



Heavy Duty Parts Catalog of Systems,
Replacement Parts, and Accessories

STARTING FLUID SYSTEMS



KBI/KOLD-BAN INTERNATIONAL, LTD.

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KBi - A Leader In The Industry

The only product that KBi manufactures is diesel engine starting systems . . . and they do it right! Years of ongoing cold room and field experience worldwide, with every size of diesel engine in the widest range of applications, have given KBi engineers a wealth of knowledge about diesel engine cold starting problems -- and their solutions! From its inception to the present, KBi has offered a complete customized service to engine and equipment manufacturers and users that is just not available elsewhere.

KBi is generally recognized as the technical leader in the highly specialized field of safe and effective diesel engine starting fluid injection systems.

Customer Service

Undoubtedly, the most underlying factor accounting for KBi's successful growth over the last 30 years, has been its responsiveness to customers' needs. The simple fact of taking a customer's problem and developing/adapting the products or services to resolve the problem is basic, but it has and will continue to be, KBi's approach to enhancing its products and maintaining its leadership in the industry.

KBi's customer service can be reached Monday through Friday between 8:00 a.m. and 5:00 p.m. (CST) at the following numbers:

Toll free: **(800)527-8278**
Phone: **(847)658-8561**
Fax: **(847)658-9280**

Cold Starting -- The Solutions



In the early 1970's, KBi developed and introduced DIESEL START, a measured shot, metered flow, operator controlled high pressure fluid starting system. With a DIESEL START System, a chambered valve controls the quantity of starting fluid injected with each activation while an orifice in the nozzle restricts the rate of flow to a safe, effective rate. Operation of a DIESEL START, measured shot metered flow system requires an operator to press and release an electric push button switch or pull and release a control cable while an engine is being cranked.

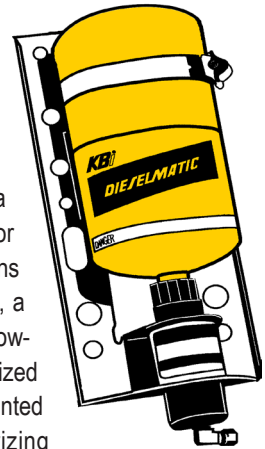
With the electric systems, a temperature sensitive switch may be installed (a KBi Thermo-Guard), which makes the fluid starting system inoperative on a warm engine, preventing potentially damaging injection of starting fluid. Additional shots of starting fluid can be safely injected immediately after cranking to eliminate white smoke and get an engine running on all cylinders.

Major advantages of the KBi DIESEL START Measured Shot Metered Flow System include:

- Safe, effective starting to temperatures of 0°F (-18°C), and lower.
- Simple, one man operation from the cab.
- Controlled metered flow which prevents ether lockup or over speeding of a cold engine.

KBi DIESELMATIC SYSTEMS

KBi also developed and introduced the DIESELMATIC System, a totally automatic fluid starting system which revolutionizes the state-of-the-art. The DIESELMATIC System is wired to the cranking circuit and is controlled by a precision engine temperature sensor (ETS), switch. When the operator turns the starter key under cold conditions, a solenoid valve opens automatically, allowing starting fluid to flow out of a pressurized cylinder, through the exclusive patented BLOCKOR (flow restricting vaporizing orifice), and into the engine air intake. A reservoir is built into the valve to maintain a flow of starting fluid for several seconds after the engine starts, to prevent the just started engine from faltering.



Major advantages of the automatic KBi DIESELMATIC System include:

- Simplified starting instructions -- simply turn the key, regardless of temperature.
- Functions only when needed -- The Engine Temperature Sensor (ETS), prevents the DIESELMATIC System from functioning when starting a warm engine.
- Impossible to abuse -- there is no way for an operator to inject starting fluid into a warm engine.
- Extended cranking motor and battery life.
- Effective to temperatures of -30°F and colder.

Following the introduction of the original DIESELMATIC System, KBi developed the DIESELMATIC EC System and the DIESELMATIC NVT System.

Check out KBi's web site at www.koldban.com for additional information on KBi's product line.

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Comparison of KBI DIESELMATIC Systems			
FEATURE	DIESELMATIC NVT	DIESELMATIC II	DIESELMATIC
ECM - Low Amperage Compatible	X	X	
Fly-Back Protection	X		
Anti-Abuse Left Hand Filtered Metering Orifice		X	X
Filtered Internal Metering Orifice	X		
Internal Primary Filter	X		
Encapsulated Coil	X	X	
Threaded Brass Inserts	X	bottom fitting only	
Internal Safety Seal	X	X	X
Molded Wire Strain Relief	X	X	
Corrosion Abatement Compliant	X	X	X
Dissimilar Metal Avoidance	X	X	X
Autophoretic Plated Bracket	X	X	X
Hexavalent Chrome Free	X	X	X
Tested to SAE J1455	X	X	
Tested to ASTM B117	X	X	

KBi, DIESEL START, DIESELMATIC, BLOCKOR, and KOMPAC are registered Trademarks of Kold Ban International, Ltd. KBi was established in the late 1960's and its only business is the manufacture, research, and development of starting aids for cold diesel engines. KBi products are O.E.M. approved and installed by most engine and equipment manufacturers.

How the KBI DIESELMATIC NVT™ Works:

KBI's DIESELMATIC NVT System is a step above KBI's DIESELMATIC System. DIESELMATIC NVT is a fully automatic Engine Starting Fluid System, which can be controlled by the newer generation ECM (electronic control module) Engines.

By plugging directly into the "starting fluid" port on an engine's ECM (no separate interface is required), the engine's ECM will determine when to activate the DIESELMATIC NVT System. Allowing the engine's ECM to control the activation of the starting fluid, based upon vital engine information obtained during the start procedure such as engine speed and ambient temperature, permits a more precise delivery of starting fluid. In addition, operator error or abuse can be prevented.

When the DIESELMATIC NVT receives the activation signal from the engine's ECM, the patented, encapsulated solenoid valve allows the starting fluid to be released from the pressurized Fluid Cylinder. The starting fluid flows through the Valve, through the Metering Orifice, through the nylon tubing and out of an Injector Nozzle located in the engine's air intake system. The engine's ECM can allow for an additional flow of starting fluid to prevent the just started engine from faltering or dying.

Please be sure to check your engine manufacturer's supplied documentation for specific information on the ECM functions.

Full, professional installation of a DIESELMATIC NVT System can be accomplished with ease in less than one hour.

DIESELMATIC NVT can also be used on older engines and engines that do not have a starting fluid port on the ECM by incorporating the Engine Temperature Sensor (ETS). This ETS is also used on KBI's standard DIESELMATIC Systems.

Exclusive Features of the DIESELMATIC NVT System:

- Can be controlled by ECM Engines (direct interface)
- Low Current Draw
 - 1.3 amps @ 12 volts
 - 0.6 amps @ 24 volts
- Engineered for Reliability
 - Sealed from Environment
 - O-Ring Cylinder Seal
 - Encapsulated Coil
 - Molded Wire Strain Relief
 - On/Off Ether Flow on Demand
 - Corrosion Resistant Brass Connections
 - Field-Serviceable Metering Orifice/Filter



DIESELMATIC NVT™ (ECM Controlled)

Complete premium Ready-Mount Style Systems with an installation time of approximately 30 minutes. Kits are pre-assembled and contain all the necessary mounting hardware, Starting Fluid Cylinder, Wire, Fuse, and Terminals required for retrofit installation. Electrical components are equipped with OEM quality weatherproof connectors and a universal wiring harness to accommodate all installations (no additional wiring required). SAE-level integrity of electrical circuit.

12-Volt DIESELMATIC NVT Systems

62121.....Engine size 3.70 - 19.67 liters (226-1200 CID)*

24-Volt DIESELMATIC NVT Systems

64084.....Engine size 3.70- 19.67 liters (226-1200 CID)*

12-Volt KOMPAC DIESELMATIC NVT Systems

22110.....Engine size 3.70 - 19.67 liters (226-1200 CID)*

24-Volt KOMPAC DIESELMATIC NVT Systems

24031.....Engine size 3.70- 19.67 liters (226-1200 CID)*



DIESELMATIC NVT™ (Non-ECM Controlled)

Complete premium Ready-Mount Style Systems with an installation time of approximately 30 minutes. Kits are pre-assembled and contain all the necessary mounting hardware, Starting Fluid Cylinder, Wire, ETS, Fuse, and Terminals required for retrofit installation. Electrical components are equipped with OEM quality weatherproof connectors and a universal wiring harness to accommodate all installations (no additional wiring required). SAE-level integrity of electrical circuit.

12-Volt DIESELMATIC NVT Systems

62120.....Engine size 3.70- 19.67 liters (226-1200 CID)*

24-Volt DIESELMATIC NVT Systems

64083.....Engine size 3.70 - 19.67 liters (226-1200 CID)*

12-Volt KOMPAC DIESELMATIC NVT Systems

22109.....Engine size 3.70 - 19.67 liters (226-1200 CID)*

22121.....Engine size 3.70 - 19.67 liters (226-1200 CID)*, without Starting Fluid Cylinder

24-Volt KOMPAC DIESELMATIC NVT Systems

24029.....Engine size 3.70- 19.67 liters (226-1200 CID)*

* Refer to Page 4, Flow Control - Metering Devices, for additional Metering Orifices which are available to integrate the DIESELMATIC NVT for use in engines of different sizes other than what is listed on Page 2 of this Catalog.

DIESELMATIC II

Automatic Turn-Key Starting Fluid System using the core technology found in KBI's patented, state of the art, DIESELMATIC NVT System. DIESELMATIC II Systems can be used with or without an Engine's ECM (Electronic Control Module). DIESELMATIC II has a low current draw and is non-polarity sensitive making it compatible with ECM Engines. Engineered for Reliability, the solenoid valve is sealed from the environment, uses an encapsulated coil and o-ring cylinder valve seal. Designed for superior performance, the DIESELMATIC II injects starting fluid precisely with absolutely no operator intervention.



DIESELMATIC II Kits are fully engineered with electrical components equipped with OEM quality weatherproof connectors and a universal wiring harness to accommodate all installations (no additional wiring required). SAE-level integrity of electrical circuit. Starting Fluid cylinder is included.

Features and Benefits of DIESELMATIC II

- Low Current Consumption: 1.3 or < amps
- "O" Ring Seal Bottle Connection
Eliminate compression seal (gasket) deficiencies.
- Encapsulated Coil
Eliminate vibration and corrosion issues associated with coil failures.
- Molded Wire Strain Relief
Sealed connection between wire leads and solenoid coil wires.
- On/Off Ether Flow on Demand
Eliminate residual/reservoir shot of ether.
- BLOCKOR® Metering Orifice
Flow restricting vaporizing orifice, controls the flow rate of starting fluid being injected into the engine.

12-Volt KOMPAC DIESELMATIC II Systems

22079.....Engine size 0.82 - 3.69 Liters (50-225 CID)*
 22078.....Engine size 3.7 - 19.67 Liters (226-1200 CID)*

24-Volt KOMPAC DIESELMATIC II Systems

24040.....Engine size 0.82 - 3.69 Liters (50-225 CID)*
 24038.....Engine size 3.7 - 19.67 Liters (226-1200 CID)*
 24042.....Engine size 3.7 - 19.67 Liters (226-1200 CID)* with M10 Metric Nozzle 230007

12-Volt DIESELMATIC II System

62276.....Engine size 3.7 - 19.67 Liters (226-1200 CID)*

24-Volt DIESELMATIC II System

64106.....Engine size 3.7 - 19.67 Liters (226-1200 CID)*

*Refer to Page 4, BLOCKOR's, which are available to integrate the DIESELMATIC II for use in engines of different sizes.

Starting Fluid Cylinders

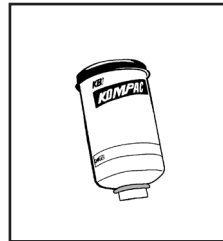
- NOTE: 1) DO NOT USE A VALVE GASKET IN ANY NVT VALVE - NVT VALVES RELY ON THE CYLINDER "O" RING (Dirt & Moisture Seal) TO CREATE THE NECESSARY SEAL!
- 2) If you are not using the Starting Fluid Cylinder on an NVT Valve, install a New KBI valve gasket (part number 300012, see page 7), each time the Starting Fluid Cylinder is removed. All KBI Replacement Starting Fluid Cylinders will have a New KBI valve gasket inside of the thread protecting cap on bottom of Starting Fluid Cylinder. **BE SURE ONLY ONE VALVE GASKET IS USED.** Spread a light film of clean oil on new Valve Gasket when installing.
- 3) All KBI Starting Fluid Cylinders contain a Dirt & Moisture Seal ("O" Ring).
- 4) All KBI Starting Fluid Cylinders are the industry standard 1 inch threads.



DIESELMATIC Cylinders

21 Ounces - Premium Engine Starting Fluid

20020.....Case of 12 Cylinders
 20030.....Single Packed Cylinder



KOMPAC Cylinders

8 Ounces - Premium Engine Starting Fluid

20041.....Case of 12 Cylinders
 20051.....Single Packed Cylinder



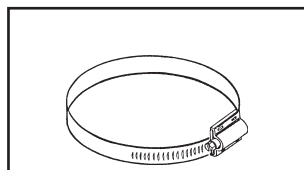
DIESEL START Cylinders

18 Ounces - Premium Engine Starting Fluid

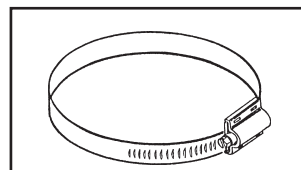
20011.....Case of 12 Cylinders
 20021.....Single Packed Cylinder

See Page 10 for Details on KBI's Cylinder Recycling Program

Cylinder Clamps

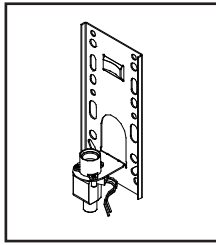


301009.....KOMPAC and DIESEL START Cylinder Clamp, 3" diameter



301082.....DIESELMATIC Heavy-Duty Cylinder Clamp, 4" diameter

Valve Assemblies



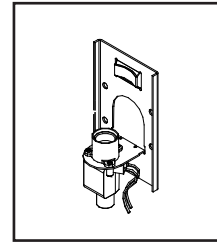
DIESELMATIC NVT

12-Volt Valve Assemblies

NVT12DH0000 Engine size 3.70 - 19.67 Liters (226-1200 CID)
 DM II 120002 Engine size 3.70 - 19.67 Liters (226-1200 CID)

24-Volt Valve Assemblies

NVT24DH0000 Engine size 3.70-19.67 Liters (226-1200 CID)
 DM II 240002 Engine size 3.70-19.67 Liters (226-1200 CID)



KOMPAC DIESELMATIC NVT

12-Volt Valve Assemblies

NVT12KH0000 Engine size 3.70 - 19.67 Liters (226-1200 CID)
 KP II 120001 Engine size 3.70 - 19.67 Liters (226-1200 CID)

24-Volt Valve Assemblies

NVT24KH0000 Engine size 3.70- 19.67 Liters (226-1200 CID)
 KP II 240002 Engine size 3.70- 19.67 Liters (226-1200 CID)

Flow Control - Metering Devices

BLOCKOR® - For DIESELMATIC Systems and DIESELMATIC II Systems
 Metering Orifice - For DIESELMATIC NVT Systems

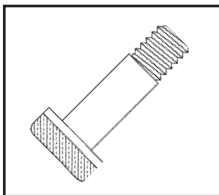
NOTE: BLOCKOR's are used and can only be used on a KBI DIESELMATIC or KOMPAC DIESELMATIC System!

Metering Orifice's are used and can only be used on a KBI DIESELMATIC NVT or KOMPAC DIESELMATIC NVT System!

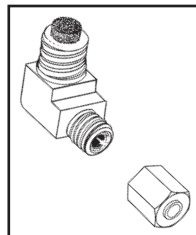
The KBI BLOCKOR Fitting is the heart of a DIESELMATIC System. A BLOCKOR controls the flow rate of starting fluid being injected into the engine and is also responsible for vaporizing the fluid in the most efficient manner possible. The BLOCKOR is the left hand threaded brass elbow fitting located at the bottom of every DIESELMATIC Valve Assembly. Refer to the KBI Installation - Operation Manual, KBI Form Number 130533, for more detailed information.

KBI has created a new BLOCKOR fitting that incorporates a threaded filter design as opposed to the O-Ring filter design used in the older style BLOCKOR fitting. This threaded design will eliminate the damage caused to the filter and therefore the metering orifice, from vibration and prolonged exposure to the elements. The new design also incorporates a tubular shaft that has the filter element mounted at one end, creating an annular chamber inside the fitting which will accumulate and trap the particles normally found to have clogged the older filter design. When servicing is required, the new filter can be removed by gently unscrewing the filter unit with a pliers.

- KBI will supersede all BLOCKOR Fittings with the new Patented filter design.
- This new design will greatly enhance the life expectancy of the filter and may actually eliminate the need to service the assembly.
- New BLOCKOR fittings can be identified by the 250XXX part number designation. The old designs were designated as 240XXX part numbers.
- The new BLOCKOR fittings can also be identified by the additional Patent Number stamping of 5,474,678 that can be found on every fitting.

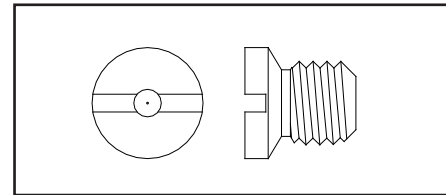


301876 Replacement BLOCKOR Filter, for use in new style BLOCKOR 250XXX Series.



BLOCKOR's

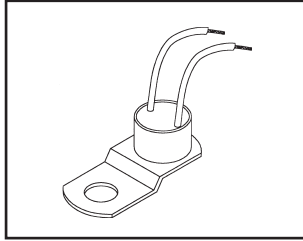
250002 Engine size 29.51-39.33 Liters (1801-2400 CID)
 250003 Engine size 19.68-29.5 Liters (1201-1800 CID)
 250005 Engine size 3.7-19.67 Liters (226-1200 CID)
 250007 Reduced flow rate
 250009 Engine size 0.82-3.69 Liters (50-225 CID)



DIESELMATIC NVT
 Metering Orifice's

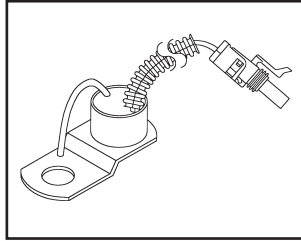
100515FR Engine size 0.82-3.69 Liters (50-225 CID)
 100515HR Engine size 3.70-19.67 Liters (226-1200 CID)
 100515JR Engine size 19.68-29.5 Liters (1201-1800 CID)
 100515LR Engine size 29.51-39.33 Liters (1801-2400 CID)
 100515OR Engine size 39.34-52.44 Liters (2401-3200 CID)

Engine Temperature Sensors (ETS) & Thermo-Guards
ETS—For DIESELMATIC Systems or Non-ECM Controlled DIESELMATIC NVT Systems
Thermo-Guard—For DIESEL START Systems



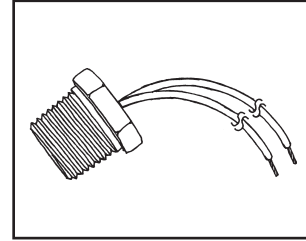
Surface Mount

- 300029.....Thermo-Guard
- 300329.....Grounded Thermo-Guard
- 300731.....ETS 55°F (13°C)
- 300789.....ETS 40°F (4°C)
- 300803.....ETS Arctic 23°F (-5°C)
- 301062.....ETS Hermetically Sealed Arctic Sensor 14°F (-10°C)
- 301066.....ETS 32°F (0°C)



Surface Mount "Engineered Kit"

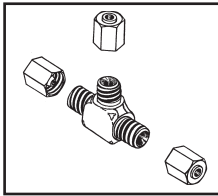
- 301417.....ETS 40°F (4°C), with Weatherpack Connector
- 301687.....ETS 17°F (-8.3°C), with Weatherpack Connector



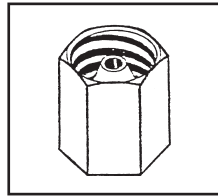
Screw-In (½ Inch NPT)

- 300201.....Thermo-Guard
- 300800.....ETS 55°F (13°C)
- 300849.....ETS 40°F (4°C)

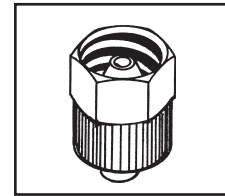
Valve/Tubing Fittings



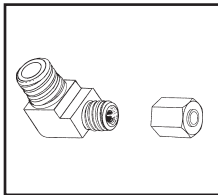
100009Atomizer Tubing "T" Fittings with Nuts and Sleeves



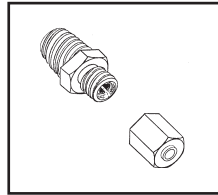
100010.....Nut and Sleeve



100166.....High Temperature Nut and Sleeve, for use with 100165 Tubing or Military Spec. Tubing

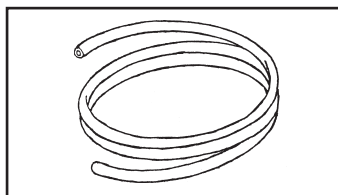


300040Valve Fitting, 90° Elbow with Nut and Sleeve

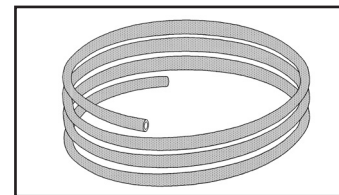


300814.....Valve Fitting, Straight with Nut and Sleeve

Tubing



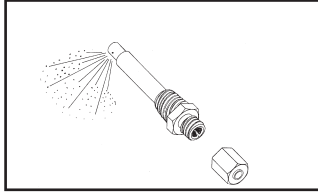
- 100165.....Bulk High Temperature Tubing - Per Foot (use with 100166 High Temperature Nut and Sleeve)
- 300017.....Nylon Atomizer Tubing - 48"
- 300045.....Nylon Atomizer Tubing - 60"
- 300410.....Bulk Nylon Atomizer Tubing - Per Foot



- 100260.....Protective Sheathing for Tubing - Per Foot
- 301447.....Protective Sheathing for Tubing - 5 Feet

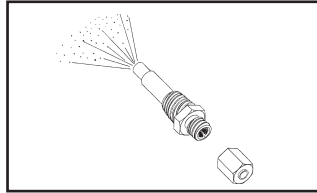
Atomizers

Atomizers are used in DIESEL START Systems Only
 U.S.A. Standard Atomizers' Threads Are - 1/8 NPT



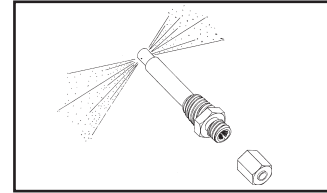
Straight Side Orifices

- 220451.....Engine size 3.29-8.19 Liters (201-500 CID)
- 220074.....Engine size 8.21-18.03 Liters (501-1100 CID)
- 220380.....Engine size 18.04-27.86 Liters (1101-1700 CID)
- 220211.....Truck Ready-Mount, code yellow
- 220212.....Truck Ready-Mount, code black



Straight End Orifices

- 220336.....Engine size 3.29-8.19 Liters (201-500 CID)
- 220464.....Engine size 8.21-18.03 Liters (501-1100 CID)
- 220149.....Engine size 18.04-27.86 Liters (1101-1700 CID)



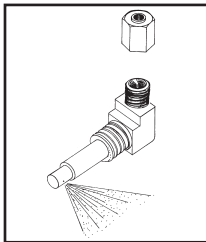
Straight 180° Orifices

- 220441.....Engine size 3.29-8.19 Liters (201-500 CID)
- 220282.....Engine size 8.21-18.03 Liters (501-1100 CID)
- 220097.....Engine size 18.04-27.86 Liters (1101-1700 CID)
- 220210.....Truck Ready-Mount, code white

Injector Nozzles

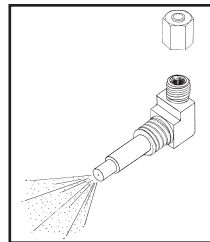
Injector Nozzles are used in DIESELMATIC Systems Only
 U.S.A. Standard Injector Nozzles' Threads are 1/8 NPT

- NOTE: 1) Use the correct replacement Injector Nozzle to insure the proper distribution of starting fluid vapors to all your engine's cylinders.
 2) Whenever possible the straight brass fitting "Injector Nozzle" supplied with your DIESELMATIC system should be used. An elbow fitting substituted in place of the straight fitting will interfere with proper vaporization of starting fluid. If an elbow fitting installation is necessary, use KBI Special Injector Nozzle P/N 220424 (end orifice) or P/N 220475 (side orifice) for engines over 12.14 Liters (741 CID); for engines under 12.13 Liters (740 CID) use KBI P/N 220401 (end orifice) or P/N 220375 (side orifice).



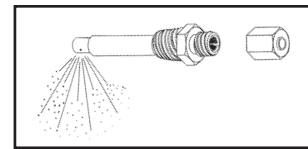
90° Elbow Side Orifices

- 220375Engine size 12.13 Liters (740 CID) and under
- 220475.....Engine size 12.14 Liters (741 CID) and over



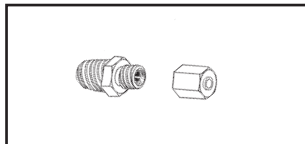
90° Elbow End Orifices

- 220401Engine size 12.13 Liters (740 CID) and under
- 220424.....Engine size 12.14 Liters (741 CID) and over



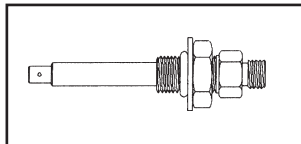
Straight Side Orifices

- 220315Engine size 12.13 Liters (740 CID) and under
- 220460.....Engine size 12.14 Liters (741 CID) and over
- 220471.....Engine size 12.14 Liters (741 CID) and over, with 1/4" Reducer Bushing



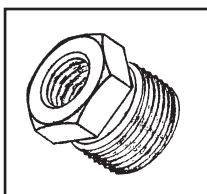
DIESELMATIC Straight Fitting

- 220295.....Injector Nozzle

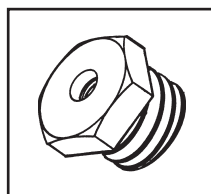


ISO Standard Nozzles and Atomizers
 Available - Contact KBI for Application.

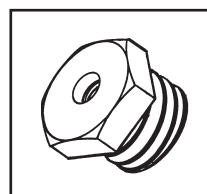
Atomizer/Nozzle Adapter Bushings



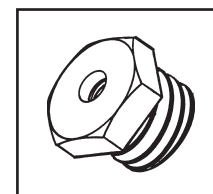
- 100015.....Adapter Bushing
1/8 - 1/4 NPT



- 300632.....Adapter Bushing
1/8 - 7/8 (14 UNF)

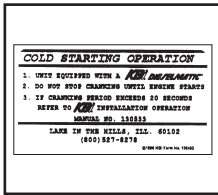


- 300974.....Metric Reducer
1/8 - M22 X 1.5



- 301040.....Metric Reducer
1/8 - M20 X 1.5

Instructions and Dash Labels



130492.....DIESELMATIC Dash Label

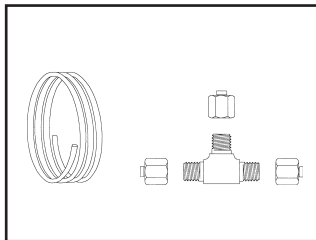


130497.....DIESELMATIC Air Filter Label

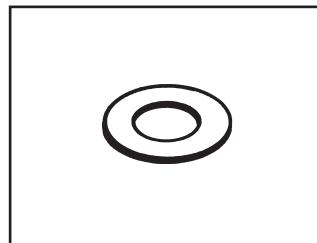


131173.....DIESELMATIC NVT Instruction Book

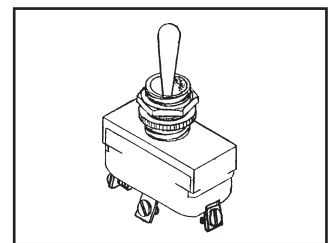
Miscellaneous Items



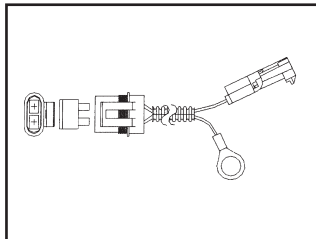
29999.....Universal Dual Manifold Adaptor Kit



300012..... Valve Gasket for Starting Fluid Cylinders.
DO NOT USE A VALVE GASKET WHEN USING STARTING FLUID CYLINDER ON AN NVT VALVE!

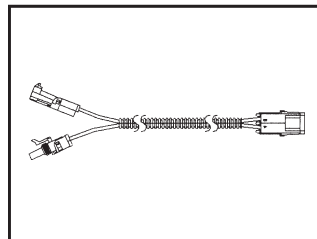


300787.....Arctic Kit for DIESELMATIC Systems (includes dash label and wiring schematic)



Fuse Harness's

302110.....12-Volt Fuse Harness, DIESELMATIC NVT System (2 amp fuse)
 302122.....24-Volt Fuse Harness, DIESELMATIC NVT System (1 amp fuse)

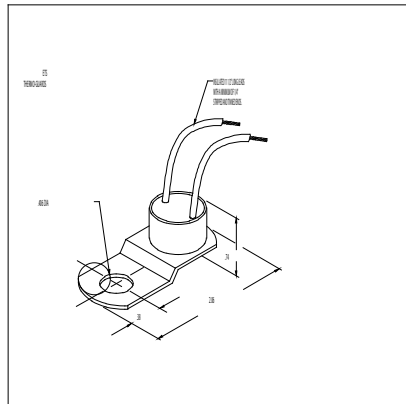


Wiring Harness's

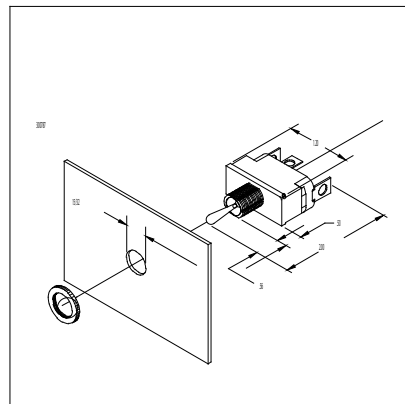
301568.....12-Volt Wiring Harness, DIESELMATIC NVT System
 301582.....24-Volt Wiring Harness, DIESELMATIC NVT System

Mounting Dimensions

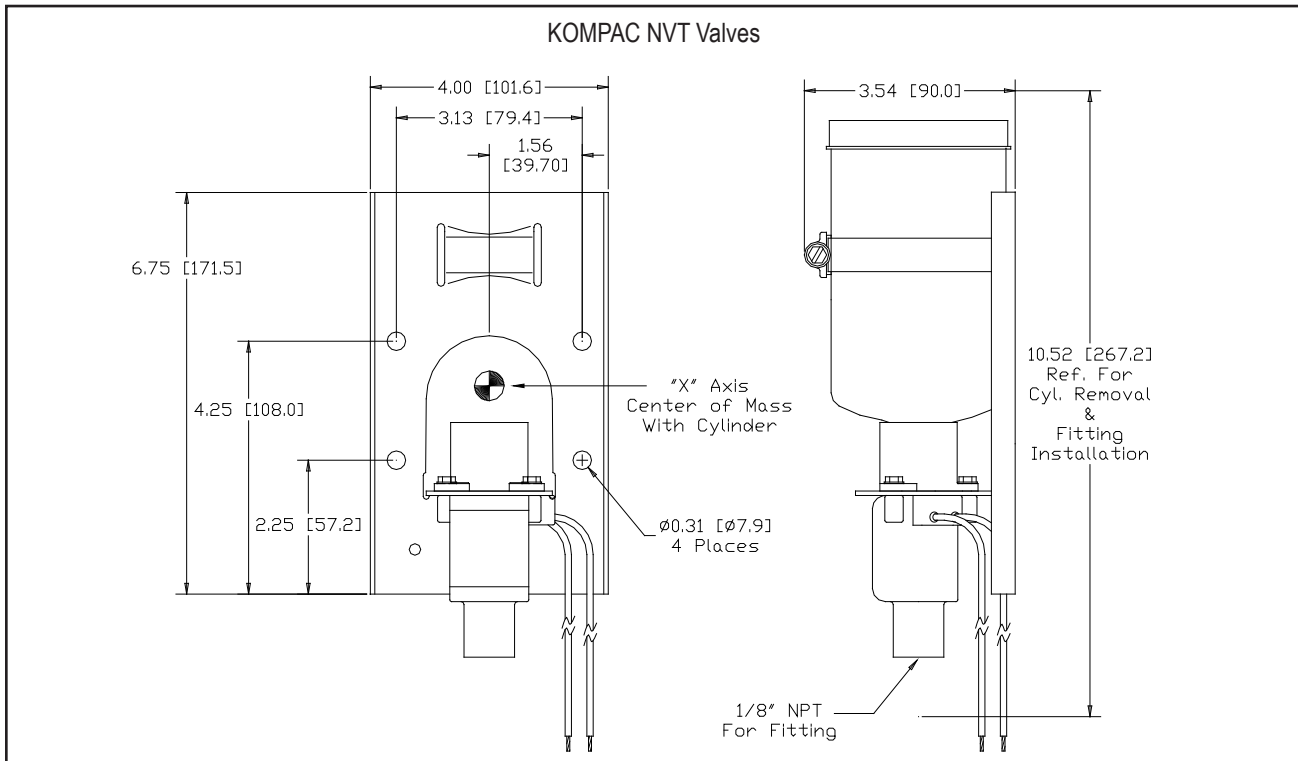
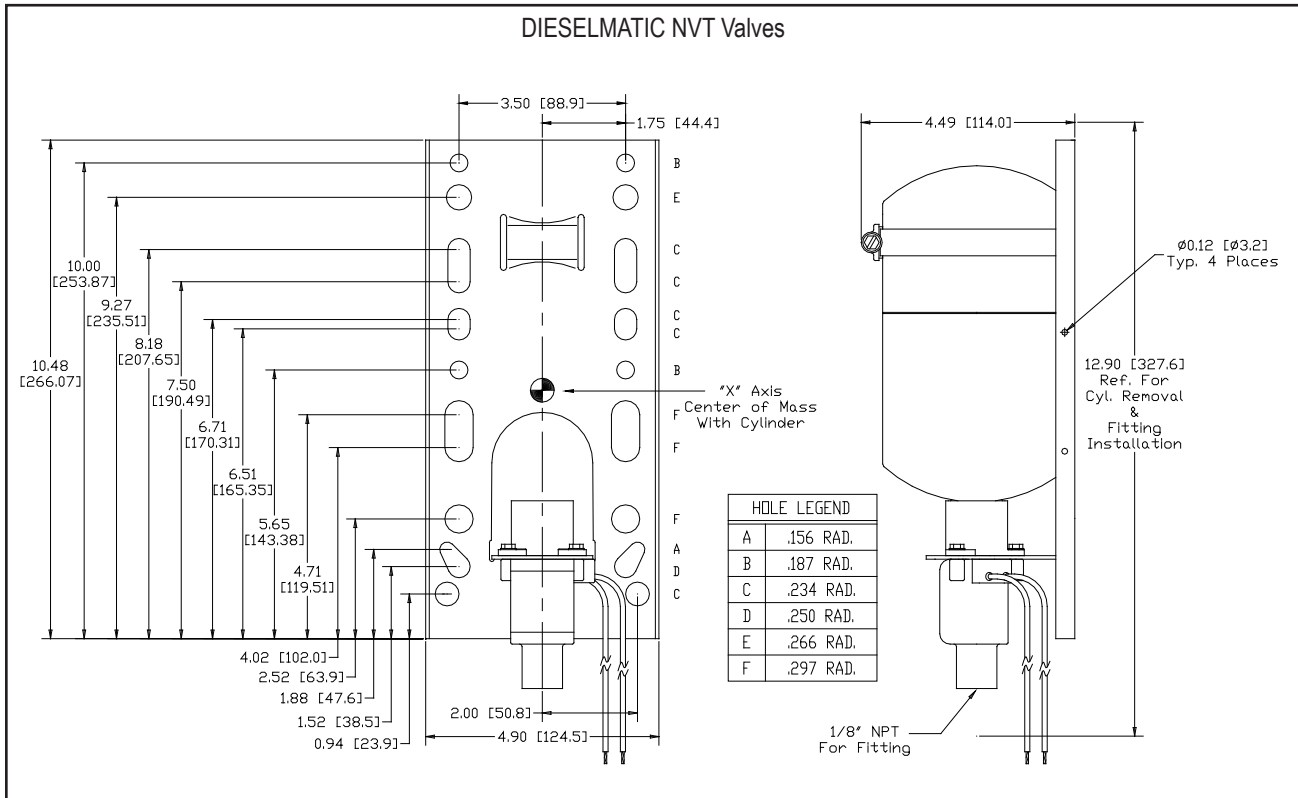
ETS - Thermo-Guards



Arctic Switch



Mounting Dimensions continued



NOTE:  Represents the center of mass.

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Cross Reference of KBi Part Numbers and Catalog Page Number:

Part Number	Page Number	Part Number	Page Number	Part Number	Page Number	Part Number	Page Number
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20020	7	100015	9	220475	9	301066	8
20021	7	100165	8	250002	7	301082	8
20030	7	100166	10	250003	7	301417	8
20041	7	100260	8	250005	7	301447	8
20051	7	130492	10	250007	7	301568	11
22078	4	130497	10	250009	7	301582	11
22079	4	131173	10	300012	11	301687	8
22109	2	220074	9	300017	8	301876	7
22110	2	220097	9	300029	8	302110	11
24029	2	220149	9	300040	10	302122	11
24031	2	220210	9	300045	8	DM II 120002	4
24038	4	220211	9	300201	8	DM II 240002	4
24040	4	220212	9	300329	8	KP II 120001	4
24042	4	220282	9	300410	8	KP II 240002	4
29999	11	220295	9	300632	9	NVT12DH0000	6
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42500	6	220375	9	300789	8	NVT24KH0000	6
62120	2	220380	9	300800	8	100515FR	7
62121	2	220401	9	300803	8	100515HR	7
62276	4	220424	9	300814	10	100515JR	7
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64084	2	220451	9	300974	9	100515OR	7
64106	4	220460	9	301009	8		
100009	10	220464	9	301040	9		

Limited Warranty

All products are guaranteed against defects in material and workmanship for one year from date of purchase. The Valve and Engine Temperature Sensor (ETS), Switch are sealed units. If these components do not operate properly, they must be returned to the factory, prepaid, for replacement. If factory inspection determines the product to be defective under the terms of this warranty, it will be replaced without charge.

Failure due to accident, abuse, neglect, improper installation or maintenance, mishandling, and repairs or attempted repairs which have been made by others, are not covered under the terms of this warranty.

Kold Ban International, Ltd., shall not be liable for loss of use of the System or other incidental or consequential costs, expenses, or damages incurred by the purchaser or user.

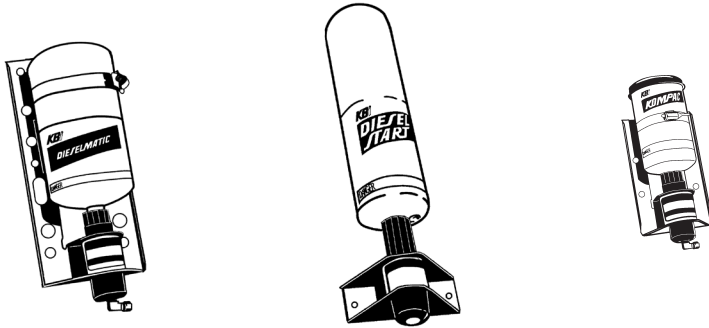
This warranty does not include labor for repair or replacement, nor does it apply to used fluid cylinders or BLOCKOR fittings, injector nozzles, and atomizers clogged by dirt.

KBi/Kold-Ban International, Ltd.
8390 Pingree Road
Lake In the Hills, Illinois 60156-9637 U.S.A.

KBi'S DIESELMATIC PRODUCTS ARE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENT NUMBERS: 4202309, 4326485, 4346683, 5301873, 5095866, 5474678, 5839469. CANADIAN Patent Number 1,120,352, U.K. PATENT NUMBER 2026096 AND OTHER U.S. AND FOREIGN PATENTS PENDING.

DON'T KNOW WHAT TO DO WITH YOUR USED STARTING FLUID CYLINDERS?

Use the **KBI** Cylinder Recycling  Program!



KBi was the first and only to develop a fully Automatic Starting Fluid (Ether), System - the DIESELMATIC. Now KBi is the first and only to offer its' current and future customers a Recycling Program for the empty/used ether bottles that are used on all Ether Start Systems.

Cylinder Recycling:

With so much emphasis on the environment and the possible impact that hazardous material may have on it, KBi has taken the lead in providing their current and future customers with a quick and effective means for recycling their used high pressure starting fluid cylinders. This program was developed to help KBi's customers alleviate any concerns on the proper disposal of Starting Fluid (ether), Cylinders. All of the proper documents and procedures needed are provided by KBi.

Participation:

Call KBi at (800)527-8278, for a Return Authorization Number. KBi will then provide a packet of labels and documents for the shipment of the "USED" Starting Fluid Cylinders. If at all possible, use the same case cartons in which the new

Starting Fluid Cylinders were originally shipped. No Starting Fluid Cylinders will be accepted by KBi without a Return Authorization Number.

Recycling Costs:

There are no processing fees assessed for recycling Starting Fluid Cylinders when an order is placed for an equal number of KBi Brand Starting Fluid Cylinders or a "Proof of Purchase" (invoice showing purchase of an equal number of KBi Brand Starting Fluid Cylinders), is provided. Without purchasing an equal number of KBi Brand Starting Fluid Cylinders (or "Proof of Purchase"), a recycling charge per cylinder will be assessed. Call KBi at (800)527-8278 for more information on recycling of Starting Fluid Cylinders. All Starting Fluid Cylinders must be shipped to KBi freight prepaid.

Qualifications:

KBi's Cylinder Recycling Program applies only to DOT39NRC Starting Fluid Cylinders. Competitive brands of Starting Fluid Cylinders will be accepted by KBi for recycling. No other high pressure cylinders, other than Starting Fluid (ether), Cylinders will be accepted by KBi for recycling.

REMEMBER KBi . . . THE LEADER FOR COLD WEATHER STARTING!!!

The KBI Cold Room for Unique or New Applications



Technicians monitor and record all specified data.

To aid in the development and testing of fluid starting systems for unique or new applications, KBI offers the industry its own Cold Testing Facilities, where starting tests can be conducted at temperatures as low as -50°F (-46°C). KBI engineers have developed practical fluid starting systems for engines ranging from hand crank 14

CID (229 ml), to engine over 3,000 CID (49 l).

Preparation

Whenever possible, it is recommended that engines or machines be tested with the loads or accessories that affect cold starting in the real world. This may include alternators, hydraulic pumps, automatic transmissions, etcetera.

Normal testing procedures include a thorough preparation of the test engine or machine for cold temperature operations, in accordance with the manufacturer's recommendations. This may include draining and refilling of the crankcase, fuel system and coolant. Batteries are selected in accordance with the manufacturer's recommendation or as supplied by the customer. Before engines or machines are moved into the Cold Room, they are started and run at warm temperatures to assure that all components are functioning properly.

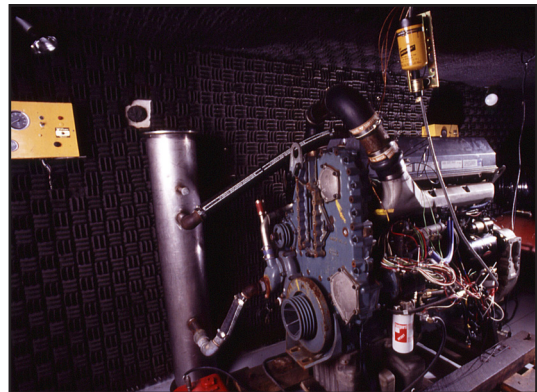
Test Procedure

Starting tests are normally conducted at 24 hour intervals to assure thorough cold soaking before each test. Batteries are cold soaked with the engine. Before each test, Cold Room air temperatures and engine fluid temperatures are recorded. Each start is monitored on a recording oscillograph with channels showing starter current draw, engine speed, engine oil pressure, etcetera.

Data is also collected on a data acquisition system. With 30 channel data recording capabilities at a frequency up to 130 microseconds, accurate and complete collection of essential test data is assured. Recorded data may include any combi-

nation of temperature measurements, smoke opacity, pressure measurements, DC voltages, RPM's, etcetera. The data acquisition system is "interactive" with eight channel analog output capability, and may be programmed to automatically control items under test.

Data collected during tests is collected on a RAM DISC and may be reviewed on a personal computer screen, printed or permanently recorded on 5 1/4" or 3 1/2" floppy discs. Test data can be sent to remote locations equipped with IBM compatible terminals via modem for off-site evaluation or review. Data from any channels can be conveniently summarized in graphic form.



Various engines are available for instrumentation and application of a clients products and/or requirements.

Normal Test Series

Each series of tests is discussed and reviewed in advance with the customer. Tests are conducted to determine the following:

1. The lowest temperature at which an engine will start and run without starting aids.
2. The effectiveness of built-in or manufacturer recommended starting aids in lowering the starting threshold. These may include manifold pre-heaters, glow plugs, block heaters, or various other types of fluid starting systems.
3. The effectiveness of various KBI DIESEL START or DIESELMATIC products.

Depending upon test results, testing at particular temperatures may be repeated, varying the crankcase lubricant, battery capacity, etcetera, to study their effects on cold starting.



COLD TEST FACILITY



KBi's Cold Test Facility Aids the Development of Diesel Engine Starting Systems.

KBi, Ltd. manufactures and markets Diesel Starting Fluid Systems worldwide. Its patented DIESELMATIC and DIESELMATIC KOMPAC Starting Fluid Systems have been developed with the help of research conducted in the company's own Cold Room. Tests show that KBi's DIESELMATIC systems provide reliable starts at -25°F and below for all sizes and makes of diesel engines.

During the last twenty years, KBi's Cold Test Facility, one of the very few in the industry, has permitted the monitoring of cold-weather starting of diesel engines from 0.23 Liters (14 CID) to over 18.03 Liters (1100 CID) under precise scientific conditions. KBi has a policy of leasing the Cold Test Facility to organizations with related research projects.

For more information concerning research data or leasing of the KBi Cold Test Facility, contact:

Mr. James O. Burke
KBi, Ltd.
8390 Pingree Road
Lake In The Hills, IL 60156-9637 U.S.A.
(847) 658-8561, Fax (847) 658-9280, www.koldban.com