450H, 550H, 650H Crawler Dozer Repair

TECHNICAL MANUAL

H-Series Crawler Dozer

TM1744 24APR19 (ENGLISH)

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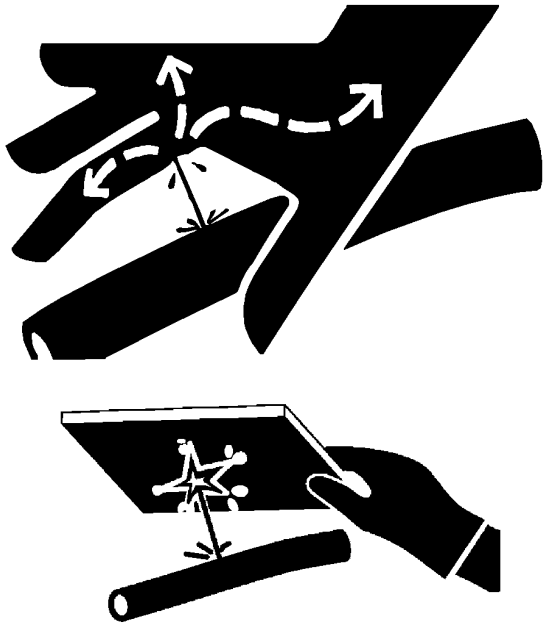
Avoid High-Pressure Fluids

This machine uses a high-pressure hydraulic system. Escaping fluid under pressure can penetrate the skin causing serious injury.

Never search for leaks with your hands. Protect hands. Use a piece of cardboard to find location of escaping fluid. Stop engine and relieve pressure before disconnecting lines or working on hydraulic system.

If hydraulic fluid penetrates your skin, see a doctor immediately. Injected fluid must be removed surgically within hours or gangrene may result. Contact a knowledgeable medical source or the Deere & Company Medical Department in Moline, Illinois, U.S.A.



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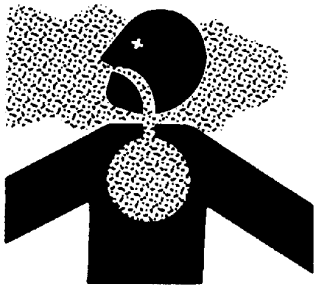
T133840 —UN—20SEP00

TX03679,00016D3 -19-07SEP06-1/1

Beware of Exhaust Fumes

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

If you must operate in an enclosed space, provide adequate ventilation. Use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring outside air into the area.



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Q—Hour Meter: Use to determine when your machine needs periodic maintenance.

R—Under-Seat Heater ON/OFF Switch: Push upper half of switch to turn heater on. Push lower half to turn heater off.

S—Transmission Speed Setting Gauge Display—If Equipped: When the machine is started, the transmission gauge speed setting default range of SP1.6 will be displayed in the gauge window (1). The speed range is displayed as a two digit value. The values can range from SP1.0 to SP3.0. When the transmission speed control button (located on FNR lever) is pressed and held in the “Up” position, the range SP value can reach a maximum value of SP3.0. When the speed control button is held in the “Down” position, the value will decrease to a minimum of SP1.0.

HG31779,00000AB -19-11JUL02-2/2

Instrument Panel (Later Machines)

T157845B —UN—22JUL02

1— Select Button
2— Display Window
3— Engine Coolant Temperature Gauge
4— Engine Oil Pressure Gauge
5— Fuel Level Gauge
6— Seat Belt/Park Brake Indicator (Red)
7— Engine Alternator Voltage Indicator (Yellow)
8— Engine Air Filter Restriction Indicator (Yellow)
9— Hydraulic Oil Filter Indicator (Yellow)
10— Hydraulic Oil Temperature (Yellow)
11— Transmission Oil Filter Indicator (Yellow)
12— Transmission Oil Temperature Indicator (Yellow)
13— Check Service Code Indicator (Yellow)
14— Stop Indicator (Red)
15— Start Aid Button
16— Front and Rear Work Lights Switch
17— Transmission Oil Pressure Gauge
18— Under-Seat Heater ON/OFF Switch
19— Key Switch

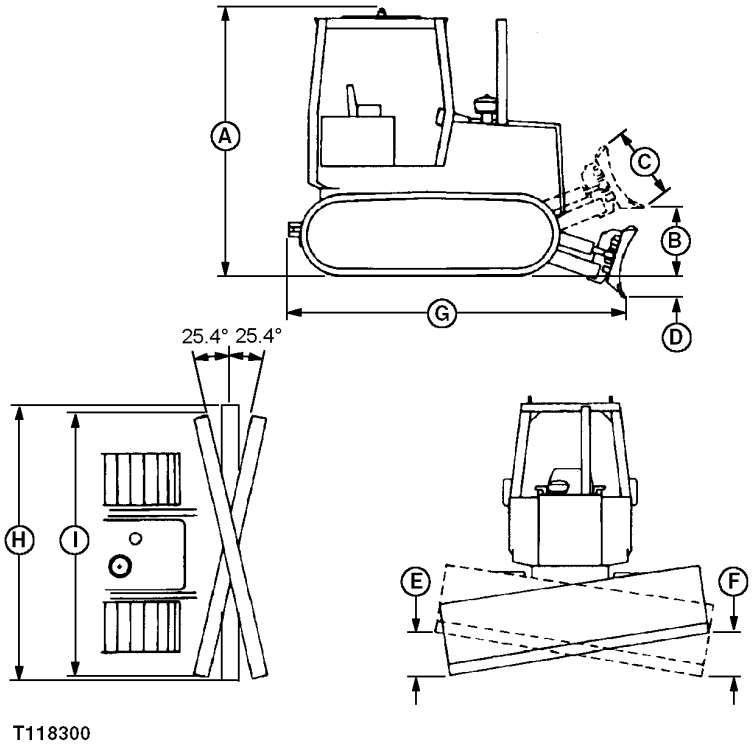
IMPORTANT: When the STOP-engine indicator is activated, stop engine immediately and investigate cause of problem. DO NOT start engine until problem has been corrected.

Each display indicator light is color-coded to indicate the severity of the situation. Red is a high-level warning, yellow is a low-level warning and clear indicates a condition.

When a red indicator lights, an audible alarm will sound. Stop the engine immediately and investigate the cause of the problem.

HG31779,0000091 -19-04JUN02-1/1

450H and 450H-LT Crawler Dozer Dimensions



T118300

T118300 —UN—11NOV98

NOTE: Specifications and design subject to change without notice. Whenever applicable, specifications are in accordance with ICED and SAE standards. Except where otherwise noted, these specifications are based on a unit with roll-over protective structure, full fuel tank, 80 kg (175 lb) operator, and standard equipment.

Item	Measurement	Specification
A—Overall Height—ROPS or Cab	Height	2590 mm (8 ft 6 in.)
B—Blade	Height	826 mm (2 ft 8.6 in.)
C—Blade Lift	Height	773 mm (2 ft 6 in.)
D—Digging	Depth	528 mm (1 ft 9 in.)
E—Blade Tilt		
90 inch Blade (Right Side)	Distance	313 mm (1 ft)
97 inch Blade (Right Side)	Distance	337 mm (1 ft 1.3 in.)
115 inch Blade (Right Side) (450H-LT)	Distance	400 mm (1 ft 4 in.)
F—Blade Tilt		
90 inch Blade (Left Side)	Distance	313 mm (1 ft)
97 inch Blade (Left Side)	Distance	337 mm (1 ft 1.3 in.)
115 inch Blade (Left Side) (450H-LT)	Distance	400 mm (1 ft 4 in.)
G—450H Overall (Without Winch)	Length	3937 mm (12 ft 11 in.)
G—450H Overall (With Winch)	Length	4496 mm (14 ft 9 in.)

Continued on next page

CED,OUO1032,1142 -19-07NOV98-1/2

550H Crawler Dozer Weights

Item	Measurement	Specification
SAE Operating Weight	Weight	7620 kg (16,800 lb)
Optional Equipment		
Rock Guards (4)	Weight	131 kg (288 lb)
Deluxe Seat (add)	Weight	9 kg (20 lb)
Cab with Heater (add)	Weight	268 kg (590 lb)
Cab with Air Conditioning (add)	Weight	306 kg (675 lb)
ROPS Heater	Weight	12 kg (26 lb)
High Intensity Lights	Weight	4 kg (9 lb)
Retrieval Hitch	Weight	23 kg (50 lb)
Extended Draw Bar	Weight	33 kg (72 lb)
4000S Winch	Weight	653 kg (1437 lb)
Winch Fairlead, Four Roller	Weight	85 kg (187 lb)
Radial Ripper	Weight	335 kg (738 lb)
Parallelogram Ripper	Weight	592 kg (1306 lb)

CED,OUO1032,1380 -19-25MAR99-1/1

650H-LGP Crawler Dozer Weights

Item	Measurement	Specification
SAE Operating Weight	Weight	8664 kg (19,100 lb)
Optional Equipment		
Rock Guards (4)	Weight	131 kg (288 lb)
Swamp Shoe	Weight	72 kg (158 lb)
Deluxe Seat (add)	Weight	9 kg (20 lb)
Cab with Heater (add)	Weight	268 kg (590 lb)
Cab with Air Conditioning (add)	Weight	306 kg (675 lb)
ROPS Heater	Weight	12 kg (26 lb)
High Intensity Lights	Weight	4 kg (9 lb)
Front Tow Hook	Weight	15 kg (33 lb)
Retrieval Hitch	Weight	23 kg (50 lb)
Extended Draw Bar	Weight	33 kg (72 lb)
4000S Winch	Weight	653 kg (1437 lb)
Winch Fairlead, Four Roller	Weight	85 kg (187 lb)
Radial Ripper	Weight	335 kg (738 lb)
Parallelogram Ripper	Weight	592 kg (1306 lb)

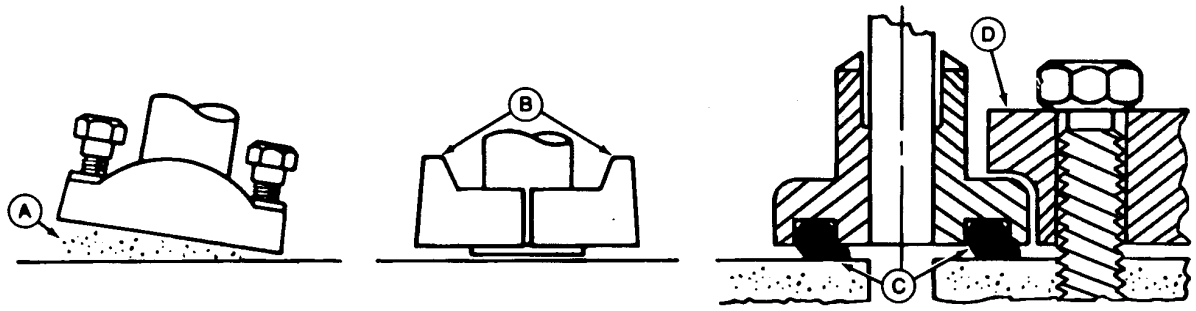
CED,OUO1032,1381 -19-25MAR99-1/1

650H and 650H-LGP Other Information

- **Lubrication:** Pressure system with full-flow spin-on filter and oil-to-water cooler.
- **Air Cleaner:** Dual stage dry-type with safety element, pre-cleaner, and dash mounted restriction indicator.
- **Cooling Fan:** Blower-type.
- **Transmission:** Dual-path, electronic-controlled, hydrostatic drive; load-sensing feature automatically adjusts speed and power to match changing load conditions; each individual track is powered by a variable-displacement piston pump and two-speed fixed-displacement motor combination; decelerator controls speed from holding to 8.0 km/h (5.0 mph).
- **Final Drives:** Heavy-duty triple-reduction final drives attach directly to the main frame and are isolated from track frame and dozer frame loads.
- **Steering:** Single-lever steering and direction control; full power turns, counter rotation, and infinitely variable track speeds provide unlimited maneuverability and optimum control; hydrostatic steering eliminates steering clutches and brakes.
- **Brakes:** Hydrostatic (dynamic) braking stops the machine whenever the direction-control lever is moved to neutral, whenever the decelerator is depressed to the end of travel, or whenever the brake pedal is depressed.
- **Automatic Park Brake:** Exclusive safety feature engages wet, multiple-disk brakes automatically whenever the engine stops, whenever the operator applies the brake pedal, or whenever the neutral start lever lock is in stop position; machine cannot be driven with brake applied, reducing wear out or need for adjustment.
- **Undercarriage:** John Deere Dura-Trax™ features large deep-heat treated components; pins and bushings are sealed for life; rollers and idlers are permanently sealed and lubricated; full-length track frame covers reduce material build up and ease cleaning.

CED,OUO1032,1388 -19-25MAR99-1/1

Service Recommendations for Metric Series Four Bolt Flange Fitting



Metric Series Four Bolt Flange Fitting

A—Sealing Surface
B—Split Flange
C—Pinched O-Ring
D—Single Piece Flange

1. Clean sealing surfaces (A). Inspect. Scratches cause leaks. Roughness causes seal wear. Out-of-flat causes seal extrusion. If defects cannot be polished out, replace component.
2. Install the correct O-ring (and backup washer if required) into groove using petroleum jelly to hold it in place.
3. Split flange: Loosely assemble split flange (B) halves. Make sure split is centrally located and perpendicular to the port. Hand tighten cap screws to hold parts in place. Do not pinch O-ring (C).
4. Single piece flange (D): Place hydraulic line in center of flange and install four cap screws. Flange must be centrally located on port. Hand tighten cap screws to hold flange in place. Do not pinch O-ring.
5. After components are properly positioned and cap screws are hand tightened, tighten one cap screw, then tighten the diagonally opposite cap screw. Tighten two remaining cap screws. Tighten all cap screws as specified in the chart below.

DO NOT use air wrenches. DO NOT tighten one cap screw fully before tightening the others. DO NOT over tighten.

TORQUE CHART[a]		
Thread[b]	**N·m**	**lb·ft**
M6	12	9
M8	30	22
M10	57	42
M12	95	70
M14	157	116
M16	217	160
M18	334	246
M20	421	318

[a]Tolerance ± 10%. The torques given are enough for the given size connection with the recommended working pressure. Increasing cap screw torque beyond these amounts will result in flange and cap screw bending and connection failures.
[b]Metric standard thread.

04T,90,K175 -19-29SEP99-1/1

Section 01
Tracks

Contents

1. Use a chain and hoist when removing rock guards. Inspect parts, replace if necessary.
2. Tighten rock guard cap screws.

Rock Guard—Specification

Rock Guard-to-Track Frame Cap Screws—Torque	203 N·m (150 lb-ft)
Rock Guard-to-Spacer-to-Rock Guard Cap Screws—Torque	278 N·m (205 lb-ft)

3. Tighten chain guide cap screws.

Chain Guides—Specification

Chain Guides-to-Track Frame Cap Screws—Torque	203 N·m (150 lb-ft)
Chain Guide-to-Spacer-to-Rock Guard Cap Screws—Torque	278 N·m (205 lb-ft)

CED,OUTX547,66 -19-10JUN02-2/2

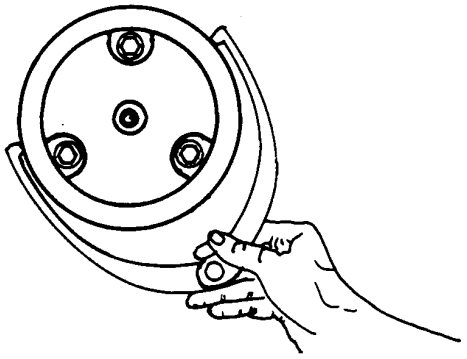
Measure Carrier Roller Wear

NOTE: See Undercarriage Appraisal Manual SP326 for additional information.

1. Use calipers to measure most worn area of roller running surface.
2. Measure caliper tip spread to the nearest 0.5 mm (0.002 in.) using the scale.
3. Flat spots on roller thread indicates roller is not free to turn.

Carrier Roller—Specification

450H and 550H Carrier Roller Wear—Outside Diameter	
100% Worn	152.4 mm (6.0 in.)
650H Carrier Roller Wear—Outside Diameter	139.7 mm (5.5 in.)
100% Worn	
	160.0 mm (6.3 in.)
	147.0 mm (5.8 in.)



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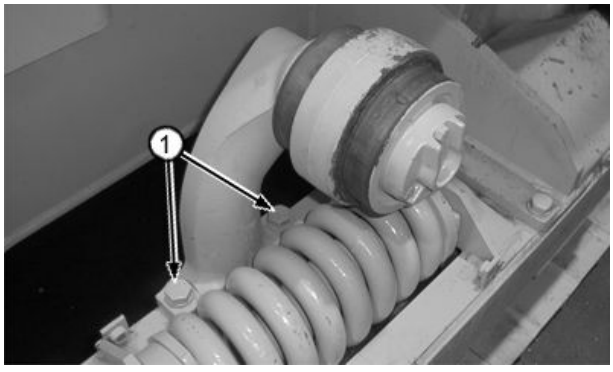
Remove and Install Carrier Roller Assembly

Carrier Roller—Specification

Bracket-to-Frame Cap Screw—Torque	620 N·m (460 lb-ft)

1— Cap Screw (2 used)



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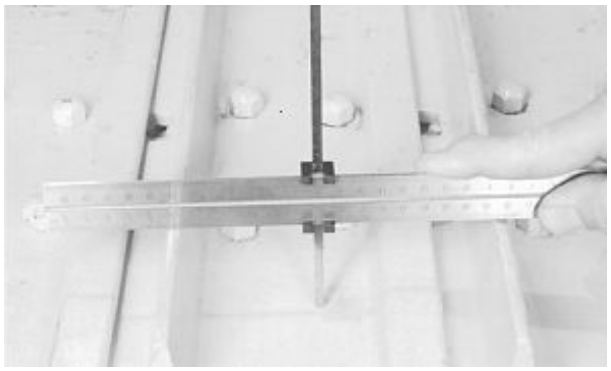
CED,TX03399,5060 -19-28OCT98-1/1

Measure Track Shoe Grouser Wear

Measure grouser height of several track shoes to find an average using a depth gauge such as the JT05521 200 mm Ruler, JT05534 Right Angle Attachment and D05231ST 300 mm Ruler from JT05518 or JT05523 Undercarriage Inspection Service Tool Kit.

NOTE: See Undercarriage Appraisal Manual SP326 for additional information.



T93612 —UN—23FEB89

Item	Measurement	Specification
Track Shoe		
450H and 550H Single Bar Grouser New Shoe	Height	48.0 mm (1.89 in.)
450H and 550H Single Bar Grouser 100% Worn	Height	20.0 mm (0.8 in.)
Track Shoe		
650H Single Bar Grouser New Shoe	Height	50.0 mm (1.97 in.)
650H Single Bar Grouser 100% Worn	Height	23.0 mm (0.91 in.)

CED,OUTX547,77 -19-16MAR99-1/1

9. Pull track chain apart. Remove spacers (B) and washers (A) from between left and right track links.
10. Operate crawler and rotate track in the reverse direction. Slowly, unwrap track off drive sprocket.
11. Place a jack under both crossbars and raise crawler to provide clearance. Block crawler up securely.

T93558 —UN—01NOV88

A—Washer (4 used) **B—Spacer (2 used)**

Continued on next page

CED,OUTX547,83 -19-08APR99-5/6

12. Install a thrust ring on each end of pin.
13. Move completed split link assembly to rear seat of saddle.

T96278 —UN—27OCT88

CED,OUTX547,89 -19-16MAR99-7/14

14. Apply LOCTITE® plastic gasket to link bore. The sealant prevents loss of vacuum or lubricant leakage through pin to link joint.

T96279 —UN—27OCT88

LOCTITE is a registered trademark of Loctite Corp.

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CED,OUTX547,89 -19-16MAR99-8/14

1— Idler Assembly
2— Shaft
3— Bracket (2 used)
4— O-Ring (2 used)
5— Spring Pin (4 used)
6— Metal Face Seal (2 used)
7— Bushing (2 used)
8— Pipe Plug
9— Shim (as required)
10— Guide (2 used)
11— Washer (8 used)
12— Cap Screw (8 used)
13— Wear Plate (2 used)
14— Washer (4 used)
15— Cap Screw (4 used)

1. Remove cap screws and washers to remove wear strips and shims.
2. Drive pins (5) out.

IMPORTANT: Keep metal face seals (6) lubricated and together at all times while disassembled.

3. Remove brackets (3), O-rings (4) and metal face seals (6).
4. Remove shaft (2) and inspect bushings (7). Replace if necessary.
5. Install new bushings. Drive in bushings until bottomed.

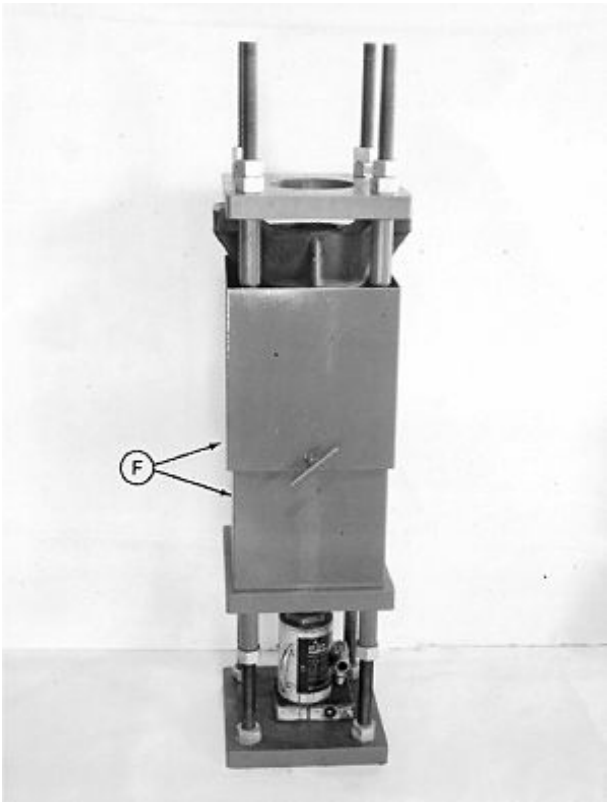
IMPORTANT: Lubricate idler bushings with oil before installing shaft.

6. Apply clean hydraulic oil to bushings (7).
7. Inspect metal face seals. See Inspect Metal Face Seals in this group.
8. Install new metal face seals, if necessary.
9. Install shaft (2), O-rings (4), and brackets (3).
10. Drive in spring pins (5).
11. Install guides, wear plates and shims. See Idler Adjustment Procedure in this group.
12. Fill idler with oil. See Check Idler Oil Level in this group.

CED,OUTX547,93 -19-08APR99-2/2

14. Install 10-ton jack on bottom of compression tool.
15. Put caps, tube and recoil spring (D) in compression tool so spring is centered.
16. Install DFT1087 [1] Recoil Spring Guard Tool (F). (See Group 0199 for instructions to make tool.)
17. Install plate (A) and nuts (B) to secure spring.
18. Operate jack to compress spring.
19. Apply John Deere NEVER-SEEZ ® Lubricant to threads of special cap screw (C). Install special cap screw through hole (E). Be sure cap screw threads fully engage end cap.
20. Slowly release jack and remove nuts and plate.
21. Install spring assembly. (See procedure in this group.)

A—Plate
B—Nut (4 used)
C—Cap Screw Head
D—Recoil Spring
E—Hole in Plate
F—DFT1087 Recoil Spring Guard Tool



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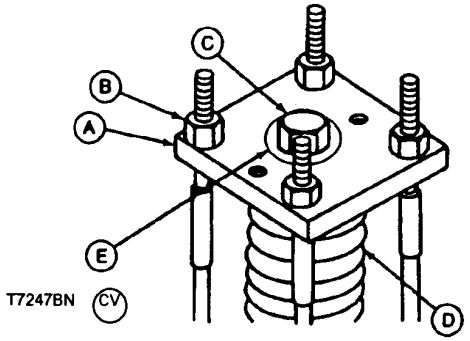


T7247BN —UN—09APR90

NEVER-SEEZ is a registered trademark of Emhart Chemical Group.

[1]Dealer Fabricated Tool. See Group 0199 for instructions to make tool.

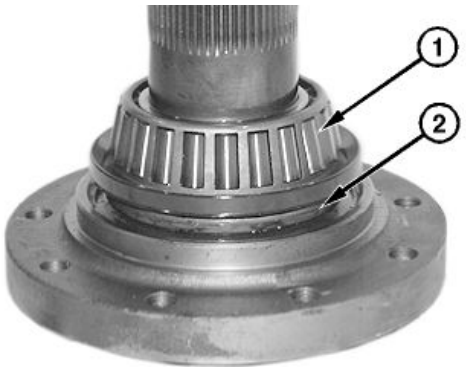
CED,OUTX547,100 -19-02APR99-4/4

Section 02
Axles and Suspension Systems

Contents

16. Remove bearing (1) from axle shaft.
17. Remove and discard seal assembly (2).
18. Clean and inspect housing and parts.

1— Bearing
2— Seal



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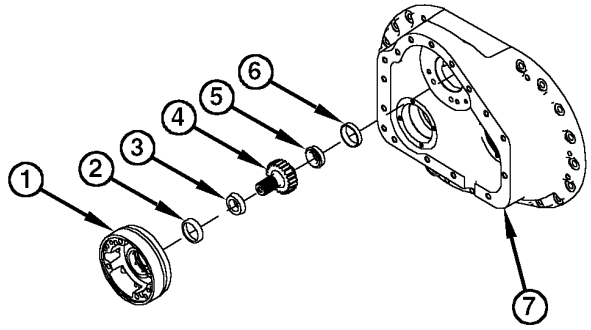
CED,OUTX547,65 -19-20JAN09-9/26

19. Remove parts (2—6) as shown.
20. Inspect final drive input gear (4) and bearing cones (3 and 5). Replace as necessary.
21. Install bearing cup (2) into brake housing.
22. Install bearing cup (6) into housing half (7).
23. Install bearing cones (3 and 5) onto final drive input gear (4).

1— Brake Housing
2— Bearing Cup
3— Bearing Cone
4— Final Drive Input Gear
5— Bearing Cone
6— Bearing Cup
7— Housing



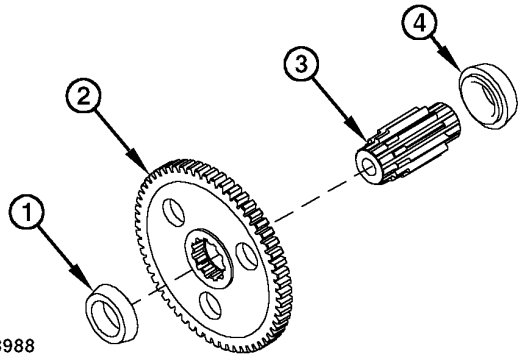
T118987

T118987 —UN—14DEC98

CED,OUTX547,65 -19-20JAN09-10/26

24. Remove parts (1—4) as shown.
25. Inspect second idler pinion gear (3) and bearing cones (1 and 4). Replace as necessary.
26. Install bearing cones (1 and 4) onto second idler pinion gear (3).

1— Bearing Cone
2— Second Idler Ring Gear
3— Second Idler Pinion Gear
4— Bearing Cone



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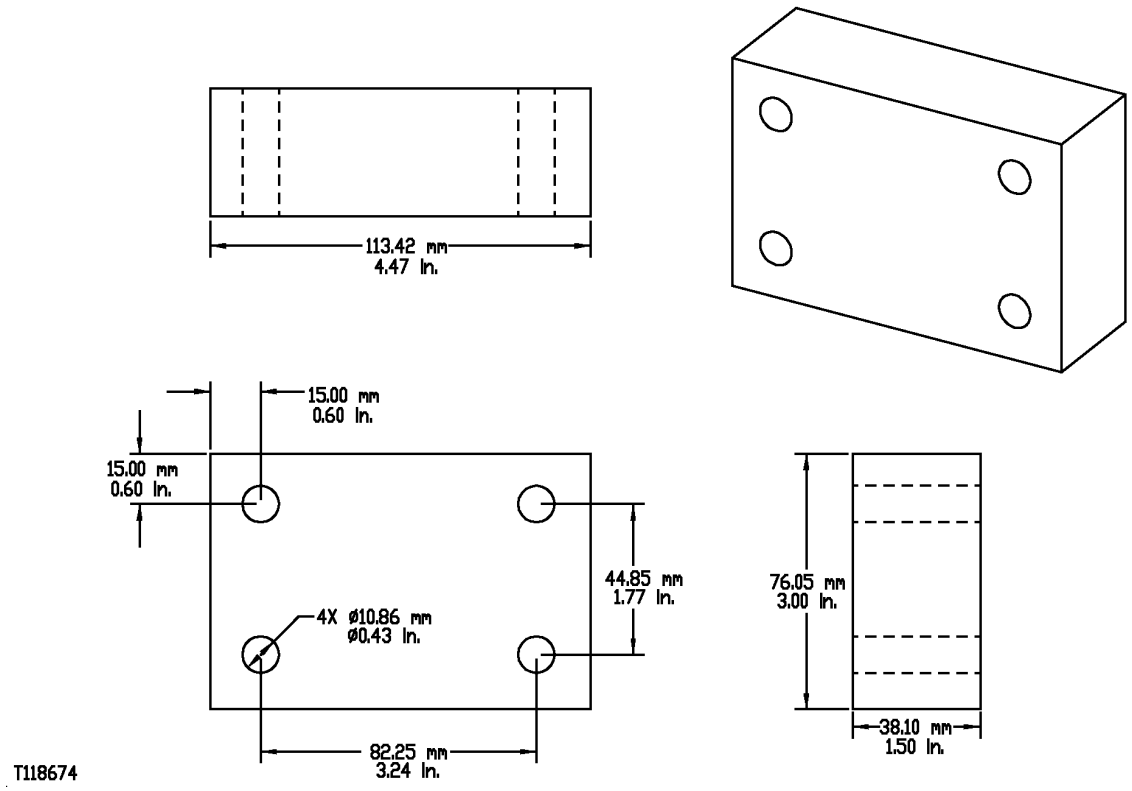
CED,OUTX547,65 -19-20JAN09-11/26

DFT1167 Final Drive Lifting Bracket Adapter Spacer



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To be used with DFT1166 Final Drive Lifting Bracket Adapter when installing DFT1063 Final Drive lifting Bracket.

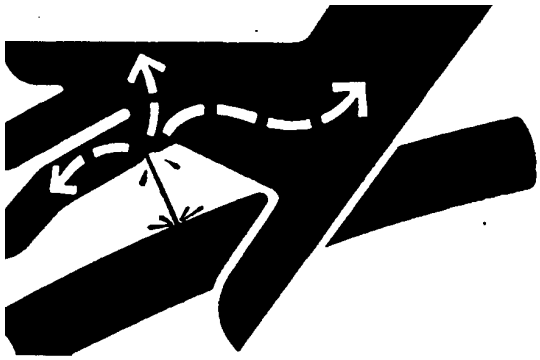
Material: 1/2 in. 1020 Steel Plate

CED,TX03399,5085 -19-19APR06-1/1

CAUTION: To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

19. Disconnect line (1). Close all openings using caps and plugs.
20. Disconnect fittings (2 and 3) and remove line.
21. Disconnect lines (6, 7, and 9).
22. Disconnect wiring connectors (5 and 11). Disconnect wire terminal (8).
23. Disconnect wiring connector (10) (450H, 550H S.N. —910010) (650H S.N.—924717).
24. Remove cap screws (4) from hydraulic pump and remove pump. Set pump aside.

1— Line (Front Pump Tee Fitting-to-Cooler Bypass Valve)
2— Tee Fitting (Front Pump)
3— Line Fitting (Rear Pump)
4— Hydraulic Pump Mounting Cap Screws (4 used)
5— Rear Directional Control Solenoid Wiring Connector
6— Line (Oil Cooler Bypass Valve-to-Reservoir)
7— Line (L.H. Motor Tee Fitting-to-Oil Cooler Bypass Valve)
8— Oil Cooler Bypass Valve Wire Terminal
9— Line (Park Brake)
10— Speed Sensor Wiring Connector (450H, 550H S.N. —910010) (650H S.N.—924717)
11— Front Directional Control Solenoid Wiring Connector



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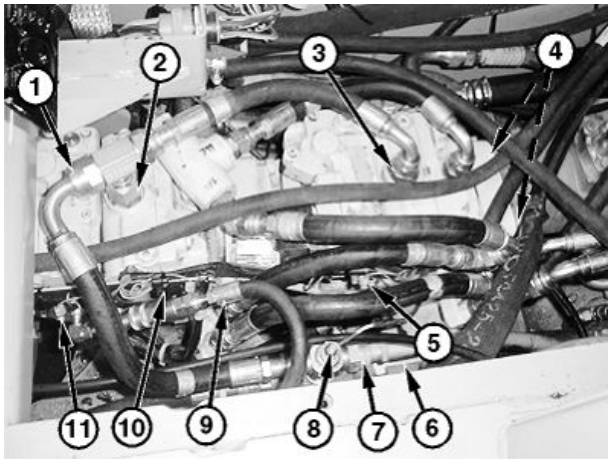

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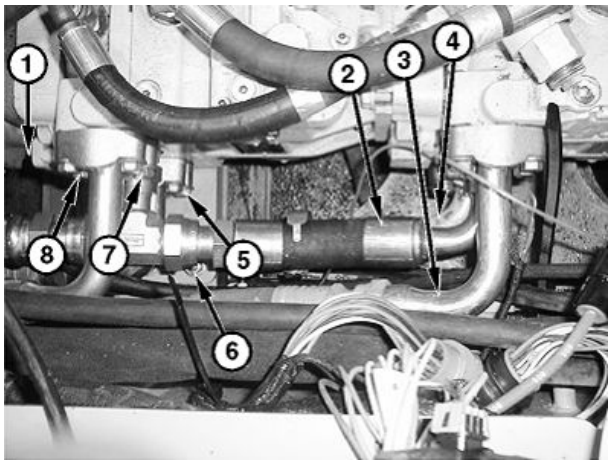
CED,TX03399,5046 -19-12AUG03-5/15

25. Disconnect lines (2—5, 7 and 8). Close all openings using caps and plugs.

    For ease of removal and installation of pumps, lines can be tied together and pulled up and out of the way.
26. Remove cap screws (1 and 6) and remove rear pump mounting bracket.

1— Hydrostatic Pump-to-Rear Mount Bracket Cap Screws (2 used)
2— Line (Front Charge Pump-to-Rear Charge Pump Tee-Fitting)
3— Line (Front Pump Reverse Outlet Port-to-R.H. Motor "A" Port)
4— Line (Front Pump Forward Outlet Port-to-R.H. Motor "B" Port)
5— Line (Rear Pump Forward Outlet Port-to-L.H. Motor "A" Port)
6— Rear Pump Mount Bracket-to-Frame Cap Screws (4 used)
7— Tee-Fitting
8— Line (Rear Pump Reverse Outlet Port-to-L.H. Motor "B" Port)



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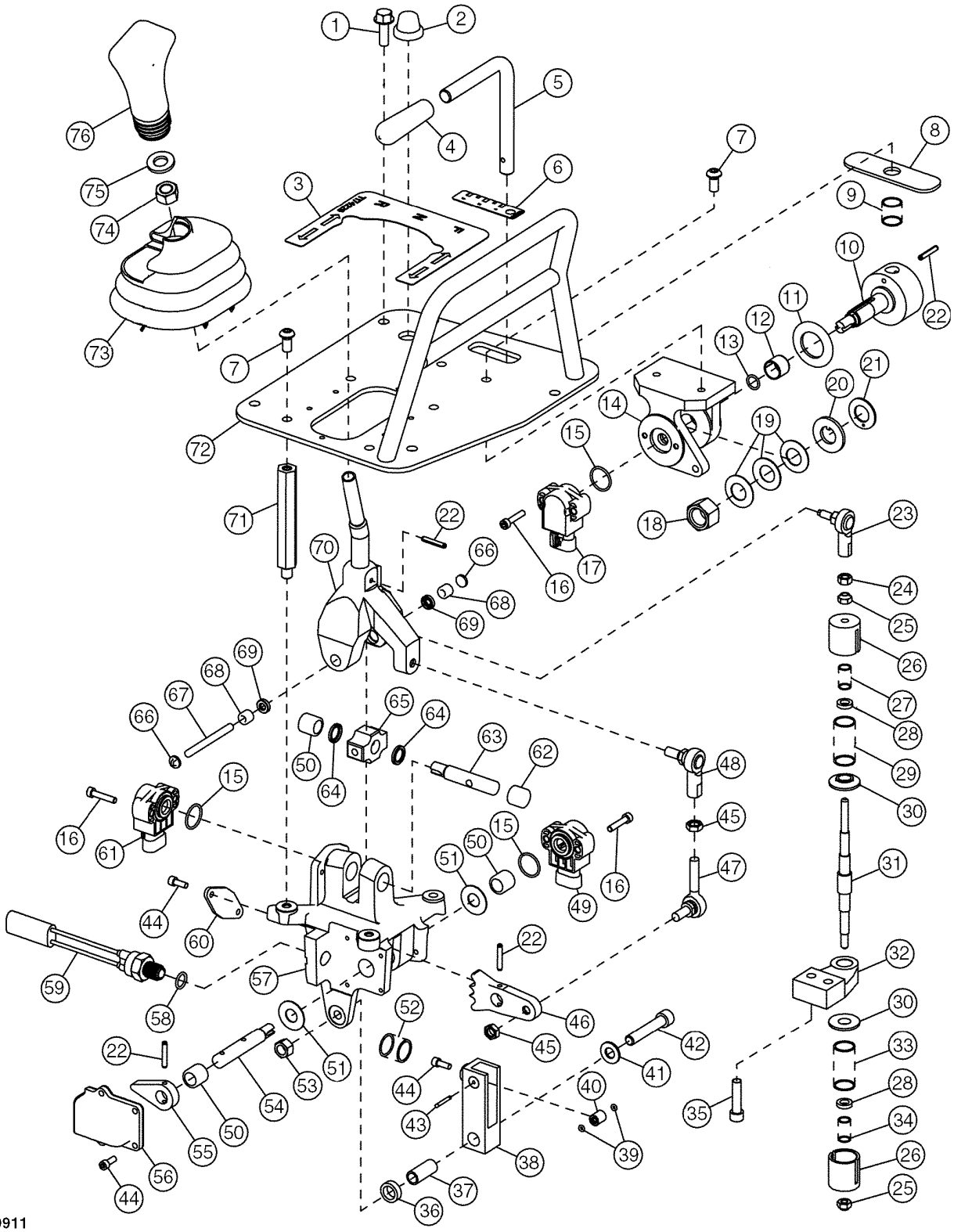
Single Lever Control (SLC) Exploded View (With Speed Lever, If Equipped)



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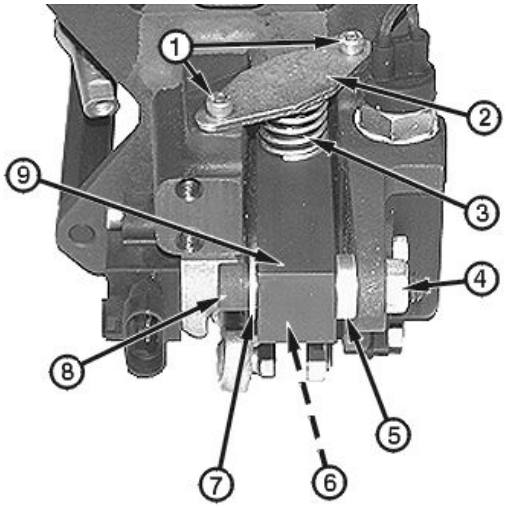
CED,OUO1066,258 -19-26MAR99-1/2

8. Remove two socket head cap screws (1), retaining plate (2) and detent spring (3).
9. Remove nut (4), socket head cap screw (8), spacer (5), washer (7) and detent lever (9).
10. Remove tube (6) from detent lever.

1— Socket Head Cap Screws (2 used)
2— Retaining Plate
3— Detent Spring
4— Nut
5— Spacer
6— Tube
7— Washer
8— Socket Head Cap Screw
9— Detent Lever



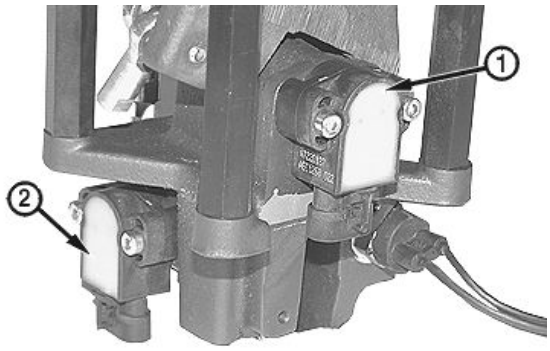
T119643B —UN—19JAN99

CED,OUTX547,108 -19-29SEP99-6/27

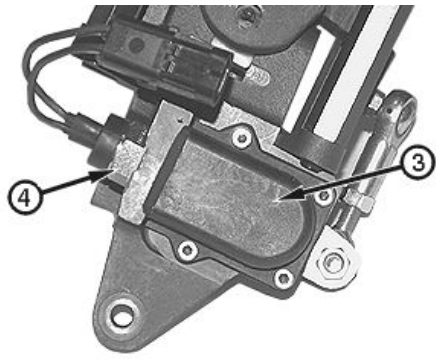
11. Remove socket head cap screws from steer sensor (1) and forward/reverse sensor (2).

    Remove sensors and O-rings.
12. Remove cover (3) and neutral start switch (4).

1— Steer Sensor
2— Forward/Reverse Sensor
3— Cover
4— Neutral Start Switch



T119644B —UN—19JAN99



T119645B —UN—19JAN99

Continued on next page

CED,OUTX547,108 -19-29SEP99-7/27

53. If removed, install boot (3) and switch (2) in grip (1).

T124646B —UN—17SEP99

CED,OUTX547,108 -19-29SEP99-24/27

54. Install and tighten screws (1—3).

T124645B —UN—17SEP99

Continued on next page

CED,OUTX547,108 -19-29SEP99-25/27

1— Charge Pump Housing/End Cap
2— Gasket
3— Valve Plate
4— Retaining Ring [1]
5— Spring Retainer [1]
6— Spring [1]
7— Spring Seat [1]
8— Cylinder Block [1]
9— Speed Sensor Ring
10— Slipper Guide Bearing (2 used)
11— Slipper Guide [1]
12— Piston Assembly [1]
13— Socket Head Cap Screw (3 used)
14— Retaining Plate
15— Lip Seal
16— Seal Carrier
17— O-Ring
18— Retaining Ring
19— Bearing
20— Spacer (4 used)
21— Cap Screw (4 used)
22— Pump Housing
23— Speed Sensor (450H, 550H S.N. —910010) (650H S.N. —924717)
24— Alignment Pin (2 used)
25— Alignment Pin (2 used)
26— Bearing Cage
27— Slider Block
28— Socket Head Cap Screw
29— Cap Screw
30— Slider Block
31— Bearing
32— Servo Arm Assembly
33— Swashplate Hold-Down Spring
34— Spring Pin
35— Guide
36— Swashplate
37— Washer
38— Cage Locator Link
39— Bearing Cage Link Pin
40— Not Used
41— Bearing Race (2 used)
42— Pump Shaft
43— Servo Piston
44— O-Ring (2 used)
45— Seal Ring (2 used)
46— O-Ring (2 used)
47— O-Ring (2 used)
48— Servo Cylinder (2 used)
49— Cap Screw (6 used)
50— Cap Screw (2 used)
51— Lever Assembly
52— O-Ring
53— Side Cover Insert
54— Side Cover
55— Cap Screw (6 used)
56— Nut (2 used)
57— Swashplate Lever Spring (2 used)
58— Shim (2 used)

[1] *Serviced as an assembly.*

CED,OUO1004,520 -19-13APR99-2/2

Disassemble Hydrostatic Pumps

CAUTION: The weight of the hydrostatic pump is approximately 60 kg (133 lb). Use proper lifting equipment and safety precautions. Failure to do so may cause personal injury.

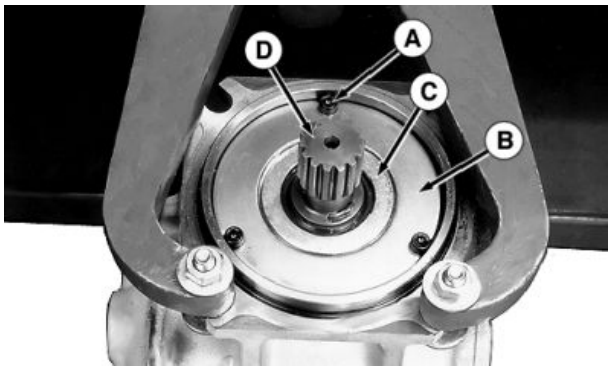
Hydrostatic Pump—Specification

Hydrostatic Pump—Weight	60 kg (133 lb) Approximate

IMPORTANT: Absolute cleanliness is essential when working on hydraulic components.

NOTE: Orientate double boss of pump housing on holding fixture as shown.

1. Mount the hydrostatic pump on a D01006AA Bench-Mounted Holding Fixture.
2. Remove displacement control valve assembly. (See Disassemble and Assemble Displacement Control Valve in this group.)



RW25727 —UN—09JUN97

A—Socket Head Cap Screw (3 used)
B—Retaining Plate
C—Seal Carrier
D—Shaft

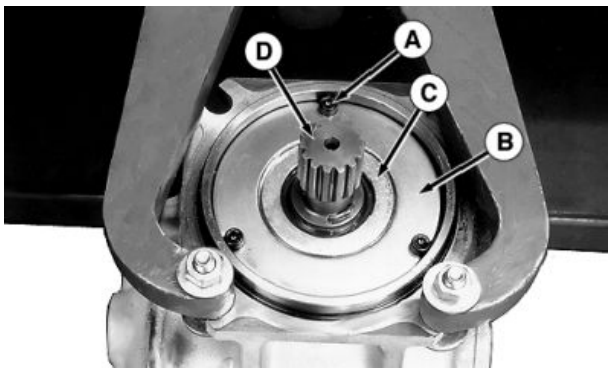
3. Remove speed sensor (front pump only).

CED,OUTX547,110 -19-28JUN02-1/22

4. Remove socket head cap screws (A) and retaining plate (B).

NOTE: The bearings on shaft (D) are slip fit in the housing bore.

5. Remove seal carrier (C) and shaft (D) with bearings. Lightly tap on opposite end of shaft to aid in removal.



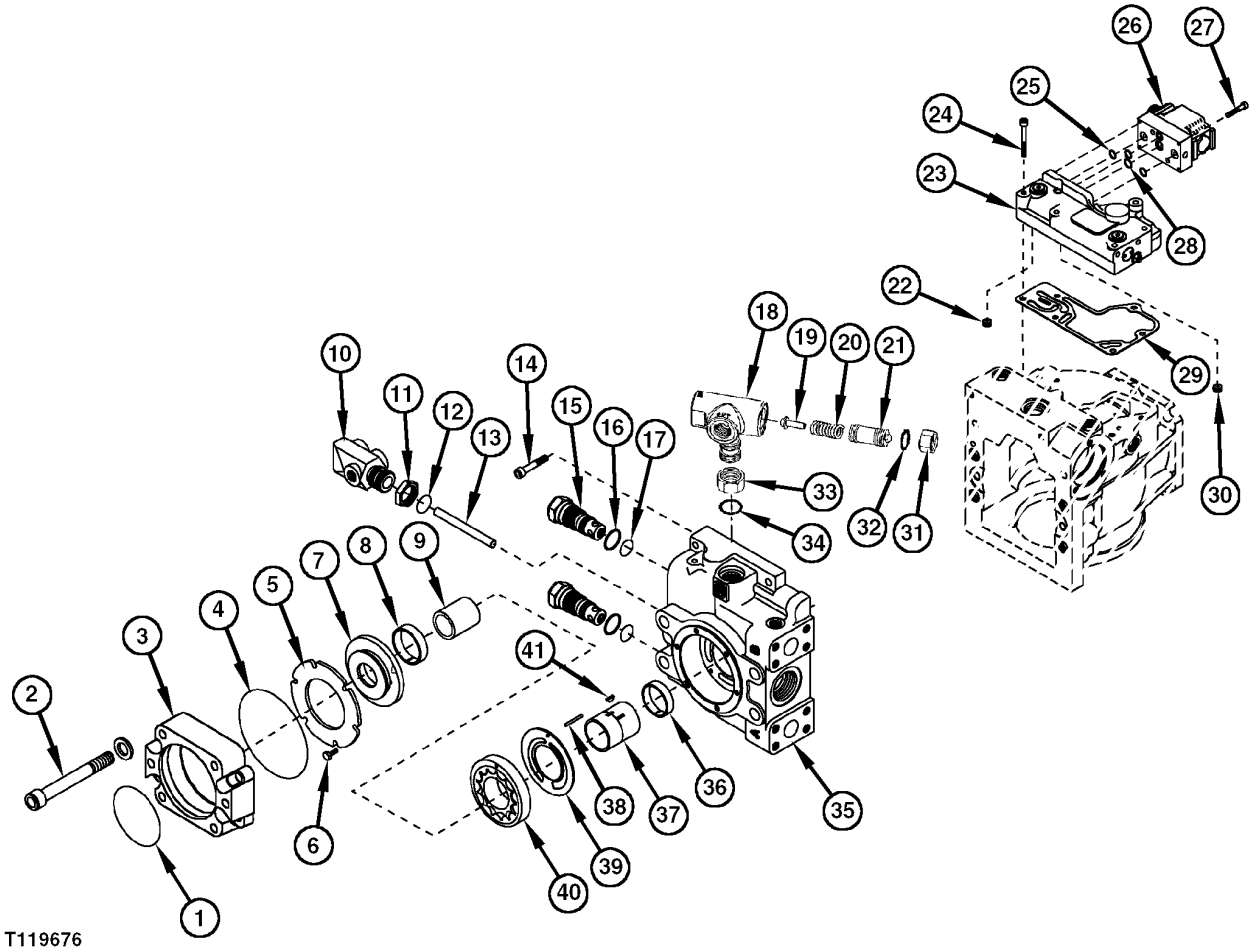
RW25727 —UN—09JUN97

A—Socket Head Cap Screw (3 used)
B—Retaining Plate
C—Seal Carrier
D—Shaft

Continued on next page

CED,OUTX547,110 -19-28JUN02-2/22

Charge Pump and Pump Controls Exploded View



T119676 —UN—22JAN99

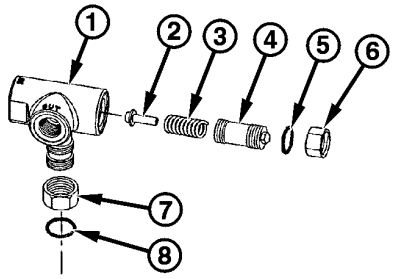
1— O-Ring
2— Socket Head Cap Screw (4 used)
3— Flange Adapter
4— O-Ring
5— Retaining Plate
6— Cap Screw (6 used)
7— Charge Pump Cover
8— Bushing
9— Coupling
10— Manifold
11— Nut
12— O-Ring
13— Tube
14— Socket Head Cap Screw (2 used)
15— Multi-Function Valve (2 used)
16— O-Ring
17— O-Ring
18— Charge Relief Valve Housing
19— Charge Relief Poppet
20— Spring
21— Adjustment Screw
22— Orifice
23— Pump Displacement Control Valve
24— Socket Head Cap Screw (6 used)
25— O-Ring (3 used)
26— Electronic Displacement Control (EDC)
27— Socket Head Cap Screws (4 used)
28— O-Ring
29— Gasket
30— Orifice
31— Nut
32— O-Ring
33— Nut
34— O-Ring
35— Charge Pump Housing/End Cap
36— Bushing
37— Charge Pump Shaft
38— Alignment Pin
39— Port Plate [1]
40— Charge Pump Gear Set [1]
41— Key

[1] *Serviced as an assembly.*

CED,OUO1008,147 -19-17DEC98-1/1

Disassemble and Assemble Neutral Charge Relief Valve

1. Disconnect lines and remove relief valve from top of front hydrostatic pump. Note orientation of valve to aid in assembly.
2. Remove parts (2—8). Clean and inspect all parts for wear or damage.
3. Install new O-rings and assemble valve.
4. Perform neutral charge relief pressure test. (See Neutral Charge Relief Pressure Test in Operation and Test Manual, Group 9026-25.)



T119677B

T119677B —UN—19JAN99

1— Valve Housing
2— Poppet
3— Spring
4— Adjusting Screw
5— O-Ring
6— Lock Nut
7— Lock Nut
8— O-Ring

CED,OUO1004,523 -19-19JAN99-1/1

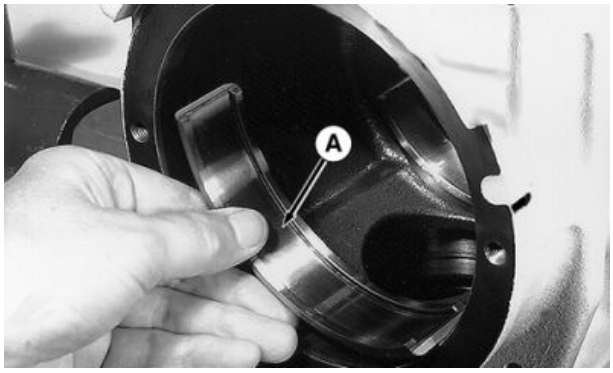
Assemble Hydrostatic Pump

NOTE: Apply clean hydrostatic oil to all internal parts before assembly

IMPORTANT: Components must be installed in proper position with original orientation to prevent premature pump failure. Bearing races must be completely seated in housing.

Inspect bearing cage wear patterns in bearing race and swash plate to determine remaining service life.

1. Install bearing races (A) in housing.
2. Lubricate and install bearing cage on the bearing races.



A—Bearing Race (2 used)

RW25758 —UN—16JUN97

RX16216015,17A -19-14APR10-1/17

IMPORTANT: Damage to polished surfaces can cause premature pump failure. Be careful when handling parts with polished surfaces to prevent nicks or scratches.

NOTE: Either side of slipper guide can be installed against slippers. Flip slipper guide if excessive wear is on top bearing surface.

3. Inspect slipper guide surface, install smoothest side away from slippers.

   Clean slipper guide bearing screw holes on swash plate surface using M8 tap.

NOTE: Apply clean hydrostatic oil to all internal parts before assembly.

Piston Assemblies

T84648L —UN—14JUN95

4. Install the piston assemblies into the slipper guide.
5. Apply clean hydrostatic oil on slippers. Center the pistons and guide on the swash plate.

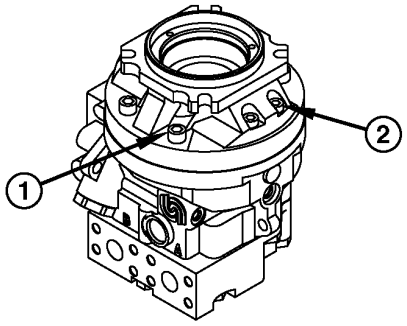
Continued on next page

RX16216015,17A -19-14APR10-2/17

11. Loosen socket head cap screws (1 and 2) on front cover.

1— M12 Socket Head Cap Screws (4 used)

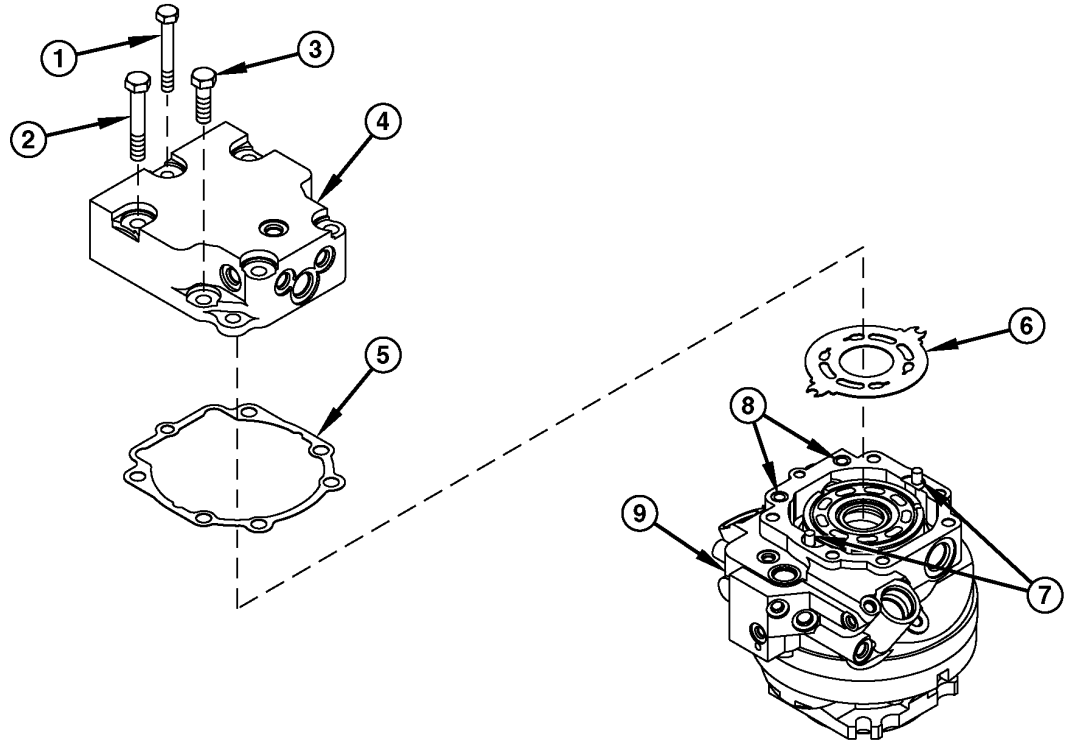
2— M10 Socket Head Cap Screws (4 used)



T119215

T119215 —UN—27JAN99

CED,OUO1004,548 -19-13APR99-4/17



T119211

T119211 —UN—27JAN99

1— M10 x 75 Cap Screw
2— M12 x 75 Cap Screw (4 used)
3— M12 x 40 Cap Screw (2 used)
4— End Cap
5— Gasket
6— Valve Plate
7— Alignment Pin (2 used)
8— Seal Ring (2 used)
9— Motor Housing

12. Rotate motor 180° on work surface.

13. Remove cap screws (1—3) from end cap (4).

NOTE: Watch for seal rings (8) and alignment pins (7) when separating end cap from motor housing.

14. Separate end cap (4) from motor housing (9).

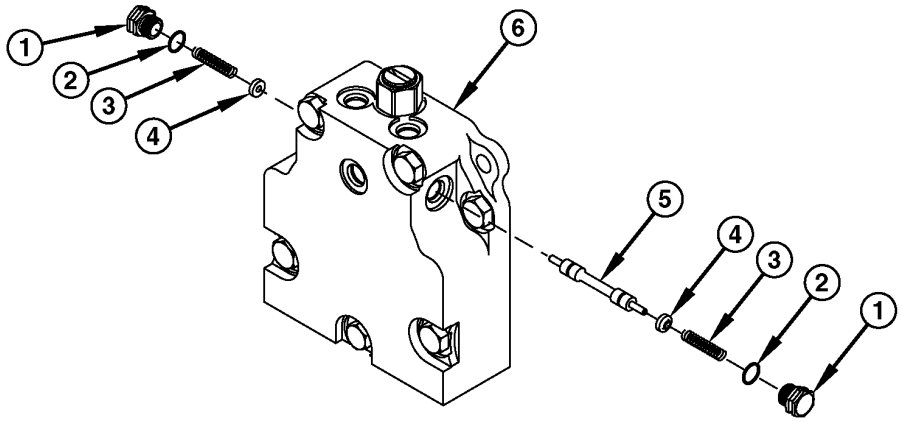
15. Remove gasket (5), seal rings (8) and alignment pins (7).

16. Remove valve plate (6).

Continued on next page

CED,OUO1004,548 -19-13APR99-5/17

Disassemble and Assemble Loop Flushing Valve



T119208

T119208 —UN—27JAN99

1— Valve Cap (2 used)
2— O-Ring (2 used)
3— Spring (2 used)
4— Shoulder Washer (2 used)
5— Spool Valve
6— Motor End Cap

1. Remove rear access plate from machine.

NOTE: Clean thoroughly around plugs before removing.

2. Remove valve caps (1) and parts (2—5).
3. Clean and inspect parts.

NOTE: Shoulder of washers (4) must face out toward springs when assembled.

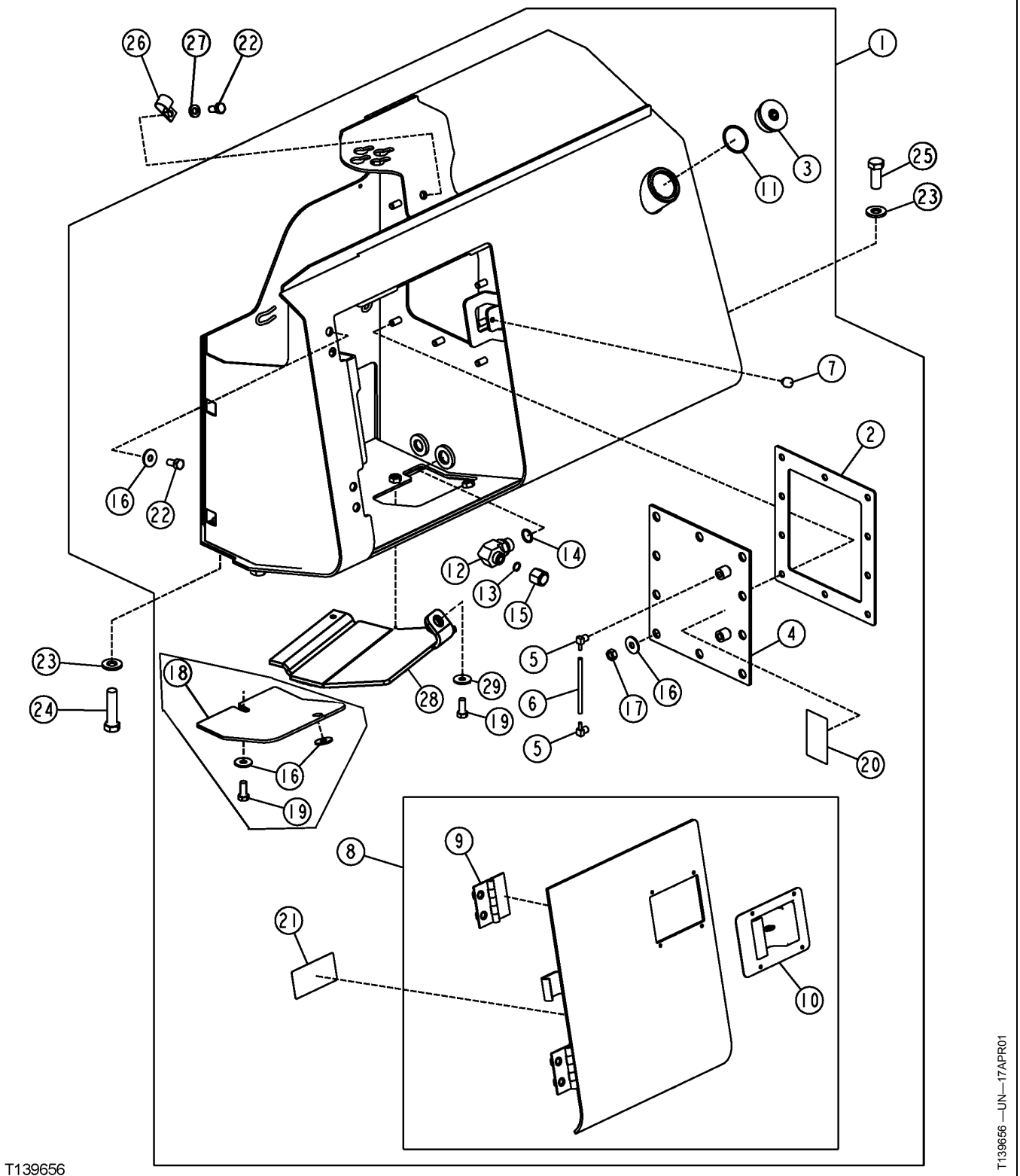
4. Install parts (1—5). Tighten valve caps (1) to specifications.

Hydrostatic Motor—Specification

Loop Flushing Valve
Caps—Torque..... 41 N·m (30 lb-ft)

5. Install rear access plate on machine.

CED,OUO1004,551 -19-13APR99-1/1



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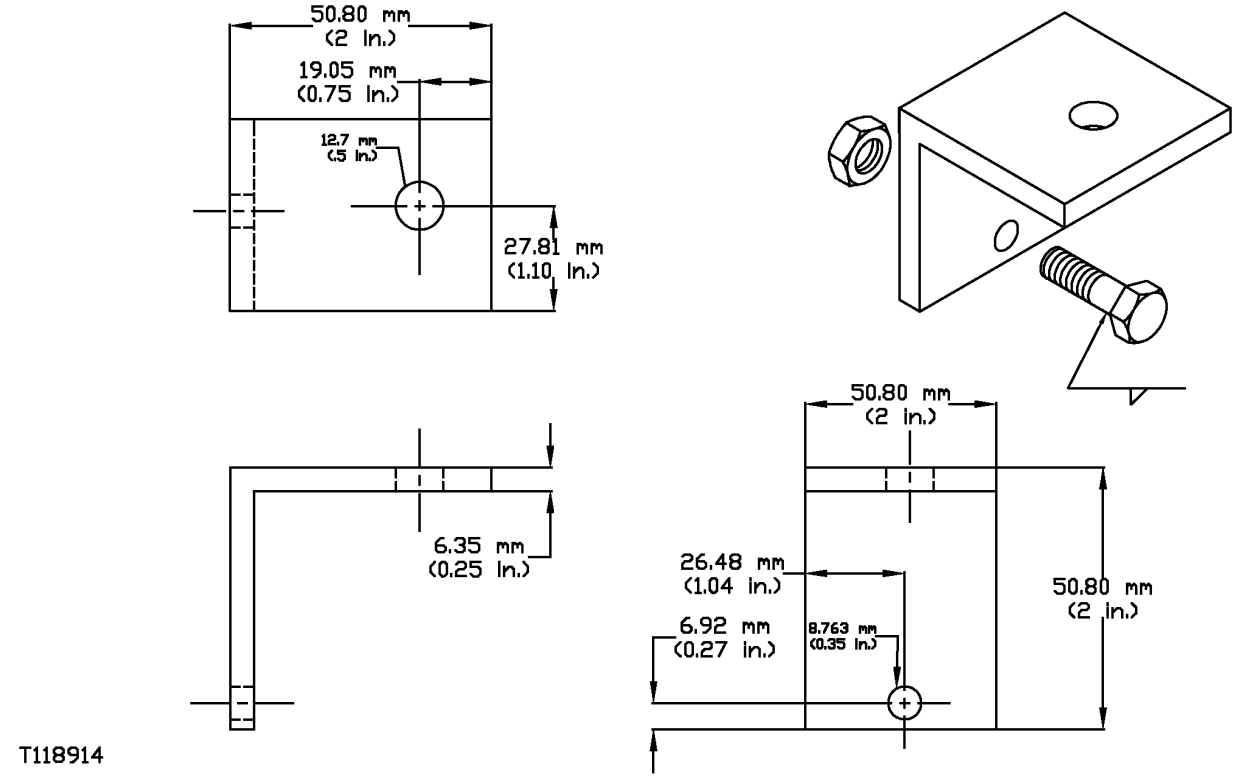
CED,TX03399,5044 -19-05MAR04-2/3

DFT1168 Right Hand Hydrostatic Motor Lifting Bracket



A—12 mm (0.472 in.) hole **B—M10 x 1.5 drill and tap hole**

Used with DFT1132 Hydrostatic Motor Removal and Installation Tool to remove and install hydrostatic right hand motor (without winch option).

Material required:

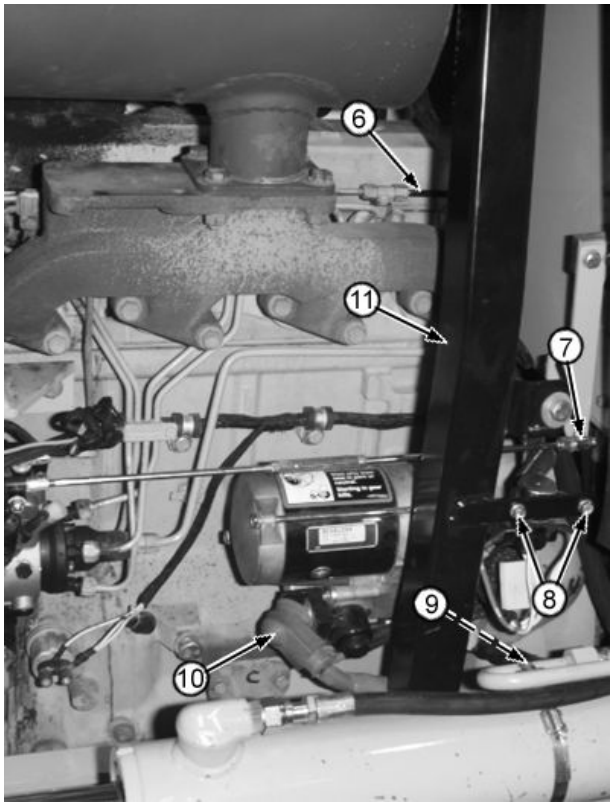
- 2 in. x 2 in. x 1/4 in. angle iron
- 5/16 x 1-1/2 in. cap screw

Cap screw must be welded to angle iron.

CED,OUO1008,160 -19-13APR99-1/1

27. Install parts (6—10).

6— Fuel Return Line
7— Speed Control Linkage
8— Start Relay Cap Screw (2 used)
9— Ground Strap
10— Start Solenoid Positive Cable
11— Rear Hood Bracket with Air Cleaner



T117449B —UN—29SEP98

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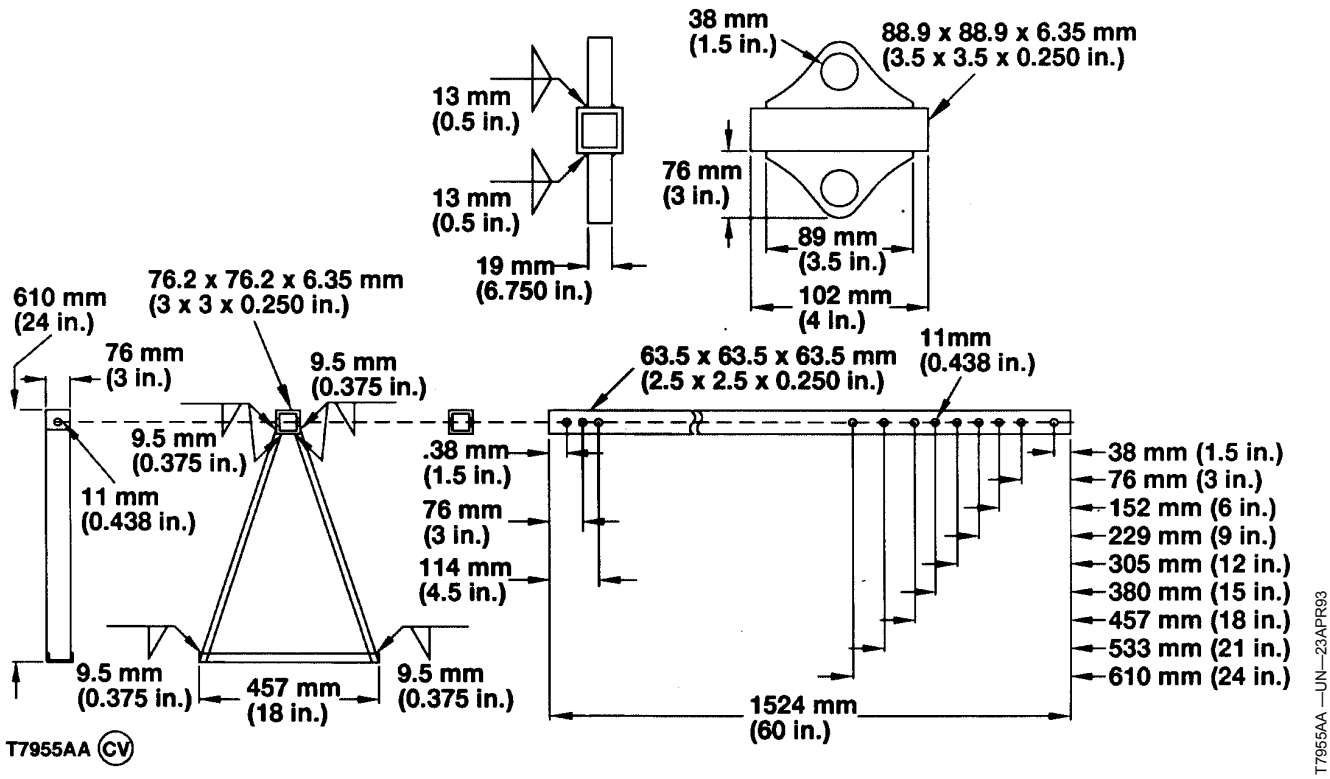
CED,TX03399,5009 -19-11FEB00-10/11

DFT1119 Pump Support



Pump support is used with a small winch hoist to support the hydrostatic pumps when an engine is removed.

Two end stands are needed.

Drill the holes through the square steel tubing so they are centered.

Material required:

- C3 x 5 Steel Channel
- 88.9 x 88.9 x 6.35 mm (3.5 x 3.5 x 0.250 in.) Square Steel Tubing
- 76.2 x 76.2 x 6.35 mm (3 x 3 x 0.250 in.) Square Steel Tubing
- 63.5 x 63.5 x 6.35 mm (2.5 x 2.5 x 0.250 in.) Square Steel Tubing
- 19 mm (3/4 in.) flat bar stock
- M10 x 89 mm or 3/8 x 3 1/2 in. D Grade (SAE Grade 5) Cap Screw (2 used)
- M10 or 3/8 in. D Grade (SAE Grade 5) Nut (2 used)

CED,TX03399,2297 -19-19APR06-1/1

Remove and Install Fan Blade and Shroud (450H, 550H) (650H S.N.—924717)

1. Remove engine side shields.
2. Release belt tension adjuster to loosen belt.
3. Disconnect compressor wiring lead connector (4).
4. Remove cap screws (5) and set compressor to right side.
5. Remove fan guard (6).
6. Remove fan blade, spacer and pulley (2).
7. To remove shroud, remove hood. (See Remove and Install Hood, Group 1910.)
8. Disconnect upper oil cooler hose (1), radiator hose (3) and coolant over flow tube from coolant tank.
9. Remove cap screws and turn shroud 90° and tilt up.
10. Install shroud, connect cooler hose, radiator hose, and coolant over flow tube.

NOTE: To aid in assembly, use two M10 x 50 mm cap screws to draw in spacer and pulley to fan drive hub.

11. Install fan pulley, spacer and fan. Tighten fan cap screws to specifications.

Fan Blade and Shroud —Specification

Fan Blade Cap Screws—Torque ..... 73 N·m (54 lb-ft)

12. Install fan guard. Tighten cap screws to specifications.

Fan Blade and Shroud —Specification

Fan Guard Cap Screws—Torque ..... 16—19 N·m (142—168 lb-in.)

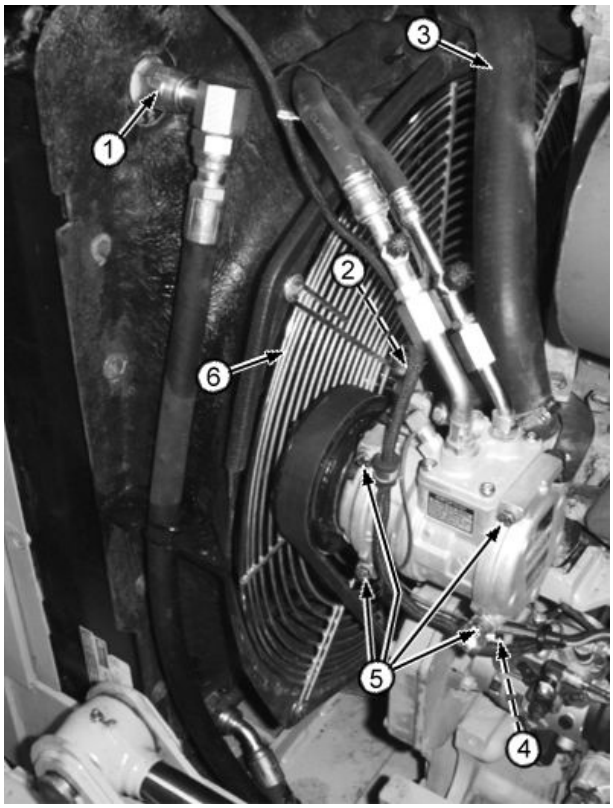
13. Install compressor. Tighten cap screws to specifications.

Fan Blade and Shroud—Specification

Compressor Cap Screws—Torque ..... 35 N·m (26 lb-ft)

14. Connect compressor wire lead connector.
15. Install fan belt and engine side shields. Install hood if removed. (See Remove and Install Hood, Group 1910.)

1— Upper Oil Cooler Hose
2— Pulley
3— Radiator Hose
4— Wiring Lead Connector
5— Cap Screws (4 used)
6— Fan Guard



T117466B —UN—30SEP98

T117467B —UN—30SEP98

OUT3019,0000081 -19-23APR19-1/1

1— Cable
2— Clamp (2 used)
3— Throttle Lever
4— Friction Disk Washer (2 used)
5— Yoke with Locking Collar
6— Angle Bracket
7— Washer
8— Cap Screw
9— Washer (2 used)
10— Nut (3 used)
11— Notched Metal Washer
12— Spring Washer (5 used)
13— Lock Nut
14— Cap Screw
15— Washer
16— Spring
17— Upper Slider Plate
18— Lower Slider Plate
19— Grip
20— Cap Screw
21— Washer

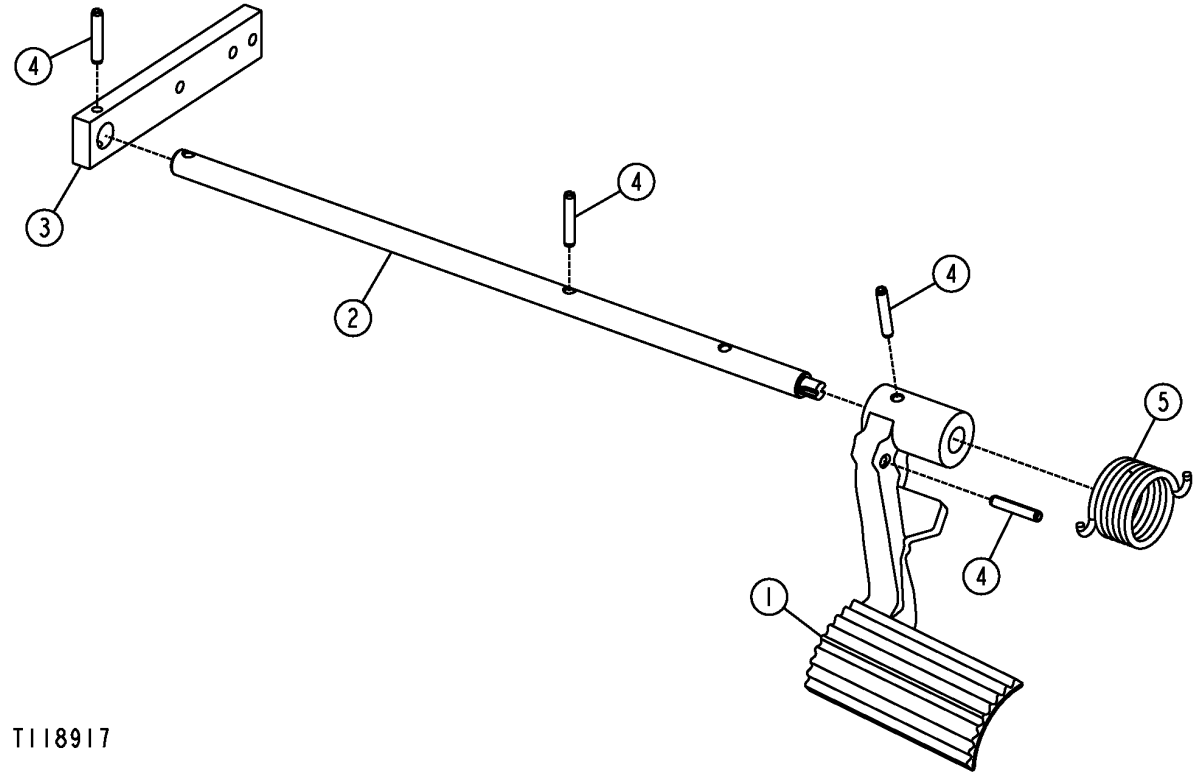
1. Lower equipment to the ground.
2. Remove left engine side shields
3. Remove dash and foot rest.
4. Remove parts as required.
5. Install parts.
6. Install spring washers (12) with concave side toward notched metal washer (11).
7. Apply instant gel adhesive to throttle lever (3) and install grip (19).
8. Tighten nut (13) to initiate a 67—76 N (15—17 lb) (force) movement on lever in the forward direction.

Speed Control Lever—Specification

Lever to Initiate Movement in Forward Direction—Force..... 67—76 N (15—17 lb)

9. Adjust linkage. (See Engine Speed Control Linkage Adjustment in Operation and Test Manual, Group 9010-20.)

CED,OUTX547,123 -19-23MAR01-2/4



T118917

T118917 —UN—21DEC98

1— Decelerator Pedal
2— Shaft
3— Bellcrank
4— Spring Pin (4 used)
5— Torsion Spring

10. Remove and install parts as necessary.
11. Adjust. (See Engine Speed Control Linkage Adjustment in Operation and Test Manual, Group 9010-20.)

Continued on next page

CED,OUTX547,123 -19-23MAR01-3/4

Mounting Frame

1— Right Hand Side Rail Frame
2 — Left Hand Side Rail Frame
3— Washer (28 used)
4— Front and Rear Side Rails-to-Engine Cap Screw (14 used)
5— Rear Support Bracket-to-Rear Hydraulic Pump Cap Screw (2 used)
6— Rubber Mount (4 used)
7— Washer (8 used)
8— Side Rails-to-Main Frame Cap Screw (4 used)
9— Cover
10— Pump-to-Flywheel Cover Cap Screw (4 used)
11— Washer (12 used)
12— Flywheel Cover-to-Engine Flywheel Cap Screw (12 used)
13— Bracket
14— Rear Pump Support-to-Side Rail Cap Screw (4 used)
15— Nut (4 used)
16— Nut (4 used)
17— Locking Plate (4 used)

Item	Measurement	Specification
Engine and Power Train Mounting Parts		
Side Rails-to-Engine Cap Screws	Torque	130 N·m (96 lb-ft)
Pump-to-Flywheel Cover Cap Screws	Torque	140 N·m (103 lb-ft)
Flywheel Cover to Engine Flywheel Cap Screws	Torque	73 N·m (54 lb-ft)
Rear Pump Support Bracket-to-Side Rails Cap Screws	Torque	140 N·m (103 lb-ft)
Rear Support Bracket-to-Rear Hydrostatic Pump Cap Screws	Torque	140 N·m (103 lb-ft)
Side Rails to Main Frame Cap Screws	Torque	320 N·m (236 lb-ft)

CED,TX03399,5021 -19-13APR99-2/2

Section 11
Park Brake

Contents

1— Knob
2— Lever
3— Cap Screw (2 used)
4— Lever Upper Stop (Boss)
5— Lever Down Stop (Boss)
6— Switch
7— Socket Head Cap Screw (2 used)
8— Cam
9— Spring Pin
10— Nylon Washer
11— Needle Bearing (2 used)
12— Bracket
13— Nylon Washer
14— Bellcrank
15— Groove Pin
16— Washer (5 used)
17— Cotter Pin
18— Pin
19— Pin Guide (2 used)
20— Spring (2 used)
21— Pin (2 used)
22— Washer (8 used)
23— Lock Nut
24— Cap Screw
25— Lock Nut
26— Washer
27— Shoulder Cap Screw
28— Brake Pedal
29— Yoke
30— Nut
31— Linkage Rod
32— Nut
33— Ball Joint
34— Cap Screw
35— Washer (2 used)
36— Washer (2 used)
37— Cap Screw (2 used)

4. Remove lower dash panel (3).

NOTE: Before disassembly, mark the position of cam (8) and bellcrank (14) in relation to lever (2) to aid in assembly.

5. Position park lock lever (2) in the unlocked position (down) and remove shoulder cap screw (27), washer (26) and lock nut (25) to disconnect brake pedal (28) from yoke (29).

   Remove cap screw (34), washers (35) and linkage rod assembly.

6. Remove cap screw (3) to remove lever upper stop (4). Rotate park brake lever up and remove cap screw (3) and lever down stop (5).

NOTE: Park brake lock lever should be in the unlocked position (down) to relieve tension on springs (20).

7. With park lever down, loosen cap screws (37).
8. Rotate right side of park lock assembly toward the operator and remove springs (20) and washers (16) by lifting springs and washers off of pins (21).
9. Remove cap screws (37), washers (36) and park lock linkage assembly.
10. Remove parts (21—24) from firewall anchor.
11. Remove switch (6).

IMPORTANT: Support assembly so needle bearings (11) do not receive an impact when driving out pins (9 and 15).

12. Remove pin (9) to remove cam (8) and nylon washer (10).
13. Remove pin (15).
14. Slide lever (2) out of bracket (12), removing washer (13) and bellcrank (14).
15. Remove bearings (11) from bracket (12).
16. Remove yoke (29) and ball joint (33) from linkage rod, if required. Count and record number of turns to aid in reassembly or replacement.
17. Clean and inspect all parts. Replace as required.
18. Install yoke (29) and ball joint (33) on linkage rod (31). Step of yoke (29) should face as shown.
19. Install bearings (11) flush into bracket (12) adding grease during assembly.
20. Clean cap screw (3) and apply cure primer. Apply thread lock and sealer (medium strength) to cap screw and install lever upper stop (4).
21. Install lever (2) through smaller side of bracket, bellcrank (14), nylon washer (13) and opposite side of bracket.
22. Install nylon washer (10) onto lever.

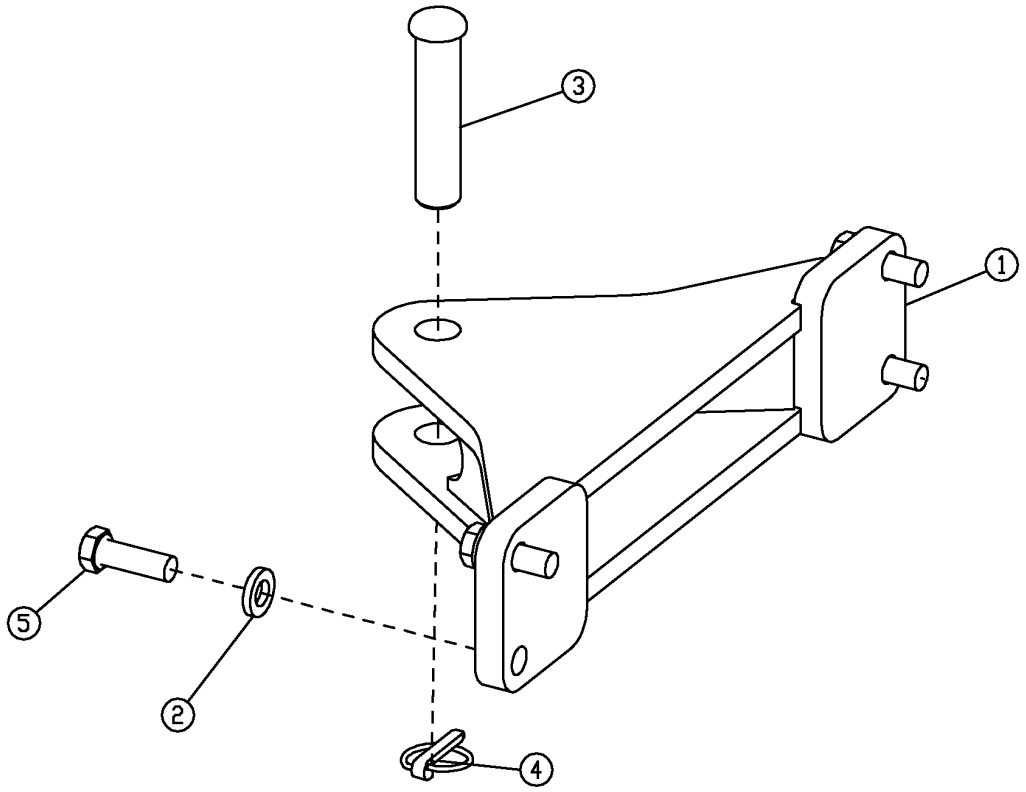
IMPORTANT: Support assembly so needle bearings (11) do not receive an impact when driving in pins (9 and 15).

23. Install cam (8) using pin (9) in orientation shown on illustration or as marked in disassembly.
24. Install bellcrank (14) using pin (15) in orientation shown in illustration or as marked in disassembly. Install pin flush in center of bellcrank.
25. Clean threads of lever (2) and apply cure primer. Apply thread lock and sealer (medium strength) to threads and install knob (1) with symbols facing outward.
26. Install parts (16—19). Install pin guides (19) and pin (18) in direction shown.
27. Install switch (6) using socket head cap screws (7).
28. Install parts (21—24) on firewall anchor. Tighten nut and then back off 1/2 turn.
29. Loosely install park lock assembly in machine using cap screws (37) and washers (16).
30. With the park lock lever in the unlocked position (down) and the right side of the park lock assembly rotated toward the operator, place washers (16) and spring (20) over pin (21). Install opposite end of spring over pin guide (19). Repeat steps for other side.
31. Rotate park lock lever to the locked position (up), while working pins (21) into pin guides (19). Rotate park lock assembly forward to the firewall and tighten cap screws (37).
32. Apply cure primer to threads of cap screw (3). Apply thread lock and sealer (medium strength) and install lever down stop (5) onto bracket (12).
33. Rotate park lock lever to unlocked position (down) and install park lock linkage rod by connecting ball joint (33) to left side of bellcrank assembly (14) and yoke (29) to brake pedal as shown. Make sure step of yoke (29) faces as shown.

Continued on next page

CED,OUTX547,131 -19-08APR99-3/4

Remove and Install Drawbar



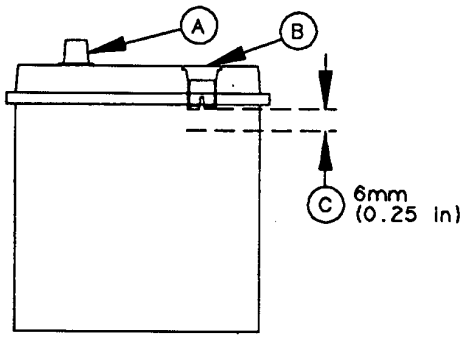
1— Plate
2— Washer (4 used)
3— Pin
4— Quick Lock Pin
5— Cap Screw (4 used)

CED,OUTX547,133 -19-20OCT98-1/1

IMPORTANT: During freezing weather, batteries must be charged after water is added to prevent battery freezing. Charge battery using a battery charger or by running the engine.

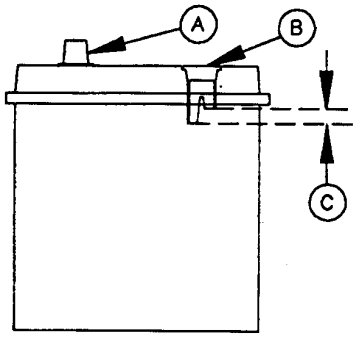
3. Fill each cell to within specified range with distilled water. DO NOT overfill.

A—Battery Post
B—Fill Tube
C—Electrolyte Level Range



T6996DB —UN—10FEB89

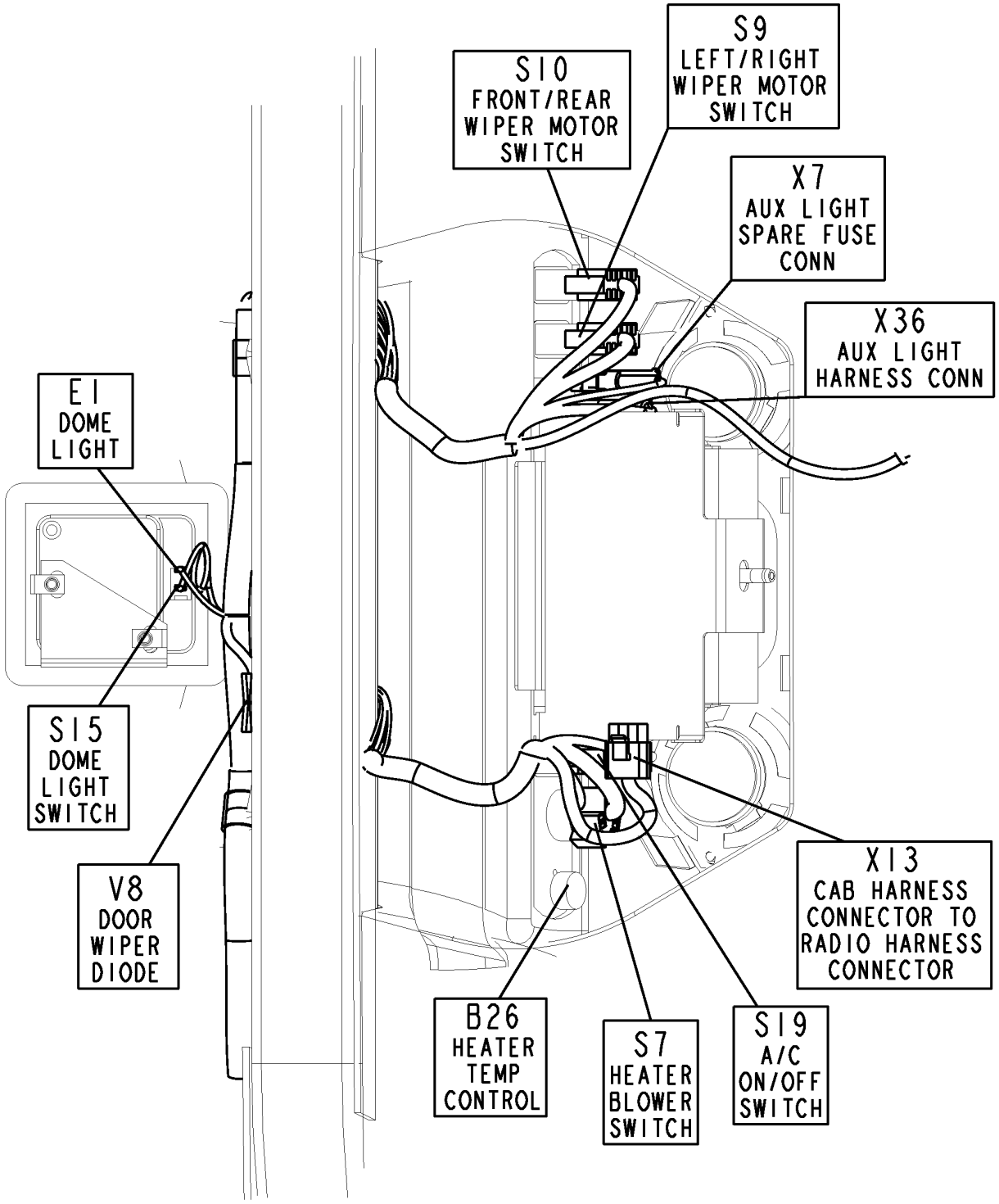
Single Level Fill Tube Application



T6996DA —UN—10FEB89

Dual Level Fill Tube Application

CED,OUTX547,137 -19-14APR99-2/2



TX1075579

CAB HARNESS (W5)
COMPONENT LOCATION (2 OF 8)

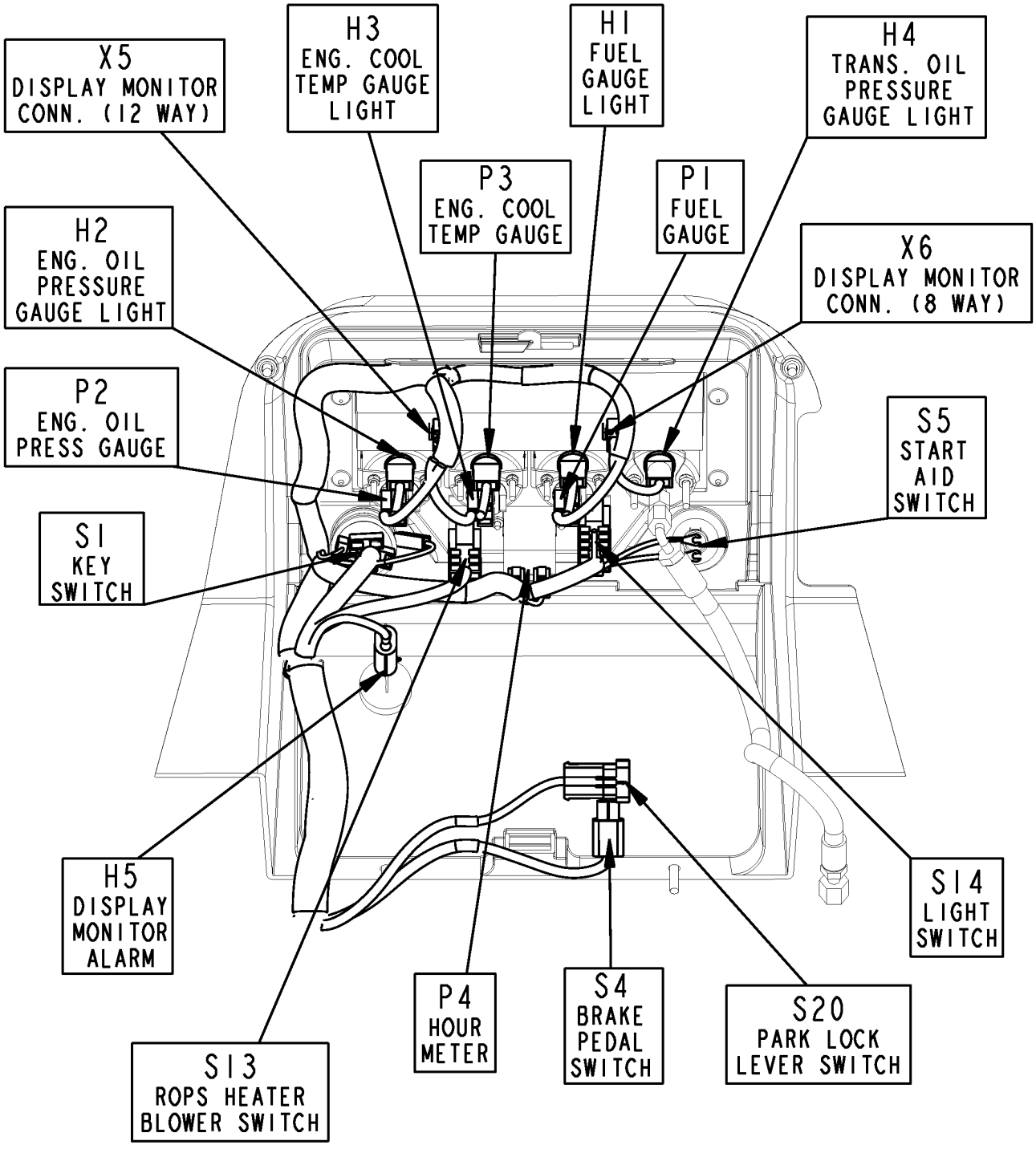
REV 3.0

TX1075579 —UN—13APR10

Cab Harness (W5) Component Location 2 of 8 (S.N. 883589—)

Continued on next page

CED,OUTX547,143 -19-15JUN10-5/22



TX1075574

CAB HARNESS (W5)
COMPONENT LOCATION (6 OF 8)

REV 3.0

TX1075574 —UN—13APR10

Cab Harness (W5) Component Location 6 of 8 (S.N. —883588)

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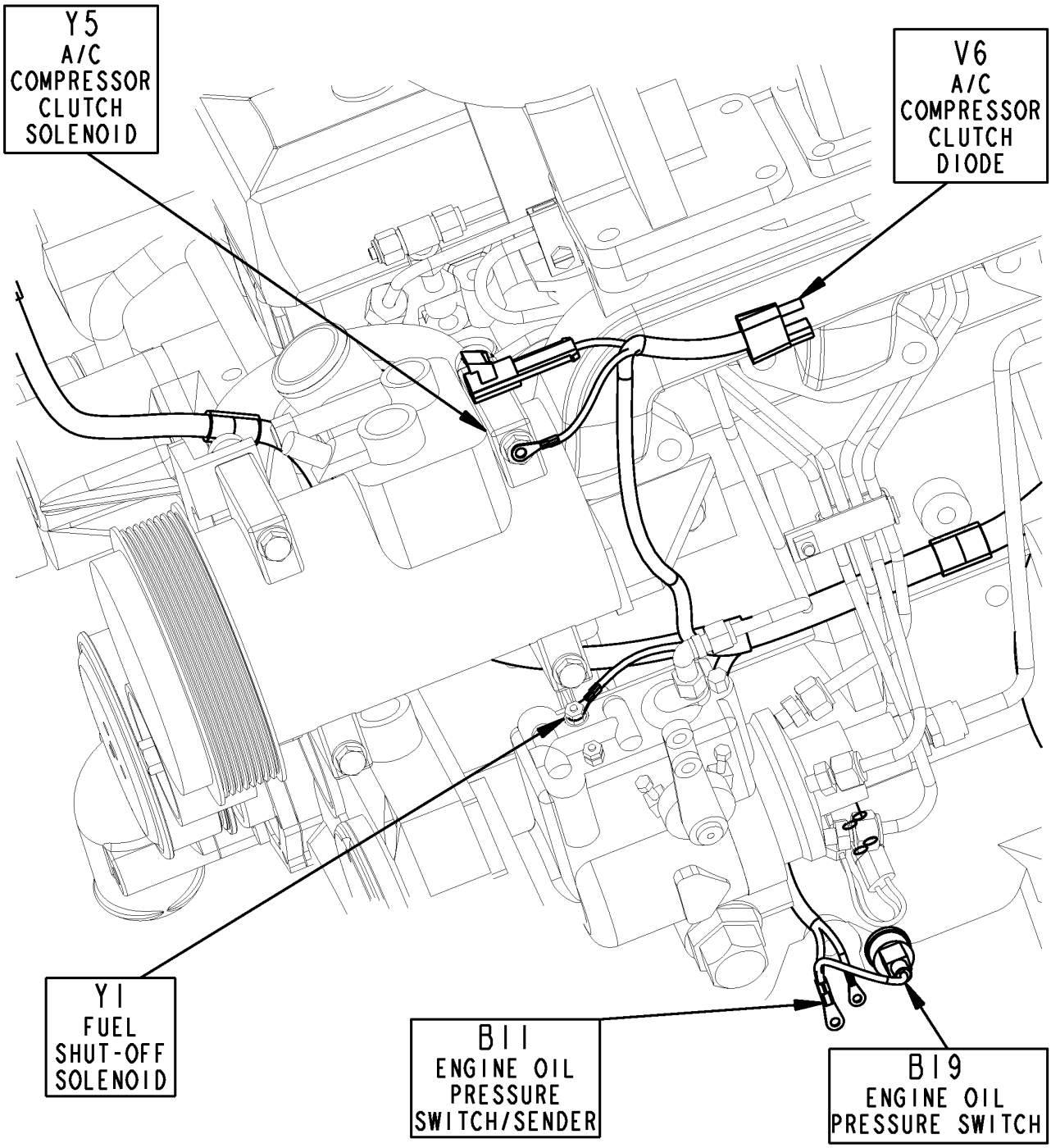
CED,OUTX547,143 -19-15JUN10-15/22



TX1075562

ENGINE HARNESS (W6) COMPONENT LOCATION (2 OF 4)

REV 3.0

Engine Component Location 2 of 4

Y5— Air Conditioning Compressor Clutch Solenoid

V6— Air Conditioning Clutch Diode

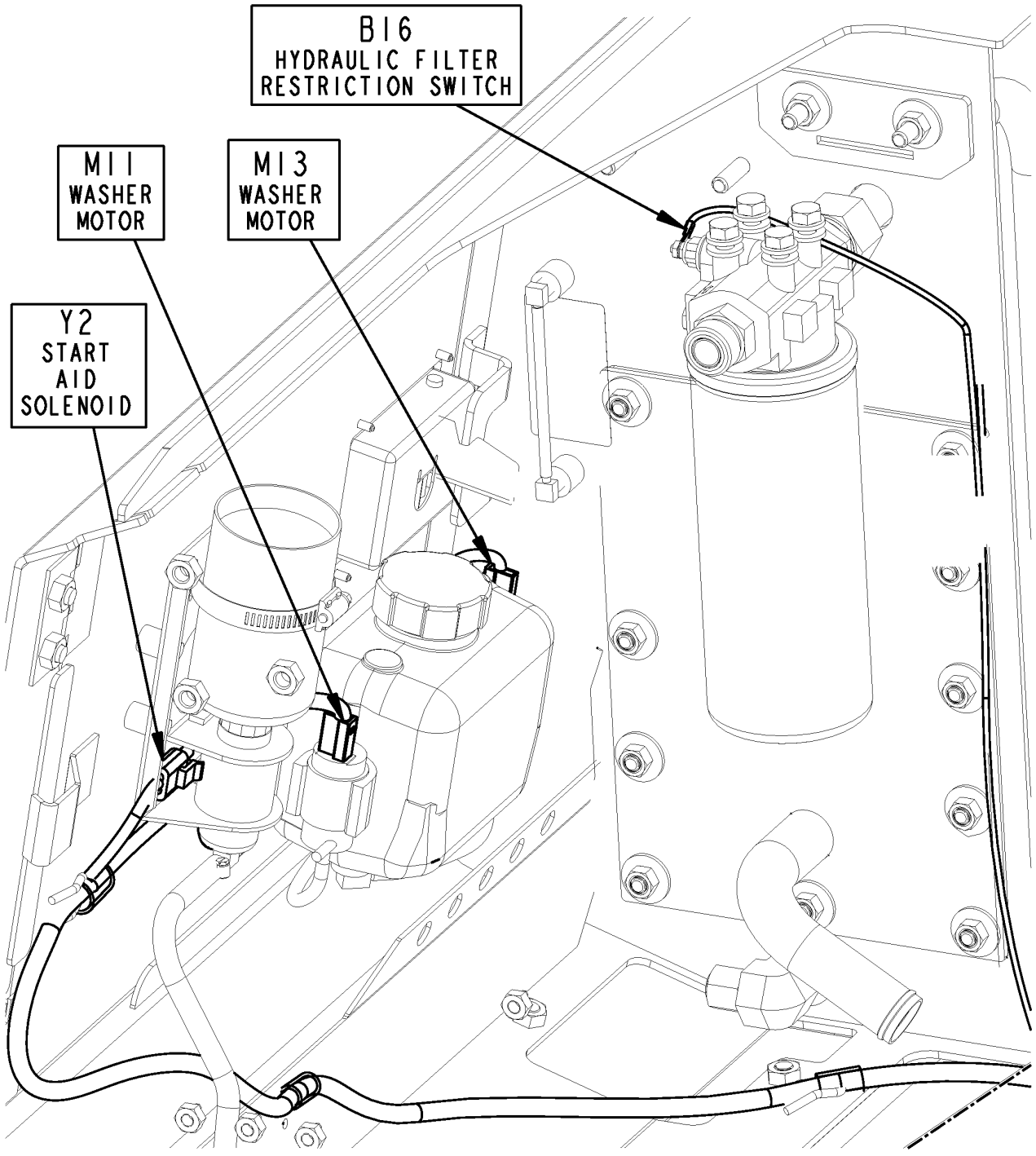
B11— Engine Oil Pressure Switch/Sender

B19— Engine Oil Pressure Switch

Y1— Fuel Shut-Off Solenoid

Continued on next page

CED,OUTX547,145 -19-15JUN10-3/7



TX1075567

TRANSMISSION HARNESS (W7)
COMPONENT LOCATION (3 OF 5)

REV 3.0

TX1075567 —UN—13APR10

Transmission Component Location 3 of 5

B16— Hydraulic Filter Restriction Switch
M11— Washer Motor
M13— Washer Motor
Y2— Start Aid Solenoid

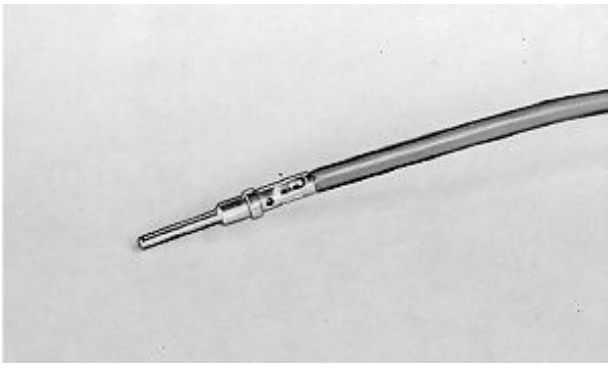
Continued on next page

CED,OUTX547,146 -19-09JUN10-6/10

IMPORTANT: If all wire strands are not crimped into contact, cut off wire at contact and repeat contact installation procedure.

NOTE: Readjust crimping tool for each crimping procedure.

8. Inspect contact to be certain all wires are in crimped barrel.



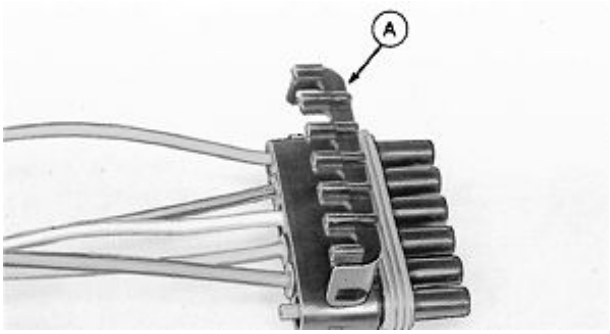
TS0135 —UN—23AUG88

CED,OUTX547,150 -19-14APR99-4/4

Replace Connectors

IMPORTANT: Identify wire color locations with connector terminal letters.

1. Open connector body (A).



TS0127 —UN—23AUG88

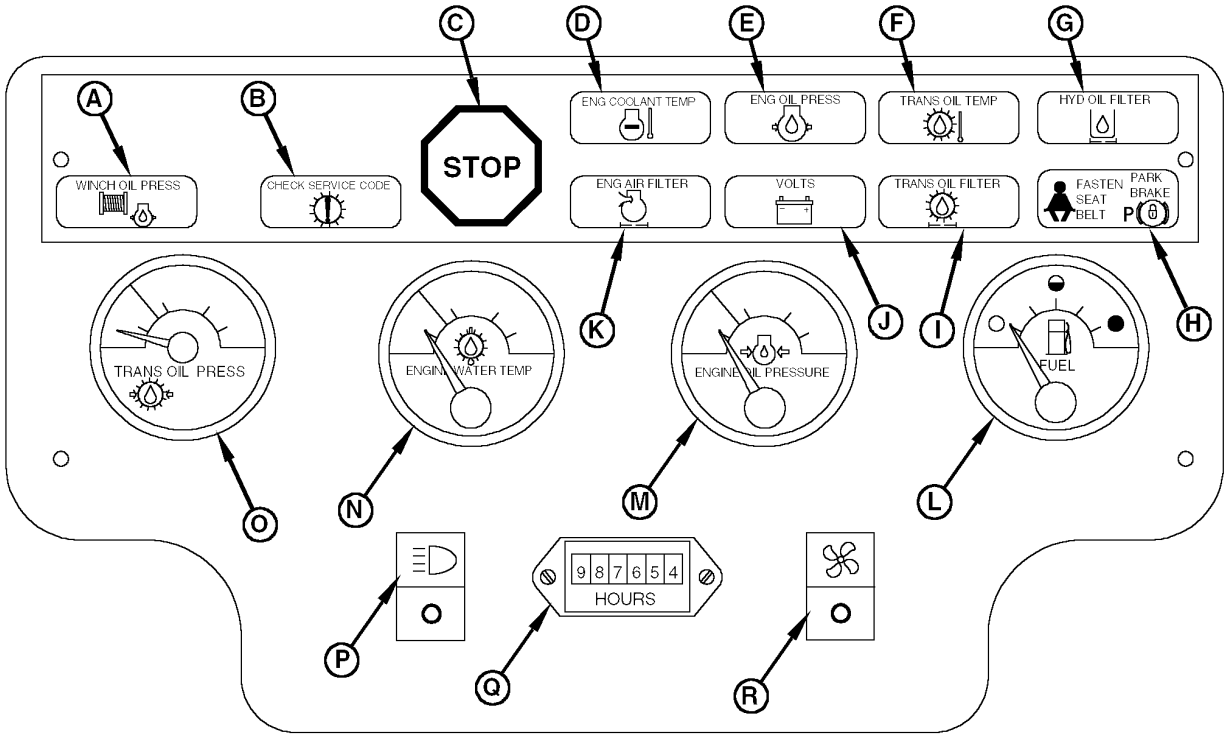
TX,1674,QQ1181 -19-14APR99-1/4

2. Insert JDG364 Extraction Tool over terminal contact in connector body.

TS0128 —UN—23AUG88

Continued on next page

TX,1674,QQ1181 -19-14APR99-2/4



T117816 —UN—22JAN99

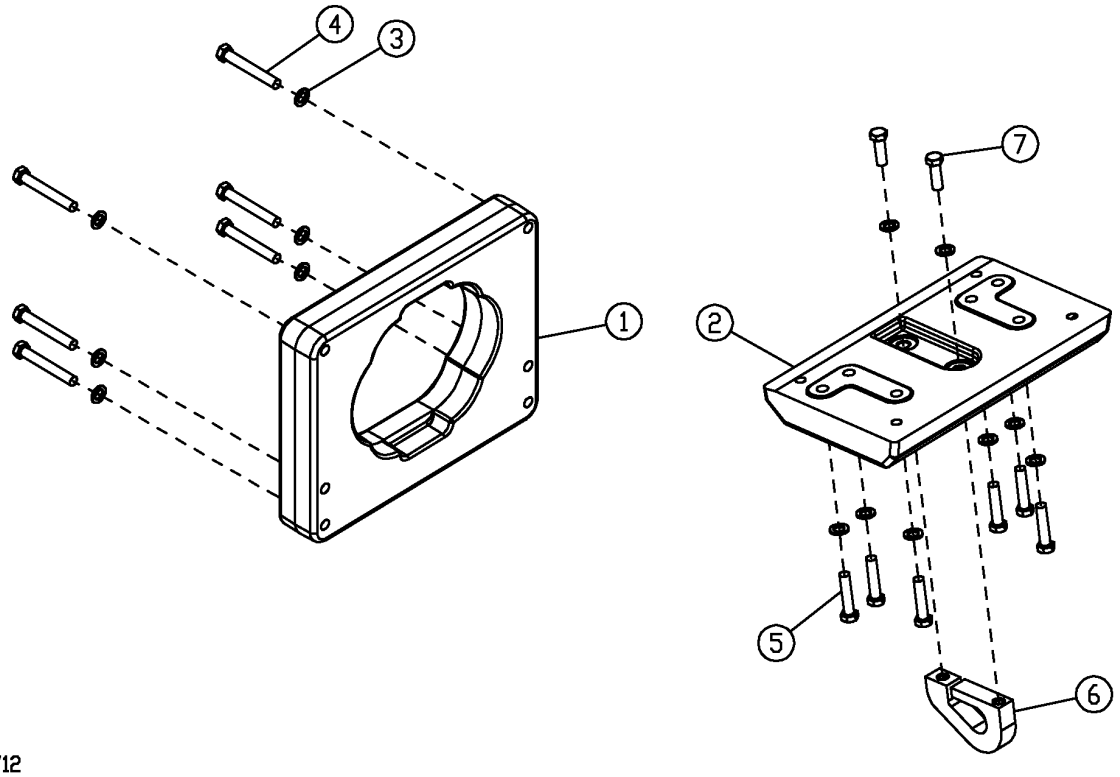
(S.N. —875552) Shown

A—Winch Oil Pressure Indicator—If Equipped (Red)
B—Check Service Code Indicator (Clear)
C—STOP-Engine Indicator (Red)
D—Engine Coolant Temperature Indicator (Red)
E—Engine Oil Pressure Indicator (Red)
F—Transmission Oil Temperature Indicator (Red)
G—Hydraulic Oil Filter Restriction Indicator (Yellow)
H—Fasten Seat Belt/Park Lock On Indicator (Clear)
I— Transmission Oil Filter Indicator (Yellow)
J— Voltage Indicator (Yellow)
K—Engine Air Filter Restriction Indicator (Yellow)
L— Engine Oil Pressure Gauge
M—Engine Water Temperature Gauge
N—Fuel Gauge
O—Transmission Oil Pressure Gauge
P—Front and Rear Work Lights Switch
Q—Hour Meter
R—Under-Seat Heater ON/OFF Switch

Continued on next page

CED,OUTX547,209 -19-10JUN10-3/5

Remove and Install Counterweight



T118712 —UN—02DEC98

1— Rear Counterweight
2— Front Counterweight
3— Washer (14 used)
4— Cap Screw (6 used)
5— Cap Screw (6 used)
6— Tow Hook
7— Cap Screw (2 used)

CAUTION: Components are heavy, use proper lifting device.

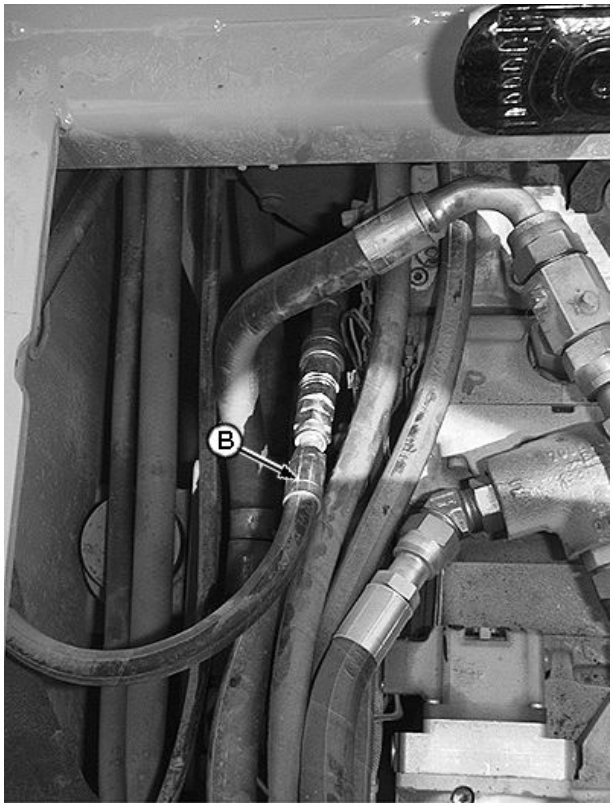
CED,OUTX547,163 -19-21OCT98-1/1

26. Disconnect brake valve return hose (A) from reservoir. Close all openings using caps and plugs.
27. Disconnect brake valve charge pressure hose (B) from pump quick coupler.

A—Brake Valve-to-Reservoir Hose

B—Hydraulic Pump-to-Brake Valve Hose

T117191B —UN—14SEP98



T117190B —UN—14SEP98

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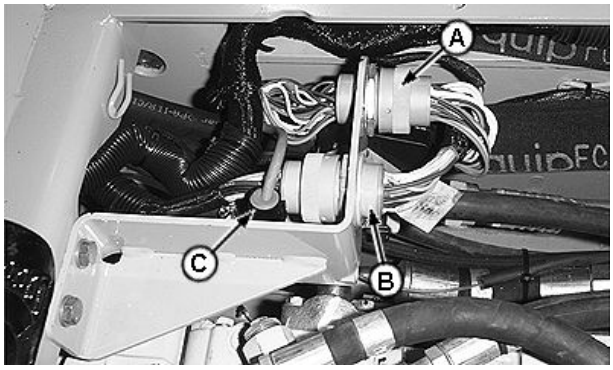
CED,TX03399,5019 -19-06APR99-9/13

28. Connect transmission and engine main wiring harness connectors (A and B) and cable (C).

A—Transmission Main Wiring Harness Connector
B—Engine Main Wiring Harness Connector
C—Cable



T116814B —UN—20AUG98

CED,OUTX466,1177 -19-16APR99-11/12

29. Install cover under fuel tank (B) and rear access cover (A).
30. Install floor plate and floor mat.
31. Install molding strip to front of cab/ROPS.
32. Connect wiring to horn and install hood and precleaner.
33. Install engine side shields.
34. Fill radiator with coolant. (See Fuel and Lubricants in Group 0004.)

Cab/ROPS—Specification

Cooling System—Capacity.....11.3 L (3 gal) (Approximate)

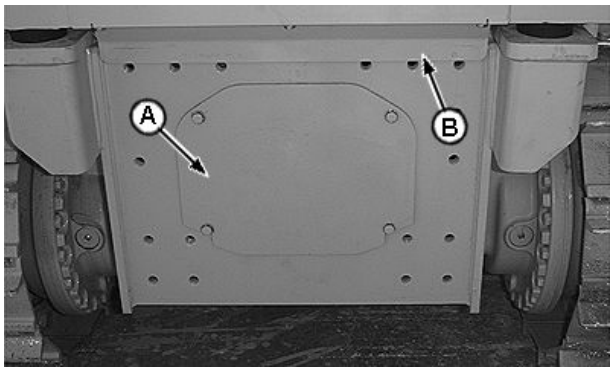
35. Fill hydraulic reservoir if drained. See Hydraulic and Hydrostatic Oil. (Group 9004.)

Specification

Hydraulic Reservoir—Capacity..... 32 L (8.5 gal) (Approximate)

NOTE: If air conditioning system is being turned on for the first time, set engine rpm at slow idle to avoid possible high pressure discharge of extra refrigerant oil that is in all new compressors.

36. **For Cabs Equipped With Air Conditioning System:** Charge air conditioning system. (See Recover, Evacuate and Charge Air Conditioning System in Group 1830.)
37. Check and adjust engine rpm. (See Engine Speed Control Linkage Adjustment in Operation and Test Manual, Group 9026-20.)



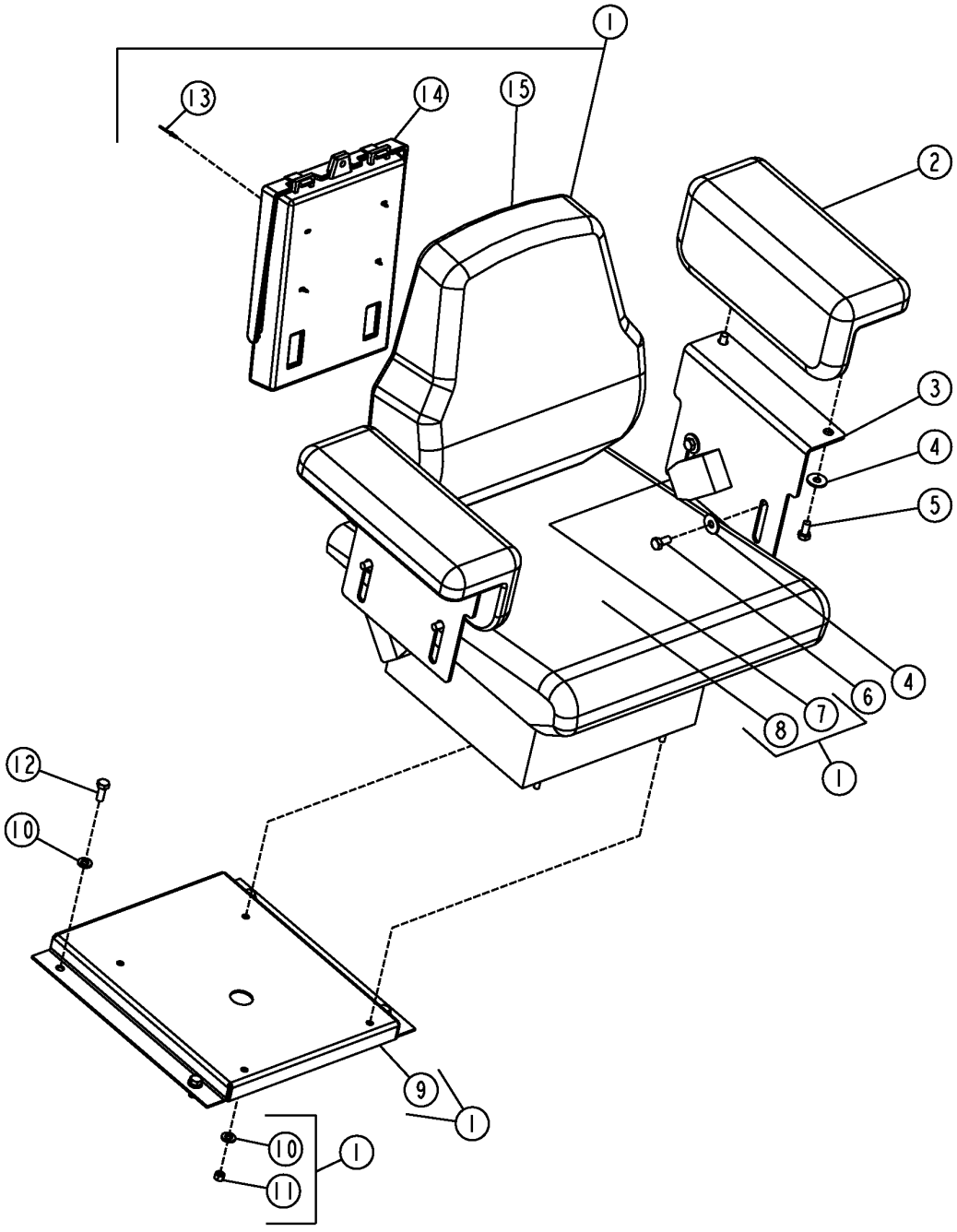
450H Shown

T116862B —UN—27AUG98

A—Rear Access Cover **B—Cover Under Fuel Tank**

CED,OUTX466,1177 -19-16APR99-12/12

Remove and Install Standard Seat



TP52109 —UN—16JAN99

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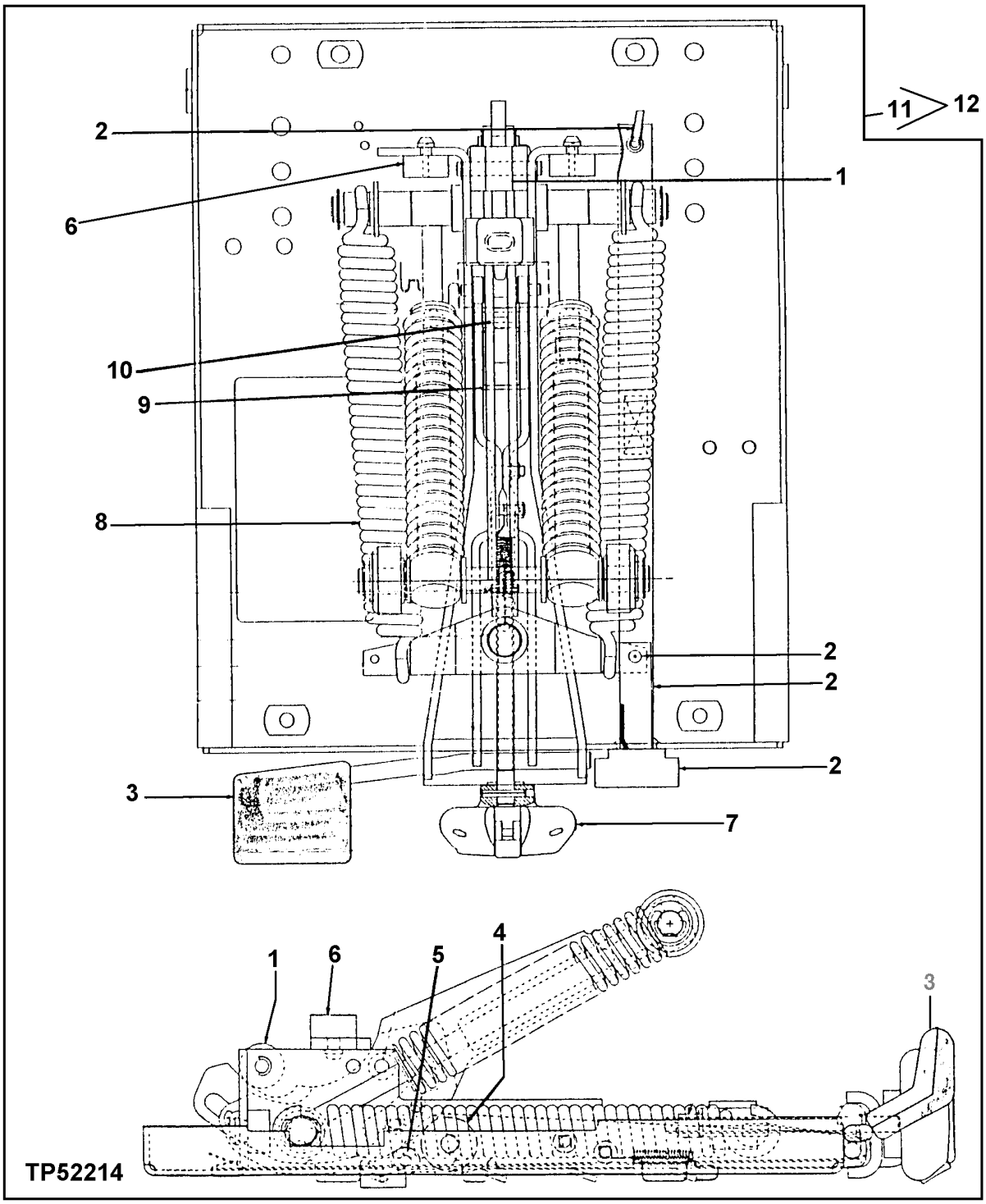
CED,OUTX547,168 -19-12APR99-1/5



Seat Suspension Kits (Deluxe Seat)

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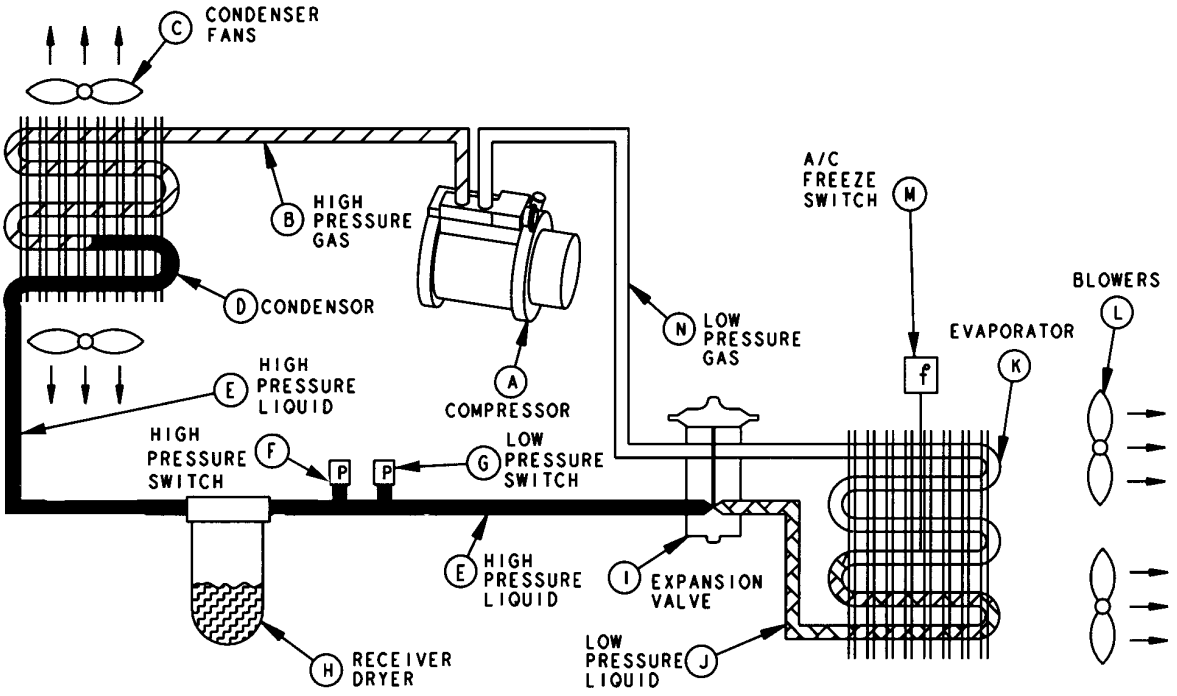
CED,OUO1066,274 -19-12APR99-7/10

R134a Refrigerant Theory of Operation



R134a Refrigerant Theory of Operation

A—Compressor
B—High Pressure Gas
C—Condenser Fans
D—Condenser
E—High Pressure Liquid
F—High Pressure Switch
G—Low Pressure Switch
H—Receiver/Dryer
I— Expansion Valve
J— Low Pressure Liquid
K—Evaporator
L—Blowers
M—A/C Freeze Switch
N—Low Pressure Gas

The compressor (A) draws low pressure gas (N) from the evaporator (K) and compresses it into high pressure gas (B). Increasing the pressure of the R134a refrigerant causes its boiling point to rise to a temperature higher than the outside air temperature.

High pressure gas (B) leaves the compressor (A) and passes through the condenser (D), the condenser fans (C) draws air through the condenser core which cools the R134a refrigerant. Cooling the refrigerant causes it to condense and it leaves the condenser (D) as a high pressure liquid (E).

The refrigerant flows from the receiver/dryer (H) to the expansion valve (I). The expansion valve (I) is a variable orifice used to cause a pressure and temperature drop in the refrigerant causing refrigerant to vaporize. The expansion valve (I) is one of the dividing lines between the high side and low side of the air conditioning system. At this point in the system, the high pressure/high temperature liquid R134a is sprayed into the evaporator (K) where it changes and becomes a gas.

The high pressure liquid passes through two switches (F and G). These switches monitor R134a refrigerant pressure. Should the pressure become too great or too small, either the high or low pressure switch will open and stop the compressor, interrupting the cycle. From the switches the high pressure liquid flows into the receiver/dryer (H) where moisture and contaminants are removed.

The expansion valve diaphragm is activated by sensing temperature and pressure within the valve body. The internal bulb senses the evaporator outlet or discharge temperature and pressure of R134a as it passes through the valve back to the low pressure or suction side of the compressor. See Expansion Valve Operation in this group for additional information on theory of operation.

If too much refrigerant is flowing into evaporator, the liquid refrigerant will still be evaporating as it leaves the evaporator, causing a low temperature at the evaporator outlet. The low temperature causes the expansion valve variable orifice to decrease in size, restricting refrigerant flow. If the evaporator outlet temperature is too warm, the orifice will increase in size, allowing more refrigerant into evaporator.

Continued on next page

CED,OUTX547,171 -19-15JUN10-1/2

16. Reinstall evaporator.
17. Go to Step 22.
18. **To Flush Evaporator Through Expansion Valve:**

    Connect flusher outlet hose to connection of receiver/dryer outlet hose using JT03188 Adapter.
19. Attach a hose and aerator nozzle to compressor inlet line using JT02101 Adapter. Put nozzle in a container to collect solvent.
20. Repeat Steps 8, 9 and 10 to flush evaporator.

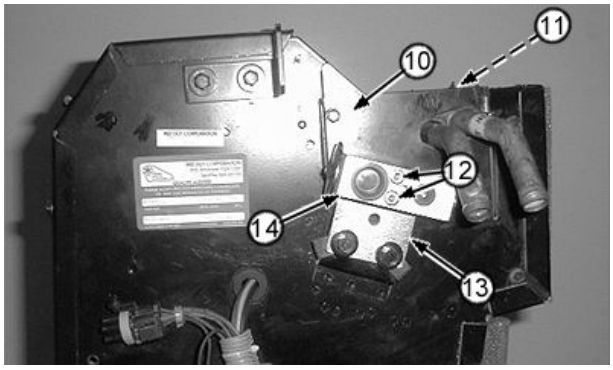
NOTE: Purging the evaporator circuit takes 12—15 minutes to thoroughly remove solvent.

21. Disconnect hose from aeration nozzle to check circuit for solvent. Hold hose close to a piece of cardboard. Continue purging until cardboard is dry.
22. Install a new receiver-dryer compatible with R134a refrigerant. Tighten connections and mounting bracket.
23. Add required oil. (See procedure in this group.)
24. Install compressor, and connect refrigerant lines to manifold.
25. Connect clutch coil wire. Install drive belt.
26. Purge system. (See procedure in this group.)

CED,TX03399,2293 -19-16APR99-2/2

6. Disconnect lines and bracket from expansion valve (14).
7. Remove two screw (12) and remove expansion valve
8. Remove bracket (13).
9. Remove two cap screw and remove plate (10).
10. Remove cover (11) and remove evaporator or heater core.

10— Plate
11— Evaporator/Heater Core Cover
12— Cap Screw (2 used)
13— Bracket
14— Expansion Valve

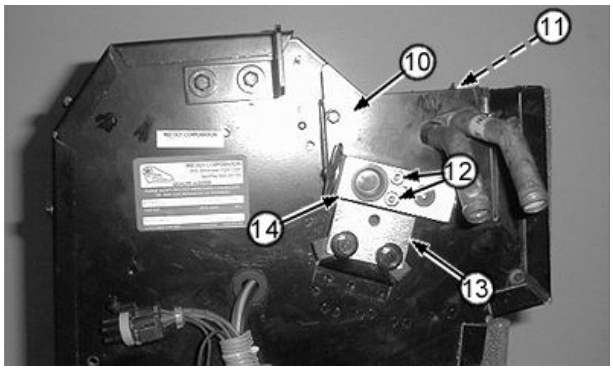


T118221B —UN—03NOV98

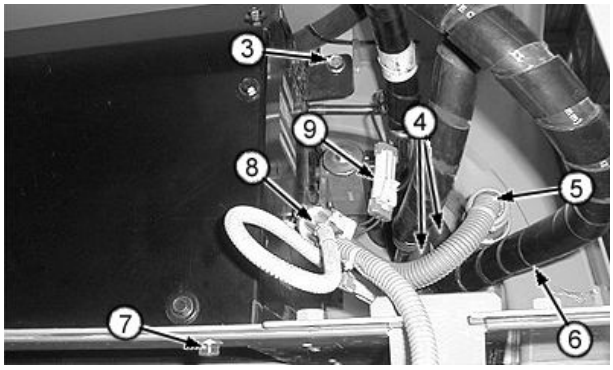
CED,OUTX547,182 -19-16APR99-2/3

11. Install evaporator or heater core.
12. Install (11, 10, 13, and 14). Tighten cap screws.
13. Connect (4—6, 8 and 9). Tighten cap screws (3 and 7).
14. Connect hoses (1 and 2).
15. Install access cover and tighten cap screws.
16. Install new receiver/dryer.
17. Apply refrigerant oil to new O-rings and immediately connect lines.
18. Add oil. (See R134a Component Oil Charge in this group.)
19. Evacuate and charge the air conditioning system. (See procedure in this group.)

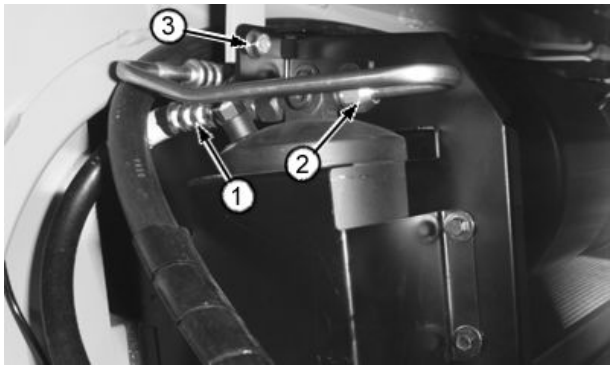
1— Receiver-Dryer Hose-to-Condenser
2— Receiver-Dryer Hose from Evaporator
3— Cap Screw (2 used)
4— Two Heater Hoses-to-Under the Seat Heater Core
5— A/C Harness Connector-to-Cab Harness Connector
6— Expansion Valve Hose-to-Compressor
7— Cap Screw (8 used)
8— A/C Blower Fans and Switch Connector
9— Low Pressure Switch Connector
10— Plate
11— Evaporator/Heater Core Cover
12— Cap Screw (2 used)
13— Bracket
14— Expansion Valve



T118221B —UN—03NOV98



T118220B —UN—05NOV98



T118219B —UN—03NOV98

CED,OUTX547,182 -19-16APR99-3/3

Section 19
Sheet Metal and Styling

Contents

Grille and Grille Housing

1— Handle (2 used)
2— Washer (4 used)
3— Cap Screw (2 used)
4— Head Light Plate
5— Standard Grille
6— Hose Guard
7— Cap Screw (6 used)
8— Washer (12 used)
9— Cap Screw (6 used)
10— Nut (2 used)
11— Washer (4 used)
12— Cap Screw (4 used)
13— Grille Housing

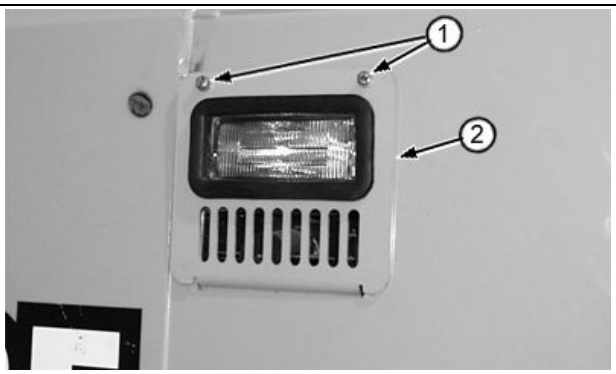
Continued on next page

CED,TX03399,5003 -19-07JUN01-2/8

Remove and Install Reverse Warning Alarm

1. Remove cap screws (1).
2. Remove panel (2)
3. Disconnect reverse warning alarm wiring leads.
4. Remove cap screws and remove reverse warning alarm.
5. Install alarm, connect wiring leads, and install panel and tighten cap screws.

1— Cap Screw (2 used) **2— Panel**



T118718B —UN—02DEC98

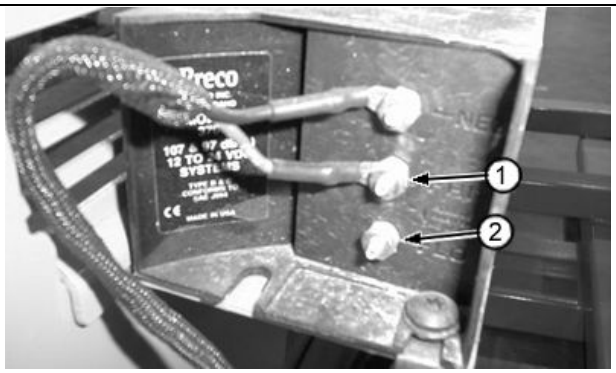
CED,OUTX547,185 -19-21OCT98-1/1

Adjust Reverse Warning Alarm Volume

IMPORTANT: The reverse warning alarm is set on high volume at the factory. It may be necessary to adjust the volume to meet local regulations.

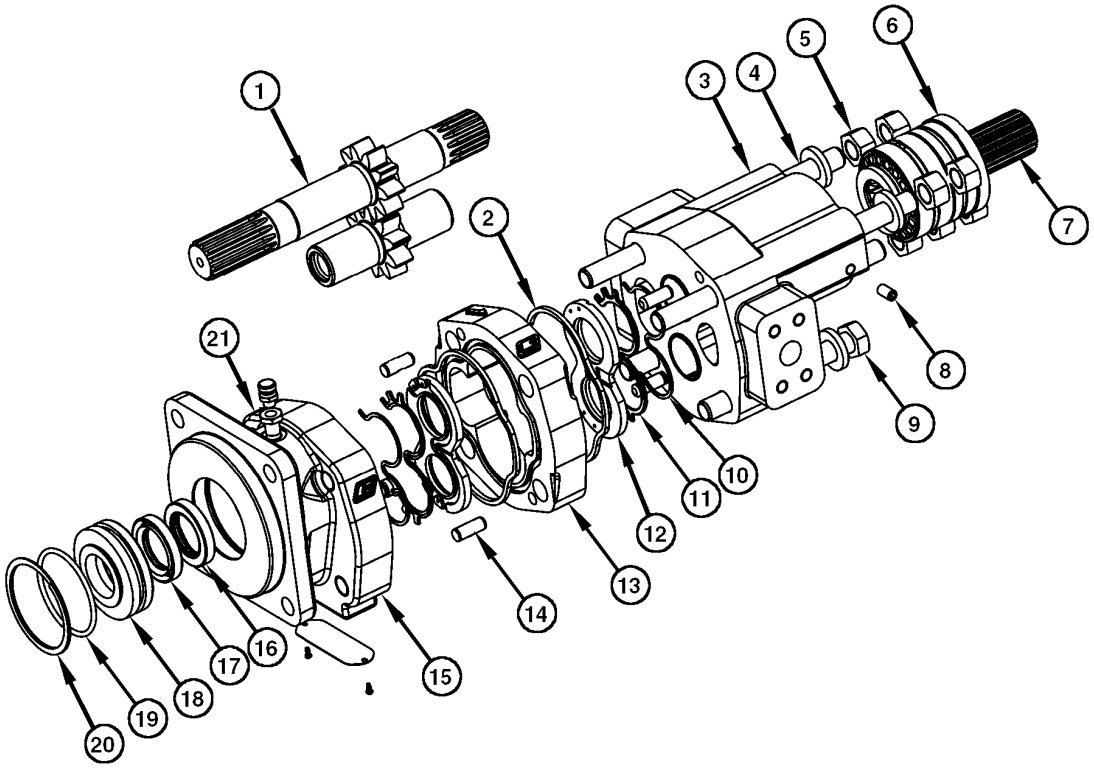
1. To change alarm to low volume, remove nut (1) and disconnect wire from “POS HI” terminal.
2. Attach wire to “POS LOW” terminal (2). Install nut and tighten.

1— Nut **2— POS LOW Terminal**



T118715B —UN—02DEC98

CED,OUTX547,186 -19-16APR99-1/1



T119603

T119603 —UN—18JAN99

Thru Drive Hydraulic Pump (S.N. —894133)

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TX,3260,SS2327 -19-16JAN04-5/6

1— Cap Screw (4 used)
2— Retainer Plate (4 used)
3— Pin (4 used)
4— Blade and Cutting Edges
5— Bushing (8 used)
6— Bushing (6 used)
7— C-Frame
8— Bushing (2 used)
9— Cap Screw (4 used)
10— Cap
11— Shim (16 used)
12— Mounting Socket (Welded On)

1. Lower all equipment to the ground.
2. Stop engine and operate control valves to relieve pressure in the hydraulic system.
3. Attach lifting chain to blade.
4. Remove cap screw (1) and retainer (2) on left side. Drive upper and lower pins (3) out.
5. Remove rubber bushings.
6. Remove retainer (2) and cap screw (1) on right side of angle cylinder rod end. Drive pin (3) out.
7. Remove rubber bushings.

CAUTION: The approximate weight of blade is 426 kg (940 lb).

Blade—Specification

Blade—Weight	426 kg (940 lb) (Approximate)

8. Install a chain and hoist to blade.
9. Remove strut retainer (2) and cap screw (1), lift up on blade and drive out pin (3).
10. Remove rubber bushings.
11. Remove pivot cap screws (9) and remove shims (11).
12. Remove blade.
13. Install blade, rubber bushings and pins.
14. If pin does not line up on right angle cylinder, loosen angle cylinder lines to relieve pressure to adjust cylinder rod.
15. Install pivot cap screws. When tightening pivot cap screws, angle blade to maximum on both sides. Tighten cap screw.

Blade—Specification

Pivot Cap Screws—Torque	624 N·m (460 lb-ft)

CED,OUTX547,192 -19-17JUL02-2/2

Specifications

Item	Measurement	Specification
C-Frame		
C-Frame with Blade	Weight	1040 kg (2294 lb) (Approximate)
C-Frame	Weight	375 kg (826 lb) (Approximate)

CED,TX03399,2352 -19-10JUN02-1/1

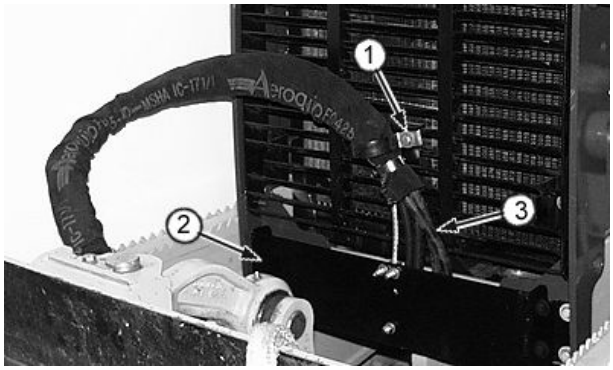
Remove and Install Dozer C-Frame (S.N. —903158)

NOTE: C-Frame can be removed with blade attached.

1. Lower all equipment to the ground.
2. Stop engine. Operate all control valves to release pressure in hydraulic system.
3. Remove blade if necessary. (See Remove and Install Dozer Blade in Group 3201.)

NOTE: If equipped with heavy duty grille, remove upper hose guard.

4. Remove clamp (1).
5. Remove hose guard (2).



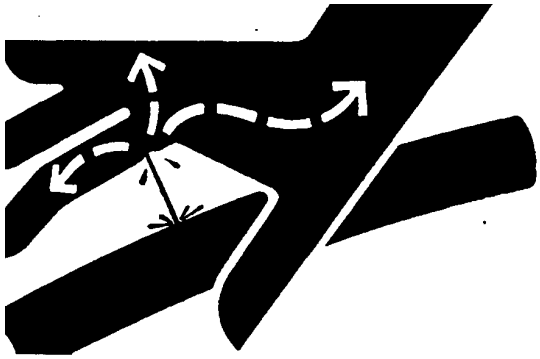
T119392B —UN—07JAN99

1— Hose Clamp
2— Hose Guard
3— Cylinder Hose (4 used)

CED,OUTX547,196 -19-17JUN02-1/4

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 —UN—23AUG88

6. Disconnect four hoses (3). Close all openings using caps and plugs.

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CED,OUTX547,196 -19-17JUN02-2/4

Disassemble and Assemble Hydraulic Control Valve

IMPORTANT: Keep all components for each valve section together as a set.

1. To aid in assembly, identify each section with a mark.
2. Place valve in a vertical position having the inlet section down and supported by wood blocks.
3. Remove nuts (8) and tie rods (7).
4. Carefully remove sections (1—6) so as not to lose or damage O-rings (11), load checks (10), and springs (9). Keep load checks and valve sections together as a set.

IMPORTANT: Use care not to damage or score mating surfaces of valve sections.

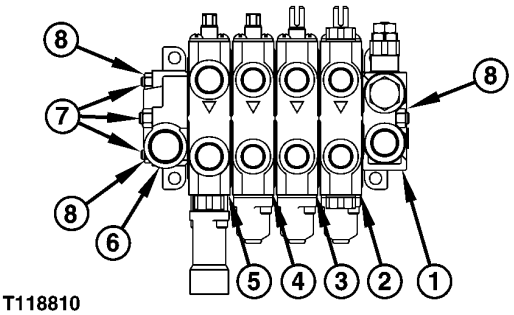
5. Inspect O-rings between each section for wear or damage. Replace as necessary.
6. Inspect springs and load checks for scoring, wear, or damage. Replace as necessary.
7. Apply clean hydraulic oil to all internal parts.
8. Install load check, spring, and O-ring into each spool section.
9. Assemble sections (1—6), making sure load checks, springs, and O-rings remain in position.

IMPORTANT: Tighten tie rod and nuts evenly to prevent valve spool binding or leakage between sections.

10. Tighten tie rod nuts (8) to specifications.

Hydraulic Control Valve—Specification

Control Valve Assembly 5/16-18 in. Tie Rod Nuts—Torque	19 ± 2 N·m (168 ± 18 lb-in.)
Control Valve Assembly 3/8-24 in. Tie Rod Nuts—Torque	44.7 ± 4.7 N·m (396 ± 42 lb-in.)



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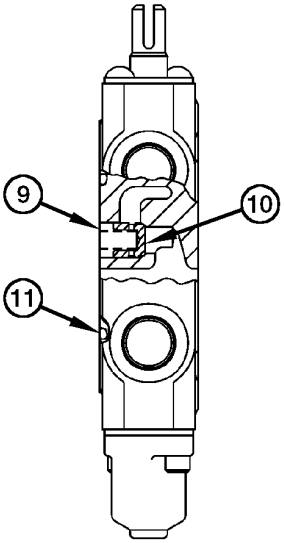

T119779

T119779 —UN—22JAN99

1— Inlet Section
2— Auxiliary Section
3— Angle Section
4— Tilt Section
5— Lift Section
6— Outlet Section
7— Tie Rod (3 used)
8— Nut (6 used)
9— Spring (1 in each spool section)
10— Load Check (1 in each spool section)
11— O-Ring (1 between each section)

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IMPORTANT: Tightening work ports relief using jam nut on end of relief will cause damage to work ports relief. Do not tighten work ports relief using jam nut on end of relief.

9. Assemble work ports reliefs (14) into housing (1). Tighten reliefs to specification.

Hydraulic Control Valve—Specification

Angle Valve Circuit Relief—Torque	45 ± 4 N·m 33 ± 3 lb.-ft.

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