NOVA BUS **SERVICE BULLETIN** **BS1994ER1**

REFERENCE:	Nova Bus Manuals
SECTION:	08 Braking System
RS Nº:	MQR 7621-350
EFFECTIVE IN PROD.:	L726-001 (2013JA30)

APPLICATION DEADLINE:
2014MA14

SUBJECT:	Front axle brake hoses and ABS sensor wiring harness (60 ft vehicles).
JUSTIFICATION:	Possible chaffing between brake hoses and surrounding components, possibly causing the loss of ABS sensor signal.

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Front axle: Verify the routing of the brake hoses. Front, central and rear axles: Verify the routing of the ABS sensor electric harness.	Nova Bus	–	10 min
2	Front axle: Replace the P-clamps and reroute the brakes hoses. Front, central and rear axles: Reroute the ABS sensor electric harness.	Nova Bus	Client*	45 min 35 min

* The cost of the material will be reimbursed when claiming for this service document.

MATERIAL

QTY	PART Nº	REV.	DESCRIPTION	REPLACES PART N°
LEVEL 1				
–	–	–	–	–
LEVEL 2 (only if required*)				
2 ft (609 mm)	N24590		Loom	
8	N44890		M6 Nut	
2.5 ft (762 mm)	N21078		Spiral loom	
6	N30730		Washer	
8	N44884-02		Bolt M6x25	
6	N31320-03		P-clamp	
2	N57040		Plastic cable tie mount (high heat)	

Materials will be available within 60 days. To order, please contact Prevost Parts by phone at 1-800-771-6682, by fax at 1-888-668-2555 or by email at prevostparts.commandes@volvo.com. Specify document number, quantity of parts required and shipping address.

* The material identified in Level 2 is to be ordered only for vehicles that respect the criteria defined in Level 1.

DISPOSAL OF PARTS

REMOVED PARTS ARE:	DISCARDED *	RETAINED	* Dispose of the unused parts and the defective parts in accordance with local environmental standards in effect.
	Yes	–	

REVISION HISTORY

REV.	DATE	CHANGE DESCRIPTION	WRITTEN BY
NR	2012DE24	Initial release	Wilder Galiano
R1	2013JN25	Quantity of N57040 passes from one to two. N44884-02 and N44890, passes from 7 to 8.	Wilder Galiano

APPROVED BY: Daniel Theriault

Digitally signed by Daniel Theriault
DN: cn=Daniel Theriault, o=Nova Bus, ou, email=daniel.theriault@volvo.com, c=CA
Date: 2013.06.27 09:07:28 -04'00'

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
Ames Transportation Agency - Iowa	L707	—	—	S92U5C4500159	S92U1C4500160	2
Austin Capital Metro - Texas	L635	—	—	S92U7C4500163	S92U5C4500162	1
Clemson Area Transit - South Carolina	L617	—	—	S92U5C4500002	S92U5C4500002	1
Connecticut Transit - Connecticut	L554	1041	1054	S92U1A4000139	S92U4A4000152	14
Connecticut Transit - Connecticut	L554	1055	1065	S92U8A4000154	S92U0A4000164	11
Connecticut Transit - Connecticut	L571	1066	1075	S92YXB4000144	S92Y4B4000169	10
Demo - Articulated Bus	L433	—	—	S92UX93000029	S92UX93000029	1
Demo - Articulated Bus APTA US	L359	—	—	S92U583000289	S92U583000289	1
Duke University - North Carolina	L651	—	—	S92Y1B4000145	S92Y3B4000146	2
Halifax - Nova Scotia	L558	717	731	S92UXA3000293	S92U6A3000307	15
Halifax - Nova Scotia	L613	732	741	S92UXB3000019	S92UXB3000028	10
Halifax - Nova Scotia	L708	742	751	L92UXC3000782	L92U0C3000791	10
Halifax - Nova Scotia	L708	742	751	L92UXC3000782	S92U0C3000791	10
Marketing Sales Demo - MSD 4	L568	—	—	S92U9B3000013	S92U9B3000013	1
Marketing Sales Demo - MSD 4	L618	—	—	S92U1C3000377	S92U1C3000377	1
New York City Transit - New York	L536	1200	1201	S92U793000490	S92U993000491	2
New York City Transit - New York	L545	1202	1203	S92U5A4000001	S92U7A4000002	2
New York City Transit - New York	L545	1204	1289	S92U1A4000013	S92U0A4000098	86
New York City Transit - New York	L643	5895	5895	S92U1B4000143	S92U1B4000143	1
New York City Transit - New York	L670	5771	5784	S92U9B4000147	S92U1B4000160	14
New York City Transit - New York	L670	5785	5857	S92U4B4000170	S92U3B4000242	73
New York City Transit - New York	L670	5858	5894	S92U4C4500024	S92U8C4500060	37
New York City Transit - New York	L670	5770	5770	S92UXC4500061	S92UXC4500061	1
New York City Transit - New York	L681	5896	5896	S92U2C4500023	S92U2C4500023	1
New York City Transit - New York	L681	5897	5953	S92U1C4500062	S92U2C4500118	57
New York City Transit - New York	L681	5954	5959	S92U2C4500121	S92U1C4500126	6
New York City Transit - New York	L681	5960	5983	S92U0C4500134	S92U1C4500157	24
New York City Transit - New York	L681	5984	5985	S92U5C4500162	S92U7C4500163	2
New York City Transit - New York	L681	5986	5986	S92U9C4500164	S92U9C4500164	1
New York City Transit - New York	L681	5253	5283	S92U0C4500165	S92U9C4500195	31
New York City Transit - New York	L692	5284	5284	S92U3C4500158	S92U3C4500158	1
New York City Transit - New York	L692	5285		S92U0C4500196	S92U0C4500213	18
Niagara Falls - Ontario	L652	—	—	S92U3C3000607	S92U6C3000617	11
Niagara Parks Commission - Ontario	L685	—	—	S92U9C3000644	S92U8C3000652	9
Saskatoon - Saskatchewan	L551	1005	1007	S92UXA3000178	S92U8A3000180	3
St. John - New Brunswick	L272	—	—	S92U483000011	S92U483000011	1
St. John - New Brunswick	L273	—	—	S92U383000050	S92U383000050	1
University of Colorado - Colorado	L427	—	—	S92U693000027	S92U693000027	1
University of Colorado - Colorado	L428	—	—	S92U893000028	S92U893000028	1
University of Colorado - Colorado	L627	—	—	S92UXB4000139	S92U6B4000140	2
York Regional Transit - Ontario	L572	1083	1094	S92U3A3000569	S92U2A3000580	12
York Regional Transit Ontario	L562	1080	1082	S92U2A3000420	S92U6A3000422	3

WARNING

Follow your internal safety procedures.

PROCEDURE

LEVEL 1: INSPECT

1.1. Verify the installation of the front axle brake hoses:

1.1.1. Verify that P-clamps N31320-03 are installed.

1.1.2. Verify that P-clamps are installed at the specified location in this document. See Figures 1 to 5.

1.1.3. Ensure the brake hose position is as described in this document. See Figures 2 to 11.

1.1.4. If one of the preceding conditions is not met, apply the **BRAKE HOSES** chapter of the second level of this document before proceeding to the next step of this document.

1.1.5. When all the preceding conditions are met, proceed to item 1.2.

1.2. Verify the installation of the ABS sensor electrical harness on the front, central and rear axles:

1.2.1. Verify that cable tie mount N57040 is installed (front axle only). See Figure 14.

1.2.2. Ensure that the position of the electric harness attaching points is as described in this document. See Figures 12 to 20.

1.2.3. If one of the preceding conditions is not met, apply the **ELECTRIC HARNESS** of the second level of this document.

1.2.4. When all the preceding conditions are met, the vehicle may be returned to service.

LEVEL 2: INSTALL

BRAKE HOSES (FRONT AXLE ONLY)

2.1. Raise the vehicle

NOTE

For information on hoisting and towing of the vehicle, see section 18: HOISTING AND TOWING in the Nova bus maintenance manual. Respect your internal safety procedures. Use appropriate hoisting equipment for your protection.

2.2. Locate the six P-clamps to replace on the front axle. See Figure 1.

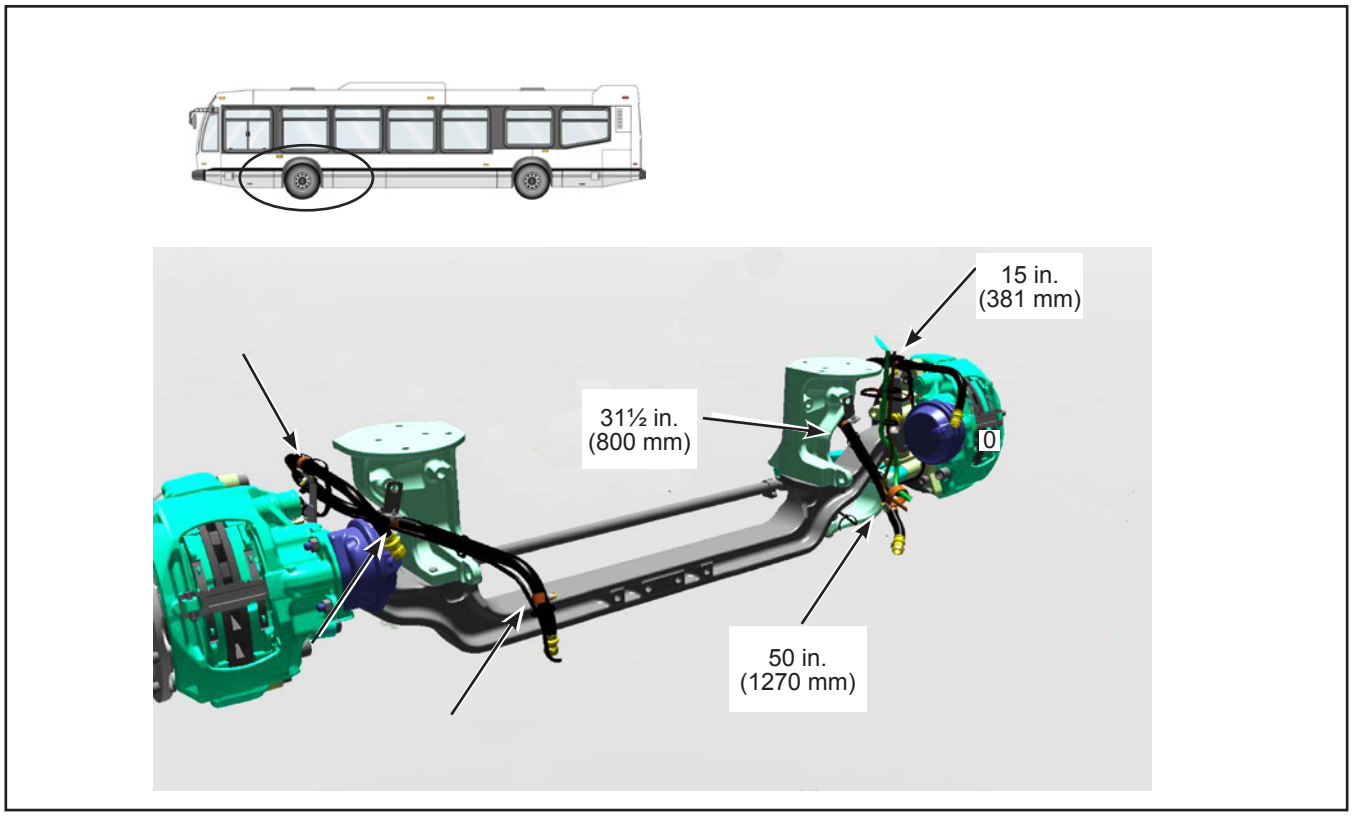

Figure 1 - Front Axle P-Clamp Location

NOTE

The following steps must be applied to both sides of the vehicle.

2.3. Remove the three P-clamps retaining the hose to the brake. Dispose of the P-clamps and hardware.

2.4. Place the brake hose fitting on the brake cylinder at an approximate angle of 35° to the vertical, toward the exterior of the vehicle. See Figure 2.

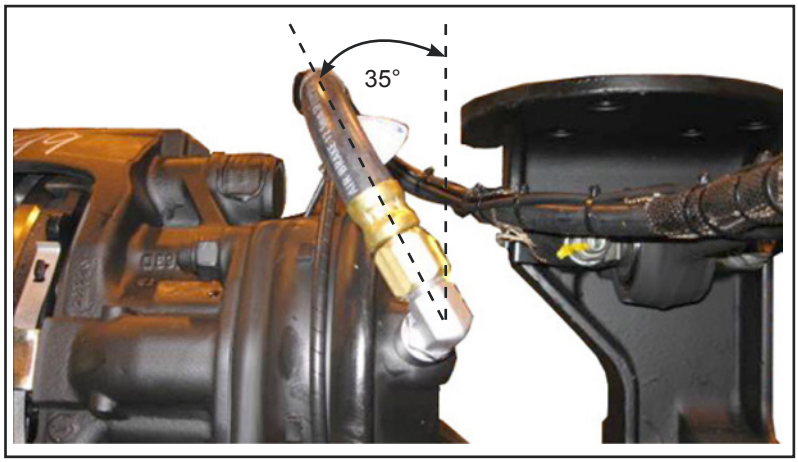

Figure 2 - 35° Brake Hose Angle

2.5. Mark the hose at the positions shown in Figures 3 to 5. It is suggested to place white adhesive tape around the hose.

Figure 3 - P-Clamp Location

Figure 4 - P-Clamp Location

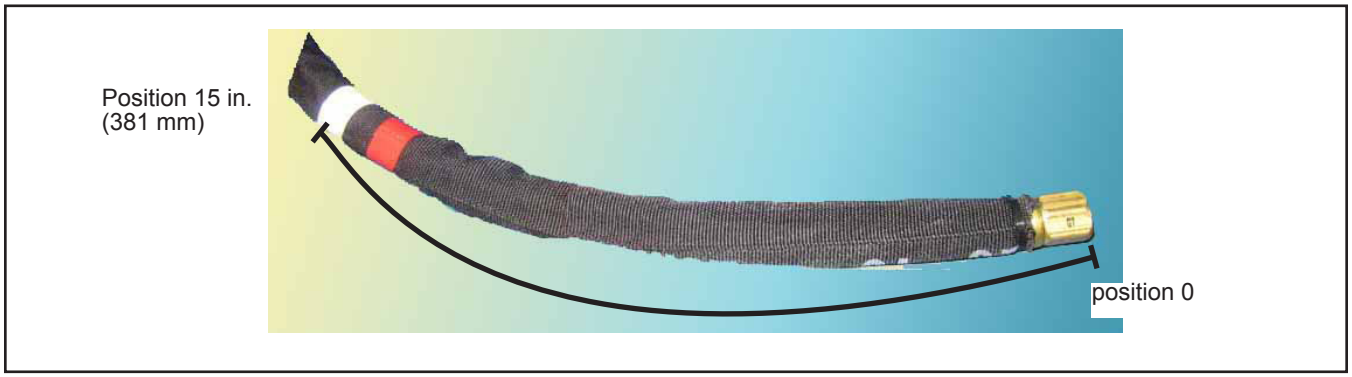

Figure 5 - Brake Hose Mark Example

2.6. Loosen the tie rod nut holding the L support. See Figure 6.

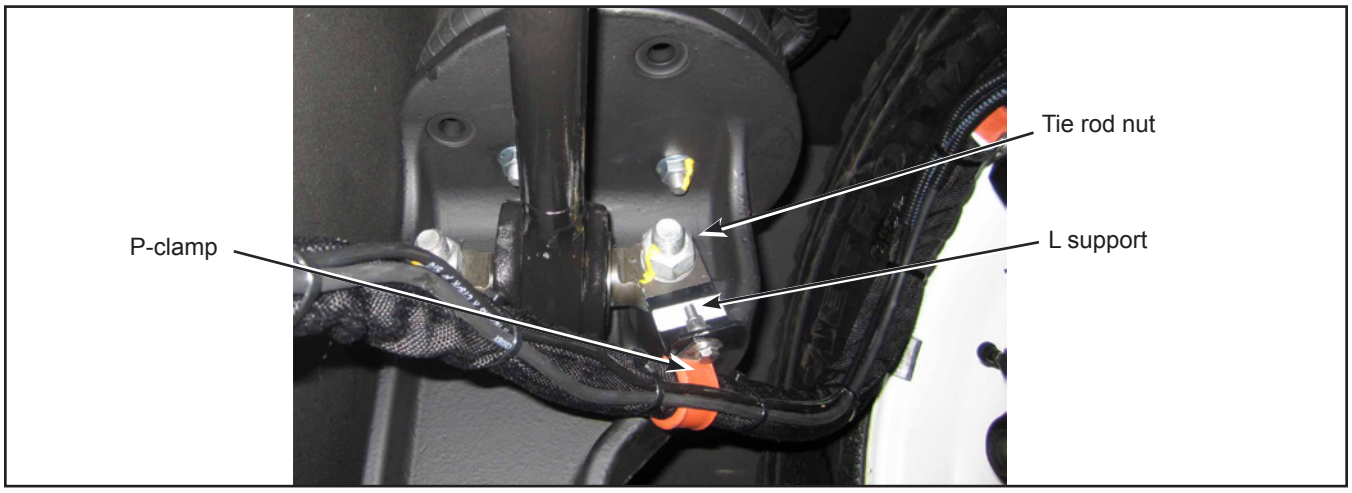

Figure 6 - P-Clamp Mounting

2.7. Position the L support at an approximate angle of 15° to the exterior of the vehicle. As a reference, the distance between the vertical axle wall and the L support corner should be of about 3/8 in. (9.5 mm). See Figure 7.

2.8. Tighten the tie rod nut holding the L support to the specified torque indicated in Figure 7.

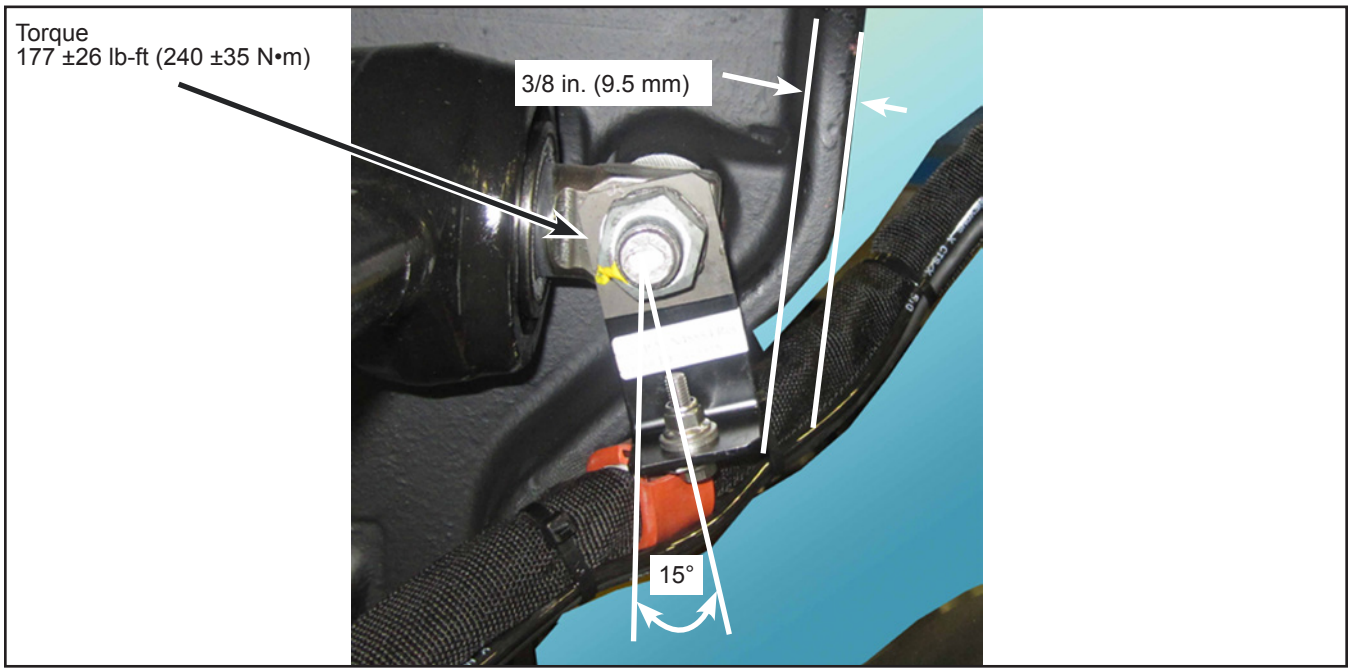

Figure 7 - L Support Position

2.9. Insert the three P-clamps N31320-03 around the brake hose at the positions indicated at step 2.5. Use a nut N44890, a bolt N44884-02 and a washer N30730 for the installation. See Figure 8. Do not tighten the hardware.

Figure 8 - L Support and P-Clamp Installation

2.10. Install a 4-in. (101 mm) length of loom N24590 between the brake hose and each P-clamp.

2.11. P-clamps at the 31½ in. (800 mm) and 50 in. (1270 mm) positions must be oriented so that they are on the same axis. See Figure 9.

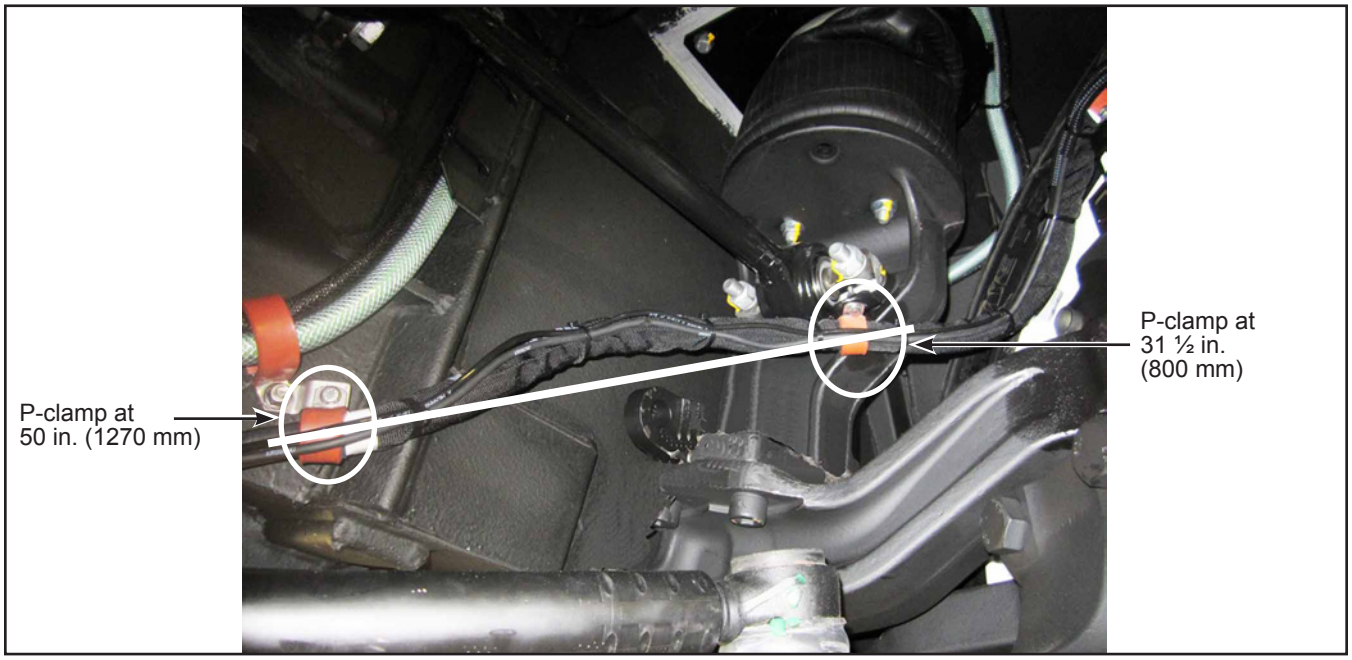

Figure 9 - P -Clamp Alignment at the 31½ in. (800 mm) and 50 in.(1270 mm) Positions

2.12. Adjust the positioning of the P-clamp at the 31½ in. (800 mm) position, to obtain a minimal distance of ½ in. (12.5 mm) between the hose and the axle. See Figure 10.

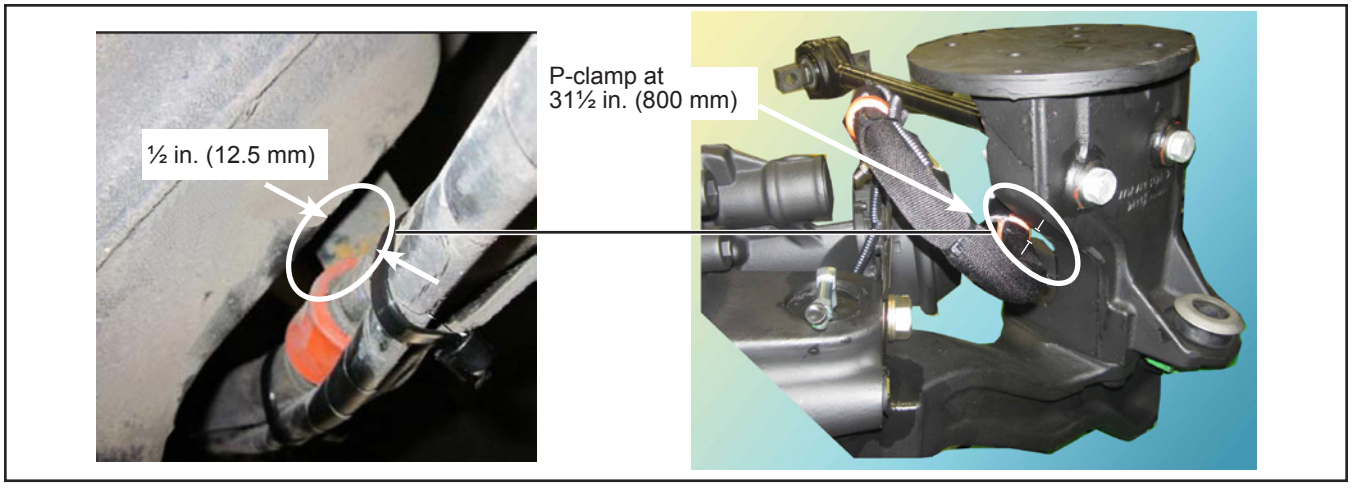

Figure 10 - Space Between the Brake Hose and the Axle

2.13. Adjust the positioning of the P-clamp at the 50 in. (1270 mm) position, to obtain à minimal gap of 3/8 in. (9.5 mm) between the hose and the vehicle structure. See Figure 11.

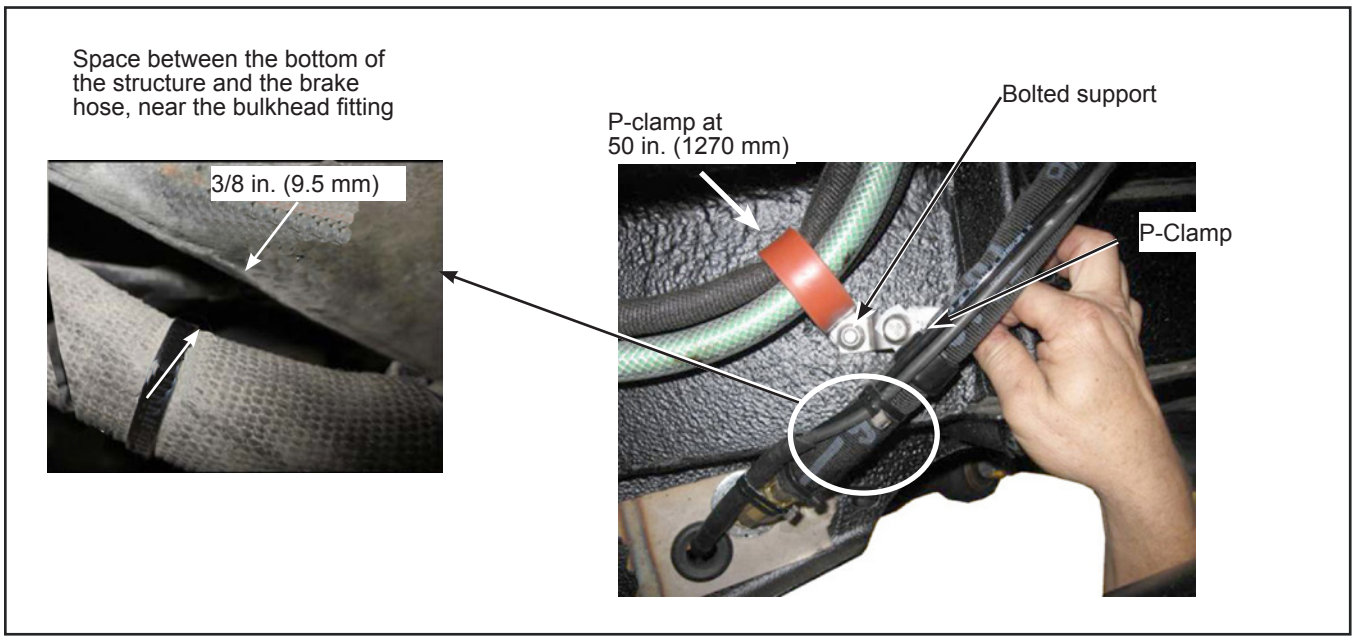

Figure 11 - P-Clamp and hose Position

2.14. Tighten the nut and bolt while maintaining the required positioning.

ELECTRIC HARNESS

FRONT AXLE ABS SENSOR HARNESS

NOTE

The following steps must be applied to both sides of the vehicle.

2.15. Locate the ABS sensor electrical harness on the front axle. See Figure 12.

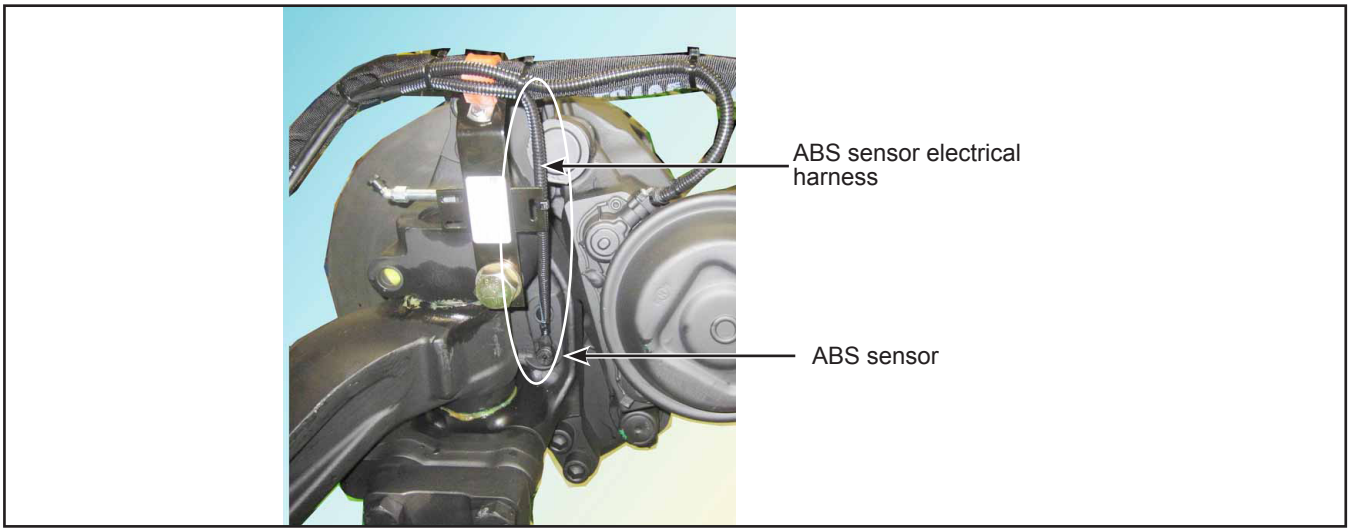

Figure 12 - ABS Sensor Electrical Harness Location

2.16. Drill a 0.20 in. (5 mm) diameter hole in the N20455-2. See Figure 13.

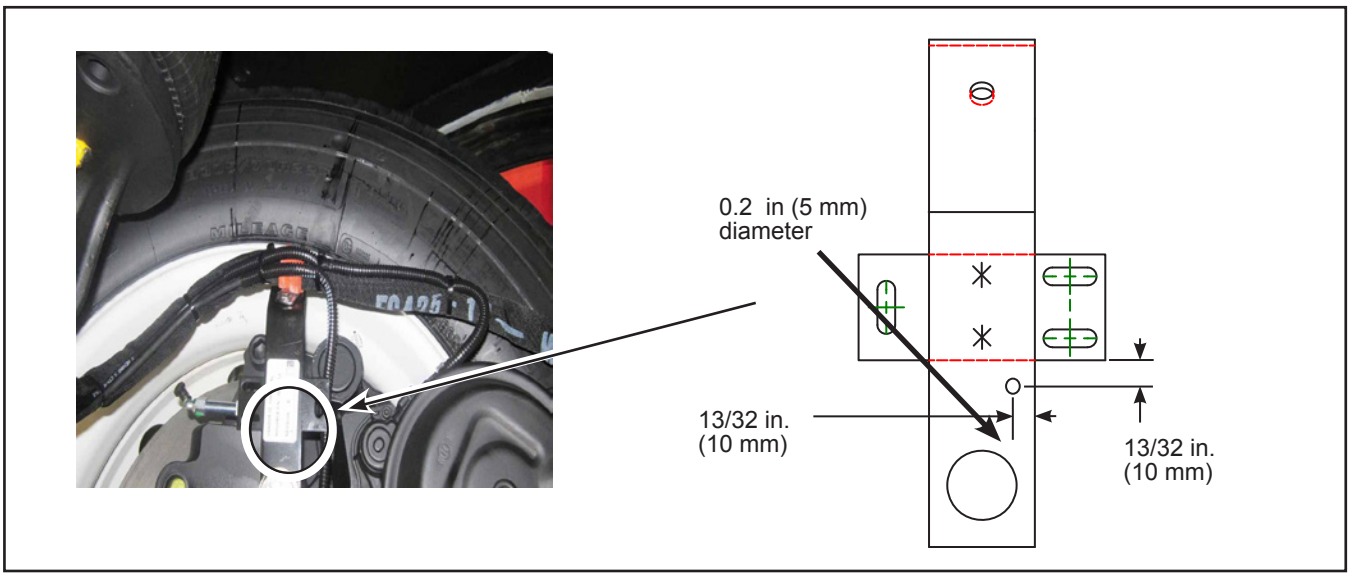

Figure 13 - Drilling of N20455-2 Support

2.17. Install the cable tie mount N57040 onto the N20455-2 support with the N44884 bolt and the N44890 nut. See Figure 14.

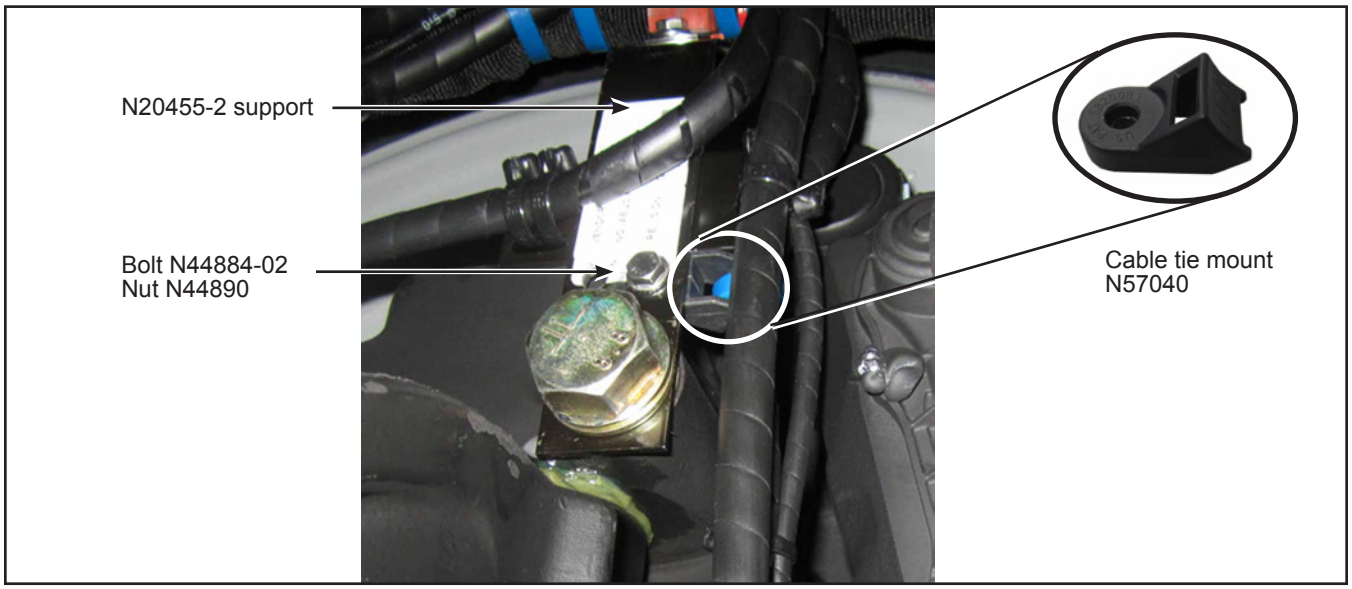

Figure 14 - CableTie Mount N57040 Installation

2.18. Install a length of protective loom N21078 onto the ABS sensor electrical harness.

2.19. Affix the electrical harness to the N57040 cable tie mount with tie-wraps at the indicated locations shown in Figure 15.

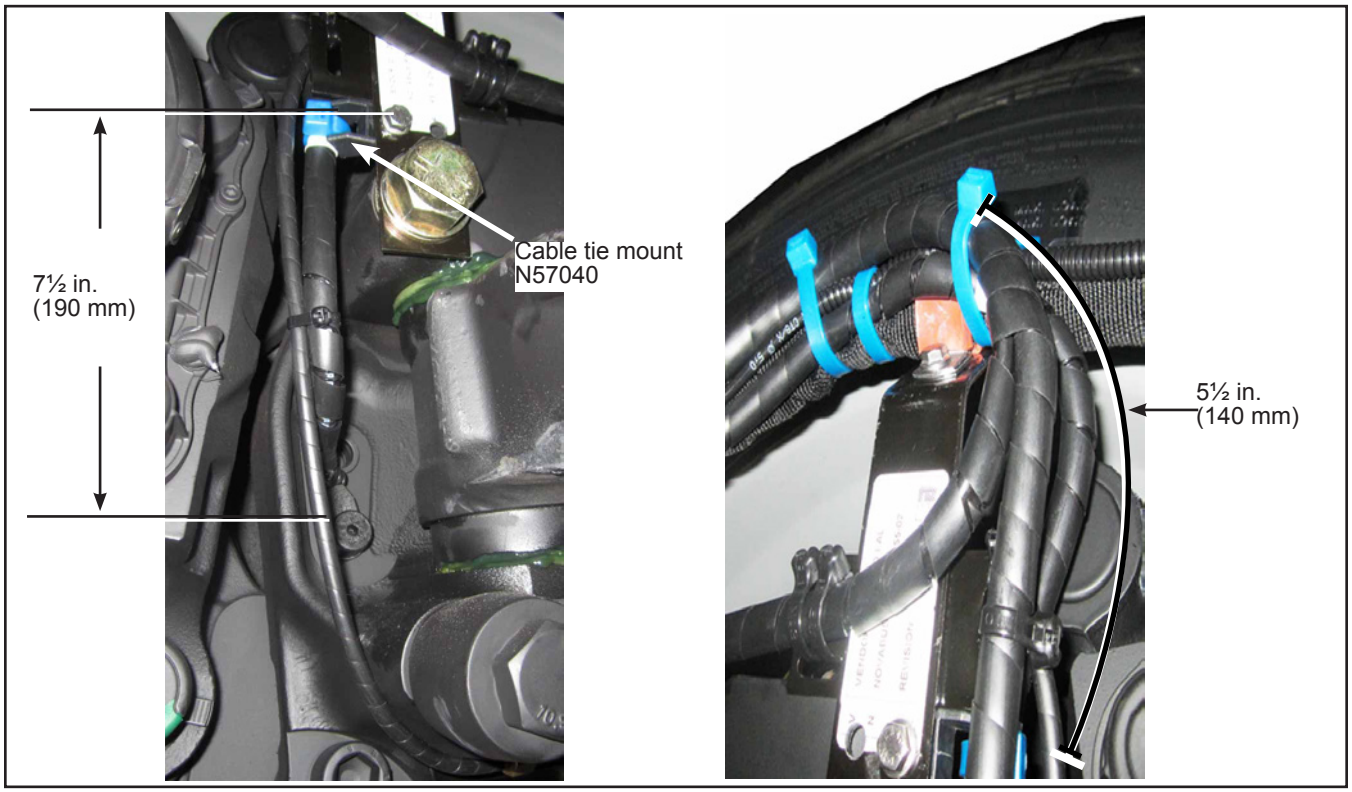

Figure 15 - Fastening of Harness With Tie-Wraps

2.20. Affix the electrical harness to the brake hose using tie-wraps, as shown in Figures 15 and 16. Distance between tie-wraps is typical. If necessary, install additional tie-wraps.

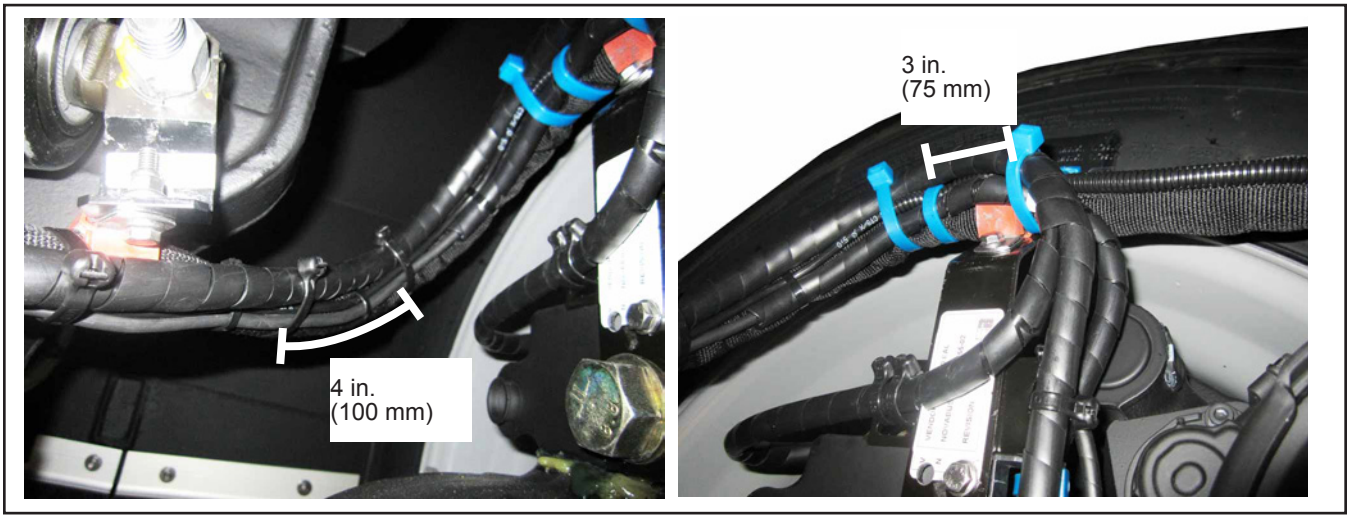

Figure 16 - Electrical Harness Attached to the Brake Hose

NOTE

See Figures 17 and 18 for the reference points when measuring brake hoses and electrical harnesses.

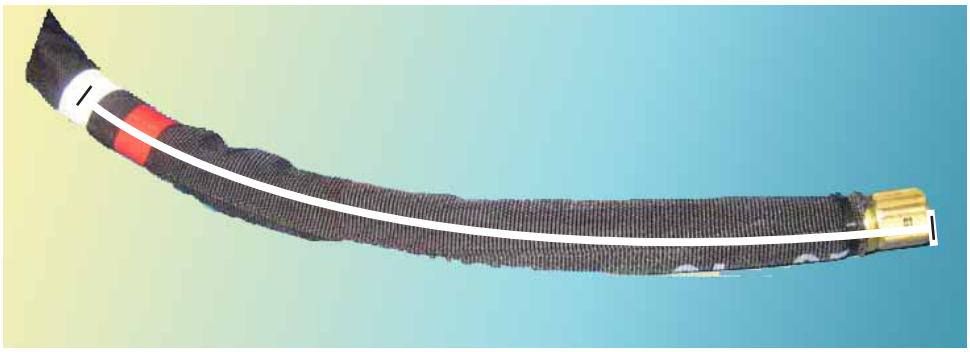

Figure 17 - Reference Points for Measuring a Brake Hose (Typical)

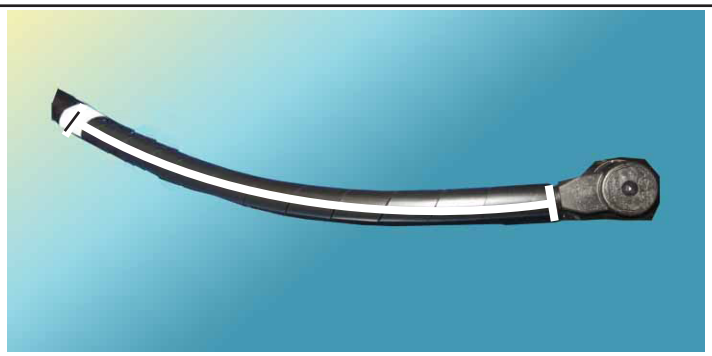

Figure 18 - Reference Points for Measuring an Electrical Harness (Typical)

MIDDLE AXLE ABS SENSOR ELECTRICAL HARNESS

NOTE

The following steps must be applied to both sides of the vehicle.

2.21. Remove the tie wrap from the ABS sensor electrical harness.

2.22. If required, remove other tie wraps to facilitate the marking and positioning of the electrical harness.

2.23. Mark the electrical harness at the position indicated in Figure 19.

2.24. Mark the Brake hose at the position indicated in Figure 19.

2.25. Affix the electrical harness to the brake hose with a tie-wrap at the tie point indicated in Figure 19. If required, affix with other tie wraps.

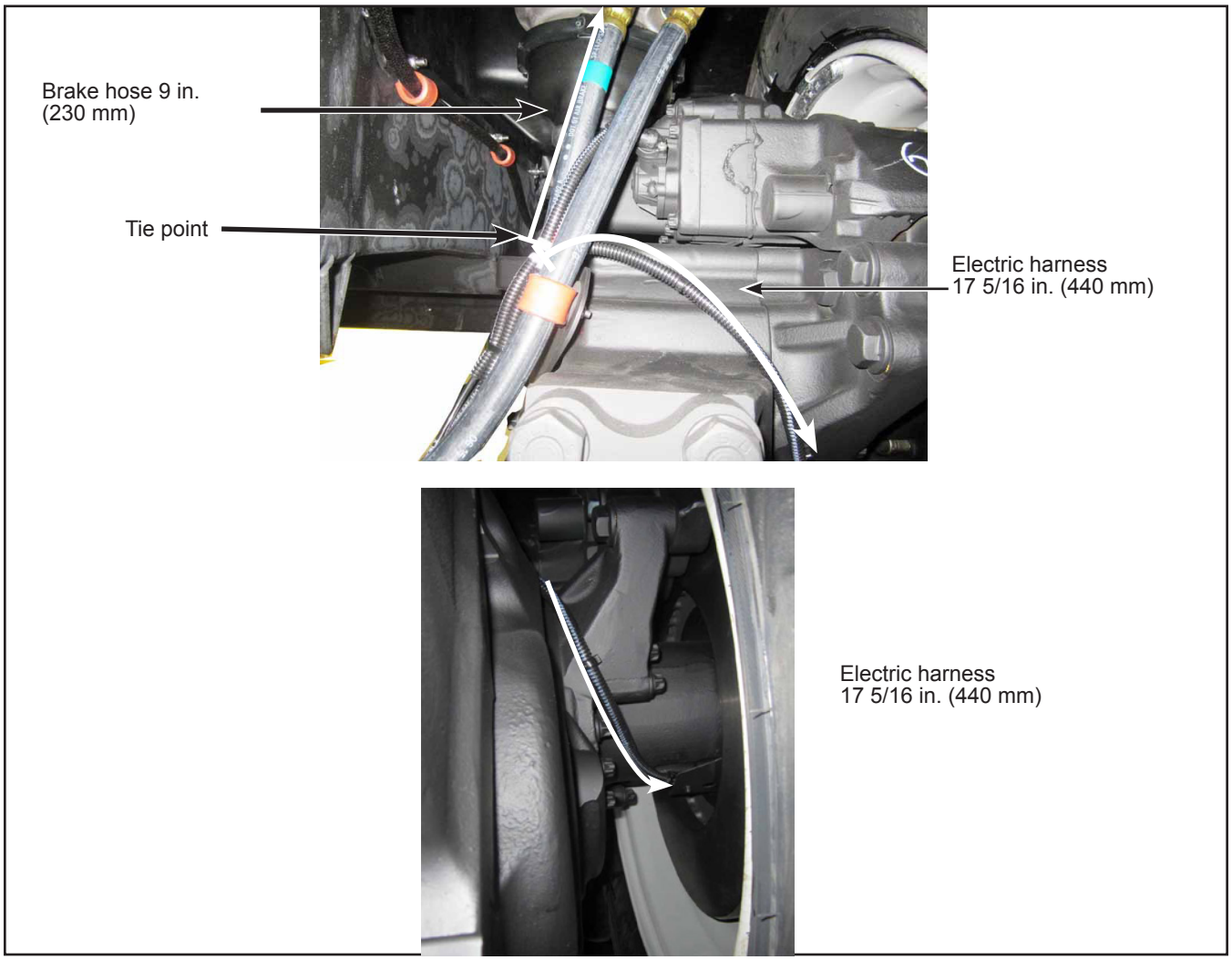

Figure 19 - ABS sensor Electrical Harness Positioning of Tie Wraps

REAR AXLE ABS SENSOR ELECTRICAL HARNESS

2.26. Remove the tie wrap from the ABS sensor's electrical harness.

2.27. If required, remove other tie wraps to facilitate the marking and positioning of the electrical harness.

DRIVER SIDE ELECTRICAL HARNESS

2.28. Mark the electrical harness at the position indicated in Figure 20.

2.29. Mark the brake hose the position indicated in Figure 20.

2.30. Affix the electrical harness to the brake hose with a tie-wrap at the tie point indicated in Figure 20. If required, affix with other tie wraps.

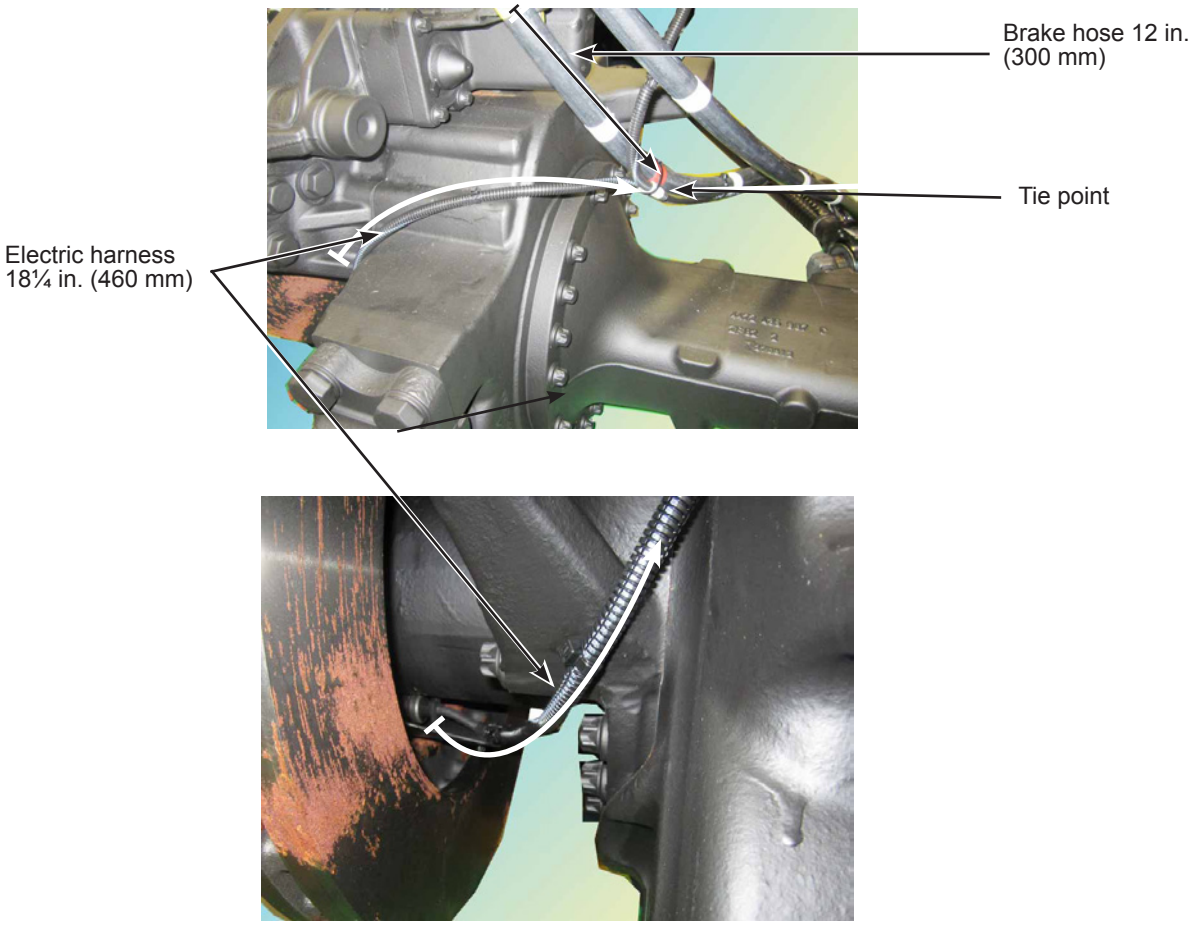

Figure 20 - Driver Side Electrical Harness Routing

CURB SIDE ELECTRICAL HARNESS

2.31. Mark the electrical harness at the position indicated in Figure 21.

2.32. Mark the brake hose at the position indicated in Figure 21.

2.33. Affix the electrical harness to the other electrical harness at tie point#1 with a tie wrap. See Figure 21.

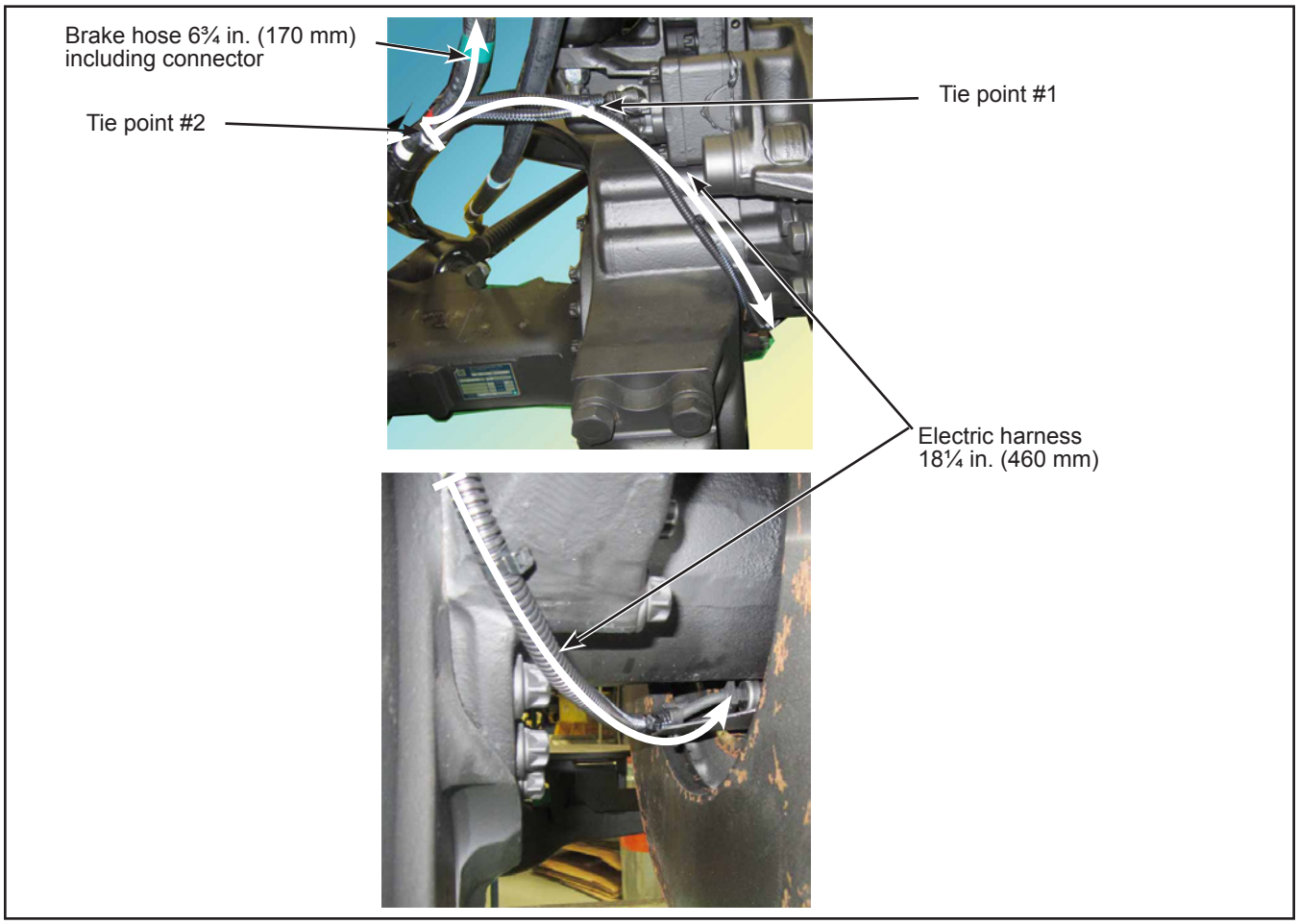

Figure 21 - Curb Side Electrical Harness Routing

2.34. Affix the electrical harness to the brake hose at tie point #2 with a tie wrap. If required, install additional tie wraps.

2.35. Lower the vehicle.

NOTE

With the aid of an assistant, ensure that there is no contact between the brake hoses and their surrounding components by fully turning the front wheels to the left and the right. During these maneuvers, ensure that the steering radius is sufficient and that the hoses do not collapse. Make sure the hoses are not strained by suspension travel. Correct if necessary, then repeat these verification steps until the desired outcome is achieved.

2.36. Verify that all bolts and nuts are well tightened.

2.37. The vehicle may be returned to service.❖