Haldex

Installation Guide

L31158 8/08

PLC InfoCenter
Hand Held or Vehicle Mounted
ABS Diagnostic Tool
Instruction Manual

Introduction

InfoCenter is a diagnostic tool used for readout of odometer and fault codes as well as other information as available in the ABS Electronic Control Unit (ECU).

The InfoCenter is normally connected to the ECU's power source. While the ECU is powered from its normal sources, information is transferred to the InfoCenter on the permanent power. A power supply cable is included with the InfoCenter. Optional 7-Way "T" Connector or In-Cab Cigarette Lighter Adapter is available.

InfoCenter has FLASH memory and can be reprogrammed when used in conjunction with our premium "PLC Plus" ABS Platform. Contact Haldex Brake Systems for further details.

FUNCTIONS

Odometer:
- Total Distance
- Trip Distance
- Service/Interval Distance Setting
- Tire Scale Setting

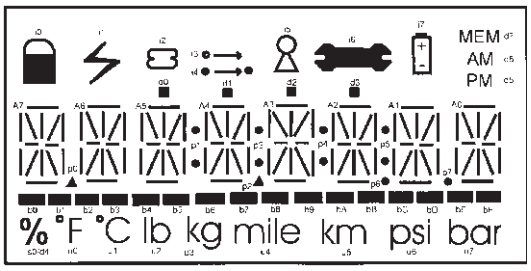
ABS ECU Information:
- Serial Number
- Product Code
- System Configuration

Diagnostics:
- OK if No Fault Codes
- Current Fault Code
- Store Fault Codes and Occurrence Count
- Sensor Check -- Wheel Speed Bars
- Modulator Valve Tests
- Trailer ABS In-Cab Warning Lamp Test
- Trailer Auxiliary Monitor and Control with PLC Plus ABS

INSTRUCTIONS

Some functions require you to hold the function button for two seconds; most, however, require that you press the function button only once.
When a COM FAIL message appears, check ABS power and press either button again.

THE DISPLAY



THE LEGENDS

- Flashing = ABS Communications
- Flashes for Suspension Control
- Total Distance
- Trip Distance
- 2 Dots above the Active Fault
- ON = Scheduled Service Due
  Flashing = Current ABS Fault

PRODUCT IDENTIFICATION AND CONFIGURATION

ABS Product Type:

PLC . . . . . .2S/1M, 2S/2M or 4S/2M
PLC SELECT . . . . . .2S/1M Only (Does Not Require A Wiring Harness)
PLC PLUS . . . . . .2S/1M, 2S/2M or 4S/2M (Optional Trailer Auxiliaries)

Configuration Codes: Figures in parentheses indicate sensing is disabled when axle is lifted.

CODE	FUNCTION	SENSORS USED (AXLE LIFTED)	MODULATORS USED
CFG C0	2S/1M	1A, 1B	Red
CFG C1	2S/2M	2A, 2B	Blue, Yellow
CFG C2	4S/2M	2A, 2B, 3A, 3B	Blue, Yellow
CFG C3	4S/2M	2A, 2B, (3A), (3B)	Blue, Yellow

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IMPORTANT NOTICE

The data listed herein is correct to the best of Haldex's knowledge and belief, having been compiled from reliable and official sources of information. However, HALDEX CAN NOT ASSUME ANY RESPONSIBILITY for possible error or misapplication of the product. Final determination of the suitability of the products for the use contemplated by the Buyer is the sole responsibility of the Buyer. Haldex shall have no rresponsibility in connection with this suitability.

Diagnostic Fault Code List

NOTE: The codes listed here are indications of where to start your diagnostic investigation, NOT a direction to necessarily replace the part(s) affected. Simple electronic tests (ie. continuity and ohms resistance checks) will help pinpoint the problem.

		POSSIBLE CAUSE(S)
BLANK DISPLAY	No supply on ignition switched line.	Fuse blown, InfoCenter or cable fault, Open circuit B -.
SENSOR BAR	Bar Displayed = Sensor Output O.K.	Spin one wheel at a time to check for sensor output.
	Bar Not Displayed = Sensor Output Low.	Check sensor resistance and sensor to exciter alignment.
OPEN OR SHORT SENSOR OUTPUT GROUP		
OK 00	System is O.K. Vehicle is moving	Indicates a wheel speed sensor or its wiring has a short or open circuit. Disconnect the relevant sensor and measure the resistance between the two pins in the sensor connector housing. The ohmmeter reading for the sensor should be between 980 and 2350 ohms. The sensor should be replaced, if this is not the case. Refer to ABS Manual L30034HBS to check ABS Harness.
S1A 01	1A sensor/wiring open or short circuit	
S1B 02	1B sensor/wiring open or short circuit	
S2A 03	2A sensor/wiring open or short circuit	
S2B 04	2B sensor/wiring open or short circuit	
S3A 05	3A sensor/wiring open or short circuit	
S3B 06	3B sensor/wiring open or short circuit	
OK 07	System is O.K. vehicle is stationary	
LOW SENSOR OUTPUT GROUP (Dynamic Codes)		
S1A 11	1A sensor system fault	Sensor is worn or not properly adjusted, wiring open or short circuit, wheel bearing not properly adjusted (these faults will only occur at speeds greater than six mph). Measure the AC voltage at the sensor in question while rotating the wheel at a rate of about one revolution every two seconds. The output should be at least 200 millivolts. If this is not the case, push in the sensor until it touches the exciter and rotate the wheel again. If this doesn't correct the problem, then the sensor should be replaced.
S1B 12	1B sensor system fault	
S2A 13	2A sensor system fault	
S2B 14	2B sensor system fault	
S3A 15	3A sensor system fault	
S3B 16	3B sensor system fault	
EXC 20	Incorrect exciter type	

Diagnostic Fault Code List (cont'd)

NOTE: The codes listed here are indications of where to start your diagnostic investigation, NOT a direction to necessarily replace the part(s) affected. Simple electronic tests (ie. continuity and ohms resistance checks) will help pinpoint the problem.

		POSSIBLE CAUSE(S)
INTERMITTENT LOW SENSOR OUTPUT GROUP (Dynamic Codes)		
S1A 21	1A sensor system fault	Loose sensor, connection, bracket or exciter, damaged exciter, sensor is not properly adjusted or has worn cable insulation, wheel bearing failure, wheel bearing is not properly adjusted (these faults will only occur at speeds greater than six mph). Measure the AC voltage at the sensor in question while rotating the wheel at a rate of about one revolution every two seconds. The output should be at least 200 millivolts. If this is not the case, push in the sensor until it touches the exciter and rotate the wheel again. If this doesn't correct the problem, then the sensor should be replaced.
S1B 22	1B sensor system fault	
S2A 23	2A sensor system fault	
S2B 24	2B sensor system fault	
S3A 25	3A sensor system fault	
S3B 26	3B sensor system fault	
OPEN OR SHORT CIRCUIT AUXILIARY CHANNEL GROUP (PLC Plus Only)		
CH0 30	Auxiliary channel 0 fault (digital channel 0) Input/Output	Analog or digital cable connections, Auxiliary box relay failure. Refer to ABS Manual L30034HBS to check ABS Harness.
CH1 31	Auxiliary channel 1 fault (digital channel 1) Input/Output	
CH2 32	Auxiliary channel 2 fault (digital channel 2) Input/Output	
CH3 33	Auxiliary channel 3 fault (digital channel 3) Input Only	
CH4 34	Auxiliary channel 4 fault (analog 1) Input Only	
CH5 35	Auxiliary channel 5 fault (analog 2) Input Only	
EXT 37	Lamp signaled by external device.	
ONE WHEEL WITH SLOW RECOVERY GROUP		
XSn 40	Sensor wiring crossed across an axle	Slow brake release, foundation brake mechanical faults, dry bearings, broken spring, restricted piping. Modulator fault. Check for kinks and blockages etc. Incorrect piping, wiring.
SLW41	Slow recovery of one wheel of red channel	
SLW42	Slow recovery of one wheel of blue channel	
SLW43	Slow recovery of one wheel of yellow channel	

Diagnostic Fault Code List (cont'd)

NOTE: The codes listed here are indications of where to start your diagnostic investigation, NOT a direction to necessarily replace the part(s) affected. Simple electronic tests (ie. continuity and ohms resistance checks) will help pinpoint the problem.

		POSSIBLE CAUSE(S)
MODULATOR SOLENOID WIRING OR SOLENOID OPEN CIRCUIT GROUP		
RDH 61 BUH 62 YEH 63 RDD 67 BUD 68 YED 69	Hold solenoid circuit fault, red channel. Hold solenoid circuit fault, blue channel. Hold solenoid circuit fault, yellow channel. Dump solenoid circuit fault, red channel. Dump solenoid circuit fault, blue channel. Dump solenoid circuit fault, yellow channel.	Modulator valve solenoid failure, solenoid connection, or valve cable damage. The most likely causes include: a bad solenoid or a loose solenoid connection. Disconnect the indicated solenoid and check the resistance at the solenoid pins. Readings across the two bottom pins should be between 7 and 9 ohms. Check the female terminals on the connector for excessive pin spread or corrosion. Replace defective hardware as required and retest. Refer to ABS Manual L30034HBS to check ABS Harness.
MODULATOR SOLENOID WIRING OR SOLENOID SHORT TO B- GROUP		
RDH 71 BUH 72 YEH 73 RDD 77 BUD 78 YED 79	Hold solenoid circuit fault, red channel. Hold solenoid circuit fault, blue channel. Hold solenoid circuit fault, yellow channel. Dump solenoid circuit fault, red channel. Dump solenoid circuit fault, blue channel. Dump solenoid circuit fault, yellow channel.	Modulator valve solenoid failure, or valve cable damage. The most likely causes include: a damaged cable or solenoid. An example of this is a worn or chafed cable that has exposed wires contacting the trailer. Disconnect the indicated solenoid and check the resistance at the cable end of solenoid. Readings from each bottom pin to ground should be open circuit. Disconnect the solenoid connector and check for continuity between each solenoid terminal and trailer ground. Replace defective hardware as required and retest. Refer to ABS Manual L30034HBS to check ABS Harness.

Diagnostic Fault Code List (cont'd)

NOTE: The codes listed here are indications of where to start your diagnostic investigation, NOT a direction to necessarily replace the part(s) affected. Simple electronic tests (ie. continuity and ohms resistance checks) will help pinpoint the problem.

		POSSIBLE CAUSE(S)
MODULATOR SOLENOID WIRING OR SOLENOID SHORT TO B+ GROUP		
SOL 80	Poor insulation in the modulator solenoid or wiring fault	Modulator valve solenoid failure or valve cable damage. Indicates that the solenoid or its cable has a short circuit to B+ (positive 12 volts). The most likely cause is a damaged cable or solenoid. Disconnect the indicated solenoid and check the resistance at the cable end at solenoid. Readings from each bottom pin to B+ should be an open circuit. Refer to ABS Manual L30034HBS to check ABS Harness.
RDH 81	Hold solenoid circuit fault, red channel	
BUH 82	Hold solenoid circuit fault, blue channel	
YEH 83	Hold solenoid circuit fault, yellow channel	
RDD 87	Dump solenoid circuit fault, red channel	
BUD 88	Dump solenoid circuit fault, blue channel	
YED 89	Dump solenoid circuit fault, yellow channel	
SUPPLY VOLTAGE GROUP		
BLO 90	Supply voltage at ECU less than 9V when a solenoid is energized	Verify +12V dc power source. DO NOT USE BATTERY CHARGER AS POWER SUPPLY.
ISO 91	Faulty supply from ISO 7638 Pin 1 or fuse blown	
BHI 92	Supply voltage at the ECU greater than 16V	
ECU 93	Internal ECU fault	ECU failure.
ECU 99	Internal ECU fault	
ECU 9A	Internal ECU fault	

SYSTEM FUNCTION GROUP	
NLV A4	No load sensing valve installed
SLH A5	Select Low High Channel 1
SLH A6	Select Low High Channel 2 (blue)
SLH A7	Select Low High Channel 3 (2S/1M; red) (4S/2M; yellow)
SLH A8	Modified Select Low High (2S/1M; red)

Diagnostic Fault Code List (cont'd)

NOTE: The codes listed here are indications of where to start your diagnostic investigation, NOT a direction to necessarily replace the part(s) affected. Simple electronic tests (ie. continuity and ohms resistance checks) will help pinpoint the problem.

VARIOUS CODES

CLR CA	Erase stored faults
CLR CC	Clear configuration
CFG CF	Sensors and solenoid not connected. Alternating with Code 90 (incomplete solenoid function). Check ECU supply voltage.
COM FAIL	Communication failure between ECU and InfoCenter. Verify Pin 7 of J560 has +12 V. Press either button or repower to re-establish communications.
STUCK BT	A button is stuck closed. Press either button or repower to re-establish communications.

Tire Scale Factor Chart

Trailer Tire Sizes USA/Canada	Scaling Factor 100T (miles)	Scaling Factor 100T (km)	Scaling Factor 80T (miles)	Scaling Factor 80T (km)
80T Smallest Tire			**579**	**360**
215/75R17.5			543	338
8R17.5			538	334
275/65R17.5HC			527	328
8.5R17.5			524	326
245/70R17.5			523	325
235/75R17.5			523	325
225/70R19.5			521	324
8.25R15			495	308
9R17.5HC			495	308
10R17.5			490	304
265/70R19.5			483	300
285/70R19.5			470	293
100T Smallest Tire	**580**	**360**		
305/70R19.5	574	357	459	286
11R17.5HC	568	353	454	283
10.00R15TR	566	352	453	282
255/70R22.5	566	352	453	282
275/70R22.5	545	339	436	271
10R22.5	520	323	416	259
9.00R20	519	323	415	258
295/75R22.5	518	322	414	258
285/75R24.5	504	313	403	251
295/80R22.5	503	313	402	250
11R22.5	502*	313	402	250
10.00R20	501	312	401	249
315/80R22.5	491	305	383	244
80T Largest Tire			**391**	**243**
11.00R20	488	303		
305/75R24.5	488	303		
11R24.5	478	297		
10.00R22	478	297		
12.00R20	472	294		
425/65R22.5	471	293		
11.00R22	466	290		
100T Largest Tire	**391**	**243**		

* Factory Tire Scale Set At 502 Rev/Mile.

USEFUL NUMBERS: 1 mile = 1.6093 km 1 km = 0.6214 mile

SCALE FACTOR (SF) FOR OTHER TIRE SIZES:

OPTION 1: SF = (1000/Rc) x (T/100)
Rc = Rolling Circumference in meters
T = Exciter actual tooth count

OPTION 2: SF = N x (T/100)
N = Revolutions per mile
T = Exciter actual tooth count

Power Up Information

First screen displays InfoCenter type: PLC InfoCenter.

Next screen displays ABS type: PLC, PLC SLCT or PLC Plus ABS.

Next screen displays an all Segment Display Test.

Next screen displays ABS Sensor/Valve Configuration: C0 2S/1M (equals two sensors/one valve)

Next screen displays: NLV A4 Auxiliary Code A4.

Next screen displays: SLH A7 or A8. Auxiliary Codes A7 or A8.

-OR-

-OR-

If powers up to an 07 code, vehicle is stationary. ABS is fully operational. If trailer ABS lamp is still ON, check stored faults. (See Pages 1-5 for complete fault code list.)

If fault code is present, the display will power up to the active fault code (See Pages 1-5 for complete fault code list.) An active fault code and a flashing wrench will be displayed.

If COM FAIL is displayed, the ABS system is not powered up or only powered by stoplight power.

Diagnostic Mode:
View/Clear Stored Faults

From the active fault screen, CODE 07, vehicle is stationary ABS is fully operational.

Hold right button two seconds until BUSY is displayed.

The first stored fault is displayed. Example: 67 fault, occurred 1 time. If OK 00 is displayed, no stored faults are present.

Repeat right button hold for next stored fault. Example: 61 fault, occurred 2 times. Repeat right button hold for two seconds until BUSY is displayed.

The next stored fault is displayed. Example: 01 fault, occurred 3 times. Repeat right button hold for two seconds until BUSY is displayed.

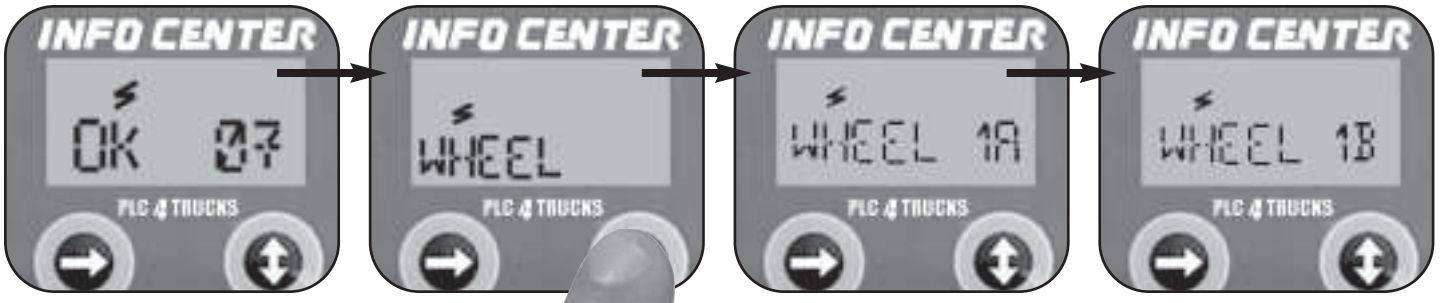
Repeat right button hold and record all stored faults until CLR? CA is displayed.

Repeat right button hold to clear stored fault codes. Otherwise wait to return to the active fault screen.

After clearing stored faults, the display returns to the active fault screen.

If display is other than 07, reference Pages 1-5. Repair, re-power and clear stored faults again.

Wheel Speed
Sensor Output Test



From the active fault screen, Code 07, vehicle is stationary; ABS is fully operational.	Press the right button to display WHEEL.	Rotate the wheel with sensor 1A (1 Rev/2 Sec) four seconds minimum. 1A will remain displayed.	Rotate the wheel with sensor 1B (1 Rev/2 Sec) four seconds minimum. 1B will remain displayed.

Upon rotation of a wheel, the sensor identification is displayed. The display will remain on until rotation of another wheel. If no sensor identification is displayed, verify sensor connection and sensor/exciter alignment.

ABS CONFIGURATION	SENSOR IDENTIFICATION
2 Sensors/1 Modulator Valve (2S/1M)	1A 1B
2 Sensors / 2 Modulator Valves (2S/2M)	2A 2B
4 Sensors / 2 Modulators Valves (4S/2M)	2A 2B 3A 3B

Odometer Information

Permanent power must be available to the trailer ABS for the odometer to be accurate.

From the active fault screen, CODE 07, vehicle is stationary; ABS is fully operational.

Press the left button to display the odometer.
Example: 18.7 miles

Press the left button again to display trip distance.
Example: 1.6 miles

Press the left button again to display distance to service.
Example: 123,000.0 miles

Press the left button again to display the service interval.
Example: SI 123
SI is 123,000 miles

Press the left button again to display the tire scale factor.
Example: 502 rev/mile

Press the left button again to return to the odometer.
Example: 18.7 miles

Clear Trip Distance

From the active fault screen, CODE 07, vehicle is stationary; ABS is fully operational.

Press the left button to display the odometer.
Example: 18.7 miles

Press the left button again to display trip distance.
Example: 1.6 miles

Hold the right button two seconds to clear the trip distance to 0.0 miles.

Set The Tire Scale Factor

Refer to the Tire Scaling Factor Chart on Page 6 to choose the correct rev/mile for your tire size.

From the active fault screen, CODE 07, vehicle is stationary; ABS is fully operational.

Press the left button to display the odometer.
Example: 18.7 miles

Press the left button again to display trip distance.
Example: 1.6 miles

Press the left button again to display distance to service.
Example: 123,000.0 miles

Press the left button again to display the service interval.
Example: SI 123 (thousands)

Press the left button again to display tire scale factor.
Example: 502 rev/mile

Hold the right button for two seconds. The first digit will begin flashing.

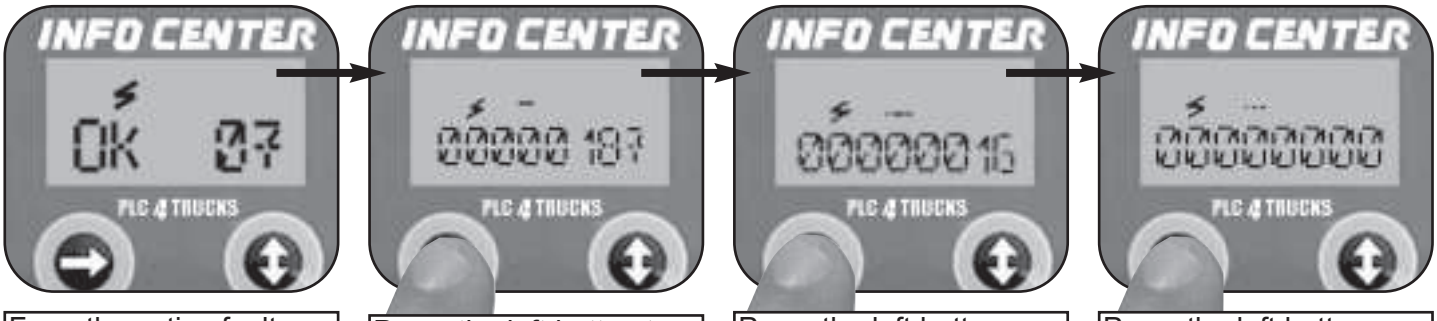
Press the right button to set the first digit (0 - 9).

Press the left button to advance to the next digit. Repeat for all three digits. (thousands)

After setting all three digits and the mile or km icon. hold the right button for two seconds until BUSY is displayed. The Tire Scale Factor is now set.
Example: 625 rev/mile.

Set The Service Maintenance Interval

The Service Maintenance Interval is the distance traveled before service is due.
Example: SI 123 = 123,000.0 miles.

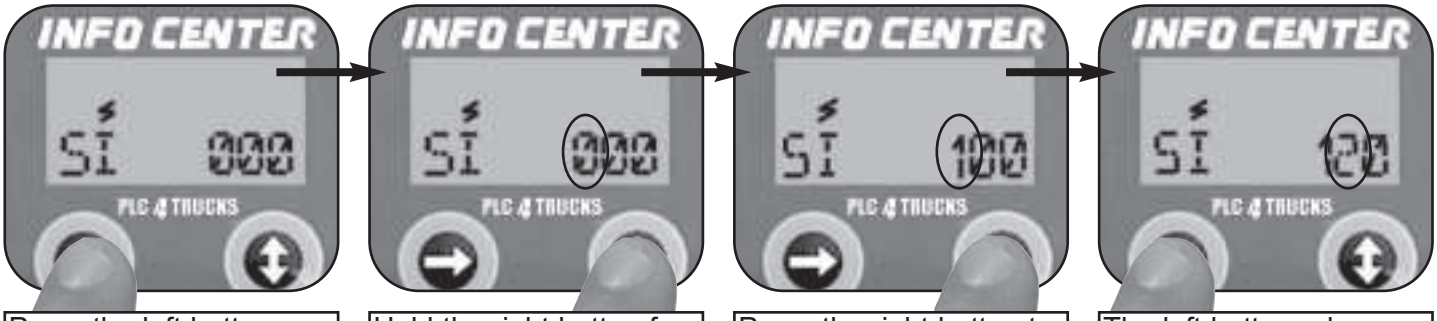


From the active fault screen, CODE 07, vehicle is stationary; ABS is fully operational.

Press the left button to display the odometer.
Example: 18.7 miles

Press the left button again to display trip distance.
Example: 1.6 miles

Press the left button again to display distance to service.
Example: 0.0 miles

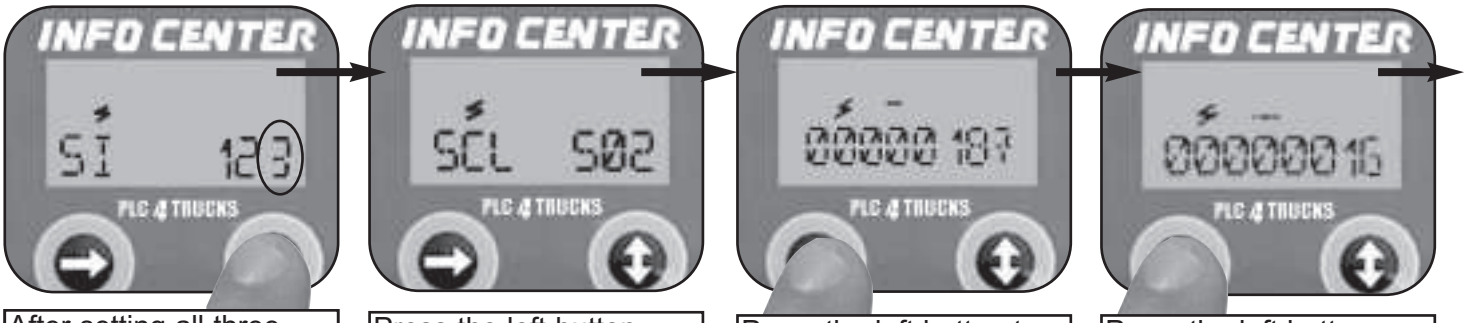


Press the left button again to display service interval.
Example: 000

Hold the right button for two seconds. The first digit will begin flashing.

Press the right button to set the first digit (0 - 9). Service Interval is in 1,000 mile increments.
Example:100 =100,000 miles

The left button advances to the next digit. Repeat for all three digits.



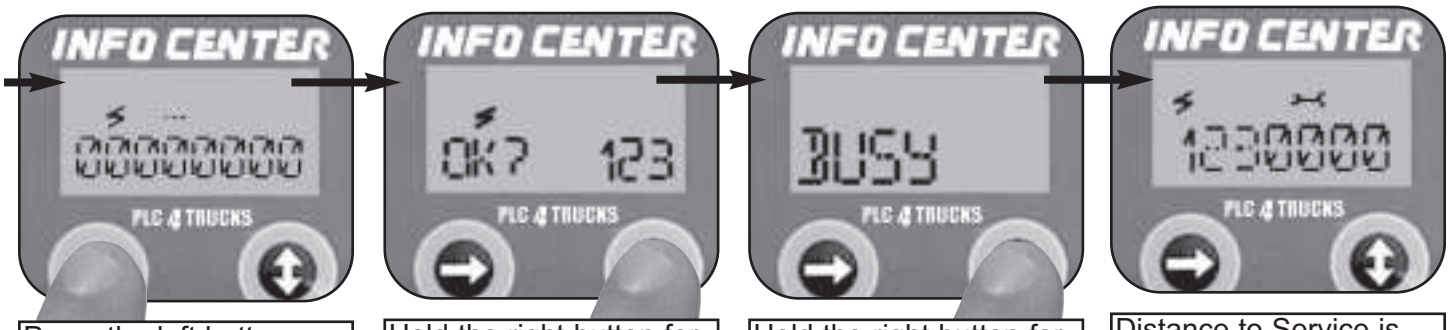
After setting all three digits, hold the right button for two seconds until BUSY is displayed. Service Interval is set to 123 = 123,000.0 miles.

Press the left button again to display the tire scale factor.

Press the left button to display the odometer.
Example: 18.7 miles

Press the left button again to display trip distance.
Example: 1.6 miles

Set The Service Maintenance Interval (cont'd)



Press the left button again to display distance to service. Example: 0.0 miles

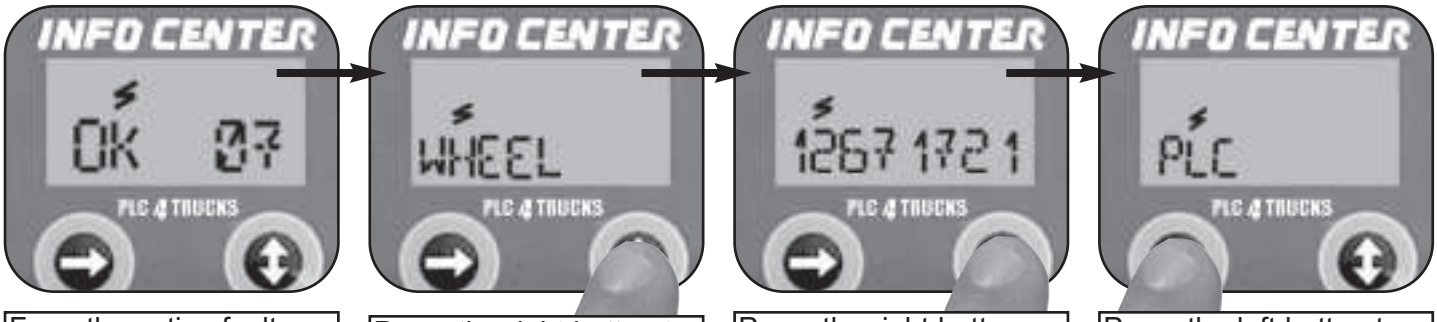
Hold the right button for two seconds. Service Interval = 123 (123,000.0 miles)

Hold the right button for two seconds until BUSY is displayed to set the distance to service to 123,000 miles.

Distance to Service is now set to 123,000.0 miles.

The Distance to Service is the Service Interval Counting Down. Once it reaches zero, service is required. The Trailer ABS Warning Lamp will flash three times on power up until distance to service is set again or until a new service interval is set.

View ABS Information

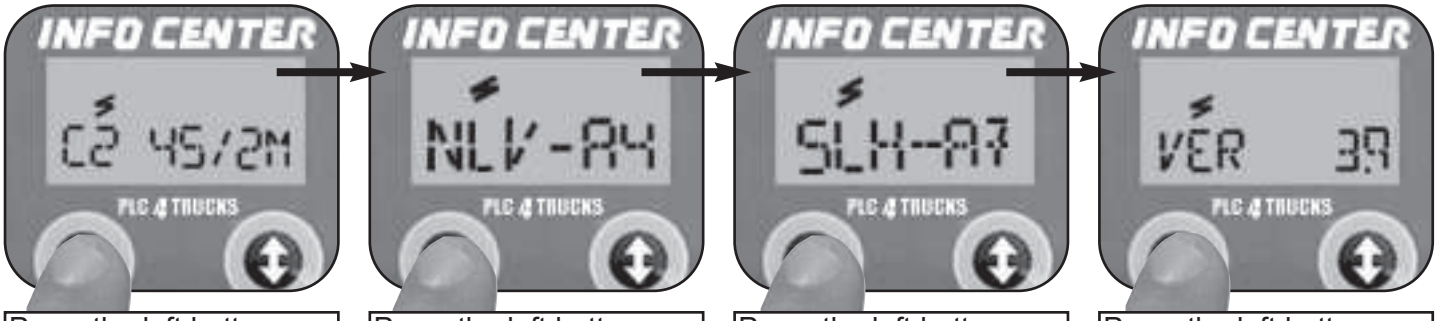


From the active fault screen, CODE 07, vehicle is stationary ABS is fully operational.

Press the right button to display WHEEL.

Press the right button again to display the ECU Serial Number.

Press the left button to view ABS Type “PLC”, “PLC SLCT” or “PLC PLUS”.

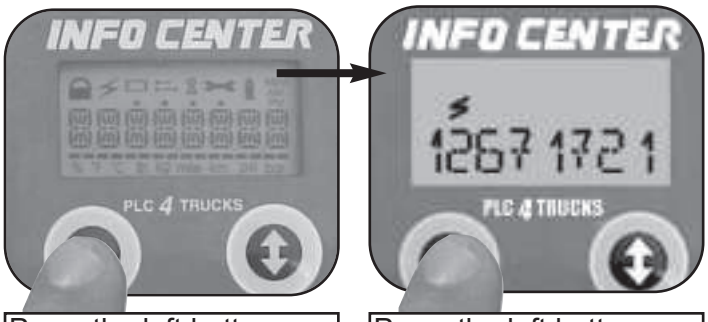


Press the left button again to view Sensor/ Valve ABS configuration. Example: C2 = 4S/2M (4 Sensors/2 Modulator Valves)

Press the left button again to view Auxiliary Code A4.

Press the left button again to view Auxiliary Code A7.

Press the left button again to view InfoCenter Software Version. Example: Version 3.9



Press the left button again to view segment display test.

Press the left button again to return to ECU Serial Number.

Modulator Valve Test (2S/1M Application)

From the active fault screen, Code 07, vehicle is stationary; ABS is fully operational.

Press the right button to display WHEEL.

Press the left button to display VLV TEST.

Hold the right button for two seconds. Request to test the red valve channel. (Red if 2S/1M)

Press the right button until BUSY is displayed. The red channel valve is energized. The ABS Warning Lamp will begin to flash.

After the valve is tested, the ABS will not be functional. Re-power the ABS System.

2S/2M and 4S/2M Applications: If multiple Modulator Valves are used, the Blue and Yellow Channels are displayed for testing.

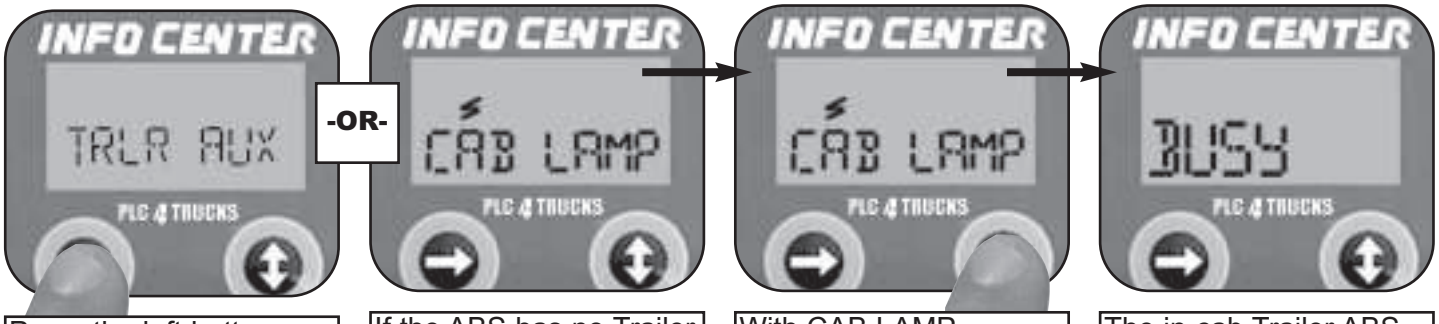
Trailer ABS In-Cab Lamp Test

This test can only be performed if no active faults are present on the trailer ABS System and the in-cab trailer ABS Warning Lamp is OFF.

From the active fault screen, CODE 07, vehicle is stationary; ABS is fully operational.

Press the right button to display WHEEL.

Press the left button to display VLV TEST.



Press the left button again. If the ABS has Trailer Auxiliaries, TRLR AUX menu will be displayed.

If the ABS has no Trailer Auxiliaries, the CAB LAMP menu will be displayed.

With CAB LAMP displayed, press the right button until BUSY is displayed.

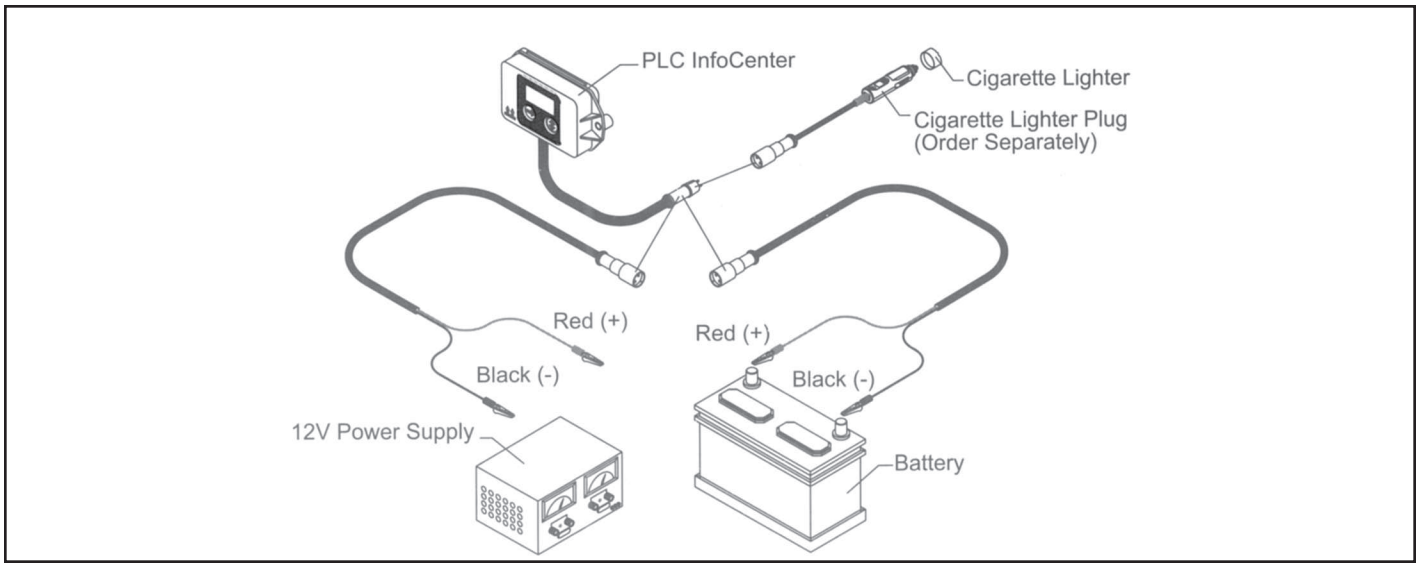
The in-cab Trailer ABS Warning Lamp is turned ON for ten seconds.

The display returns to CAB LAMP. Press the right button to repeat the in-cab lamp test. Press the left button to return to display WHEEL.

Connecting the PLC InfoCenter

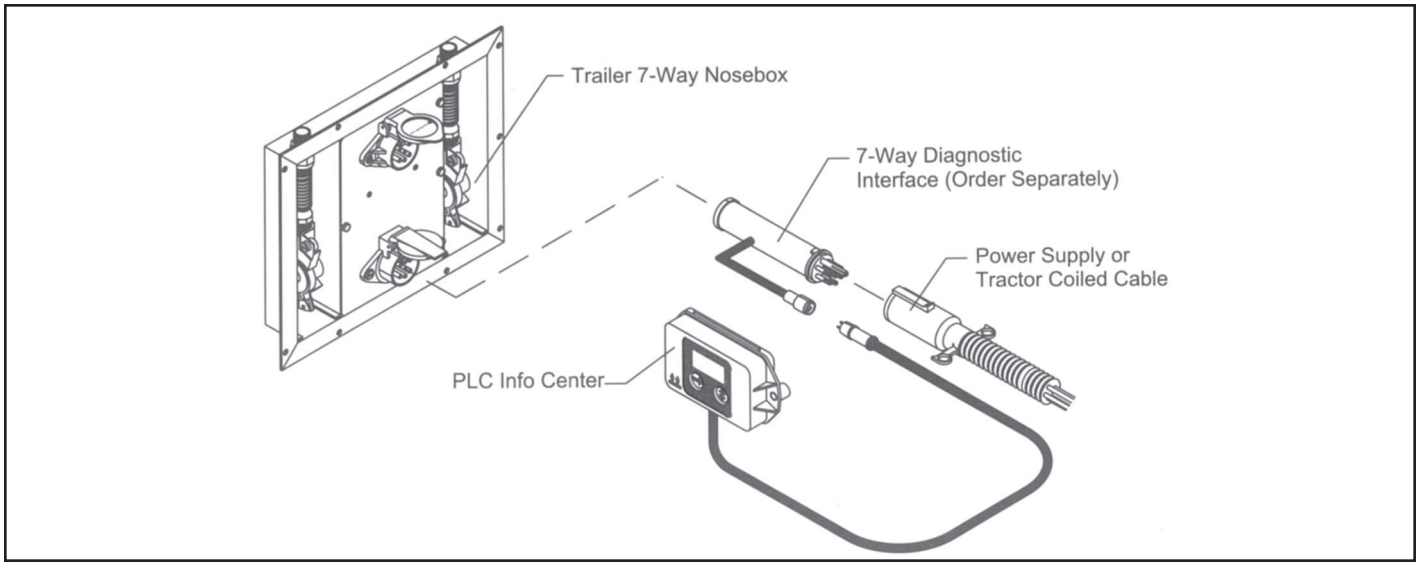
Use the InfoCenter as a handheld diagnostic tool or an in-cab trailer auxiliary tool using InfoCenter Kit AQ15849. Use the InfoCenter as a handheld diagnostic tool or as an in-cab trailer auxiliary tool to monitor or control devices on the trailer. Pictured below are the optional cable adapters available for vehicle interface. This InfoCenter does not contain an internal battery for maintaining memory and therefore requires vehicle power to operate.

PLC Diagnostic Interface Options for Vehicles Manufactured After March 1, 2001



* Power supply or battery cable . . . . . Included with InfoCenter Kit AQ15849

* Cigarette lighter plug adapter . . . . . Optional (Part Number AL2030012)



* J560 (7-Way) Diagnostic Interface Cable Adapter . . Optional (Part Number AL230010)

- Notes -

Haldex develops and provides reliable and innovative solutions with focus on brake and air suspension products to the global commercial vehicle industry.
Listed on the Stockholm Stock Exchange, Haldex has annual sales of approximately 3.9 billion SEK and employs about 2,200 people.

Innovative Vehicle Solutions

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