2. Carefully position the bucket cylinder and dipstick (1), and align the bucket (4), as shown in Figure 42. Install the attaching pins (using a brass hammer), washers, and linch pins.

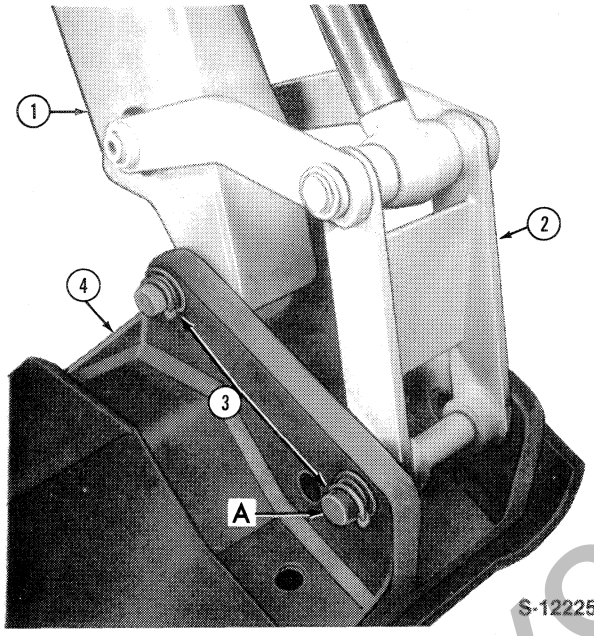


Figure 42
Backhoe Bucket Installed

1. Dipstick
2. Bucket Links
3. Attaching Pins
4. Bucket

NOTE: *There are two bucket link positions on several buckets models as shown in Figure 42. Position (A) is for most backhoe operations. It provides maximum bucket power. Bucket rotation in this setting is 153°. The second position is best suited for straight wall operations (bellholes). It allows the bucket to roll out to the maximum limit and provides maximum bucket curl. It also provides maximum clearance at full height. Bucket rotation in this setting is 179°.*

3. Lubricate the backhoe bucket attaching points. See Figure 81.

4. If it is necessary to replace the bucket side cutters, remove the three 3/4"-10 × 2-1/2" bolts and locknuts, then remove the side cutters. When installing new side cutters, be sure to tighten the nuts securely.

BACKHOE REMOVAL

NOTE: *Units less cab skip steps 2—5.*

WARNING: *For safety reasons do not operate the Ford 655A Loader unless the backhoe is installed. The Ford 655A is unstable for loader operation unless counterweighted with a backhoe.*

1. Position the vehicle on a flat surface where the backhoe will be stored or repaired.

2. Open the cab rear window (1) and place the window in the open storage position, Figure 43.

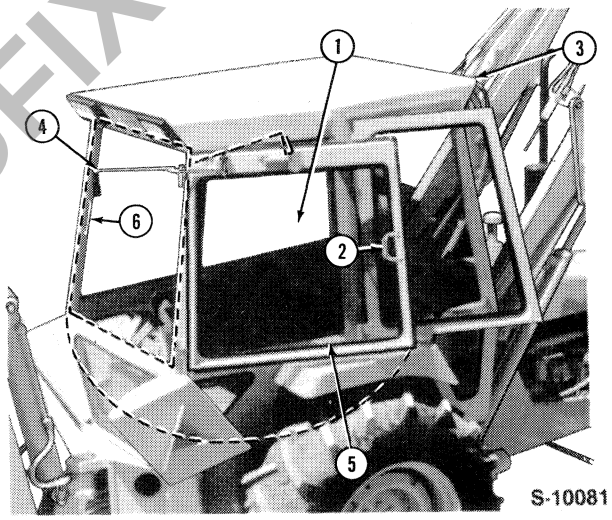


Figure 43
Rear Window
(Solid Lines — Open Position)
(Dotted Lines — Closed Position)

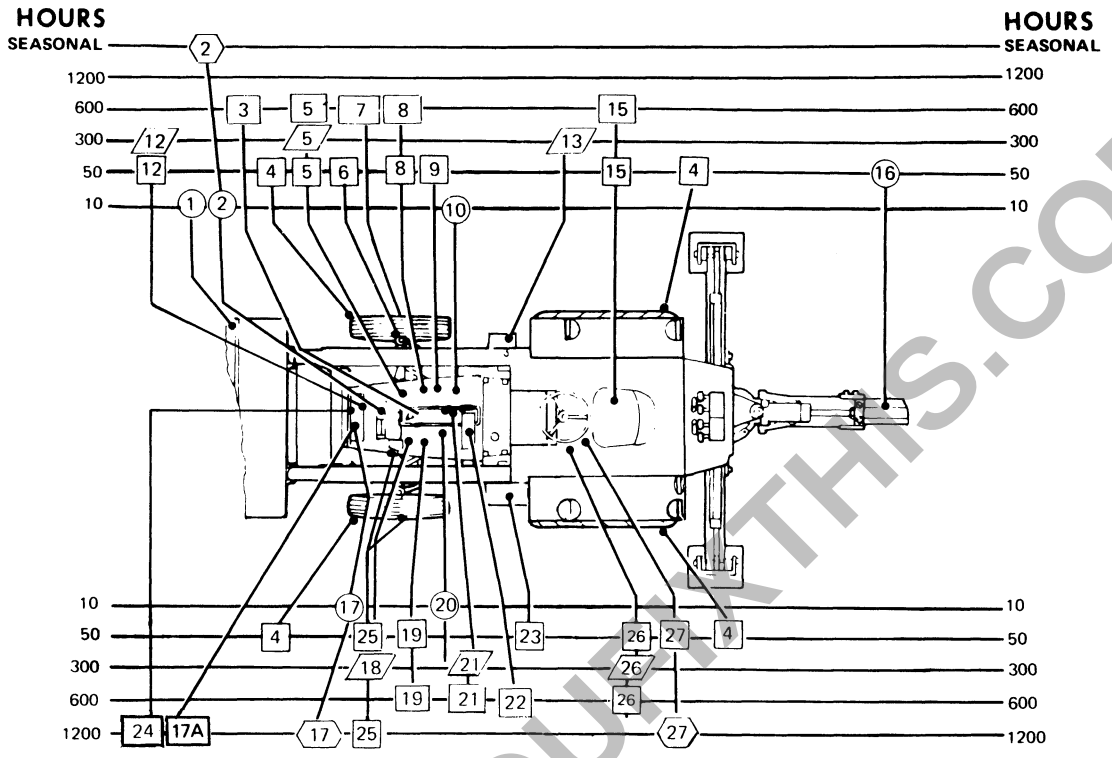
1. Rear Window
2. Rear Window Lock Handle
3. Cab
4. Window Control Handle
5. Window Storage Latch
6. Handle Latch Bracket

3. Remove the cab lower panels (1, 2 and 3), Figure 44. The panels are secured to the cab with bolts.

4. Pull the floor mat up and ahead of the seat.

5. Remove the access panels (1), Figure 45, from between the floor and backhoe deck.

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NOTE: *For loader-backhoe lube fittings use molybdenum disulfide grease, Ford Part No. ESA-MIC75B.*

NO.	LUBRICATION AND MAINTENANCE ITEMS	CHECK	LUBE	CLEAN	CHANGE	ADJUST	PAGE NO.	SERVICE INTERVAL
1	Loader		X				76	
17	Hydraulic System Oil	X					70	(10)
10	Engine Air Restriction Indicator	X					12	Hours or
20	Engine Oil Level	X					64	
2	Engine Coolant Level	X					76	Daily
23	Battery Water Level	X					83	
8	Fuel Filter			X			65	
6	Front Wheel Spindles		X				87	Every
4	Tire Pressure	X					85	
26	Transmission Oil Level	X					68	
27	Rear Axle Oil Level	X					69	[50]
25	FWD Hubs & Differential				X		73	
19	Power Steering Oil Level	X					72	Hours
15	Seat Rails		X	X			89	
12	Hydraulic Reservoir Breather Filter			X			70	
16	Backhoe		X				77	
5	Engine Oil and Filter				X		64	Every
	Fuel Injection Pump Oil				X			⟨300⟩ Hours

NO.	LUBRICATION AND MAINTENANCE ITEMS	CHECK	LUBE	CLEAN	CHANGE	ADJUST	PAGE NO.	SERVICE INTERVAL
18	Fan Belt Tension	X					79	
26	Transmission Oil and Filter				X		68	Every
13	Hydraulic System Filter				X		71	/300\
12	Hydraulic Reservoir Breather Filter				X		70	Hours
22	Air Cleaner Element				X		67	
8	Fuel Filter				X		65	Every
21	Fuel Injectors	X					81	
19	Power Steering Oil & Filter				X		72	[600]
7	Front Wheel Bearings		X				87	
26	Transmission Oil Filter				X		69	Hours
27	Rear Axle Oil				X		69	Every
24	Hyd. Pump Driveshaft*		X				75	⟨1200⟩
25	FWD Hubs & Differential*				X		73	Hours *
17	Hydraulic System Oil				X		70	
17A	Hydraulic Reservoir Screen			X			71	
2	Engine Coolant*				X		76	Seasonal

*Or annually whichever occurs first.

LUBRICATION AND MAINTENANCE CHART — FORD 655A

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SPECIFICATIONS

ENGINE

Type	Diesel
No. of cylinders	4
Bore	4.4 in. (112 mm)
Stroke	4.2 in. (107 mm)
Displacement	256 cu. in. (4195 cc)
Firing Order	1-3-4-2
Idle Speed (rpm)	600-700
Max. speed (rpm)	2450 ± 25
Rated Speed (rpm) (speed for maximum power	2200
Valve Clearance (lash) with engine warm	
Intake	Go.014 in. (.355 mm)
	No Go.016 in. (.406 mm)
Exhaust	Go.017 in. (.432 mm)
	No Go.019 in. (.482 mm)

CAPACITIES	U.S. Qt.	Imp. Qt.	Liters
Fuel Tank	96.0	(79.9)	(90.84)
Cooling System	13.5	(11.2)	(12.8)
Engine crankcase	8.0	(6.7)	(7.6)
with filter change	9.0	(7.5)	(8.5)
Transmission 4 × 4 power reversing	19.0	(15.9)	(18.0)
Rear axle*	33.9	(28.2)	(32.1)
*FWD units add 3.8 U.S. Pts.			
Front Wheel Drive Axle:			
Center section	5.8	(4.8)	(5.50)
Hubs (each side)	1.9	(1.5)	(1.75)
Hydraulic system	84.0	(61.0)	(80.0)

	U.S. Pts.	Imp. Pts.	Liters
Power steering reservoir	4.6	(3.8)	(2.2)

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 lubricants is recommended as follows:

Oils:	Hydraulic System	Ford 48 or 134
	Transmission	
	4 × 4 Power Reversing	Ford 41 or 134
	Rear Axle	Ford 134
	Front Wheel Drive Axle-Differential	Ford 134
	Front Wheel Drive Axle-Wheel Hub	Ford 134
	Fuel Injection Pump	Ford 121
	Power Steering Pump	Ford 41 or 134
	Engine Crankcase (see note below)	Ford 121
Grease:	Front Wheel Bearings and all Tractor Grease Fittings	1T-MIC137-A
	Loader-Backhoe Grease Fittings	ESA-MIC75B

NOTE: Engine Crankcase Oils

1) Viscosity grade selection for your climate:

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BREAK-IN PROCEDURES

Your new Ford 655A will provide long and dependable service if given proper care during the first 50 hours of operation:

1. To ensure adequate lubrication, idle the engine at 1000 rpm for one minute before placing a load on the engine. Do not race the engine during the one minute warm-up period.

2. After the engine has warmed sufficiently, cycle the loader or backhoe cylinders several times to warm the hydraulic system oil.

3. Use first gear ratio when moving heavy loads and avoid continuous operation at constant engine speed.

4. Avoid prolonged operation at either high or low engine speed without a load on the engine.

5. Check the instruments frequently and keep the radiator and oil reservoirs filled to their recommended levels.

DAILY CHECKS INCLUDE:

- Radiator coolant level
- Engine oil level
- Hydraulic system oil level
- Transmission oil level
- Rear axle oil level
- Power steering oil level
- Loader and backhoe lubrication fittings
- Engine air cleaner restriction indicator light

STARTING THE ENGINE

A neutral start switch on the Ford 655A allows the starting motor to be used only when the transmission shift lever(s) is in neutral. Apply the parking brake before starting the engine.

WARNING: *To avoid injury never attempt to start the engine while standing beside the unit. Always sit in the seat.*

IMPORTANT: *Do not crank the starting motor continuously for more than 30 seconds; doing so may cause starting motor failure.*

WARM WEATHER STARTING

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

1. Check to be certain the parking brake is applied and move the transmission shift lever(s) to the neutral position.

2. **Diesel Engines:** Move the hand throttle to the half-open position. Make sure the diesel engine stop control is pushed all the way in.

   Turn the starter key to its "START" position (5), Figure 29. When the engine starts, release the key. Check to be sure that the engine oil pressure and charge indicator lights go out.

   NOTE: *If the engine fails to start after cranking for approximately 10 seconds, refer to the following "COLD WEATHER STARTING" information.*

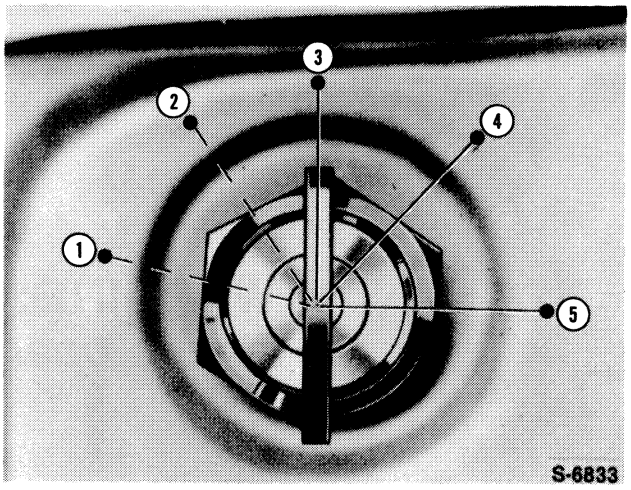


Figure 29
Key-Starter Switch Positions

1. Heat-Start
2. Heat
3. Off
4. On
5. Start

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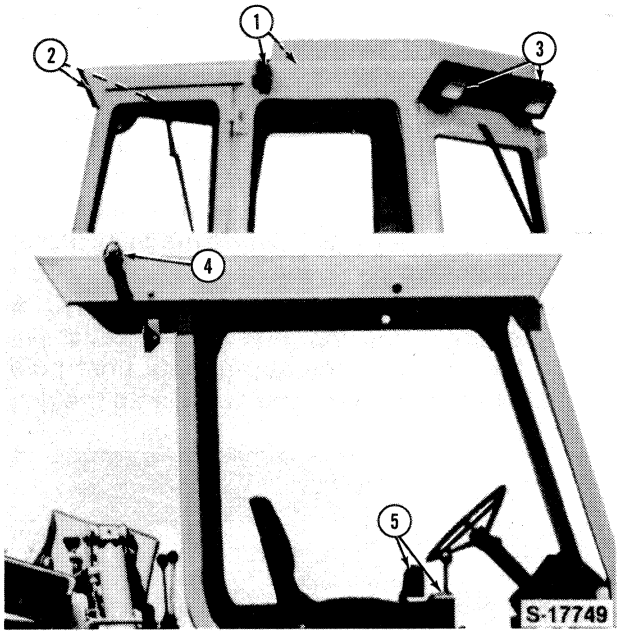


Figure 5
Operating and Warning Lights

1. Cab: Turn Signal Lights, Taillight and Flashing Warning Lights
2. Cab: Halogen Headlights
3. Cab: Halogen Worklights
4. ROPS: Taillights, Turn Signal Lights and Flasher Warning Lights
5. ROPS: Halogen Headlights

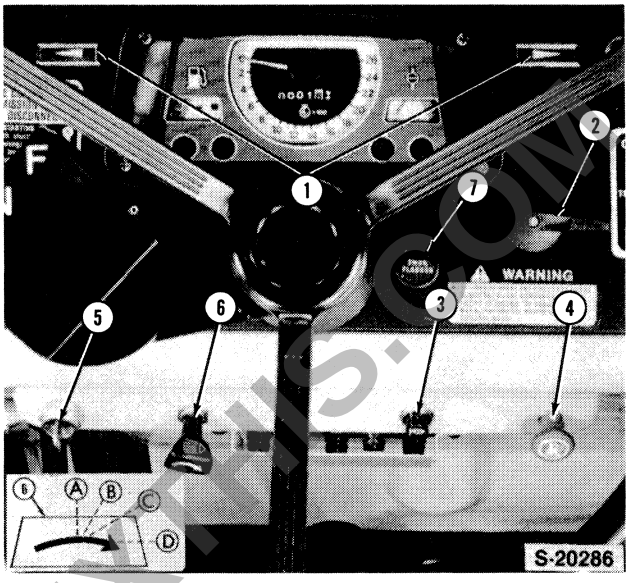


Figure 6
Operator's Console

1. Emergency Flasher Indicator Light
2. Turn Signal
3. Horn Button
4. Diesel Stop Control
5. Key-Starter Switch
6. Light Switch Positions:
   - A. Off
   - B. Instrument Lights and Headlamps
   - C. Instrument Lights and Headlamps and Rear Work Lamps
   - D. Instrument Lights and Headlamps and Taillights
7. Emergency Flasher Control Switch

For your protection and as a warning to motorists, use the flasher warning lamps whenever operating on public roads, day or night, unless prohibited by law in your state. An indicator light (1), Figure 6, shows when the flasher lights are in operation.

TURN SIGNALS

Turn signals are standard on Ford 655A tractors. A switch (2), Figure 6, is used to activate the turn signal mechanism. Flashing arrow lights indicate the direction in which the turn signal is indicating a turn. The turn signal switch activates the flashing warning lamps so that the lamp toward the turn flashes while the opposite light burns steadily.

LIGHT SWITCH

The light switch (6), shown in Figure 6, is a rotating type which turns to the right to activate lighting circuits as follows:

- "Home" position (A) Off
- First Position (B) . . . Instrument Lights and Head Lamps
- Second Position (C) . Instrument Lights, Head Lamps and Rear Work Lamps
- Third Position (D) . . . Instrument Lights, Head Lamps and Red Taillights

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lustrated in Figure 48. Both hoses (4 and 5) are for high pressure oil and can be interchanged, but they must be connected as shown to complete the hydraulic circuits.

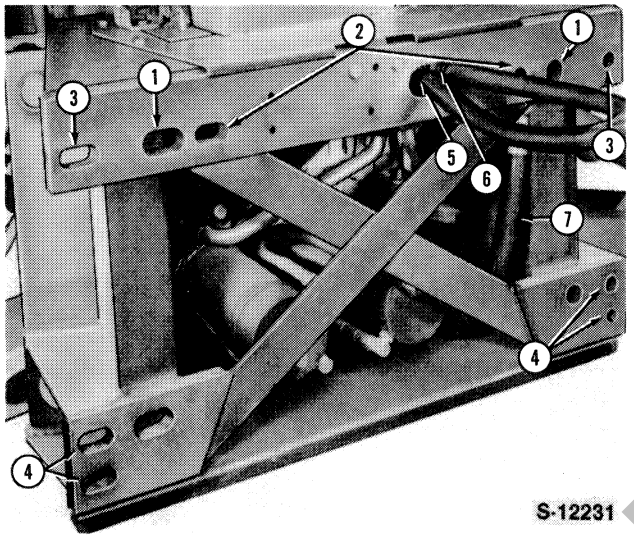


Figure 49
Backhoe Hoses — Storage Position

1. Dowel Locating Holes
2. Upper Inside Attaching Bolt Holes
3. Upper Outside Attaching Bolt Holes
4. Lower Outside Attaching Bolt Holes
5. High Pressure Fitting
6. Power Beyond Fitting
7. Return Sump Hose

4. Uncap the low pressure hose on the backhoe and store the cap.

5. Unplug the low pressure tube (7), Figure 50, on the tractor and store the plug in the tractor tool box.

6. Connect the low pressure hose (6), Figure 48, to the low pressure tube as shown.

   NOTE: *Be certain that the hoses are routed as shown in Figure 48 and are free from twists and kinks before continuing.*

7. Start the engine and back the tractor towards the backhoe.

8. Using the stabilizer and boom, align the backhoe frame attaching bolt holes and dowel locating holes.

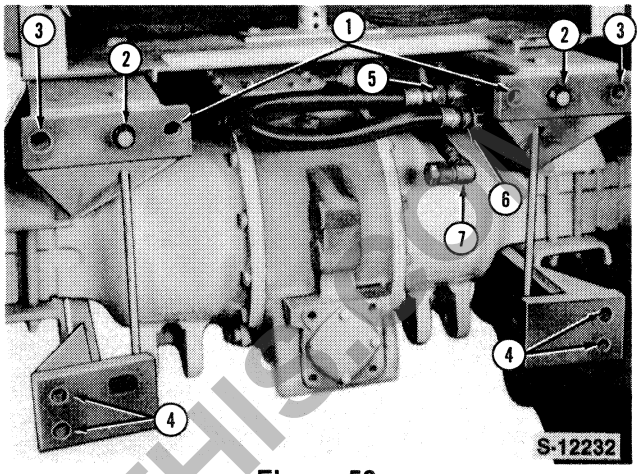
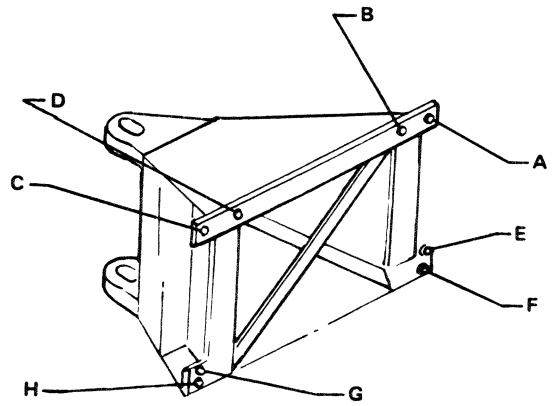


Figure 50
Tractor Backhoe Hoses and Tubes
Tractor-Loader Position

1. Upper Inside Attaching Bolt Holes
2. Locating Dowels
3. Upper Outside Attaching Bolt Holes
4. Lower Outside Attaching Bolt Holes
5. High Pressure Fitting
6. Power Beyond Fitting
7. Return Sump Line

9. Install the eight mounting bolts that secure the tractor and backhoe together. Reinforcing plates are positioned next to the slotted holes in addition to the flat washers that are used with all attaching bolts.

10. Torque all bolts to a run in or half torque of 148-250 lbs. ft. (200-340 Nm) as per torque sequence chart.



TORQUE SEQUENCE: A, B, C, D, E, F, G, & H.

11. Measure subframe to backhoe attachment gap at four places (A, C, F and H).

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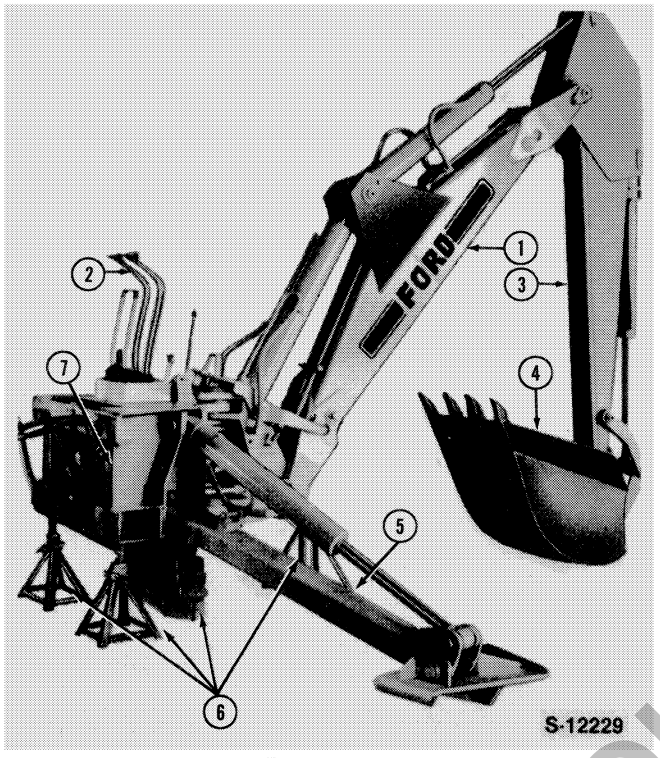


Figure 47
Backhoe Removed

1. Boom
2. Control Levers
3. Dipstick
4. Bucket
5. Stabilizer
6. Blocking
7. Frame

11. Disconnect the large diameter (low pressure) hose (6) from the tractor fitting, Figure 48. Cap the fitting.

12. Using the plug fitting from the tool box, plug the low pressure tube (7), Figure 50, on the tractor.

13. Detach one of the two hoses (4 or 5), Figure 48, at the tractor fitting and the remaining hose at the backhoe fitting. Attach each hose to the open fitting on the component to which that hose is attached. This will complete the hydraulic circuits and prevent entrance of dirt and oil loss, Figures 49 and 50. Be certain to install the hoses with no twists or kinks. The tractor engine may now be started and operated.

WARNING: *Failure to properly complete the hydraulic circuits will result in severe vehicle damage and possible personal injury.*



Figure 48
Backhoe Removal

1. Upper Backhoe Attaching Bracket
2. Lower Backhoe Attaching Bracket
3. Backhoe
4. Power Beyond Hose
5. High Pressure (Pump Supply) Hose
6. Return to Sump

BACKHOE INSTALLATION

NOTE: *DO NOT START THE ENGINE UNTIL STEPS 1-6 HAVE BEEN COMPLETED. The hydraulic circuits are open and oil loss will result if the engine is started.*

1. Position the tractor-loader to the backhoe so the subframe is aligned and the hydraulic hoses can reach their respective tubes.

2. Relieve the hydraulic pressure by actuating the loader control lever (engine off) in a circular motion.

3. Connect the high pressure (pump supply) hose (5) and power beyond hose (4) as il-

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FUEL AND LUBRICATION SERVICE PROCEDURES

ENGINE

Checking Oil Level: Check the engine oil level daily or every 10 hours of operation.

1. With the tractor standing level and the loader bucket on the ground in the dump position, and after the engine has been stopped for a period of time, check the engine oil level with dipstick (1), Figure 55.

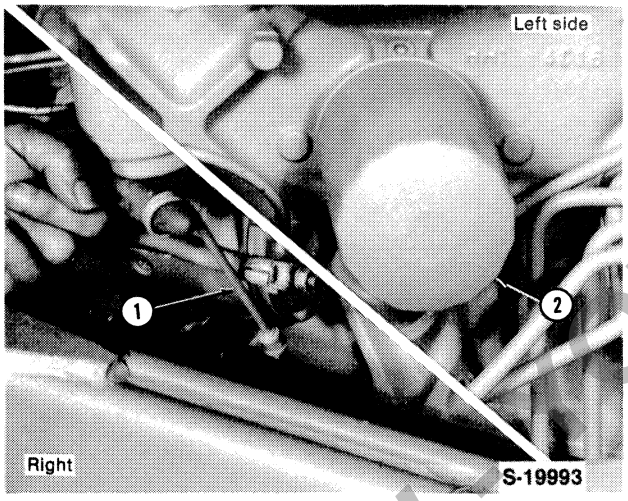


Figure 55
Engine Oil Level
1. Engine Oil Level Dipstick
2. Engine Oil Filter

2. If the oil level is low, remove the filler cap (1), Figure 56, and add oil to the engine through the filler hole in the front cover to bring the oil level to the "FULL" mark on the dipstick. Be careful not to overfill.

3. Install the oil filler cap.

Changing Oil and Filter: Change the engine oil and filter every 300 hours.

1. With the engine off, but at normal operating temperature, drain and discard the engine oil by removing the drain plug (3), Figure 57. Reinstall the plug when the oil finishes draining.

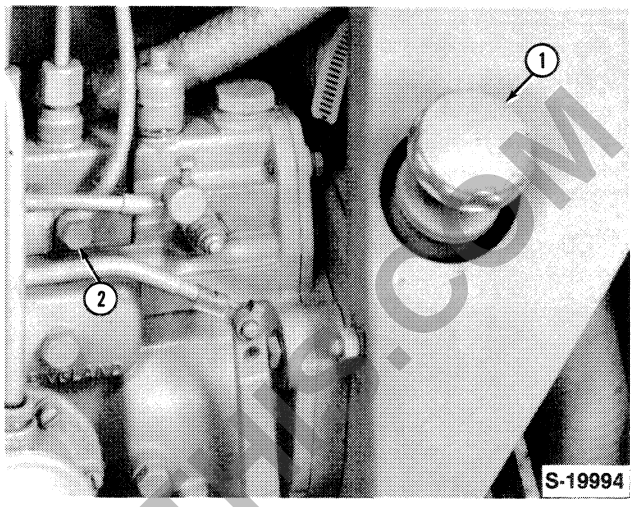


Figure 56
Engine Oil Filler Cap
1. Engine Oil Filler Cap
2. Fuel Injectors Pump Bleed Screw

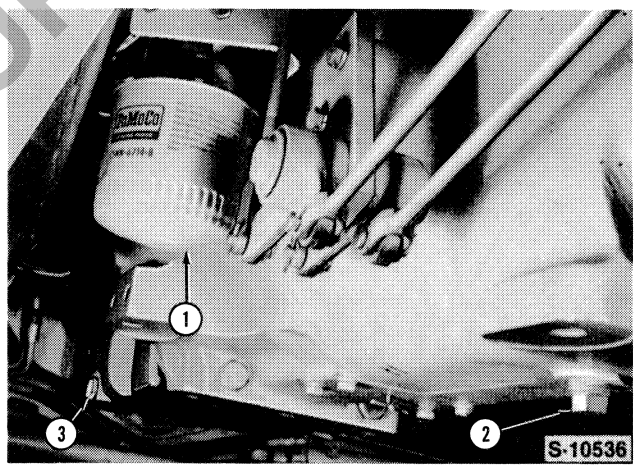


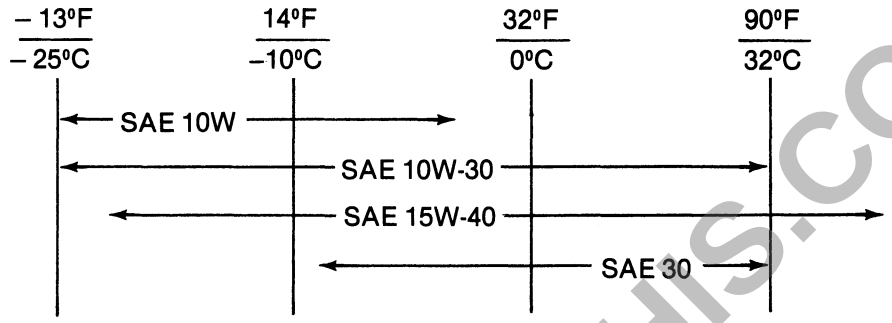
Figure 57
Transmission Oil Filter and Drain Plugs
1. Transmission Oil Filter
2. Transmission Drain Plug
3. Engine Oil Drain Plug

2. Unscrew the oil filter (2), Figure 55, catching the oil in a suitable container below the filter. Discard the filter.

3. Coat the gasket on the 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 over-tighten.

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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.

ELECTRICAL

Alternator . . . . . 12 volt, heavy duty, 51 amp., standard; 72 amp. w/cab
Regulator . . . . . Transistorized
Battery . . . . . 128 amp./hour rating, negative ground
Starting motor . . . . . Pre-engaged with solenoid
Halogen Headlamps 12V
Halogen Rear Work Lamps 12V

Tail-lamp . . . . . 4 C.P. 12V S.C. Base
Instrument Lights . . . . . 2 C.P. 12V S.C. Base
Turn Signal Indicators . . . . . 5 C.P. 14V .10 Amp.
Flasher Warning/Turn Signal Bulbs . . . . . 32 C.P. 12V S.C. Base
Fuses
- Cab Dome Light . . . . . 3 Amp.
- Panel Lights . . . . . 3 Amp.
- Flasher . . . . . 5 Amp.
- Horn . . . . . 10 Amp.

IGNITION SYSTEM

Diesel . . . . . Compression ignition

FUEL SYSTEM

Diesel Engines
- Injection Pump Type . . . . . in line
- Timing . . . . . 23° before top dead center
- Fuel filtration Type . . . . Throw away element
- Change interval . . . . 600 hours

COOLING SYSTEM

Type . . . . . recirculating pressurized liquid

Coolant Change Interval
Long-life (Ford) Antifreeze . . . . . 24 mo.
Permanent Antifreeze . . . . . 12 mo.

Fan Belt tension . Deflection with 25 lb. (11.34 kg) Thumb Pressure
New Belt . . . . . 1/2 in. (12.70 mm)
Used Belt . . . . . 3/4 in. (19.05 mm)

Thermostat Begins to open 168°F. (75.6°C.)
Fully open . . . . 192°F. (88.9°C.)
Radiator cap . . . . . 7 psi (0.48 bar) standard

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lever is used to start the tractor in motion and reverse the direction of travel.

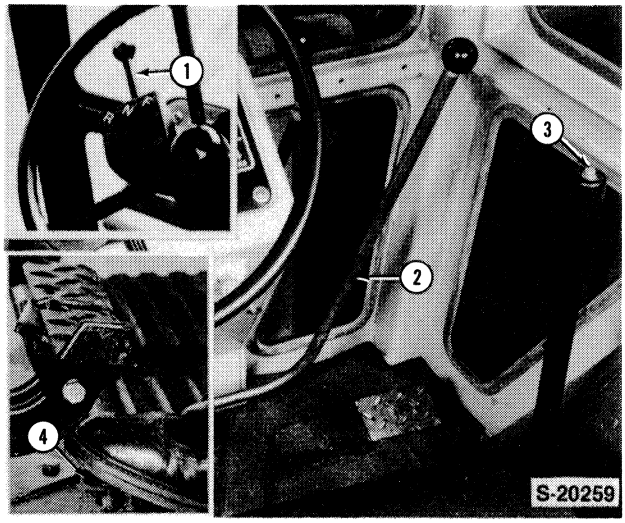


Figure 32
4 × 4 Power Reversing Transmission Controls
1. Power Reversing Lever
2. Gearshift Lever
3. Loader Control Lever — Dump Valve Switch
4. Floor Mounted — Dump Valve Pedal

WARNING: *Always apply the parking brake whenever the tractor is parked as the tractor is free to roll even though the transmission speed range lever and power reversing lever may be "In Gear."*

The 4 × 4 transmission is synchronized in the transport gears, 3rd and 4th gear, this allows upshifting from 2nd to 3rd gear and 3rd to 4th gear plus synchronized downshifting from 4th to 3rd gear without stopping the tractor.

STARTING FORWARD TRAVEL: With the engine running at idle speed and the power reversing lever in neutral lock;

1. Shift to the desired gear ratio with the transmission gearshift lever (2), Figure 32.

NOTE: ***The power reversing lever (1), Figure 32, can be shifted at any engine RPM, however for safe, smooth direction change the engine RPM should be allowed to slow down. This action is easily controlled by using the foot throttle to control engine speed.***

2. Move the power reversing lever forward for forward travel (rearward for reverse travel).

NOTE: *The power reversing lever is equipped with a neutral lock shift mechanism. With this design the power reversing shuttle lever moves through a "T" slot for the forward and reverse positions. The center position in the bracket is the positive neutral lock position. The lever is spring loaded to fall into the lock position unless it is carried (lifted) over the lock. The spring load is such that finger tips can easily carry the lever over the lock for fast-smooth shuttle operation.*

3. Use the foot throttle to control engine and ground speed.

IMPORTANT: *When operating in low temperatures with cold transmission oil, allow the oil to warm up before attempting to shift the power reversing lever. The transmission can be shifted normally after the oil warms up.*

WORK RANGE — FIRST AND SECOND GEARS

Because a clutch is not used between the engine and transmission, power flow from the engine to the transmission must be interrupted (stopped) to shift from one low gear ratio to another. This can be accomplished in two ways as follows:

1. Shift the power reversing lever to neutral (1), Figure 32. Fully stop the movement of the unit. Shift the gearshift lever to a new ratio (1st to 2nd gear) and move the power reversing lever forward for forward travel (rearward for reverse travel).

2. The second way to interrupt the engine to transmission power flow is to use the foot activated transmission dump valve pedal mounted on the deck (floor) (3), Figure 32. When the pedal is depressed the power reversing torque converter control valve is placed in neutral (the same results as placing the power reversing lever in neutral (1), Figure 32). Once the power flow is in neutral and the unit completely stopped, use the

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BACKHOE CONTROLS

The Ford 655A is available with a factory-installed 15 foot backhoe equipped with either four or two lever control. The backhoe is available with an extendible dipstick.

STANDARD BACKHOE CONTROLS (Four Lever Controls)

The backhoe is controlled by the use of the four levers shown in Figure 27. They are: left stabilizer lever (1), crowd lever (dipstick) (2), lift lever (boom) (3), actuating lever (bucket) (4), swing lever (5), right stabilizer lever (6) and extendible dipstick pedal control (7), if so equipped.

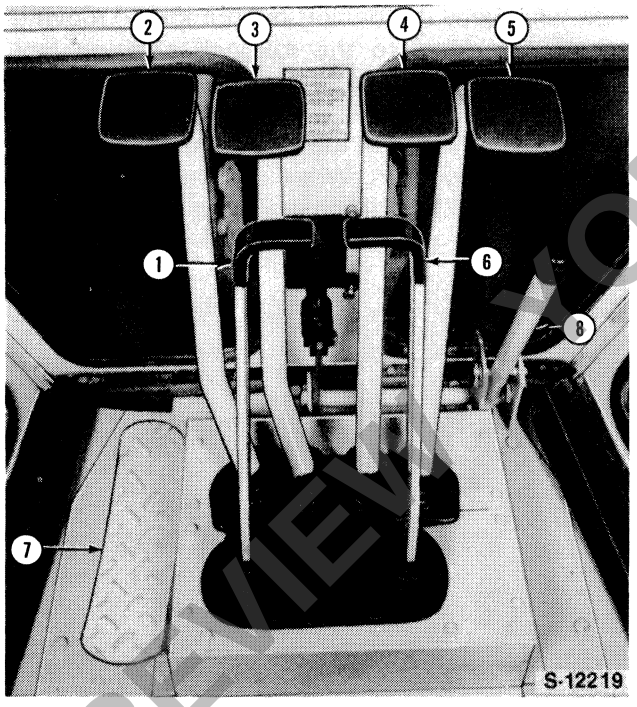


Figure 27
Backhoe Controls (Four Lever)

1. Left Stabilizer Lever
2. Crowd Lever (Dipstick)
3. Lift Lever (Boom)
4. Actuating Lever (Bucket)
5. Swing Lever
6. Right Stabilizer Lever
7. Extendible Dipstick Pedal Control
8. Boom/Swing Transport Lock (Engaged)

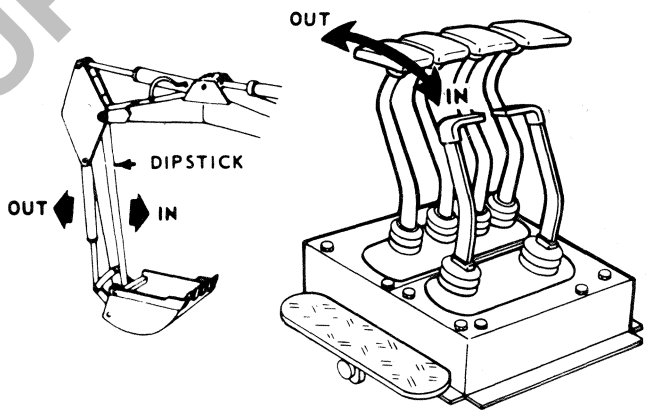
The easiest way to remember component movement is to relate lever movements to yourself when in the operator's seat facing the backhoe. As the levers are moved toward you, the components will move toward you. As the levers are moved away the components will move away from you.

The farther the levers are moved from neutral the faster the components will move. For precise control, all of the levers can be "feathered" (moved slightly) to slow element movement.

The following illustrates component movement vs. lever movement.

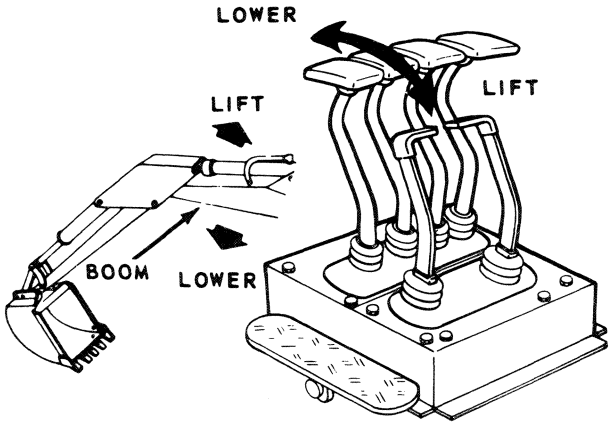
Crowd Lever

Pushing the crowd lever forward will move the dipstick and bucket "Out" or away from the operator. Pulling the crowd lever rearward will move the dipstick and bucket "In" or toward the operator.



Lift Lever

Pushing the lift lever forward will "Lower" the boom, dipstick, and bucket. Pulling the lift lever rearward will "Lift" the boom, dipstick, and bucket.



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Fan Belt: A belt-driven fan at the front of the engine draws air through the radiator, cooling the water in the radiator tubes. A slipping belt will lower the efficiency of the fan, 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 existing belt will deflect 3/4 inch (19.05 mm) and a correctly installed new belt will deflect 1/2 inch (12.70 mm) when approximately 25 pounds (11.34 kg) thumb pressure is applied midway between the alternator and crankshaft pulleys.

To adjust belt tension:

1. Loosen the alternator mounting bolts (1), Figure 84.

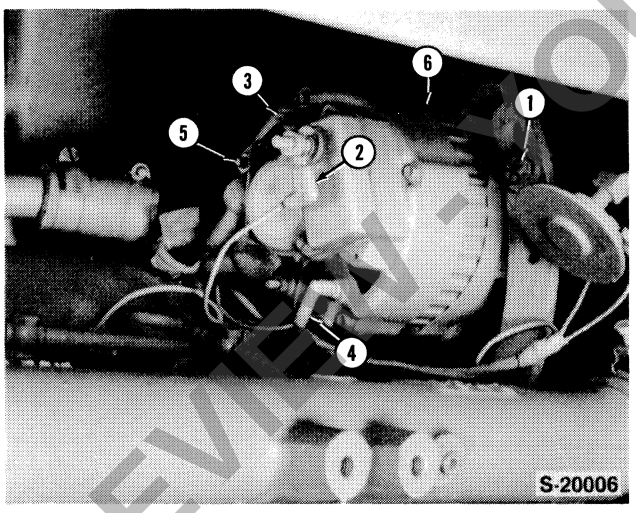


Figure 84
Alternator Belt Tension

1. Alternator Bolt
2. Field Terminal
3. Regulator Terminal
4. Ground Terminal
5. Output Terminal
6. Alternator

2. Pry the alternator away from the engine and tighten the mounting bolts.

IMPORTANT: *When prying the alternator away from the engine, apply pressure at the front housing only. Do not pry on the rear housing or damage may result. Also, adhere to the alternator precautions on page 84.*

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.

The injection pump is correctly timed to the engine when fuel injection at No. 1 piston occurs 23° btdc on the compression stroke.

Determine correct timing as follows:

1. Remove the flywheel inspection cover from the right rear of the engine to expose the inspection opening, Figure 85. Also remove the cover and gasket from the rear of the injection pump, Figure 86.

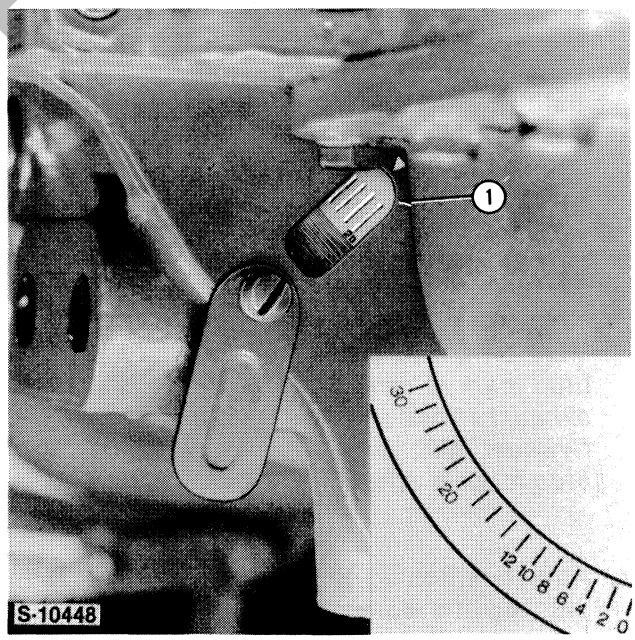


Figure 85
Timing Injector Pump

1. Inspection Opening

2. With the diesel engine stop control pulled out, rotate the flywheel by "bumping" the starter with the key-starter switch until the arrow on the camshaft is pointing toward the timing mark, Figure 86.

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