HITACHI

EH1600/EH1700
360ND/350HD
SERVICE
MANUAL
EDITION 2

PUBLICATION
NO. 10192

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SERVICE PHONE NO .....

MACHINE:

SERIAL NO .....

ENGINE TYPE NO .....

HYDRAULIC TRANSM. TYPE/NO .....

MASTER KEY SWITCH NO .....

CAB KEY NO ..... FUEL FILLER CAP KEY NO. .....

11/01

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MACHINE SPECIFICATIONS
Put the machine in the **SERVICE POSITION**

RECOMMENDED LUBRICANTS (continued)

Note 1: ***For ambient temperatures below -18° C (0° F), oil viscosity should not exceed 5000 cSt (2,250 SUS) at start up. Higher viscosities may cause pump damage from cavitation and/or insufficient bearing lubrication. Optimum viscosity at system operating temperature is 16-40 cSt (80-180 SUS).***

Note 2: ***Select an Allison C-4 fluid that is not a qualified Dexron II ® or Dexron III ® automotive transmission fluid.***

Note 3: ***Can substitue CAT TO2 qualified oil. DO NOT USE CAT TO4 qualified oil***

When start- up conditions are colder than specified in the chart, an anti-wear hydraulic oil with Viscosity Index (VI) improvers or a synthesized hydrocarbon oil should be used to obtain the desired viscosities. During start up, when the oil is at atmospheric temperature, the viscosity should not exceed 4,600 SUS or 1,000 centistrokes (mm 2/s). Higher viscosities may cause pump damage from cavitation and/or incomplete bearing lubrication. At the same time the viscosity should be maintained between 80-280 SUS of 16 to 60 cST when the system has reached its operating temperature. Consult your local lubrication specialist to obtain an oil to meet these requirements. If a suitable oil cannot be identified, consult the factory for a preheating system.

Fuel Specifications

Number 2 Diesel Fuel
Grade C for ambient temperature above -18° C (0° F)
Grade B for ambient temperature below -18° C (0° F)

Capacities

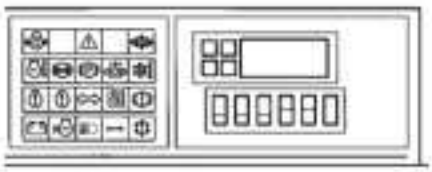
	Liters	Gallons
Engine Crankcase with Filters	143	38
Cooling System	276	73
Fuel Tank	1003	265
Torque Converter and Transmission	99	26
Differential	148	39
Planetaries (per side)	87	23
Front Wheel Bearings (per side)	7.6	2
Steer System Capacity	189	50
Steering Tank	117	31
Windshield Washer Fluid	7.6	2
Hydraulic System Capacity	473	125
Hydraulic Tank	318	84
Front Ride Strut (both struts)	26.5	7
Rear Ride Strut (both struts)	30.3	8

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CONTRONIC TROUBLESHOOTING GUIDE

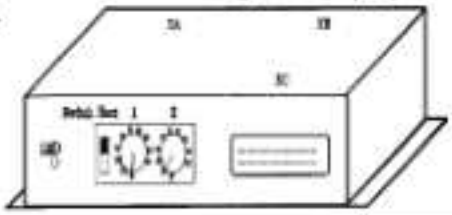
DESCRIPTION

This Contronic troubleshooting guide contains the various fault codes displayed on the Contronic screen and the steps needed to effectively troubleshoot each area.



SETUP/CALIBRATION

The ECU must be configured for the correct Hauler model by changing the switch positions on the side of the ECU as shown. A small cover hides two switches. To check or correct the setup, remove the small cover. Each switch has 10 positions. Note that for all other settings, the display will read "R??".

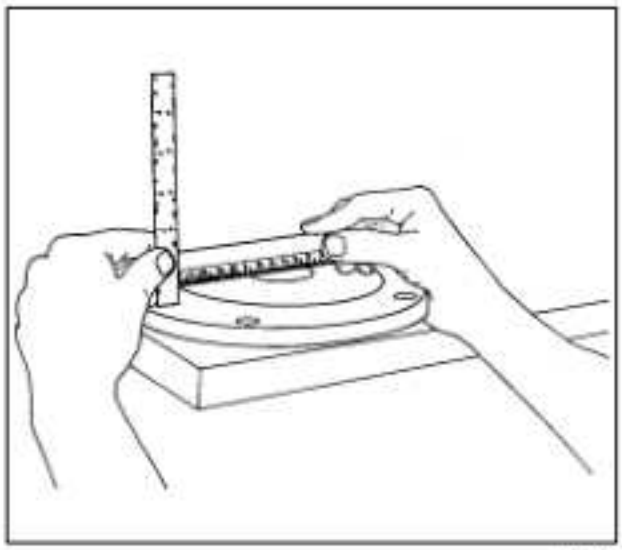


Contronic ECU Switch Settings

Model	Electronic Engine	Switch #1	Switch #2	Tire	Differential/ Planetary	Link
EH1000	-	0	1	21	3.73/5.80	CEC
EH1000	-	0	2	21	3.15/5.80	CEC
EH1000	-	0	3	24	3.73/5.80	CEC
EH1000	-	0	4	24	3.15/5.80	CEC
EH1100	-	0	5	24	3.73/5.80	CEC
EH1100	-	0	6	24	3.15/5.80	CEC
EH1000	Yes	0	7	21	3.73/5.80	CEC
EH1000	Yes	0	8	21	3.15/5.80	CEC
EH1000	Yes	0	9	24	3.73/5.80	CEC
EH1000	Yes	1	0	24	3.15/5.80	CEC
EH700	Yes	1	1	18	3.13/5.25	CEC
EH700	Yes	1	2	18	2.81/5.25	CEC
EH1600	-	1	3	27	3.73/6.63	CEC
EH1600	-	1	4	27	3.15/6.63	CEC
EH1600T	-	1	5	27	3.73/6.63	CEC
EH1600T	-	1	6	27	3.15/6.63	CEC
EH700	Yes	1	7	18	3.13/6	CEC
EH700	Yes	1	8	18	2.81/6	CEC
EH4000	Yes	1	9	40	31.88	G.E.
EH2000	-	2	0	33	1.56/21.44	CEC
EH2500	Yes	2	1	33	28.8	G.E.
EH3000	Yes	2	2	36	28.8	G.E.
EH3000	Yes	2	3	36	26.1	G.E.
EH3000	Yes	2	4	36	34.1	G.E.
EH3500	Yes	2	5	36	26.8	G.E.
EH3500	Yes	2	6	37	26.8	G.E.
EH4500	Yes	2	7	44	31.88	SIE
EH1100	Yes	2	8	24	3.73/5.80	CEC
EH1100	Yes	2	9	24	3.15/5.80	CEC
EH1600	No	3	0	27	3.15/8.00	CEC
EH1600	No	3	1	27	2.86/8.00	CEC
EH1600	No	3	2	31	3.15/8.00	CEC
EH1600	No	3	3	31	2.86/8.00	CEC
EH1700	Yes	3	4	27	3.15/8.00	CEC
EH1700	Yes	3	5	27	2.86/8.00	CEC
EH1700	Yes	3	6	31	3.15/8.00	CEC
EH1700	Yes	3	7	31	2.86/8.00	CEC

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lower edge of the straight edge to the inner surface of the flange cover. Subtract 0.794 mm (0.031 in.), the thickness of the cover gasket. **This will give Dimension 2**.



L3777

Figure 6 - Measuring Dimension 2

4. Subtract Dimension 2 from Dimension 1. The resulting dimension is the actual axle shaft end play and should be between 3.38 and 7.26mm (.133 and .286 in.). If the calculated dimension is less than 3.38mm (.133 in), check for obstructions within the axle assembly which would prevent the axle components from mating properly. If the measured dimension is greater than 7.26 mm (.286 in.), check for worn or broken axle assembly components. Replace any worn, damaged or broken parts.

5. Install flange cover (10) and gasket (7), and secure with cover bolts (6).

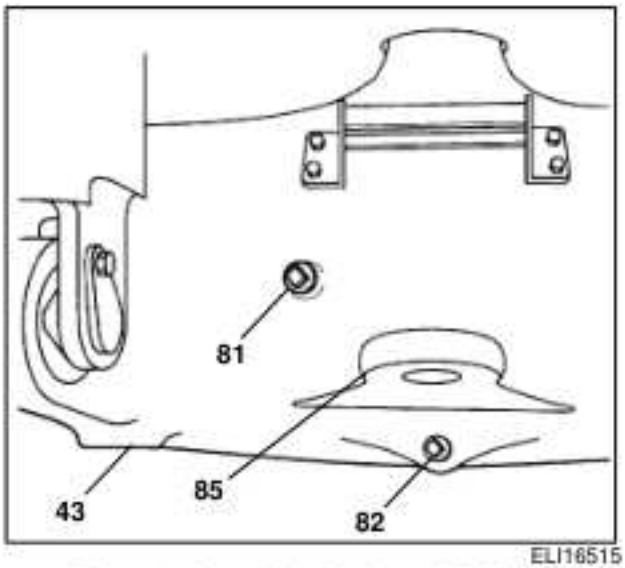
REMOVAL OF THE REAR AXLE (A lifting device capable of lifting 9 TONNES [10 tons] is required to perform this procedure.

Numbers in parentheses refer to Figure 9.

WARNING!

The components which make up the rear axle and suspension are heavy; use care when disassembling or removing these components. Misuse of lifting equipment or improper support of components may result in possible injury or damage.

1. With the machine in the **SERVICE POSITION**, Refer to Group 091, **SERVICE POSITION/ SAFETY INSTRUCTIONS**, Drain the differential by removing drain plug (82) located at the bottom of axle housing (43). See Figure 7. Remove the rear axle shafts. Refer to **REMOVAL OF AXLE SHAFT** in this Section.



ELI16515

Figure 7 - Rear Axle Drain and Fill Plugs

43. Axle Housing
81. Fill & Level Plug
82. Drain Plug
85. Body Prop Cable Lug

2. Disconnect the rear driveshaft from the differential. Refer to Group 451 **REAR DRIVESHAFT** in this manual.

3. Disconnect and remove the differential breather hose assembly (65) from elbow (70) at the rear of axle housing (43).

4. Using the required equipment, jack up the rear of the machine until the tires clear the ground. Remove the tire and rim assemblies. Refer to Group 722 **TIRES/RIMS/INFLATION**.

5. Remove the rear axle planetary assemblies. Refer to Group 466, **REAR AXLE PLANETARY**.

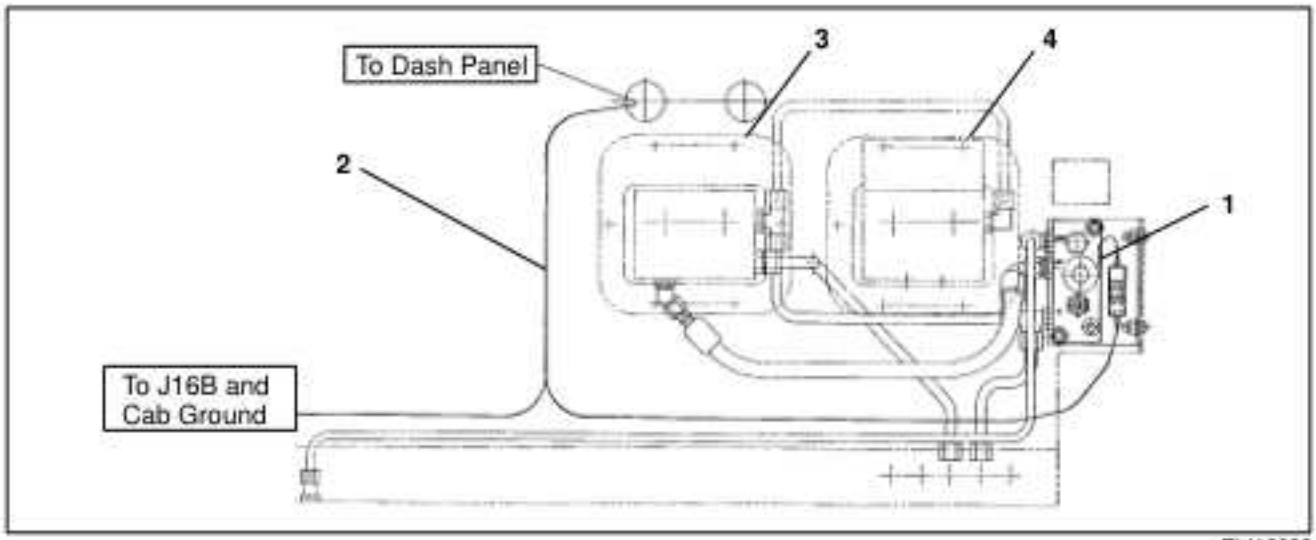
6. With the rear axle housing (43) well supported, remove the rear wheels. Refer to Group 711, **REAR WHEELS**.

7. Remove the rear brakes. Refer to Group 510, **REAR BRAKES - WET DISC**.

8. Position dollies under the rear axle assembly, and lower the machine so that the axle assembly is resting on them. Block the rear axle housing on the dollies so that it cannot rotate when the rear suspension is disconnected.

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HYDRAULIC BRAKE SYSTEM



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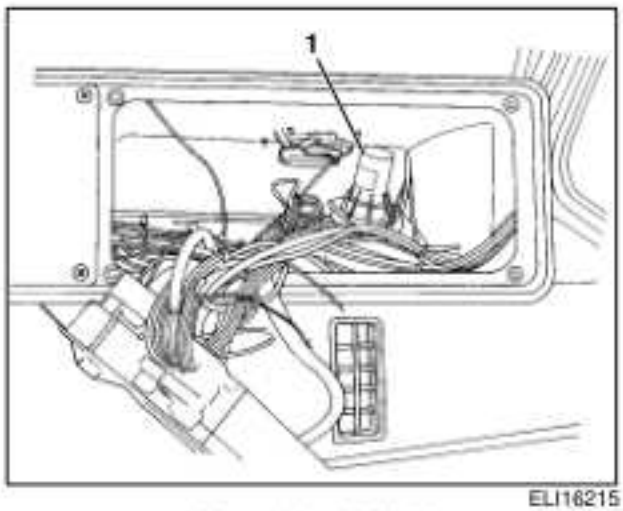
Figure 9 - Front Brake Cut-off Installation

1. Front Brake Cut-Off Valve
2. Wire Harness
3. Brake Control Valve (Reference)
4. Retarder Control Valve (Reference)

IGNITION KEY "OFF"

If the Ignition Key is turned to the OFF position, or if the engine has quit running, or if the source of oil is lost for any reason, the brake accumulators will maintain a volume of oil under pressure for some time. This volume of oil will diminish slowly through internal leakage in the brake system and diminish quickly if the service brakes are used during this time. When the accumulator supply oil pressure diminishes to 9653 to 0 kPa (1400 to 0 PSI), the circuit will be in the same phase it would be in during **SYSTEM CHARGING Supply Pressure 0 to 9653 kPa (0 to 1400 PSI)**.

Hill Hold Brake (Optional)



ELI16215

Figure 10 - Hill Hold

A level switch (1, Figure 21), located in the dash behind the Contronic Display, and connected to the electrical system, see the electrical schematic for "Hill Hold Option" in the **ELECTRICAL SYSTEM, Group 300** in this manual, adds this option to the machine.

The Contronic computer energizes the load/dump solenoid in response to specific machine conditions to prevent roll back on steep grades. Roll back may occur when the operator moves his foot from the brake pedal to the accelerator pedal on steep grades.

The system apply logic is:

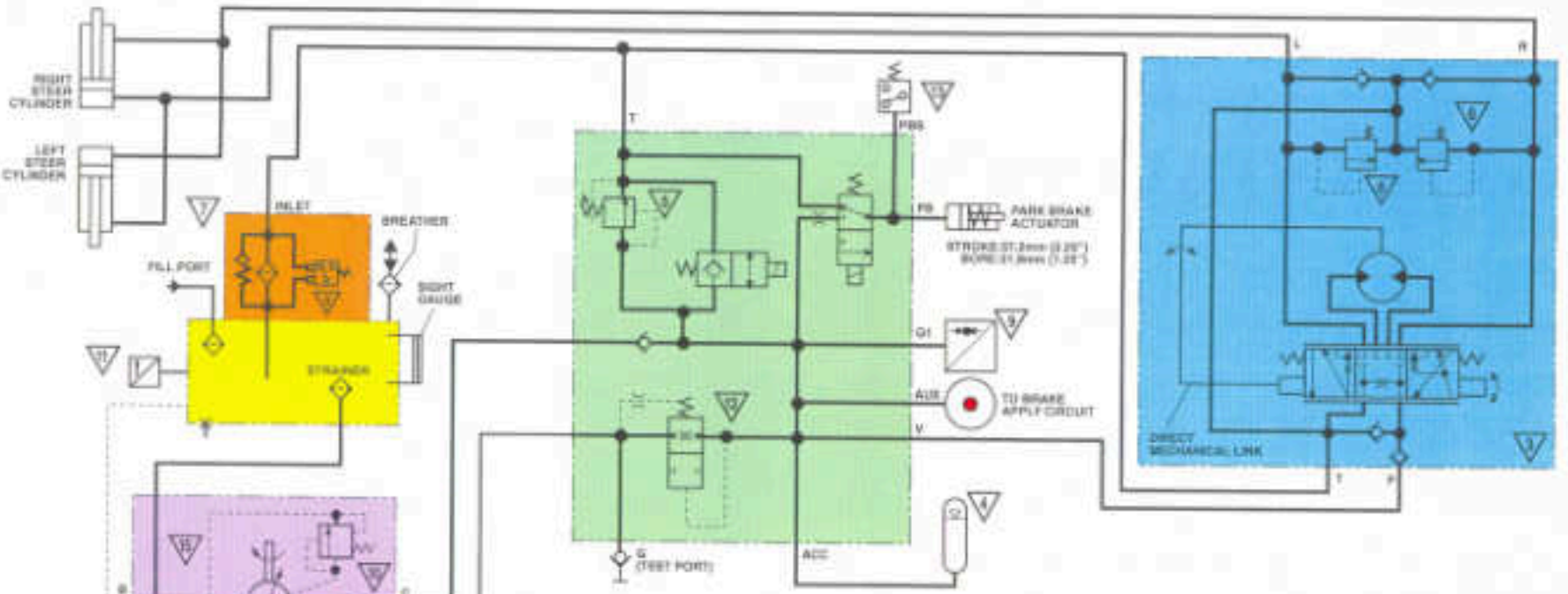
- The machine must be climbing a grade steeper than 10%.
- The brake pedal or retarder pedal must be applied.
- The machine speed must be less than 2.25 km/h (1.4 mph).

The system release logic is:

- The transmission shift lever is placed in reverse or, the brake or the retarder pedal is released and the engine speed is greater than 1200 RPM.

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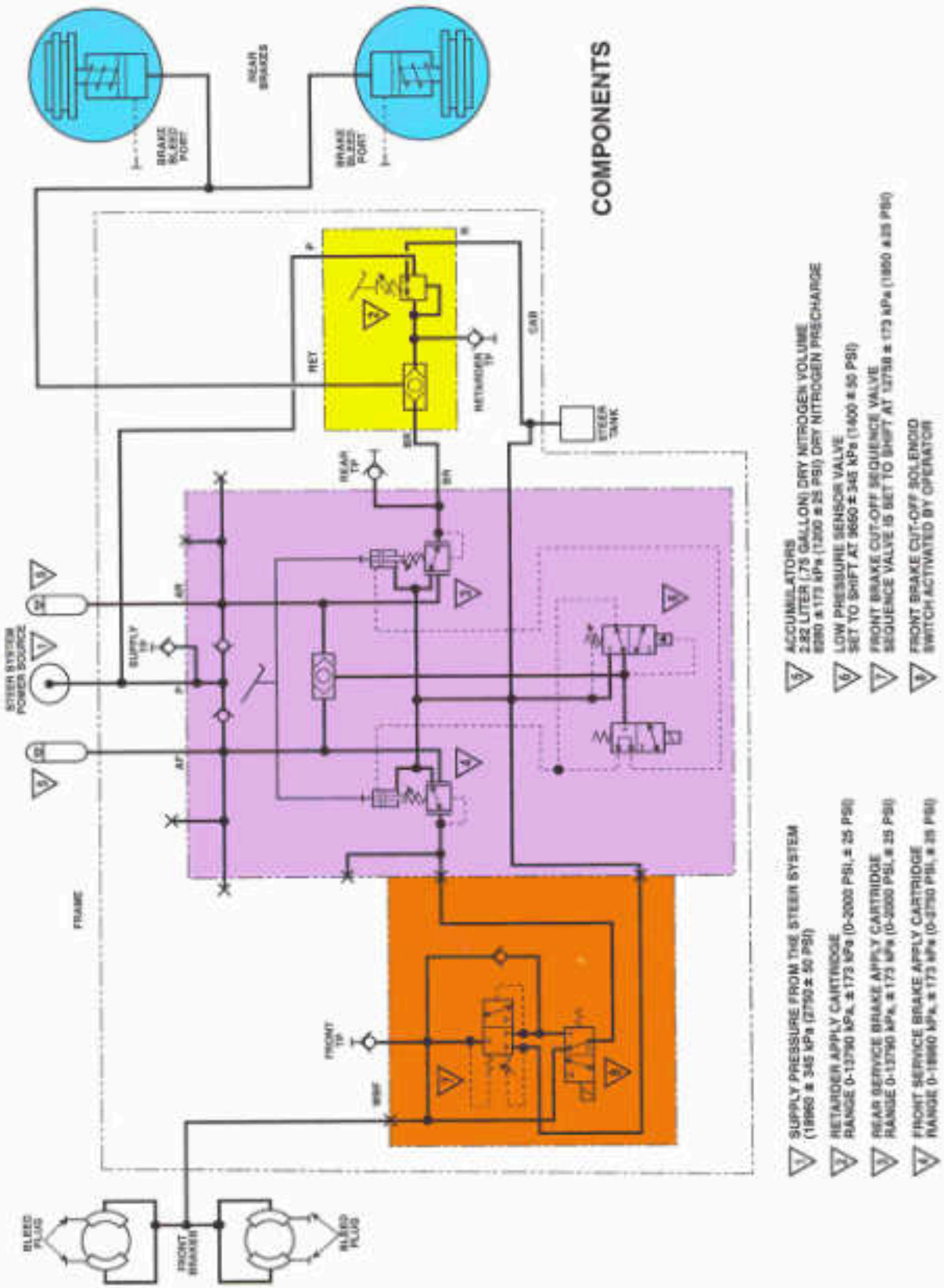
EH1600/1700 STEERING SYSTEM

COMPONENTS
(ENGINE NOT RUNNING)

1. PUMP SETTINGS
   UNLOADING PRESSURE 18960 ± 350 kPa (2750 ± 50 PSI)
   RESET PRESSURE NOMINAL 16550 ± 350 kPa (2400 ± 50 PSI)
2. PUMP STANDBY PRESSURE
   1931 ± 172kPa (280 ± 25 PSI)
3. STEER VALVE
   CLOSED CENTER NEUTRAL THERMAL BLEED
   DISPLACEMENT .98 L/REV (60 CIR) Q-AMP
4. ACCUMULATOR
   37.9 LITER (10.0 GAL) DRY NITROGEN VOLUME
   6900 ± 173 kPa (1000 ± 25 PSI) DRY NITROGEN PRECHARGE
5. SAFETY RELIEF CARTRIDGE
   22070 ± 173 kPa (3200 ± 25 PSI)
6. CROSSOVER RELIEF VALVE SETTING
   21528 ± 483 kPa (3120 ± 70 PSI)
7. FILTER BYPASS VALVE
   SET TO OPEN AT 345 ± 35 kPa (50 ± 5 PSI)
8. FILTER RESTRICTION SWITCH - N/C
   CONTACTS SET TO OPEN AT A PRESSURE DIFFERENCE OF
   242 ± 28 kPa (35 ± 5 PSI)
9. PRESSURE TRANSDUCER FOR CONTRONIC
   A.STEER WARNING INDICATION @ 12410 ±350 kPa (1800 ± 50 PSI)
   B.BRAKE WARNING INDICATION @ 11375 ± 350 kPa (1650 ± 50 PSI)
10. CASE DRAIN RELIEF: 173 kPa (25 PSI) MAX. ABOVE INLET
11. RESISTIVE TEMPERATURE DEVICE FOR CONTRONIC
    WARNING INDICATION AT 93°C (200°F)
12. VELOCITY FUSE SET AT 20 L/MIN (5 GPM)
13. PARK BRAKE PRESSURE SWITCH FOR CONTRONIC - N/C
    SET TO OPEN AT 14480 ±345 kPa (2100 ± 50 PSI)
    INCREASING PRESSURE
14. PUMP MOUNTED PRESSURE LIMITER
    SET AT 24021 kPa (3600 PSI)
15. PISTON PUMP DISPLACEMENT
    .0737 L/REV (4.5 CIR)

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EH1600/1700 BRAKE SYSTEM



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DRG. NO. 12625122

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ITEM	VEHICLE LOCATION	SCHEM POS
POWER		
30	24VDC SUPPLY	
15	IGN SW ACTIVATED 24VDC SUPPLY	
14	12VDC SUPPLY	
12	IGN SW ACTIVATED 12VDC SUPPLY	
GROUND		
31	CIRCUIT BOARD	
31BA	BATTERY	
31BE	BAT EQUALIZER	
31C	CAB	
31CF	CAB FRONT (DASH)	
31CR	CAB REAR	
31D	CIRCUIT BOARD	
31EA	CIRCUIT BOARD	
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13	6:6/22:10/23:4
14	2:1/22:5
15	2:1/22:5
16	5:6/14:6
17	2:3/20:8
18	20:7/23:1

12625122P06-SH1

ISS.	LOC.	DESCRIPTION	TRANS.	DATE	BY	CHK.	M
08		SEE SH 13	02344-003	02-10-18	EJK		
05	-	REVISED FOR ATC/EDSC OPTION	99249-25	01-09-28	SRW		M
04	B2	ADDED LEADERS 17 & 18					
	C7	ADDED ETHER START SOLENOID (OPT)					
04	F10	ADDED ETHER START (OPT) CAB REAR	00513-04	01-02-19	WCN		
03	E3	REVISED L & R HEADLAMP SCHEM POS	00091-05	00-10-20	WCN		
02	-	UPDATED REVISION LEVEL ONLY	00153-12	00-10-11	WCN		
01	-	PRODUCTION RELEASE	00153-09	00-06-12	WCN		

REQ'D	PART NO.	NAME	MASS	ITEM

METHOD A
DIM. ARE
UNITS ARE

NEXT ASSY.
SIMILAR TO 12619150
MATERIAL EEMS 18101
PROCESS EEPS 123

DRN. W. NOBLE DATE 00-06-12
CHECK DATE
FIRST MODEL R40-R130
MASS LBS 0
SCALE

EUCLID-HITACHI HEAVY EQUIPMENT, INC.
NAME SCHEMATIC ELECTRICAL
FUNCT. GROUP 0924
E.A.S.
STD.
SHT 1 OF 14
DRG. NO. 12625122
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FORMAT C

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