CEBM012601

Shop Manual

HD1500-5

DUMP TRUCK

SERIAL NUMBERS **A30070, A30071, A30077**

KOMATSU®

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ATC FAULT CODE TROUBLESHOOTING

b001 : BATTERY VOLTAGE LOW

Check whether the voltage level between the starter switch "BR" terminal and chassis is 20 V or more.

Yes. Check harness.

No. Check alternator.

b002 : SOLENOID VOLTAGE FAILURE

Turn key on and check whether voltage level between ATC2, P-12 and ATC2, P-21 is between 20 and 30 V.

Yes.Turn key off, return to the first step, and check again. If the result is the same as before, change T/M controller.

No. Check harness.

b003 : NEUTRAL SAFETY ON

Check whether shift lever position is Neutral.

Yes. Turn key on check whether voltage level between ATC5B, P-3 and chassis is 1 V or less.

Yes. Change T/M controller.

No. Check harness.

No. Change shift lever to Neutral position.

b005 : CLUTCH ENGAGED DOUBLE

Check whether T/M controller also still detects b03x (x = 1 through 9).

Yes. Carry out the b03x troubleshooting.

No. Change T/M controller.

b006 : T/M CUT RELAY FAILURE

Turn key off and replace the T/M cut relay.

Check whether T/M controller still detects b006.

Yes. Turn key off and disconnect ATC1 and ATC2A from T/M controller.Check whether the resistance between ATC1, P-9 and ATC2, P-1, and ATC1, P-9 and ATC2, P-12 is between 100 and 500W.

Yes. Change T/M controller.

No. Check harness.

No. The fault is recovered.

b007 : BATTERY VOLTAGE LOW (12 V)

Turn key off and disconnect ATC2 from T/M controller.Check whether the resistance between ATC2, P-14 (harness side) and chassis is 1 Megohm or more.

Yes. Connect ATC2, and turn key on. Check whether T/M controller still detects b007.

Yes. Turn key off, return to the first step, and check again. If the result is the same as before, change T/M controller.

No. The fault is recovered.

No. Disconnect connector at transmission range selector lever. Check whether resistance above returns to normal.

Yes. Change transmission range selector.

No. Check harness.

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RCM HARNESS CIRCUITS CONNECTOR RCM2		
Pin No.	Function	Type
1	Reserved	
2	Reserved	
3	RS422 transmit (+)	Serial output
4	RS422 transmit (-)	Serial input
5	Reserved	
6	Throttle modification	PWM output
7	Reserved	
8	Reserved	
9	Reserved	
10	RS422 receive (+)	Serial input
11	Shield	Ground
12	RS422 transmit (-)	Serial output
13	Reserved	
14	Reserved	
15	Reserved	
16	Shield	Ground
17	Reserved	
18	Reserved	

RCM HARNESS CIRCUITS CONNECTOR RCM3		
Pin No.	Function	Type
1	Emergency brake sense	Digital input
2	Emergency/auto apply sense	
3	Reserved	
4	Reserved	
5	Auto retard command	PWM input
6	Reserved	
7	RR brake pressure sense	Analog input
8	LR brake pressure sense	Analog input
9	Ret. lever pot. (high end)	
10	Reserved	
11	Reserved	
12	Reserved	
13	Brake pedal sense	Analog input
14	Slippery road sense	Digital output
15	Reserved	
16	Shield	Ground
17	Ground	Ground
18	Alternator R terminal	Analog input
19	Reserved	
20	+18 volt sensor power supply	DC voltage output
21	+18 volt sensor power supply	DC voltage output
22	Ret. lever pot. (low end)	
23	Reserved	
24	Reserved	
25	Brake accumulator pressure	Digital input
26	Brake lock sense	Digital input
27	Backplane +24 volt supply	DC voltage input
28	Reserved	
29	Traction control	Digital input
30	Reserved	
31	Brake diff. pressure sense	Digital input
32	Shield	Ground
33	Shield	Ground
34	Ret. lever potentiometer wiper	
35	Shield	Ground
36	Reserved	

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5. Install a lifting sling through the door and attach it to a hoist. The weight of each door is approximately 68 kg (150 lb). Remove the cap screws securing the door hinge to the cab. Lift the door from the cab.
6. Place the door on blocks or on a work bench.

Installation

1. Attach a lifting sling and a hoist to the door. The weight of each door is approximately 68 kg (150 lb). Lift the door into position on the cab.
2. Align the door hinges with the cab and install the hinge cap screws.
3. Attach the travel limiting strap with bolt (2, Figure 2-11) and secure with retainer clip (1).
4. Connect window motor harness (4) to the connector in the cab floor.
5. Verify proper operation of the power window and the door latch adjustment.

Door Striker Adjustment

Door seals keep air, dust and moisture from entering around the door openings. Over time, the door latch mechanism and the door seals may wear and allow dirt and moisture to enter the cab. To ensure proper sealing of the door seals, the door striker may need to be adjusted periodically.

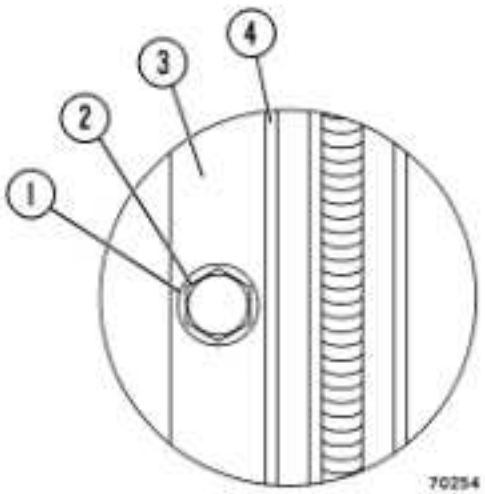


FIGURE 2-8. DOOR STRIKER ADJUSTMENT

1. Washer
2. Striker Bolt
3. Frame
4. Seal

- If the door closes, but does not provide a good seal:

1. Mark the location of washer (1, Figure 2-8) with a marker by circumscribing the outside edge of the washer onto the jamb.
2. Loosen striker bolt (2). Move the striker inwards approximately 2 mm (0.078 in.) and tighten.
3. Hold a piece of paper between the door and the door seal. Close the door and verify that it is completely closed and latched.
4. The door seal should firmly grip the paper all along the top, front, and bottom edge of the door. If the paper is loose all around, adjust the striker, again. If the paper is firmly gripped, but can be removed without tearing, open the door. Tighten the striker bolt completely without changing the adjustment and recheck.

   If the paper is tight near the top and loose at the bottom then seal compression is not even. The door must be adjusted as follows: Place a small block of wood at the top corner of the cab door above the door handle. Then press firmly inward on the lower corner of the door. Press in one or two times, then remove the wood block and check seal compression, again. Seal compression should be equal all the way around the door. If the seal is still loose at the bottom, repeat the procedure again until seal compression is equal all the way around.

   If the paper is tight near the bottom and loose at the top then seal compression is not even. The door must be adjusted as follows: Place a small block of wood at the bottom corner of the cab door below the handle. Then press firmly inward on the top corner of the door. Press in one or two times, then remove the wood block and check seal compression, again. Seal compression should be equal all the way around the door. If the seal is still loose at the top, repeat the procedure again until seal compression is equal all the way around.

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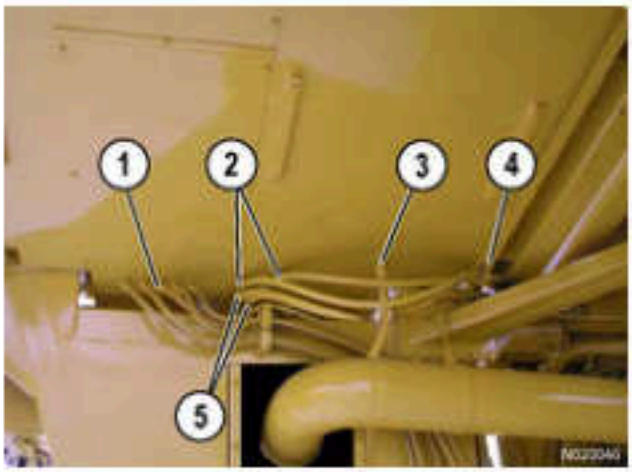


FIGURE 2-4. CAB HYDRAULIC AND HVAC

1. Hydraulic Hoses
2. Heater Hoses
3. HVAC Drain
4. Clamp
5. A/C Hoses

9. Disconnect two heater hoses (2, Figure 2-4) from the fittings underneath the cab. Remove clamp (4) securing the hoses to the bottom of the cab.
10. Disconnect five hydraulic hoses (1).
11. Disconnect two air conditioner hoses (5).
12. Cap all hoses and fittings to prevent contamination.

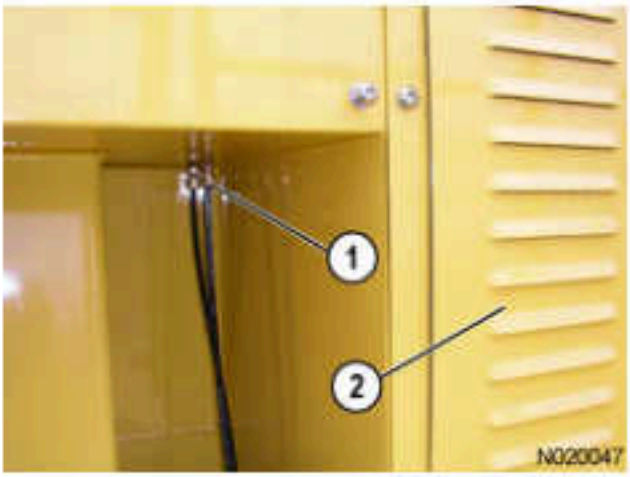


FIGURE 2-5. VACUUM HOSES

1. Vacuum Hoses
2. Filter Cover

13. Remove the access cover from the exterior of the RH side of the cab. Disconnect two vacuum hoses (1, Figure 2-5) from the front of the cab.

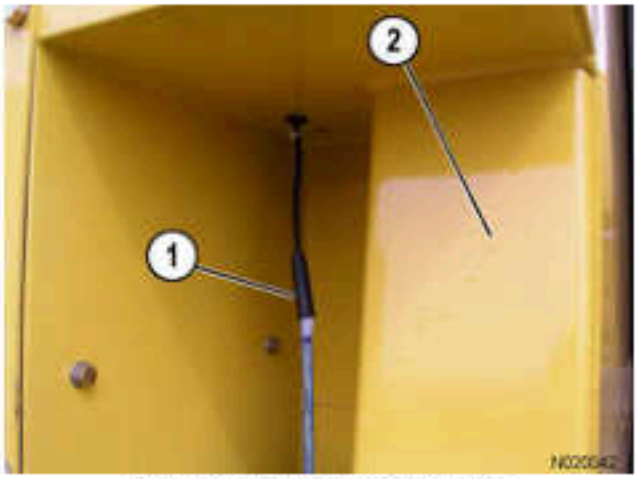


FIGURE 2-6. RADIO ANTENNA

1. Radio Antenna
2. LH Front ROPS Beam

14. Remove the access cover from the exterior of the LH side of the cab. Disconnect radio antenna (1, Figure 2-6).

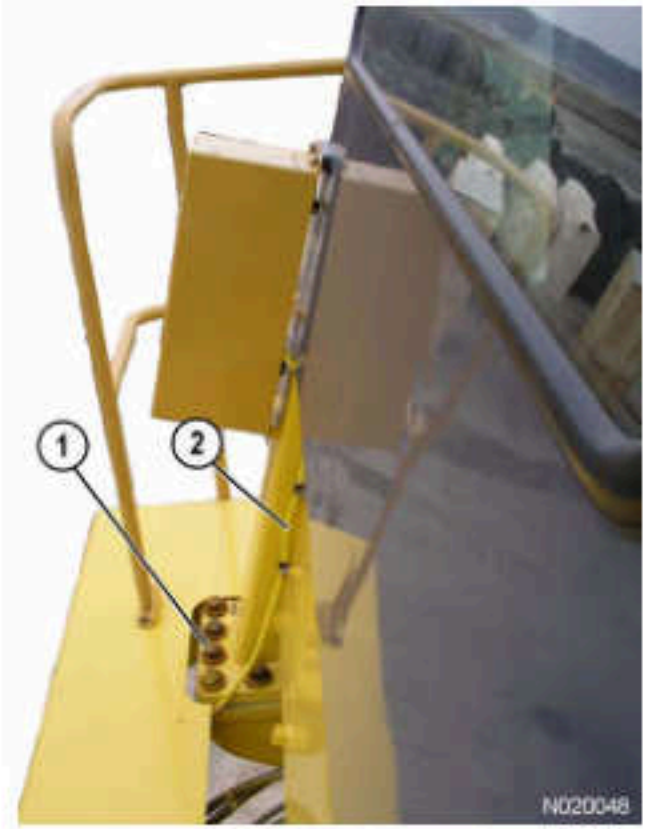


FIGURE 2-7. CAB MOUNT

1. Cap Screw
2. Harness

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Formulas -

Top View: (A + B) / 2 = 3 mm max.

Side View: (C - D) / 2 = 3 mm max.

Example -

Measurements: A = 3 mm B = 7 mm

C = 20 mm D = 6 mm

Top view formula: (3 + 7) / 2 = 5 mm

The quotient of 5 mm in this example is 2 mm over the allowable maximum of 3 mm. Loosen the cap screws at the front transmission mounts and remove the locking plates. Use a hoist to move the transmission 2 to 5 mm towards the center of the truck. Moving the transmission 2 to 5 mm would result in a quotient of 3 mm or less, meeting the specification.

NOTE: Keep the shafts parallel when adjusting the position of the transmission.

Side view formula: (20 - 6) / 2 = 7 mm

The quotient of 7 mm in this example is 4 mm over the allowable maximum of 3 mm. Use a hoist to lift the transmission enough to install shims (2, Figure 5-8) below mounting pins (1). A general guideline to follow is to divide the difference by two. This is the number of shims to install. Since the difference in this example is 4 mm, install two shims at each front mount.

NOTE: DO NOT install additional shims at the rear mounts. Adjust the transmission height by shimming the front mounts, only.

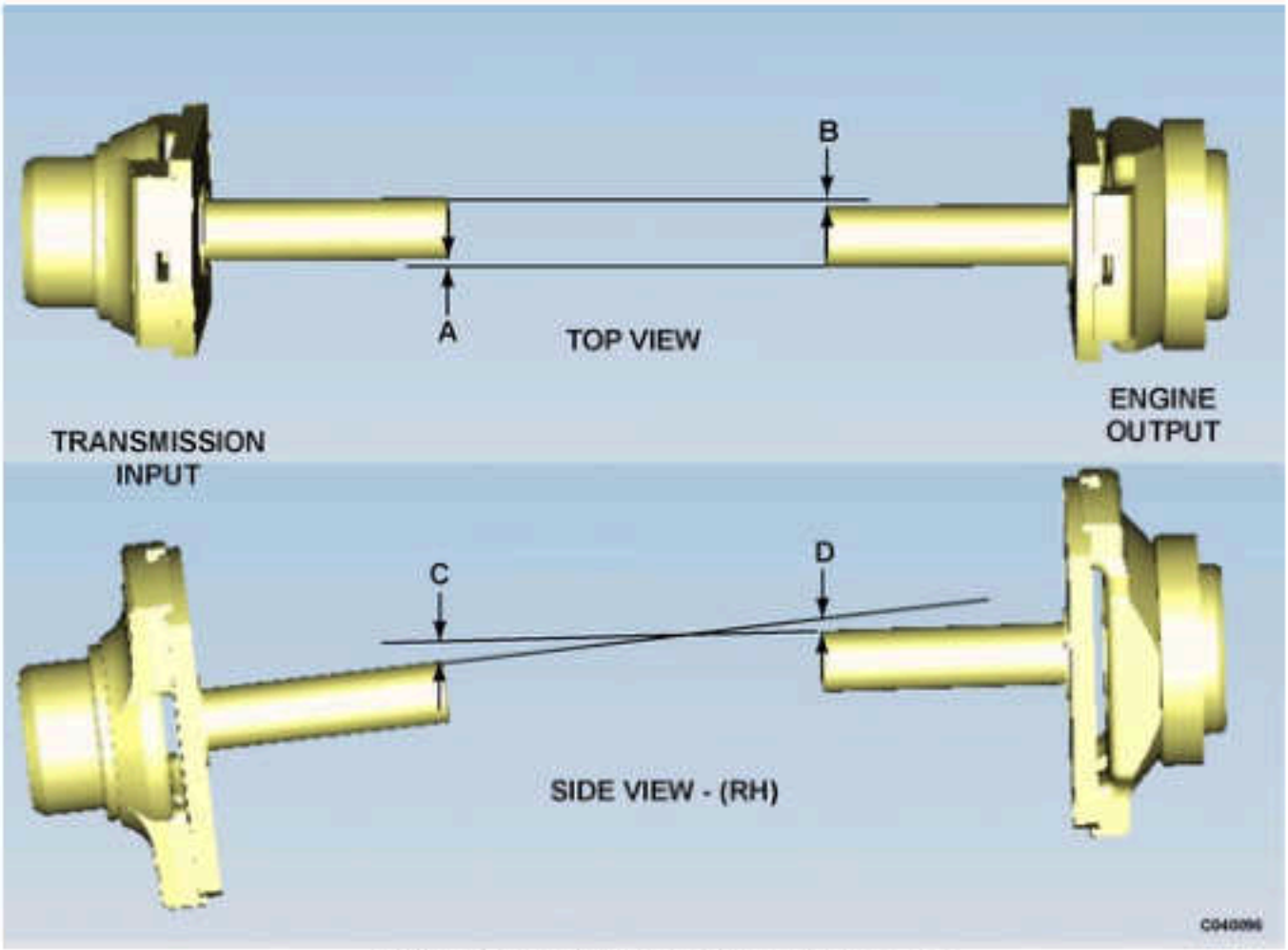


FIGURE 5-7. MEASURING DRIVE LINE ANGLES

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CKT#	DESCRIPTION	SHT/ZONE
0	CHASSIS GROUND	2-A4, 2-B7, 2-C6 3-A6, 4-A6, 6-A7, 7-A4, 8-A4 9-A4, 10-A4, 12-A4 13-A4, 14-A4, 15-A7 16-A6, 17-A5, 18-A5 18-D2, 19-A2, 20-B7, 21-A3, 22-A2
1	BATTERY DIRECT POWER (+24V)	1-A1, 5-A5, 9-A5 10-A1, 12-A5, 16-A1 20-B6, 21-A1
2	BATTERY DIRECT POWER (+12V)	1-A2, 20-B6, 21-A2
3	CONTROL POWER (+24V)	2-B3
4	CONTROL POWER (+12V)	2-B3
11	BATT. DISCONNECT POWER (+24V)	2-A5, 13-A2, 15-A1 16-A1, 17-A1
11CL	RELAY BOARD 1	16-B5
11D	LIGHT CONTROL POWER	15-B2
11DL	RELAY BOARD 5	15-A5
11DR	RELAY BOARD 5	15-B5
11F	RELAY BOARD 1	16-B5
11H	HORN SIGNAL	17-B2
11HL	RELAY BOARD 5	15-B5
11HR	RELAY BOARD 5	15-C5
11PF	PRE-LUBE PUMP PWR SUPPLY	2-B5
11PS	PRE-LUBE	2-B5
11S	SAFETY SWITCH "ON"	2-B2
11T	RELAY BOARD 1	16-A4
11Z	RELAY BOARD 1	16-C4
12	CONTROL POWER (+24V)	2-D5, 5-A5, 6-A4, 9-A5, 10-A1, 11-A6, 13-A2, 14-A1, 17-A1, 18-A1, 19-A4
12H	HOIST LIMIT PROX. SW.	10-D1
12PC	SERVICE TOOL COM PORT (2VDC	11-D7
12V	CONTROL POWER (+12V)	2-C4, 19-A1
13	KEYSWITCH "ON" (ACC)	2-C1 , 3-D4, 4-C4
13A	SWITCHED BATT POWER (+24V)	14-A1
14R	ALTERNATOR "R" SIGNAL	2-C6, 4-A7, 14-C3
14R1	ALTERNATOR "R" OUTPUT	2-C6
15	KEYSWITCH "ON" (BR)	2-B3
201	VB	4-A3
202	TX OUT	4-A3
203	TX IN	4-A3
204	SCK	4-A3
205	LOAD	4-A3
206	COMMON	4-A3
207	RESET	4-A3
21	KEYSWITCH "START" (C)	2-C2
21PS	START SIGNAL (AFTER PRE-LUBE)	2-B6
21PSW	ENGINE OIL PRESS SW.	2-A5
21PT	PRE-LUBE TIMER START	2-C3
21S	KEYSWITCH "START"	2-C2
22C	FAN CLUTCH CNTRL INPUT (7 2	18-C6
22DI	FAN CLUTCH GND FULL ON	18-C7
24DI	ALTERNATE DROOP	8-A6
24EI	ALTERNATE TORQUE	8-A6
24F1	1ST GEAR RANGE FILL SIGNAL	6-D2
24F2	2ND GEAR RANGE FILL SIGNAL	6-D2
24F3	3RD GEAR RANGE FILL SIGNAL	6-D2
24FH	HIGH GEAR RANGE FILL SIGNAL	6-C2
24FL	LOW GEAR RANGE FILL SIGNAL	6-D2
24FLU	L/C FILL SIGNAL	6-C2
24FM	MEDIUM GEAR RANGE FILL SIG.	6-C2
24FR	REVERSE GEAR RANGE FILL SIG.	6-D2
24GI	+5VDC SUPPLY	8-D2
25	BATTERY DIRECT POWER SUPPLY	5-A7
25A	PRE-LUBE STARTER START SIG.	2-B6
25B	STARTER START SIGNAL	2-B6
25CI	CONTROL POWER SUPPLY (+24V)	5-A7
25C2	CONTROL POWER SUPPLY (+24V)	5-A7
25D	DRIVE SIGNAL (-)	6-C5
25FI	F1 START SELECT SW. TOP LT.	7-C2
25F2	F1 START SELECT SW BOTTOM LT.	7-D2
25HI	HIGHEST GEAR SELECT SIG. #1	7-A3
25H2	HIGHEST GEAR SELECT SIG. #2	7-A3
25L	LOW GEAR RANGE (-)	6-C5
25L2	SHIFT LIMIT SW. BOTTOM LT.	7-D3
25L3	SHIFT LIMIT SW. TOP LT.	7-D3
25LH	LIMP HOME JUMPER	7-B2
25LMT	SHIFT LIMIT SIGNAL	7-D2
25N	NEUTRAL SIGNAL (-)	2-C3, 6-B7, 14-A3
25NI	NEUTRAL SIGNAL (-)	14-B2
25P	SOLENOID POWER SUPPLY (+24V)	5-B7
25R	REVERSE SIGNAL (-)	6-A5
25SP	SHIFTER SENSOR POWER (+12V)	6-B5
25T	T/M CUT SOLENOID RELAY SIG.	3-A4, 5-B5, 7-A3, 14-B1
25TC	T/M SOLENOID CUT SIGNAL	5-B7
25T2	MODE CHANGE #1 SW. TOP LT.	3-B6
25T3	MODE CHANGE #1 SW. BOTTOM LT.	3-C6
25T4	MODE CHANGE #2 SW. TOP LT.	3-C7
25T5	MODE CHANGE #2 SW. BOTTOM LT.	3-C7
25W	SHIFT WAIT SIGNAL	6-D7
253	3RD GEAR RANGE SIGNAL (-)	6-C5
254	4th GEAR RANGE SIGNAL (-)	6-C5
255	5th GEAR RANGE SIGNAL (-)	6-C5
27B	BATT DIRECT PWR SUPPLY (+24V)	9-C6
28AI	ETHER START CONTROL	2-A5
30	T/M CONTROLLER GROUND - ATC	2-D5, 5-A7 14-B3, 9-A6 4-C7, 11-B-2
31	WARNING LT & BUZZ PWR (+24V)	3-A1, 4-D4
31B	DIMMER POWER CIRCUIT	5-D5
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31F	FUEL LEVEL SIGNAL	7-B2
31M	THROTTLE MODIFICATION SIG.	8-B2
31S1	ENGINE SPEED SIGNAL	7-B5
31S2	ENGINE SPEED SIGNAL	7-B5
31SA	AUTOMATIC IDLE SELECT SIGNAL	3-A7
31SB	AUTO. IDLE SEL. SW. BOTTOM LT.	3-A6
31SC	AUTO. IDLE SEL. SW. TOP LT.	3-A6
31TRQ	TORQUE OUTPUT	8-C6
32L	T/M OIL LEVEL SIGNAL	7-A2
32P1	TORQUE CONVER INLET PRESS (+)	5-A4
32P2	TORQUE CONVER OUTLET PRESS (+)	5-A4
32S1	T/M INPUT SHAFT SPEED SIG (+)	7-A5
32S2	T/M OUTPUT SHAFT SPEED SIG (+)	7-B5
32S3	T/M MID-SHAFT SPEED SIG (+)	7-A5, 14-B3
32SP	SENSOR POWER (+24V)	5-A1
32T1	T/M LUBE INLET TEMP	5-C4
32T2	VALVE INLET OIL TEMP	5-C4
33AP1	BRAKE ACCUMULATOR PRESSURE	9-B2
33AP2	BRAKE ACCUMULATOR PRESSURE	9-B2
33AP3	BRAKE ACCUMULATOR PRESSURE	9-B3
33AP4	BRAKE ACCUMULATOR PRESSUR	9-B3
3361	SENSOR POWER (+18V)	12-D2
3362	LEFT REAR BRAKE PRESSURE	12-C2
3363	SENSOR POWER (+18V)	12-C2
3364	RIGHT REAR BRAKE PRESSURE	12-C2
33F	STEERING SYSTEM PRESSURE	9-B2
33G1	STEERING SYSTEM PRESSURE	9-C3
33LF	LEFT FRT BRAKE DISK WEAR SIG	10-A6
33LR	LEFT REAR BRAKE DISK WEAR SIG	10-A6
33RF	RT FRT BRAKE DISK WEAR SIG	10-A6
33RR	RT REAR BRAKE DISK WEAR SIG	10-A6
33T1	RETARDER COOL OIL TEMP-RIGHT	5-C4
33T2	RETARDER COOL OIL TEMP-LEFT	5-C4
33T3	TORQUE CONVERTER OIL TEMP	5-B4
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35C4	AUTO CRUISE ON/OFF	10-D2
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35E4	MAXIMUM SPEED SET EMPTY SIG	10-C2
35E5	MAXIMUM SPEED SET SIGNAL	10-C2
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35L3	PC INTERFACE	11-D2
35L4	PC INTERFACE	11-D2
35L5	USER SUPPLIED PC	11-A5
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35S2	RGT FRT WHEEL SPEED SIG	12-C7
35S3	RGT FRT WHEEL SPEED GROUND	12-C7
35S4	LFT FRT WHL SPEED +18V SUPPLY	12-C7
35S5	LFT FRT WHEEL SPEED SIG	12-C7
35S6	LFT FRT WHEEL SPEED GROUND	12-C7
35S7	RGT REAR WHL SPEED +18V SUPPLY	12-C7
35S8	RGT REAR WHEEL SPEED SIG	12-C7
35S9	RGT REAR WHEEL SPEED GROUND	12-C7
35S10	LFT REAR WHL SPEED +18V SUPPLY	12-D7
35S11	LFT REAR WHEEL SPEED SIG	12-D7
35S12	LFT REAR WHEEL SPEED GROUND	12-D7
35TM	THROTTLE MODIFICATION	8-B6
37F1	OIL FILTER RESTRICTION SIG	10-B6
37F2	OIL FILTER RESTRICTION SIG	10-B6
37F3	T/M OIL FILTER RESTRICT SIG	7-C2
37F4	OIL FILTER RESTRICTION SIG	10-B6
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