



- DATE:** 5/10/2023
- APPLIES TO:** This service bulletin applies to certain 2022 model year, Metro Star model Emergency Response chassis cabs built between January and April 2022.
- CONDITION:** Changes based on new product testing to improve steering geometry and reliability.
- CORRECTION:** Replace steering assist cylinder bracket, officer side steering arm, assist cylinder steering hose, and install frame rail reinforcement.
- LABOR ALLOCATION:** 14 hours
- CLASSIFICATION:** V3
- PARTS NEEDED:**

### Steering Upgrade Parts

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	0346-BB1-001	Zerk ¼ -28 SAE Grease Fitting
1	06W-06JA06JB108	Hose Asm 06-387TC/ST90/108"
1	079685-003	Steer Arm, Right Hand
2	125X350CP	Cotter Pin – 1/8 X3.50
2	22962-051	1" Flat Washer
2	30550-027	1" – 14 UNF X 3 ½" Hex Bolt
1	3161-KK1-001	BRKT, Assist Cyl MTG
3	10180200FH8Y	Bolt- 5/8 – 18 X 2.00LG FLG GR8 YEL
1	10180250FH8Y	Bolt- 5/8 – 18 X 2.50LG FLG GR8 YEL
4	1018FLN8Y	Nut – 5/8-18 FLG LK GR8 YEL

*Reference Kit: S-3779-001*

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### Frame Reinforcement Parts

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	7386-CC1-002	Reinf. Frame, L9, RH
1	08130175FH8ZF	Bolt Hex FLG ½-13 x1.75 Grade 8 ZN
8	08130200FH8ZF	Bolt Hex FLG ½ -13 X 2.00 Grade 8 ZN
1	08130225FH8ZF	Bolt Hex FLG ½ -13 X 2.00 Grade 8 ZN
10	0813FLN8ZF	Nut FLG Lock ½-13 Grade G ZN
3	10110200FH8ZF	Bolt Hex FLG 5/8-11 X 2.00 Grade 8 ZN
4	10110275FH8Y	Bolt 5/8-11 X 2.75 LG Flg GR8 Yel
4	1011FLN8Y	Nut 5/8-11 FLG LK GR8 Yel
3	1011FLN8ZF	Nut FLG Lock 5/8-11 Grade G ZN

*Reference Kit: S-3768-003*

### 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 Fire, LLC. Customer & Product Support Group.

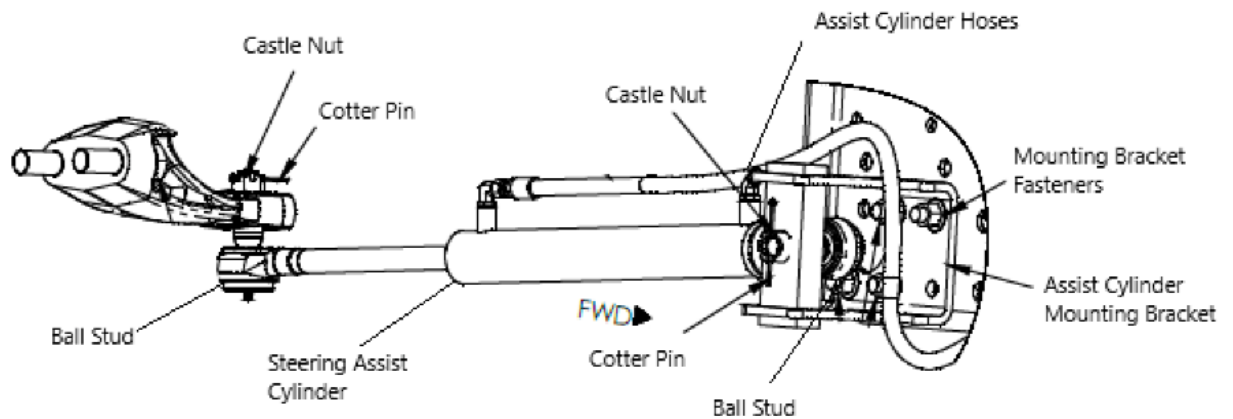
All applicable industry safety standards must be followed when performing work identified in this procedure.

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## STEP-BY-STEP INSTRUCTIONS

- 1) Remove steering assist cylinder and mounting bracket.
  - a. Remove assist cylinder hydraulic hoses. Label hose ends for proper reinstallation.
  - b. Remove cotter pins from each assist cylinder stud.
  - c. Loosen the castle nuts 4-5 turns.
  - d. Use appropriate puller tool to unseat the ball stud from the mount.
  - e. Once loosened from the mount, completely remove the castle nuts.
  - f. Remove the assist cylinder.
  - g. Remove the steering assist cylinder mounting bracket fasteners.
  - h. Discard steering assist cylinder mounting bracket.

*(See Figure 3.1)*

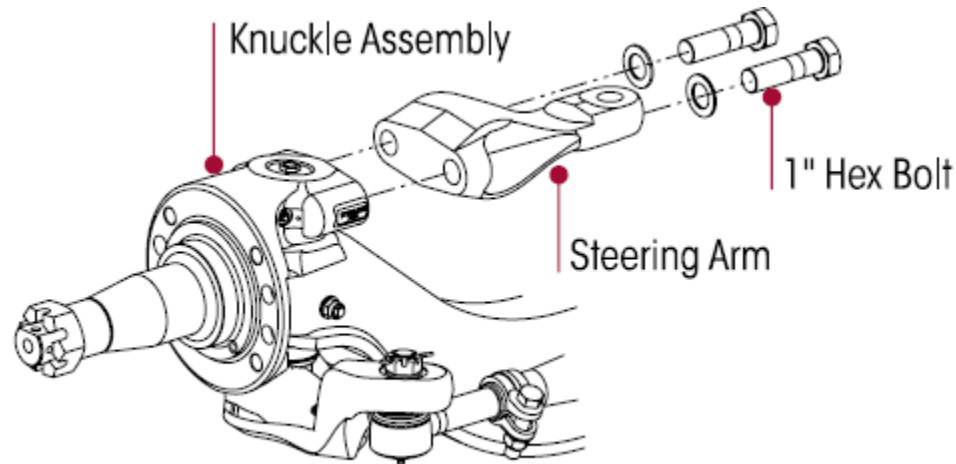


**Figure 3.1**

- 2) Disassemble Steering Arm
  - a. Remove the two steering arm to knuckle hex bolts that hold the steering arm to the knuckle.
  - b. Remove the steering arm from the knuckle. Gently tap the outside of the steering arm with a leather or plastic mallet if steering arm does not separate by hand.

*(See Figure 4.1)*

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**Figure 4.1**

### 3) Reassemble Steering Arm

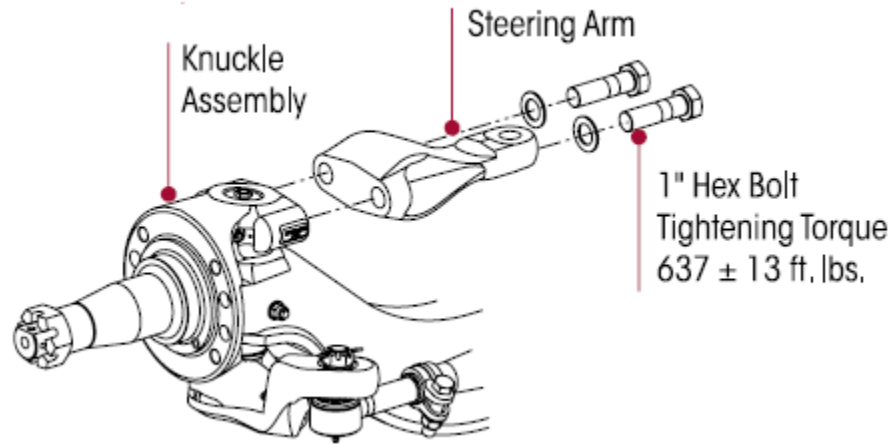
**⚠ WARNING**

TAKE CARE WHEN YOU USE LOCTITE ADHESIVE TO AVOID SERIOUS PERSONAL INJURY. READ THE MANUFACTURER'S INSTRUCTIONS BEFORE USING THIS PRODUCT. FOLLOW THE INSTRUCTIONS CAREFULLY TO PREVENT IRRITATION TO THE EYES AND SKIN. IF LOCTITE ADHESIVE MATERIAL GETS INTO YOU EYES, FOLLOW THE MANUFACTURER'S EMERGENCY PROCEDURES. HAVE YOUR EYES CHECKED BY A PHYSICIAN AS SOON AS POSSIBLE. |

- a. Use a tap to remove old thread-locker compound from the internal threads in the steering knuckle.
- b. Use new steering arm hex bolts (pn: 30550-027) and new washers (pn: 22962-051). Coat at least half of the thread area with Loctite 680 adhesive.
- c. Insert the hex bolts through the new steering arm. Hand start the bolts into the knuckle assembly.
- d. Tighten the steering arm hex bolts to  $637 \pm 13$  foot pounds torque.

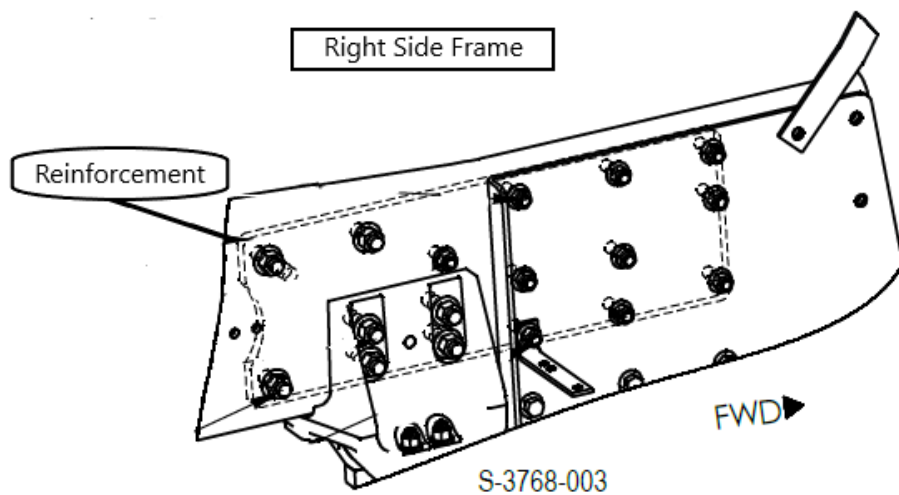
*(See Figure 5.1)*

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**Figure 5.1**

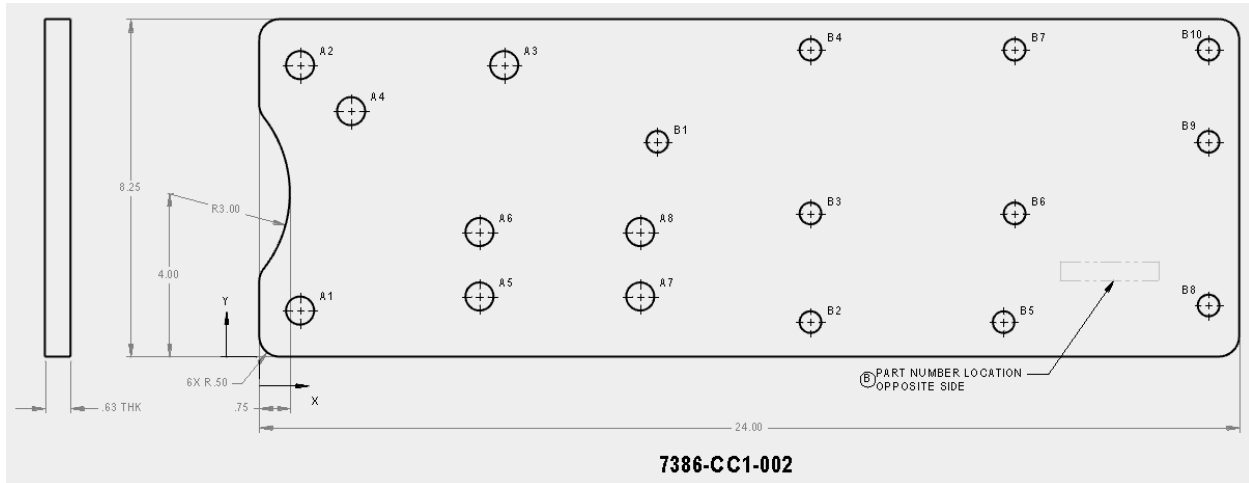
- 4) Install right side frame rail reinforcement.
  - a. Support front engine crossmember and splay rail.
  - b. Remove the fasteners shown in Figure 5.2 in preparation for the installation of the reinforcement.



**Figure 5.2**

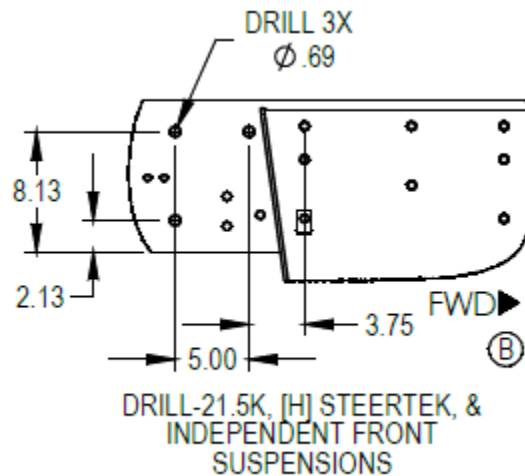
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- c. Verify reinforcement plate is correct part number (7386-CC1-002) before installation. (See part number location in Figure 6.1)



**Figure 6.1**

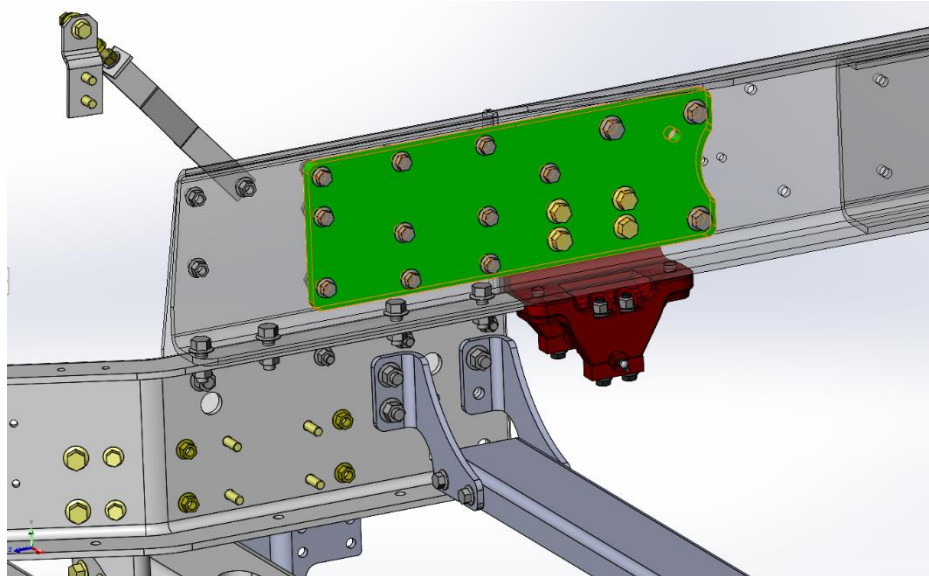
- d. Prepare frame rail for reinforcement by drilling three holes indicated in Figure 6.2



**Figure 6.2**

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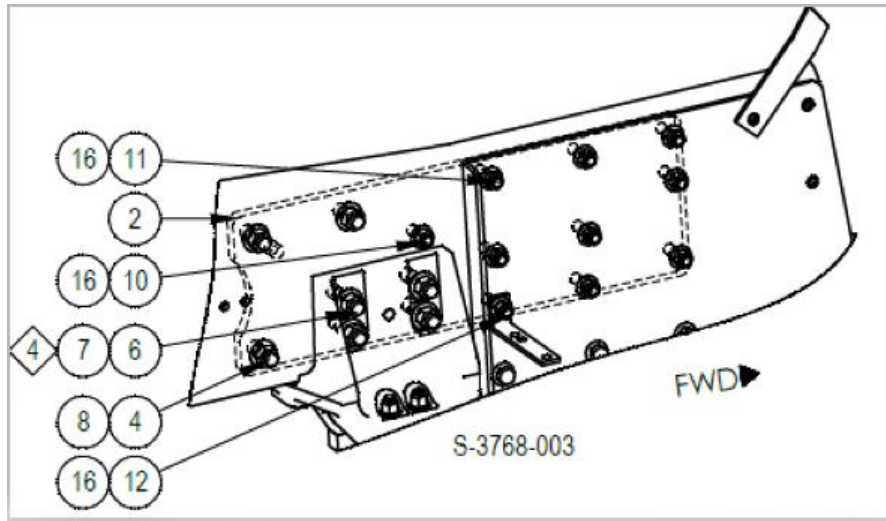
- e. Install reinforcement inside inner frame rail as shown in Figure 7.1



**Figure 7.1**

- f. Install fasteners with nuts on the outside of frame rail (*see Figure 7.2*) and torque nut side to torque spec listed in table 8.1.

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**Figure 7.2**

Item	Part Number	Description	S-3768-003 QTY	Torque Spec (Nut Side)
2	7386-CC1-002	Reinf, Frame, L9,RH,Steertek	1	
4	10110200FH8ZF	Bolt Hex FLG 5/8-11 X 2.00 Grade 8 ZN FLM	3	
6	10110275FH8Y	Bolt Hex FLG 5/8-11 X 2.75 Grade 8 ZN FLM	4	
7	1011FLN8Y	Nut- 5/8-11 FLG LK GR8 Yel	4	178 ft. lbs
8	1011FLN8ZF	Nut FLG Lock 5/8-11 Grade G ZN FLN	3	
10	08130175FH8ZF	Bolt Hex FLG 1/2-13 X 1.75 Grade 8 ZN FLN	1	
11	08130200FH8ZF	Bolt Hex FLG 1/2-13 X 2.00 Grade 8 ZN FLN	8	
12	08130225FH8ZF	Bolt Hex FLG 1/2-13 X 2.25 Grade 8 ZN FLN	1	
16	0813FLN8ZF	Nut FLG Lock 1/2-13 Grade G ZN FILM	10	75 ft. lbs

**Table 8.1**

5) Reinstall assist cylinder and new bracket. (See Figure 9.1)

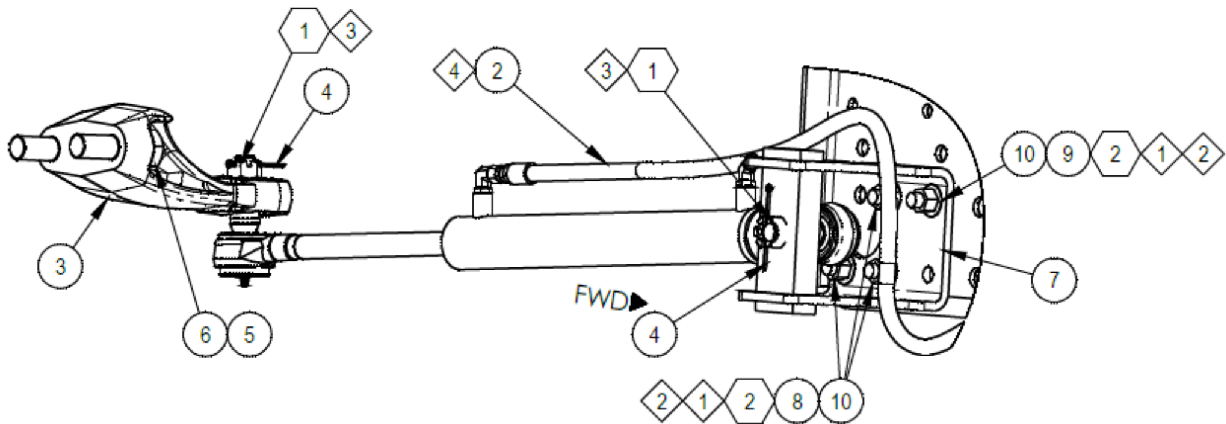
- a. Install new steering assist cylinder bracket part number 3161-KK1-001 (Item 7) using new bolts (item 8-9) and new nuts (item 10). Install bolts hand tight. Do not torque until after the steering assist cylinder is installed.

*Note: Bolt item 9 is longer and must be installed in the location noted in Figure 9.1.*

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- b. Install 90° grease zerk (0346-BB1-001) into frame mounted end of assist cylinder, oriented as shown in Figure 6.2. Reinstall steering assist cylinder ball studs into new mounting bracket and steering arm. Install castle nuts snug.
- c. Torque each castle nut to 145 ft lbs. If castle nut slot does not align with the cotter pin hole in the ball stud initially, tighten nut slightly to align the slot with the hole. **Do not loosen to align the slot to the hole.**
- d. Install cotter pins through castle nut and ball stud and bend cotter pins over.
- e. Torque the new 5/8" diameter bolts in new steering assist cylinder bracket to 201 ft lbs.

*See Figure 9.1 and Table 9.2*



**Figure 9.1**

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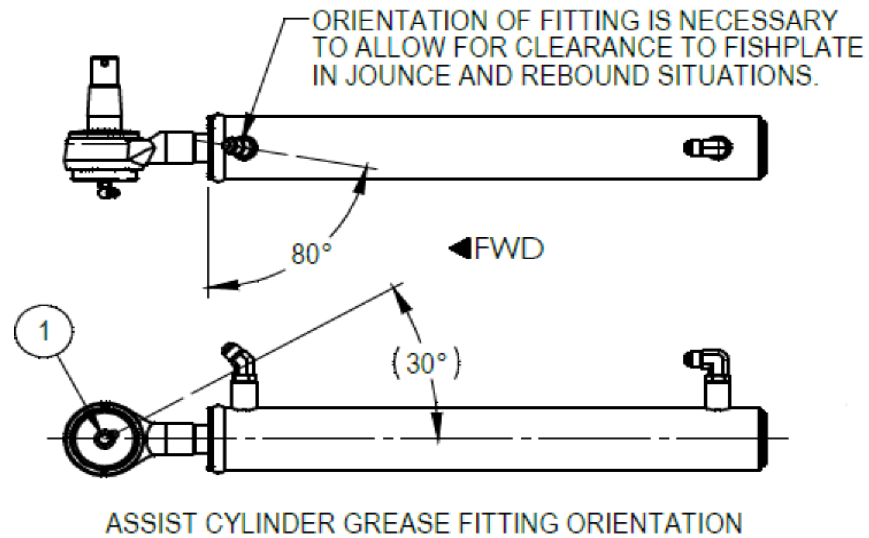


<p>1 DO NOT REUSE FASTENERS. THEY ARE TORQUED TO 90% PROOF.</p> <p>2 ASSIST CYLINDER NEEDS TO BE INSTALLED BEFORE BRACKET IS TORQUED.</p> <p>3 CONTINUE TIGHTENING, DO NOT BACK OFF, TO ALIGN THE NUT SLOT WITH THE COTTER HOLE TO PERMIT ASSEMBLY OF THE COTTER PIN.</p> <p>4 REFER TO SPARTAN P/N 0208-BB1 FOR ALL FITTING INSTALLATION SPECIFICATIONS.</p>				
1	TORQUE	RANGE (°C)	DRIVE SIDE	SUPPLIER
	145 LB-FT	120-170	NUT	Y
2	TORQUE	RANGE (°C)	DRIVE SIDE	SUPPLIER
	201 LB-FT	192-212	NUT	N
ITEM	PART NUMBER	DESCRIPTION	QTY	
1	0346-BB1-001	ZERK-1/4-28 SAE GREASE FITTING	1	
2	06W-06JA06JB108	HOSE ASM 06-387TC/ST90/108" (2125-MM5)	1	
3	079685-003	STEER ARM, RIGHT HAND (REF AXLE 1173-DD1-002)	1	
4	125X350CP	COTTER PIN-1/8 X 3.50	2	
5	22962-051	1" FLAT WASHER	2	
6	30550-027	1"-14 UNF X 3 1/2" HEX BOLT	2	
7	3161-KK1-001	BRKT,ASSIST CYL MTG	1	
8	10180200FH8Y	BOLT - 5/8-18 X 2.00LG FLG GR8 YEL	3	
9	10180250FH8Y	BOLT - 5/8-18 X 2.50LG FLG GR8 YEL	1	
10	1018FLN8Y	NUT - 5/8-18 FLG LK GR8 YEL	4	

**Table 9.2**

- f. Verify correct orientation of fittings on the assist cylinder before reconnecting hoses. See Figure 10.1

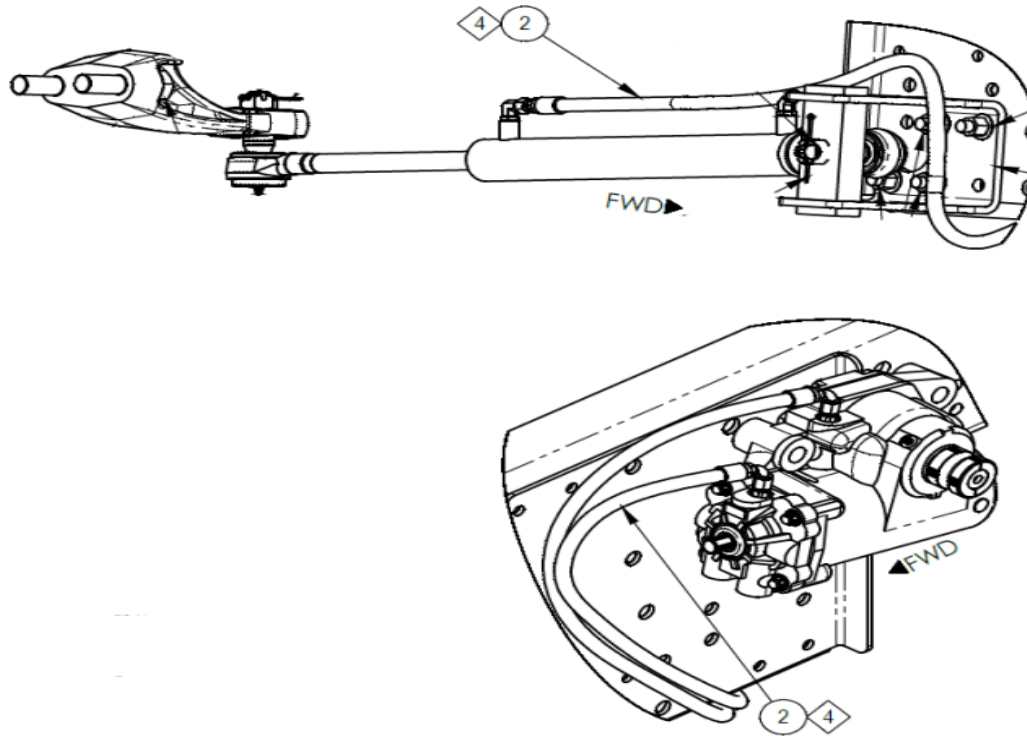
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**Figure 10.1**

- g. Reconnect hydraulic hoses to assist cylinder, noting proper port orientation per labels installed in step 1a. Replace hose plumbed to rear assist port with longer hose to improve routing (06W-06JA06JB108). Also, refer to *Figure 11.1* below for proper hose orientation.

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**Figure 11.1**

## 6) Finalize Repair

- a. Fill power steering reservoir to the full mark with power steering fluid
- b. Start the engine and cycle the steering completely from one side to the other several times to purge any air that may have entered the assist cylinder hoses.
- c. After 9-10 cycles, check power-steering level and top off to full mark.

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