

# **SERVICE MANUAL**

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## **SERVICE MANUAL SECTION**

### **PRE-DELIVERY/QUALITY INSPECTION INSTRUCTION MANUAL FOR FBC/BUS/STRIPPED CHASSIS**

**Model: 1000**

**Model: 3000**

**S10004**

**04/17/2006**



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## DESCRIPTION

### FORM CTS-1199

**IMPORTANT** – Use these instructions when inspecting the 1000 and 3000 Series vehicles.

These instructions explain how to inspect the vehicle to be sure it is ready for delivery to the customer. The following steps correspond to the items on the report.

## 1. INSPECTION

### 1.1. INITIAL INSPECTION

**NOTE** – Complete this initial inspection before driving the vehicle to the PDI area.

#### Verify or Inspect:

1. *Air/hydraulic brake pressure indicator lights and/or warning buzzer operation.*

Hydraulic Brake Pressure Warning Light and Buzzer

- A. With the key switch in OFF position; the light must be off.
- B. Turn the key switch to ON position (engine off); the light and buzzer should be on until the engine is started.
- C. Start the engine and let it run; the light and buzzer must be off.

Air Brake Low Air Pressure Warning Light and Buzzer. Turn key switch to ON.

- A. The light and buzzer must be on when the brake system air pressure is below  $70 \pm 6$  psi (483  $\pm 41$  kPa).
- B. The light and buzzer must go off once the air pressure in both systems reaches  $70 \pm 6$  psi (483  $\pm 41$  kPa).

2. *Hydraulic brake back-up motor and indicator light operation.*

- A. With the key switch in OFF position, the motor will operate when the brake pedal is pressed.
- B. Turn the key switch to ON position (engine off, pedal released); the motor will operate continuously.
- C. Start the engine and let it run; the motor must be off.

3. *Park brake light operation.*

#### Hydraulic Brakes Only

- A. With the park brake engaged and the key switch in OFF or ACC position, the light must be off. Turn the key switch to ON; the light must go on.
- B. Start the engine. The light will remain on if the parking brake is applied (it will illuminate during engine cranking, then go off once engine starts if the parking brake is not applied).
- C. Press the brake pedal and disengage the park brake; the light must go off.

4. *Operation of instruments and all lights.* Refer to the operator's manual for specific operation information.

Turn signal switch and hazard warning flashers.

- A. Turn signal switch must self-cancel if equipped with self-cancelling switch.
- B. Hazard warning flashers must operate with key switch either off or on.

Instrument panel lights, headlights, tail lights, etc., including daytime running lights if equipped.

- A. Headlights must work with key switch either off or on.

5. *Horn, windshield wiper and washer operation.*

- A. Press down on steering wheel center to verify operation of electric horn.
- B. Verify operation of the windshield wipers and washers. Refer to the body company operator's manual for specific operation instructions.

6. *Ignition key operation. Also inspect automatic transmission neutral safety or clutch safety switch operation if so equipped.*

- A. Set parking brake and position the automatic transmission selector lever in reverse or a drive position, or manual transmission in neutral without clutch pedal depressed.
- B. Attempt to start engine. Engine should not crank.
- C. Position the automatic transmission selector lever in neutral, or depress the clutch pedal.
- D. Start engine.

7. *Clutch pedal free travel. Adjust as required.*

- A. Depress the pedal until resistance is felt. If free play is less than 1/2 inch or greater than 1–1/2 inches, adjust.

## **1.2. UNDER HOOD INSPECTION**

8. *Verify that operator's manuals and other required documents are in the vehicle.*

The following documents should be included in this package:

- A. Operator's Manuals: vehicle and engine.
- B. Component manufacturer — supplied manuals and warranties like Fuller or Allison transmission maintenance manuals, for example.
- C. Incomplete vehicle documents.

9. *Record anti-freeze protection level: -20°F (-29°C) or -40°F (-40°C).* Circle one on the form. Check DCA levels and record: 1.5–3.0 units per gallon.

10. *Verify proper coolant level. Fill as required.*

- A. It should be about 1 inch (25 mm) below the filler neck opening or between min-max indicators on transparent surge tanks. Refer to the operator's manual for more information.

- B. Use only Fleetrite antifreeze or equivalent that meets International B-1 specification.

11. *Re-tighten all cooling system hose clamps.*

- A. For constant torque hose clamps (T-bolt, spring style and non-spring styles), re-tighten to 50 to 60 in-lbs. (5.6 to 6.8 Nm).
- B. For other hose clamps up to 1–3/4 inch diameter, re-tighten to 70 to 80 in-lbs. (7.9 to 9.0 Nm). Clamps larger than 1–3/4 inches, re-tighten to 80 to 100 in-lbs. (9.0 to 11.3 Nm).

12. *Pressure check cooling system. Inspect for leaks.*

- A. Use a pressure tester such as ZTSE-2384 or an equivalent to pressure check the cooling system.
- B. Follow the instructions supplied with the pressure tester to perform this operation.
- C. The ZTSE-2384 unit has a heavy-duty pump and adapters for remotely applying pressure to the cooling system at the radiator fill neck. It includes a pressure gauge, manual pressure relief valve and hose assembly with a twist-on clamp bracket to receive the adapters for various sizes of filler necks. Adapter ZTSE-23841 is needed for systems with threaded caps.

13. *Inspect starter/alternator harness cable end tightness, cable routing, support and clearance.*

14. *Verify that wiring harnesses are clear of moving parts, sharp edges, and heat sources. Relocate harnesses if necessary.*

**Verify and Inspect:**

15. *Proper engine oil level.*

- A. If the oil level is low, add oil. DO NOT OVERFILL. Fill to the FULL mark on the dipstick.
- B. Refer to the operator's manual for specific engine oil recommendations and filling procedures.

16. *For oil, fuel, and coolant leaks.*

- A. Visually inspect all hoses for leaks near the engine and near the oil system, fuel system, cooling system, brake system, and air system components.

17. *All fuel, air and coolant hoses for clearance from moving parts, sharp edges, and heat sources; also for proper routing and clipping. Relocate as needed.*

- A. Visually inspect and relocate hoses if necessary to avoid moving objects, sharp edges, and heat sources.

18. *Freedom of movement and full throttle position of accelerator pedal.*

- A. Visually inspect position of pedal. It must be able to move freely through its entire range without interference. Rotate pedal on accelerator rod and move pedal through full travel to verify that it doesn't hang up on floor panel, engine cover, etc.

**Verify and Inspect:**

19. *Re-tighten all air induction system clamps.*

- A. Re-torque hose clamps (T-bolt, spring style and non-spring styles):

On aluminum pipe, re-tighten to 50–60 in-lbs. (5.6–6.8 Nm).

On steel pipe, re-tighten to 70–75 in-lbs. (7.9–8.4 Nm).

20. *Engine air cleaner element in position.*

- A. Verify that the element is in its proper position and sealing by looking in the air intake opening on the canister. Some models do not have this opening, so the canister cover has to be removed.

21. *Air inlet pipe clearance.*

- A. Visually inspect the inlet pipe to make sure it is not too close to moving objects and surfaces that it could rub against.

22. *Power steering reservoir fluid level.*

- A. Visually inspect the fluid level by removing the reservoir cap and noting where the fluid is on the dipstick (attached to the reservoir cap). Fill if necessary. Refer to the operator's manual for specific procedures and correct fluid to use.

23. *Adjustment of front axle wheel stop setting/steering gear end of travel relief.*

- A. The Ross TAS-40, TAS-45, TAS-55 and TAS-65 power steering gears are equipped with automatic unloading (poppet) valves that automatically set to furnish power steering pump protection and reduce pressure to unload steering linkage at vehicle axle stop settings. These valves are automatically set to axle stops after installation in a vehicle at first full right and full left turns.
- B. To check or adjust the front wheel turning angle and resulting stop setting, turn the wheels to the extreme right until the steering bottoms out. The clearance between the tire and any chassis/linkage parts must be 1/2 inch to 1 inch (12.7 to 25.4 mm). Check both front wheels and adjust to specifications if necessary.
- C. With the engine at idle and the vehicle unloaded, turn the steering wheel full travel in one direction until the steering fully bottoms against the axle stop. Maximum input of torque to be applied during this procedure is 25 ft-lbs. (33.9 Nm) or 30 ft-lbs (13 kg) rim pull on an 18-inch (457 mm) diameter steering wheel. This will automatically position the poppet adjuster seat and sleeve assembly in relation to the axle stop.

**NOTE: If excessive input shaft torque or rim pull is encountered prior to reaching the axle stop, allow the vehicle to roll forward or jack up the vehicle at the front axle.**

- D. Follow the same procedure while turning the steering wheel in the other direction. The poppet valves are now positioned to trip and reduce pressure as the front wheels approach the axle stops in either direction. Refer to the Service Manual for proper instructions if turn angle is to be reduced.

24. *All steering hoses for clearance from moving parts, sharp edges, and heat sources; also for proper routing and clipping. Relocate as needed. Re-tighten all hose clamps.*

- A. Visually inspect and relocate hoses if necessary to avoid moving objects, sharp edges, and heat sources.
- B. For constant torque hose clamps, re-tighten to 90 in-lbs. (10 Nm).



- C. For other hose clamps re-tighten to 70 to 80 in-lbs. (7.9 to 9.0 Nm).

25. *That cotter keys/lock tabs are installed and properly spread on all steering/brake components and clutch linkage.*

- A. Replace all missing or damaged cotter keys or lock tabs.

26. *Steering shaft pinch bolt head twisted off at both ends of I-shaft.*

- A. Examine the steering intermediate shaft and ensure that the pinch bolt heads have been twisted off at both ends of the shaft.

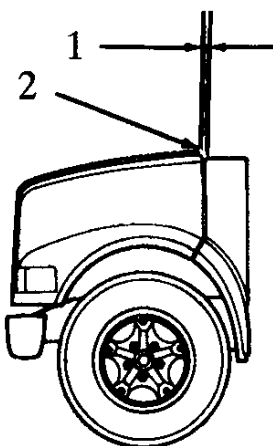
### 1.3. EXTERIOR INSPECTION

27. *Remove temporary cowl braces (FBC only).*

#### Verify and Inspect:

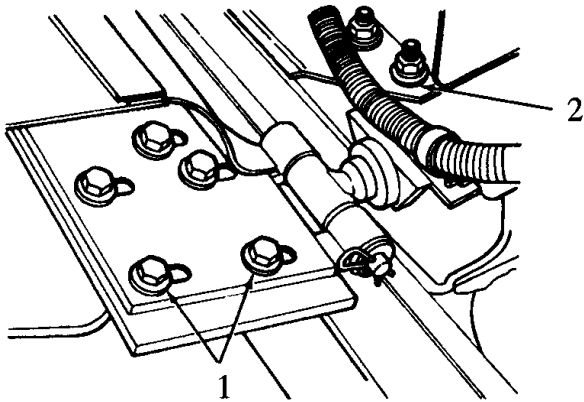
28. *Hood alignment to cowl/fender extension(s). Adjust as required. Torque hood mounting fasteners if equipped. See Item (B) for specifications.*

- A. Make sure the gap (hood-to-cowl clearance) is  $1/2 \pm .125$  inch ( $12.7 \pm 3.175$  mm). (Refer to Figure 1.)
- B. Re-torque mounting fasteners. Tighten the rear hinge half-to-radiator core support fasteners to 50–60 ft-lbs. (68–81 Nm). Tighten the front hinge half-to-rear hinge half fasteners to 30–38 ft-lbs. (41–51 Nm). (Refer to Figure 2.)
- C. Hood-to-bumper gap must be  $2.5 \pm .25$  inches ( $63.5 \pm 6.35$  mm). (Refer to Figure 3.). This gap is necessary to prevent contact between components during normal frame twist.
- D. Hood locator adjustment. (Refer to Figure 4.) Rear surface of hood bumper must be set  $.56 \pm .03$  inch ( $14.2 \pm 7.6$  mm) out past the rear edge of hood.



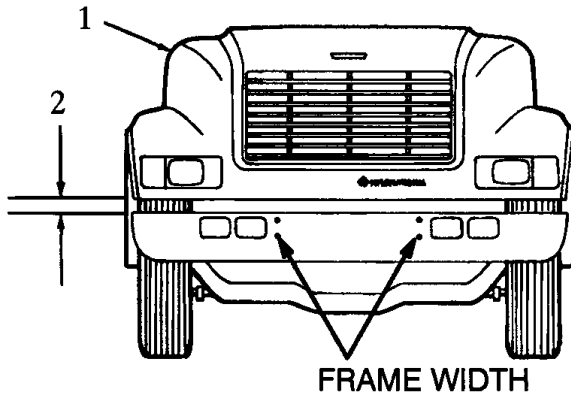
**Figure 1 Hood-To-Cowl Clearance**

1. CONSTANT HOOD-TO-COWL GAP =  $1/2 \pm .125$  INCH ( $12.7 \pm 3.175$  MM)
2. TOP OF HOOD MUST COMPRESS RUBBER SEAL BUT MAY NOT BE OVER  $1/8$  INCH ABOVE TOP OF COWL



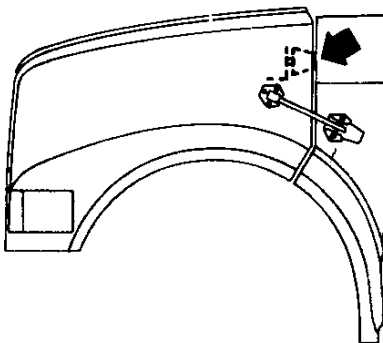
**Figure 2 Hood Hinge Mounting Fastener Location**

1. REAR HINGE HALF-TO-RADIATOR CORE SUPPORT FASTENERS
2. FRONT HINGE HALF-TO-REAR HINGE HALF FASTENERS



**Figure 3 Hood-To-Bumper Clearance**

1. HOOD SHOULD BE FLUSH  $\pm 1/8$  INCH AT COWL SIDE
2. HOOD-TO-BUMPER GAP =  $2\ 1/2 \pm 1/4$  INCHES (MEASURED AT FRAME WIDTH)



**Figure 4 Hood Locator Adjustment**

NOTE: PUSH THE HOOD TOWARD THE CAB SO THAT THE RUBBER BUMPERS CONTACT THE COWL PANEL. HOLD THE HOOD AGAINST THE CAB BY ENGAGING THE LATCHES ON BOTH SIDES OF THE VEHICLE.

29. *Hood opening and closing operation if equipped.*

- A. Make sure hood opens and closes without binding or roughness.

30. *Clearance of hood assist springs/hardware and fixed splash shield(s) to all engine compartment components if equipped.*

- A. Check attachment of assist springs/hardware and fixed splash shields to ensure they are in the correct position. Tighten any loose items.

31. *Paint appearance and damage.*

- A. If any paint problems are found, be sure to indicate exactly where they are in the comments section of the form.

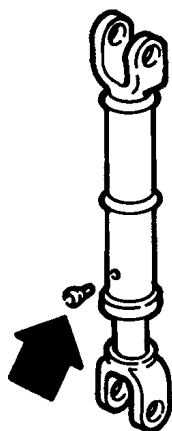
32. *Verify engine cover fit (FC models only).*

- A. Verify by sight and touch that the cover is tight against the seal. If not, adjust latch.

## 1.4. CHASSIS INSPECTION

33. *Lubricate chassis.*

- A. Refer to the operator's manual for proper lubrication procedures and capacities. Be sure to lubricate steering upper slip joint. (Refer to Figure 5.)
- B. Install grease fittings in place of plugs to lubricate. Replace plugs when finished.

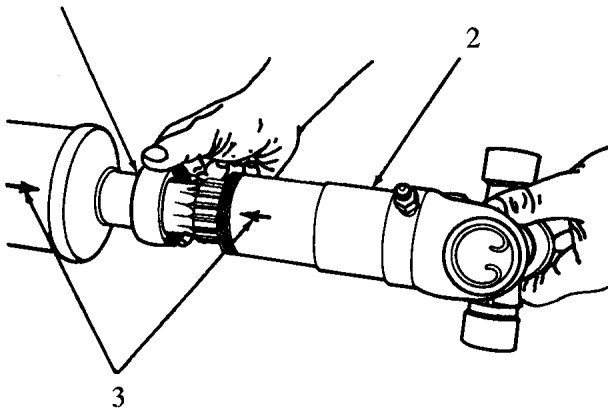


**Figure 5** Lubrication Point On Steering Upper Slip Joint

**Verify and Inspect:**

34. *Prop shaft tightness/phasing.*

- A. A correctly phased propeller shaft has its yoke bores or flange ears in the same plane at each end.
- B. The slip joint and shaft are marked with arrows or dots which must be lined up to indicate they are in phase. If they are not lined up, loosen and rotate the slip joint to align the marks. (Refer to Figure 6.)



**Figure 6 Slip Joint Alignment Arrows**

1. SEAL RETAINER
2. SLIP JOINT
3. RE-ASSEMBLE WITH ARROWS IN LINE

35. *Center bearing alignment/clearance.*

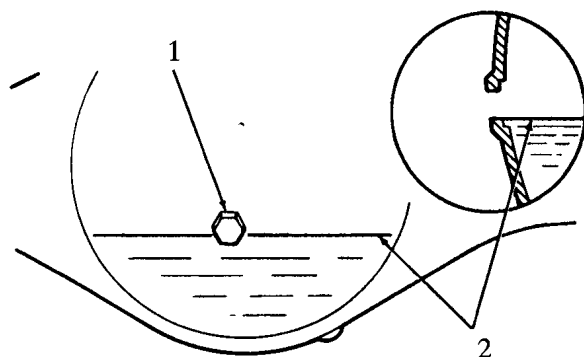
- A. Verify that center bearing assembly mounting bolts are tight.
- B. Make sure the bearing insulator is not out of carrier alignment and slinger is not contacting another component.

36. *Muffler and exhaust pipe(s) bracket mounting plus tightness; also system positioning and routing.*

- A. Inspect complete exhaust system for leaks, tightness, routing and support integrity. Correct as required.

37. *Rear axle oil level. Correct as required.*

- A. Clean dirt and grease from around the filler plug and remove. (Refer to Figure 7.)
- B. Verify that the rear axle is filled to the bottom of the filler hole (level with the filler hole opening). Refill if necessary. Refer to the operator's manual for proper procedures.
- C. Verify that drain plug is tight.



**Figure 7 Proper Rear Axle Oil Level (Manual Transmission Similar)**

1. FILLER PLUG
2. OIL LEVEL

38. All spring U-bolts, re-torque to specifications.

### Spring U-Bolt Torque Chart

**Table 1 Spring U-Bolt Torque Chart**

U-Bolt Diameter (Nominal)	Torque	
	Ft-lbs.	Nm
3/4 Inch Flanged Lock Nut	260-300	353-407
3/4 Inch Flanged Nut	260-300	353-407
7/8 Inch Hex Head With Washer	260-300	353-407
1 Inch Hex Head With Washer	325-400	441-542

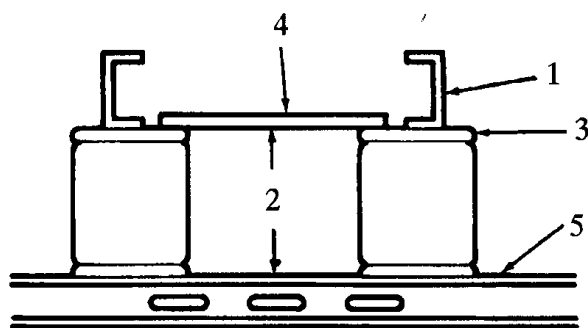
### Verify and Inspect:

39. Air suspension system for leaks and hose clearance from moving parts, sharp edges and heat sources; also proper routing and clipping. Relocate as needed.

40. Air suspension air spring height setting. Adjust to specifications.

### Check the Air Spring Height Setting

- A. Air spring height on vehicles equipped with International or Neway air suspension is measured from the bottom of a straight edge placed on the top metal plates of the air springs to the top of the transverse crossmember that the air springs are mounted to (refer to Figure 8). These dimensions control ride height. If resetting the air spring to obtain the proper ride height, deflate the system and then reset the height by inflating the air spring. **DO NOT SET THE HEIGHT BY LETTING AIR OUT.**



**Figure 8 Checking The Air Spring Height Setting**

INTERNATIONAL AIR SPRING SUSPENSION  
NEWAY AIR SPRING SUSPENSION

1. FRAME RAIL
2. AIR SPRING HEIGHT
3. AIR SPRING TOP METAL PLATE
4. STRAIGHT EDGE
5. TRANSVERSE CROSSMEMBER

**Table 2 Air Suspension Measurements International Air Suspension**

Code	Air Spring Height (see Figure 8)
03SAA, 03SAB	9.5 ± 0.25
03SAD, 03SAE, 03SAK, 03SAS, 03SAM, 03SAT, 14TAD, 14TAG, 14TAJ, 14TAK	12.0 ± 0.25
03SAP, 14TAN, 14UND	9.5 ± 0.25
03SAC, 14TAA, 14UNB	9.5 ± 0.25
14UNG	9.5 ± 0.25
03269, 03SAJ, 03SAL, 03SAU, 03SAW, 03SAY, 14673, 14693, 14694, 14TAC, 14TAE, 14TAL, 14TAM, 14TAN, 14TAU	12.5 ± 0.25
All dimensions are in inches	

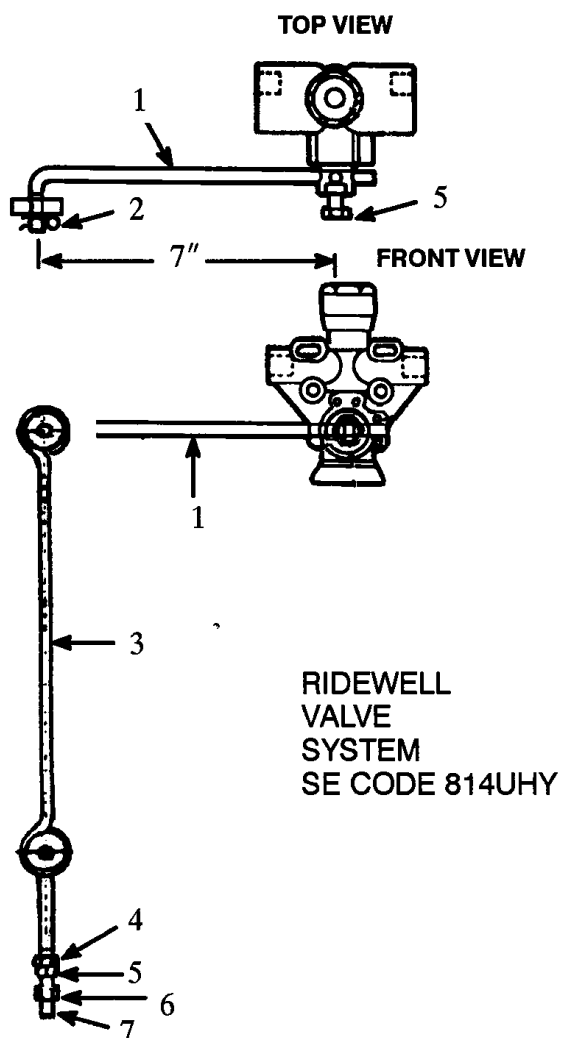
**Table 3 Neway Air Suspension**

ARD Code	Air Spring Height (See Figure 8)
14592, 14641, 14686	13 ± 0.25
14677	9.2 ± 0.25
AD Code	Air Spring Height (See Figure 8)
14UKR, 14UKV, 14UKW	13
14UKX, 14UKY, 14UKU	15.125
All dimensions are in inches.	

### Fixed Ride Height Vertical Linkage

International has changed the air suspension control valve vertical linkage from an adjustable linkage to a fixed length linkage. The fixed length vertical linkage, SE Code 814UHY (see Figure 9), went into effect on February 24, 1995 and the sleeve type "fixed" vertical linkage (see Figure 10) went into effect during the 1st quarter of 1996.

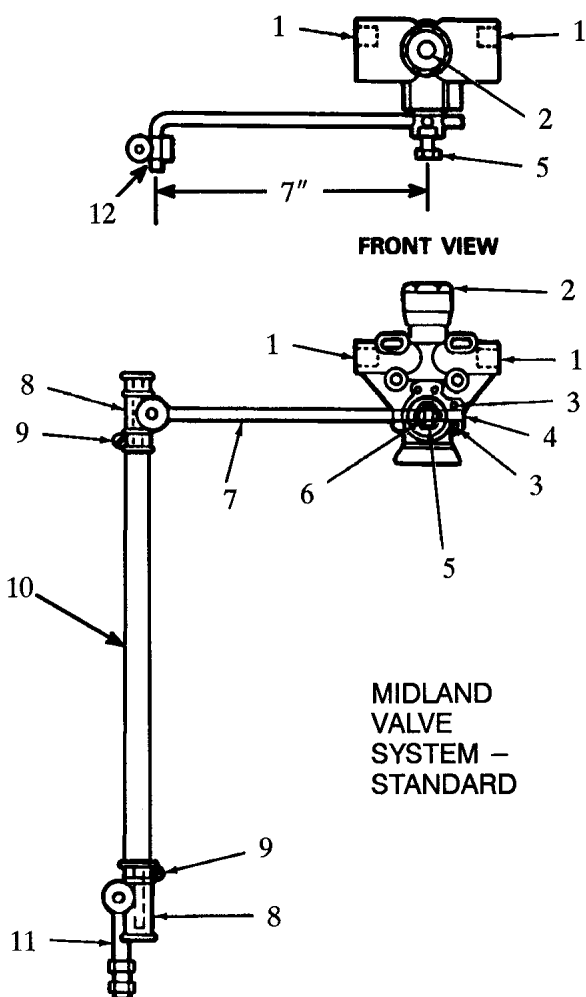
1. Verify that the center punch mark on the leveling valve capscrew is positioned toward the axle end of the lever arm. Center to center distance on the lever arm is 7 inches. If not, loosen the capscrew and move the lever arm to lengthen or shorten the arm to obtain 7 inches. Retighten the capscrew.
2. Assure that approximately 100 psi (689.5 kPa) air pressure is available in reservoir system (check cab gauge).
3. The height adjustment is set at the rear axle on a 4x2 chassis and the rear-rear axle on a 6x4 chassis.
  - a. Place a straight edge on the center line of the top metal plate on the air springs (see Figure 8). **Do not position the straight edge on the frame rails.** Measure the distance from the bottom edge of the straight edge down to the top edge of the transverse crossmember (see Figure 8).
  - b. The air spring height is Item 2 in Figure 8.



**Figure 9 Code 814UHY**

1. LEVER ARM
2. COTTER PIN AND FLAT WASHER
3. FIXED VERTICAL LINKAGE
4. JAM NUT
5. NUT ON TOP OF CROSSMEMBER
6. NUT UNDER CROSSMEMBER
7. THREADED END





**Figure 10 Sleeve Type "Fixed" Vertical Linkage**

1. TO AIR SPRINGS
2. FROM PRESSURE PROTECTION VALVE
3. ENTERING PIN HOLES
4. END OF ROD TO BE FLUSH WITH FLAT EDGE OF VALVE
5. CAPSCREW (TIGHTEN TO 14.75 FT-LBS.)
6. CENTER PUNCH MARK TO BE TOWARD LINK END OF ROD
7. LEVER ARM IN NEUTRAL POSITION
8. RUBBER LINK
9. CLAMP
10. VERTICAL LINKAGE TUBE
11. LOWER ANCHOR
12. COTTER PIN AND WASHER

4. If distance is not as specified:

- a. If the distance is less than specified, slightly raise valve lever arm and hold up until the distance increases to the correct specification. Move the lever arm to the valve neutral or horizontal position.

- b. If the distance is greater than specified, lower the valve lever arm and hold down until the distance is less than specified. Slightly raise valve lever arm and hold up until the distance increases to specification. Move the lever arm to the valve neutral or horizontal position.
  - c. When the correct specified height has been attained, install two centering pins (use two No. 21, or 5/32 inch drill bits) in the valve body to maintain the lever arm in the horizontal or centered position while installing the new fixed vertical link to the lever arm and transverse crossmember.
5. Install fixed vertical linkage as follows:
- a. Take the bottom nut off the threaded end of the fixed linkage and install the threaded end of the fixed vertical linkage in the hole in the transverse crossmember. Then install the opposite end onto the lever arm. Install the flat washer and cotter pin on the lever arm to hold the linkage in place.
  - b. Tighten the nut that rests on the top side of the transverse crossmember until it is finger tight so as not to bend the lever arm. When satisfied with positioning, tighten the nut on the bottom side of the transverse crossmember, then the jam nut on the top side of the crossmember.
41. *Brake hose clipping and clamp tightness. Make sure hoses are clear of moving parts, sharp edges, and heat sources. Relocate as needed.*
- A. Visually inspect and relocate hoses if necessary to avoid moving objects, sharp edges, and heat sources.
42. *Master cylinder hydraulic fluid level.*
- A. The fluid level must be up to the bottom edge of the ring on each reservoir fill port. Adjust as necessary. DO NOT fill to the top of the reservoir. Refer to the operator's manual.
43. *Fuel line(s) clearance from moving parts, sharp edges, and heat sources; also proper routing and clipping. Relocate as needed.*
- A. Visually inspect and relocate lines if necessary to avoid moving objects, sharp edges, and heat sources. Relocate as needed.
44. *Transmission oil level. Correct as required.*

### **Manual Transmissions**

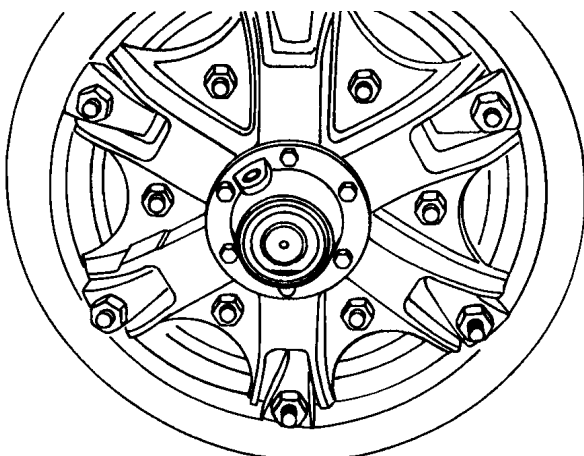
- A. Remove the filler plug and visually inspect the oil level. It must reach the bottom of the filler hole.

### **Automatic Transmissions**

- A. Refer to the transmission manufacturer operator's manual for correct procedures.

45. *Front hub(s) for leaks and proper oil level.*

- A. A clear cap on the end of the axle will show if the oil level is correct (refer to Figure 11). Refill if necessary. Refer to the oil hub manufacturer's instructions for specific procedures.

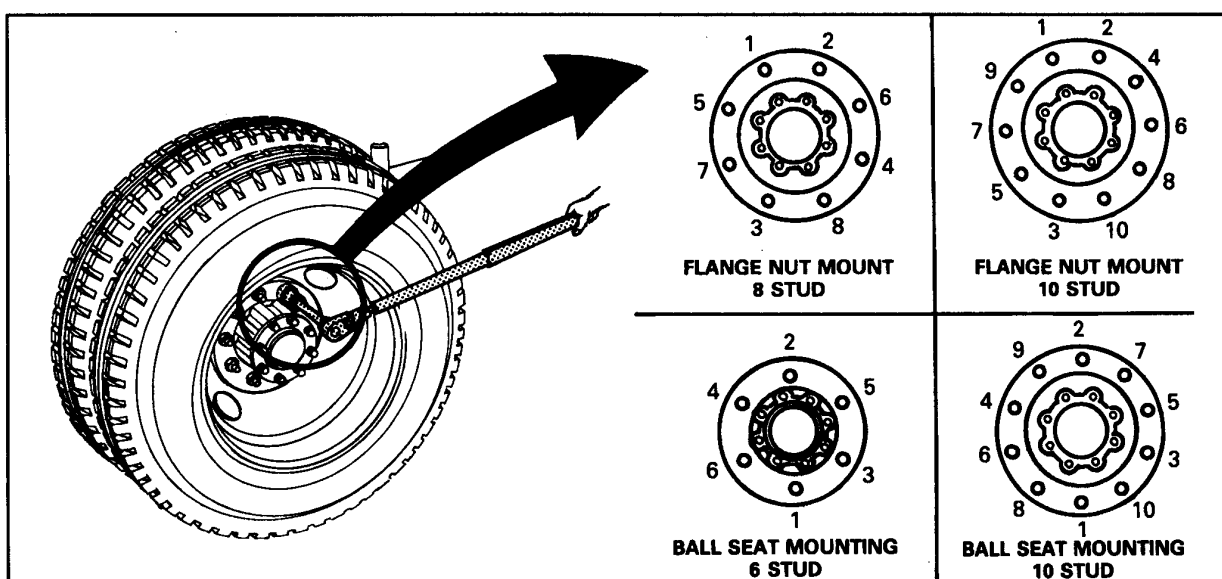


**Figure 11 Front Hub Oil Level Indicator**

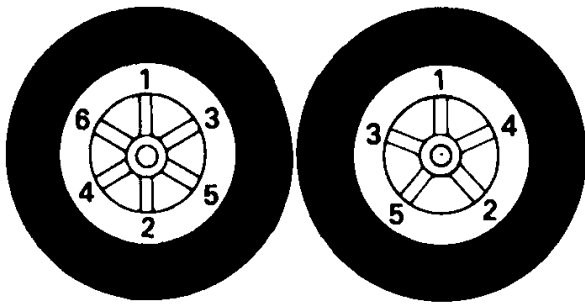
46. *Wheel/rim runout. Adjust to specifications. Retorque wheel/rim mounting nuts to specifications. Refer to the WHEEL, RIM AND TIRES Section of the Service Manual for the proper procedure to align wheels and rims. Re-torque wheel/rim mounting nuts to specifications found in the WHEELS, RIMS and TIRES section of the Service Manual. Use the proper wheel nut tightening sequence for the type of wheel. Refer to Figure 12 and Figure 13.*

**CAUTION** – Excessive tightening of the wheel nuts will elongate the bolt and deform the contact surface of the nut, resulting in an incorrect torque setting. Never use lubricants on wheel nuts or studs. Always tighten dry.

**NOTE** – Refer to the Wheels, Rims and Tires section of the Master Service Manual for additional procedures.



**Figure 12 Disc Wheel Tightening Sequence**



**Figure 13 Cast Spoke Wheel Tightening Sequence**

**Table 4 Torque Chart**

<b>DISC WHEELS</b>			
<b>Size</b>	<b>Nut Mounting</b>	<b>Torque: Ft-Lbs.</b>	<b>Torque: Nm</b>
11/16 inch	Flange	350-400	475-543
22 mm	Flange: Motor Wheel - 37.5 mm Across Flats	450-500	610-678
22 mm	Flange: International® /Budd - 33 mm Across Flats	450-500	610-678
<b>BALL SEAT (CONICAL NUT)</b>			
3/4 inch	Standard Square Cap: 13/16 inch Across Flats	450-500	610-678
3/4 inch	Standard Square Cap: 1-1/2 inches Across Flats	450-500	610-678
1-1/8 inches	Standard Hex Cap: 1-3/4 inches Across Flats	650-700	882-949
15/16 inch	Heavy Duty Square Cap: 15/16 inch Across Flats	750-900	1017-1221
1-5/16 inches	Heavy Duty Cap: 1-3/4 inches Across Flats	750-900	1017-1221
<b>CAST WHEELS</b>			
5/8 inch	Rim Clamp Nut	160-175	217-237
3/4 inch	Rim Clamp Nut	190-210	258-285

#### **Dry Threads — No Lubrication**

**Where excessive corrosion exists, a light coat of lubricant on first three threads of stud bolt is permitted.**

**Keep lubricant away from cap nut ball faces, or ball seats of disc wheels and rim clamps.**

47. *Tire air pressure. Fill to the proper inflation pressure.*

- A. Refer to the correct operator's manual for further information plus the tire load and inflation pressure charts.

48. Retorque axle flange nuts or driveshaft u-joint retaining bolts/ nuts if removed for shipping.

**For axle shafts**

- A. Make sure new gaskets have been installed on each axle removed by the transport carrier.
- B. Tighten the nuts in a star pattern to the specified torque to ensure the axle flanges are properly seated. Refer to Table 5 below.

**For U-joint bolts/nuts**

- A. Inspect slip joint boot for damage.
- B. Insure that the removed U-joint is properly seated in position.
- C. Tighten bolts/nuts to specification. **NOTE: U-joint strap retaining bolts have a thread locking patch; they may be used one time only.** Refer to Table 6.

**Table 5 Axle Flange Nut and Bolt Torque Chart**

Size	Grade/Type	Torque: Ft-Lbs.	Torque: Nm
5/8-18	8/Washer	145-175	197-237
5/8-18	5/Nylok	106-125	143-170
9/16-18	8/Washer	105-125	143-170
9/16-18	5/Nylok	96-116	129-156
3/4-16	8/Washer	250-300	340-410
3/4-16	5/Nylok	219-240	294-325
3/4-10	8/Washer	250-300	340-410
3/4-10	5/Nylok	219-240	294-325

**Table 6 U-Joint Bolt and Strap Information**

Series	International Bolt #	Series International Strap/ Retainer #	Recommended bolt torque
1480 / SPL55	1649524c1	1649525c1	50-60 ft-lbs.
1550 / SPL70	1649524c1	1649525c1	50-60 ft-lbs.
1610	1649524c1	1657367c1	50-60 ft-lbs.
SPL90 / SPL100	1649524c1	1677423c1	50-60 ft-lbs.
SPL140	3513117c1	3524814c1	100-120 ft-lbs.
SPL170	3513117c1	3513118c1	100-120 ft-lbs.
SPL250	3513117c1	3513119c1	100-120 ft-lbs.
1710	1657366c1	1657368c1	115-135 ft-lbs.
1760	1657366c1	1657368c1	115-135 ft-lbs.

**Table 6 U-Joint Bolt and Strap Information (cont.)**

Series	International Bolt #	Series International Strap/ Retainer #	Recommended bolt torque
1810	1657366c1	1657368c1	115-135 ft-lbs.
<b>NOTES:</b> The bolts can only be used once for all series. Straps and retainers for all series can be re-used if not damaged.			

49. *Battery cable end tightness and cable routing. Lubricate terminal ends and fasteners. Relocate as needed.*

50. *Correct installation of battery hold-down hardware.*

51. *State of battery charge (recharge if 12.4V or less).*

### **1.5. ROAD TEST (TO OPERATING TEMPERATURE)**

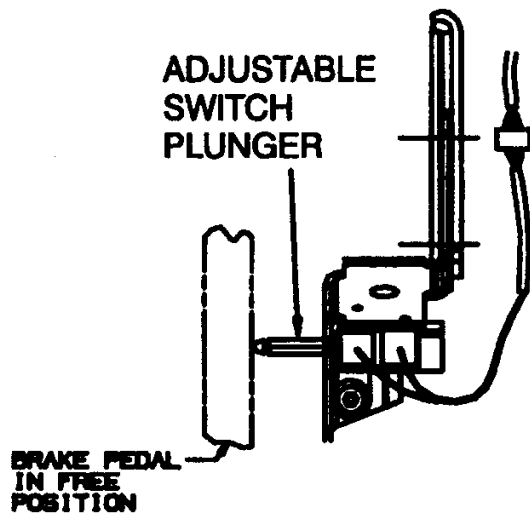
Hook up Electronic Service Tool (EST). Clear inactive fault codes.

52. *Install starting instruction label.*

53. *Install product graphic where applicable.*

**Verify satisfactory operation of:**

54. *Service brakes, clutch, steering and accelerator systems.*



**Figure 14 Stop Light/Hydraulic Brake Switch Assembly Shown Installed And Adjusted**

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A. Verify operation of hydraulic brakes if equipped.

1. To adjust the switch, push down on the brake pedal and hold the pedal down. With the pedal down, pull the plunger out of the switch about 1 inch toward the brake pedal. Slowly release the brake pedal and the switch will self adjust. Make sure that the switch cannot rotate and is held in place by the tab on the switch bracket. If the switch rotates, bend the tab as required to lock the switch in position (refer to Figure 14). **NOTE: Do not pull the brake pedal up by hand. Doing so could mis-adjust the switch.**
2. Make sure the parking brake works properly.
  - a. Apply the parking brake.
  - b. Start the engine and position the transmission shifter in a drive range.
  - c. Observe if the vehicle moves. It must not move.
  - d. Release the parking brake.

B. Verify operation of air brakes if equipped.

1. Make sure the parking brake operates properly.
  - a. Apply the parking brake by pulling out the control knob on the instrument panel.
  - b. Start the vehicle and position the transmission shifter in a drive range.
  - c. With the engine idling, observe if the vehicle moves. It must not move.
  - d. Release the parking brake.

C. Verify operation of clutch if equipped.

1. To verify clutch-free travel, depress the pedal until resistance is felt. The play should be 1/2 inch to 1-1/2 inches. If not, adjust.

D. Verify operation of steering system.

1. Be alert for unusual sounds, excessive wheel play, turnability, and effort. If any of these conditions appear, indicate the symptom on the back of the form (CTS-1199). Investigate and correct.
2. Check tilt/telescope features if equipped. **DO NOT OPERATE WHILE VEHICLE IS MOVING.**

E. Verify operation of accelerator.

55. *Heater/defroster and ventilation system.*

- A. Verify operation of heater/defroster and ventilation system. All vents and controls should function as described in the body company operator's manual.

56. *Speedometer/tachometer and all gauges.*

- A. Verify operation of speedometer and tachometer.
- B. Verify operation of additional gauges.

57. *Auxiliary brake/retarder operation if equipped.*

**IMPORTANT** – Do not use the auxiliary brake on slippery road surfaces. Use the same transmission gear you would normally use in these conditions.

58. *All accessories as equipped.*

A. Verify the operation of:

1. Air dryer: Open the reservoirs, drain cocks, or valves to purge the system of water.

59. *Engine/performance.*

A. Overall engine performance.

1. Engine coolant temperature.

**NOTE – See engine operation manual for operating ranges.**

2. Engine oil pressure.

60. *Transmission. Verify that automatic shift selector is correct in all gears and/or manual shifter decal is correct.*

A. Verify transmission shifts correctly and that the shift selector works properly in all gears.

B. Check Allison transmission retarder operation if equipped.

C. Refer to the transmission manufacturer operator's manuals for specific information

61. *Verify steering wheel alignment ( $\pm 10$  degrees).*

A. The steering wheel mounts to the steering column shaft by a 36 tooth spline. This spline mounting makes it impossible to perfectly align the steering wheel. Each spline represents 10 degrees. This means the steering wheel cannot be adjusted in less than 10 degree increments. If you have a 20 inch diameter steering wheel, the 10 degrees represent 1–3/4 inch distance as measured at the outside edge of the wheel. If you have an 18 inch diameter steering wheel, the 10 degrees represents 1–1/2 inch distance.

## **1.6. AFTER ROAD TEST**

**NOTE – Position the vehicle on a level surface and perform the following operations.**

62. *Check for fault codes and remove EST.*

**Inspect for:**

63. *Fluid leaks.*

64. *Exhaust leaks.*

65. *Air leaks.*

**Verify/Adjust:**



66. Automatic transmission fluid level if so equipped.
67. That the proper vehicle certification label is affixed. Refer to the New Vehicle Processing Manual.
68. Add PDI location code and date to Vehicle Identification Decal.
69. Fill out and affix the Pre-Delivery Service Identity Sticker (CTS-1122) (refer to Figure 15) to the inside of the vehicle's windshield (optional).
70. Transfer all items marked with an A, F, or R to the following comments section on the back of this form. Include a brief explanation of each problem in the space provided.
- A. The ✓ (check) stands for Satisfactory. It should be used on any inspection that is performed which does not uncover something wrong; it is OK.
  - B. The A code stands for Adjustment Made. It should be used only when a technician made an adjustment during the pre-delivery inspection.
  - C. The F code stands for Fluid Low/Leaks. It should be used only when a low fluid condition in a reservoir is noticed or a leak is found.
  - D. The R code stands for Repair Needed. It should be used only when a problem is found that does not require an adjustment to fix; a repair must be made after the pre-delivery inspection.
  - E. The N/A code stands for Not Applicable. It should be used only when an inspection (Items 1 through 67) cannot be performed because the vehicle does not have that feature.

 <b>INTERNATIONAL®</b>		
<b>PRE-DELIVERY SERVICE</b>		
MODEL	VEHICLE IDENTIFICATION NO.	
SERVICING LOCATION	INVOICE NO.	
Pre-delivery Service Performed By: _____ Date: _____		MOISTEN THIS SIDE -- APPLY TO WINDSHIELD
CTS-1122D (Front Side)		(Back Side)

**Figure 15 Pre-Delivery Service Identity Sticker (CTS-1122)**