SERVICE WORK INSTRUCTION

SEAKEEPER GLYCOL SERVICE – 107

PRODUCT SEAKEEPER SERIES MODELS

PURPOSE

To provide instructions on the servicing of glycol coolant system of Seakeeper Series model stabilizers, excluding Seakeeper single-cylinder integrated manifold models. See SWI-207 for those models' glycol service.

BACKGROUND

Disassembly or many hours of operation are some reasons for loss of glycol coolant volume. Also reference Document 90426: Seakeeper Scheduled Maintenance Plan.

Current model Seakeepers use a heat exchanger design with a separate reservoir and an on-demand DC-powered seawater pump. These systems present new challenges in servicing the Seakeeper coolant systems and are addressed here.

NOTES/PRECAUTIONS

1. **PERSONNEL INJURY MAY RESULT** if Seakeeper is unlocked and not at zero RPM before removing covers or accessing unit for service.
2. **PERSONNEL INJURY MAY RESULT** if attempting to perform maintenance on Seakeeper without removing flywheel motor power and applying lockouts due to remote start capabilities.
3. **PUMP DAMAGE MAY OCCUR** if glycol pump operated while dry.
4. Even after extensive venting efforts, **some air may still be seen in coolant**; this is normal and acceptable. The presence of air is evident by cloudiness in the fluid. If coolant level remains at fill level during operation, the cloudiness is not an issue.
5. When replacing hoses, wetting hose end internals with glycol solution makes installation easier.
6. It is allowable to drain glycol system using a wet-dry vacuum to assist in removal. This is acceptable if coolant override is deactivated first.
7. **Some overflow may still occur** because of thermal expansion during large temperature changes. This is acceptable if the proper fill level is maintained.

REFERENCES

- Applicable model Cooling Water Schematic drawing
- Applicable model Cooling Sub-system or Top Level Assembly drawing

PROCEDURE

SECTION 1: FILLING A RESERVOIR

Use this section to top-off a Seakeeper reservoir on all models. No flushing or venting is performed in this section.

SECTION 2: PERFORMING MAINTENANCE ON MODEL WITH INTEGRATED HEAT EXCHANGER/RESERVOIR

Use this section for servicing glycol coolant system on a Seakeeper equipped with a thermostat housing. This includes flushing and venting system if emptied for maintenance.

Example of early Seakeeper 6 integrated heat exchanger / reservoir

Example of early Seakeeper 2/3 integrated heat exchanger / reservoir

SECTION 3: PERFORMING MAINTENANCE ON MODEL WITH SEPARATE RESERVOIR

Use this section for servicing glycol coolant system on late model Seakeeper with separate reservoir and no thermostat housing. This includes flushing and venting system if emptied for maintenance.

SECTION 4: SERVICING CONTAMINATED SYSTEM

Use this section for servicing Seakeeper with contaminated glycol coolant system. This section includes flushing and venting the glycol coolant system.

SECTION 5: SERVICING OVERFLOWING RESERVOIR IN LATE MODEL SEAKEEPER

Use this section for servicing Seakeeper with a separate reservoir experiencing frothing and overflowing issues. No flushing is performed in this section.

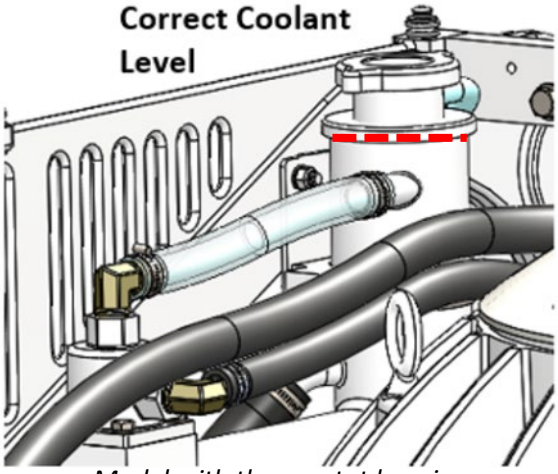
EQUIPMENT/SUPPLIES

4 - 6 feet of ½ inch hose	½" hose barb cap
½" Hose clamp	Small container/plastic bag
½" (12.7 mm) hose mender	Cable ties
½" T-Fitting (if for Seakeeper 35/40)	Funnel
Straight slot screwdriver or hex driver for hose clamps	Large bucket, two or three, 5 gal (20 L) preferred
Phillips Screwdriver	Pre-mixed 50/50 water and ethylene glycol coolant mix (automotive or marine grade), 2 to 3 gallons

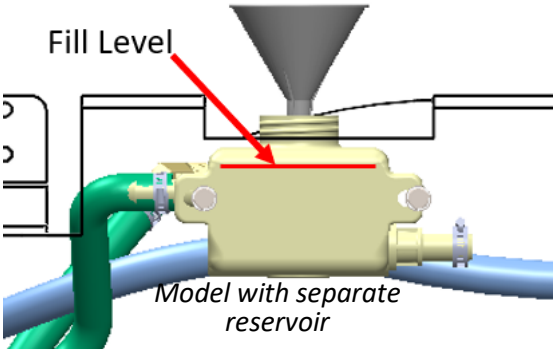
SECTION 1: FILLING A RESERVOIR

1. **REMOVE** cap from glycol reservoir.

2. **ADD** new 50/50 coolant mix to reservoir fill line shown.



Model with thermostat housing and integrated reservoir



Model with separate reservoir

3. **PLACE** cap on reservoir securely.

SECTION 2: PERFORMING MAINTENANCE ON MODEL WITH INTEGRATED HEAT EXCHANGER/RESERVOIR

1. **INSPECT** Seakeeper for glycol coolant leaks.

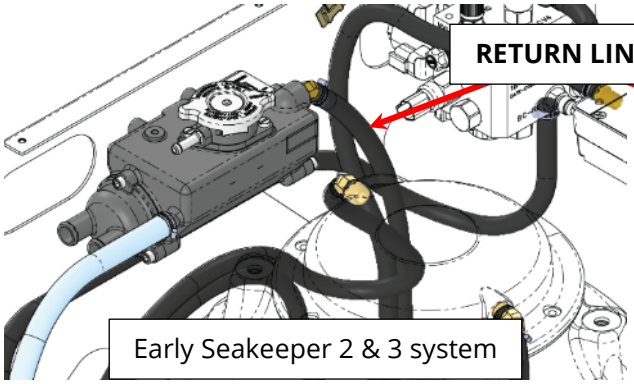
   a. **REPAIR** leaks if found.

2. **REMOVE** cap from glycol reservoir.

NOTE:

Thermostat housing has both a clear hose and a black ½" diameter hose connected to hose barbs on housing.

3. **LOCATE** glycol return line to reservoir or thermostat.

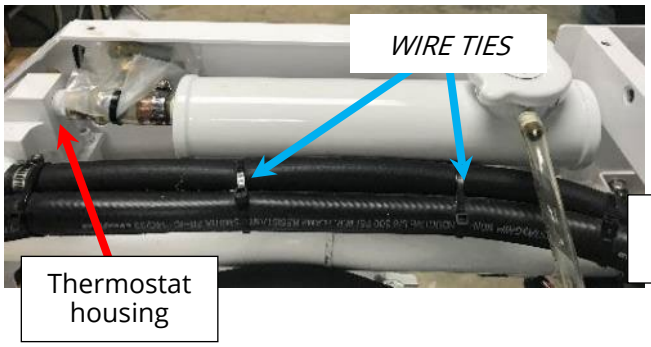


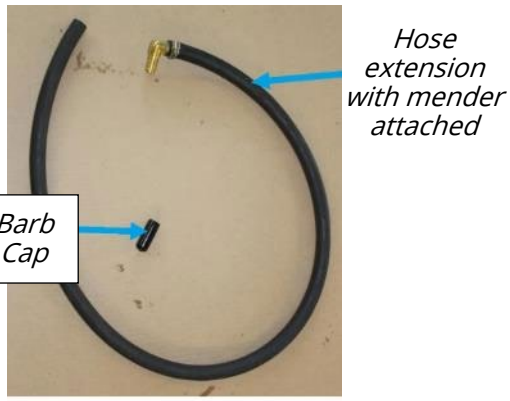
Early Seakeeper 2 & 3 system

Early Seakeeper 6 shown.

4. **CUT** wire ties securing black glycol return hose to reservoir or thermostat housing.

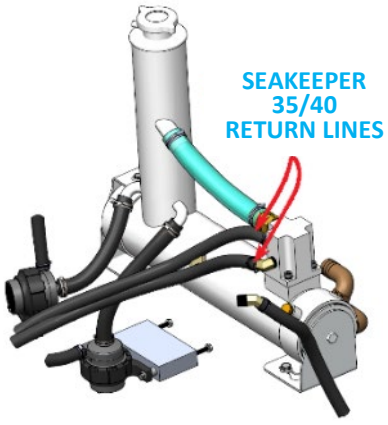
5. **INSERT** hose mender into 4–6-foot length of ½" hose and secure with hose clamp.





6. **PLACE** bag under black glycol return hose connection to contain any glycol that drains.

7. **LOOSEN** hose clamp securing return hose. [**NOTE**: Seakeeper 35 and 40 have TWO return lines – **USE** ½" T-fitting for extender hose.]



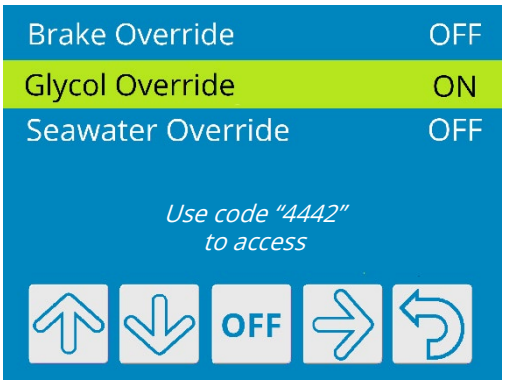
8. **REMOVE** black return hose from hose barb **AND PLACE** ½" rubber barb cap over hose barb.

9. **INSERT** ½" extender hose into return line(s) **AND TIGHTEN** return line hose clamp(s).

10. **PLACE** end of return line extender into empty large bucket.

11. **IF** performing contaminated system flush, **THEN RETURN** to section 4, step 3

12. **ACTIVATE** glycol override at display/MFD app.



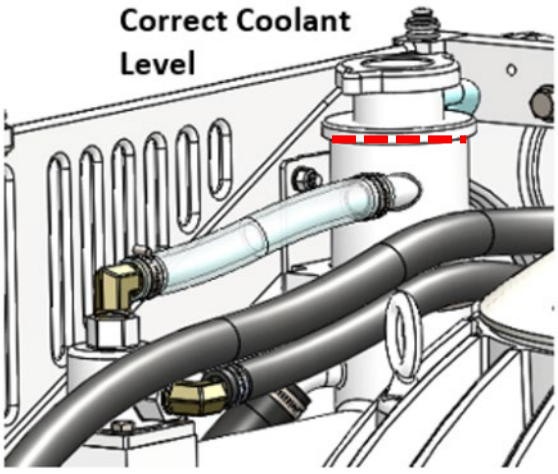
NOTE:

Pouring too quickly can lead to overflow.
Pouring too slowly can lead to air in glycol pump casing.

13. **ADD** minimum of two gallons of new 50/50 coolant mix into reservoir fill.

14. **WHEN** desired amount of fluid flushed, **THEN DEACTIVATE** coolant override at display/MFD app.

15. **ENSURE** glycol level just below filler cap neck.

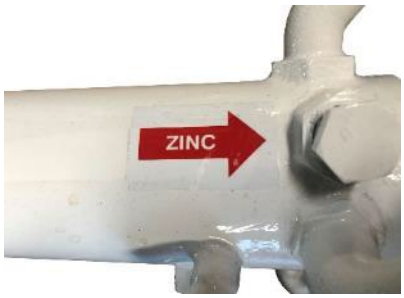


16. **REMOVE** return hose extension from return hose(s).
17. **REMOVE** barb cap from hose barb on thermostat housing.
18. **RE-ATTACH** return line to barb of thermostat housing **AND TIGHTEN** hose clamp.
19. **REPLACE** wire tie(s) securing return line(s), if removed.

NOTE:

Zincs are often identified by red arrow decals pointing to them on heat exchanger body.

20. **IF** desired, on models equipped, to inspect/replace zinc anodes, **THEN:**
    a. **IF** vessel in water, **THEN:**
        i. **SHUT** seacock valve servicing Seakeeper.
        ii. **DRAIN** seawater from system via inlet strainer.
    b. **REMOVE** zinc anodes from heat exchanger.
    c. **REPLACE** zinc anodes depleted 50% or greater.
    d. **ENSURE SHUT** inlet strainer drain, if opened for draining seawater.
    e. **OPEN** seacock, if closed for draining seawater.



CAUTION:

GLYCOL LEVEL SHOULD NOT BE ALLOWED TO DROP TO RESERVOIR OUTLET TO PREVENT RUNNING GLYCOL PUMP DRY.

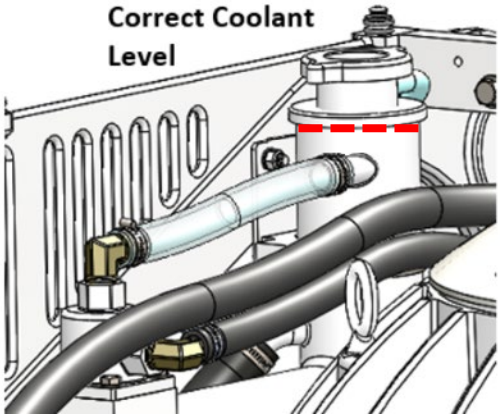
21. **VENT AND FILL** coolant system as follows:

    a. **ENSURE** glycol level at fill line shown.

    b. **ACTIVATE** glycol and brake overrides.

    c. **PRECESS** sphere manually fully back and forth **6 times** to remove air trapped in cooling jackets and associated hoses.

    d. **ADD** glycol as necessary to fill system.



22. **INSTALL** reservoir fill cap.

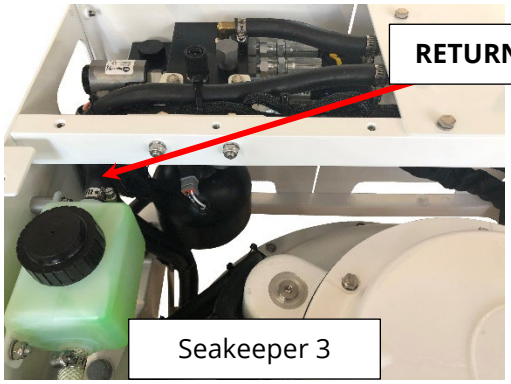
23. **DEACTIVATE** glycol and brake overrides.

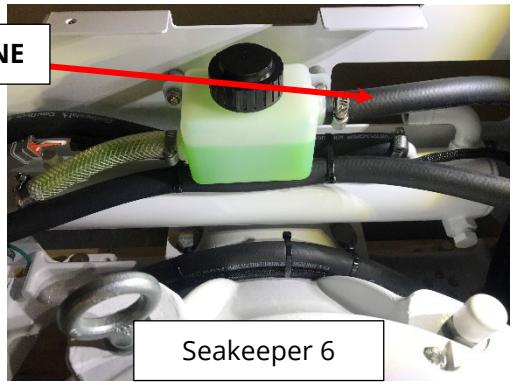
24. **REPLACE** any cable ties cut with new ties.

25. **REINSTALL** cover panels if removed.

SECTION 3: PERFORMING MAINTENANCE ON MODEL WITH SEPARATE RESERVOIR

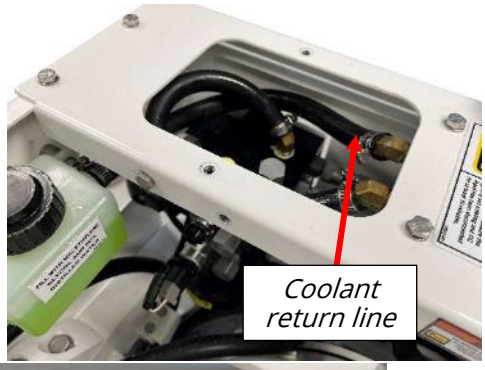
1. **INSPECT** Seakeeper for glycol coolant leak.
   a. **REPAIR** leaks found.
2. **REMOVE** cap from glycol reservoir.
3. **LOCATE** glycol return line to reservoir. [Return is higher of two lines attached to reservoir]





4. **CUT** cable ties securing black glycol return hose to reservoir, if necessary.

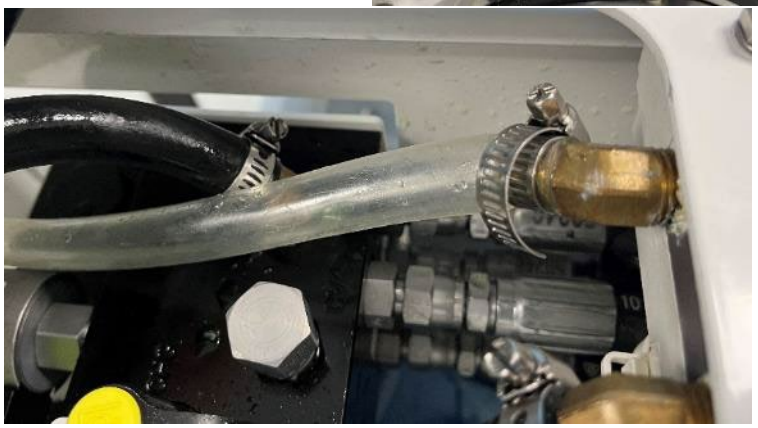
5. **IF** Seakeeper 2,
THEN:



a. **PLACE** bag or rag(s) under return line at motor drive.

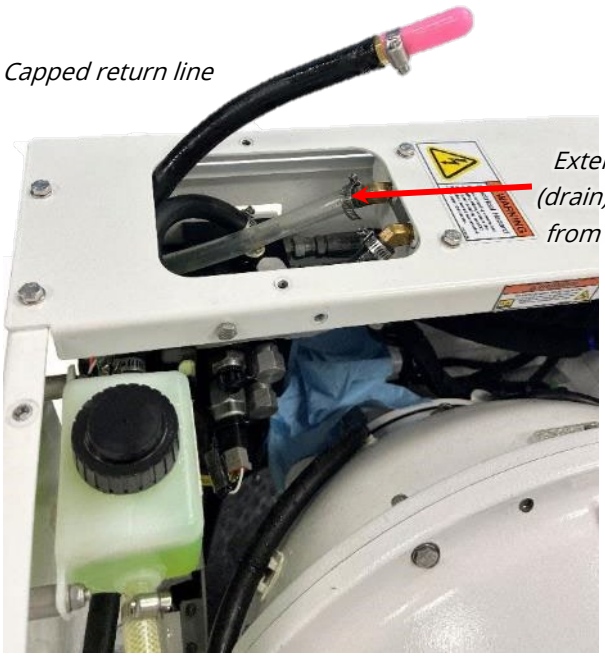
b. **REMOVE** return line from motor drive.

c. Through opening at brake manifold, **ATTACH** ½" extender hose to motor drive barb with hose clamp.



d. **PLACE** mender barb of extender hose into black return line just removed from drive.

e. **PLACE** cap over mender barb**.**



6. For all other models, **PERFORM** following:

   a. **INSERT** hose mender into 4-6 ft length of ½" hose and secure with hose clamp (hose will be used as a return line extender).

   b. **PLACE** bag or rags under black glycol return hose connection at reservoir to contain any glycol that drains.

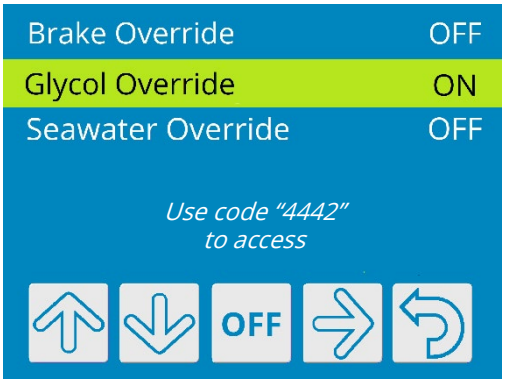
   c. **PLACE** barb cap over reservoir return line barb.

   d. **INSERT** extender hose with mender into return line.

7. **DIRECT** extender hose to large bucket.

8. **IF** performing contaminated system flush,
   THEN RETURN to section 4, step 3.

9. **ACTIVATE** glycol override at display/MFD app.



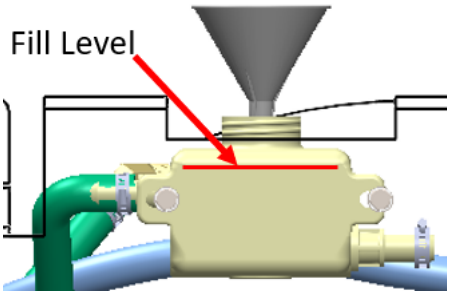
NOTE:

Pouring too quickly can lead to overflow.
Pouring too slowly can lead to air in glycol pump casing.

10. **ADD** minimum of two gallons of new 50/50 coolant mix into reservoir fill.

11. **WHEN** desired amount of fluid flushed,
THEN DEACTIVATE coolant override at display/MFD app.

12. **FILL** reservoir to fill level line shown.



13. **RESTORE** system hoses as follows:

    a. For Seakeeper 2:

        i. **REMOVE** extender hose from motor drive outlet.

        ii. **RECONNECT** return line to motor drive outlet **AND TIGHTEN** hose clamp.

    b. For all other models:

        i. **REMOVE** return hose extender and barb from reservoir return line.

        ii. **RECONNECT** reservoir return line to reservoir **AND TIGHTEN** hose clamp.

    c. **REPLACE** any cut cable ties to secure return line.

CAUTION:

GLYCOL PUMP DAMAGE WILL OCCUR IF OPERATED DRY.

14. **VENT AND FILL** glycol coolant system as follows:

    a. **IF** system emptied,
    THEN:

        i. **PRIME** glycol pump by removing pump discharge line from first heat load.

        ii. **OBSERVE** reservoir level.

        iii. **IF** reservoir level dropped,
        THEN ADD new 50/50 coolant mix to restore level.

        iv. **RECONNECT** pump discharge line to first heat load.

    b. **ACTIVATE** glycol and brake overrides.

    c. **MANUALLY PRECESS** enclosure fully minimum of **six (6) times AND ADD** coolant mix as necessary.

    d. **RUN** glycol pump an additional **five (5) minutes** to allow frothing to dissipate **AND ADD** coolant mix as necessary.

    e. After five-minute run, **ENSURE** level at fill line in reservoir.

15. **INSTALL** reservoir fill cap.

16. **DEACTIVATE** glycol and brake overrides.

17. **REINSTALL** cover panels if removed.

SECTION 4: SERVICING CONTAMINATED SYSTEM

1. **IF** Seakeeper equipped with thermostat housing,
   THEN PERFORM steps 1 through 11 of Section 2 to attach return line extender hose **AND CONTINUE** to step 3 in this section.

2. **IF** Seakeeper **not** equipped with thermostat housing,
   THEN PERFORM steps 1 through 8 of Section 3 to attach return line extender hose **AND CONTINUE** to step 3 in this section.

3. **IF** coolant blockage suspected,
   THEN:

   a. Moving from glycol pump discharge, **REMOVE** coolant hose on outlet of each load in coolant loop.

   b. **DIRECT** outlet hose to container (use extender hose if needed) **AND ACTIVATE** glycol override to check flow.

   c. When blocked heat load found, **CLEAR** blocked component with freshwater flush or wet-dry vacuum.

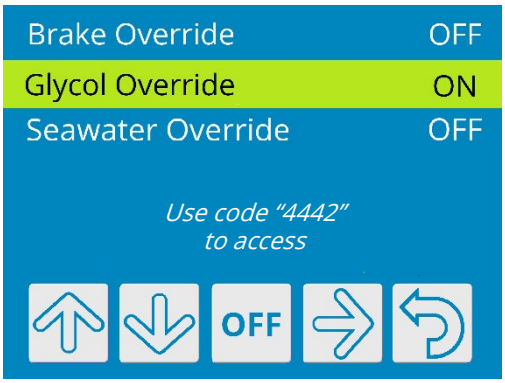
   d. **IF** coolant blockage suspected in water jackets,
   THEN REMOVE water jackets per SWI-132 **AND CLEAN** surfaces.

4. **OBTAIN** source of freshwater (freshwater hose from pier or large bucket of water).

CAUTION:

GLYCOL PUMP DAMAGE WILL OCCUR IF OPERATED DRY.

5. **ACTIVATE** glycol override.



6. **ADD** minimum of three (3) gal. (20 L) of freshwater to flush contaminated coolant.

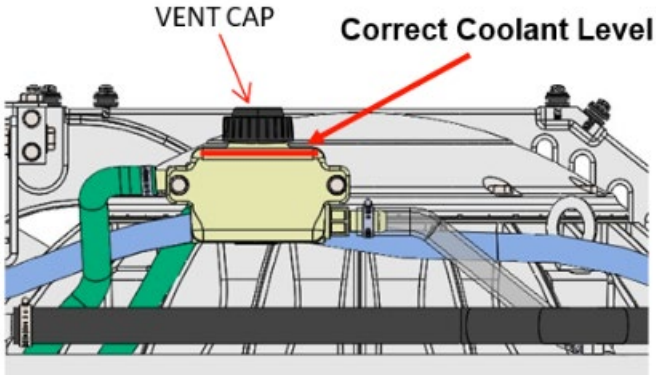
7. **DEACTIVATE** glycol override.

8. **IF** Seakeeper equipped with thermostat housing,
   THEN VENT AND FILL coolant system per section 2, steps 15 through 24.

9. **IF** Seakeeper **not** equipped with thermostat housing,
   THEN VENT AND FILL coolant system per section 3, steps 12 through 17.

SECTION 5: SERVICING OVERFLOWING RESERVOIR IN LATE MODEL SEAKEEPER

1. **REMOVE** reservoir fill cap.
2. **CHECK** reservoir level per image.



NOTE:

Reservoir level may drop as air is vented from system while glycol override activated.

CAUTION:

GLYCOL PUMP DAMAGE WILL OCCUR IF OPERATED DRY.

3. **IF** reservoir level below correct coolant level,
   THEN:
   a. **ADD** 50/50 coolant mix to fill to correct level.
   b. **ACTIVATE** glycol override to circulate and remove air from system.
   c. **ADD** additional coolant mix, as needed, to maintain reservoir level.
   d. **PERFORM** following to ensure all air removed:
      i. **CYCLE** glycol override off and then on.
      ii. **IF** reservoir level drops,
      THEN ADD coolant mix **AND REPEAT** glycol pump run until no level drop observed.

NOTE:

If proper fill level maintained, reservoir overflow is minimized.

4. **RUN** glycol pump an additional **five (5) minutes** to allow frothing to dissipate **AND ADD** coolant mix as necessary.

5. **INSTALL** reservoir fill cap.

6. **REINSTALL** covers if removed.

********** END **********

REVISION	DESCRIPTION	APPROVAL	DATE
1	Initial release	K. Zervas	25JUN2019
2	Added content for separate reservoir modifications. Minor edits. Added details for zinc inspection/ replacement. Added precautions.	A Patricio	19AUG2022
3	Separated procedure into sections to cover each type of coolant system found in Seakeepers.	A Patricio	24FEB2023
4	Seakeeper 40 release	A Patricio	13APR2023
5	Added reference to SWI-207 for single-cylinder models. Changed product applicability to Seakeeper Series Models. Included Seakeeper 40 in additional applicable steps.	A Patricio	07JUN2024