

TRW Automotive
Steering & Suspension Systems**Service Bulletin #TAS-117****Steering System Air Bleed Procedures for Various Mounts and Combinations**

Released January, 1999

This TRW Commercial Steering Division service bulletin has been written to help you repair commercial vehicles more efficiently. This bulletin should not replace your manuals; you should use them together. These materials are intended for use by properly trained, professional mechanics, NOT "Do-it-yourselfers". You should not try to diagnose or repair steering problems unless you have been trained, and have the right equipment, tools and know-how to perform the work correctly and safely.

Auto or Natural Bleed Systems

Used for single TAS or HFB gears with no manual bleed screw, and dual systems when neither the gear nor the rotary cylinder has a manual bleed screw: TAS, HFB, TAS/RCS, TAS/RCB, HFB/RBC

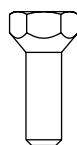
⚠ CAUTION

- Make sure poppets are set correctly before beginning this procedure.
- Find and correct the source of air entry into the system before attempting these procedures. (Air can naturally enter the system when components are being removed or installed.)
- Do not allow the fluid level to drop significantly or run out of the reservoir during the entire procedure. This may induce air into the system.

1. Fill the reservoir nearly full. Do not steer. Start and run the engine for 10 seconds, then shut it off. Check and refill the reservoir. Repeat at least three times, checking the reservoir each time.
2. Start the engine and let it idle for 2 minutes. Do not steer. Shut off the engine and check the fluid level in the reservoir. Refill as required.
3. Start the engine again. Steer the vehicle from full left to full right several times. Add fluid, as necessary, to the full line on the dip stick.

Automatic bleed systems should now be free from trapped air

Manual bleed screw
Actual size



Manual Bleed Systems

Used for single TAS or HFB gears with a manual bleed screw, and dual systems when either the gear or the rotary cylinder has a manual bleed screw: TAS, HFB, TAS/RCS, TAS/RCB, HFB/RCB

CAUTION

- **Make sure poppets are set correctly before beginning this procedure.**
- **Find and correct the source of air entry into the system before attempting these procedures. (Air can naturally enter the system when components are being removed or installed.)**
- **Do not allow the fluid level to drop significantly or run out of the reservoir during the entire procedure. This may induce air into the system.**

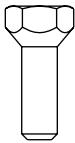
1. Fill the reservoir nearly full. Do not steer. Start and run the engine for 10 seconds, then shut it off. Check and refill the reservoir. Repeat at least three times, checking the reservoir each time.
2. Start the engine and let it idle for 2 minutes. Do not steer. Shut off the engine and check the fluid level in the reservoir. Refill as required.
3. Start the engine again. Steer the vehicle from full left to full right several times. Add fluid, as necessary, to the full line on the dip stick.
4. With engine idling, steer from full left turn to full right turn several times. **Stop steering with the road wheels at straight ahead, and loosen the manual bleed screw (in the main gear or the rotary assist cylinder, or both if equipped) 2-3 turns.** Allow air and aerated fluid to "bleed out" until only clear fluid is seen. Close the bleed screw, refill the reservoir if required.

Repeat step 4 three to four times until all the air is discharged. Torque manual bleed screw to **30 lbf·in.**

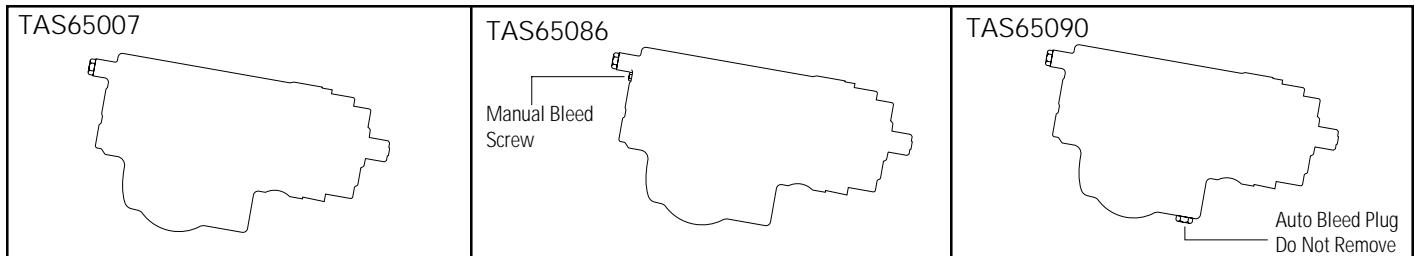
CAUTION

Do not turn steering wheel with bleed screw loosened.

Manual bleed screw
Actual size



Angled Mount TAS



⚠ CAUTION

- Make sure poppets are set correctly before beginning this procedure.
- Find and correct the source of air entry into the system before attempting these procedures. (Air can naturally enter the system when components are being removed or installed.)
- Do not allow the fluid level to drop significantly or run out of the reservoir during the entire procedure. This may induce air into the system.

If you have a **TAS65090** gear, bleed using the procedures for Auto or Natural Bleed Systems. This gear is designed to bleed automatically.

If you have a **TAS65086**, bleed using the procedures for Manual Bleed Systems. Note the position of the manual bleed screw is near the poppet fixed stop screw.

If you have a **TAS65007**, follow the procedure below.

TAS65007 Procedure

1. Fill the reservoir nearly full. Do not steer. Start and run the engine for 10 seconds, then shut it off. Check and refill the reservoir. Repeat at least three times, checking the reservoir each time.
2. Start the engine and let it idle for 2 minutes. Do not steer. Shut off the engine and check the fluid level in the reservoir. Refill as required.
3. Start the engine again. Steer the vehicle from full left to full right several times. Add fluid, as necessary, to the full line on the dip stick.
4. **Gears with poppet fixed stop screw:** With engine idling, steer from full left turn to full right turn several times. **Stop steering at the center position, and loosen the poppet fixed stop screw a few turns.** Allow air and aerated fluid to "bleed out" until only clear fluid is seen. Tighten the stop screw and refill the reservoir if required. If there is loctite® on the threads, it must be cleaned off so air and fluid can escape.
5. Repeat step 4 three to four times until all the air is discharged. Torque poppet fixed stop screw to 38-42 lbf•ft if it is the two-piece screw and washer set. Torque to 38-58 lbf•ft if it is the screw with the washer designed in.
6. **Gears with poppet adjusting screw kit:** With engine idling, steer from full left turn to full right turn several times. **Stop steering at the center position.** Loosen the jam nut. **Loosen the jam nut and adjusting screw, as a unit, a few turns.** Allow air and aerated fluid to "bleed out" until only clean fluid is seen. Turn the adjusting screw back the same number of turns it was loosened, tighten the nut and refill the reservoir if required.
7. Repeat step 6 three to four times until all the air is discharged. Torque the jam nut to 33-37 lbf•ft.

⚠ CAUTION

Do not turn steering wheel with poppet fixed screw or adjusting screw loosened.

⚠ CAUTION

If the position of the poppet adjusting screw and jam nut changed from their original position during this procedure, poppets will need to be reset to function properly.

Dual: TAS Main, C-Series Linear Auxiliary Cylinder

CAUTION

- Make sure poppets are set correctly before beginning this procedure.
- Find and correct the source of air entry into the system before attempting these procedures. (Air can naturally enter the system when components are being removed or installed.)
- Do not allow the fluid level to drop significantly or run out of the reservoir during the entire procedure. This may induce air into the system.

If the cylinder ports are located on the top side of the cylinder as installed, and the cylinder has typical stroke amounts:

1. With the engine on, steer full left and right 2-3 times. Air from the cylinder should be carried over to the main gear.
2. Bleed the main gear using one of the procedures described earlier.

If the cylinder ports are located on the top side of the cylinder as installed, but the cylinder has a short stroke:

1. Disconnect the cylinder rod end.
2. Make sure the rod won't hit anyone or anything as it travels through full stroke.
3. With the engine on, turn the steering wheel slightly toward a left turn. The cylinder will stroke to full travel in one direction.
4. Turn the steering wheel slightly toward a right turn. The cylinder will stroke to full travel in the opposite direction.
5. Repeat steps 3 and 4 at least 2-3 times.
6. Reconnect the cylinder.

If the cylinder ports are not located on the top side of the cylinder, or if there's any question about whether all the air is out of the cylinder:

1. Disconnect the cylinder at both ends.
2. Lay the cylinder on the floor, with hydraulic hoses still connected, and the ports up.
3. Stroke the cylinder completely 2-3 times by initiating alternate left and right steering wheel turns with the engine running.
4. Reconnect the cylinder.
5. Bleed the main gear using either the auto/natural bleed system or the manual bleed system procedure.