



Recall Service Bulletin



DATE: 9-12-16

APPLIES TO: This recall service bulletin applies to transit bus chassis cabs altered by Spartan Motors, USA Inc. between January 29, 2014 and December 1, 2014.

NHTSA/TC Id: 16V-537

CONDITION: Altered chassis frame may crack

CORRECTION: Install reinforcement sleeve over affected frame area.

LABOR ALLOCATION: 20 hrs.

CLASSIFICATION: E3

PARTS NEEDED:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	S-2554-001B	Kit-Service Glaval Frame Support

Kit # S-2554-001B Contains:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
4	06150FDRWZ	Washer-3/8 X 1.50 X .05 FDR Zinc
2	06160125FH8Y	Bolt-3/8-16 X 1.25LG FLG GR8 YEL
2	06160150FH8Y	Bolt-3/8-16 X 1.50LG FLG GR8 YEL
4	0616FLN8Y	Nut-3/8-16 FLG LK GR8 YEL
4	08130150FH8Y	Bolt-1/2-13 X 1.50LG FLG GR8 YEL
8	08130175FH8Y	Bolt-1/2-13 X 1.75LG FLG GR8 YEL
6	08130200FH8Y	Bolt-1/2-13 X 2.00LG FLG GR8 YEL
26	08130250FH8Y	Bolt-1/2-13 X 2.50LG FLG GR8 YEL
8	08130275FH8Y	Bolt-1/2-13 X 2.75LG FLG GR8 YEL
52	0813FLN8Y	Nut-1/2-13 FLG LK GR8 YEL
1	5836-CC1-001	REINF-Glaval Frame LH
1	5836-CC1-002	REINF-Glaval Frame RH
1	5837-CC1-001	REINF-Taper Joint Glaval Frame Outer
1	5837-CC1-002	REINF-Taper Joint Glaval Frame Outer
1	5839-CC1-001	BRKT-Glaval Shock Mount LH
1	5839-CC1-002	BRKT-Glaval Shock Mount RH

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2	5841-CC1-001	SPCR-Taper Joint Glaval Frame Outer
2	5842-CC1-001	SPCR-Taper Joint Glaval Frame Inner
2	5843-CC1-001	SPCR-Taper Joint Glaval Frame Inner
2	3-906 N0756	Parker SAE -6
1	3-908 N0756	Parker SAE -8
1	RSB16-210-002	Instruction Document

GENERAL INSTRUCTIONS:

Thoroughly review entire service bulletin before starting work. If there are questions or concerns with steps defined in this service bulletin, contact Spartan Motors USA, Inc. Customer & Product Support Group (1-800-543-4334).

All applicable industry safety standards must be followed when performing work identified in this procedure.

STEP-BY-STEP INSTRUCTIONS:

1. Raise vehicle to desired working height and securely place on jack stands. Use at least seven (7) jack stands to support truck under frame rail. Locate jack stands in the following places: two (2) in front, two (2) in middle, and two (2) just behind rear axle, and use a jack at very rear of bus cross member for support. Refer to FIG. 2-2.



FIG. 2-2

2. Perform steps for **CNG** line removal and purge procedure found in **Safety Procedural Steps to Perform Repairs on CNG Gas Powered Vehicles Prior to Service. Refer to Pages 14-20.**

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3. Remove sway bar end links, rear shocks, air springs, track rod at cross member, and disconnect height control valve linkages. Retain for re-install. Refer to FIG. 3-1.

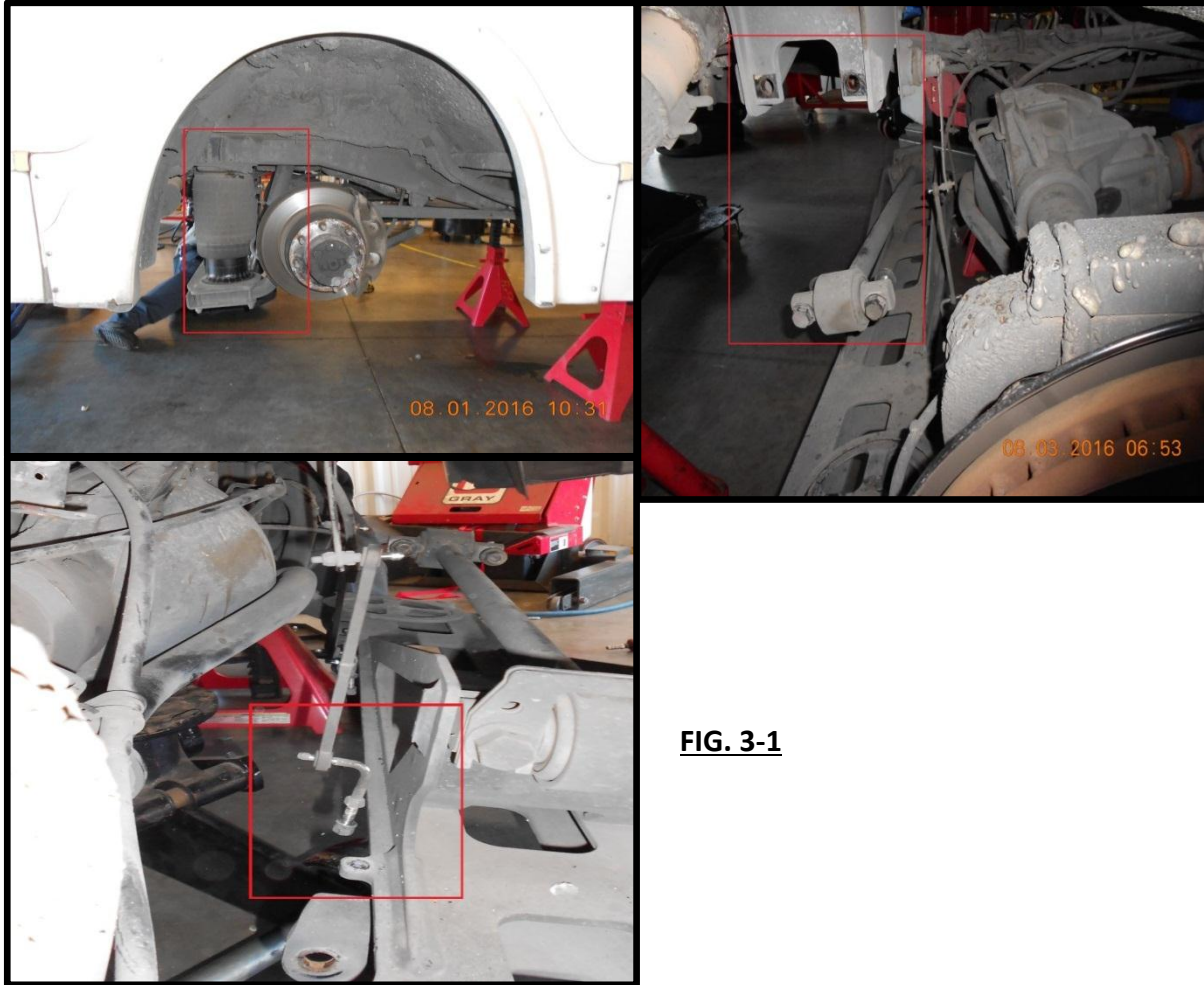


FIG. 3-1

4. Support rear axle on jack stands. Refer to FIG. 4-1.

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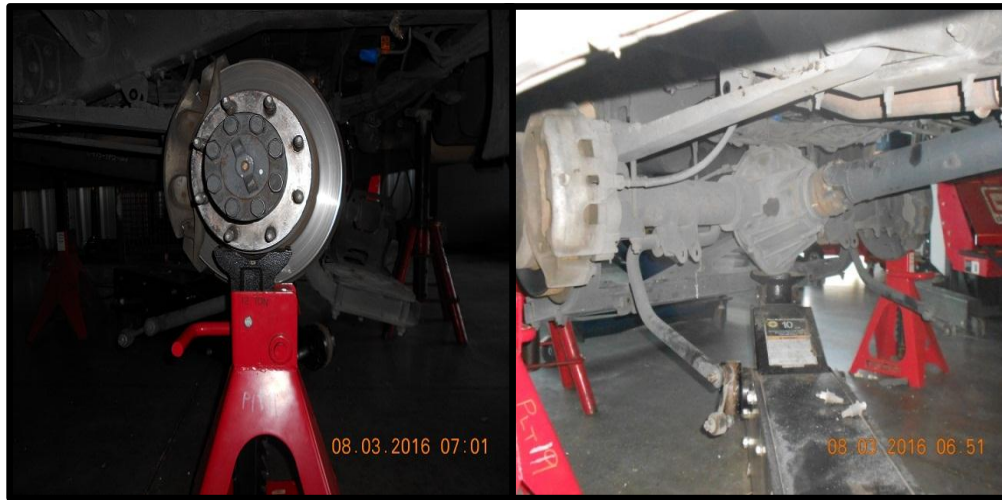


FIG. 4-1

NOTE: Follow steps 5 through 17 for both sides of frame rail.

5. Cut and remove seventeen (17) huck bolts from frame. Properly dispose of hardware. Refer to FIG. 4-2.



FIG. 4-2

6. Cut out old support bracket and grind down weld as close to frame rail as possible. Properly dispose of support bracket. Refer to FIG. 5-1.

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FIG. 5-1

7. Cut off tab connecting cross member to shock mount and **save tab for re-install**. Refer to FIG. 5-2.



FIG. 5-2

8. Remove old shock mount. Properly dispose shock mount. Refer to FIG. 5-3.



FIG. 5-3

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9. Cut frame rail in half along old weld, **do not cut into floor**. Refer to FIG. 6-1.

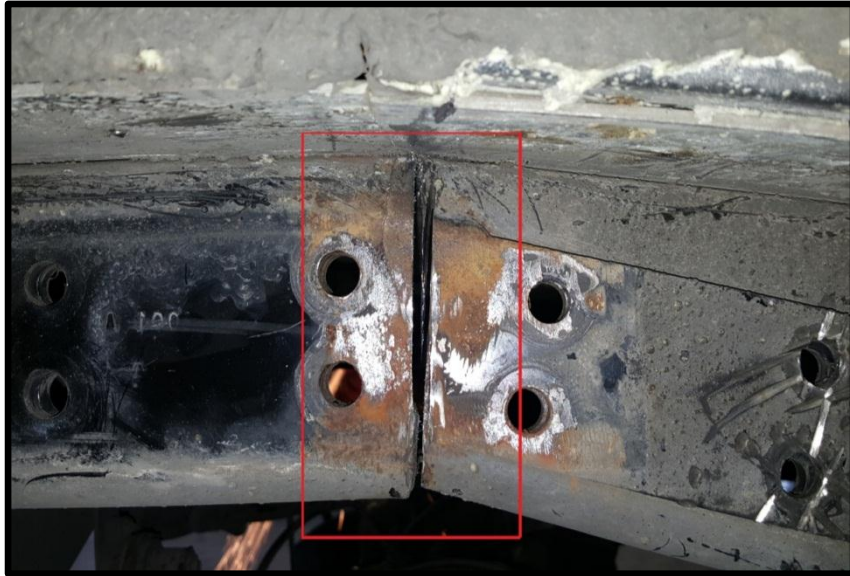


FIG. 6-1

10. Fit 5837-CC1-001 & -002 to match existing holes and transfer punch nine (9) additional hole locations.
11. Drill nine (9) additional .53" diameter holes through frame rail. Use drill fixture 5854-CC1-001 for magnetic drill attachment.
12. Remove drill fixture from vehicle and retain for re-use on other units.
13. Install new frame rail support brackets and shock mount. Refer to FIG. 7-1, FIG. 8-1, and FIG. 9-1. Torque specification is nut side of bolt 74 FT.-LBS. or head side of bolt 94 FT.-LBS.

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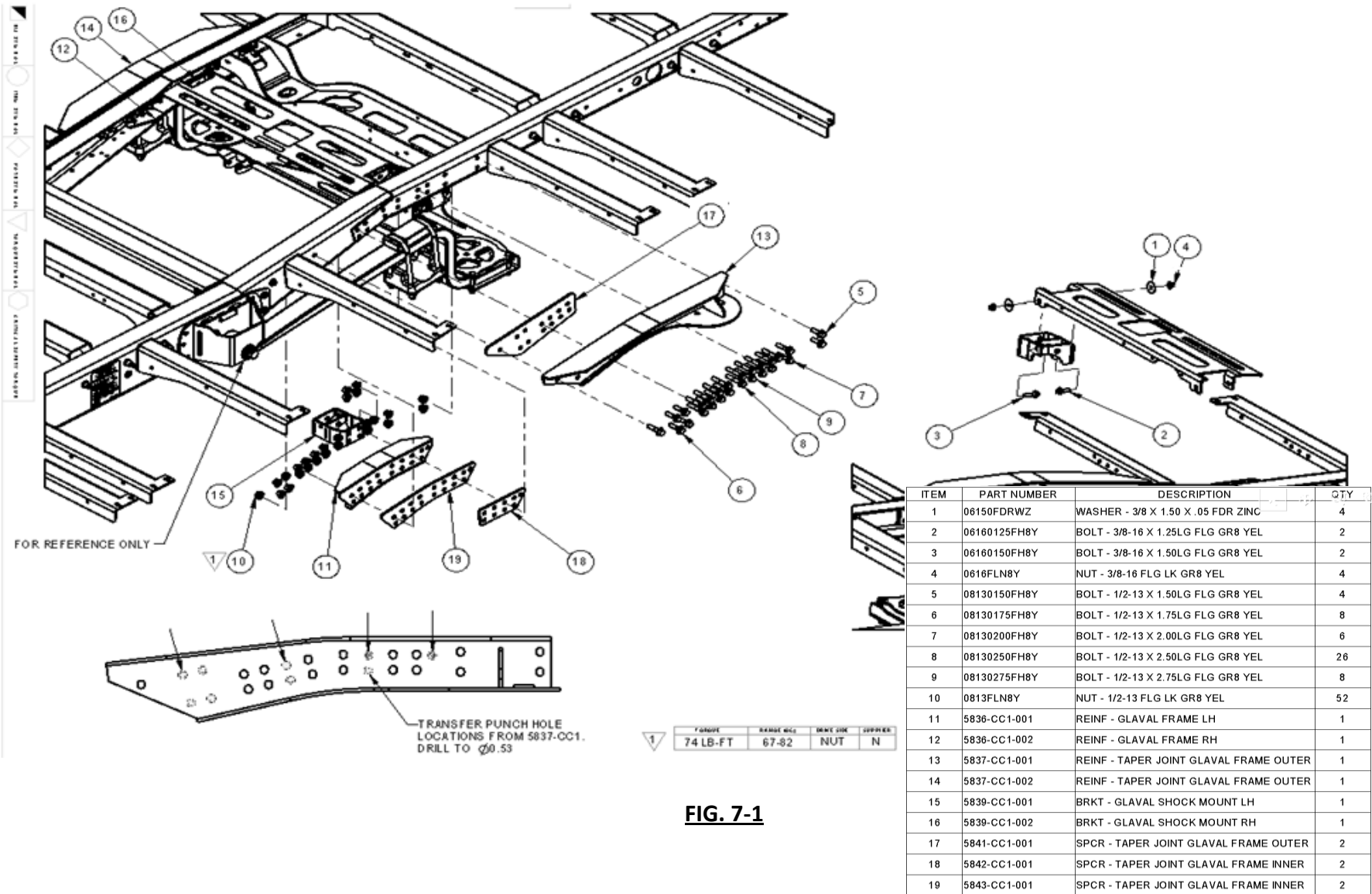
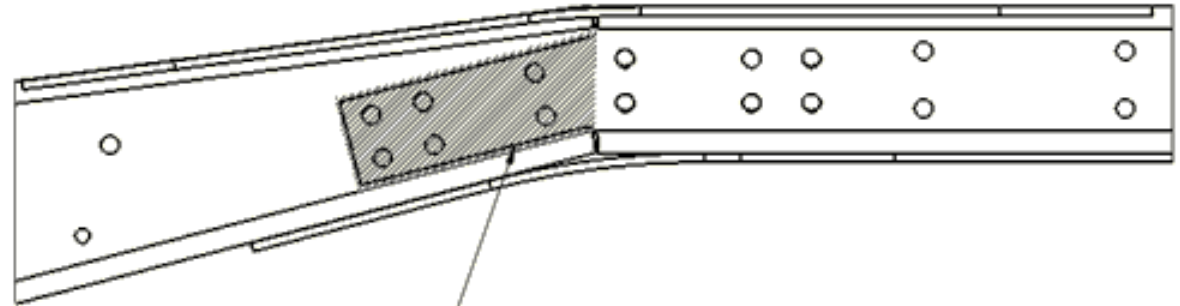
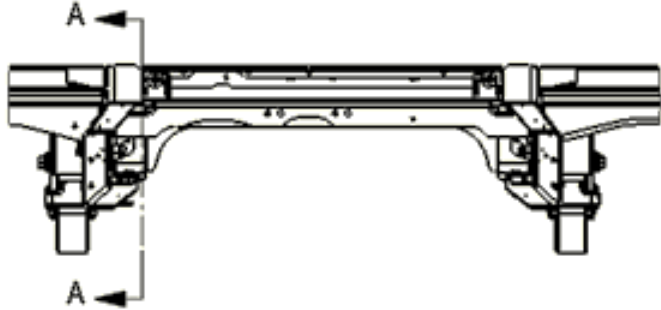


FIG. 7-1

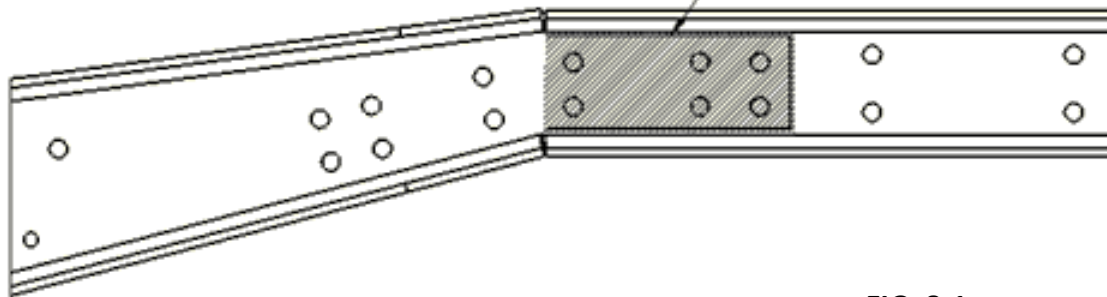
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REMOVE "TAB"



SECTION A-A

FIG. 8-1

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FIG. 9-1

14. Once shock mount bracket and cross member are torqued in place, weld retained tab for cross member back on. Refer to red box within FIG. 10-1.

NOTE: Follow recommended welding procedures per AWS D 1.1 using E70 weld wire.

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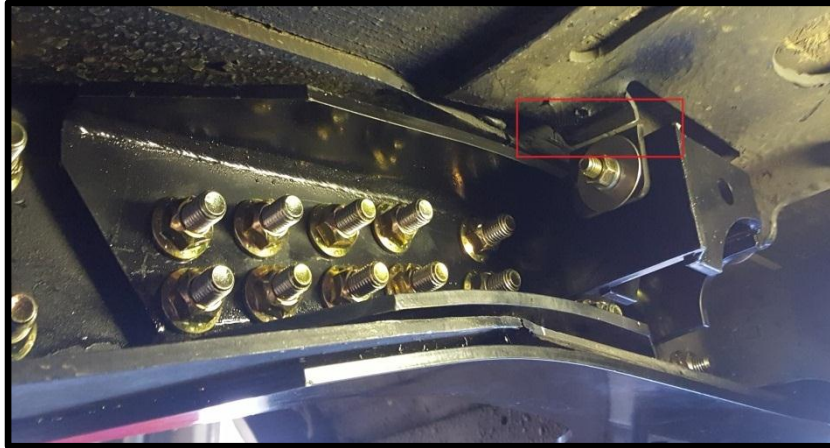


FIG. 10-1

15. Re-install retained shock and torque shock eye bolt nut side. Refer to FIG. 11-1.
16. Re-install retained air spring and torque nuts. Refer to FIG. 11-1.
17. Re-install retained air line for air bag.
18. Re-install retained track rod and torque nut side of bolt. Refer to FIG. 11-1.
19. Re-install retained rear wheels and torque. Refer to FIG. 13-1.
20. Re-install retained CNG line per CNG instructional document attached.
21. Re-install retained Height Control valve linkage. Refer to FIG. 12-1.
 - a. Once wheels are mounted on bus and torqued wheels are complete allow for suspension to be full system air pressure.
 - b. Set ride height to manufacture specification of 11.75 inches from the bottom of the air spring pad to the top of the air spring pad.

NOTE: Adhere to all torque specifications and CNG safety procedural steps attached with this bulletin instruction.

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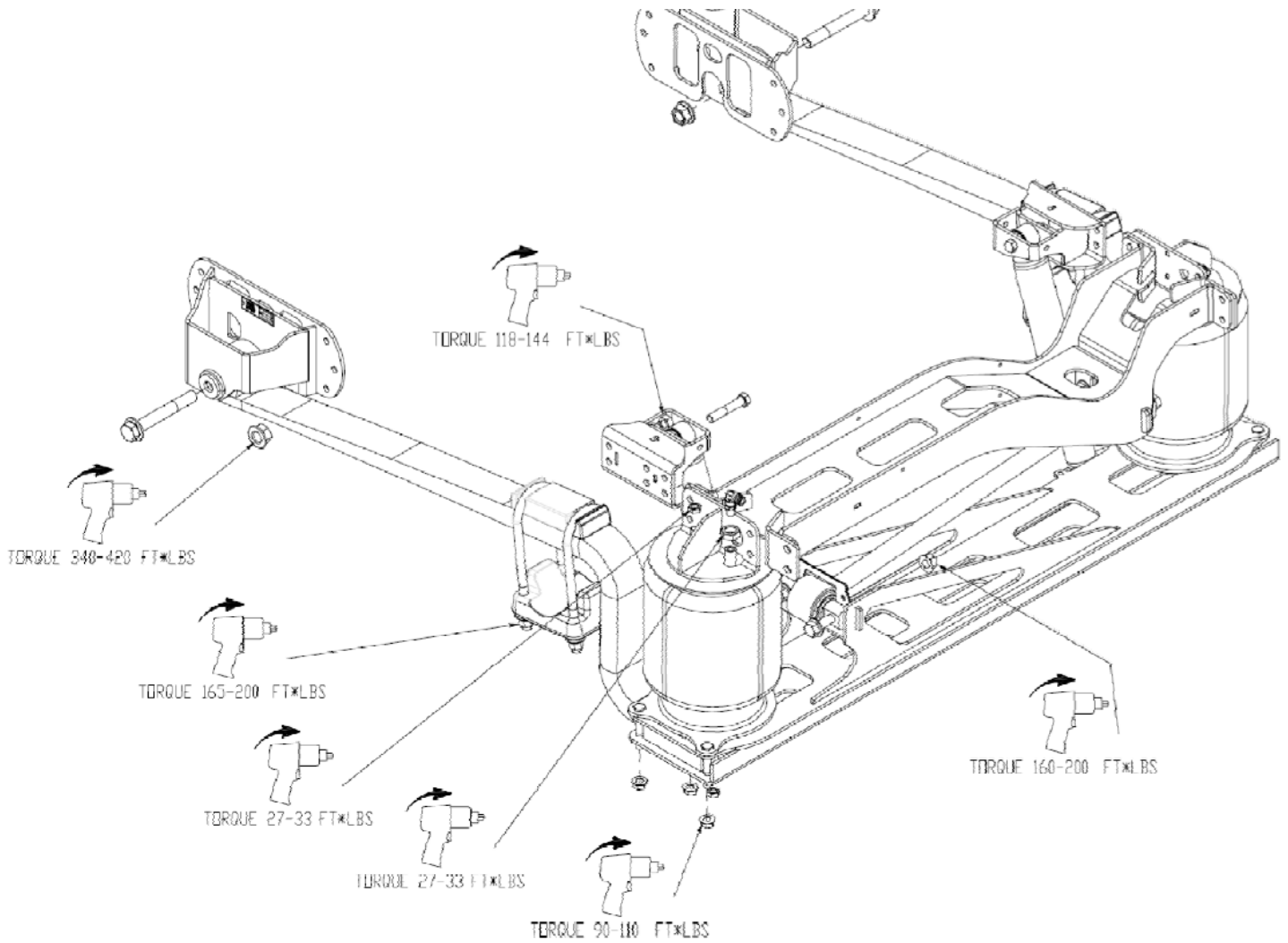


FIG. 11-1

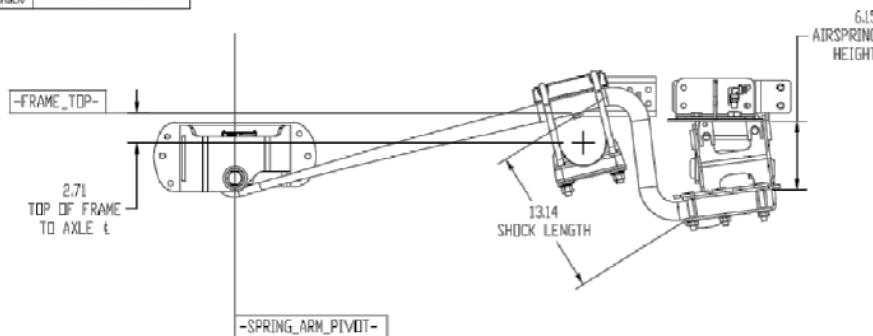
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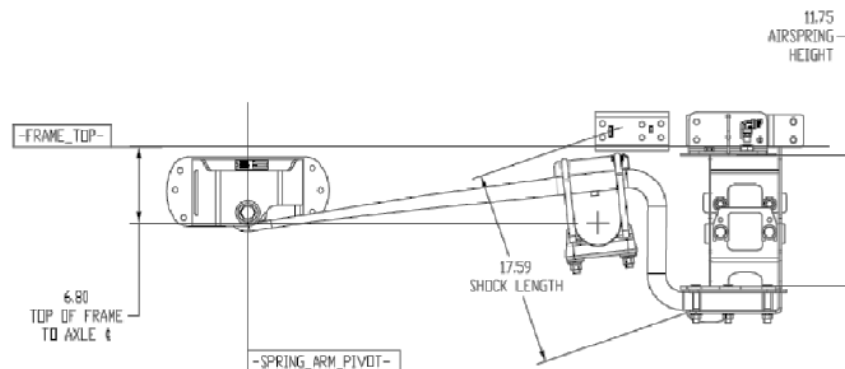


NUMBER	8M000116	LEVEL	1	2	3	4	5
PART NUMBER	8M000116						



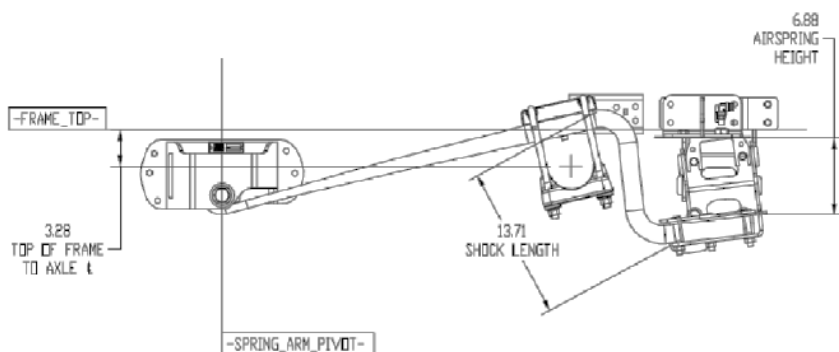
FULL JOUNCE

-4.05° FROM RIDE HEIGHT
LIMITED BY SHOCK COMPRESSION
SHOCKS AND AIRSPRINGS OMITTED FOR CLARITY



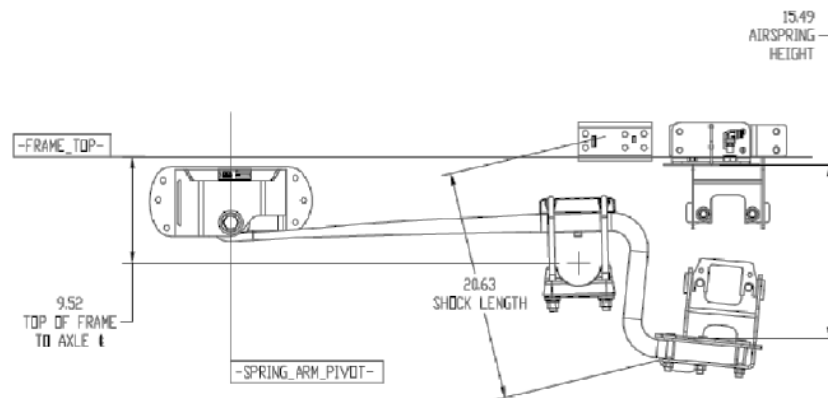
RIDE HEIGHT

SHOCKS AND AIRSPRINGS OMITTED FOR CLARITY



JOUNCE/BUMPER CONTACT

-3.51° FROM RIDE HEIGHT
SHOCKS AND AIRSPRINGS OMITTED FOR CLARITY



FULL REBOUND

-2.71° FROM RIDE HEIGHT
LIMITED BY SHOCK EXTENSION
SHOCKS AND AIRSPRINGS OMITTED FOR CLARITY

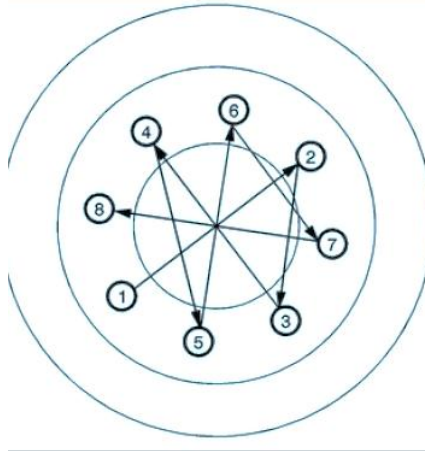
MANUFACTURING, LTD.; 223 15TH ST N.E., SIOUX CENTER, IOWA 51250, PH (712) 722-4874

FIG. 12-1

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CAUTION Caution

Improperly tightened wheel bolts or nuts can lead to brake pulsation and rotor damage. In order to avoid expensive brake repairs, evenly tighten the wheel bolts or nuts to the proper torque specification.

CAUTION
Caution
Refer to Fastener Caution.

Using a torque wrench and the appropriate socket, alternately and evenly tighten the wheel nuts to $190\text{ N}\cdot\text{m}$ (140 lb ft) in the sequence illustrated.

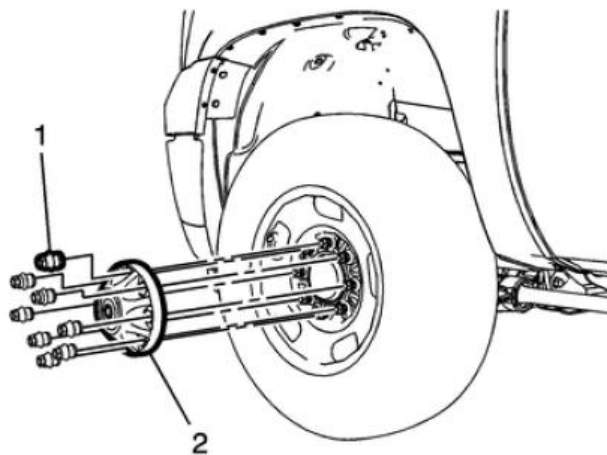


FIG. 13-1

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IMPCO Automotive Specific Service Procedure

Safety Procedural Steps to Perform Repairs on CNG Gas Powered Vehicles Prior to Service

Applicable Only to 2011 thru 2015 General Motors G4500 Cutaway Chassis Specific to Left Hand Frame Weld above Rear Axle

WARNING!

These instructions are intended for Certified CNG Repair Technicians with Training in the Handling of CNG Fuels. These instructions are NOT intended for venting gaseous fuels tanks and are for specific repairs related to high pressure line removal. This document is limited to CNG high pressure parts and or repairs but **do not include:**

CNG high pressure tanks, tank valves & or any pressure release devices.

Any attempt by an uncertified persons to use these instructions without completion & certification on the handling of CNG can cause personal bodily, property damage & or death to yourself & others.

WARNING!

All CNG fuel system **venting** should be performed outdoor in an open clear space away from any flame, heat or spark source. Venting CNG tanks indoor is NOT recommended and if done indoor venting will have to be performed in CNG approved safety room with quick ventilation systems and Gaseous monitoring devices. Use of proper venting tools and leak detectors is highly recommended. Natural gas is highly flammable. In order to reduce the risk of fire and personal injury, keep sparks, flames, and smoking materials away from the vehicle while you perform the Compressed Natural Gas (CNG) fuel system service. Training and or certification by other companies, websites or other industries may not meet Impeco Automotive guidelines and could be dangerous to yourself and others!

NOTICE!

Any person working with IMPCO Automotive products should go to IMPCO's website www.impeco-asap.com, click on the Academy tab, register and take the online courses related to CNG systems...

Part Notice:

Part numbers needed are at the end of this document, this includes OE & aftermarket numbers, service information only contains the SAE sizes needed to avoid any confusion.



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IMPCO Automotive Specific Service Procedure

Step 1:

Place the vehicle in location that you are going to perform this repair as you will not be able to start the vehicle until after the repair. Leave the vehicle in park, apply the use of wheel chucks and set parking brake.

Step 2:

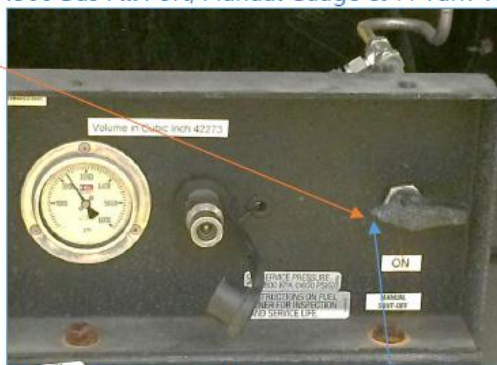
Open the rear tank access doors and turn off the CNG tank manual valves, this is a clockwise rotation and should be continued until the valve is fully seated. Then turn aft (rear) ¼ turn valve to the off position.

NOTE: ¼ turn valves have an off position that is 90 degrees of the line that they are controlling, a ¼ turn valve that is on will run in the same direction as the line that it is controlling.

Typical View of the OMB Lyra CV Valve



G4500 Bus Fill Port, Manual Gauge & ¼ Turn Valve



Note this view has ¼ turn in the off position



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Step 4:

At this point start vehicle and allow the engine to run until it stalls, will deplete all fuel in the system all the way back to the aft ¼ turn valve. Now repeat this step to insure as much CNG is used as possible.

Note: engine may crank over for an extended period of time but not start as it has not enough fuel to run, you are now done clearing the fuel system and need to perform verification of fuel depletion.

Step 5:

Fuel deletion verification

At this time you need to turn off the forward ¼ turn valve located just back of the CNG coalescing filter assembly. Turn valve off so that it is not parallel with the fuel line. Now using an adjustable or suitable size wrench firmly hold the two flats on the filter housing, insert proper size Allen wrench or Allen driver socket (1/4 inch should be correct size) into the drain plug and slowly remove the plug, there may be a very short low pressure release of trapped CNG gas that should not be longer than 2 seconds.



Step 6:

With drain plug removed from filter housing slowly rotate the red primary ¼ turn valve to the open position shown above. Carefully listen for CNG purge, there may be a 1 to 2 second purge of residual gases and then flow should stop. If there is no further CNG flow you have now evacuated the system for line and or filter repairs/maintenance.



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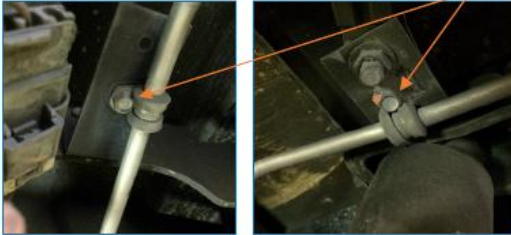


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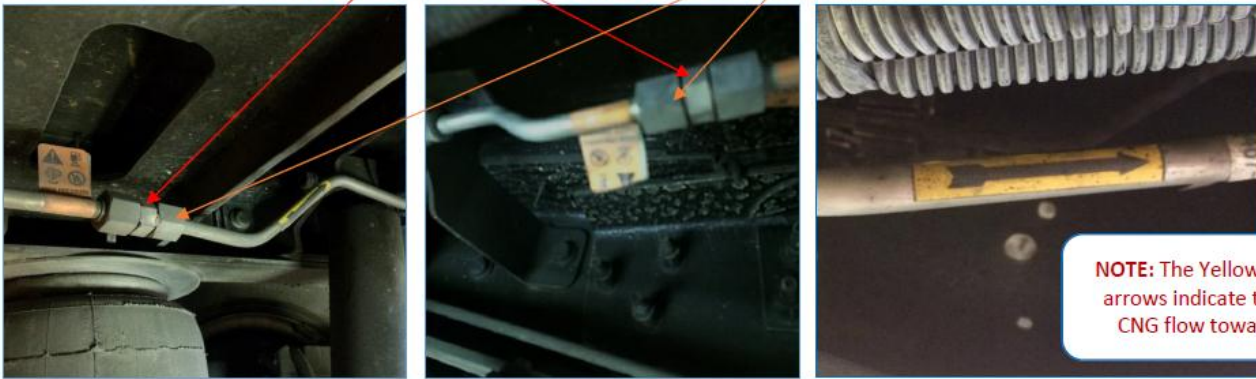
Step 7:

Over axle line removal

- a) Remove both insulated p-clip line bracket screws



- b) Using the two wrenches grab the center section of the line extension and the nut that holds the line on. Break loose the nut and by hand back nuts off completely, do not force any bending of the line it will be loose enough to be removed when both the front and back section nuts have been backed off. Repeat last procedure for the other end and then gently remove the CNG feed line



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Step 8:

Cover both exposed ends of the CNG line that are open but still in the vehicle to avoid any contamination from entering the system. The smallest amount of dirt, oil, water and or slag can damage the filter and or the HPR (High Pressure Regulator)

Step 9:

Over axle line install

After the repairs to the frame are complete remove line covers and wipe clean with paper towel.

Using instructions on **step 7**:

Reverse procedure installing the CNG line using **new #6 SAE** O-rings and torque to **35 ft-lbs.**

Install insulated p-clips and torque to **89 in-lbs. (10 Nm)**

O-rings should always be installed with Parker O-ring lube or petroleum jelly (Vaseline) (**Do not use oil**)

NOTE: make sure O-ring is fully seated in tube groove as not to be pinched (Torque line nuts **31-35 ft-lbs.**)



Notice how the O-ring is pushing towards the out edge of groove, do not use O-ring that is collapsed towards the inner edge of the O-ring groove



Notice how O-ring just protrudes above the face of the union, this should be uniform around the entire circumference of the union



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Step 10:

Install new O-ring on filter drain plug using a #8 SAE O-ring & torque to **62 lb in** (7 n-m)



With O-ring removed



With O-ring installed

Step 11:

Pressurization and leak checks

- Using Gaseous fuel liquid leak detector soak or locations, with primary $\frac{1}{4}$ turn valve in the on position not turn the Aft (rear) $\frac{1}{4}$ turn valve to the on position
- Now open both tank valves slowly as not to activate the internal high volume flow valves, make sure all tanks are completely open
- Without cranking the engine** turn key to the run position and leave it there for 15 seconds, turn key to the **off** position for 10 seconds and then again back to the run position for 15 second (**NEVER ATTEMPT TO START THE VEHICLE DURING LEAK CHECKS PROCESSES**)
- Now check for gaseous fuel leaks using leak detection fluid again, if any are found start at back at Step 2: follow all steps and repair the root cause**
- If no leaks are found close all access doors so engine will start, start and run engine driving the vehicle at least 10 miles and recheck for leaks, if no leaks are found you are done



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IMPCO Automotive Specific Service Procedure

Part References:

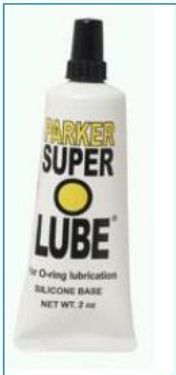
Quantity: 2 - Parker SAE-6 Face Seal CNG O-ring (See Chart below for all the O-ring part numbers)

Quantity: 1 - Parker Super O-ring Lube (OLUBE 884 or Vaseline/Petroleum Jelly can be used in place of the Parker Lube)

Quantity: 1 - Parker SAE-8 Filter Drain Plug O-ring (See Chart below for all the O-ring part numbers)

TABLE II = (O-RING REPLACEMENT CROSS REFERANCE CHART) " WHERE USED "

IMPCO COMPONENT S PART NO.	COMPONENT DESCRIPTION	SUPPLIER FITTING PART NUMBER	IMPCO O-RING REPLACE PART NUMBER
PPM02065	RECEPTACLE - FUEL FILL NON-LOCK ORFS	WEH TECHNOLOGIES INC.: C1-112771	FRONT : PPM01890-001 REAR : S3-55188-009
PPM01722	MALE -6 SAE PLUG	SSP - AFV: 6GP-CNG PARKER: 6 HP5ONSS	S3-55188-003
PPM01724	MALE -5 SAE PLUG	SSP - AFV: 5GP-CNG PARKER: 5 HP5ONSS	S3-55188-002
PPM01725	TEE UNION, SOFT SEAL SAE -6	SSP - AFV: S6T-CNG PARKER: 6 JLO-SS	S3-55188-007
PPM01809	FITTING SAE -6 x 3/8" ORFS MAL	SSP - AFV: S6GC-CNG PARKER: 6 FL5OLO-SS	S3-55188-007 S3-55188-003
PPM01820	TEE SWIVEL NUT SAE -6	SSP - AFV: S6SRT - CNG	S3-55188-007
PPM01936	FITTING - MALE UNION -6 ORFS	SSP - AFV: S6U - CNG PARKER: 6 HLO-SS N0756	S3-55188-007
PPM01984	FITTING - MALE STR SAE -6 -4 ORFS	SSP - AFV: S6-4GC - CNG PARKER: 6 4 F5OLO-SS	S3-55188-007 S3-55188-001
PPM02029	TEE - UNION -8 ORFS 316SS	SSP - AFV: S8T - CNG	S3-55188-008
PPM02098	ADAPTER - 1/2 TUBE x 9/16 - 18	PARKER: 8-6 F5OLO-SS	S3-55188-003 S3-55188-008
A4-54456-001	ADPTR -6 COMP TO -6 SAE NO NUT	SSP - AFV: ISS-6MCST6-CNG	S3-55188-003
A4-54457-001	ADPTR - COMP TO -5 SAE NO NUT	SSP - AFV: ISS-6MCST5-CNG	S3-55188-002
F4-54347-6	FITTING STR THD -AN RUN TEE	PARKER: 6R5OX-SS-N0756	S3-55188-003
PPM02010	VALVE 1/4 TURN 3/8" ORFS	SSP - AFV: 5-325-K-316-CNG	S3-55188-007
PPM01927	HOSE - 3/8" FUEL FILL/VENT (FLEX LINE)	TITFLEX: 117630-0200	S3-55188-007
PPM01842	ONE - WAY REDUNDENT CKECK VALVE	SSP - AFV: CH8SSS6-1-316-CNG	S3-55188-007



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