

Instruction Sheet

A051X337 (Issue 1)

2-2015

RBAB Spec A-C to Spec D Control System Conversion Kit Installation

1 Introduction

The information contained within is based on information available at the time of going to print. In line with Cummins Power Generation policy of continuous development and improvement, information may change at any time without notice. The users should therefore make sure that before commencing any work, they have the latest information available. The latest version of this instruction sheet is available on QuickServe Online (<https://qsol.cummins.com/info/index.html>).

2 Safety Precautions

2.1 General Safety Precautions

WARNING

Hot Pressurized Liquid

Contact with hot liquid can cause severe burns.

Do not open the pressure cap while the engine is running. Let the engine cool down before removing the cap. Turn the cap slowly and do not open it fully until the pressure has been relieved.

WARNING

Moving Parts

Moving parts can cause severe personal injury.

Use extreme caution around moving parts. All guards must be properly fastened to prevent unintended contact.

WARNING

Toxic Hazard

Used engine oils have been identified by some state and federal agencies to cause cancer or reproductive toxicity.

Do not ingest, breathe the fumes, or contact used oil when checking or changing engine oil. Wear protective gloves and face guard.

WARNING

Electrical Generating Equipment

Incorrect operation can cause severe personal injury or death.

Do not operate equipment when fatigued, or after consuming any alcohol or drug

⚠ WARNING

Toxic Gases

Substances in exhaust gases have been identified by some state and federal agencies to cause cancer or reproductive toxicity.

Do not breathe in or come into contact with exhaust gases.

⚠ WARNING

Combustible Liquid

Ignition of combustible liquids is a fire or explosion hazard which can cause severe burns or death.

Do not store fuel, cleaners, oil, etc., near the generator set.

⚠ WARNING

High Noise Level

Generator sets in operation emit noise, which can cause hearing damage.

Wear appropriate ear protection at all times.

⚠ WARNING

Hot Surfaces

Contact with hot surfaces can cause severe burns.

Wear appropriate PPE when working on hot equipment and avoid physical contact with hot surfaces.

⚠ WARNING

Electrical Generating Equipment

Incorrect operation and maintenance can result in severe personal injury or death

Make sure that only suitably trained and experienced service personnel perform electrical and/or mechanical service.

⚠ WARNING

Toxic Hazard

Ethylene glycol, used as an engine coolant, is toxic to humans and animals.

Wear appropriate PPE. Clean up coolant spills and dispose of used coolant in accordance with local environmental regulations.

⚠ WARNING

Combustible Liquid

Ignition of combustible liquids is a fire or explosion hazard which can cause severe burns or death.

Do not use combustible liquids like ether.

⚠ WARNING

Automated Machinery

Accidental or remote starting of the generator set can cause severe personal injury or death.

Isolate all auxiliary supplies and use an insulated wrench to disconnect the starting battery cables (negative [-] first).

⚠ WARNING

Fire Hazard

Materials drawn into the generator set are a fire hazard. Fire can cause severe burns or death. Keep the generator set and the surrounding area clean and free from obstructions.

⚠ WARNING

Fire Hazard

Materials drawn into the generator set are a fire hazard. Fire can cause severe burns or death. Make sure the generator set is mounted in a manner to prevent combustible materials from accumulating under the unit.

⚠ WARNING

Fire Hazard

Accumulated grease and oil are a fire hazard. Fire can cause severe burns or death. Keep the generator set and the surrounding area clean and free from obstructions. Repair oil leaks promptly.

NOTICE

Keep multi-class ABC fire extinguishers handy. Class A fires involve ordinary combustible materials such as wood and cloth. Class B fires involve combustible and flammable liquid fuels and gaseous fuels. Class C fires involve live electrical equipment. (Refer to NFPA No. 10 in applicable region.)

NOTICE

Before performing maintenance and service procedures on enclosed generator sets, make sure the service access doors are secured open.

NOTICE

Stepping on the generator set can cause parts to bend or break, leading to electrical shorts, or to fuel, coolant, or exhaust leaks. Do not step on the generator set when entering or leaving the generator room.

2.2 Generator Set Safety Code

Before operating the generator set, read the manuals and become familiar with them and the equipment. Safe and efficient operation can be achieved only if the equipment is properly operated and maintained. Many accidents are caused by failure to follow fundamental rules and precautions.

⚠ WARNING

Electrical Generating Equipment

Incorrect operation and maintenance can result in severe personal injury or death. Read and follow all Safety Precautions, Warnings, and Cautions throughout this manual and the documentation supplied with the generator set.

⚠ WARNING

Heavy Load

Incorrect lifting or repositioning can cause severe personal injury or death.

Make sure that only suitably trained and experienced personnel transport and handle generator sets and associated components. Use suitable lifting equipment, shackles, and spreader bars, in accordance with local guidelines and legislation. For more information, contact your authorized distributor.

2.3 Electrical Shocks and Arc Flashes Can Cause Severe Personal Injury or Death

⚠ WARNING

Energized circuits.

Any work with exposed energized circuits with potentials of 50 Volts AC or 75 Volts DC or higher poses a significant risk of electrical shock and electrical arc flash. These silent hazards can cause severe injuries or death.

Refer to standard NFPA 70E or equivalent safety standards in corresponding regions for details of the dangers involved and for the safety requirements.

Guidelines to follow when working on de-energized electrical systems:

- Use proper PPE. Do not wear jewelry and make sure that any conductive items are removed from pockets as these items can fall into equipment and the resulting short circuit can cause shock or burning. Refer to standard NFPA 70E for PPE standards.
- De-energize and lockout/tagout electrical systems prior to working on them. Lockout/Tagout is intended to prevent injury due to unexpected start-up of equipment or the release of stored energy. Please refer to the lockout/tagout section for more information.
- De-energize and lockout/tagout all circuits and devices before removing any protective shields or making any measurements on electrical equipment.
- Follow all applicable regional electrical and safety codes.

Guidelines to follow when working on energized electrical systems:

NOTICE

It is the policy of Cummins Inc. to perform all electrical work in a de-energized state. However, employees or suppliers may be permitted to occasionally perform work on energized electrical equipment only when qualified and authorized to do so and when troubleshooting, or if de-energizing the equipment would create a greater risk or make the task impossible and all other alternatives have been exhausted.

NOTICE

Exposed energized electrical work is only allowed as per the relevant procedures and must be undertaken by a Cummins authorized person with any appropriate energized work permit for the work to be performed while using proper PPE, tools and equipment.

In summary:

- Do not tamper with or bypass interlocks unless you are authorized to do so.

- Understand and assess the risks - use proper PPE. Do not wear jewelry and make sure that any conductive items are removed from pockets as these items can fall into equipment and the resulting short circuit can cause shock or burning. Refer to standard NFPA 70E for PPE standards.
- Make sure that an accompanying person who can undertake a rescue is nearby.

3 Instruction

3.1 Installing the Motor, Control and Harnesses

1. Disconnect and remove the existing hydraulic motor and control card.
2. Grease the splines of the new motor with the grease included in the kit (Cummins spline lubricant, part number 524-0781) and bolt it on. Torque the bolts to 41 lb-ft (57 N-m).
3. Assemble the new control card with the two shorter harnesses included in the kit. Make sure the black 2 pin Deutsch connector is connected in the exact orientation shown below. If this connector is installed upside-down the system will not function.

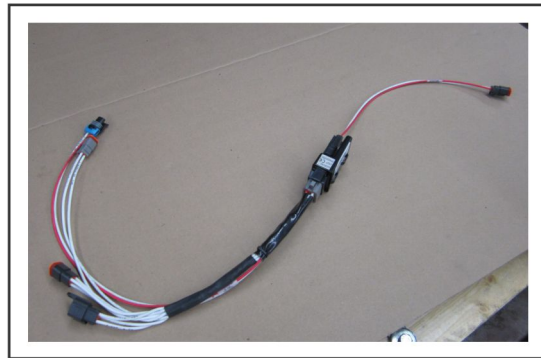


FIGURE 1. HARNESSSES



FIGURE 2. CONNECTION

Connecting the Harnesses

- a. The capped 3 pin Deutsch connector is not used in this installation.
- b. The uncapped 3 pin Deutsch connects to the magnetic pickup harness on the new hydraulic motor.

- c. Route the gray 2 pin Deutsch into the control box through the circular hole in the black sheet metal. Connect it to the generator set harness at the same DC power supply connector that was used by the original control card.
 - d. Route the black Metri-Pack connector the same way into the control box. When the side access panel is being reinstalled later, route this connector through the same opening and strain relief used by the other DC harnesses.
4. Using the two slots on the back of the control card, zip tie it to the heat exchanger's bypass tube in the same orientation pictured below.

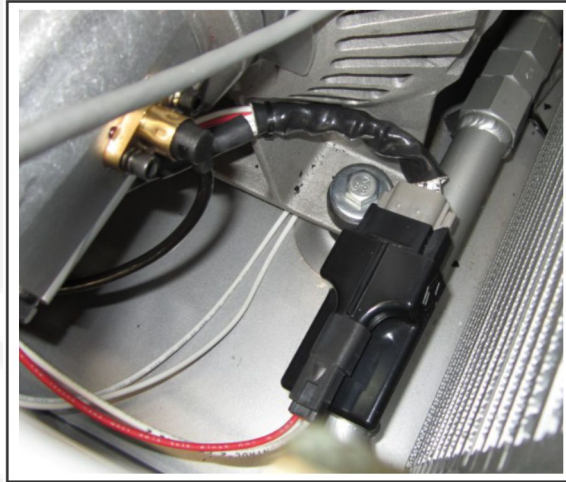
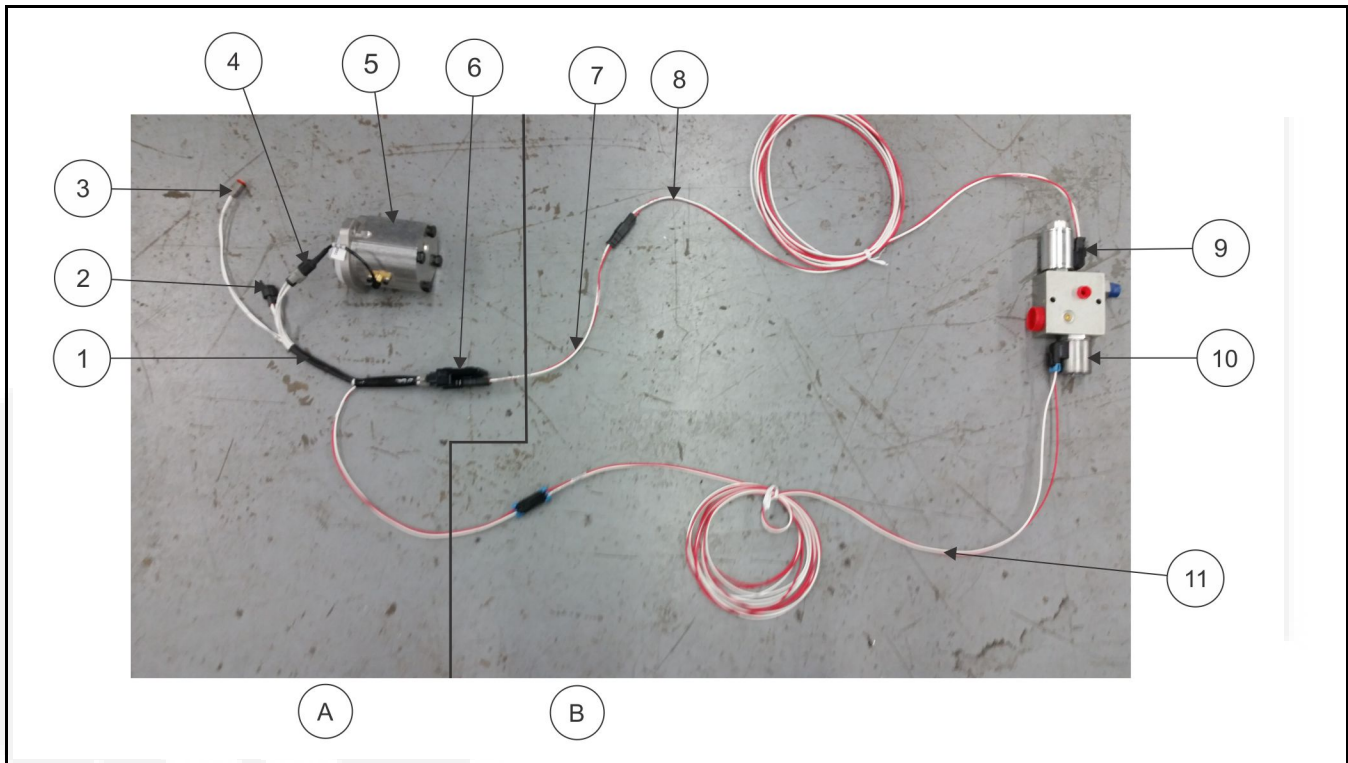


FIGURE 3. CONTROL CARD MOUNTING

5. Connect the Metri-Pack connector to the extension harness that came with the kit.
6. Route the extension harness to the hydraulic pump.

TABLE 1. OVERVIEW OF MOTOR, CONTROL AND HARNESSSES



A (Inside Enclosure)		B (Outside Enclosure)	
No.	Description	No.	Description
1	Harness A048J782	7	Harness A048N050
2	Capped Connector (not used)	8	Harness 0338-4086 (reuse)
3	Connect to DC power on generator set harness (where original control's grey connector attached to internal harness)	9	PV Valve
4	Motor connects to "PULSE PICKUP" connector	10	SP Valve
5	Motor	11	Harness A046M769
6	Control		

3.2 Installing the New Manifold Block on the Hydraulic Pump

1. Disconnect the suction hose (the larger diameter hose on the back of the pump). All of the fluid in this hose and the tank will flow out.
2. Disconnect the output hose which runs from the manifold on the back of the pump to the motor.
3. Disconnect the 2 pin Deutsch from the solenoid valve on the manifold block.
4. The hydraulic pump may or may not have to be removed from the vehicle depending on whether or not there is enough room for the manifold of the pump to rotate/ thread out. If there isn't enough room, disconnect the case drain hose from the top of the hydraulic pump and remove the pump.

5. Disconnect the load sense hose from the manifold which runs from the pump to the LS port on the manifold block.
6. Remove the adapter from the suction port on the pump case to allow the manifold clearance to thread out.
7. Remove the manifold block from the pump.
8. Installation of the manifold block and hydraulic pump are the reverse of disassembly. The load sense elbow and manifold mounting union will need to be removed from the original manifold and reused on the new manifold.
9. Connect the 2 extension harnesses to the 2 valves on the manifold. One connection is Metri-Pack and the other Deutsch.
10. Fill the hydraulic system with fluid as instructed under STARTUP in the owner's manual.

TABLE 2. UPFIT KIT - GENERATOR SET COMPATIBILITY TABLE

Kit PN	Generator Set Power Rating	Generator Set Frequency
A048V938	6, 8, 10 kW	60 Hz
A046L273	15 kW	60 Hz
A046X532	8 kW	50 Hz

