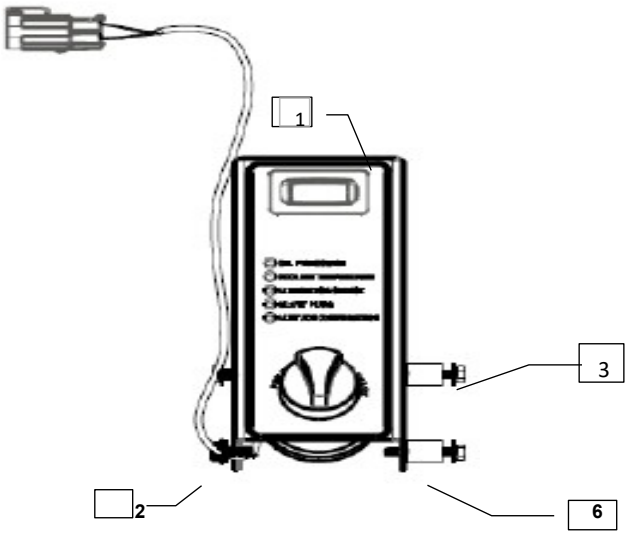
Supplement to Yanmar Kit Installation Instructions

SAFETY

This product is designed and intended only for use with a YANMAR engine. All safety and warning information contained in the Yanmar Operation Manual and Service Manual is adopted and incorporated to apply to the components, accessories, and parts that are utilized with Yanmar engines. Follow all instructions and precautions before installing this product, before operating, during operation, and during periodic maintenance procedures for your safety, the safety of others, and to protect the performance of your engine.

Item	Part No.	Description	Quantity	Remarks
1	119749-91070*	KP7, Full Kit	1	
2		Screw, Hex Head 10/32x5/8	4	
3		Screw, Hex Head 10/32x1-1/4	2	
4		Washer, Lock #10	4	
5		Washer, Fender 0.5Øx0.203x0.03	6	
6		Spacer #10x0.5Øx5/8	2	



TIER 4F MODELS

3TNV74F

3TNV80F

Note: Service parts are denoted by an asterisk. To replace non-service parts, the entire kit will need to be purchased.

KP7 - PANEL KIT
INS-KP7-0012

YANMAR

Installation Instructions

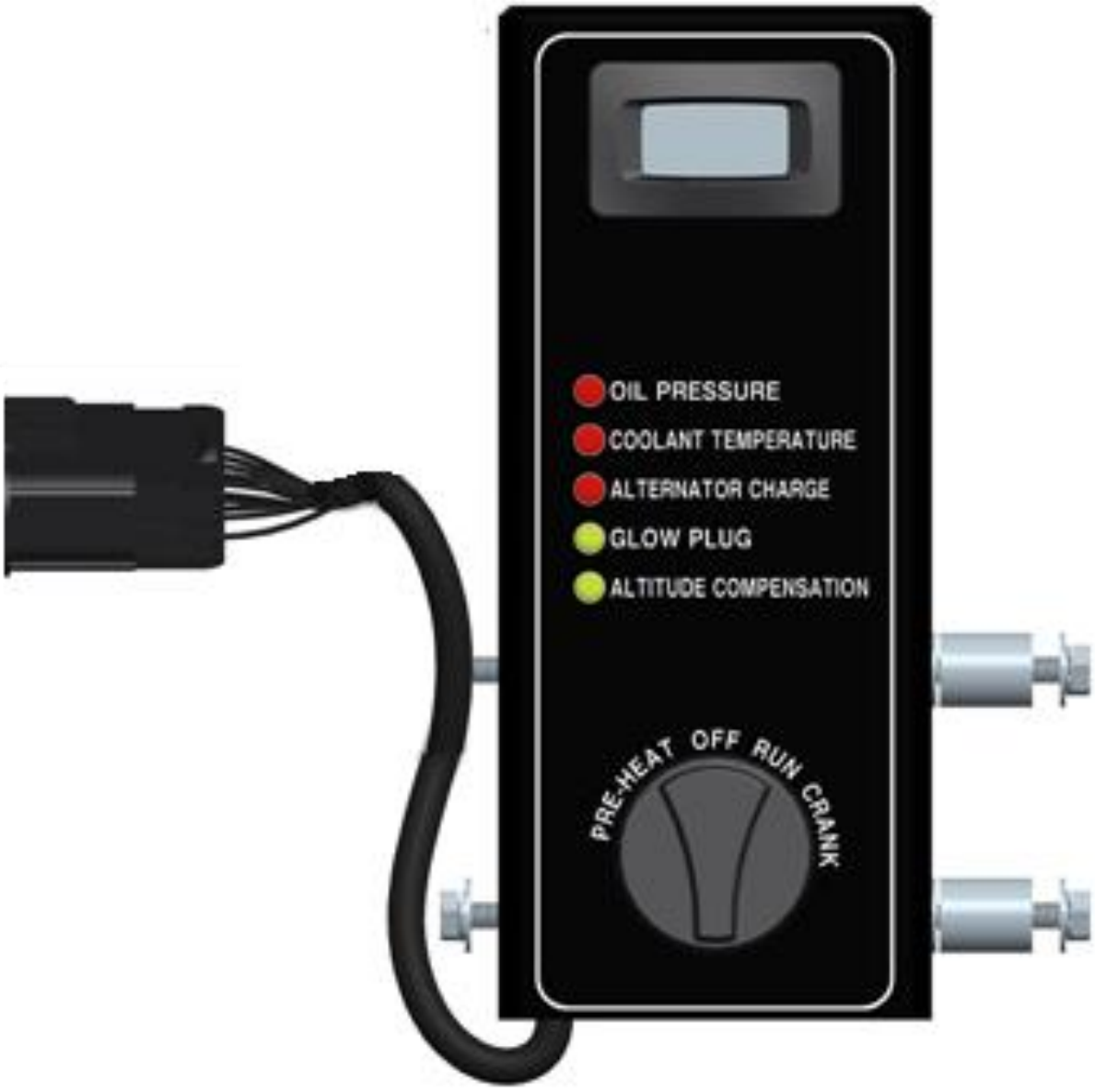
Hand tighten all bolts and nuts until assembly is completed, then torque according to specifications in Table 1. The numbers in () represent the item numbers.

1. Fasten Control Panel (1) to the engine foot using hex head bolts (2) and (3), lock washers (4), spacers (6). Note: Mount panel to engine foot on rear right engine foot, Viewed from flywheel.

Table 1: Proper torque specifications for bolts and nuts.

Diameter x Pitch	Kgf-m	Foot-lbf	N-m
M8 x 1.25	1.5 ~ 2.9	10.6 ~ 20.9	14.4 ~ 28.3
M10 x 1.50	4.5 ~ 5.5	32.5 ~ 39.8	44.0 ~ 54.0
M12 x 1.75	8.0 ~ 10.0	57.8 ~ 72.3	78.4 ~ 98.0
10/32"	0.35 ~ 0.37	2.5 ~ 2.7	3.4 ~ 3.7

Product Manual



Part Number: KS-105
Revision: 1.0

TABLE OF CONTENTS

PANEL OVERVIEW

Integrated Panel & Bracket

- Compact One Pieces Design
- Powder Coated Steel
- Welded Corners for Support and Minimized Vibration
- Mounts Directly into Engine Mounting Foot

Potted Electronics Module

- Operating Range 5.5 VDC to 36 VDC
- Temperature Range -40°C (-40°F) to 80°C (176°F)
- Potting Provides Water Tightness and Superior Vibration/Shock Protection

5 High Intensity LED Lamps

- Water Tight, Tough and Long Lasting
- Oil Pressure, Coolant Temperature, Alternator Charge, Glow Plug, Altitude Compensation

Key Switch

- Water Tight, Rated IP67
- Water Tight Plug and Play Connector
- Dedicated Pre-Heat Position

Hour Meter

- Potting Provides Water Tightness and Superior Vibration/Shock Protection

Connector

- 10 Inch Pigtail to Delphi 15422562 Connector

Pre-Heat / Glow Plug

- 4 Seconds or 15 Seconds (Selectable)
- Dedicated Pre Heat position on Key Switch
- Glow Plug Energized During Cranking

Crank Protection

- Starter will not engage during engine running
- Over crank protection (over-crank >30 seconds)

Engine Safety Shutdowns

- Low Oil Pressure
- High Engine Temperature
- Shutdown bypass is 10 seconds during engine start

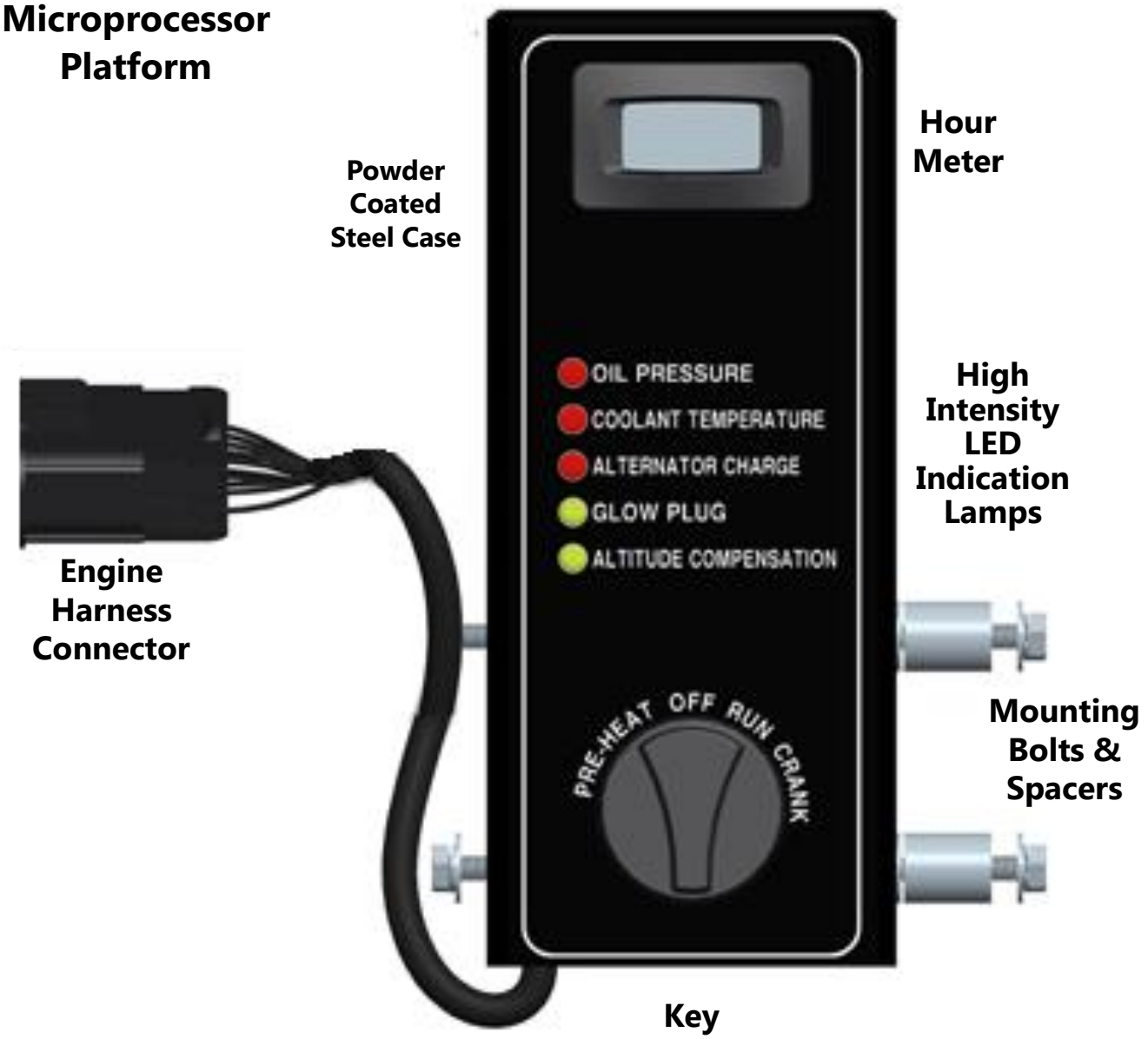
Provisions for Auto Start

The panel is designed so that it can be upgraded to an auto start version in the same product platform.

PANEL COMPONENTS

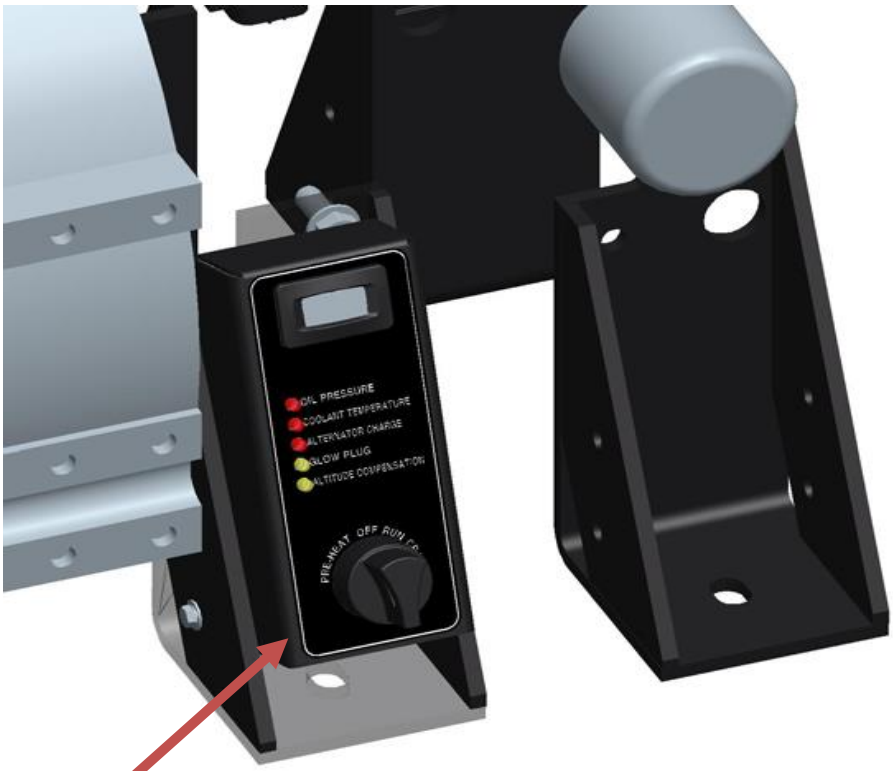
INSIDE

KS Series Microprocessor Platform



INSTALLATION

The KS-105 installs into the engine mounting bracket via four bolts, spacers and a plug and play connector.



Control Panel Mounted Inside Bracket

Installation Procedure

1) Turn Power Off
2) Insert unit into bracket
3) Install four screws
4) Plug in connector

Mounting Bolts and Spacers

PRODUCT IDENTIFICATION

Every panel has a product label that provides the part number and individual serial number for identification.

PANEL OPERATION

The KS-105 provides manual start and stop with a key switch. The key switch is an independently water tight component with a simple plug and play connector. The individual keys are provided with a rubber boot to protect the key and key switch.

Key Switch

The key switch provides the following operational positions

- **OFF Position**
- **Run Position**
- **Crank Position**
- **Pre-Heat**

Engine Pre-Heat

When the key is turned to the PRE-HEAT position, the KS-105 energizes the pre-heat signal (connector pin W5) for a 4 second period. If engine connector pin W1 (pre-heat interval select) is grounded, the pre-heat period is 10 seconds. During pre-heat operation, the yellow GLOW PLUG lamp illuminates.

Engine Start

When the key is turned to the CRANK position, the KS-105 energizes the crank signal (connector pin W3), the fuel pull signal (connector pin W6) and the fuel hold signal (connector pin W7) to initiate the engine crank and start process.

Engine Start Protections

1) **Over Crank Protection – Over crank protection is provided by the KS-105. Cranking is discontinued after holding the key in the CRANK position for 30 seconds.**
2) **Starter Re-Engage Protection – While the engine is running, the KS-105 disables the crank signal to prevent the starter engagement during running.**

Engine Stop

Turn the key switch to the OFF position to turn the engine off.

LAMP OPERATION

The KS-105 comes with five high intensity LEDs lamps.

Hour Meter
Displays engine run hours.

Oil Pressure Lamp
Oil pressure lamp turns ON when the oil pressure switch is "open" indicating a low oil pressure condition (after initial 10 second bypass period on engine start).

Coolant Temperature Lamp
Coolant temperature lamp turns ON when the engine temperature switch is "closed" indicating a high engine temperature condition.

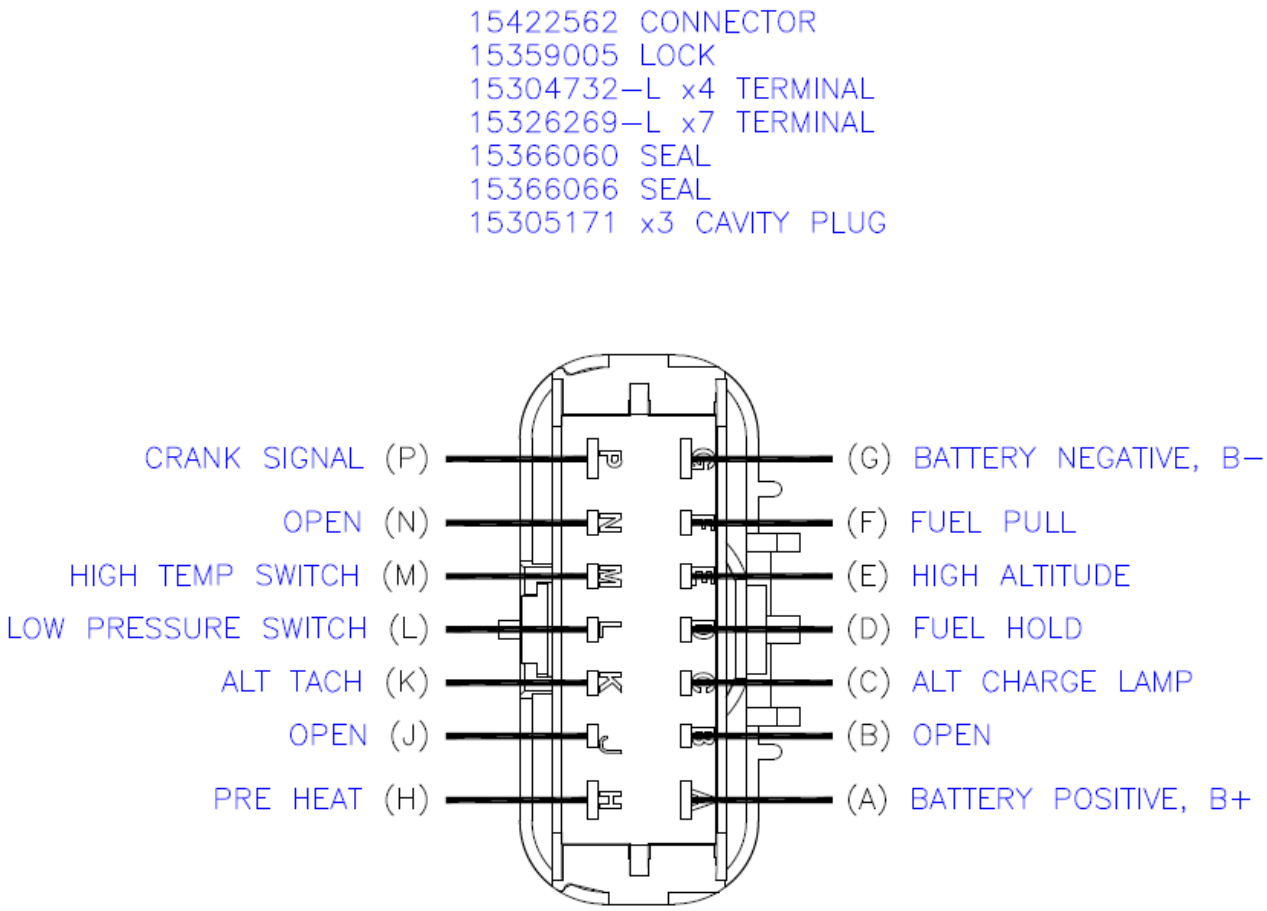
Alternator Charge Lamp
Alternator charge lamp turns ON when alternator excite signal is received from the alternator.

Glow Plug Lamp
The glow plug lamp turns "ON" when the glow plug signal is being sent from the KS-105. The glow plug signal is initiated when the key is in the "PRE-HEAT" position or the "CRANK" position. The pre-heat period is either 4 or 10 seconds depending on the pre-heat interval select circuit being grounded or not.

Altitude Compensation Lamp
The altitude compensation lamp turns ON when the altitude compensation signal is received from the altitude compensation module mounted on the engine.

ENGINE HARNESS CONNECTOR

The KS-105 provides a plug and play connector to the Yanmar engine harness.



Pre-Heat Interval Select

- A loose wire with a bullet connector provides connectivity for the Pre-Heat Interval Selection.

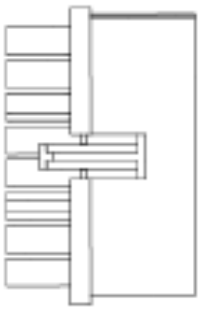
Panel Ratings:

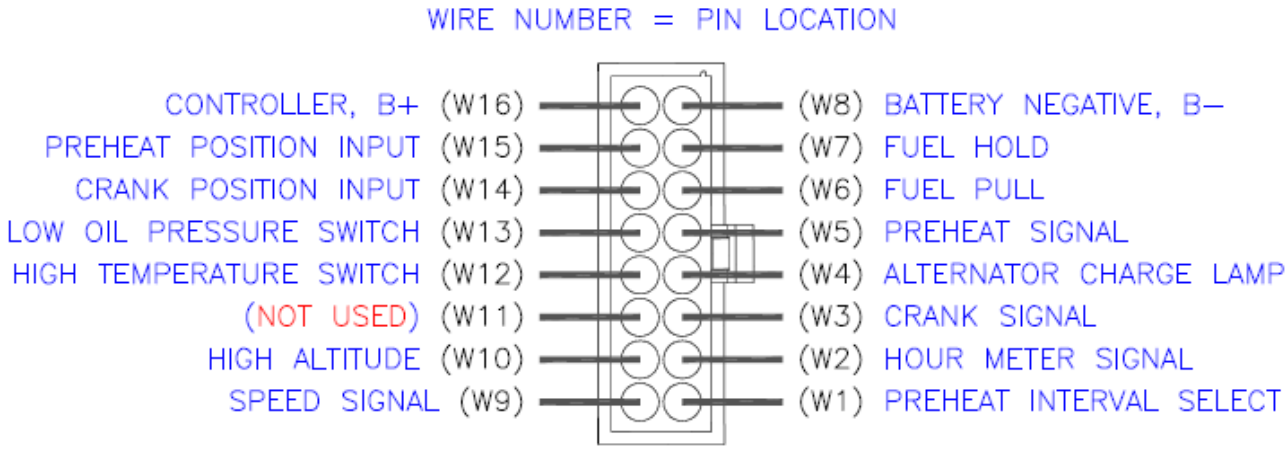
- The KS Panel is rated at 3 Amp Maximum
- Fuel Hold: 2.1A max @ 12v sourcing
- Crank and Preheat: 500mA max (Close to Ground)

INTERNAL CONNECTOR

The KS-105 provides a plug and play connector to the KS Series microprocessor electronics module.

794824-1 Connector
1-1586359-6 Wire Seal
1-1586362-6 Connector Seal
794831-1 Terminals





CIRCUIT OPERATION *(for 12VDC battery system)*

A detailed description of each KS-105 circuit is provided to address both operational and troubleshooting questions.

#	Description	Operation
Loose Wire to W1	**Pre-Heat Interval Select**	Two options for pre-heat timer based on this input being open or closed to ground: Not Ground = 4 second Pre-Heat Signal Ground = 10 second Pre-Heat Signal
Hour Meter to W2	**Hour Meter Signal**	Solid state close to ground signal based on engine running condition (200mA max)
P to W3	**Crank Signal**	Close to ground output when key is in the "CRANK" position *(This is a close to ground signal circuit to energize the crank relay with a 500mA max. This circuit is disabled while engine is running.)*
C to W4	**Alternator Charge Lamp**	12VDC signal from the alternator used to turn the alternator excite lamp ON
H to W5	**Pre-Heat Signal**	Close to ground signal when key is in the "PRE-HEAT" or "CRANK" position *(This is a close to ground signal circuit to energize the pre-heat relay with a 500mA max)*
F to W6	**Fuel Pull Signal**	12VDC signal to fuel pull circuit when key is in the "CRANK" position for a max of 5 seconds *(This is a 12VDC signal circuit to energize the fuel pull relay with a 2.1A max)*
D to W7	**Fuel Hold Signal**	12VDC signal to fuel hold circuit when key is in the "CRANK" or "RUN" position *(This is a 12VDC signal circuit to energize the fuel hold relay with a 2.1A max)*
G to W8	**Battery Negative (B-)**	Battery negative supply from B- terminal on battery
K to W9	**Speed Signal**	Input to KS-105 from engine alternator tach output. The speed signal is used to indicate the engine is running and is required for the panel to operate the engine properly.
E to W10	**High Altitude Signal**	12VDC input to KS-105 from the engine altitude module
M to W12	**High Temp Switch**	Normally open input Open = Temperature below Yanmar switch specification Close to Ground = High temperature alarm (engine shutdown)