



SERVICE MANUAL  
**WHEEL LOADER**  
**921E**  
**TIER 3**

84299249  
(Replaces 87624950)

Revised December 2009  
Issued February 2007

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

## TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

O-ring Face Seal End					O-ring Boss End Fitting or Lock Nut		
Nom. SAE Dash Size	Tube OD	Thread Size	Pound- Inches	Newton metres	Thread Size	Pound- Inches	Newton metres
-4	1/4 inch 6.4 mm	9/16-18	120 to 144	14 to 16	7/16-20	204 to 240	23 to 27
-6	3/8 inch 9.5 mm	11/16-16	216 to 240	24 to 27	9/16-18	300 to 360	34 to 41
-8	1/2 inch 12.7 mm	13/16-16	384 to 480	43 to 54	3/4-16	540 to 600	61 to 68
					Thread Size	Pound- Feet	Newton metres
-10	5/8 inch 15.9 mm	1-14	552 to 672	62 to 76	7/8-14	60 to 65	81 to 88
Nom. SAE Dash Size	Tube OD	Thread Size	Pound- Feet	Newton metres	1-1/16-12	85 to 90	115 to 122
					1-3/16-12	95 to 100	129 to 136
-12	3/4 inch 19.0 mm	1-3/16-12	65 to 80	90 to 110	1-5/16-12	115 to 125	156 to 169
-14	7/8 inch 22.2 mm	1-3/16-12	65 to 80	90 to 110	1-5/8-12	150 to 160	203 to 217
-16	1.0 inch 25.4 mm	1-7/16-12	92 to 105	125 to 140	1-7/8-12	190 to 200	258 to 271
-20	1-1/4 inch 31.8 mm	1-11/16-12	125 to 140	170 to 190			
-24	1-1/2 inch 38.1 mm	2-12	150 to 180	200 to 254			

## U.S. to Metric

	<u>MULTIPLY</u>	<u>BY</u>	<u>TO OBTAIN</u>
<b>Area:</b>	square foot acre	0.092 903 0.404 686	square meter hectare
<b>Force:</b>	ounce force pound force	0.278 014 4.448 222	newton newton
<b>Length:</b>	inch foot mile	25.4 * 0.304 8 * 1.609 344 *	millimeter meter kilometer
<b>Mass:</b>	pound ounce	0.453 592 28.35	kilogram gram
<b>Mass/Area:</b>	ton/acre	2241 702	kilogram/hectare
<b>Mass/Energy:</b>	lb/hp/hr	608.277 4	gr/kW/hr
<b>Mass/Volume:</b>	lb/cubic yd.	0.593 276	kg/cubic meter
<b>Power:</b>	horsepower	0.745 700	kilowatt
<b>Pressure:</b>	lbs/sq. in. lbs/sq. in. lbs/sq. in.	6.894 757 0.069 0.070 303	kilopascal bar kg/sq. cm
<b>Temperature:</b>	degree F	1.8 F - 32	degree C
<b>Torque:</b>	pound/inch pound/foot	0.112 985 1.355 818	newton meter newton meter
<b>Velocity:</b>	miles/hr.	1.609 344 *	kilometer/hr.
<b>Volume:</b>	cubic inch cubic foot cubic yard ounce (US fluid) quart (US liquid) quart (Imperial) gallon (US) gallons (Imperial)	16.387 06 0.028 317 0.764.555 29.573 53 0.946 353 1.136 523 3.785 412 4.546 092	cubic centimeter cubic meter cubic meter milliliter litre litre litre litre
<b>Volume/Time:</b>	gallon/min.	3.785 412	litre/min.

\* = exact

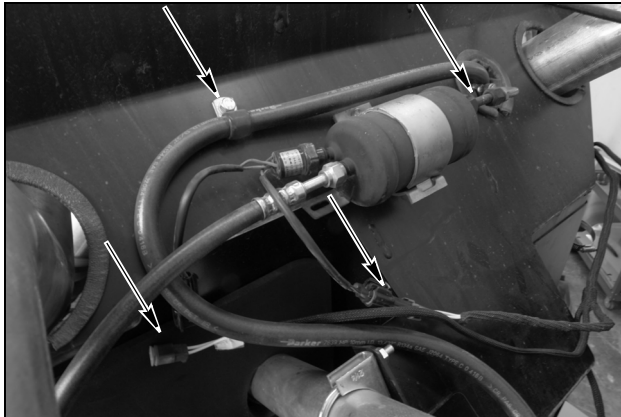
**STEP 42**



BD07B222

Disconnect air filter restriction indicator switch.

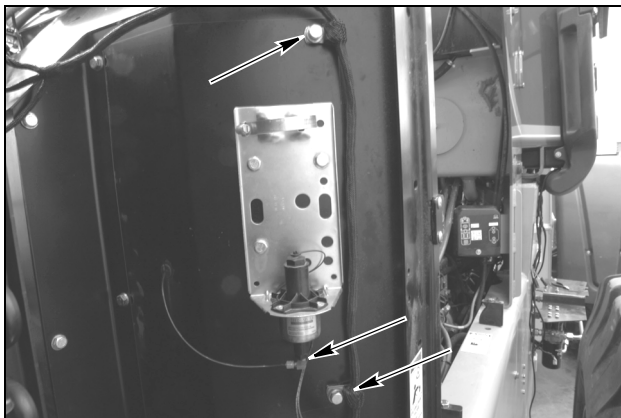
**STEP 43**



BD07B223

If equipped with air conditioning, disconnect air conditioning trinary switch, remove hose mounting clamp and move hose to engine side of fire wall. Disconnect the hose from the receiver dryer and move the hose to the engine side of the fire wall.

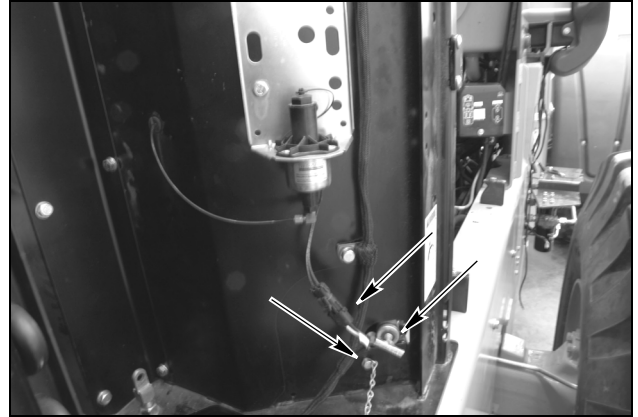
**STEP 44**



BD07B224

Remove wiring harness mounting clamp bolts. Disconnect the ether hose and move the hose to the engine side of the fire wall.

**STEP 45**



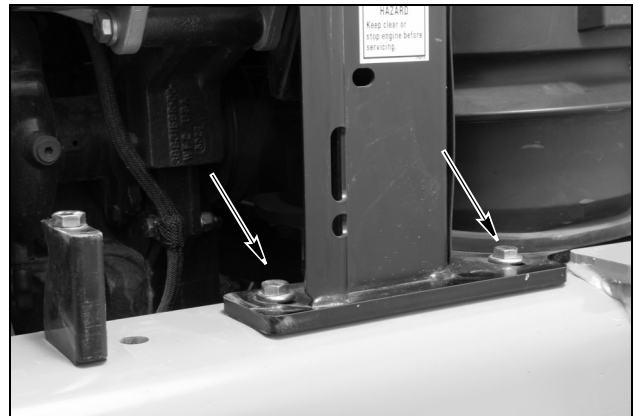
BD07B225

If equipped with ether, disconnect the ether solenoid connector. Remove mounting bolt for fuel cap chain, remove mounting bolt for engine oil dipstick.

**STEP 46**

Attach lifting equipment to the fire wall and muffler mounting frame.

**STEP 47**



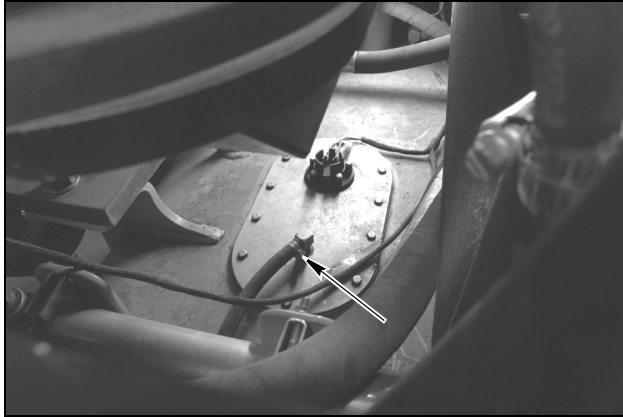
BD07B233

Remove the mounting bolts from the fire wall and muffler to hydraulic reservoir brackets.

**STEP 48**

Carefully raise and remove fire wall and muffler from loader. Lower fire wall and muffler onto suitable platform and disconnect lifting equipment.

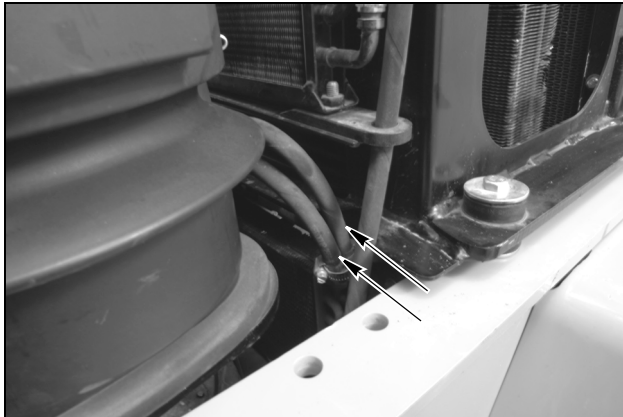
**STEP 101**



BD07B230

Connect the fuel tank vent hose.

**STEP 102**



BD07B206

Connect the fuel cooler hoses to the fuel cooler, install brackets securing fuel hoses to cooler pack.

**STEP 103**



BD07B205

Connect the lower radiator hose and cooling pack grounding wire.

**STEP 104**



BD07B204

Connect four oil cooler hoses and torque clamps to 11 Nm (100 pound-inches).

**STEP 105**



BD07B200

Connect fan hoses.

**NOTE:** *If the fan and fan guard were removed from the machine, torque the fan guard mounting bolts to 41 to 47.5 Nm (30 to 35 pound feet).*

**STEP 106**



BD07B199

Close the fan shroud and secure the latch on the fan shroud.

## SPECIFICATIONS

Idle .....	870 to 930 rpm
Alternate idle .....	570 to 630 rpm
Alternate idle .....	1170 to 1230 rpm
Full throttle (no load).....	2170 to 2300 rpm
Temperature of the torque converter oil.....	82° to 104° C (180° to 220° F)
Temperature of the hydraulic oil.....	54° to 57°C (129° to 134°F)

**NOTE:** This low idle will be held after the engine has accelerated over 1400 rpm while in gear. It will remain at this accelerated level until the transmission is placed back into neutral for two seconds.

## Stall Speeds

Torque converter.....	1975 to 2125 rpm
Hydraulic system .....	1885 to 2195 rpm
Torque converter and hydraulic system together.....	1485 to 1795 rpm

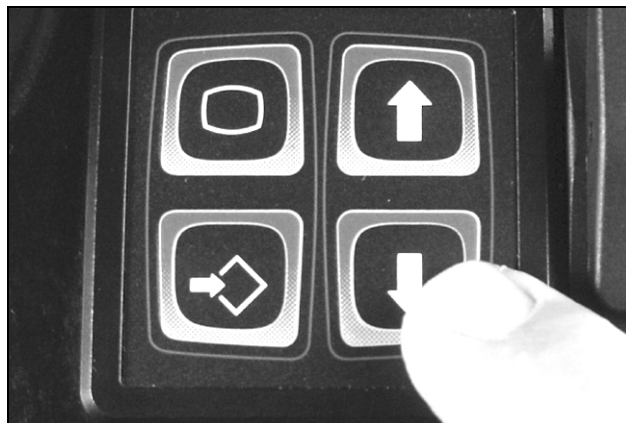
## STALL TESTS

During these tests the engine runs at full throttle and works against the torque converter, the hydraulic system, or both the torque converter and the hydraulic system. The results of these tests will show if the cause of poor performance is one or more of the following: (1) engine, (2) torque converter or transmission, and (3) hydraulic system.

## INSTRUMENT CLUSTER DISPLAYS

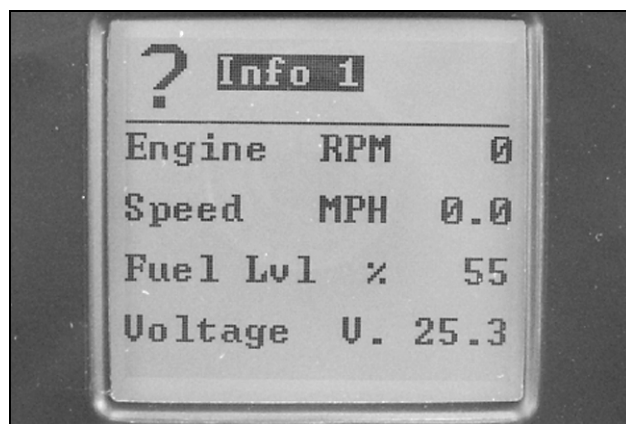
1. With the engine running, press the up or down key and scroll through the information screens and trip screens. The following sequence is using the down key only.

**NOTE:** Pressing the escape key will return the LCD back to the normal driving screen.



BD06F188

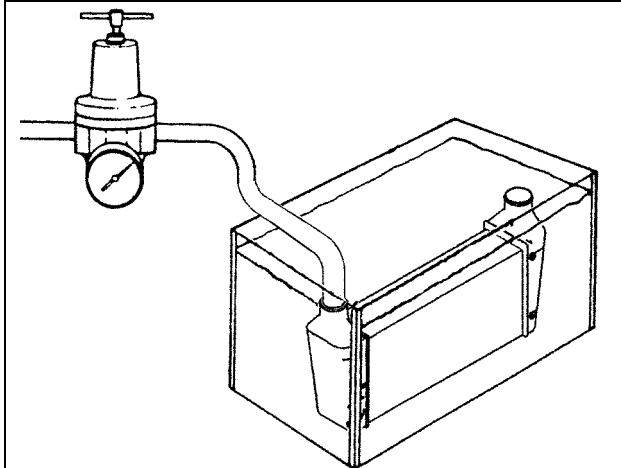
2. From the driving screen push the down arrow, as shown.



BD06F183

3. **Info 1** is the first information screen using the down arrow from the driving screen. It displays engine RPM's, speed, fuel level, and the voltage level.

## Leak Test



BS03B028

Check the core for leaks by closing off the outlet tube and attaching regulated air pressure 550kPa (80psi) to the inlet tube. Submerge the cooler in water and watch for air leakage.

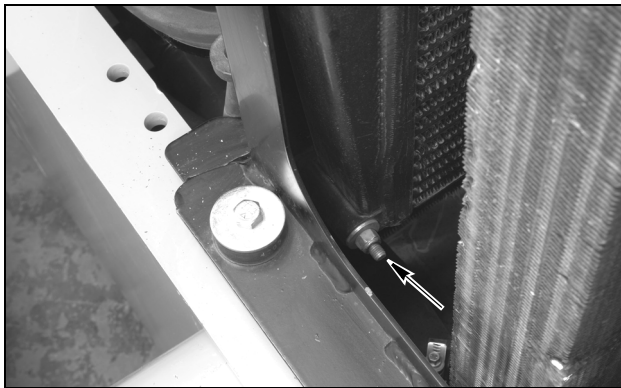
**NOTE:** *If leakage is detected replace the after cooler.*

## Installation

### STEP 1

Support after cooler with appropriate lifting device. Install after cooler in its frame.

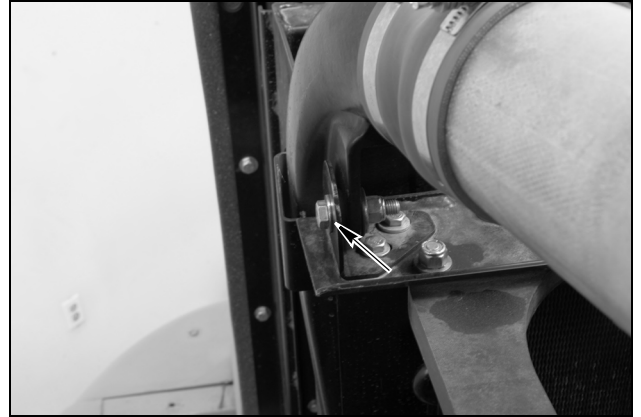
### STEP 2



BD07B194

Install two bottom mounting bolts.

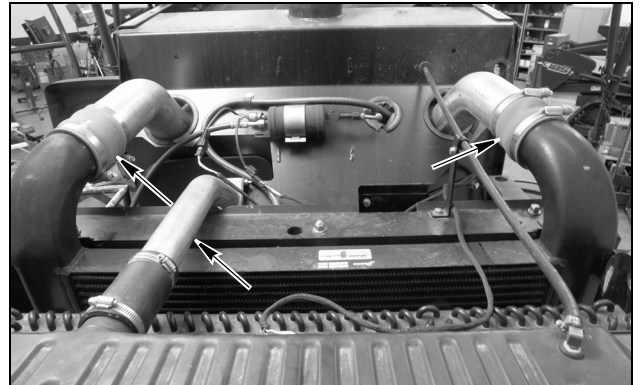
### STEP 3



BD07B178

Install two top mounting bolts.

### STEP 4

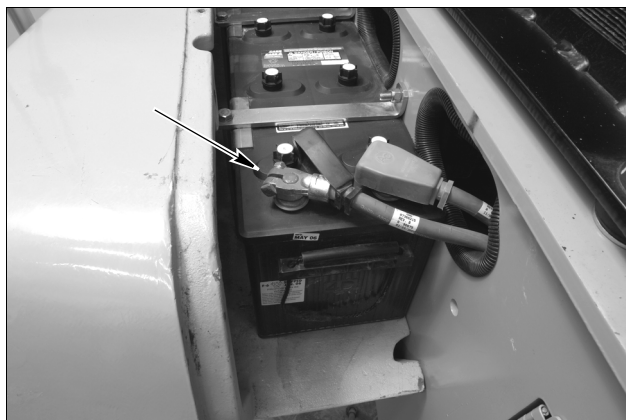


BD07B178

Install upper radiator hose and tube, tighten hose clamp. Install the hoses for the after cooler and torque hose clamps to 9.04 to 10.17 Nm (80 to 90 pound inches).

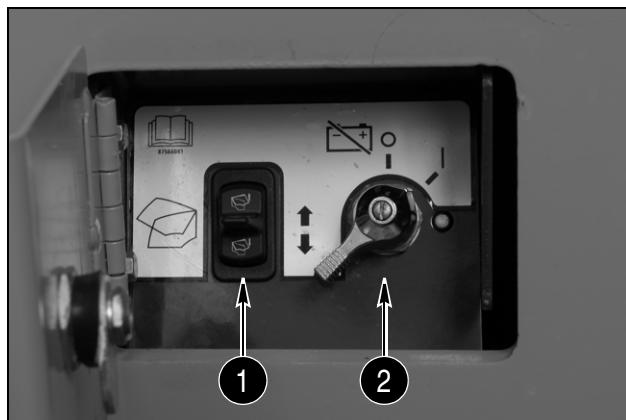
### STEP 5

Refill the cooling system.

**STEP 6**

BD07B066

Install negative battery cable and tighten nut.

**STEP 7**

BD07A218

1. HOOD SWITCH
2. MASTER DISCONNECT

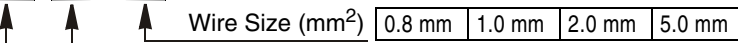
Place the master disconnect switch in the ON position. Lower the engine compartment with lifting motor.

## SPECIFICATIONS

Electrical System .....	Two 12 volt batteries connected in series, negative ground
System Voltage.....	24 volts
<b>Batteries</b>	
Group Size .....	4D
Reserve Capacity .....	290 minutes
Cold Cranking Capacity At -17° C (0° F) for 60 Seconds At 6.0 Volts .....	900 amperes
Load of Capacity (Load) Test .....	450 amperes
Alternator .....	24 volt, 100 amperes
Voltage Regulator .....	Solid State, Not Adjustable
Starter.....	24 volt, Solenoid Actuated
Bucket Control Valve (Joystick) Detent Electromagnets Resistance at 20° C (68° F) (Nominal).....	68.2 ohm
Bucket Control Valve (Single Axis) Detent Electromagnets Resistance at 20° C (68° F) (Nominal) .....	305 ohm
Fuel Level Sender.....	33 to 240 ohm
Coolant, Torque Converter, and Hydraulic Temperature Sender 20° C (68° F) .....	3521 ohm
Transmission Filter Restriction Switch with 510 ohm Internal Resistor (Normally Open)	
Closing Set point .....	2.8 Bar (40 psi)
Hydraulic Filter Restriction Switch (Normally Open) Closing Set point .....	2.8 Bar (40 psi)
Air Filter Restriction Switch (Normally Open) Closing Set point .....	-6.4 kPa (Gauge) (-0.928 psig)
A/C Trinary Pressure Switch (Closed With Normal System Pressure)	
Opens With Pressure .....	Above 28.5 ± 2.5 bar (413.3 ± 36,25 psi) Below 2.5 ± 0.25 bar (36.25 ± 3.6 psi)
Brake Declutch Pressure Switch (Normally Closed) Opening Set point.....	24 Bar (350 psi)
Brake Warning Pressure Switch (Normally Closed) Opening Set point .....	106 to 115 bar (1530 to 1670 psi)
Brake Redundant Pressure Switches (Normally Open) Closing Set point 55 to 69 bar decreasing (800 to 1000 psi)	
Brake Lamp Pressure Switch (Normally Open) Closing Set point.....	5 to 6 bar increasing (75 to 85 psi)
Secondary Steering Pressure Switch (Form C) Closing Set point .....	2.4 Bar (35 psi)
Fuel Filters Heater Resistance At 20° C (68° F) (Nominal) .....	1.9 ohm
Parking Brake Solenoid DC Resistance At 20° C (68° F) (Nominal) .....	40.3 ohm
Pilot Pressure Solenoid (Joystick) DC Resistance At 20° C (68° F) (Nominal) .....	29.9 ohm
Pilot Pressure Solenoid (Single Axis) DC Resistance At 20° C (68° F) (Nominal) .....	27.4 ohm
Ride Control Solenoid DC Resistance At 20° C (68° F) (Nominal).....	22.7 ohm
Pin Engage Solenoid DC Resistance At 20° C (68° F) (Nominal) .....	28.8 ohm
Secondary Steering Solenoid DC Resistance At 20° C (68° F) (Nominal) .....	39.3 ohm
Fan Reversing Solenoid DC Resistance At 20° C (68° F) (Nominal).....	39.3 ohm
Fan PWM Solenoid DC Resistance At 20° C (68° F) (Nominal) .....	29.3 ohm
Rollback Pressure Switch (Normally Closed) Opening Set point .....	6.2 Bar (90 psi)
Fuel Temperature Sensor At 20° C (68° F) (Nominal) .....	2500 ohm
Engine Control Unit .....	Electronic Diesel Control (QSM11)
Analog Throttle .....	Idle Validation Switch Closes At 0.775V ± 0.1V
Electronic Throttle Hall Affect .....	5V Reference ± 0.2V
Low Idle Position .....	0.5V ± 0.025V
High Idle Position .....	3.75V ± 0.1V

Wire Identification Codes

21C Bk - 1.0

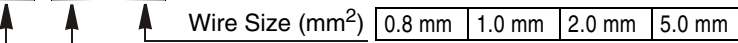


Bk = Black	DU = Dark Blue	S = Gray	LG = Light Green	K = Pink
T = Tan	W = White	N = Brown	G = Green	U = Blue
LU = Light Blue	Or = Orange	R = Red	P = Purple	Y = Yellow

Wire Identification			From Connector		To Connector	
Wire	Circuit	Color, Size, and Material	Connector	Cavity	Connector	Cavity
18G F	RH Position/Tail Fused Power	Or 0.8 GXL	CAB-E, Cab Engine	9	SPL-POS-R, Ultrasonic	
18G G	RH Position/Tail Fused Power	Or 0.8 GXL	CAB-F, Cab Front Chassis	A	SPL-POS-R, Ultrasonic	
18G H	RH Position/Tail Fused Power	Or 1.0 SXL	ENG, Engine Cab	9	SPL-POS, Ultrasonic	A
18G HN	RH Position/Tail Fused Power	Or 1.0 SXL	ENG, Engine Cab	9	ENG-H, Engine to Hood	5
18G J	RH Position/Tail Fused Power	Or 1.0 SXL	LRR-E, RH Rear Combination Light	3	SPL-POS, Ultrasonic	A
18G JN	RH Position/Tail Fused Power	Or 1.0 SXL	HD-N, Hood to Engine	5	SPL-POS-NA, Ultrasonic	A
18G K	RH Position/Tail Fused Power	Or 1.0 SXL	HD-N, Hood to Engine	5	SPL-P9, Ultrasonic	A
18G L	RH Position/Tail Fused Power	Or 1.0 SXL	SPL-P9, Ultrasonic	A	E-HD9, Trans Hood	A
18G M	RH Position/Tail Fused Power	Or 1.0 SXL	SPL-P9, Ultrasonic	A	LRR-9, RH Rear Combination Light	3
18J	EDC7 Time Delay Fused Power	Or 2.0 GXL	CAB-E, Cab Engine	18	SPL-D2, Ultrasonic	A
18J A	EDC7 Time Delay Fused Power	Or 2.0 GXL	ENG, Engine Cab	18	SPL-EDC2, Ultrasonic	A
18J B	EDC7 Time Delay Fused Power	Or 1.0 GXL	SPL-EDC2, Ultrasonic	A	EDC7, Engine Controller	3
18J C	EDC7 Time Delay Fused Power	Or 1.0 GXL	SPL-EDC2, Ultrasonic	A	EDC7, Engine Controller	2
18J D	EDC7 Time Delay Fused Power	Or 1.0 GXL	SPL-EDC4, Ultrasonic	A	EDC7, Engine Controller	8
18J E	EDC7 Time Delay Fused Power	Or 1.0 GXL	SPL-EDC4, Ultrasonic	A	EDC7, Engine Controller	9
18J F	EDC7 Time Delay Fused Power	Or 2.0 SXL	ENG, Engine Cab	14	SPL-EDC4, Ultrasonic	A
18J G	EDC7 Time Delay Fused Power	Or 2.0 GXL	CAB-E, Cab Engine	14	SPL-D2, Ultrasonic	A
18J H	Water In Fuel Sensor Fused Pwr	Or 1.0 GXL	SPL-EDC4, Ultrasonic	A	WIF, Water In Fuel Sensor	3
18J K	EDC7 Time Delay Fused Power	Or 3.0 GXL	SPL-D2, Ultrasonic	A	ECD, Elect Center D	AA2
18J L	QSM11 Time Delay Power	Or 0.8 GXL	SPL-EDC4, Ultrasonic	A	QSM11, Engine controller	17
18J M	QSM11 Time Delay Power	Or 0.8 GXL	SPL-EDC2, Ultrasonic	A	QSM11, Engine controller	7
18J N	QSM11 Time Delay Power	Or 0.8 GXL	SPL-EDC2, Ultrasonic	A	QSM11, Engine controller	8
18J P	QSM11 Time Delay Power	Or 0.8 GXL	SPL-EDC4, Ultrasonic	A	QSM11, Engine controller	18
18J Q	QSM11 Time Delay Power	Or 0.8 GXL	SPL-EDC4, Ultrasonic	A	QSM11, Engine controller	28
18K A	Diagnostic Fused Power	Or 0.8 GXL	DIA, Diagnostic	B	ECC, Work Lights	A9
18L A	Comfort Steer Fused Power	Or 0.8 GXL	SPL-CSTR, Ultrasonic	A	ECA, Elect Center A	A2
18L B	Comfort Steer Fused Power	Or 0.8 GXL	SPL-CSTR, Ultrasonic	A	ECC, Work Lights	D9
18L C	Comfort Steer Fused Power	Or 0.8 GXL	SPL-CSTR, Ultrasonic	A	ECC, Work Lights	B9

Wire Identification Codes

21C Bk - 1.0

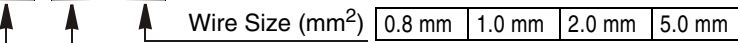


Wire Color		Bk = Black	DU = Dark Blue	S = Gray	LG = Light Green	K = Pink
Wire Name		T = Tan	W = White	N = Brown	G = Green	U = Blue
		LU = Light Blue	Or = Orange	R = Red	P = Purple	Y = Yellow

Wire Identification			From Connector		To Connector	
Wire	Circuit	Color, Size, and Material	Connector	Cavity	Connector	Cavity
35X	Sec. Str Low Press Sig	Y 0.8 TXL	CAB-T, Cab Transmission	6	AIC-2, Advance Instr Cluster 2	11
35X A	Sec. Str Low Press Sig	Y 1.0 SXL	SPL-C3, Ultrasonic	A	PSS, Sec. Steering Press Sw	C
35X B	Sec. Str Low Press Sig	Y 1.0 SXL	TRANS, Cab Transmission	6	TR-SS, Sec. Steering Mod Option	C
35X C	Sec. Str Low Press Sig	Y 1.0 SXL	SPL-C3, Ultrasonic	A	SS-TR, SS Module Trans	C
35X D	Sec. Str Low Press Sig	Y 1.0 SXL	SSM, Sec. Steering Module	8	SPL-C3, Ultrasonic	A
36A	Rear Axle Temp	P 0.8 TXL	CAB-E, Cab Engine	32	AIC-1, Advance Instr Cluster 1	5
36A A	Rear Axle Temp	P 1.0 SXL	ENG, Engine Cab	32	HOT-RA, Rear Axle Oil Temp	1
36B	Front Axle Temp	P 0.8 TXL	AIC-1, Adv Instr Cluster 1	8	CAB-F, Cab Front Chassis	8
36B A	Front Axle Temp	P 1.0 SXL	FRONT, Cab Front Chassis	8	HOT-FA, Front Axle Oil Temp	1
36C	Radiator Cool Temp Signal	P 1.0 SXL	ENG, Engine Cab	34	RECT, Engine Coolant Temp	A
36C A	Radiator Cool Temp Signal	W 0.8 TXL	CAB-E, Cab Engine	34	AIC-1, Advance Instr Cluster 1	11
36F	Fuel Level Analog	P 1.0 SXL	ENG, Engine Cab	33	RFL, Fuel Sender	1
36F A	Fuel Level Analog	P 0.8 TXL	CAB-E, Cab Engine	33	AIC-1, Advance Instr Cluster 1	2
36G	Torque Conv Output Temp Signal	P 1.0 SXL	TRANS, Cab Transmission	13	TCOT, TCO Sender	1
36G A	Torque Conv Output Temp Signal	P 0.8 TXL	CAB-T, Cab Transmission	13	TECM, Trans	49
36H	Hydraulic Oil Temp Signal	P 1.0 SXL	TRANS, Cab Transmission	30	HOT, Hydraulic Oil Temp Sender	A
36H A	Hydraulic Oil Temp	P 0.8 TXL	CAB-T, Cab Transmission	30	AIC-1, Advance Instr Cluster 1	9
36R A	Trans Temps/Filter Return	P 1.0 SXL	TRANS, Cab Transmission	12	SPL H1, Ultrasonic	A
36R B	Trans Filter Maint Sw Return	P 1.0 SXL	SPL H1, Ultrasonic	A	FM, Filter Maint Switch	2
36R C	Valve Body Temp Return	P 0.8 TXL	SPL H1, Ultrasonic	A	TRC, Trans Control	9
36R D	TCO Temp Return	P 1.0 SXL	SPL H1, Ultrasonic	A	TCOT, TCO Sender	2
36R E	Trans Temps/Filter Return	P 0.8 TXL	CAB-T, Cab Transmission	12	TECM, Trans	46
36T	Valve Body Temp Sig	P 0.8 TXL	TRANS, Cab Transmission	5	TRC, Trans Control	8
36T A	Valve Body Temp Sig	P 0.8 TXL	CAB-T, Cab Transmission	5	TECM, Trans	39
37D A	Diagnostic Signal	P 0.8 TXL	108F, Diagnostic Connector	2	TECM, Trans	15
37E	Diagnostic Signal Switched	P 0.8 TXL	108F, Diagnostic Connector	4	TECM, Trans	18
41H A	High Beam Pwr	Or 1.0 GXL	SRHSTLK, RH Stalk Switch	56a	SPL-PK2, Splice 3-4 Way	L
41H B	High Beam LH Pwr	Or 0.8 GXL	SPL-PK2, Splice 3-4 Way	K	ECB, Elect Center B	A3
41H C	High Beam RH Pwr	Or 0.8 GXL	SPL-PK2, Splice 3-4 Way	J	ECB, Elect Center B	A4

### Wire Identification Codes

**21C Bk - 1.0**



Wire Color		Bk = Black	DU = Dark Blue	S = Gray	LG = Light Green	K = Pink
Wire Name		T = Tan	W = White	N = Brown	G = Green	U = Blue
		LU = Light Blue	Or = Orange	R = Red	P = Purple	Y = Yellow

Wire Identification			From Connector		To Connector	
Wire	Circuit	Color, Size, and Material	Connector	Cavity	Connector	Cavity
J4 ECC	Driving Lights Brake Lights	ECA-BUSS	ECC, Work Lights	L1-3	ECC, Work Lights	L1-4
J5 ECC	Brake Lights Delay Power	ECA-BUSS	ECC, Work Lights	L1-4	ECC, Work Lights	L1-5
J6 ECC	Delay Power Horn	ECA-BUSS	ECC, Work Lights	L1-5	ECC, Work Lights	L1-6
J7 ECC	Horn HOD Control	ECA-BUSS	ECC, Work Lights	L1-6	ECC, Work Lights	L1-7
J8 ECC	HOD Control Cigar Lighter	ECA-BUSS	ECC, Work Lights	L1-7	ECC, Work Lights	L1-8
J9 ECC	Diagnostic Power	ECA-BUSS	ECC, Work Lights	L1-9	ECC, Work Lights	L1-8
PRM A	Ignition Power Fuse Sec. Steering	BUSS	PRM-A, Power Relay Mod A		PRM-A, Power Relay Mod A	
PRM B	Time Delay Fuse Ignition Pwr Fuse	BUSS			PRM-A, Power Relay Mod A	
PRM D	Accessory Pwr Fuse Spare	BUSS	PRM-D, Power Relay Mod D		PRM-D, Power Relay Mod D	
PRM PWR	Ignition Power Fuse Accessory Power Fuse	BUSS	PRM-A, Power Relay Mod A		PRM-D, Power Relay Mod D	
RAD1	Radio Ground	W 0.8 GXL	RAD-J3, Radio Jumper	5	RAD-J1, Radio Power	8
RAD2	12V Fused Power to Radio	W 0.8 GXL	RAD-J3, Radio Jumper	12	RAD-J1, Radio Power	7
RAD3	12V Fused Power to Radio	W 0.8 GXL	RAD-J3, Radio Jumper	7	RAD-J1, Radio Power	4
RAD4	Left Speaker Ground	W 0.8 GXL	RAD-J3, Radio Jumper	3	RAD-J2, Speaker	8
RAD5	Left Speaker	W 0.8 GXL	RAD-J3, Radio Jumper	10	RAD-J2, Speaker	7
RAD6	Not Used	W 0.8 GXL	RAD-J3, Radio Jumper	4	RAD-J2, Speaker	6
RAD7	Not Used	W 0.8 GXL	RAD-J3, Radio Jumper	11	RAD-J2, Speaker	5
RAD8	Not Used	W 0.8 GXL	RAD-J3, Radio Jumper	2	RAD-J2, Speaker	4
RAD9	Not Used	W 0.8 GXL	RAD-J3, Radio Jumper	9	RAD-J2, Speaker	3
RAD10	Right Speaker Ground	W 0.8 GXL	RAD-J3, Radio Jumper	1	RAD-J2, Speaker	2
RAD11	Right Speaker	W 0.8 GXL	RAD-J3, Radio Jumper	8	RAD-J2, Speaker	1

## 19 – Ether Solenoid

Located in the right side of the engine compartment.

Check Points	Correct Reading	Possible Cause of Bad Reading
Terminal for wire 0-BAN to ground	Continuity	Bad ground circuit.
<b>NOTE:</b> <i>Disconnect connector ETHR from ether solenoid.</i>		
Between terminals A and B of solenoid.	28.8 ohm @ 20° C (68° F)	Bad solenoid.
<b>NOTE:</b> <i>If the readings are good, check circuit 28P between solenoid connector ETHR and power relay module C connector PRM-C1. Check Power Relay Module C (15).</i>		

**34 – Fan Reversing Switch (Option)**

Located on right side console.

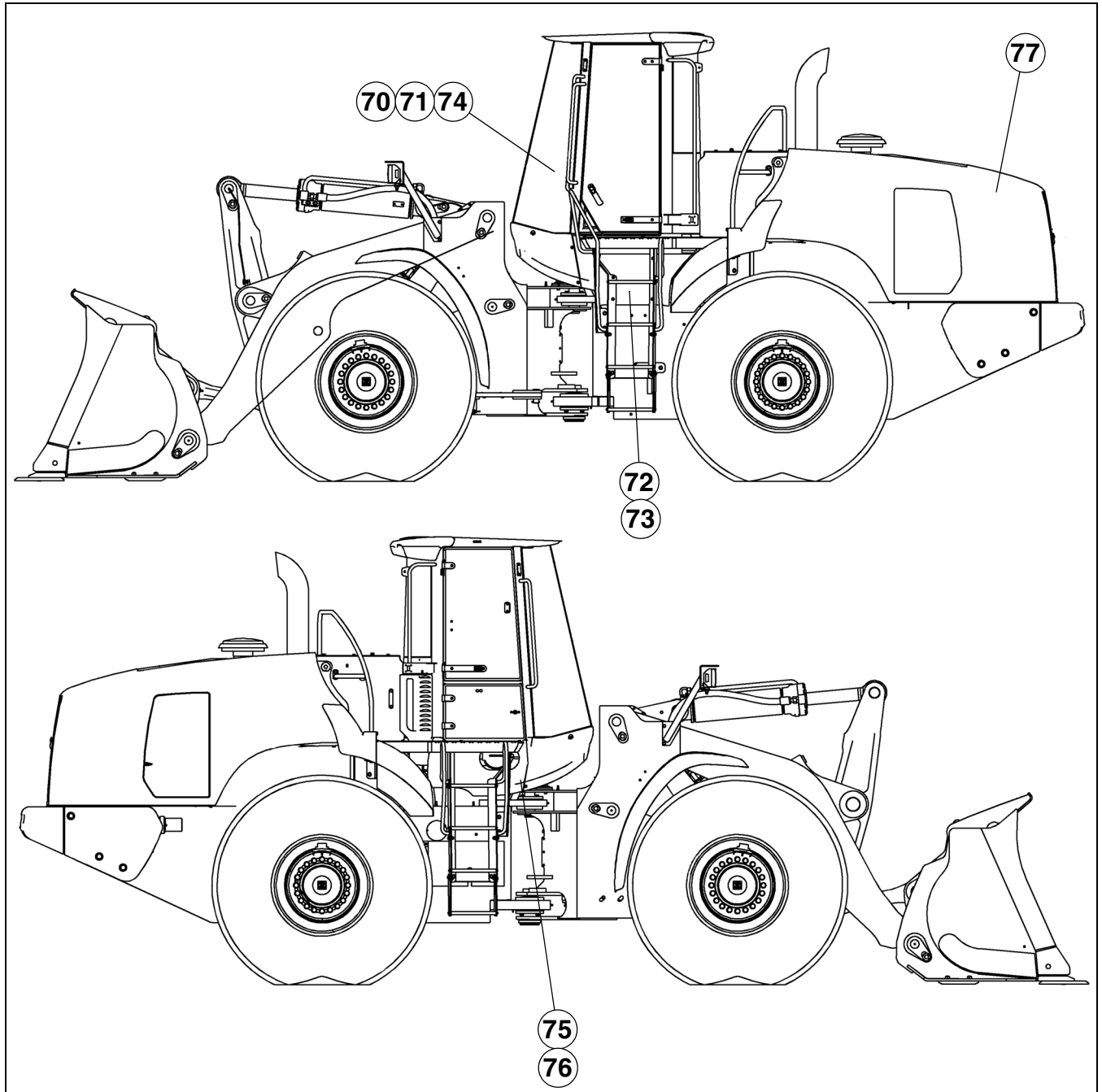
Check Points	Correct Reading	Possible Cause of Bad Reading
Terminal for wire 0-B7 to ground	Continuity	Bad ground circuit.
<b>NOTE:</b> Put the master disconnect switch and the ignition switch in the ON position.		
Terminal for wire 19P-C to ground	24 volts	Check fuse ECA-F7, power relay module A (13), also check circuit 19P.
<b>NOTE:</b> Put fan reversing switch in position 1.		
Terminal for wire 52AU to ground	24 volts	Bad fan reversing switch.
<b>NOTE:</b> Put fan reversing switch in momentary position, hold rocker.		
Terminal for wire 52M to ground	24 volts	Bad fan reversing switch.
<b>NOTE:</b> Put driving lamp switch in position 3.		
Terminal for wire 49-Q to ground	24 volts	Check driving lamp switch. If LEDs in fan reversing switch are not ON with 24 volts at check point, replace fan reversing switch.

**35 – Fan Reverse Relay**

Located in the cab access panel for fuses and relays.

Check Points	Correct Reading	Possible Cause of Bad Reading
<b>NOTE:</b> Put master disconnect switch and ignition switch in ON position.		
Terminal for wire 19P-D and 19P-E to ground	24 volts	Check fuse ECA-F7 and circuit 19P.
<b>NOTE:</b> Put the fan reverse switch in the manual reverse position.		
Terminals for wire 52A-A to ground	Continuity or resistance	Bad fan reverse solenoid, bad fan reverse switch (34), bad advanced instrument cluster (57).

## SWITCH PAD, INSTRUMENT CLUSTER 2, PARK BRAKE



BS07A135 / BS07A136

70. SWITCH PAD

71. INSTRUMENT CLUSTER CONNECTOR 2

72. HYDRAULIC FILTER RESTRICTION SWITCH

73. HYDRAULIC OIL TEMPERATURE SENDER

74. PARK BRAKE SWITCH

75. REDUNDANT BRAKE PRESSURE SWITCH 1

76. REDUNDANT BRAKE PRESSURE SWITCH 2

77. COOLANT LEVEL SENDER

**NOTE:** The battery must be at full charge and all connections clean and tight before doing any testing of the electrical system. Use a Multimeter for the following tests.

**86 – Right Hand Front Work Lamp**

Located on right front side of cab.

Check Points	Correct Reading	Possible Cause of Bad Reading
<b>NOTE:</b> <i>Disconnect wiring harness connector LRFW from RH front work lamp connector.</i>		
Flood lamp connector pin A to pin B	Continuity	Bad lamp bulb.
<b>NOTE:</b> <i>Connect wiring harness connector LRFW to RH front work lamp connector.</i>		
Terminal for wire 0-MJ to ground	Continuity	Bad ground circuit.
<b>NOTE:</b> <i>Put master disconnect switch in ON position. Put driving lamp switch (95) in position 3.</i>		
Terminal for wire 42C-G to ground	24 volts	Check fuse ECB-F1 and driving lamp switch (95). Also check circuit 42C from flood lamp to lamp switch (95) and wire 42-A to fuse ECC-F2.

**87 – Left Hand Rear Work Lamp**

Located on left rear side of cab.

Check Points	Correct Reading	Possible Cause of Bad Reading
<b>NOTE:</b> <i>Disconnect wiring harness connector LLRW from LH rear work lamp connector.</i>		
Flood lamp connector pin A to pin B	Continuity	Bad lamp bulb.
<b>NOTE:</b> <i>Connect wiring harness connector LLRW to LH rear work lamp connector.</i>		
Terminal for wire 0-ME to ground	Continuity	Bad ground circuit.
<b>NOTE:</b> <i>Put master disconnect switch in ON position. Put driving lamp switch (95) in position 4 or 5.</i>		
Terminal for wire 42R-H to ground	24 volts	Check fuse ECB-F2 and driving lamp switch (95). Also check circuit 42R from flood lamp to lamp switch (95) and wire 42-B to fuse ECC-F2.

**88 – Right Hand Rear Work Lamp**

Located on right rear side of cab.

Check Points	Correct Reading	Possible Cause of Bad Reading
<b>NOTE:</b> <i>Disconnect wiring harness connector LRRW from RH rear work lamp connector.</i>		
Flood lamp connector pin A to pin B	Continuity	Bad lamp bulb.
<b>NOTE:</b> <i>Connect wiring harness connector LRRW to RH rear work lamp connector.</i>		
Terminal for wire 0-MF to ground	Continuity	Bad ground circuit.
<b>NOTE:</b> <i>Put master disconnect switch in ON position. Put driving lamp switch (95) in position 3.</i>		
Terminal for wire 42R-G to ground	24 volts	Check fuse ECB-F2 and driving lamp switch (95). Also check circuit 42R from flood lamp to lamp switch (95) and wire 42-B to fuse ECC-F2.

**99 – Horn**

Located in the front of the machine under control valve cover.

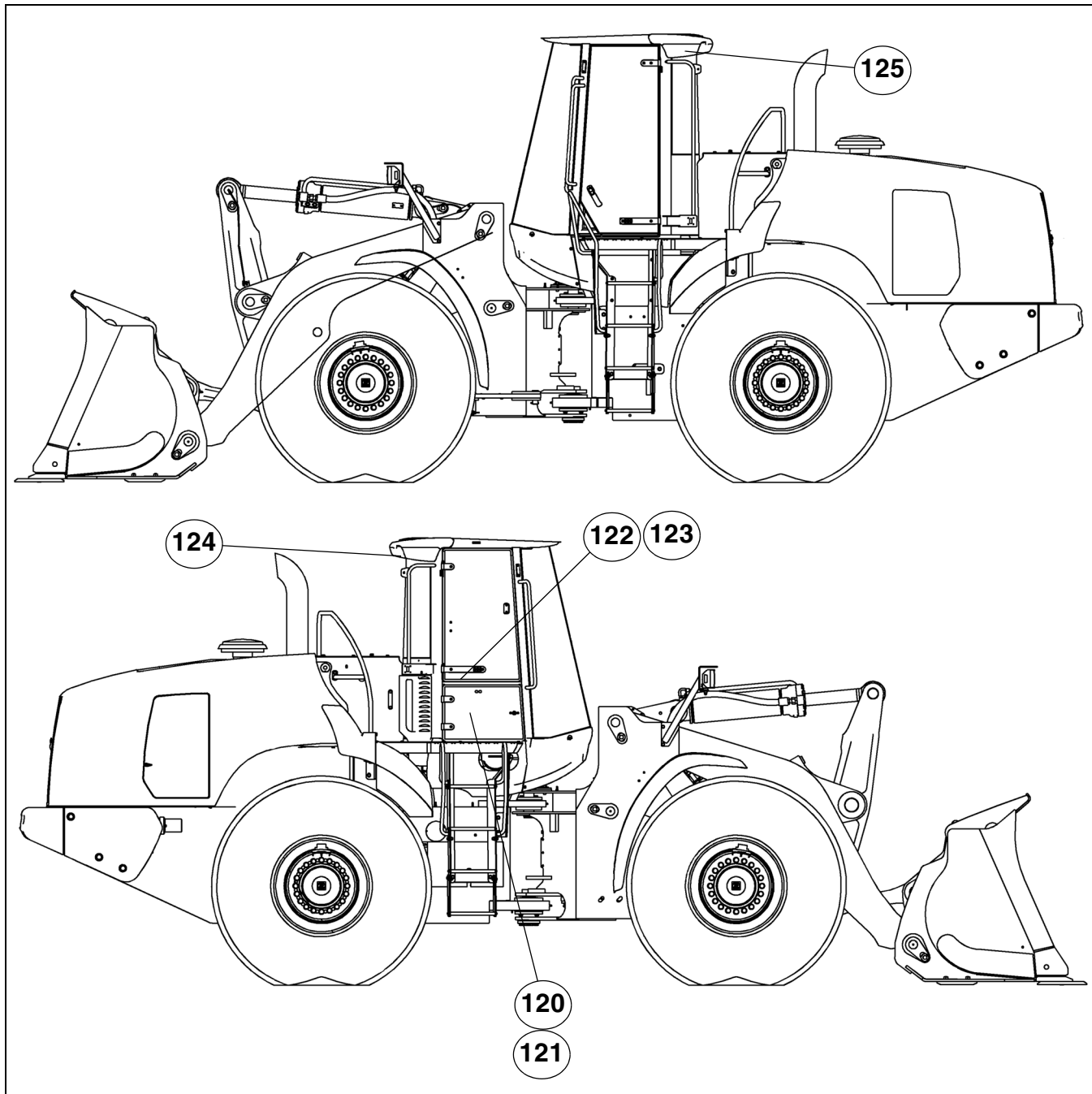
<b>Check Points</b>	<b>Correct Reading</b>	<b>Possible Cause of Bad Reading</b>
Terminal for wire 0-AF to ground	Continuity	Bad ground circuit.
<b>NOTE:</b> <i>Disconnect the wire 64 from the horn. Have an assistant push and hold the horn switch.</i>		
Terminal for wire 64 to ground.	24 volts	Check the horn relay (98). Also check wires 64 and 64-A.
<b>NOTE:</b> <i>If the readings are good replace the horn.</i>		

## 108 – Front Wiper and Washer Switch

Located on right side console.

Check Points	Correct Reading	Possible Cause of Bad Reading
Terminal for wire 0-DT to ground	Continuity	Bad ground circuit.
<b>NOTE:</b> Put the master disconnect switch and the ignition switch in the ON position. Make sure the front wiper and washer switch is in the OFF position.		
Terminal for wire 19J-B to ground	24 volts	Check fuse ECA-F12, check circuit 19J, also check power relay module D (16).
<b>NOTE:</b> Put the front wiper and washer switch in the LOW position.		
Terminal for wire 63LC to ground	0 volts	Bad front wiper and washer switch also check grounding circuit.
<b>NOTE:</b> Put the front wiper and washer switch in the HIGH position.		
Terminal for wire 63HC to ground	0 volts	Bad front wiper and washer switch also check grounding circuit.
<b>NOTE:</b> Put the front wiper and washer switch in the wash position.		
Terminal for wire 63W to ground	24 volts	Bad front wiper and washer switch.
<b>NOTE:</b> Put the driving lamp switch in position 2 or 3.		
Terminal for wire 49-T to ground	24 volts	Check driving lamp switch (95) and circuit 49. If LEDs in rear wiper and washer switch are not ON with 24 volts at check point, replace rear wiper and washer switch.

## RADIO AND POWER CONVERTER



BS07A135 / BS07A136

120.POWER RELAY MODULE E

121.POWER CONVERTER 24 TO 12 VOLT (OPTION)

122.12 VOLT POWER OUTLETS (OPTION)

123.RADIO (OPTION)

124.RIGHT SPEAKER (OPTION)

125.LEFT SPEAKER (OPTION)

**NOTE:** The battery must be at full charge and all connections clean and tight before doing any testing of the electrical system. Use a Multimeter for the following tests.

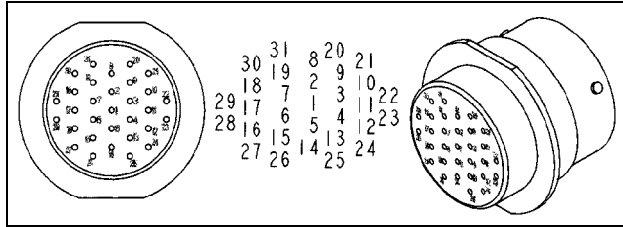
**140 – Water Valve Potentiometer**

Check Points	Correct Reading	Possible Cause of Bad Reading
<b>NOTE:</b> Put the master disconnect switch and the ignition switch in the ON position. Take reading between pins on potentiometer.		
Place potentiometer in maximum heat position	4 volts	Bad potentiometer
Place potentiometer in mid range position	2.5 volts	Bad potentiometer
Place potentiometer in maximum cool position	0 volts	Bad potentiometer
<b>NOTE:</b> If no voltage is present at potentiometer check the driver (132).		

**141 – Air Recirculating Switch**

Check Points	Correct Reading	Possible Cause of Bad Reading
<b>NOTE:</b> Disconnect connector from the switch. Place switch in outside air position.		
Between terminals on switch	Continuity	Bad recirculating switch.
<b>NOTE:</b> Place switch in recirculate air position.		
Between terminals on switch	Open	Bad recirculating switch.

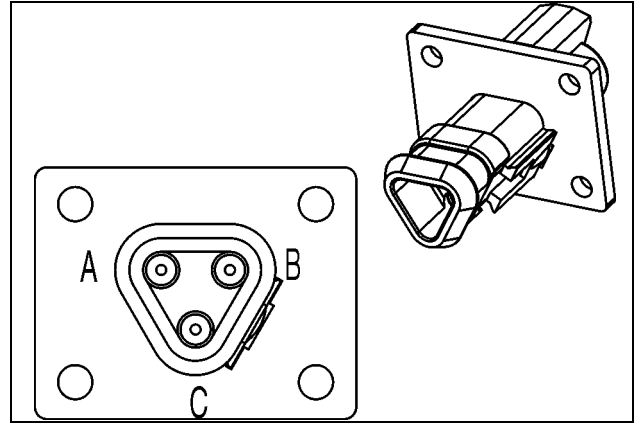
**CONNECTOR CAB-T - CAB TO TRANSMISSION**



380839A1

CAV	WIRE IDENT	CIRCUIT
1	33R	Front Brake Accumulator Pressure Low
2	31D-A	Coolant Level Signal
3	19M	Secondary Steering Accessory Fused Power
4	19R-E	Sec. Steering Ignition Fused Power
5	36T-A	Valve Body Temp Signal
6	35X	Secondary Steer Low Press Signal
7	25A-A	Engine Speed Signal
8	25C-A	Turbine Speed Signal
9	25B-A	Intermediate Speed Signal
10	25D-A	Output Speed Signal
11	0-DM	Speed Sensor Ground
12	36R-E	Trans Temp/Filter Return
13	36G-A	TCO Temp Signal
14		Not Used
15		Not Used
16	25K-A	Trans Solenoid Valve Y1
17	25L-A	Trans Solenoid Valve Y2
18	25M-A	Trans Solenoid Valve Y3
19	25N-A	Trans Solenoid Valve Y4
20	25P-A	Trans Solenoid Valve Y5
21	25J-A	Trans Solenoid Valve Y6
22	25S-A	Output Sw Power VPS1
23	31H-A	Hyd Filter Restriction Switch Sig
24		Not Used
25		Not Used
26	19S1	Sec. Steering Fused Power
27		Not Used
28	0-DN	Output Speed Sensor Ground
29	19A-M	Output Speed Sen. Fused Pwr
30	36H-A	Hydraulic Oil Temp
31	32F-A	Trans Filter Maint Switch

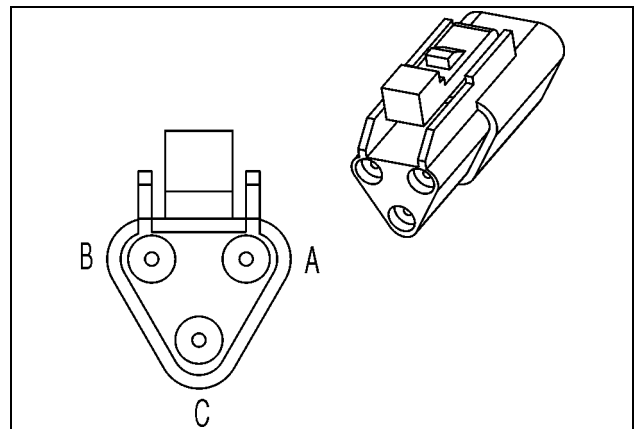
**CONNECTOR CAN - CAN BULK HEAD**



87315266

CAV	WIRE IDENT	CIRCUIT
A	CAN-HA	CAN High
B	CAN-LA	CAN Low

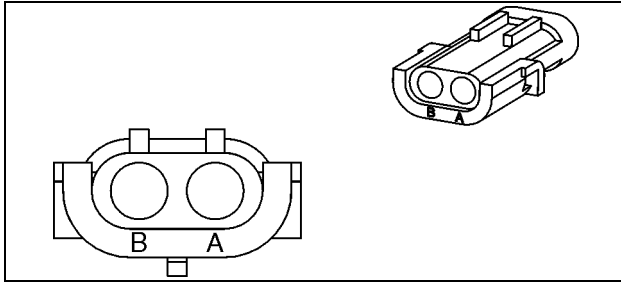
**CONNECTOR CAN2 - CAN BULK HEAD**



87315267

CAV	WIRE IDENT	CIRCUIT
A	CAN-H	CAN High
A	CAN-HJ	CAN High From Engine
B	CAN-L	CAN Low
B	CAN-LM	CAN Low From Engine

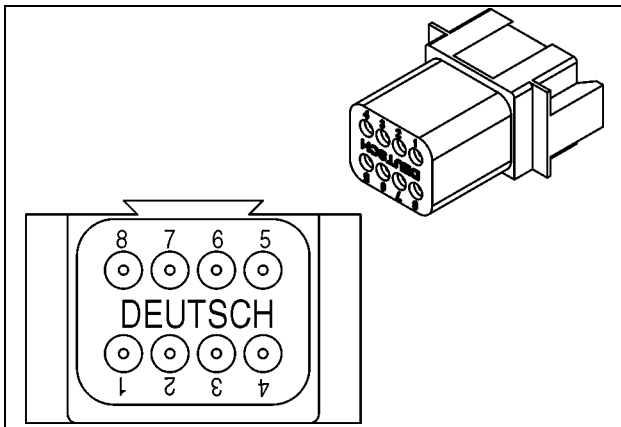
**CONNECTOR ENG-D - DISCONNECT HARNESS**



245483C1

CAV	WIRE IDENT	CIRCUIT
A	13C-A	Fuel Shutoff Fused Power
B	13M-A	Fuel Shutoff Fused Power
B	13M-B	Key Switch Power Disc Switch

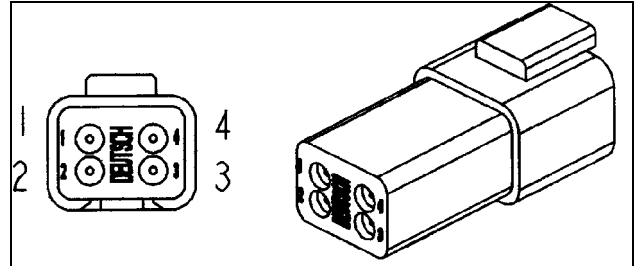
**CONNECTOR ENG-H - ENGINE TO HOOD**



225320C1

CAV	WIRE IDENT	CIRCUIT
1	0-BAG-N	Hood Ground (NA)
2	44A-DN	Brake Light Relay Out
3	45L-AN	Left Turn Signal
4	45R-AN	Right Turn Signal
5	18G-HN	RH Position/Tail Fused Pwr
6	18F-AN	LH Position/Tail Fused Pwr
7	35A-GN	Backup Alarm Relay Out
8	35A-R	Backup Alarm Relay Out

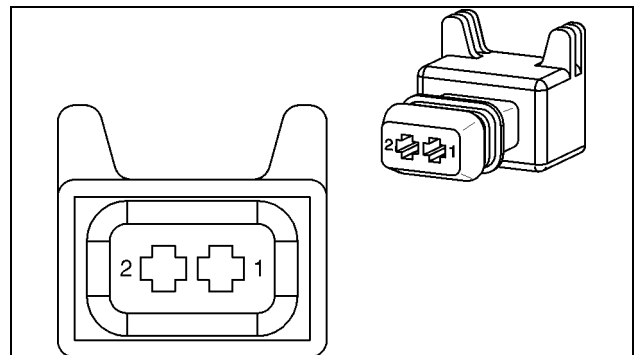
**CONNECTOR ENG-T - ENGINE TO TRANSMISSION**



225326C1

CAV	WIRE IDENT	CIRCUIT
1	0-BZ	Sec. Steering Splice Ground
2	0-BK	Transmission Splice Grounds
3	31D-C	Coolant Level Sender Eng Transmission
4		Not Used

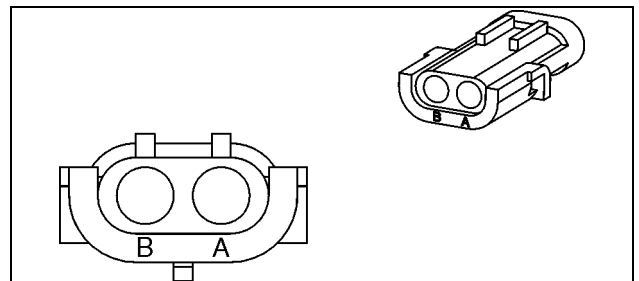
**CONNECTOR ESS - ENGINE SPEED SENSOR**



291718A1

CAV	WIRE IDENT	CIRCUIT
1	25A	Engine Speed Signal
2	0-HF	Engine Speed Sensor Ground

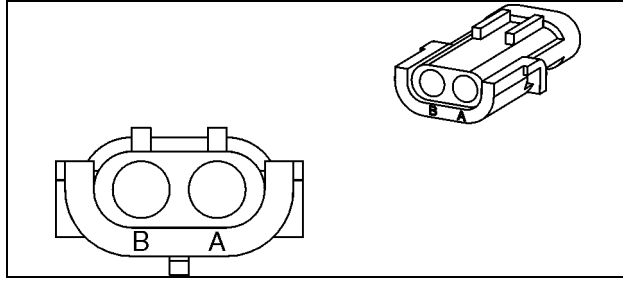
**CONNECTOR ETHR - ETHER SOLENOID**



245483C1

CAV	WIRE IDENT	CIRCUIT
A	28P	Ether Solenoid PWR
B	0-BAN	Ether Solenoid Ground

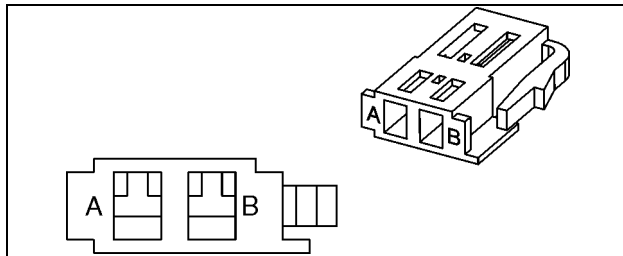
**CONNECTOR LRRW - RH REAR WORK LAMP**



245483C1

CAV	WIRE IDENT	CIRCUIT
A	42R-G	RH Rear Work Lamp Fused Pwr
B	0-MF	RH Rear Work Lamp Ground

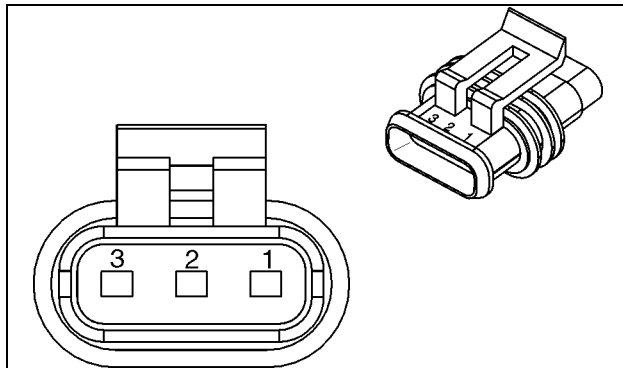
**CONNECTOR LSPK - LEFT SPEAKER**



195552A1

CAV	WIRE IDENT	CIRCUIT
A	65L	Left Speaker Signal
B	0-PA	Left Speaker Ground

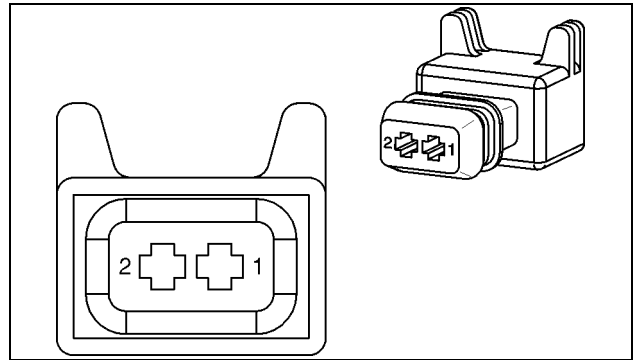
**CONNECTOR OSS - OUTPUT SPEED SENSOR**



291719A1

CAV	WIRE IDENT	CIRCUIT
1	0-HE	Output Speed Ground
2	25D	Output Speed Signal
3	19A	Output Speed Fused Pwr

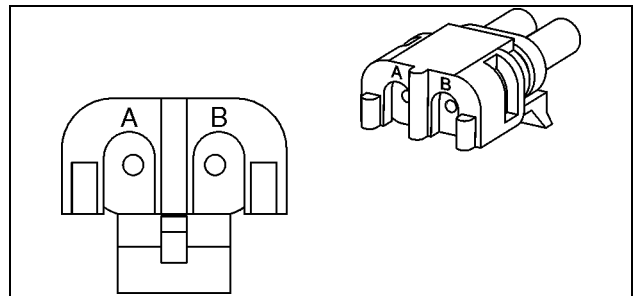
**CONNECTOR PAF - AIR FILTER RESTRICTION SWITCH**



291718A1

CAV	WIRE IDENT	CIRCUIT
1	31F	Air Filter Restriction Switch Signal
2	0-BY	Air Filter Restriction Switch Grnd

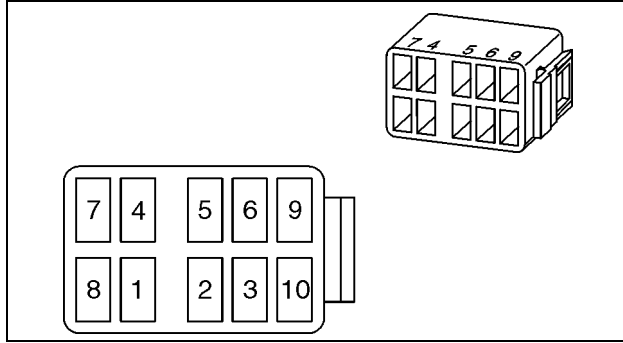
**CONNECTOR PBD - BRAKE DECLUTCH PRESSURE SWITCH**



245482C1

CAV	WIRE IDENT	CIRCUIT
A	19A-A	Brake Declutch Sw Fused Pwr
B	25G	Brake Declutch Switch Control

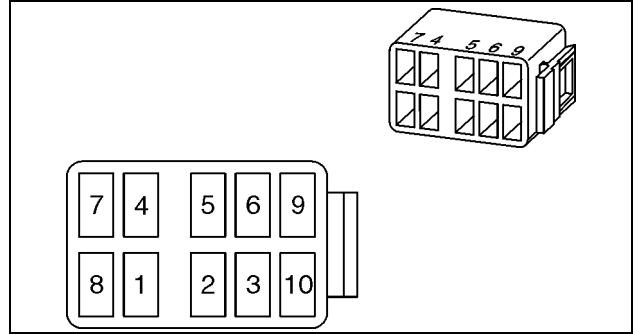
**CONNECTOR SDR - DRIVING LIGHTS SWITCH**



382391A1

CAV	WIRE IDENT	CIRCUIT
1		Not Used
2	19Z-A	Driving lights Switch Fused Pwr
3	41T	Position Lights Switch Power
4		Not Used
5	19Z-B	Driving Lights Switch Fused Power
6	41J	Driving Lights Power
7	0-B19	Back Light Ground
8	49-P	Back Light Power
9		Not Used
10		Not Used

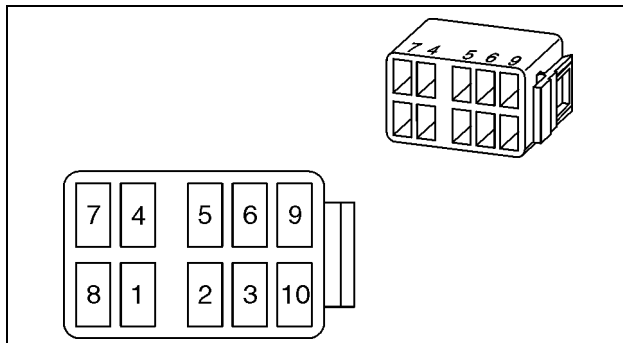
**CONNECTOR SFC - FAN CONTROL SWITCH**



382391A1

CAV	WIRE IDENT	CIRCUIT
1		Not Used
2	52J	Fan Control Switch Jumper
3	52-AU	Fan Reverse Auto
4	52J	Fan Control Switch Jumper
5	19P-C	Fan Reverse Switch Fused Pwr
6	52M	Fan Reverse Manual
7	0-B7	Back Light Ground
8	49-Q	Back Light Power
9		Not Used
10		Not Used

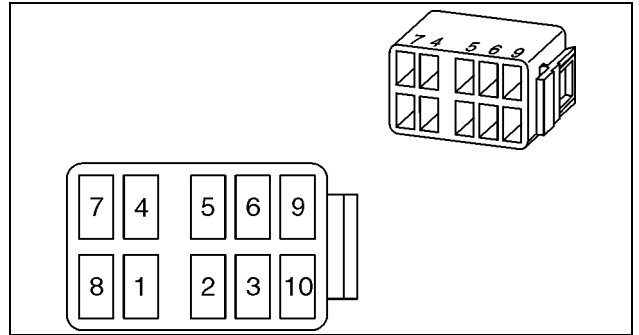
**CONNECTOR SETHR - ETHER SWITCH**



382391A1

CAV	WIRE IDENT	CIRCUIT
1		Not Used
2	28J	Ether AIC OK Signal
3	28H	Ether Switch Signal
4		Not Used
5		Not Used
6		Not Used
7	0-B30	Back Light Ground
8	49U	Back Light Power
9		Not Used
10		Not Used

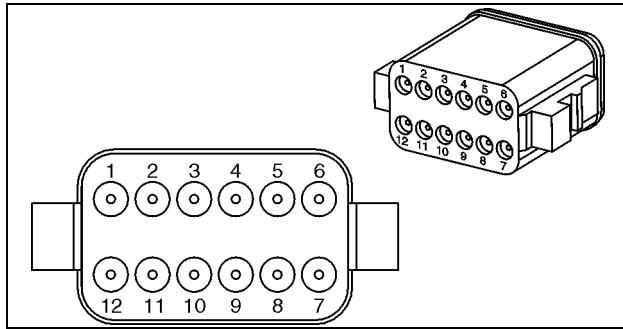
**CONNECTOR SFL - RETURN-TO-TRAVEL SWITCH**



382391A1

CAV	WIRE IDENT	CIRCUIT
1	55A-B	RTT/Float Switch Power
2	53P-B	Pilot Control Relay Out
3	55A-C	RTT/Float Switch Power
4	0-29	RTT/Float Ground
5	55B	RTT Float Switch Control
6	54B-C	HC-RTT Control Signal
7	0-B2	Back Light Ground
8	49-K	Back Light Power
9		Not Used
10		Not Used

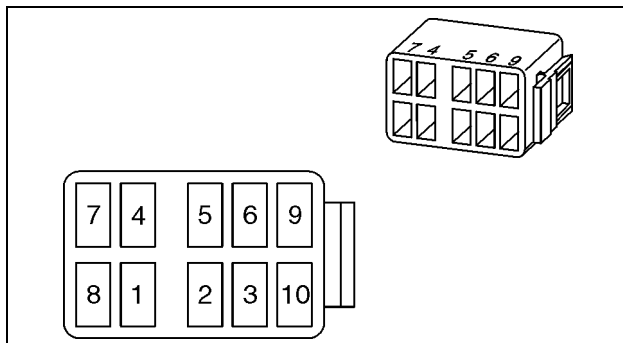
**CONNECTOR SSM - SECONDARY STEERING MODULE**



225389C1

CAV	WIRE IDENT	CIRCUIT
1	19R-C	Sec. Steering Ignition Fused Pwr
2	51-A	Secondary Steer Control
3	19S1-X	Secondary Steer Fused Power
4	0-CE	Secondary Steer Chassis Grnd
5		Not Used
6		Not Used
7	19M-C	Secondary Steer ACC Fused Pwr
8	35X-D	Secondary Steer Low Press Sig
9	51P-A	Secondary Steer High Press
10		Not Used
11	0-CA	Secondary Steer Signal Grnd
12	0-CB	Secondary Steer Signal Grnd

**CONNECTOR STA - TRANSMISSION AUTO SWITCH**

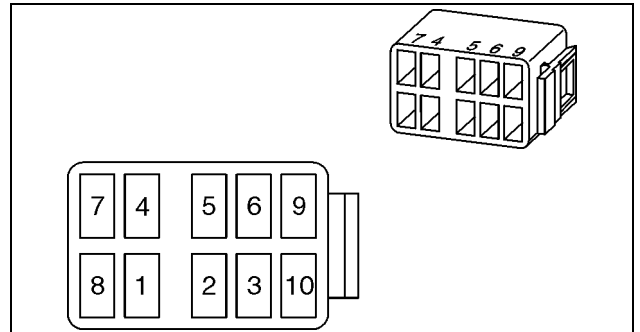


382391A1

CAV	WIRE IDENT	CIRCUIT
1		Not Used
2	19A-Q	Trans Auto Sw Fused Power
3	25H	Trans Auto Signal
4		Not Used
5		Not Used
6		Not Used

CAV	WIRE IDENT	CIRCUIT
7	0-B17	Back Light Ground
8	49S	Back Light Power
9		Not Used
10		Not Used

**CONNECTOR STE - TRANSMISSION ENABLE SWITCH**



382391A1

CAV	WIRE IDENT	CIRCUIT
1		Not Used
2	19A-D	Trans Enable Sw Fused Power
3	26E	Trans Enable Signal
4		Not Used
5		Not Used
6		Not Used
7	0-DAP	Back Light Ground
8	49-H	Back Light Power
9	32J-C	Trans Enable Indiction
10	19A-E	Trans Enable Sw Fused Pwr

Connector SWL .....	168	Front Axle Oil Temperature Sender .....	66
Connector TCOT .....	168	Front Left Hand Combination Lamp .....	85
Connector TDM .....	168	Front Right Hand Combination Lamp .....	86
Connector TECM .....	169	Front Washer Pump Motor .....	99
Connector TR_SS .....	170	Front Wiper and Washer Switch .....	97
Connector TRAN_E .....	170	Front Wiper High Speed Cut Out Relay .....	95
Connector TRANS .....	170	Front Wiper High Speed Relay .....	95
Connector TRC .....	171	Front Wiper Low Speed Relay .....	96
Connector TS1 .....	171	Front Wiper Motor .....	98
Connector TS2 .....	171	Fuel Level Sender .....	64
Connector TSS .....	172		
Connector WF .....	172	<b>H</b>	
Connector WSH .....	172	Hazard Switch .....	82
Connector YCS .....	172	Height Control Switch .....	51
Connector YFN .....	172	Height Control/Return-To-Travel Proximity Switch .....	53
Connector YFR .....	172	High-Low Beam Switch .....	83
Connector YPB .....	173	Hood	
Connector YPE .....	173	Down Relay .....	119
Connector YPP .....	173	Motor .....	120
Connector YRC .....	173	Switch .....	119
Connector YSS .....	173	Up Relay .....	119
Connector, Diagnostic .....	61	Horn .....	87
Coolant Level Sender .....	71	Horn Relay .....	86
		Horn Switch .....	83
<b>D</b>		Hydraulic Filter Restriction Switch .....	69
Declutch Brake Switch .....	61	Hydraulic Oil Temperature Sender .....	69
Declutch Switch .....	61		
Diagnostic Connector .....	61	<b>I</b>	
Diode Module .....	100	Ignition Switch .....	42
Diodes		Instrument Cluster Connector 1 .....	63
Lights .....	78	Instrument Cluster Connector 2 .....	68
Secondary Steering .....	102	Intermediate Speed Sensor .....	61
Dome Lamp .....	76		
Door Switch .....	75	<b>L</b>	
Driving Lamp Switch .....	83	Lamp	
		Dome .....	76
<b>E</b>		High Beam .....	85, 86
Electrical Wire Identification .....	8	Left Hand Front Combination .....	85
Electromagnetic Detents .....	52	Left Hand Front Work .....	76
Electronic Diesel Control .....	49	Left Hand Rear Combination (Europe Only) .....	92
Engine Speed Sensor .....	61	Left Hand Rear Combination (North America Only) .....	91
Ether		.....	91
Solenoid .....	47	Left Hand Rear Work .....	77
Switch .....	46	License Plate (Europe Only) .....	93
		License Plate (North America Only) .....	92
<b>F</b>		Low Beam .....	85, 86
Fan PWM Solenoid .....	58	Position .....	85, 86
Fan Reverse Relay .....	57	Right Hand Front Combination .....	86
Fan Reversing Solenoid .....	59	Right Hand Front Work .....	77
Fan Reversing Switch .....	57	Right Hand Rear Combination (Europe Only) .....	90
Filter Maintenance Switch .....	61	Right Hand Rear Combination (North America Only) .....	89
Flasher Module .....	81	Right Hand Rear Work .....	77
FNR Switch for Joystick Controls .....	61	Switch, Driving .....	83
FNR Switch for Single Axis Controls .....	61	Turn .....	85, 86
Front		Left Hand Front Combination Lamp .....	85
Left Hand Work Lamp .....	76	Left Hand Front Work Lamp .....	76
Right Hand Work Lamp .....	77		

## CHARGING A BATTERY



**WARNING:** *Never try to charge the battery if the electrolyte in the battery is frozen.*

47-83

Before you charge the battery, check the level of the electrolyte.

It is difficult to give an exact charging rate because of the following variable conditions: (1) temperature of the electrolyte, (2) level of charge, and (3) condition of the battery. Use the charging guide for the correct charging rate and time.

See Specifications in Section 4001 for the reserve capacity of the battery in this machine.

The charging rate must be decreased if:

1. Too much gas causes the electrolyte to flow from the cells.
2. The temperature of the electrolyte rises above 52°C (125°F).

**NOTE:** *For the best charge, use the slow charging rates.*

The battery is fully charged when, over a three hour period at a low charging rate, no cell is giving too much gas, and the specific gravity does not change.

### Charging Guide For Maintenance Free Batteries

Recommended Rate\* and Time for Fully Discharged Battery

Battery Capacity - See Reserve Capacity under Specifications	Slow Charge	Fast Charge
80 Minutes or Less	10 Hours at 5 Amperes 5 Hours at 10 Amperes	2.5 Hours at 20 Amperes 1.5 Hours at 30 Amperes
Above 80 to 125 Minutes	15 Hours at 5 Amperes 7.5 Hours at 10 Amperes	3.75 Hours at 20 Amperes 1.5 Hours at 50 Amperes
Above 125 to 170 Minutes	20 Hours at 5 Amperes 10 Hours at 10 Amperes	5 Hours at 20 Amperes 2 Hours at 50 Amperes
Above 170 to 250 Minutes	30 Hours at 5 Amperes 15 Hours at 10 Amperes	7.5 Hours at 20 Amperes 3 Hours at 50 Amperes

\*Initial rate for standard taper charger.

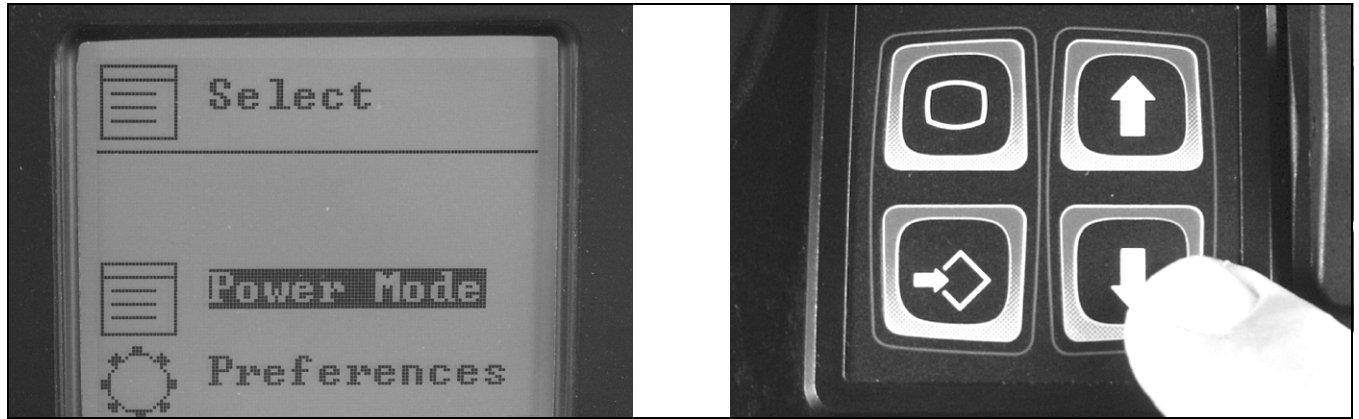
**NOTE:** *A maintenance free battery will have the words Maintenance Free on the decal on the top of the battery. If the center part of the decal has been removed to get access to the battery caps, it is possible the words Maintenance Free will have been removed from the decal.*

Continued on next page

## Entering The Service Screens

After the machine has been started or the key switch has been turned to on the operator or service technician may use this service menu to adjust machine configurations to working conditions, test components, view faults that may have occurred, or select preferences.

**NOTE:** When all the selections have been made they will be stored in memory. If there is an abrupt battery disconnect you may loose all of your selections and need to reprogram the LCD Multi-function display.



BD06H038 / BD06F188

Press and hold the confirmation button for two seconds to arrive at the above service screen. Use down arrow to scroll through the menu's.

Items and selections in this menu are:

### 1. Power Mode Menu

- Max - Maximum power possible
- Standard - Standard operation
- Auto - Will cycle between Max and Standard
- Eco - Limited power for economy

### 2. Preferences Menu

- Language - English, Italian, French, Spanish, Portuguese, German
- Units - Metric, English or Imperial
- Clock - 24 or 12 hour

### 3. Options Menu

- Fan Auto - manual or automatic
- Idle Auto - manual or automatic
- Show RPM
- Show MPH/KPH

### 4. Display Menu

- Day Display
- Day LED
- Night Display
- Night LED

### 5. Clock Menu

- Hour
- Minute
- Day

### ● Month

- Year

### 6. Cluster H/W

- Part Number
- Serial Number
- ID
- Version

### 7. Cluster S/W

- Part Number
- Loader Version
- ID
- Version

### 8. Config Menu

- Change Model \*
- Select Tires (Select tire sizes)
- Clutch Calibration (calibrate gear box)\*
- Gear Limits (choose maximum gear)
- Park Brake (Park brake test)
- Cold Start (choose cold start system)
- FAN Test (sound level)
- Special
  - Reset Error
  - Factory Set

CODE	DEFINITION	DESCRIPTION AND POSSIBLE STEPS FOR REPAIR
3051	Battery voltage to ECM too high	Alternator voltage governor defect. Replace alternator governor device or alternator.
3052	Battery voltage to ECM too low	Battery defect, alternator defect, wiring problems (too high resistance) or ECU defect. Occurrence possible during cold start. Replace battery or alternator. Check ECU and wiring.
3062	Cylinder 1 signal low	Check the wiring and the injection signals, replace ECU
3066	Cylinder 5 signal low	Check the wiring and the injection signals, replace ECU.
3070	Cylinder 3 signal low	Check the wiring and the injection signals, replace ECU.
3074	Cylinder 6 signal low	Check the wiring and the injection signals, replace ECU.
3078	Cylinder 2 signal low	Check the wiring and the injection signals, replace ECU.
3082	Cylinder 4 signal low	Check the wiring and the injection signals, replace ECU.
3161	Fan actuator signal low	No information available at time of print.
3280	Sensor supply voltage 1 high	Excessive battery voltage, defect in wiring harness, electrical failure in connected sensors or in the EDC. Check battery voltage, check wiring for correct voltage supply of the sensor and the EDC, replace EDC
3281	Sensor supply voltage 1 low	Insufficient battery voltage, defect in wiring harness, electrical failure connected sensors or in the EDC. Check battery voltage, check wiring for correct voltage supply of the sensor and the EDC, replace EDC
3283	Sensor supply voltage 2 high	Excessive battery voltage, defect in wiring harness, electrical failure in connected sensors or in the EDC. Check battery voltage, check wiring for correct voltage supply of the sensor and the EDC, replace EDC
3284	Sensor supply voltage 2 low	Insufficient battery voltage, defect in wiring harness, electrical failure connected sensors or in the EDC. Check battery voltage, check wiring for correct voltage supply of the sensor and the EDC, replace EDC
3290	Turbo compound monitoring - signal not plausible	Engine will run derated.

# SECTION INDEX

## STEERING

<b>Section Title</b>	<b>Section Number</b>
Removal and Installation of Steering Components . . . . .	5001
Steering Specifications, Pressure Checks, and Troubleshooting . . . . .	5002
Steering Control Valve . . . . .	5003
Steering Cylinders . . . . .	5005
Center Pivot . . . . .	5006
Auxiliary Steering Motor and Pump . . . . .	5008
Joystick Steering System . . . . .	5009

## AUXILIARY STEERING MANIFOLD

### Removal

**NOTE:** *When disconnecting hydraulic fittings, plug hoses and cap fittings to prevent entry of foreign matter into hydraulic system.*

1. Park loader on level ground and lower bucket to ground. Put transmission in NEUTRAL, apply parking brake, and shut down engine,
2. Put master disconnect switch in OFF position.
3. Remove all dirt and grease from auxiliary steering manifold (10) and adjacent area. See illustration on page 11.

**NOTE:** *The auxiliary steering manifold is located under the hydraulic reservoir on the left side of the rear frame.*

4. Remove hydraulic reservoir fill cap.
5. Connect a vacuum pump to hydraulic reservoir.
6. Start vacuum pump.
7. Tag and disconnect auxiliary pump pressure hose (6).
8. Tag and disconnect load sensing hoses (4 and 5).
9. Tag and disconnect tank return hose (3).
10. Tag and disconnect main pump pressure hose (1).
11. Tag and disconnect steering pressure hose (2).
12. Tag and disconnect pressure switch connector (7) from the auxiliary steering manifold (10).
13. Tag and disconnect solenoid (8) from the auxiliary steering manifold (10).
14. Tag and disconnect electrical module connector (11).
15. Support auxiliary steering manifold. Remove the two bolts (12) and auxiliary steering manifold (10), bracket (9), and control module.
16. Stop the vacuum pump.

### Installation

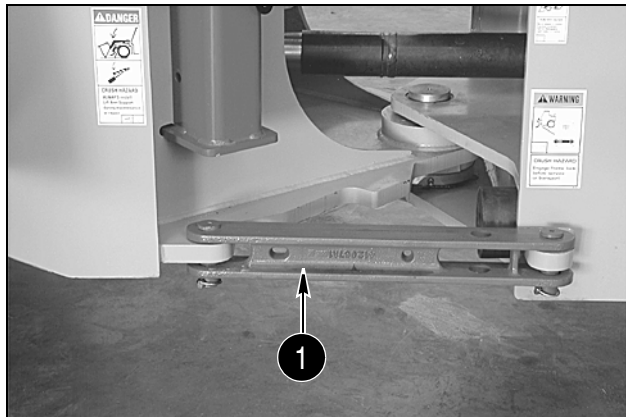
1. Position bracket (9), with manifold (10), and electrical module under hydraulic reservoir and install bolts and tighten. Refer to illustration on page 11.
2. Start vacuum pump.
3. Connect auxiliary pump pressure hose (6).
4. Connect auxiliary steering manifold to tank return hose (3).
5. Connect load sensing hoses (4 and 5).
6. Connect steering pressure hose (2).
7. Connect main pump pressure hose (1).
8. Stop vacuum pump. Disconnect vacuum pump from hydraulic reservoir.
9. Connect pressure switch connector (7) to the auxiliary steering manifold following tags installed during removal.
10. Connect solenoid connector (8) to the auxiliary steering manifold following tags installed during removal.
11. Remove and discard tags installed during removal.
12. Check fluid level in hydraulic reservoir. Add oil as required. See Section 1002 for specifications.
13. Install fill cap on hydraulic reservoir.
14. Put battery disconnect switch in ON position. Start engine and run at low idle for 30 seconds. Stop engine and check for leaks.
15. Check to make sure manifold operates correctly. See Section 5002.

## STEERING PRIORITY VALVE

**NOTE:** The differential pressures must be properly adjusted before doing this test. Refer to Section 8002 Testing and Adjusting the Pump Differential Pressures.

### Pressure Setting Test

1. Install articulation lock (1).



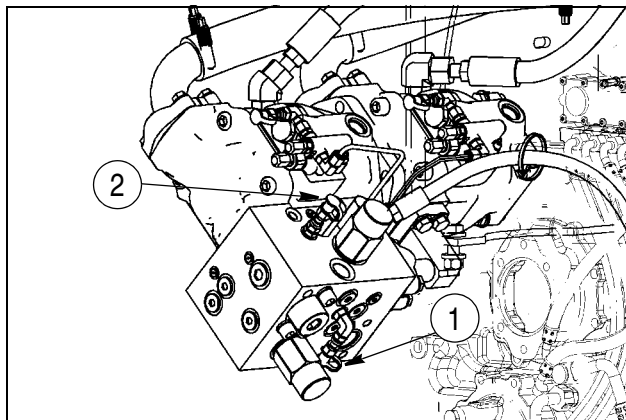
BD03A040

1. ARTICULATION LOCK



**WARNING:** Keep clear of this area when engine is running. Machine could pivot unless the transport and service link is in its LOCKED position. After servicing is completed, unlock the transport and service link and secure in place on the rear frame.

SA069



BS06N368

1. G1 TEST PORT
2. G2 TEST PORT

2. Remove the dust cap from the G1 test port (1).
3. Connect a 345 bar (5000 psi) pressure gauge to the G1 test port (1).

**NOTE:** Make sure when you connect the pressure gauge that you do so in a manner that you can read the pressure gauge while sitting in the operators seat.

Make sure that the temperature of the hydraulic oil is at least 54° C (129° F).

4. To measure the temperature of the oil using the instrument panel:
  - A. Press the up or down arrow key.
  - B. Stop at the info screen with the temperatures that need to be monitored.
5. Apply the parking brake.
6. Start and run the engine at high idle.
7. Lower the lift arms and hold the control lever in the FLOAT position.
8. Hold the bucket control lever in the rollback position.
9. Continue holding until the specified temperature of the oil is reached.
10. With the articulation lock still in place, turn and hold the steering wheel for a hard right turn.
11. Continue holding the steering wheel, and read the pressure gauge.
12. The pressure gauge must indicate 239 to 243 bar (3465 to 3525 psi). If the pressure is not correct, adjust the steering relief valve.

## Seal Installation

### STEP 1



BD04H024

Install the sleeve into the body.

### STEP 2



BD04H025

Put the "O" ring of the two piece seal on the recessed tip of the plunger.

### STEP 3



BD04H026

Place the seal cup onto the recessed tip of the plunger.

**NOTE:** *Flat portion of the seal should be facing you.*

### STEP 4



BD04H027

Press the seal cup into the "O" ring.

### STEP 5



BD04H028

Lubricate the seal with hydraulic oil.

### STEP 6



BD04H029

Install the plunger into the bore of the sleeve.

**NOTES**

5006-10

43. Check the fluid level in the hydraulic reservoir.  
Add oil as required.
44. Install the fill cap in the hydraulic reservoir.
45. Bleed air from the front axle bleed screws. Refer to Section 7002 for complete brake bleeding instructions.

46. Lubricate the pivot pins for the steering cylinder rod eyes.
47. Install the covers on both sides of the machine.

## JOYSTICK STEERING SYSTEM (JSS)

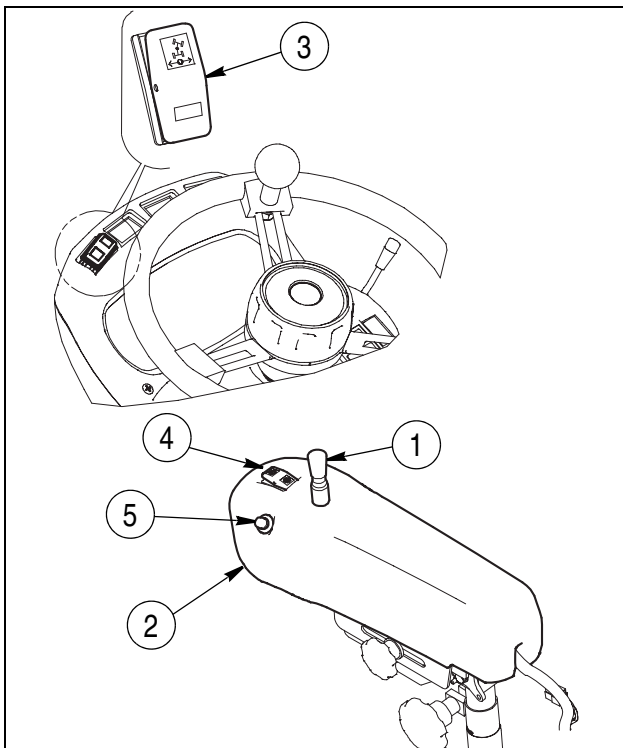
### Description of the JSS

The JSS is mounted in parallel with the standard steering system. The standard steering system always has priority. If during joystick operation, the primary steering wheel is moved, steering will revert to primary steering. Joystick steering is designed for short, repetitive machine operations.

### WARNING

*Do not use joystick steering if operating at speeds over 20 km/h (12.4 mph). Always use the primary steering wheel at higher speeds for optimum control of the machine. Failure to comply could result in machine damage, death or serious injury.*

M1349



521E-4R00

1. JOYSTICK STEERING CONTROL
2. ARMREST
3. MONITOR
4. FORWARD - NEUTRAL - REVERSE SWITCH
5. KICK-DOWN BUTTON1

### Activation logic of the software and joystick steering

To activate the joystick steering system, it is necessary that the machine meet specific conditions prior to activation. The software will run a preliminary test to verify the machine is in the preset conditions and check the condition of the JSS system.

### Preliminary check

Preset condition must be met by:

- left armrest completely lowered
- gear lever in neutral
- equipment locking switch disenabled
- pilot pressure switch on
- joystick steering switch in neutral
- machine is stationary.

### System efficiency check

- with the JSS off, the pilot pressure must be less than or equal to 8 bar (115 psi).
- the software monitors the armrest position switch. When the JSS is turned on and during operation, the switch position is checked. If the position of the armrest is raised or the switch is shorted, the system will deactivate.

After all conditions have been met, the JSS will be powered by closing PIN 1:21 of the output AIC that switches over the relay K2 enabling the electric supply of the JSS with consequent activation of the system under safety conditions.

The system will stay active if the following conditions are maintained:

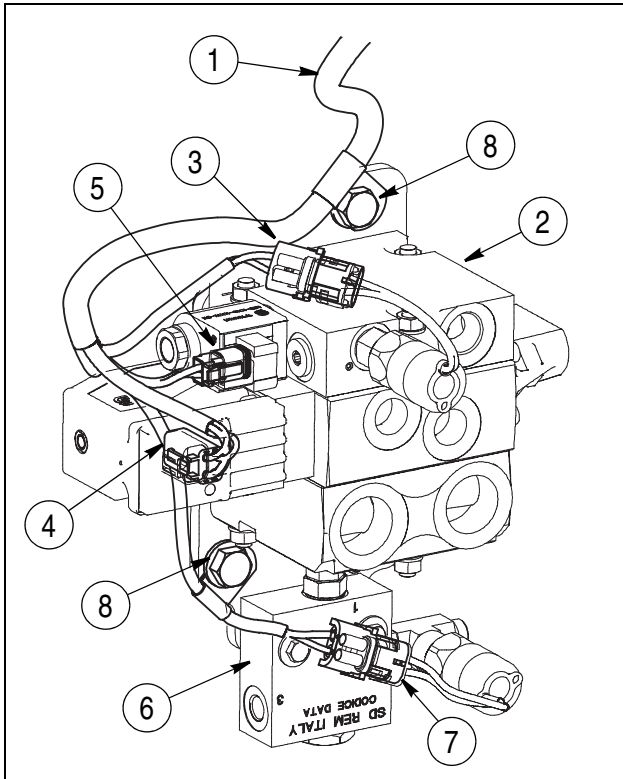
- the left armrest stays lowered
- the main gear lever stays in neutral
- the steering wheel stays inactive
- the control switch stays ON
- no system errors occur

### Joystick steering is turned off as soon as:

- the left armrest is raised.
- the gearbox / main lever control is moved from neutral to forward or reverse drive.
- the steering wheel is operated.
- the proportional valve suffers trouble.
- system errors occur.
- the JSS switch is disconnected.
- ignition turned off.

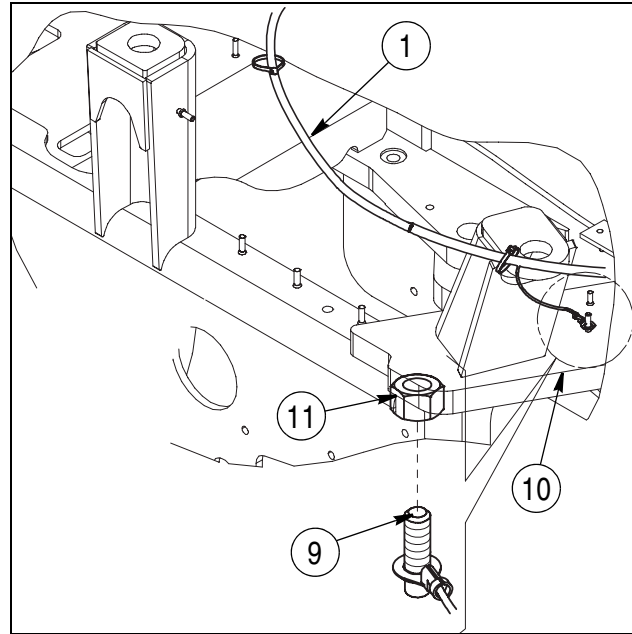
## Installation

### STEP 13



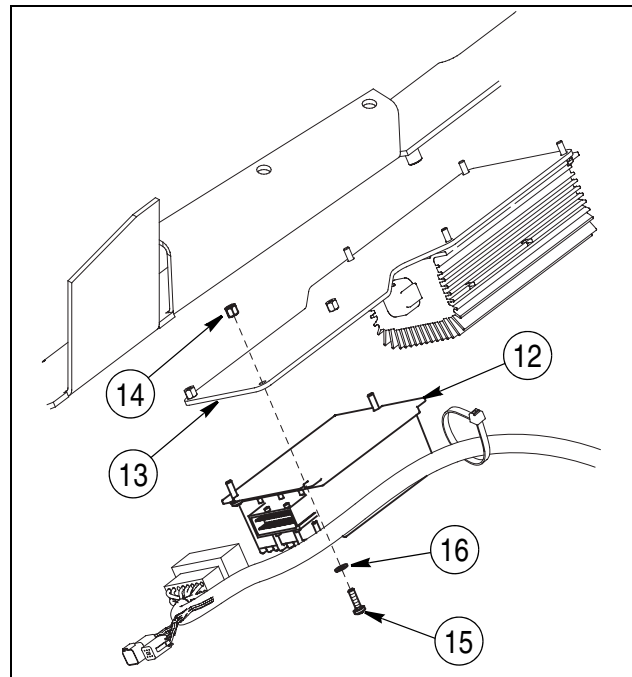
Connect the chassis harness (1) to PVG32 valve (2), connect connector (3) to the pilot pressure switch. Connect connector (5) to the solenoid valve. Connect connector (4) of the proportional valve. Connect connector (7) to the pressure switch on valve PVFC (6) and secure the harness with strap (8) on the valve.

### STEP 14



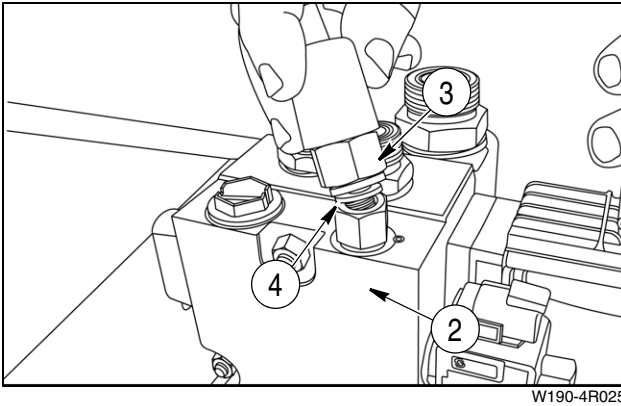
Connect the chassis harness (1) to the grounding stud (9), install and tighten the nut (11).

### STEP 15



Open the access panel on the right-hand side of the cab to access the fuse and relay compartment. Install the steering control module (12) on the supporting plate (13) by installing the three nuts (14), cap screws (15) and washers (16). Tighten the cap screws.

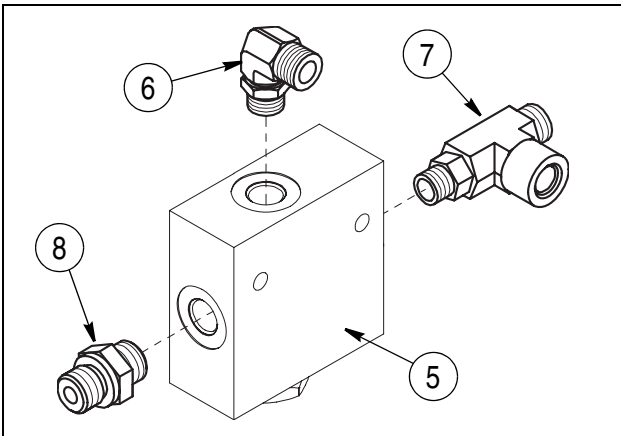
**STEP 26**



W190-4R025

Install pressure switch (3) with seal (4) into the reducer (2).

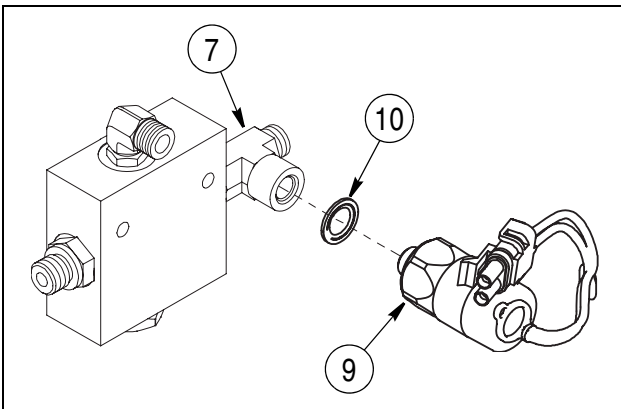
**STEP 27**



W270-4R056

Install elbow (6) into port "1", "T" fitting (7) into port "2" and union (8) into port "3". Torque to all to 45 N m (33 pound feet).

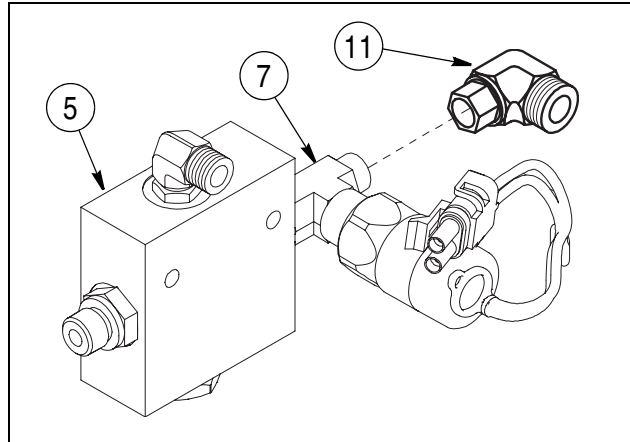
**STEP 28**



W270-4R057

Install pressure switch (9) with seal (10) into the "T" fitting (7).

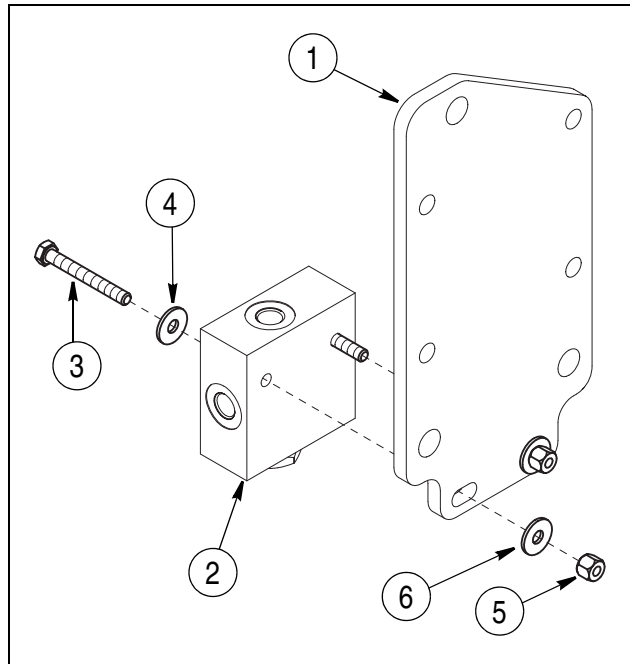
**STEP 29**



W270-4R058

Install elbow (11) into "T" fitting (7). Torque to 14 N m (10 pound feet).

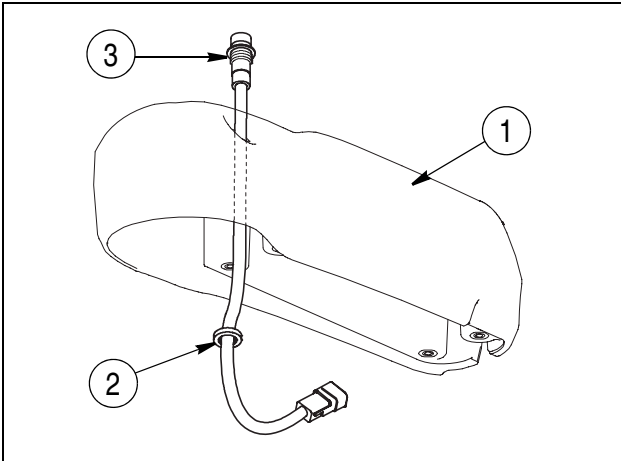
**STEP 30**



W270-4R035

Mount the valve PVFC (2) onto support (1). Install two cap screws (3), washers (4), nuts (5) and washers (6) and tighten.

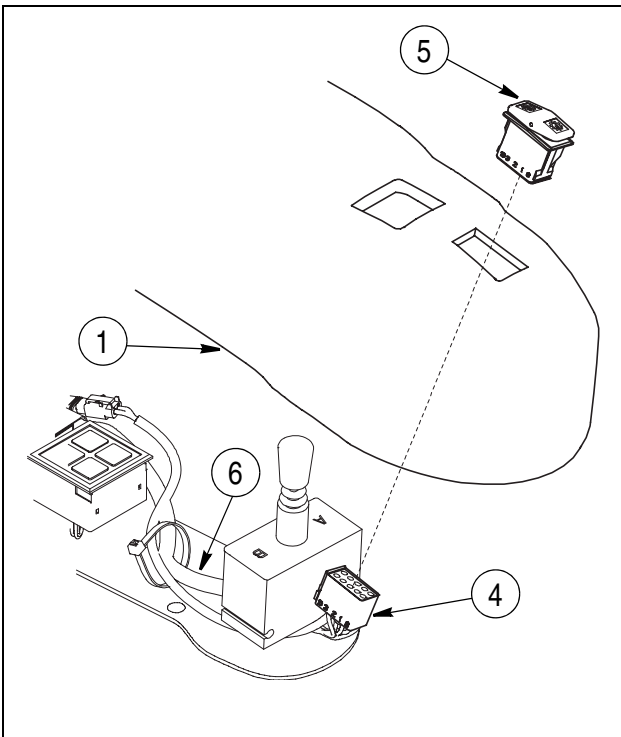
**STEP 5**



W190-4R102

From the inside and bottom of the armrest cover (1) unscrew the threaded washer (2) and remove the “Kick-Down” button (3).

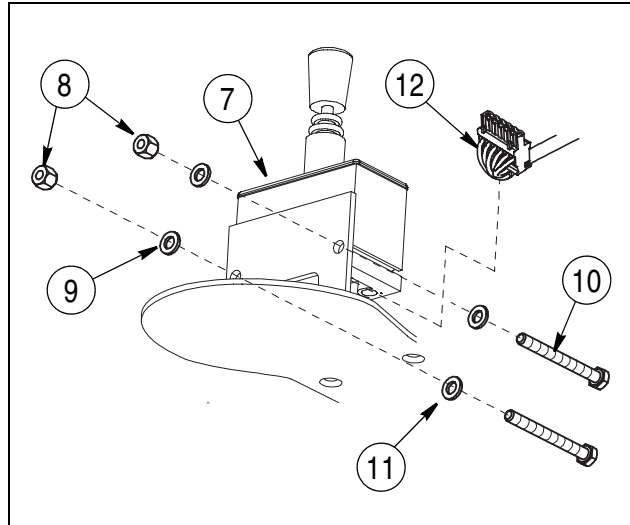
**STEP 6**



W190-4R103

Disconnect the connector (4) from the “F-N-R” switch (5) from the armrest cable (6). Remove the switch (5) from the armrest (1).

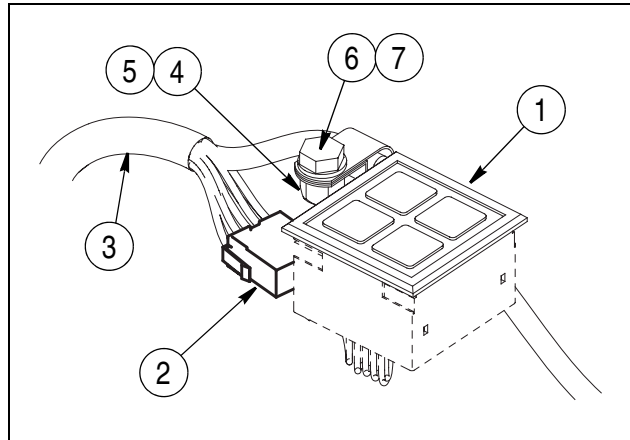
**STEP 7**



W190-4R038

Remove the two nuts (8), washers (9), screws (10) and washers (11) from the PVRES joystick (7). Disconnect the connector (12) from the valve (7).

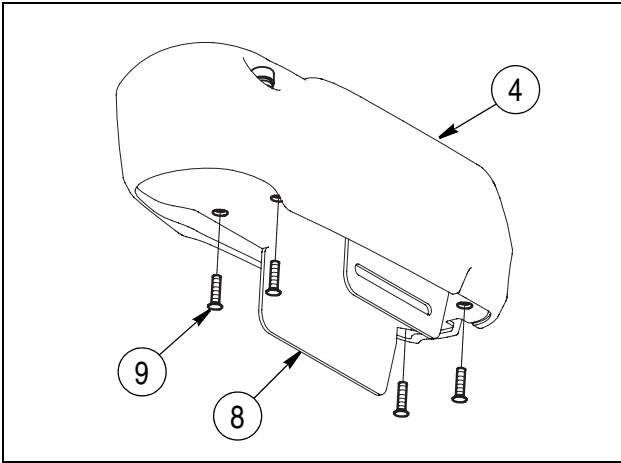
**STEP 8**



W190-4R040

Disconnect the connector (2) from the CAN module (1). Release the armrest cable (3) from the mounting bracket by removing the nut (4) and the washer (5), capscrew (6) and the washer (7).

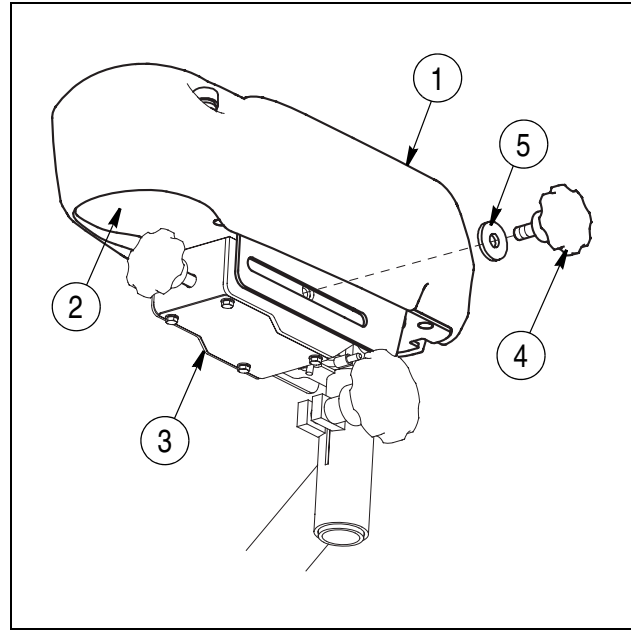
**STEP 45**



W190-4R069

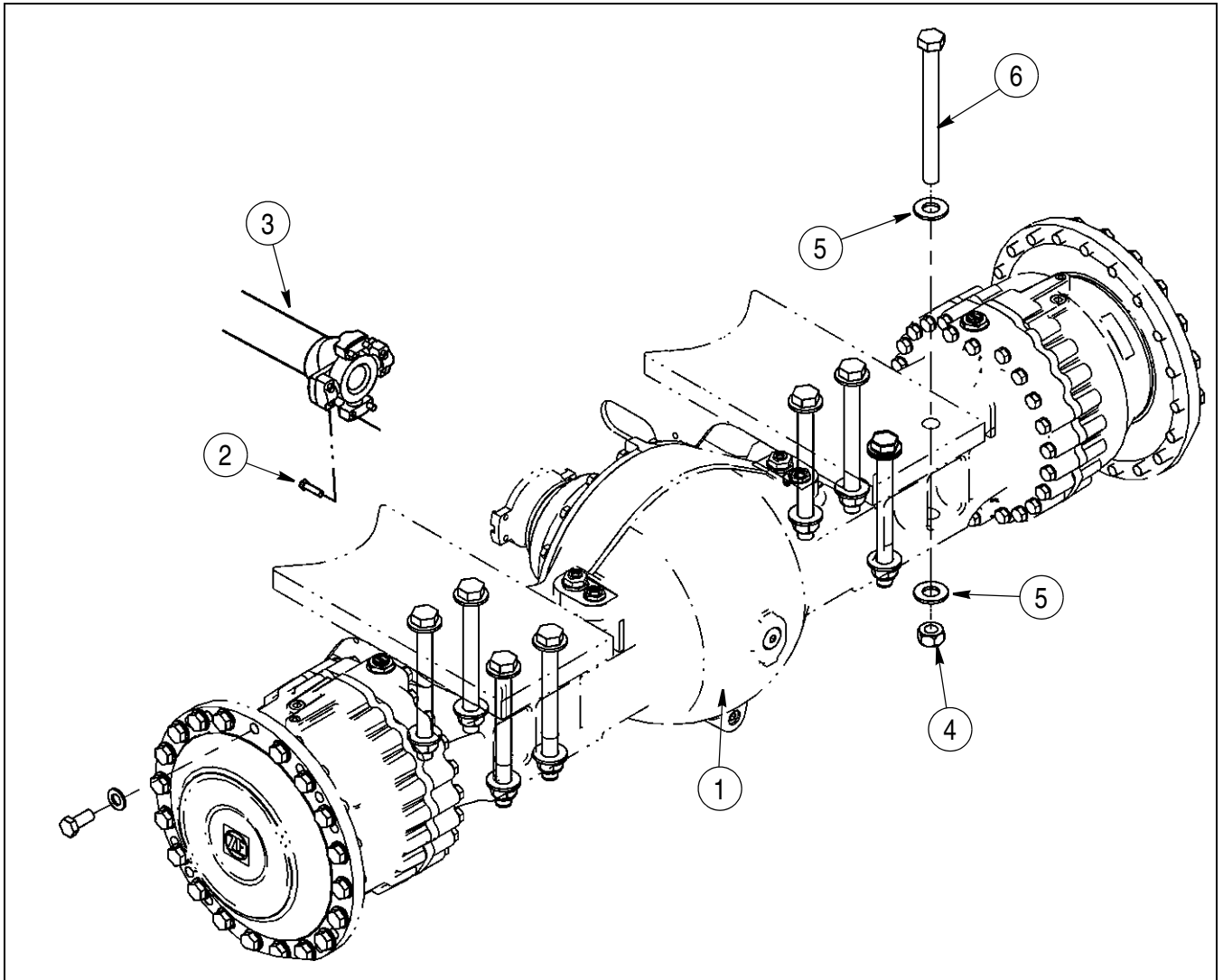
Put the armrest (4) on the support (8), secure it with four capscrews (9).

**STEP 46**



W190-4R070

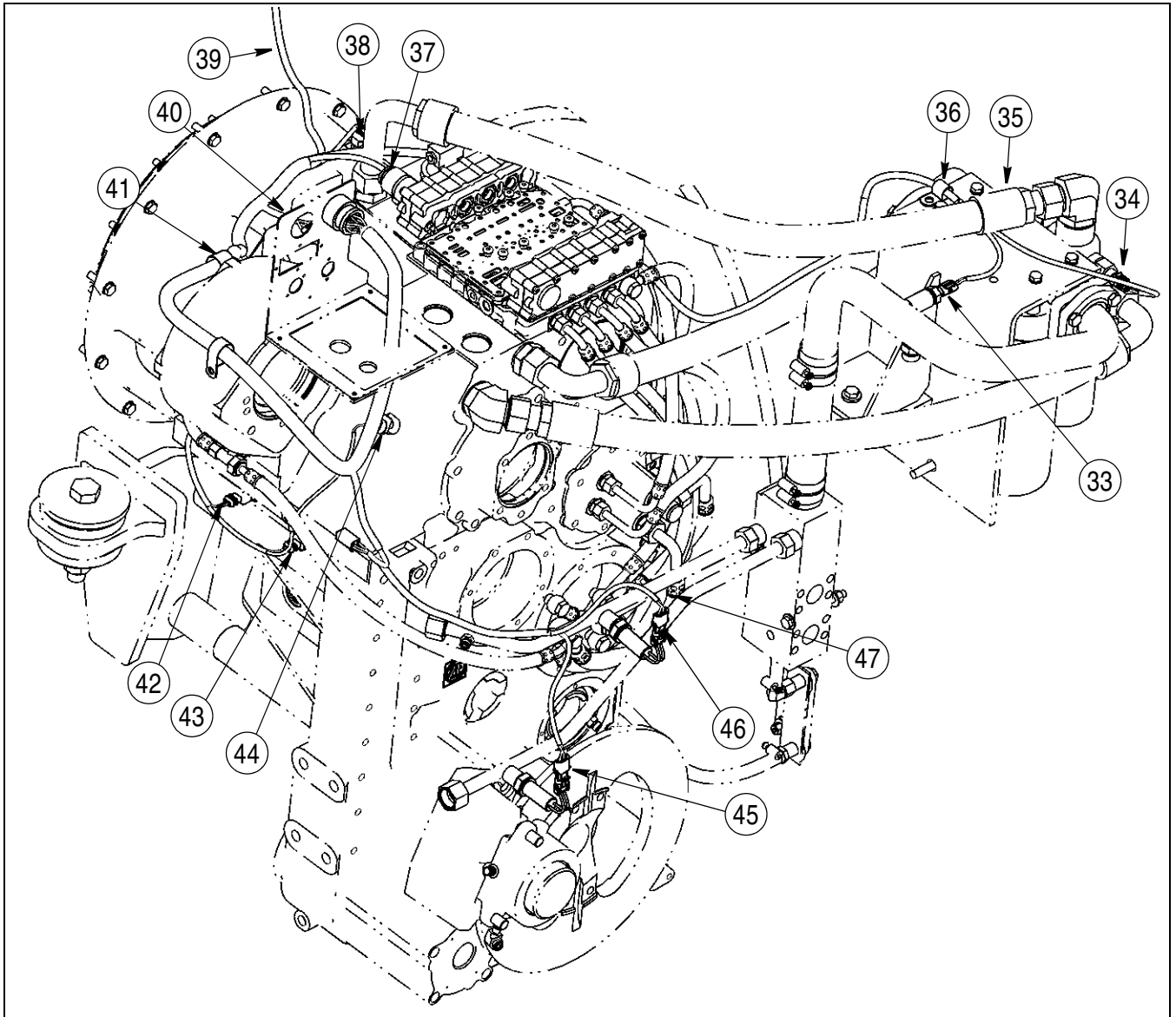
Position armrest (1) with support (2) onto the armrest adjustment (3) and install knob (4) with washer (5).



BC06A074

- 1. FRONT AXLE
- 2. BOLT
- 3. FRONT DRIVE SHAFT
- 4. SELF LOCKING NUT
- 5. WASHER
- 6. BOLT

**FRONT AXLE**



BC06A072

- |  |                                    |                          |
|--|------------------------------------|--------------------------|
| 33. HYDRAULIC OIL TEMPERATURE SENDER   | 38. TORQUE CONVERTER OUTPUT SENDER | 43. TURBINE SPEED SENSOR |
| 34. TRANSMISSION FILTER CLOGGED SWITCH | 39. SECONDARY STEERING (OPT)       | 44. ENGINE SPEED SENSOR  |
| 35. HYDRAULIC FILTER CLOGGED SWITCH    | 40. TRANSMISSION GROUND            | 45. PRB2 BRAKE SWITCH    |
| 36. CLAMP                              | 41. CLAMP                          | 46. PRB1 BRAKE SWITCH    |
| 37. TRANSMISSION CONTROLLER            | 42. INTERMEDIATE SPEED SENSOR      | 47. OUTPUT SPEED SENSOR  |

**TRANSMISSION WIRING HARNESS**

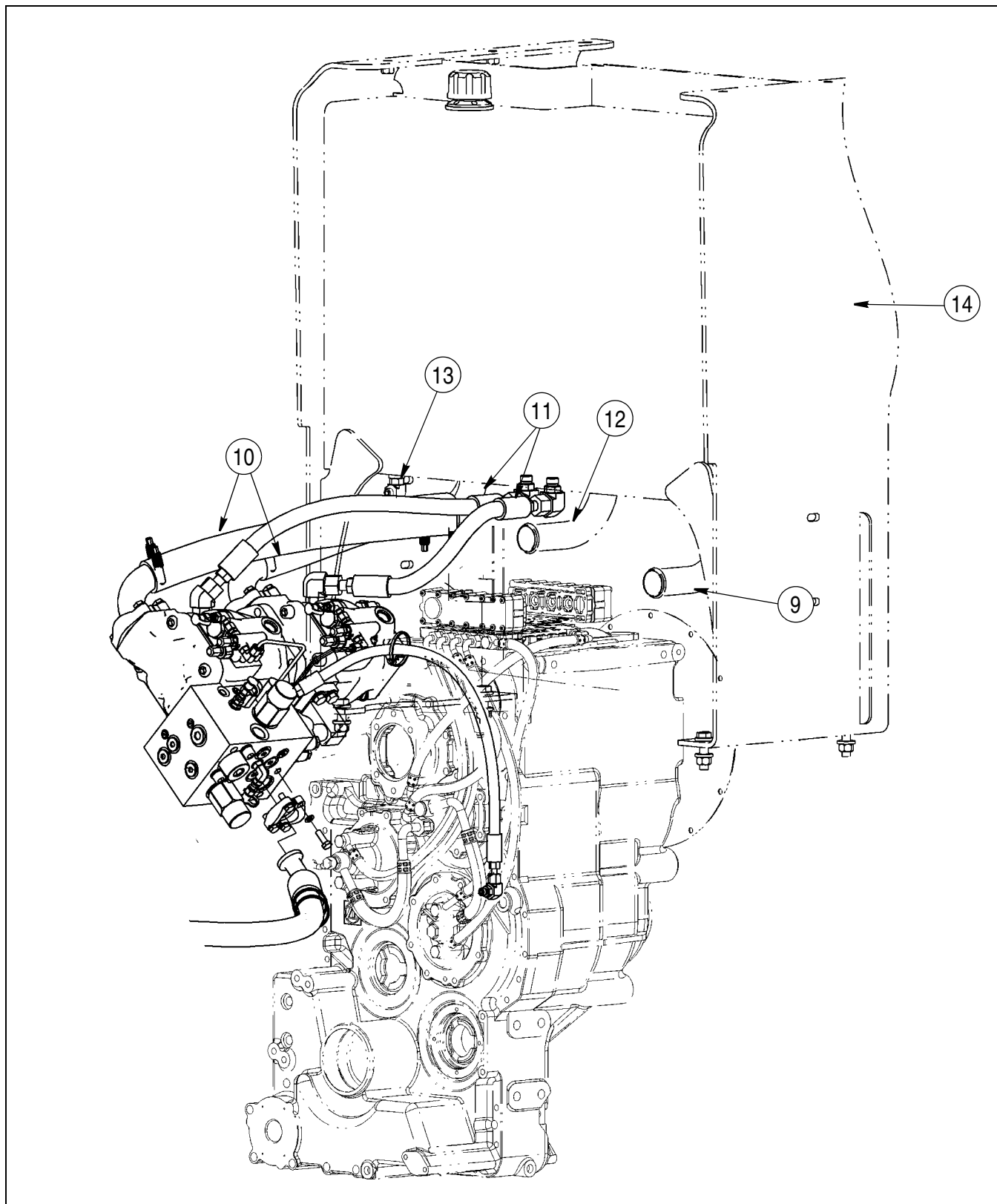
CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL



BC06A078

- |                                      |                             |
|--------------------------------------|-----------------------------|
| 9. RETURN FROM HYDRAULIC FILTER      | 12. BRAKE PUMP SUCTION HOSE |
| 10. SUCTION HOSES TO HYDRAULIC PUMPS | 13. PILOT HOSE              |
| 11. HYDRAULIC PUMP CASE DRAIN HOSES  | 14. HYDRAULIC RESERVOIR     |

**HYDRAULIC RESERVOIR**

# TRANSMISSION OPERATION

## General

The transmission is equipped with a Transmission ECM (Electronic Control Module). This module controls modulation and shifting that were normally associated with hydraulically modulated transmissions, providing smoother shifts and enhanced clutch life.

The Transmission ECM relies on signal from several solenoids that are incorporated into the design. These solenoids measure the speed of several components, as well as other sensors that measure temperature. These solenoids and sensors are further defined in the following paragraphs.

In addition, the transmission incorporates a two-piece transmission case for ease of transmission maintenance, helical cut gears that help reduce noise.

## Transmission ECM

Modulation and shifting are controlled by the Transmission Electronic Control Module (Transmission ECM). This module replaces the oil and springs that are found in hydraulically modulated transmissions.

The Transmission ECM controls the clutch engagement, providing smoother shifts and enhanced clutch life, whether the transmission is set to the automatic or manual shift mode.

The Transmission ECM also informs the Information Center, by the use of diagnostic codes, of any transmission error and the hours of operation that the error occurred.

## Electrical Shift Solenoids

Electrical Shift Solenoids control the modulation of the clutches, eliminating the need for a modulation valve, and providing a smooth shift while maintaining constant control over clutch engagement as follows:

- A. A temperature sensor relays the oil temperature to the Transmission ECM.
- B. The Transmission ECM times the rate the solenoid energizes and de-energizes.
- C. As the transmission changes gears, there is reduced hesitation from one gear to the next.

## Transmission ECM Tasks

The Transmission ECM performs a variety of tasks in the overall system. The Transmission ECM:

- A. Determines which clutches to engage in the transmission.

- B. Protect the engine and transmission turbine from overspeed conditions during downloading.
- C. Receives speed information from the engine speed sensor, the turbine speed sensor, the intermediate clutch speed sensor and the transmission output speed sensor. These speed sensors are checked to determine if normal sensor operation is present. The data is also used to control modulation during shifting and to determine the appropriate shift patterns.
- D. Detects system failures and determines the appropriate alternative actions.
- E. Provides various diagnostic messages to the Information Center.
- F. Provides other information to the information center, which in turn displays engine speed, wheel speed, gear shift selection, and actual gear selection.
- G. Provides a method to calibrate the transmission clutch control.
- H. Establishes clutch modulation pressure during transmission shifts.

## Transmission Sensor Data Collection.

The Transmission ECM collects and uses information from four sensors to accurately shift the transmission and determine if any clutches are slipping. These sensors are:

Engine (Speed) Sensor - monitors engine speed to determine the load on the engine for shift points and sends the engine rpm to the Transmission ECM, which sends the information to the tachometer in the Information Center.

Turbine (Speed) Sensor - assists the engine speed sensor in determining the load going into the transmission and helps determine shift points.

Intermediate (Shaft Speed) Sensor - determines differential gear speed in the transmission to check for clutch slippage.

Output (Speed) Sensor - monitors transmission output shaft speed to help determine the load on the transmission and to assist in determining shift points. Sends output shaft speed to Transmission ECM which sends the information to the speedometer in the Information Center.

## ERROR CODES

In case of possible errors in the system, a yellow warning triangle will illuminate, a code will be displayed on the LCD. See section 4005 for error code retrieval procedures and definitions. See electrical schematic to assist in fault isolation.

## TRANSMISSION SHIFTER LOGIC INFORMATION

Function	Shifter	Shifter Wire Color	Shifter Tower Connector TS2	Shifter Shroud Connector TS1	Harness Wire #	Trans. ECM # Connector TECM
power	B+	red/black	A	A	19A	45
forward	V	yellow	-	B	25F	43
reverse	R	pink	-	C	25R	64
neutral	N	gray	-	D	25T	67
gear2(3-4)	B2	green	B	-	25W	65
gear1(1-4)	B1	blue	C	-	25Z	63
downshift	DS	purple	D	-	25Y	22

**NOTE:** Power is supplied through the fuse ECA-F1 to the transmission shifter via 19A wire. This is 24 Volt. Within the shifter are limit switches to transfer the signal voltages to the outputs. In forward V is high. In reverse R is high. In neutral N is high. In first gear, B1 is high and B2 is low. In second gear, B1 and B2 are low. In third gear, B1 is low and B2 is high. In fourth gear, B1 and B2 are high. Downshift, DS, is activated when the end of the shifter is engaged.

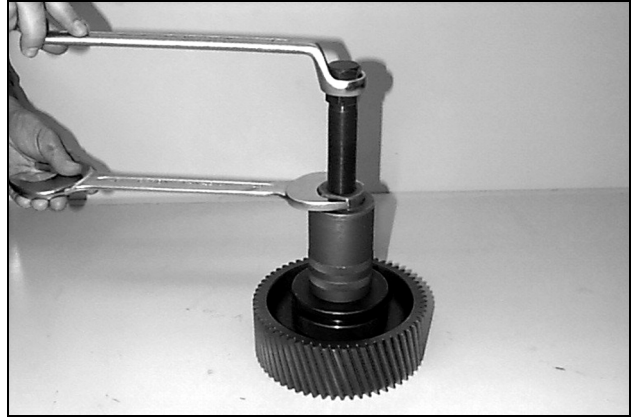
## RELATIONSHIP BETWEEN TRANSMISSION ECM, VALVES, AND CLUTCHES

Transmission ECM Pin #	Transmission Valve	Clutch #	Transmission Valve Pin #	Wire #	Cab/eng Pin #
10	Y2	KR	2	25L	17
56	Y1	K4	1	25K	16
32	Y3	K1	3	25M	18
55	Y4	K3	4	25N	19
9	Y5	KV	5	25P	20
51	Y6	K2	6	25J	21
12,13	all Y	all K	7	25S	22
39	TEMP	none	8	36T	5
46	TEMP	none	9	36R	12

**STEP 19**

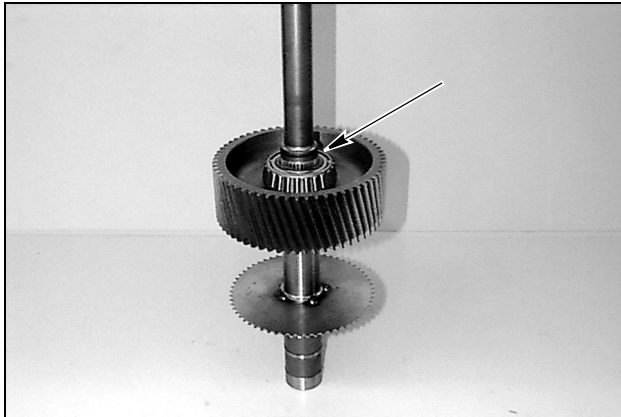
BD07B012

Invert the transmission and remove the input shaft.

**STEP 22**

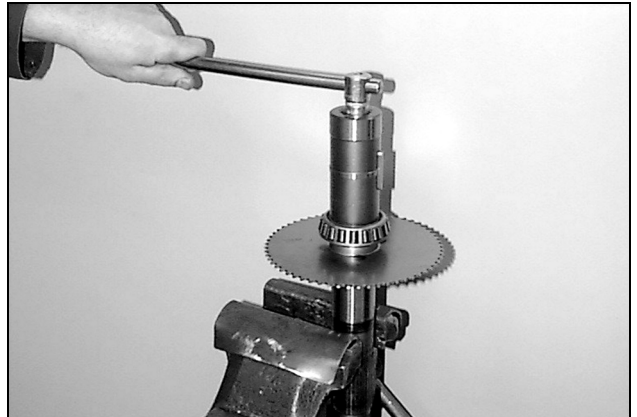
BD07B015

Pull the bearing from the spur gear.

**STEP 20**

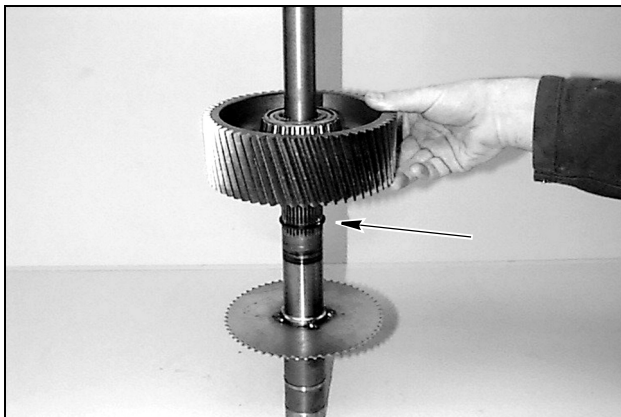
BD07B013

Remove retaining ring.

**STEP 23**

BD07B016

Place the input shaft in a vice with soft caps. Loosen the cap screw and remove the retaining plate.

**STEP 21**

BD07B014

Remove the spur gear from the shaft and remove the snap ring from the shaft.

**STEP 24**

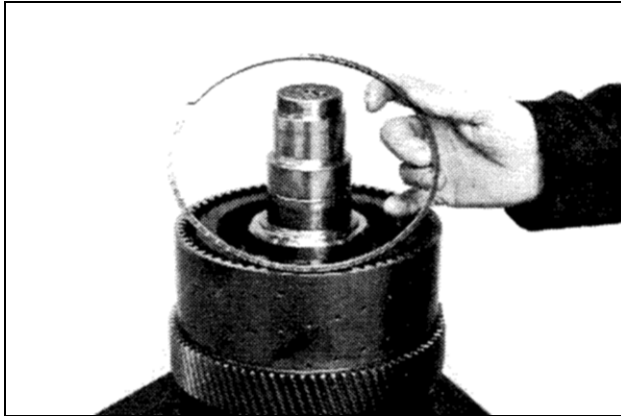
BD07B017

Remove the bearing and driver from the shaft, watch for shims when removed.

**IMPORTANT:** Put cap over bolt hole prior to installing puller to protect the threads in the shaft.

# Clutch Carrier Disassembly

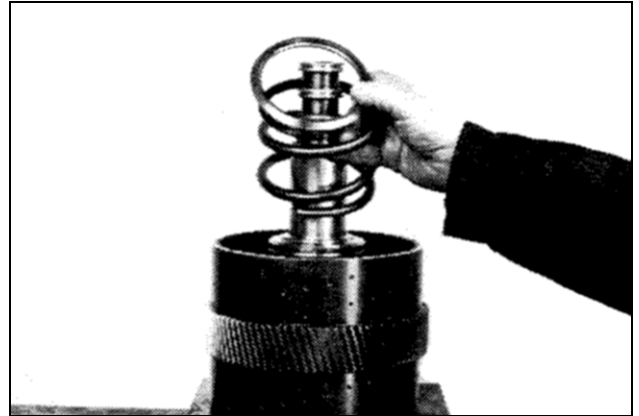
## STEP 75



A15131

Remove the clutch disc retaining ring.

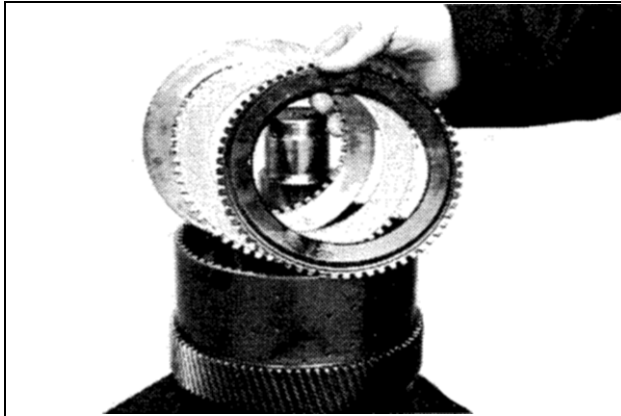
## STEP 78



A15134

Remove the retainer and spring.

## STEP 76



A15132

Remove the clutch backing plates, top friction plate and adjustment steel disc. Remove remainder of discs.

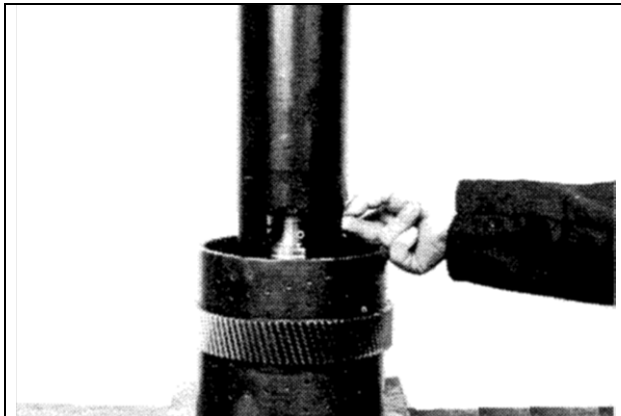
## STEP 79



A15135

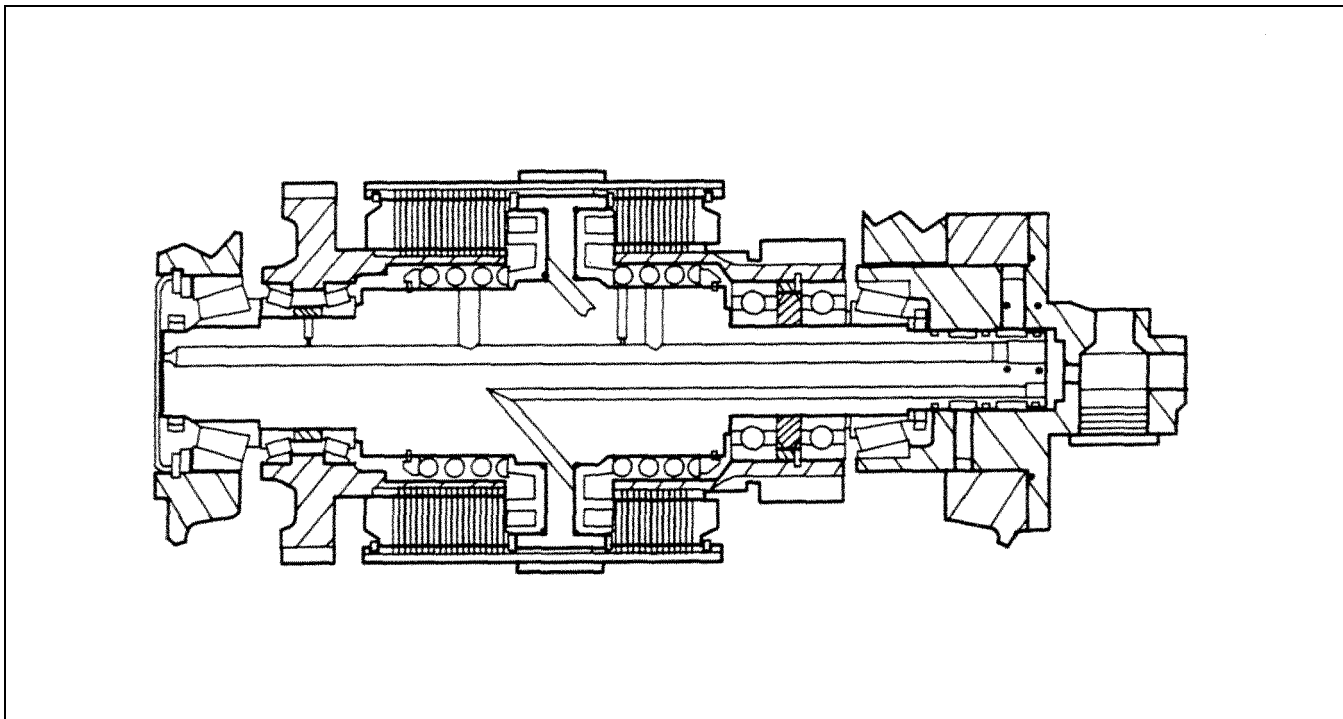
Remove the spacer washer.

## STEP 77



A15133

Using tube CAS-2264, compress the spring. Remove the retaining ring.

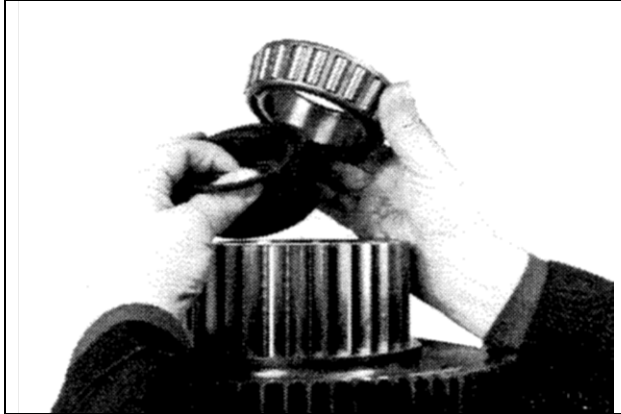


FORWARD / FIRST CLUTCH ASSEMBLY

798L92

## SPUR GEAR BEARING END PLAY PROCEDURE

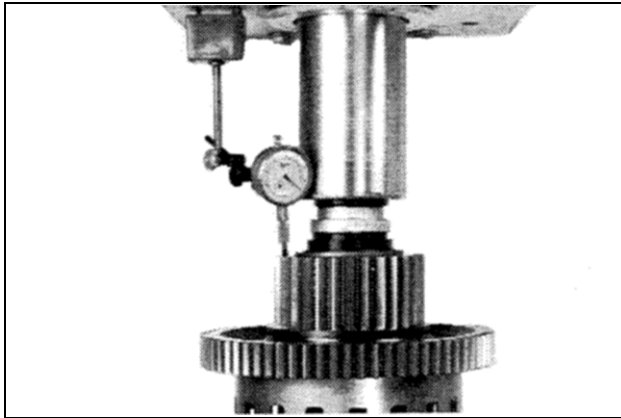
### STEP 133



A15266

Install sleeve and 3.55 mm shim on lower bearing race. Install the upper bearing.

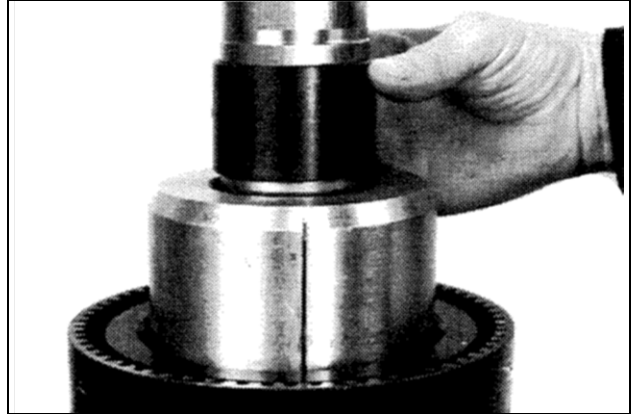
### STEP 134



A15264

Press bearing assembly together. Install a dial indicator on press and indicate to the spur gear. Move the spur gear up and down and check end play. End play must be 0.05 to 0.15 mm. Select the correct size shim for the correct end play.

### STEP 135



A15269

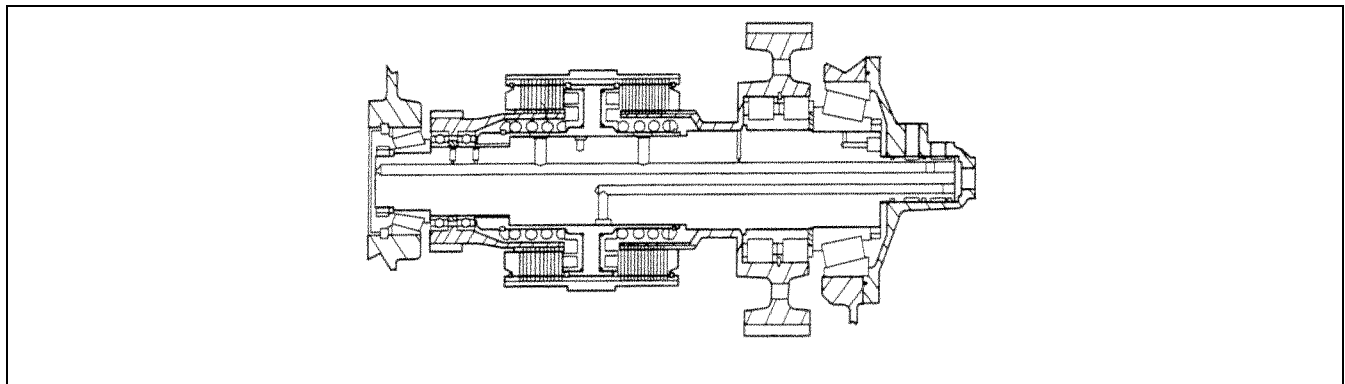
Align all the clutch discs using alignment tool CAS-2265-1 and spacer CAS-2265-2.

### STEP 136



A15270

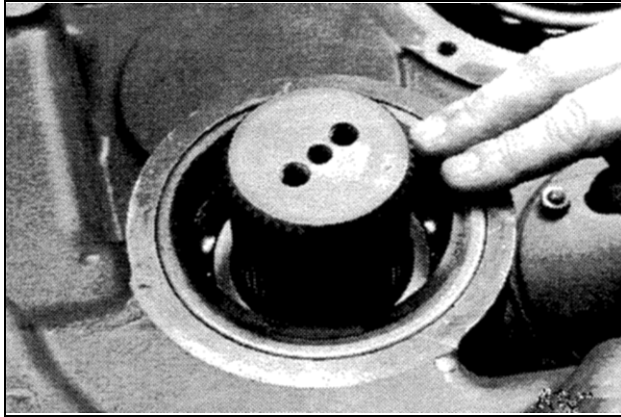
Install the lower bearing against the shaft shoulder using tube CAS-2266-1 and step plate CAS-2266-2.



**FOURTH/THIRD CLUTCH ASSEMBLY**

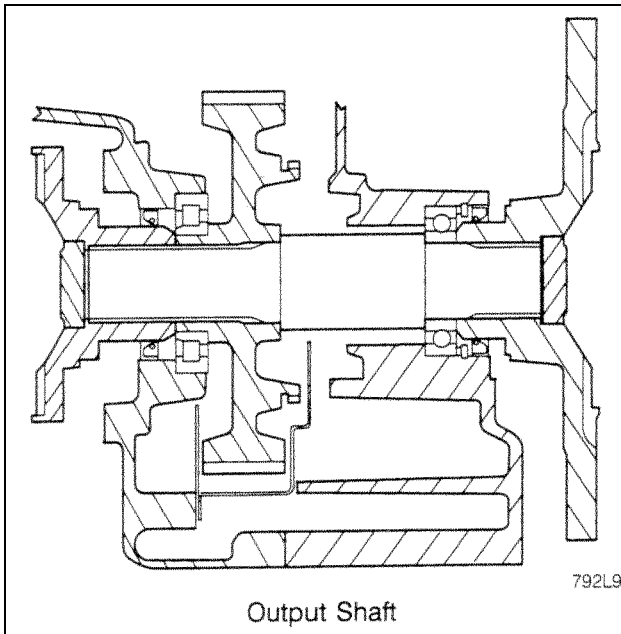
794L92

**STEP 199**



A15305

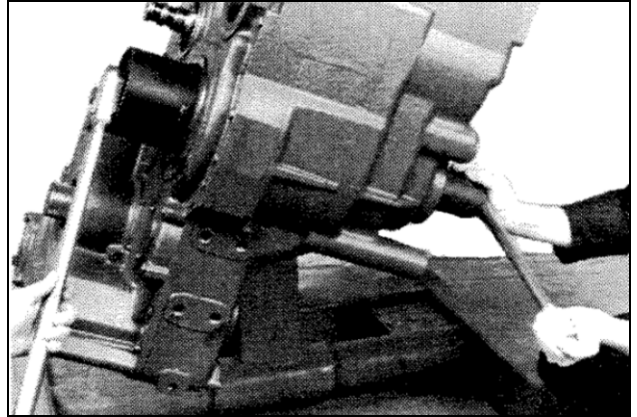
Install the seal so the lip is to the inside. Apply RTV sealant between the outer diameter of the seal and the housing.



792L91

792L92

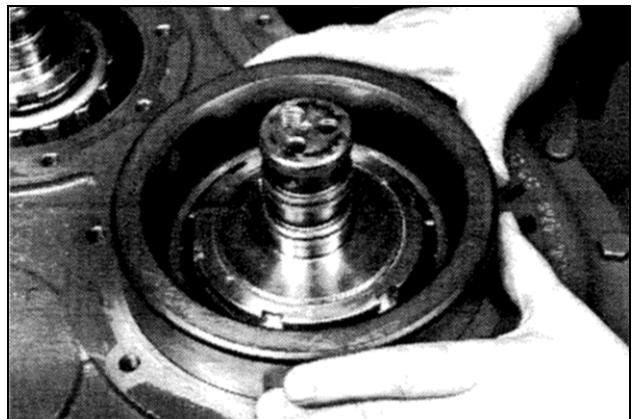
**STEP 200**



A15308

Tighten all the slotted nuts on the clutch packs to a torque of 550 Nm.

**STEP 201**

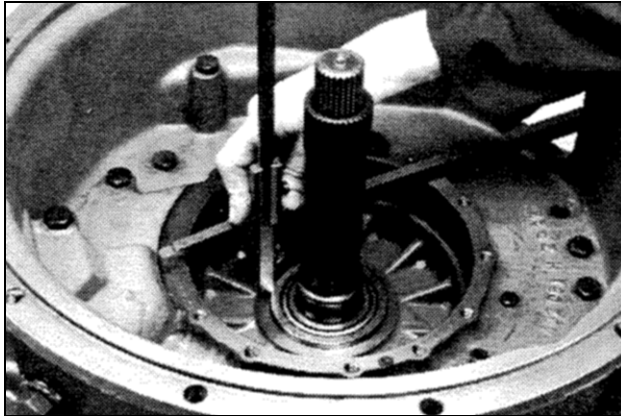


A15306

Install bearing cup for the second / reverse and third / fourth clutch assemblies.

# Converter Bearing Preload Procedure

## STEP 238



STEP 206

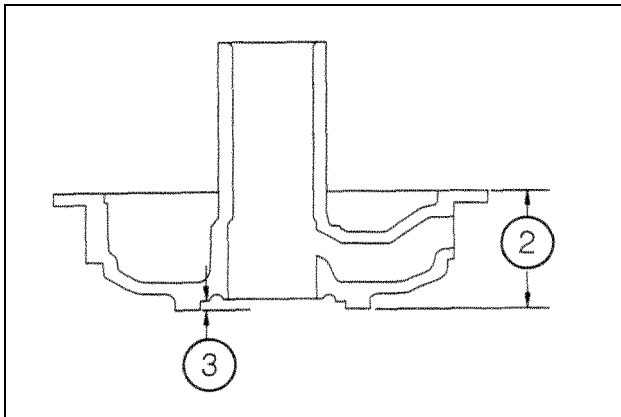
Install converter housing. Tighten the bolts to a torque of 34 Nm (M8 bolts), 79 Nm (M12-8.8 bolts) and 117 Nm (M12-10.9 bolts).

Measure from the bearing outer race (cup) to the flange mounting surface (Dimension 1).

## STEP 239

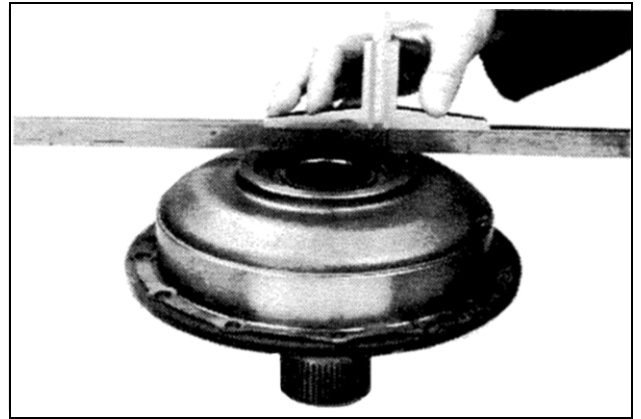


A15337



751L92

Install the gasket on the flange and measure from the gasket to the bottom of the oil supply housing (Dimension 2).



A15338

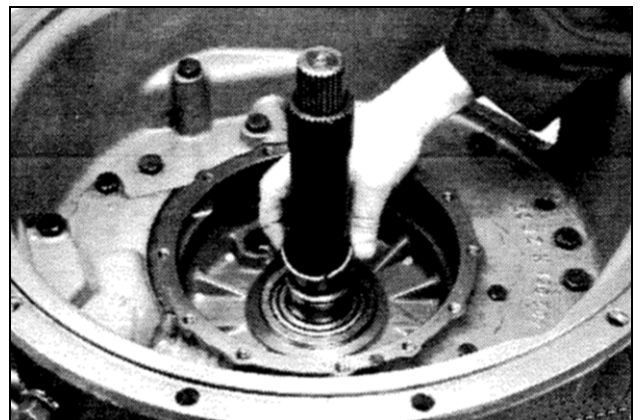
Measure from the bottom of the housing to the bearing outer race locating surface (Dimension 3). Determine shim size needed by using the following:

EXAMPLE:

Dimension 2	65.37 mm
Dimension 3	-4.50 mm
Dimension X	<hr/> 60.87 mm

Dimension 1	62.10 mm
Dimension X	-60.87 mm
Difference	<hr/> 1.23 mm
Bearing Preload	+0.07 mm
Shim Size Needed	<hr/> 1.30 mm

## STEP 240

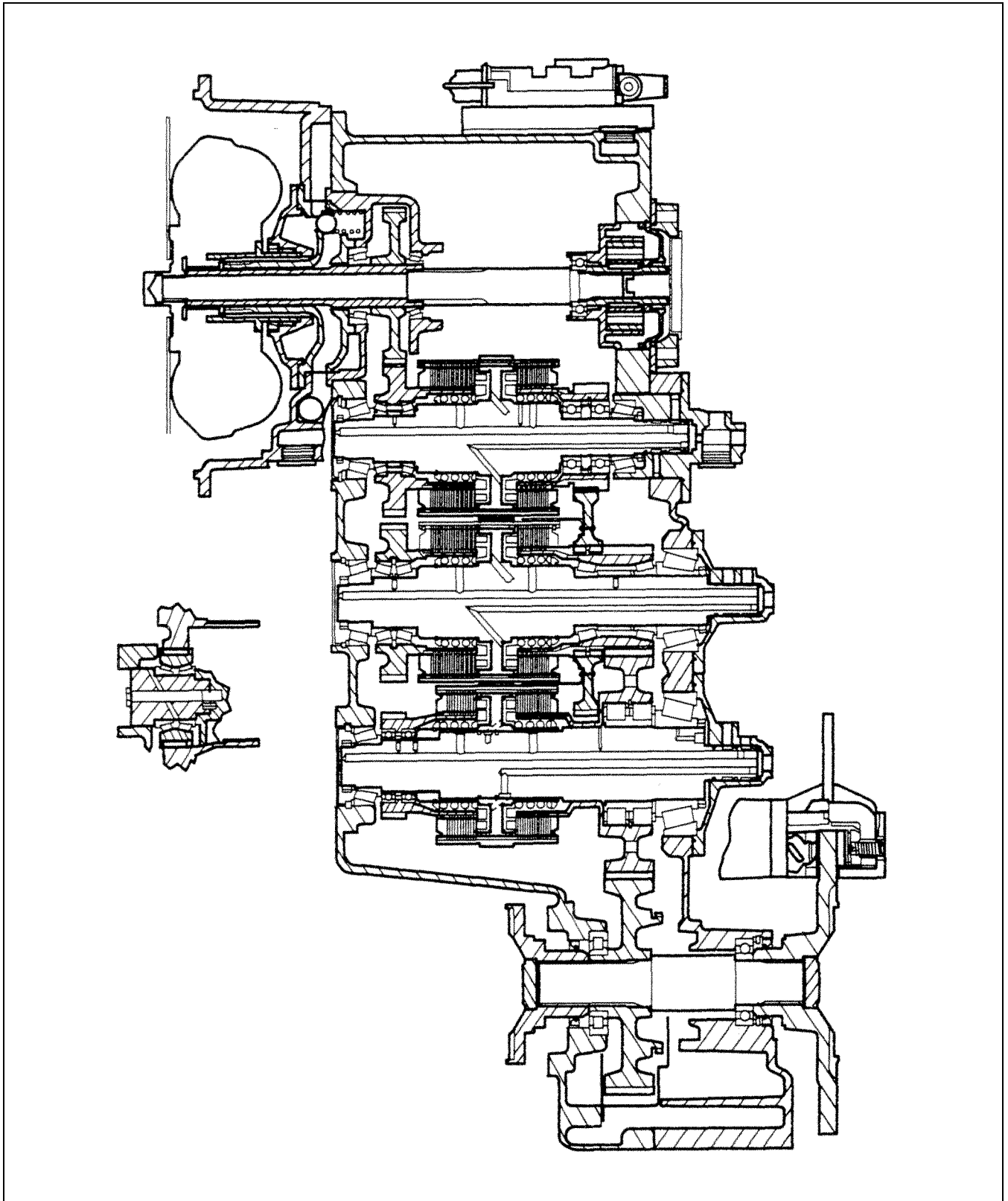


A15335

Install the oil control ring on the drive shaft. Lock the ends of the ring together.

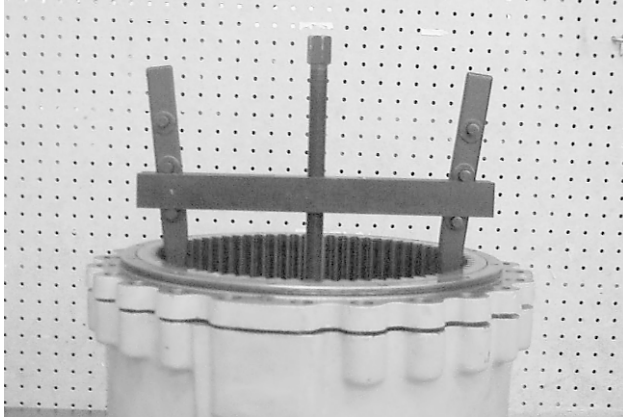
SECOND GEAR REVERSE - Energize M1 which permits oil flow to reverse clutch. Energize M4 which permits oil flow through M4 poppet valve to M2 poppet valve which is open to second clutch and also dumps third clutch oil.

THIRD GEAR REVERSE - Energize M1 which permits oil flow to reverse clutch. Third clutch is still hydraulically locked up.



782L92

**STEP 12**

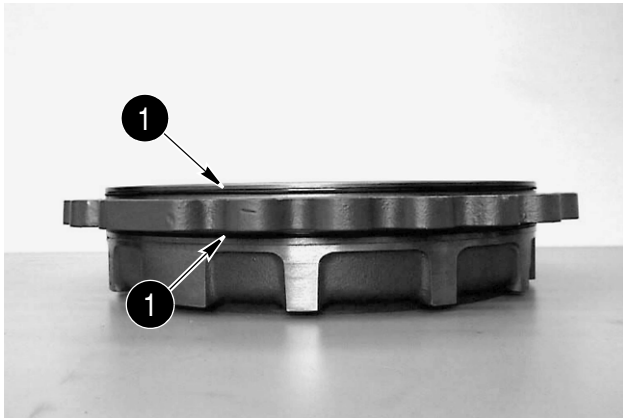


BD01C020

Remove the ring gear using the CAS2848 puller and 8061 step plate.

**NOTE:** This photo is shown with the planetary removed. The planetary does not need to be removed for this procedure.

**STEP 13**

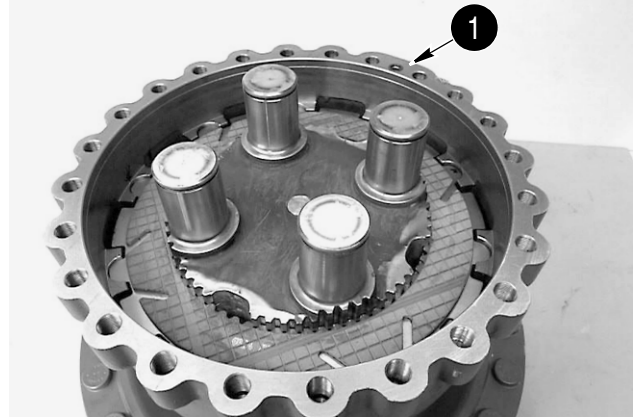


BD00M251

1. O-RING

Remove the O-rings from the grooves of the ring gear.

**STEP 14**



BD00M290

1. O-RING

Remove the O-ring from the recess of the brake housing. Remove the brake disc from the housing.

**STEP 15**

Go to step 89 for the brake service assembly procedures.

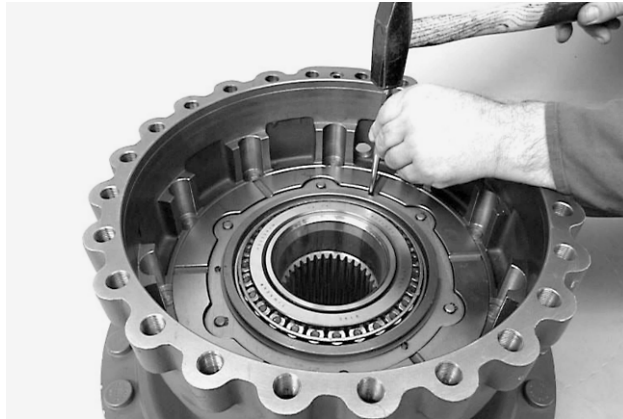
**STEP 16**



BD00M238

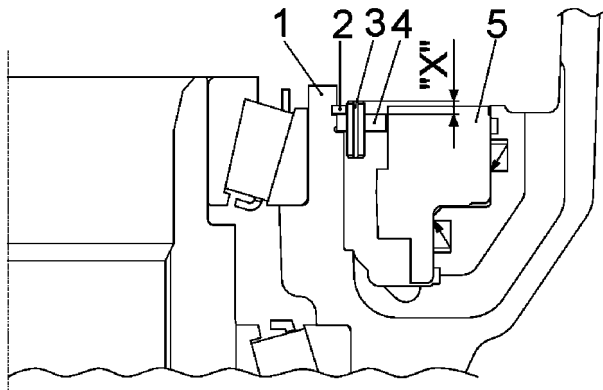
Remove the cover off of the wheel end.

**STEP 64**



BD00M287

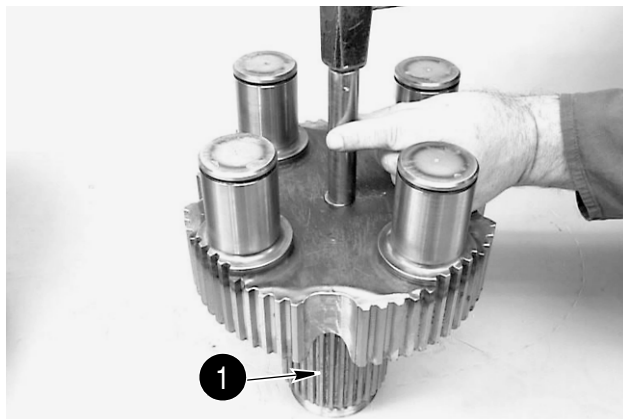
Drive the three slotted pins into the bores of the support shim to lock the circlip. See illustration below.



BS00M075

- |                  |                                       |
|------------------|---------------------------------------|
| 1. BRAKE HOUSING | 4. SUPPORT SHIM                       |
| 2. CIRCLIP       | 5. PISTON                             |
| 3. SLOTTED PIN   | X. 5.0 MM $_{-0.5}^{0.2}$ (0.2 -0.02) |

**STEP 65**

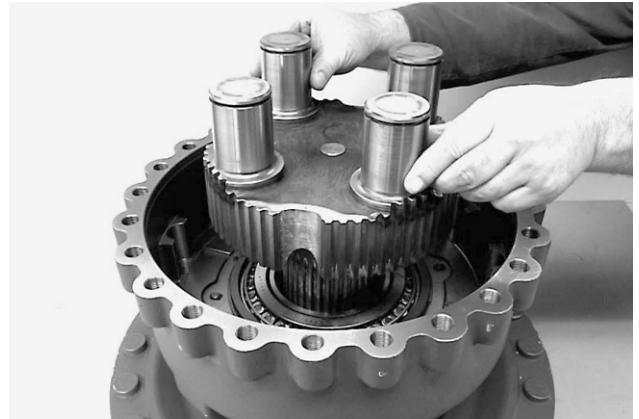


BD00M288

1. SPLINE

Drive the stop bolt into the planet carrier until contact. Then coat the spline with anti-corrosive antiseize.

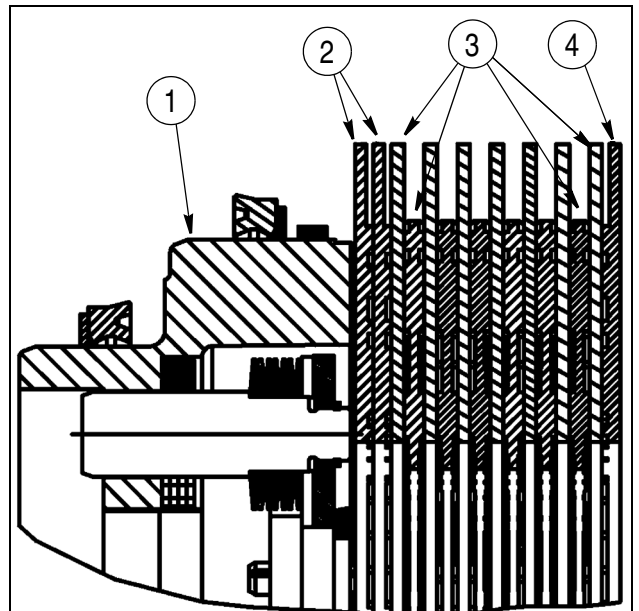
**STEP 66**



BD00M289

Insert the planet carrier into the spline of the wheel end shaft until contact.

**STEP 67**

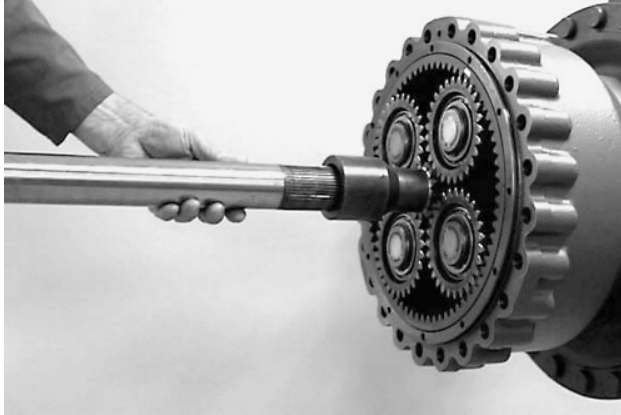


BS07A485

- |                 |                     |
|-----------------|---------------------|
| 1. BRAKE PISTON | 3. PLATES AND DISCS |
| 2. DAMPING DISC | 4. DAMPING DISC     |

**NOTE:** Damping discs, items 2 and 4, are only used in the rear axle.

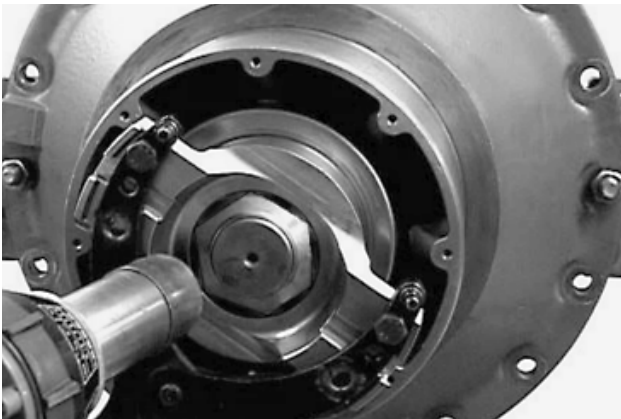
Install the damping discs (2) with friction surface facing **OUT**, install plates and discs (3), and install damping disc (4) with friction surface facing **IN**. Lubricate the brake disc with clean axle oil.

**STEP 111**

BD00M243

Pull the stub shaft out of the sun gear shaft.

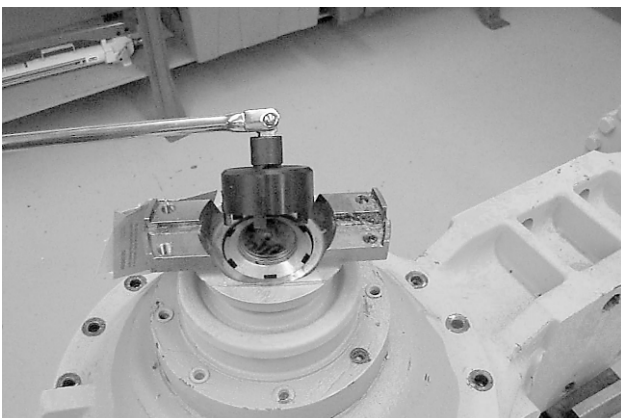
**NOTE:** Pay attention to released shims.

**STEP 112**

BD00M409

Heat the locknut using CAS10810 heat gun.

**NOTE:** Locknut is locked with Loctite Type No. 262.

**STEP 113**

BC01C016

Remove the pinion locknut using CAS1579A holding bar and CAS2842 locknut wrench.

**STEP 114**

BD00M395

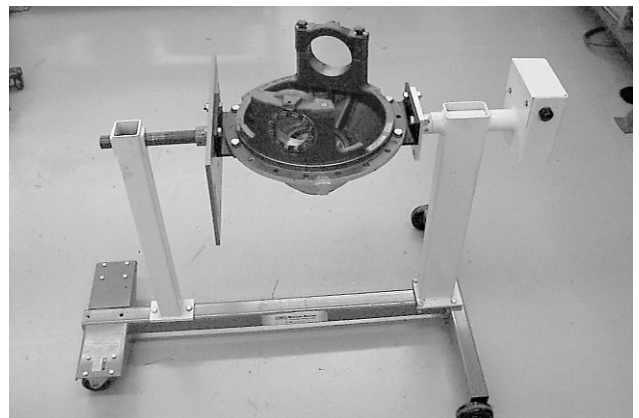
Loosen and remove the bolts.

**NOTE:** Mark the location of the differential carrier to the axle casing.

**STEP 115**

BD01C019

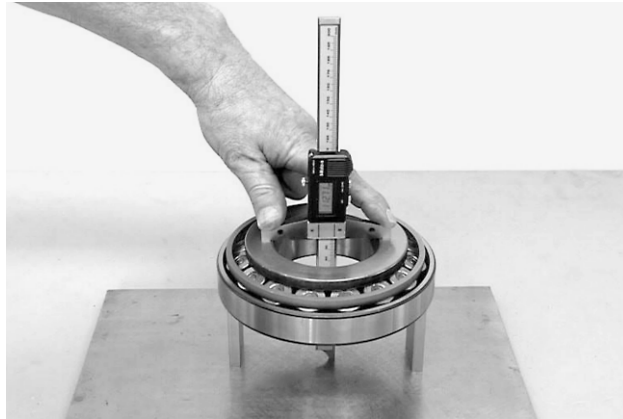
Lift the differential carrier out of the axle casing using CAS2846 lifting bail.

**STEP 116**

BD01C036

Fasten the differential carrier on OEM4135 stand using CAS2847 brackets.

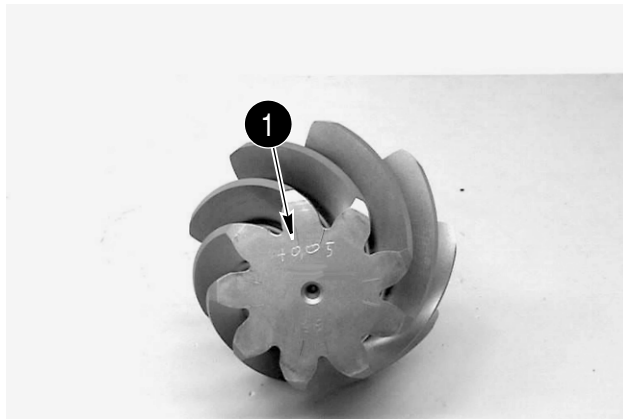
**STEP 162**



BD00M350

Measure the bearing width.  
 Bearing width . . . . . 42.65 mm (1.68 inch)

**STEP 163**



BD00M351

1. 202.04 <sup>+0.05</sup>  
 Reading on pinion . . . . . 202.04 mm (7.95 inch)  
 Example B:

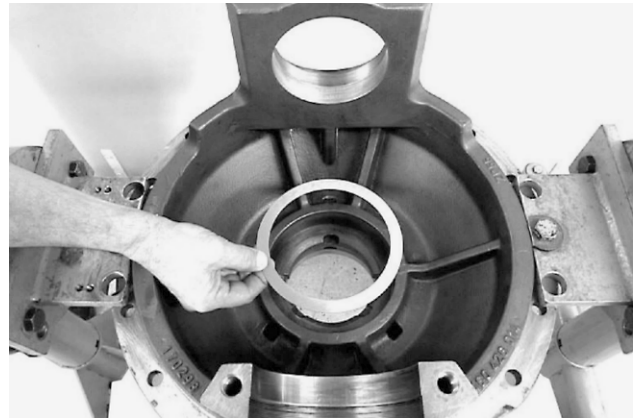
<b>Bearing thickness</b>	42.65 mm (1.68 inch)
<b>Reading on pinion</b>	+ 202.04 mm (7.95 inch)
	244.69 mm (9.63 inch)
<b>Total</b>	

Example C:

<b>Example A: total</b>	245.60 mm (9.67 inch)
<b>Example B: total</b>	- 244.69 mm (9.63 inch)
	0.91 mm (0.04 inch)
<b>Required shim thickness</b>	

**Install the Drive Pinion**

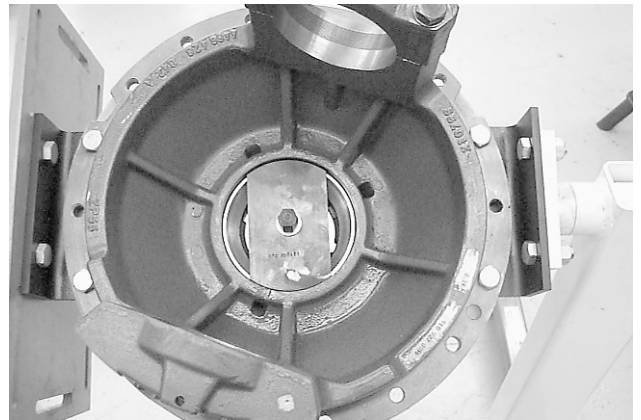
**STEP 164**



BD00M352

Place the determined shim e.g. s = 0.91 mm (0.04 inch) into the bearing bore of the differential carrier.

**STEP 165**



BD01C028

Freeze the bearing outer ring and insert it into the bearing bore using CAS2855 and CAS2845.

# Section 6005

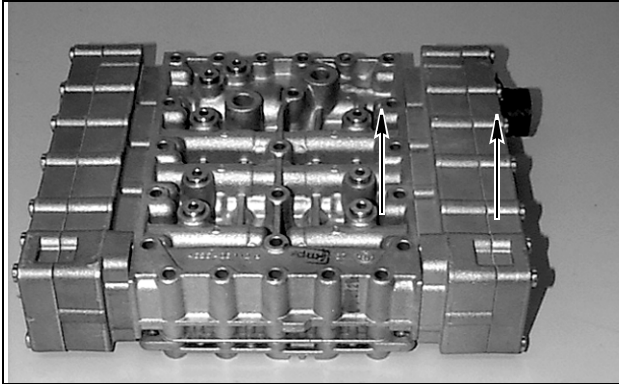
**DRIVE SHAFTS, CENTER BEARING, AND UNIVERSAL  
JOINTS**

**6005**

## CONTROL VALVE

### Disassembly

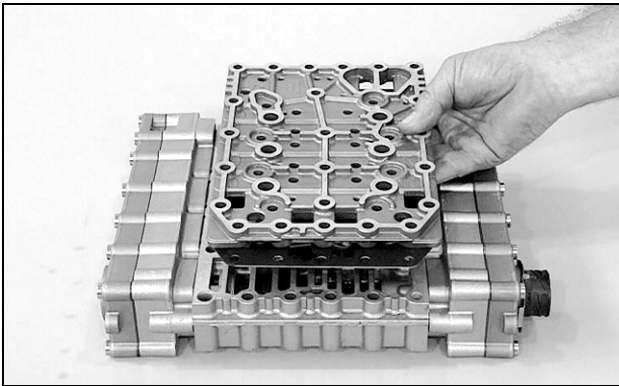
#### STEP 1



BD06A007

Mark the installation position of the wiring harness to the valve block.

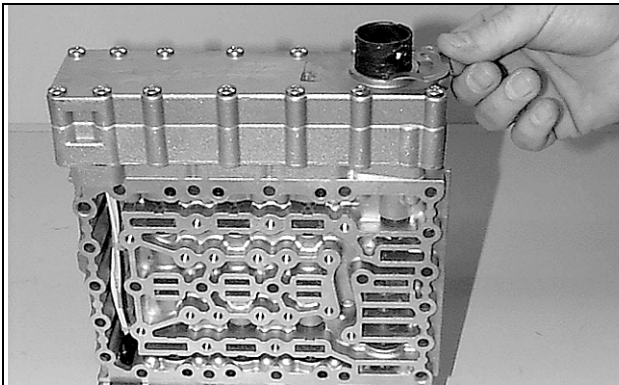
#### STEP 2



BD06A008

Loosen and remove the cap screws that secure the distribution plate and intermediate plate to the valve body, remove the intermediate plate and distribution plate.

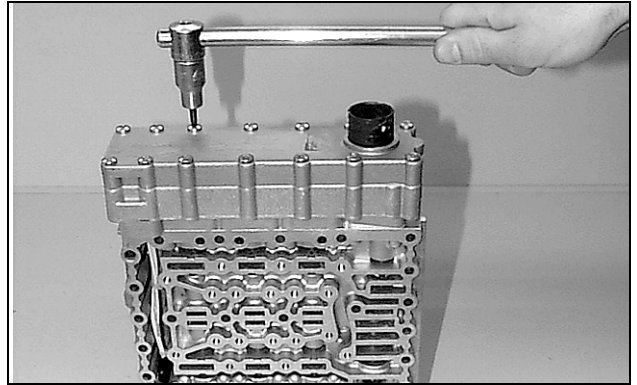
#### STEP 3



BD06A009

Remove the wiring harness retaining clamp.

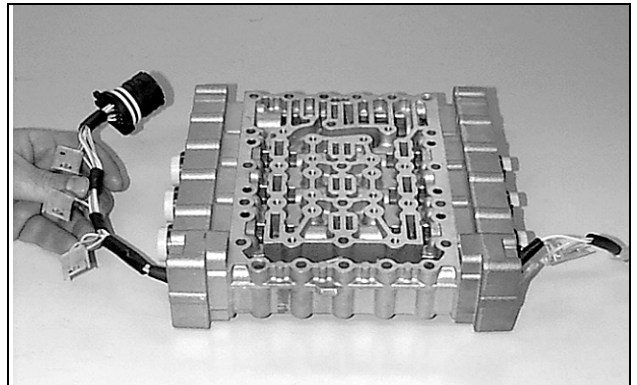
#### STEP 4



BD06A010

Loosen and remove the cap screws, remove the cover. Remove the opposite cover.

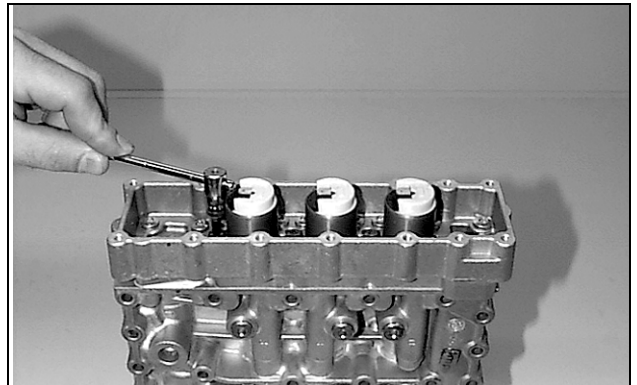
#### STEP 5



BD06A011

Remove the wiring harness.

#### STEP 6



BD06A012

Loosen and remove the retaining plate cap screws, remove the retaining plates and solenoids.

## BRAKE VALVE

### Removal

1. Park the machine on a level surface and lower the loader bucket to the floor. Stop the engine.
2. Put blocks on both sides of each tire to prevent machine movement.
3. Make sure the brake accumulators are completely discharged. Push down and release the brake pedals at least 30 times.
4. Turn the master disconnect switch to the OFF position.
5. Remove the cab skirts located under the cab or canopy.
6. To release the pressure on the parking brake accumulator, the line at the accumulator must be SLOWLY cracked open. A pan will be needed to catch the hydraulic oil.
7. Connect a drain hose to the quick disconnect couplings in each brake circuit to release any pressure in the brake circuit.
8. Clean the brake valve (1) and lines, refer to the illustration on page 5.
9. Put identification tags on all electrical and hydraulic lines that are connected to the brake valve (1).
10. Connect a vacuum pump to the hydraulic reservoir. Start the vacuum pump
11. Disconnect the lines from the brake valve (1) and put plugs in each line.
12. Remove the brake valve (1).

### Installation

1. Install the brake valve (1) in the cab or canopy. Refer to the illustration on page 5.
2. Remove the plugs from the hydraulic lines and connect the hydraulic lines to the brake valve (1).
3. Stop the vacuum pump and remove.
4. Connect all of the electrical connections.
5. Turn the master disconnect switch to the ON position.
6. Bleed the brake system. See Section 7002.
7. Install the cab skirts.
8. Check the hydraulic reservoir oil level and add oil as required. See Section 1002 for the correct oil.

## TROUBLESHOOTING THE HYDRAULIC BRAKE SYSTEM

**NOTE:** *The hydraulic brake schematic is included in the hydraulic schematic. Refer to the rear pocket of this manual.*

1. Check the oil level in the hydraulic reservoir; add oil as necessary.
2. Push and release the brake pedal many times with the engine stopped to remove all hydraulic pressure from the brake system until there is no pressure on the pedal.
3. Install two 207 bar (3000 psi) pressure gauges to front and rear hydraulic brake accumulator test ports, refer to page 8 for the locations of the test ports.
4. Make sure that the pressure gauge hoses are long enough so the gauges can be read while sitting in the operators seat.

**NOTE:** *The gauges can not be connected to the test ports if hydraulic pressure remains in the system.*

5. Start the engine. Run the engine at low idle while reading the pressure gauges. The alarms (buzzer, master warning light and brake pressure warning light) should shut off when the accumulator with the lowest pressure reaches 106 to 115 bar (1537 to 1668 psi), approximately 40 seconds at any engine speed.
6. After the alarms stop, run the machine at high idle to finish charging the accumulators. The pressure must increase on both gauges until 190 to 196 bar (2756 to 2843 psi) is reached. This is the accumulator valve cut-out pressure. It is normal for the pressure to drop slightly once the cut-out pressure is reached.
7. With the engine running at high idle, push and release the brake pedal rapidly while reading the drop in pressure on the gauges. The pressure drops may not be equal, but as the lowest pressure reaches 157 to 167 bar (2277 to 2422 psi), the system pressure must start to increase. This is the valve cut in pressure.

**NOTE:** *The brake cut-in and cut-out pressures of the brake system charge valve are factory preset and are not adjustable.*

**NOTE:** *If the pressure on one of the pressure gauges is lower than specified, the problem can be a bad accumulator valve.*

8. Stop the engine. Turn the ignition switch to the ON position. Push and release the brake several times while reading the pressure on the gauges. Each push and release of the pedal will result in a slight drop in pressure, but not necessarily equal on the two gauges.
9. As the lowest pressure reaches 106 to 115 bar (1530 to 1668 psi) the brake warning lamp and alarm buzzer must actuate. If the warning lamp and alarm buzzer fail to work, test the low brake pressure warning switches and electrical circuit. If the warning lamp and alarm buzzer actuate at a higher or lower pressure than specified, test the low brake pressure warning switches and replace as needed.
10. Start engine to re-charge the brakes. When charging is complete, turn off the engine and put the key in run position. Press and hold the brake pedal down for 5 seconds and release for 5 seconds, until the low pressure warning buzzer goes off. Press and release the brake pedal eight more times at the same rate (5 seconds on and 5 seconds off).
11. After eight brake pedal strokes the pressure in each accumulator must be 87 bar (1260 psi) or greater.
12. Depress the pedal a ninth time. The pressure must be above the accumulator pre-charge pressure on the chart on page 6.
13. If the pressures are not within the required specifications, then the brake system must be bled.
14. After bleeding the brake system, perform the brake system check again.
15. Continue to slowly push and release the brake pedal several times until the gauge pressure suddenly drops to zero. The last pressure reading before the drop to zero is the nitrogen charge pressure in the accumulator. Test the pressure in both accumulators. If the pressure is below 48 to 59 bar (696 to 856 psi), charge or replace the accumulator(s) (see page 6).

**NOTE:** *Nominal temperature of 20° C (68° F), colder temperature will reduce pressure, hotter temperature will increase pressure.*

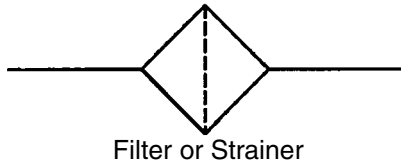
## NOTES

# Section 8000

## HOW TO READ HYDRAULIC SCHEMATICS

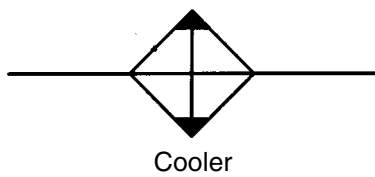
## Accessories

Filters, strainers, and heat exchangers are represented as squares that are turned 45 degrees and have the port connection at the corners.



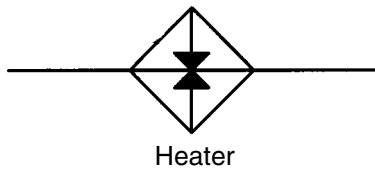
BS07B688

A dotted line perpendicular to the flow line indicates a filter or strainer.



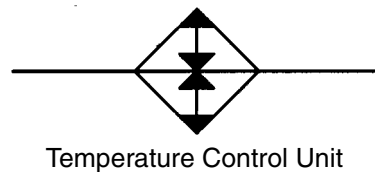
BS07B689

A solid line perpendicular to the flow with black triangles pointing out indicates a cooler.



BS07B690

The symbol for a heater is like the symbol for a cooler, except the black triangles point in.

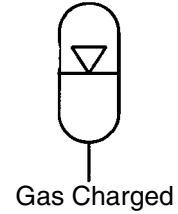


BS07B693

Two sets of triangles pointing in and out indicates a temperature control.

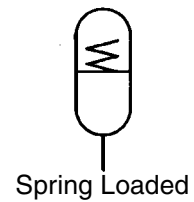
As you can see, the black triangles point in the direction that the heat is dissipated. or in the case of the control unit, they show that the heat can be regulated.

An oval with details inside indicates an accumulator. The details inside will tell you what type of accumulator it is: spring loaded, gas charged, or other features.



BS07B691

The divider line indicates there is a separator between the charge and the oil. A hollow triangle indicates gas.



BS07B692

A spring shows that the accumulator is spring loaded.

# **Section 8001**

## **REMOVAL AND INSTALLATION OF HYDRAULIC COMPONENTS**

**STEP 28**

Check for hydraulic oil leakage at the remote control valve.

**STEP 29**

Check the level of hydraulic oil in the reservoir and add as required.

**STEP 30**



BD06F209

Position the access panel on the ROPS cab or the ROPS canopy and install and tighten the screw.

**STEP 31**



BD06F208

Install and close the access panel.

**STEP 32**



BD06F207

Close the right hand window.

**STEP 19**

BD01D710

Align the pivot pin with the front frame and install the spacer, washer and bolt. Tighten the bolt.

**STEP 20**

BD01D708

Remove the caps and plugs and connect the hoses to the lift cylinder.

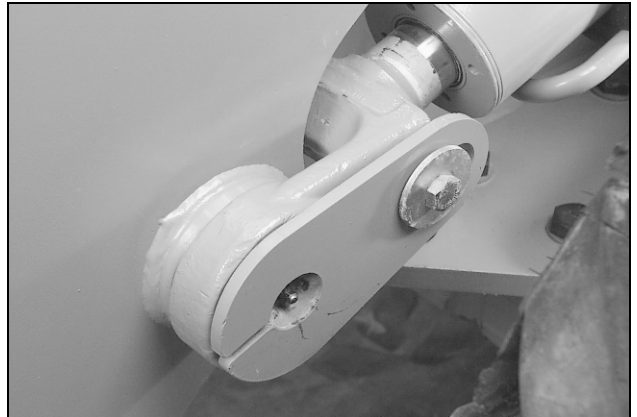
**STEP 21**

If the yoke of the lift cylinder is not aligned with the loader frame, have another person start and run the engine at low idle and use the loader control lever to SLOWLY move the yoke into alignment with the loader frame.

**STEP 22**

BD01D712

Install the pivot pin for the yoke. Stop the engine.

**STEP 23**

BD01D709

Align the pivot pin with the yoke and install the spacer, washer and bolt. Tighten the bolt.

**STEP 24**

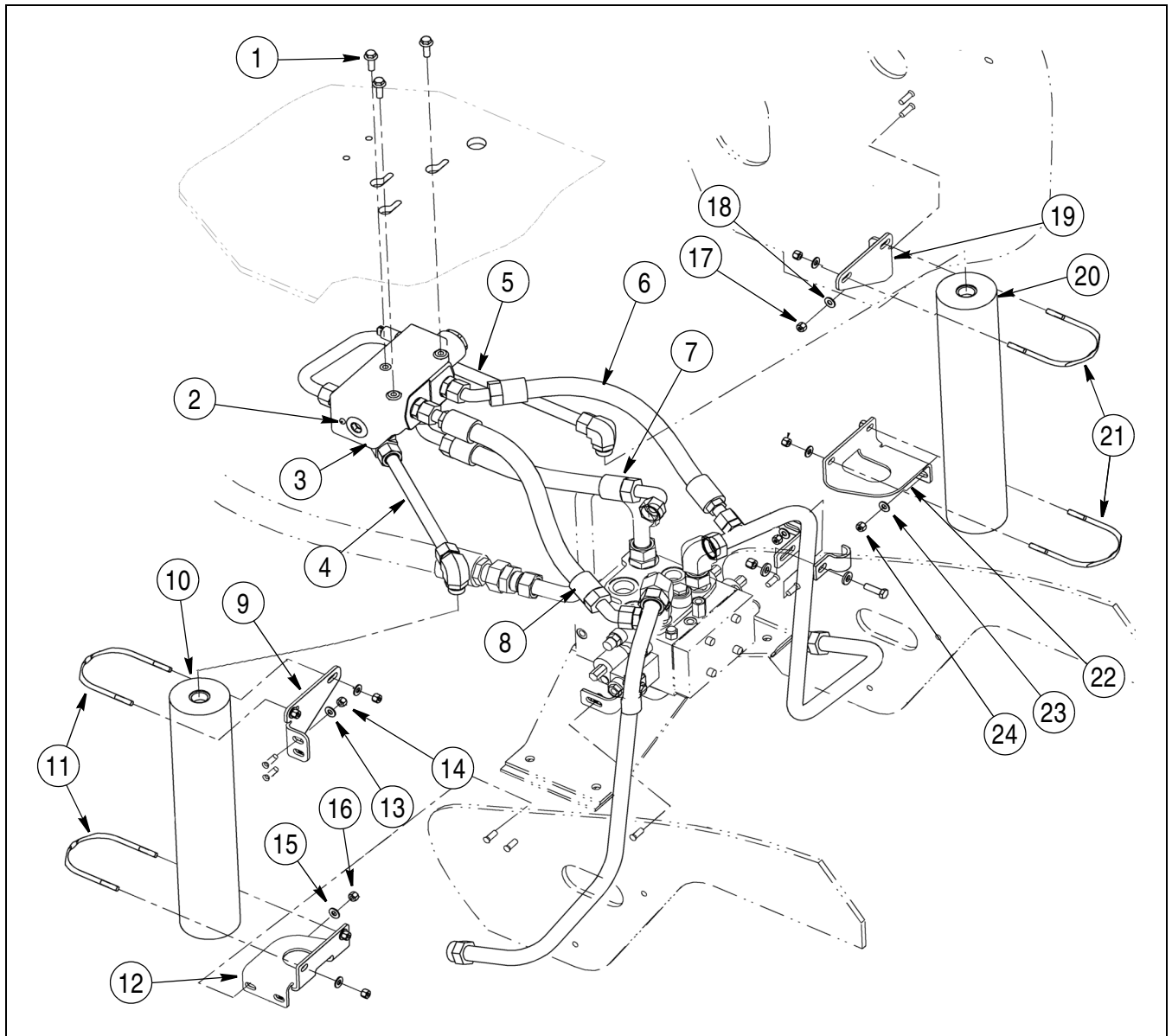
SLOWLY extend and retract the piston rod three times to remove any air from the lift cylinders.

**STEP 25**

Lubricate the pivot pins with molydisulfide grease.

**STEP 26**

Check the level of hydraulic oil in the reservoir and add as required. Tighten the filler cap on the hydraulic reservoir.



BC06A217

- |                           |                       |                      |
|---------------------------|-----------------------|----------------------|
| 1. BOLT (3)               | 9. BRACKET            | 17. NUT (2)          |
| 2. BLEEDER VALVE          | 10. RIGHT ACCUMULATOR | 18. WASHER (2)       |
| 3. RIDE CONTROL VALVE     | 11. U-BOLT            | 19. BRACKET          |
| 4. RIGHT ACCUMULATOR TUBE | 12. BRACKET           | 20. LEFT ACCUMULATOR |
| 5. LEFT ACCUMULATOR TUBE  | 13. WASHER (2)        | 21. U-BOLT           |
| 6. HOSE TO LEFT CYLINDER  | 14. NUT (2)           | 22. BRACKET          |
| 7. HOSE TO RETURN TUBE    | 15. WASHER (2)        | 23. WASHER (2)       |
| 8. HOSE TO RIGHT CYLINDER | 16. NUT (2)           | 24. NUT (2)          |

**STEP 12**

Tag and disconnect the hoses (6, 7, and 8) and tubes (4 and 5) from the ride control valve (3) from the machine. Install a plug in the hoses and caps on fittings.

**STEP 13**

Loosen and remove the three bolts (1) that fasten the ride control valve (3) to the frame.

**STEP 14**

Remove the ride control valve (3) from the machine.

**STEP 15**

Remove and discard all O-rings.

## SPECIFICATIONS

**NOTE:** Both pump sections provide flow for both the steering and loader functions.

Manufacturer.....	Bosch-Rexroth
Pump 1 (closest to transmission) .....	169.5 L/min at 250 bar, at 2100 r/min (44.8 gpm at 3626 psi, at 2100 r/min)
Pump 2 (furthest from transmission) .....	169.5 L/min at 250 bar, at 2100 r/min (44.8 gpm at 3626 psi, at 2100 r/min)
Combined pump flow .....	339 L/min at 250 bar, at 2100 r/min (89.6 gpm at 3626 psi, at 2100 r/min)
Main relief valve pressure settings .....	248 to 255 bar (3600 to 3700 psi)
Circuit relief valve pressure setting	
Auxiliary A and B port.....	290 bar (4200 psi)
Bucket A and B port .....	290 bar (4200 psi)
Pilot accumulator pressure .....	13 to 15 bar (188 to 218 psi)
Steering relief valve pressure setting .....	See Section 5002
Brake accumulator pressure .....	See Section 7002
Ride Control Accumulator Dry Nitrogen Pressure .....	See chart on page 22
Ride Control Accumulator Fluid Capacity .....	3.8 liters (231.9 cu. inch)
Ride Control Accumulator Maximum Operating Pressure .....	280 bar (4061 psi)

## ACCUMULATOR SPECIAL TORQUES

Gas Charging Valve.....	20 Nm (14.8 pound-feet)
-------------------------	-------------------------

**STEP 7**

Record the reading on the test gauge.

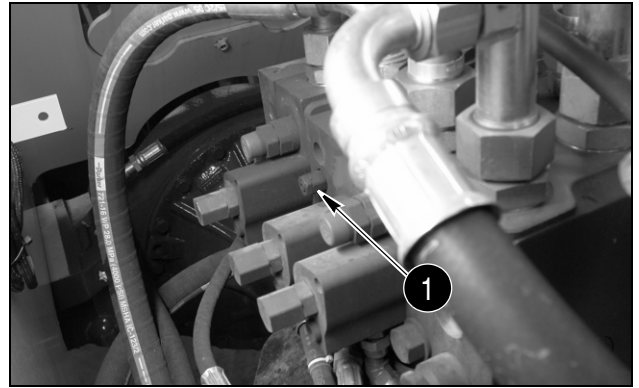
**STEP 8**

Reading should be 248 to 255 bar (3595 to 3700 psi).

**STEP 9**

If this reading is more or less than specified, it will be necessary to adjust the loader relief pressure.

## Adjusting the Loader Limit Pressure



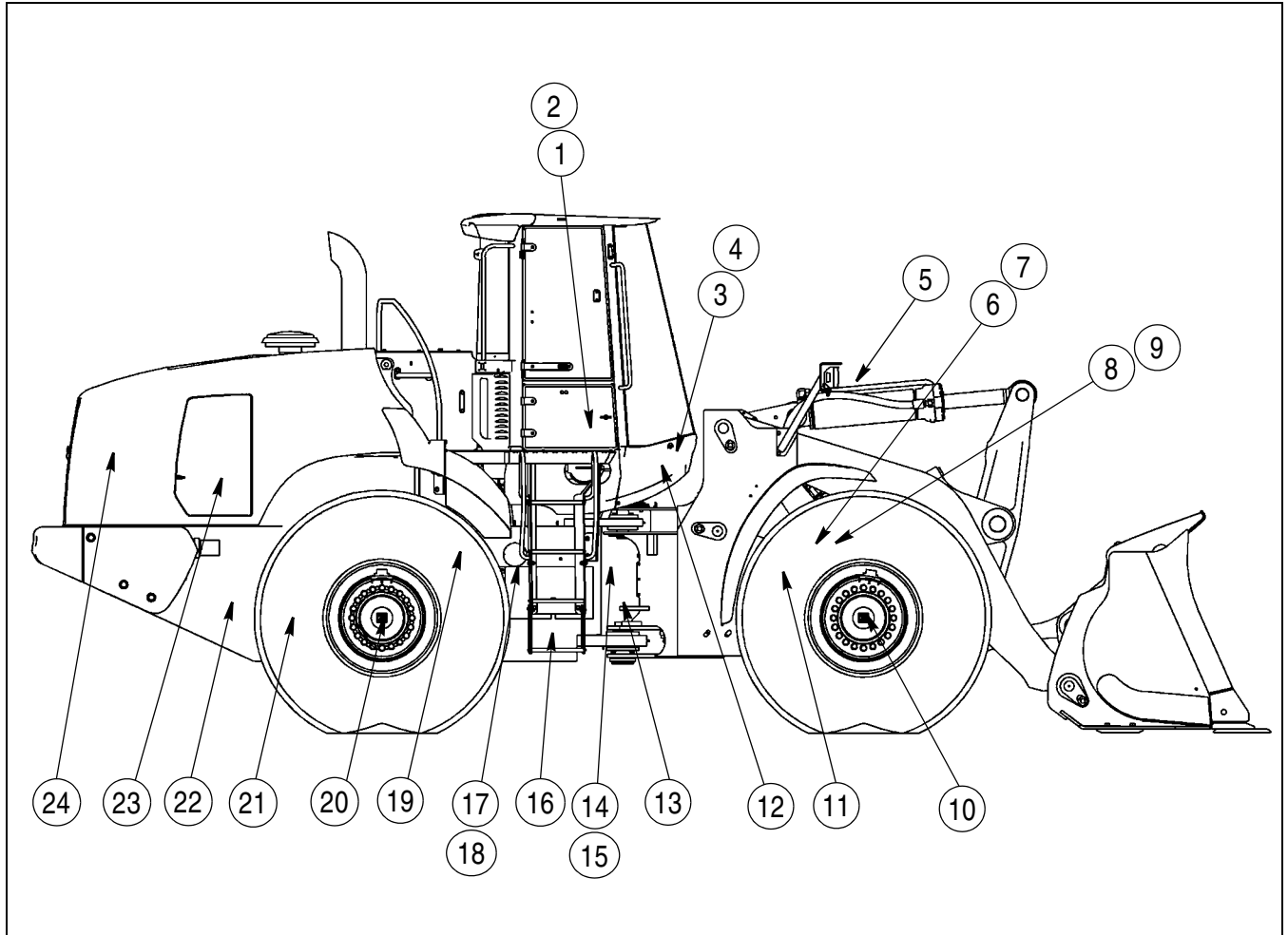
BD06H193

**STEP 10**

Turn the screw (1) clockwise to increase the loader relief. Turning the screw counterclockwise will decrease the loader relief pressure.

**NOTE:** *1/4 turn of the adjustment screw will change the pressure approximately 35 bar (500 psi).*

## HYDRAULIC COMPONENT LOCATIONS



BS06N414

- |  |   |
|--|---|
| 1. PILOT CONTROL VALVE   | 13. STEERING CYLINDER                             |
| 2. PILOT PRESSURE DIAGNOSTIC COUPLER   | 14. BRAKE ACCUMULATORS                            |
| 3. BRAKE LIGHT PRESSURE SWITCH   | 15. BRAKE ACCUMULATOR PRESSURE DIAGNOSTIC COUPLER |
| 4. BRAKE WARNING PRESSURE SWITCH   | 16. PARKING BRAKE CYLINDER                        |
| 5. BUCKET CYLINDER (TILT CYLINDER)   | 17. STEERING PRESSURE DIAGNOSTIC COUPLER          |
| 6. PILOT PRESSURE ACCUMULATOR  | 18. STEERING PRIORITY VALVE                       |
| 7. LOADER CONTROL VALVE  | 19. AUXILIARY STEERING PRESSURE SWITCH            |
| 8. LIFT CYLINDER   | 20. REAR BRAKE CYLINDER                           |
| 9. RIDE CONTROL ACCUMULATOR  | 21. FAN VALVE                                     |
| 10. FRONT BRAKE CYLINDER   | 22. AUXILIARY STEERING PUMP AND MOTOR             |
| 11. RIDE CONTROL ACCUMULATOR BLEEDER VALVE AND RIDE CONTROL VALVE (OPTIONAL) | 23. HYDRAULIC COOLER                              |
| 12. FRONT AND REAR AXLE BRAKE PRESSURE DIAGNOSTIC COUPLERS                   | 24. FAN DRIVE MOTOR                               |

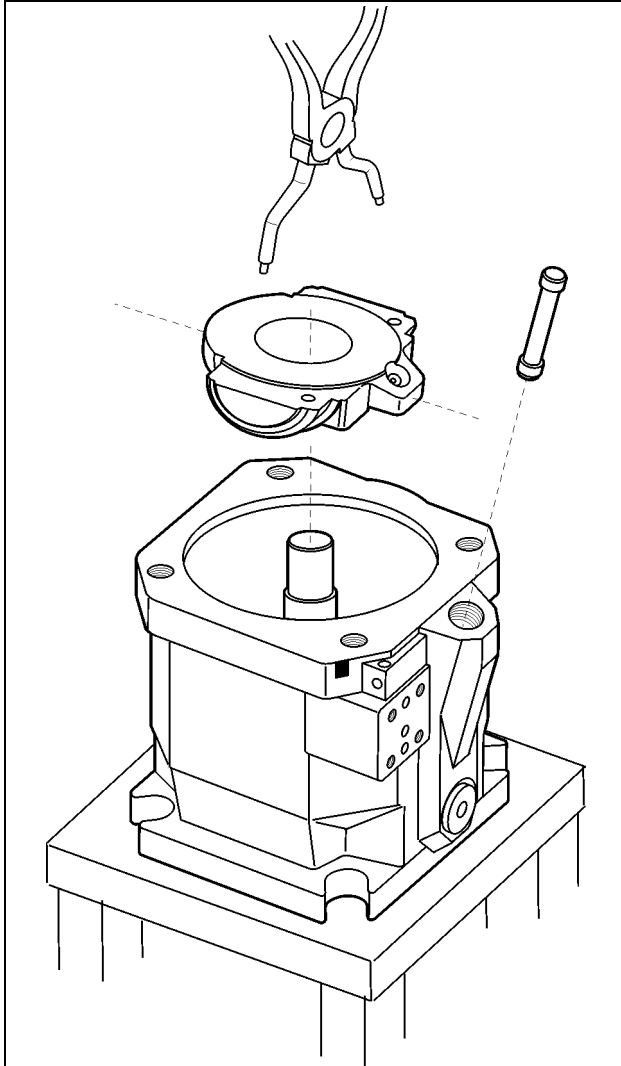
## PUMP SPECIFICATIONS

Manufacturer.....	Rexroth
Pump 1 (closest to transmission) .....	170 L/min at 248 bar, at 2100 r/min (45 U.S. gpm at 3600 psi at 2100rpm)
Pump 2 (farthestmost from transmission) .....	170 L/min at 248 bar, at 2100 r/min (45 U.S. gpm at 3600 psi at 2100rpm)
Rotation .....	Clockwise as seen from the end of the shaft
Special torques	
Pump end cover bolts.....	165 Nm (121.5 pound-feet)
Pump housing plug .....	127 Nm (93.5 pound-feet)
Control piston plug .....	90 Nm (66 pound-feet)

## PREPARING THE EQUIPMENT PUMP FOR USE

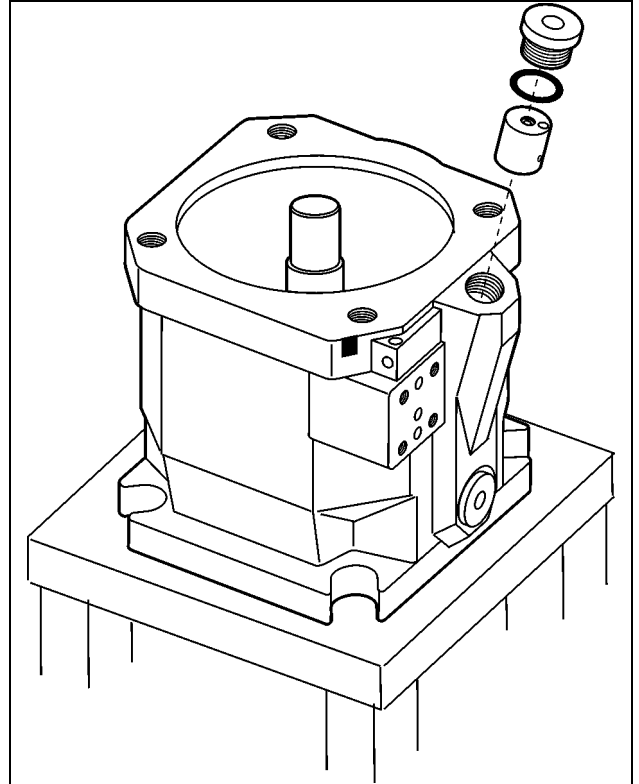
Do the following procedure any time you install a new or overhauled equipment pump:

1. Start and run the engine at half throttle for three minutes.
2. With the engine running at half throttle, move the bucket control lever into roll back position. Hold the bucket control lever in this position until the bucket stops moving.
3. Hold the bucket control lever in the roll back position for five seconds. Then put the bucket control lever in the NEUTRAL position for five seconds.
4. Repeat Step 3 for three minutes.
5. Increase the engine speed to full throttle and repeat Steps 3 and 4.
6. Stop the engine and check for leaks.
7. Replace the hydraulic filter.

**STEP 33**

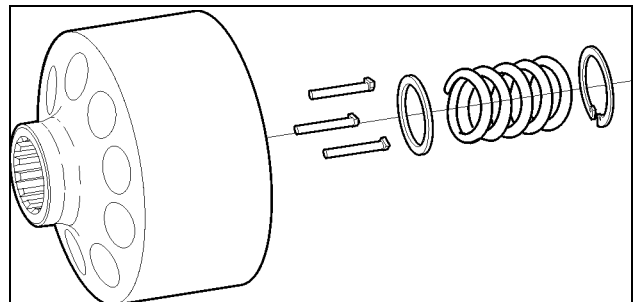
BC06F581

Install the swash plate into the housing, work the swash plate from side to side to seat it in the bearings and spring. Install the piston rod.

**STEP 34**

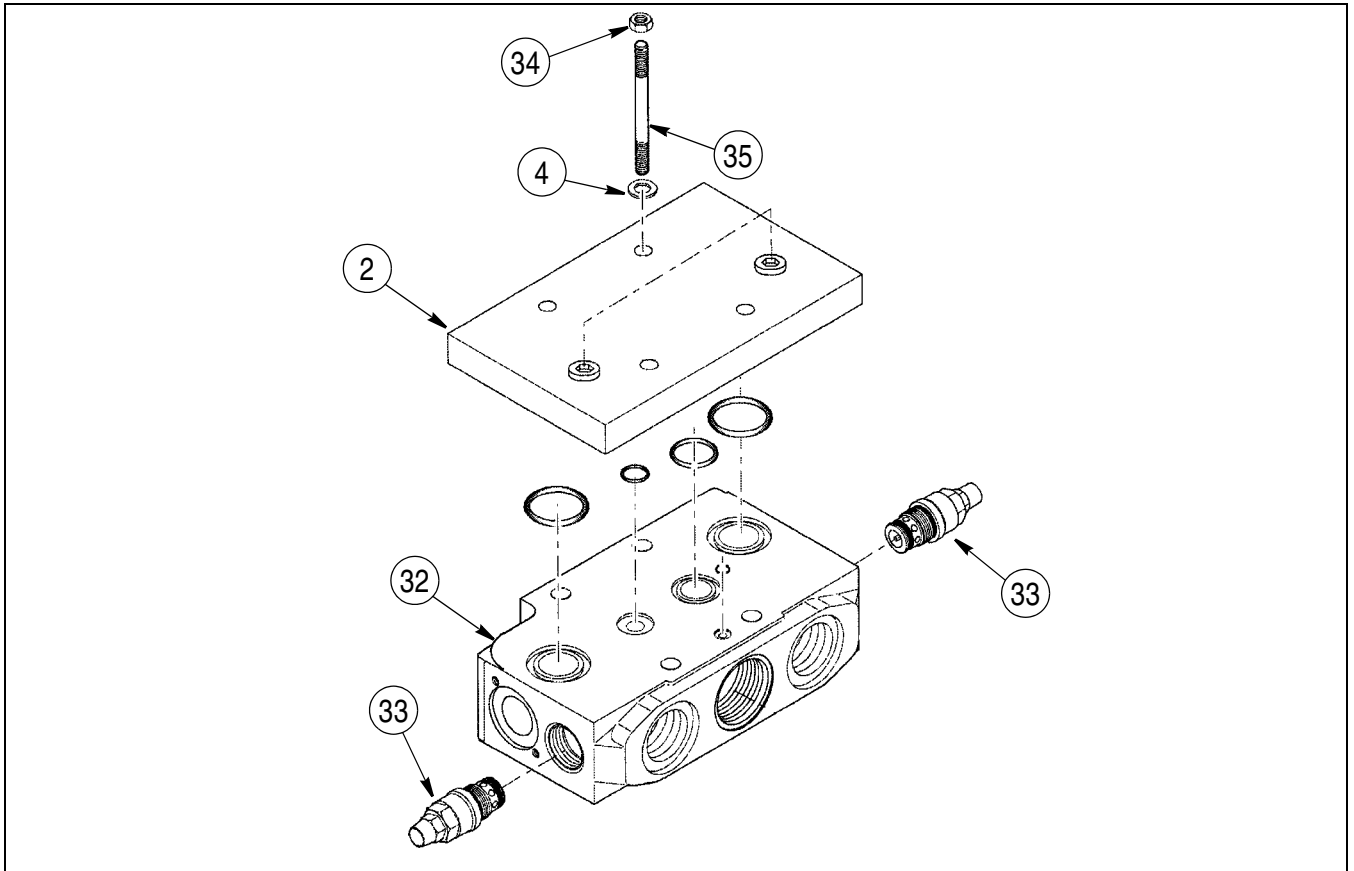
BC06F582

Install the piston into the housing with flat surface out. Lubricate the O-ring and install the plug, tighten the plug to 90 Nm (66 pound-feet).

**STEP 35**

BC06F583

Use grease to hold the pressure pins into position, install the spacer, spring and snap ring.



BS03C035

34. NUT

35. STUD

**4 SPOOL MOUNTING CONFIGURATION**

# Section 8006

## CYLINDERS

8006

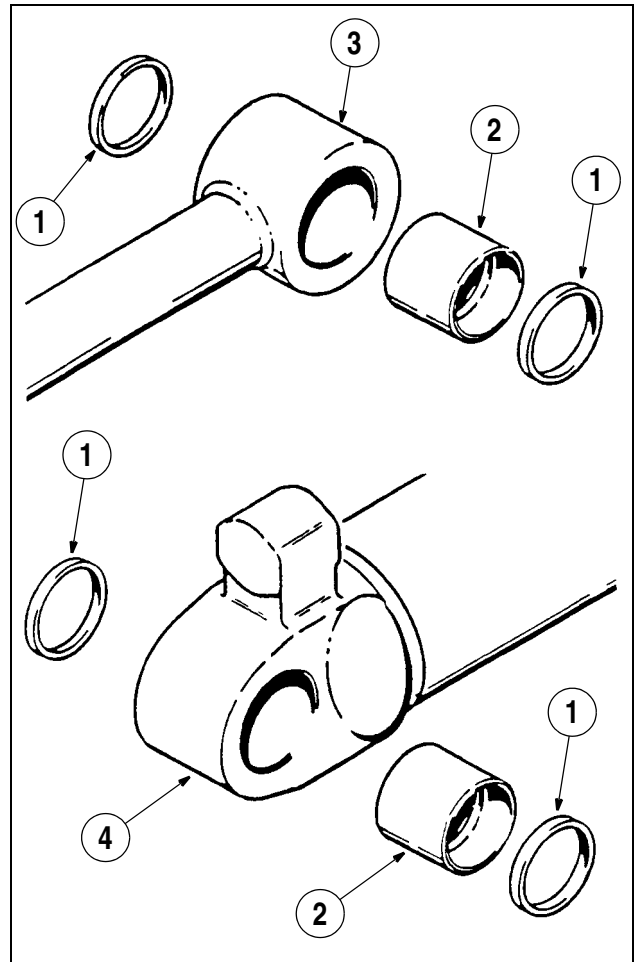
## REPLACING BUSHINGS FOR THE BUCKET AND LIFT CYLINDERS

### Disassembly

1. Put the piston rod eye (3) in a press, refer to Figure 7.
2. Use an acceptable driver to press the seals (1) and bushing (2) out of the piston rod eye (3).
3. Put the tube (4) in a press.
4. Use an acceptable driver to press the seals (1) and bushing (2) out of the tube (4).
5. Clean the bore for the bushings (2) in the piston rod eye (3) and the tube (4).

### Assembly

1. Use an acceptable driver to press a new bushing (2) into the piston rod eye (3) until the bushing (2) is centered in the piston rod eye (3), refer to Figure 7.
2. Use an acceptable seal driver to install the seals (1) in the piston rod eye (3). The lips of the seals (1) must be toward the outside of the bore.
3. Use an acceptable driver to press a new bushing (2) into the tube (4) until the bushing (2) is centered in the tube (4).
4. Use an acceptable seal driver to install the seals (1) in the tube (4). The lips of the seals (1) must be toward the outside of the bore.



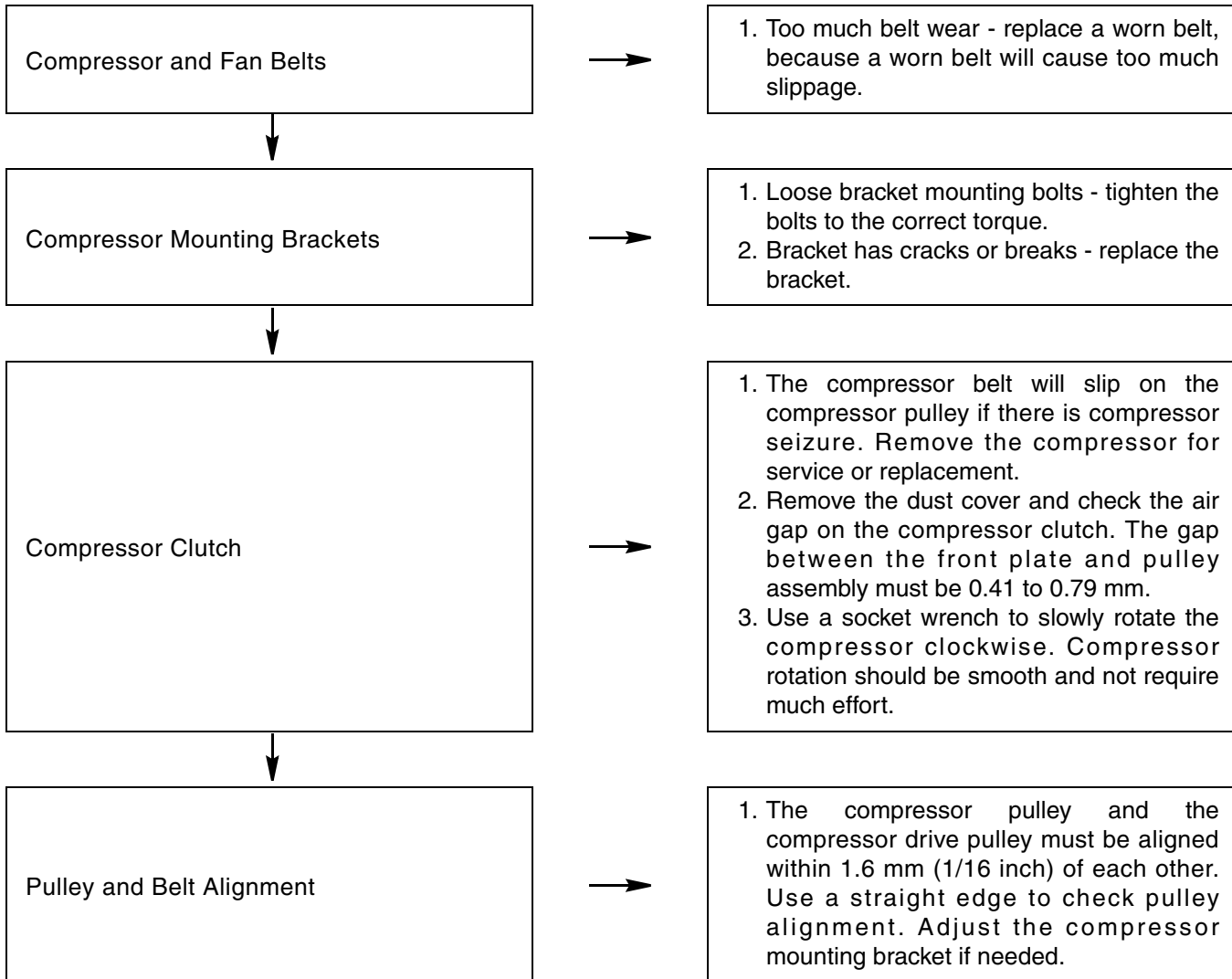
GS98J806

- |            |                   |
|------------|-------------------|
| 1. SEAL    | 3. PISTON ROD EYE |
| 2. BUSHING | 4. TUBE           |

**FIGURE 7. BUSHING REMOVAL AND REPLACEMENT**

## SYSTEM CHECKS

### Mechanical Compressor Check



### Expansion Valve Malfunctioning - Indications:

- A. Discharge air from heater/evaporator warm.
- B. Much condensation on suction hose at compressor.
- C. Much condensation on evaporator outlet.



See Section 9004 and replace the expansion valve.

### Refrigerant Contamination:

Refrigerant Contamination



1. See table below and check stable saturation pressures at given temperature to determine if contamination exists.
    - A. Measure pressure from gauge on reclamation unit.
    - B. Measure temperature from refrigerant in reclamation tank. If refrigerant has been in reclamation unit for some time, use ambient temperature. The numbers in the table represent the boiling point for HFC-134a.
    - C. Pressure readings below range given in chart indicate contaminated refrigerant.
- IMPORTANT:** Do not use contaminated refrigerant or mix with uncontaminated refrigerant. Dispose of in accordance with all applicable laws and local procedure.

### HFC-134a Stable Saturation Pressure/ Temperature Chart

Temperature ° F (° C)	Pressure PSIG (Bar)
50 (10)	45 (3.1)
55 (13)	51 (3.5)
60 (16)	57 (3.9)
65 (18)	64 (4.4)
70 (21)	71 (4.9)
75 (24)	78 (5.4)
80 (27)	88 (6.1)
85 (29)	95 (6.6)
90 (32)	104 (7.2)
95 (35)	114 (7.9)
100 (38)	124 (8.6)
102 (39)	129 (8.9)
104 (40)	133 (9.2)
106 (41)	138 (9.5)
108 (42)	142 (9.8)
110 (43)	147 (10.1)
112 (44)	152 (10.5)
114 (46)	157 (10.8)
116 (47)	162 (11.2)
118 (48)	167 (11.5)
120 (49)	172 (11.9)

## TABLE OF CONTENTS

SPECIFICATIONS .....	3
SPECIAL TOOLS .....	3
SAFETY PROCEDURES .....	4
AIR CONDITIONER SYSTEM REFRIGERANT RECOVERY .....	5
AIR CONDITIONER SYSTEM EVACUATION AND RECHARGING .....	7
PRESSURE - TEMPERATURE CHART .....	10

## TABLE OF CONTENTS

SAFETY PROCEDURES .....	3
SPECIAL TOOLS .....	4
COMPRESSOR .....	5
Removal .....	5
Installation .....	6
EXPANSION VALVE, EVAPORATOR/HEATER CORE, HEATER VALVE, BLOWERS .....	8
Removal .....	9
Installation .....	14
CONDENSER AND RECIEVER DRIER .....	19
Removal .....	19
Installation .....	20

**NOTE:** If replacing the heater control valve, heater core, air conditioning expansion valve, air conditioning evaporator core do steps 22 through 31, if replacing electrical components go to step 32.

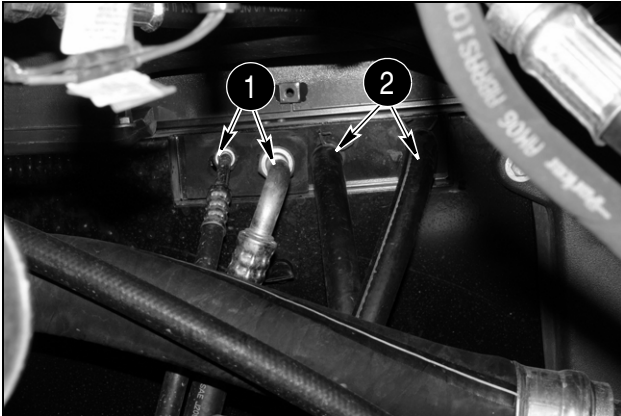
### STEP 22



BD07A223

Remove the right side cab skirt.

### STEP 23

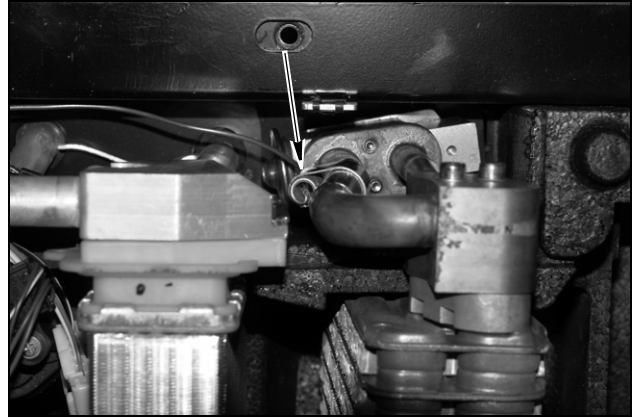


BD06G205

- 1. AIR CONDITIONING HOSES
- 2. HEATER HOSES

Fasten identification tags on the hoses. Disconnect the hoses for the heater core and evaporator core, install plugs in the hoses and caps on the fittings.

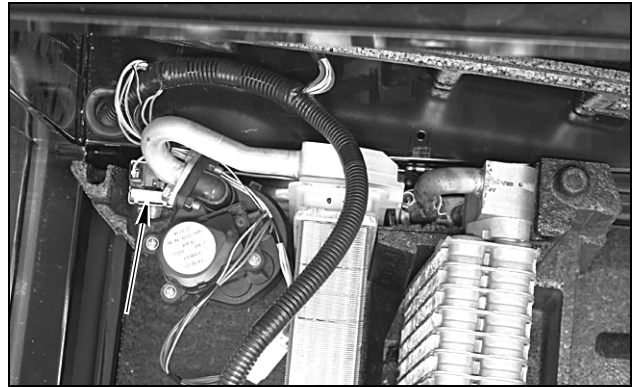
### STEP 24



BD06G206

Remove the thermostat probe and clamp from the evaporator core.

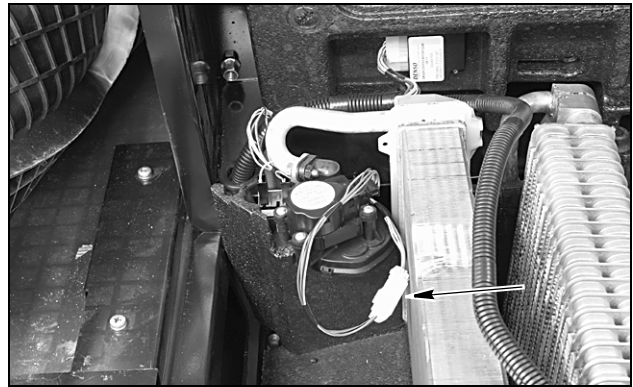
### STEP 25



BD06G237

Disconnect the electrical connectors from the thermostat control.

### STEP 26



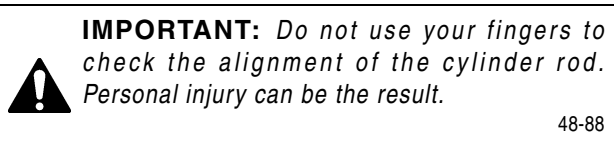
BD06G236

Disconnect the electrical connectors from the heater control valve.

## NOTES

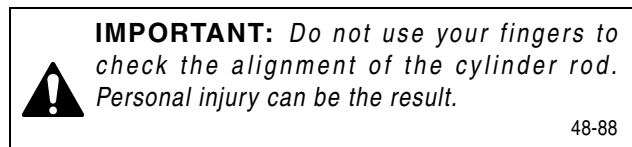
## Installation

1. Apply antiseize compound to the inner bores and outer bores for the pivot pins of the front frame, refer to the illustration on page 9.
2. Move the machine into alignment with the loader frame (2).
3. Lower the loader frame (2) into alignment with the front frame.
4. Apply antiseize compound to the pivot pins (9 and 10) that fasten the loader frame (2) to the front frame.
5. Start the pivot pins (9 and 10) into the front frame. Install the washers (18) and new wipers (22) between the loader frame (2) and the front frame.
6. Install the pivot pins (9 and 10) all the way.
7. Install the bolt (19), washer (20) and spacer (21) that fasten the pivot pins (9 and 10). Tighten the bolt.
8. Install the proximity switch and cover. Left-hand side of the machine only.
9. Disconnect the chain hoist from the loader frame (2).
10. If the machine is equipped with front lamps, hold the front lamps in place and install the cap screws and lock washers that fasten the front lamps to the front frame. Tighten the cap screws.
11. If the machine is equipped with auxiliary hydraulics, remove the plugs from the tube fittings and the caps from the hoses. Connect the hoses to the tubes.
12. Connect the chain hoist to the bucket cylinder (8) and lower the bucket cylinder (8).
13. Start the engine and run the engine at low idle.
14. Have another person help you at this time. Move the bucket control lever as required to align the piston rod eye of the bucket cylinder (8) with the bellcrank (11). Stop the engine.



15. Install the pivot pin (7) in the bellcrank (11) and the piston rod eye of the bucket cylinder (8).
16. Install the bolt (15), washer (16), and spacer (17) that fasten the pivot pin (7). Tighten the bolt.

17. Disconnect the chain hoist from the bucket cylinder (8).
18. Fasten the chain hoist to one of the lift cylinders.
19. Raise the piston rod yoke of the lift cylinder so the piston rod yoke is aligned with the loader frame (2).
20. Install a driver in the piston rod yoke and the loader frame (2).
21. Repeat Steps 18, 19, and 20 for the other lift cylinder.
22. Disconnect the chain hoist from the lift cylinder.
23. Start the engine. Raise the loader frame and roll the bucket all the way forward. Lower the bucket to the floor. Stop the engine.
24. Fasten the chain hoist to the cross member (1) of the loader frame (2).
25. Start the engine and run the engine at low idle.
26. Have another person help you at this time. Move the lift control lever as required to align the piston rod yoke of one of the lift cylinders with the loader frame (2).



27. Remove the driver and install the pivot pin (3).
28. Install the bolt (12), washer (13), and spacer(14) that fasten the pivot pin (3). Tighten the bolt.
29. Repeat Steps 26, 27, and 28 for the other lift cylinder. Stop the engine.
30. Lubricate the pivot pins with molydisulfide grease.
31. Disconnect the chain hoist from the cross member (1) of the loader frame (2).
32. Tighten the filler plug in the reservoir.
33. If the machine is equipped with auxiliary hydraulics, start the engine and run the engine at low idle.
34. Slowly extend and retract the clam cylinders four times to remove air from the auxiliary circuit.
35. Stop the engine, check the level of the oil in the reservoir, and check for leaks. Add oil to the reservoir as required.

## Installation

### STEP 1

Check rubber mounts (3 and 4) for deterioration, tears, deformation, or other damage; replace rubber mounts as necessary.

### STEP 2

Position cab over rear chassis, then slowly lower cab onto rear chassis making sure that brake valve and steering control valve are positioned so that they enter into cab. Making sure that no wires, hoses or mounting hardware are crushed.

### STEP 3

Install washers, bolts, and nuts to secure cab to rear chassis. Tighten bolts to a torque of 773 to 854 Nm (570 to 630 pound feet)

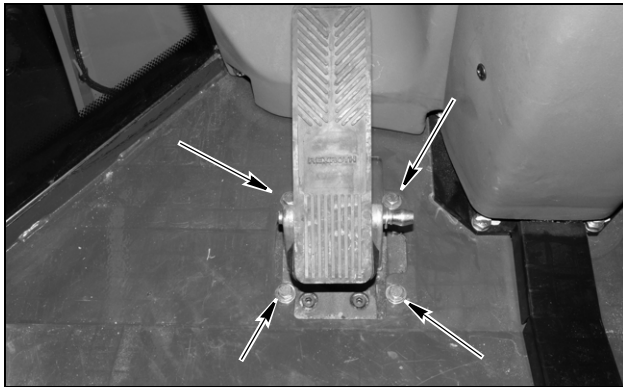
### STEP 4

Disconnect lifting equipment from cab.

### STEP 5

Remove lifting eyes.

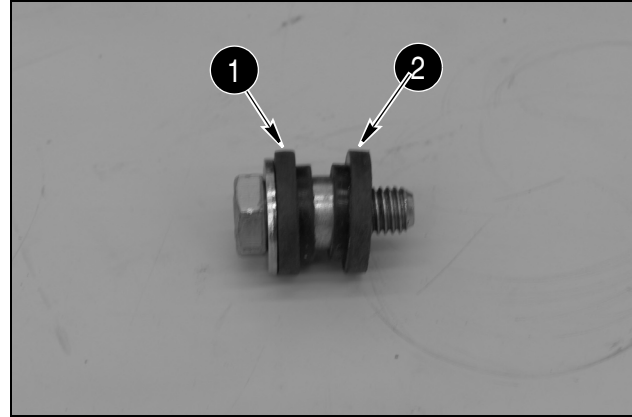
### STEP 6



BD06G185

Align mounting holes in brake valve with associated holes in cab or canopy floor. Install hardware to secure brake valve to floor.

### STEP 7



BD07B141

Put the rubber bushing (1) on the spacer with the tapered end towards the steering valve. Rubber bushing (2) is mounted between the cab and the steering control valve.

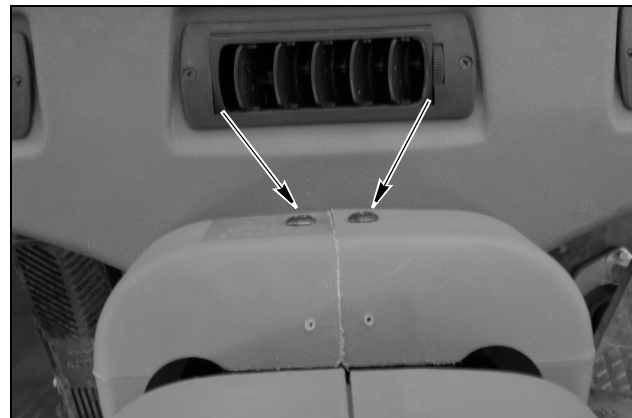
### STEP 8



BD07B102

Install the four mounting bolts for the steering control valve, two shown and two in the front.

### STEP 9



BD07B101

Install the upper trim onto the column, tilt the steering wheel and install and tighten the mounting screws.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL