



# SPARTAN CHASSIS, INC.

TSB04-250-001

July, 2004

Page 1 of 4

## TECHNICAL SERVICE BULLETIN

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### SUBJECT:

Towed Vehicle Brake System – Installation Instructions

### PURPOSE AND APPLICATION:

When installed, a Spartan motorhome chassis model equipped with a full air brake system (as manufactured by Spartan Chassis, Inc.), is capable of providing an isolated air source for a towed automobile braking system.

### PART AND SERVICE INFORMATION:

<u>QTY.</u>	<u>Part Number</u>	<u>Description</u>
1	S-1628-001	KIT- TOWED VEHICLE BRK SYS
<b>S-1628-001 Kit Contains:</b>		
1	2135-MM5-001	VALVE - PRESSURE PROTECTION
1	2136-MM5-001	RESERVOIR - TOWED VEHICLE BRK SYS
1	2137-MM5-001	VALVE - RELAY
10'	0724-MM5-A02	AIR TUBING - 1/4" BLACK
20'	0724-MM5-B02	AIR TUBING - 3/8" BLACK
1	0716-MM5-A02	FTG - STRAIGHT 4-4
1	0716-MM5-A03	FTG - STRAIGHT 4-6
1	0716-MM5-A05	FTG - STRAIGHT 6-4
1	0716-MM5-A06	FTG - STRAIGHT 6-6
2	0716-MM5-A07	FTG - STRAIGHT 6-8
1	0716-MM5-B02	FTG - 90° 4-4
1	0716-MM5-B06	FTG - 90° 6-6
2	0716-MM5-B07	FTG - 90° 6-8
1	0716-MM5-H02	FTG - NIPPLE 4-4
1	0716-MM5-J03	FTG - BUSHING 6-4
2	0716-MM5-K02	FTG - PLUG -4
2	0716-MM5-K04	FTG - PLUG -8
1	0716-MM5-P02	FTG - 90° STREET ELBOW -4
1	0716-MM5-R03	FTG - STREET TEE -6
1	0716-MM5-B03	FTG - 90° 4-6
1	0716-MM5-B05	FTG - 90° 6-4
1	0716-MM5-Q04	FTG - UNION TEE -8
2	0716-MM5-A11	FTG - STRAIGHT 10-8
2	0716-MM5-A12	FTG - STRAIGHT 12-8
1	2157-MM5	PLUMBING DIAG - TOWED VEHICLE BRK SYS
1	TSB04-250-001	INSTRUCTION DOCUMENT

Technical Service Bulletins are intended for use by Professional Technicians only. They are written to guide Professional Technicians in performing service to vehicles of product specific nature in conjunction with industry standards. Professional Technicians are appropriately trained on industry standards and have the tools and equipment to perform procedures safely and properly.



# SPARTAN CHASSIS, INC.

TSB04-250-001

July, 2004

Page 2 of 4

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### PLEASE READ THE ENTIRE BULLETIN BEFORE PROCEEDING WITH ANY WORK.

**NOTE:** The Towed Vehicle Brake System is designed for application to Spartan motorhome chassis systems only.

**NOTE:** Certain ports are identified with numbers or letters on the plumbing diagram and are referenced in the instructions. The kit includes a straight and 90° fitting for most locations to allow for optimal positioning of the hose routing.

1. Observe all industry safety standards and secure vehicle to allow for installation of the Towed Vehicle Brake System.
2. Identify mounting location for the reservoir.

Air reservoir tank mounting should meet or exceed the following:

- ◆ Attach (to a vertical surface) using 3/8"-16 non-corrosive hardware.
- ◆ Tank must have sufficient clearance from any moving component(s), exhaust, or any other heat sources.
- ◆ Air hoses must be plumbed free from kinks, bends, and away from heat sources and moving components where a pinched condition could occur.
- ◆ Attach to the frame rail web or crossmember when possible.

If a frame web location cannot be identified within the criteria stated above, the reservoir may be attached to a body component as permitted by the body manufacturer. Contact the body manufacturer for additional information.

### SUB-ASSEMBLE AIR RESERVOIR TANK

3. Install a 1/4" NPT plug into bottom port of reservoir.
4. Determine which end port will be used as the inlet port of the reservoir and install pressure protection valve to inlet port using a 1/4" NPT fitting and reducing bushing.

**NOTE:** Orient the valve in a manner that the arrow is viewed from the top and directed toward the reservoir.

5. Install a 3/8" compression - 1/4" NPT fitting (straight or 90°) into the inlet of the pressure protection valve (B).

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# SPARTAN CHASSIS, INC.

TSB04-250-001

July, 2004

Page 3 of 4

## TECHNICAL SERVICE BULLETIN

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6. Install a 3/8" compression - 1/4" NPT fitting (straight or 90°) into the outlet (C) of the air reservoir.
7. Install the sub-assembled reservoir to the pre-selected location.

### SUB-ASSEMBLE RELAY VALVE

The relay valve contains two 1/4" "CONT" ports, two 1/2" "RES" ports, and two 1/2" "DEL" ports. Either of each port may be used, depending on which is most convenient, making sure the other is plugged. Plugs are provided in the kit.

8. Plug the unused ports. Install either a straight or 90° 1/4" compression - 1/4" NPT fitting into the "CONT" port and either a straight or 90° 3/8" compression - 1/2" NPT fitting into the "RES" port. The unused "DEL" port requires a 1/2" plug.
9. Install the sub-assembled relay valve in a suitable location, using the same criteria referenced in step #2.

### REWORK PLUMBING

10. Drain the "PRIMARY" air reservoir.
11. Locate the existing relay valve that is plumbed to the service side of the drive axle brakes. Remove the 90° fitting from the port (2) on the bottom of the valve and install a 3/8" NPT street tee in its place.  
  
Reinstall the 90° degree fitting into the bottom of the street tee and reconnect tubing. Install either a straight or 90° 1/4" compression - 3/8" NPT fitting into the open port on the street tee.
12. On the existing relay valve, locate the green tubing connected to the "RES" port (1) and determine its diameter. It will be either 5/8" (#10) or 3/4" (#12).
13. Sub-assemble a tee consisting of one 1/2" NPT union tee, two straight 5/8" or 3/4" compression - 1/2 NPT fittings determined by tubing size in previous step, and one straight or 90° 3/8" compression - 1/2 NPT fitting.
14. Insert tee into the green tubing connected to the "RES" port (1) identified in step #12 by cutting line at a point near the relay valve and tightening connections.
15. Route a length of black 3/8" (#6) tubing between the 3/8" fitting of the tee sub-assembly installed into step #14 (A) and the inlet fitting port of the air reservoir pressure protection valve (B). Tighten connections.

**NOTE: Be sure to secure tubing away from abrasion points and heat sources.**

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TSB04-250-001

July, 2004

Page 4 of 4

## TECHNICAL SERVICE BULLETIN

---

16. Route a length of black 3/8" (#6) tubing between fitting on outlet of air reservoir (C) and 3/8" fitting in "RES" port on new relay valve (D). Tighten connections.

**NOTE: Be sure to secure tubing away from abrasion points and heat sources.**

17. Route a length of black 1/4" (#4) tubing between the 1/4" fitting added to the bottom of existing relay valve (E), and the 1/4" fitting in the "CONT" port of the new relay valve (F). Tighten connections.

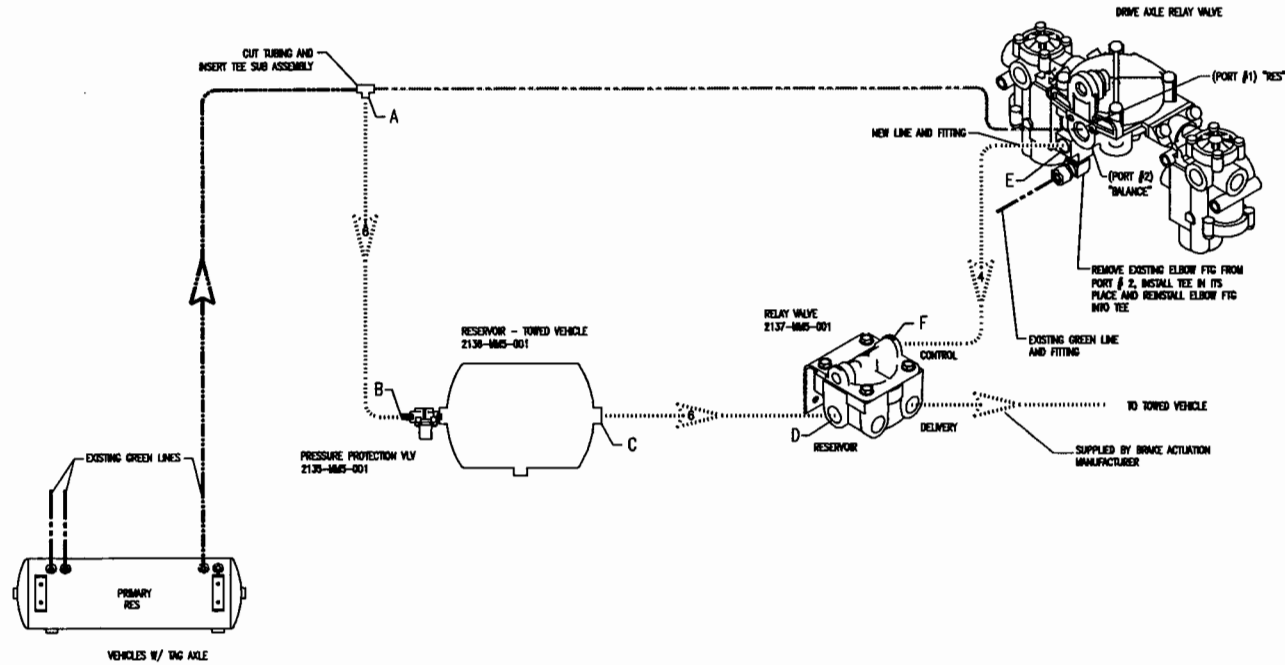
**NOTE: Be sure to secure tubing away from abrasion points and heat sources.**

18. Re-inflate the vehicle air system and check for proper function and leaks. Air should flow from the open "DEL" port in the new relay valve only when the brake pedal is depressed.

19. Connect the hose leading from the towed vehicle to the open "DEL" port in the new relay valve. As noted in step #8, a plug is provided for the unused port.

**NOTE: The open "DEL" port MUST be closed to prevent air leakage. If a towed vehicle will not be attached, it is recommended that a hose be installed into the "DEL" port with a "quick disconnect" for future hook-up.**

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LEGEND

SUPPLY	ORANGE WELD
SYSTEM #1	GREEN WELD
SYSTEM #2	RED WELD
SUSPENSION	BLUE WELD
PARK BRAKE	BROWN WELD
WIRE BRAID	BLACK WELD
AUX SYSTEM	YELLOW WELD
CONTROL	YELLOW WELD
COTTON BRAID	YELLOW WELD
SMALL STEEL TUBING	YELLOW WELD
CHECK VALVE	ORANGE WELD
DOUBLE CHECK VALVE	ORANGE WELD

NOTE:  
COMPLETED SYSTEM MUST MEET OR EXCEED THE  
FOLLOWING MOTOR VEHICLE SAFETY STANDARDS:  
571.106-BRAKE HOSES  
571.121-AIR BRAKE SYSTEMS

REV	DESCRIPTION OF CHANGE	AUTH	DATE	DR	CHK	APVD

DET	QTY	MATERIAL	DESCRIPTION	REV
2157-MM5				
		PART NUMBER	PART NUMBER OPPOSITE	
				1 / 1

**SPARTAN** SPARTAN MOTORS CHASSIS, INC.  
P.O. BOX 248 - CHANDLER, AZ 85025

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DATE: 6/14/04

DESIGNER: B. ST. JOHN  
CHECKER: GLW  
APPV: GLW

PLUMBING DIAG  
TOWED VEHICLE BRK SYS

**2157-MM5** -