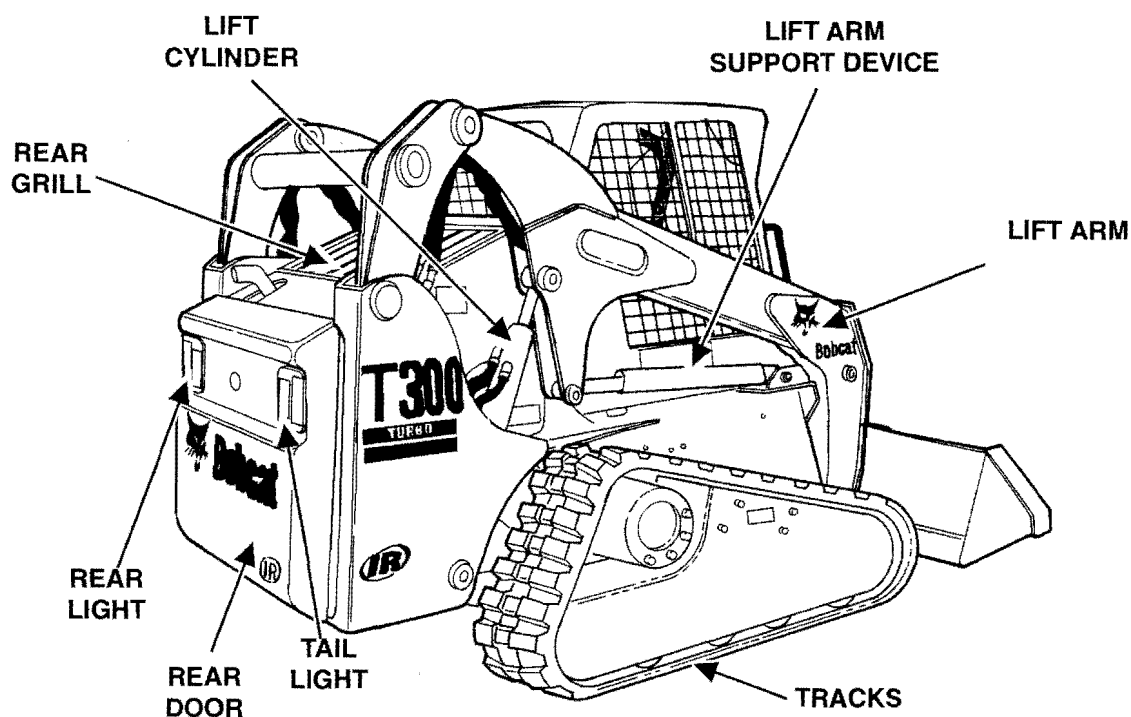
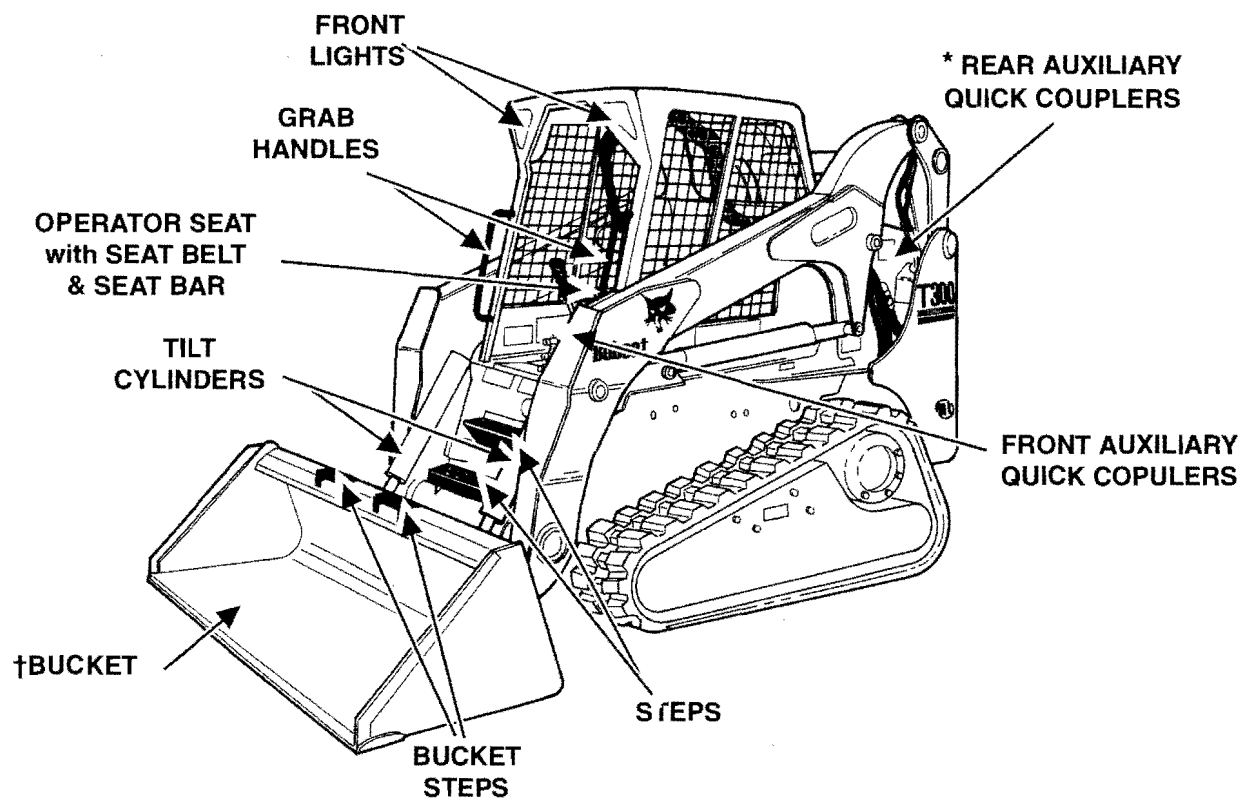


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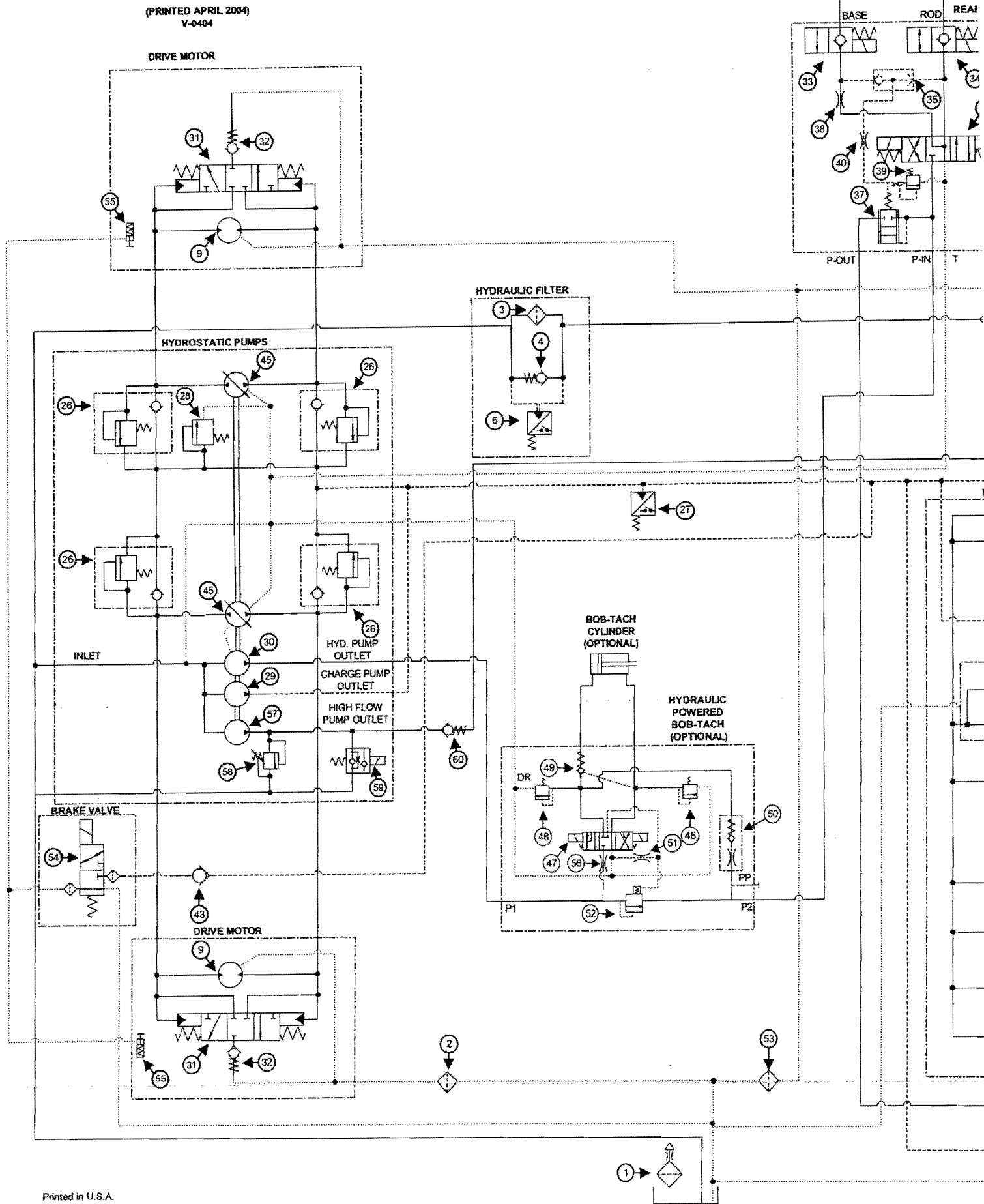
* Option or Field Accessory

† Many buckets and other attachments are available.

B-16951a
B-16950

WITH HIGH FLOW OPTION
T300 (S/N 525411001 AND ABOVE)
(S/N 525511001 AND ABOVE)

(PRINTED APRIL 2004)
V-0404



(VALVE (OPTIONAL)

OIL
DOLER

RAULIC CONTROL VALVE

AUXILIARY
SPOOL

TILT
CYLINDER
SPOOL

LIFT
CYLINDER
SPOOL

INTEGRATED QUICK COUPLER BLOCK

(FRONT AUXILIARY
LEFT SIDE LIFT ARM)

BUCKET POSITION VALVE (OPTIONAL)

BICS CONTROL VALVE

TILT CYLINDERS

LIFT CYLINDERS

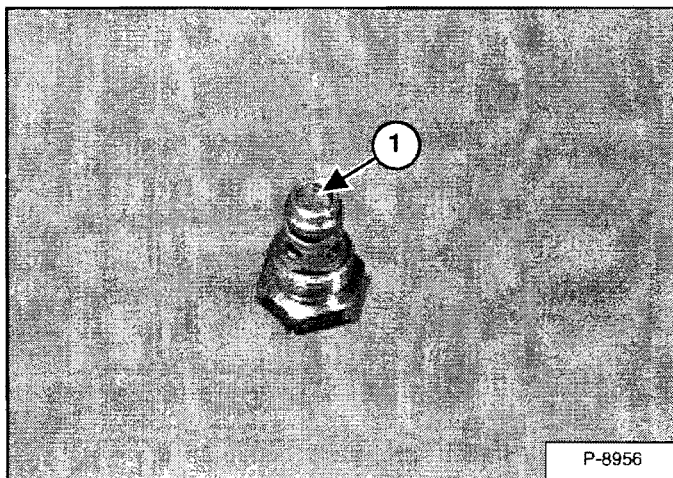
— WORKING CIRCUITS
- - - PILOT CIRCUITS
... DRAIN CIRCUITS
□ COMPONENTS

LIFT ARM BY PASS VALVE

V-0405 (4-8-04)

**BICS™ Valve, Check Valve Disassembly And
Assembly (Cont'd)**

Figure 20-41-41



Clean and inspect the screen (Item 1) [Figure 20-41-41] on the end of the valve.

**BICS™ Valve, Lock Valve Disassembly And
Assembly**

Figure 20-41-42

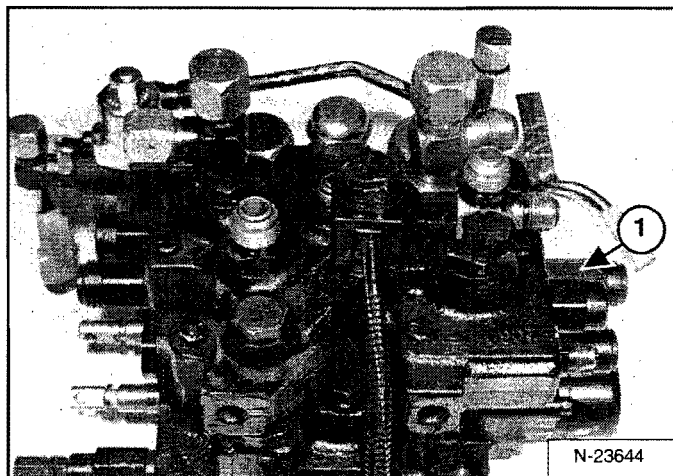


Figure 20-41-43

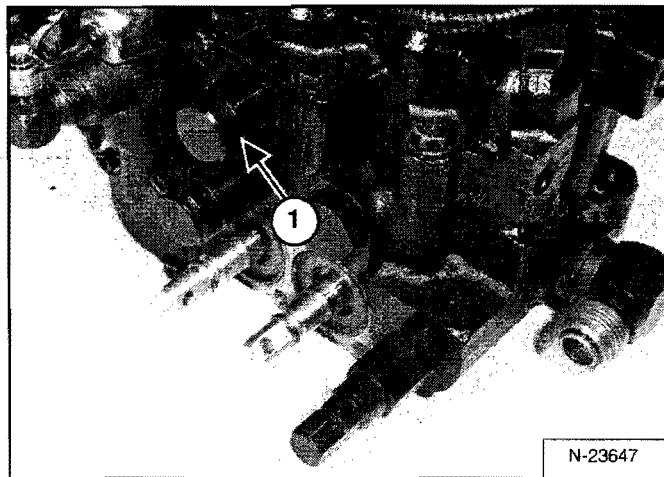
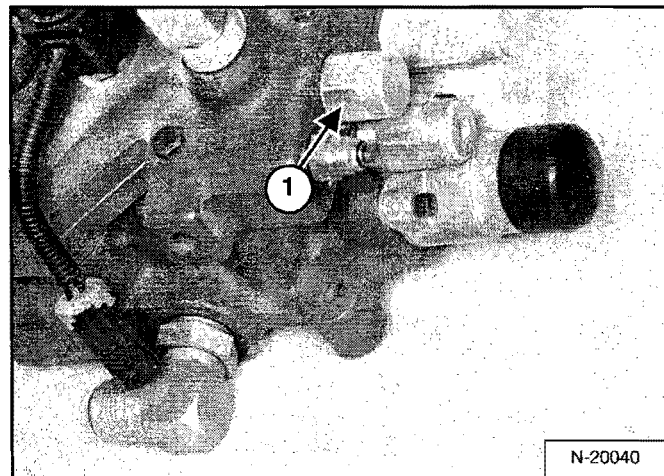


Figure 20-41-44

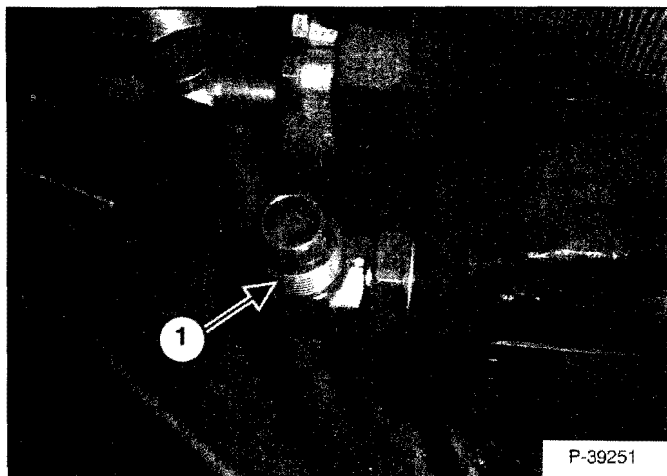


Remove the lock valves (Item 1) [Figure 20-41-42], [Figure 20-41-43] & [Figure 20-41-44] from the BICS™ valve.

Installation: Tighten the lock valves to 25 ft.-lbs. (34 Nm) torque.

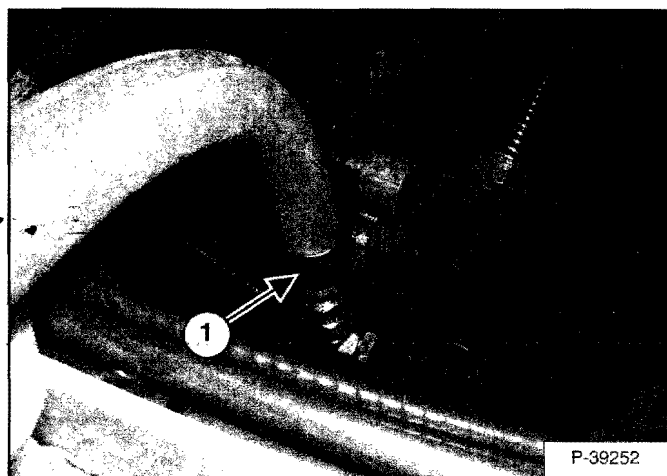
Check The Output Of The Hydraulic Pump (Cont'd)

Figure 20-61-7



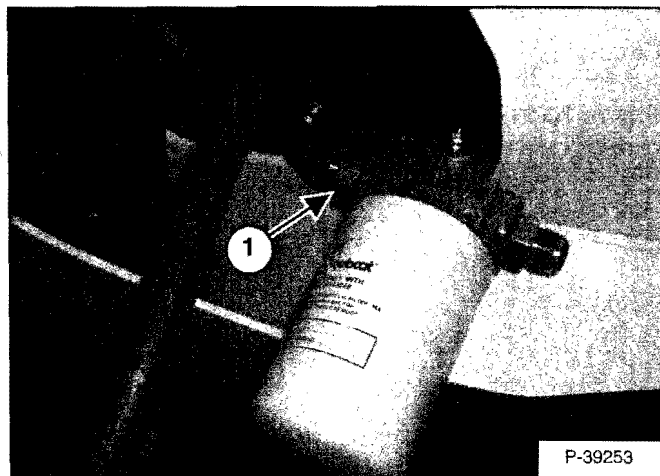
Install the elbow fitting 17KB 1212 (Item 1) [Figure 20-61-7] into the OUTLET of the charge pump.

Figure 20-61-8



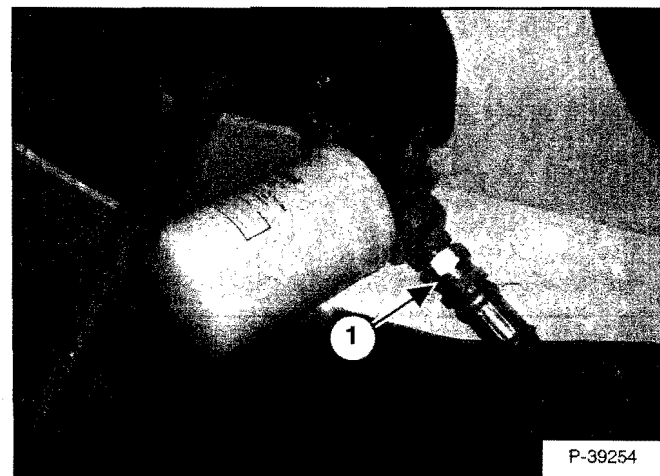
Connect the Inlet hose from the hydraulic tester (Item 1) [Figure 20-61-8] to the OUTLET fitting of the charge pump.

Figure 20-61-9



Connect the outlet fitting on the hydraulic filter (Item 1) [Figure 20-61-9] to the hose that was remove from the charge pump and routes to the back side of the hydrostatic pump.

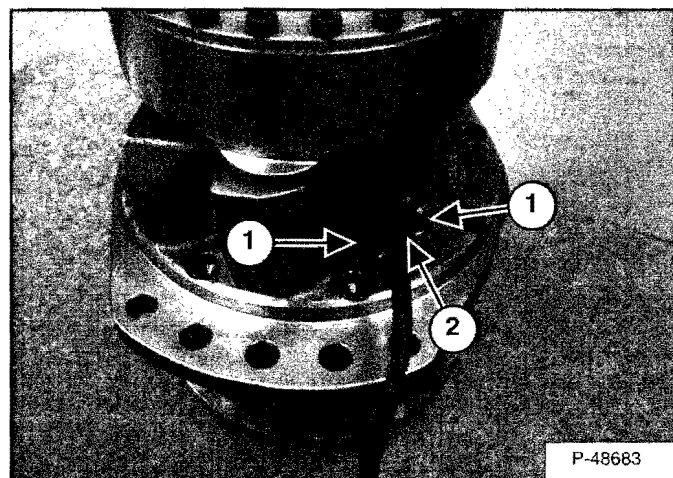
Figure 20-61-10



Connect the outlet hose on the hydraulic tester (Item 1) [Figure 20-61-10] to the inlet fitting on the hydraulic filter assembly.

Disassembly

Figure 30-21-6



NOTE: Mark the RPM speed sensor for the proper installation.

Remove the two speed sensor mount bolts (Item 1) and remove the speed sensor (Item 2) [Figure 30-21-6] from the drive motor.

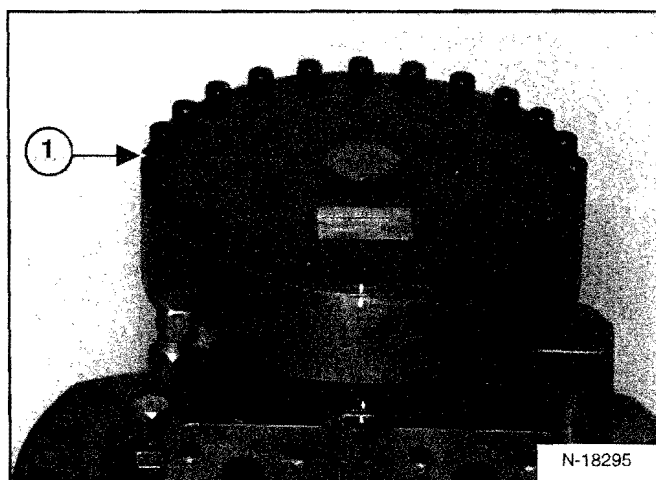
Figure 30-21-7



NOTE: Mark the motor, brake and motor carrier housings for proper alignment for ease of assembly [Figure 30-21-7].

Drain the oil from the motor casing.

Figure 30-21-8

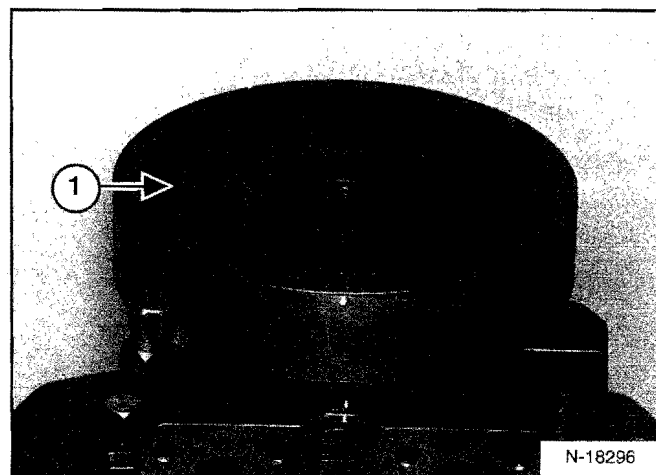


Remove the twenty four mounting bolts (Item 1) [Figure 30-21-8] from the brake cover plate.

NOTE: Unscrew the bolts alternately, one turn at a time to release the preload on the end cap.

Remove the cover plate and gasket from the brake housing.

Figure 30-21-9



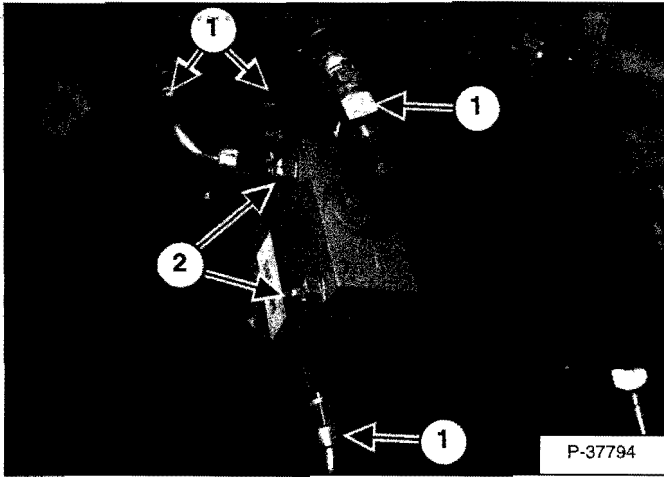
Remove the disk spring (Item 1) [Figure 30-21-9] from the brake housing.

NOTE: Mark the top side of the disk spring for proper installation.

BRAKE (CONT'D)

Block Removal And Installation (Cont'd)

Figure 40-10-4



Mark the hydraulic hoses for proper installation.

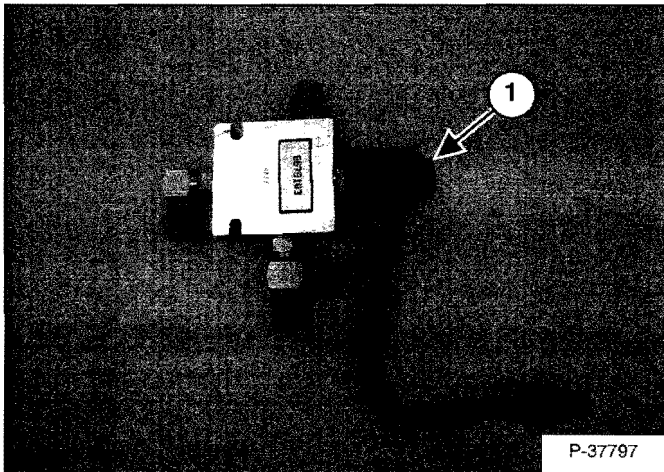
Remove the four hydraulic hoses (Item 1) [Figure 40-10-4] that go from the brake block to the brakes at the hydrostatic motors.

Remove the two mount bolts (Item 2) [Figure 40-10-4].

Remove the brake block and mount from the loader.

Block Disassembly And Assembly

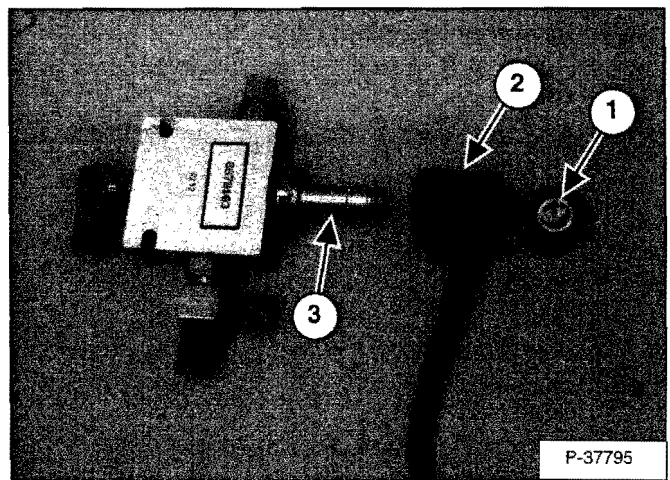
Figure 40-10-5



Loosen the electrical brake solenoid nut (Item 1) [Figure 40-10-5].

Assembly: Tighten the solenoids nut to 9-12 in.-lbs. (1,02-1,36 Nm) torque.

Figure 40-10-6

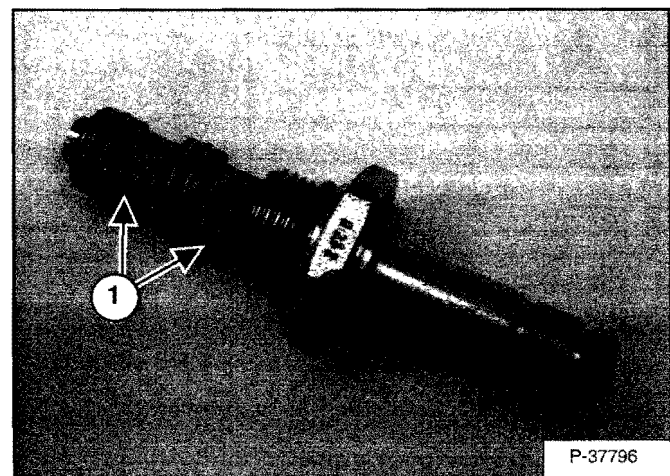


Remove the solenoid nut (Item 1) and solenoid coil (Item 2) [Figure 40-10-6].

Installation: Tighten the solenoid nut 48-60 in.-lbs. (5,4-6,8 Nm) torque.

Remove the solenoid valve (Item 3) [Figure 40-10-6] from the block.

Figure 40-10-7



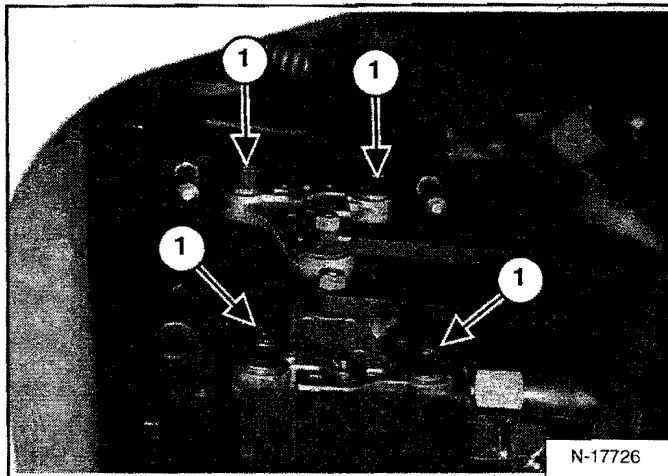
Inspect the O-rings and back-up washer on the solenoid valve and replace as needed [Figure 40-10-7].

Check the screens (Item 1) [Figure 40-10-7] and clean with solvent.

Assembly: Tighten the solenoid valve to 16-20 ft.-lbs. (21,7-27,1 Nm) torque.

Linkage Removal and Installation (Cont'd)

Figure 50-100-20

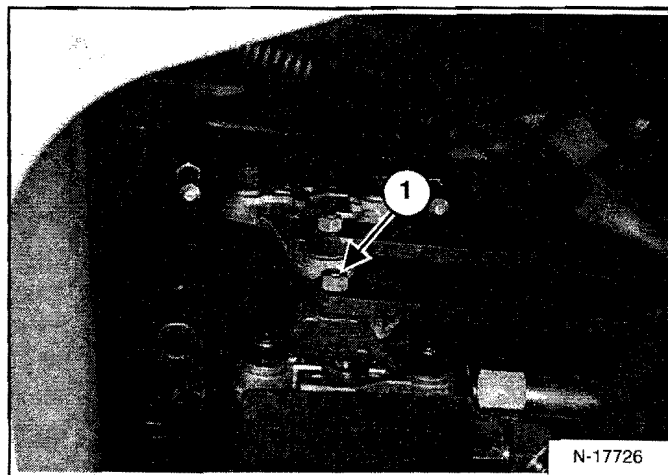


Check the surface of the four pintle cams (Item 1) [Figure 50-100-20].

If worn replace the cam.

Installation: Tighten the bolts to 45-50 ft.-lbs. (62-68 Nm) torque.

Figure 50-100-21

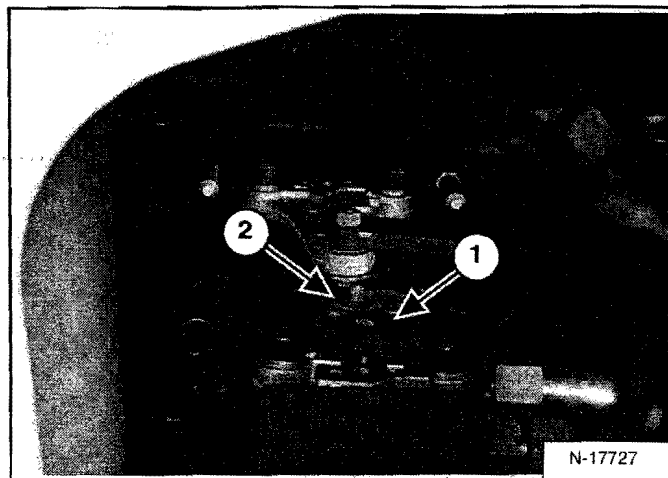


Remove the linkage bar nut (Item 1) [Figure 50-100-21] from the torsion bushing.

The bolt is threaded into the linkage bar, remove the bolt from underneath the pintle arm.

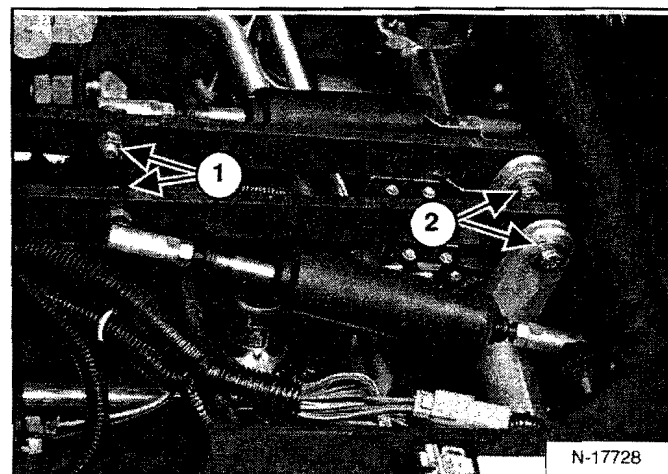
Installation: Tighten the bolt to 11-13 ft.-lbs. (21-25 Nm) torque, then tighten the nut (Item 1) [Figure 50-100-21] to 21-25 ft.-lbs. (28-33 Nm) torque.

Figure 50-100-22



Remove the linkage bar (Item 1) [Figure 50-100-22] from the pintle arm. remove the torsion bushing (Item 2) [Figure 50-100-22] from the pintle arm.

Figure 50-100-23



Remove the nuts (Item 1) [Figure 50-100-23] from both shock absorber ball joint ends.

Installation: Tighten the nuts to 25-28 ft.-lbs. (34-38 Nm) torque.

Disconnect the shock absorbers from the linkage bars.

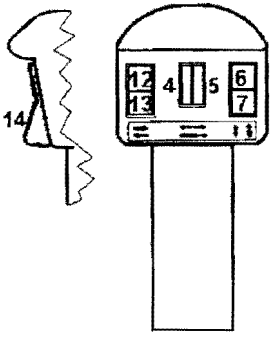
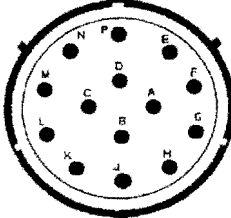
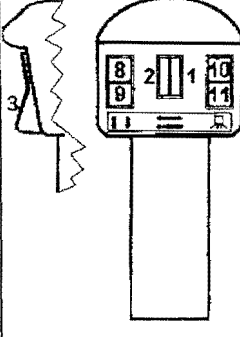
Remove the nuts (Item 2) [Figure 50-100-23] from the linkage bar mounting bolt. The bolts are threaded into the linkage bars, remove the bolts.

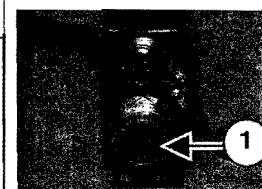
Installation: Tighten the bolts to 11-13 ft.-lbs. (21-25 Nm) torque, then tighten the nuts to 21-25 ft.-lbs. (28-33 Nm) torque.

The torsion bushings can now be removed from the steering bell cranks.

The linkage and the centering plate must be readjusted for neutral after the components have been reassembled.

Controls Identification Chart

Left Side Control Handle Switches	Switch Number	Solenoid Number Activated		Attachment Harness Terminal Activated	Attachment Harness Connector	Right Side Control Handle Switches
			RH	HFH		
	1	1	1	1, 8	Fourteen Pin Connector Viewed from front (pin side of connector) of loader.  B-16449	
	2	2	2	2		
	3	1	1	1, 8		
	4	2	2, 3	6, 7		
	5	1	1, 3	5, 7		
	6	1	1, 3	5, 7		
	7	1	1, 3	5, 7		
	8	1	1, 3	5, 7		
	9	1	1, 3	5, 7		
	10, 11, 12, 13, 14	-	--	--		



NOTE: All diagnostics must be done at the fourteen pin connector (Item 1). (If so equipped as a dealer installed kit.)

The ACD (Attachment Control Device) automatically recognizes the use of the seven or fourteen pin connector when connected.

If the ACD light flashes, check for diagnostic service codes. See the Electrical System Service Manual for the proper procedure.

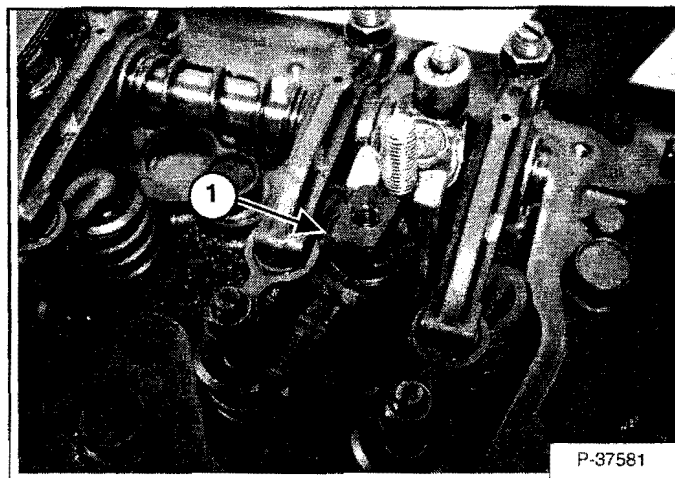
RH - Loaders with Rear Hydraulics Option.

HFH - Loaders with High Flow Hydraulics Option.

- * If harness terminals K & L are jumped together, switches 4 thru 9 will function the same as switch 1 & 2.
- * Terminal K is activated with Key switch ON.

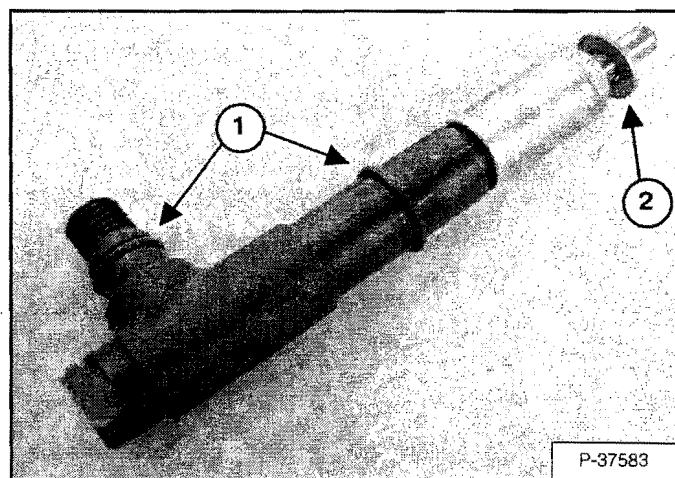
Valve Cover, Injector Nozzle And Seal Removal And Installation (Cont'd)

Figure 70-90-22



Remove the injector nozzle (Item 1) [Figure 70-90-22] from the engine.

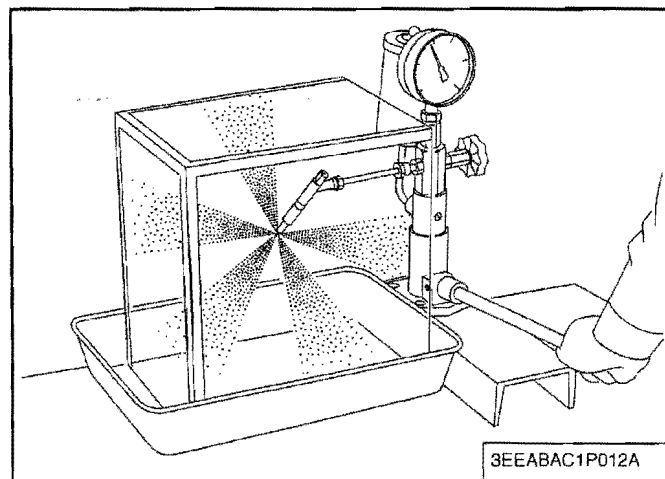
Figure 70-90-23



Check the injector nozzle O-rings (Item 1) and nozzle washer (Item 2) [Figure 70-90-23].

Always replace the injector O-rings and washer before installation.

Figure 70-90-24



Set the injection nozzle to the nozzle tester (Code No.: 07909-31361).

Slowly move the tester handle to measure the pressure at which fuel begins jetting out from the nozzle.

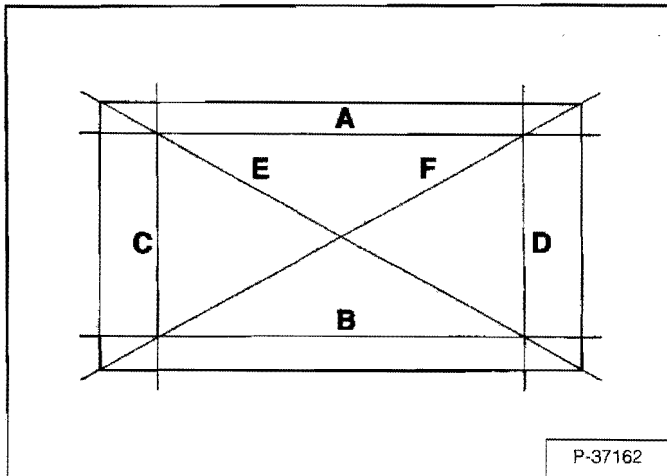
If the measurement is not within the factory specifications, replace the injection nozzle assembly or repair at Denso service shop.

NOTE: Injection nozzle gasket must be replaced when the injection nozzle is removed for checking.

Injection pressure	Factory spec.	1st stage	18.63 to 19.61 MPa 190 to 200 kgf/cm ² 2702 to 2845 PSI
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Cylinder Head Surface Flatness (Cont'd)

Figure 70-90-157



Thoroughly clean the cylinder head surface.

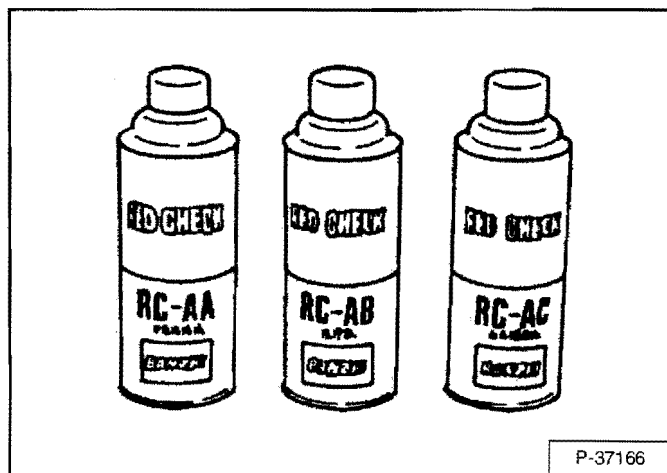
Place a straightedge on the cylinder head's four sides and two diagonal [Figure 70-90-157]. Measure the clearance with a feeler gauge [Figure 70-90-156].

If the measurement exceeds the allowable limit, correct it with a surface grinder. (See Contents Page SPEC-01.)

NOTE: Be sure to check the valve recessing after correcting.

Cylinder Head Flaw

Figure 70-90-158



Prepare an air spray red check (Code No. 07909-31371).

Clean the surface of the cylinder head with detergent (Item 1) [Figure 70-90-158].

Spray the cylinder head surface with the red permeative liquid (Item 2) [Figure 70-90-158]. Leave it five to ten minutes after spraying.

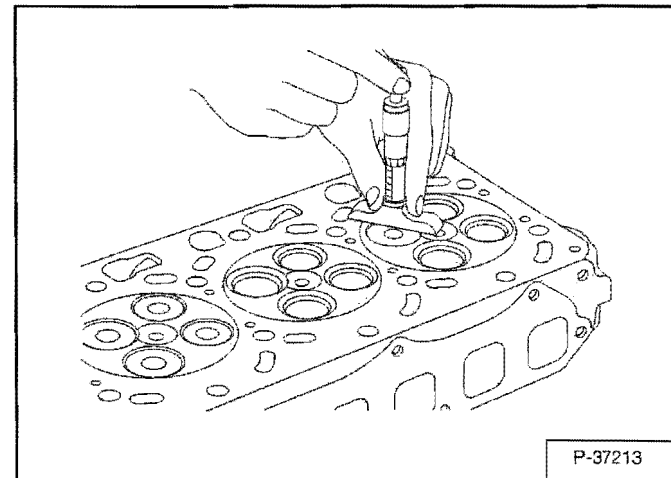
Wash away the red permeative liquid on the cylinder head surface with the detergent (Item 1) [Figure 70-90-158].

Spray the cylinder head surface with white developer (Item 3) [Figure 70-90-158].

If flawed, it can be identified as red marks.

Valve Recessing

Figure 70-90-159



Clean the cylinder head, the valve face and seat.

Insert the valve into the valve guide.

Measure the valve recessing with a depth gauge [Figure 70-90-159].

If the measurement exceeds the allowable limit, replace the valve.

If it still exceeds the allowable limit after replacing the valve, correct the valve seat face of the cylinder head with a valve seat cutter or valve seat grinder.

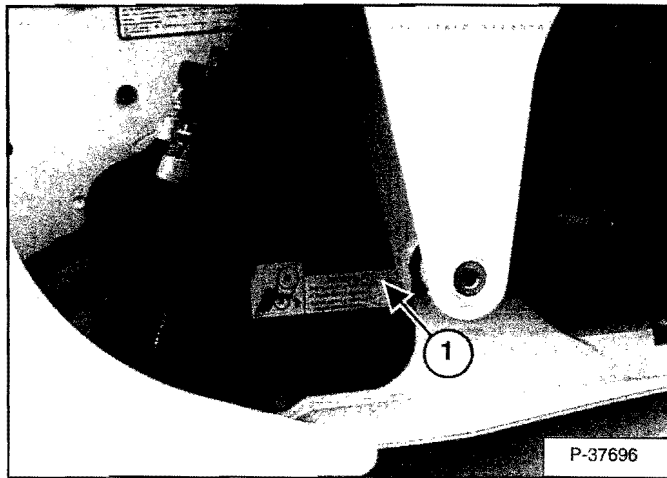
Then, correct the cylinder head surface with a surface grinder, or replace the cylinder head.

Valve recessing	Factory spec.	Intake valve	(recessing) 0.6 to 0.8 mm (0.0236 to 0.0315 in.)
		Exhaust valve	(recessing) 0.85 to 1.05 mm (0.0335 to 0.0413 in.)
	Allowable limit	(recessing) 1.2 mm (0.0472 in.)	

BASIC TROUBLESHOOTING (CONT'D)

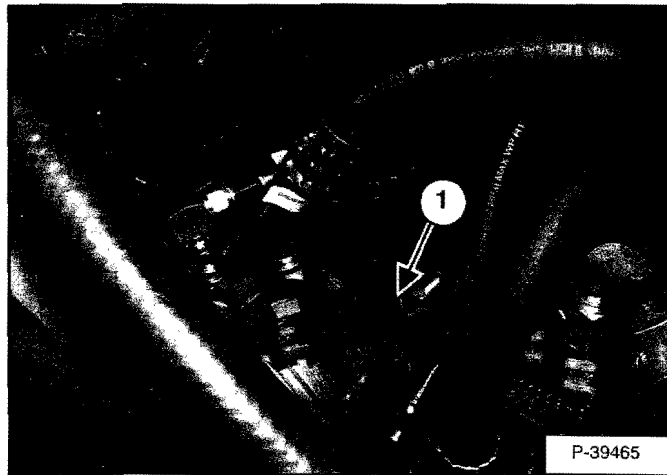
Checking The Electrical System (Cont'd)

Figure 80-50-10



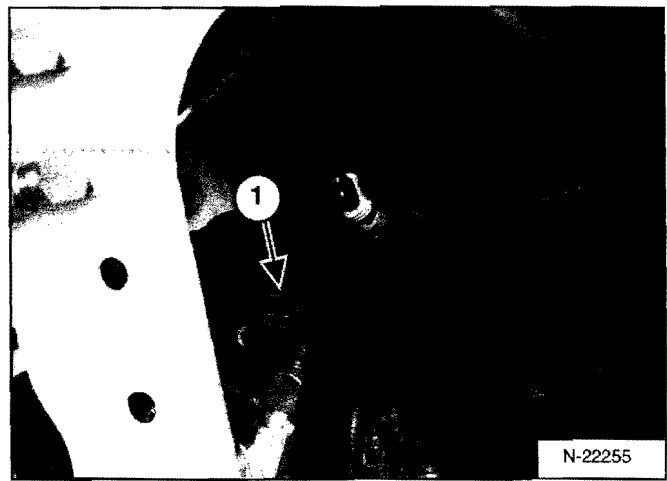
Remove the right side access cover (Item 1) [Figure 80-50-10].

Figure 80-50-11



Disconnect the loader harness (Item 1) [Figure 80-50-11] from the compressor clutch wire.

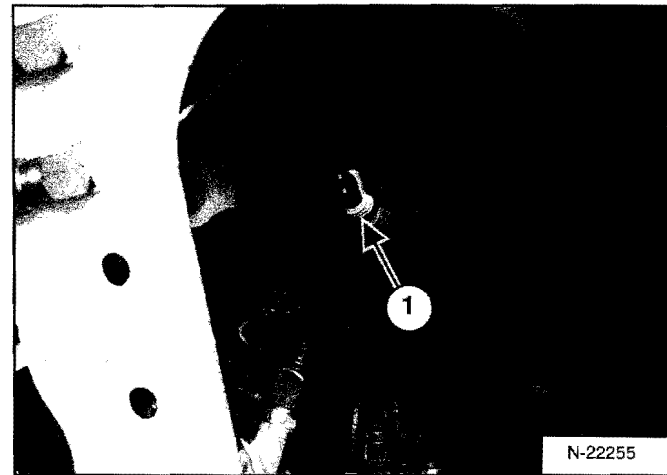
Figure 80-50-12



With a multimeter, check the resistance to the compressor clutch (Item 1) [Figure 80-50-12].

If there is no resistance value, replace the compressor clutch. (See Contents Page 80-01.)

Figure 80-50-13



With a multimeter, check the voltage to the compressor clutch at the loader harness (Item 1) [Figure 80-50-13].

The voltage reading should be around 12 volts.

If there is no power at the clutch, check the wiring harness for broken wires.

If there is power at the clutch, reconnect the wiring harness to the compressor clutch.

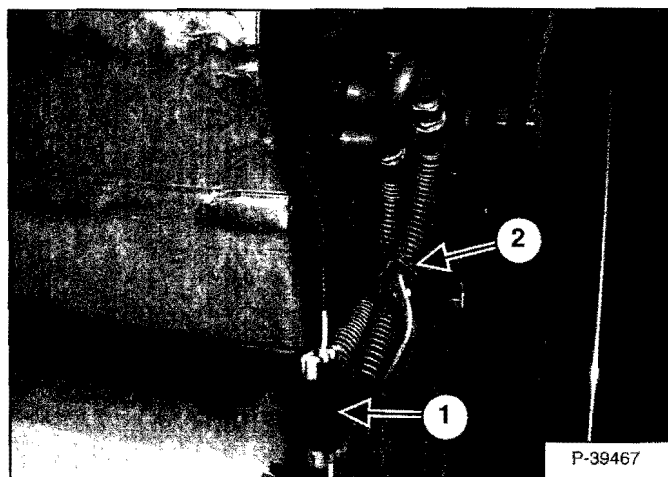
Removal And Installation

Raise the lift arms and install an approved lift arm support device. (See Contents Page 10-01.)

Raise the operator cab. (See Contents Page 10-01.)

Evacuate the A/C system. (See Contents Page 80-01.)

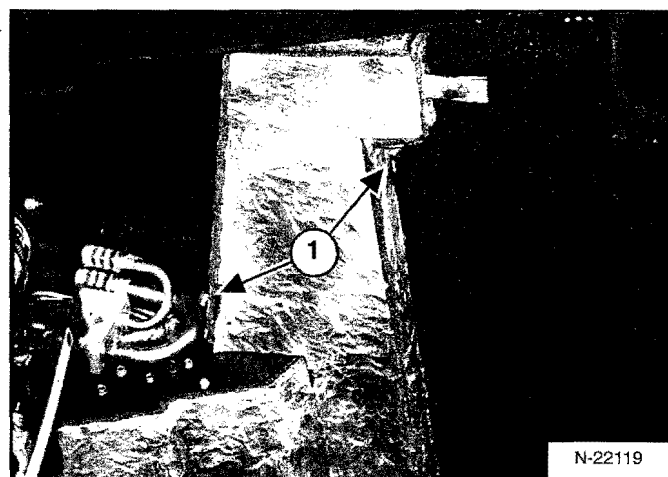
Figure 80-160-1



At the rear of the cab, disconnect the thermostat wiring connector (Item 1) [Figure 80-160-1].

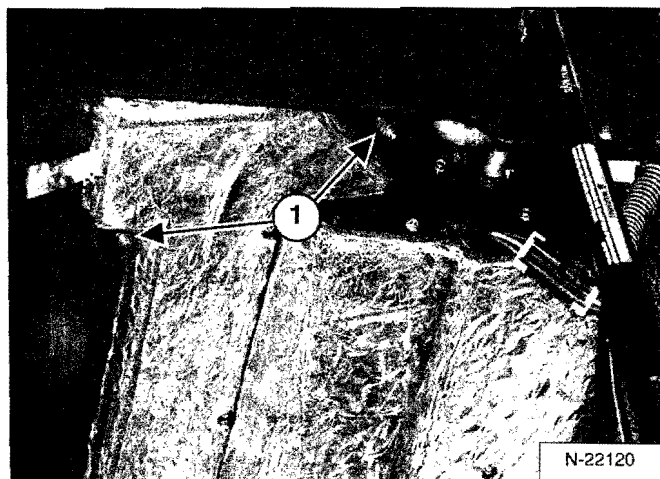
Disconnect the blower fan wiring connector (Item 2) [Figure 80-160-1] from the loader wiring harness.

Figure 80-160-2



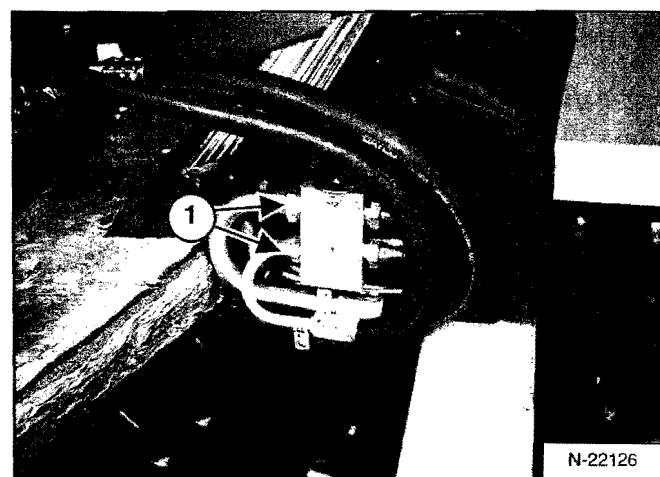
Remove the two mounting nuts (Item 1) [Figure 80-160-2].

Figure 80-160-3



Remove the two mounting nuts (Item 1) [Figure 80-160-3].

Figure 80-160-4



Remove the Evaporator/Heater Unit from the rear of the cab and place it on the fenders of the loader supported by 2 X 4's [Figure 80-160-4].

NOTE: Mark the tubelines for correct installation.

Remove the two A/C hoses (Item 1) [Figure 80-160-4] from the expansion valve.

Installation: Tighten the A/C hoses to 22 ft.lbs. (29,8 Nm) torque.

Cap and plug the hoses and the expansion valve fittings with the proper A/C caps and plugs.

CONVERSIONS

Decimal And Millimeter Equivalents

FRACTIONS	DECIMALS	MM
	1/64 —	0.015625 — 0.397
1/32 —	0.03125 —	0.794
	3/64 —	0.046875 — 1.191
1/16 —	0.0625 —	1.588
	5/64 —	0.078125 — 1.984
3/32 —	0.09375 —	2.381
	7/64 —	0.109375 — 2.778
1/8 —	0.1250 —	3.175
	9/64 —	0.140625 — 3.572
5/32 —	0.15625 —	3.969
	11/64 —	0.171875 — 4.366
3/16 —	0.1875 —	4.762
	13/64 —	0.203125 — 5.159
7/32 —	0.21875 —	5.556
	15/64 —	0.234375 — 5.953
1/4 —	0.2500 —	6.350
	17/64 —	0.265625 — 6.747
9/32 —	0.28125 —	7.144
	19/64 —	0.296875 — 7.541
5/16 —	0.3125 —	7.938
	21/64 —	0.328125 — 8.334
11/32 —	0.34375 —	8.731
	23/64 —	0.359375 — 9.128
3/8 —	0.3750 —	9.525
	25/64 —	0.390625 — 9.922
13/32 —	0.40625 —	10.319
	27/64 —	0.421875 — 10.716
7/16 —	0.4375 —	11.112
	29/64 —	0.453125 — 11.509
15/32 —	0.46875 —	11.906
	31/64 —	0.484375 — 12.303
1/2 —	0.5000 —	12.700

1 mm = 0.03937"

FRACTIONS	DECIMALS	MM
	33/64 —	0.515625 — 13.097
17/32 —	0.53125 —	13.494
	35/64 —	0.546875 — 13.891
9/16 —	0.5625 —	14.288
	37/64 —	0.578125 — 14.684
19/32 —	0.59375 —	15.081
	39/64 —	0.609375 — 15.478
5/8 —	0.6250 —	15.875
	41/64 —	0.640625 — 16.272
21/32 —	0.65625 —	16.669
	43/64 —	0.671875 — 17.066
11/16 —	0.6875 —	17.462
	45/64 —	0.703125 — 17.859
23/32 —	0.71875 —	18.256
	47/64 —	0.734375 — 18.653
3/4 —	0.7500 —	19.050
	49/64 —	0.765625 — 19.447
25/32 —	0.78125 —	19.844
	51/64 —	0.796875 — 20.241
13/16 —	0.8125 —	20.638
	53/64 —	0.828125 — 21.034
27/32 —	0.84375 —	21.431
	55/64 —	0.859375 — 21.828
7/8 —	0.8750 —	22.225
	57/64 —	0.890625 — 22.622
29/32 —	0.90625 —	23.019
	59/64 —	0.921875 — 23.416
15/16 —	0.9375 —	23.812
	61/64 —	0.953125 — 24.209
31/32 —	0.96875 —	24.606
	63/64 —	0.984375 — 25.003
1 —	1.000 —	25.400

0.001 = 0.0254 mm

U.S. To Metric Conversion

	TO CONVERT	INTO	MULTIPLY BY
LINEAR MEASUREMENT	Miles	Kilometers	1.609
	Yards	Meters	0.9144
	Feet	Meters	0.3048
	Feet	Centimeters	30.48
	Inches	Meters	0.0254
	Inches	Centimeters	2.54
	Inches	Millimeters	25.4
AREA	Square Miles	Square Kilometers	2.59
	Square Feet	Square Meters	0.0929
	Square Inches	Square Centimeters	6.452
	Acre	Hectare	0.4047
VOLUME	Cubic Yards	Cubic Meters	0.7646
	Cubic Feet	Cubic Meters	0.02832
	Cubic Inches	Cubic Centimeters	16.39
WEIGHT	Tons (Short)	Metric Tons	0.9078
	Pounds	Kilograms	0.4536
	Ounces (Avdp.)	Grams	28.3495
PRESSURE	Pounds/Sq. In.	Kilopascal	6.895
WORK	Foot-Pounds	Newton-Meter	1.356
LIQUID VOLUME	Quarts	Liters	0.9463
	Gallons	Liters	3.785
LIQUID FLOW	Gallons/Minute	Liters/Minute	3.785
TEMPERATURE	Fahrenheit	Celsius	1. Subtract 32°
			2. Multiply by 5/9