Change No. 1

MWO 9-2320-272-35-1
C1
HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 JANUARY 2007

MODIFICATION WORK ORDER
Modification of 5-TON
M939, M939A1, M939A2 SERIES FAMILY OF VEHICLES (FOV)
M939 BRAKE STABILIZATION PROGRAM
(Retrofit of Anti-lock Brake System (ABS) for M939 FOV)

MWO 9-2320-272-35-1, 01 February 2003, is changed as follows:

1. Remove old pages and insert new pages as indicated below.

2. New or changed material is indicated by a vertical bar in the margin of the page.

3. New or changed illustrations are indicated by a miniature pointing hand highlighting the change.

Remove Pages	Insert Pages
1-4	1-4

4. File this change sheet in the front of the MWO for reference purposes.

MWO 9-2320-272-35-1
C1

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0635505

Distribution:

DISTRIBUTION: To be distributed in accordance with initial distribution number (IDN) 381118, requirements for MWO 9-2320-272-35-1.

URGENT

MWO effective date is 1 November 1999 and completion date is 1 November 2008.

MWO 9-2320-272-35-1

MODIFICATION WORK ORDER

MODIFICATION OF 5-TON M939, M939A1, M939A2 SERIES FAMILY OF VEHICLES (FOV)

M939 BRAKE STABILIZATION PROGRAM
(Retrofit of Anti-lock Brake System (ABS) for M939 FOV)

NOMENCLATURE	NSN	EIC	NOMENCLATURE	NSN	EIC
Truck, Cargo, WO/W	2320-01-050-2084	BRY	Truck, Tractor, WO/W	2320-01-206-4077	BS2
Truck, Cargo, WO/W	2320-01-206-4087	BSS	Truck, Tractor, WO/W	2320-01-230-0302	BTP
Truck, Cargo, WO/W	2320-01-230-0307	BS7	Truck, Tractor, W/W	2320-01-047-8752	BTD
Truck, Cargo, W/W	2320-01-047-8769	BRT	Truck, Tractor, W/W	2320-01-205-2684	BS5
Truck, Cargo, W/W	2320-01-206-4088	BST	Truck, Tractor, W/W	2320-01-230-0303	BTQ
Truck, Cargo, WW	2320-01-230-0308	BS8	Truck, Van, Expansible	2320-01-047-8750	BTB
Truck, Cargo, WO/W	2320-01-047-8771	BRV	Truck, Van, Expansible	2320-01-205-2682	BS4
Truck, Cargo, WO/W	2320-01-206-4089	BSW	Truck, Van, Expansible	2320-01-230-0300	BTR
Truck, Cargo, WO/W	2320-01-230-0309	BS9	Truck, Medium Wrecker	2320-01-047-8754	BTF
Truck, Cargo, W/W	2320-01-047-8770	BRU	Truck, Medium Wrecker	2320-01-206-4078	BS6
Truck, Cargo, W/W	2320-01-206-4090	BSX	Truck, Medium Wrecker	2320-01-230-0304	BTT
Truck, Cargo, W/W	2320-01-230-0310	BTM	Truck, Chassis	2320-01-047-8745	
Truck, Dump, WO/W	2320-01-047-8756	BTH	Truck, Chassis	2320-01-230-0287	BTU
Truck, Dump, WO/W	2320-01-206-4079	BSY	Truck, Chassis	2320-01-205-2666	
Truck, Dump, WO/W	2320-01-230-0305	BTN	Truck, Chassis	2320-01-205-2667	BT6
Truck, Dump, W/W	2320-01-047-8755	BTG	Truck, Chassis	2320-01-230-0288	BTW
Truck, Dump, W/W	2320-01-206-4080	BSZ	Truck, Chassis	2320-01-050-4894	
Truck, Dump, W/W	2320-01-230-0306	BTD	Truck, Chassis	2320-01-205-2668	
Truck, Tractor, WO/W	2320-01-047-8753	BTE	Truck, Chassis	2320-01-230-3261	BTX

Headquarters, Department of the Army, Washington, D.C.
1 February 2003

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM." The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or E-mail your letter or DA Form 2028 direct to: AMSTA-LC-CI Tech Pubs, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The E-mail address is ROCK-TACOM-TECH-PUBS@conus.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

1. PURPOSE.

This modification is to improve operational safety of the vehicle by retrofit installation of Antilock Brake System (ABS).

2. PRIORITY.

This modification is classified as URGENT.

3. END ITEM TO BE MODIFIED.

NOTE

Some trucks modified to include the M939 Brake Stabilization Program kit early in the program were marked with MWO 9-2320-272-55-1 as shown in figure 69. These trucks already have the ABS applied, and do not require application of this MWO.

NOMENCLATURE	NSN	PART NO.	CAGEC	MODEL NO.
Truck, Dump, WO/Winch	2320-01-050-2084	8736986-2	19207	M923
	2320-01-206-4087	8750151	19207	M923A1
	2320-01-230-0307	8750177	19207	M923A2
Truck, Cargo, Dropsides, W/Winch	2320-01-047-8769	8736986-1	19207	M925
	2320-01-206-4688	8750152	19207	M925A1
	2320-01-230-0308	8750169	19207	M925A2
Truck, Cargo, XLong Wheelbase	2320-01-047-8771	8736987-2	19207	M927
WO/Winch	2320-01-206-4089	8750155	19207	M927A1
	2320-01-230-0309	8750181	19207	M927A2
Truck, Cargo, XLong Wheelbase	2320-01-047-8770	8736987-1	19207	M928
W/Winch	2320-01-206-4090	8750156	19207	M928A1
	2320-01-230-0310	8750182	19207	M928A2
Truck, Dump, WO/Winch	2320-01-047-8756	8736988-2	19207	M929
	2320-01-206-4079	8750157	19207	M929A1
	2320-01-230-0305	8750183	19207	M929A2
Truck, Dump, W/Winch	2320-01-047-8755	8736989-1	19207	M930
	2320-01-206-4080	8750158	19207	M930A1
	2320-01-230-0306	8750184	19207	M930A2
Truck, Tractor, WO/Winch	2320-01-047-8753	98736990-2	19207	M931
	2320-01-206-0477	8750159	19207	M931A1
	2320-01-230-0302	8750185	19207	M931A2
Truck, Tractor, W/Winch	2320-01-047-8752	8736990-1	19207	M932
	2320-01-205-2684	8750160	19207	M932A1
	2320-01-230-0303	8750186	19207	M932A2
Truck, Van, Expansible	2320-01-047-8750	8736992	19207	M934
	2320-01-205-2682	8750161	19207	M934A1
	2320-01-230-0300	8750187	19207	M934A2
Truck, Medium Wrecker	2320-01-206-4078	8750163	19207	M936A1
	2320-01-230-0304	8750189	19207	M936A2
Truck, Chassis	2320-01-047-8745			
	2320-01-205-2666			
	2320-01-230-0287			
Truck, Chassis	2320-01-205-2667			
	2320-01-230-0288			
Truck, Chassis	2320-01-050-4894			
	2320-01-205-2668			
	2320-01-230-3261			

4. MODULE(S) TO BE MODIFIED.

Not applicable.

5. PART(S) TO BE MODIFIED.

Not applicable.

6. APPLICATION.

a. Time Compliance Schedule: The effective date of this MWO is 1 November 1999 and its completion date is 1 November 2008.

b. The lowest level of maintenance authorized to apply the MWO is DS maintenance.

c. Personnel authorized to perform this modification shall be MOS 63B personnel only.

WARNING

This MWO supersedes MWO 9-2320-272-20-7. Do not apply MWO 9-2320-272-20-7 to any vehicle after this MWO has been installed. Failure to comply may result in injury to personnel.

d. No MWOs will be applied prior to or concurrently with the application of this MWO.

e. Work force and man-hour requirements for application of this MWO to a single unit, end item, or system are as follows:

REQUIREMENTS	
WORK FORCE/SKILLS	**MAN-HOURS**
One Wheeled Vehicle Mechanic (MOS 63B) or equivalent	
Total man-hours required for a single application of this MWO:	
M939 Basic	17 hrs.
M939 A1	10 hrs.
M939 A2	10 hrs.

7. TECHNICAL PUBLICATIONS AFFECTED/CHANGED AS A RESULT OF THIS MWO.

Technical Publication	Date
TM 9-2320-272-10 W/C1	August 1996
TM 9-2320-272-24	June 1998
TM 9-2320-272-24P	February 1999

a. Current TMs are to be superseded by an Interactive Electronic Technical Manual (IETM) which will contain the ABS maintenance and repair parts data.

b. Use the Brake Stabilization Program EIR Digest Article in the interim until the M939 IETM is released.

8. MWO KITS, PARTS, AND THEIR DISPOSITION.

a. The following kit is required to accomplish this modification. The security classification of this kit is unclassified. Shipping data for kits used on M939/A1, M939A2, M936/A1, M936A2, and M945 are: weight 2 lbs; the kit measures 15 in. x 13 in. x 14 in.; its volume is 2730 sq. in. Plus an air dryer kit. Shipping data for air dryer kit is: weight 24 lbs; the kit measures 10-1/2 in. x 10-1/2 in. x 19 in.; its volume is 2095 sq in.

b. Brake Stabilization Program Modification Kit Matrix of kit usage and kit component parts are listed below. The listing is used to inventory the kit for completeness.

ABS Kit Matrix of Kit Usage.

M939/A1	M939A2	M936/A1	M936A2	M945
(2530-01-K73-1319)	(2530-01-498-8318)	(2530-01-498-8306)	(2530-01-498-8126)	(2530-01-498-8331)
Kit 1	Kit 1	Kit 1	Kit 1	Kit 1
Kit 3	Kit 3	Kit 3	Kit 3	Kit 3
	Kit 4		Kit 4	
Kit 5		Kit 5		Kit 5
Kit 6B		Kit 6B		Kit 6B
	Kit 7		Kit 7	
	Kit 8			
Kit 9				Kit 9
		Kit 10		
			Kit 11	
Kit 12	Kit 12	Kit 12	Kit 12	Kit 12
Kit 13	Kit 13			Kit 13
		Kit 14	Kit 14	
Kit 15	Kit 15	Kit 15	Kit 15	Kit 15
Kit 16	Kit 16	Kit 16	Kit 16	Kit 16
Kit 17	Kit 17	Kit 17	Kit 17	Kit 17
Kit 19	Kit 19	Kit 19	Kit 19	Kit 19
Kit 20	Kit 20	Kit 20	Kit 20	Kit 20
Kit 21	Kit 21	Kit 21	Kit 21	Kit 21
	Kit 22		Kit 22	
Kit 23		Kit 23		Kit 23
Kit 25	Kit 25	Kit 25	Kit 25	Kit 25

DESCRIPTION (miscellaneous)	APPLICABLE MODELS
Air Dryer WHMB50011F (not painted) (NSN 4440-01-407-5135)	M939/A1/A2 and M945
Air Dryer WHMB50011G (painted) (MCN 4440-01-K73-1378)	M936/A1/A2
Support, Air Dryer MTG Plate WHMB300245AD	M939/A1/A2 and M945
Wire Ties WTS800UVBK 100	ALL
High Temp Hose WHRHTH 1-4-96”	M936/A1, M939/A1, and M945
High Temp Hose WHRHTH 1-2-29”	M939/A1
High Temp Hose WHRHTH 1-2-41”	M939A2
High Temp Hose WHRHTH 1-2-53”	M936/A1 and M945
High Temp Hose WHRHTH 1-2-75”	M936A2
Tubing 1/2” WPFT-8B-500 (24 feet)	ALL
Tubing 3/8” WPFT-6B-500 (35 feet)	ALL
Tubing 3/8” WPFT-6B-500 (6 feet)	ALL
Tubing 1/4” WPFT-4A-1000 (14 feet)	M936/A1
Tubing 1/4” WPFT-4A-1000 (11 feet)	M939/A1 and M945

Kit 1. KTABS-939SS – ABS Base Kit.

DESCRIPTION	PART NUMBER	QTY.
Inversion, Valve	WHMBN50002B	1
Valve, 2 Port Relay W/ECU	WHMB400211HB	1
Valve, 2 Port Relay	WHMB400211HA	1
Valve, LQ-2 or	PPS5007510	1
Front Limiting Valve w/Hardware	WCDFAPL-100	1
Bracket, Sensor	WHMB200817Z	2
Clip, Sensor	WHMB59512309	2
Exciter Ring	WHMB202010BC	2
Sensor, 2M Straight	WHMB364208011	2
Sensor Connector Latch (for 1/2" hose)	WHMB100469F	2
Loom	WHMB300561MB	1

Kit 3. ABS Harness Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Harness, Fusible, Straight	WEL10464	1
Harness, Fusible, Pigtail	WEL20516-A	1
Harness, Ground, Y	WEL20516-B	1
Grommet, Firewall	WHRCAN931-A12-23	1
Label, ABS Warning	WMS1007	1
Label, Triangle Warning	WMS1008	1
MWO Tag	WMWO-272-55-1	1
Light, Warning	WEL202023	1
Nut, Hex, Lock 5/16-24, Grade 5	WNHL5-16-24G5	1
Nut, Hex, "K" Lock #10-32	WNKL10-32	1
Nut, "K" Lock #6-32	WNKL6-32	2
Screw, Hex, 5/16-24 x 1, Grade 5	WSH5-16-24X100G5	1
Screw, Pan, Phillips #10-32 x 3/4	WSPP10-32X075	1
Screw, Pan, Phillips #6-32 x 3/4	WSPP6-32X075	2
Diagnostic Bracket	WHMB102008SP	1

Kit 4. Air Dryer Control Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Elbow, 1/4 Tube – 1/8 Male NPT w/VIBRA	WBPDVS149F-4-2	1
Adapter, 1/8 FEM Pipe – 1/8 Male w/VIBRA	WBPDVS222P-2-2	1
Union, 1/4 37 DEG X1/4 37 DEG	WBPD42F-4	1
Plug, 1/4 NPT Countersunk Hex (Brass)	WTFD1-4HHPBV	1

Kit 5. KTABS-939B/A1 and KTABS-936B/A1.

DESCRIPTION	PART NUMBER	QTY.
Elbow, 1/8 NPT to FEM 90 Degree Union	WBPD2200P-2-2	1
1/8 NPT Female x 1/4 Tube Female	WBPD66NTA-4-2	1
1/8 Hex Nipple, 1" Long	WBPDVS216P-2	1
Elbow, 1/8 NPT x 1/4 Tube 90 Degree	WBPDVS269NTA-4-2	1
Connector, 1/8 NPT x 1/4 SAE	WBPDVS48F-4-2	1
Plug, 1/8" Countersunk Hex Steel	WTFD1-8HHPSV	1

Kit 6B. Air Dryer Heater Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Harness, Air Dryer Heater	WEL20751	1
Nut, Hex, Lock 1/2 x 20 Grade C	WNHL1-2-20G8	1
Washer, Star 1/2 1.25 O.D.	WWS1-2X125	1

Kit 7. Air Dryer Heater Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Harness, Air Dryer Heater	WEL20750-B	1
Dummy Connector (male)	WEL7982907	1
Shell (male)	WEL8338561	1
Nut, Hex, Lock 1/2 x 20 Grade C	WNHL1-2-20G8	1
Washer, Star 1/2 1.25 O.D.	WWS1-2X125	1

Kit 8. Air Dryer Inlet Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Tee, 1/2 NPT Union	WBPD2203P-8	1
Elbow, 1/2 NPT Male x 1/2 45 Deg Fare	WBPDVS149F-8-8	1
Bushing, 1/2 NPT x 1/4 NPT Reducing	WBPDVS209P-8-4	1
Extender, 1/2 NPT x 1/2 M/F	WBPDVS222P-8-8	1
Connector, 1/2 to 3/4 Straight Tube Male	WBPDVS68AB-12-8	1
P-Clamp, 7/8-3/8 Mount, Loop, Neoprene	WCND7-8X3-8	2
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	2
Screw, Hex, 3/8-24 x 1.25 Grade 8	WSH3-8-24X125G8	2
Washer, Flat, 3/8	WWF3-8	4
Valve, 250 psi Safety	WHMBN1178DF	1

Kit 9. Air Dryer Inlet Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Tee, 1/2 NPT Union	WBPD2203P-8	1
Elbow, 1/2 NPT Male x 1/2 45 Deg Fare	WBPDVS149F-8-8	1
Bushing, 1/2 NPT x 1/4 NPT Reducing	WBPDVS209P-8-4	1
Extender, 1/2 NPT x 1/2 M/F	WBPDVS222P-8-8	1
Connector, 1/2 NPT x 1/2 Copper Tube	WBPDVS68AB-8-8	1
P-Clamp, 7/8-3/8 Mount, Loop, Neoprene	WCND7-8X3-8	1
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	1
Screw, Hex, 3/8-24 x 1.25 Grade 8	WSH3-8-24X125G8	1
Washer, Flat, 3/8	WWF3-8	2
Valve, 250 psi Safety	WHMBN1178DF	1

Kit 10. Air Dryer Inlet Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Tee, 1/2 NPT Union	WBPD2203P-8	1
Elbow, 1/2 NPT Male x 1/2 45 Deg Fare	WBPDVS149F-8-8	1
Bushing, 1/2 NPT x 1/4 NPT Reducing	WBPDVS209P-8-4	1
Extender, 1/2 NPT x 1/2 M/F	WBPDVS222P-8-8	1
Connector, 1/2 NPT x 1/2 Copper Tube	WBPDVS68AB-8-8	1
P-Clamp, 1/2 Copper x 3/8 Mount, Neoprene	WCND1-2X3-8	3
P-Clamp, 7/8-3/8 Mount, Loop, Neoprene	WCND7-8X3-8	2
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	3
Screw, Hex, 3/8-24 x 1.25 Grade 8	WSH3-8-24X125G8	2
Washer, Flat, 3/8	WWF3-8	4
Valve, 250 psi, Safety	WHMBN1178DF	1

Kit 11. Air Dryer Inlet Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Tee, 1/2 NPT Union	WBPD2203P-8	1
Elbow, 1/2 NPT Male x 1/2 45 Deg Fare	WBPDVS149F-8-8	1
Bushing, 1/2 NPT x 1/4 NPT Reducing	WBPDVS209P-8-4	1
Extender, 1/2 NPT x 1/2 M/F	WBPDVS222P-8-8	1
Connector, 1/2 to 3/4 Straight Tube Male	WBPDVS68AB-12-8	1
P-Clamp, 1/2 Copper x 3/8 Mount, Neoprene	WCND1-2X3/8	2
P-Clamp, 7/8-3/8 Mount, Loop, Neoprene	WCND7-8X3-8	4
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	4
Screw, Hex, 3/8-24 x 1.25 Grade 8	WSH3-8-24X125G8	3
Washer, Flat, 3/8	WWF3-8	6
Valve, 250 psi, Safety	WHMBN1178DF	1

Kit 12. Air Dryer Outlet Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Sleeve, 1/2	WBPD60NTA-8	1
Nut, 1/2 Compression	WBPD61NTA-8	1
Insert, 1/2 Tube	WBPD63NTA-8	1
Elbow, 1/2 NPT x 1/2 Tube 90 Deg, Body	WBPDVS269AB-8-8B	1
Connector, 1/2 NPT x 1/2 Tube Straight	WBPDVS68NTA-8-8	1

Kit 13. Air Dryer Support Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Nut, Hex, Lock, 3/8-24 Grade 8	WNHL3-8-24G8	7
Screw, Hex, 3/8-24 x 1.25 Grade 8	WSH3-8-24X125G8	7
Washer, Flat, 3/8	WWF3-8	14

Kit 14. Air Dryer Support Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	4
Screw, Hex, 3/8-24 x 1.50 Grade 8	WSH3-8-24X150G8	4
Washer, Flat, 3/8	WWF3-8	8

Kit 15. Doublecheck – Front Axle Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Tee, 3/8 NPT Cross	WBPD2205P-6	1
Union, 1/2	WBPD62NTA-8	1
Elbow, 3/8 NPT x 3/8, Tube 90 Deg	WBPDVS269NTA-6-6	3
Connector, 3/8 NPT x 1/2, Tube Straight	WBPDVS68NTA-8-6	1
Nut, Hex, Lock 5/16-24, Grade 5	WNHL5-16-24G5	1
Screw, Hex, 5/16-24 x 1, Grade 5	WSH5-16-24X100G5	1
Washer, Flat, 5/16	WWF5-16	1

Kit 16. Doublecheck – Inversion Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Elbow, 3/8 NPT 90 Deg Street	WBPDVS2202P-6-6	1
Elbow, 3/8 NPT x 1/2, Tube 90 Deg	WBPDVS269NTA-8-6	1
Tee, 3/8 NPT Male, For Tubing, Run	WBPDVS271NTA-6-6	1
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	1
Screw, Hex, 3/8-24 x 1.25 Grade 8	WSH3-8-24X125G8	1
Washer, Flat, 3/8	WWF3-8	1

Kit 17. Inversion Valve Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Elbow, 1/4 NPT x 3/8, Tube 90 Deg Male	WBPDVS269NTA-6-4	3
Elbow, 3/8 NPT x 3/8, Tube 90 Deg	WBPDVS269NTA-6-6	2
Connector, 1/4 NPT x 3/8, Tube Straight Male	WBPDVS68NTA-6-4	1
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	2
Screw, Hex, 3/8-24 x 1.25 Grade 8	WSH3-8-24X125G8	2
Washer, Flat, 3/8	WWF3-8	4

Kit 19. Primary Tank – Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Tee, 1/2 Male Branch	WBPDVS2224P-8	1
Elbow, 1/2 NPT x 1/2, Tube 90 Deg	WBPDVS269NTA-8-8	1
Connector, 1/2 NPT x 1/2, 45 Deg Male Steel	WTFD8-8FTXSV	1

Kit 20. Relay, Front – Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Tee, 3/8 Tube Union	WBPD264NTA-6	1
Sleeve, 1/2	WBPD60NTA-8	3
Nut, 1/2 Compression	WBPD61NTA-8	3
Insert, 1/2 Tube	WBPD63NTA-8	4
Elbow, 3/8 NPT x 3/8, Tube 90 Deg	WBPDVS269NTA-6-6	1
Elbow, 3/8 NPT x 1/2, Tube 90 Deg	WBPDVS269NTA-8-6	1
Elbow, 1/2 NPT x 1/2, Tube 90 Deg	WBPDVS269NTA-8-8	1
Plug, 1/2 Countersunk Hex (steel)	WTFD1-2HHPSV	1
Plug, 1/4 NPT, Countersunk Hex (brass)	WTFD1-4HHPBV	2
Elbow, 3/8 NPT x 90 Deg, 45 Deg - 8 Male	WTFD8CTXSV	1
Connector, 3/8 NPT x Straight, 45 Deg 8 Male	WTFD8FTXSV	1
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	2
Washer, Flat, 3/8	WWF3-8	2

Kit 21. Relay, Rear – Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Sleeve, 3/8 Compression	WBPD60NTA-6	1
Sleeve, 1/2 Compression	WBPD60NTA-8	3
Nut, 3/8 Compression	WBPD61NTA-6	1
Nut, 1/2 Compression	WBPD61NTA-8	3
Insert, 3/8 Tube	WBPD63NTA-6	1
Insert, 1/2 Tube	WBPD63NTA-8	4
Elbow, 3/8 NPT x 3/8 Tube 90 Deg	WBPDVS269NTA-6-6	1
Elbow, 3/8 NPT x 1/2, Tube 90 Deg	WBPDVS269NTA-8-6	1
Connector, 1/2 NPT x 1/2 Tube Straight	WBPDVS68NTA-8-8	1
Elbow, 3/8 NPT x 90 Deg, 45 Deg - 8 Male	WTFD8CTXSV	1
Connector, 1/2 NPT x 1/2 Tube Straight	WTFD8FTXSV	1
Nut, Hex, Lock 3/8-24 Grade 8	WNHL3-8-24G8	2
Washer, Flat, 3/8	WWF3-8	2
Union, Extender, 1/2 Tube x 1/2 Tube	WBPD62NTA-8	1

Kit 22. Sensor & Exciter – Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
P-Clamp, 5/16 x 9/16 Mount, Neoprene	WCND5-16X9-16	2
Grommet, Backing Plate	WHRC10105	2
Elbow, 1/2 x 1/2, 37 Deg Special	WTFD8C50X-S	2
Nut, Hex, Lock 9/16-18 Grade 8	WNHL9-16-18G8	4
Screw, 9/16-18 x 2.25, G8	WSH9-16-18X225G8	4
Washer, Flat, 9/16	WWF9-16	8

Kit 23. Sensor & Exciter – Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
P-Clamp, 5/16 x 9/16 Mount, Neoprene	WCND5-16X9-16	2
Grommet, Backing Plate	WHRC10105	2
Nut, Hex, Lock 9/16-18 Grade 8	WNHL9-16-18G8	4
Screw, Hex, 5/16-18 x 1/2, Grade 8	WSH5-16-18X050G8	10
Screw, 9/16-18 x 2.25, G8	WSH9-16-18X225G8	4
Washer, Flat, 9/16	WWF9-16	8
Washer, Lock 5/16	WWL5-16	10

Kit 25. Spring Brake – Doublecheck – Mounting Hardware.

DESCRIPTION	PART NUMBER	QTY.
Reducer, 1/2 NPT x 3/8 NPT	WBPDVS216P-8-6	1
Connector, 3/8 NPT x 3/8, Tube Straight	WBPDVS68NTA-6-6	1
Elbow, 1/2 NPT x 3/8, Tube 90 Deg	WBPDVS269NTA-6-8	1
Elbow, 3/8 NPT x 1/2, Tube 90 Deg	WBPDVS269NTA-8-6	1
Valve, Doublecheck	WHMBN20954A	1

c. Bulk and Expendable Material.

NOMENCLATURE	NSN	CAGEC	PART NO.	QTY
Screw, Drive		96906	MS21318-20	1
Tire, Pneumatic, Vehicle w/insert (M939 Basic vehicles only)	2610-01-473-3997	81348	X/GBX/GP3/TYRB/ CL0/0/11.00R20/H	11
Inner Tube, Pneumatic (M939 Basic vehicles only)	2610-00-029-0563	81348	GP2/11.00R20/ TR444/ONCENTER	11
Compound, Sealing	8030-01-025-1692	80244	24241	250cc
Lubricant, Molykote Paste		71984	CU7439	Qt.

d. Parts Disposition. All parts not reused during installation will be returned to stock for disposition in accordance with AR 725-50.

9. SPECIAL TOOLS; TOOL KITS; JIGS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND FIXTURES REQUIRED.

a. Special tool:

NOMENCLATURE	NSN	CAGEC	PART NO.
Haldex Info-Centre		C0UKB6	WHMB364317001

b. Hand tools necessary to apply MWO are contained in the following kit:

NOMENCLATURE	NSN	CAGEC	PART NO.	SUPPLY CATALOG
Tool Kit, General Mechanic's	5180-00-177-7033	50980		SC 5180-95-N26
Hole Saw Arbor w/1/4 in.		25795	4L535	
Hole Saw 1-1/2 in.		25795	4L495	
Step Bit 1/4-3/4 in.		53800	#9-MG44687	

c. Tools necessary to apply MWO are contained in following shop set:

NOMENCLATURE	NSN	CAGEC	SUPPLY CATALOG
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No. 1	4910-00-754-0654	19204	SC 4910-95-A74

10. MODIFICATION PROCEDURE.

NOTE

The Quality Assurance (QA) checklist in appendix A will be used as an in-progress checklist during the modification procedure and as a final checklist to ensure adequate QA provisions have been addressed.

a. Pre-Modification Vehicle Checks.

(1) Check voltage per TM 9-2320-272-24 (voltage must not exceed 31 volts).

(2) Verify operation of check valves by draining secondary reservoir.

(a) Primary reservoir pressure should NOT decrease when secondary reservoir is being drained, however a 10-15 psi decrease is allowable.

(b) If primary reservoir pressure does decrease along with secondary, inspect and clean or replace the primary reservoir one-way check valve as needed.

(3) Start engine and allow air pressure to build to normal operating pressure (TM 9-2320-272-10).

(4) Shut engine down (TM 9-2320-272-10).

(5) Verify operation of check valves by draining primary reservoir.

(a) Secondary reservoir pressure should NOT decrease as primary reservoir is being drained, however a 10-15 psi decrease is allowable.

(b) If secondary reservoir pressure does decrease along with primary, inspect and clean or replace the secondary reservoir one-way check valve as needed.

(6) Verify air lines at brake treadle valve are properly connected at front axle limiting valve.

(a) Charge the air system to normal operating pressure (TM 9-2320-272-10).

(b) Disconnect the existing upper green tube at the front axle limiting valve.

(c) Have an assistant depress and hold down the brake pedal.

(d) Listen for escaping air at the green tube, and check the primary air gauge for decreasing pressure.

(e) If secondary air gauge decreases, air line connections at the treadle valve are reversed and should be properly connected (TM 9-2320-272-24).

b. Vehicle Preparation.

CAUTION

Install/route all air lines with sufficient length so that they do not kink when permanently secured with wire ties. Install/route all electrical wires so they are not subject to damage during vehicle operation. Improperly installed/routed air lines may become kinked and electrical lines may wear prematurely, or become damaged, causing ABS system failure.

(1) Park vehicle in a suitable work area, cage rear-rear axle brakes, and place vehicle on six jackstands (M939) or two jackstands under rear-rear axle (M939A1/A2). (Refer to TM 9-2320-272-24.)

(2) Drain air system. (Refer to TM 9-2320-272-10.)

(3) Disconnect battery ground cables. (Refer to TM 9-2320-272-24.)

(4) Remove rear-rear axle left and right wheels and tires (M939A1/A2). (Refer to TM 9-2320-272-24.)

WARNING

Radial tires must be installed on all M939 basic models modified with ABS. Failure to comply may result in injury to personnel.

(5) Remove all wheels and tires (M939) from vehicle and replace tires with new radials. (Refer to TM 9-2320-272-24.)

(6) Remove rear-rear axle hub and drums. (Refer to TM 9-2320-272-24.)

(7) Remove dustshield from hub (M939/A1). (Refer to TM 9-2320-272-24.)

(8) Remove rear-rear axle brakeshoes. (Refer to TM 9-2320-272-24.)

NOTE

Perform step 9 for exciter ring installation on M939/A1 vehicles and step 10 for exciter ring installation on M939A2 vehicles. Apply loctite 242 to threads of screws (M939/A1) at installation.

(9) Clean mating surface area where dustshield was mounted on hub and install WHMB202010BC exciter ring, five WWL5-16 lockwashers, and WSH5-16-18X050G8 screws as shown in figure 1. Tighten screws 110-145 lb-in.

(10) Press every other wheel stud (5 total) out of hub approximately 0.125-in. to 0.250-in. Clear mating surface area around wheel studs and position WHMB202010BC exciter ring under heads of five existing wheel studs and turn clockwise as shown in figure 2. Press wheel studs down on exciter ring.

(11) Drill a 0.625-in. hole in upper forward lobe of brake adjusting slot as shown in figure 3 using a step drill or die grinder.

(12) Apply a thin coat of Molykote CU7439 or equivalent to bore of WHMB200817Z sensor mounting bracket as shown in figure 3. Align tabs and push WHMB59512309 sensor clip into rear of sensor mounting bracket (WHMB200817Z).

(13) Apply a thin coat of Molykote CU7439 or equivalent to sensor barrel and push sensor barrel into sensor clip (WHMB59512309) until shoulder of WHMB364208011 sensor contacts sensor clip tabs as shown in figure 3.

(14) Remove existing three nuts, screws, and six washers from brake spider plate as shown in figure 3.

(15) Position sensor cable in slot on sensor mounting bracket (WHMB200817Z) and route sensor cable along forward side of axle flange, flush against spider plate as shown in figure 3.

CAUTION

Make sure sensor cable is in slot before tightening screw.

(16) Install sensor mounting bracket (WHMB200817Z) on brake spider plate with two WWF9-16 washers, WSH9-16-18X225G8 screws, WWF9-16 washers, and WNHL9-16-18G8 locknuts as shown in figure 3. Tighten screws 110-145 lb-ft.

(17) Secure sensor cable to brake spider with WCND5-16X9-16 clamp, existing washer, screw, washer, and nut. Hold screw and clamp and tighten nut 110 lb-ft.

CAUTION

Verify that sensor cable doesn't contact moving brake components after installation.

(18) Route sensor cable through 0.625-in. hole in brake adjusting slot and install WHRC10105 grommet on sensor cable. Pull sensor cable tight and install grommet (WHRC10105) and sensor cable in brake adjusting slot as shown in figure 3.

CAUTION

Cap or plug all hoses, tubes, lines, connections, and openings immediately after disconnection to prevent contamination. Remove caps or plugs prior to installation. Failure to do so may result in damage to equipment.

NOTE

- Refer to table 3 for torque on tubing nuts.
- Perform steps 19 through 20 for M939A2 vehicles.

(19) Loosen tube nut and two CTIS bracket screws and move CTIS tube back away from elbow as shown in figure 4.

NOTE

Note position of elbow for installation.

(20) Loosen jamnut and remove existing elbow from CTIS flange as shown in figure 4.

(21) Install WTFD8C50X-S elbow on CTIS flange and connect tube to elbow as shown in figure 4. Tighten jamnut, tube nut, and two CTIS bracket screws. Tighten screws 110-140 lb-ft.

(22) Route sensor cable along side of brake chamber and secure with WTS800UVBK tiedown straps every six inches as shown in figure 5.

(23) Install rear-rear axle brakeshoes. (Refer to TM 9-2320-272-24.)

NOTE

Do not install axle shafts until after final check valves test is performed (para. 10.h).

(24) Install rear-rear axle drum and hub. (Refer to TM 9-2320-272-24.)

NOTE

Perform step 25 for M939A1/A2 vehicles only. Perform step 26 for M939 vehicles.

(25) Install rear-rear wheels and tires. (Refer to TM 9-2320-272-24.)

(26) Install all wheels and tires including spare. (Refer to TM 9-2320-272-24.)

NOTE

Doublecheck valve No. 2 is used for all vehicles except M931/M932 vehicles. Doublecheck valve No. 5 is used for M931/M932 vehicles.

(27) Remove doublecheck valve No. 2 (figure 6) or doublecheck valve No. 5 (figure 7) from frame rail. (Refer to TM 9-2320-272-24.) **Do not disconnect air lines at this time.**

(28) Remove two red tubes, elbow, and tee from doublecheck valve No. 2 as shown in figure 6, or doublecheck valve No. 5 (M931/M932) as shown in figure 7, and install WBPDVS269NTA-6-6 elbow as shown in figures 7 and 8.

NOTE

M928 models use existing screw for mounting valve.

(29) Install doublecheck valve No. 2 or doublecheck valve No. 5 (M931/M932) on frame rail with WSH5-16-24X100G5 screw, WWF5-16 washer, and WNHL5-16-24G-5 nut as shown in figure 7 or 8.

(30) Remove eight existing screws, washers, and cover from driver's side step box as shown in figure 9.

NOTE

Remove existing tiedown straps on air lines as necessary.

(31) Remove existing nut, screw, and clamp with air lines from step brace as shown in figure 9.

(32) Measure 1.50-in. in from outside edge and mark a line as shown in figure 10. Measure 6.00-in. up from bottom edge and mark a line across 1.50-in line. Drill 25/64-in. diameter hole in rear side wall of step box at line crossing.

(33) Temporarily mount WHMBN50002B inversion valve level on outside of step box with screw. Using valve mounting bracket as a template, drill 25/64-in. diameter hole through step box as shown in figure 10. Remove screw and inversion valve (WHMBN50002B) from step box.

CAUTION

Cap or plug all hoses, tubes, lines, connections, and openings immediately after disconnection to prevent contamination. Remove caps or plugs prior to installation. Failure to do so may result in damage to equipment.

(34) Install WBPDVS68NTA-6-4 connector in BAL port on inversion valve (WHMBN50002B) and three WBPDVS269NTA-6-4 elbows in control port, supply port, and delivery port, position elbows facing out the same as adapter as shown in figure 11.

(35) Disconnect existing tube from bottom elbow on doublecheck valve No. 4 and side elbow on doublecheck valve No. 3. Remove existing elbows from doublecheck valves No. 3 and No. 4 as shown in figure 12.

(36) Install inversion valve (WHMBN50002B) on inside of driver's step box with two WWF3-8 washers, WSH3-8-24X125G8 screws, WWF3-8 washers, and WNHL3-8-24G8 locknuts as shown in figure 13.

NOTE

Cut tubing length as required.

(37) Install WBPDVS269NTA-6-6 elbow on bottom of existing doublecheck valve No. 4 and connect WPFT-6B-500 tube to elbow with sleeve and nut. Route tube (WPFT-6B-500) over to supply port elbow on inversion valve (WHMN50002B) and connect with sleeve and nut as shown in figure 14.

(38) Install WBPDVS269NTA-6-6 elbow on side of existing doublecheck valve No. 3 and connect tube (WPFT-6B-500) to elbow with sleeve and nut. Route tube (WPFT-6B-500) over to delivery port elbow on inversion valve (WHMBN50002B) and connect with sleeve and nut as shown in figure 14.

(39) Remove nut, screw, and doublecheck valve No. 1. from driver's side frame rail as shown in figure 15. (Refer to TM 9-2320-272-24.)

(40) Remove all fittings from doublecheck valve No. 1 except 1/2-in. adapter as shown in figure 16. Shake valve and listen for unobstructed movement of shuttle inside valve, clean or replace if obstructed.

(41) Enlarge mounting hole on doublecheck valve No. 1 to 3/8 inch as shown in figure 16.

(42) Install WBPDVS2202P-6-6 elbow in outlet port of existing doublecheck valve No. 1. Install WBPDVS271NTA-6-6 tee on elbow WBPDVS2202P-6-6. Install WBPDVS269NTA-8-6 elbow on doublecheck valve No. 1 as shown in figure 16. This valve is now used as doublecheck valve No. 6.

NOTE

Perform step 43 for M939A2 vehicles. Perform step 44 for M939/A1 vehicles.

(43) Install doublecheck valve No. 6 on existing L-shaped bracket on driver's side frame rail just below cab with existing screw, washer, and nut as shown in figure 17.

(44) Remove rear nut and screw from front step brace bracket as shown in figure 18. Install doublecheck valve No. 6 to inside of driver's frame rail with existing screw, WWF3-8 washer, and WNHL3-8-24G8 locknut as shown in figure 18.

(45) Disconnect and remove red tube that was connected to tee on doublecheck valve No. 2 or 5 as shown in figure 6 or 7, and remove tube and adapter from secondary delivery foot valve hose at transition from red tube to hose. Route hose forward along frame rail to approximate location from where doublecheck valve No. 1 was removed as shown in figure 15.

(46) Install WBPDVS269NTA-6-6 elbow on top port on WBPD2205P-6 cross tee with elbow facing rear as shown in figure 19. Install WBPDVS269NTA-6-6 elbow on bottom port on cross tee (WBPD2905P-6) with elbow facing rear. Install WBPDVS68NTA-8-6 connector on cross tee (WBPD2205P-6) as shown in figure 19.

(47) Install hose from foot valve to open port on cross tee (WBPD2205P-6) at old doublecheck valve No. 1 location as shown in figure 20.

(48) Connect existing tube from front quick-release valve to adapter (WBPDVS68NTA-8-6) on cross tee (WBPD2205P-6) as shown in figure 20.

(49) Route WPFT-6B-500 tube from doublecheck valve No. 2 or doublecheck valve No. 5 (M931/M932) forward to cross tee (WBPD2205P-6) as shown in figures 7 or 8 and 20.

(50) Connect tube (WPFT-6B-500) to elbow (WBPDVS269NTA-6-6) on doublecheck valve No. 2 or doublecheck valve No. 5 (M931/M932) with sleeve and nut as shown in figure 7 or 8.

(51) Connect other end of tube (WPFT-6B-500) to top elbow (WBPDVS269NTA-6-6) on cross tee (WBPD2205P-6) with sleeve and nut as shown in figure 20.

(52) Install WPFT-6B-500 tube on BAL port connector on inversion valve (WHMBN50002B) with sleeve and nut as shown in figure 14. Route tube to doublecheck valve No. 6 as shown in figure 17 or 18. Connect tube to top of tee (WBPDVS271NTA-6-6) on doublecheck valve No. 6 as shown in figure 17 or 18.

(53) Install WPFT-6B-500 tube on control port elbow on inversion valve (WHMBN50002B) with sleeve and nut as shown in figure 14. Route tubing forward to cross tee (WBPD2205P-6) and connect to bottom elbow (WBPDVS269NTA-6-6) with sleeve and nut as shown in figure 20.

(54) Install existing cover on driver's step box with eight existing washers and screws as shown in figure 9.

(55) Route existing hose from old doublecheck valve No. 1 figure 15, back to doublecheck valve No. 6 as shown in figure 17 or 18.

(56) Connect existing hose to 1/2 in. adapter on doublecheck valve No. 6 as shown in figure 17 or 18.

(57) Route existing green tube from old doublecheck valve No. 1 (figure 15), to doublecheck valve No. 6 as shown in figure 17 or 18.

(58) Cut green tube to fit and connect to tee (WBPDVS271NTA-6-6) on doublecheck valve No. 6 with sleeve and nut as shown in figure 17 or 18.

(59) Install WBPD62NTA-8 union in right side glad hand tube as shown in figure 21.

(60) Install WPFT-8B-500 tube on union (WBPD62NTA-8) with sleeve and nut as shown in figure 21. Route tube towards rear to doublecheck valve No. 6 and connect to elbow (WBPDVS269NTA-8-6) with sleeve and nut as shown in figure 17 or 18.

WARNING

Do not apply MWO 9-2320-272-20-7 to any vehicle after this MWO has been installed. Failure to comply may result in injury to personnel.

(61) Remove two nuts, washers, screws, washers, and front limiting valve from bracket as shown in figure 22, or quick-release valve as shown in figure 23, if MWO 9-2320-272-20-7 was applied, remove four tubes from valve.

NOTE

Kit 1 will be supplied with either a LQ-2 valve or a front limiting valve as shown in figure 24.

(62) Connect four existing tubes to PPS5007510 LQ-2 or WCDFAPL-100 valve as shown in figure 24.

NOTE

It may be necessary to relocate valve or adjust tube lengths for installation.

(63) Install LQ-2 valve (PPS5007510) or front limiting valve (WCDFAPL-100) on existing bracket with two screws, washers, and nuts as shown in figure 24. Install WTS800UVBK tiedown straps as necessary as shown in figure 24.

(64) Locate existing union tee mounted on step brace on driver's side forward of fuel tank as shown in figure 25.

(65) Disconnect existing tube from 45° elbow on union tee and remove 45° elbow and bushing from union tee as shown in figure 25.

(66) Install WBPDVS216P-8-6 reducer and WHMBN20954A doublecheck valve No.7 in existing union tee as shown in figure 26. Tighten valve so that two inlet ports are vertical as shown in figure 26.

(67) Install WBPDVS269NTA-8-6 elbow in bottom port of doublecheck valve No. 7 with opening of elbow facing rearward as shown in figure 26.

(68) Install WBPDVS68NTA-6-6 connector in open port on doublecheck valve No. 7 as shown in figure 26.

(69) Connect existing tube to elbow (WBPDVS269NTA-8-6). Install WPFT-6B-500 6 ft tube in adapter (WBPD68NTA6-6) on doublecheck valve No. 7 with sleeve and nut as shown in figure 26.

(70) Remove existing red tube and fitting from lower secondary air tank tee as shown in figure 27.

(71) Install WBPDVS269NTA-6-8 elbow on tee at lower secondary air tank as shown in figure 28. Position elbow facing up.

(72) Route 6 ft tube (WPFT-6B-500) from doublecheck valve No. 7 (figure 26) over to lower secondary air tank and connect to elbow (WBPDVS269NTA-6-8) with sleeve and nut as shown in figure 28.

(73) Remove hose and elbow from upper primary air tank tee as shown in figure 29. Retain elbow for installation on M939/A1 vehicles except LWB and wrecker.

(74) Install WBPDVS224P-8 tee on upper primary air tank tee as shown in figure 30.

NOTE

- Perform step 75 for M939/A1 vehicles except LWB and wrecker. Perform step 76 for M939A2 vehicles, LWB, and wrecker.
- It may be necessary to relocate valve or adjust tube lengths for installation.

(75) Install WBPDVS269NTA-8-8 elbow and existing elbow (from step 74) on upper primary air tank tee (WBPDVS224P-8) as shown in figure 30.

(76) Install WBPDVS269NTA-8-8 elbow and WTFD8-8FTXSV connector on upper primary air tank tee (WBPDVS224P-8) as shown in figure 30.

(77) Remove front relay valve (figure 31), (refer to TM 9-2320-272-24). Install WTFD8CTXSV elbow in delivery port No. 2 on WHMB400211HB front relay valve w/ECU with elbow facing away from mounting bracket as shown in figure 32.

(78) Install WBPDVS269NTA-6-6 elbow in control port No. 4 on front relay valve w/ECU (WHMB400211HB) with elbow facing up as shown in figure 32.

(79) Install WBPDVS269NTA-8-8 elbow in supply port No. 1 on front relay valve w/ECU (WHMB400211HB) with elbow facing away from elbow (WBPDVS269NTA-8-6) as shown in figure 32.

(80) Install WTFD8FTXSV connector in other port No. 2 on front relay valve w/ECU (WHMB400211HB) as shown in figure 32.

(81) Install WBPDVS269NTA-6-6 elbow on control port No. 4 on WHMB400211HA rear relay valve with elbow facing up as shown in figure 33.

(82) Install WBPDVS68NTA-8-8 connector on supply port No. 1 on rear relay valve (WHMB400211HA) as shown in figure 33.

(83) Install WTFD8CTXSV elbow on delivery port No. 2 on rear relay valve (WHMB400211HA) with elbow facing the same as connector (WBPDVS68NTA-8-8) as shown in figure 33.

(84) Install WTFD8FTXSV connector on other delivery port No. 2 on rear relay valve (WHMB400211HA) as shown in figure 33.

(85) Install front relay valve w/ECU (WHMB400211HB) on existing bracket with two WWF3-8 washers and WNHL3-8-24G8 locknuts as shown in figure 34. Tighten locknuts 30-45 lb-ft.

NOTE

If necessary, shorten existing red supply tube and install with new sleeve and nut.

(86) Connect existing red supply tube to port No. 1 elbow on front relay valve w/ECU (WHMB400211HB) as shown in figure 34.

(87) Install existing hose from front rear axle manifold to port 2 elbow on front relay valve w/ECU (WHMB400211HB) as shown in figure 34.

(88) Install existing hose from manifold on frame rail to port 2 connector on front relay valve w/ECU (WHMB400211HB) as shown in figure 34.

(89) Locate existing green tube running along driver's side frame rail through crossmember to existing tee across from rear relay valve (WHMB400211HA). Cut tube approximately 3 inch forward of crossmember as shown in figure 35.

(90) Install WBPD264NTA-6 tee on existing green tubes with two sleeves and nuts as shown in figure 35.

(91) Install WPFT-6B-500 tube on tee (WBPD264NTA-6) with sleeve and nut and other end of tube in port No. 4 elbow on front relay valve w/ECU (WHMB400211HB) with sleeve and nut as shown in figures 35 and 34.

(92) Locate manifold on passenger side frame rail across from front relay valve. Remove two white vent tubes and fittings from manifold and install two WTFD1-4HHPBV plugs in manifold as shown in figure 36.

(93) Remove rear relay valve (figure 31). (Refer to TM 9-2320-272-24.)

(94) Install rear relay valve (WHMB400211HA) on existing bracket with two WWF3-8 washers and WNHL3-8-24G8 nuts as shown in figure 37. Tighten nuts 30-45 lb-ft.

(95) Extend green 1/2 in. tube supply line to port No.1 of ABS rear relay valve by splicing and adding a 20 in. length of WPFT-8B-500 new 1/2 in. tubing as shown in figure 37.

(a) Locate original 1/2 in. green tubing by tracing disconnected end from ABS rear relay valve through crossmember. Measure 4 in. forward of crossmember along 1/2 in. green tubing.

(b) Cut 1/2 in. green tubing at this point and discard.

(c) Connect WPFT-8B-500 new 20 in. length of tubing to existing 1/2 in. green tubing, using WBPD62NTA-8 (Kit 21) 1/2 in. union.

(d) Route WPFT-8B-500 new 20 in. length of tubing back through crossmember as originally routed.

(e) Install new WBPD63NTA-8 insert, WBPD61NTA-8 compression nut, and WBPD60NTA-8 sleeve on WPFT-8B-500 new 20 in. length of tubing.

(96) Connect WPFT-8B-500 new 20 in. length of tubing to connector on port No. 1 of rear relay valve (WHMB400211HA) as shown in figure 37.

(97) Connect existing hose from frame rail to elbow in port No. 2 of rear relay valve (WHMB400211HA) as shown in figure 37.

(98) Connect existing hose from rear-rear axle manifold to connector on port No. 2 of rear relay valve (WHMB400211HB) as shown in figure 37.

(99) Remove existing tube from adapter in tee on inside of driver's side frame rail as shown in figure 38.

(100) Route WPFT-6B-500 tube from existing adapter on tee to elbow on port No. 4 on rear relay valve (WHMB400211HA) and install on rear relay valve with sleeve and nut as shown in figures 38 and 37.

(101) Install other end of tube in adapter on tee with WBPD63NTA-6 insert, WBPD60NTA-6 sleeve, and WBPD61NTA-6 nut as shown in figure 38.

(102) Remove existing white tube and fitting from intake stack and install WTFD1-2HHPSV pipe plug in opening as shown in figure 39. Remove or cut tubing as necessary.

NOTE

Perform steps 103 through 107 for forward-rear axle.

(103) Remove existing 1/2-in. green tube from forward-rear drive axle manifold block and driver's side service brake chamber as shown in figure 40.

(104) Remove existing 1/2-in. orange tube from forward-rear drive axle manifold block and passenger side spring brake chamber as shown in figure 40.

NOTE

It may be necessary to remove insert from elbow for installation.

(105) Remove existing adapter from forward-rear drive axle manifold block (passenger side) as shown in figure 40, and install WBPDVS269NTA-8-6 elbow facing forward on manifold block as shown in figure 42.

(106) Install WPFT-8B-500 tube on elbow (WBPDVS269NTA-8-6) at forward-rear axle manifold block with sleeve and nut as shown in figure 42. Install other end of tube on driver's side service brake chamber with WBPD63NTA-8 insert, WBPD60NTA-8 sleeve, and WBPD61NTA-8 nut as shown in figures 41 and 43.

(107) Install WPFT-8B-500 tube on existing adapter at forward-rear axle manifold block (driver's side) with WBPD63NTA-8 insert, WBPD60NTA-8 sleeve, and WBPD61NTA-8 nut as shown in figure 42. Install other end of tube (WPFT-8B-500) on elbow at passenger side spring brake chamber with WBPD63NTA-8 insert, WBPD60NTA-8 sleeve, and WBPD61NTA-8 nut as shown in figures 41 and 43.

NOTE

Perform steps 108 through 112 for rear-rear axle.

(108) Remove existing 1/2-in. green tube from rear-rear axle manifold block and driver's side service brake chamber as shown in figure 44.

(109) Remove existing 1/2-in. orange tube from rear-rear axle manifold block and passenger side spring brake chamber as shown in figure 44.

NOTE

It may be necessary to remove insert from elbow for installation.

(110) Remove existing adapter from rear-rear axle manifold block (passenger side) as shown in figure 44, and install WBPDVS269NTA-8-6 elbow facing rear on manifold block as shown in figure 42.

(111) Install WPFT-8B-500 tube on elbow (WBPDVS269NTA-8-6) at rear-rear axle manifold block with sleeve and nut as shown in figure 42. Install other end of tube on driver's service brake chamber with WBPD63NTA-8 insert, WBPD60NTA-8 sleeve, and WBPD61NTA-8 nut as shown in figures 41 and 45.

(112) Install WPFT-8B-500 tube on existing adapter at rear-rear axle manifold block (driver's side) with WPBD63NTA-8 insert, WBPD60NTA-8 sleeve, and WBPD61NTA-8 nut as shown in figure 42. Install other end of tube (WPFT-8B-500) on elbow at passenger side spring brake chamber with WBPD63NTA-8 insert, WBPD60NTA-8 sleeve, and WBPD61NTA-8 nut as shown in figures 41 and 45.

NOTE

Perform steps 113 through 118 for M939/A1 only.

(113) Remove alcohol evaporator reservoir. (Refer to TM 9-2320-272-24.)

(114) Remove steel tubing between alcohol evaporator reservoir and air compressor intake manifold as shown in figure 46.

(115) Remove elbow from air compressor intake manifold and install WTFD1-8HHPSV plug in open port of air compressor intake manifold as shown in figure 46.

NOTE

Pipe plug may be located on top or front of governor.

(116) Remove hex pipe plug from unloader port between two mounting bolts on front side of governor mounted on firewall as shown in figure 47.

(117) Install WBPDVS216P-2 nipple in governor unloader port and WBPD2200P-2-2 elbow facing driver side on nipple. Install WBPDVS48F-4-2 connector on elbow (WBPD2200P-2-2) and connect WHRHTH-1-4-96 hose to connector as shown in figure 47.

(118) Route and secure hose (WHRHTH-1-4-96) with WTS800UVBK tiedown straps every 6-in. across firewall toward driver side until it reaches existing hoses from foot valve, route down to driver's side frame rail above transmission mount towards rear of vehicle.

(119) Remove air compressor discharge tube from wet tank to 1/2-in. tube union on crossmember. Remove existing screws and loop clamps supporting tubing to crossmember as shown in figure 48.

(120) Remove tube elbow from wet tank inlet port as shown in figure 48.

(121) Cut existing air compressor discharge tubing 12-inches in front of frame crossmember as shown in figure 49. Deburr open end of tubing and clean outside of tubing to allow for installation of new fitting.

(122) Install WBPDVS209P-8-4 reducing bushing and WBPDN1178DF 250 psi safety valve in top port of WBPD2203P-8 union tee as shown in figure 49.

NOTE

Perform step 123 for M939/A1 vehicles. Perform step 124 for M939A2 vehicles.

(123) Install WBPDVS68AB-8-8 connector on union tee (WBPD2203P-8) and connect existing tube to connector with sleeve and nut as shown in figure 49.

(124) Install WBPDVS68AB-12-8 connector on union tee (WBPD2203P-8) and connect existing tube to connector with sleeve and nut as shown in figure 49.

NOTE

Different vehicles will have different length of air dryer hoses.

(125) Install fixed end of new air dryer hose to union tee (WBPD2203P-8) as shown in figure 49. Route hose across crossmember to passenger side and secure with WCND7-8X3-8 clamp, WSH3-8-24X125G8 screw, two WWF3-8 washers, and WNHL3-824G8 locknut as shown in figure 49.

NOTE

Perform step 126 for M939/A1 vehicles. Perform step 127 for M939A2 vehicles.

(126) Install air dryer fittings as follows: control port – WBPDVS269NTA-4-2 elbow; inlet port – WBPDVS222P-8-8 extender and WBPDVS149F-8-8 elbow; outlet port – WBPDVS269AB-8-8B elbow as shown in figure 50.

(127) Install air dryer fittings as follows: control port – WBPDVS222P-2-2 adapter and WBPDVS149F-4-2 elbow; inlet port – WBPDVS222P-8-8 extender and WBPDVS149F-8-8 elbow; outlet port – WBPDVS269AB-8-8B elbow as shown in figure 50.

NOTE

Perform steps 128 and 129 for M939A2 vehicles.

(128) Remove air dryer. (Refer to TM 9-2320-272-24.)

(129) Remove heater harness wiring attached to passenger side frame rail up to Y-connector. (Refer to TM 9-2320-272-24.)

NOTE

Perform steps 130 through 132 for all vehicles except M936/A1/A2.

(130) Position WHMB300245AD air dryer mounting bracket on forward side of crossmember. Ensure that top of mounting bracket is 1/4-in. to 1/2-in. below top of crossmembers flat surface. Using air dryer mounting bracket as a template, locate, mark, and drill three 25/64-in. diameter holes in crossmember as shown in figure 51.

(131) Install mounting bracket (WHMB300245AD) on crossmember with three WSH3-8-24X125G8 screws, six WWF3-8 washers, and three WNHL3-8-24G8 locknuts as shown in figure 51. Tighten locknuts 30-45 lb-ft.

(132) Install WHMB50011F air dryer on air dryer mounting bracket with four WSH3-8-24X125G8 screws, eight WWF3-8 washers, and four WNHL3-8-24G8 locknuts as shown in figure 52. Ensure inlet port is facing towards passenger side frame rail. Tighten locknuts 30-45 lb-ft.

NOTE

Perform steps 133 and 134 for M936/A1/A2 vehicles.

(133) Position WHMB50011G air dryer on outside passenger side frame rail as shown in figure 53. Locate, mark, and drill four 25/64-in. diameter holes in frame rail as shown in figure 54.

(134) Install air dryer (WHMB50011G) on passenger side frame rail with four WSH3-8-24X150G8 screws, eight WWF3-8 washers, and four WNHL3-8-24G8 locknuts as shown in figure 53. Tighten locknuts 30-45 lb ft.

(135) Install WBPDVS68NTA-8-8 connector in inlet port on wet tank fitting as shown in figure 55.

(136) Install WPFT-8B-500 tube on air dryer outlet port elbow and inlet port connector on wet tank with two sleeves and nuts as shown in figures 53 and 55.

(137) Route and install new air dryer hose on inlet port elbow at air dryer as shown in figure 53 or 55.

NOTE

Perform steps 138 and 139 for M939/A1 vehicles.

(138) Install WPFT-4A-1000 tube on air dryer control port elbow with sleeve and nut as shown in figures 53 and 55.

(139) Route tube (WPFT-4A-1000) from air dryer control port, back through crossmember to driver's side frame rail, along frame rail until it reaches hose (WHRHTH-1-4-96) installed on governor (figure 47). Install WBPD66NTA-4-2 connector and tube (WPFT-4A-1000) on hose (WHRHTH-1-4-96) with sleeve and nut as shown in figure 47.

NOTE

Perform steps 140 through 143 for M939A2 vehicles.

(140) Remove existing control port hoses from tee on expello valve at wet tank as shown in figure 56.

(141) Remove expello valve from wet tank tee and install WTFD1-4HHPBV plug in wet tank tee as shown in figure 56.

(142) Connect existing control port hoses together using WBPD42F-4 union as shown in figure 56.

(143) Install existing control port hose on air dryer control port elbow as shown in figures 53 and 55.

NOTE

Perform step 144 for M936/A1/A2 vehicles.

(144) Install tube and air dryer hose on rear lower leg of wet tank support U-bolt with WCND1-2X3-8 clamp, WCND7-8X3-8 clamp, WWF3-8 washer, and WNHL3-8-24G8 locknut as shown in figure 53.

(145) Locate, mark, and drill 1.500-in. diameter hole in firewall above upper mounting bolt for vehicle power control box in engine compartment as shown in figure 57. Remove burrs from hole.

NOTE

When attaching loom connector to ECU, ensure both sides of the connector "Click" onto the ECU. When properly seated, the loom connector will not move.

(146) Attach WHMB300561MB loom to ECU. Connector is keyed so that it can only attach in one direction. Push connector on ECU with even force so that both clips on sides click simultaneously when seating connector onto ECU. Secure connection by closing spring clip and latching attached clasp over harness connector as shown in figures 34 and 58.

(147) Route harness sensor cables labeled 2A blue and 2B yellow through crossmembers to rear-rear axle manifold as shown in figure 58.

(148) Route cable with yellow tag labeled valve through crossmembers to rear relay valve and connect to valve as shown in figure 58.

(149) Route two wheel speed sensor cables from rear-rear axle along brake hoses to rear-rear axle manifold. Attach sensor cables to brake hoses with WTS800UVBK tiedown straps every 6-in. Connect driver side wheel speed sensor cable to harness sensor cable labeled 2A. Connect passenger side wheel speed sensor cable to harness sensor cable labeled 2B. Install WHMB100469F sensor connector latch at each sensor connection point and secure sensor cables to nearest brake hose as shown in figure 59.

(150) Connect cable with blue tag labeled valve to forward relay valve as shown in figure 58.

(151) Route harness power cable and diagnostic cable forward along passenger side frame rail (figure 58) through crossmembers, avoiding sharp edges or moving parts. Secure cables with WTS800UVBK tiedown straps every 6-in. Once near primary manifold, follow primary foot valve hose to foot valve. Feed cables up along firewall and pass diagnostic cable first and then power cable through hole in firewall as shown in figure 60.

(152) Remove cap from existing auxiliary power lead No. 10 on firewall. Attach WEL10464 fusible straight harness (15 amp) connector to power lead No. 10 and route other end and fuse holder through hole in firewall as shown in figure 60.

(153) Remove lower mounting bolt and washer from control box on firewall. Place ring terminal from WEL20516-B ground Y-harness onto bolt and install washer and bolt into control box on firewall. Route other end of ground Y-harness through hole in firewall as shown in figure 60.

(154) Place WHRCAN931-A12-23 grommet around cables and insert grommet into hole in firewall as shown in figure 61.

(155) Install WHMB102008SP diagnostic connector mounting bracket on brace under dash on passenger side next to STE/ICE-R connector in existing hole with WSPP10-32X75 screw and WNKL10-32 locknut as shown in figure 61.

(156) Using mounting bracket as a template, mark and drill 21/64-in. diameter hole in brace as shown in figure 61.

(157) Secure mounting bracket to brace with WSH5-16-24X100G5 screw and WNH5-16-24G5 locknut in hole drilled in step 156 as shown in figure 61.

(158) Route diagnostic cable connector under dash over to passenger side and secure with WTS800UVBK tiedown straps as shown in figure 61.

(159) Remove diagnostic connector cap, mounting nut, and cap retainer from connector and install connector on diagnostic bracket with cap retainer and mounting nut. Install cap on connector as shown in figure 61.

(160) Locate, mark, and drill a 13/32-in. diameter hole in gauge panel as shown in figure 62. Using WMS1007 ABS warning label as a template, drill two 9/64-in. diameter holes in gauge panel as shown in figures 62 and 63.

(161) Insert WEL202023 warning light into hole from back side of gauge panel and place ABS warning label (WMS1007) over light and align holes as shown in figure 63.

(162) Install two WSPP6-32X075 screws through label and light assembly and secure with WNKL6-32 locknuts as shown in figure 63.

NOTE

It may be necessary to remove starter switch to gain access to lead.

(163) Remove existing lead No. 54 at position R from starter switch and install female end (labeled R) of WEL20516-A fusible pigtail harness (3 amp) connector. Attach existing lead No. 54 to fusible pigtail harness lead No. 54 as shown in figures 64 and 65.

(164) Attach red lead conductor of power cable to fusible straight harness (15 amp) (WEL10464) connector as shown in figure 65.

(165) Attach white lead conductor of power cable to female connector on ground Y-harness connector as shown in figure 65.

(166) Attach lamp/relay lead No. 3 to remaining connector on ground Y-harness as shown in figure 65.

(166) Attach lamp/relay lead No. 1 to black lead connector of power cable as shown in figure 65.

(167) Attach lamp/relay lead No. 2 to purple lead connector of power cable as shown in figure 65.

(169) Attach lamp/relay lead No. 4 to connector on fusible pigtail harness (3 amp) connector as shown in figure 65.

(170) Attach remaining fusible pigtail harness (3 amp) connector to yellow lead connector of power cable as shown in figure 65.

(171) Secure all wiring with WTS800UVBK tiedown straps as required under dash.

NOTE

Perform steps 172 through 175 for M939/A1 vehicles.

(172) Remove nut from bolt on passenger side frame rail beside air dryer as shown in figure 66.

(173) Install ground lead from WEL20751 air dryer harness on passenger side frame rail bolt with WWS1-2X125 star washer and WNHL1-2-20G8 locknut as shown in figure 66.

(174) Connect power lead connector on air dryer harness to 28-volt heater connector on air dryer as shown in figure 66.

NOTE

Circuit lead 587 is located at front of vehicle above and around engine starter.

(175) Route positive lead of air dryer harness to front of vehicle. Remove existing plug from lead 587 and connect positive lead connector from air dryer harness to lead 587 as shown in figure 66.

NOTE

Perform steps 176 through 179 for M939A2 vehicles.

(176) Remove nut from bolt on from passenger side frame rail beside air dryer as shown in figure 67.

(177) Install ground lead of WEL20750-B air dryer harness on passenger side frame rail bolt with WWS1-2X125 star washer and WNHL1-2-20-G8 locknut as shown in figure 67.

(178) Install power lead connector on air dryer harness to 28-volt heater connector on air dryer and other end of harness positive lead to existing Y-connector on passenger side frame rail as shown in figure 67.

(179) Install WEL7982907 dummy connector in WEL8338561 shell and install shell in opening on Y-connector at passenger side frame rail as shown in figure 67.

(180) Secure all tubing (figure 68) and wiring with WTS800UVBK tiedown straps every 6 to 8 in.

(181) Connect battery ground cables. (Refer to TM 9-2320-272-24.)

c. Preliminary Inspection and Test

(1) Connect battery ground cables (TM 9-2320-272-24).

(2) Connect Haldex Info-Centre diagnostic tool to diagnostic connector located inside cab on passenger side according to tool instructions.

(3) Start engine and charge air system to normal operating pressure (TM 9-2320-272-10).

(4) Ensure both primary and secondary reservoirs are filled.

(5) Listen for air dryer to purge at compressor cut-out.

(6) Shut engine down (TM 9-2320-272-10).

(7) Listen for leaks at reservoirs and throughout all air system plumbing. Soap solution is recommended to check integrity of fittings. Tighten or repair any leaks.

d. Parking Brake Operational Test

(1) Release parking brakes (TM 9-2320-272-10).

(2) Visually check spring brake chambers to ensure parking brake spring is being compressed inside brake chamber when parking brakes are released (remove spring brake dust cover to allow visual access). One person needs to watch brake chamber while a second person releases parking brake.

(3) Reapply parking brakes (TM 9-2320-272-10). Verify exhausting air is heard at vent stack.

e. Delivery Air and ABS Test

(1) Release parking brakes (TM 9-2320-272-10).

(2) Apply full brake pressure and listen for delivery air leaks (monitor dashboard pressure gauges – pressure drop should not exceed 5 psi per minute).

(3) With full brake pressure still applied, turn battery switch to ON position and starter switch to RUN position.

(4) Listen for two ABS relay valves to Blow-Down (a quick exhaust of control air through valve exhaust port) front valve should blow-down first, followed by rear valve.

(5) Verify ABS indicator lamp in dashboard turns ON for approximately two seconds, then turns OFF during valve blow-down cycle.

(6) Verify display on Haldex Info-Centre briefly shown C1 then changes to a steady 07 (the 07 indicates system is OK and stationary). If lamp does not illuminate, remains on or a code other than 07 appears, refer to Diagnostic and Troubleshooting (step j).

f. ABS Sensor Checks

(1) Turn battery switch to ON position and starter switch to RUN.

NOTE

The Haldex Info-Centre may also “lock” sensor check display by pressing on right hand button on face of Haldex Info-Centre. The display will show “WHL” to left. You may then spin wheel and display will show “S2B” to indicate this sensor is sensing wheel motion. This feature allows one person to perform this test unassisted.

(2) Verify passenger side sensor is properly connected and positioned by rotating passenger side hub and wheel at a rate of approximately 1 revolution every 2 seconds. The Haldex Info-Centre should display “S2B” while wheel is turning.

NOTE

The Haldex Info-Centre may also “lock” sensor check display by pressing on right hand button on face of Haldex Info-Centre. The display will show “WHL” to left. You may then spin wheel and display will show “S2A” to indicate this sensor is sensing wheel motion. This feature allows one person to perform this test unassisted.

(3) Verify driver side sensor is properly connected and positioned by rotating driver side hub or wheel at rate of approximately 1 revolution every 2 seconds. The Haldex Info-Centre should display “S2A” while wheel is turning.

g. Air Dryer Electrical Check

Turn battery switch to ON position and starter switch to RUN position. Disconnect air dryer harness connector and check voltage between two pins in vehicle harness connector. The voltage should be approximately 24-volts.

h. Check Valves Test

(1) Verify operation of check valves by draining secondary reservoir.

(a) Primary reservoir pressure should NOT decrease when secondary reservoir is being drained, however a 10-15 psi decrease is allowable.

(b) If primary reservoir pressure does decrease along with secondary, inspect and clean or replace the primary reservoir one-way check valve or doublecheck valve No. 7 as needed.

(2) Start engine and allow air pressure to build to normal operating pressure (TM 9-2320-272-10).

(3) Shut engine down (TM 9-2320-272-10.)

(4) Verify operation of check valves by draining primary reservoir.

(a) Secondary reservoir pressure should NOT decrease as primary reservoir is being drained, however a 10-15 psi decrease is allowable.

(b) If secondary reservoir pressure does decrease along with primary, inspect and clean or replace the secondary reservoir one-way check valve or doublecheck valve No. 7 as needed.

(5) While rotating rear wheels, validate inversion valve operation by verifying spring brakes engage when brake pedal is depressed. With primary air tank drained, spring brake dust cover removed for visual access, and spring brake override disengaged, diaphragm in spring brake chamber should compress and release as foot valve is operated (TM 9-2320-272-10).

(6) Install rear-rear axle shafts (TM 9-2320-272-24).

NOTE

Ensure all inspections, except inspection “l”, on the Quality Assurance Checklist (appendix A) are performed prior to performing step 7.

(7) Raise vehicle, remove jackstands, and lower vehicle to ground (TM 9-2320-272-24).

i. Road Test

(1) With Haldex Info-Centre still connected to diagnostic connector, drive vehicle above 6 miles per hour.

(a) The ABS indicator lamp should remain OFF.

(b) The Haldex Info-Centre display code should change from 07 to 00 and sensor indicator bars on each side of -00- should be displayed.

(2) Make one quick, hard stop from 25 miles per hour or less to initiate ABS.

(a) Verify ABS indicator lamp remains OFF. If lamp illuminates or codes other than 07 are displayed, refer to diagnostics and troubleshooting (step j) to correct problem.

(b) If no fault codes appear and ABS indicator lamp remains OFF, antilock brake system is operating properly.

(c) If there are fault codes on Haldex Info-Centre display and ABS indicator lamp turns ON, there is a problem in ABS which must be diagnosed using troubleshooting procedures in step j and diagnostic fault codes table 1.

(d) If ABS functions properly at 25 mph and conditions allow for higher speed driving, repeat test stop at 40 mph. Verify that the rear wheels modulate and do not lock-up. Additional test stops at higher speeds may be performed at discretion of driver.

j. Antilock Brake System (ABS) Electronic Diagnostic Troubleshooting

(1) General.

(a) The Antilock Brake System (ABS) is designed to prevent rear wheel lockup by automatically regulating brake pressure on rear wheels, as needed, for maximum adhesion. The ABS improves handling and controllability during emergency stops and normal braking in rain, snow, ice, or sand.

(b) The ABS consists of two wheel-end tone rings and wheel speed sensors located on the rear-rear axle hubs, two modulator valves, and an Electronic Control Unit (ECU). The ABS system interfaces with the vehicles electrical and pneumatic systems. The controlling unit of the entire system is the ECU. The ECU receives signals from the wheel speed sensors and instructs the appropriate modulator valves to adjust brake pressure as necessary.

(2) This paragraph contains troubleshooting information and tests for locating and correcting malfunctions which may develop in the ABS system.

(3) The troubleshooting guide is used to keep the vehicle operating and trouble-free as much as possible in the quickest, easiest way.

(4) The following is a list of definitions used in the troubleshooting procedures.

(a) Clear Mode – Clears faults from memory of the ECU.

(b) Electronic Control Unit (ECU) – Receives signals from wheel sensors on rear-rear axle hubs and activates the appropriate response.

(c) Fault – A malfunction detected and/or stored in the memory of the ECU.

(d) Active Fault – A condition that currently exists in the system, even when battery switch has been turned OFF, then ON, and vehicle driven in excess of 5 mph. The ABS warning lamp will come on and remain on. Active faults must be repaired before they can be cleared from ECU memory.

(e) Stored Fault – An active fault that has not been cleared from ECU memory, or intermittent fault that has occurred, but no longer exists. The ABS warning lamp will come ON and stay ON after vehicle has been driven in excess of 5 mph and go off after battery switch has been turned OFF.

(5) Disconnect power from ABS system by placing battery switch and starter switch in the OFF position and disconnecting battery ground cable before testing for shorted or open leads or making any repairs.

(6) Most ABS problems are related to:

(a) Cut, corroded or abraded leads.

(b) Corroded connectors or terminals.

(c) Connectors not latched or seated correctly to mating connectors.

(7) After making any repairs, connect diagnostic tester and refer to Diagnostic Fault Codes table 1.

(8) Diagnostic Code Descriptions.

(a) Code 00, 07, 8.8, and C1. Indicates that the system is working. Diagnostic tester will indicate 00 with vehicle moving and 07 when vehicle is stationary indicating that there are no active faults. Code 8.8 is a self diagnostic test. Code C1 indicates that the ABS is a 2S/2M system (two sensors with modulator valves).

(b) Code 03 or 04. Indicates that a wheel sensor or wheel sensor lead has a short or open circuit. Disconnect wheel sensor lead from wiring harness lead and measure the resistance between the two pins of wheel sensor lead. The ohmmeter reading should be between 980 and 2350 Ohms. Replace wheel sensor if not within limits. To check wiring harness lead, disconnect ABS main wiring harness connector from ECU and check for short or open circuit between sensor lead pins 1 and 10 (table 2) for 2A right rear wheel wheel sensor and pins 2 and 11 for 2B left rear wheel sensor. Also check for damaged connector pins. Replace or repair as necessary.

NOTE

If the gap on both sensors is too great, you may not show a fault. The ECU will think the vehicle is not moving and you will not have ABS brakes.

(c) Codes 13 or 14. Occurs when vehicle is moving and indicates that the wheel sensor output is insufficient for a moving vehicle. The most likely reason for this code is that the gap between wheel sensor and tone ring is too great. Lift and support rear-rear axle wheels, disconnect wheel sensor leads and connect a AC meter to right or left wheel sensor leads. Measure AC voltage while rotating wheel at a rate of one revolution every two seconds. The output voltage should be at least 200 millivolts. If less than limit, try pushing wheel sensor in until sensor connects tone ring and recheck voltage. If voltage is not within limit, replace wheel sensor.

(d) Codes 23 or 24. Occurs when vehicle is moving and indicates that there is an intermittent loss of sensor signal. This type of fault is often difficult to diagnose. The most likely causes include:
— Dragging brake
— Pinched or kinked air delivery hose
— Defective modulator valve or failed primary air system
Check brakes to ensure that they release completely and look for visual external damage to delivery hoses or delivery tubes. Check exhaust ports of ABS valves for obstruction. Repair or replace defective hardware as necessary.

(e) Code 62, 63, 68, or 69. Indicates that a solenoid or its cable has an open circuit internally. The most likely causes include bad solenoid or loose solenoid connection. Disconnect the appropriate solenoid connector and check resistance at the solenoid pins. Check for 30-36 Ohms between bottom pins. Check for 15-18 Ohms between either bottom pin and the top pin. Check the female terminals on the connector for excessive pin spread or corrosion. Replace defective solenoid or connector as required. Additional possible causes are a bad solenoid cable, ABS main wiring harness connector not completely latched into the ECU, or a damaged harness pin. Attach the solenoid cable (table 2) to solenoid. Remove main wiring harness connector from ECU and check the resistance between pins 3 and 13, 3 and 23, and 13 and 23 for forward (BLUE) valve cable or between 4 and 14, 4 and 24, and 14 and 24 for rear (YELLOW) valve cable (table 2). The resistance should be approximately 32 Ohms between pins 3 and 13 and 4 and 14 and resistance should be approximately 16 Ohms between pins 3 and 23, 13 and 23, 4 and 24, and 14 and 24 (table 2). Replace ECU or ABS main wiring harness as necessary.

(f) Codes 72, 73, 78, and 79. Indicate that a solenoid or its cable has a short to ground. The most likely cause is a damaged cable or solenoid. To check this, remove ABS main wiring harness connector from ECU and check for continuity between pins 3, 13, and 23 for (BLUE) forward valve cable and 4, 14, and 24 for (YELLOW) rear valve cable and vehicle B+, with battery and starter switches in the ON or RUN position. If resistance is less than 10MΩ in any test, move battery and starter switches to the OFF position. Repair or replace ABS main wiring harness connector or defective ECU.

(g) Code 82 or 83. Indicates that hold solenoid circuit has a fault, in blue channel (82) or yellow channel (83). The most likely cause is a damaged solenoid cable, solenoid, or ECU.

(h) Code 88 or 89. Indicates that lamp solenoid circuit has a fault in blue channel (88) or yellow channel (89). The most likely cause is a damaged solenoid cable, solenoid, or ECU.

(i) Code 90. Indicates that ABS voltage is below 21 volts. The most likely causes include, damaged, or corroded lead terminals, blown 3 amp fuse, or a splice in the ABS power supply circuit. Check ground, 3 AMP fuse connections, and ABS power supply connections. If power is coming from somewhere other than the vehicle electrical system, make sure the test battery is fully charged or the voltage converter has adequate voltage (21.0 to 33.0 volts) and current capacity (11 amp). DO NOT USE A BATTERY CHARGER.

(j) Code 91. Indicates no power to RED cable. Check 15 amp fuse.

(k) Code 92. Indicates that the ABS power supply voltage is above 33.1 volts. The most suspect cause is a malfunctioning voltage regulator. Repair or replace as necessary.

(l) Code 80, 93, E0-E9, or EA-EF. Indicates that the ECU is likely defective. Replace ECU and recheck.

(m) Code CA or CC.
— A CA code is an invitation to clear all faults stored in history.

NOTE

Stored moving sensor faults will not be erased from memory until the vehicle is driven above 6 mph.

— A CC code will be displayed during the third consecutive time that a clear all is attempted. This is an invitation to clear configuration and should be avoided. If a CC is displayed, power down the system and then power up the system.

11. CALIBRATION REQUIREMENTS.

The installer shall establish processes to ensure that monitoring and measurement devices are consistent with the following requirements.

a. Measuring equipment shall:

(1) Be calibrated or verified at specific intervals, or prior to use, against measurement standards traceable to international or national measurement standards. When no such standards exist, the basis for calibration or verification shall be recorded.

(2) Be adjusted or readjusted as necessary.

(3) Be identified to enable the calibration status to be determined.

(4) Be safeguarded from adjustments that would invalidate the measurement result.

(5) Be protected from damage and deterioration during handling, maintenance and storage.

b. In addition, the installer shall assess and record the validity of the previous measuring results when the equipment is found not to conform to the established requirements. You shall take appropriate action on the equipment and any product affected. Records of the results of calibration and verification shall be maintained.

12. WEIGHT AND BALANCE DATA.

Weight and balance are not significantly affected by this MWO.

13. QUALITY ASSURANCE REQUIREMENTS.

a. General. The following information is supplied to ensure the proper application of this modification and provide clarification in regard to the adequacy of installer's inspection methods and procedures applicable to Quality Assurance (QA). The procedures include, but are not limited to, installer responsibilities, government verification, and in-process and workmanship inspections. Inspections shall be in accordance with TM 750-245-4.

b. Installer Responsibilities. The installer is responsible for compliance with quality assurance requirements specified herein. These requirements and the installer's plan of inspection, or quality program, constitute the minimum examinations and tests necessary to assure compliance with established requirements. Requirements contained in the MWO shall be included in the installer's inspection plan or quality program. Specific installer responsibilities for this MWO, for installation of the M939 Brake Stabilization Program Kit, and for follow-on tasks IAW MWO 9-2320-272-35-1. Installer is responsible for notifying the Government representative if kit was received incomplete or received in open or damaged packaging material. The installer is responsible for quality workmanship.

c. In-process Inspection. During the application operation, paragraph 10, Modification Procedures will be used to check the installer's work. If ABS fails to operate properly after the MWO is applied, troubleshoot IAW paragraph 10.j of this document. The installer will correct all defects before the vehicle is placed in service. All vehicles modified during a production shift will be checked to ensure product quality.

d. Workmanship Inspection. Inspect components removed, installed or replaced during the modification for security of mounting.

14. RECORDING AND REPORTING OF THE MODIFICATION.

a. Records and report forms. Refer to DA PAM 738-750, DA PAM 738-751, and TM 9-110-803-15.

b. Quality Assurance Checklist. Complete FORM TRK 1204 Rev A, 20 Feb 02 (Appendix A) for each vehicle and submit by mail to Premier Professional Systems Inc., 37800 Van Dyke Ave., Sterling Heights, Michigan 48312.

NOTE

Some vehicles modified to include the M939 Brake Stabilization Program Kit early in the program were marked with "MWO 9-2320-272-55-1." These vehicles already have the ABS applied, and do not require application of this MWO.

c. Marking Equipment.

(1) After M939 Brake Stabilization Program Kit is installed, mark MWO number "MWO 9-2320-272-35-1" in the MWO applied block if not marked, and date in date block on WMWO 9-2320-272-35-1 tag as shown in figure 69.

(2) Install MWO tag by drilling a 0.104-inch diameter hole (#37 drill) in cab body reinforcement panel and secure with MS21318-20 drive screw as shown in figure 69.

(3) After screw is installed, flatten or remove protruding excess screw material from inside of cab body reinforcement panel.

(4) Install WMS5100B triangle warning label on lower left corner of driver's window as shown in figure 70.

15. MATERIAL CHANGE (MC) NUMBER.

This MWO is authorized by (MC) number 1-97-06-4533.

16. MODIFICATION IDENTIFICATION.

a. When installed correctly, Brake Stabilization Program Kit will appear on MWO tag as shown in figure 69.

b. After Brake Stabilization Program Kit is installed, the vehicle shall be tested for proper operation.Any faults detected or discrepancies noted will be corrected before the vehicle is returned to normal service.

Table 1. Diagnostic Fault Codes.

00	System is OK, vehicle is moving > 6 MPH	Not a problem
03 04	**A** sensor/wiring open or short circuit rear axle left side **B** sensor/wiring open or short circuit rear axle right side	Sensor loose, sensor faulty, or damaged cable
07	System is OK, no sensor output. Rotate wheel to generate wheel signal	Not a problem
13 14	**A** sensor system fault, rear axle left side (2A) **B** sensor system fault, rear axle right side (2B) (Low Sensor Output Group)	Sensor worn or maladjusted, damaged sensor or cable
23 24	**A** sensor system fault, rear axle left side (2A) **B** sensor system fault, rear axle right side (2B) (Intermittent Low Sensor Output Group)	Wheel bearing worn, loose, maladjusted; exciter damaged, loose. Damaged or corroded sensor electrical connection
42 43	Slow recovery of one wheel of blue channel left side Slow recovery of one wheel of yellow channel right side	Brake drag, damaged modulator, or pinched hose. Failed primary reservoir
62, 63 68, 69	Hold solenoid open circuit, blue channel (62), yellow channel (63) Dump solenoid open circuit, blue channel (68), yellow channel (69)	Solenoid cable damaged, solenoid damaged, loose connection
72, 73 78, 79	Hold solenoid short circuit, blue channel (72), yellow channel (73) Dump solenoid short circuit, blue channel (78), yellow channel (79)	Solenoid cable damaged, solenoid damaged
82, 83 88, 89	Hold solenoid circuit fault, blue channel (82), yellow channel (83) Dump solenoid circuit fault, blue channel (88), yellow channel (89)	Solenoid cable damaged, solenoid damaged, or ECU damaged
90	Supply voltage at the controller <21V	Power cable wire, terminal, or splice damaged or corroded
91	No supply voltage at controller	Voltage at 3 amp fuse, no voltage at 15 amp fuse
92	Supply voltage at the controller >33V	Power cable wire, terminal, or splice damaged or corroded
C1 CA, CC A(x)	C1 - 2S/2M configuration CA - Erase memory signal, CC - Clear configuration (power down if this occurs) Software options	Not a problem
8.8	Self diagnostic check at power-up	Not a problem
E0-E9 EA-EF 93, 99	Defective ECU Defective ECU Defective ECU	Replace ECU and retest
Blank Hi, Lo	No power to diagnostic unit Low power or communication issue	Faulty power supply, open or short in communication line No power to line 10 mixed, hardware

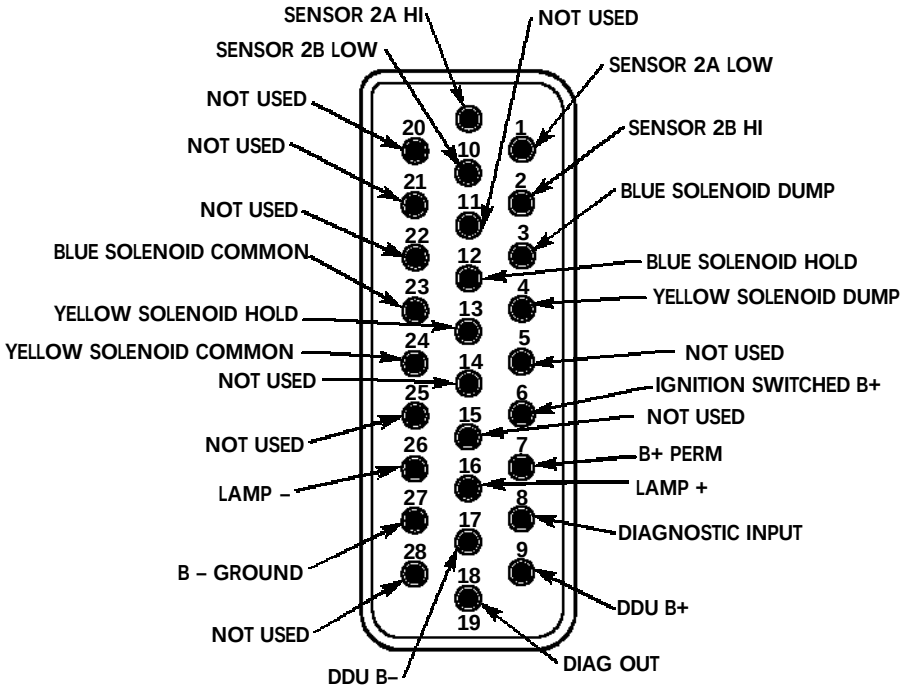


Table 2. ABS Main Wiring Harness 28 Pin Connector.

1. Slide nut and sleeve on tubing.
2. Slide I.D. of tubing onto fitting insert until it bottoms.
3. Assemble nut to fitting body.
4. Tighten assembly finger-tight to cover body threads.

KNURL-ON

---

1. Slide nut and sleeve on tubing.
2. Slide I.D. of tubing onto fitting insert until it bottoms.
3. Assemble nut to fitting body.
4. Finger-tighten nut. From that point, tighten with a wrench two complete turns.

SELF-ALIGN-PTF

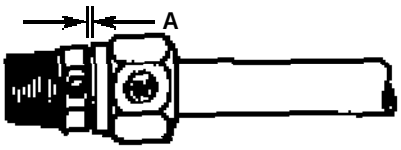
---

1. Cut tubing to desired length. Ensure ends are cut reasonably square.
2. Slide tubing into preassembled fitting and push until tube bottoms.
3. Tighten nut as indicated in chart. Another check on proper assembly is dimension A, when nut is fully tightened.

DISASSEMBLY — Remove nut and pull tubing out of fitting body. Insert will remain on tubing.

REASSEMBLY — Push tubing and insert into fitting body until it bottoms. Thread nut onto fitting body and tighten as in step 3.

NYLON TUBING
FOR AIRBRAKE



TUBE O.D.	TIGHTEN NUT TO:	A
1/4	77 - 103 lb-in. (8.7 - 11.6 N·m)	.085/.105
3/8	10 - 15 lb-ft (13.5 - 20.3 N·m)	.125/.145
1/2	22 - 30 lb-ft (29.8 - 40.6 N·m)	.100/.120
5/8	23 - 32 lb-ft (31.1 - 43.3 N·m)	.115/.135
3/4	34 - 45 lb-ft (46.1 - 61.0 N·m)	.180/.200

Table 3. Tube Nut Torques.

INSTRUCTIONS FOR COMPLETING THE QA CHECKLIST (FORM TRK 1204)

Section I. VEHICLE INFORMATION

1. **ABS WORK ORDER NUMBER** – Reserved for an internal work order number to be assigned.
2. **DATE** – This will be the date the vehicle is in-processed and accepted for the ABS MWO application. This date will not correspond to the ABS Work Order Number, Julian Date if the initial truck data entered into RAILS on a date other than when the vehicle is accepted for the ABS MWO application.
3. **SERIAL NUMBER** – Annotate the serial number as indicated on the vehicle data plate located on the curbside dash. For the M939/A1 vehicles, the serial number is also stamped on the roadside front frame rail. All serial numbers will be checked for proper format. The original serial number prefix formats as provided by the original equipment manufacturer (OEM) are provided in table A. Where the serial number prefix does not match the OEM list, the serial number will be verified by a second individual ie Site Chief, Lead Mechanic, or QA Inspector. The verbiage "Serial Number Verified" will be written in the "Preinspection Notes Block". If the serial number can still not be verified, contact Premier Professional System (PPS) at 800.953.7679.
4. **REGISTRATION/USA NUMBER** – Annotate the vehicle registration number as indicated on the vehicle data plate located on the curbside dash. (NOTE: Do not refer to any painted registration numbers as they could be incorrect.)
5. **MILEAGE** – Annotate the vehicle mileage as indicated on the vehicles odometer.
6. **MODEL AND NOMENCLATURE** – Annotate the model and nomenclature of the vehicle as indicated on the vehicle data plate located on the curbside dash.
7. **ADMINISTRATIVE NUMBER** – Annotate the administrative number assigned to the vehicle.
8. **UNIT IDENTIFICATION CODE (UIC)** – Annotate the depot, post, camp, or station UIC.
9. **NATIONAL STOCK NUMBER (NSN)** – Annotate the NSN of the specific vehicle model as indicated on the vehicle data plate located on the curbside dash.
10. **UNIT/ORGANIZATION** – Annotate the unit designation in this block.
11. **DEPARTMENT OF DEFENSE ACTIVITY ADDRESS CODE (DODDAAC)** – Annotate then unit's DODAAC.

Section II. PREVIOUS MWO'S APPLIED

Annotate previously authorized MWO's have been applied to the vehicle by placing a check or "X" in the appropriate block. If the MWO has been applied but the metal tag is not affixed to the vehicle, annotate this in the Pre-Inspection Notes Block.

Section III. PREINSPECTION NOTES

Annotate any deficiencies found during the preinspection.

Section IV. CTIS OPERATIONAL STATUS (A2 MODELS ONLY)

Annotate the status of the CTIS by checking the appropriate block. Should the CTIS be nonoperational, annotate those deficiencies in the CTIS notes block.

Section V. INSTALLATION INFORMATION

1. **DATE INSTALLED** – Annotate the date the ABS MWO was installed.
2. **INSTALLING TECHNICIAN** – Annotate the last name of the technician who applied the ABS MWO. If multiple technicians work on different parts of the application, annotate the Lead Mechanic's name.
3. **KIT SHIPPING CONTROL NUMBER** – Annotate the Vendor's Shipping Control Numbers from the Primary and Stand-Alone Kit containers. These numbers should begin with a prefix of "P" and "S" respectively. The assigned number following the prefixes should match with one another.
4. **INSTALLATION HOURS** – Annotate the hours taken to install the ABS MWO from the appropriate vehicle listed in table A.
5. **TIRES REPLACED** – Annotate if tires were replaced. (Basic models only.)
6. **APPLICATION SITE** – Enter the depot or National Guard site where the ABS MWO application was performed.
7. **INSTALLATION NOTES** – Annotate here any problems that materialized during the actual ABS MWO application that could not have been identified during the preinspection checks.
8. **ROAD TESTED** – Annotate by checking the block that the vehicle has been tested successfully.
9. **DATABASE UPDATED** – This block is checked when the information on this checklist has been updated in the provided database. If that can not be accomplished, then the "NO" block must be checked.

Section VI. IN-PROCESS/FINAL INSPECTION

1. **ABS MWO COMPONENTS QA CHECKS (a through l)** – Annotate by initialing the block associated with the item to be inspected.
2. **PASS QA/INSPECTION** – Annotate by checking this block when all components and associated hardware for proper installation has been made.
3. **PRE-EXISTING FAULTS** – Annotate any checks that could not be performed due to previously identified faults. Complete and attach FORM TRK 1204-1, 16 Apr 02 (Attachment A).
4. **NON ABS DEFICIENCIES** – Annotate any deficiencies found during application that do not effect ABS but do effect vehicle braking.
5. **QA INSPECTOR/DATE** – The QA inspector will sign, date, and print his name acknowledging that a proper inspection has been conducted on the vehicle and that the ABS MWO application meets the quality criterion and is ready for issue.
6. **SITE SUPERVISOR/DATE** – The site supervisor will sign, date, and print his name acknowledging that a proper inspection has been conducted on the vehicle and that the ABS MWO application meets the quality criterion and is ready for issue.
7. **UNIT REP/POC** – The Unit Representative/POC will sign, date and print his name acknowledging that a proper inspection has been conducted on the vehicle and that the ABS MWO application meets the quality criterion and is ready for issue.

Table A

MODEL	SERIAL NUMBER	MODEL	SERIAL NUMBER	MODEL	SERIAL NUMBER
M923/A1	C523-xxxxx	M930/A1	C530-xxxxx	M936/A1	C536-xxxxx
M925/A1	C525-xxxxx	M931/A1	C531-xxxxx	M942/A1	C542-xxxxx
M927A1	C527-xxxxx	M932/A1	C532-xxxxx	M944/A1	C544-xxxxx
M928/A1	C528-xxxxx	M934/A1	C534-xxxxx		
M929/A1	C529-xxxxx	M935/A1	C535-xxxxx		
M923A2	1001AAxxx	M929A2	1005ABxxx	M934A2	1009AAxxx
M923A2	1001ABxxx	M929A2	2005ABxxx	M934A2	1009ABxxx
M923A2	23/xxxxx	M929A2	29/xxxxx	M934A2	34/xxxxx
M925A2	1002AAxxx	M930A2	1006AAxxx	M936A2	1011AAxxx
M925A2	1002ABxxx	M930A2	30/xxxxx	M936A2	1011ABxxx
M925A2	25/xxxxx	M931A2	1007AAxxx	M936A2	1030AAxxx
M927A2	1003AAxxx	M931A2	1007ABxxx	M936A2	1032AAxxx
M927A2	1003ABxxx	M931A2	1030AAxxx	M936A2	1048AAxxx
M927A2	2003AAxxx	M931A2	1044AAxxx	M936A2	2011AAxxx
M927A2	2003ABxxx	M931A2	2007ABxxx	M936A2	36/xxxxx
M927A2	27/xxxxx	M931A2	31/xxxxx	M942A2	1012AA001
M928A2	1004AAxxx	M932A2	1008AAxxx	M942A2	2012AAxxx
M928A2	1004ABxxx	M932A2	1008ABxxx	M930A2	1013AA001
M928A2	2004ABxxx	M932A2	1045AAxxx	M931A2	2013AAxxx
M928A2	28/xxxxx	M932A2	2008AAxxx	M931A2	44/xxxxx
M929A2	1005AAxxx	M932A2	32/xxxxx		

Table B

M939	M939A1	M939A2
17 Hours	10 Hours	10 Hours

MWO 9-2320-272-35-1

QUALITY ASSURANCE CHECKLIST

ABS WORK ORDER NUMBER | DATE

VEHICLE INFORMATION

Serial Number: | USA Number: | Mileage:

Model And Nomenclature: | Admin. Number:

UIC: | NSN: | DODAAC:

Unit/Organization:

PREVIOUS MWO'S APPLIED:

ALL BASIC/A1 TRUCKS	YES	NO
MWO 9-2320-272-20-2 M939/A1 Seat Belts	☐	☐
MWO 9-2320-272-20-5 M939/A1 Shackle Lift Kit	☐	☐
MWO 9-2320-272-20-6 M939/A1 Fuel Tank Vent	☐	☐
MWO 9-2320-272-24-1 M939/A1 Spring Brake Cont Valve	☐	☐

ALL BASIC/A1 WRECKERS	YES	NO
MWO 9-2320-272-20-4 M936/A1 Wrkr Auto Throttle	☐	☐
MWO 9-2320-272-20-1 M936/A1 Wrkr Brake Lock Override	☐	☐
ALL A2 TRUCKS	☐	☐
MWO 9-2320-272-20-8 M939A2 Accelerator Linkage		

PRE- INSPECTION NOTES:

CTIS Operational Status (A2 Models Only): ☐ Operational ☐ Non-Operational

CTIS Notes

INSTALLATION INFORMATION:

Date Installed: | Installing Technician: (Last Name)

Kit Shipping Control Numbers: | Installation Hours:

Tires Replaced ☐ YES ☐ NO Application Site:

Installation Notes

☐ Road Tested

Database Updated ☐ YES ☐ NO

FORM TRK 1204 Rev D, 18 Apr 02

Inspect the following components and associated hardware for proper installation (Technician initial when applied, Inspector initial when QA accepted):	Technician	QA Inspector	Other
a) Sensor Brackets. Ensure sensor bracket mounting bolts have been properly torqued to 110 - 145 lb-ft.			
b) Wiring Harness. Inspect connectors for proper connection. Inspect harness for proper routing and is properly secured to vehicle (tie-straps placed every 12 - 18 inches).			
c) Vehicle Plumbing. Relay valves and air dryers torqued to 35 - 40 lb-ft. Inspect air lines and fittings for proper installation. Using soap solution, verify no leaks exist where components were installed. Ensure air lines have been properly routed.			
d) Hubs/Wheels. Toner ring mounted properly and torqued to 110-130 Inch Pounds. Brake shoes seated in anchor and adjuster. Inspect tires for proper mounting. Ensure valves on tires are oriented in proper direction (180 degrees opposite one another). Inspect CTIS for proper installation. Inspect Inner Bearing Nut is torqued to 50 lb-ft then backed out 1/6 to 1/4 turn. Inspect Outer Bearing Nut is torqued to 250-400 lb-ft. Inspect wheel retaining lugs are torqued to 250-400 lb-ft.			
e) Inspect air system for proper operation by charging system and ensuring primary and secondary system maintain air pressure. During charging process, listen for air dryer to purge at compressor cut-out. Listen for leaks throughout all of the air system.			
f) With spring brake dust cover removed for visual access, ensure parking brakes release properly by releasing brake lever and visually verifying diaphragm in spring brake chamber has compressed.			
g) Inspect delivery system for air leaks. Apply full treadle pressure and listen for air leaks. Ensure air pressure does not drop in excess of 3 psi per minute from beginning pressure. With battery switched to "ON" position, listen for "Blow-down" of control air from relay valves.			
h) ABS Light. Verify ABS indicator light turns "ON" then "OFF" during valve "Blow-down".			
i) ABS Sensors. Verify proper connection of wheel sensors. With Info-Centre connected, while spinning curbside wheel, the Info-Centre should display "S2B" to the left of "97". While spinning roadside wheel, the Info-Centre should read "S2A" to the right of "97".			
j) Spring Brake Operation. Remove spring brake dust cover to allow visual access. Ensure spring brake override is disengaged. Have assistant operate foot valve while observing spring brake chamber for spring brake operation. Diaphragm should compress and release as foot valve is operated.			
k) Inversion and Double-Check Valve Operation. Verify secondary tank double-check valve No. 7 (mounted on the inlet side of spring brake tank)for operation by venting the primary reservoir. Secondary reservoir pressure gauge should not deplete. However, 10 to 15 PSI is allowable depletion. Validate inversion valve operation by verifying spring brakes engage when brake pedal depressed, with primary tank drained and spring brake override engaged.			
l) ABS Operation. Ensure ABS is functioning properly by driving vehicle approximately 25 MPH and making one panic stop. Verify no fault codes appear on Info-Centre and ABS light remains off. Verify that rear wheels modulate and do not lock up. *Place ABS sticker in vehicle windshield.*			

☐ Pass QA/Inspection of components and associated hardware for proper installation has been made. (Items a-l)

The following checks could not be performed due to pre-existing faults (Attach Notification of Pre-existing Condition(s), FORM TRK 1204-1, 16 Apr 02):

The following deficiencies were found during the ABS installation process. These deficiencies will not effect the ABS but will have an effect on the overall braking performance (i.e. worn brake drums, oily brake shoes or non-operational check valves.

By signing this document, the unit representative acknowledges that a review of the QA Checklist and inspection of the vehicle has been conducted and that the vehicle has met all the requirements for acceptance. The ABS system is warranted for one (1) year from the date of application. All warranty claims must be submitted to the TACOM Warranty Coordinator on DA FORM 5988.

	Print Name:	Sign Name:
QA Inspector/Date:		
Site Supervisor/Date:		
Unit Rep/POC/Date:		

NOTIFICATION OF PRE-EXISTING CONDITION(S)

VEHICLE SERIAL NUMBER:		UNIT/ORGANIZATION:				MODEL NUMBER:	
MWO APPLIED AT:		MILEAGE:		HOURS:		DATE:	

It is the responsibility of ______________________________ to issue this notification to the undersigned. This is an **OFFICAL NOTICE** that due to pre-existing condition(s), ______________________________ has been prevented from completing either the application, testing or validation of the ABS/ MWO. Pre-existing conditions not corrected in a timely manner may cause damage to the Anti-lock Brake System (ABS) which would result in any warranty claims being disallowed. A copy of the Quality Assurance Checklist is provided with this "Notification of Pre-existing Condition(s)"

____________________ will apply the ABS/MWO regardless of any pre-existing condition(s). We are however not obligated to correct any pre-existing condition(s). Any deficiencies caused during the MWO application will be corrected prior to being released. Pre-existing condition(s) may or may not hinder the aplication of the ABS/MWO.

FAILURE TO COMPLETELY APPLY, TEST OR VALIDATE THE ABS/MWO DOES NOT NECESSARILY MEAN THE VEHICLE IS WITHOUT BRAKING CAPABILITY. THE VEHICLE REVERTS BACK TO NORMAL OEM BRAKING WHEN THE ABS FUNCTION IS DISABLED OR NON-OPERATIONAL. THE FORTY (40) MPH SPEED RESTRICTION WILL ALSO APPLY UNTIL CORRECTIONS AND FINAL VALIDATION IS PERFORMED.

AS A RESULT OF THESE PRE-EXISTING CONDITION(S) WHICH HAS PREVENTED FINAL VALIDATION OF THE ABS/MWO, THE YELLOW ABS STICKER "WILL NOT" BE PLACED ON THE WINDSHIELD AS REQUIRED BY TACOM. ONCE THE CORRECTIVE ACTION(S) AND FINAL DISPOSITION HAS BEEN MADE, THE STICKER WILL BE RELEASED FOR APPLICATION ON THE " ROADSIDE" WINDSHIELD.

PROBLEM IDENTIFIED DURING:

☐ Pre-Inspection ☐ Installation ☐ Final Inspection ☐ Validation/Road Test

CRITICALITY OF DEFICIENCY:	WAS ABS VALIDATED?	DID VEHICLE PASS ROADTEST?
☐ Urgent ☐ Non-Urgent	☐ Yes ☐ No	☐ Yes ☐ No

☐ Inoperative Air System	☐ Not Charging	☐ Missing Brake Component(s)	☐ Unservicable Check Valves
☐ Over Charging/Spiking	☐ Will Not Start	☐ Defective Brake Component(s)	________ Other

Define Problem/Pre-existing Condition(s)

THE UNDERSIGNED, A REPRESENTATIVE OF ______________________________ HAVE READ AND UNDERSTAND THE CONTENT AND INTENTION OF THIS NOTIFICATION. I FULLY UNDERSTAND THAT THE ANTI-LOCK BRAKE SYSTEM (ABS) COULD NOT BE VALIDATED OR MAY BECOME DEFECTIVE AS A RESULT OF THE ABOVE LISTED PRE-EXISTING CONDITION(S). I FURTHER ACKOWLEDGE AND ACCEPT RESPONSIBILITY TO NOTIFY THE APPROPRIATE AUTHORITIES OF THE STATUS OF THE VEHICLE'S CONDITION(S) AND THE REQUIREMENTS OR CORRECTIVE ACTIONS NEEDED TO INSURE THAT A CORRECT VALIDATION OF THE ABS IS PERFORMED BY AUTHORIZED PERSONNEL.

UNIT/ORGANIZATION
REPRESENTATIVE: ____

PRINT NAME TITLE/RANK SIGNATURE DATE

VEHICLE RETURNED TO UNIT/ORGANIZATION BY:

____

PRINT NAME TITLE/RANK SIGNATURE DATE

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Pre-existing Condition(s) has been corrected and validation has been complete. ABS sticker has been applied.

____

PRINT NAME TITLE/RANK SIGNATURE DATE

TRK FORM 1204-1, 18 Apr 02

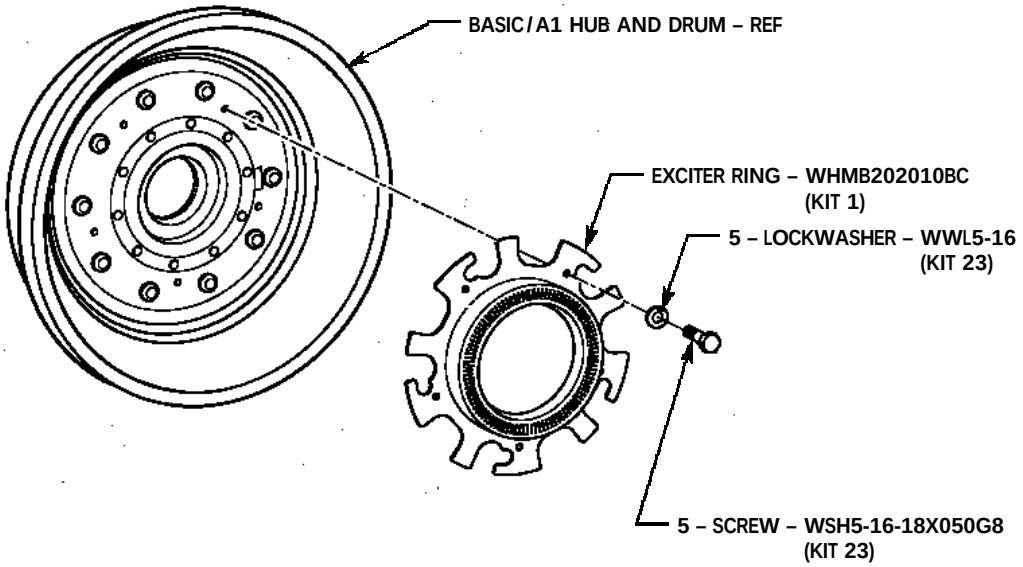


FIGURE 1

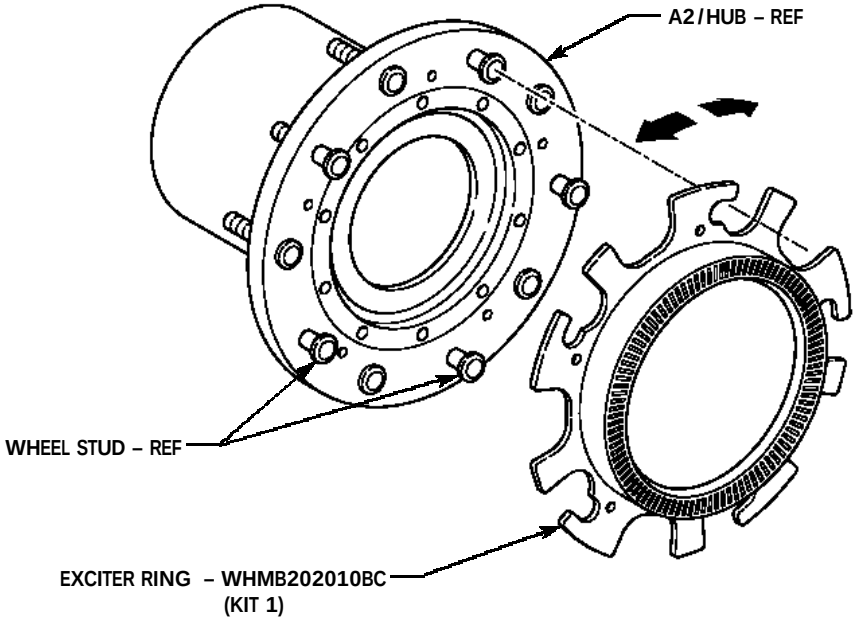


FIGURE 2

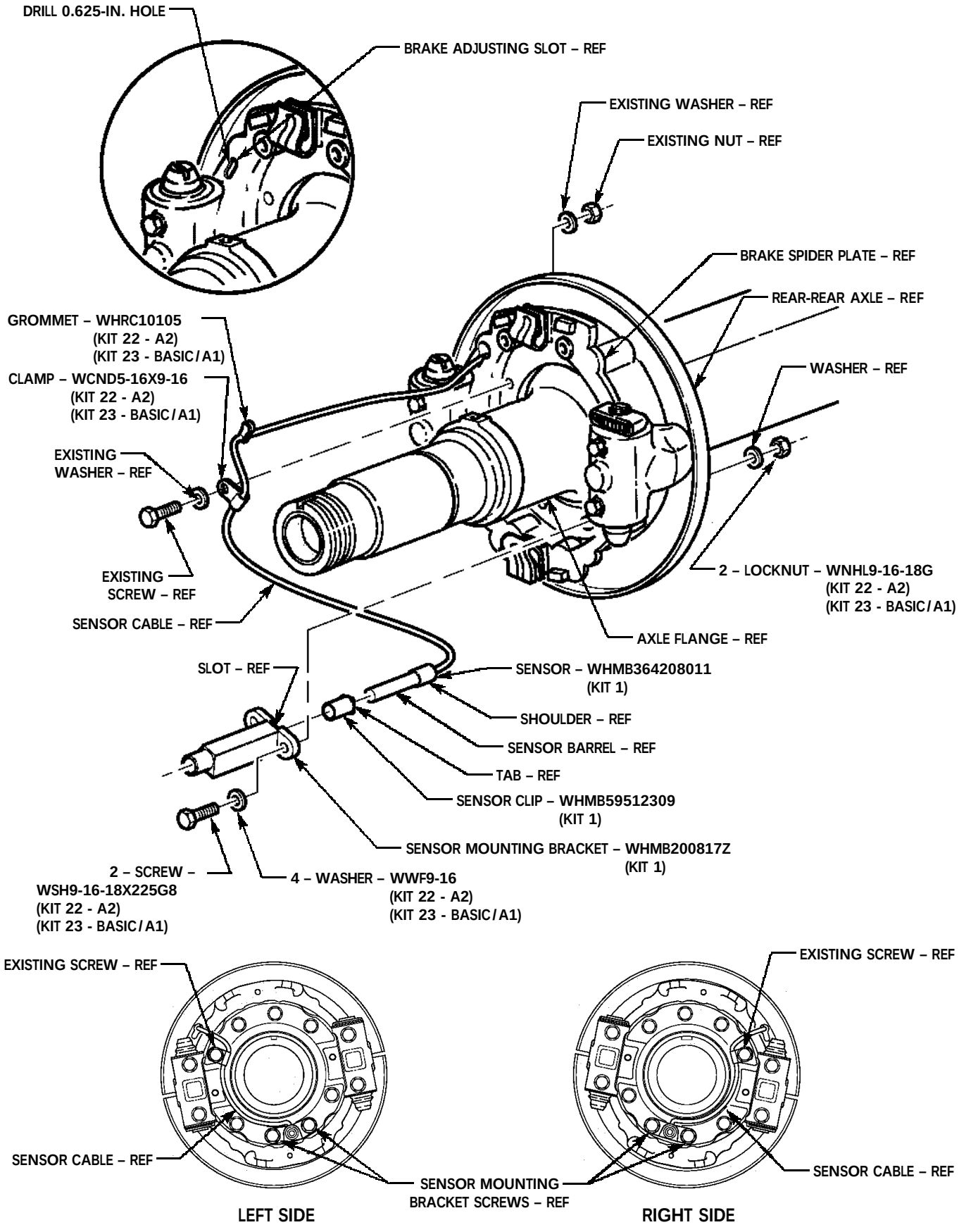

DRILL 0.625-IN. HOLE
BRAKE ADJUSTING SLOT – REF
EXISTING WASHER – REF
EXISTING NUT – REF
BRAKE SPIDER PLATE – REF
REAR-REAR AXLE – REF
GROMMET – WHRC10105
(KIT 22 - A2)
(KIT 23 - BASIC/A1)
CLAMP – WCND5-16X9-16
(KIT 22 - A2)
(KIT 23 - BASIC/A1)
WASHER – REF
EXISTING
WASHER – REF
EXISTING
SCREW – REF
2 – LOCKNUT – WNHL9-16-18G
(KIT 22 - A2)
(KIT 23 - BASIC/A1)
SENSOR CABLE – REF
AXLE FLANGE – REF
SLOT – REF
SENSOR – WHMB364208011
(KIT 1)
SHOULDER – REF
SENSOR BARREL – REF
TAB – REF
SENSOR CLIP – WHMB59512309
(KIT 1)
SENSOR MOUNTING BRACKET – WHMB200817Z
(KIT 1)
2 – SCREW –
WSH9-16-18X225G8
(KIT 22 - A2)
(KIT 23 - BASIC/A1)
4 – WASHER – WWF9-16
(KIT 22 - A2)
(KIT 23 - BASIC/A1)
EXISTING SCREW – REF
SENSOR CABLE – REF
SENSOR MOUNTING
BRACKET SCREWS – REF
LEFT SIDE
EXISTING SCREW – REF
SENSOR CABLE – REF
RIGHT SIDE

FIGURE 3

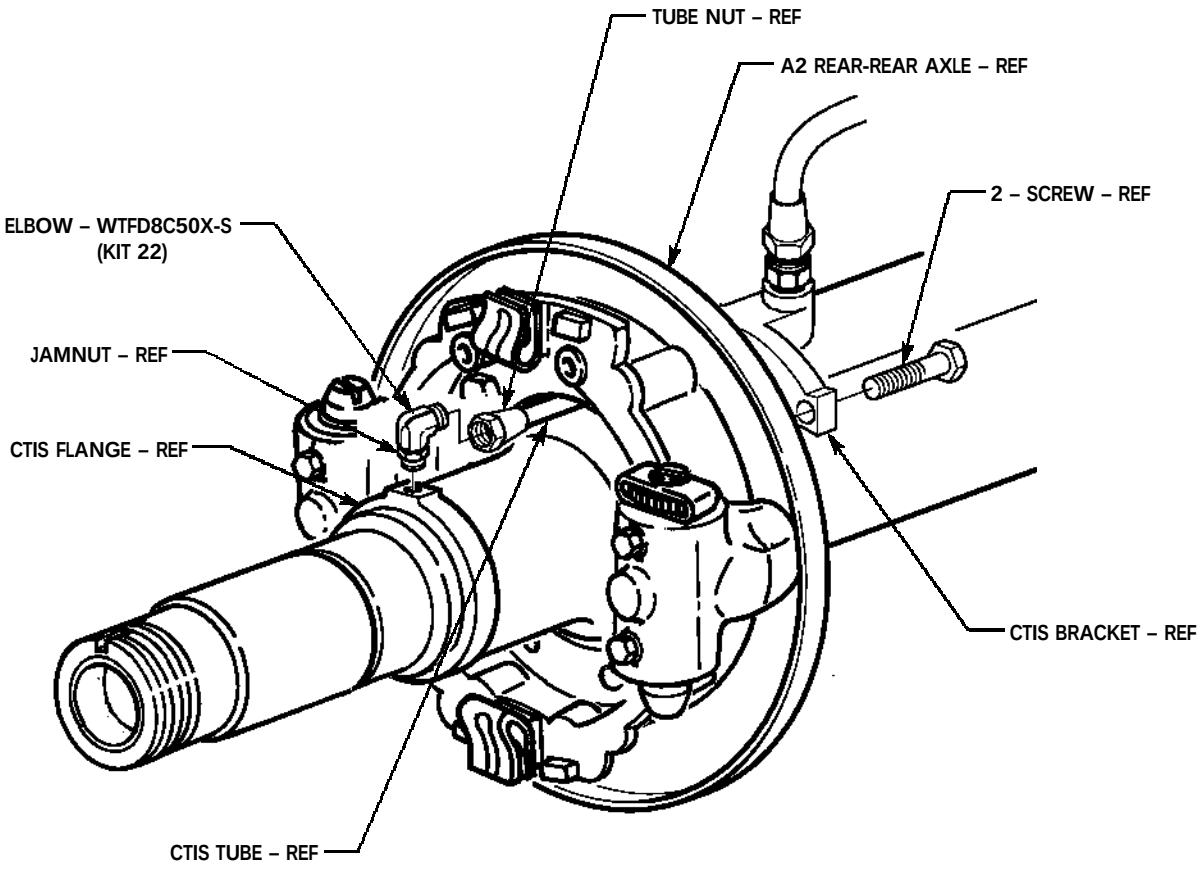

TUBE NUT – REF
A2 REAR-REAR AXLE – REF
2 – SCREW – REF
ELBOW – WTFD8C50X-S
(KIT 22)
JAMNUT – REF
CTIS FLANGE – REF
CTIS BRACKET – REF
CTIS TUBE – REF

FIGURE 4

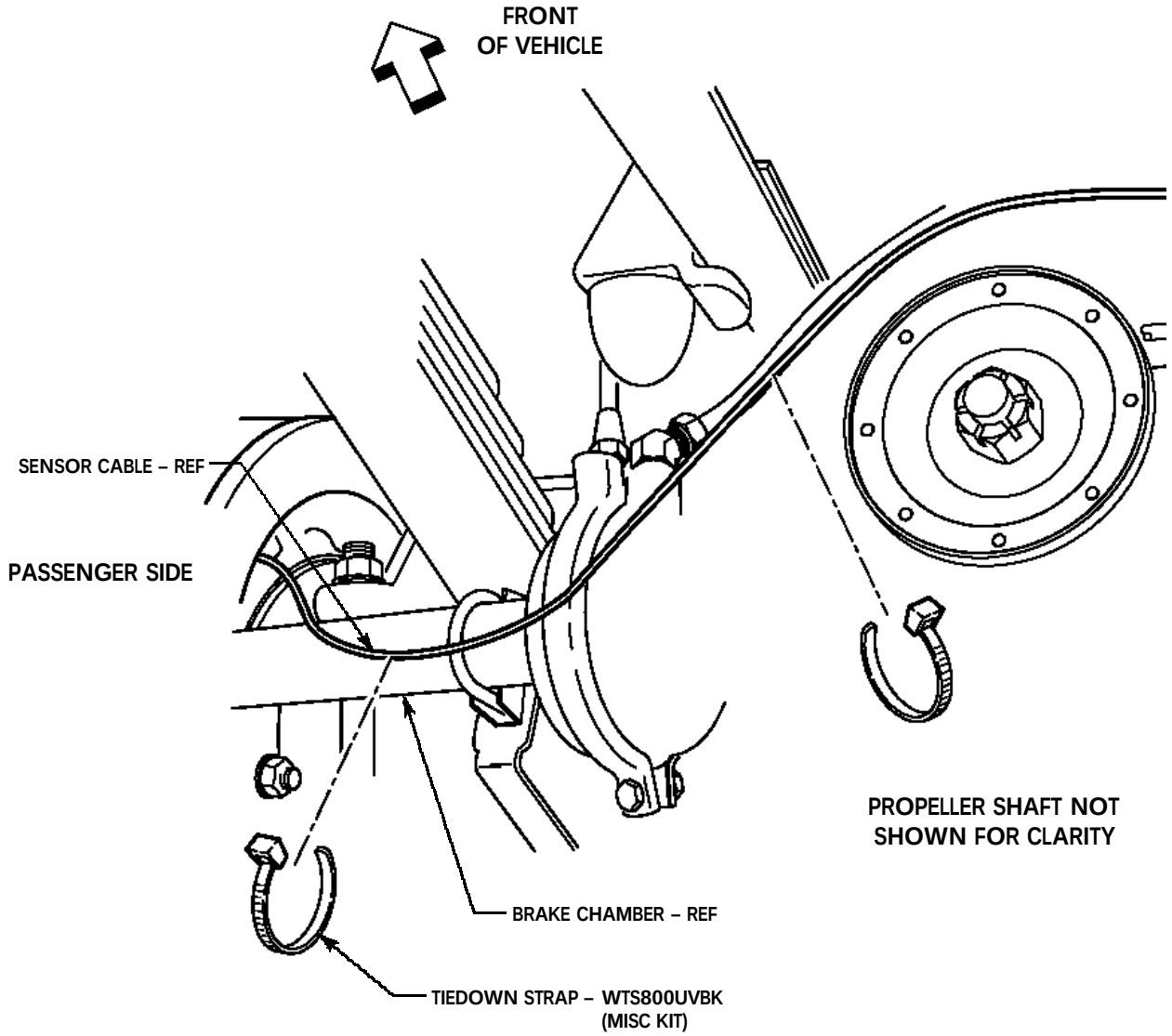

FRONT
OF VEHICLE
SENSOR CABLE – REF
PASSENGER SIDE
PROPELLER SHAFT NOT
SHOWN FOR CLARITY
BRAKE CHAMBER – REF
TIEDOWN STRAP – WTS800UVBK
(MISC KIT)

FIGURE 5

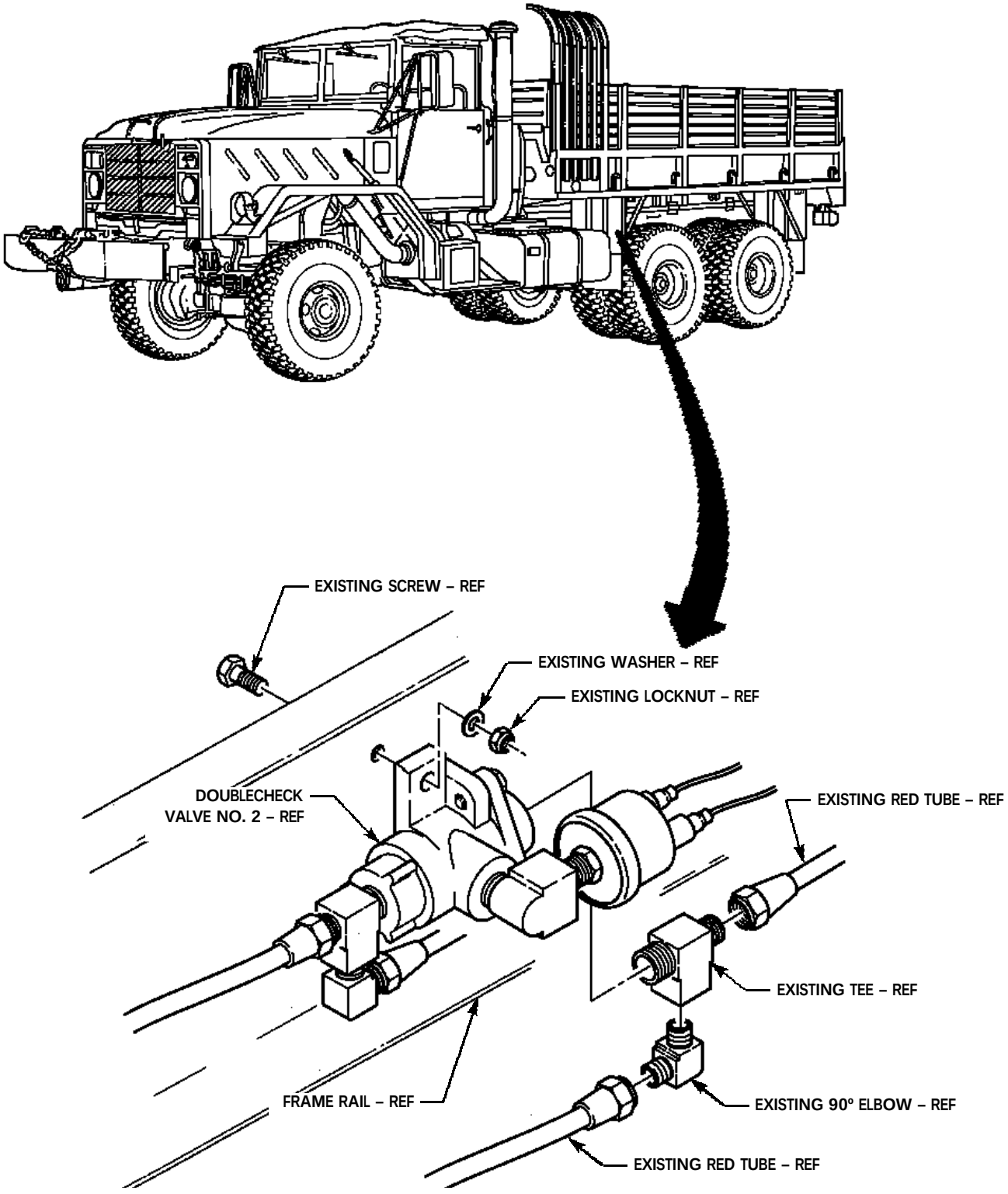

EXISTING SCREW – REF
EXISTING WASHER – REF
EXISTING LOCKNUT – REF
DOUBLECHECK VALVE NO. 2 – REF
EXISTING RED TUBE – REF
EXISTING TEE – REF
FRAME RAIL – REF
EXISTING 90° ELBOW – REF
EXISTING RED TUBE – REF

FIGURE 6

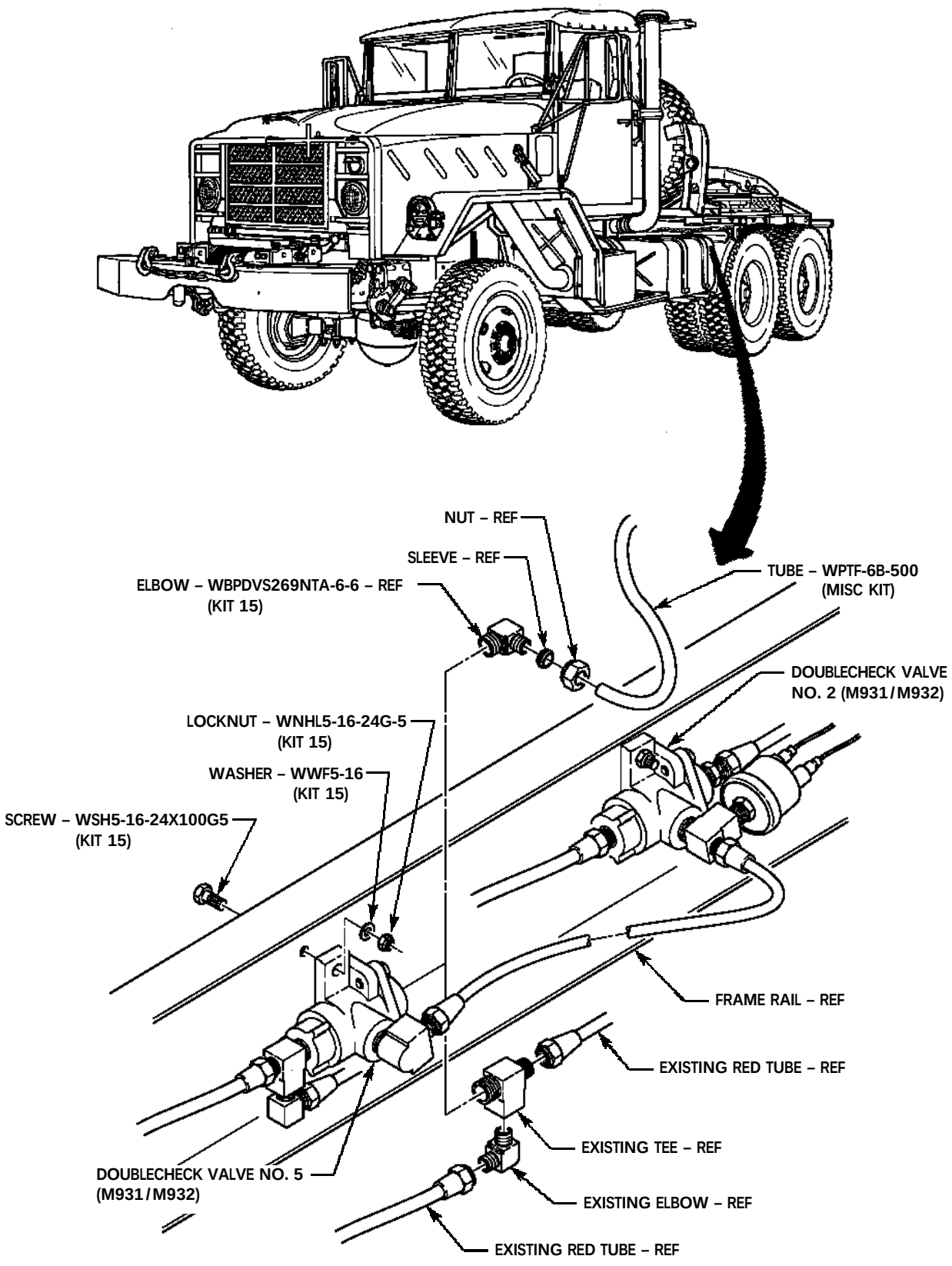

NUT – REF
SLEEVE – REF
ELBOW – WBPDVS269NTA-6-6 – REF
(KIT 15)
TUBE – WPTF-6B-500
(MISC KIT)
DOUBLECHECK VALVE
NO. 2 (M931/M932)
LOCKNUT – WNHL5-16-24G-5
(KIT 15)
WASHER – WWF5-16
(KIT 15)
SCREW – WSH5-16-24X100G5
(KIT 15)
FRAME RAIL – REF
EXISTING RED TUBE – REF
EXISTING TEE – REF
DOUBLECHECK VALVE NO. 5
(M931/M932)
EXISTING ELBOW – REF
EXISTING RED TUBE – REF

FIGURE 7

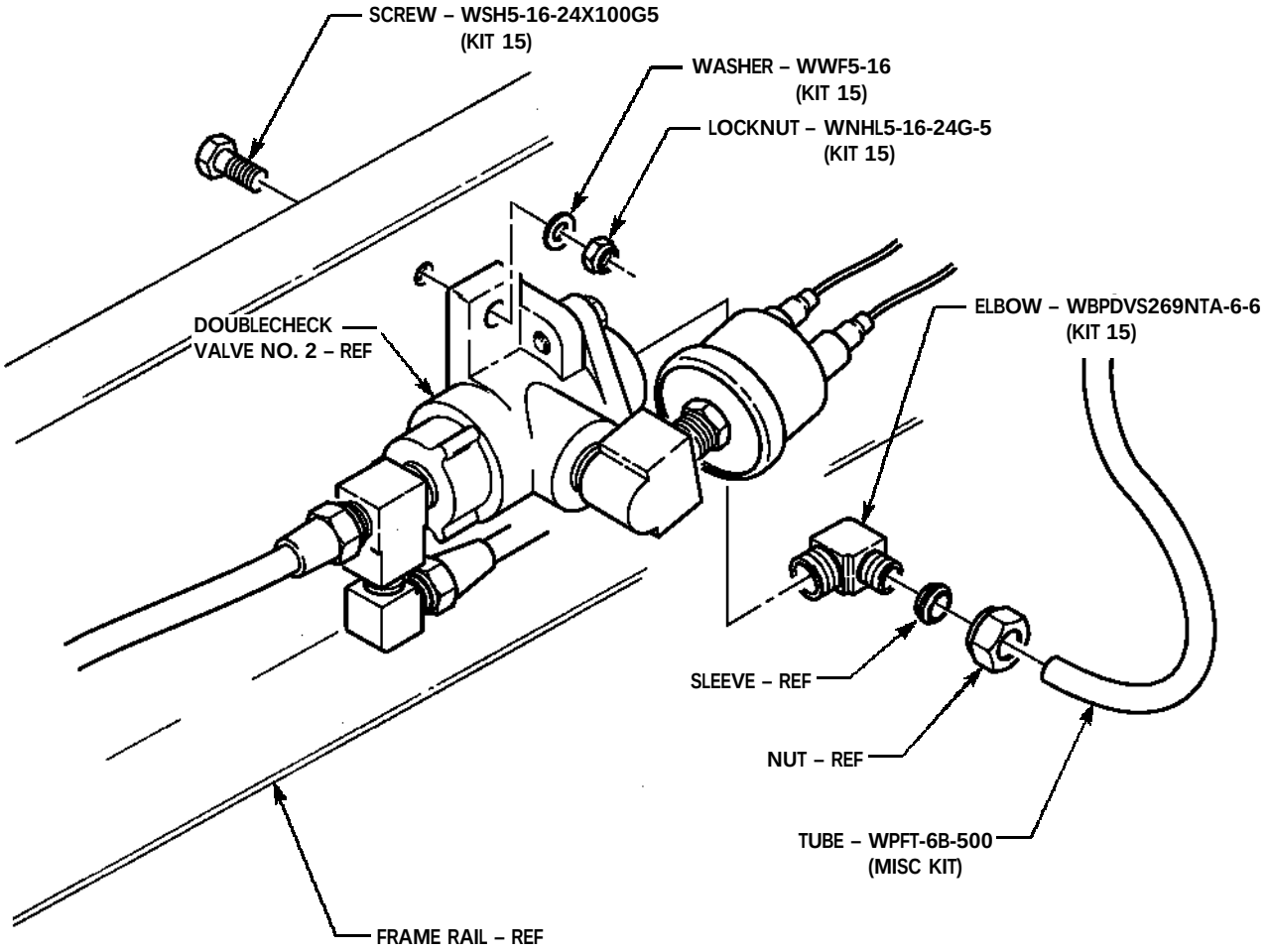

SCREW – WSH5-16-24X100G5
(KIT 15)
WASHER – WWF5-16
(KIT 15)
LOCKNUT – WNHL5-16-24G-5
(KIT 15)
DOUBLECHECK
VALVE NO. 2 – REF
ELBOW – WBPDVS269NTA-6-6
(KIT 15)
SLEEVE – REF
NUT – REF
TUBE – WPFT-6B-500
(MISC KIT)
FRAME RAIL – REF

FIGURE 8

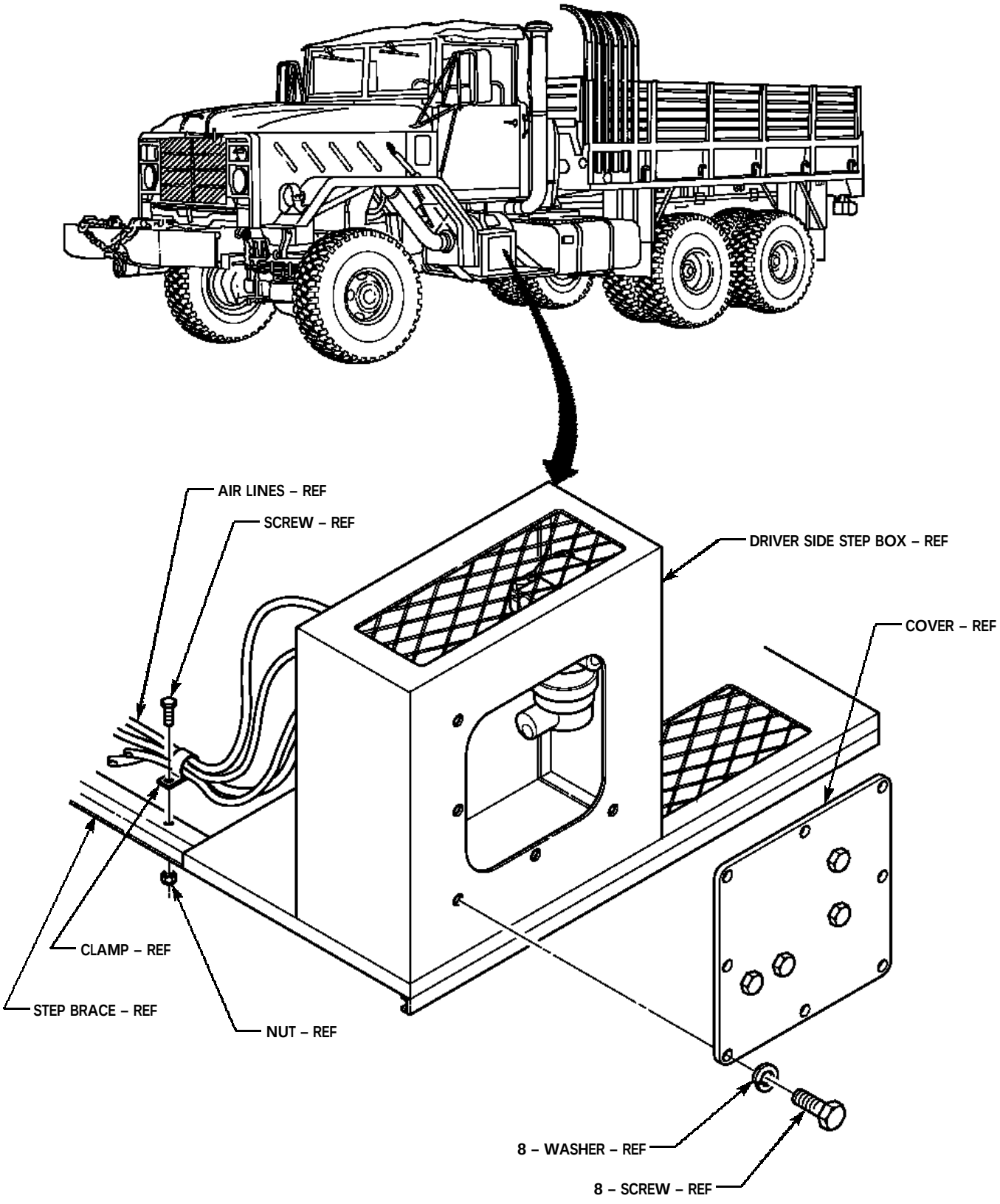

AIR LINES – REF
SCREW – REF
DRIVER SIDE STEP BOX – REF
COVER – REF
CLAMP – REF
STEP BRACE – REF
NUT – REF
8 – WASHER – REF
8 – SCREW – REF

FIGURE 9

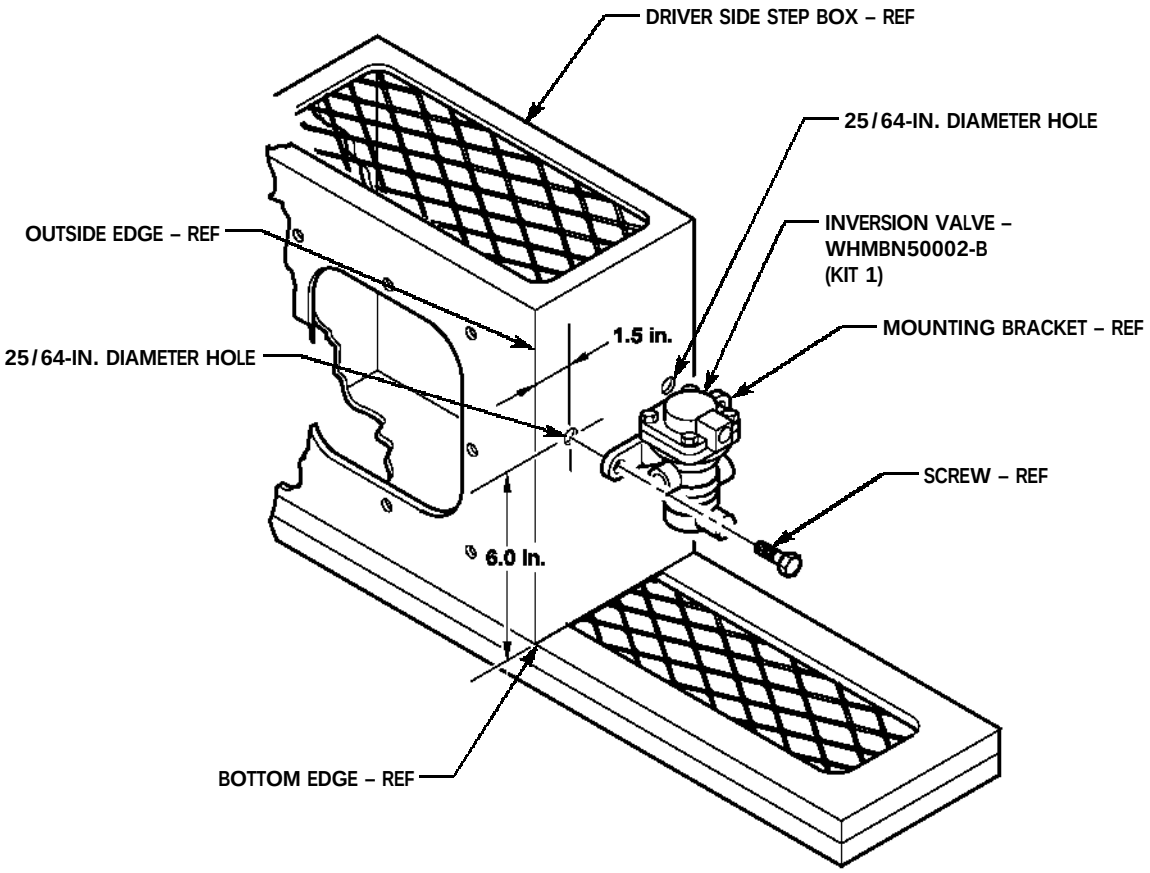

DRIVER SIDE STEP BOX – REF
25/64-IN. DIAMETER HOLE
INVERSION VALVE – WHMBN50002-B (KIT 1)
OUTSIDE EDGE – REF
1.5 in.
MOUNTING BRACKET – REF
25/64-IN. DIAMETER HOLE
SCREW – REF
6.0 In.
BOTTOM EDGE – REF

FIGURE 10

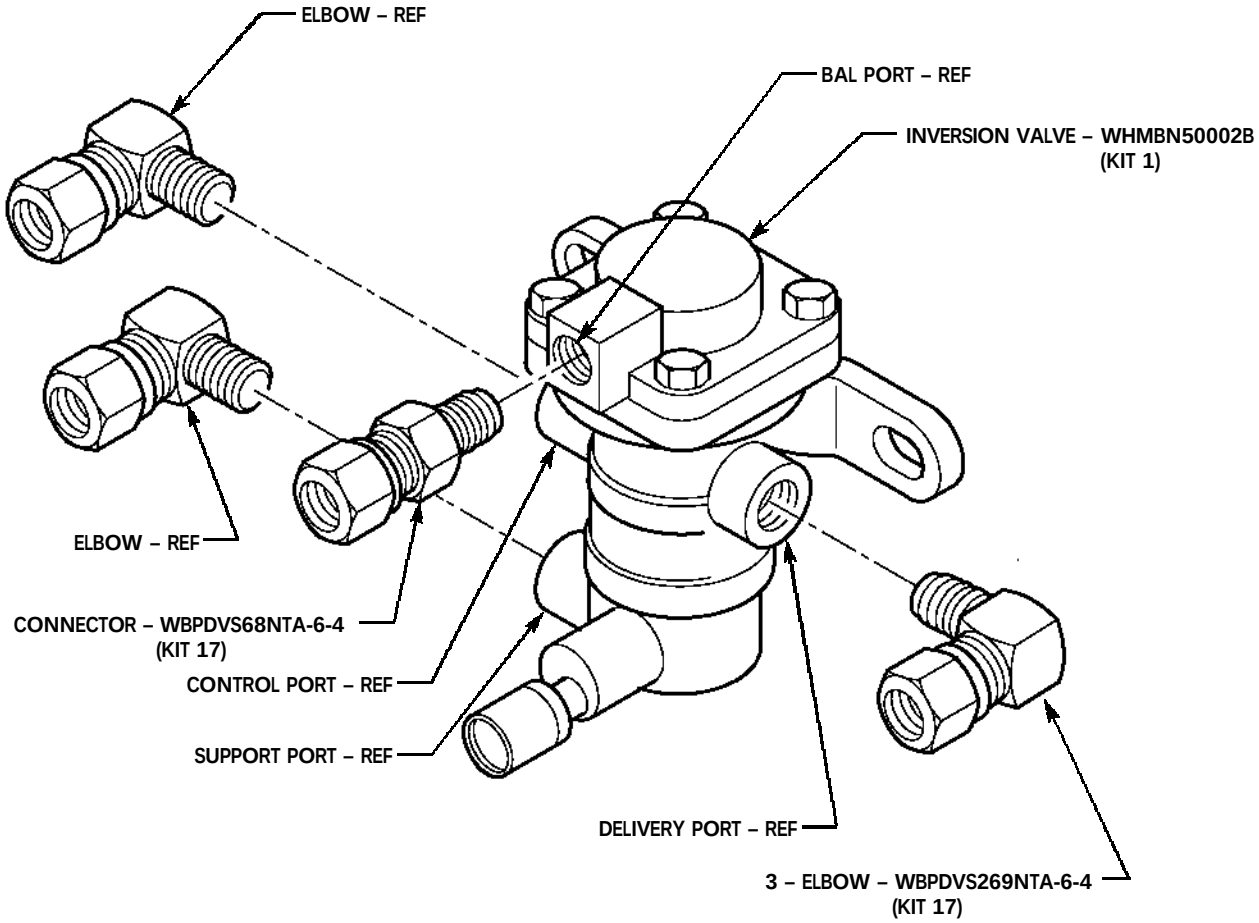

ELBOW – REF
BAL PORT – REF
INVERSION VALVE – WHMBN50002B
(KIT 1)
ELBOW – REF
CONNECTOR – WBPDVS68NTA-6-4
(KIT 17)
CONTROL PORT – REF
SUPPORT PORT – REF
DELIVERY PORT – REF
3 – ELBOW – WBPDVS269NTA-6-4
(KIT 17)

FIGURE 11

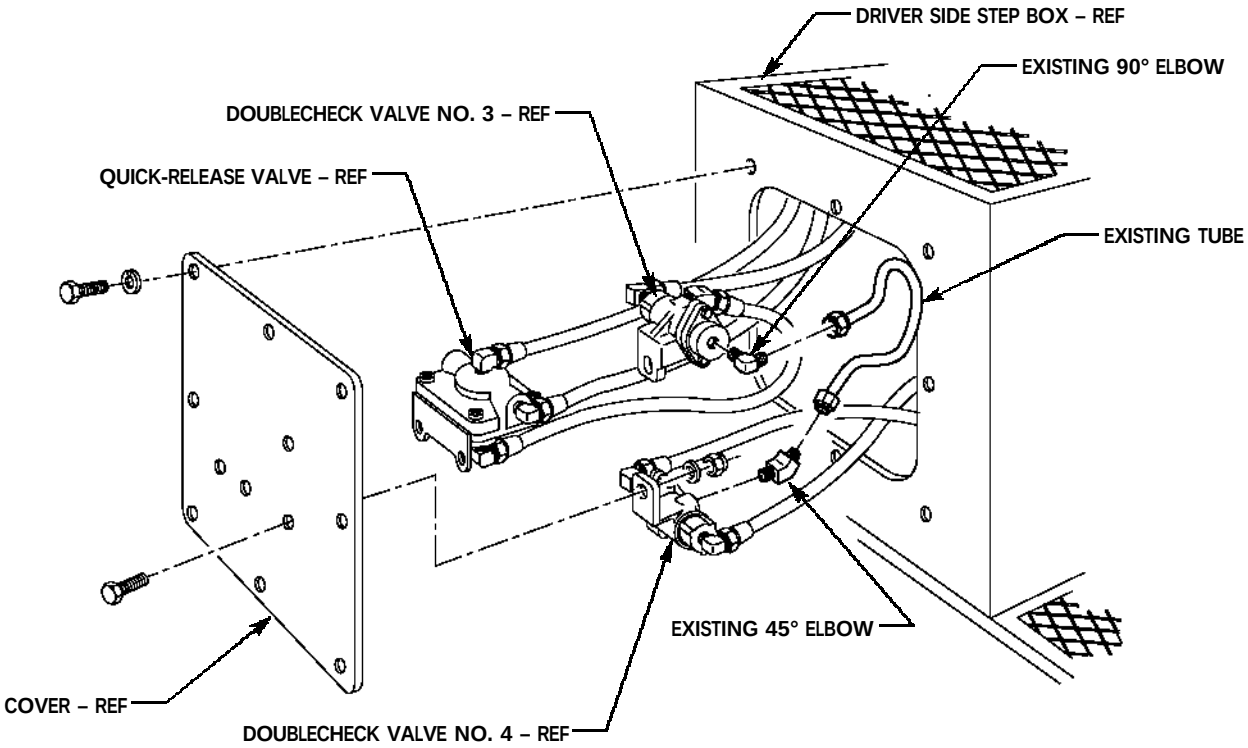

DRIVER SIDE STEP BOX – REF
EXISTING 90° ELBOW
DOUBLECHECK VALVE NO. 3 – REF
QUICK-RELEASE VALVE – REF
EXISTING TUBE
EXISTING 45° ELBOW
COVER – REF
DOUBLECHECK VALVE NO. 4 – REF

FIGURE 12

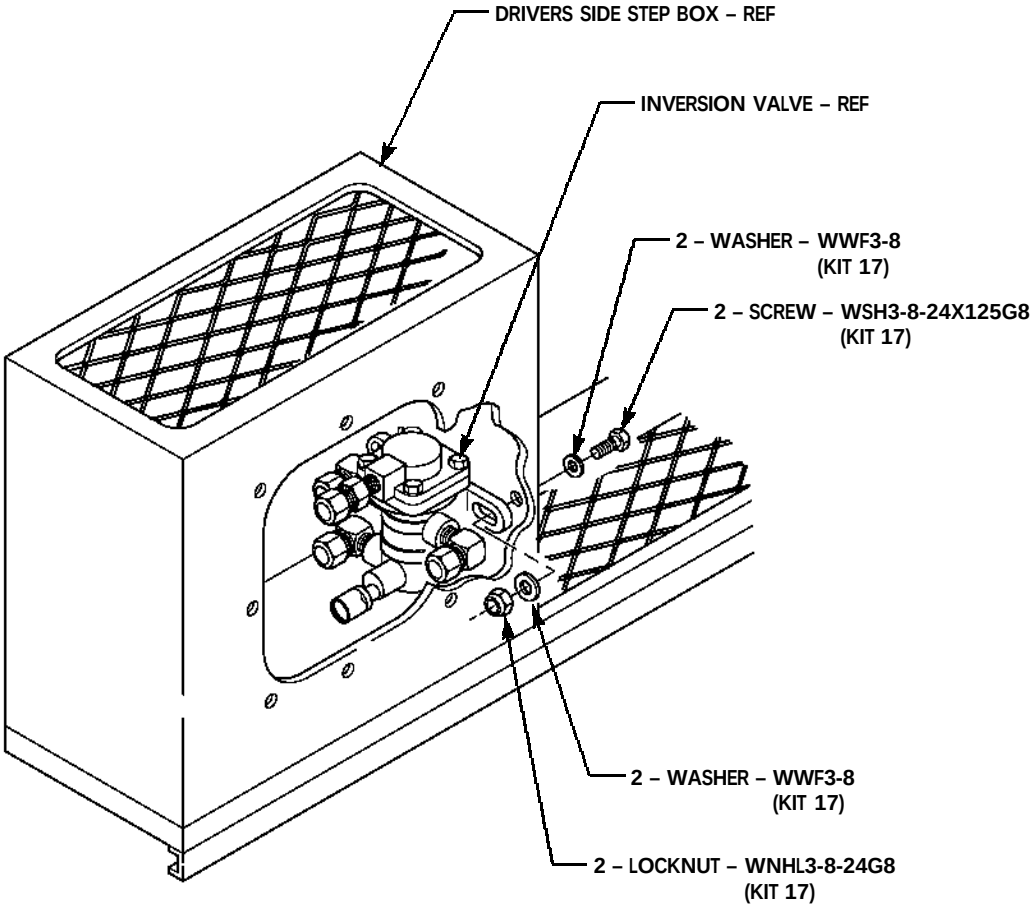

DRIVERS SIDE STEP BOX – REF
INVERSION VALVE – REF
2 – WASHER – WWF3-8
(KIT 17)
2 – SCREW – WSH3-8-24X125G8
(KIT 17)
2 – WASHER – WWF3-8
(KIT 17)
2 – LOCKNUT – WNHL3-8-24G8
(KIT 17)

FIGURE 13

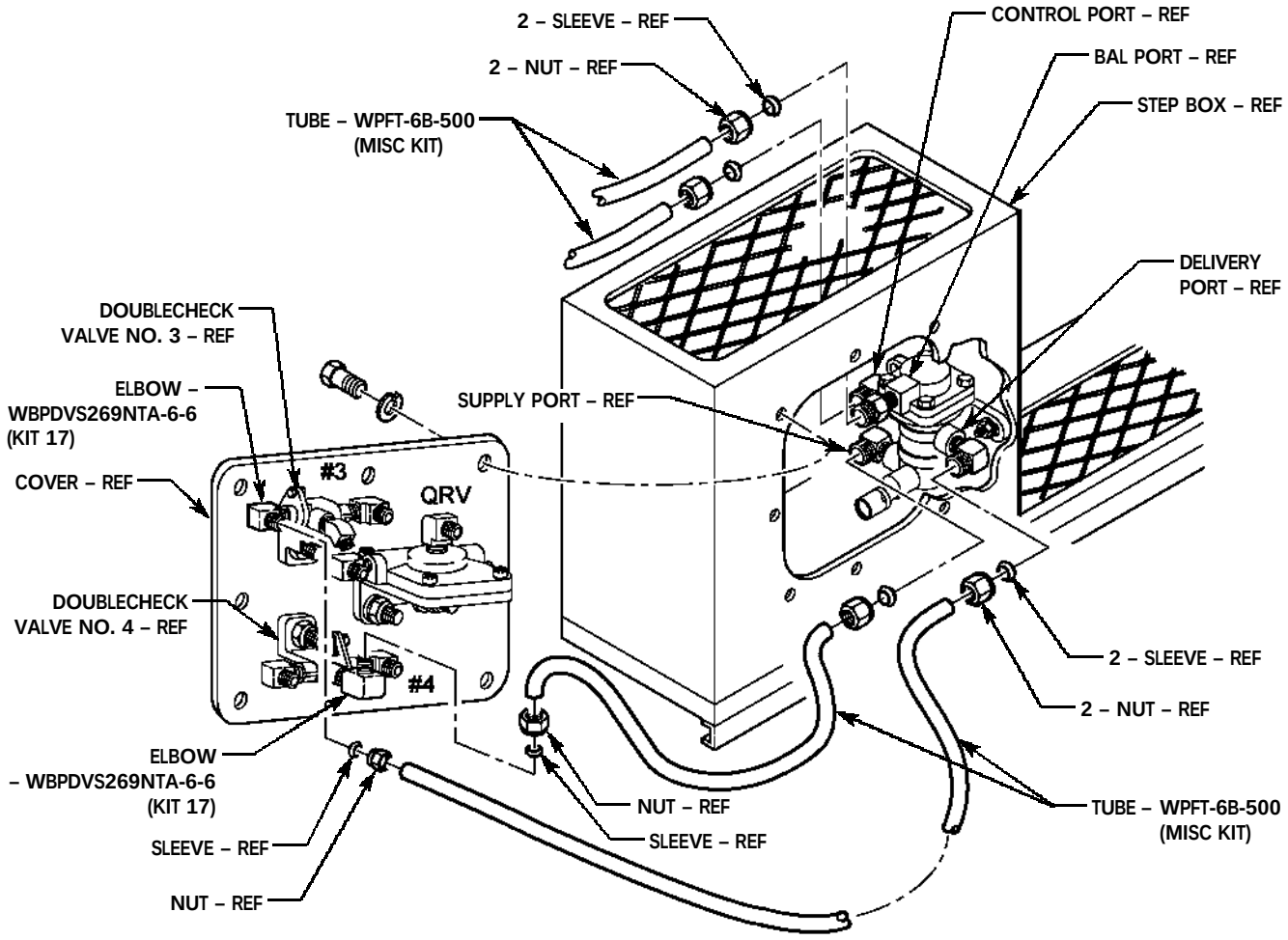

2 – SLEEVE – REF
2 – NUT – REF
TUBE – WPFT-6B-500
(MISC KIT)
CONTROL PORT – REF
BAL PORT – REF
STEP BOX – REF
DELIVERY
PORT – REF
DOUBLECHECK
VALVE NO. 3 – REF
ELBOW –
WBPDVS269NTA-6-6
(KIT 17)
COVER – REF
SUPPLY PORT – REF
#3
QRV
DOUBLECHECK
VALVE NO. 4 – REF
#4
2 – SLEEVE – REF
2 – NUT – REF
ELBOW
– WBPDVS269NTA-6-6
(KIT 17)
NUT – REF
SLEEVE – REF
TUBE – WPFT-6B-500
(MISC KIT)
SLEEVE – REF
NUT – REF

FIGURE 14

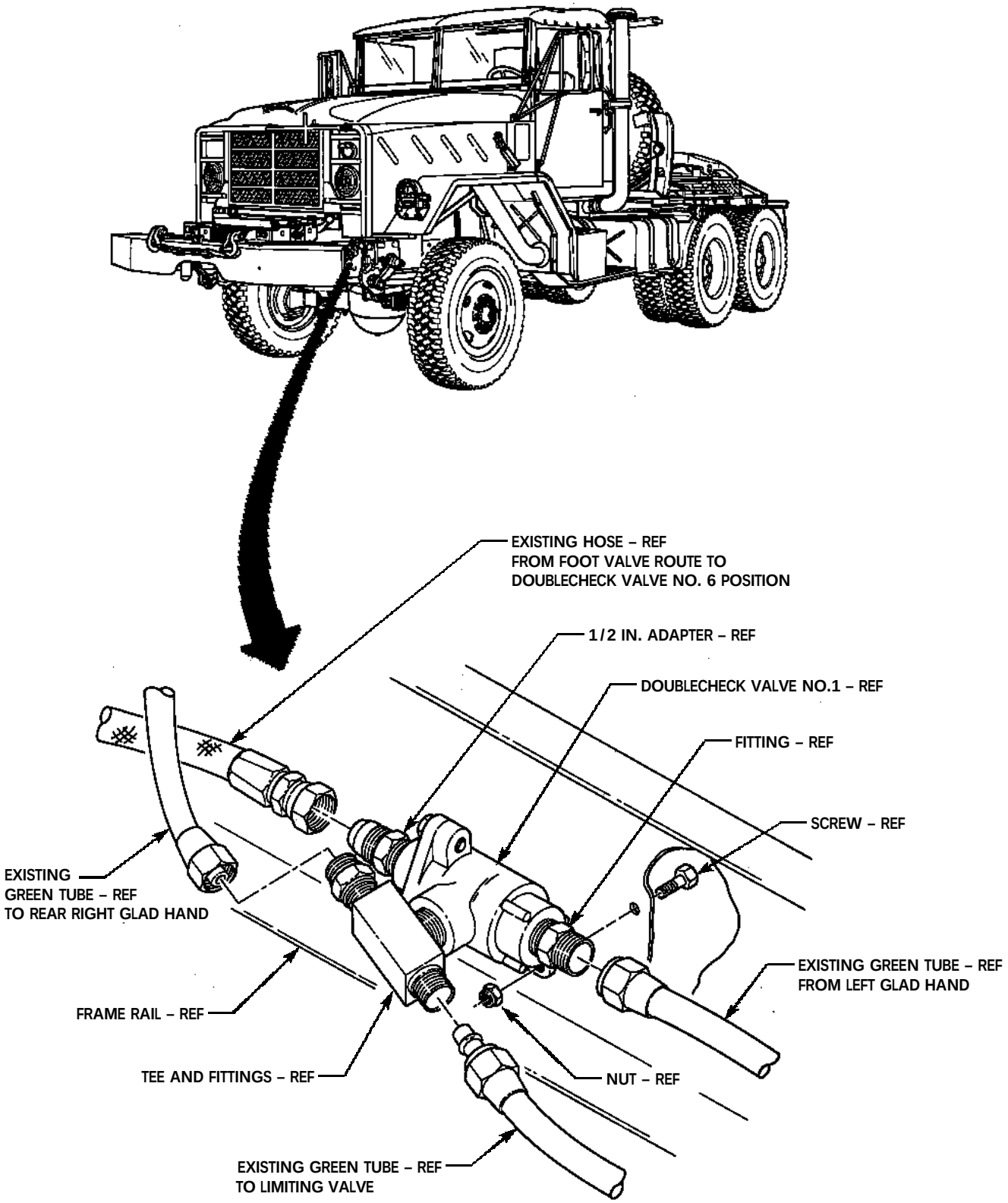

EXISTING HOSE – REF
FROM FOOT VALVE ROUTE TO
DOUBLECHECK VALVE NO. 6 POSITION
1/2 IN. ADAPTER – REF
DOUBLECHECK VALVE NO.1 – REF
FITTING – REF
SCREW – REF
EXISTING
GREEN TUBE – REF
TO REAR RIGHT GLAD HAND
EXISTING GREEN TUBE – REF
FROM LEFT GLAD HAND
FRAME RAIL – REF
TEE AND FITTINGS – REF
NUT – REF
EXISTING GREEN TUBE – REF
TO LIMITING VALVE

FIGURE 15

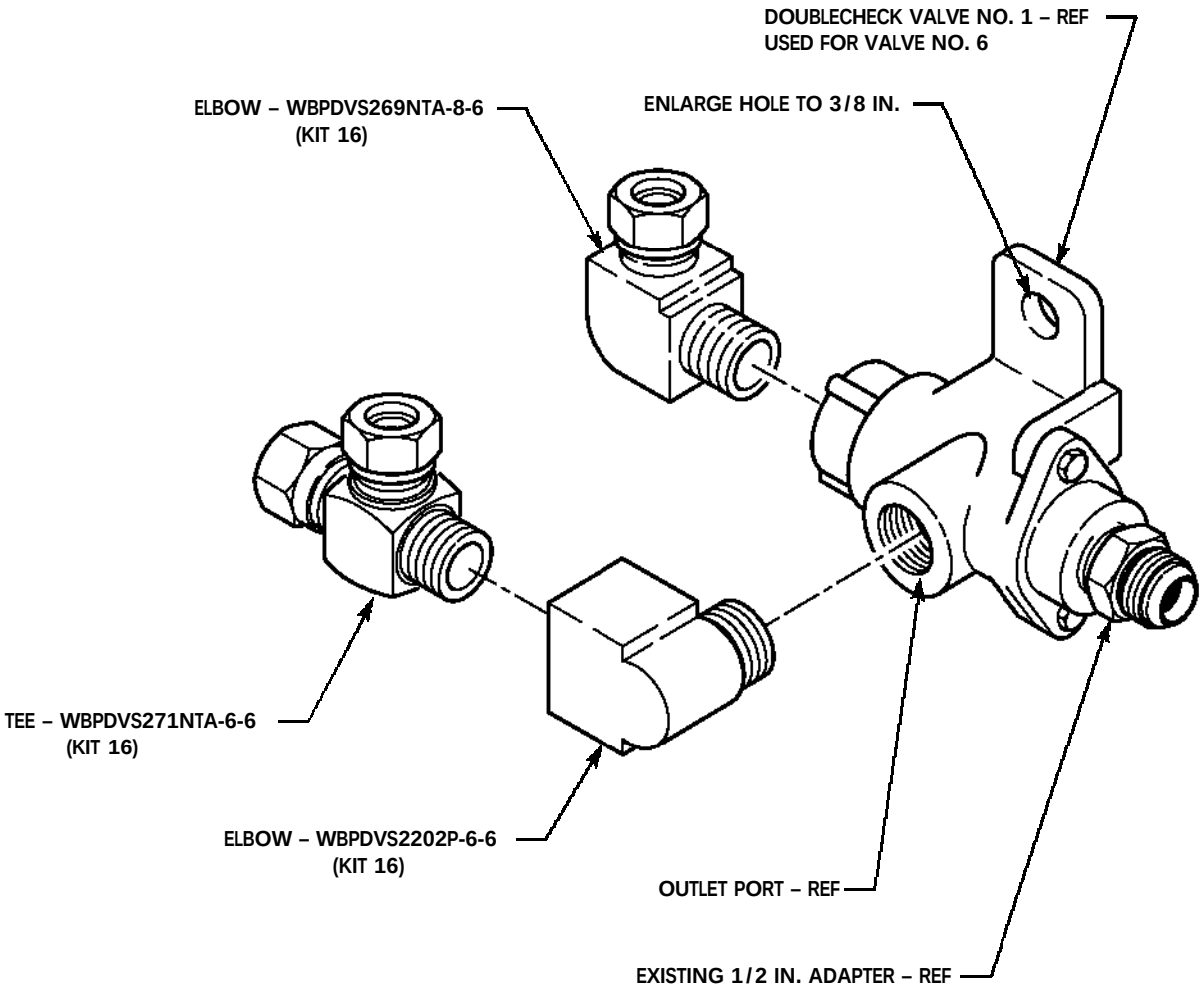

DOUBLECHECK VALVE NO. 1 – REF
USED FOR VALVE NO. 6
ELBOW – WBPDVS269NTA-8-6
(KIT 16)
ENLARGE HOLE TO 3/8 IN.
TEE – WBPDVS271NTA-6-6
(KIT 16)
ELBOW – WBPDVS2202P-6-6
(KIT 16)
OUTLET PORT – REF
EXISTING 1/2 IN. ADAPTER – REF

FIGURE 16

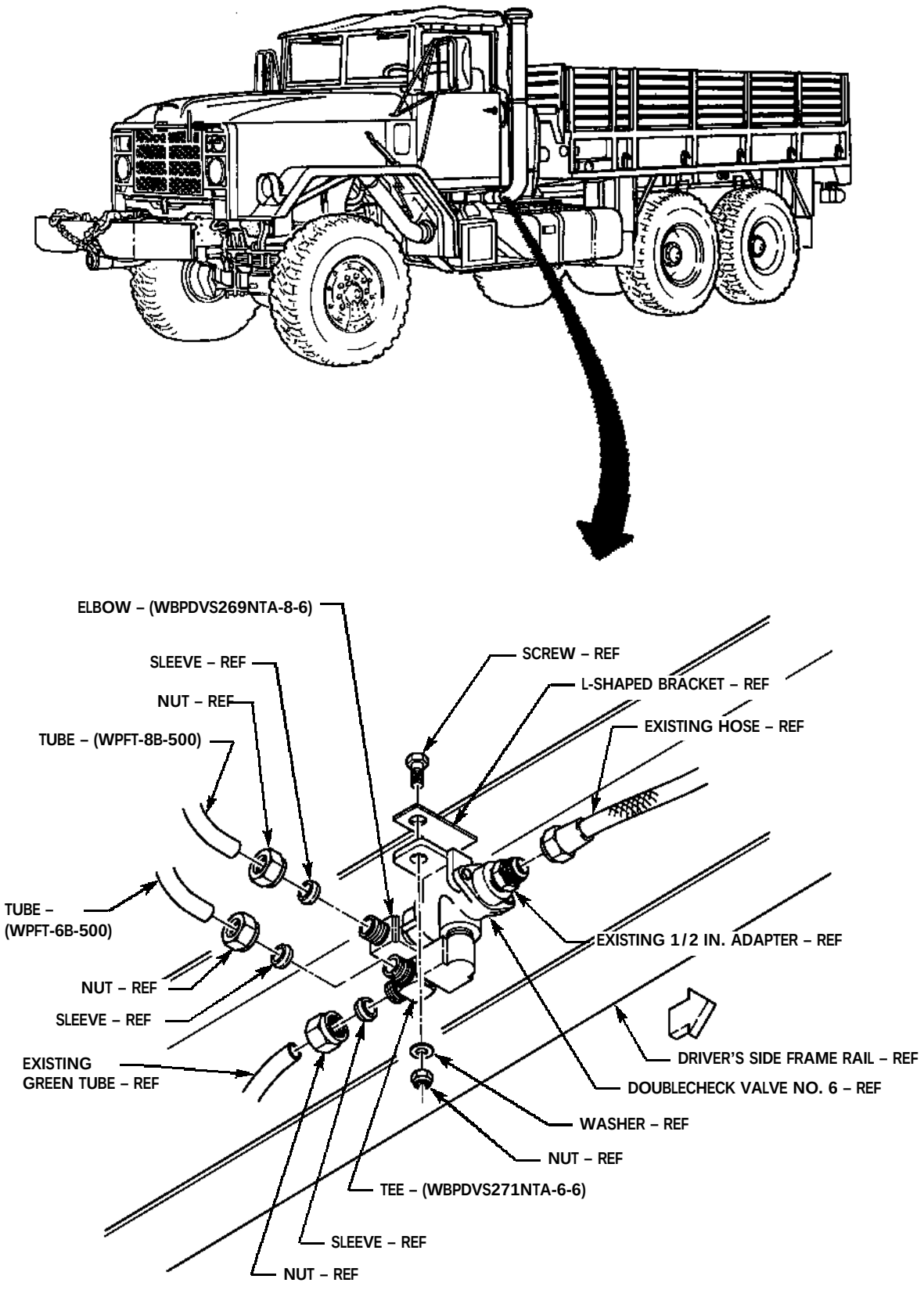

ELBOW – (WBPDVS269NTA-8-6)
SLEEVE – REF
NUT – REF
TUBE – (WPFT-8B-500)
SCREW – REF
L-SHAPED BRACKET – REF
EXISTING HOSE – REF
TUBE – (WPFT-6B-500)
EXISTING 1/2 IN. ADAPTER – REF
NUT – REF
SLEEVE – REF
EXISTING GREEN TUBE – REF
DRIVER'S SIDE FRAME RAIL – REF
DOUBLECHECK VALVE NO. 6 – REF
WASHER – REF
NUT – REF
TEE – (WBPDVS271NTA-6-6)
SLEEVE – REF
NUT – REF

FIGURE 17

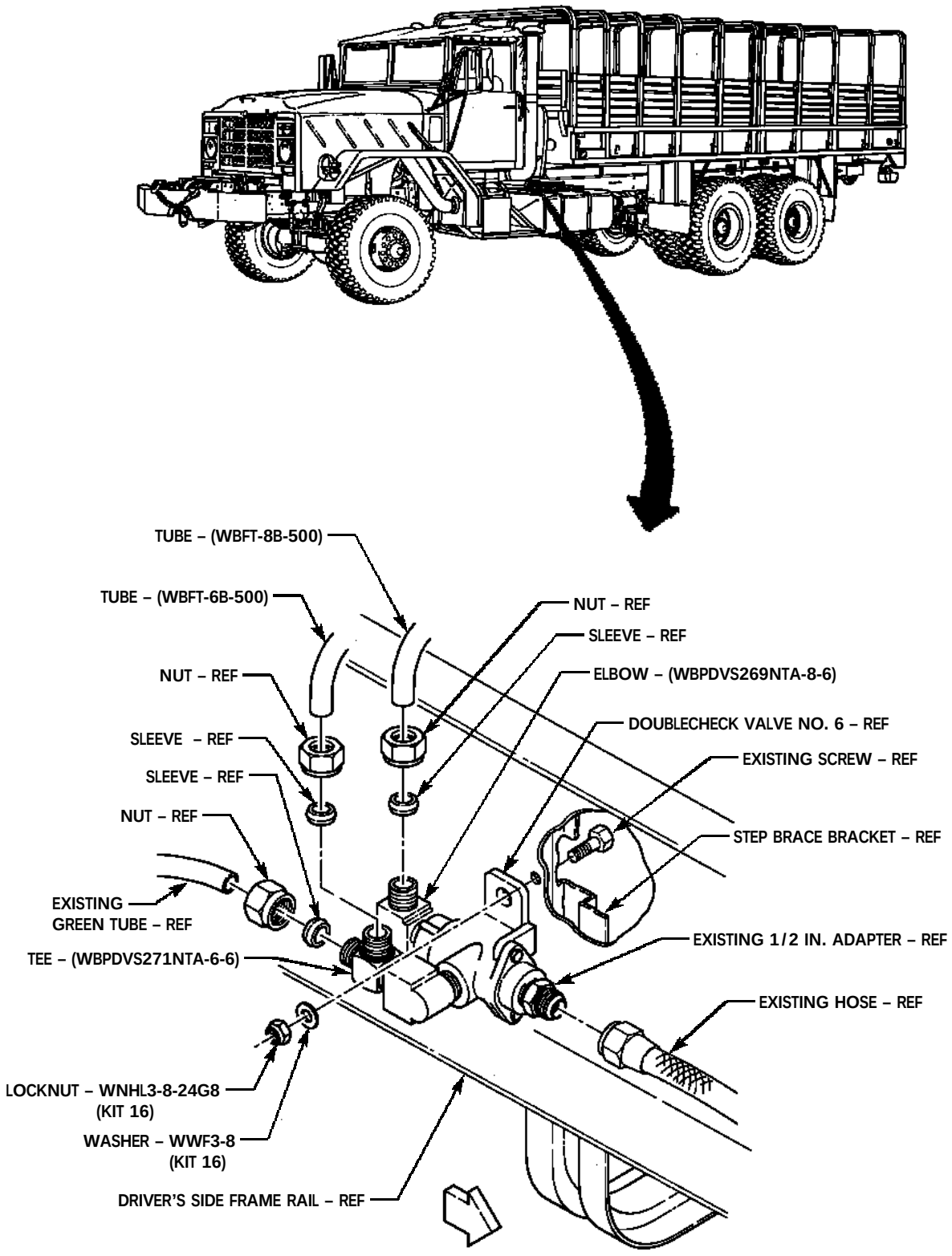

TUBE – (WBFT-8B-500)
TUBE – (WBFT-6B-500)
NUT – REF
SLEEVE – REF
NUT – REF
SLEEVE – REF
SLEEVE – REF
NUT – REF
EXISTING GREEN TUBE – REF
TEE – (WBPDVS271NTA-6-6)
LOCKNUT – WNHL3-8-24G8 (KIT 16)
WASHER – WWF3-8 (KIT 16)
DRIVER'S SIDE FRAME RAIL – REF
NUT – REF
SLEEVE – REF
ELBOW – (WBPDVS269NTA-8-6)
DOUBLECHECK VALVE NO. 6 – REF
EXISTING SCREW – REF
STEP BRACE BRACKET – REF
EXISTING 1/2 IN. ADAPTER – REF
EXISTING HOSE – REF

FIGURE 18

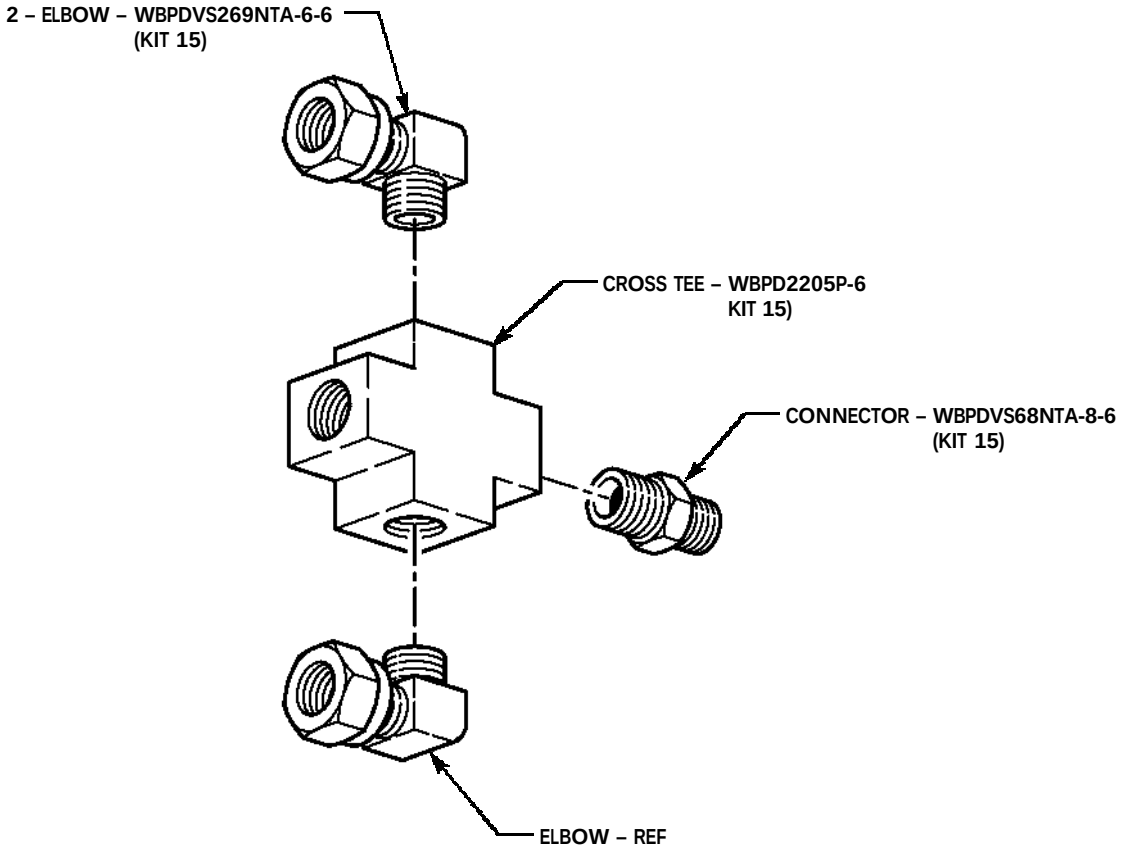

2 – ELBOW – WBPDVS269NTA-6-6
(KIT 15)
CROSS TEE – WBPD2205P-6
KIT 15)
CONNECTOR – WBPDVS68NTA-8-6
(KIT 15)
ELBOW – REF

FIGURE 19

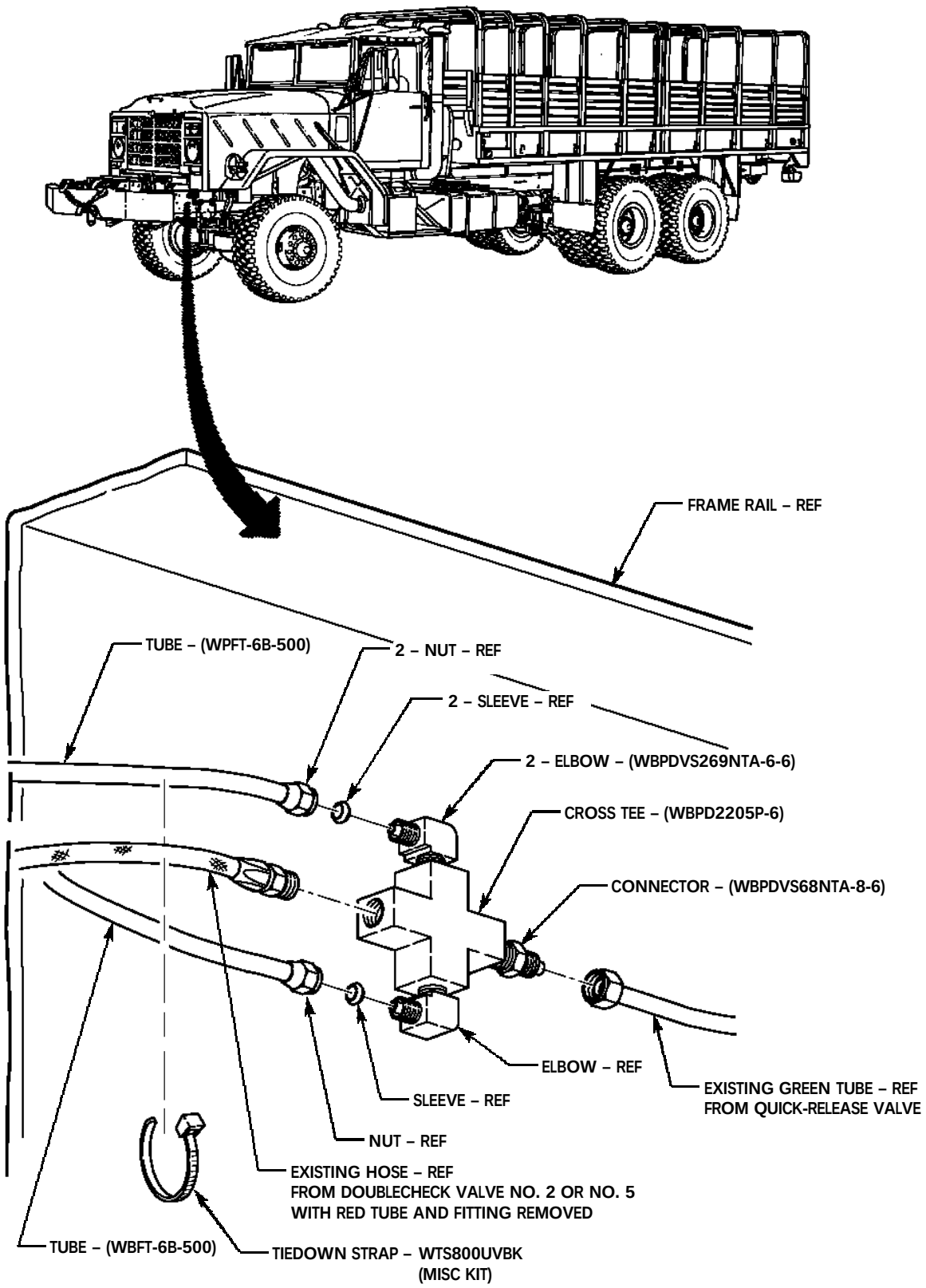

FRAME RAIL – REF
TUBE – (WPFT-6B-500)
2 – NUT – REF
2 – SLEEVE – REF
2 – ELBOW – (WBPDVS269NTA-6-6)
CROSS TEE – (WBPD2205P-6)
CONNECTOR – (WBPDVS68NTA-8-6)
ELBOW – REF
EXISTING GREEN TUBE – REF
FROM QUICK-RELEASE VALVE
SLEEVE – REF
NUT – REF
EXISTING HOSE – REF
FROM DOUBLECHECK VALVE NO. 2 OR NO. 5
WITH RED TUBE AND FITTING REMOVED
TUBE – (WBFT-6B-500)
TIEDOWN STRAP – WTS800UVBK
(MISC KIT)

FIGURE 20

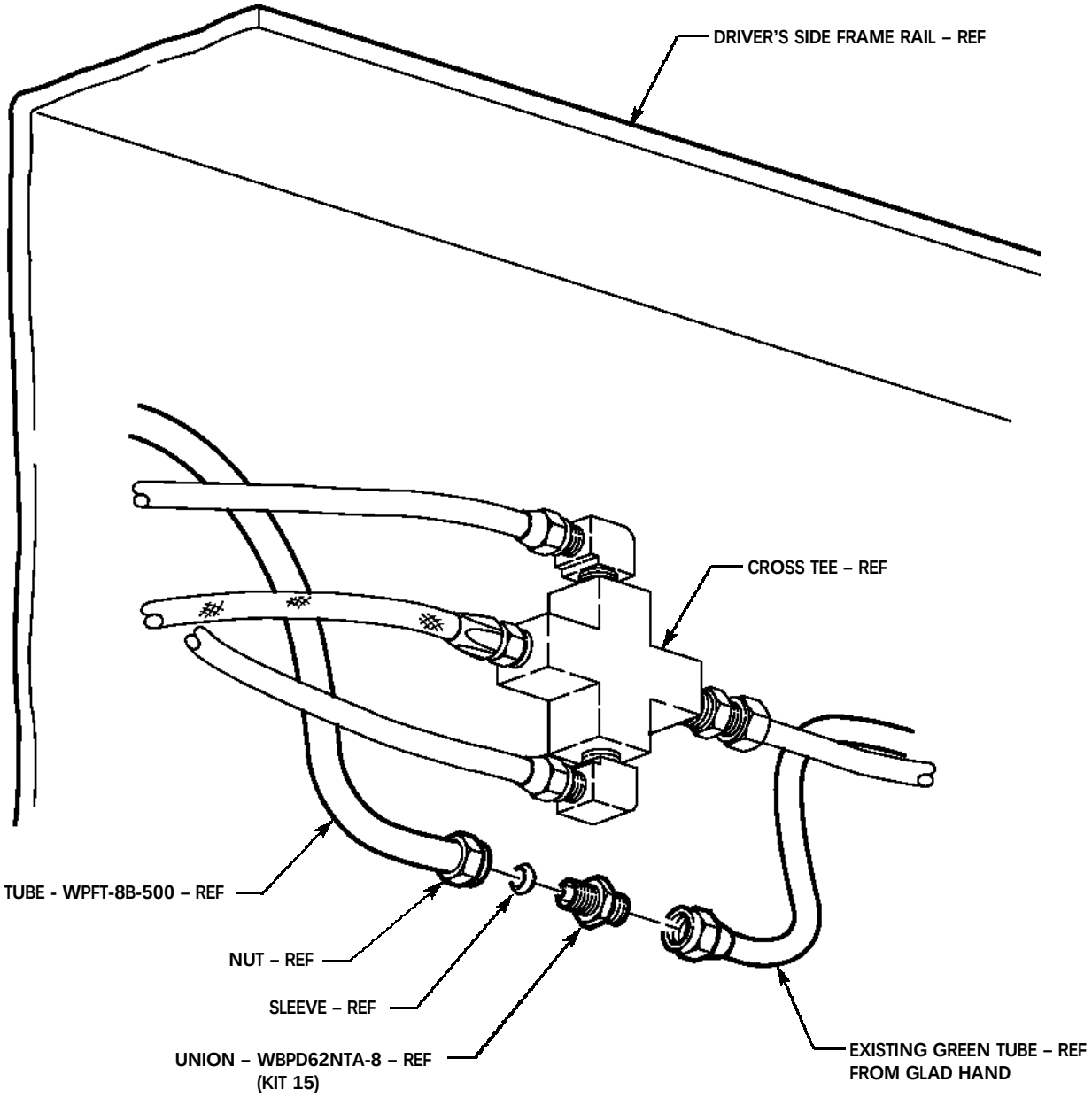

DRIVER'S SIDE FRAME RAIL – REF
CROSS TEE – REF
TUBE - WPFT-8B-500 – REF
NUT – REF
SLEEVE – REF
UNION – WBPD62NTA-8 – REF
(KIT 15)
EXISTING GREEN TUBE – REF
FROM GLAD HAND

FIGURE 21

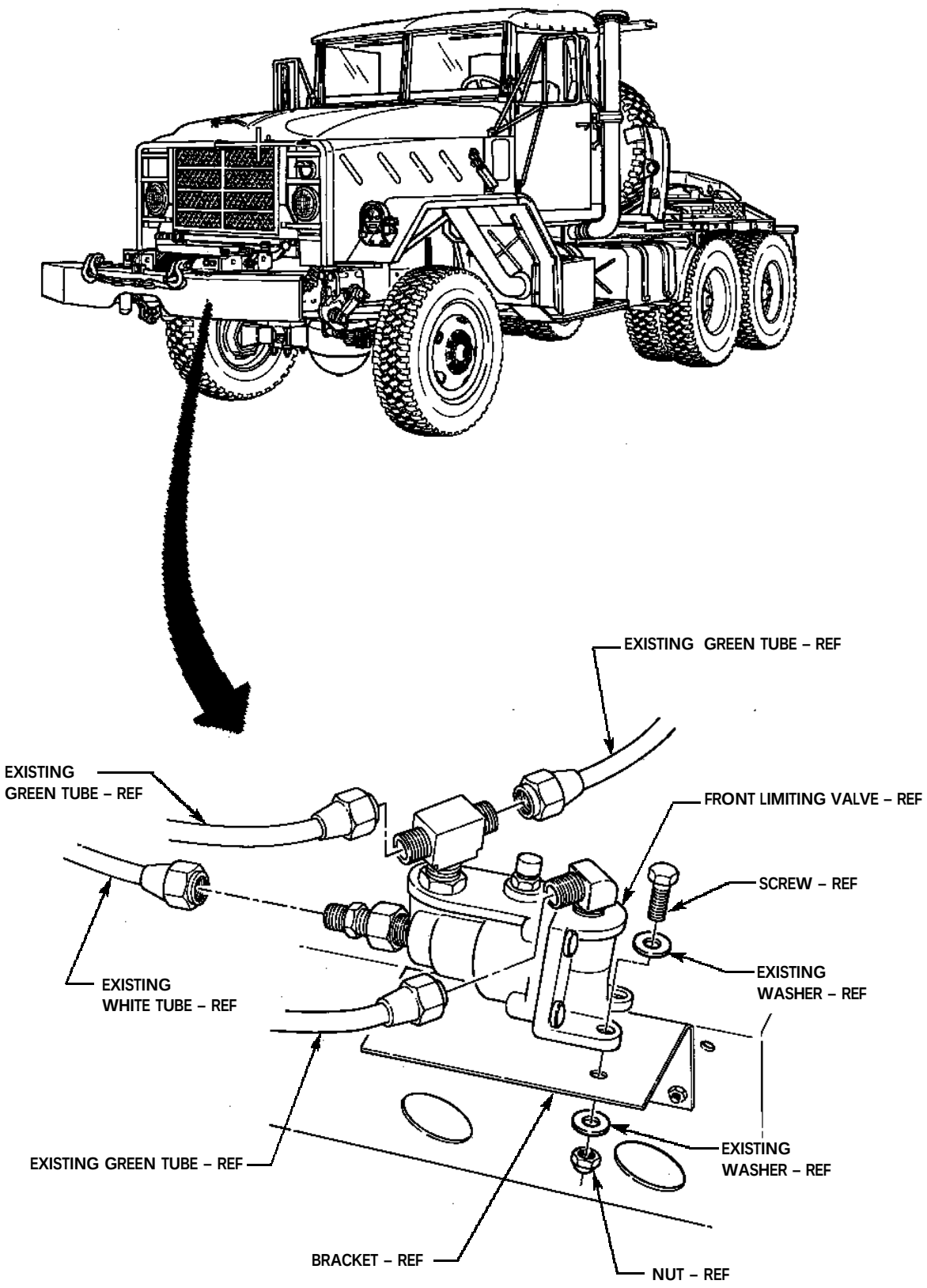

EXISTING GREEN TUBE – REF
EXISTING
GREEN TUBE – REF
FRONT LIMITING VALVE – REF
SCREW – REF
EXISTING
WASHER – REF
EXISTING
WHITE TUBE – REF
EXISTING GREEN TUBE – REF
EXISTING
WASHER – REF
BRACKET – REF
NUT – REF

FIGURE 22

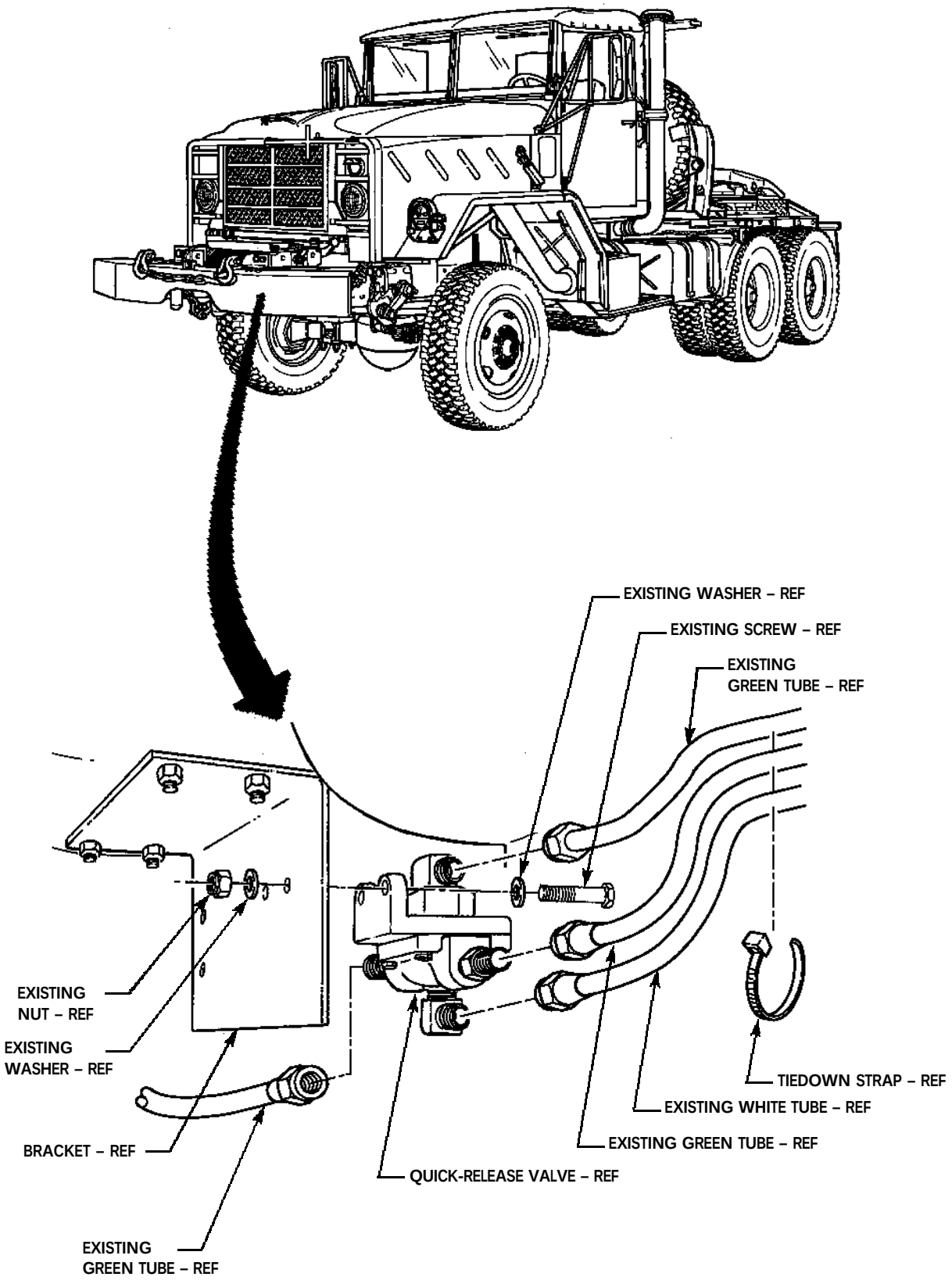

EXISTING WASHER – REF
EXISTING SCREW – REF
EXISTING
GREEN TUBE – REF
EXISTING
NUT – REF
EXISTING
WASHER – REF
BRACKET – REF
EXISTING
GREEN TUBE – REF
QUICK-RELEASE VALVE – REF
EXISTING GREEN TUBE – REF
EXISTING WHITE TUBE – REF
TIEDOWN STRAP – REF

FIGURE 23

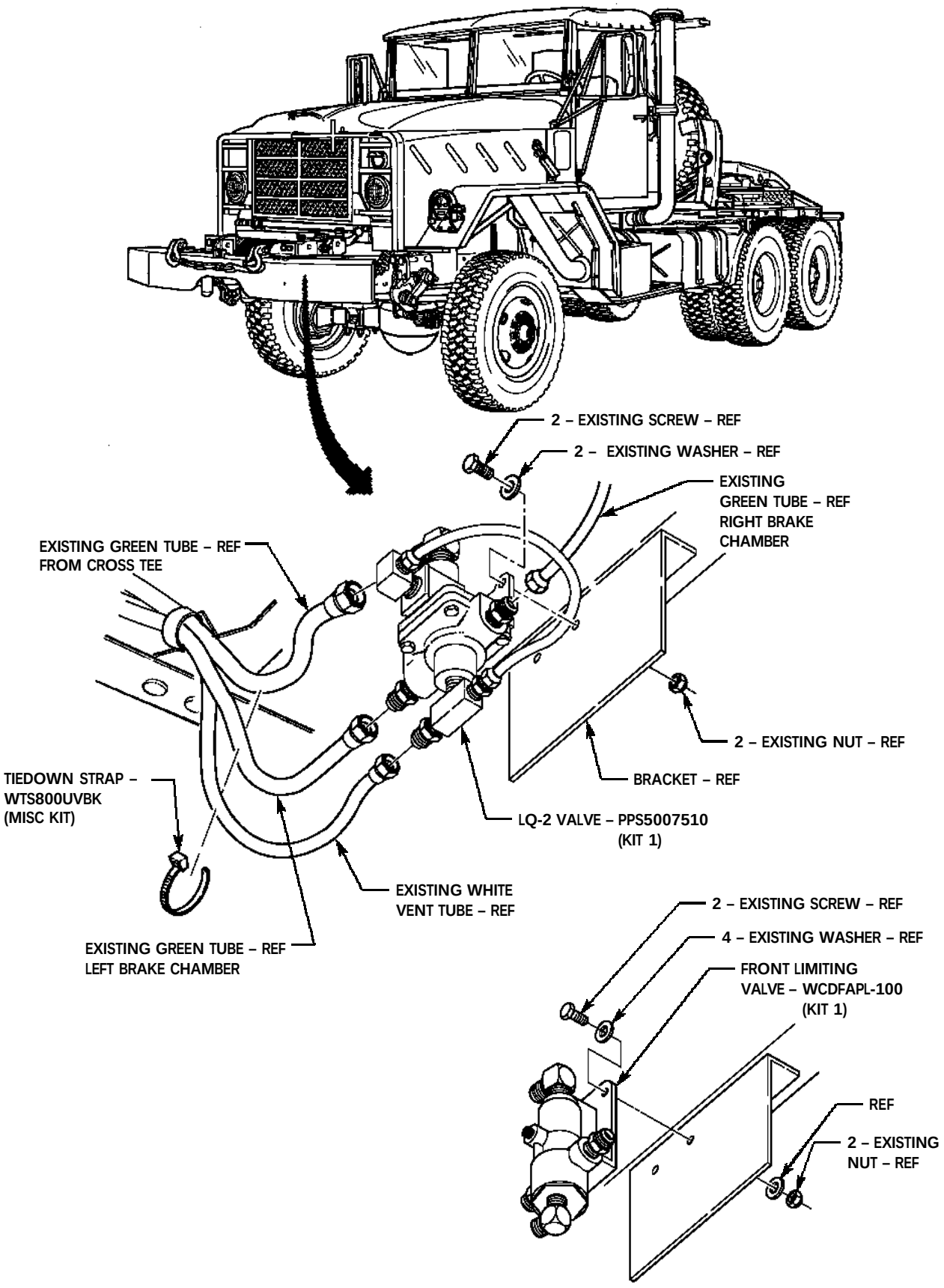

2 – EXISTING SCREW – REF
2 – EXISTING WASHER – REF
EXISTING GREEN TUBE – REF RIGHT BRAKE CHAMBER
EXISTING GREEN TUBE – REF FROM CROSS TEE
2 – EXISTING NUT – REF
BRACKET – REF
TIEDOWN STRAP – WTS800UVBK (MISC KIT)
LQ-2 VALVE – PPS5007510 (KIT 1)
EXISTING WHITE VENT TUBE – REF
EXISTING GREEN TUBE – REF LEFT BRAKE CHAMBER
2 – EXISTING SCREW – REF
4 – EXISTING WASHER – REF
FRONT LIMITING VALVE – WCDFAPL-100 (KIT 1)
REF
2 – EXISTING NUT – REF

FIGURE 24

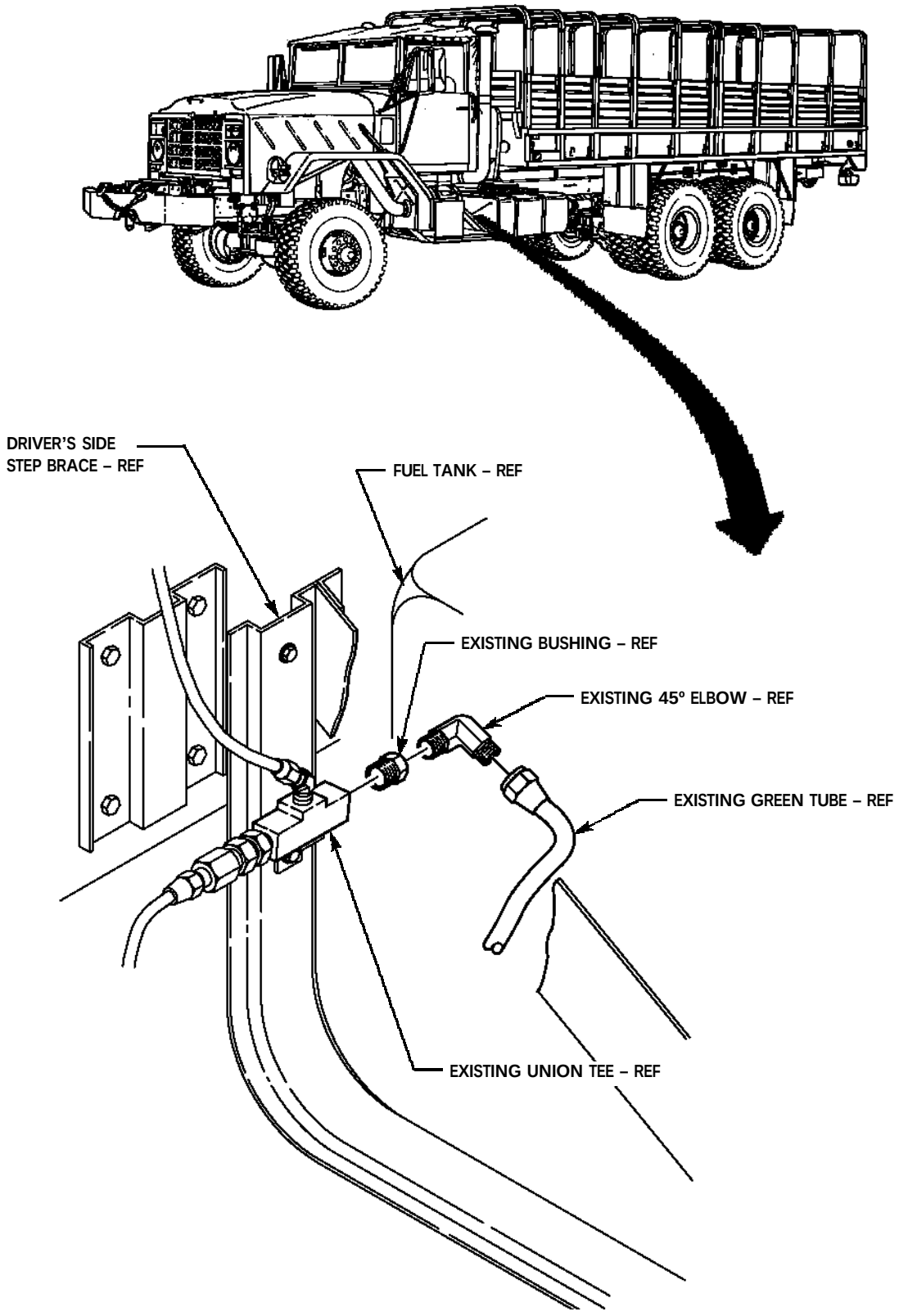

DRIVER'S SIDE
STEP BRACE – REF
FUEL TANK – REF
EXISTING BUSHING – REF
EXISTING 45° ELBOW – REF
EXISTING GREEN TUBE – REF
EXISTING UNION TEE – REF

FIGURE 25

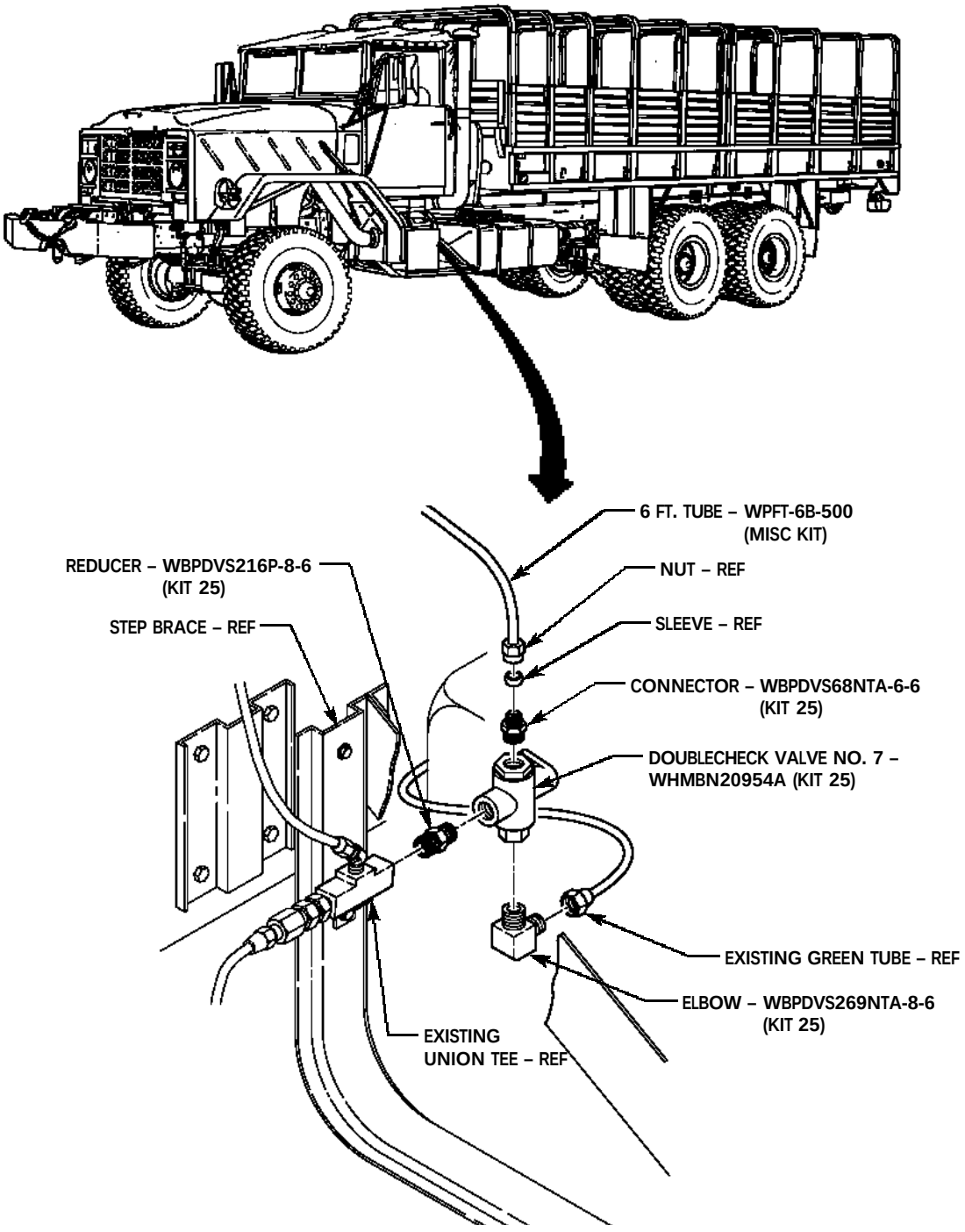

6 FT. TUBE – WPFT-6B-500
(MISC KIT)
REDUCER – WBPDVS216P-8-6
(KIT 25)
NUT – REF
STEP BRACE – REF
SLEEVE – REF
CONNECTOR – WBPDVS68NTA-6-6
(KIT 25)
DOUBLECHECK VALVE NO. 7 –
WHMBN20954A (KIT 25)
EXISTING GREEN TUBE – REF
ELBOW – WBPDVS269NTA-8-6
(KIT 25)
EXISTING
UNION TEE – REF

FIGURE 26

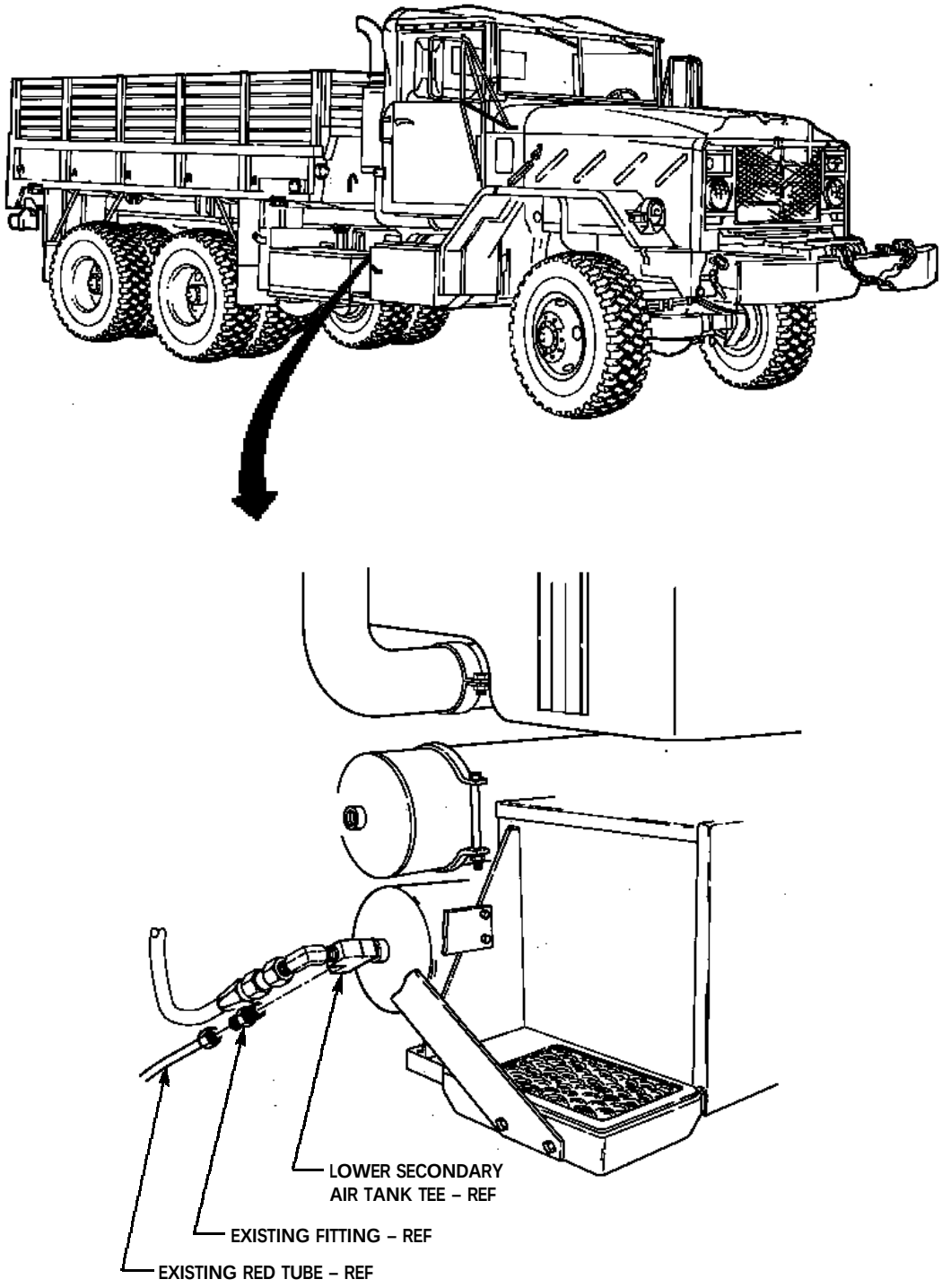

LOWER SECONDARY
AIR TANK TEE – REF
EXISTING FITTING – REF
EXISTING RED TUBE – REF

FIGURE 27

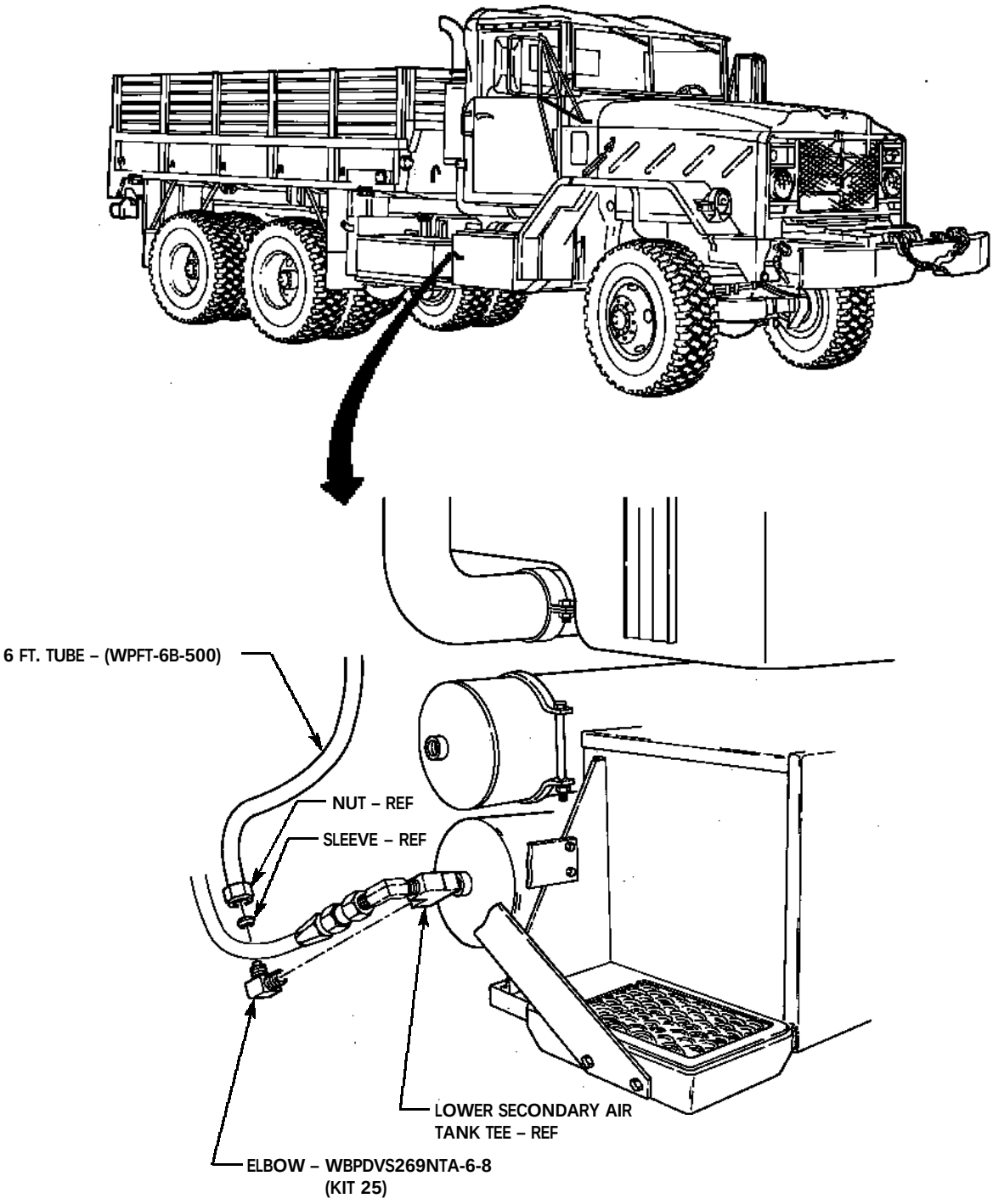

6 FT. TUBE – (WPFT-6B-500)
NUT – REF
SLEEVE – REF
LOWER SECONDARY AIR TANK TEE – REF
ELBOW – WBPDVS269NTA-6-8 (KIT 25)

FIGURE 28

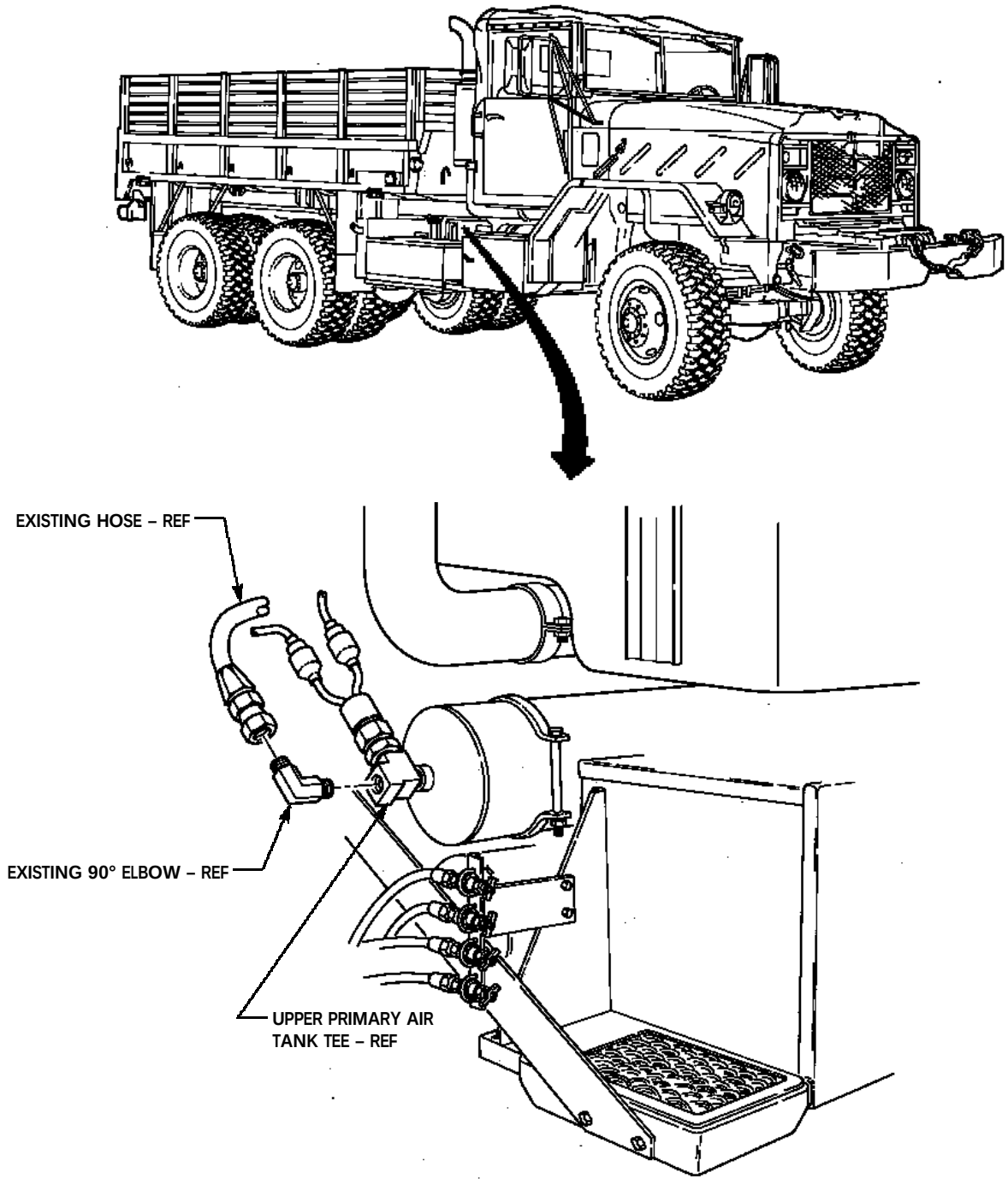

EXISTING HOSE – REF
EXISTING 90° ELBOW – REF
UPPER PRIMARY AIR TANK TEE – REF

FIGURE 29

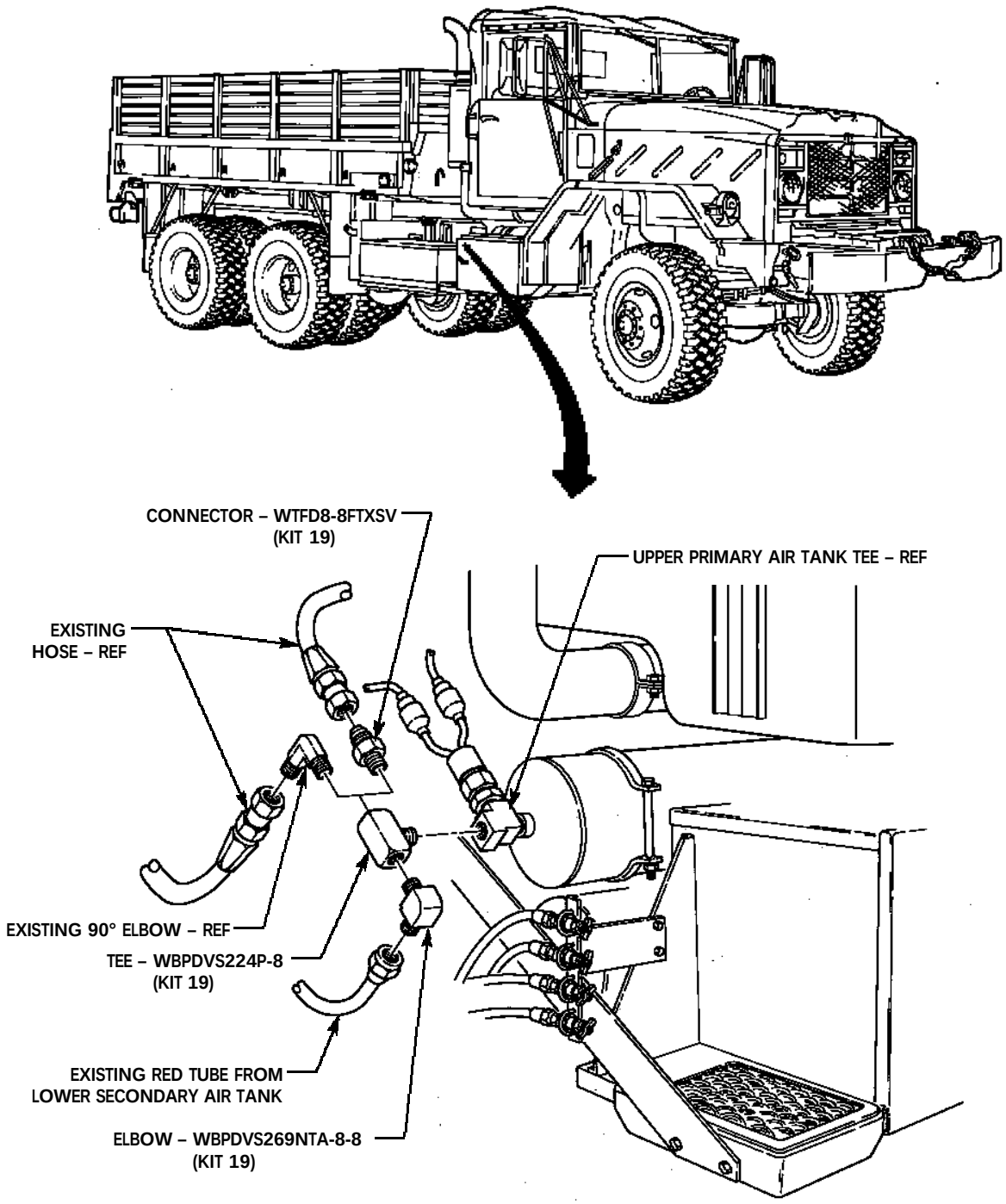

CONNECTOR – WTFD8-8FTXSV
(KIT 19)
UPPER PRIMARY AIR TANK TEE – REF
EXISTING
HOSE – REF
EXISTING 90° ELBOW – REF
TEE – WBPDVS224P-8
(KIT 19)
EXISTING RED TUBE FROM
LOWER SECONDARY AIR TANK
ELBOW – WBPDVS269NTA-8-8
(KIT 19)

FIGURE 30

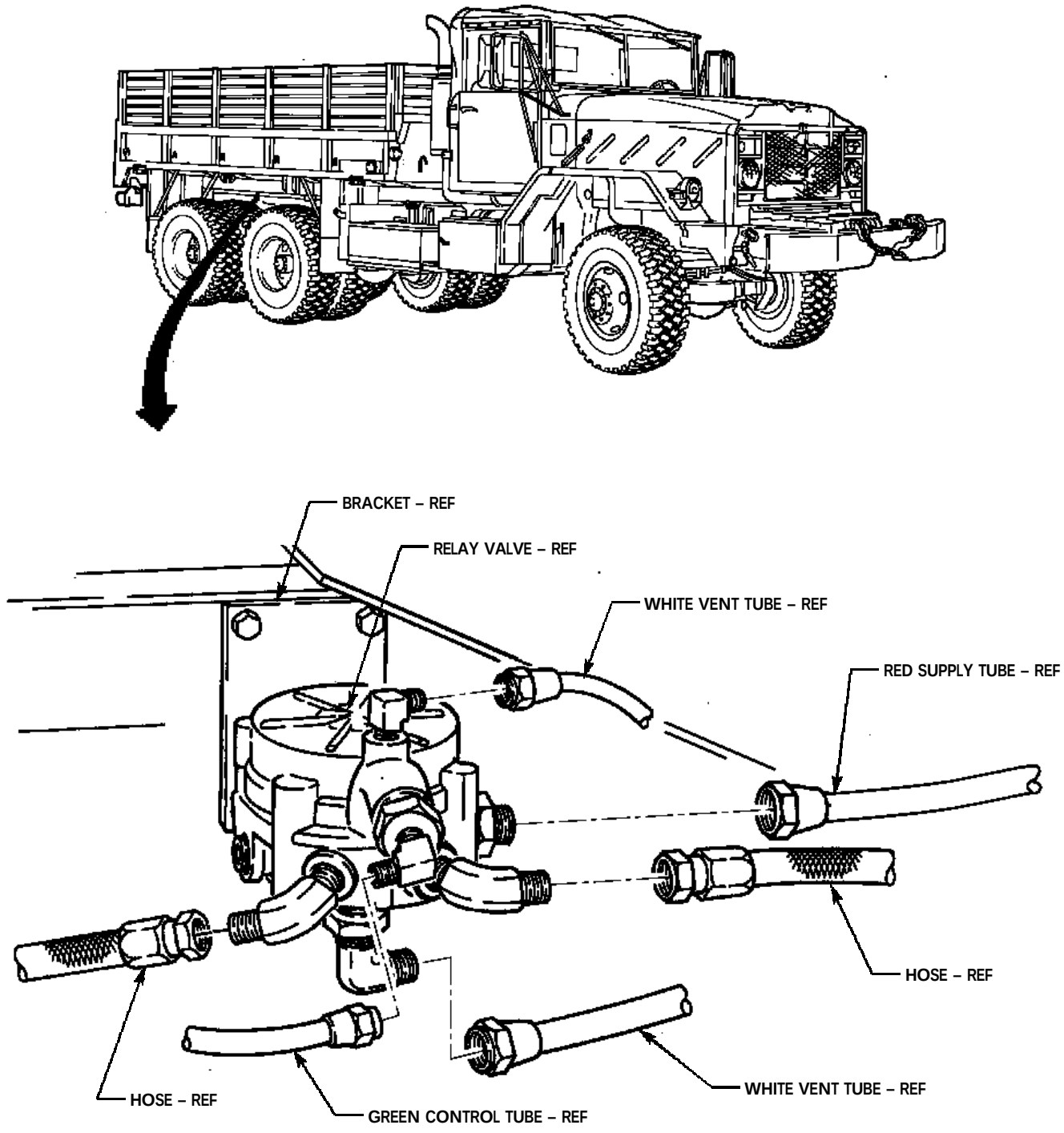

BRACKET – REF
RELAY VALVE – REF
WHITE VENT TUBE – REF
RED SUPPLY TUBE – REF
HOSE – REF
HOSE – REF
GREEN CONTROL TUBE – REF
WHITE VENT TUBE – REF

FIGURE 31

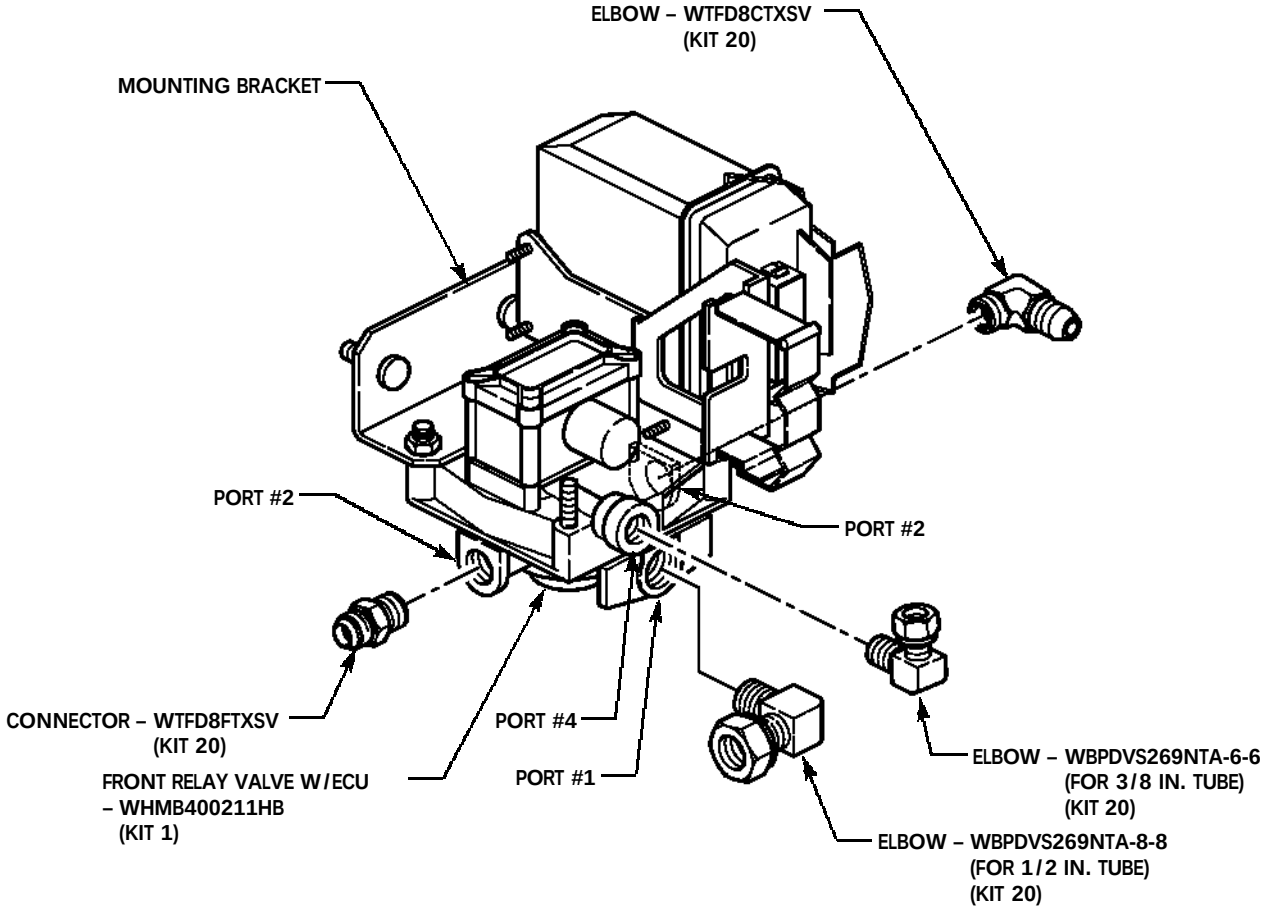

ELBOW – WTFD8CTXSV
(KIT 20)
MOUNTING BRACKET
PORT #2
PORT #2
CONNECTOR – WTFD8FTXSV
(KIT 20)
FRONT RELAY VALVE W/ECU
– WHMB400211HB
(KIT 1)
PORT #4
PORT #1
ELBOW – WBPDVS269NTA-6-6
(FOR 3/8 IN. TUBE)
(KIT 20)
ELBOW – WBPDVS269NTA-8-8
(FOR 1/2 IN. TUBE)
(KIT 20)

FIGURE 32

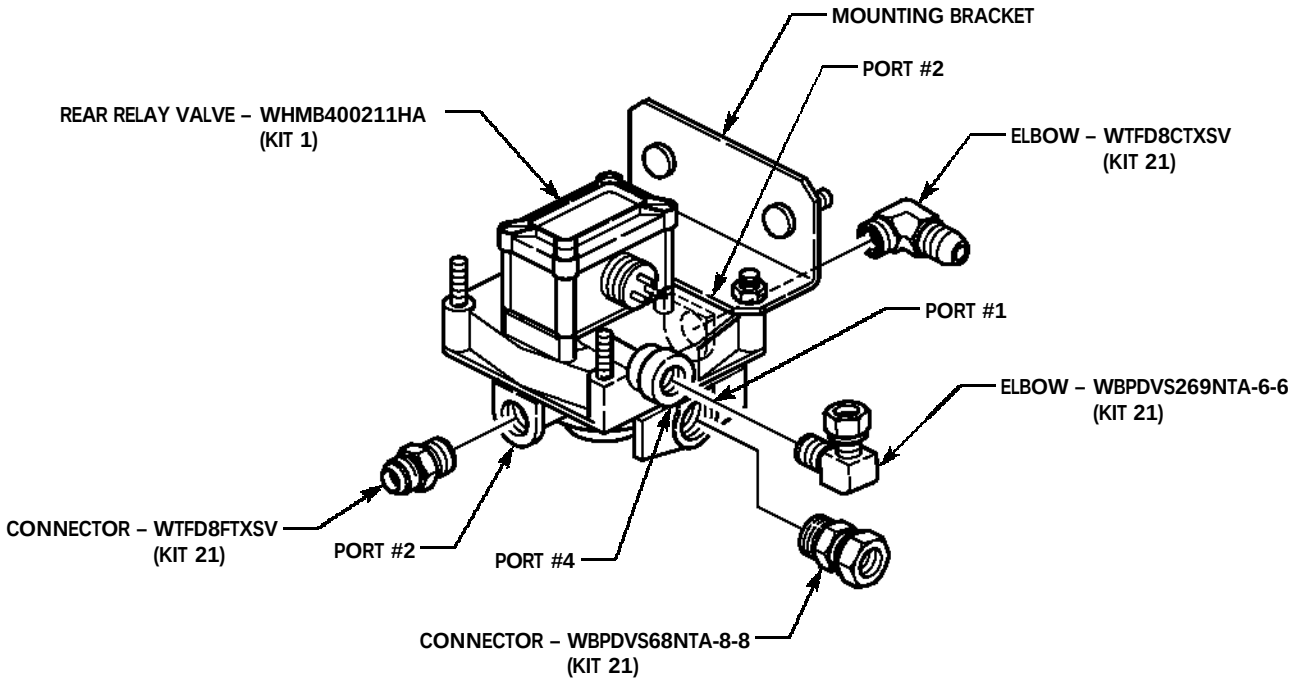

MOUNTING BRACKET
PORT #2
REAR RELAY VALVE – WHMB400211HA
(KIT 1)
ELBOW – WTFD8CTXSV
(KIT 21)
PORT #1
ELBOW – WBPDVS269NTA-6-6
(KIT 21)
CONNECTOR – WTFD8FTXSV
(KIT 21)
PORT #2
PORT #4
CONNECTOR – WBPDVS68NTA-8-8
(KIT 21)

FIGURE 33

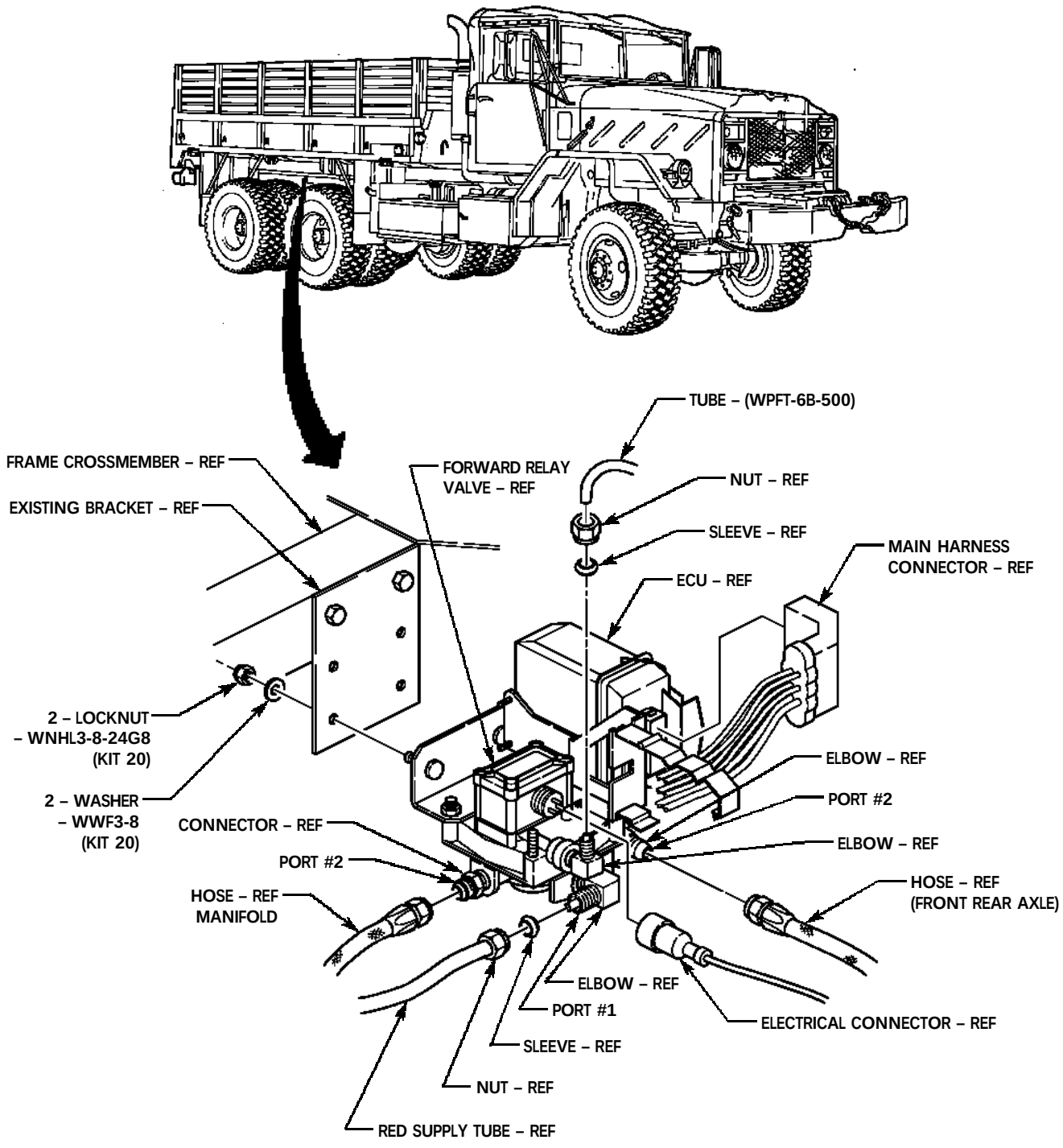

TUBE – (WPFT-6B-500)
FRAME CROSSMEMBER – REF
FORWARD RELAY VALVE – REF
NUT – REF
EXISTING BRACKET – REF
SLEEVE – REF
MAIN HARNESS CONNECTOR – REF
ECU – REF
2 – LOCKNUT – WNHL3-8-24G8 (KIT 20)
ELBOW – REF
2 – WASHER – WWF3-8 (KIT 20)
PORT #2
CONNECTOR – REF
ELBOW – REF
PORT #2
HOSE – REF (FRONT REAR AXLE)
HOSE – REF MANIFOLD
ELBOW – REF
PORT #1
ELECTRICAL CONNECTOR – REF
SLEEVE – REF
NUT – REF
RED SUPPLY TUBE – REF

FIGURE 34

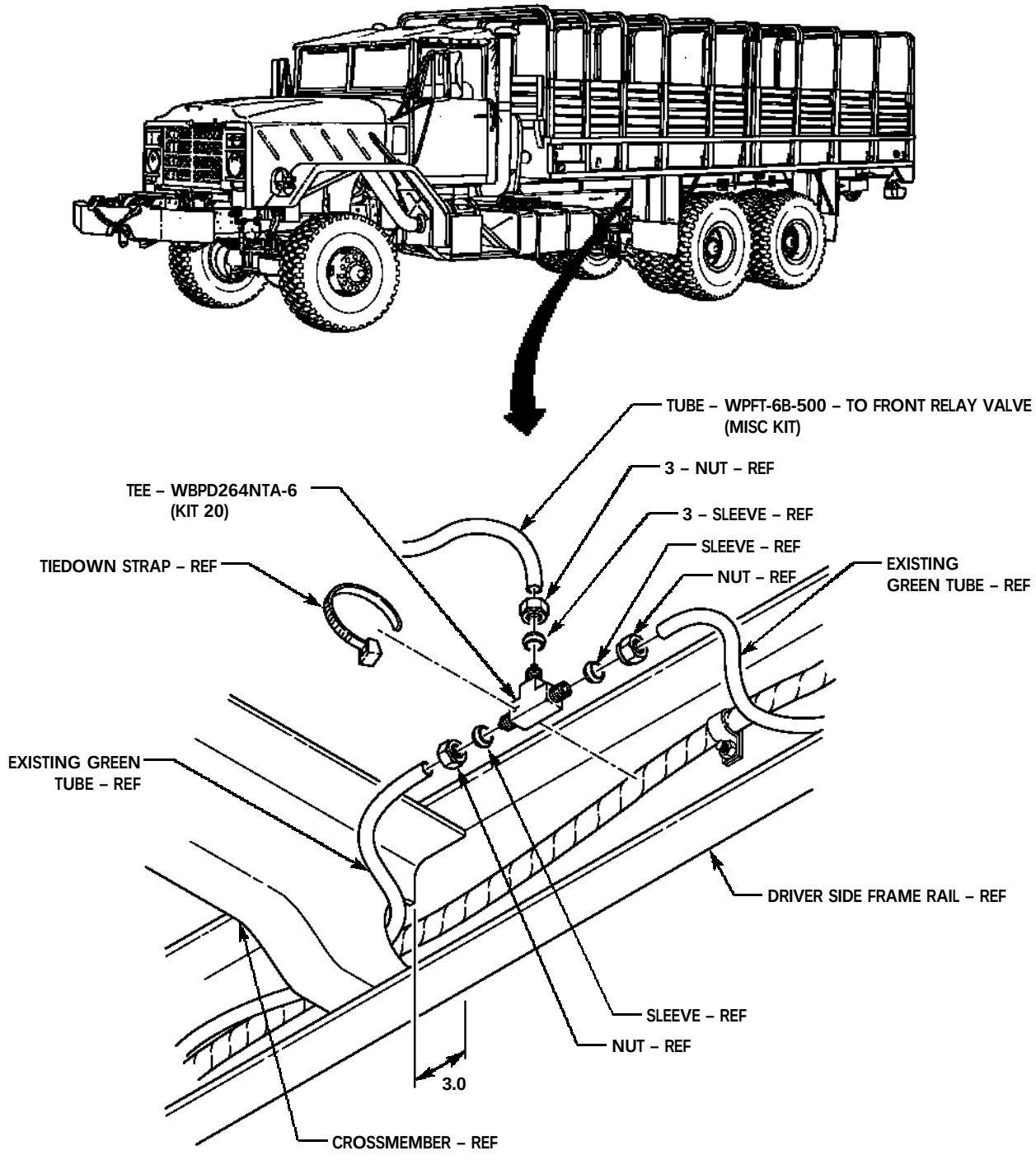

TUBE – WPFT-6B-500 – TO FRONT RELAY VALVE (MISC KIT)
3 – NUT – REF
TEE – WBPD264NTA-6 (KIT 20)
3 – SLEEVE – REF
SLEEVE – REF
TIEDOWN STRAP – REF
NUT – REF
EXISTING GREEN TUBE – REF
EXISTING GREEN TUBE – REF
DRIVER SIDE FRAME RAIL – REF
SLEEVE – REF
NUT – REF
3.0
CROSSMEMBER – REF

FIGURE 35

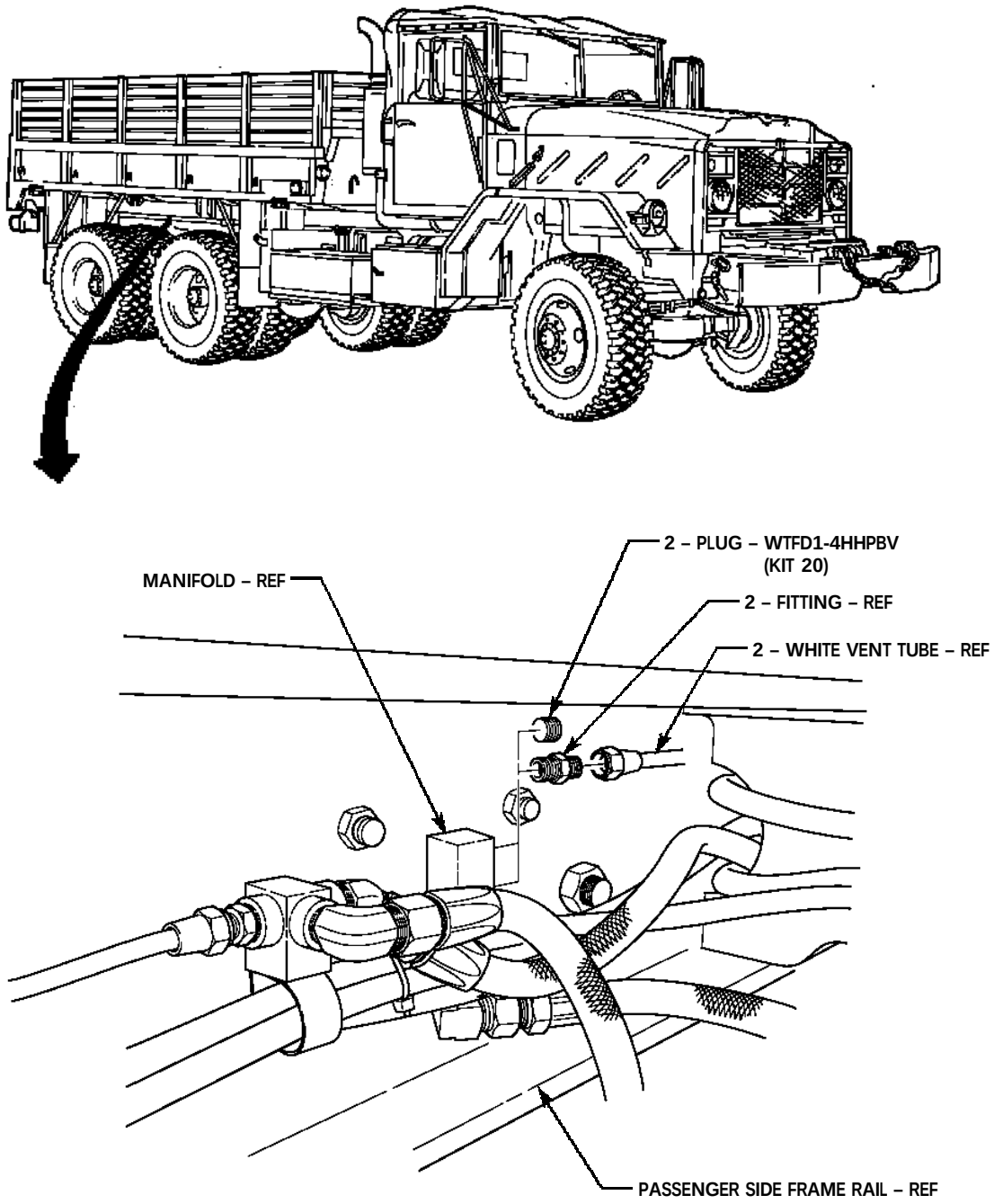

2 – PLUG – WTFD1-4HHPBV
(KIT 20)
MANIFOLD – REF
2 – FITTING – REF
2 – WHITE VENT TUBE – REF
PASSENGER SIDE FRAME RAIL – REF

FIGURE 36

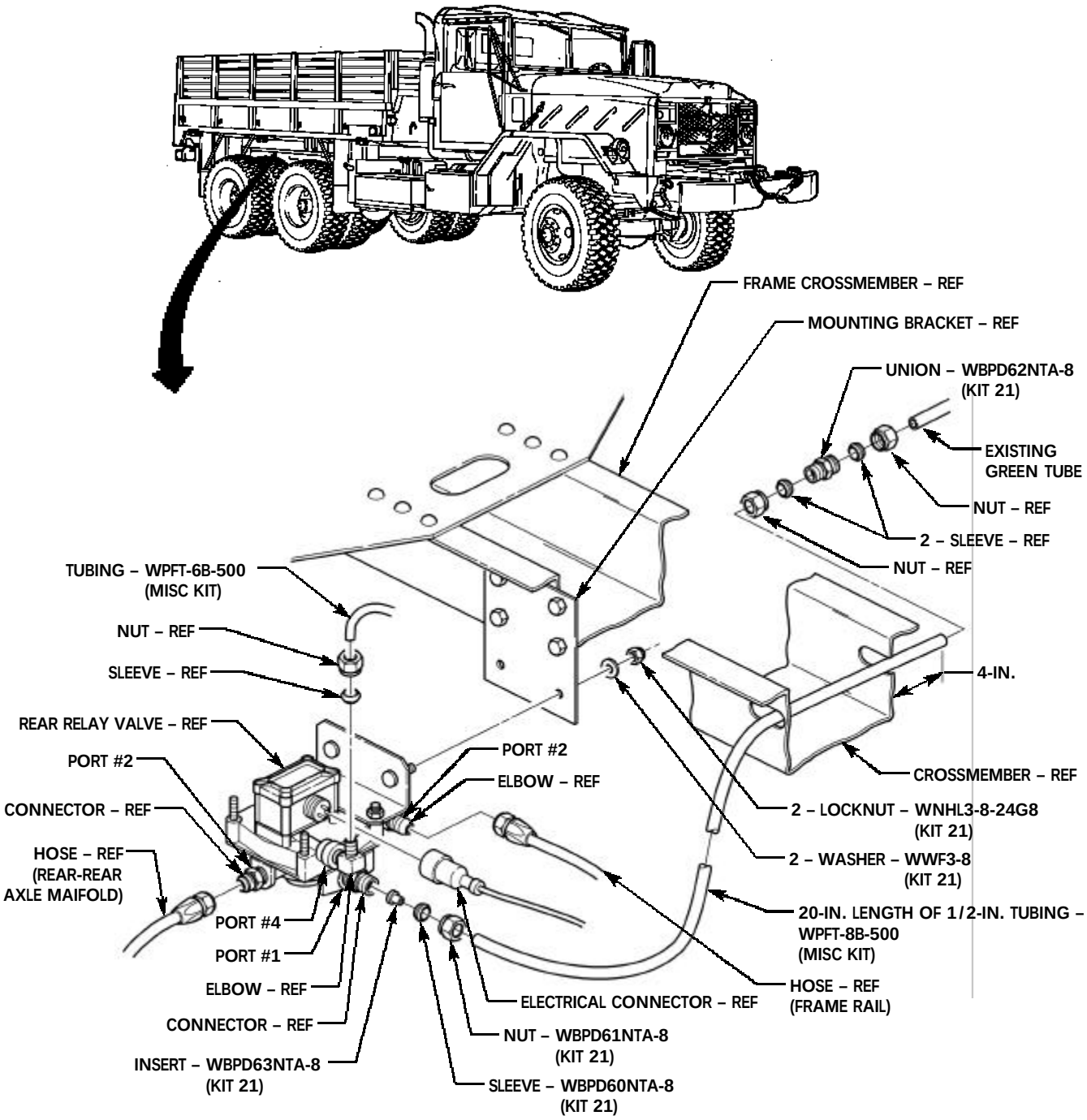

FRAME CROSSMEMBER – REF
MOUNTING BRACKET – REF
UNION – WBPD62NTA-8 (KIT 21)
EXISTING GREEN TUBE
NUT – REF
2 – SLEEVE – REF
NUT – REF
TUBING – WPFT-6B-500 (MISC KIT)
NUT – REF
SLEEVE – REF
REAR RELAY VALVE – REF
PORT #2
CONNECTOR – REF
HOSE – REF (REAR-REAR AXLE MAIFOLD)
PORT #4
PORT #1
ELBOW – REF
CONNECTOR – REF
INSERT – WBPD63NTA-8 (KIT 21)
PORT #2
ELBOW – REF
4-IN.
CROSSMEMBER – REF
2 – LOCKNUT – WNHL3-8-24G8 (KIT 21)
2 – WASHER – WWF3-8 (KIT 21)
20-IN. LENGTH OF 1/2-IN. TUBING – WPFT-8B-500 (MISC KIT)
HOSE – REF (FRAME RAIL)
ELECTRICAL CONNECTOR – REF
NUT – WBPD61NTA-8 (KIT 21)
SLEEVE – WBPD60NTA-8 (KIT 21)

FIGURE 37

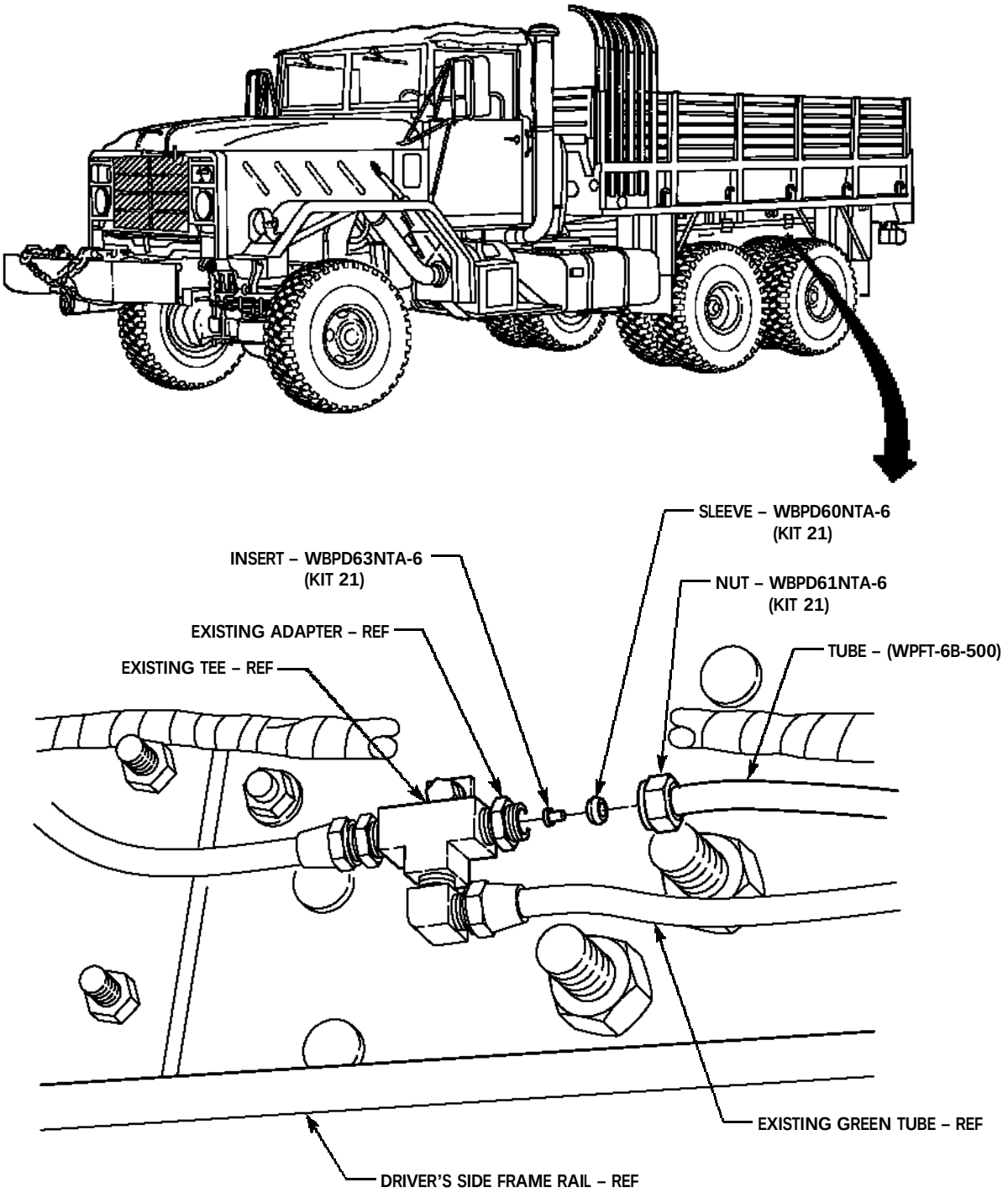
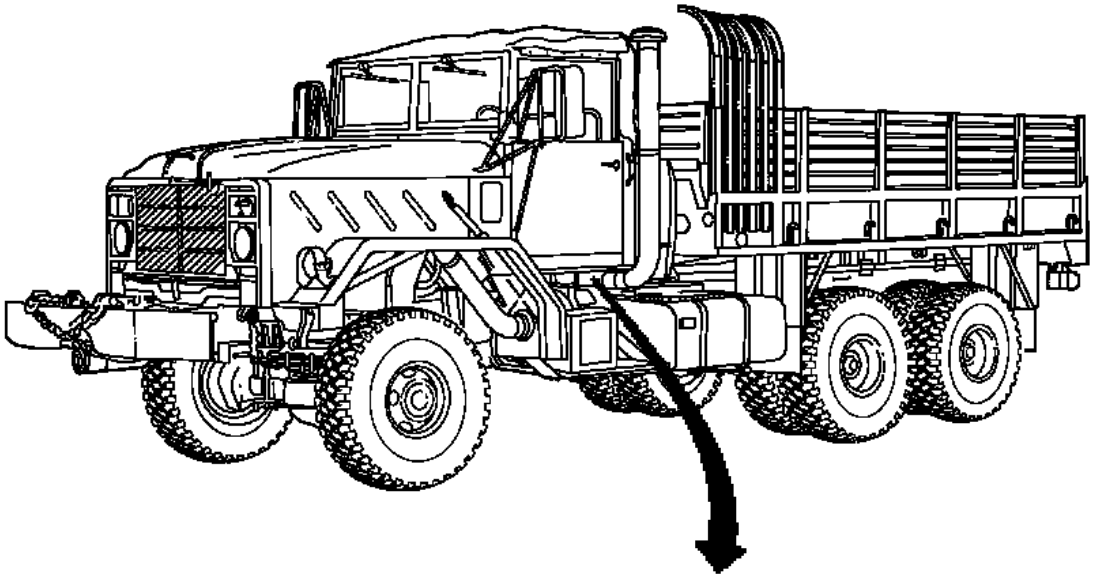

SLEEVE – WBPD60NTA-6
(KIT 21)
INSERT – WBPD63NTA-6
(KIT 21)
NUT – WBPD61NTA-6
(KIT 21)
EXISTING ADAPTER – REF
TUBE – (WPFT-6B-500)
EXISTING TEE – REF
EXISTING GREEN TUBE – REF
DRIVER'S SIDE FRAME RAIL – REF

FIGURE 38



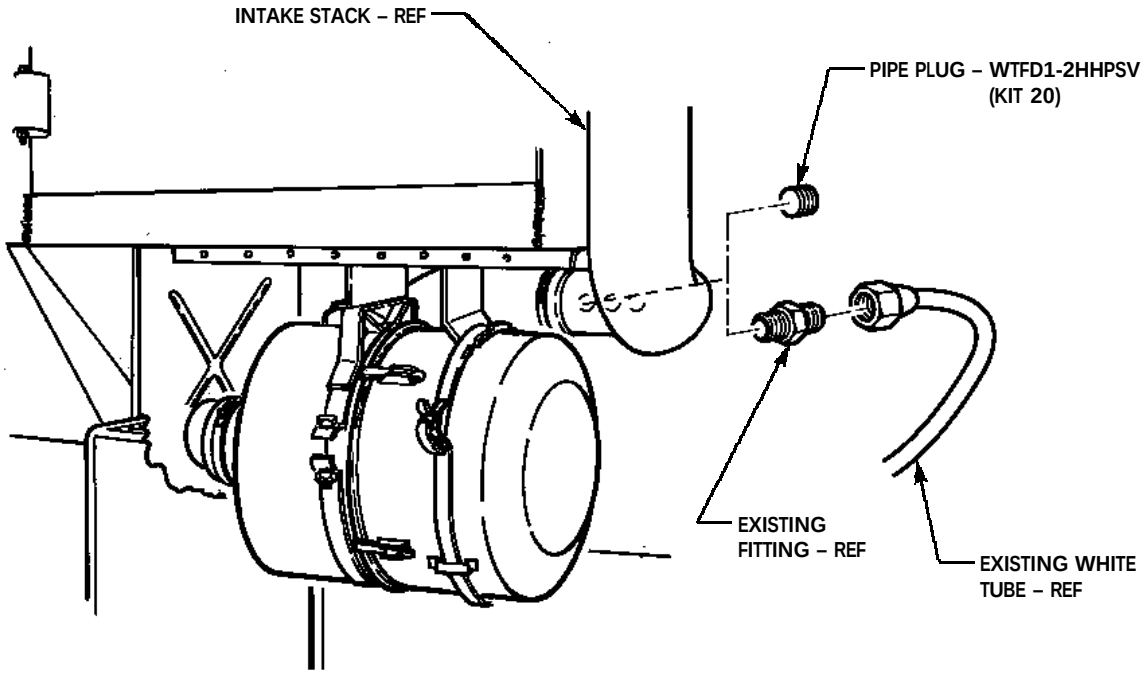

INTAKE STACK – REF
PIPE PLUG – WTFD1-2HHPSV
(KIT 20)
EXISTING
FITTING – REF
EXISTING WHITE
TUBE – REF

FIGURE 39

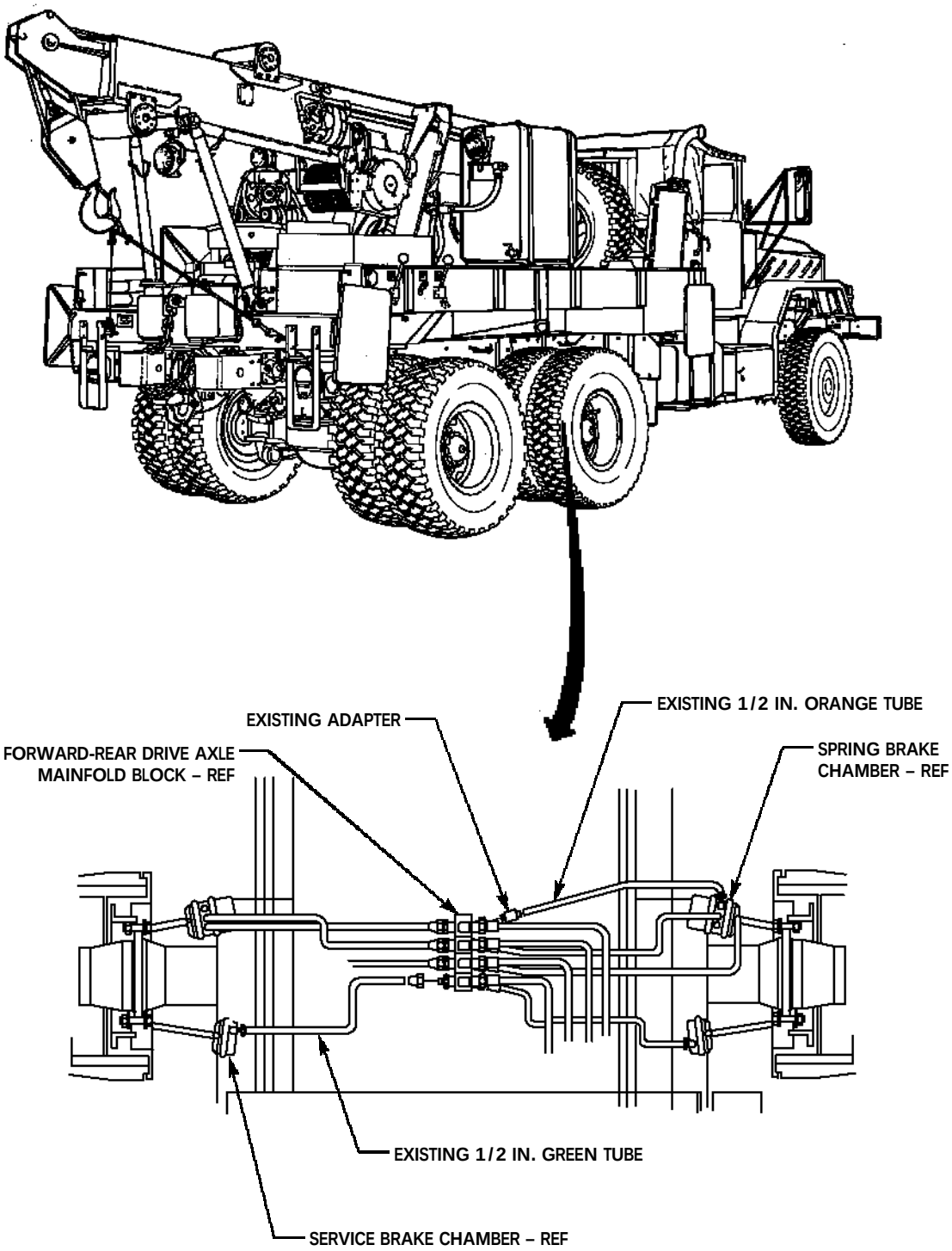

EXISTING ADAPTER
EXISTING 1/2 IN. ORANGE TUBE
FORWARD-REAR DRIVE AXLE MAINFOLD BLOCK – REF
SPRING BRAKE CHAMBER – REF
EXISTING 1/2 IN. GREEN TUBE
SERVICE BRAKE CHAMBER – REF

FIGURE 40

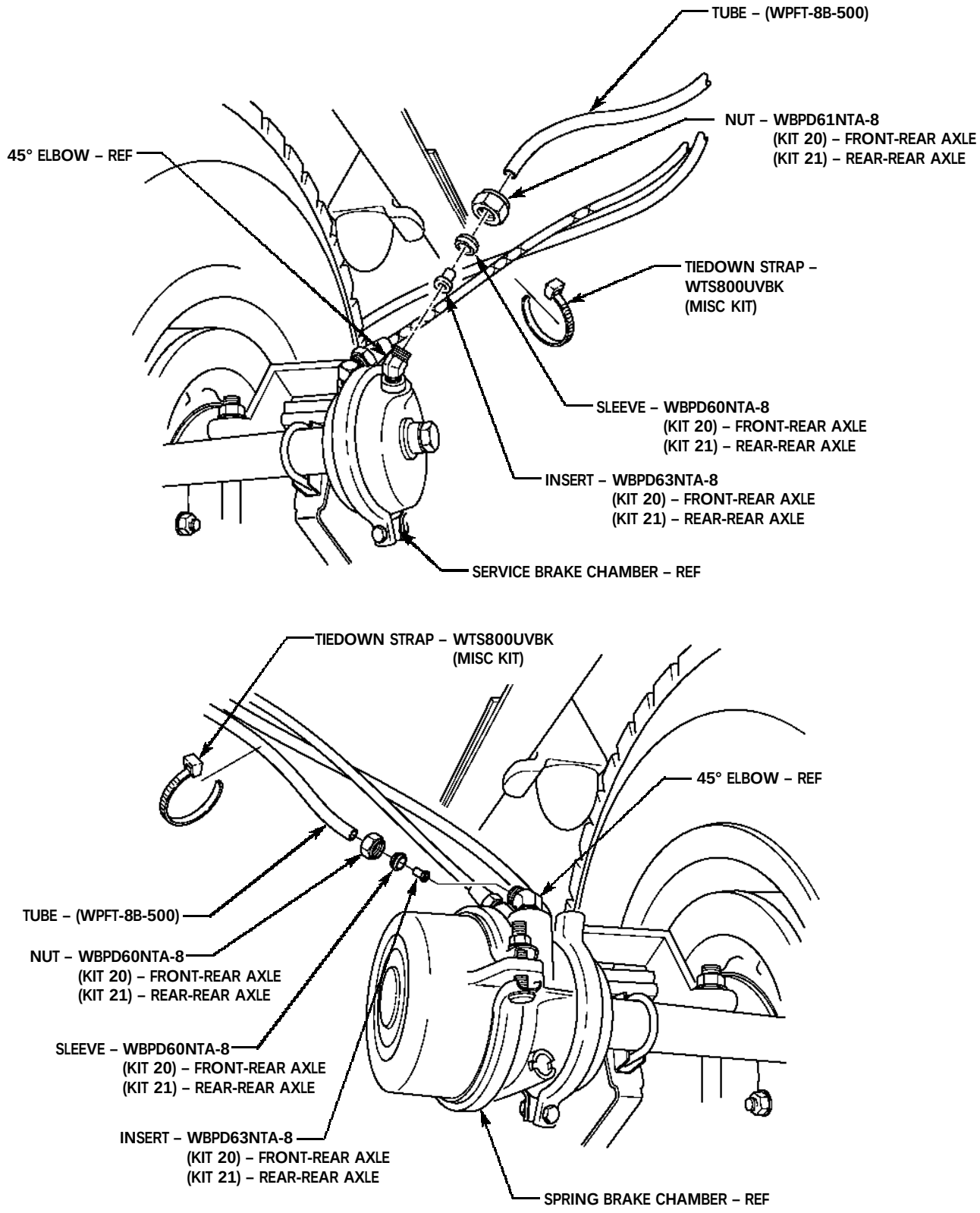

TUBE – (WPFT-8B-500)
NUT – WBPD61NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
45° ELBOW – REF
TIEDOWN STRAP –
WTS800UVBK
(MISC KIT)
SLEEVE – WBPD60NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
INSERT – WBPD63NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
SERVICE BRAKE CHAMBER – REF
TIEDOWN STRAP – WTS800UVBK
(MISC KIT)
45° ELBOW – REF
TUBE – (WPFT-8B-500)
NUT – WBPD60NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
SLEEVE – WBPD60NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
INSERT – WBPD63NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
SPRING BRAKE CHAMBER – REF

FIGURE 41

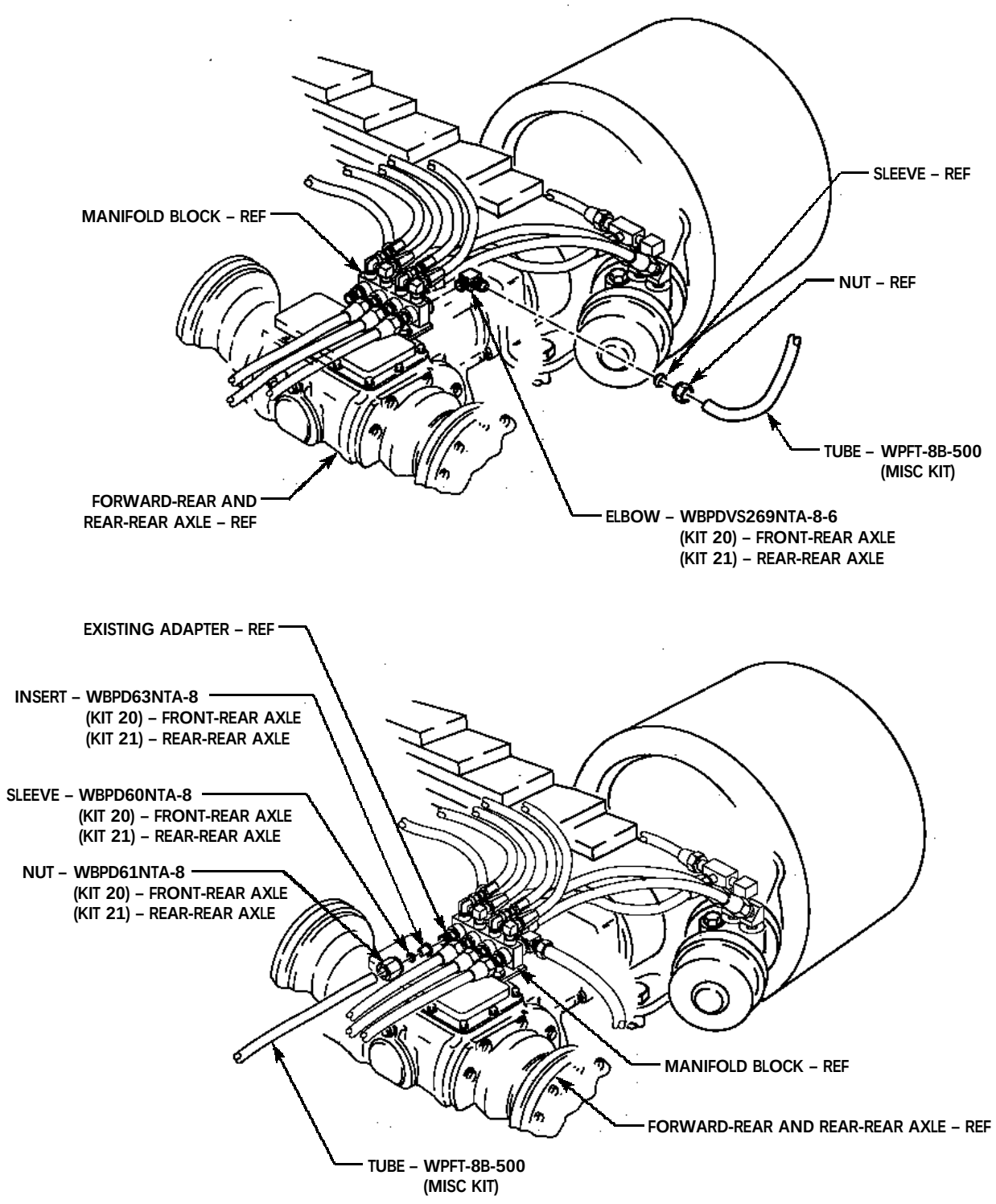

SLEEVE – REF
MANIFOLD BLOCK – REF
NUT – REF
TUBE – WPFT-8B-500
(MISC KIT)
FORWARD-REAR AND
REAR-REAR AXLE – REF
ELBOW – WBPDVS269NTA-8-6
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
EXISTING ADAPTER – REF
INSERT – WBPD63NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
SLEEVE – WBPD60NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
NUT – WBPD61NTA-8
(KIT 20) – FRONT-REAR AXLE
(KIT 21) – REAR-REAR AXLE
MANIFOLD BLOCK – REF
FORWARD-REAR AND REAR-REAR AXLE – REF
TUBE – WPFT-8B-500
(MISC KIT)

FIGURE 42

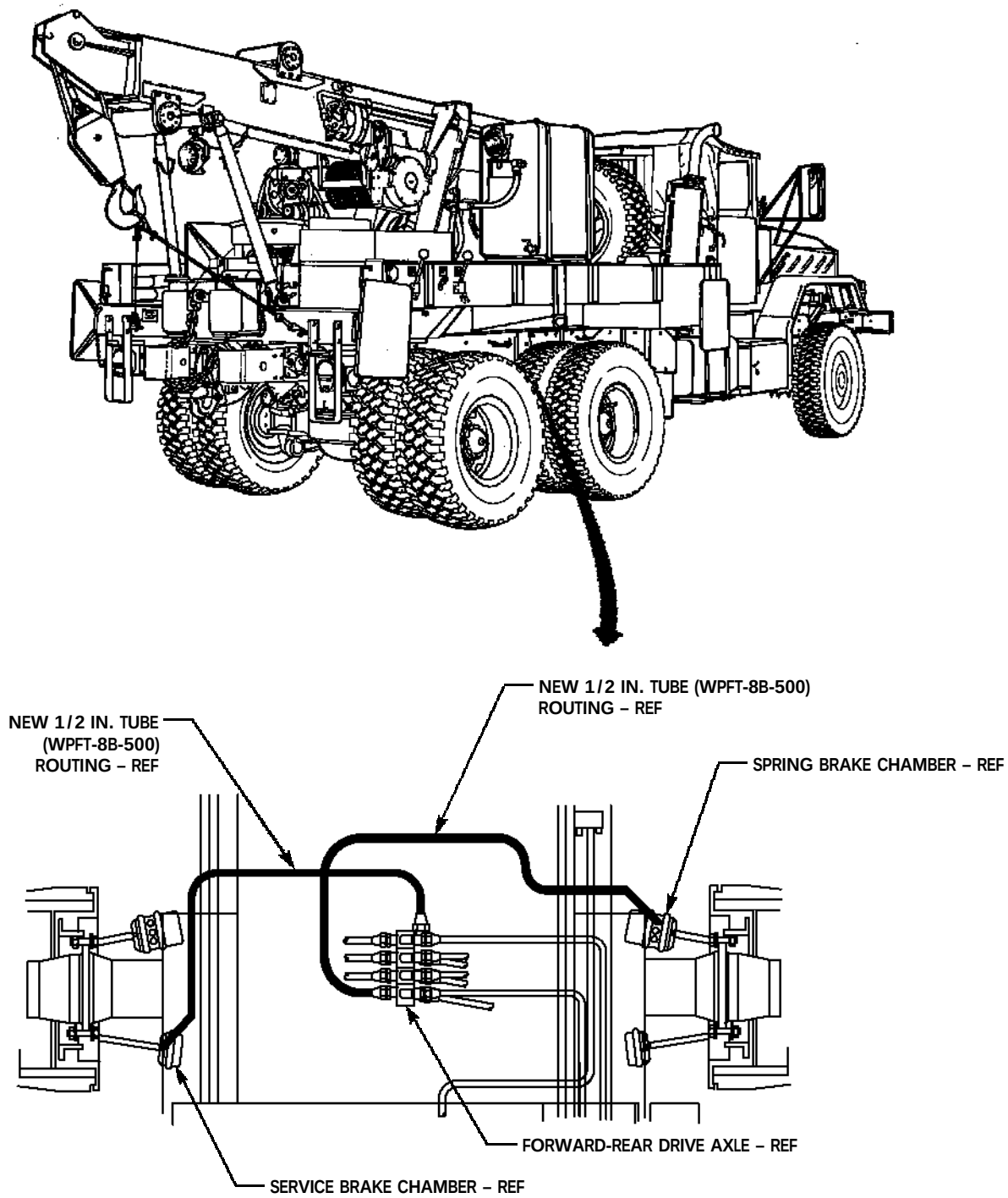

NEW 1/2 IN. TUBE (WPFT-8B-500) ROUTING – REF
NEW 1/2 IN. TUBE (WPFT-8B-500) ROUTING – REF
SPRING BRAKE CHAMBER – REF
FORWARD-REAR DRIVE AXLE – REF
SERVICE BRAKE CHAMBER – REF

FIGURE 43

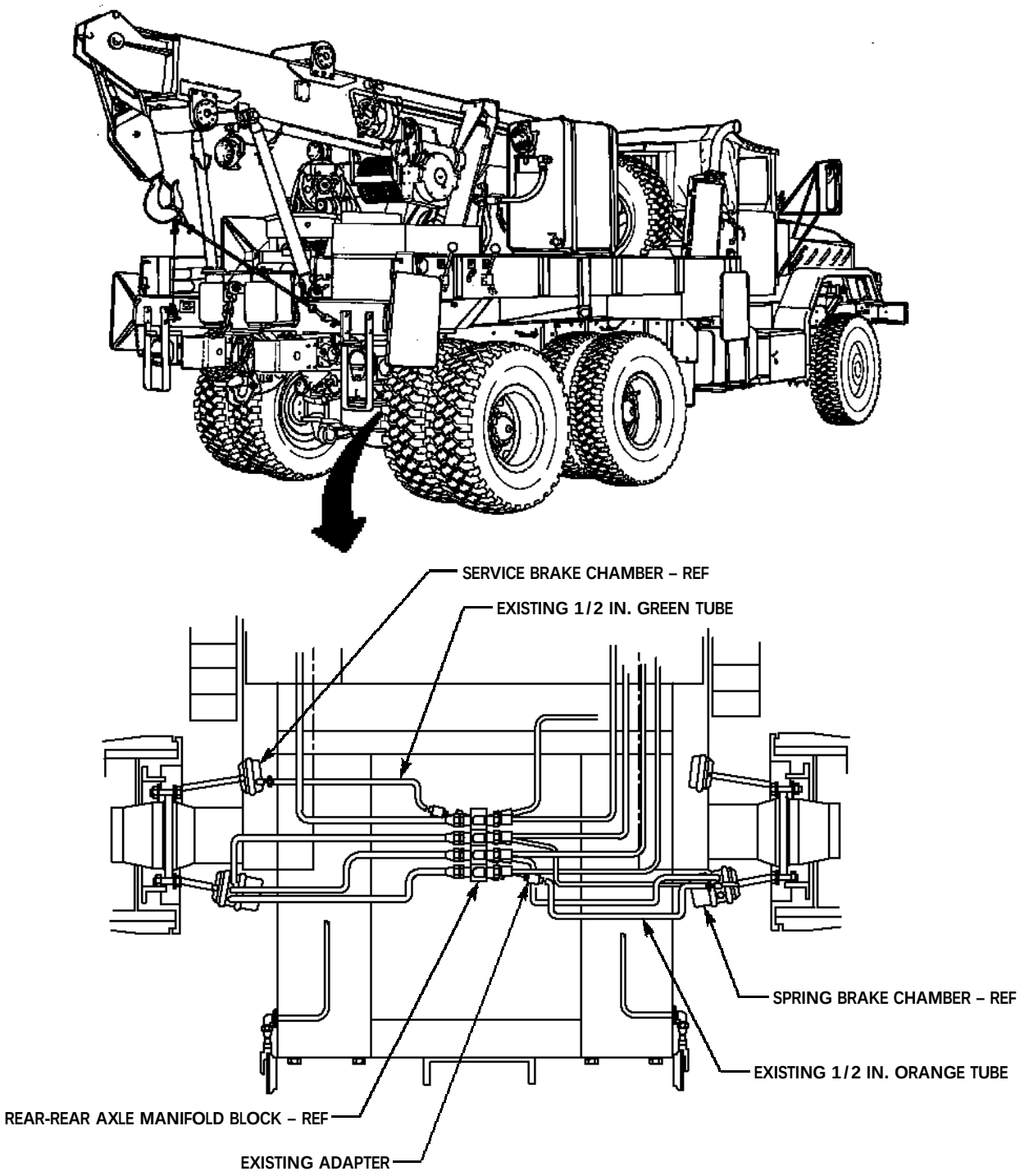

SERVICE BRAKE CHAMBER – REF
EXISTING 1/2 IN. GREEN TUBE
SPRING BRAKE CHAMBER – REF
EXISTING 1/2 IN. ORANGE TUBE
REAR-REAR AXLE MANIFOLD BLOCK – REF
EXISTING ADAPTER

FIGURE 44

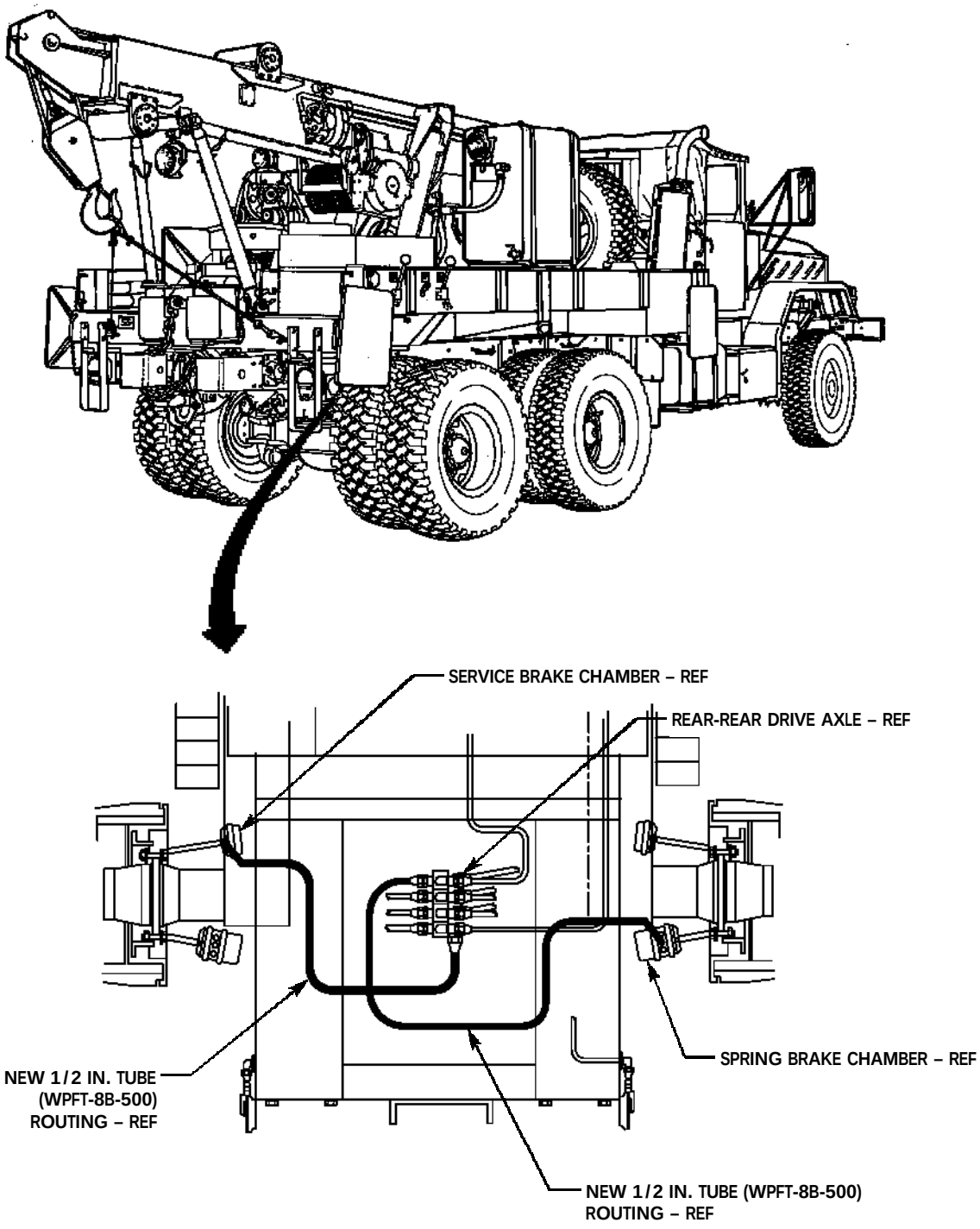

SERVICE BRAKE CHAMBER – REF
REAR-REAR DRIVE AXLE – REF
NEW 1/2 IN. TUBE (WPFT-8B-500) ROUTING – REF
SPRING BRAKE CHAMBER – REF
NEW 1/2 IN. TUBE (WPFT-8B-500) ROUTING – REF

FIGURE 45

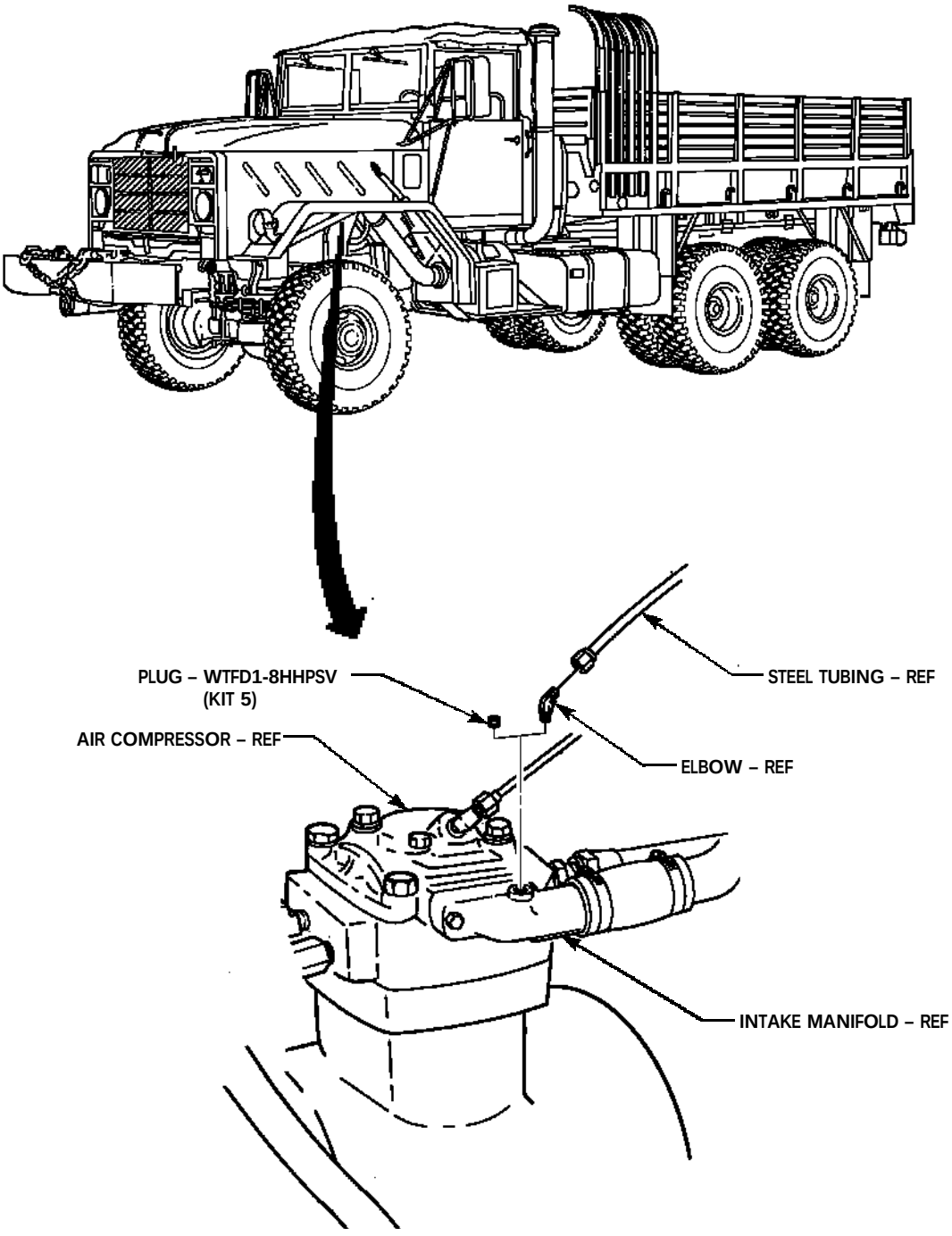

PLUG – WTFD1-8HHPSV
(KIT 5)
AIR COMPRESSOR – REF
STEEL TUBING – REF
ELBOW – REF
INTAKE MANIFOLD – REF

FIGURE 46

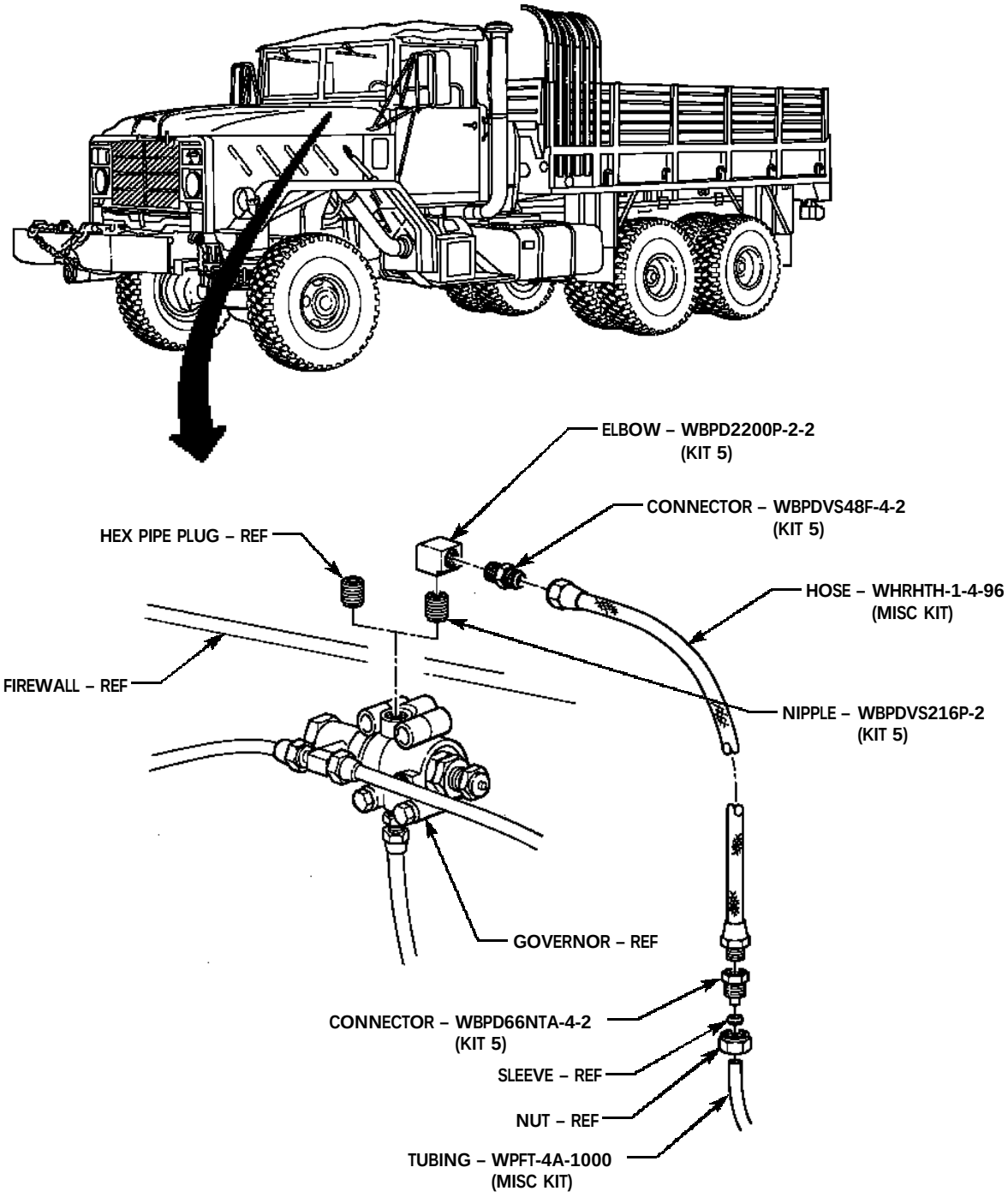

ELBOW – WBPD2200P-2-2
(KIT 5)
CONNECTOR – WBPDVS48F-4-2
(KIT 5)
HEX PIPE PLUG – REF
HOSE – WHRHTH-1-4-96
(MISC KIT)
FIREWALL – REF
NIPPLE – WBPDVS216P-2
(KIT 5)
GOVERNOR – REF
CONNECTOR – WBPD66NTA-4-2
(KIT 5)
SLEEVE – REF
NUT – REF
TUBING – WPFT-4A-1000
(MISC KIT)

FIGURE 47

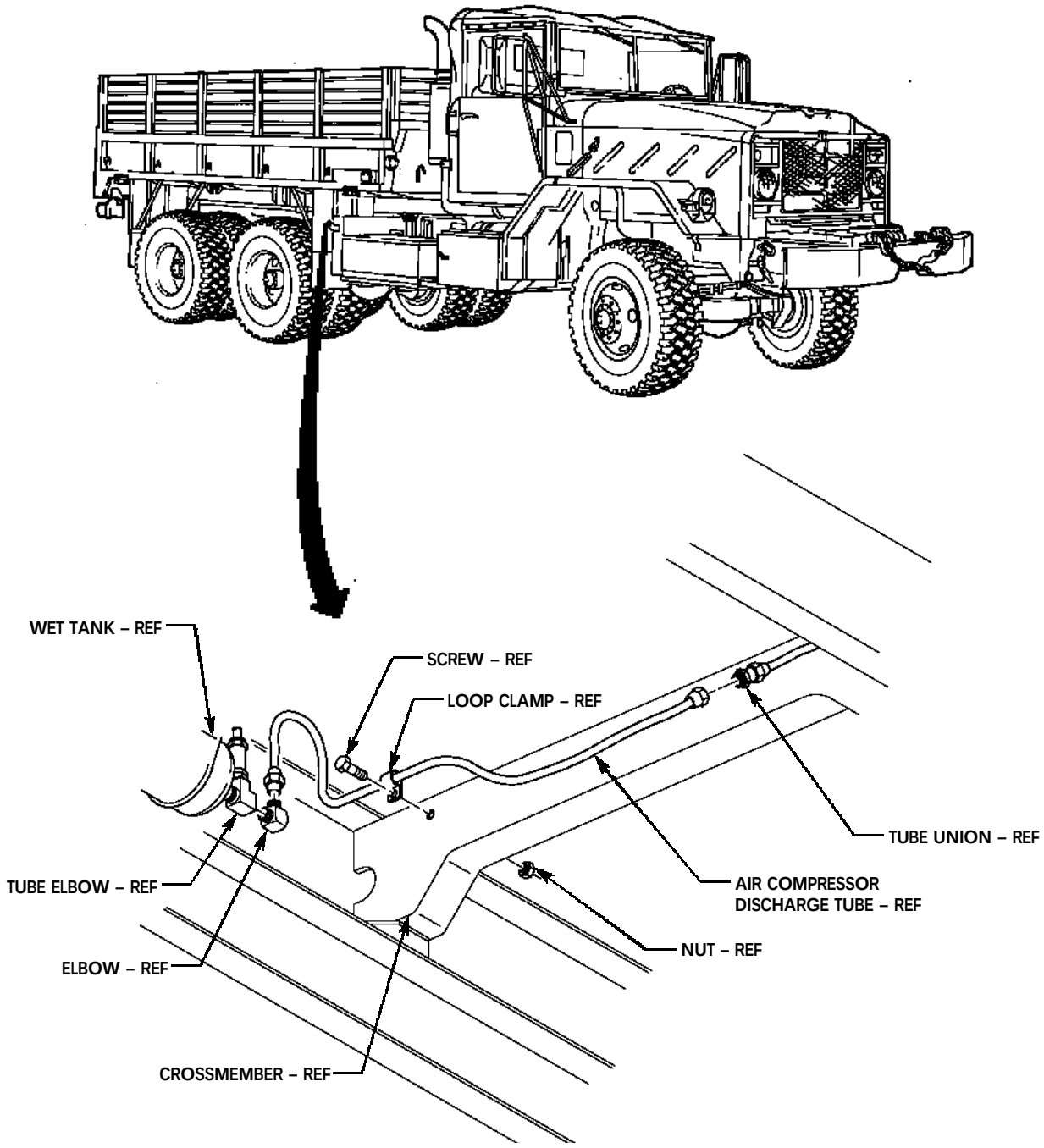

WET TANK – REF
SCREW – REF
LOOP CLAMP – REF
TUBE UNION – REF
AIR COMPRESSOR
DISCHARGE TUBE – REF
TUBE ELBOW – REF
NUT – REF
ELBOW – REF
CROSSMEMBER – REF

FIGURE 48

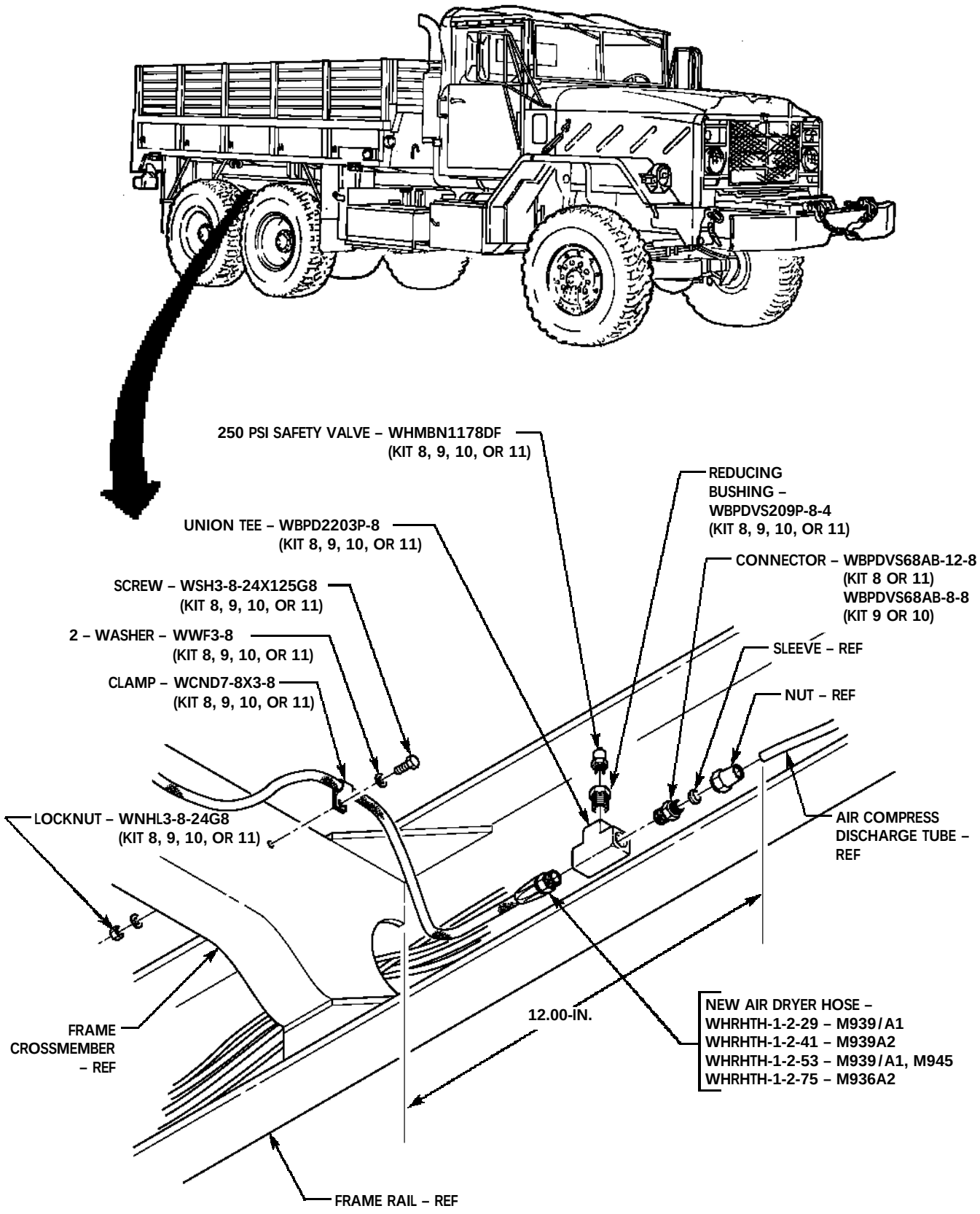

250 PSI SAFETY VALVE – WHMBN1178DF
(KIT 8, 9, 10, OR 11)
REDUCING
BUSHING –
WBPDVS209P-8-4
(KIT 8, 9, 10, OR 11)
UNION TEE – WBPD2203P-8
(KIT 8, 9, 10, OR 11)
CONNECTOR – WBPDVS68AB-12-8
(KIT 8 OR 11)
WBPDVS68AB-8-8
(KIT 9 OR 10)
SCREW – WSH3-8-24X125G8
(KIT 8, 9, 10, OR 11)
2 – WASHER – WWF3-8
(KIT 8, 9, 10, OR 11)
SLEEVE – REF
CLAMP – WCND7-8X3-8
(KIT 8, 9, 10, OR 11)
NUT – REF
LOCKNUT – WNHL3-8-24G8
(KIT 8, 9, 10, OR 11)
AIR COMPRESS
DISCHARGE TUBE –
REF
FRAME
CROSSMEMBER
– REF
12.00-IN.
NEW AIR DRYER HOSE –
WHRHTH-1-2-29 – M939/A1
WHRHTH-1-2-41 – M939A2
WHRHTH-1-2-53 – M939/A1, M945
WHRHTH-1-2-75 – M936A2
FRAME RAIL – REF

FIGURE 49

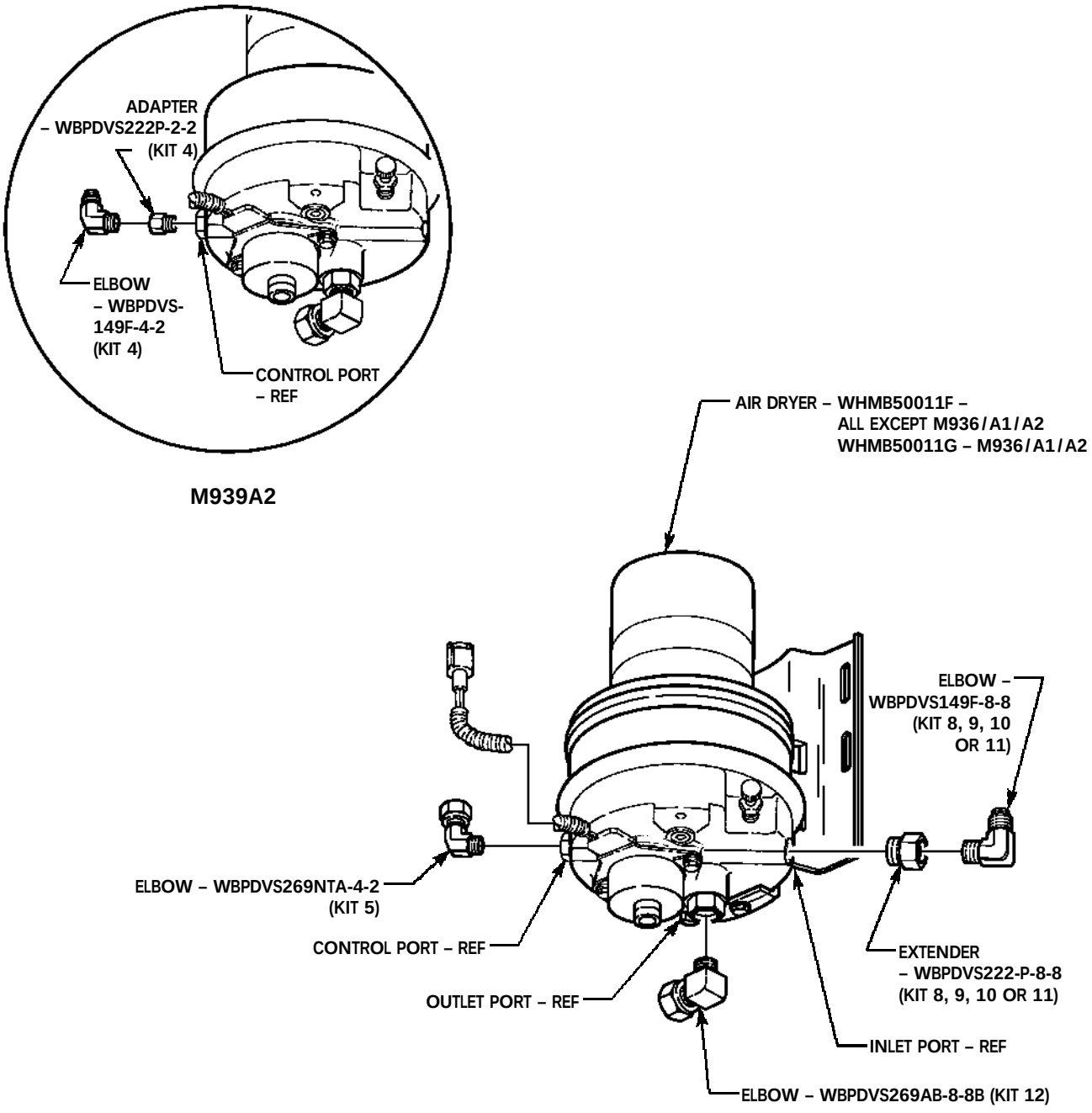

ADAPTER – WBPDVS222P-2-2 (KIT 4)
ELBOW – WBPDVS-149F-4-2 (KIT 4)
CONTROL PORT – REF
M939A2
AIR DRYER – WHMB50011F – ALL EXCEPT M936/A1/A2 WHMB50011G – M936/A1/A2
ELBOW – WBPDVS149F-8-8 (KIT 8, 9, 10 OR 11)
ELBOW – WBPDVS269NTA-4-2 (KIT 5)
CONTROL PORT – REF
OUTLET PORT – REF
EXTENDER – WBPDVS222-P-8-8 (KIT 8, 9, 10 OR 11)
INLET PORT – REF
ELBOW – WBPDVS269AB-8-8B (KIT 12)

FIGURE 50

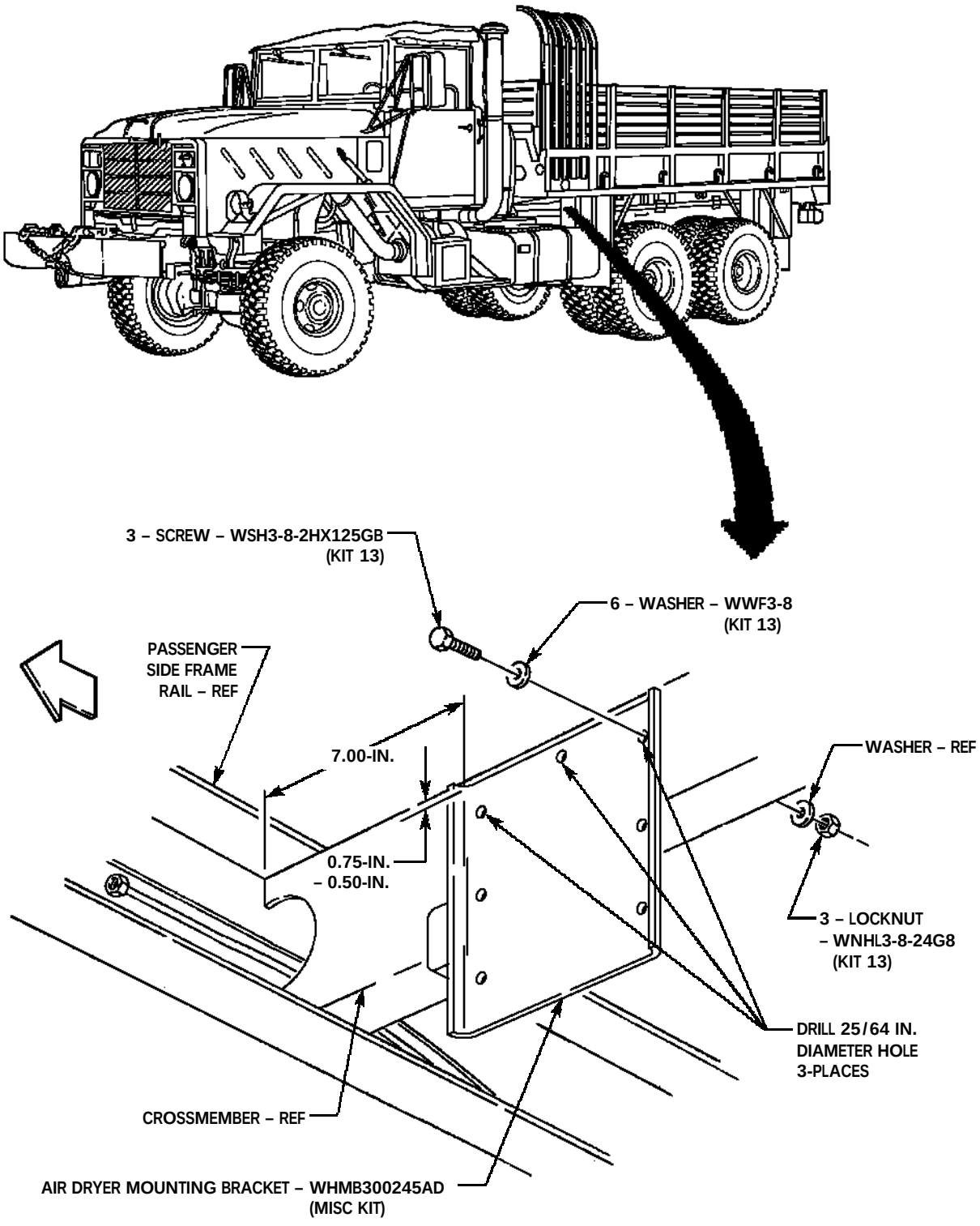

3 – SCREW – WSH3-8-2HX125GB
(KIT 13)
6 – WASHER – WWF3-8
(KIT 13)
PASSENGER
SIDE FRAME
RAIL – REF
7.00-IN.
0.75-IN.
– 0.50-IN.
WASHER – REF
3 – LOCKNUT
– WNHL3-8-24G8
(KIT 13)
DRILL 25/64 IN.
DIAMETER HOLE
3-PLACES
CROSSMEMBER – REF
AIR DRYER MOUNTING BRACKET – WHMB300245AD
(MISC KIT)

FIGURE 51

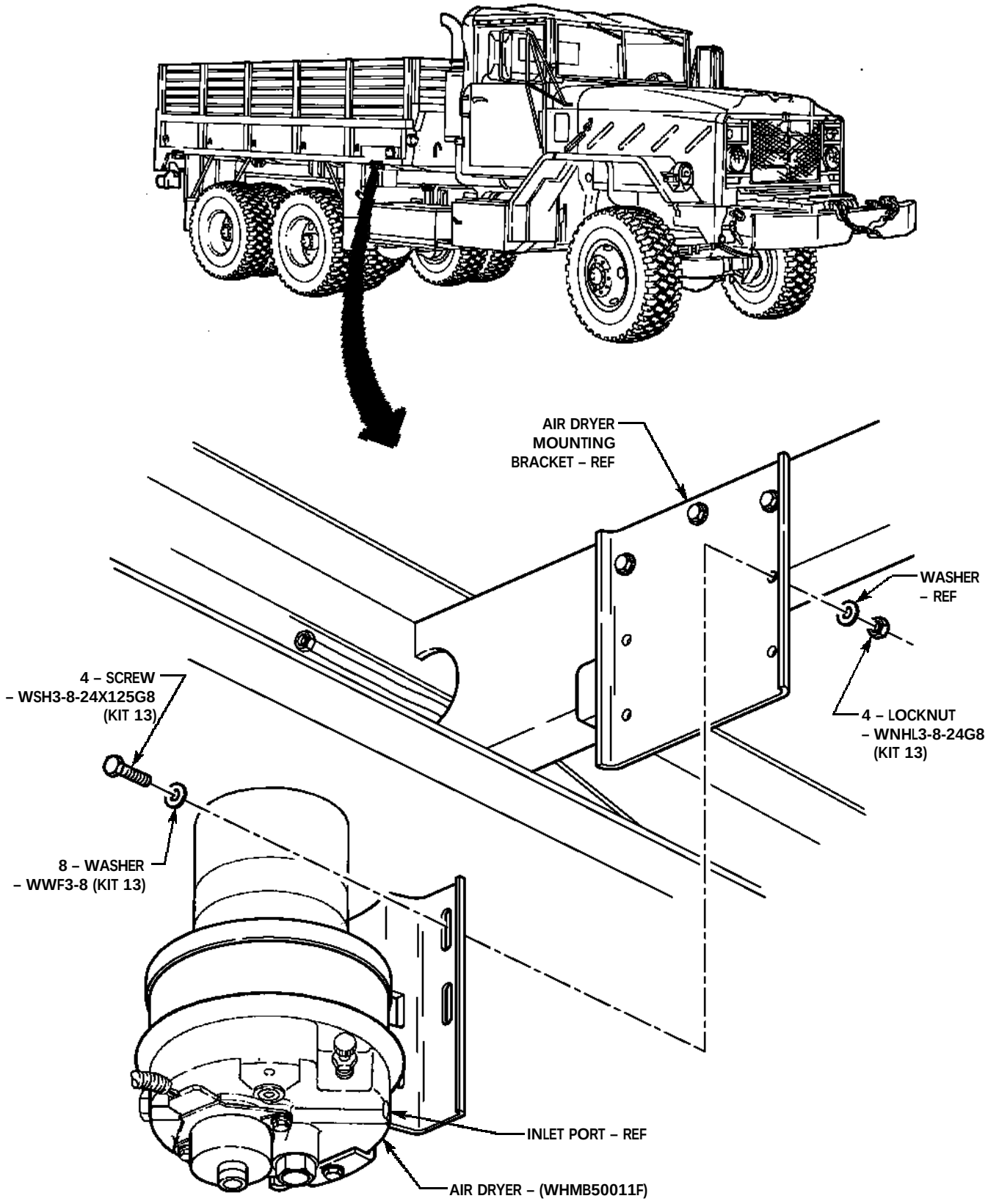

AIR DRYER MOUNTING BRACKET – REF
WASHER – REF
4 – SCREW – WSH3-8-24X125G8 (KIT 13)
4 – LOCKNUT – WNHL3-8-24G8 (KIT 13)
8 – WASHER – WWF3-8 (KIT 13)
INLET PORT – REF
AIR DRYER – (WHMB50011F)

FIGURE 52

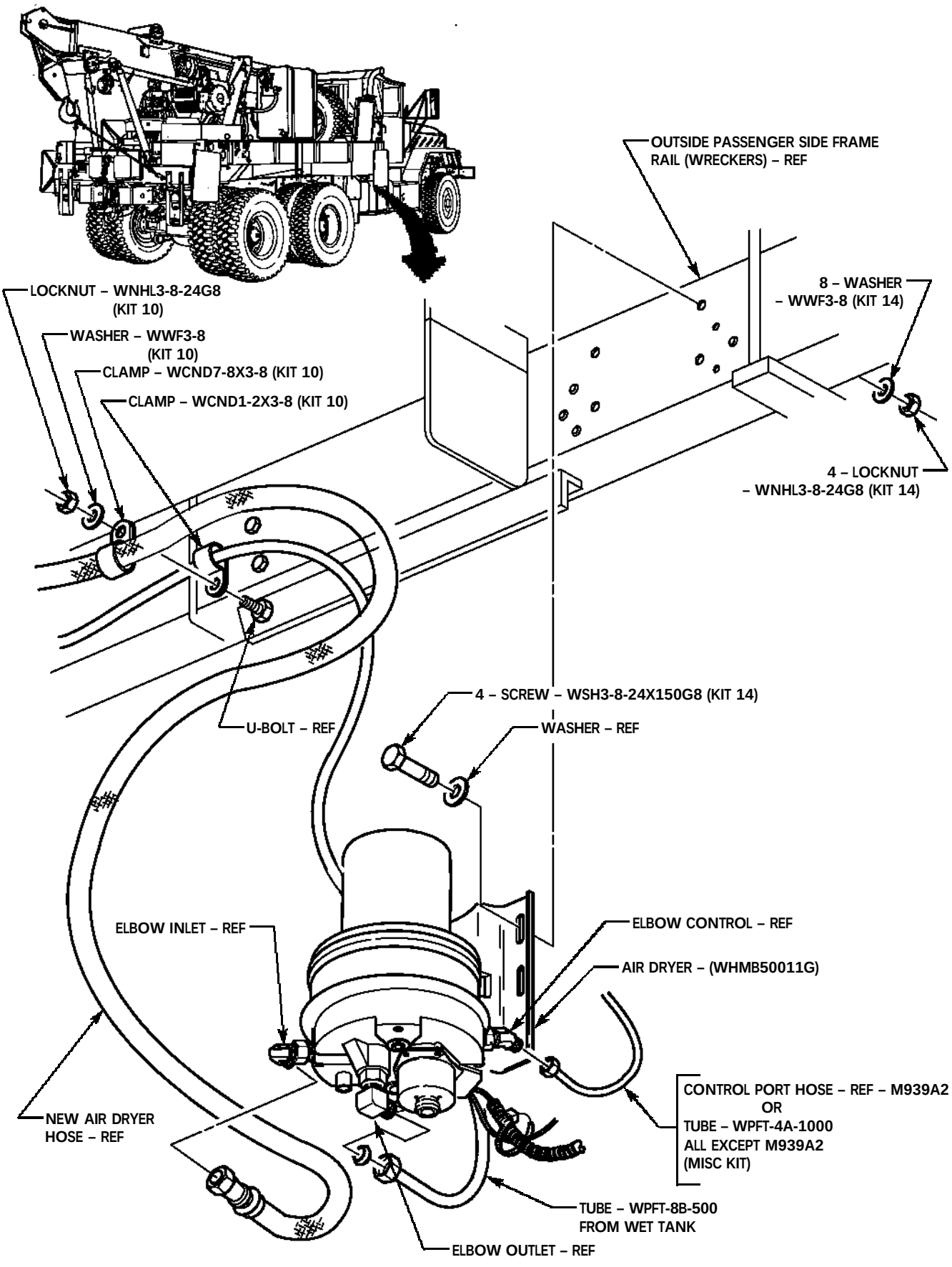

OUTSIDE PASSENGER SIDE FRAME RAIL (WRECKERS) – REF
LOCKNUT – WNHL3-8-24G8 (KIT 10)
WASHER – WWF3-8 (KIT 10)
CLAMP – WCND7-8X3-8 (KIT 10)
CLAMP – WCND1-2X3-8 (KIT 10)
8 – WASHER – WWF3-8 (KIT 14)
4 – LOCKNUT – WNHL3-8-24G8 (KIT 14)
4 – SCREW – WSH3-8-24X150G8 (KIT 14)
WASHER – REF
U-BOLT – REF
ELBOW INLET – REF
ELBOW CONTROL – REF
AIR DRYER – (WHMB50011G)
CONTROL PORT HOSE – REF – M939A2
OR
TUBE – WPFT-4A-1000
ALL EXCEPT M939A2
(MISC KIT)
NEW AIR DRYER HOSE – REF
TUBE – WPFT-8B-500
FROM WET TANK
ELBOW OUTLET – REF

FIGURE 53

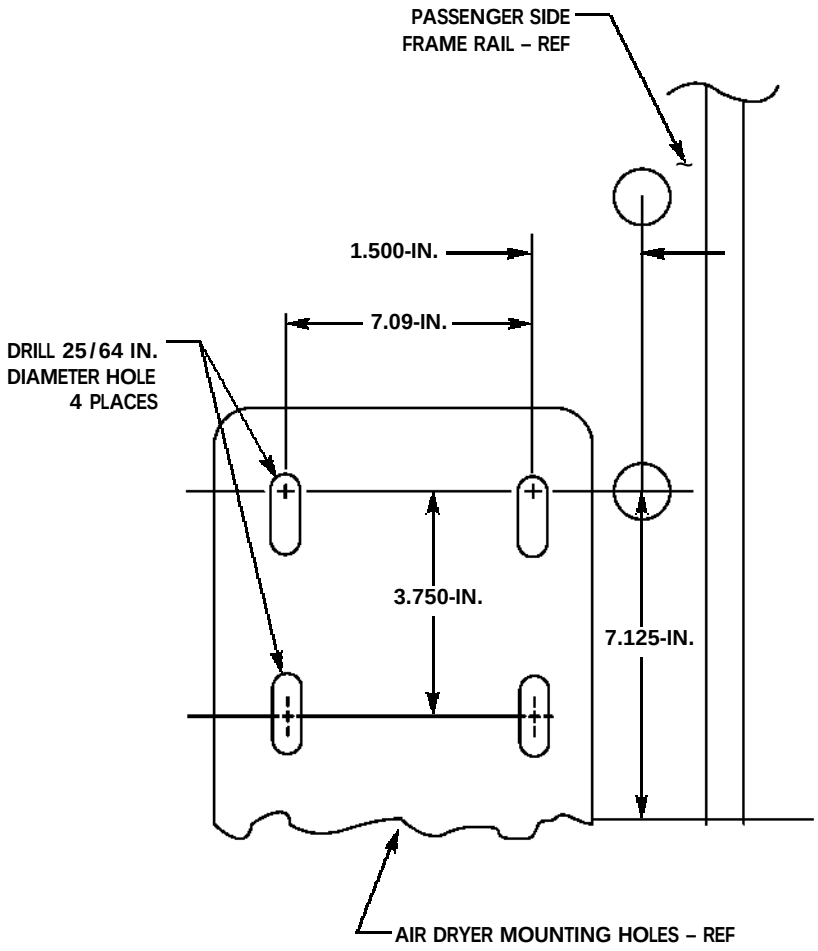

PASSENGER SIDE
FRAME RAIL – REF
1.500-IN.
7.09-IN.
DRILL 25/64 IN.
DIAMETER HOLE
4 PLACES
3.750-IN.
7.125-IN.
AIR DRYER MOUNTING HOLES – REF

FIGURE 54

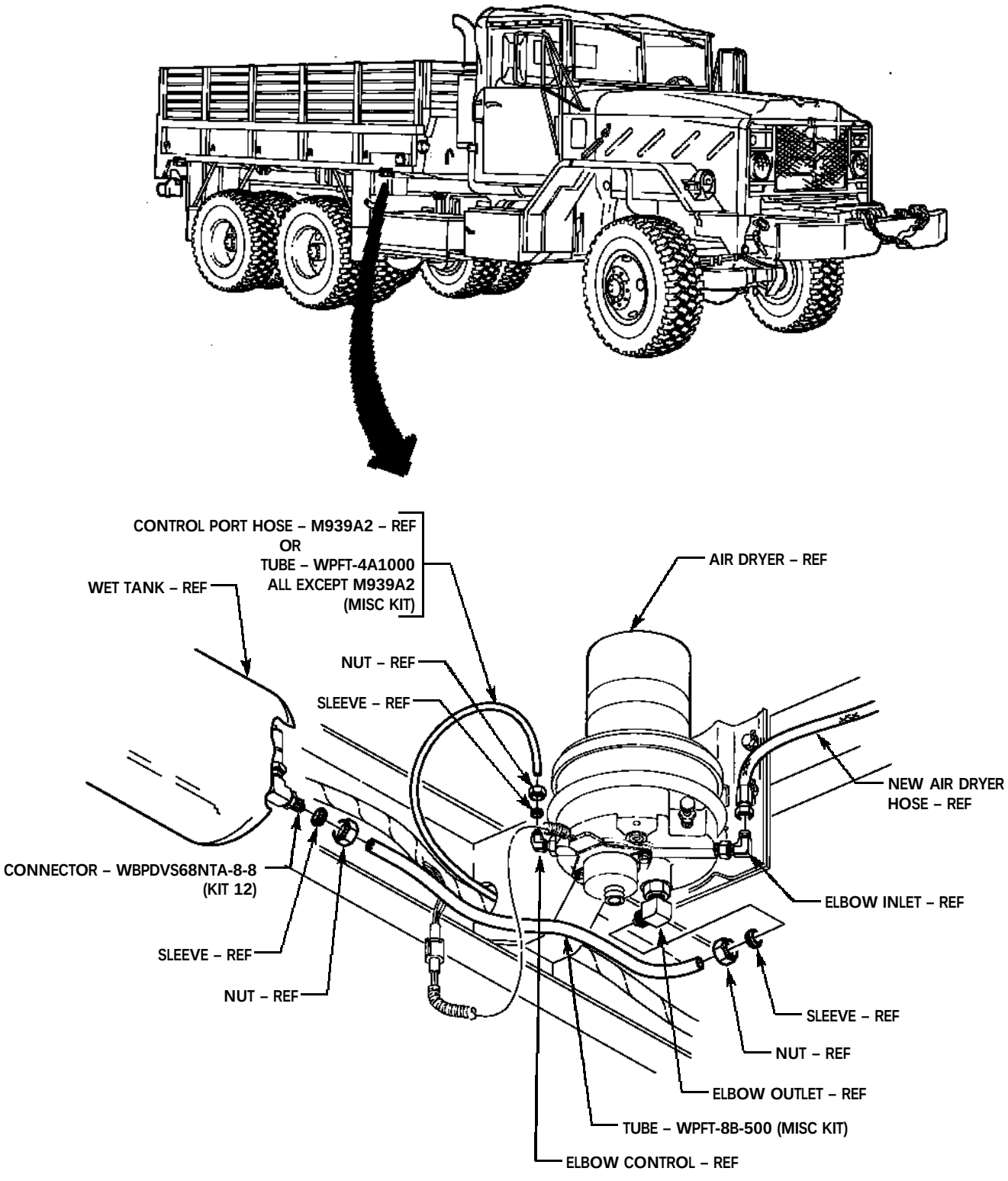

CONTROL PORT HOSE – M939A2 – REF
OR
TUBE – WPFT-4A1000
ALL EXCEPT M939A2
(MISC KIT)
WET TANK – REF
AIR DRYER – REF
NUT – REF
SLEEVE – REF
NEW AIR DRYER
HOSE – REF
CONNECTOR – WBPDVS68NTA-8-8
(KIT 12)
ELBOW INLET – REF
SLEEVE – REF
NUT – REF
SLEEVE – REF
NUT – REF
ELBOW OUTLET – REF
TUBE – WPFT-8B-500 (MISC KIT)
ELBOW CONTROL – REF

FIGURE 55

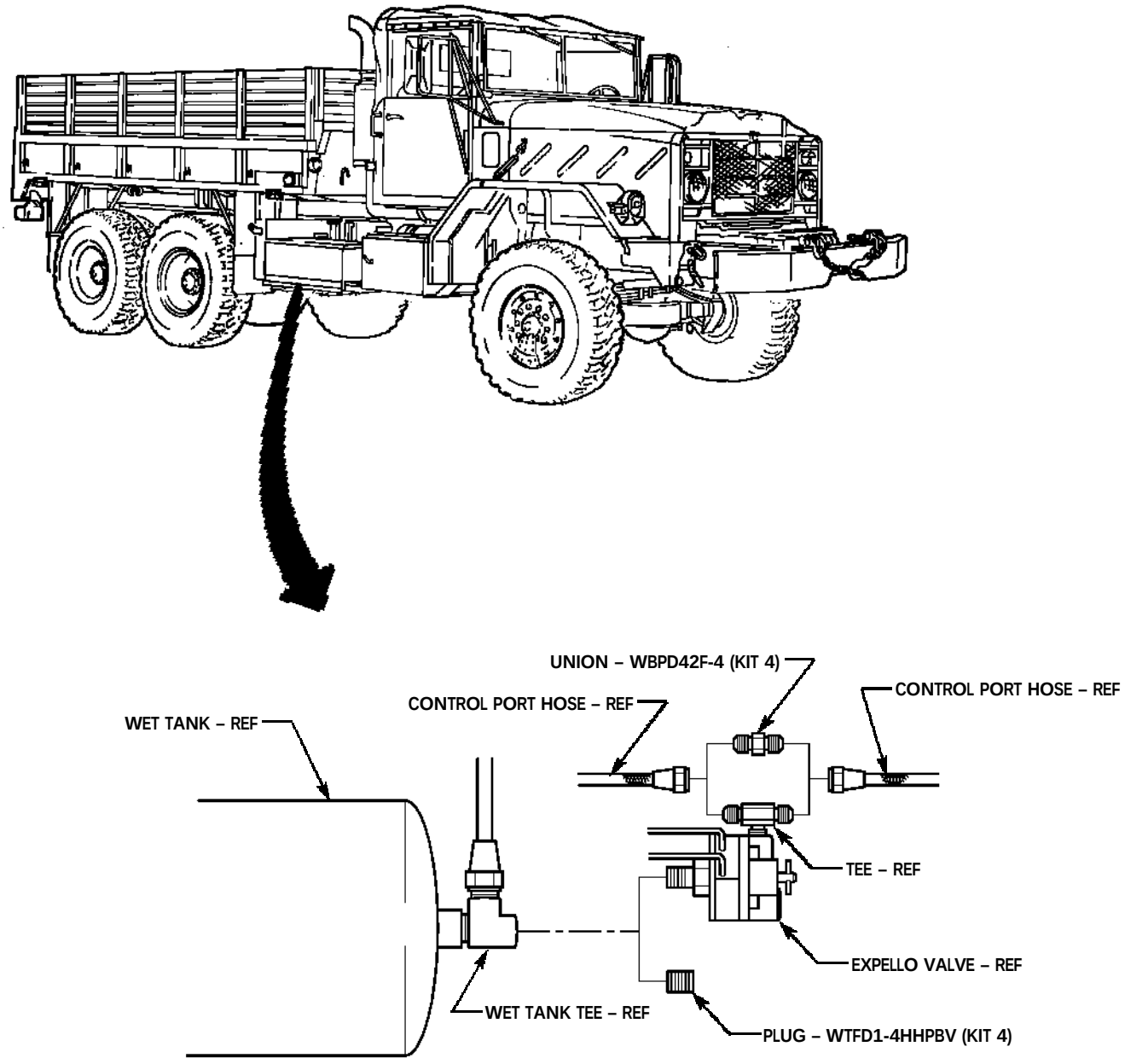

UNION – WBPD42F-4 (KIT 4)
CONTROL PORT HOSE – REF
CONTROL PORT HOSE – REF
WET TANK – REF
TEE – REF
EXPELLO VALVE – REF
WET TANK TEE – REF
PLUG – WTFD1-4HHPBV (KIT 4)

FIGURE 56

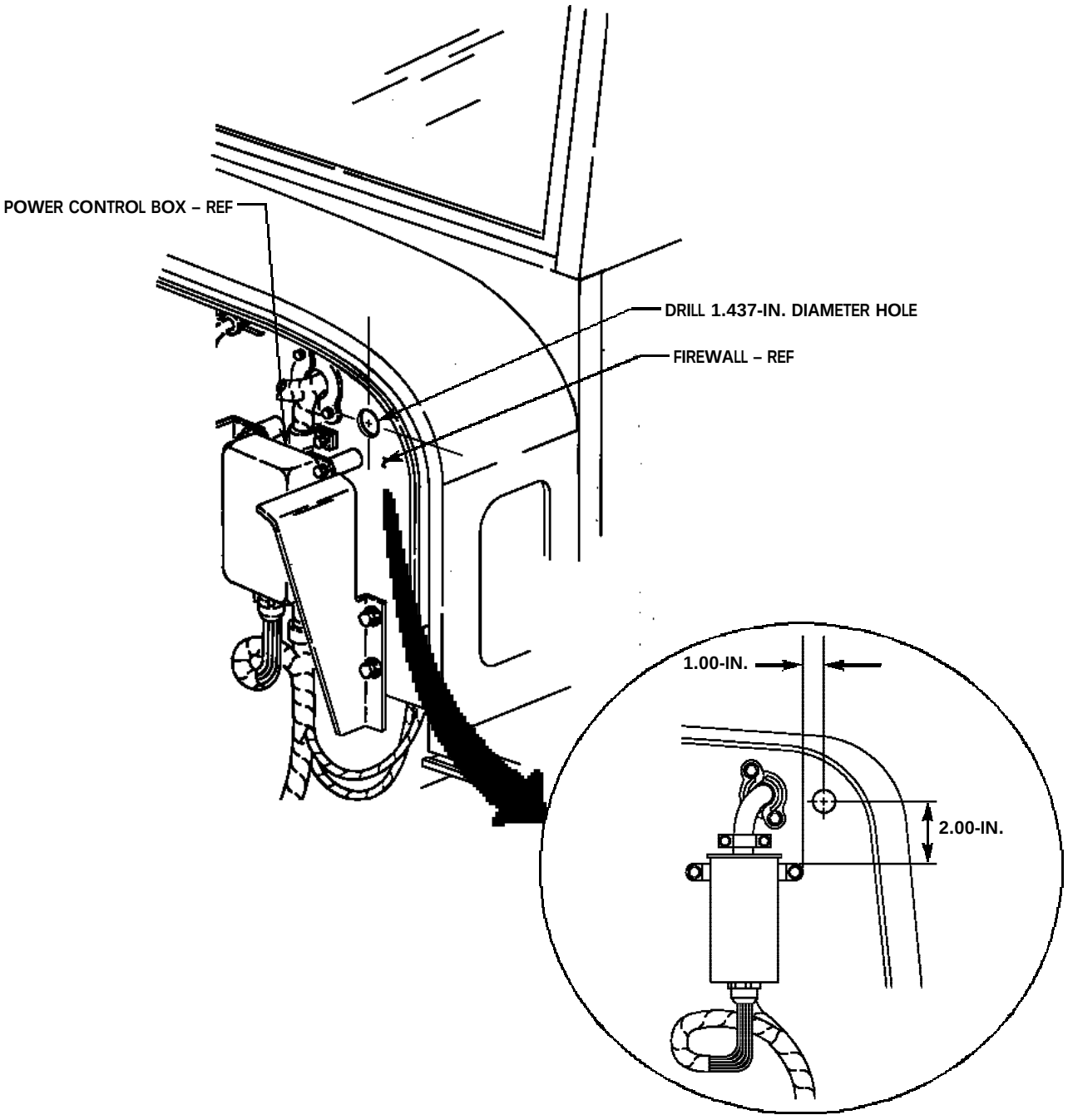

POWER CONTROL BOX – REF
DRILL 1.437-IN. DIAMETER HOLE
FIREWALL – REF
1.00-IN.
2.00-IN.

FIGURE 57

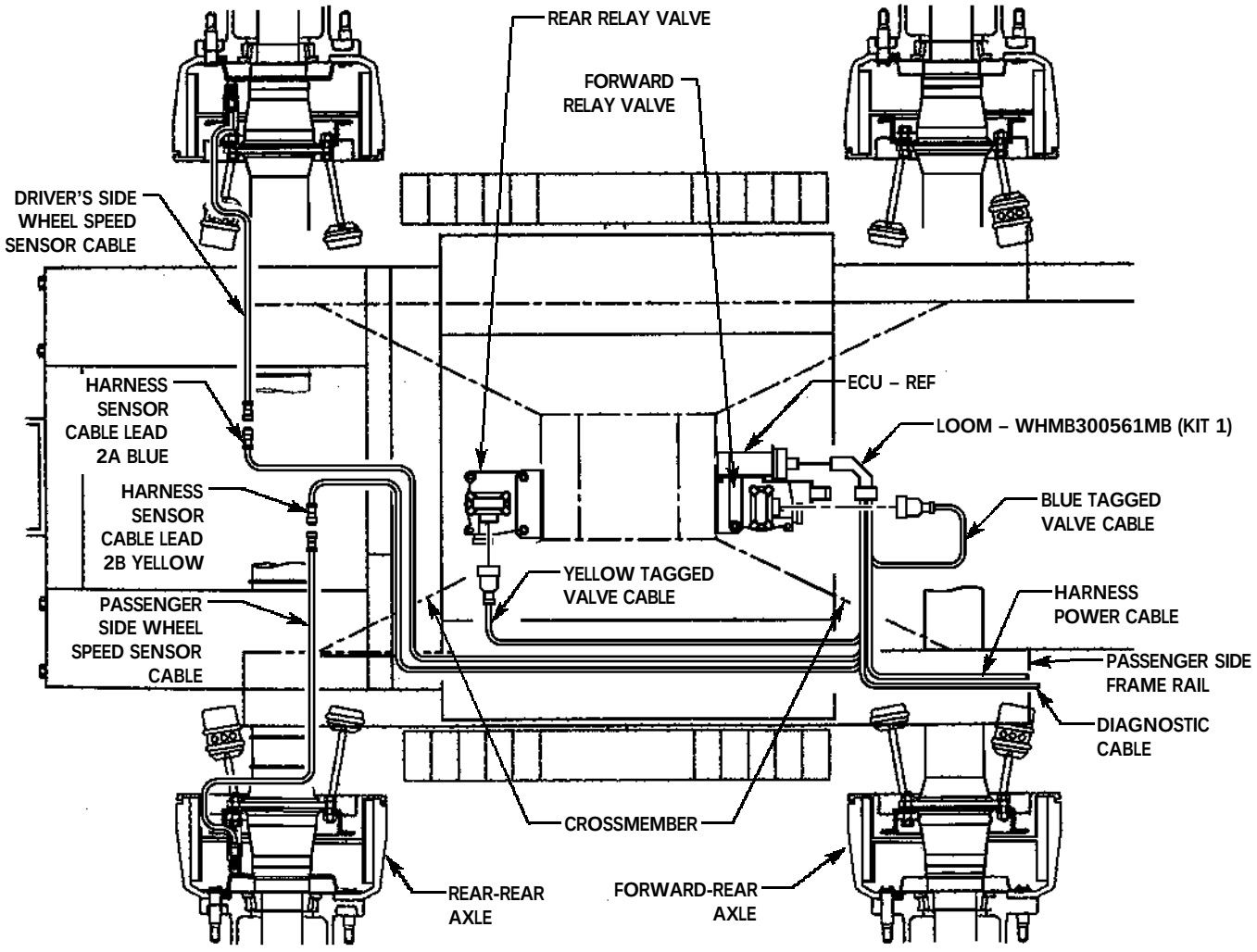

REAR RELAY VALVE
FORWARD RELAY VALVE
DRIVER'S SIDE WHEEL SPEED SENSOR CABLE
HARNESS SENSOR CABLE LEAD 2A BLUE
HARNESS SENSOR CABLE LEAD 2B YELLOW
PASSENGER SIDE WHEEL SPEED SENSOR CABLE
ECU – REF
LOOM – WHMB300561MB (KIT 1)
BLUE TAGGED VALVE CABLE
YELLOW TAGGED VALVE CABLE
HARNESS POWER CABLE
PASSENGER SIDE FRAME RAIL
DIAGNOSTIC CABLE
CROSSMEMBER
REAR-REAR AXLE
FORWARD-REAR AXLE

FIGURE 58

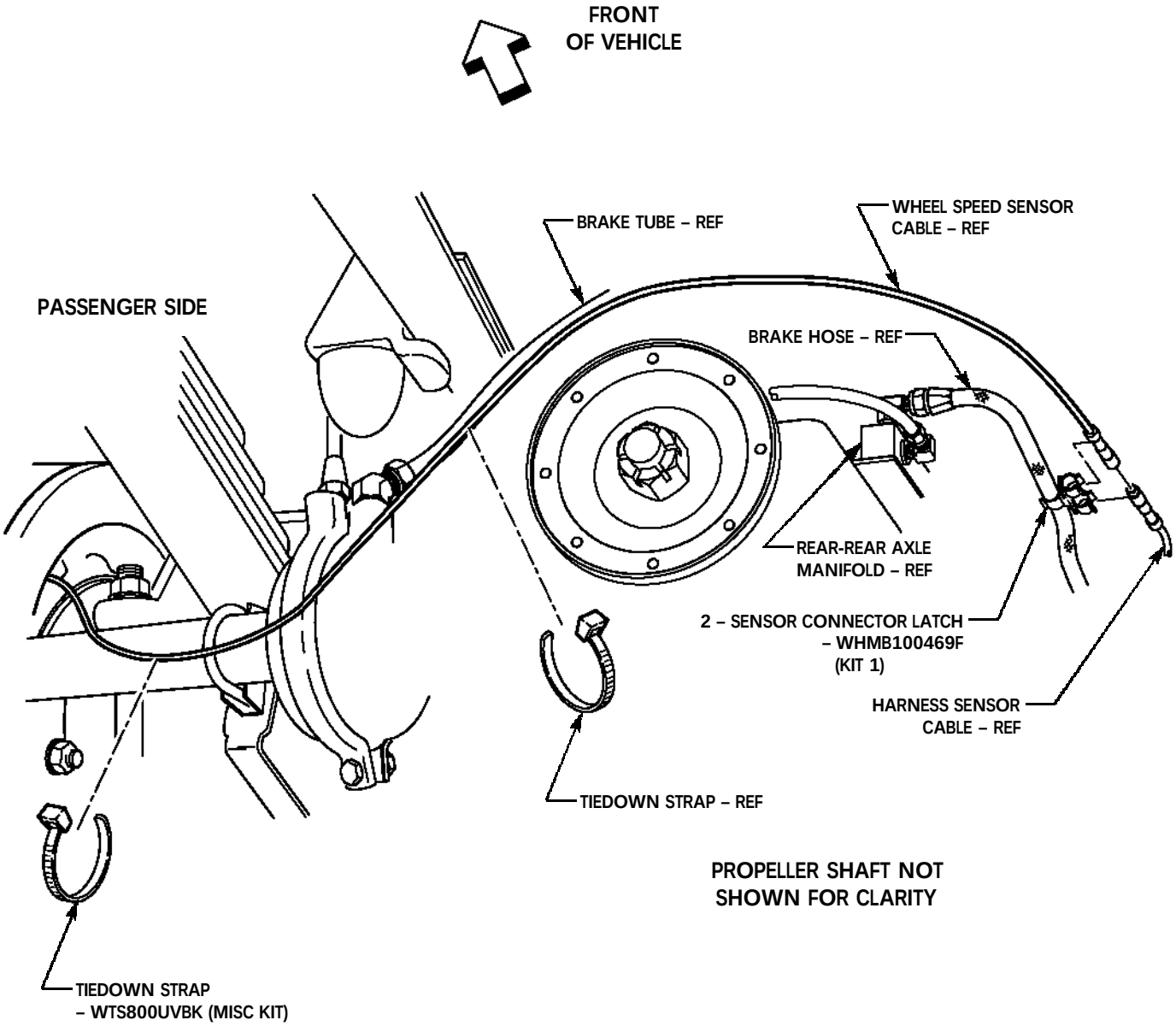

FRONT
OF VEHICLE
PASSENGER SIDE
BRAKE TUBE – REF
WHEEL SPEED SENSOR
CABLE – REF
BRAKE HOSE – REF
REAR-REAR AXLE
MANIFOLD – REF
2 – SENSOR CONNECTOR LATCH
– WHMB100469F
(KIT 1)
HARNESS SENSOR
CABLE – REF
TIEDOWN STRAP – REF
PROPELLER SHAFT NOT
SHOWN FOR CLARITY
TIEDOWN STRAP
– WTS800UVBK (MISC KIT)

FIGURE 59

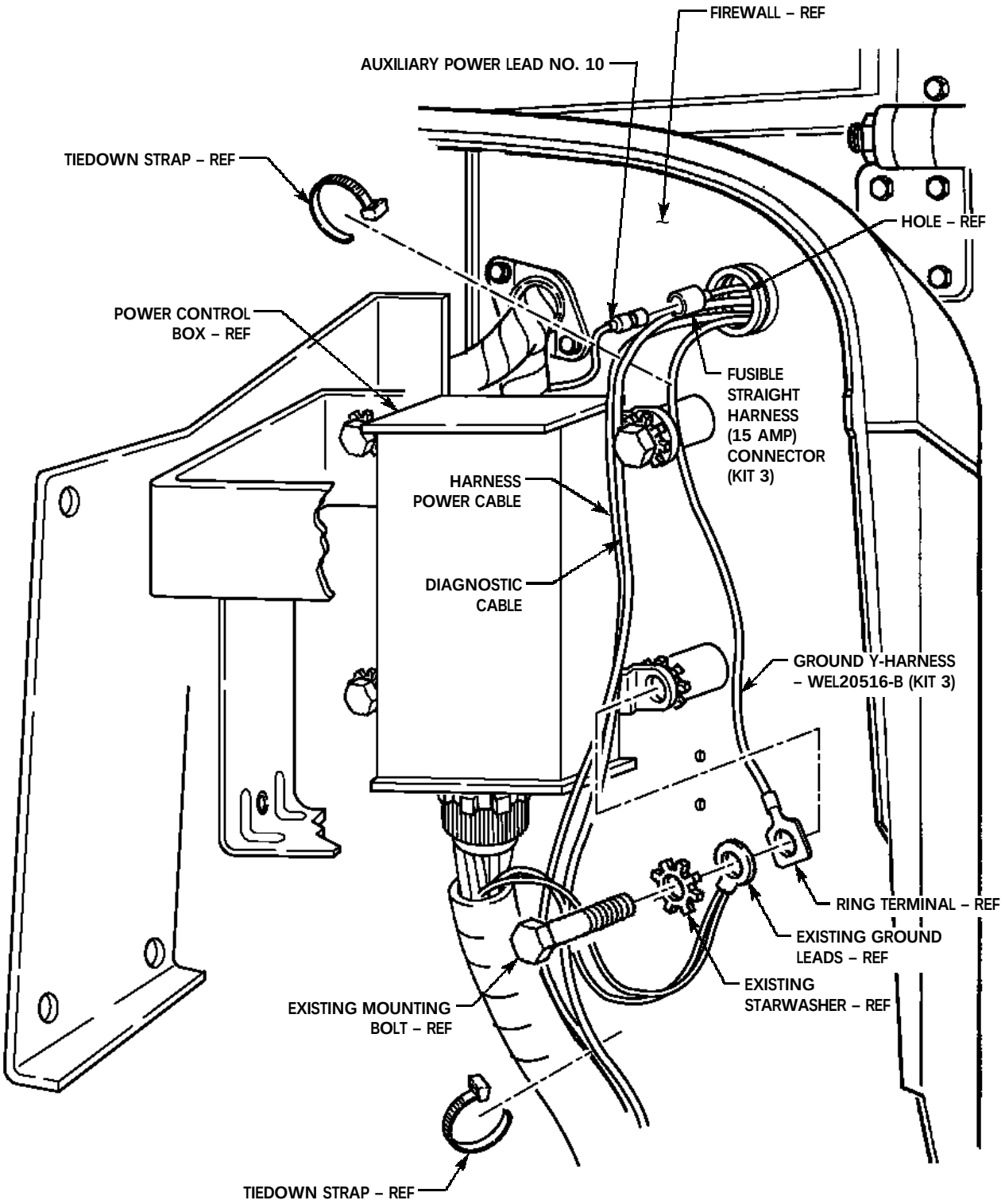

FIREWALL – REF
AUXILIARY POWER LEAD NO. 10
TIEDOWN STRAP – REF
HOLE – REF
POWER CONTROL BOX – REF
FUSIBLE STRAIGHT HARNESS (15 AMP) CONNECTOR (KIT 3)
HARNESS POWER CABLE
DIAGNOSTIC CABLE
GROUND Y-HARNESS – WEL20516-B (KIT 3)
RING TERMINAL – REF
EXISTING GROUND LEADS – REF
EXISTING STARWASHER – REF
EXISTING MOUNTING BOLT – REF
TIEDOWN STRAP – REF

FIGURE 60

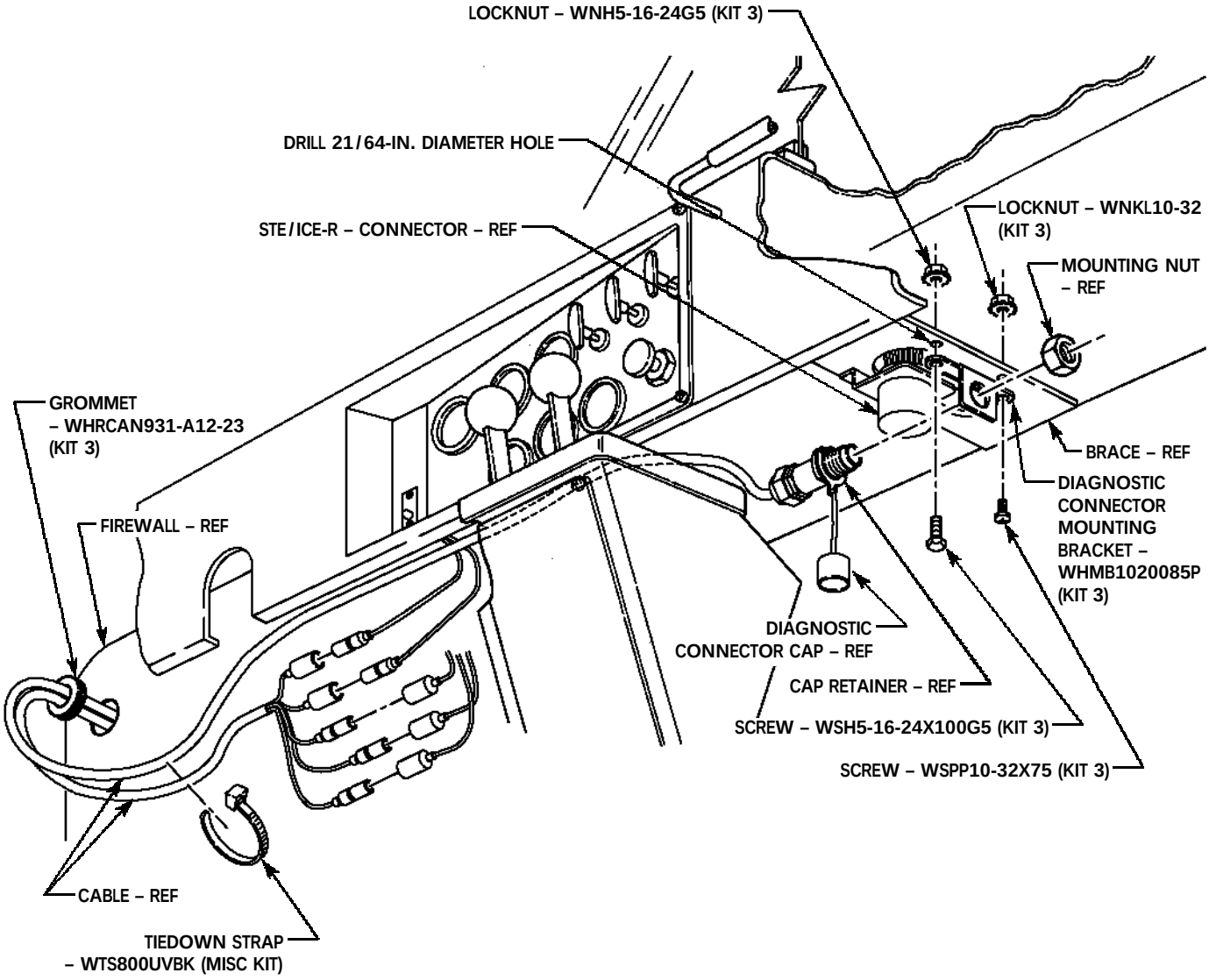

LOCKNUT – WNH5-16-24G5 (KIT 3)
DRILL 21/64-IN. DIAMETER HOLE
STE/ICE-R – CONNECTOR – REF
LOCKNUT – WNKL10-32 (KIT 3)
MOUNTING NUT – REF
GROMMET – WHRCAN931-A12-23 (KIT 3)
BRACE – REF
DIAGNOSTIC CONNECTOR MOUNTING BRACKET – WHMB1020085P (KIT 3)
FIREWALL – REF
DIAGNOSTIC CONNECTOR CAP – REF
CAP RETAINER – REF
SCREW – WSH5-16-24X100G5 (KIT 3)
SCREW – WSPP10-32X75 (KIT 3)
CABLE – REF
TIEDOWN STRAP – WTS800UVBK (MISC KIT)

FIGURE 61

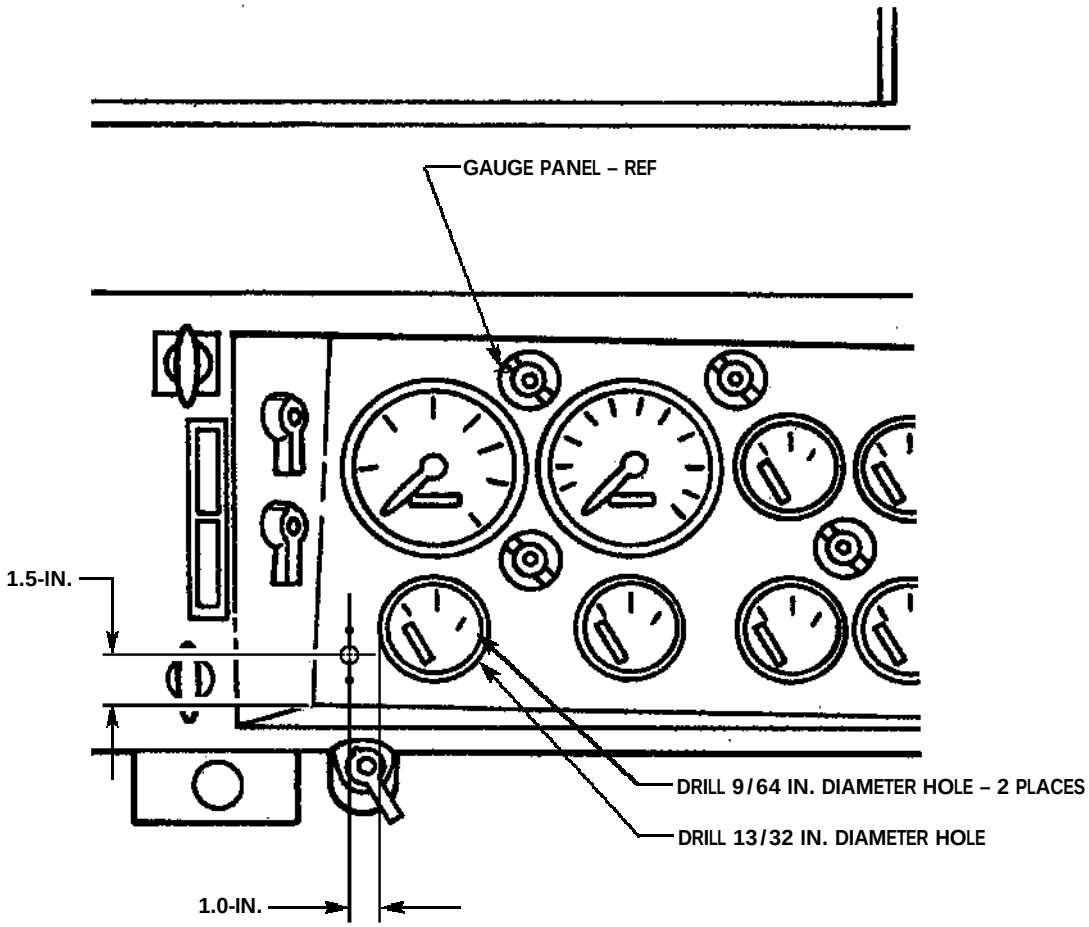

GAUGE PANEL – REF
1.5-IN.
DRILL 9/64 IN. DIAMETER HOLE – 2 PLACES
DRILL 13/32 IN. DIAMETER HOLE
1.0-IN.

FIGURE 62

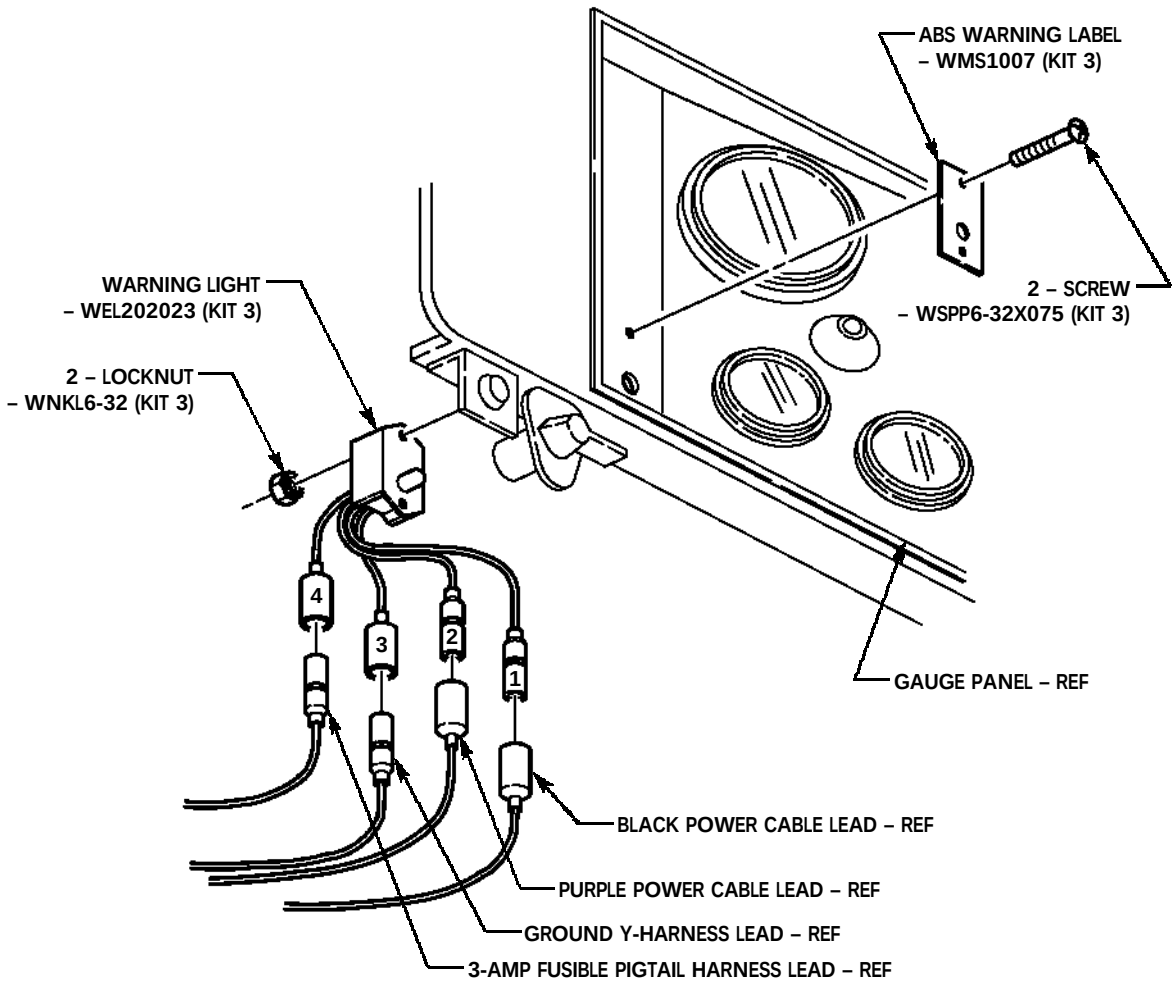

ABS WARNING LABEL
– WMS1007 (KIT 3)
2 – SCREW
– WSPP6-32X075 (KIT 3)
WARNING LIGHT
– WEL202023 (KIT 3)
2 – LOCKNUT
– WNKL6-32 (KIT 3)
4
3
2
1
GAUGE PANEL – REF
BLACK POWER CABLE LEAD – REF
PURPLE POWER CABLE LEAD – REF
GROUND Y-HARNESS LEAD – REF
3-AMP FUSIBLE PIGTAIL HARNESS LEAD – REF

FIGURE 63

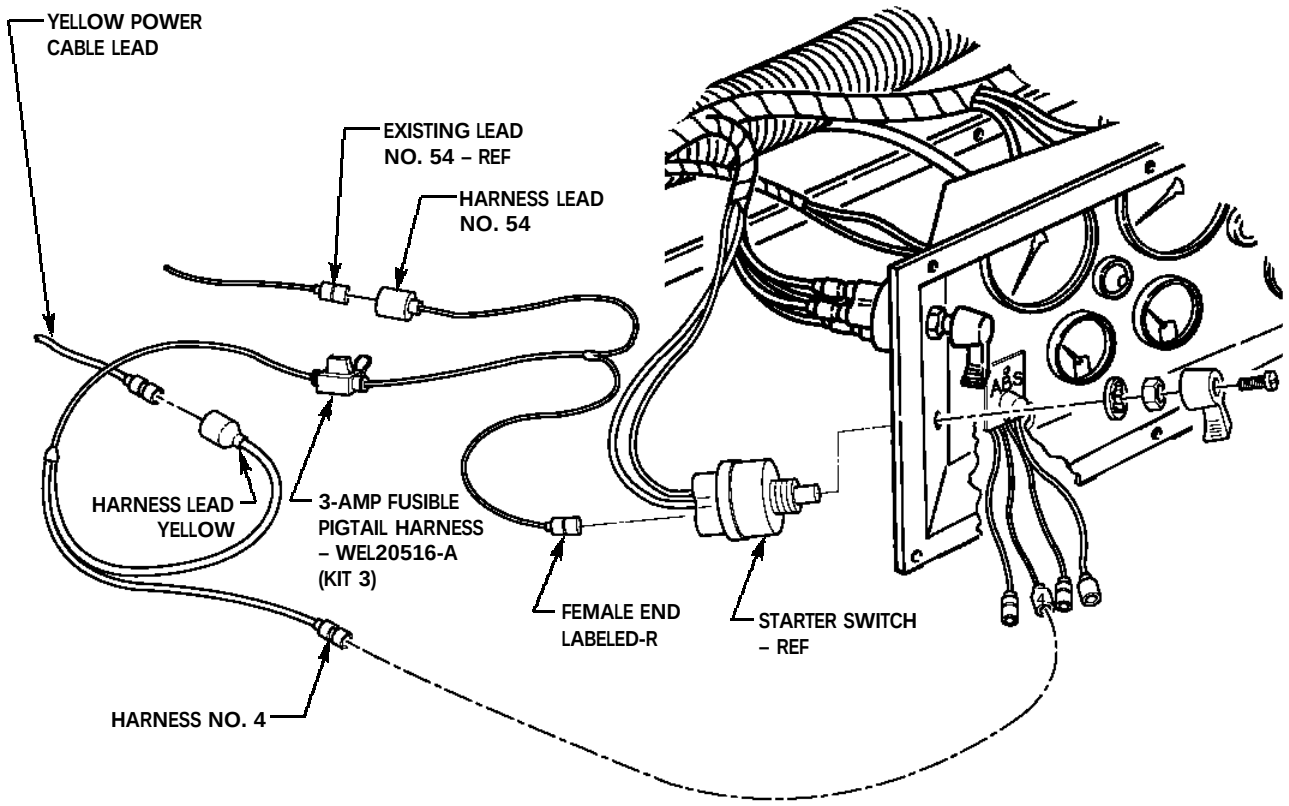

YELLOW POWER CABLE LEAD
EXISTING LEAD NO. 54 – REF
HARNESS LEAD NO. 54
HARNESS LEAD YELLOW
3-AMP FUSIBLE PIGTAIL HARNESS – WEL20516-A (KIT 3)
FEMALE END LABELED-R
STARTER SWITCH – REF
HARNESS NO. 4
ABS

FIGURE 64

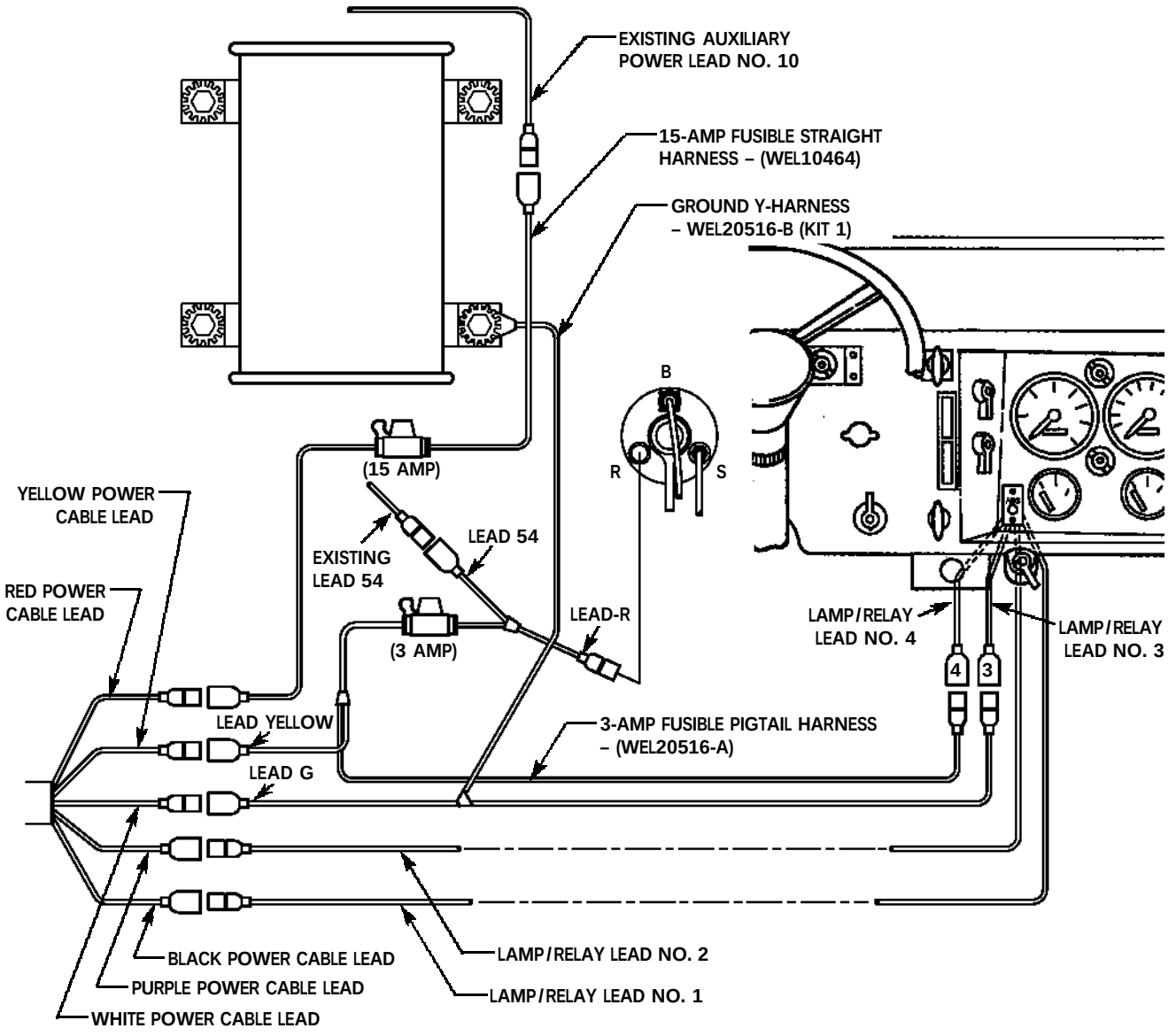
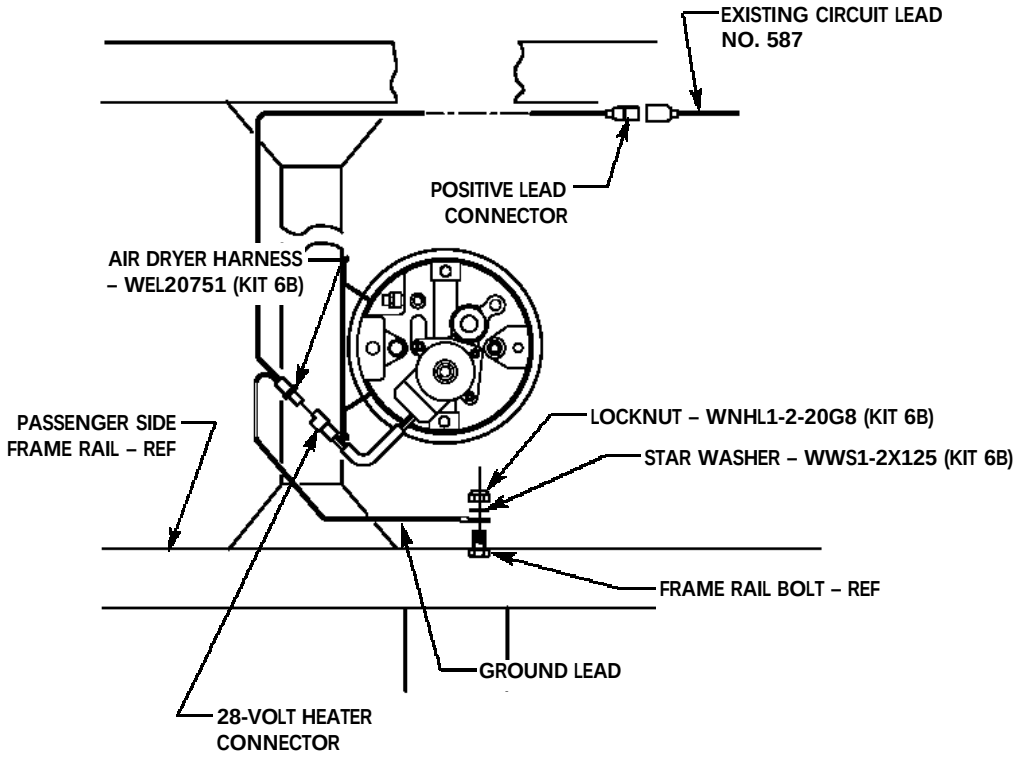
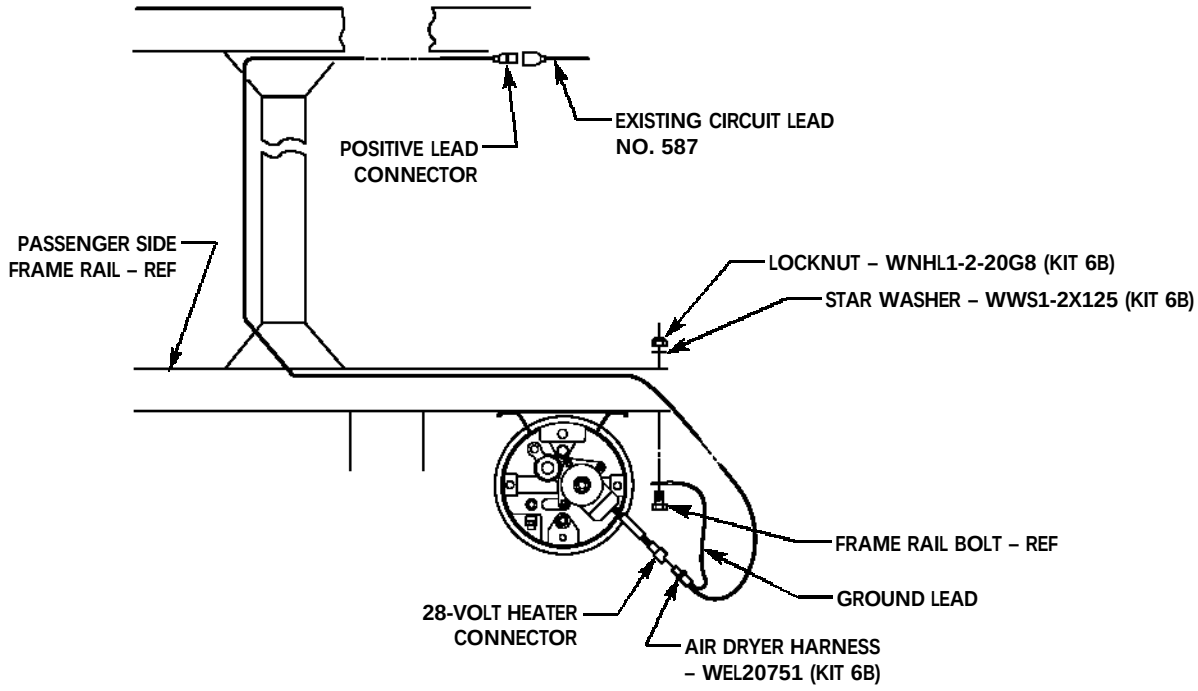

EXISTING AUXILIARY POWER LEAD NO. 10
15-AMP FUSIBLE STRAIGHT HARNESS – (WEL10464)
GROUND Y-HARNESS – WEL20516-B (KIT 1)
B
R
S
(15 AMP)
YELLOW POWER CABLE LEAD
EXISTING LEAD 54
LEAD 54
RED POWER CABLE LEAD
LEAD-R
(3 AMP)
LAMP/RELAY LEAD NO. 4
LAMP/RELAY LEAD NO. 3
4
3
LEAD YELLOW
3-AMP FUSIBLE PIGTAIL HARNESS – (WEL20516-A)
LEAD G
LAMP/RELAY LEAD NO. 2
BLACK POWER CABLE LEAD
PURPLE POWER CABLE LEAD
LAMP/RELAY LEAD NO. 1
WHITE POWER CABLE LEAD

FIGURE 65

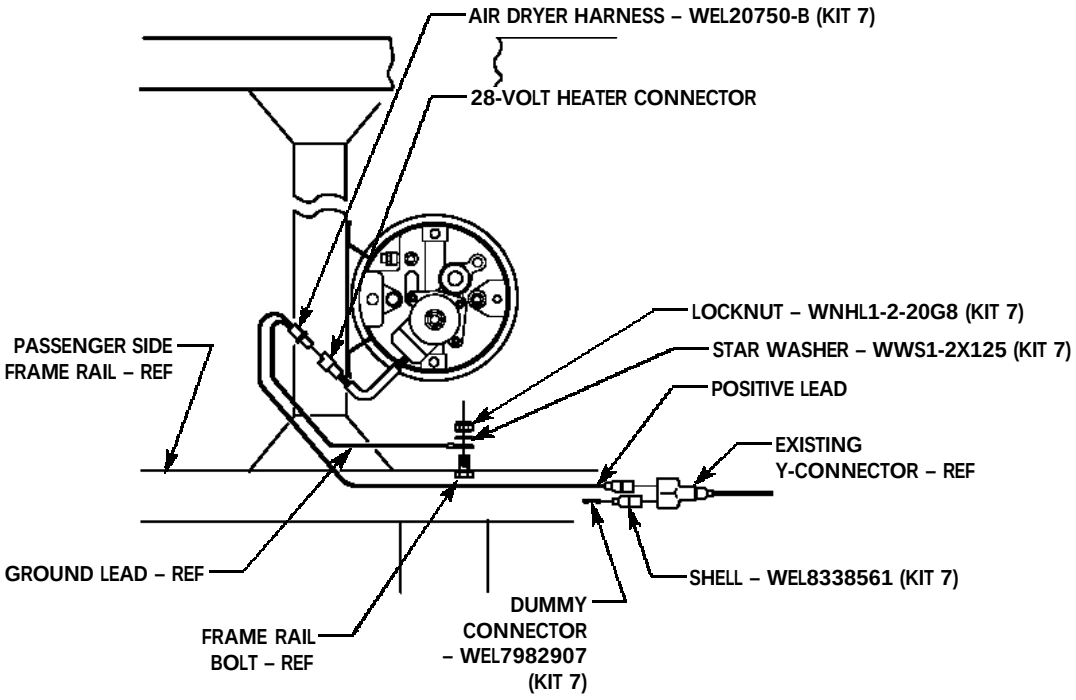


(M939/A1)

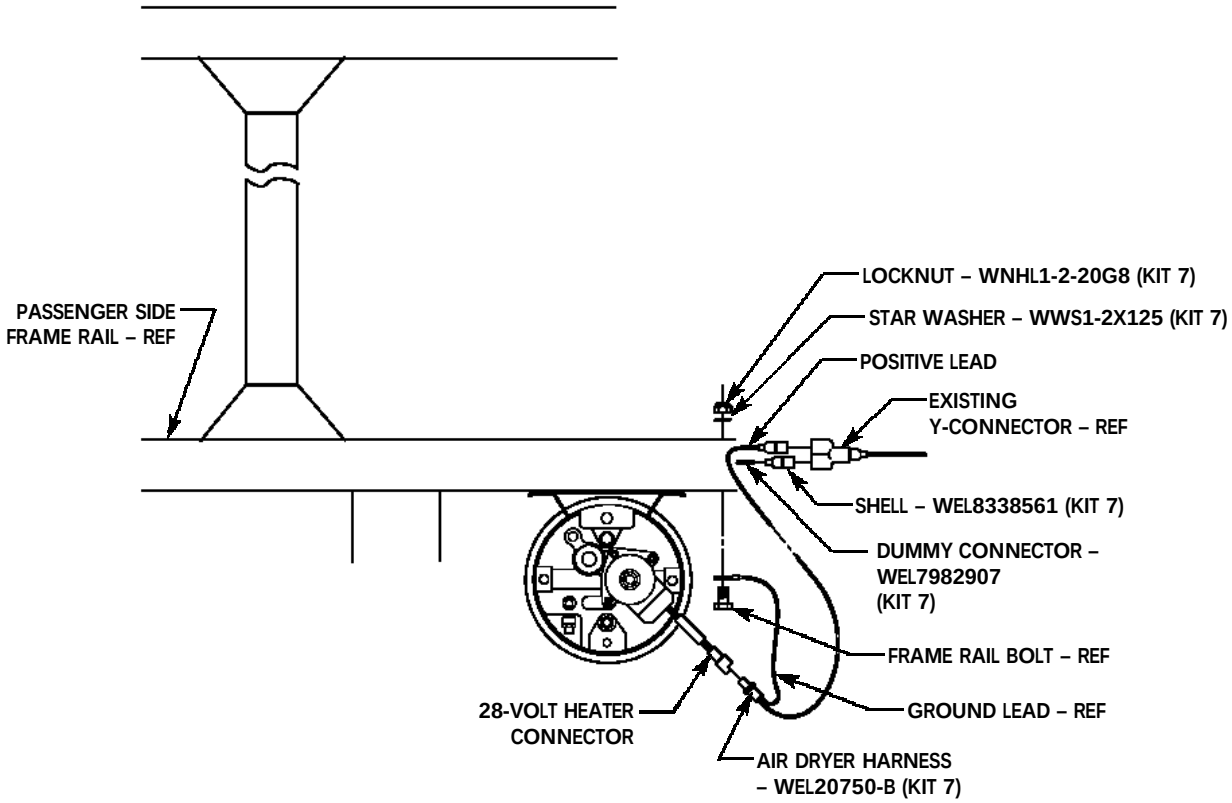


(M936/A1)

FIGURE 66



(M939A2)



(M936A2)

FIGURE 67

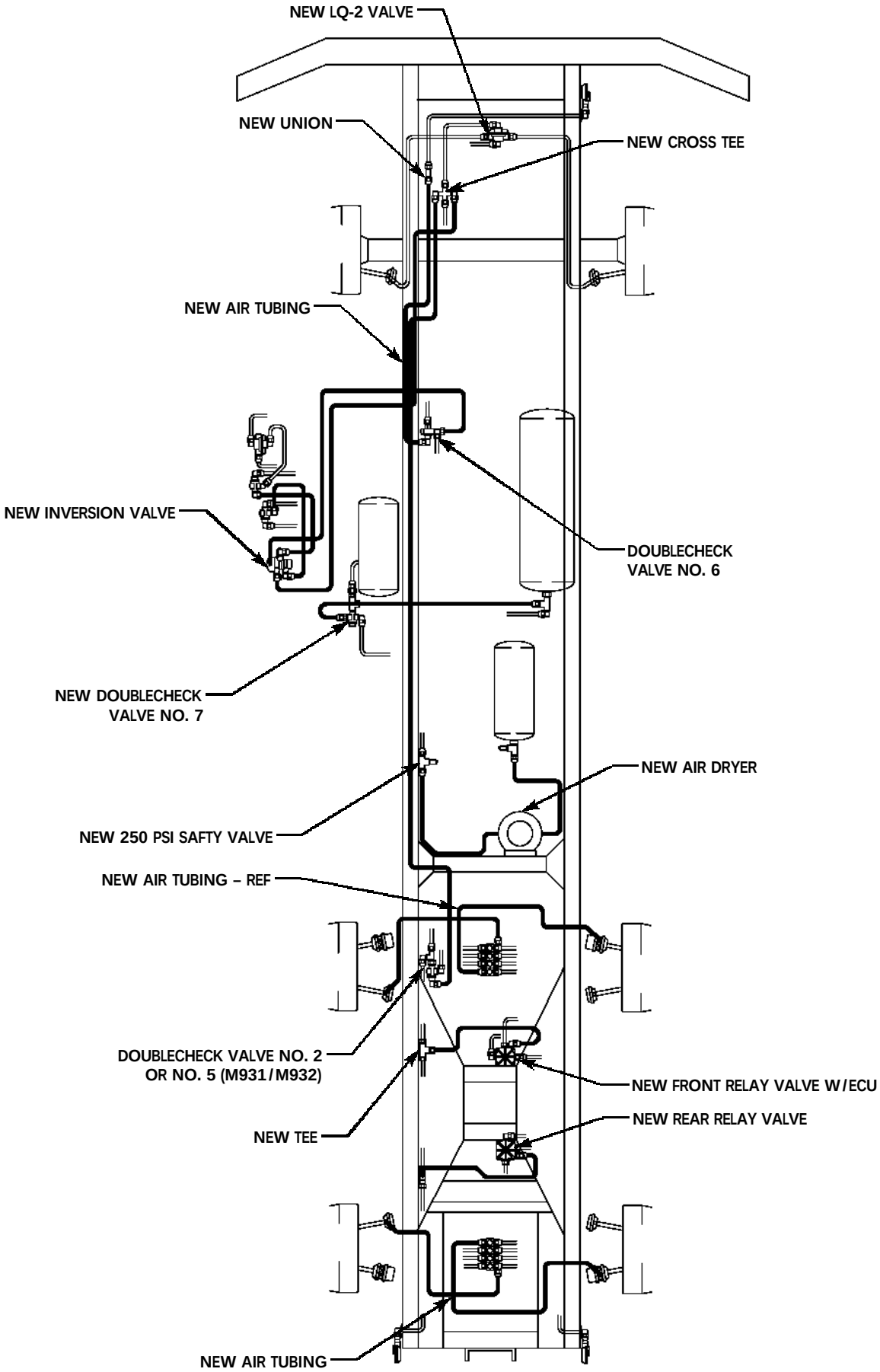

NEW LQ-2 VALVE
NEW UNION
NEW CROSS TEE
NEW AIR TUBING
NEW INVERSION VALVE
DOUBLECHECK VALVE NO. 6
NEW DOUBLECHECK VALVE NO. 7
NEW AIR DRYER
NEW 250 PSI SAFTY VALVE
NEW AIR TUBING – REF
DOUBLECHECK VALVE NO. 2 OR NO. 5 (M931/M932)
NEW FRONT RELAY VALVE W/ECU
NEW REAR RELAY VALVE
NEW TEE
NEW AIR TUBING

FIGURE 68

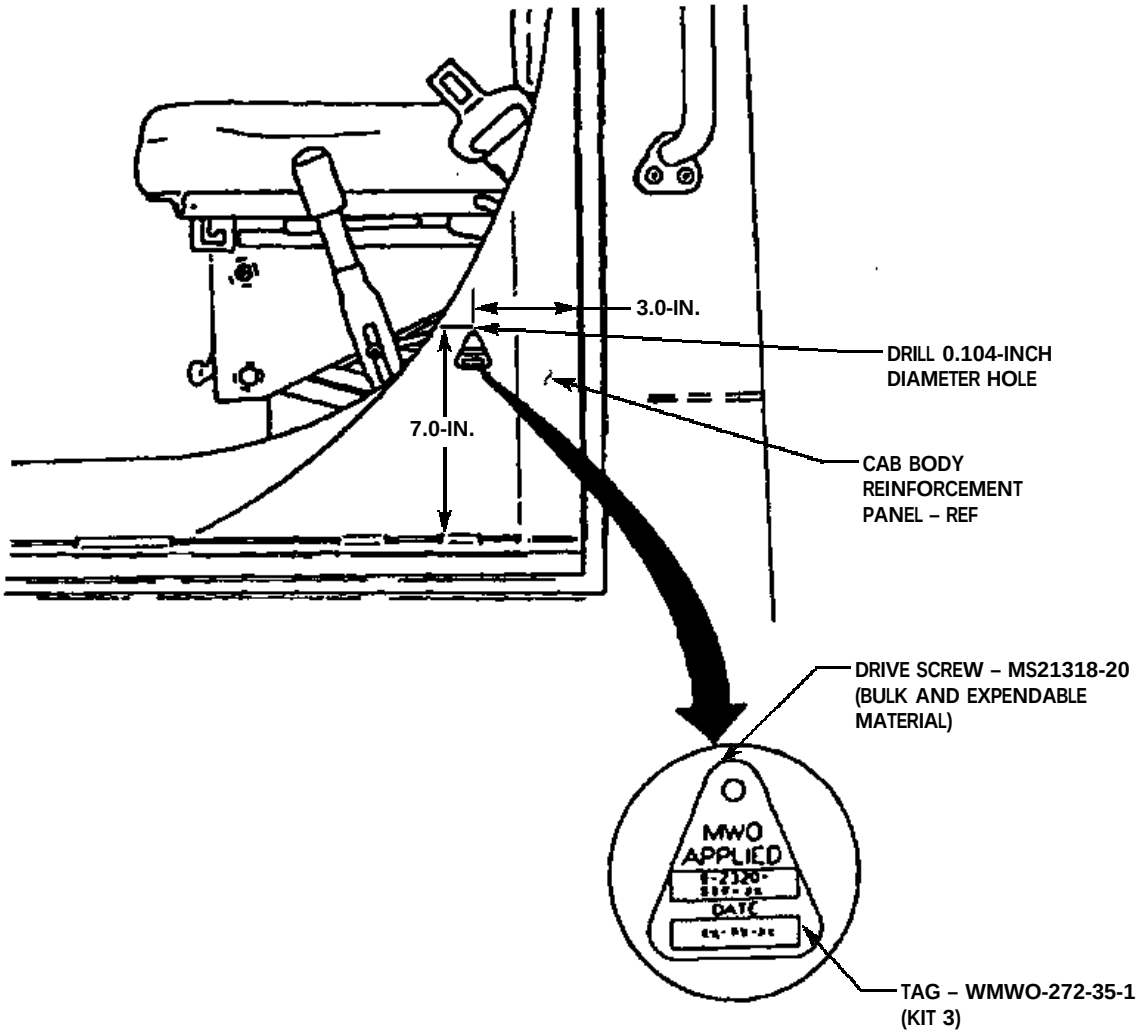

3.0-IN.
DRILL 0.104-INCH DIAMETER HOLE
7.0-IN.
CAB BODY REINFORCEMENT PANEL – REF
DRIVE SCREW – MS21318-20 (BULK AND EXPENDABLE MATERIAL)
MWO APPLIED
DATE
TAG – WMWO-272-35-1 (KIT 3)

FIGURE 69

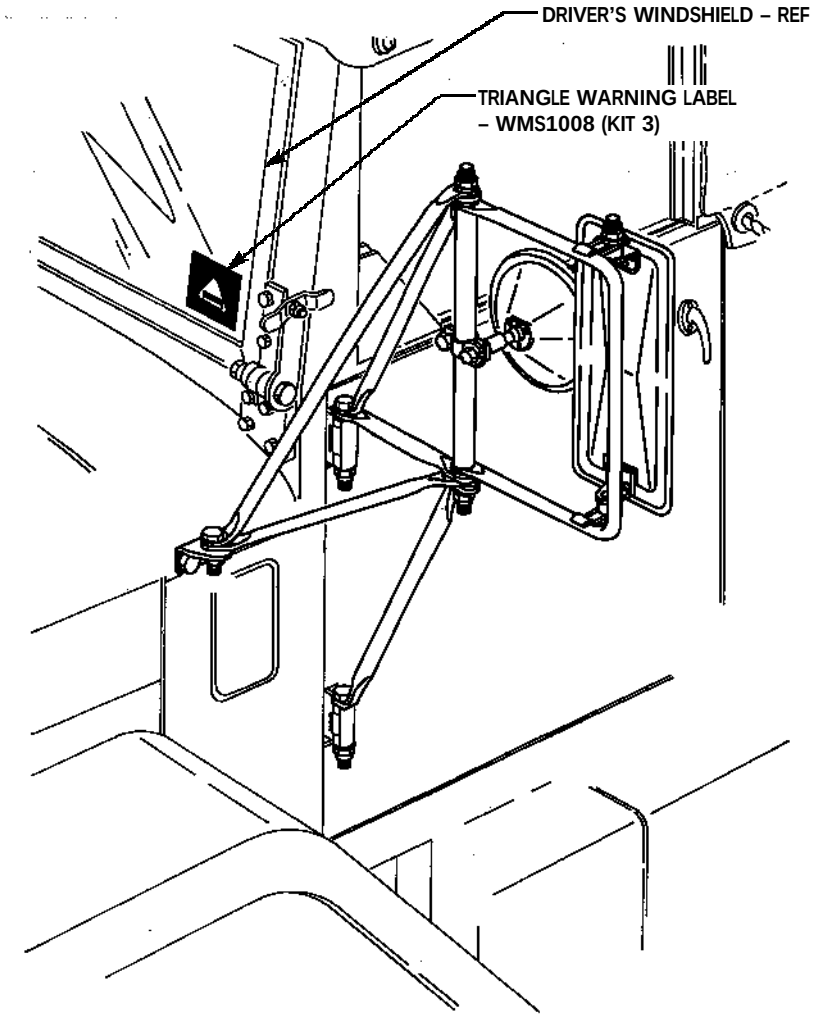
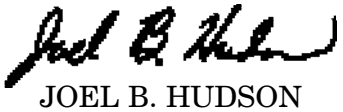

DRIVER'S WINDSHIELD – REF
TRIANGLE WARNING LABEL
– WMS1008 (KIT 3)

FIGURE 70

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0207901

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