BREAK-IN PROCEDURES

Your new Ford Tractor will provide long and dependable service if given proper care. During the first 50 hours of operation:

1. Avoid "lugging" the engine. Operating in too high a gear under a heavy load will cause excessive engine "lugging". "Lugging" occurs when the engine will not respond to a throttle increase.

2. Avoid continuous operation at a constant engine speed. Use a lower gear when pulling a heavy load; a higher gear when pulling a light load. Selecting the correct gear ratio will save fuel and prolong engine life.

3. Check the instruments frequently and keep the radiator and oil reservoirs filled to the recommended levels. Daily checks should include:

   - Engine oil level.
   - Power steering oil level.
   - Transmission oil level.
   - Tractor hydraulic lift system oil level (rear axle).
   - Air cleaner restriction indicator.

STARTING THE ENGINE

A safety starter permits the starting motor to operate only when the transmission high-low shift lever is in neutral (8x2 Transmission) or when the gearshift lever is in "neutral" (8x4 Syncromesh Transmission).

WARNING: *Always shift both levers to neutral before starting the engine. NEVER ATTEMPT TO START THE ENGINE WHILE STANDING BESIDE THE TRACTOR—ALWAYS SIT IN THE SEAT.*

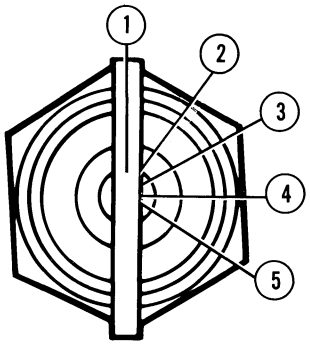
IMPORTANT: *Do not crank the starting motor continuously for more than 30 seconds to avoid starting motor failure.*

WARM WEATHER STARTING

1. Depress the clutch pedal and move the shift levers to the neutral position. Apply the parking brake. Place the hydraulic lift control lever(s) in the lower position, the P.T.O. control lever in the disengaged position, and the remote valve handles in the neutral position.

2. Move the hand throttle half-open. Make sure the diesel engine stop control is pushed all the way in.

3. Turn the starter key to its "START" position, Figure 13. When the engine starts, release the key. Make sure the warning lights go out. If the engine fails to start after cranking for approximately 30 seconds, refer to the following "Cold Weather Starting" information.



S-14710

Figure 13
Key-Starter Switch Positions

1. 'OFF'
2. Accessories 'ON'
3. Warning Lights and Instruments 'ON'
4. Heat
5. Heat-Start

COLD WEATHER STARTING

Thermostart: The thermostart cold weather starting aid is available for all diesel tractors. The unit is effective in temperatures down to 0ºF (-18ºC). If colder temperatures are encountered, a coolant immersion heater, described below, is recommended.

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AIR CLEANER RESTRICTION WARNING LIGHT

The air cleaner restriction warning light (11), Figure 5, illuminates when the air cleaner requires service and the engine is running. When the key-starter switch is turned to the ON position the light will illuminate to allow you to check that the light is functioning properly and will extinguish when the engine starts. If the light illuminates while the engine is running, stop the engine and service the air cleaner as described in "AIR CLEANER" page 51.

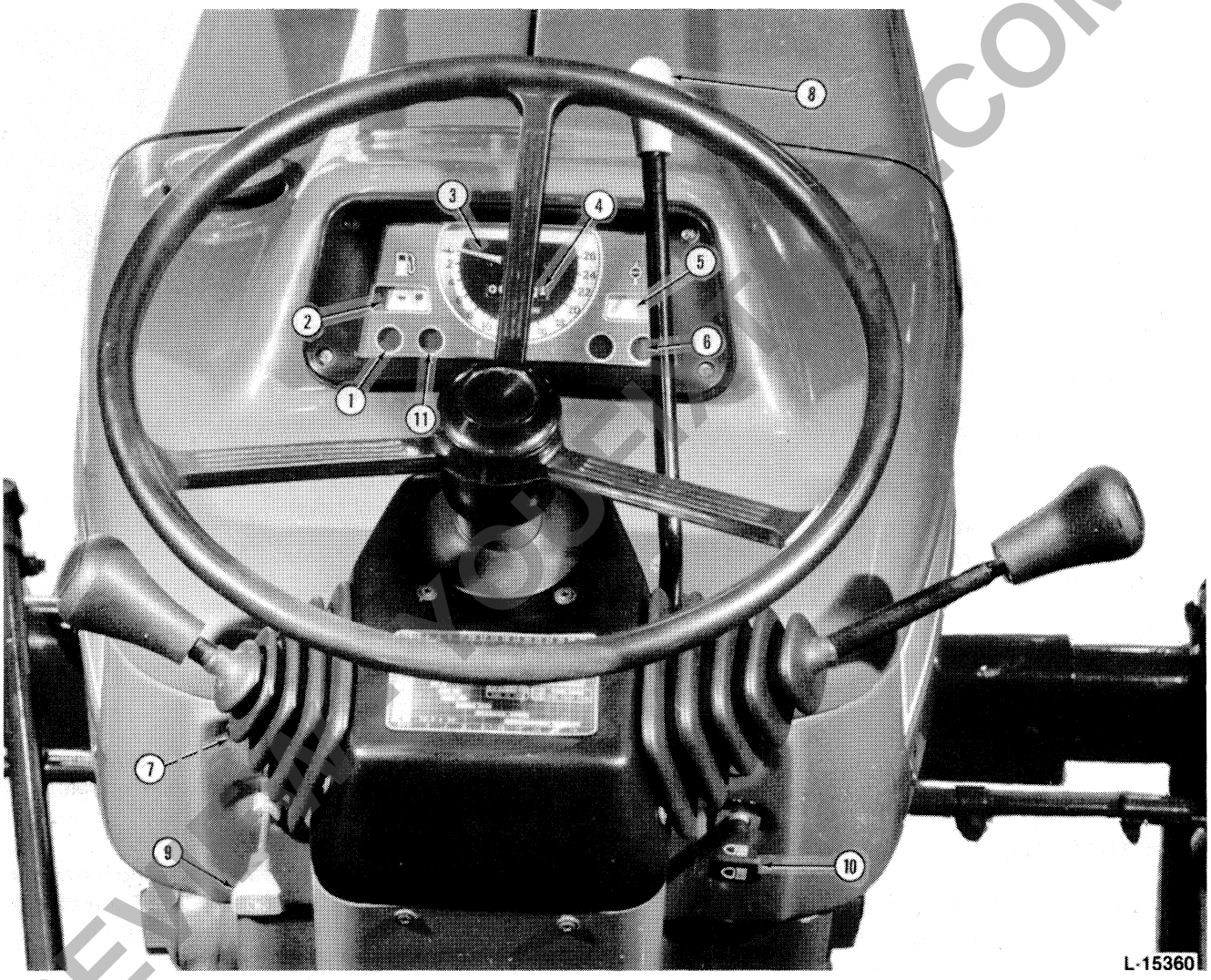


Figure 5
Instrument Panel

1. Alternator Warning Light
2. Fuel Gauge
3. Tachometer
4. Hour Meter
5. Coolant Temperature Gauge
6. Engine Oil Pressure Warning Light
7. Key-Starter Switch
8. Hand Throttle
9. Diesel Stop Control
10. Light Switch
11. Air Restriction Indicator Light

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LUBRICATION AND MAINTENANCE CHART

SERVICE INTERVAL	ITEM	CHECK	CLEAN	LUBE	CHANGE	ADJUST	PAGE NO.	SERVICE PROCEDURE
Daily or 10 Hours	Air Cleaner						51	Refer to Page 51 for Air Cleaner Service.
	Engine Oil Level	X					48	
	Radiator Coolant Level	X					51	
	Pre-Cleaner Bowl	X						
50 Hours	Battery Electrolyte Level	X					61	
	Fuel Filter (Diesel)		X				49	Drain filter and bleed system.
	Front Wheel Hubs			X			56	
	Front Wheel Spindles			X			56	
	Brake Pedal Pivots			X			56	
	Power Steering Cylinders			X			56	2310,2910,3910 and 4610 SU
	Clutch Pedal Pivots			X			56	
	Hydraulic Lift Linkage			X			56	
	Diff. Lock Pedal Pivot			X			56	
	Tire Pressure	X					42	**CAUTION**: *Do Not Inflate Rear Tires Over 35 PSI.*
	Rear Axle Oil Level	X					53	
	Clutch Pedal Free Travel	X					64	
	Belt Pulley Oil Level	X					56	
300 Hours	Engine Oil				X		48	
	Engine Oil Filter				X		48	
	Fan Belt	X					58	
	Hydraulic System Filter				X		54	Initial Change at 50 Hours; Subsequent Changes at 300 hours.
	Transmission Oil Level	X					53	
	Engine Valve Clearance					X	60	
	Power Steering Reservoir Oil Level	X					55	
600 Hours	Fuel Filter (Diesel)				X		49	
	Fuel Injectors (Diesel)				X		58	
	Power Steering Oil				X		55	
	Power Steering Filter				X		55	
	Steering Gear Oil Level	X					54	
	Front Wheel Bearings			X			63	
1200 Hours	Belt Pulley Oil				X		56	
	Rear Axle Oil				X		53	
	Transmission Oil				X		53	
Seasonal	Radiator Coolant							See Page 57 for Instructions.
	Front Axle Tie Rods		X					

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CAPACITIES

	Ford 2310	Ford 2910	Ford 3910	4610SU	Ford 4610
Fuel Tank:	13 U.S. gals. (10.8 Imp. gals.) (49.2 liters)	13 U.S. gals. (10.8 Imp. gals.) (49.2 liters)	13 U.S. gals. (10.8 Imp. gals.) (49.2 liters)	13 U.S. gals. (10.8 Imp. gals.) (49.2 liters)	16 U.S. gals. (13.3 Imp. gals.) (60.5 liters)
Cooling System:	11 U.S. qts. (9.2 Imp. qts.) (10.4 liters)	11 U.S. qts. (9.2 Imp. qts.) (10.4 liters)	11 U.S. qts. (9.2 Imp. qts.) (10.4 liters)	11 U.S. qts. (9.2 Imp. qts.) (10.4 liters)	11 U.S. qts. (9.2 Imp. qts.) (10.4 liters)
Power Steering System:	3.75 U.S. pts. (3.16 Imp. pts.) (1.80 liters)	3.75 U.S. pts. (3.16 Imp. pts.) (1.80 liters)	3.75 U.S. pts. (3.16 Imp. pts.) (1.80 liters)	3.75 U.S. pts. (3.16 Imp. pts.) (1.80 liters)	4.6 U.S. pts. (3.8 Imp. pts.) (2.2 liters)
Engine Crankcase:					
With Filter Change	7 U.S. qts. (5.8 Imp. qts.) (6.6 liters)	7 U.S. qts. (5.8 Imp. qts.) (6.6 liters)	7 U.S. qts. (5.8 Imp. qts.) (6.6 liters)	7 U.S. qts. (5.8 Imp. qts.) (6.6 liters)	7 U.S. qts. (5.8 Imp. qts.) (6.6 liters)
Without Filter Change	6 U.S. qts. (5 Imp. qts.) (5.65 liters)	6 U.S. qts. (5 Imp. qts.) (5.65 liters)	6 U.S. qts. (5 Imp. qts.) (5.65 liters)	6 U.S. qts. (5 Imp. qts.) (5.65 liters)	6 U.S. qts. (5 Imp. qts.) (5.65 liters)
Hydraulic Lift System (Rear Axle):					
With Live P.T.O.	24.6 U.S. qts. (20.5 Imp. qts.) (23.3 liters)	— — —	— — —	— — —	— — —
With Ind. P.T.O.	— — —	24.6 U.S. qts. (20.5 Imp. qts.) (23.3 liters)	24.6 U.S. qts. (20.5 Imp. qts.) (23.3 liters)	48.3 U.S. qts. (40.2 Imp. qts.) (45.7 liters)	48.3 U.S. qts. (40.2 Imp. qts.) (45.7 liters)
Transmission:					
8 x 4	— — —	9.9 U.S. qts. (8.3 Imp. qts.) (9.4 liters)	9.9 U.S. qts. (8.3 Imp. qts.) (9.4 liters)	9.9 U.S. qts. (8.3 Imp. qts.) (9.4 liters)	9.9 U.S. qts. (8.3 Imp. qts.) (9.4 liters)
8 x 2	12.2 U.S. qts. (10.1 Imp. qts.) (11.5 liters)	12.2 U.S. qts. (10.1 Imp. qts.) (11.5 liters)	12.2 U.S. qts. (10.1 Imp. qts.) (11.5 liters)	12.7 U.S. qts. (10.6 Imp. qts.) (12.0 liters)	12.7 U.S. qts. (10.6 Imp. qts.) (12.0 liters)
Belt Pulley (Accessory)	0.6 U.S. qts. (0.5 Imp. qts.) (0.57 liters)	0.6 U.S. qts. (0.5 Imp. qts.) (0.57 liters)	0.6 U.S. qts. (0.5 Imp. qts.) (0.57 liters)	1.2 U.S. qts. (1 Imp. qts.) (1.13 liters)	1.2 U.S. qts. (1 Imp. qts.) (1.13 liters)

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The thermostart element is installed in the air intake manifold. It introduces and ignites fuel in the manifold before it enters the combustion chamber. The element is operated with the key-starter switch. To start a cold engine with the thermostart:

1. Depress the clutch pedal and move the gear shift levers to the neutral position.

2. Move the hand throttle to the half-open position.

3. Turn the starter key to its "HEAT" position, Figure 13, and hold for 30 seconds, then start the engine by turning the key to its "HEAT-START" position.

4. 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.

5. After the engine starts, release the key and reduce the throttle setting.

WARNING: *DO NOT USE ETHER IN CONJUNCTION WITH THERMOSTART.*

Coolant Immersion Heater (Accessory):

The coolant immersion heater, a cold weather starting aid, Figure 14 consists of a heating element installed in the right side of the engine block. A detachable cord is provided for plugging into an electrical outlet. The heater provides for easier starting by warming the engine coolant and oil, and is effective to -20°F (-28°C).

To Operate the Heater:

1. Plug the heater cord into a 15 amp rated extension cord.

2. Plug the cord into a 115 volt A.C. electrical circuit that is protected by a 15 amp fuse or circuit breaker.

3. Keep plugged in for two hours, then start the engine as covered under "COLD WEATHER STARTING", page 18.

NOTE: *The heater can be plugged in longer than two hours without damage but its effectiveness will not be increased. When the heater is not in use, install the dust plug in the element.*

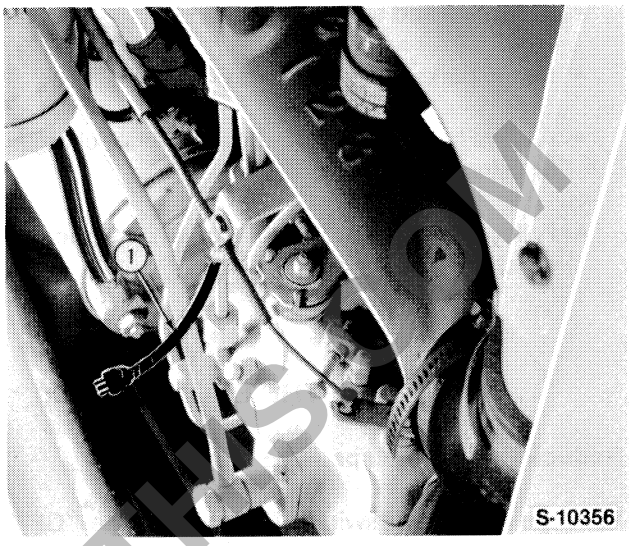


Figure 14
Coolant Immersion Heater
1. Heater Element Cord

STARTING THE TRACTOR WITH JUMPER CABLES

WARNING: *Never attempt to start the engine while standing beside the tractor. Always sit in the tractor seat.*

If it is necessary to use jumper cables to start the engine, proceed with the following instructions. Connect one end of the jumper cable to the tractor battery positive (+) terminal and the other to the auxiliary battery positive (+) terminal. Connect one end of the other cable first to the auxiliary battery negative (−) terminal and the other end to the tractor starter negative (-) terminal. Follow the starting procedures after the jumper cables are connected.

Idle the engine and turn on all electrical equipment (lights, etc.), then disconnect the cables in reverse order of the connecting procedure above. This will help protect the alternator from damage due to extreme load changes.

NOTE: *Reversed battery polarity will damage the voltage regulator and alternator.*

WARNING: *Batteries contain sulfuric acid and produce explosive gases. Follow the instructions below to prevent personal injury.*

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FUEL SHUT-OFF VALVE

The fuel shut-off valve, Figure 6, is located on the right side of the tractor under the fuel tank. Turn the valve to the right to shut off the fuel.

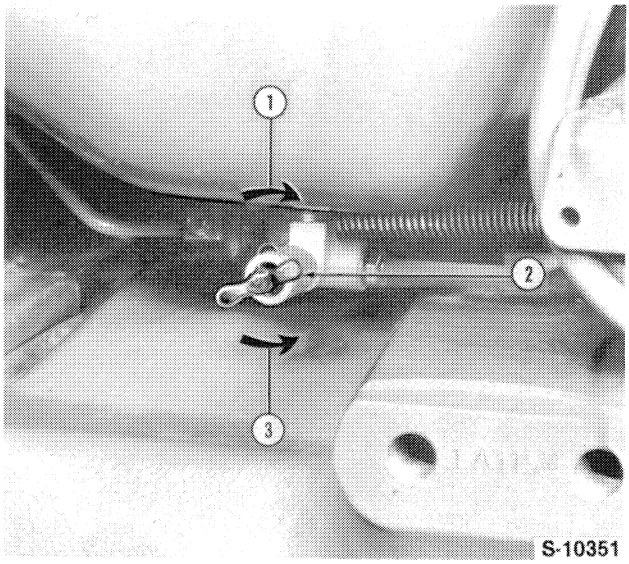


Figure 6
Fuel Shut-Off Valve

1. Close Valve
2. Valve
3. Open Valve

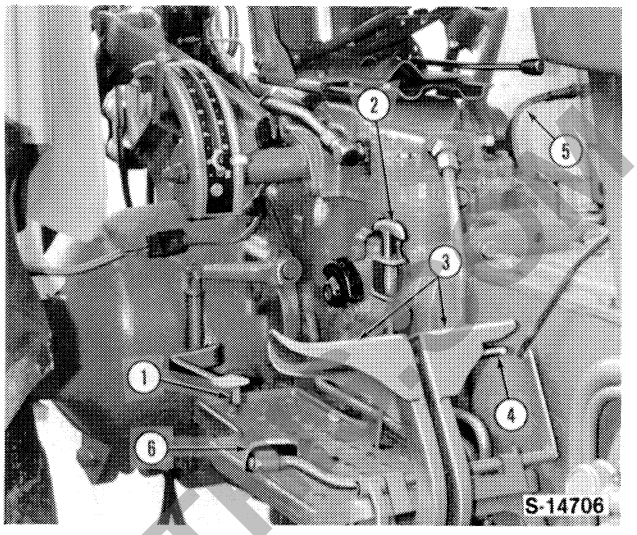


Figure 7
Brake Controls

1. Differential Lock Pedal
2. Parking Brake Handle
3. Brake Pedals
4. Brake Pedal Lock
5. P.T.O. Control Lever
6. Foot Throttle

FOOT THROTTLE

The foot throttle (6), Figure 7, is used to temporarily increase engine speed above the speed set by the hand throttle. It returns to the hand throttle setting when released.

BRAKE CONTROLS

Brake Pedals: The brake pedals are shown in Figure 7. The right brake pedal is used to brake the right rear wheel. The left pedal is used to brake the left rear wheel. Depress both pedals simultaneously to stop the tractor.

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

WARNING: *When operating the tractor at high speeds, DO NOT attempt to make sharp turns by using the brakes.*

Brake Pedal Lock: The brake pedal lock (4), Figure 7, secures the brake pedals together. Always lock the pedals together when the tractor is operated at road speeds.

Parking Brake: The parking brake handle (2), Figure 7, is used to lock the brakes. Always apply the parking brake when the tractor is parked.

To apply the brake:

- Lock the brake pedals together with the brake pedal lock.

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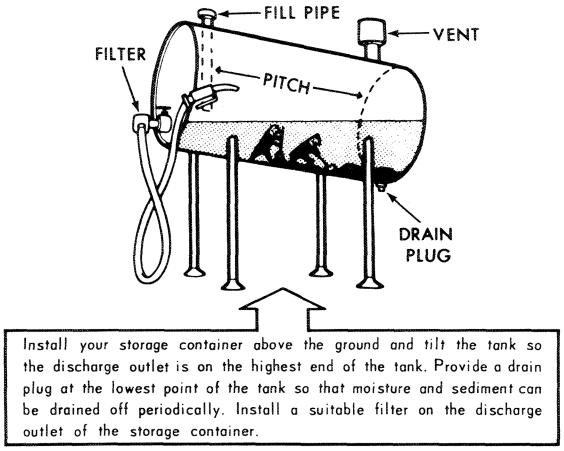


Figure 45
Diesel Fuel Storage

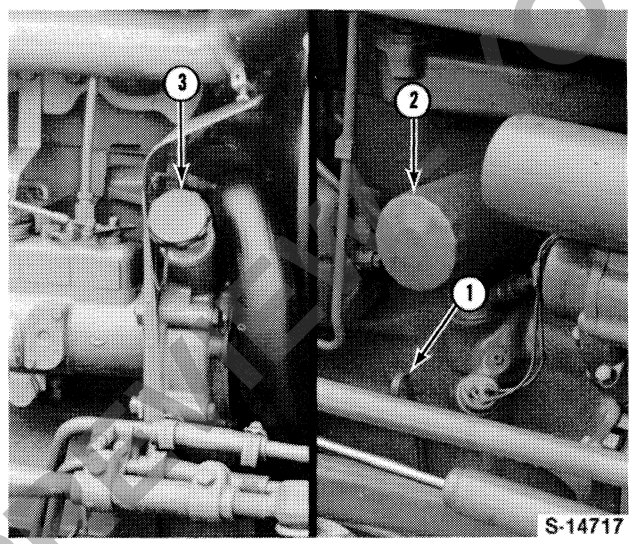


Figure 46
Engine Oil Dipstick and Filler Tube
1. Dipstick
2. Oil Filter
3. Filler Tube Cap

Oil and Filter Change Interval Adjustment based on diesel fuel sulfur content under normal operating conditions.

% SULFUR CONTENT	CHANGE INTERVAL (HOURS)
0.5—1.0	150
1.1—1.3	75

1. With the engine off, but at normal operating temperature, remove the drain plug, Figure 47, and drain the oil. Install the plug after the oil has drained.

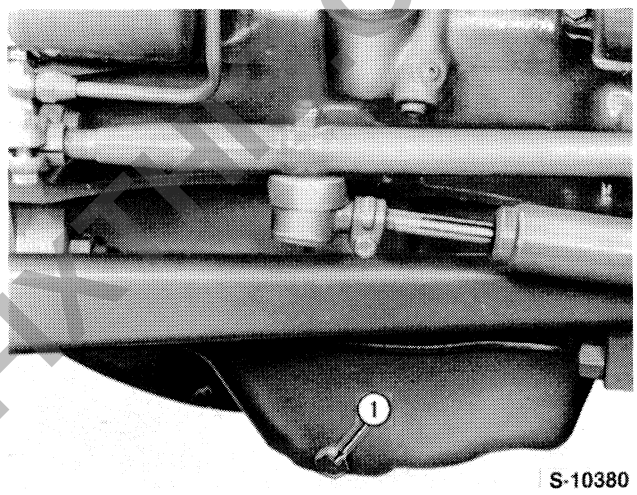


Figure 47
Draining Engine Oil
1. Drain Plug

2. Remove and discard the filter, Figure 46.

3. Coat the gasket on a new filter with a film of oil. Screw the filter into place until the gasket contacts its mating surface, then turn the filter approximately 3/4 of a turn by hand. Do not overtighten.

4. Add new oil of the type specified, page 69. Start the engine and check the filter for leaks.

FUEL FILTER

Draining the Filter: Drain the diesel fuel filter every 50 hours to remove water. Drain the filter at more frequent intervals when high condensation is evident.

1. Be sure there is adequate fuel in the tank, then unsrew the drain plug in the base of the filter, Figure 48.

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ENGINE

	Ford 2310	Ford 2910	Ford 3910	Ford 4610
Type	**Diesel**	**Diesel**	**Diesel**	**Diesel**
No. of cylinders	3	3	3	3
Bore	4.2 in. (106.7 mm)	4.2 in. (106.7 mm)	4.4 in. (111.8 mm)	4.4 in. (111.8 mm)
Stroke	3.8 in. (96.5 mm)	4.2 in. (106.7 mm)	4.2 in. (106.7 mm)	4.4 in. (111.8 mm)
Displacement	158 cu. in. (2589 cc)	175 cu. in. (2868 cc)	192 cu. in. (3147 cc)	201 cu.in. (3294 cc)
Compression Ratio	17.3:1	17.3:1	16.3:1	15.3:1
Firing Order	1-2-3	1-2-3	1-2-3	1-2-3
Idle Speed (rpm)	600-700	600-850	600-850	600-850
Maximum Speed:				
No Load (rpm)	2000	2200	2200	2200
Rated (rpm)	2000	2000	2000	2200
Low Idle	600-850	600-850	600-850	600-850
Valve Clearance (Lash) Warm Engine				
Intake	All Models—0.014 in. go—0.016 in. no-go (0.356-0.406 mm)			
Exhaust	All Models—0.017 in. go—0.019 in. no-go (0.432-0.483 mm)			

LUBRICANTS

All Ford Tractor lubricants are specially blended from select base stocks and premium additives for long and trouble-free service. The use of these lubrications is recommended as follows:

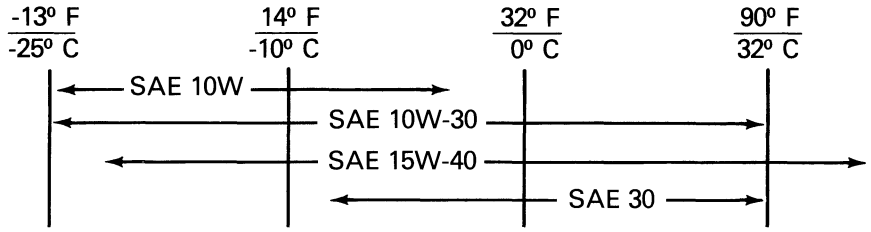
Oils:
- Transmission/Rear Axle/Hydraulic Sump ..... Ford 134
- Front Wheel/Drive Hubs ..... Ford 134
- Power Steering Pump ..... Ford 41
- Engine Crankcase (see note below) ..... Ford 121

Grease:
- Front Wheel Bearings and all Grease Fittings 1T-MIC137-A

NOTE: Engine Crankcase Oils

1) Viscosity grade selection for your climate:

OUTDOOR TEMPERATURES AND RANGES OF APPLICATION



In areas where prolonged periods of extreme temperatures are encountered, local lubricant practices are acceptable, such as the use of SAE 5W, SAE 40 or SAE 50 grades of oil. These oils must be of API CD or SF/CD Quality.

2) Engine crankcase oil drain intervals should be adjusted downward when diesel fuel sulfur content is above 0.5%.

Consult your dealer for details of Engine Crankcase Oil Usage.

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