PREVOST

Instruction Sheet IS-19040 NYCT

POWER STEERING PUMP DISCHARGE HOSE (PRESSURE) REPLACEMENT

Release 4 12-05-2019	Added in tool list: - Pair of low profile jack stands with operating handle - Cloth tape

NOTICE

Use this instruction sheet for the replacement of the following hoses:

DOB Bus Number Series 2400 – 2489: hose #161335P

DOB Bus Number Series 2490 - 2789: hose #161335P & #160039

Kit #160127 & #160122 are necessary at time of first installation as the new hose #160006 has a greater diameter than the former hose model installed, thus it is necessary to use new split block #504189.

BILL OF MATERIAL

Kit #160122 (DOB Bus Number Series 2400 – 2489) includes the following parts:

Part No.	Description	Qty
160006	HOSE, PRESSURE 11690 mm (460 inches), dia. 22 mm	1
1600100	FLANGE, POWER STEERING HOSE (wall mount split block half)	2
500107	SCREW, TC HEX Z050 1/4-20x2	3
501031	SEAL, JIC 37° #8	1
504189	CLAMP, SPLIT BLOCK 22 mm/19 mm PA GROUP 3,	13
504728	RETAINER PLATE T3	3
FI-19040	FEUILLE D'INSTRUCTION	1
IS-19040	INSTRUCTION SHEET	1

Kit #160127 **(**DOB Bus Number Series 2490 - 2789**)** includes the following parts:

Part No.	Description	Qty
160006	HOSE, PRESSURE 11690 mm (460 inches), dia. 22 mm	1
500107	SCREW, TC HEX Z050 1/4-20x2	3
501031	SEAL, JIC 37° #8	1
504189	CLAMP, SPLIT BLOCK 22 mm/19 mm PA GROUP 3,	13
504728	RETAINER PLATE T3	3
FI-19040	FEUILLE D'INSTRUCTION	1
IS-19040	INSTRUCTION SHEET	1

NOTE
Material can be obtained through regular channels.

OTHER MATERIAL

Description		
NYLON TIE, 3/16 x 13" or similar		QTY:2
#8 JIC 37° CAP		QTY:2
#8 JIC 37° PLUG		QTY:1
#8 JIC 37° MALE/MALE UNION, STRAIGHT		QTY:1
LOCTITE 262, RED		
TORQUE SEAL		
OIL DRAIN PAN		
CLOTH TAPE such as: Comp-o-stick by North American Tapes LLC or similar product Comp-o-stick tape Prevost P/N: 682481		As required
MOBIL DEXRON-VI ATF (AUTOMATIC TRANSMISSION FLUID)		As required

PREVOST

PERSONNAL PROTECTIVE EQUIPMENT

Wear your personal protective equipment, including but not limited to the followings:

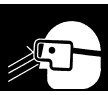
Safety shoes

Safety goggles

General purpose gloves

DANGER

Wear eye protection and remove rings, metal jewelry and watches with metal bands.



DANGER

Wear protective glasses when striking objects to avoid injury to your eyes. Chips or other debris can fly off objects that are struck. Make sure no one can be injured by flying debris before striking any objects.

PREVOST

LIST OF TOOLS/EQUIPMENT TO BE USED

RIGHT ANGLE DRILL 	**3/8-INCH MAGNETIC HEX HEAD DRIVER** 
CUTTING PLIERS 	**RATCHET AND SOCKET SET – METRIC/SAE** 
LARGE FLAT SCREW DRIVER 	**TORQUE WRENCH** 
OPEN END WRENCH SET 13/16, 7/8 	**7/8" TORQUE WRENCH CROWFOOT ADAPTER** 
PHILLIPS BIT 	**COLORED ELECTRICAL TAPE** 
PAIR of **LOW PROFILE JACK STANDS** with **POSITIONING HANDLE** 	

PROCEDURE

DANGER

Park vehicle safely, apply parking brake, stop the engine. Prior to working on the vehicle, set the battery master switch (master cut-out) to the OFF position and trip the main circuit breakers equipped with a trip button.

Lock out & Tag out (LOTO) must be performed during set-up, maintenance or repair activities. Refer to your local procedure for detailed information regarding the control of hazardous energy.

1. Tilt the front bumper open to access the spare wheel compartment. To do so, unscrew the two bumper top retaining bolts bolts (2) and tilt down the bumper.

   ➢ 

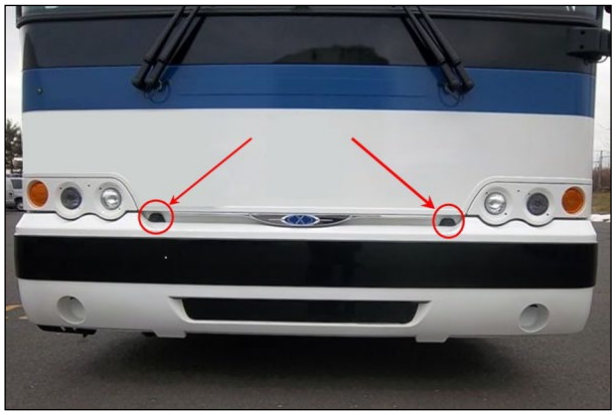


FIGURE 1: BUMPER TOP RETAINING BOLTS

2. Remove the security ties on the operating handles and then open three baggage compartment doors on curbside (see image).

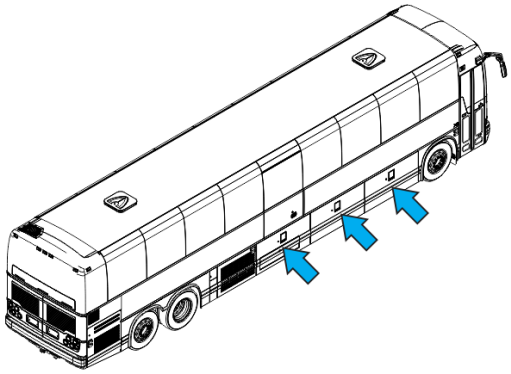


FIGURE 2

3. Open the front electrical & service compartment (see image).

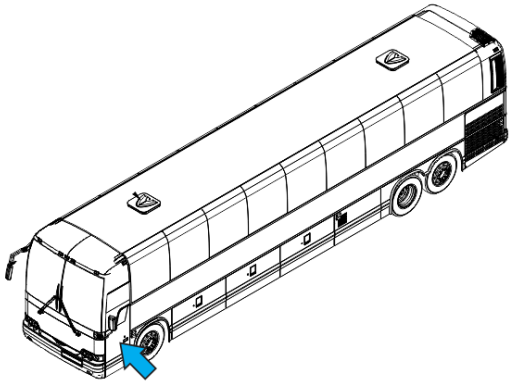


FIGURE 3: FRONT ELECTRICAL & SERVICE COMPARTMENT

4. To prevent skin burns, make sure that steering fluid has sufficiently cooled before starting the next steps.
5. Have a suitable container to collect the steering fluid under the steering gear.

6. **Identification the discharge hose** (pressure) on the vehicle.
    - In the spare wheel compartment, it is wrapped in a yellow sheath and is connected to the top of the steering box (fig.4).

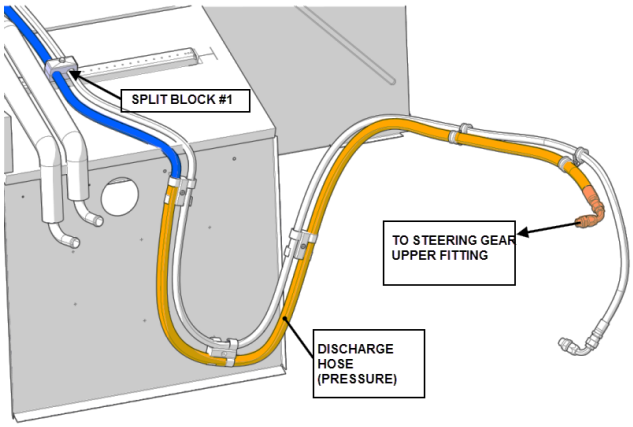


FIGURE 4

    - In the rear wheel well, it is located on curbside. It connects to a hard section (metal pipe) from the steering pump (fig. 5). Search above the rear R.H. side air spring of the drive axle

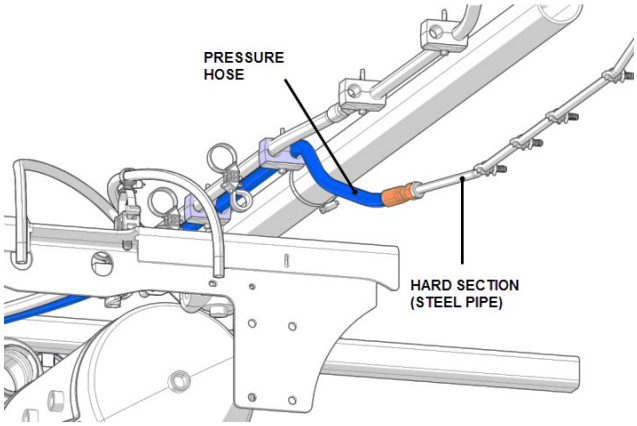


FIGURE 5

7. In the spare wheel compartment, separate the hose from the five (5) securing elements identified and remove the split block.

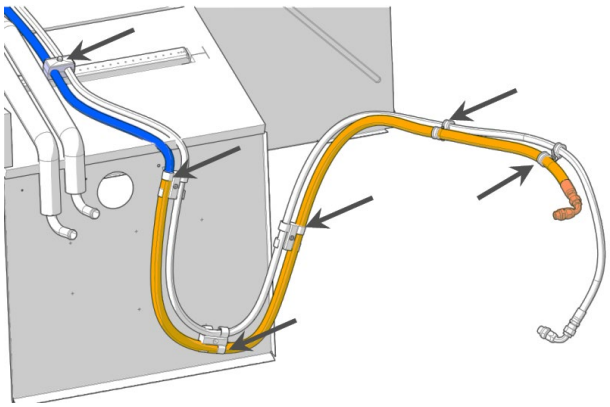


FIGURE 6 : TWO (2) P-CLAMPS, THREE (3) HOSE GUIDES, ONE (1) SPLIT BLOCK

8. While following the discharge hose from the spare wheel compartment and proceeding one after the other, remove and discard all thirteen (13) split blocks identified in figure 9. Save the hardware for reuse.

   TIP: The new split blocks will be installed at the same locations. Using colored electrical tape, you can mark each location to help you remind where to install the new ones.

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   Note that split blocks 11, 12 & 13 are located at the top of the rear wheel well.

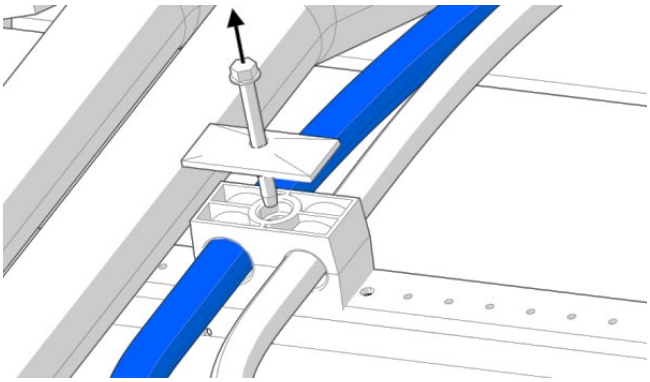

FIGURE 7 : SPLIT BLOCK #1 IN THE SPARE WHEEL COMPARTMENT

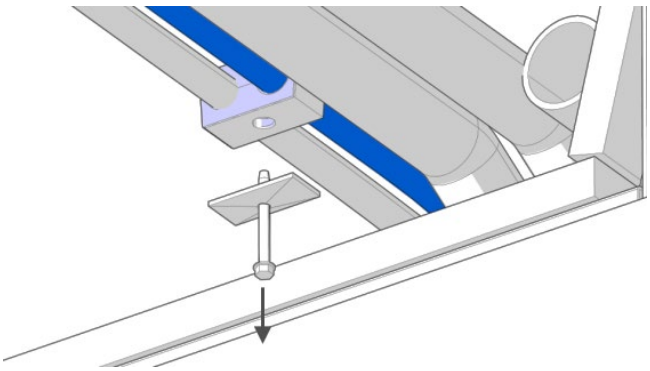

FIGURE 8 : OTHER TYPICAL SPLIT BLOCKS AT THE CEILING OF THE BAGGAGE COMPARTMENTS (9 LOCATIONS)

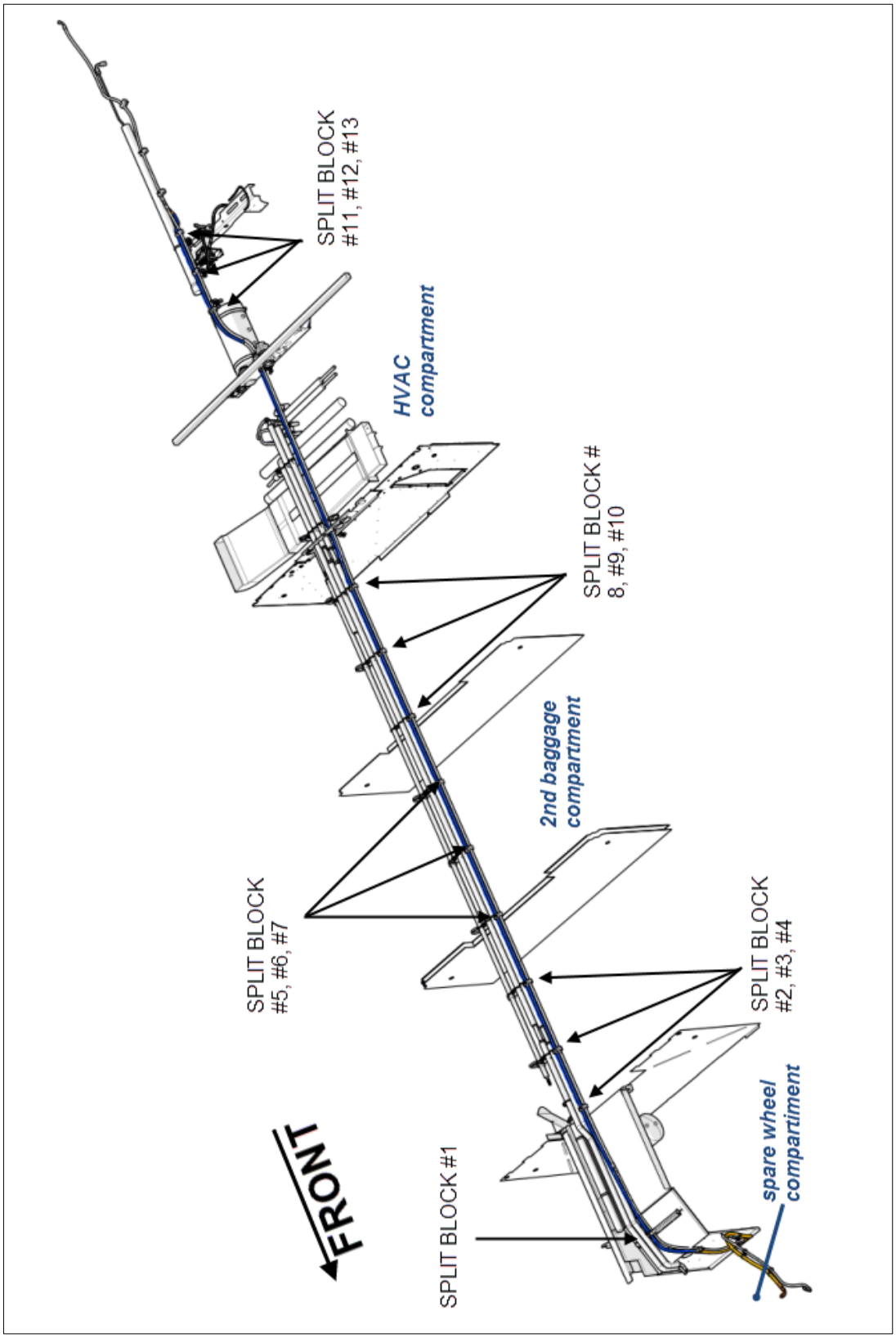

FIGURE 9a : POWER STEERING PUMP DISCHARGE HOSE (PRESSURE)

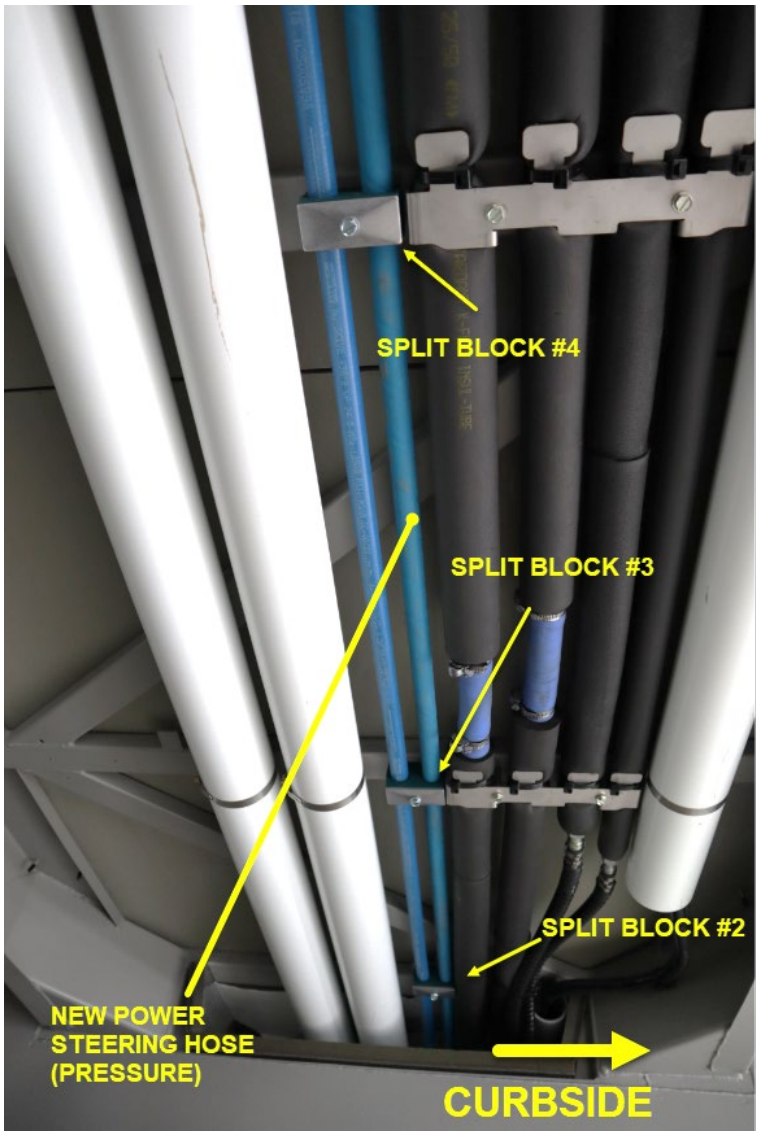
SPLIT BLOCK #4
SPLIT BLOCK #3
SPLIT BLOCK #2
NEW POWER
STEERING HOSE
(PRESSURE)
CURBSIDE

FIGURE 9b

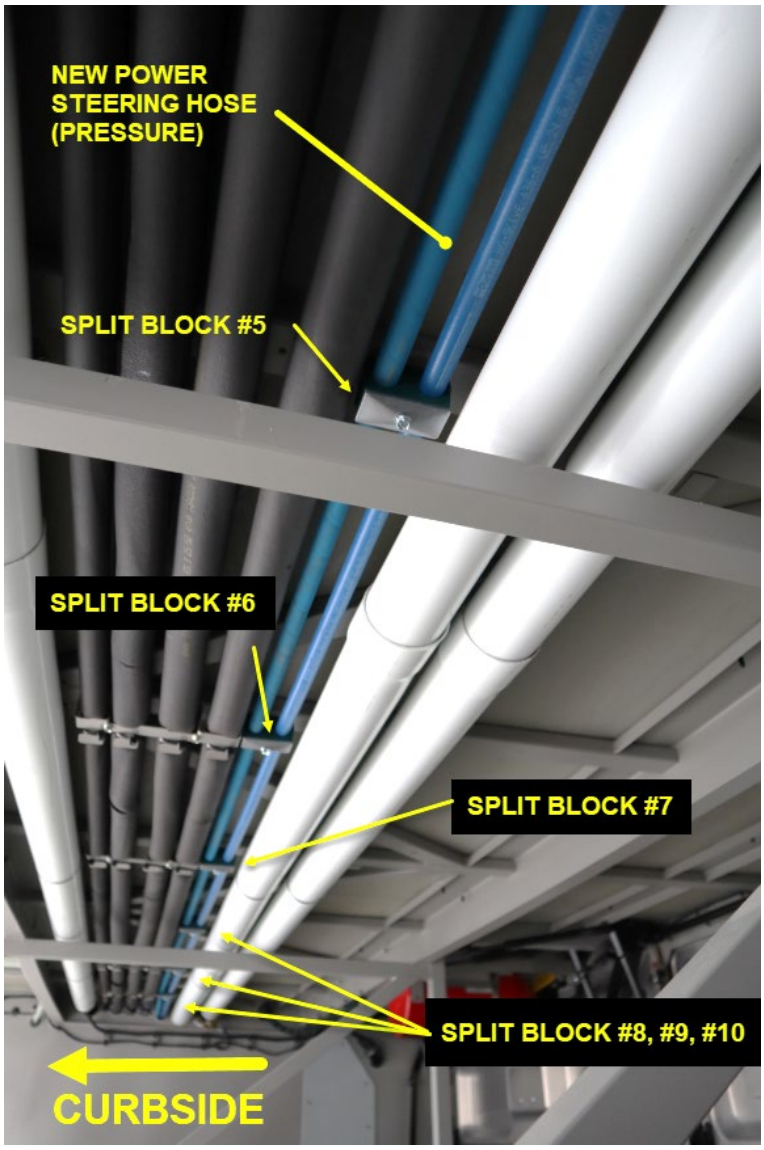
NEW POWER
STEERING HOSE
(PRESSURE)
SPLIT BLOCK #5
SPLIT BLOCK #6
SPLIT BLOCK #7
SPLIT BLOCK #8, #9, #10
CURBSIDE

FIGURE 9c

9. In the front service compartment, place a container under the steering gear to collect the steering fluid that may drip.

FIGURE 10

10. Locate the straight fitting of the discharge hose (pressure) at the top of the steering gear.

11. Disconnect the discharge hose (pressure) straight fitting while holding the elbow fitting.

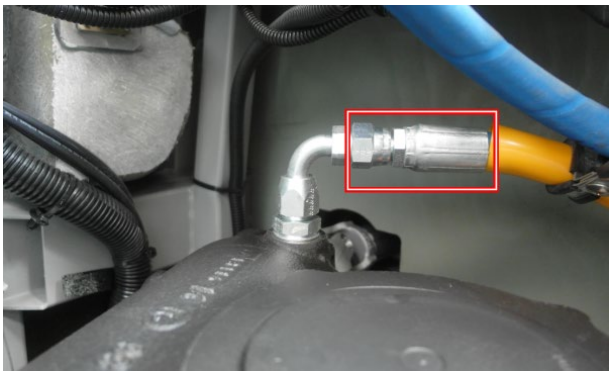

FIGURE 11

- 13/16
- 7/8

12. Drain the fluid dripping from the hose in the container.

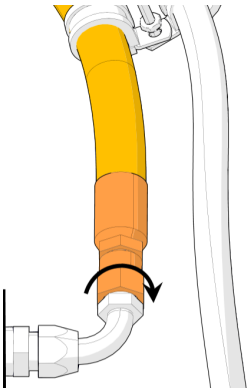

FIGURE 12

13. Place a #8 JIC 37° cap on the steering gear elbow fitting in order to avoid intrusion of dirt.

- 7/8

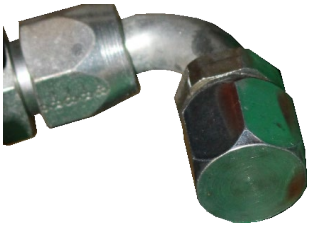

FIGURE 13

14. Place a #8 JIC 37° plug into the discharge hose at the steering box to keep any residual fluid in the hose from dripping in the service compartment or on maintainer while removing the old hose.

FIGURE 14

➢ 13/16

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15. Lift the vehicle in order to gain access to the rear wheel well. Always use safety stands when working under the vehicle. Refer to Maintenance Instruction *MI14-01B Hoisting and Towing Procedure for NYCT X3-45 Commuter Buses* for further details on lifting procedures and safe lifting practices.
16. Locate the discharge hose (pressure) on curbside of the rear wheel well. It connects to a hard section (steel pipe) which is from the steering pump (fig.15).

Unscrew the fitting while holding the hard section (steel pipe) with a wrench.

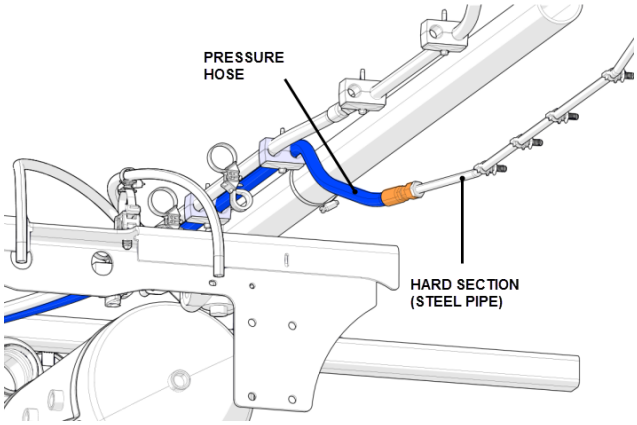

FIGURE 15

➢ 13/16

➢ 7/8

17. Collect any fluid dripping. Cap the hard section (steel pipe) from the power steering pump using one #8 JIC 37° cap.

➢ 7/8

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18. In the rear wheel well, join the old and new hose together with a male-male JIC 37 ° #8 union fitting. This will help guide the new hose in place while removing the old hose.

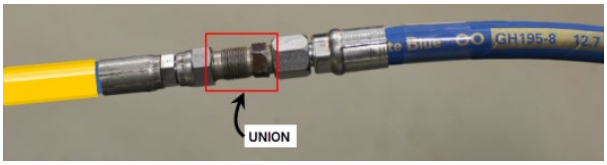

FIGURE 16

19. In the rear wheel well, cut the nylon tie located around the rubber boot (cuff-end bellows) where the power steering hose passes through the bulkhead between the wheel well and the HVAC compartment.

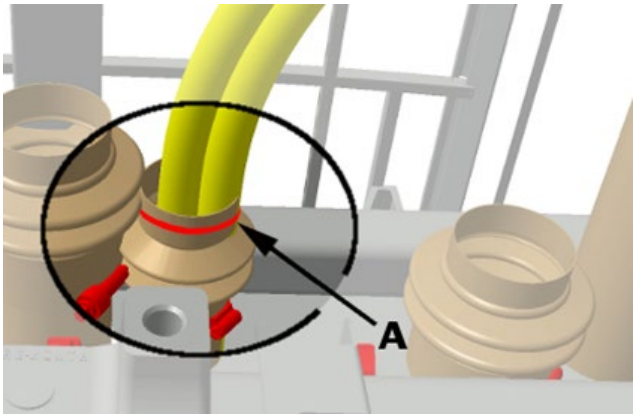

FIGURE 17 : CUFF-END BELLOWS AND NYLON TIE (item A)

20. Begin to remove the old hose by pulling from the spare wheel compartment while a colleague helps feed the new hose at the rear wheel well.

21. Help the colleague in guiding the new hose in the baggage compartments, while he continues to remove the old hose.

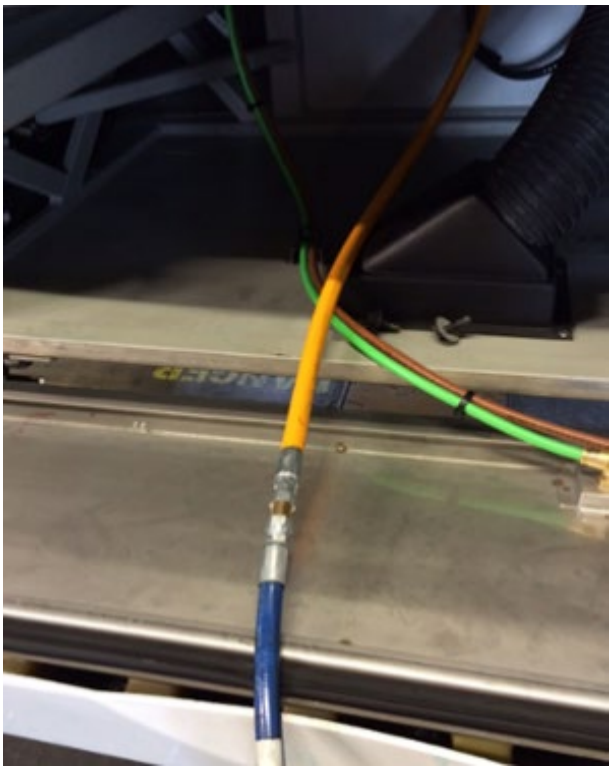

FIGURE 18

CONNECTION TO THE HARD SECTION

22. Inspect the sealing surfaces. Clean and dry the fitting.

23. Place seal #501031 on the fitting of the rigid section.

24. Apply red Loctite on the JIC 37° fitting threads only. Take care not to put Loctite on the conical part (flare) of the fitting or inside the hose.

25. Tighten the fitting by hand, then with a **7/8 crowfoot** and 13/16 open wrench, tighten the fitting.

    - 13/16
    - Torque wrench & 7/8 crowfoot
    - Torque: 57 lbf-ft

26. Add a **torque seal** mark across the fitting once properly tighten.

27. In the rear wheel well, add a nylon tie around the rubber boot (cuff-end bellows) where the power steering hose passes through the bulkhead.

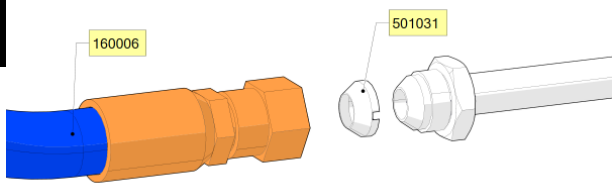

FIGURE 19

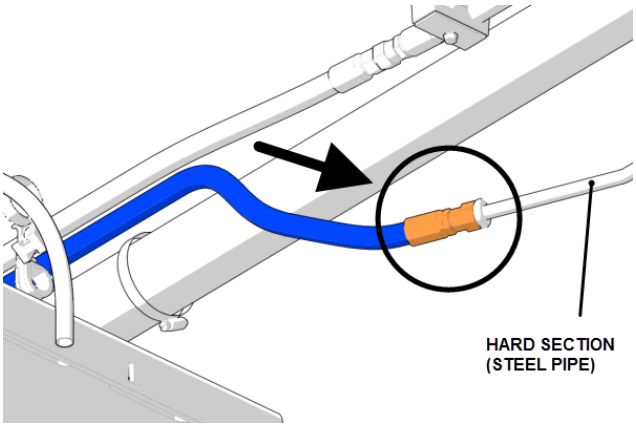

FIGURE 20

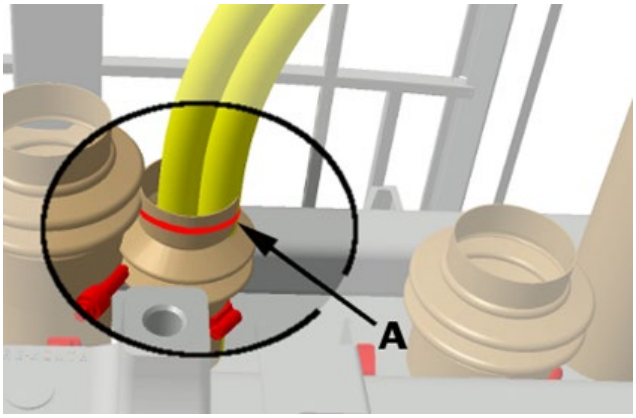

FIGURE 21 : CUFF-END BELLOWS AND NYLON TIE (item A)

CONNECTION TO THE STEERING GEAR

28. Inspect the sealing surfaces. Clean and dry the fitting.

29. Apply red Loctite on the JIC 37° fitting threads only. Take care not to put Loctite on the conical part (flare) of the fitting or inside the hose.

30. Tighten the fitting by hand, then with a **7/8 crowfoot** and 13/16 open wrench, tighten the fitting.

    -  13/16
    - Torque wrench & 7/8 crowfoot
    - Torque: 57 lbf-ft

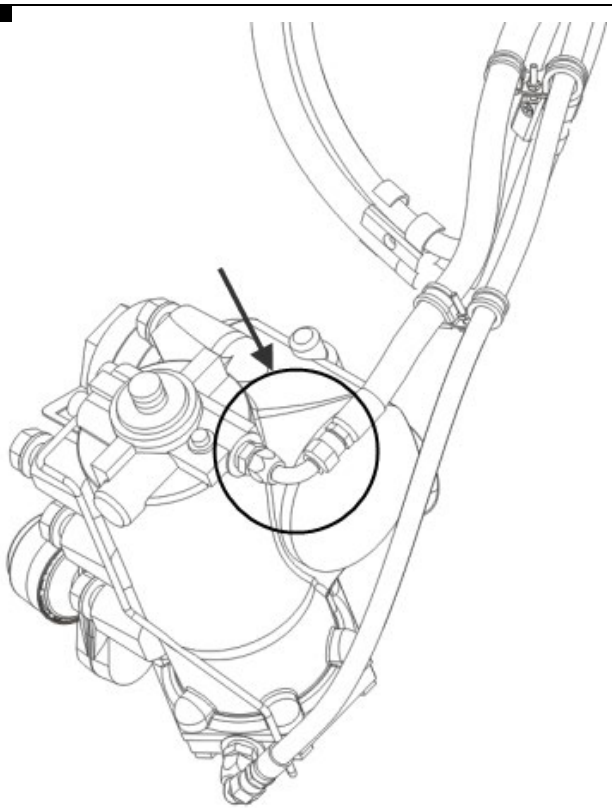

FIGURE 22

31. Add a **torque seal** mark across the fitting once properly tighten.

32. From the spare wheel compartment, pull on the hose to stretch and move 'slack' into this compartment.

33. Install the new thirteen (13) split blocks #504189 (figure 1 & 15). **Place the new split blocks at the same locations than the ones you have removed earlier in this procedure.**

    Reuse the retainer plates and existing screws **except** for the split blocks located in the rear wheel well as the existing hardware is very likely to be corroded. For these split blocks, use the hardware included with the kit.

Note: make sure that the new pressure hose is placed in the 22 mm (7/8") diameter bore. The new hose must be placed the closest to the vehicle side, i.e. curbside.

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- Torque: 8 lbf-ft (11 Nm)
- Apply torque seal mark

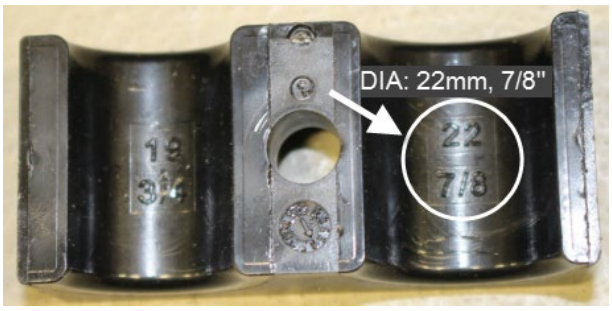


FIGURE 23

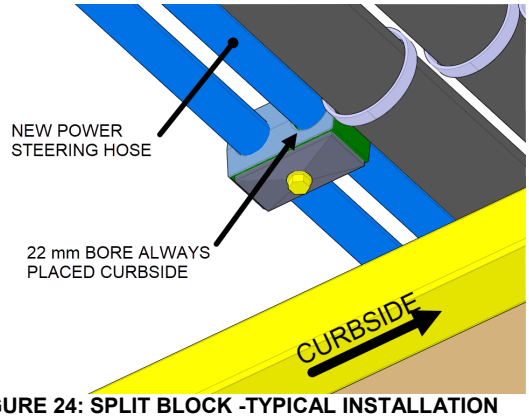


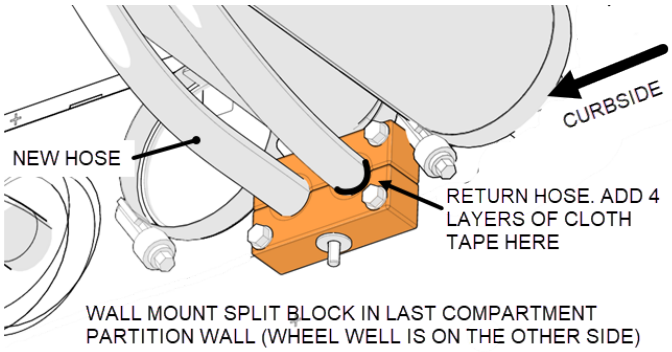
FIGURE 24: SPLIT BLOCK -TYPICAL INSTALLATION

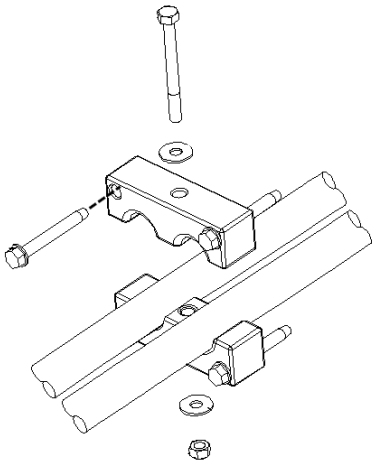
NOTICE - APPLICABLE TO DOB BUS NUMBER 2400 TO 2489

WALL MOUNT SPLIT BLOCK - 2x p/n #1600100

One (1) split block designed to be mounted on a partition wall is installed on the vehicle. Replace with the wall mount split block included in the kit and fasten using existing hardware.

Take note that the new **wall mount split block** has two 22 mm bores. The power steering pump **return** hose has a diameter of 19 mm. You need to add about four layers of cloth tape (such as industrial cloth tape by *North American Tapes LLC or similar product*) around the return hose to make sure it is properly clamped in this split block.





WALL MOUNT SPLIT BLOCK

- 

- Torque: 8 lbf-ft (11 Nm)
- Apply torque seal mark

34. In the spare wheel compartment, secure the discharge hose (pressure) as previously arranged.

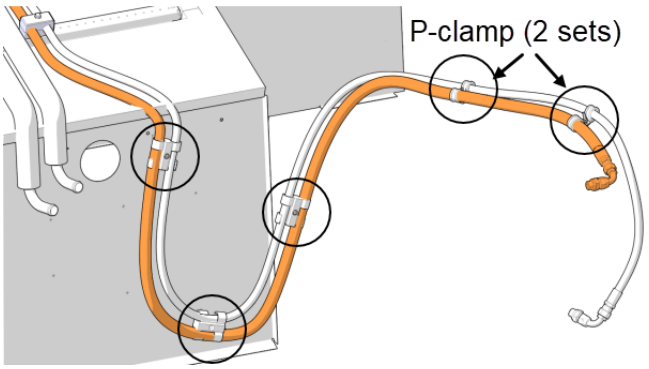


FIGURE 25 : TWO (2) P-CLAMPS, THREE (3) HOSE GUIDES

FLUID FILLING AND BLEEDING

35. In the engine compartment, on engine curbside, remove the tank cover and place the nut on the spring to maintain normal pressure on the filter in the tank.

36. Fill the tank with Mobil Dexron-VI ATF fluid up to 2 inches from the top of the tank (only to prevent spills).

37. Start the engine and have it run at idling speed to fill the steering system with fluid. During this operation, the fluid level in the tank will drop. Therefore, to avoid any suction of air, the fluid tank has to be topped up constantly.

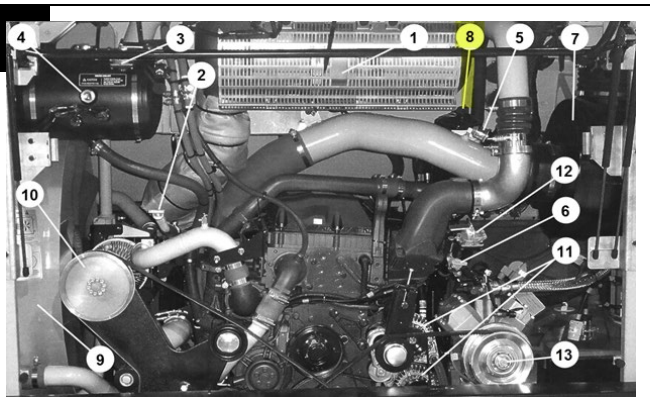


FIGURE 26: POWER STEERING FLUID TANK, ITEM 8 ON PICTURE ABOVE

FIGURE 27: POWER STEERING FLUID TANK

BLEEDING

38. FOR STEERING GEAR VERSIONS WITH AUTOMATIC BLEEDING …

Steering gear versions with automatic bleeding do not have any bleed screws. These steering gears automatically bleed any air remaining within the steering system. Proceed as follows :

a) Lift the front of the vehicle from **under the axle** so that the wheels are not on the ground and can be turned with the steering wheel.

Use a pair of low profile jack stands to support the front axle beam.

Always place safety stands when working under the vehicle. Refer to Maintenance Instruction *MI14-01B Hoisting and Towing Procedure for NYCT X3-45 Commuter Buses* for further details on lifting procedures and safe lifting practices.

b) Start the engine and have it run at idling speed for 2-3 minutes. Ask a colleague to turn the wheel from one knuckle stop to the other until the effort needed is constant, so the air will be evacuated by the steering fluid reservoir. Monitor the fluid level in the tank.

c) After bleeding, fill the tank up to 1" from the top of the tank. Check the fluid level with the dipstick.

DANGER

DO NOT work near the fan with the engine running. The engine fan can engage at any time without warning. Anyone near the fan when it turns on could be seriously injured.

WARNING

Never attempt adjustments while the engine is running unless otherwise specified for the service procedure. To help prevent an accident caused by moving parts, work carefully around them. Guards, covers and shields should be in place whenever maintenance is not being performed. Keep objects away from moving fan blades. They will throw or cut any object or tool that falls or is pushed into them.

39. STEERING GEAR WITH BLEEDER/BLEEDER SCREW

Refer to paragraph **5.4.3 Bleeding** of RB Robert Bosch Servocom Service Manual (8090) available on the Technical Publications site.

https://techpub.prevostcar.com/en/download?id=352&type=publications

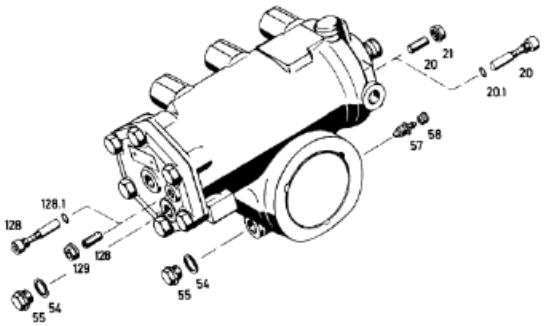


FIGURE 28 : BLEEDER (item 57) & BLEED SCREWS

40. Inspect the connections to make sure that there are no leaks at the fittings.
41. Close all compartment doors and reinstall cable locks.
42. Close the front service compartment door.
43. Close the front bumper. Tighten the two bumper top retaining bolts. Apply torque seal marks.
    - 19 mm
    - Torque: 47 lbf-ft
    - Torque seal

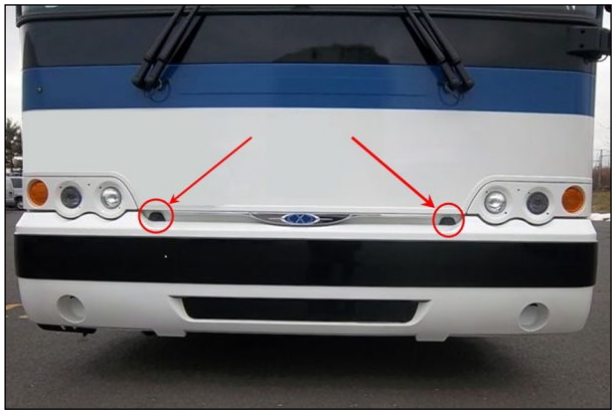


FIGURE 29: BUMPER TOP RETAINING BOLTS

44. Check the good operation of the system by performing a test drive.

PARTS / WASTE DISPOSAL

Discard waste according to applicable environmental regulations (Municipal/State[Prov.]/ Federal)