

DOCUMENT	422 COOLER UPGRADE SINGLE PLATE COOLER WITH DRAIN TO ATMOSPHERE COOLING CIRCUIT
MACHINE/ GROUP	422 SANDVIK JUMBO
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Background

Tube coolers are inherently inefficient, and are lower pressure rated in comparison to plate coolers. Water through the cooler is also subject to inconsistent flow and pressure spikes due to the cooler flow being within the mine water and machine Drilling/flushing path.

Installing a 40-bar single plate cooler which accepts oil from both boom return circuits on jumbo, or main return on Simba, allows the cooler to be removed from the flushing circuit offline.

OFFLINE COOLING UPGRADE - Water is supplied by 2 metering taps pre cooler, firstly from a constant post water pump supply.

Jumbo - OPTION additional cooling from Boom 1 flushing block B PORT (flushing is not active).

SIMBA - secondly from the temperature-controlled shunt valve.

The flow passes from the taps (restriction) to the cooler at approx. 20Lpm per tap, then flows unrestricted through the cooler to ground. Ensuring no more than 1 bar water pressure is ever present within the cooler.

This greatly reduces electrolysis to the cooler and hoses, removes large water hoses from the carrier, as well as ensuring no water deluge into return oil should the cooler eventually fail from corrosion.

In the event of a corrosion related cooler failure, when the machine is turned off and water is left on there may be a small bleed of water to oil.

MOUNTING – various machines

E70S -The single cooler is mounted at the now vacant P2 Electric Motor well.

S SIMBA - The cooler is mounted above the hydraulic tank, with an adapter bracket to mount the OEM manifold where the existing tube cooler was mounted.

DD421 - A single cooler is mounted at the rear on a custom bracket in place of the tube coolers.

DD422 - A single cooler is mounted next to the right power pack on a custom bracket (boom 2) in place of the tube coolers

Note - The OEM plate cooler or tube cooler do not have sufficient surface area to function as an offline cooler. G Cunningham.

Important - Follow all site standard safety requirements including supporting booms on rated safety stands, lifting and slinging procedures, isolations and always use the correct equipment for the task.

Hose List

Hose Label	Part Number	Description	Specification – JIC flare to flare
W130	MT30J0 30J0 115 920	Cooler to Tank (INCLUDED IN BUILD)	-24 fittings, -30 2 wire hose = 1150mm
W216	MT21J0 21J0 120 620	Water Pump to B1 (NOT INC)	-16 = 1200mm
W316	MT21J0 21J0 280 620	Water Pump to B2 (NOT INC)	-16 = 2800mm
W406	MT09J0 09J0 500 220	OPTION - Flushing Block B1 to Cooler Tap	-6 = 5000mm
W512	MT17J0 17J0 190 520	Cooler to Ground (NOT INC)	-12 = 1900mm
W606	MT09J0 09J0 065 220	Water T-piece B2 to Cooler Tap 2 (NOT INC)	-6 = ~650mm

Removal of Tube Coolers

1. Remove the left cooler and bracket.
2. Remove the pipe from the cooler to the top of the tank (not used) both sides. Cap LH side at tank, RH will be replaced with supplied -30 hose.
3. Remove the hose from the B1 return block under the cabin, to the tube cooler on B1. Keep this hose as it will be rerouted to the new offline cooler. B2 hose is moved to the new offline cooler inlet.



Pic 1

Install the B2 Plate Cooler

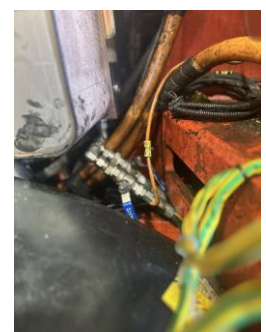
4. Fit the new mounting bracket plate to the original mounting position with bent section facing outward and back, to allow for cooler manifolds depth. Leave bolts loose to aid in adjustment.
5. Assemble the oil manifolds (these have 2 x 1½" ports) to the cooler outer top and bottom ports, as per *Pic 1*.
6. Ensuring side exiting 1½" ports are facing outwards as shown, with a 90 deg elbow fitted, as per *Pic 2*.
7. Fit the lower water manifold with -8 JIC to accept a T Piece and tap.
8. Fit the upper water outlet manifold with a ¾ BSPP to 1 1/16 JIC adapter.
9. Install plugs to the unused ports of the manifolds.
10. Temporarily remove AFFF line to aid in fitment and strap upwards out of the way.
11. Hang the plate cooler on the bracket with manifolds facing the engine (the stainless manifolds will take the weight of the cooler). Install the mounting straps to secure the cooler (do not over tighten). Then tighten bracket bolts to frame after adjusting.
12. Attach a ¾ JIC hose to the top cooler water outlet, run this to 300mm from the ground, without a hose tail on the open end.
13. Fit the tap to the lower cooler inlet as per *Pic 3*.



Pic 2

Water
inlet

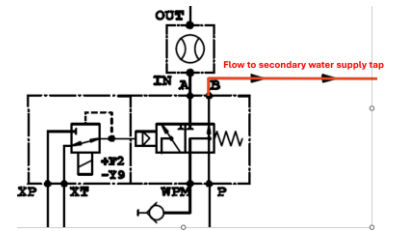
Oil
inlet



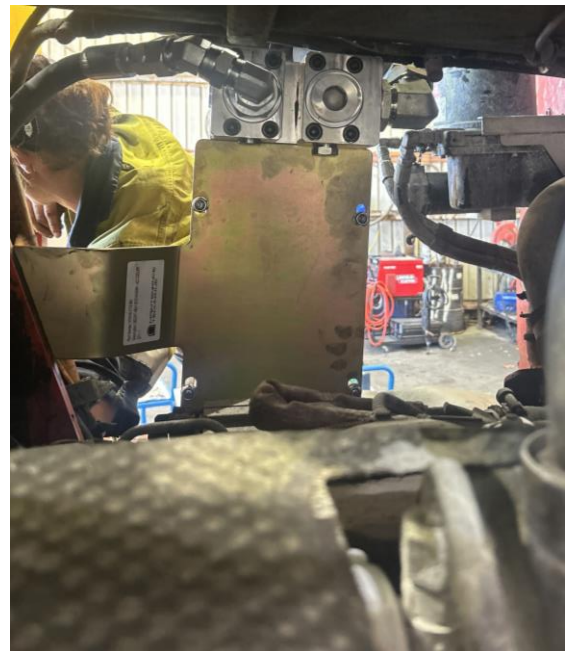
Pic 3

Hosing to the Cooler - Water

14. Remove both original water hoses which ran to the cooler supply, from the rear water manifold.
15. Make new -12 hoses from the rear water manifold and run forward to join to the original cooler outlet hoses. THE COOLER IS NO LONGER IN THE FLUSHING PATH.
16. **New cooler supply hose-** use a -12 JIC T piece to connect the new hose to the original cooler outlet on B2, install a reducer to -6 JIC. Run a -6 hose from this T piece to Tap 2 on the lower cooler manifold (cooler inlet constant flow)
17. **OPTION - B1 flushing manifold supply hose -** Connect the new hose with a JIC nipple to the original cooler outlet on B1, this runs forward to the flushing manifold
18. **Secondary cooler supply** – Remove the plug from the Boom 1 flushing valve port B and install a -6 JIC nipple. Run a 3/8 hose from this point to Tap 1 (additional cooling flow when flushing is off) on the cooler inlet. Shown in **RED**



19. **Cooler Outlet** - Make a -12 hose from the top water manifold (cooling outlet) and run down to a visible position in front of power pack, using a 90 degree and 45 degree elbow to raise the outlet as high as possible preventing drying and premature scaling of cooler. A fitting on the end of this hose isn't necessary. If blocked or restricted the cooler could be damaged.



Hosing to the Cooler - OIL

20. Rerun the B1 (under cabin) return manifold hose to follow similar path as the B2 return hose, both return hoses connect to the offline cooler inlet using a 1 7/8 T-piece and Elbow see image below, ensure hangers and straps are used where possible to prevent rubbing around the centre hitch and driveshaft.
21. Fit the supplied -30 return hose, from top of cooler to the tank inlet using 45 degree Elbow both ends as per image below.



Test the System

22. Start the machine and check for oil leaks
23. connect water to the machine and test constant water, as well as extra water which is active when B1 flushing is turned off.
24. Set both taps so they're two thirds open



ITEM	PART NUMBER	DESCRIPTION	QTY	COMMENTS
1	MT9106 0775 883	MOUNT STRAP	2	
2	MT9106 0775 885	PROTECTION	4	
3	MT9106 0775 884	COOLER MOUNT	1	
4	MT9106 0775 886	HEX HEAD BOLT	4	M12 x 250
5	MT0291 1112 00	LOCK NUT	4	M12
6	MT0301 2358 00	WASHER	4	12mm
	MT9106 0774 91	OIL COOLER		NOT INCLUDED

MT9106 0775 884
COOLER MOUNT

MT9106 0775 883
MOUNT STRAP

MT9106 0775 885
PROTECTION

MT9106 0775 888
COOLER MOUNT COMPLETE

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