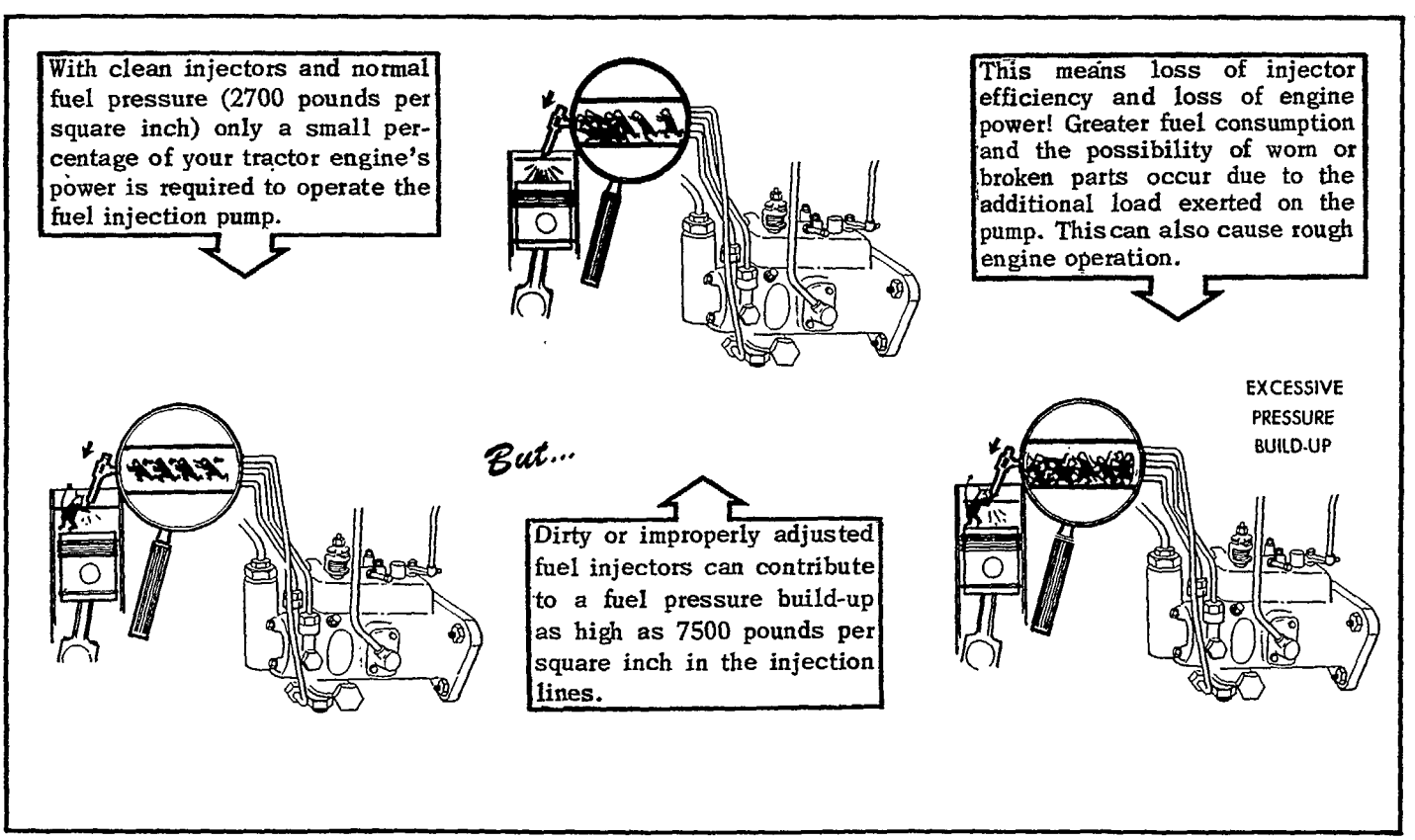


Figure 71
Dirt vs. Injectors

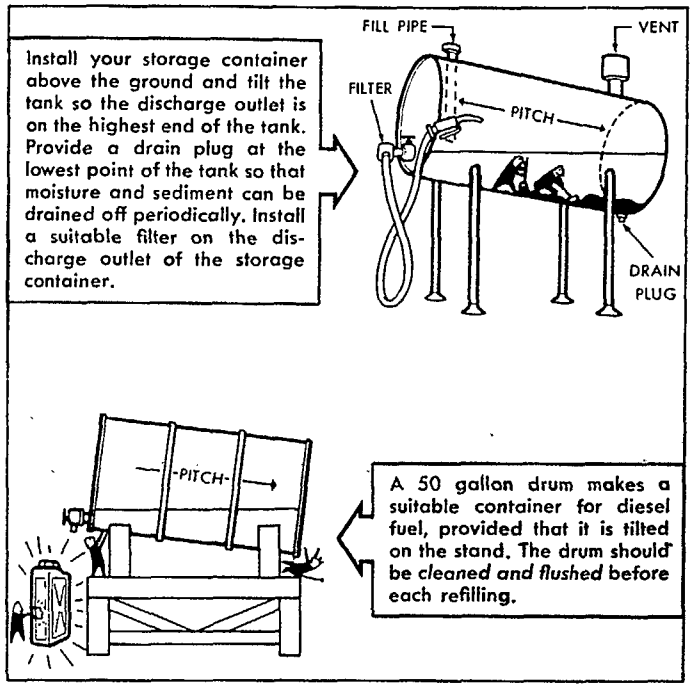


Figure 72
Diesel Fuel Storage

used, as shown in Figure 72. Use the largest tank possible and keep it as full as possible to minimize condensation.

If bulk storage is not possible and the fuel is stored in barrels, keep them in a clean, dry place. The barrel in use should be fitted with a fuel outlet filter and a drain tap, and should be supported so it slopes downward ½ inch per foot length away from the tap. Never tip the barrel to use fuel below the level of the tap.

After use, install the cap at the top of the barrel and clean up fuel which may have been spilled. Diesel fuel will not evaporate and will collect dust and dirt.

GASOLINE FUEL

Type of Fuel to Use

Ford gasoline engines are designed to operate most efficiently with good quality **regular grade** gasoline. The use of poor quality fuel can cause knocking, overheating, and ultimately, engine failure.

For summer operation, use summer grade fuel. For winter operation, use winter grade fuel.

Use of highly volatile winter grade fuel during warm weather can result in vapor lock or sluggish engine performance. Use of summer grade fuel in cold weather can result in hard starting. Consult your fuel dealer.

Storage

Local regulations on fuel storage vary, but a tank similar to that recommended for diesel fuel should be used, regulations permitting. The tank should be properly vented, marked as to contents, and located in a cool, dry place to reduce evaporation losses, Figure 73. By limiting the quantity of fuel stored to about a 30-day supply, the following advantages are gained:

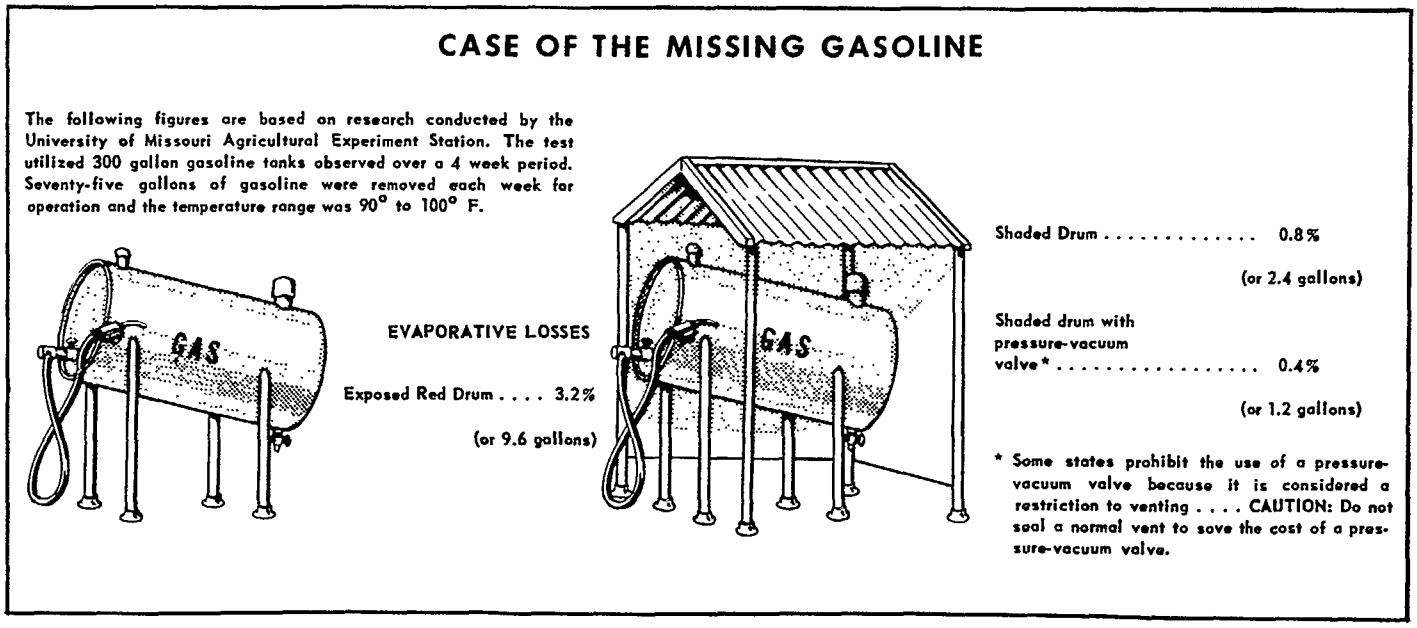


Figure 73
Gasoline Storage

- For easier starting, oil companies blend their fuel so volatility is adjusted to the outside temperatures. A 30-day supply will reduce winter hard starting due to a storage of summer grade fuel. It will also reduce the possibility of summer vapor lock or sluggish engine problems from the use of winter grade fuel.
- A short storage period will lessen fuel evaporation and subsequent gum formation.

REFUELING THE TRACTOR

If there is no filter on the outlet of the storage tank, or if a can is used to refuel, use a funnel with a 100-mesh screen or finer when filling the tractor fuel tank. The tractor tank should be kept as full as possible to minimize condensation.

NOTE: *It is a good practice to fill the tractor fuel tank with fuel after completing work at the end of each day, as this will reduce overnight condensation of water in the tank.*

LUBRICANTS

Type of Lubricant to Use

ENGINE OIL RECOMMENDATIONS

Temperature	Viscosity Grade & API Classification	
	Diesel	Gasoline
Below + 10° F	SAE 5W (DM)	SAE 5W (MS) or SAE 5W-20W (MS)
+ 10° F to 40 ° F	SAE 10W (DS)	SAE 10W (MS) or SAE 5W-20W (MS)
32° F to 90° F	SAE 20 (DS)	SAE 20 (MS) or SAE 10W-30 (MS)
Above 75° F	SAE 30 (DS)	SAE 30 (MS) or SAE 10W-30 (MS)

NOTE: *When using diesel fuel with a sulfur content below 1.0%, diesel engine oil with an API Classification of DM may be used instead of a DS oil, but the oil and filter change interval must be reduced to 150 hours. When the sulfur content of a fuel is greater than 1.0%, but less than 1.3%, a DS oil must be used (except for temperatures of 10° F and below), and the oil and filter change interval must be reduced to 150 hours. The use of fuel with a sulfur content above 1.3% is not recommended.*

Manual Shift Transmission Oil ..... ESN-M2C77-A or M-4864-A

Select-O-Speed Transmission Oil ..... ESN-M2C41-A or M2C41

Hydraulic System (Rear Axle):

- Ford 2000, 2110, 3000, and 4110 ..... ESN-M2C77-A or M-4864-A
- Ford 4000 and 5000 ..... ESN-M2C53-A or M-2C53-B

Belt Pulley Oil ..... ESN-M2C77-A or M-4864-A

Steering Gear Housing:

- Manual and Power ..... ESEN-M2C94-A / ESW-M2C28-BA } or M-4864-B

Power Steering Reservoir Oil ESEN-M2C92-A

Front Wheel Bearings .....good quality, multi-purpose, lithium base, cup-type grease

Lubrication Fittings .....good quality, multi-purpose, lithium base, cup-type grease

Storage

Your new Ford Tractor is equipped with suitable lubricant filters to protect vital points from damage by dirt which may enter under normal operating conditions. Precautions must, however, be taken by you to prevent lubricant contamination by dirt or water during storage. Service intervals in this section are based on the assumption that only new oil, of the type specified, is used.

Barrels of lubricant should be kept under cover, preferably in a clean, dry place, and they should be clearly marked to indicate the lubricant which they contain.

When a barrel is kept in an exposed location it should be tilted to allow any moisture to run away from the filler cap. Always use a clean container when transferring oil from a barrel to the tractor and make sure that any cap or bung, which has been removed, is installed as soon as possible.

FUEL AND LUBRICANT SERVICE PROCEDURES

ENGINE

Checking Oil Level: The engine oil level should be checked daily or every 10 hours.

1. With the tractor standing level, and after the engine has been stopped for a period of time, check the engine oil level with the dipstick, Figure 74.

2. If the oil level is low, remove the filler cap, Figure 75, and add oil to the engine through the filler hole in the rocker cover to bring the oil level to the "FULL" mark on the dipstick. Be careful not to overfill.

Changing Oil and Filter: The engine oil and filter should be changed every 300 hours.



Figure 74
Engine Oil Level Dipstick

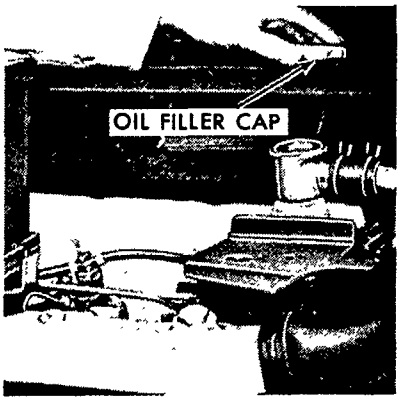


Figure 75
Engine Oil Filler Cap

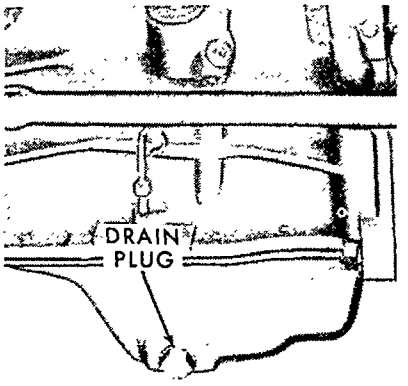


Figure 76
Engine Oil Pan Drain Plug

1. With the engine at normal operating temperature, drain and discard the engine oil by removing the drain plug, Figure 76. Reinstall the plug when the oil finishes draining.
2. Unscrew the oil filter retaining bolt slowly, Figure 77, catching the used oil in a suitable container placed below the filter body. Remove the filter body and discard the filter element, filter body sealing gasket, and retaining bolt gasket.
3. Clean the filter body and install a new filter element, being sure that the end marked "Engine End" is toward the engine. Use a new filter body sealing gasket and retaining bolt gasket, lubricated on all surfaces with clean oil. Tighten the retaining bolt securely.
4. Add new oil of the type specified, page 50. Start the engine and check for leaks after adding the oil.

Lubricating Distributor (Gasoline): Oil the distributor through the oil cup, Figure 78, with seasonal engine oil every 50 hours. Grease the cam every 300 hours as follows:

1. Release the spring clips and remove the cap, rotor, and dust cover.
2. Apply a **small** amount of distributor cam grease or ball bearing grease on the distributor cam, Figure 78. Do not use oil on the cam and do not over-lubricate.
3. Add two drops of engine oil to the cam center spindle and lubricate the distributor weight mechanism by adding a few drops of oil through the contact breaker base plate.
4. Lubricate the distributor shaft bushing by adding oil to the oil cup.
5. Clean the primary wire terminal and surrounding area. Make sure the distributor cap is clean inside and outside and that cracks do not exist.

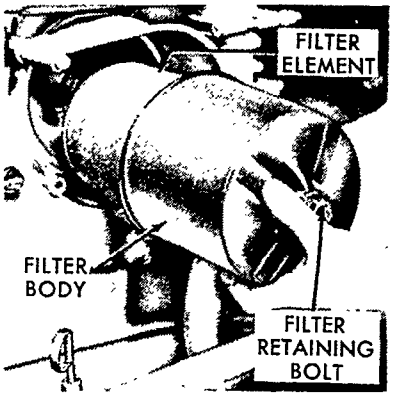


Figure 77
Engine Oil Filter

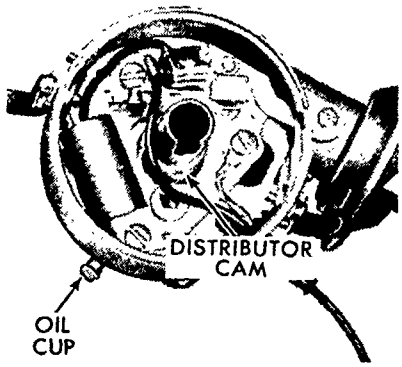


Figure 78
Distributor Lubrication Points

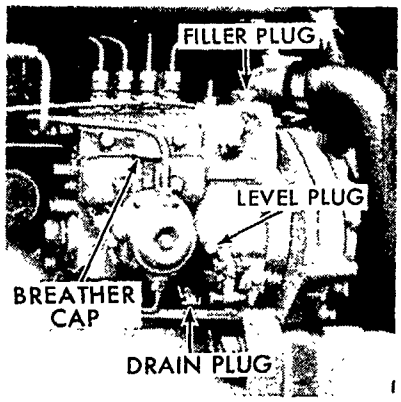


Figure 79
Fuel Injection Pump — Ford 3000 and 5000

6. Check the condition of the points and install new points if they are burned or pitted. Refer to "Distributor Points," page 69, for point removal and installation procedures. If the points are dirty, clean them and check the gap as outlined in the procedure.

IN-LINE FUEL INJECTION PUMP (DIESEL)

The in-line fuel injection pump on Ford 3000 and 5000 Tractors incorporates a breather, Figure 79. The pump oil should be changed and the breather cleaned every 300 hours.

1. Drain the pump by removing the filler plug, level plug, and drain plug, Figure 79.
2. Remove and clean the breather.
3. Install the breather and drain plug.
4. Fill the pump with clean engine oil until oil flows from the level plug hole.
5. Install the filler and level plugs.
6. Bleed the system as outlined on page 53.

FUEL FILTER(S) (DIESEL)

Draining the Filter(s): The diesel fuel filter(s) should be drained every 50 hours to remove moisture. Drain the filter(s) at more frequent intervals when high condensation is evident. Two filters are used on the Ford 5000. All other models use one filter.

1. Be sure there is adequate fuel in the tank, then unscrew the drain tap in the base of the filter(s), Figure 80.
2. Allow fuel to drain until all water has been removed and only diesel fuel flows from the filter(s). Close the drain tap(s).
3. Bleed the system as outlined on page 53.

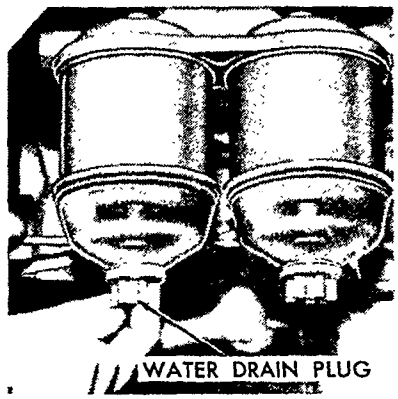


Figure 80
Fuel Filter Drain Plugs (Ford 5000 Shown)

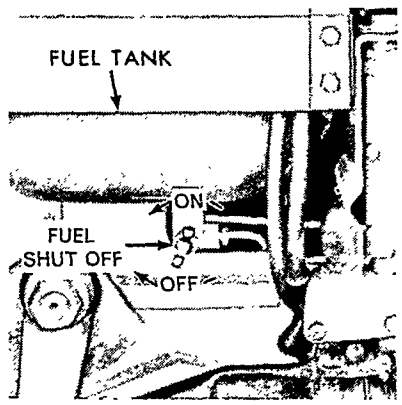


Figure 81
Fuel Shut-Off Valve

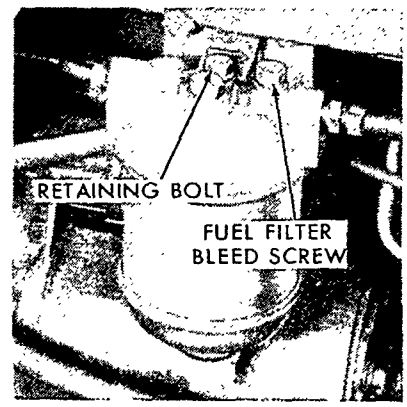


Figure 82
Fuel Filter Bleed Screw — In-Line Pump (Ford 3000)

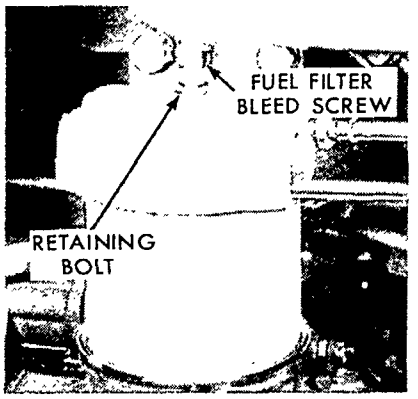


Figure 83
Fuel Filter Bleed Screw — Distributor Pump (Ford 2000 and 4000)

Changing the Filter(s): The diesel fuel filter(s) should be changed every 1200 hours.

1. Close the fuel shut-off valve, Figure 81, and unscrew the filter retaining bolt(s), Figures 82, 83, and 84.
2. Remove the filter base and element(s). Discard the element(s) and sealing rings, Figure 85.
3. Wash the filter base and the adapter with a brush and clean diesel fuel.
4. Install new element(s) and rubber sealing rings, taking care not to allow dirt from the hands to come in contact with the parts. Do not overtighten the bolts securing the filter element(s) to the adapter, otherwise the sealing rings will be damaged.
5. Open the fuel shut-off valve to allow fuel to flow to the filter(s).

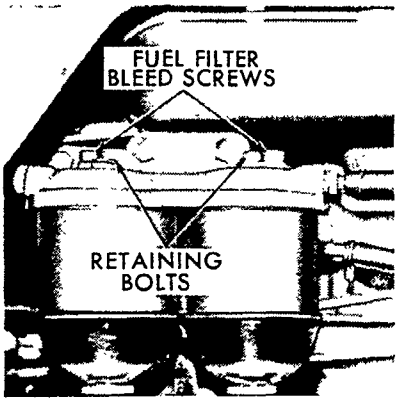


Figure 84
Fuel Filter Bleed Screws (Ford 5000)

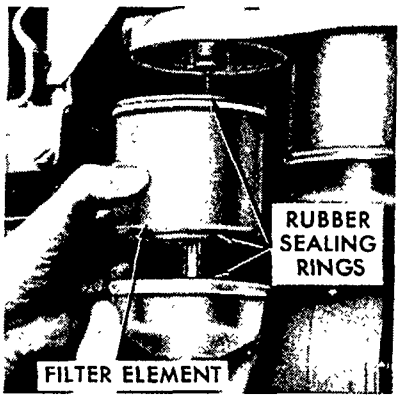


Figure 85
Changing Diesel Fuel Filter(s)

6. Bleed the system as outlined in the following procedure.

BLEEDING THE DIESEL FUEL SYSTEM

The diesel fuel system should be bled as follows whenever:

- The injector lines, injectors, and/or the fuel injection pump have been removed.
- The filter(s) have been removed for cleaning or replacement.
- The fuel filter(s) have been drained.
- The tractor has run out of fuel.

In-Line Injection Pump:

1. Make sure there is adequate fuel in the tank.
2. Bleed the diesel fuel filter(s) as follows:
   - Ford 3000 . . . Loosen the fuel filter bleed screw, Figure 82, on top of the filter. Bleed the filter by actuating the lift pump lever, Figure 86, until air-free fuel flows from the filter, then tighten the bleed screw.
   - Ford 5000 . . . Loosen the fuel filter bleed screw, Figure 84, on top of the filter farthest from the pump. Bleed the filter by actuating the lift pump lever, Figure 86, until air-free fuel flows from the filter, then tighten the bleed screw. Bleed the filter nearest the pump in the same manner.

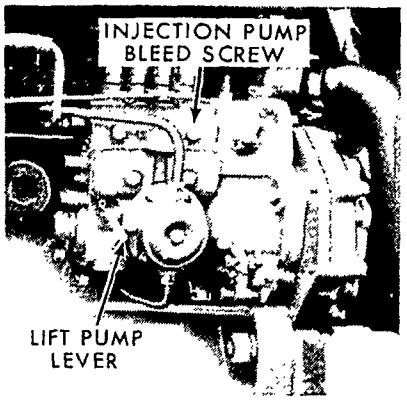


Figure 86
Injection Pump Bleed Screw — In-Line Pump

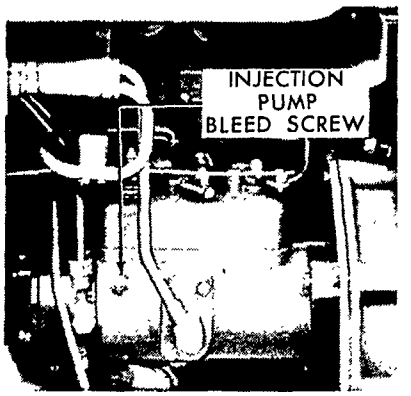


Figure 87
Injection Pump Bleed Screw — Distributor Pump

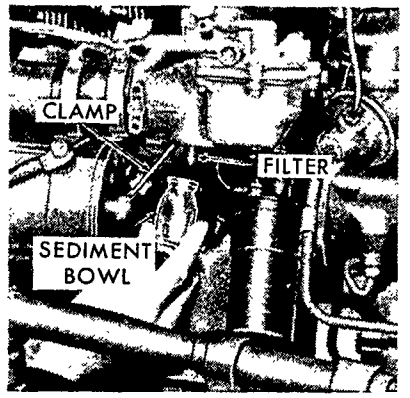


Figure 88
Sediment Bowl Removal

3. Loosen the injection pump bleed screw, Figure 86, and actuate the lift pump lever until air-free fuel flows from the screw. Then close the screw.
4. Loosen the injector lines at the injectors.
5. With the throttle wide open and the diesel engine stop control pulled out, crank the engine until air-free fuel flows from each connection. Tighten each connection.

Distributor Injection Pump:

1. Make sure there is adequate fuel in the tank.
2. Loosen the fuel filter bleed screw, Figure 83, on top of the filter. Allow the filter to bleed by gravity until air-free fuel flows from the screw, then retighten the screw.
3. Loosen the injection pump bleed screw, Figure 87. With the diesel engine stop control pulled out, crank the engine until air-free fuel flows from the screw. Then close the screw.
4. Loosen the injector lines at the injectors.
5. With the diesel engine stop control pulled out, crank the engine until air-free fuel flows from each connection. Tighten each connection.

CLEANING THE FUEL SEDIMENT BOWL AND FILTER (GASOLINE)

The gasoline fuel sediment bowl and filter should be cleaned every 50 hours.

1. Close the fuel shut-off valve, Figure 81.

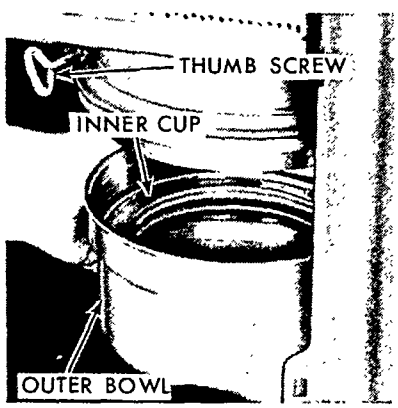


Figure 89
Air Cleaner — Oil Bath Type

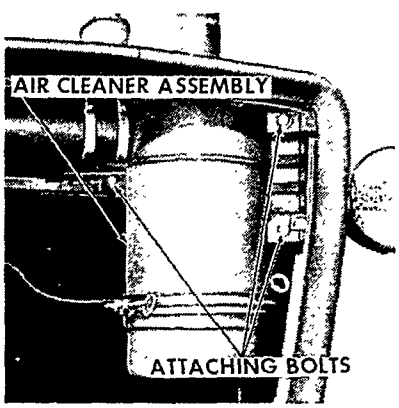


Figure 90
Air Cleaner Assembly — Oil Bath Type

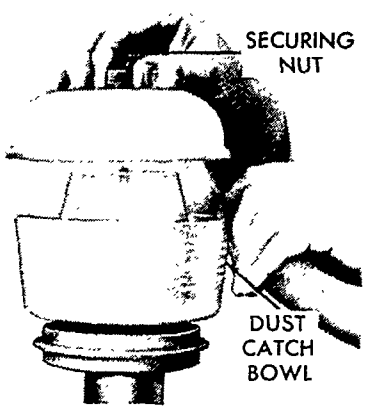


Figure 91
Pre-Cleaner Bowl (Accessory for Oil Bath Type Cleaners Only)

2. Loosen the sediment bowl clamp and screw assembly, Figure 88.
3. Remove the glass bowl and disc-type filter. Wash them in clean fuel.
4. Check the condition of the gasket between the glass bowl and casting. Install a new gasket if necessary.
5. Install the disc-type filter. Position the bowl and clamp over the filter, but do not tighten.
6. Open the fuel shut-off valve and allow the bowl to fill with fuel, then tighten the clamp and screw assembly.

AIR CLEANER (OIL BATH TYPE)

Checking Dirt Level: The dirt level in the oil bath air cleaner should be checked daily or every 10 hours. Under conditions of extreme dust or chaff, service the oil bath air cleaner twice daily.

1. Remove the radiator chaff screen and loosen the air cleaner bowl retaining band thumbscrew, Figure 89.
2. Remove the inner cup from the bowl and check the oil and dirt level.
3. If the dirt level is more than ¼ inch high, service the air cleaner as outlined in the following procedure. If the dirt level is satisfactory, reassemble the cleaner and install the chaff screen.

Changing Oil: The oil in the oil bath air cleaner should be changed every 50 hours or whenever the daily or 10-hour inspection shows the dirt level to be more than ¼ inch high.

1. Remove the radiator chaff screen and disassemble the inner cup from the outer bowl, Figure 89, as covered in the preceding procedure.
2. Discard the oil and clean the screen, inner cup, and outer bowl with solvent.
3. Place the inner cup in the outer bowl and refill with clean engine oil until level with the mark on the cup. The mark is a common level for both the cup and bowl. Fill both to the mark. Do not overfill.
4. Reassemble the cleaner and install the chaff screen.

IMPORTANT: *When servicing the air cleaner, do not spill oil on the radiator fins. Oil on the fins will cause dirt to accumulate, blocking the air passage and reducing cooling efficiency.*

Cleaning the Air Cleaner Body: The oil bath air cleaner should be removed from the tractor, be disassembled, and cleaned every 600 hours.

1. Remove the radiator chaff screen and, if equipped, the air pre-cleaner, Figure 91.
2. Loosen the clips securing the engine air inlet pipe to the air cleaner.
3. Remove the attaching bolts that hold the air cleaner in place, Figure 90, then remove the air cleaner.
4. Remove the outer bowl and inner cup, Figure 89, and discard the oil.
5. Wash all parts in clean fuel, including the mesh screen inside the body of the air cleaner. Allow the parts to dry.
6. After cleaning, install the air cleaner body, making sure the engine air inlet pipe is correctly located and that the pipe retaining clips and air cleaner attaching bolts are tight.
7. Install the inner cup in the bowl and fill with clean engine oil until level with the mark on the cup. The mark is a common level for both the cup and bowl. Fill both to the mark. Do not overfill.
8. Install the oil-filled bowl and secure it in place with the thumbscrew.
9. Install the pre-cleaner, if equipped, and the radiator chaff screen.

PRE-CLEANER BOWL (ACCESSORY)

The pre-cleaner bowl should be cleaned daily or every 10 hours. Under conditions of extreme dust, the bowl may require cleaning twice daily. The dirt level should never be allowed to accumulate above the level mark on the bowl, and the **pre-cleaner should never be used with dry-type air cleaners.** Use it with oil bath-type cleaners only.

1. Loosen the securing nut on top of the pre-cleaner and remove the bowl, Figure 91.
2. Remove the dirt, wipe the bowl clean and dry, and reinstall.

AIR CLEANER (DRY ELEMENT TYPE)

Cleaning the Element: The dry air cleaner element should be cleaned every 50 hours. Under conditions of extreme dust, it is suggested that the element be cleaned every 25 hours.

1. Remove the filter element as shown in Figure 92. Clean it by tapping the side or end carefully against the palm of your hand.
2. Compressed air, not to exceed 100 psi, may be used for cleaning. Insert the nozzle inside the element to

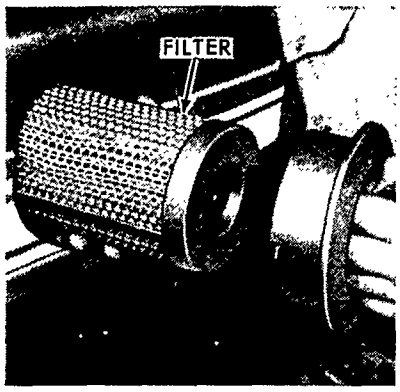


Figure 92
Dry-Type Air Cleaner

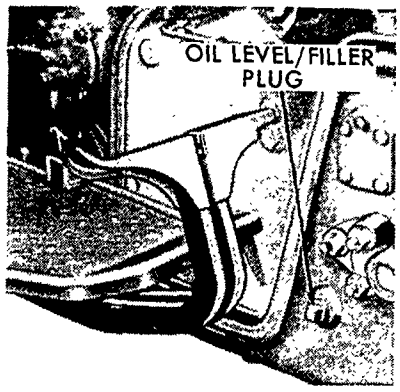


Figure 93
Select-O-Speed Transmission Oil Level/Filler Plug

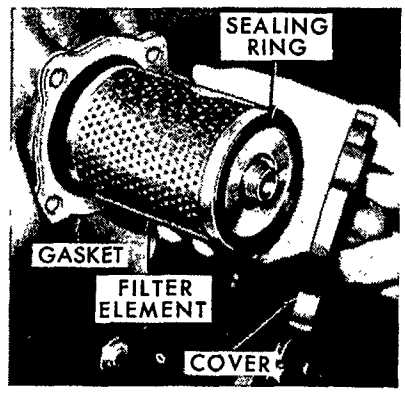


Figure 94
Select-O-Speed Oil Filter

blow out the dust. Blow the dust from the outside of the element by holding the nozzle at least 6 inches away.

3. After the element is cleaned, reinstall.

Washing the Element: The dry air cleaner element should be washed every 300 hours to remove exhaust smoke or film.

1. Remove the filter element as shown in Figure 92.
2. Agitate the element in warm water containing a small amount of non-sudsing type detergent.

IMPORTANT: *Do not use water hotter than the hand can stand, as the element will be damaged. Never wash the element with fuel oil, gas, or solvent. Do not oil the element.*

3. Rinse the element with clean water to thoroughly loosen all foreign material. Shake excess water from the element and allow it to dry.

IMPORTANT: *Do not try to remove excess water with compressed air, as the air will rupture a wet element.*

4. After the element is dry, check for damage by holding a light inside the element. If an even, fine pattern of light is seen, the element is clean and undamaged. A large spot of light indicates the element is damaged, and a new element should be installed.
5. Inspect the gasket on the end of the element for damage. If the gasket is damaged or missing, install a new element.

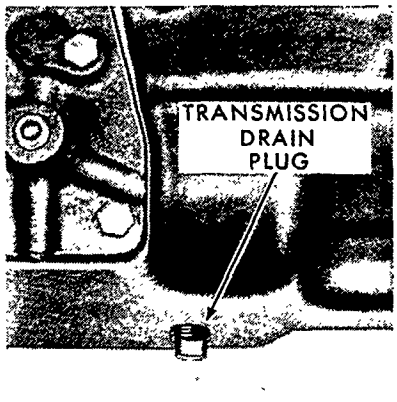


Figure 95
Select-O-Speed Transmission Drain Plug — Except Ford 5000

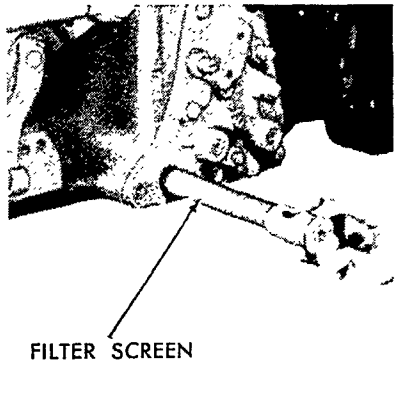


Figure 96
Select-O-Speed Oil Inlet Screen — Ford 2110, 3000, 4000, and 4110



Figure 97
Select-O-Speed Oil Inlet Screen — Ford 5000

Changing the Element: The air cleaner element should be changed every 600 hours or whenever the 300-hour inspection shows the element to be damaged.

1. Remove the filter element as shown in Figure 92.
2. Wipe the inside of the filter canister free of dust.
3. Install the new filter element.

SELECT-O-SPEED TRANSMISSION

Checking Oil Level: The Select-O-Speed oil level should be checked every 300 hours.

1. With the tractor standing level and the engine turned off, check the oil level by removing the oil level/filler plug, Figure 93, from the right side of the transmission.
2. The oil should be level with the bottom of the hole. If it is low, add new oil of the type specified, page 50, to bring the oil level up to the level/filler plug hole.
3. Install the plug.

NOTE: *Always use caution to be sure that foreign material does not enter the transmission.*

Changing Oil Filter and Band Adjustment: The Select-O-Speed oil filter should be changed every 600 hours as follows. The bands should also be adjusted at this time by your Ford Tractor-Equipment Dealer.

1. **Ford 5000 Only:** Drain the transmission oil into a clean container so the oil can be reused. The drain plug is located in the cover on the bottom of the case that covers the screen, Figure 97.
2. Remove the attaching bolts from the filter cover, Figure 94, that is located on the left side of the transmission case.
3. Pry the cover away from the case and remove the filter element.
4. Install a new gasket and filter element. Be sure the element is installed so the sealing ring is toward the cover.
5. Install the cover and tighten the attaching bolts to 35-40 lbs. ft.
6. **Ford 5000 Only:** Install the drain plug and fill the transmission through the oil level/filler plug hole, Figure 93, until the oil is level with the hole. Install the plug

Changing Oil and Cleaning the Inlet Screen: The Select-O-Speed oil should be changed and the oil inlet screen cleaned every 2400 hours.

Ford 2110, 3000, 4000, and 4110:

1. With the tractor standing level, drain and discard the transmission oil by removing the transmission drain plug, Figure 95.
2. Loosen the hex head bolt and retainer clip that holds the filter screen, Figure 96, in place.
3. Remove and thoroughly clean the screen.
4. Install a new O-ring on the plug end of the screen, then install the screen and secure it with the retainer clip and bolt.
5. Install the drain plug in the bottom of the transmission case.
6. Remove the oil level/filler plug, Figure 93, and fill with new oil of the type specified, page 50, until level with the hole. Install the plug.

Ford 5000:

1. With the tractor standing level, drain and discard the oil by removing the transmission drain plug.
2. Remove the ten bolts that retain the cover to the bottom of the transmission case. Remove the cover.
3. Withdraw the oil inlet screen, Figure 97, from the transmission and thoroughly clean the screen.
4. Install the screen, cover gasket, and cover. Tighten the bolts securely.
5. Install the drain plug in the bottom of the transmission case.
6. Remove the oil level/filler plug, Figure 93, and fill with new oil of the type specified, page 50, until level with the hole. Install the plug.

MANUAL SHIFT TRANSMISSION

Checking Oil Level: The manual shift transmission oil level should be checked every 300 hours.

Ford 2000, 2110, 3000, 4000, and 4110:

1. With the tractor standing level and the engine turned off, check the oil level by removing the level plug, Figure 98, from the right side of the transmission case.
2. The oil should be level with the bottom of the hole. If it is low, remove the filler plug and add new oil of the type specified, page 50, to bring the oil level up to the level/filler plug hole.
3. Install the level and filler plugs.

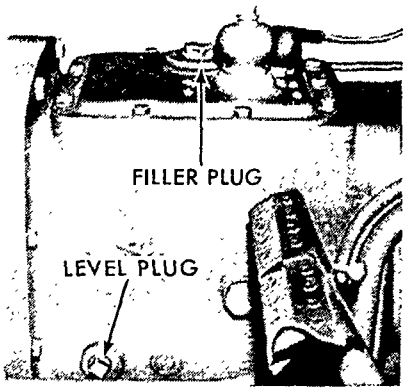


Figure 98
Manual Transmission Oil Level and Filler Plugs — Ford 2000, 2110, 3000, 4000, and 4110

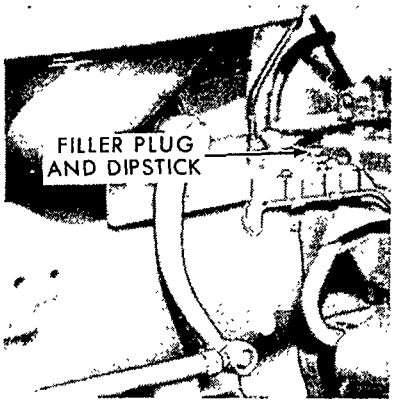


Figure 99
Manual Transmission Filler Plug and Dipstick — Ford 5000

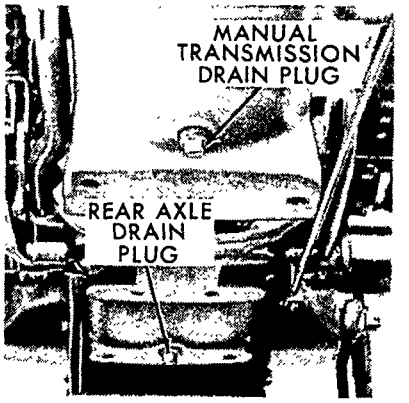


Figure 100
Manual Transmission and Rear Axle Drain Plugs — Ford 2000, 2110, 3000, 4000, and 4110

Ford 5000:

1. With the tractor standing level and the engine turned off, check the oil level with the combined filler plug and dipstick, Figure 99.
2. The transmission is filled to the correct level when the oil level is midway between the end of the dipstick and the mark on the stick. If low, add new oil of the type specified, page 50. **Do not fill to the mark on the stick, as the transmission will be overfilled.**
3. Install the combined filler plug and dipstick.

Changing Oil: The manual shift transmission oil should be changed every 1200 hours.

Ford 2000, 2110, 3000, 4000, and 4110:

1. With the transmission oil at normal operating temperature, drain and discard the oil by removing the transmission drain plug, Figure 100. Reinstall the plug after the oil has drained.
2. Remove the level and filler plugs, Figure 98, and fill the transmission with new oil of the type specified, page 50, until level with the level plug hole.
3. Install the level and filler plugs.

Ford 5000:

1. With the transmission oil at normal operating temperature, drain and discard the oil by removing the drain plug, Figure 101. Reinstall the plug after the oil has drained.
2. Remove the combined filler plug and dipstick, Figure 99, and fill the transmission with new oil of the type specified, page 50.

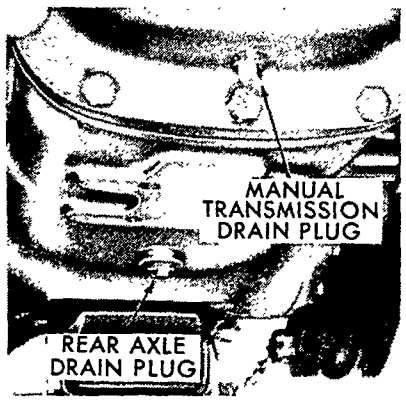


Figure 101
Manual Transmission and Rear Axle Drain Plugs — Ford 5000



Figure 102
Hydraulic System (Rear Axle) Oil Level Plug — Ford 2000, 2110, 3000, and 4110

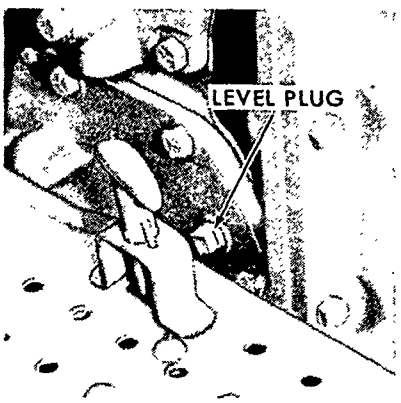


Figure 103
Hydraulic System (Rear Axle) Oil Level Plug — Ford 4000

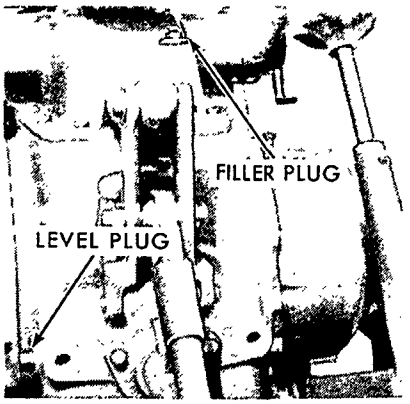


Figure 104
Hydraulic System (Rear Axle) Oil Level and Filler Plugs — Ford 5000

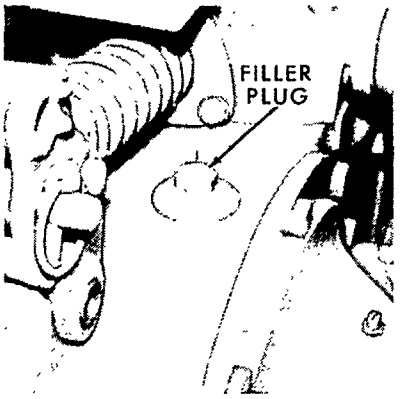


Figure 105
Hydraulic System (Rear Axle) Oil Filler Plug — Ford 2000, 2110, 3000, and 4110 (Ford 2000 Shown)

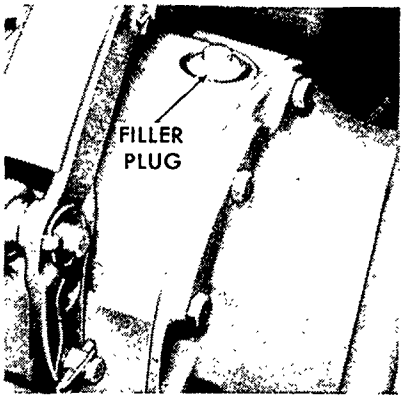


Figure 106
Hydraulic System (Rear Axle) Oil Filler Plug — Ford 4000

3. The transmission is filled to the correct level when the oil level is midway between the end of the dipstick and the mark on the stick. **Do not fill to the mark on the stick, as the transmission will be overfilled.**
4. Install the combined filler plug and dipstick.

HYDRAULIC LIFT SYSTEM (REAR AXLE)

Checking Oil Level: The hydraulic system (rear axle) oil level should be checked every 50 hours.

1. With the tractor standing level, the hydraulic lift arms in the raised position, and any external cylinders retracted, check the oil level by removing the level plug. Figures 102, 103, and 104 illustrate the location of the level plugs for the various tractors.
2. The oil should be level with the bottom of the hole. If it is low, remove the filler plug and add oil of the type specified, page 50, to bring the oil level up to the level plug hole. Figures 104, 105, and 106 illustrate the location of the filler plugs
3. Install the level and filler plugs.

Changing Oil: The hydraulic lift system (rear axle) oil should be changed every 1200 hours.

1. With the tractor standing level, the hydraulic left arms in the lowered position and any external cylinders retracted, drain and discard the oil by removing the rear axle drain plug, Figures 100 and 101. Reinstall the plug after the oil has drained.
2. Remove the level and filler plugs, Figures 102 through 106, and fill the rear axle with new oil of the type specified, page 50, until level with the level plug hole.

NOTE: *Refer to the following "Winter Blend Oil Recommendations" if the tractor is to be operated at temperatures between plus 20°F and minus 20°F.*

3. Install the level plug, start the engine and fully raise the lift arms. Also extend any external hydraulic cylinders.
4. Remove the level plug and add oil as required until level with the level plug hole.
5. Install the level and filler plugs.

Changing Hydraulic Oil Filters: The hydraulic lift system oil filters (inlet and exhaust) should be changed every 2400 hours or whenever the rear axle or hydraulic lift system is overhauled. This service should be performed by your Ford Tractor-Equipment Dealer.

"Winter Blend" Oil Recommendations: Improved tractor hydraulic system action during cold weather (+ 20°F. to -20°F) can be achieved by blending M-4864-D oil with the specified rear axle oil, page 50.

The following chart lists the quantities that should be blended to achieve improved cold weather performance. Note that the chart applies only to those tractors equipped with a piston-type pump. Do not use "winter blend" oil in the Ford 4000 and 5000 with Independent P.T.O. (gear-type pump). See Figure 107 for identification of tractors with piston pumps and gear pumps.

IMPORTANT: *To prevent premature final drive gear wear, DO NOT operate the tractor with "winter blend" oil in the rear axle when temperatures are above 40°F. Also, when "winter blend" oil is used in the Ford 4000 Tractor, the brakes may become noisy (squeal when applied).*

REAR AXLE AND HYDRAULIC LIFT SYSTEM "WINTER BLEND" OIL RECOMMENDATIONS

(For Temperatures Between + 20°F and -20°F)

Tractors With a Piston-Type Hydraulic Pump	Quantity Specified Oil		Quantity Blend M-4864-D		Quantity Total Capacity	
	U.S. Qts.	Imp. Qts.	U.S. Qts.	Imp. Qts.	U.S. Qts.	Imp. Qts.
Ford 2000, 2110, 3000, and 4110	12.6	10.5	12.6	10.5	25.2	21.0
Ford 4000	16.8	14.0	16.8	14.0	33.6	28.0

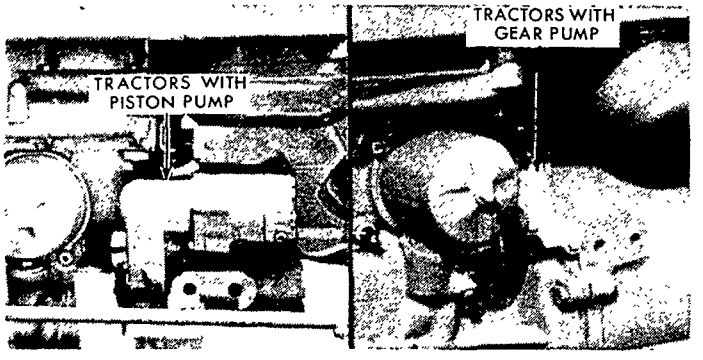


Figure 107
Tractor Identification — Piston Pump vs. Gear Pump

STEERING GEAR HOUSING (MANUAL AND POWER)

The oil level in the manual and power steering gear housing should be checked every 600 hours.

1. Remove the sheet metal from the left side of the tractor at the base of the fuel tank to gain access to the level/filler plug, Figure 108.
2. With the tractor standing level, check the oil level by removing the level/filler plug.
3. The oil should be level with the bottom of the hole. If it is low, add new oil of the type specified, page 50, to bring the oil level up to the level/filler plug hole.
4. Install the level/filler plug and the sheet metal previously removed.

POWER STEERING RESERVOIR

Checking Oil Level: The oil level in the power steering reservoir should be checked every 300 hours.

1. With the engine stopped, the tractor standing level, and the wheels in the straight-ahead position, check the oil level with the level indicator, Figure 109.
2. The oil level should be up to the "level mark" on the indicator. If low, add new oil of the type specified, page 50, until the oil reaches the level mark on the indicator. Do not overfill.
3. Start the engine and turn the steering wheel from stop-to-stop several times (five or more) to purge air from the system.
4. Stop the engine and recheck the oil level. Add oil as required and repeat Step 3.

Changing Oil Filter: The oil filter in the power steering reservoir should be changed every 600 hours.

1. Remove the reservoir cover attaching nut, then lift the cover and sealing gasket from the reservoir.
2. Remove the filter element and retaining spring, Figure 110, from the oil filled reservoir. Discard the element.
3. Draw the oil from the reservoir with a suction gun, then clean the reservoir with a lint-free cloth.

NOTE: *If, on inspection, the oil appears contaminated, change the oil in the entire system. Your Ford Tractor-Equipment Dealer has the necessary tools and equipment to flush the system.*

4. Install the new filter element, spring, and cover, making sure the sealing gasket is properly positioned.
5. Fill the reservoir with new oil of the type specified, page 50, until level with the mark on the indicator. Do not overfill.
6. Start the engine and turn the steering wheel from stop-to-stop several times (five or more) to purge air from the system.
7. Stop the engine and recheck the oil level. Add oil as required and repeat Step 6.

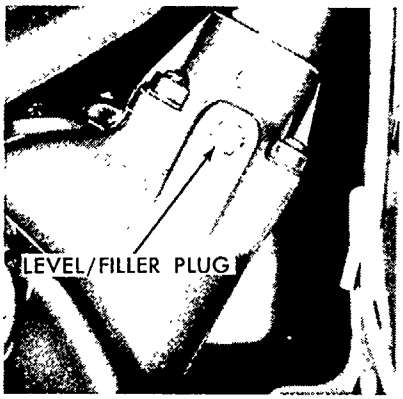


Figure 108
Steering Gear Housing Lever/Filler Plug

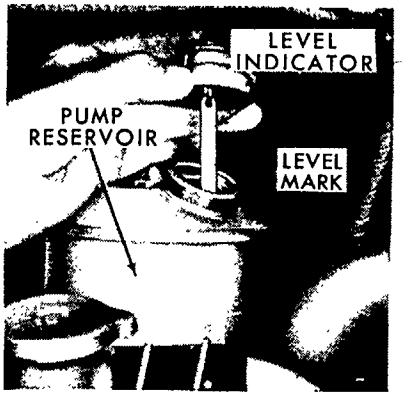


Figure 109
Power Steering Oil Level Check

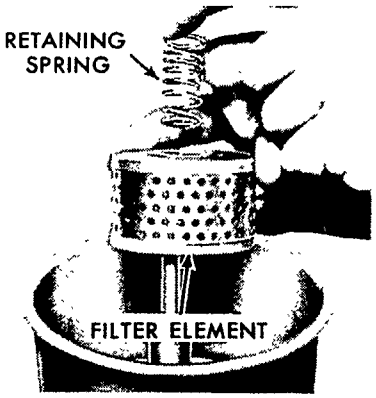


Figure 110
Power Steering Oil Filter Element

BELT PULLEY (ACCESSORY)

Checking Oil Level: The oil level in the belt pulley gearbox should be checked every 50 hours.

1. With the tractor standing level and the pulley assembly positioned horizontally to the left or right, check the oil level by removing the level/filler plug, Figure 111.
2. The oil should be level with the bottom of the hole. If it is low, add new oil of the type specified, page 50, to bring the oil level up to the level/filler plug hole.
3. Install the level/filler plug.

Changing Oil: The oil in the belt pulley gearbox should be changed every 1200 hours.

1. Remove the four attaching bolts, Figures 111, that retain the pulley assembly to the differential housing. Pull the assembly rearward away from the P.T.O. shaft.
2. Remove the level/filler plug from the housing. Invert the assembly to drain the oil.

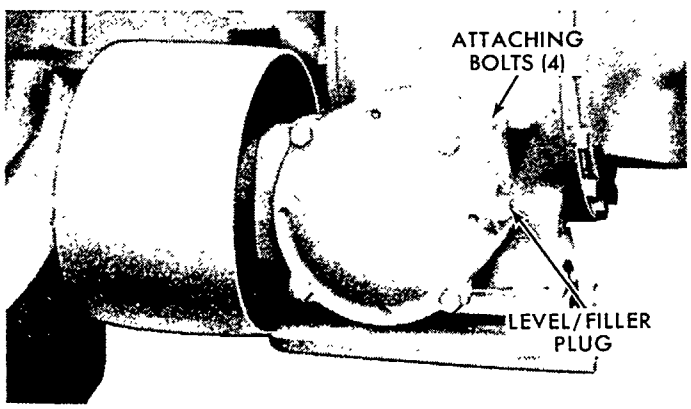


Figure 111
Belt Pulley Level/Filler Plug

3. Replace the assembly on the P.T.O. shaft so the plug hole is to the left or right. Insert one of the bolts to retain the assembly in this position.
4. Add new oil of the type specified, page 50, until the oil reaches the level plug hole.
5. Install the plug. Remove the securing bolt and install the assembly in the position required. Install and tighten the four attaching bolts.

LUBRICATION FITTINGS

The following lubrication points (refer to the Lubrication Charts, pages 46 and 47), require the application of a good quality grease every 50 hours. In extremely dirty conditions, lubrication should be made more often. Refer to page 50 for the type of grease that should be used.

- Front Wheel Spindles
- Brake and Clutch Pedal Pivots
- Power Steering Cylinder(s) (Except Ford 5000)
- Steering Center Arm Pivot (Ford 5000)
- Differential Lock Pedal Pivots
- Hydraulic Lift Linkage

1. Wipe away all old grease and dirt from the lubrication fittings to prevent dirt or foreign material from entering the fittings when new grease is applied.
2. Use a high pressure gun to force in the new grease.

GENERAL MAINTENANCE

COOLING SYSTEM

Checking Coolant Level: To obtain maximum efficiency and service life from the engine, it must operate at the correct temperature. This is dependent on the cooling

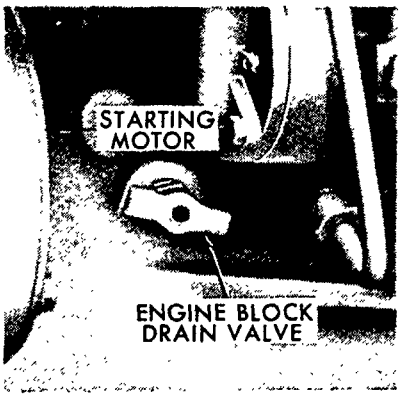


Figure 112
Engine Block Drain Valve

system. The system should be kept filled with clear water with a rust inhibitor or antifreeze solution. If the antifreeze does not contain a rust inhibitor, then it should be added. The coolant level should be checked daily or every 10 hours.

1. Remove the radiator cap and check the level of the coolant.



CAUTION: *The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow pressure to escape before removing the cap completely.*

2. If the coolant level is more than 1 to 1½ inches below the bottom of the filler neck, add clean water or antifreeze solution as necessary to fill the radiator. Remember that if the cooling system already contains antifreeze, add only antifreeze solution of the correct strength. Plain water will reduce the strength, and hence the protection of the solution.

IMPORTANT: *Alcohol-type antifreeze is not recommended. Do not mix an alcohol-type solution to permanent or long-life types of antifreeze.*

3. Keep the radiator fins clear of chaff or dirt to allow free passage of air. If oil is spilled on the radiator fins, clean immediately with a suitable solvent. Oil will allow dirt to accumulate and restrict the radiator core cooling passages.

Draining and Flushing the Cooling System: Drain and flush the radiator and engine block every 6 or 24 months as indicated below:

Pure water .... Drain, flush and refill every 6 months, add rust inhibitor

Permanent antifreeze ..... Change every 24 months

To drain the system:

1. Remove the radiator cap and open the drain valve at both the radiator and the engine block. The radiator drain valve is located on the bottom left side of the radiator. The engine block drain valve is located in front of the starting motor on the right side of the engine. See Figure 112.

2. Allow the coolant to drain and then run water through the system with the engine running by placing a water hose in the radiator filler neck. When the water flowing from the drain valve is free of discoloration and sediment, remove the hose and stop the engine.

3. Close the two drain valves and slowly refill the system with clean water, or an antifreeze solution with a rust inhibitor, until the coolant is approximately 1 to 1½ inches below the bottom of the filler neck.

NOTE: *When filling the radiator on Ford 5000 Tractors with a gasoline engine, open the breather on top of the intake manifold, Figure 113. Close the breather when coolant flows from the vent.*

4. Clean the cap and cap seal, and install the cap.

5. Run the engine until normal operating temperature is reached, then stop the engine and recheck the coolant level. Add coolant as required.

IMPORTANT: *Never run an engine when the cooling system is empty, and do not add cold water or cold antifreeze solution to a hot radiator.*

Thermostat: The thermostat on all diesel engines and on the Ford 5000 gasoline engine is located in the coolant outlet connection in the front of the cylinder head. See Figure 114.

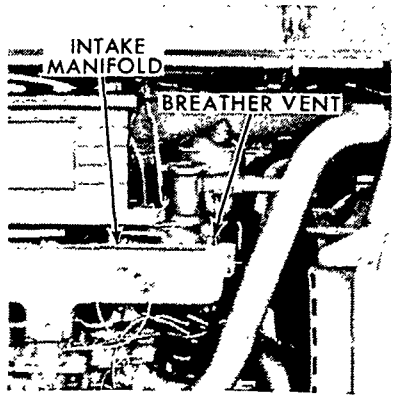


Figure 113
Breather Vent — Ford 5000 Gasoline

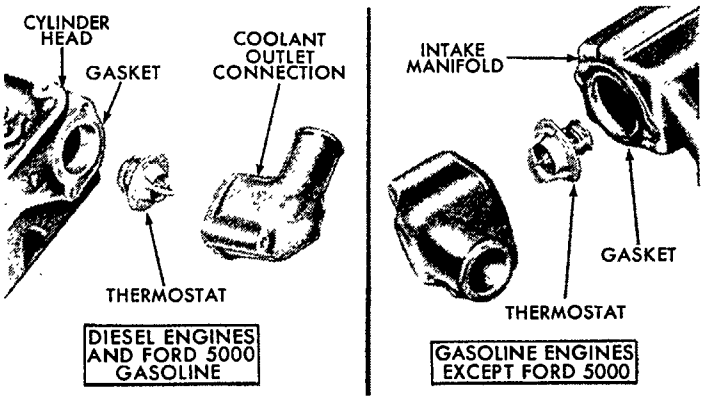


Figure 114
Engine Thermostats

The thermostat on all gasoline engines (except the Ford 5000) is located in the coolant outlet connection on the front of the intake manifold. See Figure 114.

When the engine is cold, the thermostat, which is a temperature sensitive valve, shuts off the flow of coolant to the radiator, allowing rapid engine warm-up. A recirculating bypass allows the coolant to circulate within the engine whenever the thermostat shuts off flow to the radiator.

IMPORTANT: *Do not remove and discard the thermostat in an attempt to improve the cooling. This will cause the engine to run below normal working temperatures resulting in excessive engine wear.*

If it ever becomes necessary to install a new thermostat, it should be positioned in the recess of the water outlet connection so the heat element (spring end) will be in the cylinder head of diesel engines and the Ford 5000 gasoline engine (intake manifold on all other gasoline engines). See Figure 114.

Fan Belt: A belt-driven fan at the front of the engine draws air through the radiator, cooling the water in the radiator tubes. To prevent restricting the flow of air, the radiator chaff screens must be free of chaff, dirt, etc. An occasional check should be made of the radiator itself to make sure that no foreign matter is blocking the cooling passages.

A slipping fan belt will lower the efficiency of the fan and result in inaccurate Proof-Meter operation; therefore, correct belt tension must be maintained. Check the condition and tension of the fan belt every 300 hours. A belt that shows signs of cracking or fraying should be discarded, and a new belt installed.

A correctly tightened belt will deflect ¼ inch to ½ inch total movement when a 60-90 pound force is applied midway between the generator and crankshaft pulleys.

To adjust belt tension:

1. Loosen the three generator mounting bolts, Figure 115.



CAUTION: *Never attempt to loosen or tighten the generator mounting bolts when the engine is running.*

2. Pry the generator away from the engine and tighten the mounting bolts.
3. Recheck belt deflection.

TIMING FUEL INJECTION PUMP

The fuel injection pump should never be disassembled or adjusted without specialized training and equipment. Consult your Ford Tractor-Equipment Dealer if any internal repairs or adjustments become necessary. The pump timing can, however, be checked and adjusted.

Distributor-Type Pump: The injection pump is correctly timed to the engine when the mark on the pump mounting flange is aligned with the zero mark on the engine front mounting plate, Figure 116. If the marks are not aligned, loosen the injection pump mounting bolts, rotate the pump to align the marks, and retighten the bolts.

IMPORTANT: *Do not crank the engine when the pump mounting bolts are loose. Also, if the pump is removed, and then reinstalled, make sure the pin in the drive gear (not shown) is aligned with the slot in the pump drive hub before tightening the mounting bolts.*

In-Line Type Pump: The injection pump is correctly timed to the engine when fuel injection at the No. 1 piston

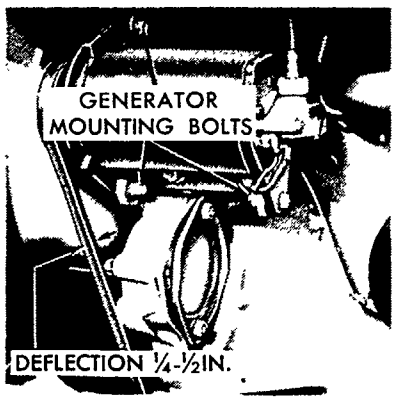


Figure 115
Generator/Fan Belt Tension

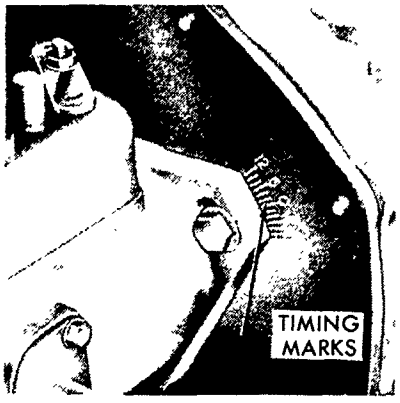


Figure 116
Diesel Injection Pump Front Mounting Plate — Distributor Pump

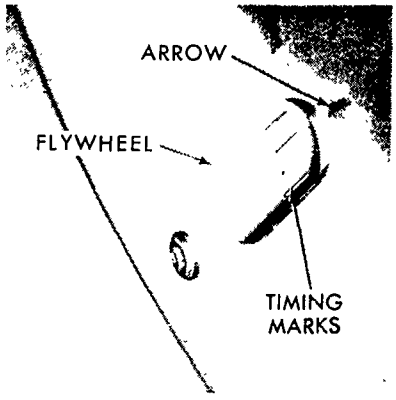


Figure 117
Rear Cover Plate Timing Inspection Hole

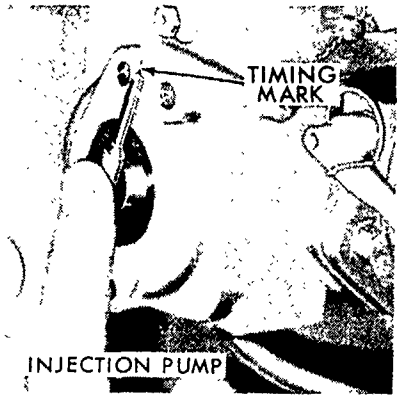


Figure 118
In-Line Injection Pump Timing Mark

occurs 19° btdc on the compression stroke. Determine correct timing as follows:

1. Remove the flywheel inspection cover from the right rear of the engine, Figure 117, and the cover and gasket from the rear of the injection pump, Figure 118.

2. With the diesel engine stop control pulled out, rotate the flywheel by "bumping" the starter with the key-starter switch until the timing marks, Figure 117, can be seen on the flywheel.

3. Using a screwdriver, through the inspection cover opening, continue to turn the flywheel until the 19° btdc mark is aligned with the arrow. The No. 1 piston should now be at 19° btdc on its compression stroke.

NOTE: *If the arrow on the end of the pump camshaft is pointing away from the timing mark on the pump, Figure 118, and the 19° btdc mark is centered, the piston is on its exhaust stroke. If this is the case, rotate the flywheel 360° (one full turn) until the 19° btdc mark is again aligned with the arrow, Figure 117.*

4. After positioning the No. 1 piston at 19° btdc on the compression stroke, place a pointer in the V-notch of the pump camshaft as shown in Figure 118. If the pointer does not align with the timing mark, the pump is not correctly timed to the engine and should be retimed as outlined in Steps 5 through 8.

5. Drain the coolant from the radiator and remove the lower hose.

6. Remove the inspection plate and gasket from the front of the engine, Figure 119.

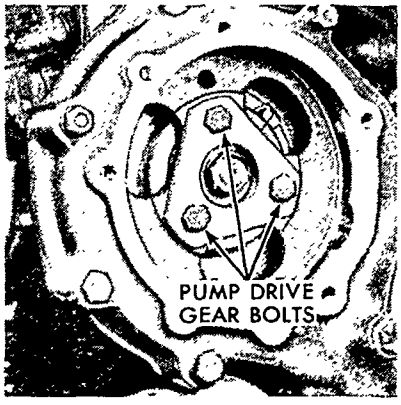


Figure 119
In-Line Injection Pump Adjustment Bolts

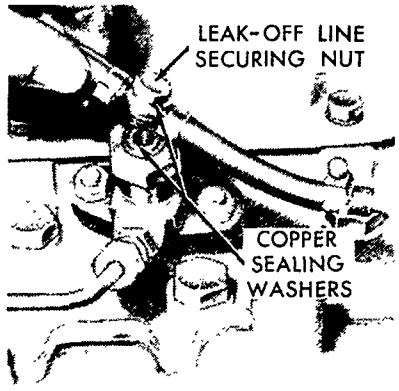


Figure 120
Removing Injector Leak-Off Lines

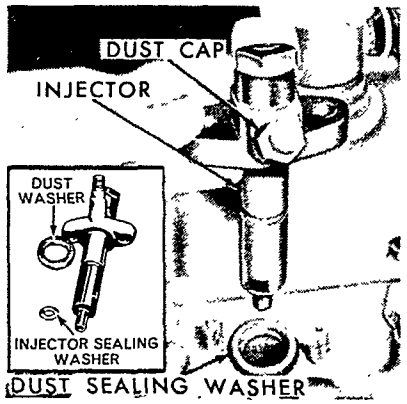


Figure 121
Injector and Sealing Washers

7. Loosen the pump drive gear bolts and rotate the pump until the pointer, Figure 118, aligns with the timing mark.
8. Tighten the pump drive gear bolts, and install all covers, gaskets, and plates previously removed. Install the radiator lower hose and fill the radiator.

FUEL INJECTOR REMOVAL AND INSTALLATION

The injectors should be cleaned, tested, and adjusted every 600 hours. Do not attempt to dismantle or adjust the injectors yourself. Remove them from the tractor, as follows, and have them serviced by your Ford Tractor-Equipment Dealer.

1. To gain access to the injectors, remove the battery tray locating bolt and swing the battery tray outward.
2. Remove all loose dirt from around the injectors and lines. Disconnect the leak-off line connections from the injectors, Figure 120, and remove the leak-off line.
3. Disconnect the injection pump-to-injector line connections at both the pump and injectors. Cover the ends of the lines and the injector inlet and leak-off ports to prevent the entry of foreign material. Discard the connector bolt leak-off line-to-injector sealing washers.
4. Unscrew the two retaining nuts from each injector and remove the injectors, Figure 121.
5. Remove and discard the copper sealing washers and the cork dust sealing washers from the injector locating bores in the cylinder head. If a spare set of injectors is not immediately available, cover the bores to prevent entry of foreign material.

After the injectors have been serviced, install them as follows:

1. Place new injector body cork dust sealing washers around the injector body.
2. Install a new copper injector nozzle sealing washer in each injector locating bore. Install the new injectors and tighten the retaining nuts evenly to 10-15 lbs. ft.

IMPORTANT: *Do not overtighten the retaining nuts or you may distort the injector.*

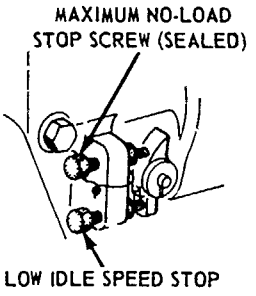
3. Position the injector lines and tighten the fittings to the injectors and injection pump finger tight. Tighten the injector line fittings at the injector pump to 18-22 lbs. ft. Also tighten the line fittings at the injectors.
4. Install the leak-off line using new connector bolt sealing washers, above and below the leak-off connection, at each injector. Tighten the connector bolts to the injectors. Make sure the leak-off line-to-tank return line fitting is tight, then bleed the system as outlined on page 53.

DIESEL ENGINE SPEED ADJUSTMENTS

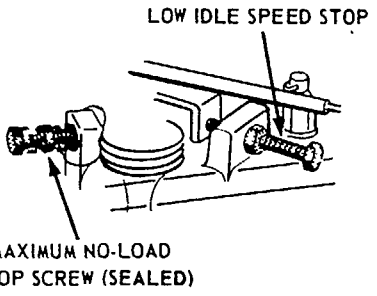
The maximum no-load and idle speeds of the engine are set by adjustments on the pump. The maximum no-load speed stop screw is set and sealed at the factory and should only be adjusted by a qualified diesel mechanic at your Ford Tractor-Equipment Dealer. If the maximum speed of the engine is not within the range shown below, check for correct throttle linkage adjustment as outlined in the following procedure.

- Ford 2000, 2110, and 3000 .... 2225-2275 rpm no-load
- Ford 4000 and 4110 ..... 2425-2475 rpm no-load
- Ford 5000 ..... 2325-2375 rpm no-load

1. Warm the engine to normal operating temperature, then stop the engine.



In Line Pump — Ford 3000 and 5000



Distributor Pump — Ford 2000, 2110, 4000, and 4110

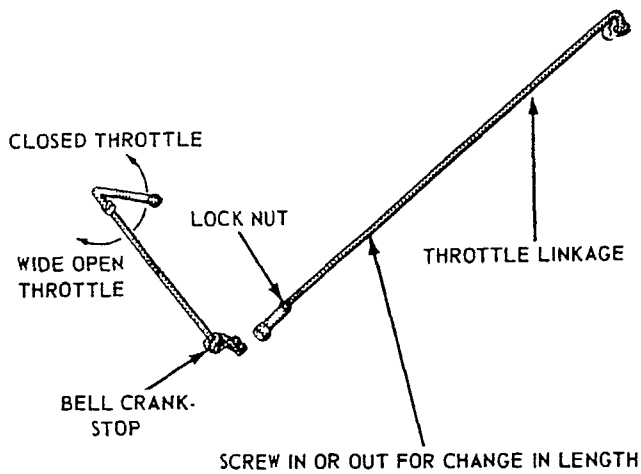
2. Disconnect the throttle linkage at the bellcrank and move the hand throttle lever to the wide-open position.

3. Pull the throttle linkage rod toward the bellcrank far enough to bring the control stop on the injection pump back against the sealed maximum no-load stop screw. To prevent a false setting, **do not pull excessively on the control rod.**

4. Hold the rod in the maximum speed position as in Step 3, and adjust it to fit the distance between the bellcrank and pump while maintaining the hand throttle in the wide-open position as in Step 2.

5. Connect the rod to the bellcrank and tighten the jam nut.

6. Start the engine and check for proper maximum no-load speed. The engine should be running at the correct speed. If it is not, the sealed maximum no-load speed stop screw should be adjusted by your Ford Tractor-Equipment Dealer.



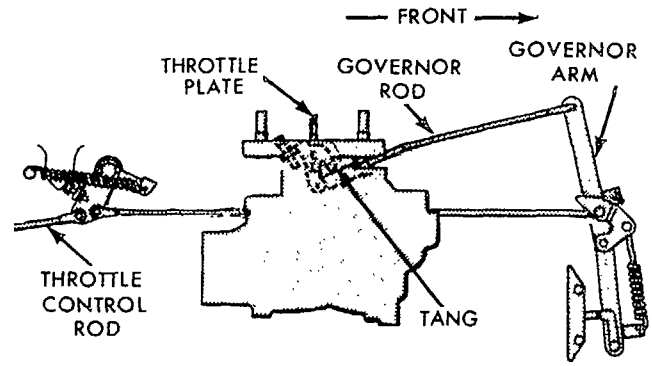
7. After obtaining the correct maximum no-load speed, move the hand throttle lever to the idle position. Loosen the lock nut on the idle speed stop and adjust the stop to obtain 600-700 rpm. Tighten the lock nut.

GASOLINE ENGINE SPEED ADJUSTMENTS

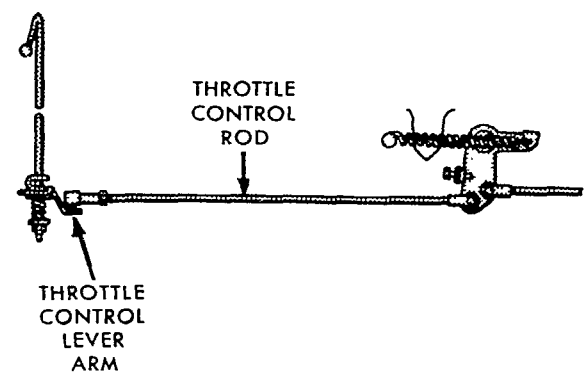
Constant engine speed for any given throttle setting is provided by a centrifugal governor located in the engine front cover. This governor is driven by the engine timing gears, and connected by suitable linkage to the throttle plate on the carburetor. Adjust as outlined below.

Ford 2000, 2110, 3000, 4000, and 4110:

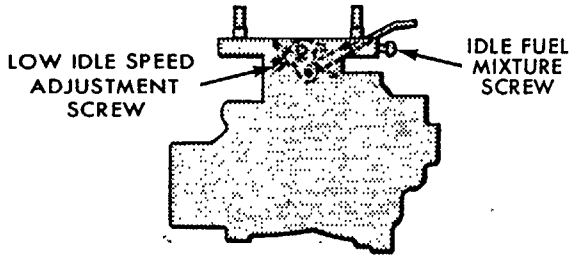
1. With the engine stopped, move the hand throttle to the wide-open position.



2. Remove the right-hand steering gear sheet metal cover.
3. Loosen the jam nut on the governor rod and disconnect the rod from the throttle plate lever at the carburetor.
4. Rotate the carburetor throttle plate lever clockwise to the full-open position so the wide-open throttle tang on the lever is against the stop on the carburetor.
5. With the governor arm fully rearward, (wide-open) and the throttle plate fully open, adjust the governor rod length to meet the throttle plate lever, then lengthen the rod by turning the clevis one additional turn. Connect the rod to the lever and tighten the jam nut.
6. Move the hand throttle to the closed position. Loosen the jam nut on the throttle control rod and disconnect the rod from the throttle control lever arm.
7. Push the throttle control rod fully forward (idle position) and adjust the length to meet the attachment point on the throttle control lever arm. Connect the rod to the arm and tighten the jam nut.



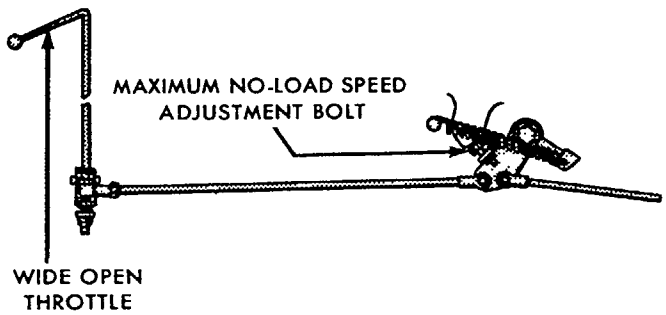
8. Start the engine and allow it to run until it reaches normal operating temperature, then adjust the low idle adjustment screw in or out until the engine maintains 600-700 rpm.



9. Adjust the idle fuel mixture screw in or out until the engine reaches its highest idle rpm, then recheck the low idle speed and readjust if necessary.

10. Move the hand throttle to the wide-open position. Check the rpm as indicated on the Proof-Meter and, if necessary, turn the maximum no-load speed adjustment bolt to achieve the recommended maximum no-load speed:

- Ford 2000 and 2110 ..... 2065-2165 rpm no-load
- Ford 3000 ..... 2285-2385 rpm no-load
- Ford 4000 and 4110 ..... 2395-2495 rpm no-load

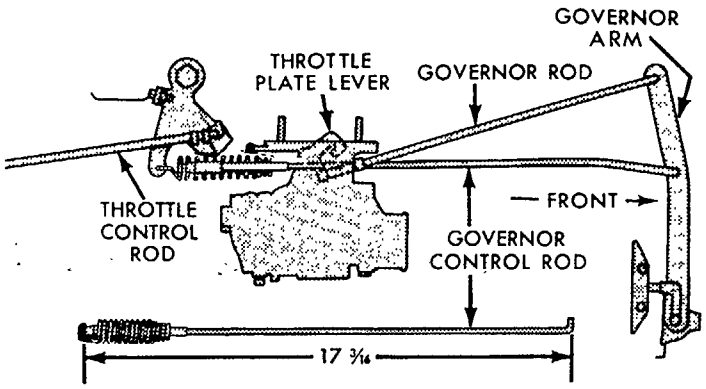


11. Tighten the adjustment bolt lock nut, then move the hand throttle to the idle position and recheck the low idle speed. Readjust if necessary.

12. Stop the engine and install the right-hand steering gear sheet metal cover.

Ford 5000:

1. With the engine stopped, move the hand throttle to the wide-open position.
2. Remove the right-hand steering gear sheet metal cover.



3. Loosen the jam nut on the governor rod and disconnect the rod from the throttle plate lever at the carburetor.

4. Rotate the carburetor throttle plate lever counterclockwise to the full-open position so the wide-open throttle tang on the lever is against the stop on the carburetor.

5. With the governor arm fully rearward (wide-open), and the throttle plate fully open, adjust the governor rod length to meet the throttle plate lever, then lengthen the rod by turning the clevis one additional turn. Connect the rod to the lever and tighten the jam nut.

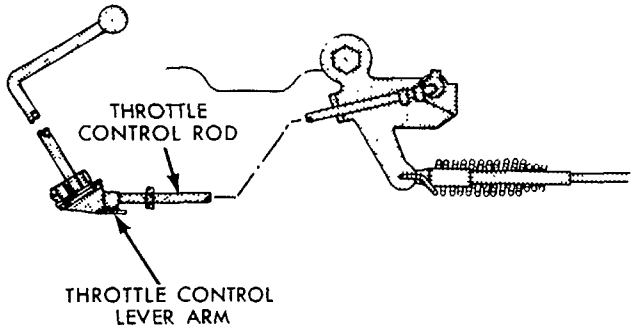
6. Move the hand throttle to the closed position.

7. Remove the governor control rod by disconnecting it from the governor arm and governor control lever.

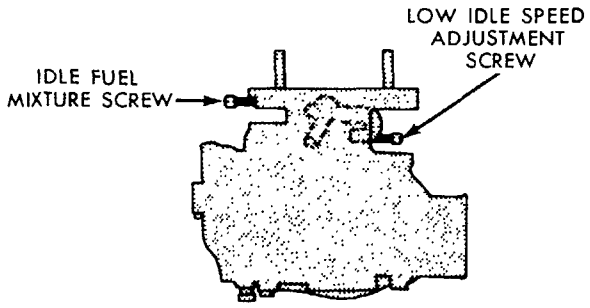
8. Adjust the governor control rod to a length of 17-3/16 inches as shown. Tighten the jam nut and reinstall the rod.

9. With the hand throttle in the closed position, loosen the jam nut on the throttle control rod, then disconnect the rod from the throttle control lever arm.

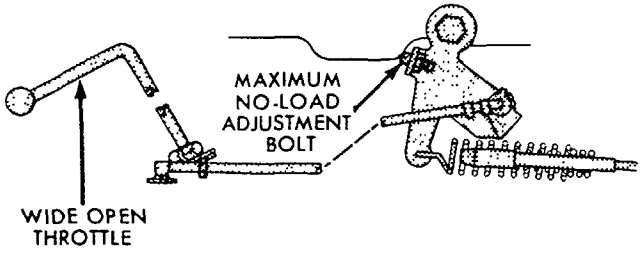
10. Push the throttle control rod fully forward (idle position) and adjust its length to meet the attachment point on the throttle control lever arm, then lengthen the rod by turning the clevis two full turns. Connect the rod to the arm and tighten the jam nut.



11. Start the engine and allow it to run until it reaches normal operating temperature, then adjust the low idle adjustment screw in or out until the engine maintains 600-700 rpm.



12. Adjust the idle fuel mixture screw in or out until the engine reaches its highest idle rpm, then recheck the low idle speed and readjust if necessary.



13. Move the hand throttle to the wide-open position. Check the rpm as indicated on the Proof-Meter and, if necessary, turn the maximum no-load speed adjustment until 2285-2385 maximum no-load speed is obtained.
14. Tighten the adjustment bolt lock nut, then move the hand throttle to the idle position and recheck the low idle speed. Readjust if necessary.
15. Stop the engine and install the right-hand steering gear sheet metal cover.

FOOT THROTTLE ADJUSTMENT

Ford 2110 and 4110:

If the engine will not return to low idle speed when the hand throttle is closed, check the injection pump (or carburetor) settings for proper adjustment. If further adjustment is necessary to obtain the specified low idle speed, tighten the adjuster nut, insert, Figure 122, until the throttle closes correctly.

If the foot and hand throttles are malfunctioning, adjustment can be made as follows:

1. Remove the right-hand steering gear sheet metal cover.
2. Loosen the lock nuts at the top and bottom of the foot-operated throttle rod, Figure 122, and remove the clevis pin.
3. Adjust the length of the throttle rod so the foot pedal touches the foot plate, at the same time the throttle disc hits the stop plate on the steering column. The throttle control rod should then be adjusted so the throttle lever on the injection pump (or carburetor) is touching the maximum speed stop screw.
4. Reconnect the foot-operated throttle rod, install the clevis pin and secure with a new cotter pin. Tighten the throttle rod lock nuts.
5. Install the right-hand steering gear sheet metal cover.
6. Start the engine and allow it to run until it reaches normal operating temperature.
7. Recheck both throttles and readjust as necessary.

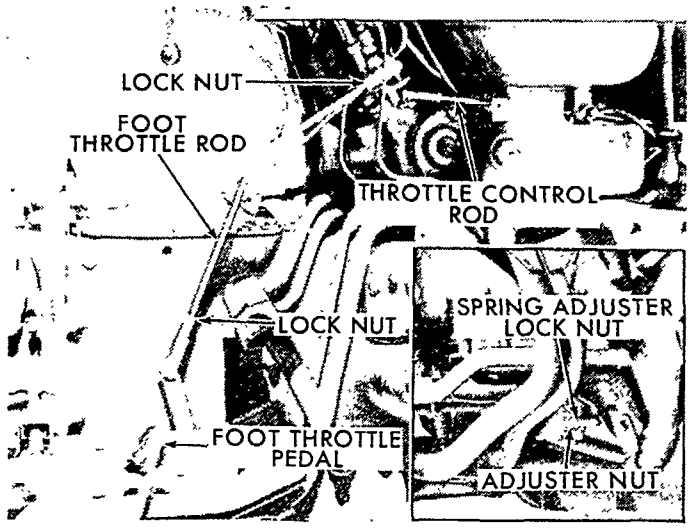


Figure 122
Foot Throttle Adjustment — Ford 2110 and 4110

DISTRIBUTOR POINTS

New distributor points should be installed every 600 hours. If the points are dirty, pitted, or set incorrectly, engine misfiring and loss of power will result. In such circumstances, the point gap should be reset or new points installed. The following procedure covers the installation of new points. To reset the point gap only, omit Steps 3 through 6. Badly burned or pitted points can be caused by a faulty condenser, oil having reached the parts, or prolonged use.

1. With the key-starter switch in the "OFF" position, remove the distributor primary lead from the coil "DIST" terminal. This will prevent coil damage if the engine is cranked with the key-starter switch "ON" when adjusting the point gap.
2. Remove the distributor cap, rotor, and dust cover, Figure 123.
3. Loosen the screw that connects the condenser wire and primary wire to the breaker point assembly.
4. Remove the screws and lock washers securing the distributor points to the breaker plate and remove the points. It is recommended that a new condenser be installed when new points are installed. Remove the screw and lock washer securing the condenser to the breaker plate.
5. Install new points (and condenser) on the breaker plate. Tighten the screws.
6. Attach the condenser lead and the primary wire to the breaker point assembly.
7. With the key-starter switch, rotate the cam so the distributor points are closed. Check the alignment and, if necessary, bend the stationary breaker point bracket.

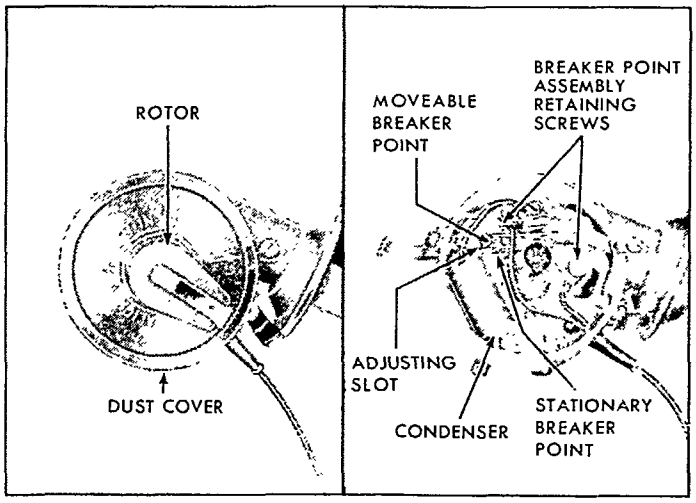


Figure 123
Changing Distributor Points

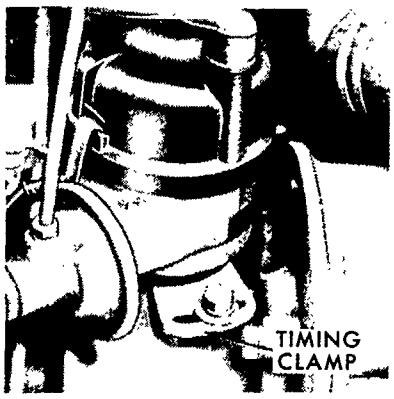


Figure 124
Distributor Timing Clamp

8. To adjust the points, crank the engine until the rubbing block on the moving contact is on the high point of a distributor cam lobe.
9. Slightly loosen the two point assembly retaining screws. Insert a screwdriver in the adjustment slots and rotate until the specified gap (0.022 to 0.028 inch) is obtained. Check the gap with a blade-type feeler gauge.
10. Tighten the retaining screws and recheck the gap. Repeat the procedure if the point gap changed while tightening the adjusting screws.
11. Install the rotor, dust cover, and distributor cap.
12. With the key-starter switch "OFF," connect the distributor primary lead to the coil "DIST" terminal.

IGNITION TIMING

Ignition timing can be checked as follows:

1. Remove the flywheel inspection cover at the right rear of the engine, Figure 117.
2. Disconnect the vacuum line from the advance mechanism on the distributor.
3. Connect the timing light to the engine with the high tension lead on the No. 1 spark plug lead and the other two leads on the proper battery terminals.
4. Start the engine and run it at idle speed (600-700 rpm). Direct the timing light so it flashes on the flywheel inspection opening. If the timing is not at $2° \pm 2°$ btdc, loosen the distributor timing clamp bolt, Figure 124, and rotate the distributor as required. Tighten the clamp bolt to maintain the adjustment.

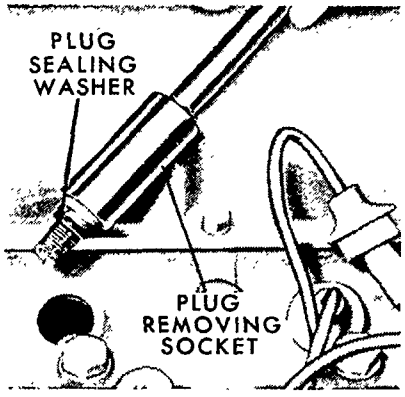


Figure 125
Removing Spark Plugs

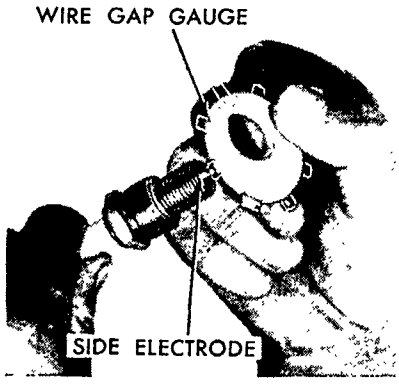


Figure 126
Checking Spark Plug Gap



Figure 127
Checking Valve Clearance

5. Remove the timing light leads and connect the vacuum line to the distributor.
6. Install the flywheel inspection cover.

SPARK PLUGS

To maintain engine efficiency and performance, the spark plugs should be cleaned every 300 hours and new plugs installed every 600 hours.

1. To gain access to the spark plugs, loosen the battery tray wing nut and swing the battery outward.
2. Remove the distributor-to-spark plug wires from the plugs.

IMPORTANT: *Do not pull on the wires. Pry the protective boots from the plugs, then pull on the boots.*

3. Using a spark plug socket, remove the spark plugs, Figure 125, and inspect for damaged insulators, fouling, and excessive electrode erosion. If serviceable, clean with sandblasting equipment.
4. Check the gap with a wire gauge, Figure 126. Adjust the gap to 0.023-0.027 inch. Keep the outside of the spark plugs and leads clean by wiping away any oil, grease, or dirt. If the spark plugs are in poor condition, new plugs should be installed regardless of service hours operated.
5. Install the plugs and tighten them to 26-30 lbs. ft. Connect the wires and move the battery back into position. Tighten the battery tray wing nut.

VALVE CLEARANCE (LASH)

One of the most important factors governing good engine performance is that of correct valve clearance. Check the clearance every 600 hours. Excessive clearance will cause the engine to operate excessively noisily, and insufficient clearance will cause poor engine performance. Therefore, it is extremely important that care be exercised when adjusting valve lash. The lash can be checked and adjusted as follows:

1. Run the engine at idle speed for 10 to 30 minutes to be sure normal operating temperature is obtained.
2. Loosen the battery tray wing nut and swing the battery outward.
3. Remove the rocker arm cover.
4. With the engine idling, check the clearance of each valve with a step-type feeler gauge, Figure 127.

   The setting should be:

   Intake ..... 0.014 go — 0.016 no-go

   Exhaust ..... 0.017 go — 0.019 no-go

5. If the clearance is incorrect on any valve, turn the adjusting screw at the push rod end of the valve rocker arm either into or out of the arm while checking for correct clearance with the step-type feeler gauge, Figure 127.
6. Install the rocker arm cover. Use a new gasket if the old one is damaged. Tighten the cover bolts evenly.
7. Move the battery back into position and tighten the wing nut.

BATTERY

Keep the battery connections tight and free of corrosion. An ammonia or baking soda-water solution is good for washing the outside surface and terminals of the battery. Make sure the solution does not enter the battery. After cleaning with the solution, wash the battery with clear water. Protect the terminals from corrosion with a light application of petroleum jelly.

In freezing conditions, the battery must be maintained in a good state of charge. When a battery is discharged or run down, the electrolyte is weak and may freeze, damaging the case. If it becomes necessary to add water (distilled), it should be done just before using the tractor so the charging will mix the water and the electrolyte.

NOTE: *The generator does not develop maximum output at engine speeds below 1150 rpm. The current required to start the engine, particularly when excessive cranking is required, will temporarily lower the battery charge. The use of the tractor lights during cranking should be avoided.*

Determine the battery charge by checking the specific gravity of the electrolyte. Note in the following chart how the state of charge decreases when the specific gravity decreases.

State of Charge	Specific Gravity Temperate Climates	Specific Gravity Tropical Climates
Fully Charged	1.280	1.225
75%	1.230	1.180
50%	1.180	1.135
25%	1.130	1.090
Discharged	1.080	1.040

Checking Electrolyte Level: The electrolyte level in the battery should be checked every 50 hours.



CAUTION: *When the generator is charging, an explosive gas is produced inside the battery. Do not use an exposed flame for checking electrolyte level or have lighted tobacco near the vent openings. Do not check the electrolyte level while the engine is running.*

1. Clean the top of the battery, then remove the vent plugs.
2. If the electrolyte level is low, **add distilled water.** The level is correct when the liquid just covers the ring in the filler wells; the top of the red shield; or ¼-inch above the plates, depending on the type of battery.

NOTE: *Keep distilled water in a clean, well covered, non-metallic container.*

3. Install the vent plugs after making sure the breathing holes are not blocked. At below freezing temperatures, be sure to run the engine for a period of time, after adding water, so the generator will charge and prevent the water from freezing.

GENERATOR AND REGULATOR

The generator is belt-driven from the engine crankshaft pulley. It is important that belt slippage does not occur, otherwise the charging rate will be affected. Details of belt adjustment are given on page 63, under the heading of "Fan Belt."

The only maintenance on the generator is to periodically inspect the wiring connections and keep them clean and tight.

A voltage regulator automatically controls the generator charging rate. No attempt should be made to adjust the setting of the regulator unit. It is a sealed unit and cannot be adjusted.

If the charge indicator light indicates that the generator is not charging the battery, check the fan belt and the wiring connections. If these are satisfactory and the warning light continues to indicate no charge, consult your Ford Tractor-Equipment Dealer.

SEALED BEAM HEADLAMPS

Should a headlamp failure occur, the sealed beam unit must be replaced. To change the sealed beam unit:

1. Remove the headlamp rim locking screw, spread the rim, and remove it.
2. Remove the headlamp from the lamp housing, as shown in Figure 128.
3. Loosen the wiring connections and discard the headlamp.
4. Install the new headlamp making sure the wiring connections are tight; that the top of the headlamp is up; and that the locating tab is positioned in the slot.
5. Install the rim and tighten the rim locking screw.

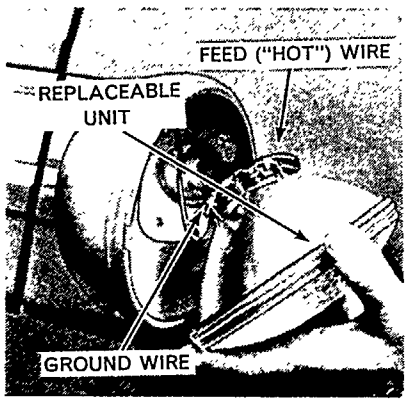


Figure 128
Changing Sealed Beam Headlamp

TAIL LAMP AND FLASHING SAFETY LAMP

To replace a tail lamp bulb or flashing safety lamp bulb:

1. Remove the lens and/or rim assembly, then remove the bulb.
2. Install a new bulb and reinstall the lens and/or rim assembly.

INSTRUMENT LIGHTS

To change an instrument bulb:

1. Remove the screws that secure the instrument panel to the rear hood panel assembly and pull the instrument panel rearward.
2. If necessary, disconnect the Proof-Meter drive cable to obtain better access.
3. Remove the bulb socket from the rear of the instrument panel and install a new bulb.
4. Reassemble in the reverse order.

TIRES

Check tire pressures every 50 hours, or weekly. Refer to the "Tire Inflation Vs. Permissible Load" Chart on page 43, for the air pressures that should be used.

NOTE: *If the rear wheels are weighted with liquid ballast, a special tire gauge should be used because the calcium chloride and water will cause corrosion in the standard-type gauge.*

When checking tire pressures, inspect the tire for damaged side walls and tread cuts. Neglected damage will lead to early tire failure.

FRONT WHEEL BEARINGS

The front wheels are carried on the wheel spindles by inner and outer tapered roller bearings. A grease seal is provided at the inner end of the spindle, and a hubcap at the outer end, to retain the lubricant and to keep out dirt and other foreign material.

Front wheel bearings should be repacked every 600 hours as follows:

1. Apply the parking brake to hold the tractor securely.
2. Jack up one of the front wheels, Figure 129, and remove the hubcap, the cotter pin and the nut. Remove the thrust washer, outer bearing, and then the complete wheel assembly.
3. Remove the grease retainer from the rear of the hub and the inner bearing from the wheel.

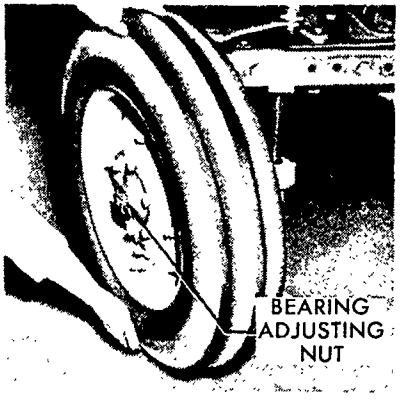


Figure 129
Servicing Front Wheel Bearings

4. Thoroughly clean all parts in a suitable solvent and allow to dry naturally. Do not use compressed air. Inspect the bearing cone and roller assemblies for excessive discoloration or wear of the rollers; similarly, check the bearing cups.
5. Repack the cones with clean, short-fiber grease. Insert approximately ¼-inch layer of grease in the space between the bearing cups in the hub, but do not pack the hub completely. Place a film of grease on the surface of the spindle.
6. Reinstall the inner bearing and install a new grease retainer in the rear of the hub.
7. Place the wheel assembly on the spindle and install the outer bearing, thrust washer, and castellated nut. Tighten the nut, at the same time turning the wheel, until a slight drag is felt. Back off the nut until the nearest slot in the nut lines up with the hole in the spindle. Install a new cotter pin, then the hubcap.

FRONT WHEEL TOE-IN

Front wheel toe-in adjustments on your tractor were made at the factory. Normally, the front wheels maintain their toe-in; however, an occasional check should be made. If the alignment marks, Figures 130 and 131, do not line up, the toe-in is incorrect. Check for correct toe-in as follows:

Checking Toe-In

1. With the front wheels in the straight-ahead position, mark the front of the wheels (not the tires) at wheel

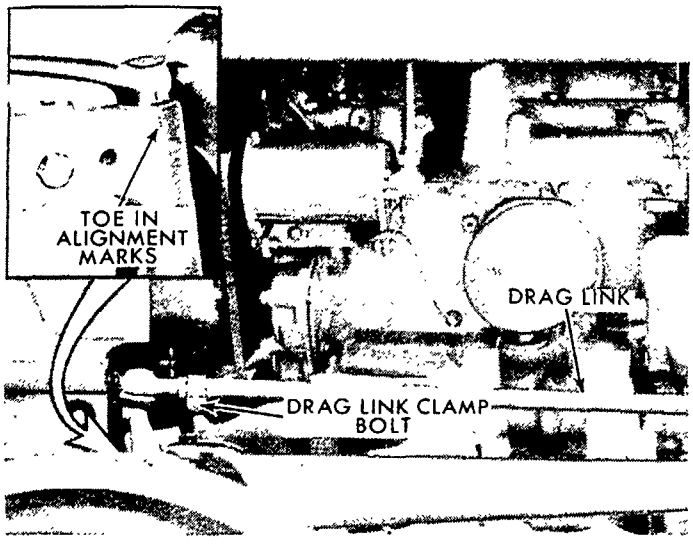


Figure 130
Toe-In Alignment Marks — Ford 2000, 2110, 3000, and 4110

hub height. Determine the straight-ahead position by turning the steering wheel from lock to lock and then halfway back.

2. Measure and record the distance between the front of the wheels at the marks, then push the tractor forward or backward until the marks are at wheel hub height on the rear of the wheels.
3. Measure and record the distance between the rear of the wheels at the marks.
4. The difference between the dimensions recorded in Steps 2 and 3 should give zero to ½ inch toe-in (toe-out on Ford 5000 with manual steering).
5. If the toe-in/toe-out is not correct, adjust as outlined in the applicable paragraph that follows:

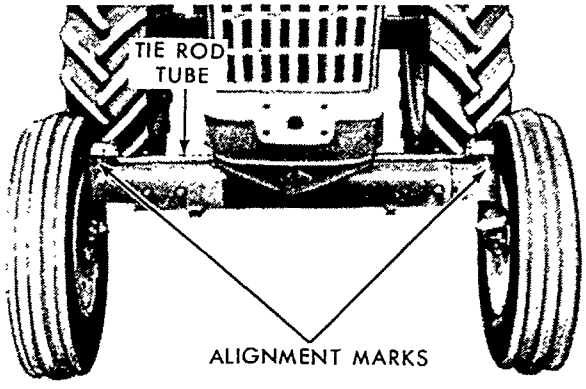


Figure 131
Toe-In Alignment Marks — Ford 4000 and 5000

Adjusting Toe-In

Ford 2000, 2110, 3000, and 4110 (Manual Steering):

1. Loosen the drag link clamp bolts, Figure 130, at each end of the left and right drag links.
2. Turn each drag link the same number of turns to give zero to ½-inch toe-in.
3. After the correct toe-in is obtained, position the open side of the clamps in line with the slots in the drag links and tighten the clamps.

Ford 2000, 2110, 3000, and 4110 (Power Steering):

1. Loosen the clamps on the left and right drag link tubes, Figure 132.
2. Turn each tube the same number of turns to give zero to ½-inch toe-in.
3. After the correct toe-in is obtained, position the open side of the clamps in line with the slots in the tubes and tighten the clamps.

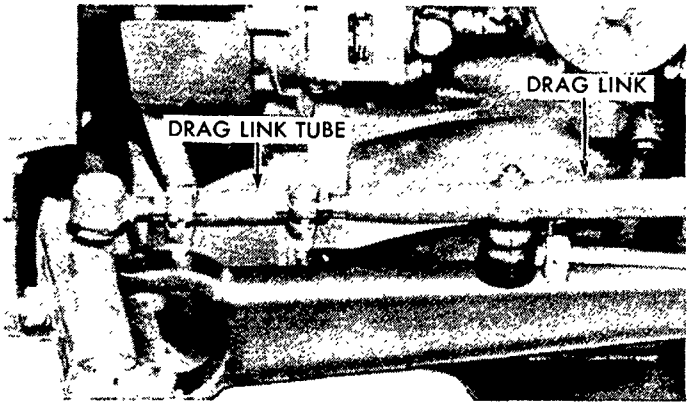


Figure 132
Drag Link Adjustment — Ford 2000, 2110, 3000, and 4110 (Power Steering)

Ford 4000 and 5000 (Manual Steering) and Ford 4000 (Power Steering):

1. Remove the clamp bolt from the right-hand end of the tie rod tube, Figure 131, and loosen the right-hand tie rod end assembly attaching bolt.
2. Turn the connecting rod between the tie rod tube and tie rod end assembly, as required, to give zero to ½-inch toe-in (zero to ½-inch toe-out on Ford 5000 with manual steering).
3. After the correct toe-in/toe-out is obtained, install and tighten the clamp bolt. Also tighten the tie rod end assembly attaching bolt.

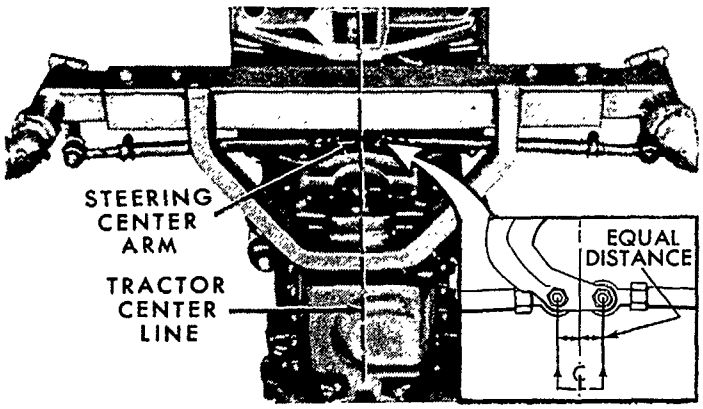


Figure 133
Steering Center Arm Alignment — Ford 5000

Ford 5000 (Power Steering):

1. Sight under the front support to make sure the steering center arm, Figure 133, is positioned so both the left and right inboard tie rod end assemblies are an equal distance from the center line of the tractor. Then, loosen the jam nuts and remove the tie rod clamp bolts from the outboard end of each tie rod.
2. Turn each tie rod the same number of turns to give zero to ½-inch toe-in.
3. After the correct toe-in is obtained, install the clamp bolts and tighten the jam nuts.

BRAKE ADJUSTMENT

Whenever the brake pedal travel becomes excessive, or if the travel of one pedal is unequal to that of the other, adjustment should be made in the following manner.

Ford 2000, 2110, 3000, and 4110:

1. Jack the tractor up until both rear wheels are free to turn.
2. Remove the adjusting slot cover from the brake back plate and, with the brake pedals released, turn the adjusting screw clockwise, Figure 134, until the brake drags.
3. Back off the adjusting screw until the brake drags very slightly when the wheel is turned. Adjust both brakes in the same manner.
4. Adjust the right brake tie rod, Figure 135, with the clevis until the clevis pin can enter the hole when the brake camshaft lever is moved forward to take up the clearance.
5. Adjust the left brake tie rod with the clevis until both brake pedals are in line when both brakes are engaged.
6. Road test the tractor to make sure the braking action of both rear wheels is equal. Readjust if necessary.

Ford 4000:

1. Disconnect the brake return spring on the right pedal, allowing the pedal to drop. Push the pedal down to take up any slack in the linkage.
2. Loosen the lock nut next to the pull rod nut, Figure 136, and turn the pull rod nut until the pedal is 1½ inches to 1¾ inches below the left pedal. Tighten the lock nut.
3. Disconnect the brake return spring on the left pedal, allowing the pedal to drop. Push the pedal down to take up any slack in the linkage.
4. Loosen the lock nut next to the pull rod nut and turn the pull rod nut until the left pedal is level with the right pedal. Check the adjustment by engaging the brake pedal lock. The brake pedal lock should engage easily if the pedals are aligned. This will give even braking action which is particularly important at road speeds.
5. Tighten the lock nut and install both brake pedal return springs.
6. Road test the tractor to make sure the braking action of both rear wheels is equal. Readjust if necessary.

Ford 5000:

1. With the right-hand brake pedal in the up position, loosen the lock nut next to the connector, Figure 137. Turn the connector until there is ⅛-inch clearance between the connector disc and the seal in the rear axle housing. Tighten the lock nut and repeat this procedure on the left-hand brake linkage.
2. Disconnect the brake return spring on the right-hand pedal, allowing the pedal to drop. Push the pedal down to take up any slack in the linkage.
3. Loosen the lock nut next to the clevis and turn the connector until the pedal is 1½ inches below the left-hand pedal. Tighten the lock nut.
4. Disconnect the brake return spring on the left-hand pedal, allowing the pedal to drop. Push the pedal down to take up any slack in the linkage.
5. Loosen the lock nut next to the clevis and turn the connector until the left-hand pedal is level with the right-hand pedal. Check the adjustment by engaging the brake pedal lock. The brake pedal lock should engage easily if the pedals are aligned and will provide even braking action which is particularly important at road speeds.

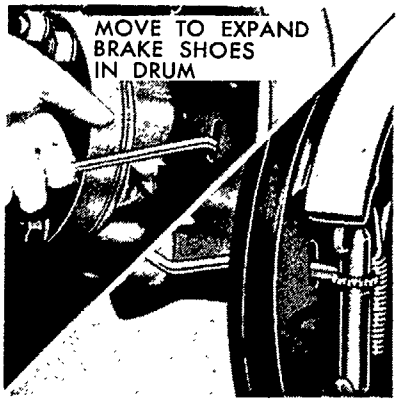


Figure 134
Brake Adjustment — Ford 2000, 2110, 3000, and 4110

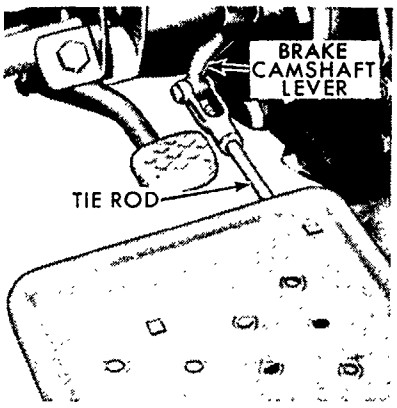


Figure 135
Brake Tie Rod Adjustment — Ford 2000, 2110, 3000, and 4110

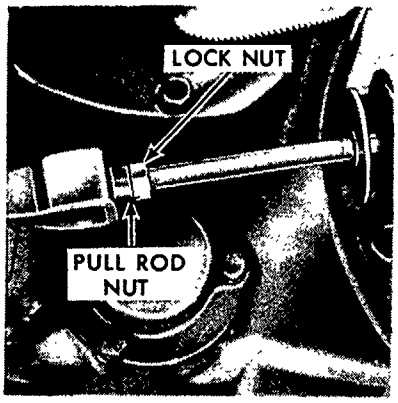


Figure 136
Brake Adjustment — Ford 4000

6. Tighten the lock nut and install both brake pedal return springs.
7. Road test the tractor to make sure the braking action of both rear wheels is equal. Readjust if necessary.

CLUTCH PEDAL ADJUSTMENT

To obtain maximum clutch life, it is essential that the clutch pedal free travel be checked every 50 hours so as to maintain free travel at:

- Ford 2000, 2110, 3000, and 4110 — Transmission P.T.O. ..... 1⅛ to 1⅜ inches
- Ford 2000, 2110, 3000, and 4110 — Live P.T.O. ..... 1⅜ to 1⅝ inches
- Ford 4000 — Transmission P.T.O. ... 1¼ to 1½ inches
- Ford 4000 — Independent P.T.O. ... 1⅝ to 1⅞ inches
- Ford 5000 — Independent P.T.O. ..... 1½ to 2 inches

The free travel is the distance the pedal can be moved before resistance is met, Figure 138. If the pedal free travel is excessive or insufficient, adjust as follows:

Transmission and Independent P.T.O.

1. Loosen the operating rod clevis lock nut, Figure 139, and remove the cotter pin and clevis pin.



CAUTION: *The clutch release arm is spring-loaded and will "snap" clockwise when the clevis pin is removed. Use a pry bar to hold the arm when disconnecting and connecting the clevis.*

2. Turn the clevis to increase or decrease the effective length of the operating rod until the correct pedal free travel is obtained.
3. Install the clevis pin, secure with a new cotter pin and tighten the clevis lock nut.
4. Recheck the pedal free travel. Readjust if necessary.

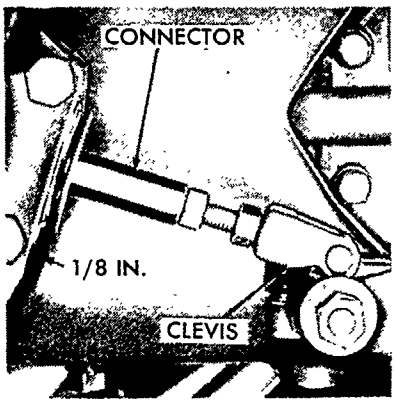


Figure 137
Brake Adjustment — Ford 5000

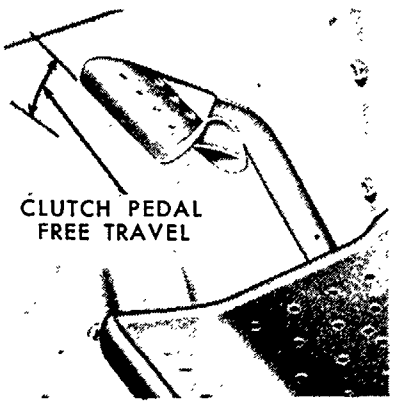


Figure 138
Clutch Pedal Free Travel

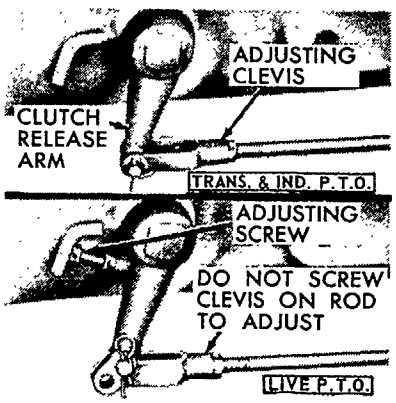


Figure 139
Clutch Adjustment

Live P.T.O.

1. Loosen the lock nut on the adjusting screw, Figure 139, and adjust the screw until the pedal free travel is 1⅜ to 1⅝ inches. Tighten the lock nut.
2. Fully depress the clutch pedal and start the tractor engine. If the pedal free travel is correct, the P.T.O. shaft should not turn with the pedal fully depressed. If the shaft continues to turn, consult your Ford Tractor-Equipment Dealer.

IMPORTANT: *The clutch operating rod should not be altered in length in an attempt to adjust free play of the pedal.*

NOTE: *If a lower clutch pedal height is desired and your operation does not require the use of the P.T.O., the clevis may be attached to the release arm at the front holes. Make sure the P.T.O. control lever, Figure 40, is in the disengaged position, otherwise the P.T.O. shaft will continue to turn when the clevis is attached at the front holes.*

"BLOCKING OUT" HYDRAULIC LIFT SYSTEM UPPER LINK TENSION LOADS

Ford 3000 and 4000

When grading and backfilling with light equipment, such as a rear blade, the equipment may have a tendency to "dive." If this condition is encountered, a spacer (available from your Ford Tractor-Equipment Dealer) can be installed between the draft control main spring and spring seat to correct the condition. See Figure 140. To install the spacer:

1. Loosen the tractor seat attaching nuts and push the base of the seat forward.
2. Remove the pin that attaches the hydraulic lift rocker to the yoke, Figure 140. Pull the rocker back and unscrew the yoke.
3. Remove the three bolts and lock washers from the spring housing and pull the housing from the tractor, along with the washer, spring, and spring seat.

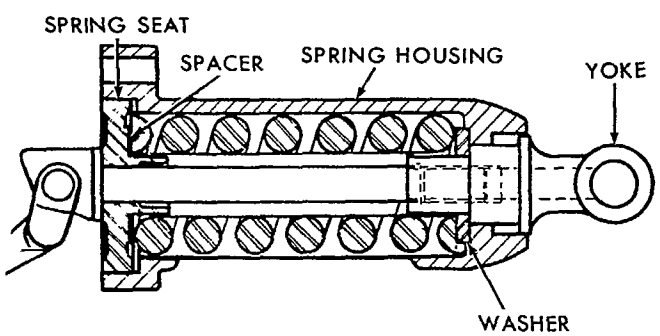


Figure 140
Spacer Installation — Ford 3000 and 4000

4. Remove the spring seat and any shims that may be behind the seat from the counterbore of the housing.
5. Install the spacer over the spring seat as shown in Figure 140. Install the spring seat and any shims that were removed, then attach the assembled housing to the tractor with the three bolts and lock washers previously removed.
6. Screw the yoke on the plunger until all free play is eliminated, then back the yoke out until the hole is horizontal. Do not back the yoke out more than is necessary to position the hole horizontally.
7. Attach the hydraulic lift rocker to the yoke with the pin previously removed.
8. Move the base of the tractor seat to its original position and tighten the attaching nuts.

TRACTOR STORAGE

Tractors that are to be stored for an extended period should be protected during storage. The following is a suggested list of operations to be carried out.

1. Thoroughly clean the tractor. Use touch-up paint where necessary to prevent rust.
2. Raise the lift arms hydraulically to their fully raised position so the lift piston is in a fully extended position. This will protect the cylinder wall surfaces from corrosion.
3. Lubricate the tractor. Drain and refill the transmission and the rear axle hydraulic lift system with new oil. Drain the engine oil and refill with new lubricating oil. Also clean the air cleaner.
4. **Gasoline Tractors:** Drain the fuel tank and run the engine until the carburetor float chamber is empty.
   - Remove the spark plugs and pour three ounces of lubricating oil into each cylinder.
   - Crank the engine several revolutions with the key-starter switch. This procedure will coat the cylinder walls and piston rings with an oil film that will help prevent rust and permit easier starting when the tractor is removed from storage.
   - Reinstall the spark plugs, but do not run the engine.
5. **Diesel Tractors:** If the tractor is stored or removed from operation for an extended period, special precautions should be taken to protect the fuel injection pump and the injector nozzles against corrosion and gumming during the storage period.

- Before storing, the fuel system should be flushed with a special oil, a quantity of which will remain in the system when the engine is shut down for storage.
- Special diesel fuel system flushing oils are available from most oil companies. If special flushing oil is not readily obtainable, mix one U.S. pint (0.8327 Imp. qt.) of SAE 10 non-detergent engine oil with 10 U.S. quarts (8.33 Imp. qts.) of No. 2 diesel fuel.
- Drain the fuel tank and pour two U.S. gallons (1.67 Imp. gals.) of the special flushing oil (or lubricating mixture) in the fuel tank.
- Run the engine for 10 minutes to assure complete distribution of the special oil through the injection pump and fuel injectors. There is no need to remove the injector nozzles.

6. Remove the battery and clean it thoroughly. Be sure that it is fully charged, and that the electrolyte is to its proper level. Place it in storage in a cool, dry place above freezing temperature. The battery should be charged periodically during storage.
7. Place blocking under the tractor axles to remove the weight from the tires.
8. Drain the radiator and engine block. Flush the system and close the drain valves.
9. Check the tractor for worn or damaged parts. Install new parts as required.
10. Cover the exhaust pipe opening.

Tractors that have been placed in storage should be completely serviced in the following manner before using:

1. Inflate the tires to the recommended pressures, and remove the blocking.
2. Fill the cooling system. Use corrosion inhibitor in warm weather; permanent antifreeze in cold weather.
3. Fill the fuel tank with fuel. Check the oil level in the crankcase, hydraulic lift system (rear axle), transmission, and if equipped, the power steering reservoir and oil bath air cleaner.
4. Install a fully charged battery and remove the exhaust cover, if other than a rain cap.
5. Start the engine and allow it to idle a few minutes. Be sure the engine is receiving lubrication and that each control is functioning correctly.
6. Drive the tractor without a load to be sure it is operating satisfactorily.

ACCESSORIES

The following accessories are available for your new Ford Tractor from your Ford Tractor-Equipment Dealer.

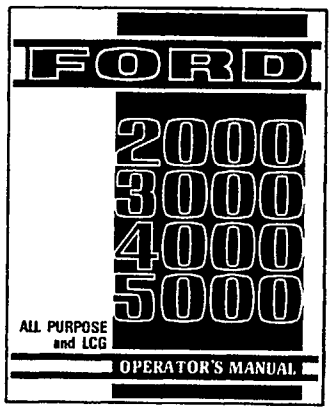
ACCESSORY	Ford 2000	Ford 2110	Ford 3000	Ford 4000	Ford 4110	Ford 5000
HYDRAULICS						
• Auxiliary Services Control Valve	X	X	X	X	X	Std.
• Single-Spool Remote Control Valve	X	X	X	X	X	X
• Double-Spool Remote Control Valve	X	X	X	X	X	X
• Double-Acting Remote Cylinder	X	X	X	X	X	X
• Quick Release Coupling	X	X	X	X	X	X
EQUIPMENT LINKAGE AND DRAWBAR						
• Category I To II Conversion Kit	—	—	X	X	—	—
• Category II to I Conversion Kit	—	—	—	—	—	X
• Linkage Stabilizer Kit	X	—	X	X	—	X
• Clevis for Swinging Drawbar	X	X	X	X	X	X
• Linkage Drawbar	X	X	X	X	X	X
ELECTRICAL						
• Equipment Work Light Kit	X	X	X	X	X	X
• Equipment Warning Light Kit	X	X	X	X	X	X

ACCESSORY	Ford 2000	Ford 2110	Ford 3000	Ford 4000	Ford 4110	Ford 5000
SEATS						
Deluxe Seat	X	X	X	Std.	Std.	Std.
SPECIAL PURPOSE						
• Diesel Air Pre-Cleaner and Stack	X	—	X	X	X	X
• Belt Pulley and Guard	X	X	X	X	X	X
• Bumper	X	X	X	—	X	—
• Canvas Cab	X	X	X	X	X	X
• Dual Rear Wheels	—	X	—	—	X	X
• Grease Gun and Holster	X	X	X	X	X	X
• P.T.O. Shield	X	X	X	X	X	X
• Spark Plug Tire Pump (Gasoline)	X	X	X	X	X	X
• Bumper Weights	X	—	X	—	—	—
• Front End Weights	—	—	—	X	—	X
• Front Wheel Weights	X	—	X	X	—	X
• Rear Wheel Weights	X	—	X	X	—	X
• Diesel Engine Starting Aids	X	X	X	X	X	X
• Power Steering	X	X	X	X	X	X
• Tool Box	X	Std.	Std.	Std.	Std.	Std.
• Over/Under Auxiliary Transmission*	X	X	X	—	—	—

*Used with 4-Speed Manual Shift Transmission

notes

specifications



The specifications on the following pages are provided for your information and reference. For additional information, see your Ford Tractor-Equipment Dealer.



Properly maintained Equipment

is Safe Equipment.

"Ford Motor Company, whose policy is one of continuous improvement, reserves the right to make changes in design and specifications at any time without notice and without obligation to modify units previously built."

SPECIFICATIONS

CAPACITIES

	Ford 2000	Ford 2110	Ford 3000	Ford 4000	Ford 4110	Ford 5000
Fuel Tank:	13 U.S. gals. (10.8 Imp. gals.)	13 U.S. gals. (10.8 Imp. gals.)	13 U.S. gals. (10.8 Imp. gals.)	16 U.S. gals. (13.3 Imp. gals.)	13 U.S. gals. (10.8 Imp. gals.)	20 U.S. gals. (16.6 Imp. gals.)
Cooling System:	13.2 U.S. qts. (11.0 Imp. qts.)	13.2 U.S. qts. (11.0 Imp. qts.)	13.8 U.S. qts. (11.5 Imp. qts.)	14.0 U.S. qts. (11.6 Imp. qts.)	14.0 U.S. qts. (11.6 Imp. qts.)	15.3 U.S. qts. (12.8 Imp. qts.)
Engine Crankcase:						
With Filter Change	8 U.S. qts. (6.7 Imp. qts.)	8 U.S. qts. (6.7 Imp. qts.)	8 U.S. qts. (6.7 Imp. qts.)	8 U.S. qts. (6.7 Imp. qts.)	8 U.S. qts. (6.7 Imp. qts.)	10 U.S. qts. (8.4 Imp. qts.)
Without Filter Change	6 U.S. qts. (5 Imp. qts.)	6 U.S. qts. (5 Imp. qts.)	6 U.S. qts. (5 Imp. qts.)	6 U.S. qts. (5 Imp. qts.)	6 U.S. qts. (5 Imp. qts.)	8 U.S. qts. (6.7 Imp. qts.)
Hydraulic Lift System (Rear Axle):						
With Trans. P.T.O.	25.2 U.S. qts. (21.0 Imp. qts.)	25.2 U.S. qts. (21.0 Imp. qts.)	25.2 U.S. qts. (21.0 Imp. qts.)	33.6 U.S. qts. (28.0 Imp. qts.)	—	—
With Live P.T.O.	25.2 U.S. qts. (21.0 Imp. qts.)	25.2 U.S. qts. (21.0 Imp. qts.)	25.2 U.S. qts. (21.0 Imp. qts.)	—	25.2 U.S. qts. (21.0 Imp. qts.)	—
With Ind. P.T.O.	—	—	—	32.4 U.S. qts. (26.9 Imp. qts.)	25.2 U.S. qts. (21.0 Imp. qts.)	34.8 U.S. qts. (29.0 Imp. qts.)
Transmission:						
4-Speed (Trans. P.T.O.)	6.6 U.S. qts. (5.5 Imp. qts.)	6.6 U.S. qts. (5.5 Imp. qts.)	6.6 U.S. qts. (5.5 Imp. qts.)	—	—	—
4-Speed with Over/Under Auxiliary	7 U.S. qts. (5.8 Imp. qts.)	7 U.S. qts. (5.8 Imp. qts.)	7 U.S. qts. (5.8 Imp. qts.)	—	—	—
8-Speed (Trans. P.T.O.)	13.2 U.S. qts. (11.0 Imp. qts.)	13.2 U.S. qts. (11.0 Imp. qts.)	13.2 U.S. qts. (11.0 Imp. qts.)	13.2 U.S. qts. (11.0 Imp. qts.)	—	—
8-Speed (Live P.T.O.)	13.2 U.S. qts. (11.0 Imp. qts.)	13.2 U.S. qts. (11.0 Imp. qts.)	13.2 U.S. qts. (11.0 Imp. qts.)	—	13.2 U.S. qts. (11.0 Imp. qts.)	—
8-Speed (Ind. P.T.O.)	—	—	—	13.2 U.S. qts. (11.0 Imp. qts.)	—	10.8 U.S. qts. (9.0 Imp. qts.)
Select-O-Speed	—	11.0 U.S. qts. (9.2 Imp. qts.)	11.0 U.S. qts. (9.2 Imp. qts.)	12.3 U.S. qts. (10.2 Imp. qts.)	11.0 U.S. qts. (9.2 Imp. qts.)	11.8 U.S. qts. (9.8 Imp. qts.)
Belt Pulley (Accessory)	0.6 U.S. qts. (0.5 Imp. qts.)	0.6 U.S. qts. (0.5 Imp. qts.)	0.6 U.S. qts. (0.5 Imp. qts.)	1.2 U.S. qts. (1.0 Imp. qts.)	1.2 U.S. qts. (1.0 Imp. qts.)	1.2 U.S. qts. (1.0 Imp. qts.)

ENGINE

	Ford 2000 & 2110		Ford 3000		Ford 4000 & 4110		Ford 5000	
Type	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel
No. of Cylinders	3	3	3	3	3	3	4	4
Bore	4.2 in.	4.2 in.	4.2 in.	4.2 in.	4.4 in.	4.4 in.	4.4 in.	4.4 in.
Stroke	3.8 in.	3.8 in.	3.8 in.	4.2 in.	4.4 in.	4.4 in.	4.2 in.	4.2 in.
Displacement	158 cu. in.	158 cu. in.	158 cu. in.	175 cu. in.	201 cu. in.	201 cu. in.	256 cu. in.	256 cu. in.
Compression Ratio	7.75:1	17.5:1	7.75:1	16.5:1	7.75:1	16.5:1	7.75:1	16.5:1
Firing Order	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3	1-3-4-2	1-3-4-2
Idle Speed (rpm)	600-700	600-700	600-700	600-700	600-700	600-700	600-700	600-700
Maximum Speed:								
No Load (rpm)	2065-2165	2225-2275	2285-2385	2225-2275	2395-2495	2425-2475	2285-2385	2325-2375
Rated (rpm)	1900	2000	2100	2000	2200	2200	2100	2100
Valve Clearance (Lash — Warm Engine):								
Intake	all models — 0.014 in. go . . . . 0.016 in. no-go							
Exhaust	all models — 0.017 in. go . . . . 0.019 in. no-go							

ENGINE OIL RECOMMENDATIONS

Temperature	Viscosity Grade and API Classification	
	Diesel	Gasoline
Below +10° F.	SAE 5W (DM)	SAE 5W (MS) or SAE 5W-20W (MS)
+10° F. to 40° F.	SAE 10W (DS)	SAE 10W (MS) or SAE 5W-20W (MS)
32° F. to 90° F.	SAE 20 (DS)	SAE 20 (MS) or SAE 10W-30 (MS)
Above 75° F.	SAE 30 (DS)	SAE 30 (MS) or SAE 10W-30 (MS)

When using diesel fuel with a sulfur content below 1.0%, diesel engine oil with an API Classification of DM may be used instead of a DS oil, but the oil and filter change interval must be reduced to 150 hours. When the sulfur content of a fuel is greater than 1.0%, but less than 1.3%, a DS oil must be used (except for temperatures of 10°F. and below), and the oil and filter change interval must be reduced to 150 hours. The use of fuel with a sulfur content above 1.3% is not recommended.

COOLING SYSTEM

Type .....pressurized liquid, recirculating bypass
Water Pump:
  Type .....centrifugal
  Drive .....V-belt
Fan:
  Diameter .....16 in.
  Fan Belt Deflection .....¼ to ½ in. with 60-90 lbs. force applied midway between generator and crankshaft pulleys
Thermostat:
  Starts to Open ..... 188°F.
  Fully Open ..... 212°F.
Radiator Cap .....7 psi

ELECTRICAL SYSTEM

Generator .....12-volt, shunt-wound
  Output .....22 amps.
Regulator .....current voltage
Battery:
  Gasoline Engine except Ford 5000 .....80 amp. hour rating
  Diesel Engine and Ford 5000 Gasoline .... 128 amp. hour rating
  Ground .....negative
Starting Motor .....positive engagement
Headlamp Sealed Beam Unit .....No. 4419
Tail Lamp Bulb .....No. 1155
Flasher Warning Lamp Bulb .....No. 1156
Instruments and Warning Light Bulb .....No. 1895

IGNITION SYSTEM

Diesel:
  Type .....compression
Gasoline:
  Type .....spark
  Method .....coil and distributor
  Distributor Point Gap — Breaker .....0.022-0.028 in.
  Dwell Angle ..... 35-38°
  Timing (at 600-700 rpm with vacuum line disconnected): .....2° ± 2° btdc
Spark Plugs:
  Type .....Autolite AG5
  Gap .....0.023-0.027 in.

FUEL SYSTEM

Carburetor (Gasoline):
  Type .....updraft
  Initial Adjustment (Idle Screw) .....approximately one full turn out
Injection Pump (Diesel):
  Type:
    Ford 3000 and 5000 .....in-line
    Ford 2000, 4000, and 4110 .....distributor
  Timing .....19° btdc

CLUTCH

Type:
  Ford 2000, 2110, 3000, and 4000 w/Transmission P.T.O. ....11 in. single, dry plate
  Ford 2000, 2110, 3000, and 4110 w/Live P.T.O. .....11 in. double (11 in. main disc and 8½ in. P.T.O. disc), dry plate
  Ford 4000 w/Independent P.T.O. .....11 in. single, dry plate
  Ford 5000 w/Independent P.T.O. .....12 in. single, dry plate

SPECIFICATIONS

CLUTCH (Cont'd.)

Pedal Free Travel:
- Ford 2000, 2110, 3000, and 4110 — Transmission P.T.O. ..... 1⅛ to 1⅜ in.
- Ford 2000, 2110, 3000, and 4110 — Live P.T.O. ..... 1⅜ to 1⅝ in.
- Ford 4000 — Transmission P.T.O. ..... 1¼ to 1½ in.
- Ford 4000 — Independent P.T.O. ..... 1⅝ to 1⅞ in.
- Ford 5000 — Independent P.T.O. ..... 1¼ to 1½ in.

BRAKES

Ford 2000, 2110, 3000, and 4110:
- Type ..... mechanical (expanding shoe)
- Drum Diameter ..... 14 in.
- Shoe Width ..... 1½ in.
- Total Lining Area ..... 98½ sq. in.

Ford 4000 and 5000:
- Type ..... mechanical (wet disc)

Disc Diameter:
- Ford 4000 ..... 8.0 in. O.D. 6.8 in. I.D.
- Ford 5000 ..... 8.75 in. O.D. 7.4 in. I.D.

Lining Area:
- Ford 4000 ..... 168.0 sq. in.
- Ford 5000 ..... 287.2 sq. in.

STEERING

Type ..... manual or hydraulic power assist

Turns Lock-to-Lock:
- Ford 2000, 2110, 3000, and 4110 ..... 2½
- Ford 4000 ..... 4½
- Ford 5000 4

Power Assist Pump:

Type ..... gear

Capacity:
- At 700 rpm ..... 2.5 U.S. gpm (2.1 Imp. gpm) (min.)
- At 2000 rpm (Ford 2000, 2110, 3000, and 4110) ..... 4.25 U.S. gpm (3.5 Imp. gpm) (max.)
- At 2200 rpm (Ford 4000 and 5000) ..... 4.5 U.S. gpm (3.8 Imp. gpm) (max.)

Relief Valve Setting:
- Ford 2000, 2110, 3000, and 4110 ..... 600-700 psi
- Ford 4000 ..... 800-900 psi
- Ford 5000 ..... 1050-1150 psi

POWER TAKE-OFF

Engine Speed for 540 rpm P.T.O. Speed:
- 4-Speed (Transmission P.T.O.) ..... 1500 rpm
- 4-Speed in Over-Range (with Over/Under Auxiliary Transmission) (Transmission P.T.O.) ..... 1000 rpm
- 8-Speed (Transmission P.T.O.):
  - Ford 2000 and 3000 ..... 1600 rpm
  - Ford 4000 ..... 1800 rpm
- 8-Speed (Live P.T.O.) ..... 1800 rpm
- 8-Speed (Independent P.T.O.):
  - Ford 4000 ..... 1800 rpm
  - Ford 5000 ..... 1900 rpm
- Select-O-Speed:
  - Ford 2110, 3000, 4000, and 4110 ..... 1800 rpm
  - Ford 5000 ..... 1900 rpm

Engine Speed for 1000 rpm P.T.O. Speed:
- Deluxe Select-O-Speed ..... 1950 rpm

HYDRAULIC LIFT SYSTEM

Type:
- Ford 2000, 2110, and 4110 .... live with single-acting draft control and Category I 3-point linkage.
- Ford 3000 ..... live with dual sensing draft control, flow control, position control, and Category I 3-point linkage.
- Ford 4000 ..... live with dual sensing draft control, flow control, position control, and Category I 3-point linkage.
- Ford 5000 ..... live — less rockshaft and 3-point linkage.

Pump Type:
- Ford 2000, 2110, 3000, 4000, and 4110 w/Select-O-Speed ..... piston, engine driven
- Ford 4000 w/8-speed and all Ford 5000's (Independent P.T.O.) ..... gear, P.T.O. driven

Pump Capacity:
- Ford 2000, 2110, and 4110 ..... 4 U.S. gpm (3.3 Imp. gpm) at 2000 rpm
- Ford 3000 and 4000 with External Piston-Type Pump ..... 5 U.S. gpm (4.2 Imp. gpm) at 2000 rpm
- Ford 4000 with Internal Gear-Type Pump ..... 5.5 U.S. gpm (4.6 Imp. gpm) at 2200 rpm
- Ford 5000 .... 6 U.S. gpm (5.0 Imp. gpm) at 2100 rpm

System Relief Valve Setting ..... 2500 psi

CAST IRON WEIGHTS

Front Wheel Weights ..... 45 pounds each, two per wheel

Rear Wheel Weights:
- Ford 2000 and 3000
  - (24- and 28-Inch Wheels — Manual Adjust) ..... 80 pounds each
  - (28-Inch Wheels — Power Adjust) ..... 100 pounds each
- Ford 4000 and 5000
  - (30-Inch Wheels — Manual Adjust) ..... 80 pounds each
  - (30-Inch Wheels — Power Adjust) ..... 110 pounds each
  - (38-Inch Wheels — Manual or Power Adjust) ..... 100 pounds each

Front End Weights:
- Ford 2000 and 3000 ..... 100 pounds each
- Ford 4000 ..... 80 pounds each
- Ford 5000 ..... 80 pounds each

LUBRICANTS

Manual Shift Transmission ..... ESN-M2C77-A or M-4864-A

Select-O-Speed Transmission ..... ESN-M2C41-A or M2C41

Hydraulic Lift System (Rear Axle):
- Ford 2000, 2110, 3000, and 4110 ... ESN-M2C77-A or M-4864-A
- Ford 4000 and 5000 ..... ESN-M2C53-A or M2C53-B

Belt Pulley ..... ESN-M2C77-A or M-4864-A

Steering:
- Steering Gear Housing (Manual and Power) ..... ESEN-M2C94-A / ESW-M2C28-BA } or M-4864-B
- Power Steering Reservoir ESEN-M2C92-A

Front Wheel Bearings .... good quality, multi-purpose, lithium base, cup-type grease

Lubrication Fittings ..... good quality, multi-purpose, lithium base, cup-type grease

TIRES

	Ford 2000	Ford 2110 & 4110	Ford 3000	Ford 4000	Ford 5000
Front					
Standard	5.50-16 (4 ply F2)	6.50-13 (4 ply F3)	5.50-16 (4 ply F2)	6.00-16 (4 ply F2)	6.00-16 (4 ply F2)
Optional		6.00-16 (4 ply I1)	6.00-16 (4 ply F2)	7.50-16 (4 ply F2)	7.50-16 (4 ply F2)
		9.00-10 (4 ply I1)		7.50-18 (4 ply F2)	7.50-18 (4 ply F2)
Rear					
Standard	11.2-28 (4 ply R1)	8.3-24 (4 ply R3)	12.4-28 (4 ply R1)	12.4-38 (4 ply R1)	13.6-38 (4 ply R1)
Optional	12.4-28 (4 ply R1)	18.4-16A (6 ply R3)	13.6-28 (4 ply R1)	13.6-38 (4 ply R1)	15.5-38 (6 ply R1)
	13.6-24 (4 ply R1)		14.9-24 (4 ply R1)	13.6-38 (6 ply R2-0)	15.5-38 (6 ply R2-0)
			16.9-24 (6 ply R3)	14.9-30 (6 ply R1)	16.9-30 (6 ply R1)
				16.9-26 (6 ply R3)	18.4-26 (6 ply R3)
				16.9-30 (6 ply R1)	18.4-30 (6 ply R1)
				18.4-26 (6 ply R3)	18.4-30 (6 ply R2-0)

GENERAL DIMENSIONS

	Ford 2000	Ford 2110 & 4110	Ford 3000	Ford 4000	Ford 5000
Length	126½ in.	116 in.	127 in.	137 in.	141⅝ in.
Height:					
To Top of Exhaust	79¾ in.	75⅛ in.	83 in.	84¾ in.	86⅜ in.
To Hood Line	52½ in.	47½ in.	54 in.	57½ in.	60¾ in.
To Steering Wheel	57½ in.	54¼ in.	58 in.	63 in.	63½ in.
Width:					
At Minimum Track	63⅜ in.	68⅝ in.	64 in.	67½ in.	68½ in.
Ground Clearance:					
At Front Axle	21½ in.	16 in.	21½ in.	19½ in.	18 in.
At Transmission	12⅝ in.	8⅝ in.	13⅜ in.	17¼ in.	16¼ in.
Turning Radius:					
Without Brakes	10 ft. 9 in.	10 ft. 9 in.	10 ft. 9 in.	11 ft. 6 in.	12 ft. 3 in.
With Brakes	9 ft. 9 in.	9 ft. 9 in.	9 ft. 9 in.	10 ft.	10 ft. 0 in.
Weight (Less Options)	3615 lbs.	3530 lbs.	3700 lbs.	4375 lbs.	5330 lbs.
Wheelbase	75-13/16 in.	75-13/16 in.	75-13/16 in.	84½ in.	87½ in.

TRACTOR GROUND SPEED CHARTS

FORD 2000, 2110 AND 3000 4-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	1900 rpm mph	2000 rpm mph	2100 rpm mph
1st	2.0	3.0	3.8	4.0	4.2
2nd	2.4	3.6	4.6	4.8	5.0
3rd	3.5	5.3	6.7	7.0	7.4
4th	7.4	11.1	14.1	14.8	15.5
Rev.	2.1	3.2	4.0	4.2	4.4

FORD 2000, 2110 AND 3000 4-SPEED WITH OVER/UNDER AUXILIARY TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	1900 rpm mph.	2000 rpm mph	2100 rpm mph
1st	2.0	3.0	3.8	4.0	4.2
Over	3.0	4.5	5.7	6.0	6.3
Under	1.3	2.0	2.5	2.7	2.8
2nd	2.4	3.6	4.6	4.8	5.0
Over	3.6	5.4	6.8	7.2	7.5
Under	1.6	2.4	3.0	3.2	3.4
3rd	3.5	5.3	6.7	7.0	7.4
Over	5.3	8.0	10.0	10.5	11.1
Under	2.3	3.5	4.4	4.6	4.9
4th	7.4	11.1	14.1	14.8	15.5
Over	11.4	16.5	not recommended	not recommended	not recommended
Under	4.9	7.4	9.3	9.4	10.4
Rev.	2.1	3.2	4.0	4.2	4.4
Over	3.1	4.7	5.9	6.3	6.6
Under	1.4	2.1	2.7	2.8	3.0

FORD 5000 8-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	2000 rpm mph	2100 rpm mph
1st	0.8	1.1	1.5	1.5
2nd	0.9	1.4	1.8	2.0
3rd	1.7	2.5	3.4	3.5
4th	2.3	3.4	4.6	4.7
5th	2.7	4.0	5.4	5.6
6th	3.3	5.0	6.6	7.0
7th	5.9	8.9	11.8	12.4
8th	8.0	12.0	16.0	16.8
Rev. Low	1.1	1.6	2.2	2.3
Rev. High	3.9	5.8	7.8	8.1

FORD 2110 SELECT-O-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	1900 rpm mph
1st	0.5	0.7	1.0
2nd	0.7	1.0	1.3
3rd	0.7	1.2	1.5
4th	1.1	1.7	2.1
5th	1.8	2.7	3.4
6th	2.3	3.5	4.4
7th	2.7	4.1	5.1
8th	3.4	5.1	6.5
9th	5.2	8.3	10.5
10th	8.1	12.3	15.6
Rev. 1	1.6	2.4	3.0
Rev. 2	2.3	3.5	4.4

FORD 3000 SELECT-O-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	2000 rpm mph	2100 rpm mph
1st	0.5	0.7	1.0	1.1
2nd	0.7	1.0	1.4	1.5
3rd	0.8	1.2	1.6	1.7
4th	1.1	1.7	2.2	2.4
5th	1.8	2.7	3.6	3.8
6th	2.3	3.5	4.6	4.8
7th	2.7	4.1	5.4	5.7
8th	3.4	5.1	6.8	7.2
9th	5.5	8.3	11.0	11.6
10th	8.2	12.3	16.4	17.2
Rev. 1	1.6	2.4	3.2	3.4
Rev. 2	2.3	3.5	4.6	4.8

FORD 2000, 2110, 3000 AND 4110 8-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	1900 rpm mph	2000 rpm mph	2100 rpm mph
1st	0.8	1.2	1.6	1.6	1.7
2nd	1.0	1.5	1.9	2.0	2.1
3rd	1.8	2.7	3.4	3.6	3.8
4th	2.4	3.6	4.6	4.8	5.1
5th	2.9	4.4	5.6	5.8	6.1
6th	3.6	5.4	6.9	7.2	7.6
7th	6.4	9.6	12.2	12.8	13.4
8th	8.7	13.1	16.5	17.4	18.3
Rev. Low	1.2	1.8	2.2	2.4	2.5
Rev. High	4.2	6.3	8.0	8.4	8.8

FORD 4000 8-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	2000 rpm mph	2200 rpm mph
1st	0.7	1.1	1.4	1.5
2nd	0.9	1.3	1.8	2.0
3rd	1.6	2.4	3.2	3.5
4th	2.1	3.2	4.2	4.7
5th	2.6	3.9	5.2	5.6
6th	3.2	4.8	6.4	7.0
7th	5.6	8.4	11.2	12.3
8th	7.6	11.4	15.2	16.8
Rev. Low	1.0	1.5	2.0	2.3
Rev. High	3.7	5.5	7.4	8.1

FORD 4000 SELECT-O-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	2000 rpm mph	2200 rpm mph
1st	0.5	0.7	1.0	1.1
2nd	0.7	1.0	1.4	1.5
3rd	0.8	1.2	1.6	1.8
4th	1.1	1.7	2.2	2.4
5th	1.8	2.7	3.6	4.0
6th	2.3	3.5	4.6	5.1
7th	2.6	3.9	5.3	5.7
8th	3.4	5.1	6.8	7.5
9th	5.5	8.3	11.0	12.1
10th	8.0	12.0	16.0	17.6
Rev. 1	1.5	2.3	3.1	3.4
Rev. 2	2.3	3.5	4.6	5.1

FORD 4110 SELECT-O-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	2200 rpm mph
1st	0.5	0.7	1.1
2nd	0.7	1.0	1.5
3rd	0.8	1.2	1.8
4th	1.1	1.7	2.4
5th	1.8	2.7	4.0
6th	2.3	3.5	5.1
7th	2.6	3.9	5.7
8th	3.4	5.1	7.5
9th	5.5	8.3	12.1
10th	8.0	12.0	17.6
Rev. 1	1.5	2.3	3.4
Rev. 2	2.3	3.5	5.1

FORD 5000 SELECT-O-SPEED TRANSMISSION

Gear	1000 rpm mph	1500 rpm mph	2000 rpm mph	2100 rpm mph
1st	0.5	0.7	0.9	1.0
2nd	0.7	1.0	1.4	1.5
3rd	0.8	1.2	1.6	1.7
4th	1.1	1.7	2.2	2.3
5th	1.7	2.6	3.4	3.6
6th	2.2	3.3	4.4	4.6
7th	2.5	3.8	5.0	5.3
8th	3.3	4.9	6.6	6.9
9th	5.3	8.0	10.6	11.1
10th	7.8	11.7	15.6	16.4
Rev. 1	1.5	2.2	3.0	3.1
Rev. 2	2.2	3.3	4.5	4.6

PRE-DELIVERY SERVICE
CHECK AND ADJUST AS REQUIRED

INOPERATIVE SERVICE CHECKS:

1. Tire pressure ☐
2. Air cleaner oil level and hose connections ☐
3. Oil level in in-line injection pump ☐
4. Clean gasoline fuel sediment bowl ☐
5. Radiator coolant level ☐
6. Fan belt ☐
7. Battery cleanliness, vent openings, electrolyte level, and charge ☐
8. Engine oil level ☐
9. Transmission oil level ☐
10. Hydraulic and rear axle center housing oil level ☐
11. Starter safety switch operation ☐
12. Hydraulic lift draft control mainspring adjustment ☐
13. Upper link, drawbar, and pin in position ☐
14. Steering gear box oil level ☐
15. Power steering reservoir oil level ☐
16. Brake adjustment and pedal equalization ☐
17. Operation of brake pedal lock ☐
18. Rear wheel-to-rim clamp bolts, lock nuts, or jack screws for tightness ☐
19. Front and rear wheel disc and hub nuts for tightness ☐
20. Front wheel toe-in ☐
21. Fuel level ☐
22. Sheet metal and paint condition ☐
23. Tool box for Operator's Manual ☐
24. Lift rod leveling crank for proper operation ☐
25. Drain diesel fuel filter(s) ☐

OPERATIVE SERVICE CHECKS:

All operating checks are to be performed with the tractor at normal operating temperature.

1. Lights and instruments for proper operation ☐
2. Fluid and oil leaks ☐
3. Diesel maximum no-load speed and idle speed adjustments, and fuel shut-off ☐
4. Carburetor and throttle linkage adjustment ☐
5. Starting and starter safety swtich ☐
6. Select-O-Speed:
   - Band adjustment ☐
   - Selector alignment ☐
   - Drive line disengagement lever ☐
7. P.T.O. engagement and disengagement:
   - Transmission type — clutch pedal and P.T.O. lever ☐
   - Live type — 2-stage clutch
   - pedal and P.T.O. lever ☐
   - Independent type — P.T.O. lever ☐
   - *Select-O-Speed
   — T-handle adjustment, P.T.O. ☐
   — 1000 rpm stub shaft ☐
   — **Ground speed shift lever ☐

   * Except Ford 5000
   ** Deluxe Select-O-Speed Transmission only
8. Hydraulic System:
   - Selection lever for draft and position control operation ☐
   - Flow control operation ☐
   - Draft control for tension and compression loads ☐
   - Auxiliary service control or remote control valve (if installed) ☐

PERFORMANCE SERVICE CHECKS:

1. Engine operation including throttle and governor operation ☐
2. Transmission including inching pedal or clutch ☐
3. Steering control ☐
4. Differential lock engagement and disengagement ☐
5. Brake action ☐
6. All optional equipment and accessories ☐

TRACTOR MODEL NO. _____ INSPECTION PERFORMED — WARRANTY EXPLAINED TRACTOR SERIAL NO. _____

OWNER'S SIGNATURE DATE DEALER'S SIGNATURE DATE

50-HOUR SERVICE
CHECK AND ADJUST AS REQUIRED

INOPERATIVE SERVICE CHECKS:

1. Tire pressure ☐
2. Change air cleaner oil and check hose connections ☐
3. Dry air cleaner element, and hose connections ☐
4. Replace diesel fuel filter(s) and bleed system ☐
5. Change oil in in-line injection pump ☐
6. Tighten in-line pump delivery valve holders ☐
7. Clean gasoline fuel sediment bowl ☐
8. Radiator coolant level ☐
9. Fan belt ☐
10. Battery cleanliness and vent openings, electrolyte level, and charge ☐
11. All electrical cables, terminals, and wires ☐
12. Drain and refill engine oil ☐
13. Replace engine oil filter ☐
14. Transmission oil level ☐
15. Replace Select-O-Speed Filter ☐
16. Hydraulic and rear axle center housing oil level ☐
17. Steering gear box oil level ☐
18. Power steering reservoir oil level ☐
19. Rear wheel-to-rim clamp bolts, lock nuts, or jack screws for tightness ☐
20. Spark plug gap ☐
21. Injection pump timing ☐
22. Cylinder head bolt torque ☐

OPERATIVE SERVICE CHECKS:

1. Lights and instruments for proper operation ☐
2. Fluid and oil leaks ☐
3. Diesel maximum no-load speed and idle speed adjustments, and fuel shut-off ☐
4. Carburetor and throttle linkage adjustment ☐
5. Distributor dwell and point spacing ☐
6. Gasoline engine timing ☐
7. Starting and starter safety switch ☐
8. Select-O-Speed band adjustment ☐
9. Valve lash ☐
10. Hydraulic system:
    - Lift control lever adjustment ☐
    - Selector lever for draft and position control operation ☐
    - Flow control operation ☐
    - Draft control for tension and compression loads ☐

PERFORMANCE SERVICE CHECKS:

1. Engine operation including throttle and governor operation ☐
2. Transmission including inching pedal or clutch ☐
3. Steering control ☐
4. Differential lock engagement and disengagement ☐
5. Brake action ☐
6. All optional equipment and accessories ☐

TRACTOR MODEL NO. _____ INSPECTION PERFORMED TRACTOR SERIAL NO. _____

OWNER'S SIGNATURE DATE DEALER'S SIGNATURE DATE

DEALER COPY

PRE-DELIVERY SERVICE
CHECK AND ADJUST AS REQUIRED

INOPERATIVE SERVICE CHECKS:

1. Tire pressure ☐
2. Air cleaner oil level and hose connections ☐
3. Oil level in in-line injection pump ☐
4. Clean gasoline fuel sediment bowl ☐
5. Radiator coolant level ☐
6. Fan belt ☐
7. Battery cleanliness, vent openings, electrolyte level, and charge ☐
8. Engine oil level ☐
9. Transmission oil level ☐
10. Hydraulic and rear axle center housing oil level ☐
11. Starter safety switch operation ☐
12. Hydraulic lift draft control mainspring adjustment ☐
13. Upper link, drawbar, and pin in position ☐
14. Steering gear box oil level ☐
15. Power steering reservoir oil level ☐
16. Brake adjustment and pedal equalization ☐
17. Operation of brake pedal lock ☐
18. Rear wheel-to-rim clamp bolts, lock nuts, or jack screws for tightness ☐
19. Front and rear wheel disc and hub nuts for tightness ☐
20. Front wheel toe-in ☐
21. Fuel level ☐
22. Sheet metal and paint condition ☐
23. Tool box for Operator's Manual ☐
24. Lift rod leveling crank for proper operation ☐
25. Drain diesel fuel filter(s) ☐

OPERATIVE SERVICE CHECKS:

All operating checks are to be performed with the tractor at normal operating temperature.

1. Lights and instruments for proper operation ☐
2. Fluid and oil leaks ☐
3. Diesel maximum no-load speed and idle speed adjustments, and fuel shut-off ☐
4. Carburetor and throttle linkage adjustment ☐
5. Starting and starter safety switch ☐
6. Select-O-Speed:
   - Band adjustment ☐
   - Selector alignment ☐
   - Drive line disengagement lever ☐
7. P.T.O. engagement and disengagement:
   - Transmission type — clutch pedal and P.T.O. lever ☐
   - Live type — 2-stage clutch
   - pedal and P.T.O. lever ☐
   - Independent type — P.T.O. lever ☐
   - *Select-O-Speed
   - — T-handle adjustment, P.T.O. ☐
   - — 1000 rpm stub shaft ☐
   - — **Ground speed shift lever ☐

   * Except Ford 5000
   ** Deluxe Select-O-Speed Transmission only
8. Hydraulic System:
   - Selection lever for draft and position control operation ☐
   - Flow control operation ☐
   - Draft control for tension and compression loads ☐
   - Auxiliary service control or remote control valve (if installed) ☐

PERFORMANCE SERVICE CHECKS:

1. Engine operation including throttle and governor operation ☐
2. Transmission including inching pedal or clutch ☐
3. Steering control ☐
4. Differential lock engagement and disengagement ☐
5. Brake action ☐
6. All optional equipment and accessories ☐

TRACTOR MODEL NO. _____ INSPECTION PERFORMED — WARRANTY EXPLAINED TRACTOR SERIAL NO. _____

OWNER'S SIGNATURE DATE DEALER'S SIGNATURE DATE

DEALER COPY

50-HOUR SERVICE
CHECK AND ADJUST AS REQUIRED

INOPERATIVE SERVICE CHECKS:

1. Tire pressure ☐
2. Change air cleaner oil and check hose connections ☐
3. Dry air cleaner element, and hose connections ☐
4. Replace diesel fuel filter(s) and bleed system ☐
5. Change oil in in-line injection pump ☐
6. Tighten in-line pump delivery valve holders ☐
7. Clean gasoline fuel sediment bowl ☐
8. Radiator coolant level ☐
9. Fan belt ☐
10. Battery cleanliness and vent openings, electrolyte level, and charge ☐
11. All electrical cables, terminals, and wires ☐
12. Drain and refill engine oil ☐
13. Replace engine oil filter ☐
14. Transmission oil level ☐
15. Replace Select-O-Speed Filter ☐
16. Hydraulic and rear axle center housing oil level ☐
17. Steering gear box oil level ☐
18. Power steering reservoir oil level ☐
19. Rear wheel-to-rim clamp bolts, lock nuts, or jack screws for tightness ☐
20. Spark plug gap ☐
21. Injection pump timing ☐
22. Cylinder head bolt torque ☐

OPERATIVE SERVICE CHECKS:

1. Lights and instruments for proper operation ☐
2. Fluid and oil leaks ☐
3. Diesel maximum no-load speed and idle speed adjustments, and fuel shut-off ☐
4. Carburetor and throttle linkage adjustment ☐
5. Distributor dwell and point spacing ☐
6. Gasoline engine timing ☐
7. Starting and starter safety switch ☐
8. Select-O-Speed band adjustment ☐
9. Valve lash ☐
10. Hydraulic system:
    - Lift control lever adjustment ☐
    - Selector lever for draft and position control operation ☐
    - Flow control operation ☐
    - Draft control for tension and compression loads ☐

PERFORMANCE SERVICE CHECKS:

1. Engine operation including throttle and governor operation ☐
2. Transmission including inching pedal or clutch ☐
3. Steering control ☐
4. Differential lock engagement and disengagement ☐
5. Brake action ☐
6. All optional equipment and accessories ☐

TRACTOR MODEL NO. _____ INSPECTION PERFORMED TRACTOR SERIAL NO. _____

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Price $1.00