

### Service Information System

◀ Producto: BACKHOE LOADER  
Modelo: 428C BACKHOE LOADER 2CR  
Configuración: 428C Backhoe Loader Side Shift, Parallel Lift 2CR00001-16211 (MACHINE) POWERED BY 3054 Engine

#### Operación de Sistemas

#### 416C, 426C, 428C, 436C and 438C Backhoe Loaders Hydraulic and Steering System

Número de medio -SENR1208-03

Fecha de publicación -01/03/1999

Fecha de actualización -09/10/2001

i03879412

## General Information (Hydraulic System)

SMCS - 7000

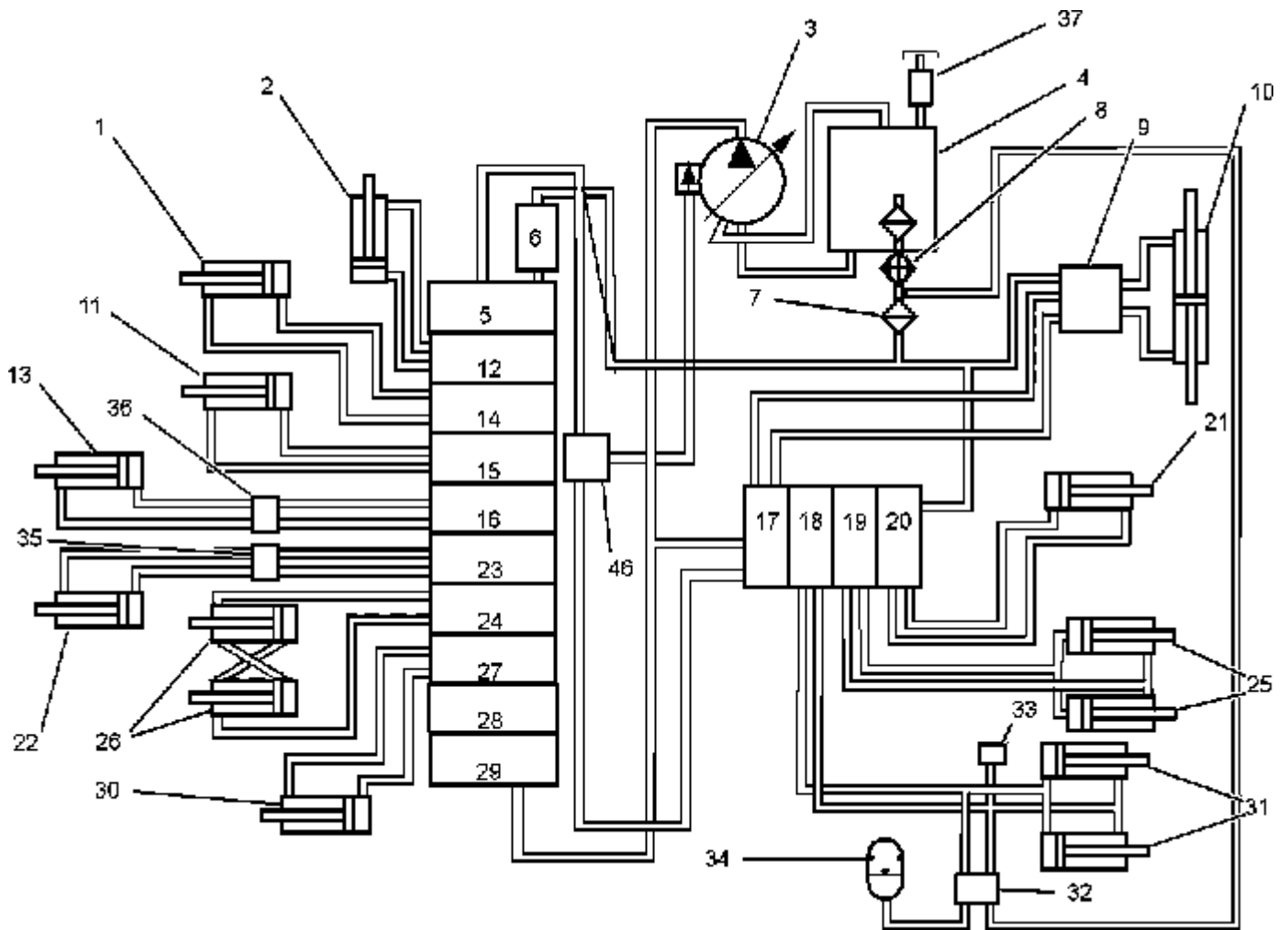


Illustration 1

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## Hydraulic Schematic for 416C, 426C and 436C

(1) Stick cylinder, (2) Extendable stick cylinder, (3) Pump, (4) Hydraulic tank, (5) End cover, (6) Back pressure valve, (7) Return oil filter, (8) Oil cooler, (9) Metering pump, (10) Steering cylinder, (11) Backhoe bucket cylinder, (12) Extendable stick control valve, (13) Right stabilizer cylinder, (14) Stick control valve, (15) backhoe bucket control valve, (16) Right stabilizer control valve, (17) Priority valve, (18) Lift control valve, (19) Tilt control valve, (20) Auxiliary control valve, (21) Auxiliary cylinder, (22) Left stabilizer cylinder, (23) Left stabilizer control valve, (24) Swing control valve, (25) Loader tilt cylinder, (26) Swing cylinders, (27) Boom control valve, (28) Auxiliary control valve, (29) Inlet cover, (30) Boom cylinder, (31) Lift cylinders, (32) Ride control valve (if equipped), (33) Pressure switch for ride control (if equipped), (34) Ride control accumulator (if equipped), (35) Lock valve for the left stabilizer, (36) Lock valve for the right stabilizer, (37) Overflow tank for the hydraulic system and (46) Shuttle valve (if equipped)

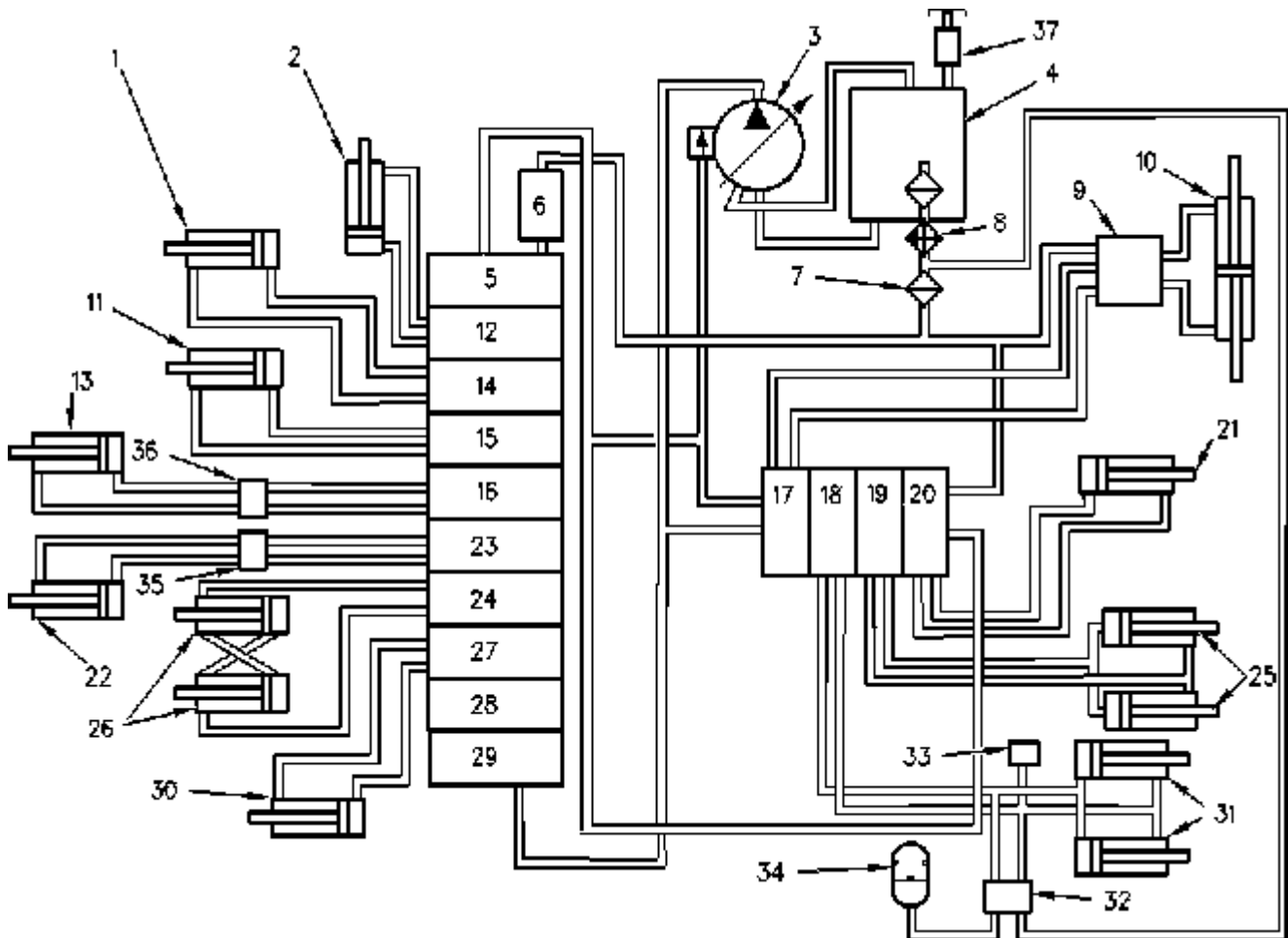


Illustration 2

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## Hydraulic Schematic for 416C, 426C and 436C

(1) Stick cylinder, (2) Extendable stick cylinder, (3) Pump, (4) Hydraulic tank, (5) End cover, (6) Back pressure valve, (7) Return oil filter, (8) Oil cooler, (9) Metering pump, (10) Steering cylinder, (11) Backhoe bucket cylinder, (12) Extendable stick control valve, (13) Right stabilizer cylinder, (14) Stick control valve, (15) backhoe bucket control valve, (16) Right stabilizer control valve, (17) Priority valve, (18) Lift control valve, (19) Tilt control valve, (20) Auxiliary control valve, (21) Auxiliary cylinder, (22) Left stabilizer cylinder, (23) Left stabilizer control valve, (24) Swing control valve, (25) Loader tilt cylinder, (26) Swing cylinders, (27) Boom control valve, (28) Auxiliary control valve, (29) Inlet cover, (30) Boom cylinder, (31) Lift cylinders, (32) Ride control valve (if equipped), (33) Pressure switch for ride control (if equipped), (34) Ride control accumulator (if equipped), (35) Lock valve for the left stabilizer, (36) Lock valve for the right stabilizer and (37) Overflow tank for the hydraulic system

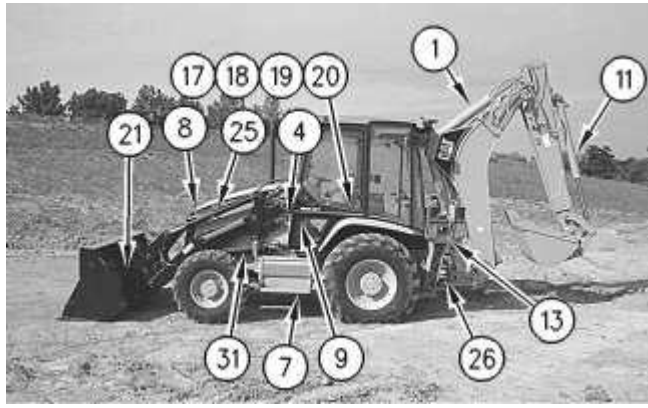


Illustration 3

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The location of components on the left side of the machine is for the 416C, 426C, and 436C backhoe loader with the parallel lift.

(1) Stick cylinder, (4) Hydraulic tank, (7) Filter, (8) Cooler, (9) Metering pump, (11) Bucket cylinder, (13) Right stabilizer cylinder, (17) Priority valve, (18) Lift control valve, (19) Tilt control valve, (20) Auxiliary control valve, (21) Auxiliary control valve, (25) Tilt cylinders, (26) Swing cylinders and (31) Lift Cylinders

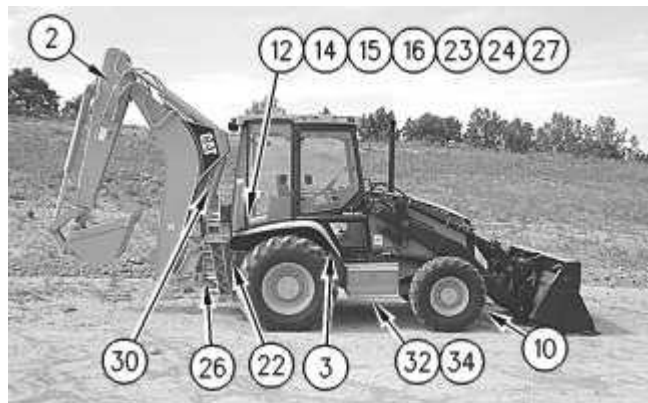


Illustration 4

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The location of components on the right side of the machine is for the 416C, 426C, and 436C backhoe loader.

(2) Extendable stick cylinder, (3) Pump, (10) Steering cylinder, (12) Extendable stick control valve, (14) Stick control valve, (15) Backhoe bucket control valve, (16) Right stabilizer control valve, (22) Left stabilizer cylinder, (23) Left stabilizer control valve, (24) Control valve for the swing cylinder, (26) Swing cylinder, (27) Boom control valve, (30) Boom cylinder, (32) Ride control valve and (34) Ride control accumulator

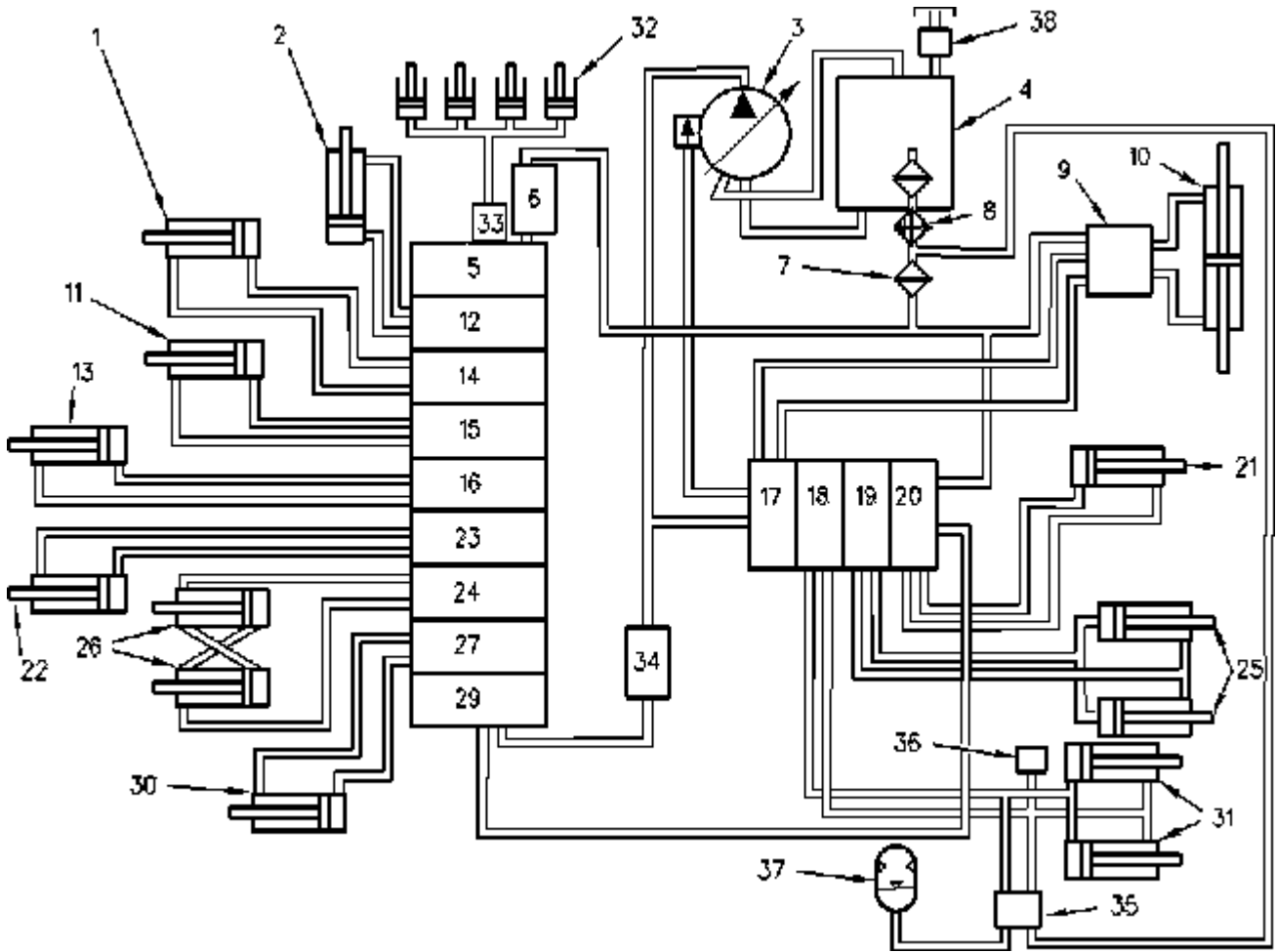


Illustration 5

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Hydraulic Schematic for the 428C and 438C

(1) Stick cylinder, (2) Extendable stick cylinder, (3) Pump, (4) Hydraulic tank, (5) End cover, (6) Back pressure valve, (7) Return oil filter, (8) Oil cooler, (9) Metering pump, (10) Steering cylinder, (11) Backhoe bucket cylinder, (12) Extendable stick control valve, (13) Right stabilizer cylinder, (14) Stick control valve, (15) Backhoe bucket control valve, (16) Right stabilizer control valve, (17) Priority valve, (18) Lift control valve, (19) Tilt control valve, (20) Auxiliary control valve, (21) Auxiliary cylinder, (22) Left stabilizer cylinder, (23) Left stabilizer control valve, (24) Swing control valve, (25) Loader tilt cylinder, (26) Swing cylinders, (27) Boom control valve, (28) Auxiliary control valve, (29) Inlet cover, (30) Boom cylinder, (31) Lift cylinders, (32) Sideshift lock cylinders, (33) Control valve for the Sideshift lock cylinder, (34) Shut off valve, (35) Ride control valve (if equipped), (36) Pressure switch for ride control (if equipped), (37) Ride control accumulator (if equipped) and (38) Overflow tank for the hydraulic system

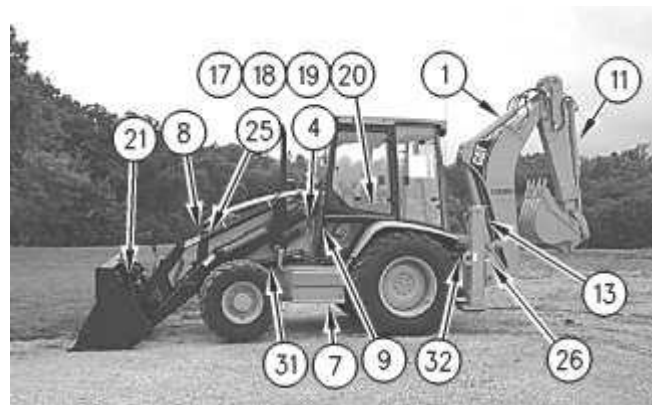


Illustration 6

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The location of components on the left side of the machine is for the 428C, and 438C backhoe loader with the parallel lift.

(1) Stick cylinder, (4) Hydraulic tank, (7) Filter, (8) Cooler, (9) Metering pump, (11) Bucket cylinder, (13) Right stabilizer cylinder, (17) Priority valve, (18) Lift control valve, (19) Tilt control valve, (20) Auxiliary control valve, (21) Auxiliary control valve, (25) Tilt cylinders, (26) Swing cylinders, (31) Lift cylinders and (32) Sideshift lock cylinders

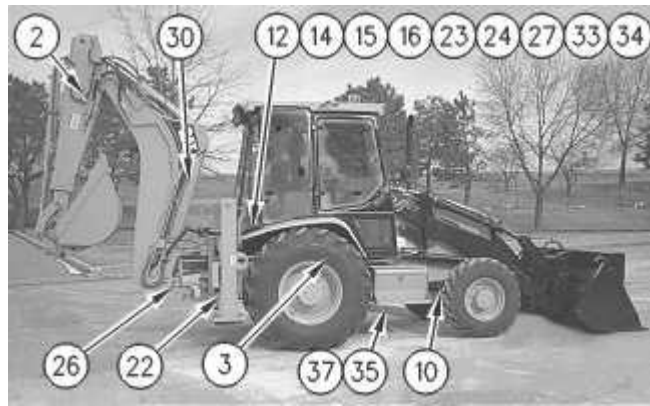


Illustration 7

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The location of components on the right side of the machine is for the 428C, and 438C backhoe loader.

(2) Extendable stick cylinder, (3) Pump, (10) Steering cylinder, (12) Extendable stick control valve, (14) Stick control valve, (15) Backhoe bucket control valve, (16) Right stabilizer control valve, (22) Left stabilizer cylinder, (23) Left stabilizer control valve, (24) Swing cylinder control valve, (26) Swing cylinder, (27) Boom control valve, (30) Boom cylinder, (33) Control valve for the sideshift lock cylinder, (34) Shutoff valve, (35) Ride control valve and (37) Ride control accumulator

The hydraulic system provides oil for the steering and for the backhoe. The system also provides oil for the loader, for the ride control and for the operation of the stabilizers. The standard hydraulic system consists of hydraulic tank (4), Variable displacement axial piston pump (3), return oil filter (7), oil cooler (8), bank valves for the backhoe control (14), (15), (16), (23), (24), and (28), loader control valves (18) and (19), metering pump for the steering (9), and various associated cylinders.

The bank valve controls the hydraulic lift cylinder (31) and the hydraulic tilt cylinder (25) of the bucket. If equipped, the auxiliary cylinder (21) functions with auxiliary control valve (20). Loader tilt cylinder (25) and loader lift cylinder (31) are components of the loader circuit. If equipped, the ride control valve (32) and ride control accumulator (34) works with the loader lift circuit. A machine with single tilt will be equipped with one tilt cylinder. A machine with parallel lift will be equipped with two tilt cylinders.

The backhoe control valve controls the backhoe, and the swing cylinders. The backhoe control valve also controls the stabilizer cylinders (13) and (22), stick cylinder (1), bucket cylinder (11), swing cylinders (26), and boom cylinder (30).

The backhoe control valve controls the sideshift on the 428C and 438C machines.

If equipped, with an extendable stick, the backhoe circuit also includes cylinder (2) and control valve (12).

Some of the 428C and 438C machines may be equipped with an optional shutoff valve (34).

The hydraulic system also provides oil for steering. The standard two-wheel steering system consists of metering pump (9) and steering cylinder (10).

Oil is supplied by the pump (3) on machines that are equipped with all wheel steer. All wheel steer provides additional steering capability with the rear wheels.

The hydraulic tank (4) is located in the rear of the engine compartment in front of the cab. Access to the hydraulic tank is gained by opening the hood.

The metering pump (9) is located in the front of the cab. The priority valve (17), and the loader lift control valve (18) are mounted on the right side frame under the cab. The loader tilt control valve (19), and the

auxiliary control valve (20) are mounted on the right side frame under the cab. Access to the bank valves is from the bottom of the machine or by removing the floorplate.

The auxiliary cylinder (21), the tilt cylinders (25), and the lift cylinders (31) are located at the front of the machine. The auxiliary cylinder is mounted on the bucket, or near the bucket. The two tilt cylinders on a machine with parallel lift are mounted on each side of the hood. The one tilt cylinder on a single tilt machine is located in front of the radiator. The tilt cylinder is centered in the loader frame. The lift cylinders are located on each side of the engine compartment near the center of the machine.

The stick cylinder (1), the bucket cylinder (11), right stabilizer cylinder (13), and swing cylinders (26) are located at the rear of the machine.

The sideshift lock cylinders for the 428C and the 438C machines are located at the rear of the machine.

The hydraulic system is a load sensing, pressure compensated, closed centered system. The pump for the hydraulic system is controlled automatically. The pump is a piston type. The pump has a separate torque limiter that is mounted in the pump housing.

The pump is located in the middle of the machine, mounted to the transmission. Access is gained under the machine or by removing the floorplate in the cab.

The left stabilizer cylinder (22) and the boom cylinder (30) are located at the rear of the machine. The boom cylinder is mounted to the backhoe. The left stabilizer cylinder is mounted on the rear frame. The left stabilizer cylinder is mounted in the frame rails of the sideshift on the 428C and the 438C machines.

The bank valves are located at the back of the machine. The stick control valve (14), and the bucket control valve (15) are part of the bank valves for the backhoe. The control valve for the right stabilizer (16), and the control valve for the left stabilizer (23) are part of the bank valves for the backhoe. The swing control valve (24), and the boom control valve (27) are part of the bank valves for the backhoe. The control valve for the sideshift lock cylinder (33), and the shutoff valve (34) are part of the bank valves on the 428C and the 438C machines. Access is gained from the bottom of the machine or by removing covers.

If the machine is equipped with an extendable stick, extendable stick cylinder (2), and the control valve for the extendable stick (12) are also part of the hydraulic system. Cylinder (2) is located at the rear of the machine, mounted in the backhoe. Control valve (12) is installed in the bank valves for the backhoe and the valves are mounted at the rear of the machine.

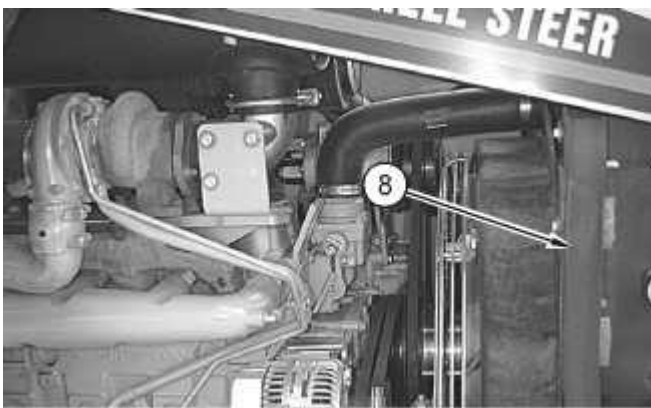


Illustration 8

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Hydraulic oil cooler location

(8) Hydraulic oil cooler.

The hydraulic oil cooler (8) is mounted in front of the radiator at the front of the engine compartment. Access to the oil cooler is gained by opening the hood and removing the side covers.

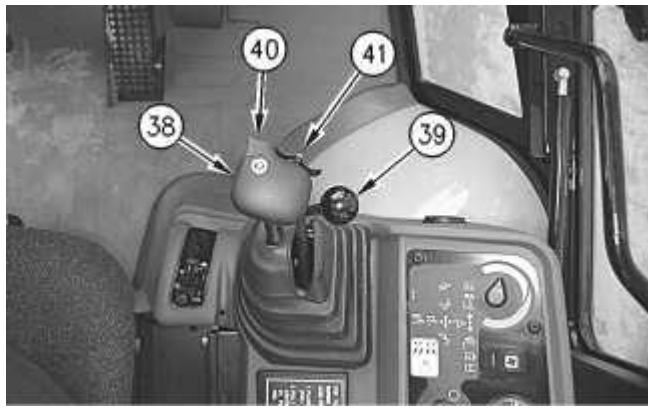


Illustration 9

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Location of the control lever for the Loader

(38) Control lever for the loader bucket, (39) Auxiliary control lever, (40) Switch for the transmission neutralizer and (41) Switch for the all wheel steer

The operator must face forward and the seat must face forward while you move the machine. When you operate the loader control, the operator and the seat must face forward. The loader controls are located on the right side of the operator station. The control lever for the loader bucket (38) controls the following positions of the bucket.

The control lever for the loader bucket (38) controls FLOAT, LOWER, RAISE, RETURN-TO-DIG, TILT BACK, and DUMP positions of the bucket.

This lever also has a switch (40) in order to neutralize the transmission. The lever also has a switch (41) for the all wheel steer.

If the machine is equipped with an auxiliary valve, the auxiliary control valve (39) controls that circuit.

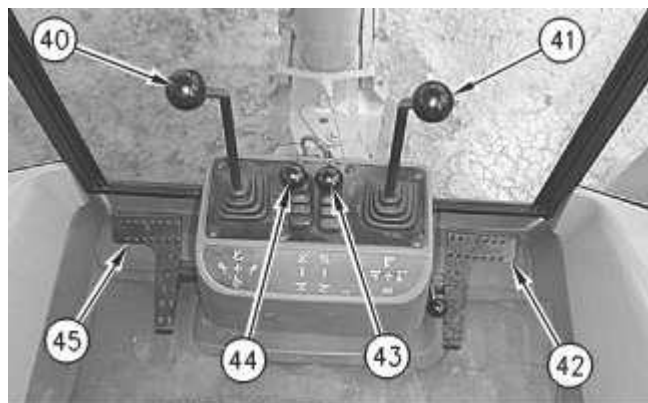


Illustration 10

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Location of the Backhoe control lever

(40) Control for the Boom and swing, (41) Control for the Stick and bucket, (42) Control for the Extendable stick , (43) Control for the right stabilizer , (44) Control for the left stabilizer and (45) Control for the foot operated auxiliary control (if equipped)

Different combinations of the levers and pedals are available. Refer to Operation and Maintenance Manual, SEBU6873.

The operator must rotate the seat in order to operate the backhoe. The operator faces the rear of the machine with the levers for the backhoe in sight.

**Note:** The left side of the machine and the right side of the machine are established by the view when you are operating the controls. Refer to Operation and Maintenance Manual, SEBU6873 for additional

information.

The control for the boom (40) controls the BOOM RAISE, BOOM LOWER, SWING LEFT and SWING RIGHT. The control for the stick (41) controls the STICK IN, STICK OUT, BUCKET LOAD, and BUCKET DUMP.

The control levers (43) and (44) control the stabilizer up and the stabilizer down positions of the right side stabilizers and left side stabilizers.

The extendable stick control pedal (42) controls the STICK EXTEND. The extendable stick control pedal (42) controls the STICK RETRACT.

The auxiliary pedal (45) controls the pressurized lines of an attachment.

**Note:** There are different combinations of levers and pedals that are available. Refer to Operation and Maintenance Manual, SEBU6873.

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