

**Application
Engineering
Bulletin**

Subject Installation Recommendations	This AEB is for the following applications: <input type="checkbox"/> Automotive <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Power Generation	
Date April 2001 (Rev Dec 2001)	Page 1 of 38	AEB Number 15.44
Engine Models included: QSB,QSC,QSL9,QSM11,QSX15,QSK19,QST30,QSK45,QSK60		
Fuel Systems included:		

[Changes in blue](#)

Introduction

The Quantum Installation Recommendations Technical Package was written to assist OEMs in integrating Quantum engines into their equipment. This technical package includes the wiring diagram, pinouts, and other pertinent information needed to install a Quantum engine

Refer to the following other Industrial AEB's:

- AEB 15.40 – Electronic Features**
- AEB 15.42 – OEM Components and Interfaces**
- AEB 15.43 – Datalinks and Diagnostics**

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Table of Contents

Introduction	1
Table of Contents.....	2
Section I – Grid Heaters.....	3-4
Section II – Power and Ground Requirements	4-5
System Grounding Requirements	4
High-Current Accessory Grounds.....	4
Cylinder Block as Ground	4
Starter Ground.....	4
Frame Returns.....	4
Switches and Sensor Grounding Requirements	5
Solenoid Grounding Requirements.....	5
Section III – Keyswitch Requirements.....	6
Keyswitch Connection Requirements	6
Sourcing.....	6
Fusing.....	6
Inductive Load Sharing.....	6
Fault Lamp/Keyswitch Wiring Configuration	6
Optional 2-Lamp Strategy Wiring	6
Section IV – Welding Requirements.....	7
Section V – OEM Harness and Harness Routing.....	7-8
Wire Section.....	7
Contacts and Connectors	7
Protective Covering.....	8
Harness Routing and Support	8
Section VI – Datalink Requirements for QSM11 and QSX15.....	9
Section VII – Wiring Diagrams/Pin Mapping	10-18
QSK45/60 Cense Wiring Diagram	10
QSB Wiring Diagram.....	12
QSC Wiring Diagram.....	14
QSM11 Wiring Diagram.....	16
QSX15 Wiring Diagram	18
QSK19/45/60 Wiring Diagram.....	20
QST30 Wiring Diagram	22
QSB Pin Mapping	24
QSC/QSL9 Pin Mapping.....	25-26
QSM11/QSX15 Pin Mapping	26-28
QSK19 Pin Mapping.....	29-30
QST30 Pin Mapping.....	30-31
Section VIII – Pinout Specifications	32-43
5V Sensor Voltage Source Pinout Specifications.....	32
5V Switched Pullup Input Pinout Specifications	33
10V Switched Pullup Input Pinout Specifications	34
ECM Supply and Return Pinout Specifications	35
Ratiometric Analog Input Pinout Specifications	36
Resistive Analog Input Pinout Specifications.....	37
Switched Pulldown Input Pinout Specifications.....	38
Switched Sink Driver Output Pinout Specifications	39
Switched Source Driver Output Pinout Specifications	40
Tachometer Source Driver Output Pinout Specifications	41
Variable Reluctance Input Pinout Specifications (Differential Input).....	42
Variable Reluctance Input Pinout Specifications (Single-Ended Input).....	43

Section I - Grid Heaters

QSB, QSC, QSL9

The intake air heater system is used to aid in starting during cold temperatures and to reduce white smoke after such a start. The system consists of two heater elements that are controlled by the ECM via two high current relays. Grid heaters are required for QSB/C/L9 engines.

Note: The installer is responsible for procuring and mounting the grid heater power relays in a location free of road splash and also for routing battery connections through the relay contacts to the (2) grid heaters which are shipped with the engines. The intake air heater relays must not be mounted on engine.

Since power routed to the grid heaters is through one wire then the gauge of the wire should be 2 AWG minimally since each of the grid heating elements require 105 amps during the heating cycle. The gauge of the wire from the grid heater, relays to the grid heater elements, also need to be 6 AWG minimally to carry the required current. Fuses or fusible links set to 125 amps are advocated for the grid heating elements. The 24 V DC heater-relay is connected to the OEM interface connector. The ECM can source up to 3 amps to turn this relay on. The switch contact of this relay must carry the current from battery (+) to the grid heating elements. Only one relay is required to drive both grid heaters on 24 V DC systems since the grid heaters are wired in series.

QSM11, QSX15

The intake air heater system is used to aid in starting during cold temperatures and to reduce white smoke after such a start. The system consists of one heater elements that are controlled by the ECM via one high current relay.

Note: The installer is responsible for procuring and mounting the grid heater power relays in an acceptable location in respect to vibration and environmental influences such as road splash. The intake air heater relays must not be mounted on engine.

The gauge of the wire from the grid heater, relays to the grid heater elements, also need to be sized for the heater's current requirement. Typically, a 6 AWG minimally to carry the required current. Fuses or fusible links set to 125 amps are advocated for the grid heating elements. The 24 V DC heater-relay is connected to the OEM interface connector. The ECM can source up to 3 amps to turn this relay on. The switch contact of this relay must carry the current from battery (+) to the grid heating elements. Only one relay is required to drive both grid heaters on 24 V DC systems since the grid heaters are wired in series.

The QSM11 grid heater requires that the installer provide the ground wire or strap. This ground wire should be routed directly to the starter ground connection or the battery ground. It is not acceptable to ground the grid heater to the engine block or cylinder head.

The QSX15 grid heater is grounded directly to the engine's ground lug. The QSX15 grounding wire is supplied with the engine.

QST 30

The intake air heater system is used to aid in starting during cold temperatures, while helping to reduce white smoke. The system consists of twelve heater elements that are controlled by a primary and secondary ECM via two high current relays. The ECM can source up to 3 amps.

Note: The installer is responsible for routing battery (+) connections to the contacts of the grid heater relays, which are shipped with each engine.

Each grid heater element is rated for 86A@12V. As a result, each bank of grid heater elements will draw 258 amps in an ideal 24-volt system and have a total current draw of 512 amps for both banks. Therefore, the