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Lubrication and Fluid Level Check Locations: 00-07

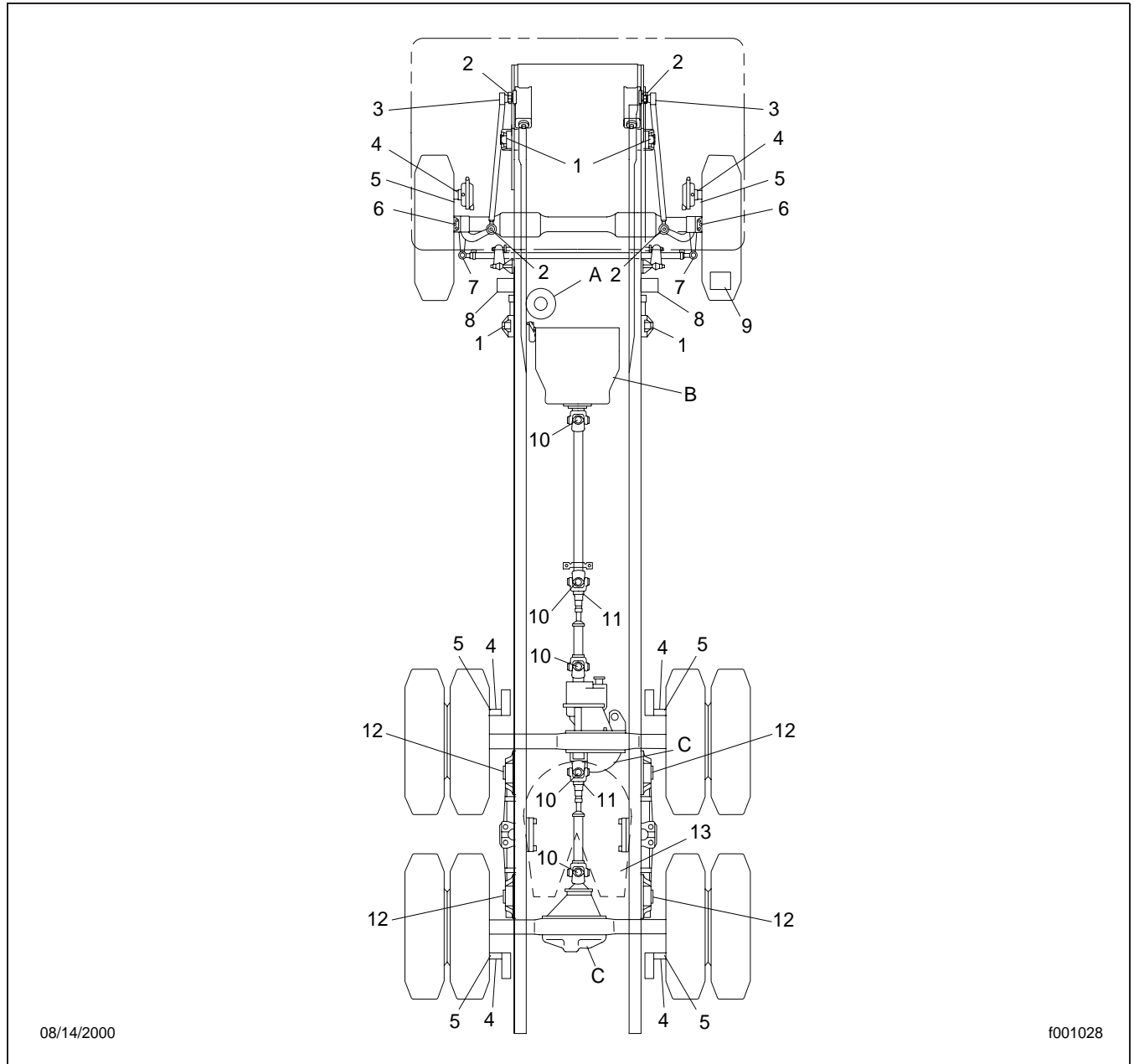


Fig. 4, Lubrication and Fluid Level Check Locations

Lubrication and Fluid Level Check Locations: 00–07

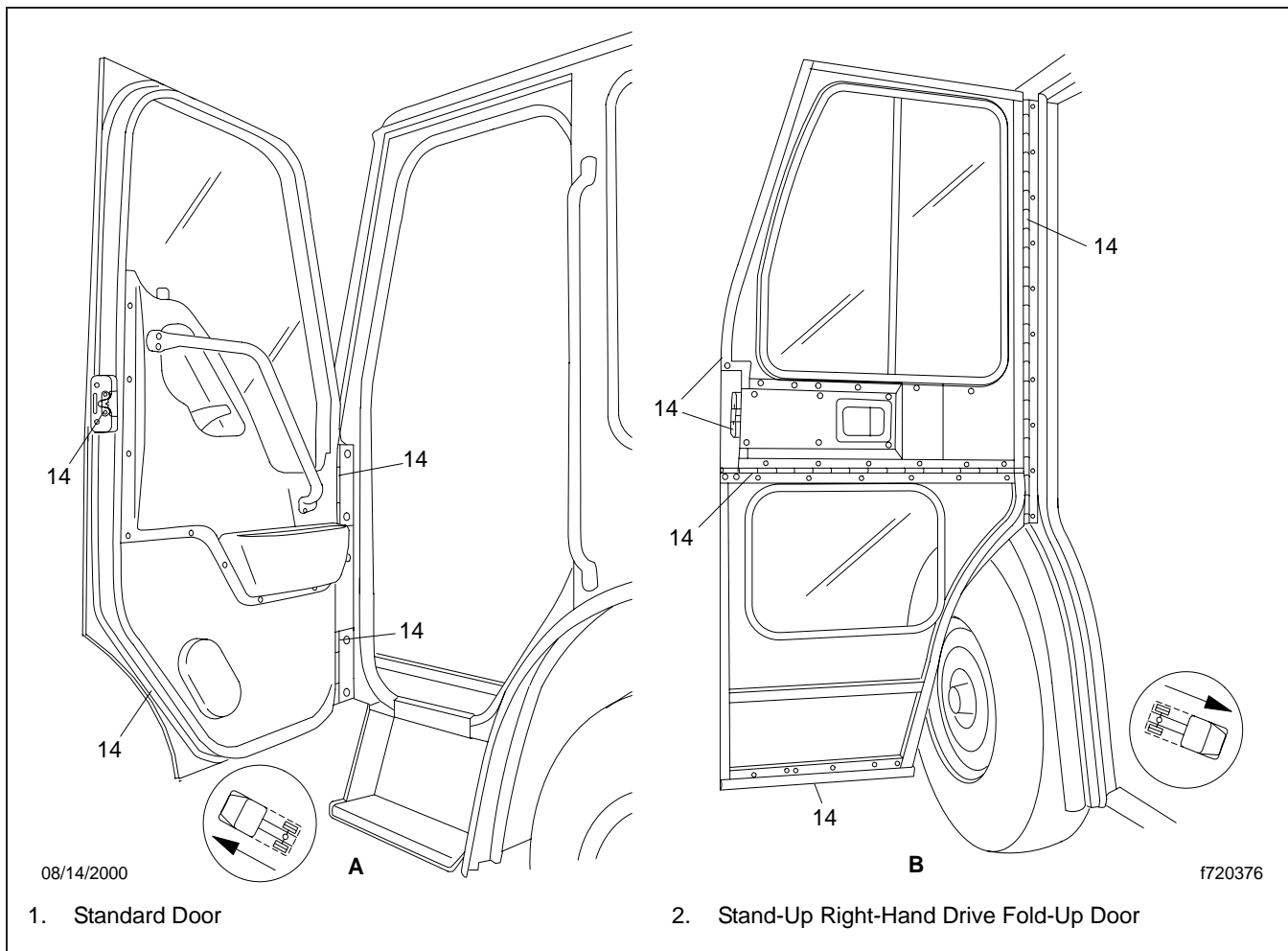
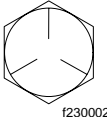
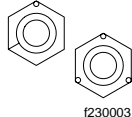
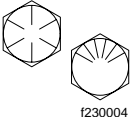
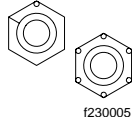
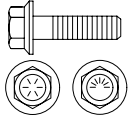
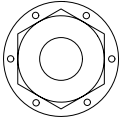


Fig. 5, Lubrication and Fluid Level Check Locations

Torque Specifications Tables: 00–16

Torque Values for U.S. Customary Thread Fasteners With Dry (Unlubricated)* Plain (Unplated) Threads†						
Thread Diameter Pitch	Regular Hex				Flanged	
	Grade 5 Bolt	Grade 5 or B Nut	Grade 8 or 8.2 Bolt	Grade 8 or C Nut	Grade 8 or 8.2 Bolt	Grade G Nut
	Torque: lbf-ft (N-m)		Torque: lbf-ft (N-m)		Torque: lbf-ft (N-m)	
						
1/4–20	8 (11)		10 (14)		—	
1/4–28	9 (12)		12 (16)		—	
5/16–18	15 (20)		22 (30)		22 (30)	
5/16–24	17 (23)		25 (34)		—	
3/8–16	28 (38)		40 (54)		40 (54)	
3/8–24	31 (42)		45 (61)		—	
7/16–14	45 (61)		65 (88)		65 (88)	
7/16–20	50 (68)		70 (95)		—	
1/2–13	70 (95)		95 (129)		95 (129)	
1/2–20	75 (102)		110 (149)		—	
9/16–12	100 (136)		140 (190)		140 (190)	
9/16–18	110 (149)		155 (210)		—	
5/8–11	135 (183)		190 (258)		190 (258)	
5/8–18	155 (210)		215 (292)		—	
3/4–10	240 (325)		340 (461)		340 (461)	
3/4–16	270 (366)		380 (515)		—	
7/8–9	385 (522)		540 (732)		—	
7/8–14	425 (576)		600 (813)		—	
1–8	580 (786)		820 (1112)		—	
1–12	635 (861)		900 (1220)		—	
1–14	650 (881)		915 (1241)		—	

* Threads may have residual oil, but will be dry to the touch.

† Male and female threads (bolt and nut) must both be unlubricated and unplated; if either is plated or lubricated, use **Table 5**. American LaFrance recommends that all plated and unplated fasteners be coated with oil before installation.

Table 6, Torque Values for U.S. Customary Thread Fasteners With Dry (Unlubricated) Plain (Unplated) Threads

15-01 Alternator, Battery, and Starter Checking



WARNING

Batteries release a gas mixture that is explosive. Do not smoke when working around batteries. Put out all flames, and remove any source of sparks or intense heat. Make sure the battery compartment has been completely vented before disconnecting or connecting battery cables.

Battery acid is extremely harmful if splashed in eyes or on skin. Always wear a face shield and protective clothing when working around batteries.

1. Check the tightness of the alternator bracket fasteners; tighten the fasteners as needed. For torque values, see **Group 15** of the *Condor® Workshop Manual*.
2. Check that all electrical connections at the alternator and starter are clean. Clean and tighten all charging system electrical connections as needed.
3. Inspect the battery cables for wear, and replace as needed. Clean the cable connector terminals with a wire brush. See **Group 54** of the *Condor® Workshop Manual* for troubleshooting instructions, and for adjustment, repair, or replacement instructions.
 - 3.1. Clean and tighten the battery ground cable, terminal, and clamps.
 - 3.2. Inspect the retainer assembly (or battery-hold-downs) and the battery box. Replace worn or damaged parts. Remove any corrosion with a wire brush, and wash with a weak solution of baking soda and water. Rinse with clean water, and dry. Paint the retainer assembly, if needed, to prevent rusting.
 - 3.3. Check that foreign objects, such as stones, bolts, and nuts are removed from the battery box.
 - 3.4. After cleaning, connect the cables to the batteries, and tighten them to the torque specifications listed on the battery, generally 10 to 15 lbf·ft (14 to 20 N·m).

- 3.5. Spray each connection with dielectric red enamel and coat the battery terminals with dielectric grease; see **Table 1**.

Protectant Material	Approved Brand
Dielectric Grease	Lubriplate FLP DS-ES
Dielectric Red Enamel Spray	3M 1602 IVI-Spray Sealer
	Spray-On B-6-665

Table 1, Approved Dielectric Protectants

4. Check the alternator wiring for missing insulation, kinks, and heat damage. Replace or repair as needed.
5. Check the terminals on the battery shut-off switch and the magnetic switch. Make sure the terminal connections are clean and tight. Coat the terminal connections with dielectric red enamel after cleaning; see **Table 1**.

4. Visually check the fan for bent, cracked, or damaged blades. Replace if damaged. Check for adequate clearance between the fan and other components.
 5. Check the fan belt for wear, tension, and alignment. Correct if necessary.
 6. Check for wear on the friction facing. See **Fig. 2**. Replace the friction facing if it is worn to a 1/16-inch (1.6-mm) thickness or less. Also check the facing for signs of oil contamination or burn marks. If evidence of oil or burn marks are found, replace the friction facing.
 7. Connect the battery cables. Lower the cab and start the engine, and charge the air system to 120psi (827 kPa). Shut down the engine. Separate the halves of the fan solenoid connector. The fan clutch should engage.
- If the fan does not operate correctly, see **Group 20** of the *Condor® Workshop Manual* for troubleshooting and repair procedures.
8. With the air system charged to 120 psi (827 kPa), and with the fan solenoid connector halves separated, check the fan clutch for audible air leaks, using a suitable listening device.

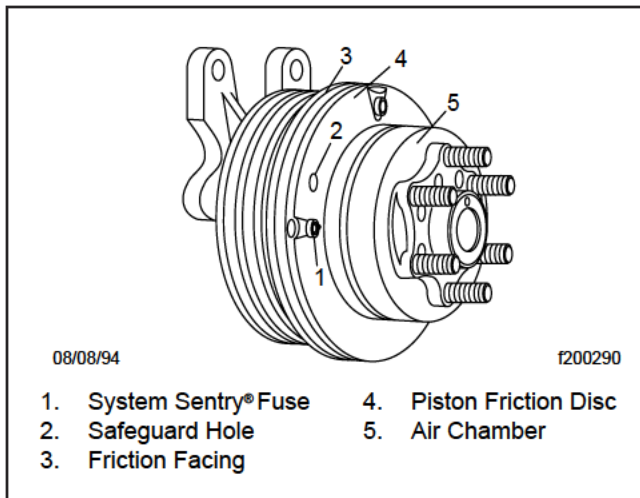


Fig 2, Horton Advantage Fan Clutch

9. If a leak is detected, remove the fan blade. Using a soapy water solution, check the fan clutch at the following locations to locate the source of the leak.

Install a new seal kit. See **Group 20** of the *Condor® Workshop Manual* for repair procedures.

- 9.1. Check for a leak at the bleed hole on the fan pilot. Air leakage means that the cartridge assembly (**Fig. 3**, Ref. 16) or face seal (Ref. 17) is damaged.
- 9.2. Check for air leaks between the air chamber and the piston friction disc. Air leakage means that the large O-ring (Ref. 14) is damaged.
- 9.3. Check for air leaks around the safeguard hole on the piston friction disc. Air leakage means the small O-ring (Ref. 18) is damaged.
- 9.4. Check for air leaking from the System Sentry® fuse. Leaking air means the clutch has gotten so hot the lead alloy in the fuse melted. This released the clutch before the heat could damage the clutch bearings. Before replacing the fuse, find and repair the source of the heat.

20-02 Pressure Relief Cap Checking

WARNING

Do not remove or loosen the surge tank cap until the engine and cooling system have completely cooled. Use extreme care when removing the cap. A sudden release of pressure from removing the cap prior to the system cooling can result in a surge of scalding coolant that could cause serious personal injury.

CAUTION

The radiator cap currently installed may not be the same one installed when the vehicle was built. If the radiator cap must be replaced, make sure that it is the correct cap for the cooling system of the vehicle. Because the radiator cap pressure rating affects the operating temperature of the engine, installing an improperly rated radiator cap may have adverse effects on the cooling system, and

6. With the engine running at idle, remove the dipstick from the tube and wipe it clean.
7. Insert the dipstick into the tube and remove the dipstick.
8. Check the fluid level reading and repeat the check procedure to verify the reading.

If the fluid level is within the COLD RUN band, the transmission may be operated until the fluid is hot enough to perform a hot check.

If the fluid level is not within the COLD RUN band, add or drain fluid as needed to adjust the fluid level to the middle of the COLD RUN band. See Fig. 2.



CAUTION

As the fluid temperature increases, so does the fluid level. Do not fill above the COLD RUN band if the transmission fluid is below normal operating temperature.

NOTE: Perform a hot check at the first opportunity after the normal operating temperature, 160 to 200°F (71 to 93°C), has been reached.

Hot Check

1. Park the vehicle on a flat, level surface. Apply the parking brake and chock the tires.
2. Shift the transmission to NEUTRAL.

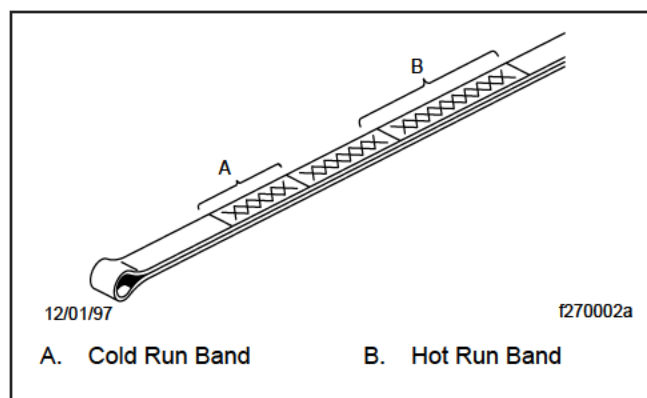


Fig 2, Dipstick Markings

3. Operate the engine at idle (500 to 800 rpm) until normal operating temperature is reached. Check that the sump temperature is 160 to 200°F (71 to

93°C). Check that the converter-out temperature is 180 to 220°F (82 to 104°C).

4. With the engine idling, remove the dipstick from the tube and wipe it clean.
5. Insert the dipstick into the tube and remove the dipstick.
6. Check the fluid level reading and repeat the check procedure to verify the reading. Safe operating level is within the HOT RUN band on the dipstick. The HOT RUN band is between the HOT FULL and HOT ADD marks.

If the fluid level is not within the HOT RUN band, add or drain fluid as needed to bring the fluid level within the HOT RUN band. See Fig. 2.

Visually inspect the breather valve on the transmission.

Allison Transmission—Electronic Method

Before checking the transmission oil level, the following conditions must be met:

- The engine must be at idle.
- The transmission must be in neutral.
- The transmission output shaft must be stopped.
- The transmission fluid must be within normal operating temperatures of 140°F (60°C) to 220°F (104°C).

1. Start the engine, allow the transmission fluid to reach operating temperature, and place the transmission in neutral.
2. On push-button shift selectors, press both the up and down arrow buttons once at the same time and release. On lever shift selectors, press the DIAGNOSTICS (the button with the Allison Logo) button once.
3. The ECU performs a system check. If a problem is found during the system check, an oil level sensor diagnostic code will be displayed. Oil level sensor diagnostic codes are listed in Table 3.

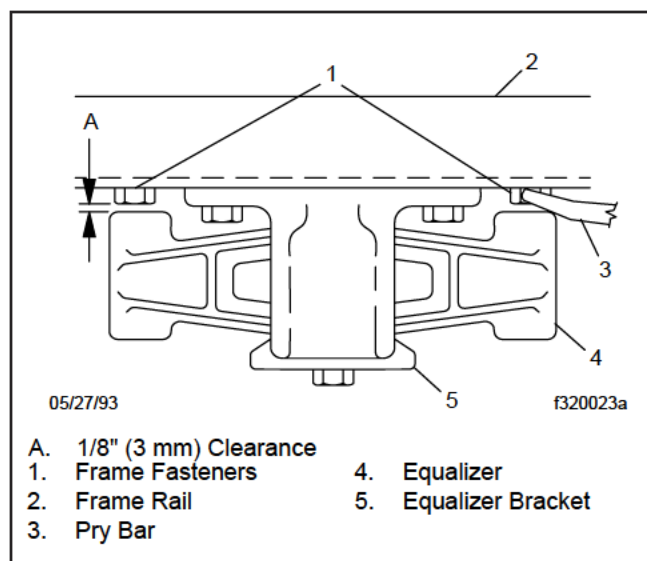


Fig. 4, Side View of the Equalizer

American LaFrance AirLiner Suspension

! WARNING

Do not replace individual leaves of a damaged leaf spring assembly; replace the complete spring assembly. Visible damage (cracks or breaks) to one leaf causes hidden damage to other leaves. Replacement of only visibly damaged parts is no assurance that the spring is safe. Failure to replace a damaged spring assembly could cause an accident, resulting in serious personal injury or property damage.

Inspect the forward and rear spring brackets for wear, cracks, and other damage. If any of these conditions exist, replace the damaged bracket(s). See **Group 32** of the *Condor® Workshop Manual* for instructions.

! WARNING

Replace worn, cracked, or damaged spring brackets. Failure to do so could result in bracket breakage, possibly leading to loss of vehicle control and resulting in personal injury or property damage.

Inspect the crossmember(s) and gussets for wear, cracks, and other damage. If any of these conditions

exist, replace the damaged parts. See **Group 32** of the *Condor® Workshop Manual* for instructions.

IMPORTANT: Before checking the AirLiner suspension height, make sure there is no load on the chassis, and the trailer is unhitched.

1. Park the vehicle on a level surface, using a light application of the brakes. Do not apply the parking brakes. Shift the transmission into neutral, and build the secondary air pressure to at least 100psi (690 kPa). Shut down the engine.
2. Mark the location of the front and rear tires on the floor, and chock the tires on one axle only.
3. Check the length of the overtravel lever between its pivot points. See Fig. 5, Ref. A. If the vehicle is equipped with an adjustable leveling valve, the length should be 8 inches (203 mm). If the length is incorrect, See **Group 32** of the *Condor® Workshop Manual* for adjustment procedures.

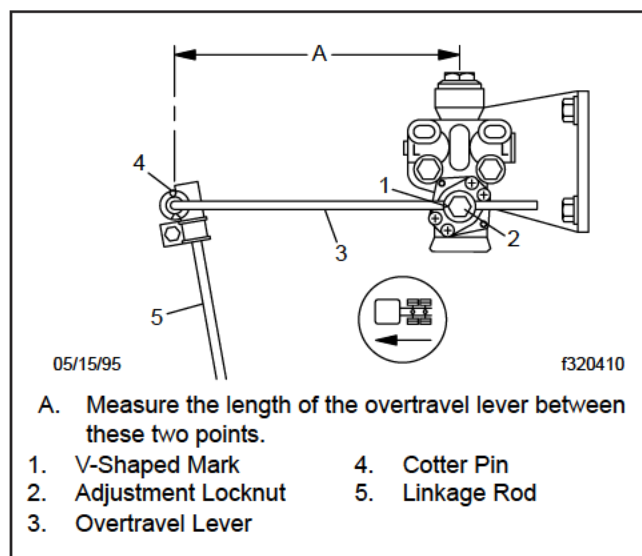


Fig. 5, AirLiner Overtravel Lever and Linkage Rod Measurement

4. On single-drive rear axle configurations, measure the distance from the bottom of the left axle stop to the top of the U-bolt pad. On tandem (dual-drive) rear axle configurations, measure the distance from the bottom of the forward most left axle stop

to the top of the axle U-bolt pad. See **Fig. 6**, Ref. A.
See **Table 1** for the correct distances.

Suspension Height Adjustment Distances			
Suspension Type	Distance in Inches (mm)		
	Minimum	Target	Maximum
20/40K AirLiner	2-3/8 (60)	2-5/8 (67)	2-7/8 (73)
23/46K AirLiner	2-3/4 (70)	3 (76)	3-1/4 (83)
Low/Mid-Ride Height AirLiner	2-1/4 (57)	2-1/2 (64)	2-3/4 (70)

Table 1, Suspension Height Adjustment Distances

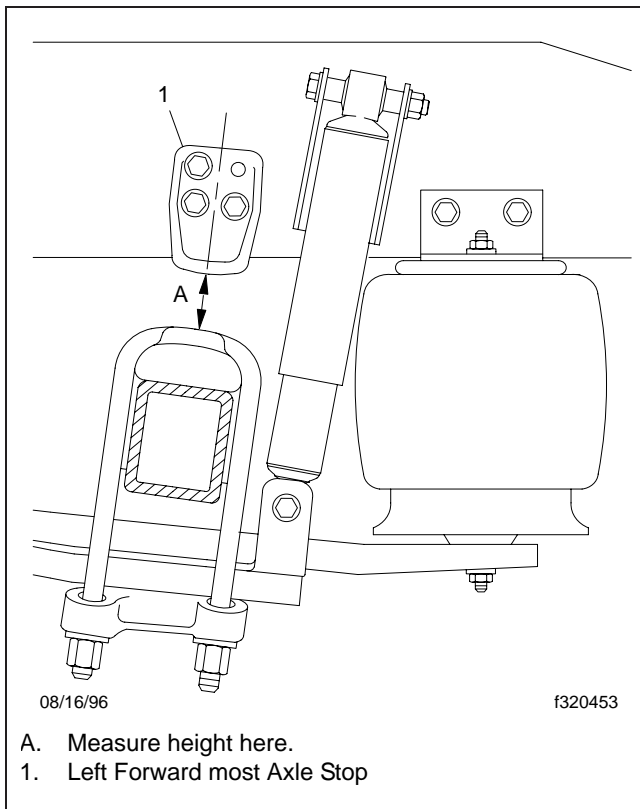


Fig. 6, AirLiner Axle Stop Measurement

- If the axle stop measurement is not correct, See **Group 32** of the *Condor® Workshop Manual* for adjustment procedures.
- Apply the parking brakes, and remove the chocks.

American LaFrance TufTrac

Inspect all suspension fasteners for the proper torque values. See **Group 00** of this manual for proper bolt

torque specifications. Visually inspect the frame for elongated holes or abnormal wear at the suspension mounting points, and have the frame repaired as needed. If elongated holes are found on the frame, check the suspension alignment. Check brackets and torque rods for damage or loose fasteners

Chalmers Tandem Axle Suspension

Chock the front tires to prevent the vehicle from moving. Place the transmission in neutral, and release the parking brakes before inspecting the Chalmers rear suspension.

Power-wash the Chalmers rear suspension, or clean it with a hard-bristle brush before performing a visual inspection.

- Visually inspect the rubber bushings for cracks or other damage.

Try to move the torque rod ends using your hands only, and check for any free-play. If free-play is felt, replace the torque rod end bushing. Do not use a pry bar to check for free-play. Use of a pry bar may lead to premature bushing replacement.
- Lift the rear of the vehicle and support the frame on jack stands to unload the suspension components. The vehicle is lifted high enough when the beam ends are off of the saddles. All jack stands must be of sufficient strength and rigidity to safely support the vehicle. Do not perform any work on or around a vehicle that is supported solely by a lifting device.

Visually inspect the walking beam for cracks or other damage. If damage is found, replace the walking beam.

Keep the vehicle supported by the jack stands for the next operation.

3. Manipulate the walking beam so that a micrometer, vernier, or dial caliper may be used to determine the wear area thickness on the bottom face. See **Fig. 7**. Measurements should be taken a minimum of 1/2 inch from the beam flange edges to eliminate any edge wear that may have occurred. Subtract the wear area thickness (see **Fig. 7**, Ref. B) from the thickness at the non-wear area (see **Fig. 7**, Ref. A) to determine the amount of wear.

If the beams show any wear greater than 0.062 inch (1.5 mm), a Chalmers wear plate must be installed, or the walking beam must be replaced.

4. Rotate the restrictor cans 360 degrees and visually inspect the cans for cracks, severe corrosion, and distortion. If any of these conditions are present, or the restrictor can is missing, replace the restrictor can.

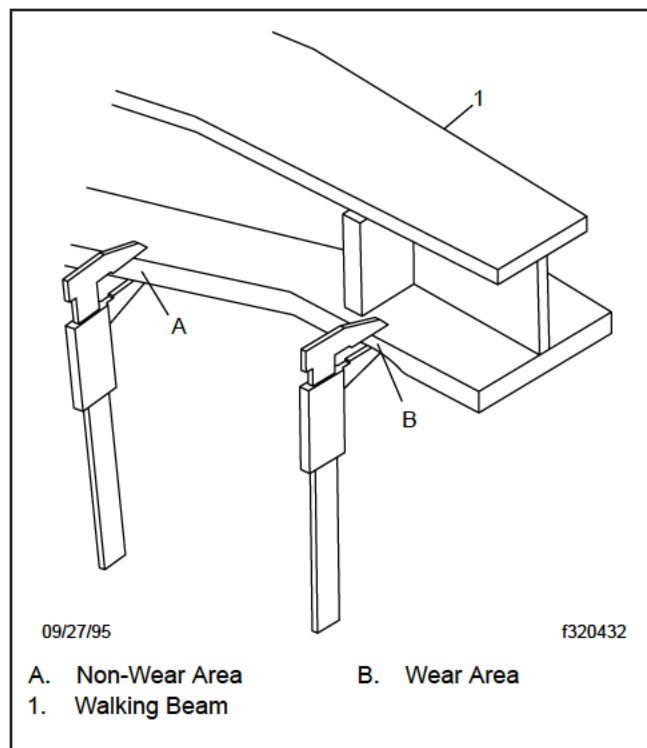


Fig. 7, Walking Beam End Wear Thickness



WARNING

Replace all cracked or missing restrictor cans. Failure to do so could lead to loss of vehicle control,

which could result in personal injury. Vehicles with cracked or missing restrictor cans may be driven slowly to the nearest workshop for restrictor can replacement.

Chalmers Single Axle Suspension

1. Chock the front tires to prevent the vehicle from moving. Place the transmission in neutral, and release the parking brakes before inspecting the Chalmers rear suspension.
2. Power-wash the Chalmers rear suspension, or clean it with a hard-bristle brush before performing a visual inspection.
3. Visually inspect the rubber bushings for cracks or other damage.

Try to move the torque rod ends using your hands only, and check for any free-play. If free-play is felt, replace the torque rod end bushing. Do not use a pry bar to check for free-play. Use of a pry bar may lead to premature bushing replacement.

4. Rotate the restrictor cans 360 degrees and visually inspect the cans for cracks, severe corrosion, and distortion. If any of these conditions are present, or the restrictor can is missing, replace the restrictor can.



WARNING

Replace all cracked or missing restrictor cans. Failure to do so could lead to loss of vehicle control, which could result in personal injury. Vehicles with cracked or missing restrictor cans may be driven slowly to the nearest workshop for restrictor can replacement.

Hendrickson HN Series

1. Park the vehicle on a level surface, apply the parking brakes, and chock the front tires.
2. Visually inspect the end beam connection for distorted or frayed rubber. Also look for the equalizing beam being lower in the beam hanger. If either of these conditions are found replace the rubber end bushings and all connecting parts.

The gap at each side of the visible rubber on the lower part of the end bushing is normal. See **Fig. 8**.

Place a jack stand under each beam end (see Fig. 8) and check for movement of the rubber end bushing inner casting. If movement is noted replace the rubber end bushing and all connecting parts.

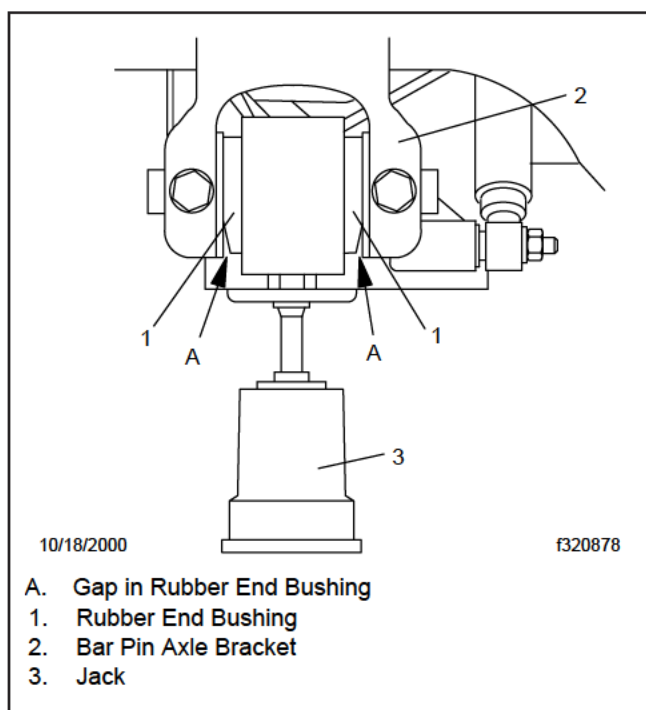


Fig. 8, Beam End Connection

WARNING

If movement is noted, do not operate the vehicle. Replace the rubber end bushings and all connecting parts. The above condition can result in costly repair, downtime, possible separation of components, loss of vehicle control, property damage, or personal injury.

3. Inspect all torque rods and transverse rods for looseness, or shredded rubber. With the brakes applied, slowly rock an empty vehicle while an assistant visually checks the action at both ends of the rod. Or with the vehicle shut down, a lever check can be made with a long pry bar placed under each rod end and pressure applied.

Whether the rod ends are straddle mount or tapered stud, they can be renewed by pressing out

the worn end, and installing a cartridge type replacement. A two-piece rod is also available to cut and weld to the desired length.

4. Visually inspect the rebound strap to make sure it is intact and not torn. If the rebound strap is not intact, or is torn replace it.
5. Visually inspect the auxiliary spring. The normal height of an unloaded auxiliary spring is 4 inches (10 cm). Replacement is recommended when the height of the auxiliary spring decreases to 3-1/2 inches (9 cm) or below. See Fig. 9.

NOTE: When bolster springs are replaced, it is recommended that both bolster springs on a beam be replaced even if only one shows wear.

6. Visually inspect all four bolster springs. Make sure that there is no rubber trapped or in contact with sharp metal edges from overhanging metal plates.

Replace the bolster spring if swelling due to contamination of oil or grease, increases the rubber diameter to 1/4 inch (6.4 mm) beyond its normal position.

Replace the bolster spring if separation of the rubber from the bonded metal surface to a depth greater than 1-1/2 inches (3.8 cm) is found. See Fig. 10.

NOTE: Creases formed by folding of the rubber surface under load should be ignored. These appear as strips on the surface, polished by wear or covered with tacky rubber.

It is also recommended that all tightening torques on the Hendrickson HN Series suspension be checked once a year. See Table 2 for torque specifications.

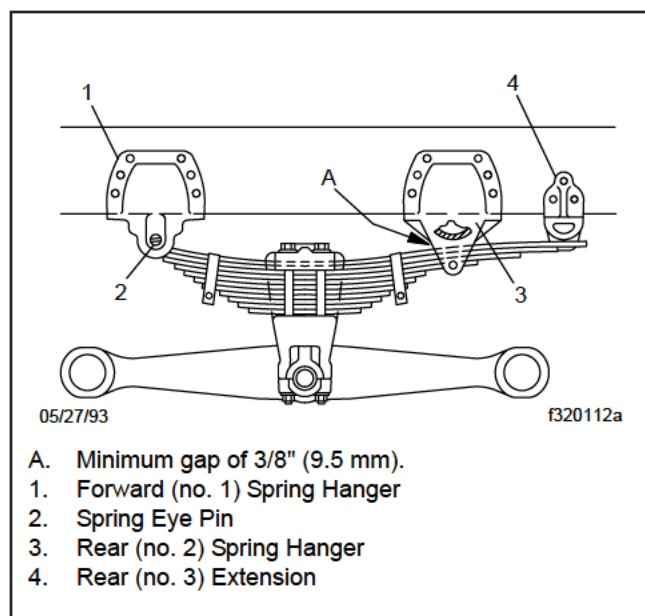


Fig. 11, RTE Suspension (unloaded)

Neway Suspension



WARNING

Inspect the components and check their operation. Failure to perform these inspections and checks could result in separation of worn suspension components and loss of vehicle control, possibly causing personal injury and property damage.

1. Park the vehicle on a level surface. Apply the parking brakes and chock the tires to prevent the vehicle from moving.
2. Inspect the rear suspension for any signs of damage, loose components, wear, or cracks. Replace any damaged components to prevent failure or equipment breakdown.

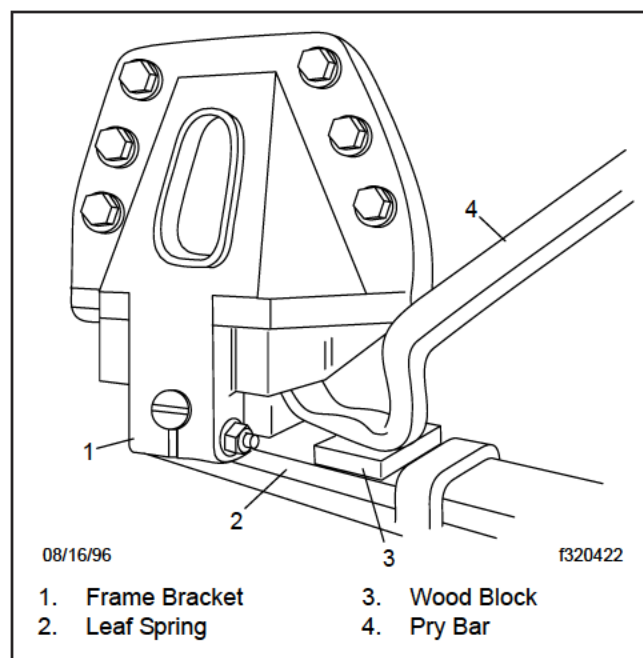


Fig. 12, Hendrickson RTE Series Frame Bracket Inspection

3. Inspect all bolts and nuts at the pivot and axle connections to assure they are properly torqued. Check all other nuts and bolts for proper torque. See **Group 00** of this manual for proper torque specifications.
4. Check the air pressure gauge to confirm that there is in excess of 65 psi (448 kPa) in the air system, and inspect the air springs for sufficient and equal firmness.

NOTE: Height control valves control all air springs. Check for air leaks by applying a soapy solution, then checking for bubbles, at all air connections and fittings.

5. Check the riding height of the air suspension by measuring the distance from the centerline of the rear axle (see **Fig. 13**) to the bottom of the frame rail. If the riding height is incorrect, adjust the air-suspension.

Teyco 79 KB

Inspect all suspension fasteners for the proper torque values. See **Group 00** of this manual for proper bolt torque specifications. Visually inspect the frame for elongated holes at the suspension mounting points,

and have the frame repaired as needed. If elongated holes are found on the frame, check the suspension

alignment. Check brackets and torque rods for damage or loose fasteners

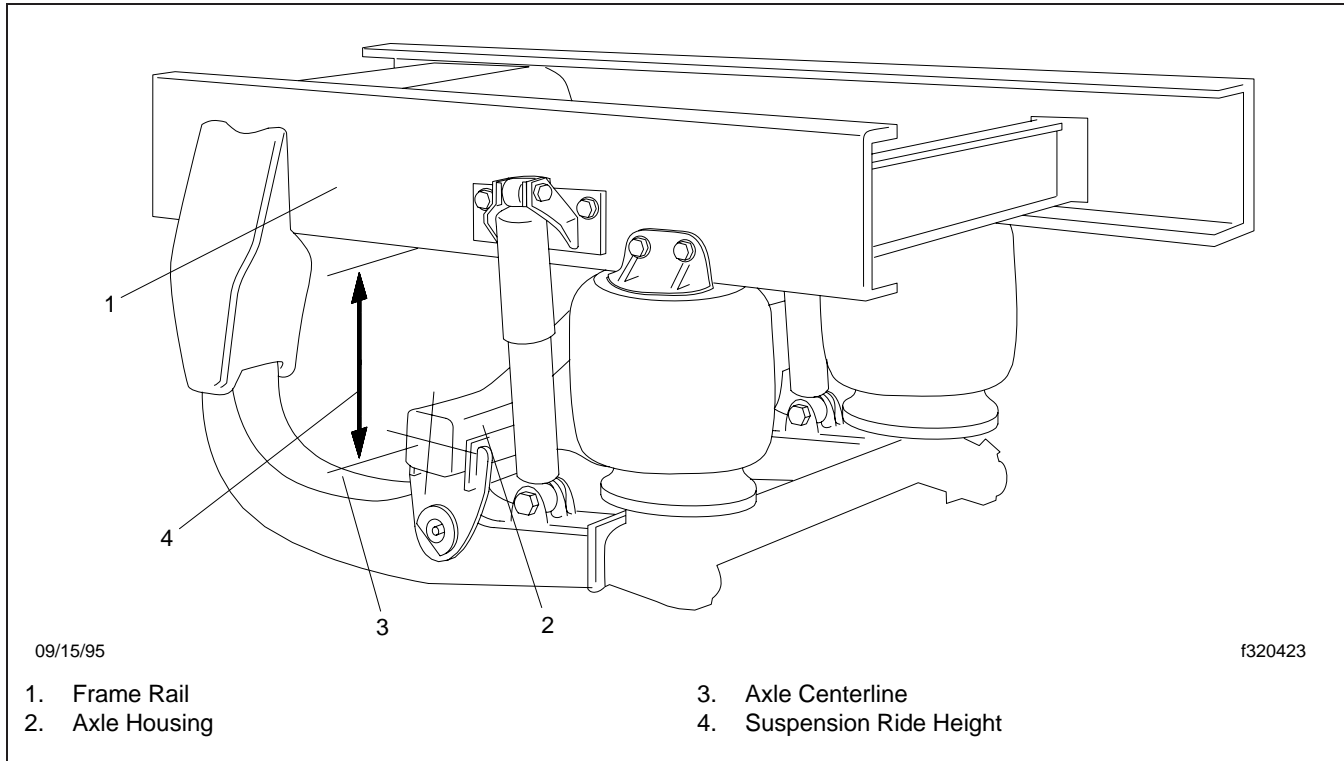


Fig. 13, Neway Ride Height Inspection

32-02 Suspension Lubrication

Front Suspension

Wipe all dirt away from the grease fittings (if equipped) on the spring-eye bushings. Apply multipurpose chassis grease with a pressurized grease gun until the old grease is forced out.

NOTE: Service Schedule IV vehicles equipped with a 12,000 lb (5452 kg) front axle are fitted with maintenance-free rubber bushings, and do not require lubrication.

Rear Suspension

American LaFrance TufTrac

No lubrication is required on the TufTrac rear suspension.

Chalmers

No lubrication is required on the Chalmers rear suspension.

American LaFrance Spring

Single Axle

No lubrication is required on American LaFrance single axle rear suspensions.

Tandem Axle

Lubricate the equalizer cap-and-tube assembly bushings by applying multi-purpose chassis grease at the grease fitting until the old grease is forced out from the cap-and-tube assembly. See **Fig. 14**.

Hendrickson HN Series

No lubrication is required on Hendrickson HN Series rear suspensions.

Hendrickson RTE Series

For Hendrickson RTE Series, lubricate the bronze, ball-indented bushings in the spring eye, as follows:

1. Park the vehicle on a level surface, apply the parking brakes, and chock the front tires.

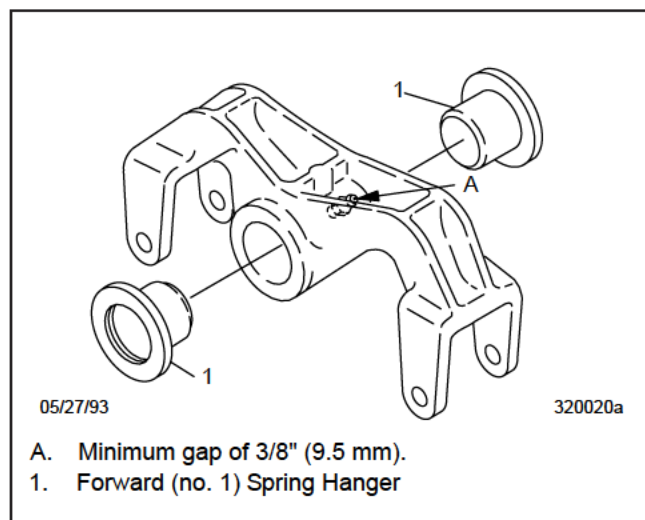


Fig. 14, Equalizer Assembly Lubrication

2. Raise the rear of the vehicle until the rear wheels are suspended in the air, then support the vehicle with safety stands. This relieves the load on the bushings and pins to allow the proper flow of lubricant around them.
3. Use a multi-purpose chassis grease and lubricate the bronze, ball-indented bushings in the spring eyes at the grease fitting. See Fig. 15. Continue to lubricate until grease exits both ends of the bushing. If the pin will not accept lubricant, remove the pin and clean the lubrication channels where lubricant may have hardened. Remove the safety

stands and lower the vehicle after lubrication is complete.

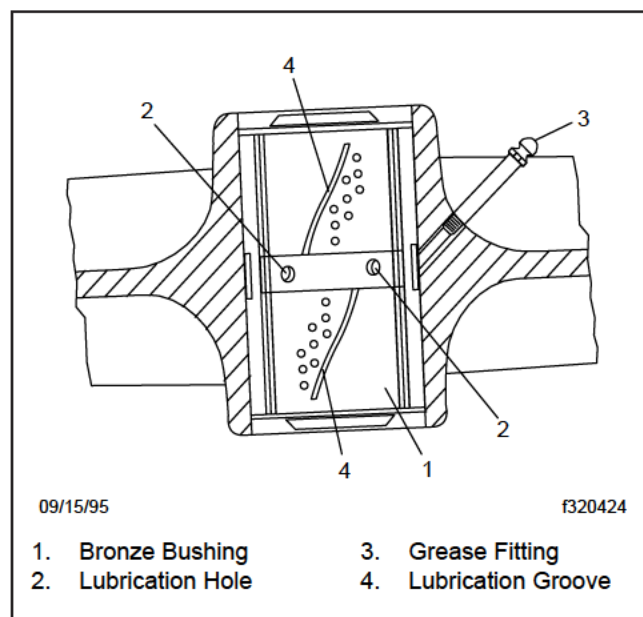


Fig. 15, Hendrickson RTE Series Bushing Lubrication

Neway

No lubrication is required on Neway rear suspensions.

Reyco

No lubrication is required on Reyco rear suspensions.

32-03 Suspension U-Bolt Torque Check

CAUTION

Failure to retorque U-bolt nuts could result in spring breakage and abnormal tire wear.

1. Park the vehicle on a flat surface and apply the parking brakes. Chock the tires to prevent the vehicle from moving.
2. Check the U-bolt torque in a diagonal pattern. Set a click-type torque wrench to the highest torque value for the fastener being checked. See Table 4 for U-bolt torque specifications. Turn the wrench in a clockwise motion (looking up) until the torque wrench clicks.