

Section 6

In-block Heaters

*Heater Installation
Guide*

In-line Heater

*Direct Immersion
Cords*

Thermocords

Flush Mount Kits



In-Block

Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
Allis Chalmers							
670T & I 685T & I 6138LT, T & I 25000 (844 CID)	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Replaces 1" thread-in plug on the oil cooler at rear of the engine on the right side. Note that not all of the engines have this opening.		
Case/IH – Agricultural							
ALL 4 CYL 390 ALL 6 CYL 590	CUB-751FP CUB-101FP CUB-151FP	CUB-752FP CUB-102FP CUB-152FP	750 1000 1500		Inserts in any of the freeze plugs right side of engine		22mm
ALL 6 CYL 830	CUC-151FP	CUC-152FP	1500		Inserts in the freeze plug right rear of the block		22mm
Caterpillar							
C-10 C-12	TF121-000	TF122-000	1250		Replaces the 1" threaded plug in the oil cooler bonnet	YES	1" NPT
C-9 Non ACERT C-15 Non ACERT C-16 Non ACERT	CATV-151	CATV-152	1500		C-9 Only: Mount in rear face of block C-15, C-16: Mount in rear oil cooler bonnet from the back end		1" NPT
C7 ACERT 3126	FP101-001 FP151-001	FP102-001 FP152-001	1000 1500		Replace 44mm frost plug on right hand side of engine just below the turbo charger.	YES	
C7 ACERT rear port	TL101-000	TL102-000			Replace 1-1/16" plug in the rear of the block		
C9 ACERT	CATV-151	CATV-152	1500		Replace 1" NPT plug in the right rear of the engine block		
C11 ACERT C13 ACERT	TF151-008	TF152-008	1500		Replace any of the 1-5/16" plugs in rear of oil cooler on the right hand side of the engine	Check Exhaust Routing	1 5/16" STOR
C15 ACERT w/o breaksaver	TF151-009	TF152-009	1500		Replace 1-3/16" plug in rear of the oil cooler on the right hand side of the engine		
C15 ACERT with breaksaver	TF151-008	TF152-008	1500		Replace 1-5/16" plug in the oil cooler on the right hand side of engine		
C9 2007 ACERT C13 2007 ACERT C15 2007 ACERT	TF151-012	TF152-012	1500		Replace 1-3/16" plug in the rear of the oil cooler on the right hand side of the engine		
1674	CATB-151	CATB-152	1500		Replaces the 1-1/2" thread-in plug on the right side of the engine		
1693 & D343	CATC-151	CATC-152	1500		Replaces water jacket access plate on the left side of the engine		
1693T & 1693TA	CATC-151-S	CATC-152-S	1500		Replaces water jacket access plate on the left side of the engine		
3013 1.5L 3014 2.0L	FP531-003	FP532-003	530		Replaces 40mm core plug on the front, left side of the engine		

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
Caterpillar — Continued							
3024 2.22L	FP531-003	FP532-003	530		Replaces 40mm core plug on the front, left side of the engine		
3034 2.95L	FP531-001	FP532-001	530		Replaces 50mm core plug located at back of head		
3044 3.3L	PF531-001	PF532-001	530		Mounts in "football shaped" opening on the right of the engine		
3046 5.0L	PF531-000	PF532-000	530		Replaces 35mm core plug located at rear of engine, left side		
3054 3.99L 3054B 4.23L	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000		Mounts in the 1-1/4" freeze plug opening on the left side of the engine		
3054C	PER-751FP	PER-752FP	750		Mounts in 1-1/4" freeze plug at left rear of engine		
3056 6.0L	PER-151FP	PER-152FP	1500		Mounts in the 1-1/2" freeze plug on the right side of the engine		
3114 3116	FP101-001 FP151-001	FP102-001 FP152-001	1000 1500		Replaces the core plug on the right side of the engine just below the turbocharger	YES	11/16"X12
3176 10.3L through 1995	DD8L-101 CAT-12015 TF151-001	DD8L-102 CAT-12023 TF152-001	1000 1250 1500		Replaces the 3/4" plug on the right side of the engine just below the head.		1" NPT
3176 10.3L 1996 and later	TF121-000	TF122-000	1250		Replaces the 1" threaded plug in the oil cooler bonnet	YES	11/16"X12
3196 12.0L	TF121-000	TF122-000	1250		Replaces 1" threaded plug in oil cooler bonnet	YES	11/16"X12
3204 all 1100 series	CATX-751 CATX-101	CATX-752 CATX-102	750 1000		Replaces the core plug on the right side of the engine just below the turbocharger		22mm
3208 — 2 heaters with a single cord	CATX-2-751-Y	CATX-2-752-Y	1500 total		Use on industrial engines when clear access is available. Replaces any core plug - one on each side of the engine		
3208 Recommended Aftermarket Installation	JD3/4-101IN JD1-101IN JD3/4-151IN JD1-151IN	JD3/4-102IN JD1-102IN JD3/4-152IN JD1-152IN	1000 1000 1500 1500		Replaces any of the 3/4" or 1" plugs on the water transfer casting (right front of the engine). 3/4" use JD3/4 — 1" use JD1		
3304 3306	DD8L-101 CAT-12015 TF151-001	DD8L-102 CAT-12023 TF152-001	1000 1250 1500		Replaces the 3/4" plug on the left side of the engine		
3406C/E 14.6L	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Replaces 1" thread-in plug in the rear of the oil cooler bonnet on the right side of the engine		1" NPT

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block

Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
Caterpillar — Continued							
3406 & 3408 except 1998 ADEM 2	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Replaces 1" thread-in plug in the rear of the oil cooler bonnet on the right side of the engine		1" NPT
3406E 1998 ADEM 2 engines only	TF151-002	TF152-002	1500		Replaces the 1" threaded plug that points downward on the top of the rear of the oil cooler bonnet	YES	1" NPT
3406E ADEM 3 and ADEM 2000 engines	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Replaces 1" thread-in plug in the rear of the oil cooler bonnet on the right side of the engine		1" NPT
3456 15.8L	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Replaces 1" thread-in plug in the rear of the oil cooler bonnet on the right side of the engine		1" NPT
Chevrolet/GMC (Small Truck)							
5.7L V8 (350 CID)	FC601-501	NONE	600		Mounts in the freeze plug in the engine's block No replacement cord available		
6.2L V8 Diesel 6.5L V8 Diesel	FC601-PY2						
Cummins							
<p>6 Cylinder Engines: H, NT, NH, N Family 743 CID, 855 CID, 927 CID, "N14"</p> <p>1. Cummins engines are often referred to by their horsepower rating "i.e. 350 Cummins"</p> <p>2. Cummins engines are often referred to as Big Cam, Big Cam2, 3, 4, full flow cooling, etc.</p> <p>All refer to engines of 855 CID Size – listed below</p>							
Group I							
Flat plate design	CUN-151B	CUN-152B	1500		6 bolt flat plate on the right side of the engine. May use either the forward or rear opening depending on clearance.		1" NPT
Flat plate design when the 1/2" NPT opening is used	CUN-151BH	CUN-152BH	1500				1" NPT
Group II							
When an external oil cooler is used..		Note: When a 4 bolt flat plate element design is encountered, remove the next two bolts on the casting, remove the whole casting, and replace the casting and element with either CNT-151B/CNT-152B OR CNT151B90/CNT152B90					
When connection is 1 1/2" rubber hose Engines produced Aug. 1975 thru June 1982	CNT-151B-90	CNT-152B-90	1500		6 bolt, flat plate design with an elbow that will rotate 360 degrees to connect with any hose or casting		1" NPT
Uses an "O" ring for the 1 1/4" water tube connection Engines produced prior to August '75	CNT-151B	CNT-152B	1500		6 bolt, flat plate design with an elbow that will rotate 360 degrees to connect with any hose or casting		1" NPT

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block

Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
Cummins — Continued							
Group III							
For industrial engines with hole pattern reversed	CUN-151BREV	CUN-152BREV	1500		Six bolt flat plate on the right side of the block		1" NPT
Group IV							
1998 and later N14 Industrial	PF151-002	PF152-002	1500		Six bolt flat plate on the right side of the block		1" NPT
Additional Cummins Engine Models							
Cummins A 4 cyl & 6 cyl	CUA-101F	CUA-102F	1000		Inserts in any of the freeze plugs on right side of engine. Element points down.		
ISC/QSC 8.3L ISL/QSL 9.0L	DD8L-101	DD8L-102	1000		3/4" NPT threaded plug in the right rear side of engine		22mm
L10, M11 ISM	CUL-151	CUL-152	1500		Inserts in the forward opening of the heater casting on the right rear of block		1" NPT
OSB 3.9L, 5.9L ISB 5.9	TF751-002	TF752-002	750		3/4" NPT threaded plug in the front of the oil cooler casting		22mm
ISM/QSM 11.0L Flat Plate Design	PF151-003	PF152-003	1500		Right rear. Replaces plate.		1" NPT
QSX, ISX Signature 600	PF151-004	PF152-004	1500		Mounts in the "football shaped" plate on the right side of the block		27mm
4BT 3.9L	CUB-751FP CUB-101FP	CUB-752FP CUB-102FP	750 1000		Inserts in any of the freeze plugs right side of engine	Check Exhaust Routing	22mm
6BT 5.9L	CUB-751FP CUB-101FP CUB-151FP	CUB-752FP CUB-102FP CUB-152FP	750 1000 1500		Inserts in any of the freeze plugs right side of engine	Check Exhaust Routing	22mm
6CT 8.3L	CUC-151FP	CUC-152FP	1500		Inserts in the freeze plug right rear of the block		22mm
Detroit Diesel							
SERIES 10 4 cylinder Phaser engines	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000		Mounts in the 1-1/4" freeze plug opening on either side of the engine		
SERIES 10 6 cylinder Phaser engines	PER-151FP	PER-152FP	1500		Mounts in the 1-1/2" freeze plug on the right side of the engine		
SERIES 30	DD8L-101	DD8L-102	1000		Mounts in the 3/4" NPT opening in the block		

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block

Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
Detroit Diesel – continued							
SERIES 40 all versions	PER-751FP INTA-121 FR151-001	PER-752FP INTA-122 FR152-001	750 1250 1500		Mounts in the frost plug opening on the left side of the engine		
SERIES 50 SERIES 60	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Mounts in the 1" NPT opening in either water pick up pipe (up to 1991) or in the 1" NPT opening on the oil cooler housing after 1991	yes on 1991 and later	3/4" NPT
SERIES 55	PF151-000	PF152-000	1500		Mounts in the triangle plate on the side of the block		
3-53, 4-53, 3-71, 4-71 with water cooled air compressor	DD-751-S	DD-752-S	750		Mounts in the "football shaped" plate on the block. Check clearance.		
3-53, 4-53, 3-71, 4-71 without water cooled air compressor	DD-751	DD-752	750		Mounts in the "football shaped" plate on the block. Check clearance.		
6-71 with water cooled air compressor	DD-151-S	DD-152-S	1500		Mounts in the "football shaped" plate on the block. Check clearance.		
6-71 without water cooled air compressor	DD-151	DD-152	1500		Mounts in the "football shaped" plate on the block. Check clearance.		
8.2 L V-8 Diesel	DD8L-101	DD8L-102	1000		Threads into the 3/4" NPT opening on the block		
6V-53 with water cooled air compressor	DD6V-751-S	DD6V-752-S	750		Mounts in the "football shaped" plate on the block. Check clearance.		
6V-53 without water cooled air compressor	DD6V-751	DD6V-752	750		Mounts in the "football shaped" plate on the block. Check clearance.		
6V71 & 8V71 Alternate location	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Threads into 1" NPT plug in the front face of the block		
6V-71 & 8V-71 6V-92 & 8V-92 except GMC General models	DDV-151B	DDV-152B	1500		Mounts in the square plate on the block		
6V92 & 8V92 alternate location - threads into oil cooler.	DD8L-101	DD8L-102	1000		Threads into the 3/4" NPT opening in the oil cooler housing. Note - not all engines have this opening		
Deutz							
BF4L913 BF6L913 F3L912 F3L913 F6L913 1011 SERIES oil cooled engines	OLT221515 plus A22M48M (adapter)	n/a	150		Use adapter kit to mount the 22MM heater in the 48MM opening		22MM or 48MM

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block

Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
Deutz – continued							
1012 — 4 & 6 cyl 1013 — 4 cyl	PF751-000	PF752-000	750		Mounts in the "football shaped" plate opening on the oil cooler casting		
1013 6 cyl	PF121-001	PF122-001	1250		Mounts in the "football shaped" plate opening on the oil cooler casting		
1015 6 & 8 cyl	TL151-004	TL152-004	1500		Mounts in 30MM plug in water elbow on front of the engine		
2012 — 4 & 6 cyl	PF751-002	PF752-002	750		Mounts in the "football shaped" plate opening on the oil cooler casting		
Ford							
6.9L & 7.3L V-8 diesels through 1993	FC101-PY1	None	1000		Mounts in a freeze plug on the engine's block. No replacement cord available.		
7.3L V-8 diesels from 1994 on	TF751-002 DD8L-101	TF752-002 DD8L-102	750 1000		Mounts in the 3/4" NPT plug in the engine's block		
Hino							
3.8L, 5.8L, 6.0L, 6.4L, 6.7L, W04C-T, W06E, H06C-T, H07C-B	DD8L-101	DD8L-102	1000		Threads into 3/4" NPT opening in the block	YES	
Isuzu							
4BD1 6HE1 6BD1 6SA1 6BG1	TF401-501	NONE	400		Replaces 1" NPT plug in left rear of engine		
Iveco							
NEF 4cyl NEF 6 cyl	PF751-001	PF752-001	750		Mount in either front or rear opening on right side of engine block		
John Deere							
With 3/4" plug in the back of the block	JD3/4-101IN JD3/4-151IN	JD3/4-102IN JD3/4-152IN	1000 1500		3/4" NPT opening in the rear face of the block	check Exhaust routing	
With 1" plug in the back of the block	JD1-101IN JD1-151IN	JD1-102IN JD1-152IN	1000 1500		1" NPT opening in the rear face of the block		
With 1 5/8" opening on the side of the water jacket	JDS-101	JDS-102	1000		1-5/8" threaded opening on the side of the block in the water distribution channel		

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block

Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
John Deere – continued							
6105 (10.5L) 6125 (12.5L)	AC-101 CATV-151	AC-102 CATV-152	1000 1500		1" NPT opening in the oil cooler casting		
Komatsu							
L10 (10L) M11(11L)	CUL-151	CUL-152	1500		Inserts in the forward opening of the heater casting on the right rear of the block		
SA6D125	MA-151	MA-152	1500		Threads into the freeze plug opening in the block		
Kubota							
M, B, L Series D905 V1205 D1005 V1305 D1105 V1505 D3000B V4000B D3200B V4300B DH905 VH1205 DH1005 VH1305	TF401-501	N/A	400		Replaces 1" NPT plug in left front of engine		
Mack							
Mid liner E3 MS200 & MS250	MAM-101	MAM-102	1000		Mounts in rear face of block		
Mid liner E5 MS300	MAM-151	MAM-152	1500		Mounts in the oil cooler bonnet		
E6 engines "smooth bore" from 1981 on	MASB-151	MASB-152	1500		Mounts in the freeze plug opening. Smooth opening design.		
E6 engines threaded freeze plug opening not produced after '81 END 465, 711, EN438, 504, 707, 673, 675, 676 (1957 through 1981)	MA-151	MA-152	1500		Mounts in any threaded freeze plug opening		
E7 Engines Except E-Tech water pump mount	PF151-001	PF152-001	1500		Mounts in the plate in either the front or rear face of the block in the water jacket passage. For 2002 engine – mounts in rear face of block.		
E9, ENDT865, 866 and 1000 series V8 engines Use two heaters	DD8L-101	DD8L-102	2000 total		Threads into the 3/4" NPT opening on each side of the block		

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block

Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.















Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
MAN							
D2840 D2842 D2848	PF121-003	PF122-003	1250		Replace "football shaped" plate in lower water pipe on right side of engine		
D2866 D2876	PF151-006	PF152-006	1500		Replace 3 bolt plate on left side of engine. May require adapter if 3 bolt opening is not available on engine. Consult customer service.		
Mercedes Benz							
MBE904 MBE906	PF101-001	PF102-001	1000		Replace frost plug in rear of engine on right side	YES	
Massey Ferguson							
3 cylinder 4 cylinder 6 cylinder	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000		Mounts in any of the 1-1/4" freeze plug openings in the engine		
Navistar/International							
V800 (796 CID)	AC-101 CATV-151	AC-102 CATV-152	1000 1500		Threads into a 1" NPT opening in the oil cooler bonnet		
INLINE 6 CYLINDER — all series — 312, 360, 414, 436, 466 & 530	PER-751FP INTA-121 FR151-001	PER-752FP INTA-122 FR152-001	750 1250 1500		Mounts in the frost plug on the left side of the engine. Fits all series of these engines.		
6.9L & 7.3L V8 diesels through 1993	FC101-PY1 or FC601-501	None	1000 600		No replacement cord available. Mounts in a freeze plug above starter		
7.3L & T444 all series	DD8L-101	DD8L-102	1000		3/4" NPT threaded opening in the block		
9.0L — V8 diesel	INT9-101F	INT9-102F	1000		Mounts in a freeze plug		
Oliver							
ALL EXCEPT 1265, 1365 & 1900	TF751-002 DD8L-101	TF752-002 DD8L-102	750 1000		Threads into a 3/4" NPT opening in the block		
Onan — See Cummins "A" Series							
Perkins							
3.152 4.236 6.354	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000		Mounts in the 1-1/4" freeze plug opening on the right side of the engine		
103.15 104.22 404.22	FP531-003	FP532-003	530		Mounts in left front freeze plug		

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

In-Block Direct Immersion Heaters

Note: In-block heaters are complete with 2-wire w/ground 6 foot HPN cord and plug. For cord replacements or "Y" thermocord energy saver, please reference page 56.



Engine Model	Part Number 120 Volts	Part Number 240 Volts	Watts	Product Image	Application Information	Heat Shield Required	Oil Heater Thread Size*
Perkins – continued							
700 Series 704.30	FP531-001	FP532-001	530		Mounts in freeze plug in rear of head		
800 Series	PF531-001	PF532-001	530		Mounts in football shaped plate on the left front of the block		
1004 (right side)	FR751-002 FR101-000 PER-151FP	FR752-002 FR102-000 PER-152FP	750 1000 1500		Mounts in the 1-1/2" freeze plug opening on the right side of the engine		
1004 (left side)	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000		Mounts in the 1-1/4" freeze plug opening on the left side of the engine		
1006 (6 Cyl) A & B	PER-151FP	PER-152FP	1500		Mounts in the 1-1/2" freeze plug on the right side of the engine		
1103C	FR531-000	FR532-000	530		Replaces 1-1/4" freeze plug on right rear of engine. Element should point towards 10 o'clock position.		
1104 (4 Cyl) C	PER-751FP PER-101FP	PER-752FP PER-102FP	750 1000		Mounts in 1-1/4" freeze plug opening on right rear of engine with element straight up in 12 o'clock position		
Volvo							
D9	PF151-007	PF152-007	1500		Mounts in the "football shaped" plate on the front, right side of the engine		
D12C Prior to Serial # 250502	PF151-005	PF152-005	1500		Mounts below turbo charger on right center of engine	YES	
D12C After Serial # 250502	PF121-002	PF122-002	1250			YES	
TD60, TD61, TD70, TD71, TD100, TD101, VE10, TD120, TD121	VT6-101	VT6-102	1000		Mounts into threaded opening (44mm) in the front of the engine		
Yanmar							
3T72HLE 4TN82E D4T YYDXL4.41	TF401-501	N/A	400		1" NPT No replacement cord available		

NOTE: The only replacement parts for the direct immersion heaters is the power cord. Please see the power cord section on page 56 for the proper replacement cord set.

For thermostat control of in-block direct immersion heaters, see page 56. The energy saver Thermocord is available in various temperature ranges.

Supplemental heat for engines using in-block heaters can be achieved by the installation of oil pan heaters in the lube-oil. Reference pages 26 and 27 of this catalog or consult factory.

* If supplemental oil heating is desired, this column gives the correct thread size in oil pan. See NOTE on page 54.

Heater Installation

Instructions for:
In-block direct immersion heaters

Please refer to specific instructions that accompany heater.

THREADED PLUG TYPE HEATERS



- A. Drain the cooling system.
- B. Remove the recommended plug. (See instructions with heater)
- C. Apply teflon tape to pipe threads or grease to O ring.
- D. Thread heater into engine.

Please follow these steps to ensure proper operation of your Kim Hotstart in-block heater.

1. Align cord with pins on the heater and press the cord into the heater. Place clamp around cord & heater. **DO NOT PLUG IN HEATER YET!**
2. Route the cord, keeping away from hot or moving surfaces.
3. Re-fill the cooling system. Run engine until engine thermostat opens and continue running for another 20 minutes to eliminate air.
4. Stop engine and let cool. Check for leaks. Check coolant level.
5. Plug heater into power supply and test for proper operation. Block should feel warm near heater.

PLATE TYPE HEATERS



- A. Drain the cooling system.
- B. Remove the recommended plate. (See instructions with heater)
- C. Clean the gasket area.
- D. Apply gasket sealant to plate and engine surfaces.
- E. Insert heater into engine. Tighten bolts.

Please follow these steps to ensure proper operation of your Kim Hotstart in-block heater.

1. Align cord with pins on the heater and press the cord into the heater. Place clamp around cord & heater. **DO NOT PLUG IN HEATER YET!**
2. Route the cord, keeping away from hot or moving surfaces.
3. Re-fill the cooling system. Run engine until engine thermostat opens and continue running for another 20 minutes to eliminate air.
4. Stop engine and let cool. Check for leaks. Check coolant level.
5. Plug heater into power supply and test for proper operation. Block should feel warm near heater.

FREEZE (CORE) PLUG TYPE HEATERS








- A. Drain the cooling system.
- B. Remove the recommended core plug. (See instructions with heater)
- C. Clean, smooth and dry core plug opening.
- D. If retaining ring style, apply a light coat of grease to the O ring and core plug opening. If press-in style, apply a light coat of high-temperature, high-strength retaining compound (Loctite 640 recommended).
- E. Insert heater into engine and position properly. Push the heater into the engine by hand, then tap in using a suitable tool until flange is even with engine block.

Please follow these steps to ensure proper operation of your Kim Hotstart in-block heater.

1. Align cord with pins on the heater and press the cord into the heater. Place clamp around cord & heater. **DO NOT PLUG IN HEATER YET!**
2. Route the cord, keeping away from hot or moving surfaces.
3. Re-fill the cooling system. Run engine until engine thermostat opens and continue running for another 20 minutes to eliminate air.
4. Stop engine and let cool. Check for leaks. Check coolant level.
5. Plug heater into power supply and test for proper operation. Block should feel warm near heater.

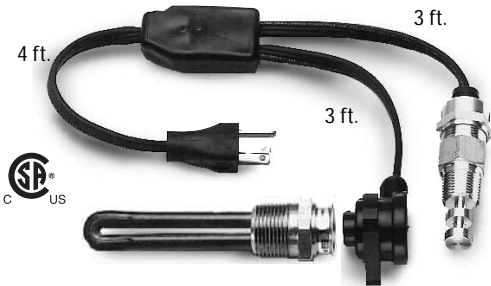
Replacement Cords & Thermocords

Heat Shield	
Model No.	
HS1	
Use when exhaust manifold or turbo come close to heater termination.	


For use with In-Block Direct Immersion heaters				
Cord Length	Plug Style	120 Volt	240 Volt	STYLE 1
6'	1	IM6-1IN	IM6-2IN	  15 amp 120 Volts
11'	1	IM11-1IN	IM11-2IN	
16'	1	IM16-1IN	IM16-2IN	
Fits most competitor's applications.				
Cord Length	Plug Style	120 Volt	240 Volt	STYLE 2
6'	2	11PR72T	21PR72T	  15 amp 120 Volts Fits into flush mount housing
11'	2	11PR132T	21PR132T	
16'	2	11PR192T	21PR192T	

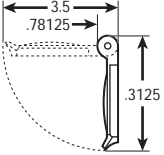
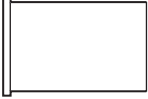
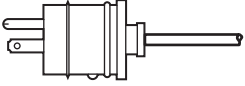



NOTE: When ordering in-block heater **and** thermocord, place suffix **-WOC** (which stands for **without cord**) after the heater model number to save cost as the standard 6 foot heater cord is replaced by the thermocord harness.


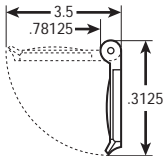

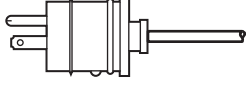
Thermocord for In-Block Direct Immersion heaters				ENERGY SAVER
Part No.	Volts	Thread Size	Temp Range	
A-2822-0B	120	1/2"	100-120	 <p>4 ft. 3 ft. 3 ft.</p> <p>Heater shown for illustration purposes only.</p>
A-2822-0C	120	1/2"	120-140	
A-2822-0H	240	1/2"	100-120	
A-2822-0I	240	1/2"	120-140	
A-2822-0M	120	1/2"	80-100	
A-2822-0P	240	1/2"	80-100	

Flush Mount Kits & Accessories

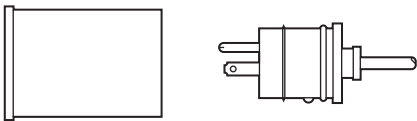
Flush mount kits for In-Block Direct Immersion heaters					
Model Number 120 Volt	Model Number 240 Volt	Cord Length	Plug Style	Kits include: 11PR- style cord (shown on page 56), recessed male receptacle and hinged flip cover	
IM6-1IN-FM	IM6-2IN-FM	6'	2		
IM11-1IN-FM	IM11-2IN-FM	11'	2		
IM16-1IN-FM	IM16-2IN-FM	16'	2		

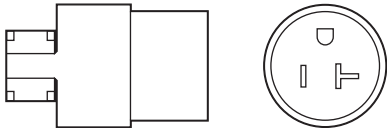




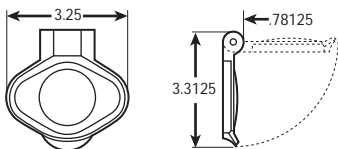
Flush mount kits for tank heaters					
Model Number	Volts	Amps	For Heater with Wattage of:	Kits include: Recessed male receptacle with 6' cord (no female connectors), hinged flip cover and female connector	
FM15120	120	15	500 to 1800		
FM15240	240	15	500 to 3000		
FM20120	120	20	2000 to 2250		

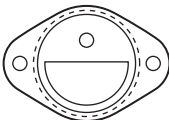
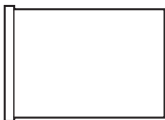
Other Accessories

Recessed Male Receptacle – with 6 ft. cord (no female connectors)			
Model Number	Volts	Amps	
RM5-15	120	15	
RM6-15	240	15	
RM5-20	120	20	
RM6-20	240	20	

Female Connector Only - for extension cords			
Model Number	Volts	Amps	
FM1G20A	120	15/20	
FM2G20A	240	15/20	

Hinged Cover Only		
Model Number	Description	
*FC-KH FC-KH-C	Black/Kim Logo Chrome/Kim Logo	

*Note: Standard with kit

Plug Housing		
Model Number		
A-2223-PH		

Specifying an Engine Pre-Heater

1. Determine the best type of heater to be used for the application.
 - Direct Immersion or Tank Type?
 - Weathertight unit for all indoor or outdoor applications (hospital, communications building, shopping mall, pump station, off-road equipment).
 - Explosion Proof unit for Hazardous Locations (off-shore platform, oil rig, gas compression station).
2. Determine engine size.
 - Cubic inch or litre displacement.
3. Determine wattage required by using this general formula:
 - 3 watts x cubic inch displacement = watts required.
 Example: Engine is 855 C.I.D. — 855 x 3 = 2565. Requirement is 2500 watt heater.
 - This formula is a very good rule of thumb to use down to 0°F ambient temperature. This formula will generally hold engine temperature at approximately 100°F above ambient.
 - Very large engines may require a forced circulation system (see pages 16, 17 and 59).
4. Now that you have the required wattage, you need to determine:
 - Voltage available that will power the heater (120, 208, 277, 240, 380, 480).
 - Is the power source Single Phase or Three Phase?
5. For thermostat selection, determine the desired engine temperature to be maintained.
 - 100°F to 120°F applies 95% of the time. However, specifications vary with respect to the user and a higher or lower range may be required.

You now have the specifications needed to select the required engine pre-heater from the many products listed in this catalog. For other technical information and installation tips, see pages 40 and 55. If you have other questions or need additional assistance, please contact our customer service department.

Conversion Factors
Litres x 1.0567 = Quarts
Quarts x 0.94635 = Litres
Litres x 0.26417 = Gallons
Gallons x 3.7854 = Litres

Cubic Inches - Litres Conversion Chart

Cubic Inches	Litres	Cubic Inches	Litres	Cubic Inches	Litres
150	2.46	1600	26.22	3050	49.98
200	3.28	1650	27.04	3100	50.80
250	4.10	1700	27.86	3150	51.62
300	4.92	1750	28.68	3200	52.44
350	5.74	1800	29.50	3250	53.26
400	6.55	1850	30.32	3300	54.08
450	7.37	1900	31.13	3350	54.90
500	8.19	1950	31.95	3400	55.71
550	9.01	2000	32.77	3450	56.53
600	9.83	2050	33.59	3500	57.35
650	10.65	2100	34.41	3550	58.17
700	11.47	2150	35.23	3600	58.99
750	12.29	2200	36.05	3650	59.81
800	13.11	2250	36.87	3700	60.63
850	13.93	2300	37.69	3750	61.45
900	14.75	2350	38.51	3800	62.27
950	15.57	2400	39.33	3850	63.09
1000	16.39	2450	40.15	3900	63.91
1050	17.21	2500	40.97	3950	64.73
1100	18.03	2550	41.79	4000	65.55
1150	18.84	2600	42.61	4050	66.37
1200	19.66	2650	43.42	4100	67.19
1250	20.48	2700	44.24	4150	68.00
1300	21.30	2750	45.06	4200	68.82
1350	22.12	2800	45.88	4250	69.64
1400	22.94	2850	46.70	4300	70.46
1450	23.76	2900	47.52	4350	71.28
1500	24.58	2950	48.34	4400	72.10
1550	25.40	3000	49.16	4450	72.92

Cubic Inches x 0.01639 = Liters
 Liters x 61.024 = Cubic Inches

Conversion Chart
 Fahrenheit - Celsius

-40° F	-40° C
-30° F	-34° C
-20° F	-29° C
-10° F	-23° C
0° F	-18° C
10° F	-12° C
20° F	-7° C
30° F	-1° C
40° F	4.5° C
50° F	10.0° C
60° F	15.5° C
70° F	21.0° C
80° F	26.5° C
90° F	32.0° C
100° F	37.5° C
110° F	43.5° C
120° F	49.0° C
130° F	54.5° C
140° F	60.0° C
150° F	65.5° C
160° F	71.0° C
170° F	76.5° C
180° F	82.0° C
190° F	88.0° C
200° F	93.5° C
210° F	99.0° C

F = C x 9/5 + 32
 C = (F - 32) x 5/9

HOTSTART offers complete circulating heating systems for any large industrial engine. These systems are engineered and designed specifically for installation on a large generator, compressor package, marine engine, or locomotive. Most systems are mounted on a steel plate with a pre-wired junction box, pump and motor components, a flow detection device and in-line high-limit thermostats. Plus, most systems have fused 120 volt control voltage, regardless of applied voltage.

Several systems are available for lube oil heating, coolant heating, diesel fuel heating or combinations of any aforementioned fluid. Systems are adaptable to function in wet/damp locations or hazardous environments. Complete with all necessary components and controls, these automated systems are available in various wattage, voltage and phase combinations to accommodate most large industrial preheating needs.

For additional information regarding HOTSTART's circulating heating systems, please contact HOTSTART and have all your questions answered by one of our engine heating product specialists.



CL Model
Coolant only, watertight circulating heating system



COLER Model
Class I Group D combination circulating heating system

Large capacity systems heat and circulate coolant or lube oil to efficiently maintain an engine's optimum temperature during shut-down and layover periods.



COR Model for locomotive engines
coolant/lube oil combination heating system

Circulating-type combination heating systems combine the benefits of coolant heating and oil heating into one pre-wired, pre-assembled dual heating system.

OER Model
Oil only, Class I Group D circulating heating system



Lloyds & ABS Approved



COL Model
Watertight with NEMA 12 enclosures combination circulating heating system

Industrial Circulating Systems - Large engine applications

All HOTSTART circulating heating systems come pre-wired and pre-assembled for easy installation, operation and maintenance.

Customer Services



To better serve you, HOTSTART provides a customer service department to answer all your engine heating concerns, any questions regarding HOTSTART products or to take your sales order.

Customer Support Department:
(509) 536-8660

Sales orders and requests for quotes can also be faxed in over our toll-free FAX line.

Toll-free FAX line: (800) 224-5550

Warranty Information

The warranty below has been drafted to comply with the Federal Law applicable to products manufactured after December 31, 1976. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

HOTSTART products are warranted against defects in workmanship and materials. No other express warranty, written or oral, applies. No person is authorized to give any other warranty or assume any liability except by written statement from an officer of HOTSTART Inc.

The warranty extends for twelve months from date of shipment from factory or authorized distributor.

Products must be installed and maintained in accordance with HOTSTART Inc. instructions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from corrosion, misapplication, improper specification or other operating conditions beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

Absolutely no material can be returned to HOTSTART Inc. without prior factory authorization.

Upon factory authorization, return the defective part or product, freight prepaid, to: HOTSTART Inc., 5723 E. Alki, Spokane Valley, WA 99212. Telephone (509) 534-6171; FAX (509) 534-4216.

Defective items will be repaired or replaced, at our option, at no charge. Such repair or replacements is the exclusive right of HOTSTART Inc. HOTSTART Inc. is not liable for labor costs incurred in removal, reinstallation, or unauthorized repair of the product or for damage of any type whatsoever including incidental or consequential damage. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the preceding limitation or exclusion may not apply to you.

HOTSTART Inc.



HOTSTART®

P.O. Box 11245
Spokane Valley, Washington U.S.A 99211-0245

Phone: (509) 534-6171

Fax: (509) 534-4216

Toll Free Fax: (800) 224-5550

www.hotstart.com

Distributor

12-09