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Date: <u>September 9, 2016</u>

Model: <u>BAE Hybrid Buses</u>

Approved:

Robert L. Birdwell, Executive Director Quality Control & Field Service

Subject: WP 29 Fill Procedure For BAE Hybrid Buses

This bulletin is to modify and clarify the coolant fill procedure on all BAE Hybrid Buses.

This bulletin includes EMP's Service Bulletin on this subject.

The fill procedure is changed to prevent 'dry run' of the EMP pump, PN 1030002225PA09.

Gillig will be sending a new Hybrid Radiator Fill/Drain Procedure placard, 59-70064-003, for each BAE Hybrid bus.

SERVICE BULLETIN

RLB:rlb

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Service Bulletin WP29 Fill Procedures for BAE Hybrid Systems on Gillig Buses



This service bulletin is effective for the following part numbers:

Part Number	
1030002225PA09	

Rev	Rev By	Date	Description of Change	Approved By
Α	JRB	9/7/2016	New Release	ECN4412



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BULLETIN OVERVIEW

The purpose of the Service Bulletin is to describe the required fill procedure required to prevent dry run conditions due to air entrapment.

Gillig fill instructions run the pump at 20% speed. EMP has shown that the pump running at 20% will not evacuate air from the inlet and the pump will operate but would not pump fluid at start-up. This results in damage to the shaft seals inside the pump.

Therefore the instructions must be updated to correct the fill procedure.



Figure 1 – Gillig MCP System

The information contained in this manual is updated periodically. While great care is taken in compiling the information contained in this manual, Engineered Machined Products, Inc. cannot assume liability for losses of any nature arising from any errors and/or omissions.

The information and specifications contained throughout this manual are up to date at the time of publication. Engineered Machined Products, Inc. reserves the right to change the content of this manual at any time without notice.



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INTRODUCTION

Purpose

The purpose of the Service Bulletin is to describe the required fill procedure required to prevent dry run conditions due to air entrapment.

Service Technician Responsibilities

The Service Technician is responsible to review the installation/service manuals and observe proper cautions prior to maintenance on any of the system components. In addition, the technician must also refer to vehicle documentation regarding the integration of the system into the vehicle and follow all Safety instructions before doing service and test procedures in this manual for the system or vehicle. Familiarization will allow for accurate troubleshooting, diagnosis and repairs.

Liability Disclaimer

EMP cannot anticipate every possible circumstance that might involve a potential hazard. The safety messages in this document, in related manuals, and on the product are therefore not all inclusive. If a tool, procedure, work method, or operating technique that is not specifically recommended by EMP is used, you must satisfy yourself that it is safe for you and for others. You should ensure that the product will not be damaged or be made unsafe by the operation, maintenance, or repair procedures that you choose.

Definition of Terms

LH = Left Hand RH = Right Hand TMC = Thermal Management Controller DLA = Data Link Adaptor R&R = Remove and Replace



SAFETY

Warnings, Cautions & Notes

Three types of headings are used in this manual to stress your safety and safe operation of the system. They appear in the text as follows:

WARNING: This symbol is used to make you aware of an unsafe condition, hazard, or practice that can result in personal injury or death.

CAUTION: This symbol is used to alert you to a condition or practice that can cause damage to the system or the vehicle, or both.

NOTE: Is used to provide additional information that requires special attention by the technician.

Product Safety Warnings

WARNING: EMP cannot anticipate every possible circumstance that might involve a potential hazard. The safety messages in this document, in related manuals, and on the product are therefore not all inclusive. If a tool, procedure, work method, or operating technique that is not specifically recommended by EMP is used, you must satisfy yourself that it is safe for you and for others. You should ensure that the product will not be damaged or be made unsafe by the operation, maintenance, or repair procedures that you choose.

WARNING: Ensure that all safety messages and information messages are read and understood before installation, maintenance, or any repairs are performed. The person servicing may be unfamiliar with many of the systems on the vehicle. It is important to use caution when service work is performed. Knowledge of the vehicle system and operation are important before the removal or disassembly of any component.

WARNING: Make sure the vehicle is in neutral, the parking brake is set, and the wheels are blocked before doing any work or diagnostic procedures on the EMP component, system, or vehicle.

WARNING: Disconnect the main negative battery cable and/or switch off the battery disconnect switch before installation or servicing.

WARNING: Use extreme caution when working on systems under pressure (i.e. coolant, hydraulic fluids, air, fire suppression, etc...)

WARNING: Make sure the work area is ventilated and well lit.

WARNING: Make sure charged fire extinguishers are in the work area.

WARNING: Reinstall all safety guards, shields, and covers after servicing the vehicle.

WARNING: Make sure all tools, parts, and service equipment are removed from the engine compartment and vehicle after all work is done.

WARNING: Ensure that all system power and ground connection points are torqued to EMP specifications to prevent system damage. Failure to follow specified torque requirements at any point of the vehicle system power and ground can result in loose connections which can damage electronic components on EMP components and systems and will void EMP warranty.



FILL PROCEDURE

Instructions for Fill/Drain Procedure

On subject buses the instructions shown in Figure 2 are provided for the Hybrid radiator fill procedure. The highlighted section regarding pump speed is being updated to prevent dry-run conditions due to air trapped in the system. Pump seal damage due to dry run conditions will not be covered under warranty.



Figure 2 – Instruction Placard on Vehicle

The following changes to the fill procedure are to prevent dry run conditions due to air entrapment:

- If the transit has vacuum fill equipment, EMP recommends vacuum fill as the preferred fill method.
- If not using vacuum fill, the pump speeds during fill procedure should be at max speed.
- Ensure the surge tank stays full during the fill procedure. This is important as the pump running at high speed will drain the surge tank very quickly.

NOTE: This requirement may require two people to conduct the fill procedure.

 It is possible to ensure the pump is pumping solid fluid by monitoring the current draw (>7 amps at Max speed)



To fill using the pump, the BAE Software is required.

1. Open IDS. See Figure 3.





2. Click HT06. See Figure 4.

BAE SYS	STEMS	RAF Systems HybriDri	HybriDriv
Bundle Release Versio	on	IDS Home Screen	Proposition 298
Health Pages		Overview Information	Event & Fault Information
	HT01 - Real Time Clock	VPMS HybriDrive & System Overview	SCU Active Event and Fault Page
	HT02 - Brakes, Accelerator, and Gear Selector	Documentation	PCS Active Event and Fault Page
	MT03 - System Temperatures	Documentation	APS Active Event and Fault Page
	HT04 - Lights and Other Misc. Outputs	HDS100/HDS200 System Manual	
	HT05 - ESS Traction Battery Status	HDS300 System Manual	ESS Active Event and Paul Page
	HT06 - MTS Cooling System Status	Health Test Manual	NEVIO and KUACED Outpact
	HT07 - ECP Cooling System Status	Software Download	The document
	HT08 - Interlock Status	CEM Software Download Page	ND0Q Support (Enable CAN A) Betwy for HEXID.
	WT09 - SCU-to-Engine Interface		The Scripts will automatically
	HT10 - APS Operational Status	OEM Health Pages	
	HT11 - Test Drive Performance Check	CEM HT Pages	
	WT12 - Performance Limiters		
	HT13 - Engine Off Status		

Figure 4 – IDS Home Screen

3. Click on MTS Cooling Override and drag slider to 100% while filling surge tank. See Figure 5.

BAE SYST	EMS			.6	Hane Screen
Health Test Manua	- +	ealth Test #06 - Modula	r Traction System Cooli	ng Test	Bat 🐼 Poward
System Information	Cooling System Costrols	MTS WEG Pump	MTS Lube Oil Pump	Oil Lovel/Pressure Built in test	ACTII Warmsp
ISG Temperature Fault	Turn on BDP and MDP	MTS WES Pump Comm Loss	MTS Lube Pump Comm Lose	Oil Lavel Test	The ACTH Warmup Operation is based
FRATES .		Faulted	Failed	To initiate Oi Level Test	2.) Vehicle in Neutral 3.1472 Luite OI Ruma Communication
DG Terpersture (DegC)	MTS Fan Neutral Gain 0 Scale deven fane inhen in Neutral	NTS WEGPunp Pault	MTS Lube OI Pure Fault	1.) Vehicle on Level Ground 2.) Master Run Switch is "ON" 3.) Press 'Begin On Level Test", Wat, 1.) Internet OIL Level Test Test Test Test	4.)MTS Lube Oil Femp 5.)ACTM Motor Speed
ACTH Temperature Pault		HTS WEG Fump Test Command	MTS Lube OI Pump Test Command	Level Test Complete shows 'Test Complete'	
Failel	Cooling System Testing	¢ 2 100	0 2 100		ACTIN Warmup Needed
CTM Tenperature (DepC)	MTS Cooling Override	Percent	Percent		01
	ON - CAUTION!	MTS WEG Pump Speed Command	MTS Lube OI Pump Speed Command	Initiate OI Level Test	ACTH Warmup Enabled
ACTH Speed (RPMs)	MTS WEG Fan Test Command	1.9853	1.9853 R/M	Of Level Test Active	Inables
	0 200 200	Current MTS V/EG Punp Speed	MTS Lube OI Pump Speed	Of Level Test In Progress	ACTM Warmo Fault
Engine	Percent	1.9053	1.9853	Tactive	Faled
R.mmg	MTS WEG Pan PVIM Command	NTC MEC Down Mean and Down	MTS Jube OI D. ms Measured Douer	OILEVEITEst Complete	
Selected Gear	1.9853	1.9853	1.9853	Test NOT Complete	
Drive		w	W	ACTINION Pressure Shirtch	
vence settery (vidc)	Package Fun Test	MTS Pump WDS Temperature -43,8456	HTS Loss OV Temperature	Of Pressure Normal	
1.9853	MTS WEG Fan Test Compand	Deg C	Deg C	Of Level Test Result	
	% Results 3.2 invalid on al-default	Modular Tracton System Cooling	MTSLube OI Temperature Fault	Palat	
	5 Meter RPM = 0 10 Meter RPM + Minimum	Package WEG Pump Test	Failer		
	90 Water RPM - Maximum 95 Reverse et Maximum RPM		The state of the local day of the	CAUTION: Ensure THT	S Cooling Overside" is
	95-100 Invalid; Ren at Default		Libe Purio Test	turned off before di	riving the vehicle.
daci 🥼					
Te Log 2					

Figure 5 – Cooling System Controls © 2016 EMP, Inc.



TECHNICAL HELP

Contact EMP Customer Service for technical help at 1-906-789-7497 or <u>service@emp-corp.com</u>.

Additional information about this product is located under the support tab of the EMP official website: <u>www.emp-corp.com</u>