Technical Service Bulletin 110122

Paragon Oil Plumbing Upgrade Procedure

This Service Bulletin applies to early Comark Paragon transmitters equipped with rigid copper oil plumbing lines, see left picture below. The current Paragon product now features the braided hose and larger oil filter design that is based from the newer Arqiva Paragon Cabinet, see right picture below. The upgrade kit is offered packaged with a site visit from a Comark Field Engineer to perform the service with the proper specialty tools. Because of the degree of difficulty and the unique specialty tools, Comark highly recommends the packaged option. The purpose of this bulletin is to provide a brief guide to the installation of the Braided Hose/Filter Plumbing Upgrade Kit.

Early Paragon Copper Pipe Design

New Arqiva Braided Hose Design

Paragon Oil Plumbing Upgrade Procedure	
Applicability	All early Comark Paragon transmitters with rigid copper lines and the white smaller oil filter assembly.
Prerequisites	Fully read and understand this bulletin before attempting procedure.
Equipment Required	Comark Paragon Plumbing Upgrade Tool Kit: 2” Open-end torque wrench set at 170 ft lbs., several jumbo combination wrenches (1-5/8”, 1-3/4”, 2”, 43MM), two 24” and one 12” adjustable wrenches. Ridgid 31125 #18 aluminum offset pipe wrench, Ridgid E110 hex wrench, oil filter wrench, and cheater pipe. (Rental of this tool kit is available through Comark Customer Service). Standard hand tools, torx drivers (T15, T25), 10mm socket, 1/4” three inch extension and ratchet, heat gun, small pail or food storage container, paper towels, oil absorbent pads, Scotch-Brite, and a wire brush.
Comments	HPA must be off line with the AC power off. Reference SB031207

1. Ensure that HPA is off line in STOP MODE and once the three-minute cool down is complete, remove the A/C power by the Service Disconnect or turn off Circuit Breakers CB1-CB4 on the upper left front panel of the HPA. Force the HPA UPS off (hold power button in, starts beeping when the power is off). UPS is located in the back on the left side of the HPA Control Cabinet. Consult Installation drawing plumbing schematic to determine if the HPA cooling system if going to turn off or if it will continue to run because of other loads (combiner or system load) or if there is another HPA in the cooling loop.

   NOTE: It is not necessary to turn off the glycol coolant valves because this bulletin only addresses the oil coolant side of the oil/water heat exchanger.

2. Remove the breather and place upright in a safe place. Plug hole with a paper towel to protect the oil reservoir.

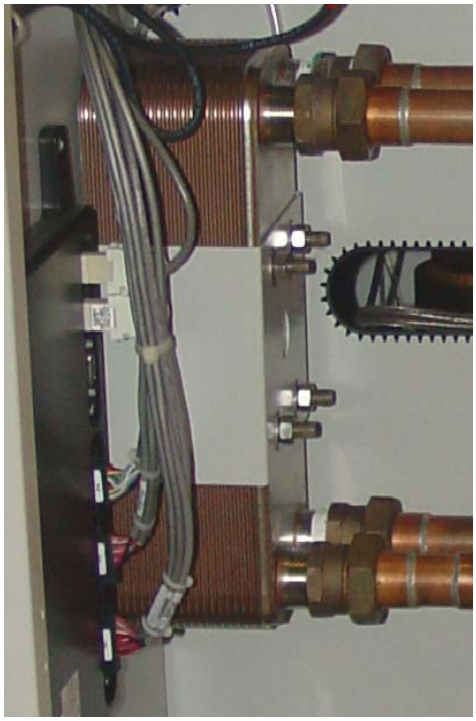
   NOTE: Replace the clear breather if it is contaminated with oil or the desiccant has expired (use color indicator on breather, typically gold when new to green or dark green when expired). If it is the older metal type, it is long past the replacement period and you will need to purchase the adapters in order to use the newer clear breather. Order 609116-01 and 609117-01 adapters (one time) and 609115-01 (breather) from Comark Customer Service.

3. Remove the cavity airflow filter box. Use 10 mm socket, extension and ratchet to remove two nuts and use a tie wrap to tie off on the water coolant valve handle near the cavity blower so that it as out of your way. Put the nuts aside to reuse later.
4. Disconnect the P2 “OIL IN TEMP” sensor (below right, between oil and air filter). Do this now so you don’t forget later and break the sensitive sensor and cost you down time waiting for a replacement.

Paper towel in vent

Cavity Air Flow Filter Box

5. Place an oil absorbent pad or a thick layer of paper towels on top of the oil pump motor to ensure that no oil could get into the motor vents.
6. Loosen the top outside union on the Water/Oil Heat Exchanger (HX) to allow air in so that the oil can drain into the tank. You may also want to move the right low pass filter mounted to the black load to allow for more room for the large wrenches. Use a small screwdriver to pry open the gray plastic clamps and move out of the way.



Water/Oil Heat Exchanger

Cavity Blower Air Filter, RF filter and Upper HX pipe Tied Off

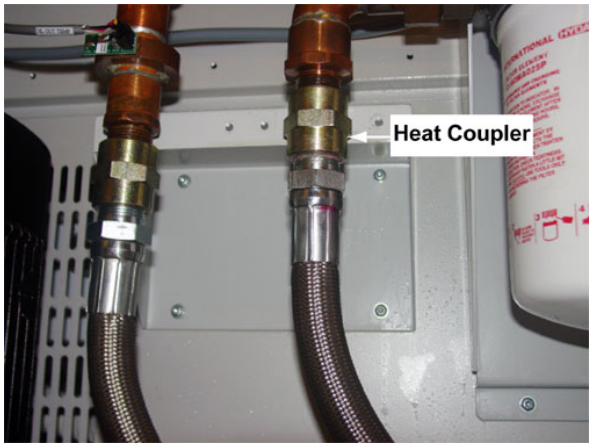
7. Loosen filter output union to allow air in.
8. Remove lower stainless band-type clamps and the plumbing bracket assembly with a T25 Torx driver.
9. Remove filter output union half and drain hose into a small pail or food storage container place on the floor below the oil tank to allow oil to drain out. Put union loosely back on to allow some time for the oil to drain back toward the IOT in preparation for removal of the entire oil filter output pipe assembly in the next step.
10. Place a fresh, clean oil pad or a thick layer of paper towels, or some cardboard to protect the oil tank finish between the vent and oil return, a board or piece of wood may be a better choice. This will be the area that the heated joint will be loosened. Carefully heat the joint with a heat gun to loosen the old pipe dope while still attached to the filter housing (see arrow in photo). Once heated, loosen the union and place hose and filter output on the oil tank and while still hot, remove the filter output piece from the IOT

braided hose using the two large adjustable wrenches. Note: Whenever using adjustable wrenches, wiggle the wrench while turning the thumbscrew to get the maximum grip.

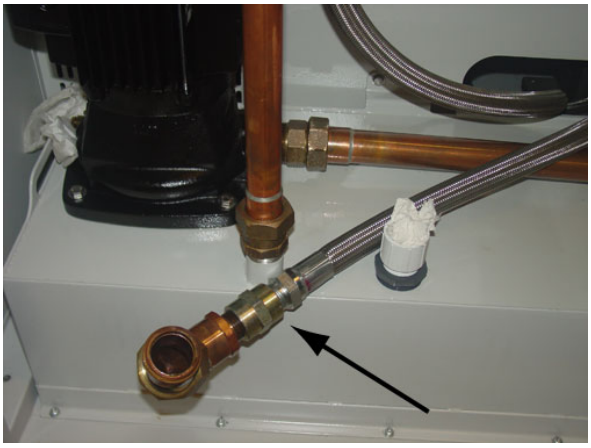
WARNING: Please take proper precautions and exercise care around the heat and the presence of paper, cardboard and oil.

11. Clean the male end of the IOT braided hose with a wire brush being careful not to get any contaminates into the end of the hose.
12. Finish loosening the upper HX union and use a tie wrap to tie off as shown above.

NOTE: If the upper HX union has not leaked, it is your choice whether you want to disturb it or may want to mark it so it gets oriented the same way before removing to apply the Teflon sealant.



Heat Coupler



Remove Coupler from Hose

13. Loosen the bottom outside HX union and the other end where it drains into the tank. Remove the two union halves from the HX and the oil tank (may require heat to remove). Clean threads with wire brush, careful not to get any debris into the oil system (wadded paper towels may provide insurance, carefully remove when assembling).
14. Loosen unions on the filter input and the union on the pump assembly.
15. Remove pipe and be careful of the oil temperature sensor. Remove with a T15 Torx driver and set aside in a safe place.

NOTE: Oil temperature sensor may be stuck on the soft copper. Simply place a large slotted screwdriver on the heat sink and give it a careful “tap” to free it.

All parts removed, ready to re-assemble.

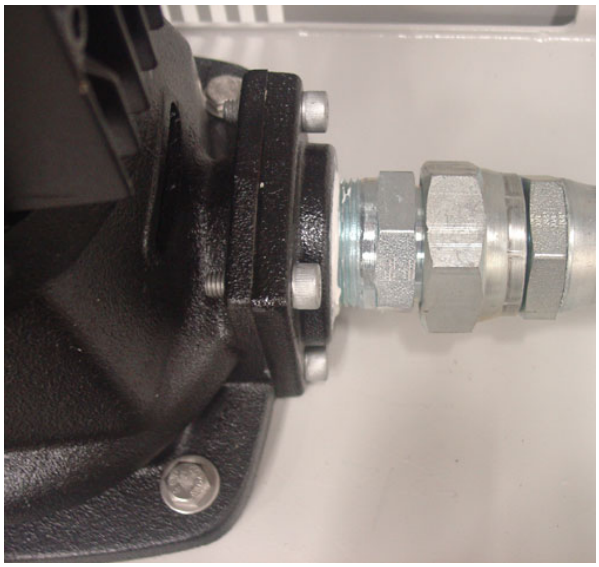
16. Remove the old filter bracket and wipe down area for the two new brackets. Install the new oil filter bracket and the new plumbing bracket using four new (4) T25 Torx screws for each (provided). Install the plumbing bracket clamps using the (2) 3/8-16 X 5/8 S/S bolts, locks, and flat washers from the back and an additional flat on the front between the bracket and clamp finger tight. They will be tightened later in the procedure.
17. Install new oil filter (spin on) housing using four (4) 3/8-16 X 5/8 S/S bolts, locks, and flat washers. For proper orientation, the arrows on the housing and on the flow tube should be pointing to the left (towards the oil pump assembly). Tighten using a 9/16” wrench. Use Lock-Tite thread locker if available.
18. Use Scotch-Brite to buff the mating surfaces of the brass union. Apply Teflon thread sealant liberally on the male threads of the brass union and hand tighten into the left side (output) of the filter housing. Repeat for the male/flare nipple and hand tighten into the right side (input) of the filter housing. Mark lines on the union and nipple so that you will know that you turned it two (2) full turns in the step 21.
19. Apply Teflon thread sealant on the male end of the IOT braided hose and install the replacement oil filter output piece to it. Tighten and orient it so that it will go back on the replacement oil filter assembly to be installed.
20. If available, use a little amount of copper-based anti-seize compound on the mating threads of the union. Loosely install the filter output assembly so that the brass union is

hand tight and then back off a turn so that it will not bind up while tightening it up in the next step. Installing it now is a precaution in case the brass union distorts as it gets tightened.

21. Use the 1-3/4" box end on the left side (brass union) and the 43 mm box end on the right side and at the same time tighten both so that the opposing torque helps minimize the pressure on the oil filter bracket (left wrench goes down as the right wrench goes up). There may be some metal screeching noise, but this is normal. Turn both two complete turns from hand tight.

NOTE: Two complete turns after hand tight is a guide that we use in Production. It is important to get the connections as tight as possible (cold) without damaging the plumbing components whether it is more than two turns or less which is very unlikely.

Arrows pointing the left (output)



Male/flare nipple into the oil pump assy.

22. Verify that the pump output flange bolts are tight. Use a 6 mm hex bit socket or hex (Allen) wrench.
23. Apply Teflon thread sealant liberally on the male threads of the other male/flare nipple and hand tighten it into the pump assembly output and tighten using the 43 mm wrench.
24. Apply Teflon thread sealant liberally on the male end of the outer bottom HX nipple. Install the female/flare nipple and tighten using the 43 mm wrench. Care must be taken to make sure that the heat exchanger does not get damaged while applying pressure.
25. Apply Teflon thread sealant liberally on the male end of the tank return nipple. Install the female/flare nipple and tighten using the 43 mm wrench.
26. Install the red Flairtite seals on all of the tapered male ends and on both male ends of the swivel nut elbows.

Red Flair-tite seals on tank return and pump flange tapered male ends

27. Install one swivel nut elbow on the shorter (25”) hose and connect the female elbow end to the HX tapered male end and the other end on the tank return tapered male end. Tighten all three swivel nuts to 170 ft. lbs. using the 2” open end torque wrench and 43 mm open end wrench to hold male side to avoid putting a “twist” in the braid.
28. Install the other swivel nut elbow on the longer (28”) hose and connect the female elbow end to the filter housing (input) tapered male end and the other end on the pump assembly output tapered male end. Tighten all three swivel nuts to 170 ft. lbs. using the 2” open end torque wrench and 43 mm open end wrench to hold male side to avoid putting a “twist” in the braid.
29. Install the larger left pipe clamp (1-1/4”) by removing the screw and putting safely aside. If available, put Lock-Tite thread locker in the threaded part of the clamp. Place the 3/8-16 X 5/8” bolt on its head and place a 3/8 lock and a flat on it and hold it behind the bracket and push it through the left slotted hole. Place a 3/8 flat on the bolt protruding through the bracket. Open up the clamp and slide it on the pipe and turn the bolt until it catches the clamp. The clamp assembly order is Bolt, Lock, Flat, Bracket, Flat, clamp. Close the clamp and put the screw back in and tighten the clamp and tighten. Tighten the 3/8” bolt with a 9/16” wrench.

30. Repeat the above steps with the smaller (1”) clamp on the right side. Snug up the union while tightening the clamp. Use the two 24” adjustable wrenches to tighten the brass union tight.
31. Install the cavity airflow box using the nuts that were set aside earlier. Tighten using the 10 mm socket, extension and ratchet.
32. Install the new oil filter. Apply a few drops of new oil on the o-ring and twist on. Turn until it contacts the housing and turn it ½ turn with the oil filter wrench.
33. Install the temperature sensor and the screw in its new location on the output pipe of the filter using a T15 Torx driver.
34. Cut the tie wraps that contain the P2 “OIL IN TEMP” cable so that it can drop straight down to the right side of the oil filter bracket. “Thread” it behind the oil filter bracket so that the P2 connector end comes out on the left side and connect it back to the sensor.
35. Replace the cut tie wraps using the T25 torx driver and the new NNT7CT tie wraps in the kit.
36. Reinstall the desiccant breather.
37. Power up the HPA, turn on the UPS and set the date and time, reference Service Bulletin 031207.
38. Press the manual oil pump switch in momentarily “MANUAL PUMP RUN” to turn on oil pump for a short time, press it in again momentarily again to turn it off. Check oil level and add Alpha 2 oil as needed. Run for about 30 minutes to ensure all bubbles are gone and that there are no leaks.
39. Press the manual oil pump again to turn pump off. Bring HPA back on line into the reject load.
40. Check for leaks and retighten plumbing only if necessary. While it is best not to disturb any fitting that uses pipe dope, it may be necessary to further tighten to stop a leak.

Manual pump button

Upgrade Completed

41. Procedure Complete.

Here at Comark, we are constantly striving to improve the satisfaction of both our new and existing customers. Continually working to improve the reliability of the installed fleet of Comark transmitters in the field is another way in which we demonstrate our commitment to you, our valued customer.

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