

TRW Automotive
Commercial Steering Systems

Service Bulletin #TAS-107

On-Vehicle Poppet Adjustment for TAS85 Steering gears with manual poppets

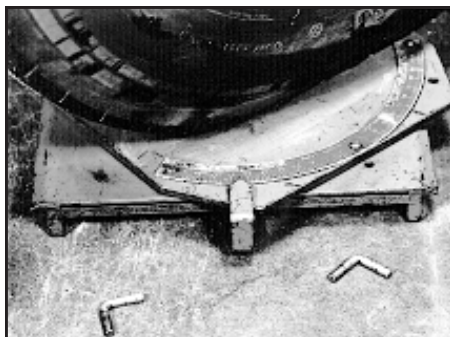
Revised March, 1994
Electronic Version April, 1998

NOTE

This poppet system utilizes one of two different cartridges which operate within different ranges of gear travel. Each gear contains only one cartridge located in the input shaft end of the gear.

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.

TRW Part Number	Overall Cartridge Length	Gear Travel Range from Center	
		Degrees Output Shaft Rotation	Hand Wheel Turns
409139-A1	3 3/4"	27°30' - 37°30'	1.75 - 2.4
409139-A2	3 3/8"	37°30' - 47°30'	2.4 - 3



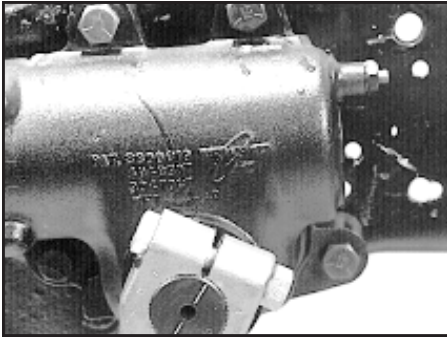
Set axle stops

1. Set axle stops to manufacturer's wheelcut or clearance specifications.



Install PSSA or pressure gage, warm-up system

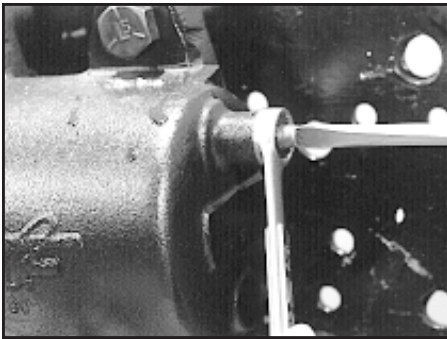
2. Install a pressure gage or Power Steering System Analyzer (PSSA) into the supply line from the pump to the gear. Make sure the PSSA can be pressurized. Start the engine and let it idle.



Position rack piston to set upper poppet

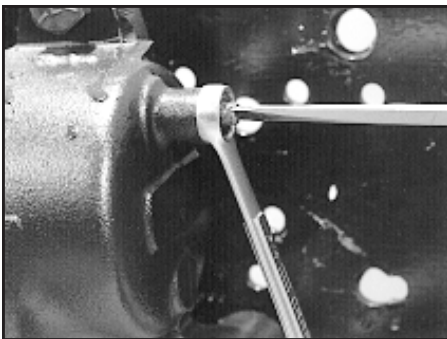
3. Look at the output shaft timing marks and note which mark is nearest the housing piston bore. Turn the steering wheel in the direction that makes this timing mark move away from the input shaft. Turn the steering wheel to full turn and pull hard when the axle stop contacts the axle stop bolt.

CAUTION Never operate a vehicle at pump relief pressure for longer than 10 seconds at a time, the pump may become damaged.



Loosen adjusting screw

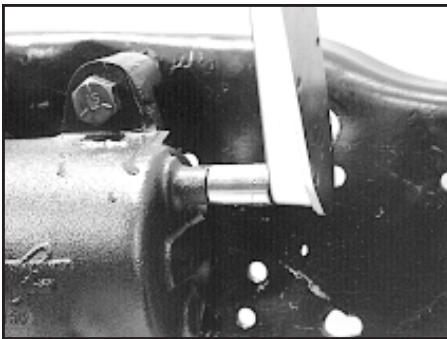
4. If the pump is not at relief pressure, slightly loosen the poppet adjusting screw jam nut on the end of the gear opposite the input shaft. Turn the adjusting screw counterclockwise while holding the jam nut with an open end wrench until the pressure gage reads pump relief pressure. The driver should still be pulling hard on the steering wheel at full turn.



Turn adjusting screw in

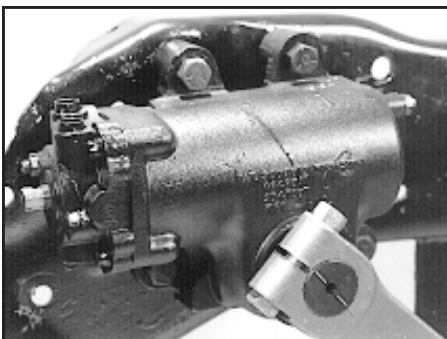
5. Slowly screw in the poppet adjusting screw just until the gage shows a reduction in pressure, then turn it in two additional turns. Tighten the jam nut.

Test this poppet to confirm it is set correctly by steering partially back toward straight ahead and then into the full turn two or three times. Pressure should be 1000 psi or less for a single gear system, or 1500 psi or less for a typical gear/slave system. Flow should remain within normal ranges for the gear.



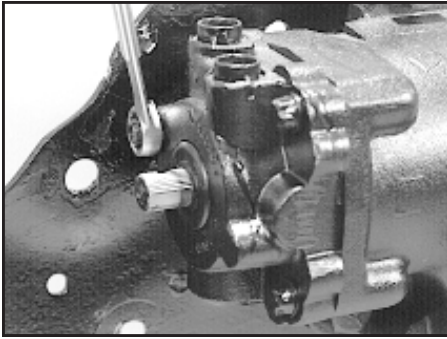
Torque jam nut

6. After confirming this poppet is set correctly, torque the jam nut to 30-34 lbf•ft.



Full turn opposite direction

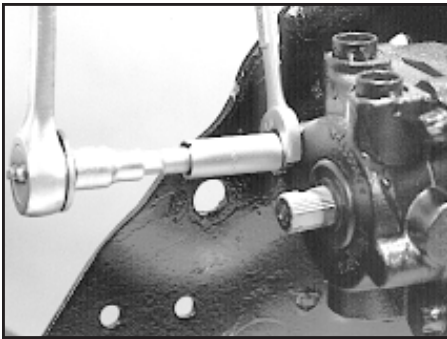
7. With the engine still at idle, turn the steering wheel to full turn in the opposite direction (output shaft timing mark moves toward the input shaft). Pull hard when the axle stop contacts the axle stop bolt.



Loosen upper poppet adjusting screw jam nut

- Loosen the poppet adjusting screw jam nut in the valve housing until the screw can be turned inside the nut and valve housing. Since this is a high pressure area, keeping the jam nut seal in contact with the valve housing will minimize leakage.

⚠ CAUTION	Do not attempt to remove the plastic plug in the poppet assembly. Severe external leakage will occur if the plug and internal set screw are removed.
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Loosen poppet adjusting screw

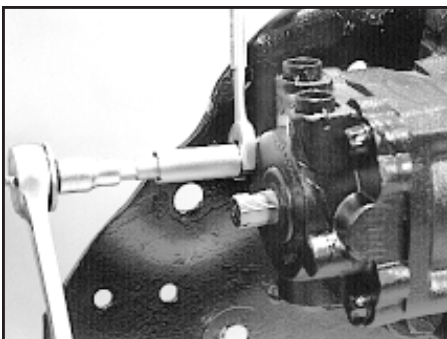
Use Apex. tool number U635* or similar tool to turn the poppet cartridge
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- Hold the jam nut with an open end wrench, and loosen the poppet cartridge, allowing no more than 1/2 inch of the screw to be exposed beyond the jam nut, until the pressure gage reads pump relief pressure. The driver should still be pulling hard on the steering wheel at full turn. See CAUTION below.

If the gage reads pump relief, go to step 10.

If you have turned out the poppet cartridge to the 1/2 inch maximum exposed thread and not yet reached pump relief pressure, the steering gear travel from center exceeds the adjustment range of the installed poppet cartridge. Install the shorter cartridge and repeat the procedure from step 7 with the engine at idle.

⚠ CAUTION	Exposing more than 1/2" of the poppet cartridge beyond the jam nut will cause internal leakage and may damage poppet cartridge seals.
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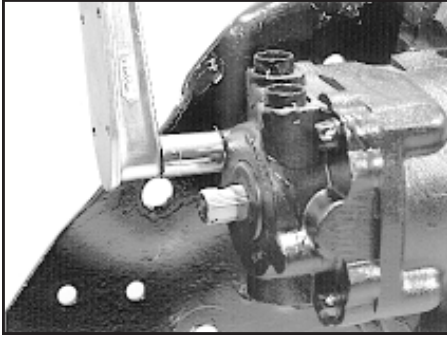
Turn in adjusting screw

- While holding the jam nut with an open end wrench, slowly screw in the poppet cartridge just until the gage shows a reduction in pressure. Turn the poppet cartridge in two additional turns and tighten the jam nut.

If the cartridge is turned in as far as it will go and pressure reduction has not yet occurred, the steering gear travel from center is not enough for the adjustment range of the installed poppet cartridge. Repeat the procedure from step 7 after installing the longer cartridge.

Test this poppet to confirm it is set correctly by steering partially back toward straight ahead and then into the full turn two or three times. Pressure should be 1000 psi or less for a typical single gear system, or 1500 psi or less for a typical gear/slave system. Flow should remain within normal ranges for the gear.

*Call Apex Division of Cooper Industries, Inc., customer service at (513) 222-7871 for a distributor near you.



Torque jam nut

11. If it is set correctly, torque the jam nut to 30-34 lbf•ft.

CAUTION

Proper torque value for the jam nut is essential. Under-torquing could cause leakage; over-torquing could fracture the poppet cartridge causing loss of power assist.



Refill reservoir

12. Check the fluid level in the reservoir and refill if required.