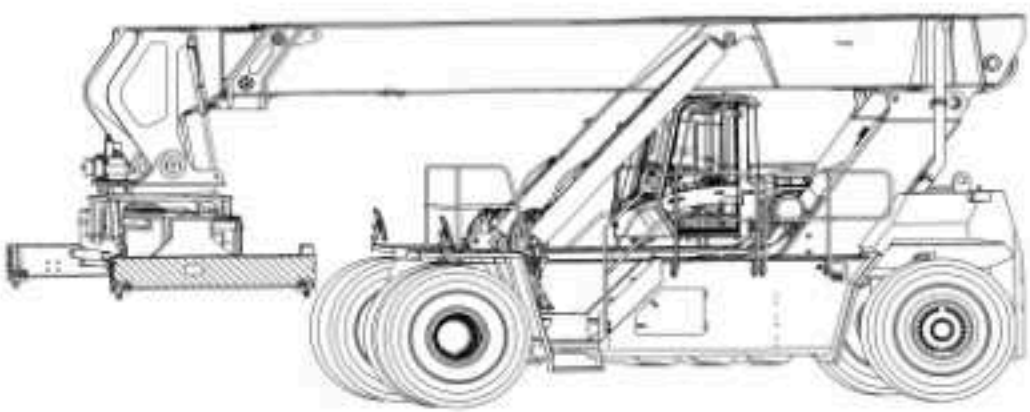
SERVICE MANUAL

B222 (HR45-27, HR45-31, HR45-36, HR45-40, HR45-41S, HR45-41L, HR45-41LS



Rev. 07/14

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TABLE OF CONTENTS

General 1
Description 1
Differential Repair 1
  Remove 1
    Differential Carrier From Axle Housing, Remove 1
    Differential and Ring Gear From Differential Carrier, Remove 5
    Drive Pinion and Pinion Carrier From Differential Carrier, Remove 7
  Disassemble 8
    Differential and Ring Gear Assembly, Disassemble 8
    Drive Pinion and Pinion Carrier, Disassemble 9
  Clean and Inspect 12
  Assemble 13
    Pinion, Bearings, and Pinion Carrier, Assemble 13
    Pinion Bearings, Adjust Preload 13
      Press Method 13
      Yoke or Flange Method 14
    Triple-Lip Seal, Install 15
    Pinion Carrier Shim Set, Adjust Thickness (Depth of Pinion) 16
    Differential and Ring Gear, Assemble 18
    Differential Gears Rotating Torque, Check 21
    Differential and Ring Gear Assembly, Install 21
    Differential Bearings, Preload Adjust 23
    Ring Gear, Runout Check 24
    Ring Gear Backlash, Adjust 24
    Gear Set, Tooth Contact Pattern Check 27
    Thrust Screw, Install and Adjust 30
  Install 30
    Differential Assembly Into Axle Housing, Install 30
Specifications 32
Troubleshooting 36

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Torque Specifications

TORQUE SPECIFICATIONS FOR LUBRICATED OR PLATED SCREW THREADS

Table 12. Grade 5

Nom. Size	Fine Thread	Coarse Thread
0.2500	12.2 to 14.9 N•m (9 to 11 lbf ft)	10.8 to 13.6 N•m (8 to 10 lbf ft)
0.3125	21.7 to 27.1 N•m (16 to 20 lbf ft)	16.3 to 21.7 N•m (12 to 16 lbf ft)
0.3750	35.2 to 39.3 N•m (26 to 29 lbf ft)	31.2 to 33.9 N•m (23 to 25 lbf ft)
0.4375	55.6 to 61 N•m (41 to 45 lbf ft)	50.2 to 55.6 N•m (37 to 41 lbf ft)
0.5000	86.8 to 94.9 N•m (64 to 70 lbf ft)	77.3 to 85.4 N•m (57 to 63 lbf ft)
0.5625	123.4 to 135.6 N•m (91 to 100 lbf ft)	111.2 to 122 N•m (82 to 90 lbf ft)
0.6250	173.5 to 191.1 N•m (128 to 141 lbf ft)	153.2 to 168.1 N•m (113 to 124 lbf ft)
0.7500	302.3 to 332.1 N•m (223 to 245 lbf ft)	271.1 to 298.2 N•m (200 to 220 lbf ft)

Table 13. Grade 8

Nom. Size	Fine Thread	Coarse Thread
0.2500	14.9 to 17.6 N•m (11 to 13 lbf ft)	12.2 to 14.9 N•m (9 to 11 lbf ft)
0.3125	38 to 43.4 N•m (28 to 32 lbf ft)	35.2 to 40.7 N•m (26 to 30 lbf ft)
0.3750	50.2 to 55.6 N•m (37 to 41 lbf ft)	44.7 to 48.8 N•m (33 to 36 lbf ft)
0.4375	78.6 to 86.8 N•m (58 to 64 lbf ft)	70.5 to 77.3 N•m (52 to 57 lbf ft)
0.5000	122 to 134.2 N•m (90 to 99 lbf ft)	108.4 to 119.3 N•m (80 to 88 lbf ft)
0.5625	173.5 to 191.1 N•m (128 to 141 lbf ft)	155.9 to 172.2 N•m (115 to 127 lbf ft)
0.6250	244 to 268.4 N•m (180 to 198 lbf ft)	215.5 to 237.2 N•m (159 to 175 lbf ft)
0.7500	427 to 470.4 N•m (315 to 347 lbf ft)	382.3 to 420.2 N•m (282 to 310 lbf ft)

Table 14. Grades 8.8, 10.9, and 12.9

Nom. Size	Grade 8.8	Grade 10.9	Grade 12.9
	Coarse Thread	Coarse Thread	Coarse Thread
M5	5 to 6 N•m (3.7 to 4.4 lbf ft)	7 to 8 N•m (5.2 to 5.9 lbf ft)	8 to 10 N•m (5.9 to 7.4 lbf ft)
M6	8 to 10 N•m (5.9 to 7.4 lbf ft)	12 to 15 N•m (8.9 to 11.1 lbf ft)	13 to 16 N•m (9.6 to 11.8 lbf ft)
M8	20 to 25 N•m (14.8 to 18.4 lbf ft)	30 to 35 N•m (22.1 to 25.8 lbf ft)	35 to 40 N•m (25.8 to 29.5 lbf ft)
M10	40 to 50 N•m (29.5 to 36.9 lbf ft)	60 to 65 N•m (44.3 to 47.9 lbf ft)	65 to 75 N•m (47.9 to 55.3 lbf ft)

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A power train harness is connected to the main electrical wire harness at location CPS166 and a transmission harness is connected to the mail electrical wire harness at location CPS174. See Figure 1. The power train and transmission harnesses provide the engine and transmission with electricity. See Figure 2 and the section **Instrument Panel Indicators and Senders** 2200 SRM 1234 for further information regarding senders and indicator functions.

A controller wire harness is connected to the main wire harness at location CPS15 and CPS152. See Figure 3.

See the section **Stabilizer** 2120 SRM 1361 for further information regarding the Stabilizer (if equipped).

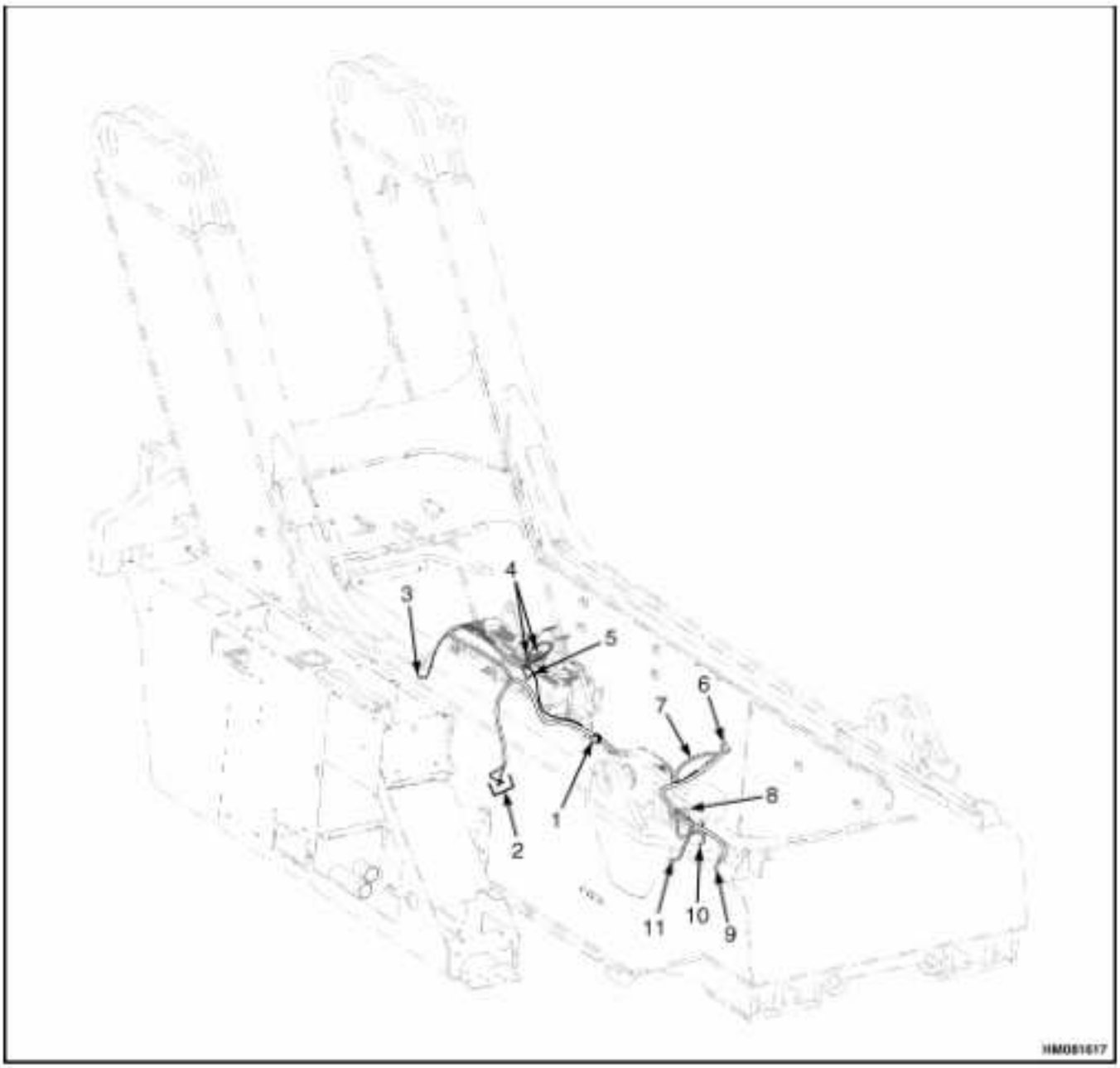


Figure 2. Power Train Wire Harness

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Table 7. APC200 Fault Codes (Continued)

Fault Code	Fault Explanation	APC200 Action	Troubleshooting
75.09	Analog output 5 (wires B03) related fault: the output is not connected	Controller will flag the fault, but no actions will be taken.	Check the wiring between the controller and the device connected on the analog output 5. Check the device connected.
76.00	Analog output 6 (pin R1) related fault: output wire is shorted to ground.	Controller will flag the fault, but no actions will be taken.	Check the wiring between APC200 and VFS6+. Check the VFS itself.
76.01	Analog output 6 (pin R1) related fault: output wire is shorted to battery +, or not connected.	Controller will flag the fault, but no actions will be taken.	Check the wiring between APC200 and VFS6+. Check the VFS itself.
76.02	Analog output 6 (pin R1) related fault: the output current exceeds 1400 mA.	Controller will flag the fault, but no actions will be taken.	Check the wiring between APC200 and VFS6+. Check the VFS itself.
76.03	Analog output 6 (pin R1) related fault: the output current is out of range, occurs when the load has the incorrect impedance.	Controller will flag the fault, but no actions will be taken.	Check the wiring between APC200 and VFS6+. Check the VFS itself.
76.09	Analog output 6 (pin R1) related fault: the output is not connected	Controller will flag the fault, but no actions will be taken.	Check the wiring between APC200 and VFS6+. Check the VFS itself.
77.02	All proportional valve grounds are switched off due to an over current on one or more proportional valves.	Controller reverts to a "shut down" mode and will force neutral 0.	Check the wiring to all VFS'sand check the VFS's themselves.
80.00	Total Neutral Solenoid (pin K1) related fault: output is shorted to ground.	Controller reverts to a Limp Home Mode.	Check the wiring between APC200 and Total Neutral Solenoid. Check the Solenoid itself.
80.01	Total Neutral Solenoid (pin K1) related fault: output is shorted to battery +	Controller reverts to a Limp Home Mode.	Check the wiring between APC200 and Total Neutral Solenoid. Check the Solenoid itself.
80.09	Digital output 1 (pin E2) related fault: output is not connected	The APC200 reverts to a Shut Down Mode and will deactivate the total neutral solenoid.	Check the wiring between the controller and the total neutral solenoid + line. (RSP+). Check the solenoid itself.

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