

INSTALLATION INSTRUCTIONS

IN-BLOCK DIRECT IMMERSION HEATERS FP SERIES

Hotstart Manufacturing, Inc. is the owner of all trademarks and copyrightable material contained herein; all rights are reserved; no form of reproduction is authorized without prior written consent from Hotstart Manufacturing, Inc.

BEFORE YOU INSTALL

⚠ CAUTION

Personal injury: Disconnect power supply before performing any electrical work. Do not energize heater prior to installation.

Hot surfaces: Hot surfaces are a potential injury hazard. Use caution when working on or around the heater. Allow heater to cool before removing or servicing.

NOTICE

Heater failure: During operation, heater element must not contact engine water jacket walls or become exposed to air. Heater operation while in contact with walls or while exposed to air may cause premature element failure. Never energize heater while engine is running.

LOCATE IN-BLOCK INSTALLATION AREA

ENGINE		HEATER			INSTALLATION
MAKE	MODEL	120 V	240 V	WATTS	
Caterpillar	C7 Acert	FP101-001 FP151-001	FP102-001 FP152-001	1000 1500	Replaces core plug below turbocharger on right side of engine.
	3013 3024	FP531-003	FP532-003	530	Replaces core plug on front left side of engine.
	3034	FP531-001	FP532-001	530	Replaces core plug located at rear of cylinder head.
	3114 3116 3126	FP101-001 FP151-001	FP102-001 FP152-001	1000 1500	Replaces core plug below turbocharger on right side of engine.
	A Series 4, 6 cyl B Series 3.3 L	CUA-101F FP531-004	CUA-102F FP532-004	1000 530	Replaces any core plug on right side of engine. Element points downward. Replaces core plug at left rear of engine.
Ford Lehman	4 Cylinder	FP531-002	FP532-002	530	Replaces any core plug on left side of engine.
	6 Cylinder	FP751-000 FP101-002	FP752-000 FP102-002	750 1000	
HINO	J08E	FP151-003	FP152-003	1500	Replaces front core plug on right side of engine. Element points to 6 o'clock.
International by NAVISTAR	9.0 L V8	INT9-101F	INT9-102F	1000	Replaces any core plug.
Mitsubishi	L3E	FP401-001	—	400	Replaces front core plug on right side of engine. Element points to 9 o'clock.
	S3L	FP401-000	—	400	Replaces core plug in rear of cylinder head. Element points to 4 o'clock.
Perkins	103.15 104.22 404.22	FP531-003	FP532-003	530	Replaces core plug on left front of engine.
	704.30	FP531-001	FP532-001	530	Replaces core plug located at rear of head.
	Deutz	2.9 L	FP531-006	FP532-006	530

Corporate &
Manufacturing
Headquarters
Spokane, WA, USA

Oil & Gas Office
Katy, TX, USA

281.600.3700
oil.gas@hotstart.com

Railroad Office
Merrillville, IN, USA

+49.2241.12734.0
railroad@hotstart.com

Europe Office
Köln, Germany

+49.2241.12734.0
europe@hotstart.com

United Kingdom Office
Birmingham, UK

+49.2241.12734.0
UK@hotstart.com

Asia Pacific Office
Tokyo, Japan

+81.3.6902.0551
apac@hotstart.com

509.536.8660
sales@hotstart.com

INSTALLING IN-BLOCK HEATER

PREPARE INSTALLATION

NOTICE

Heater failure: Do not test heater prior to installation. Heater operation while exposed to air may cause premature element failure.

1. Drain and flush cooling system to remove any debris present in the engine's cooling system. Remove existing plug.
2. Clean and dry core plug opening walls. Remove burrs, sharp edges, or debris from machined surfaces of opening. **NOTICE!** Do not nick or damage mounting surface.

INSTALL HEATER

3. Apply thin film of high temperature/high strength retaining compound to adapter outer rim walls.
NOTE: Hotstart recommends Loctite 640.
4. Insert heater into core plug opening.
5. Fit a suitable sleeve (such as a socket or similar tool) over heater adapter. Sleeve must fit within adapter outer rim.
6. Using a hammer, strike sleeve to secure heater in plug opening. Strike sleeve evenly to ensure heater does not enter into core plug opening at an angle. **NOTICE!** Do not strike adapter or adapter rim directly. Striking adapter directly or installing heater at an angle may deform adapter and cause leaking.
7. Check installation. Ensure element is in correct orientation and adapter seats flush against second step on engine block. **NOTICE!** Heater element must not contact opening walls. Element contact with walls may cause heater failure.
NOTE: The extended adapter lip is used to remove the heater.

INSTALL CORD

8. Align cord and element pins on heater. Press cord pins into element assembly firmly.
9. Tighten cord assembly:
 - If thread-on style plug, hand tighten hex nut. **NOTICE!** Do not exceed 40 lbf · in (4.5 N · m).
 - If push-on style plug, position clamp around plug. Hand tighten plug. Using pliers, tighten an additional two clicks.**NOTE:** For marine applications or other high moisture environments, dielectric grease may be applied to element pins for additional water protection.

10. Route cord. Tie cord down to prevent damage and strain. **NOTICE!** Keep cord away from hot or moving objects.

COMPLETING INSTALLATION

11. Refill coolant system. Start engine.
12. Allow engine to run until engine thermostat opens, purging air from cooling system. **NOTICE!** Engine must be run to eliminate air from heating system before energizing heater. Heater operation while exposed to air may cause premature element failure.
13. Plug heater into power source.
14. Check for proper operation. Engine block near heater should become warm to the touch.

OPERATION & MAINTENANCE

CAUTION

Extension cord hazard: Use appropriate type and size extension cord based on extension cord manufacturer's recommendation.

Fire/Electrical hazard: Inspect power plug and exposed cord for damage or wear before each use.

15. Plug heater into appropriate power supply based on wattage and voltage listed on heater label.
16. Disconnect heater before starting engine. **NOTICE!** Running engine while heater is in operation may cause heater damage.