



Engine Operation Manual

DFP4 2012 T1x

DFP4 2012 C1x

DFP4 2012 CM3x

DFP6 2012 T1x

DFP6 2012 C1x

DFP6 1013 C1x

DFP6 1013 C2x

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2	CH	Mar. 2009	Changed Assembly Drawings, Control Panel Drawings. Misc. Updates
3	CH	Dec. 2009	Added DFP4-2012-Cm30-34 & DFP6-1013-C27
4	CH	Oct. 2010	Revised Manual to display EU compliant guarding and in-block coolant heater

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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1. DEUTZ Corporation (“DC”) warrants to the original retail customer that each new DEUTZ diesel engine fire pump driver (“DFP Fire Pump Driver”) supplied by DC or an authorized distributor of DC, purchased by the original retail customer and properly installed consistent with DC guidelines and in compliance with FM (Factory Mutual) and UL (Underwriters Laboratories) rules and guidelines, will be free from defects in material and workmanship under normal use and service. If, during the warranty period following the delivery of the DFP Fire Pump Driver, it is shown there is a defect in material or workmanship caused solely by failure of DC to meet such standards, and customer has notified DC in writing of such defect within that period, DC shall repair or replace, at DC’s cost and option, such defective component or part. Such repair or replacement will be made without charge to the customer at customer’s premises or, at the option of DC, at such other location as DC may designate. Any component or part that is replaced shall become the property of DC. Any repaired or replaced component or part shall be warranted until the expiration of the original warranty period. DC’s warranty obligation is expressly conditioned upon the customer fulfilling all obligations pursuant to customer’s purchase order, including, without limitation, all payment obligations.

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2. **DFP Fire Pump Driver (NEW):** Warranty coverage is provided for the DFP Fire Pump Driver series listed below:

Warranty Period	Operating Hours	Warranty Coverage
12 Months	Unlimited	All Components
24 Months	DFP4 2011 2000h	All Components of the diesel engine
	DFP4 2012 3000h	
	DFP6 2012 3000h	
	DFP6 1013 3000h	
	DFP6 2013 3000h	
36 Months	DFP4 2011 3000h	Main Components of the diesel engine, Crankcase, Crankshaft, Camshaft, Connecting Rods, Cylinder Head Casting
	DFP4 2012 4500h	
	DFP6 2012 4500h	
	DFP6 1013 4500h	
	DFP6 2013 4500h	

The Limited Warranty for the DFP Fire Pump Driver shall commence at the date of sale to the original retail customer, or one year from the date of manufacture of the DFP Fire Pump Driver, whichever occurs first.

3. **PARTS:** Warranty is provided for each new genuine DEUTZ Parts for a period of 12 months from the date of sale to the original retail customer.

4. This warranty does not cover the following: (i) wear and tear or contaminants; (ii) exposure, corrosion or prolonged or improper storage; (iii) normal maintenance service or the replacement or repair of parts required to be replaced or repaired in the course of normal maintenance service; (iv) improper installation, use, fuels, lubricants, operation, maintenance, transportation or packing; (v) misuse, alteration, negligence and accidents; (vi) chemical or electrical action; and (vii) unauthorized repairs. This warranty does not cover any components not manufactured by DC or DEUTZ AG, such as components added by DC’s customers before reselling it to the end-customer, and DC makes no warranty whatsoever with respect to such components.

5. The warranties, obligations, liabilities and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. DC’s total aggregate liability with respect to any defective component (which includes the DEUTZ engine) or new genuine DEUTZ Parts shall not exceed the amount paid by the customer for such DFP Fire Pump Driver and customer agrees to release, defend, indemnify and hold DC harmless from and against any and all further liability in excess thereof arising in any manner from any alleged defective component or part. To the fullest extent allowed by law, releases from, and limitations of liability shall apply notwithstanding breach of contract, tort (including negligence), strict liability or other theory of legal liability of the party released or whose liability is limited. The laws of the State of Georgia shall govern this warranty.

6. UNDER NO CIRCUMSTANCES WILL THE CUSTOMER BE ENTITLED TO RECISSION OR TO A REDUCTION IN THE PURCHASE PRICE. CUSTOMER WAIVES ANY AND ALL CLAIM FOR LOSS OF TIME, REPLACEMENT POWER, INCREASED COST, INCONVENIENCE, LOSS OF USE OR PROFIT, LOSS OF GOODWILL, COST OF CAPITAL, COST OF RENTALS OR ANY OTHER DIRECT, INDIRECT, PUNITIVE, SPECIAL, EXEMPLARY, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER.

7. THIS WARRANTY AND THE DEUTZ EMISSION WARRANTIES FOR EPA-APPROVED DEUTZ ENGINES AND GENUINE DEUTZ PARTS INSTALLED IN SUCH ENGINES ARE IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES OF DC AND DEUTZ AG WITH RESPECT TO DEUTZ ENGINES AND GENUINE DEUTZ PARTS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. NEITHER DC NOR DEUTZ AG ASSUME, NOR AUTHORIZE ANY DISTRIBUTOR OR OTHER PERSON TO ASSUME, ON THEIR BEHALF, ANY OTHER OBLIGATION OR LIABILITY.

8. For DFP Fire Pump Driver warranty details contact:

DEUTZ Corporation
Warranty Department
3883 Steve Reynolds Blvd
Norcross GA 30093 USA
Phone: 770-564-7100
www.deutzamericas.com

Effective date: March 16, 2009

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1. General

1.1. About this Manual

This manual contains instructions for the DEUTZ DFP2012 and DFP1013 series engine. Reading this manual will provide you with information enabling you to avoid accidents, preserve the manufacturer's warranty and maintain the engine.

1.1.1. Notices in this Manual



This symbol is used to communicate all safety warnings. Please follow them carefully. In addition, please follow all state and federal regulations associated with the use of this product.

1.2. DEUTZ Diesel Engines



The Deutz Fire Protection engine is ONLY intended for operation after being incorporated into a final machine. Failure to properly install and protect the engine may result in injury or death. See Appendix E for incorporation instructions

DEUTZ engines are the product of many years of research and development. The resulting know-how coupled with stringent quality standards, guarantee their long service life, high reliability and low fuel consumption. As a result, DEUTZ diesel engines meet the highest standards for environmental protection.

1.2.1. Care and Maintenance

Sound care and maintenance practices will ensure that the engine continues to meet the customers' requirements. Recommended service and maintenance intervals must be observed and carried out. Special care should be taken under abnormally demanding operating conditions.



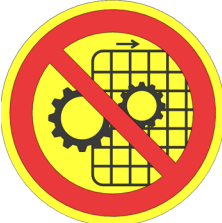




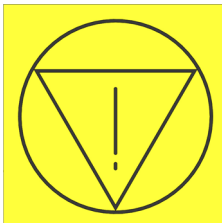
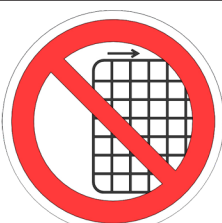
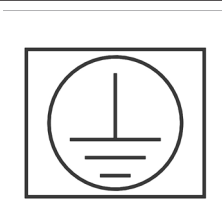
1.2.2. Safety Considerations

Please abide by the following:

1. Shutdown the engine before carrying out maintenance or repair work
2. Ensure that the engine cannot be started accidentally
3. Replace any guards or panels that may have been removed
4. Observe industrial safety regulations when running the engine in an enclosed environment or underground

1.3. Warning Label Identification

Your Deutz Fire Protection engine will have several different warning labels affixed. Here are the symbols you will see and the definition of each.

 <p>Warning - Hot Surface</p>	 <p>Read Instruction Manual Before Operating Equipment</p>
 <p>Warning - Do Not Operate Without Guards - Moving Parts Behind Guard</p>	 <p>Read Technical Instructions Before Servicing or Maintaining Equipment</p>
 <p>Warning - Rotating Belts - Severe Injury Possible</p>	 <p>Hearing Protection Required</p>
 <p>Warning - Equipment May Start Automatically</p>	 <p>Emergency Stop Lever</p>
 <p>Warning - Do Not Operate Without Guards In Place</p>	 <p>Battery Ground Point</p>

1.4. Service

In the event of a breakdown or for spare part inquiries please contact one of our authorized service representatives. Our trained specialists will carry out repairs quickly and professionally using genuine spare parts.

Original parts from DEUTZ AG are always produced in accordance with state-of-the-art technology. Please turn to section 6 of this manual for further service information.

1.5. Asbestos



DEUTZ original parts are asbestos-free

California Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

2. Engine Description

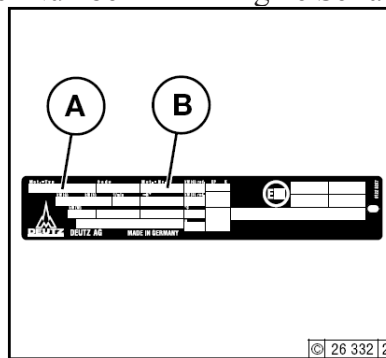
2.1. Model

Each DEUTZ engine has a rating plate that contains information about your engine (see section 2.1.1. below).

2.1.1. Engine Rating Plate

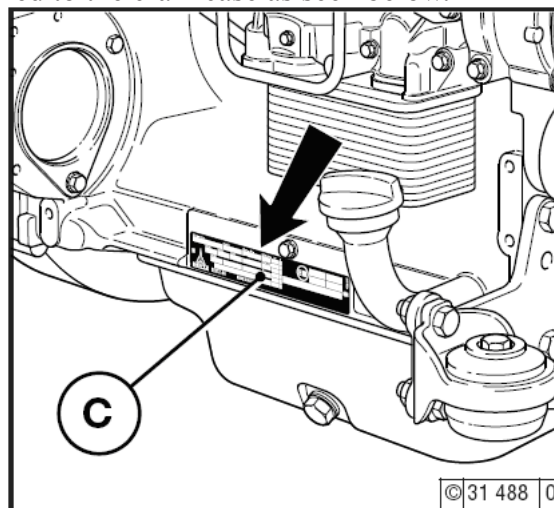
The DEUTZ rating plate contains performance information as well as the following:

A - Model Number B - Engine Serial Number






2.1.2. Position of the Engine Rating Plate

The rating plate C is attached to the crankcase as seen below.



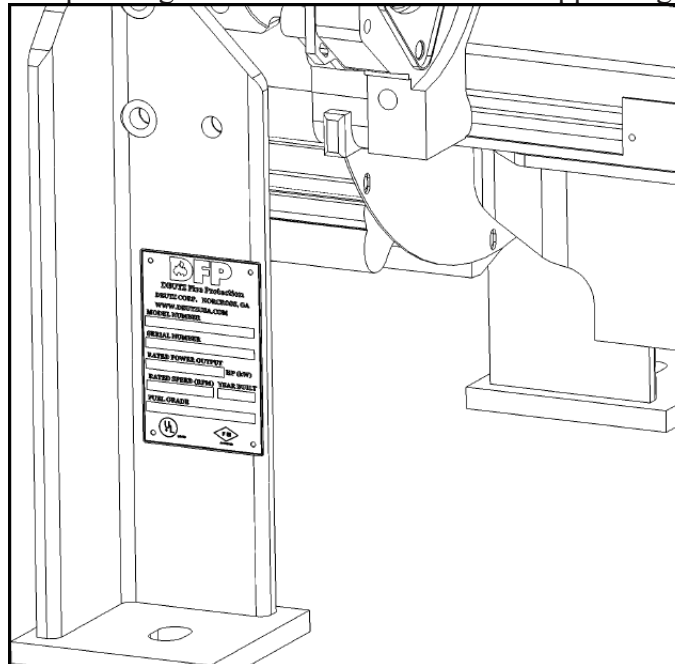
2.1.3. Fire Pump Rating Plate

The Fire Pump Rating Plate contains performance information regarding your model of fire pump.

 DEUTZ Fire Protection DEUTZ CORP. NORCROSS, GA WWW.DEUTZUSA.COM	
MODEL NUMBER <input type="text"/>	
SERIAL NUMBER <input type="text"/>	
RATED POWER OUTPUT <input type="text"/> HP (kW)	
RATED SPEED (RPM) <input type="text"/>	YEAR BUILT <input type="text"/>
FUEL GRADE <input type="text"/>	
 LISTED	 APPROVED

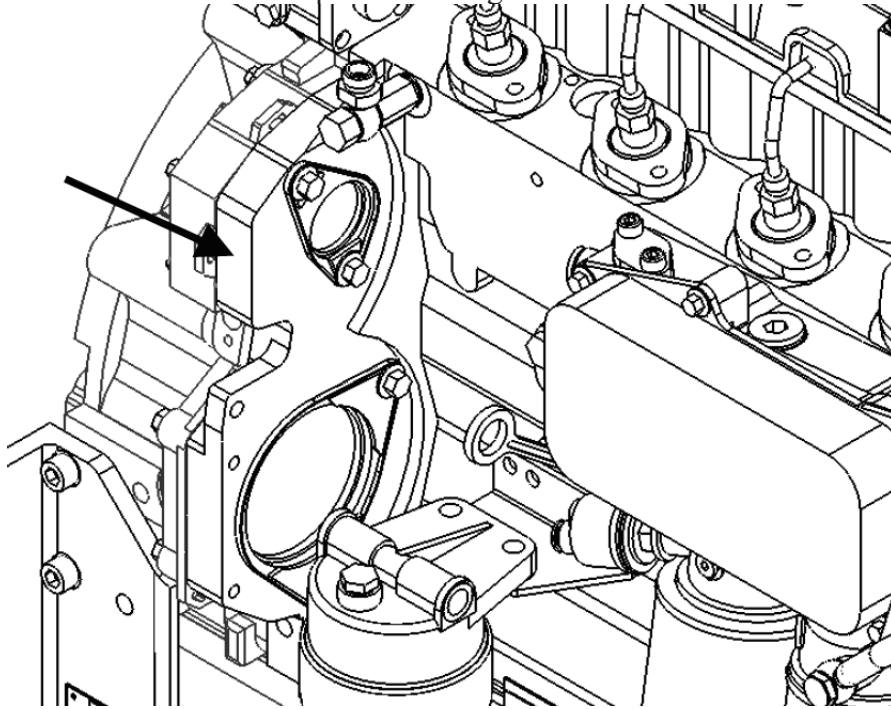
2.1.4. Location of the Fire Pump Rating Plate

The Fire Pump Rating Plate is located on the rear support leg as shown.



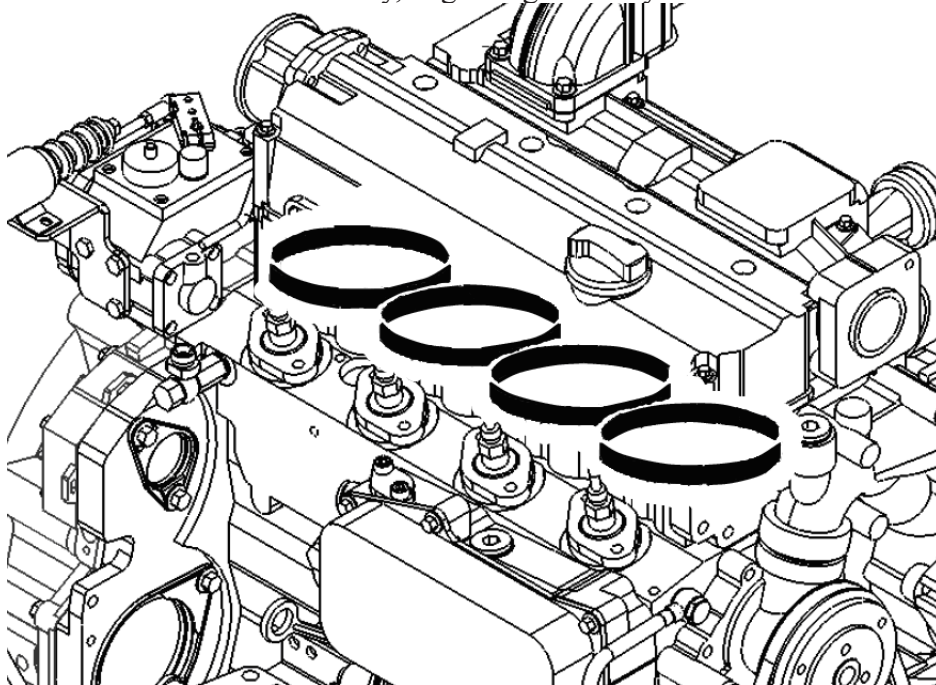
2.1.5. Engine Serial Number

The engine serial number is also stamped on the engine as indicated below.



2.1.6. Cylinder Numbering

The cylinders are numbered consecutively, beginning at the flywheel.



2.1.7. Fuel Delivery Lock



Adjustments to the governor are to be carried out by authorized DEUTZ SERVICE specialists only.

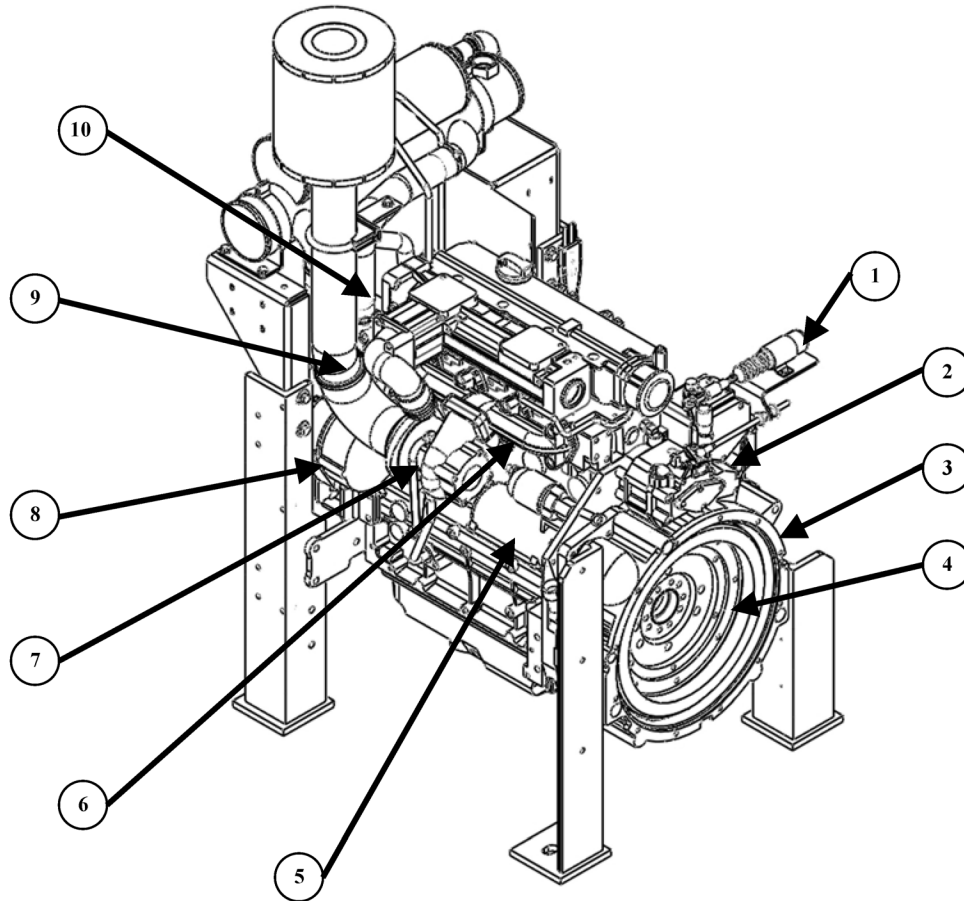
The manufacturer shall not be held liable for damages resulting from adjustments made to the governor by the operator. The lock screws are protected by the following methods:

1. Locking paint
2. Tamper resistant heads

2.2. Engine Illustrations

The purpose of this section is to identify the components of your DEUTZ engine.

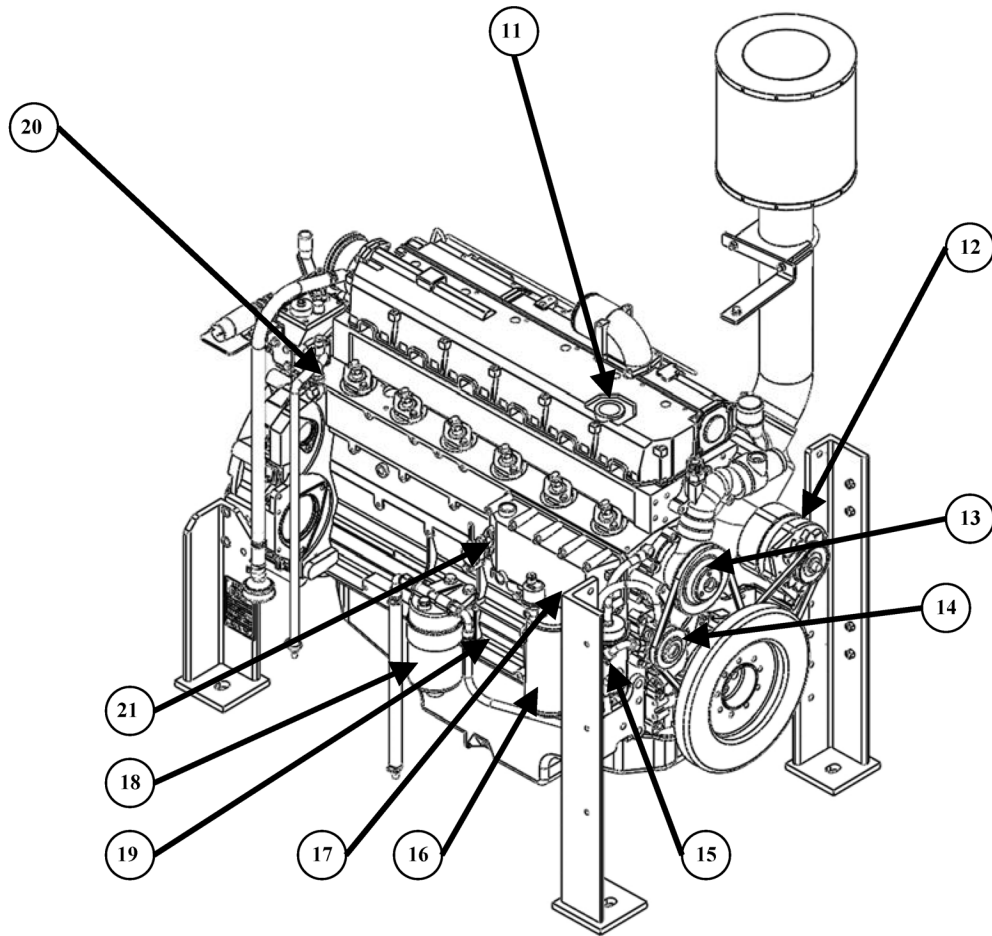
2.2.1. Starter Side (2012 and 1013)



NOTE: Some parts have been removed from the drawing for clarity.

1. "Energize to Stop" Solenoid	6. Exhaust Manifold
2. Speed Governor	7. Turbocharger
3. SAE Housing	8. Alternator
4. Flywheel	9. Coolant Inlet
5. Starter	10. Coolant Outlet

2.2.2. Service Side (2012 and 1013)



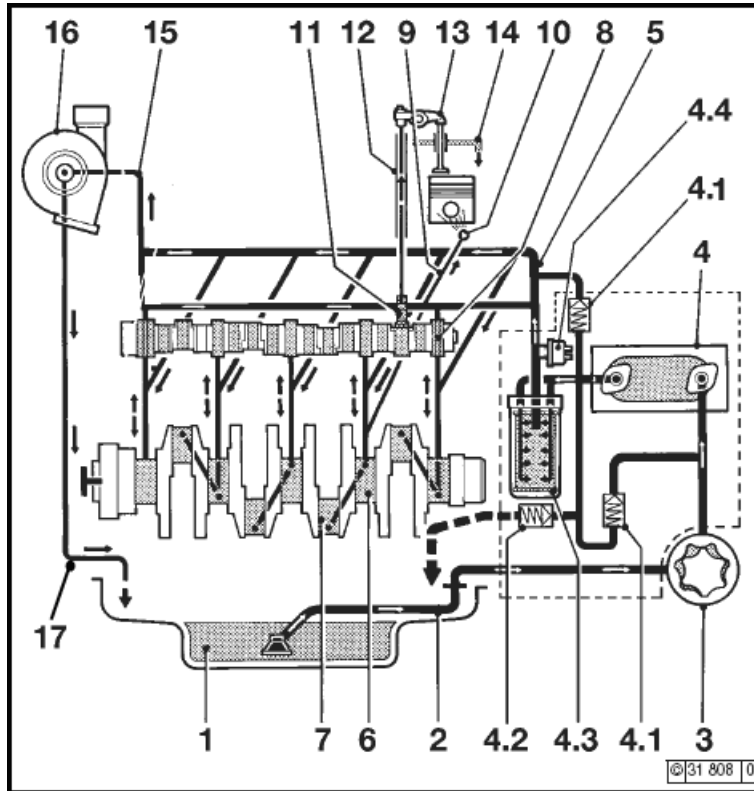
NOTE: Some parts have been removed from the drawing for clarity.

11. Oil Fill location	17. Lube Oil Cooler
12. Alternator	18. Fuel Pre-filter
13. Coolant Pump	19. Dip Stick
14. Fuel Pump	20. Fuel Return (built in pressure relief valve)
15. Fuel Filter	21. Coolant Preheater
16. Lube Oil Filter	

2.3. Oil Circuit

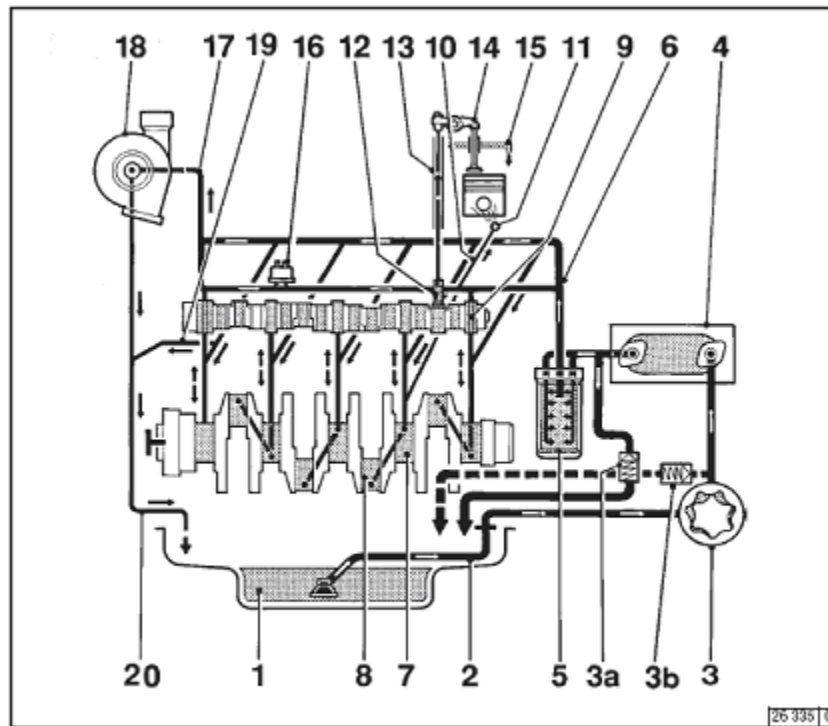
The following section contains information regarding the oil circuit of your engine.

2.3.1. Lube Oil Circuit (2012)



1. Oil pan	8. Camshaft bearing
2. Intake line	9. Line to spray nozzle
3. Lube oil pump	10. Spray nozzle for piston cooling
4. Main oil cooler	11. Valve lifter with rocker arm lubrication
4.1 Heat exchanger bypass valve	12. Push rod, oil supply for rocker arm
4.2 Pressure Relief Valve	13. Rocker arm
4.3 Lube oil filter	14. Oil line to oil pan
4.4 Oil pressure sensor	15. Feed line to turbocharger
5. Main oil galley	16. Turbocharger
6. Crankshaft bearing	17. Turbocharger return to crankcase
7. Con-rod bearing	

2.3.2. Lube Oil Circuit (1013)



1. Oil pan
2. Intake Line
3. Lube oil pump
 - a. Heat Exchanger Bypass Valve
 - b. Pressure-Relief Valve
4. Lube Oil Cooler
5. Lube Oil Filter
6. Main Oil Gallery
7. Crankshaft Bearing
8. Connecting Rod Bearing
9. Camshaft Bearing
10. Spray Nozzle Line
11. Spray Nozzle for Piston Cooling
12. Tappet w/control bore for pulse lubrication of rocker arms
13. Pushrod (lube oil supply of rocker arms)
14. Rocker Arm
15. Return line to oil pan
16. Oil Pressure Sensor
17. Oil line to exhaust turbocharger
18. Exhaust turbocharger
19. Return to Oil Pan
20. Return to Oil Pan

2.4. Fuel System

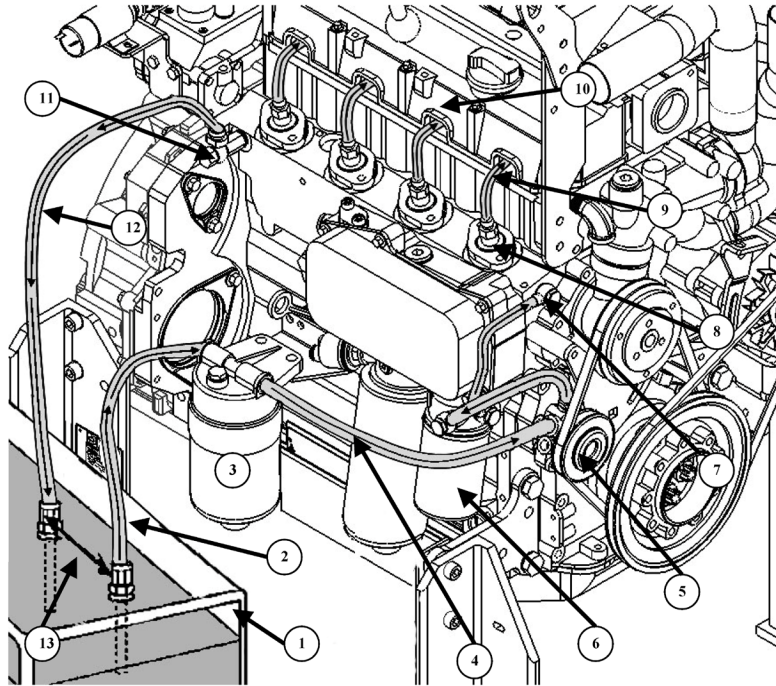
The following section contains information regarding the fuel system of your engine.



Suction Hoses and Fittings must have an ID (Inner Diameter) of at least 0.5 inches for lengths up to 6 meters (20 feet).

Return Hoses and Fittings must have an ID (Inner Diameter) of at least 0.375 inches.

2.4.1. Fuel System Schematic (2012 - 1013)



NOTE: Some parts have been removed from the drawing for clarity.

1. Fuel tank (supplied by customer)
2. Suction line to fuel pre-filter (supplied by customer)
3. Fuel pre-filter
4. Suction line to fuel lift pump
5. Fuel lift pump
6. Secondary spin-on fuel filter
7. Fuel supply line to injection pumps
8. Fuel injection pumps
9. High pressure injection line
10. Injectors (not pictured)
11. Banjo bolt with built in pressure relief valve
12. Return line to fuel tank (supplied by customer)
13. There **MUST** be at least **20 inches** between the lines and the bottom of the pickup tubes should be approximately 40mm from the bottom of the tank.

2.5. Coolant System

The following information pertains to your engines cooling system.

2.5.1. Coolant Pre-Heater



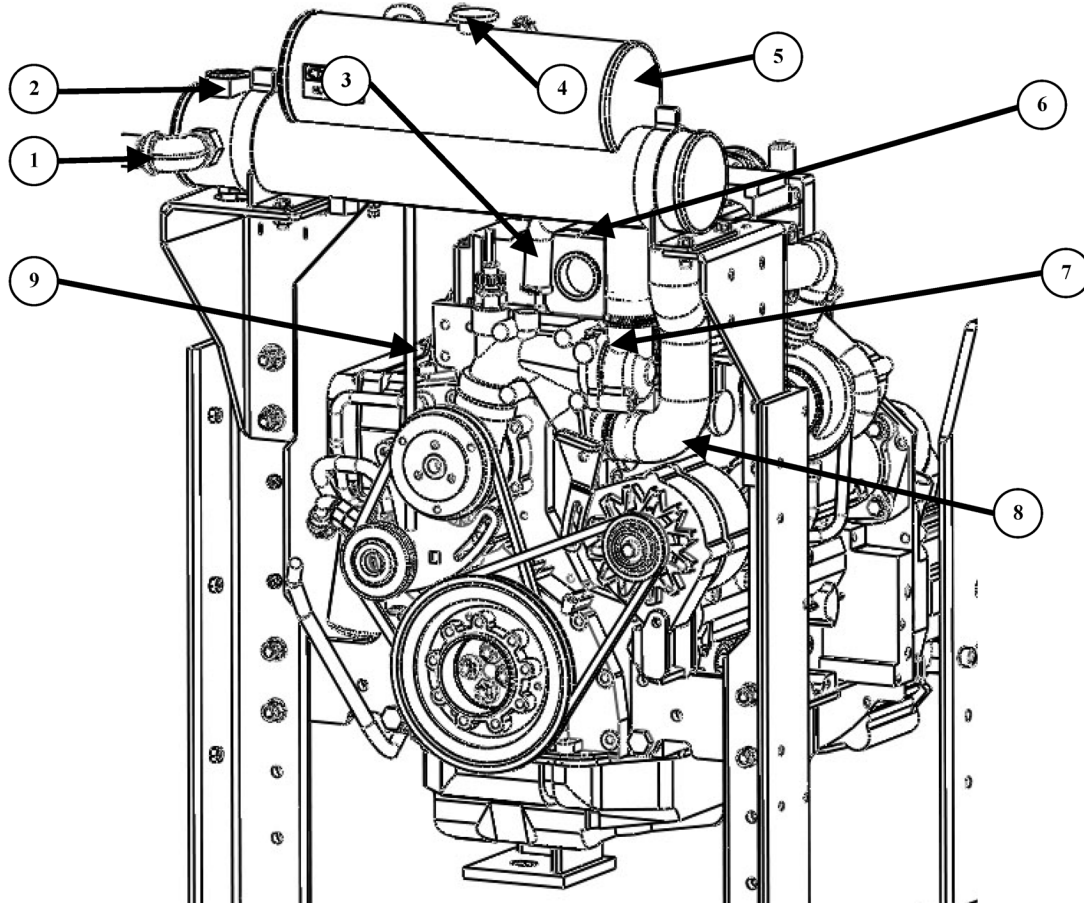
DO NOT Energize coolant pre-heater until engine is confirmed to have coolant. Engine damage may occur!



De-Energize the coolant pre-heater before performing maintenance work. If the engine coolant was drained during maintenance, verify engine has been filled with coolant before energizing the pre-heater.

The Deutz Fire Pump drivers utilize a coolant pre-heater to maintain a constant coolant temperature when the engine is not running. The pre-heater is of a convection circulation type where the hot coolant rises and forces colder coolant back to the heater. The pre-heater must be plugged in to an appropriately sized outlet. The heaters are 750 or 1250 watt, and are either 120V or 220V depending on customer specification. The heater operates while the engine is not running and has a built in thermostat allowing it to cycle on and off to maintain the appropriate coolant temperature.

2.5.2. Coolant Block Diagram (Turbo Only Models, T10 or T15)

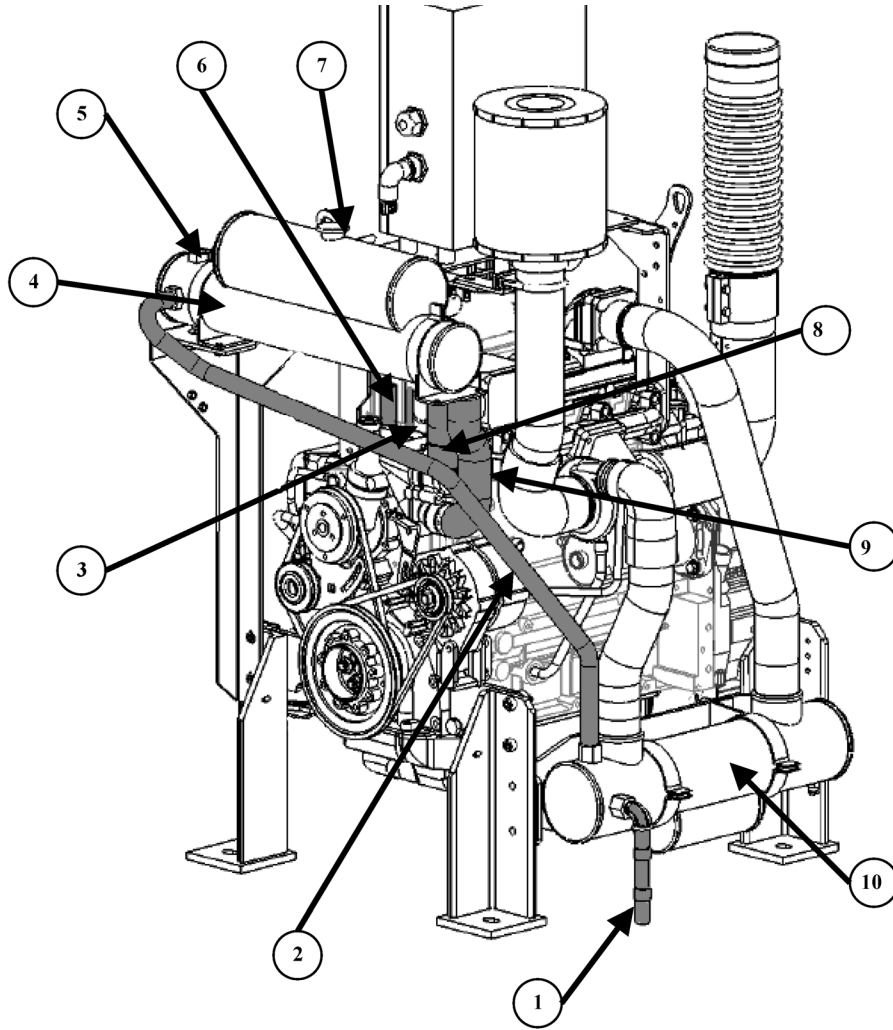


NOTE: Some parts have been removed from the drawing for clarity.

1. Raw water in (1" NPT)
2. Raw water out (1-1/4" NPT)
3. Compensation Hose
4. Coolant fill
5. Heat exchanger
6. Vent hose
7. Coolant outlet from engine
8. Coolant inlet to engine
9. Coolant pre-heater
10. Coolant pre-heater outlet hose

2.5.3. Coolant Block Diagram (Charge Air Cooled Engine C10, C15, C20, C25, Cm30-34)

Note: DFP4 2012 C10 shown but the same cooling system layout applies for the models mentioned above.



Note: some parts removed for clarity

1. Raw water in (1" NPT)	6. Compensation Hose
2. Raw water to heat exchanger (provided)	7. Coolant Fill
3. Vent Hose	8. Coolant Outlet from Engine
4. Heat Exchanger	9. Coolant Inlet to Engine
5. Raw water out (1-1/4" NPT)	10. Charge Air Cooler

3. Engine Operation

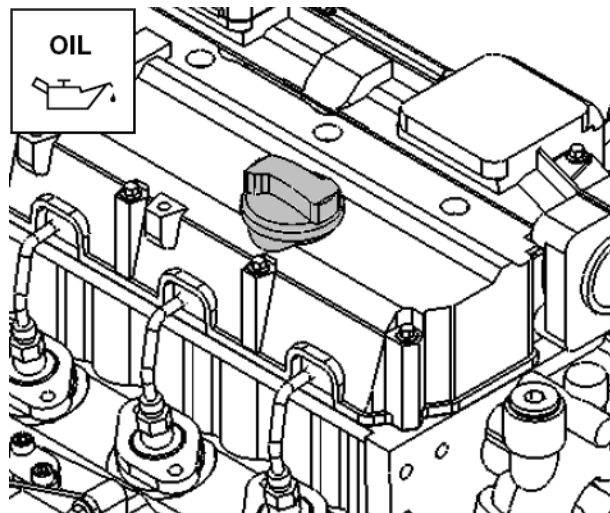
3.1. Commissioning

This section contains information regarding the commissioning of your engine.

3.1.1. Adding Engine Oil



Never add oil to the engine while it's running

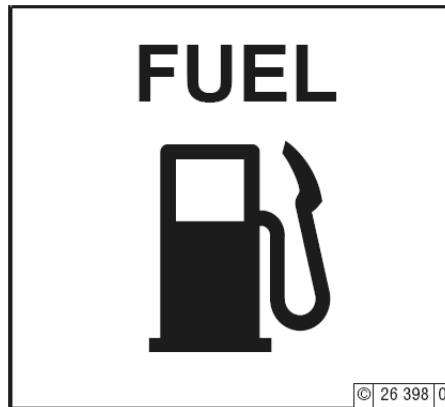


- Engines may be delivered without oil.
- Check the dipstick before adding oil.
- Pour lube oil into the oil filler neck (see above diagram).
- Oil capacity information can be found in section 8.2.
- For oil grade and viscosity information, see section(s) 4.1 - 4.1.2

3.1.2. Initial Engine Oil Fill-Up

Please see section 8.2 for further information.

3.1.3. Adding Fuel



Use only commercial-grade diesel fuel. For fuel grade, see section 4.2. Use summer or winter-grade fuel, depending on the ambient temperature.

- Never fill the tank while the engine is running.
- Ensure cleanliness!
- Do not spill fuel!
- **DO NOT** use **BIO-DIESEL**; bio-diesel can cause the fuel injection components to stick if the engine is not run for an extended period of time.

3.1.4. Fill/Bleed the Cooling System

See sections **6.3.1**, **6.3.2** and **8.2** for this information as it pertains to each engine.

3.1.5. Other Preparations

- Check the battery and cable connections, see section 6.6.1.1.
- Trial run:
 - After the engine has been prepared, carry out a brief trial run for approximately 10 minutes **UNLOADED**, if possible.
- During and after the trial run:
 - Check the engine for leaks
- After the engine has been turned off:
 - Check the oil level and top off, if necessary, see section 6.1.2
 - Re-tension V-belts, see section(s) 6.4.1 – 6.4.1.5

3.2. Starting

This section pertains to the method(s) for starting your engine.

3.2.1. Electric Starting

Before starting the engine, be aware of the following:



When manually starting the engine, make sure that the cooling water valve is open to the engine's heat exchanger.



CAUTION: If the speed governor has been REMOVED, the engine is NOT to be started.

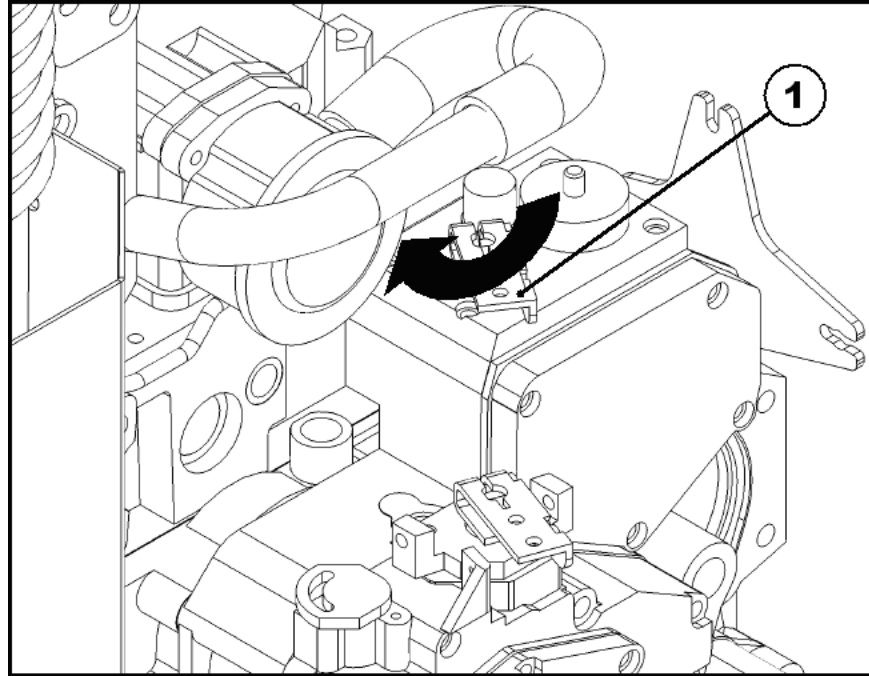


Make sure that no one is standing in the immediate vicinity of the engine or driven components.



After any repair work: Check that all guards have been replaced and that all tools have been removed from the engine.

NOTE: Do not engage the starter for more than 15 seconds at a time. If the engine doesn't start, wait a minute and then try again. If the engine doesn't start after multiple attempts, then inspect the engine to ensure it's been setup properly (for example, the fuel supply). Please refer to your engine's maintenance, service and trouble shooting guides for further information.

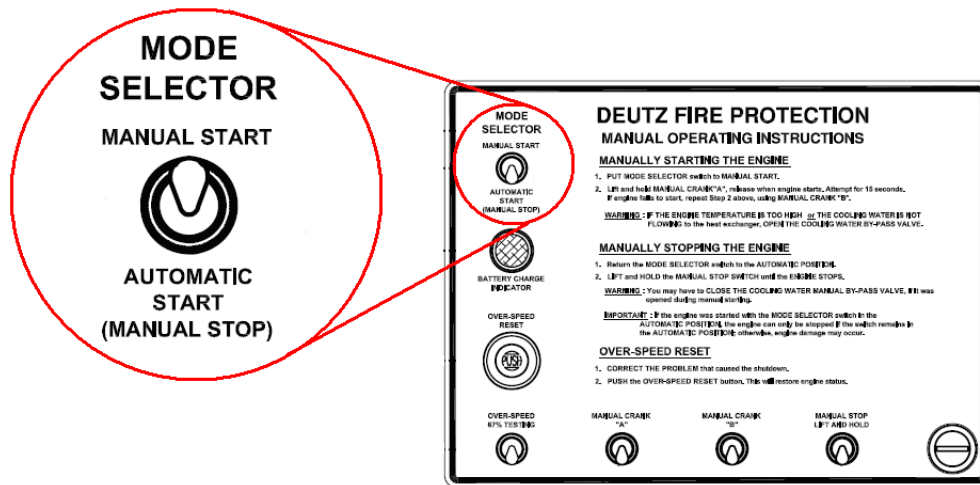


NOTE: Some parts have been removed from the drawing for clarity.

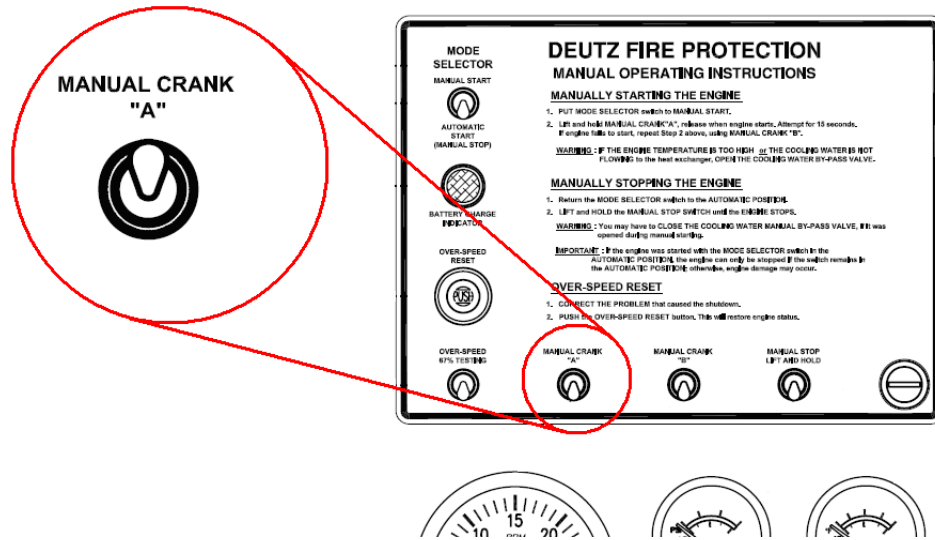
Make sure the shutoff lever (1) is in the operating position as seen above.

3.2.2. Starting via Control Panel

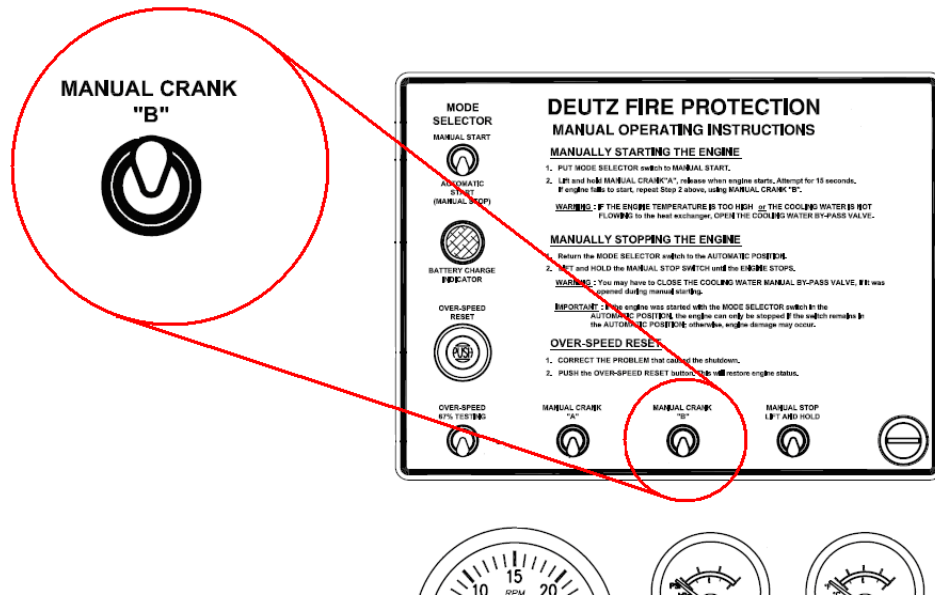
1. Put the MODE SELECTOR switch to MANUAL START.



2. Lift and hold the MANUAL CRANK “A” switch, releasing it when the engine starts. Attempt to start the engine for 15 seconds.



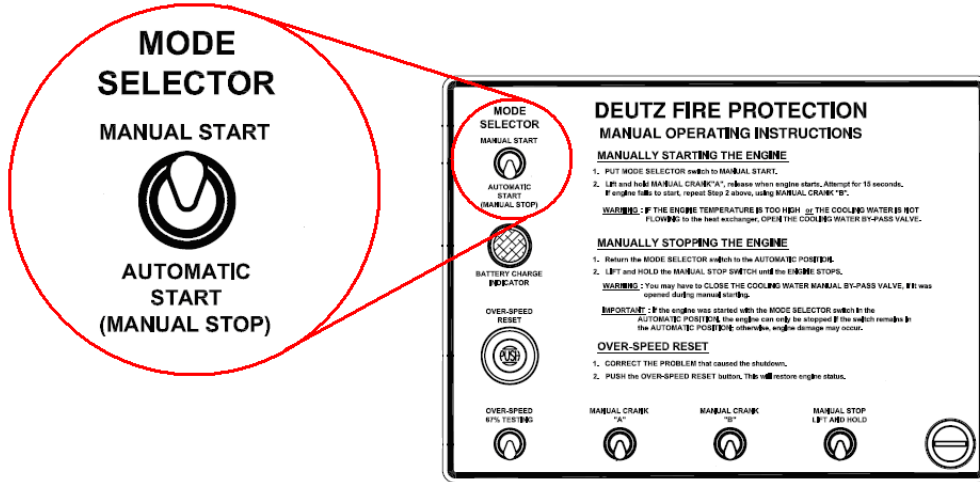
3. If the engine doesn't start lift and hold the MANUAL CRANK "B" switch and release it once the engine starts. Attempt to start the engine for 15 seconds.



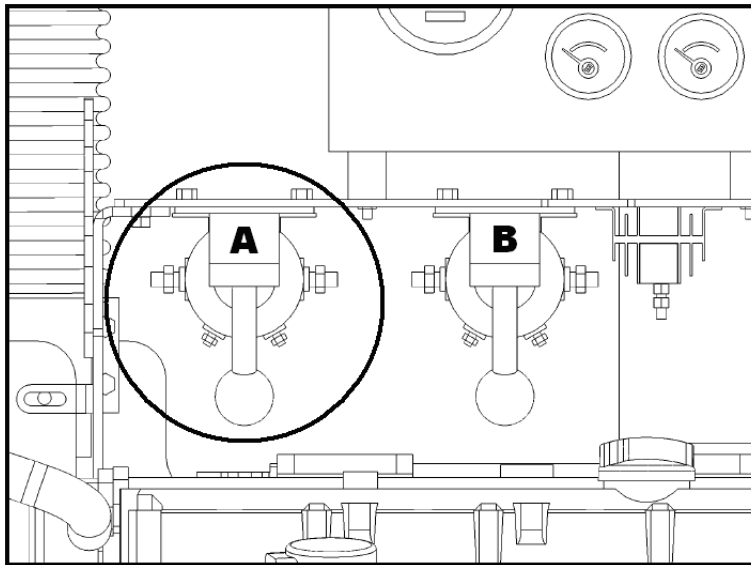
4. If the starter engages and turns the engine but it doesn't crank and run; then alternate between the "MANUAL CRANK A" and "MANUAL CRANK B" switches.
5. If the starter engages for every starting attempt and the engine fails to run; then consult the fault table in section 7.1 or call DEUTZ service department.
6. If the starter fails to engage and crank the engine then try starting the engine as outlined in section 3.2.3 entitled "Starting via Manual Solenoids".

3.2.3. Starting via Manual Solenoids

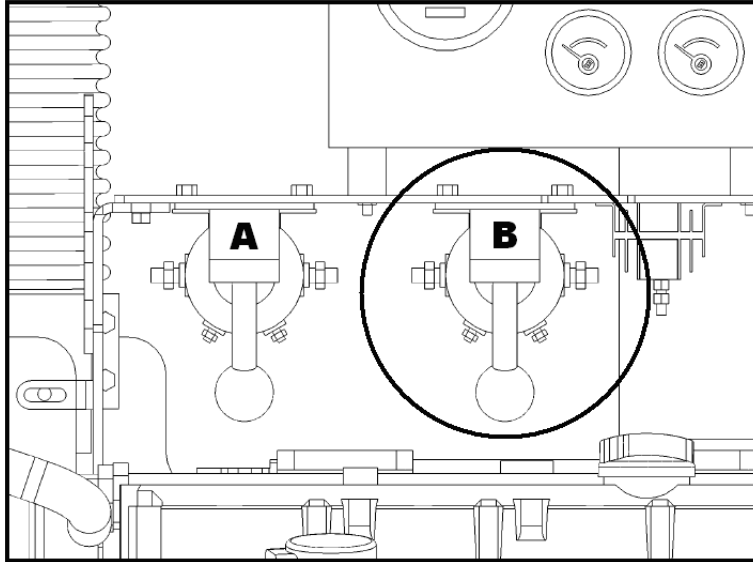
- Put the MODE SELECTOR switch to MANUAL START.



- Lift and hold the manual crank “A” solenoid lever and release it once the engine starts. Attempt to start the engine for no longer than 15 seconds.



- If the engine **does not** start then repeat step 2 above using manual crank “B” solenoid.



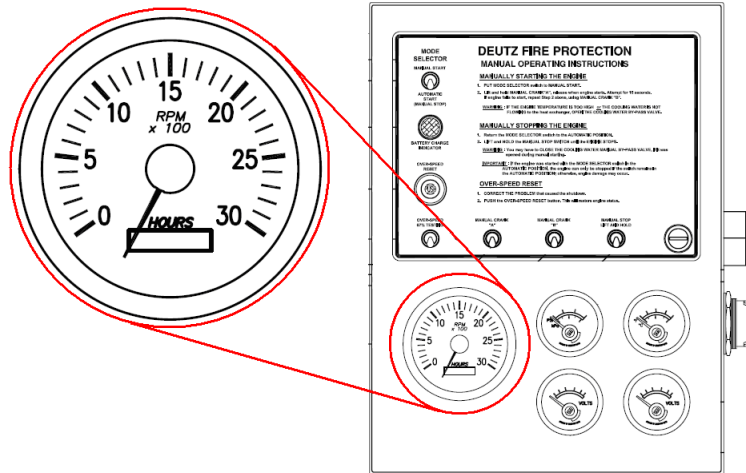
4. If the starter engages and turns the engine but it doesn't crank and run; then alternate between the "MANUAL CRANK A" and "MANUAL CRANK B" switches.
5. If the starter engages for every starting attempt and the engine fails to run; then consult the fault table in section 7.1 or call DEUTZ service department.

3.3. Monitoring Engine Operation

The following sections contain information about monitoring the operation of your DEUTZ engine.

3.3.1. Tachometer

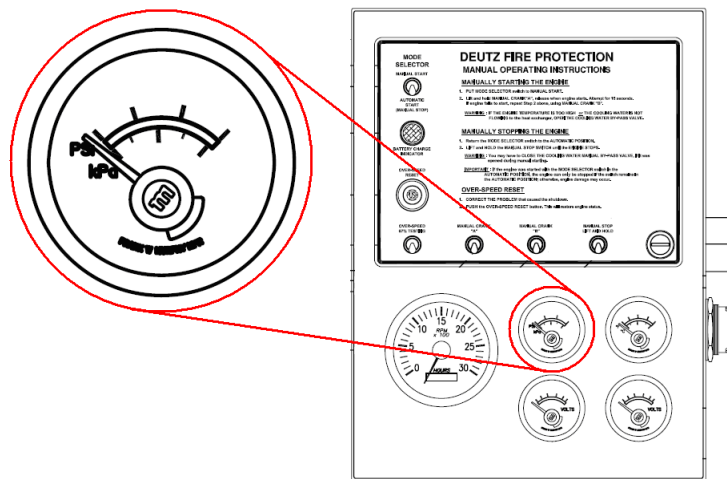
The tachometer displays the speed at which your engine is running. Built into the tachometer is a digital display for engine operation hours. This display will only count up while the engine is running.



3.3.2. Oil Pressure Indicator

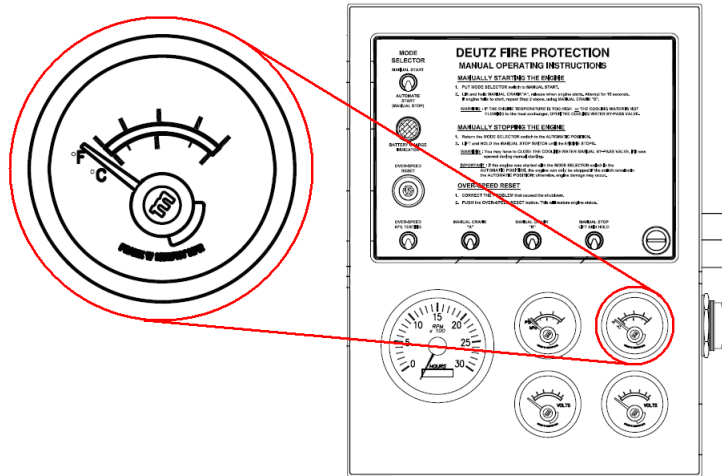
The oil pressure gage, seen below, should indicate a **MINIMUM** oil pressure as follows depending on engine running speed:

- 1.5 bar (22 psi) when running at 1470 RPM
- 1.8 bar (26 psi) when running at 1760 RPM
- 2.0 bar (29 psi) when running at 2100 RPM or higher



3.3.3. Coolant Temperature Gage

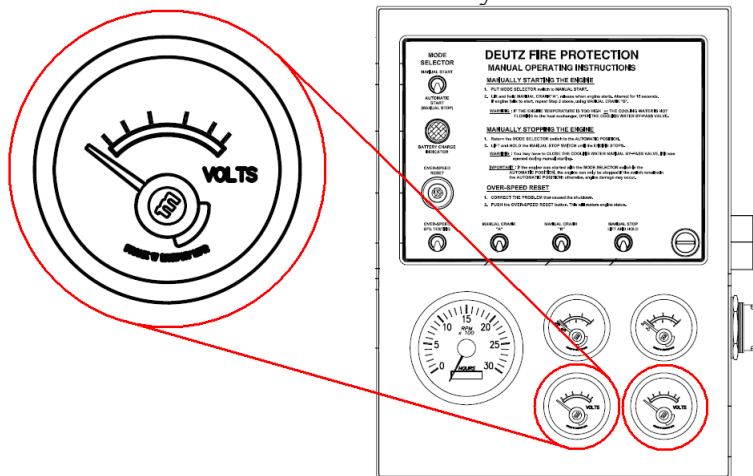
NOTE: The pointer will typically indicate that the engine is operating in the 85-95°C or 185-203°F range. If the indicator displays an abnormally high temperature (above 105°C or 221°F) then the engine is starting to overheat. If this occurs shut off the engine and refer to the fault table in section 7.1.



3.3.4. Volt Meter

The two volt meters, pictured below, monitor the voltage of the primary and secondary engine battery. When the engine is running the normal voltage should read:

- 13 to 14.5 Volts for a 12V system
- 26 to 28 Volts for a 24V system



3.4. Shutting Off the Engine

The information in this section pertains to shutting down your DEUTZ engine.

3.4.1. Electric Shut-Off

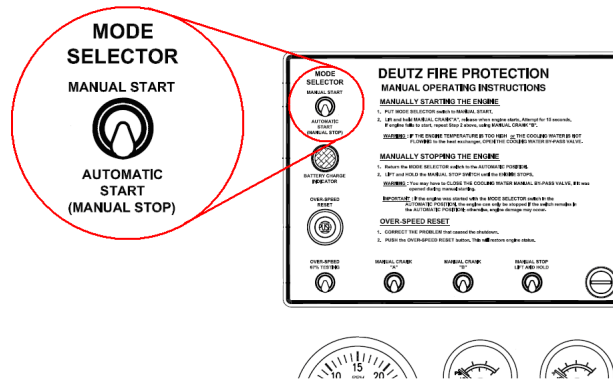


If the **cooling water manual by-pass valve** was opened during manual starting, it must be **CLOSED manually, after the engine is stopped**, when initiating an electric shutdown.

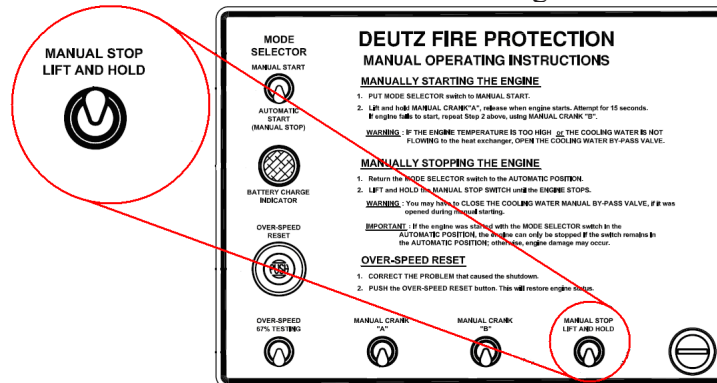


If the engine was started with the **MODE SELECTION** switch in the **AUTOMATIC** position, the engine can only be stopped if the switch remains in the **AUTOMATIC POSITION**; otherwise, **engine damage can occur**.

1. Return the mode selector switch back to the **AUTOMATIC START** position, see drawing below.



2. Lift and hold the **MANUAL STOP** switch until the engine comes to a complete stop.

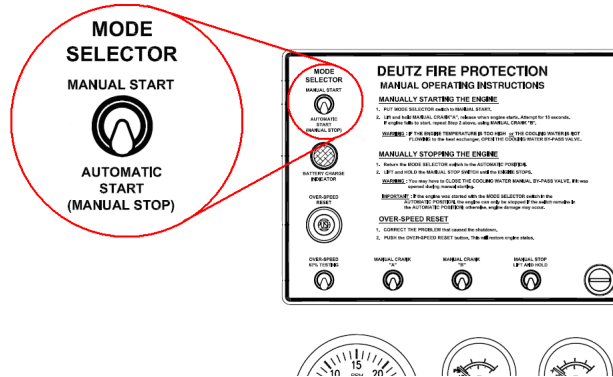


3.4.2. Mechanical Shut-Off

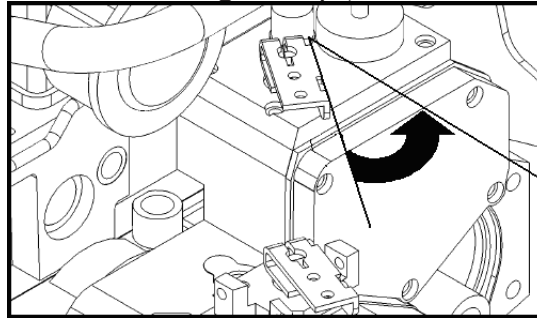
Please follow the step(s) below to properly shutdown your engine:

NOTE: If possible, **do not** switch the engine off while fully loaded.

1. Return the mode selector switch back to the AUTOMATIC START position.



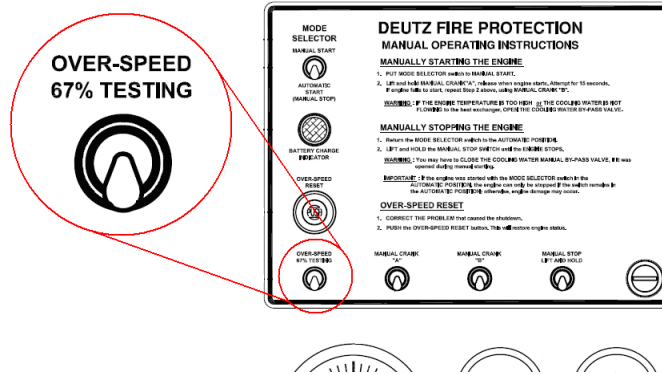
2. Move the shut-off lever until the engine comes to a complete stop. (NOTE: The charge battery light will come on when the engine stops).



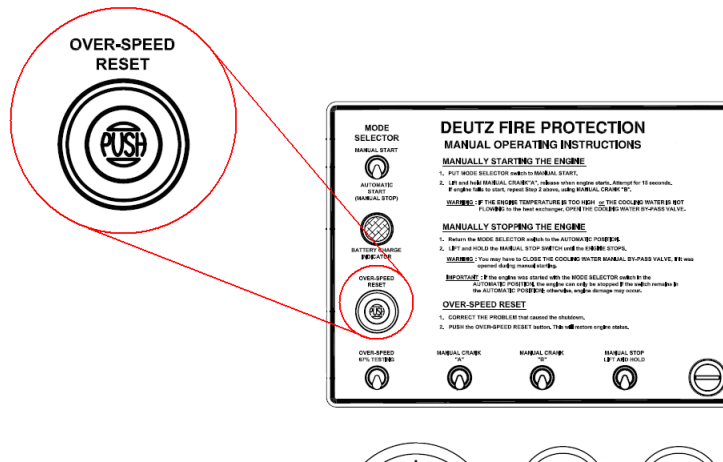
3.5. Verifying the “Over-Speed” Test Switch

Each engine is equipped with an over-speed test switch that is mounted directly to the control panel. This test allows the over-speed set point to be obtained at only 67% of the factory preset speed. Please follow the steps below to perform this test.

1. Start the engine (see section 3.2.2)
2. Hold the OVER-SPEED TESTING switch in the up position (as seen below) until the engine shuts down. If the engine does not immediately shutdown, contact your authorized service representative.



3. Push the OVER-SPEED RESET button



4. Restart the engine

3.6. Operating Conditions

The following information pertains to the operating conditions that your DEUTZ engine may be in.

3.6.1. High Ambient Temperature and Altitude

As the ambient temperature and/or altitude increases the air density decreases. As a result, the following engine characteristics will be **IMPAIRED**:

- Engine maximum output
- Exhaust gas quality
- Increased coolant temperature
- Starting behavior (in extreme cases):

The engine can be used at altitudes up to **91m (300ft)** and temperatures up to **25°C (77°F)** without a decrease in performance. If the engine is to be used at higher altitudes and temperatures then the amount of injected fuel must be **REDUCED**. This will **DECREASE** engine power per NFPA regulations as follows:

- Deduct 1% for each 100m (328 ft) above 91 m (300 ft)
- Deduct 1% for each 5.6°C (10°F) above 25°C (77°F)

If you have any doubts about the operation of your engine under these or similar conditions, ask your equipment supplier. Otherwise please contact DEUTZ SERVICE.

4. Operating Media

The information in this section explains what lube oil and fuel that is to be used in your DEUTZ engine.

4.1. Lube Oil

Lube Oils are categorized and rated according to their performance and quality. Oils with similar specifications can be used.

4.1.1. Quality

The following chart lists the approved lube oils for your engine:

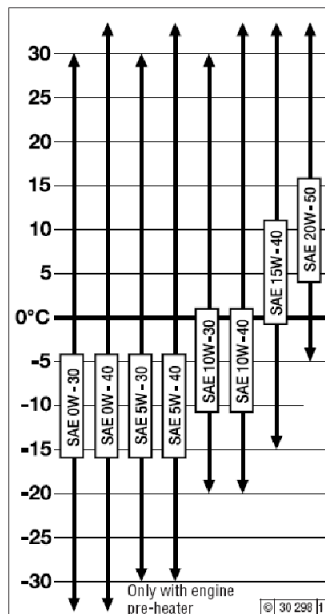
Approved API Oils:

Minimum: CG-4

Approved ACEA Oils:

Minimum: E3-96/E5-02/E7-04

4.1.2. Viscosity



The viscosity of oil is dependant on its temperature. As a result, the oil used in the engine should be based on the ambient temperature of the environment it's in. If the temperature temporarily falls below the recommended limits of the SAE grade selected it will **not** damage the engine.

If this occurs, cold starting of the engine **may** be affected. To minimize engine wear **do not** exceed the application limits of the selected oil for long periods of time. Oil changes that are brought about by the seasons can be avoided by using multi-grade lube oils. Multi-grade oils, particularly **light-flowing oils**, help **reduce** fuel consumption. Please use the chart below to determine the proper oil for your engine.

4.2. Fuel

The information in this section refers to the fuel that should be used in your DEUTZ engine.

4.2.1. Quality

DFP4 2012 Cm30-34

- Diesel fuels
 - EN 590
 - NATO F-54
 - ASTM D 975 1-D
 - ASTM D 975 2-D
 - JIS K2204 Grade 1
 - JIS K2204 Grade 2

Use commercially available fuels with sulfur content below 0.5 %. The lubricating oil change intervals must be halved at higher sulfur content.

If other fuels are used which do not meet the requirements of the operating manual, the warranty will be voided.

The certification measurements for compliance with the legal emission values are made with the test fuels specified in the laws. These correspond to the diesel fuels in accordance with EN 590 and ASTM D 975 described in the operation manual. No emission values are guaranteed with the other fuels described in this operation manual.

The respective fuels prescribed by law must be used to comply with the national emission regulations (e.g. Sulfur content).

All Others Covered By This Manual:

Use commercially available diesel fuel with less than 1.0% sulfur content. Fuels with a sulfur content greater than 1.0% are not allowed. The following are the approved fuel specification / standards to be used with your DEUTZ Fire Protection Engine:

- EN 590: 2004
- ASTM D 975-03; 1-D and 2-D

4.2.2. Winter-Grade Fuel

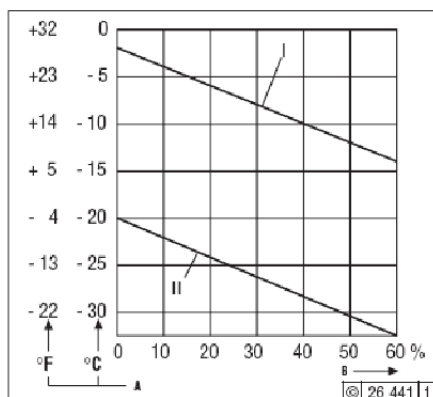


NEVER mix diesel fuels with petrol or gasoline



Mix the Kerosene and diesel fuel in the fuel tank. First add the Kerosene, and then add the diesel fuel.

At low temperatures waxing may occur in the fuel system thus reducing engine efficiency. If the ambient temperature is less than 0 degrees C, winter grade fuel (suitable down to -20 degrees C) should be used. This type of fuel is usually available from filling stations well in advance of the cold months.



Diesel fuel containing additives (Super diesel) is often on sale and for use down to temperatures of -20 degrees C.

- At temperatures below -15 to -20 degrees C, Kerosene must be added to the diesel fuel. The relevant percentages are given on the diagram below.

Legend:	
I	Summer-grade diesel fuel
II	Winter-grade diesel fuel
A	Ambient temperature
B	Percentage of kerosene added

If summer-grade diesel fuel must be used at temperatures below 0 degrees C, up to 60% kerosene can be added. In most cases, adding a flow improver (additive) can be used to provide the fuel with adequate resistance to the cold temperatures. Please contact DEUTZ SERVICE for more information regarding fuel additives.

4.3. Coolant

This section contains information regarding your engines coolant.

4.3.1. Quality of Water for Coolant

The values listed below cannot be exceeded and testing needs to be done on the water used in the engine.

Water Quality	Min	Max
pH value at 20 degrees C	6.5	8.5
Chloride ion content [mg/dm ³]	-	100
Sulphate ion content [mg/dm ³]	-	100
Total hardness [dGH]	3	20

4.3.2. Coolant Treatment



If nitrite-based cooling system protectants are mixed with amine-based agents, dangerous nitrosamines are formed.

In the case of liquid-cooled engines, special attention must be paid to the treatment and control of the coolant. The engine may become damaged by corrosion, cavitation and freezing as a result of improper coolant treatment. The coolant is treated by adding a cooling system protectant to the cooling water.

Continuous monitoring of the cooling system is necessary, see section 3.3.3 for details. In addition to checking the coolant level, the concentration of the cooling system protectant must be checked as well. A commercial tester should be used to check for the proper amount of protectant.

4.3.3. Cooling System Protectants



Cooling system protectants must be disposed of in accordance with environmental regulations.

DEUTZ cooling system protectant can be purchased in drums. Order Part No. 0101 1490 (5 liters) or 1221 1500 (210 liters). These products are nitrite, amine and phosphate free and provide protection against corrosion, cavitation and freezing. If the aforementioned cooling protectants are unavailable then the following can be used as alternatives:



DO NOT MIX product groups **A** and **B** together, use one or the other.

Product Group	Supplier	Product Name	Notes
A	DEUTZ AG	Cooling system protective agent: PN 0101 1490 PN0101 6416 PN 1221 1500	5 liter container 20 liter container 210 liter container
	ARAL	Antifreeze Extra	
	AVIA	Antifreeze APN	
	BASF	Glysantin G48 Protect Plus	
	BUCHER (Schweiz)	Motorex Antifreeze Extra	
	ESSO	ESSO Antifreeze Extra	
	FUCHS EUROPE	FUCHS FRICOFIN	
	INA Industrija	INA Antifriz AL Super	
	MOBIL	Mobil Antifreeze Extra	
	OMV	OMV Coolant Plus	
	SHELL	Glycoshell	
	THE BURMA OIL	Castrol Antifreeze NF	
	TOTAL	ELF Glacelf MDX	
	VALVOLINE	G48 Antifreeze	
	VEEDOL	Veedol Antifreeze NF	
	BP	BP Anti-Frost Code No. X 2270 A	
HUNOLD	Kuhlerschutz ANF		
INEOS	Napgel C2270/1		
B	AGIP	Antifreeze Special	
	ARTECO/Texaco	Havoline XLC	Europe, South America
	CALTEX	Havoline XLC	Asia, Australia
	Chevron Texaco	Chevron Extended Life Coolant	
	Orvema b.v.	Orvema Protex LL	Netherlands
	TOTAL	ELF Glacelf Auto Supra Total Organifreeze	
	Texaco USA	Havoline Extended Life Coolant (HELAC)	USA, w/o Nitrit and Molybdat
		Texaco Extended Life Coolant (TELC)	USA, With Nitrit

The use of other cooling system protectants (e.g. Chemical anti-corrosion agents) is possible in certain cases. Please contact DEUTZ Service for further information regarding chemical alternatives.

The concentrations listed below must be used:

Cooling system protectant	Water
Max. 50 Vol. %	50%
Min. 35 Vol. %	65%

For information regarding filling volume please refer to the chart below:

Cooling system protection [degrees C]	Frost protection [degrees C]	Volume of cooling system* (Liters)							
		18	20	22	25	27	30	32	35
		Cooling system protectant (Liters)							
35	-22	6.3	7.0	7.7	8.75	9.5	10.5	11.2	12.3
40	-28	7.2	8.0	8.8	10	10.8	12	12.8	14
45	-35	8.1	9.0	9.9	11.3	12.2	13.5	14.4	15.8
50	-45	9.0	10	11	12.5	13.5	15	16	17.5

* For coolant volume information, see Section 8.2 in this manual

5. Routine Maintenance

This section describes the service plan that you should follow to keep your DEUTZ engine in top running condition.



Stop the engine before carrying out any maintenance work.

5.1. Maintenance Schedule

Please use the charts on the following pages to keep track of your engine's maintenance schedule.

Please see the next couple of pages which contain the following:

- Yearly Maintenance Schedule
- Maintenance Schedule (Every 2 Years)
- Maintenance Schedule (Every 5 Years)

5.2. Yearly Maintenance Schedule

Item	THE ITEMS BELOW ARE TO BE CHECKED EVERY YEAR
General Inspection	Check the engine for loose or damaged fittings, clamps, guards, insulating blankets or wiring. Repair or replace as necessary. Inspect V-belts for looseness or wear and tighten connections. Clean battery terminal posts, check for tight connections, and maintain electrolyte level.
Engine Oil	Replace oil
Oil Filter	Replace oil filter
Exhaust System	Visually inspect the exhaust system hangers, supports, and flexible pipes for signs of leakage or rusting. Repair or replace damaged piping.
Fuel Filter	Replace the fuel filter
Engine Crankcase Breather	Clean the engine crankcase breather
Fuel Pre-filter Element	Clean / change pre-filter element
Fuel Tank	Drain water and sediment from the fuel tank
Cooling Loop Solenoid and Y-Trap	Check for proper operation, clean if necessary
Power Wiring	Clean and inspect terminals on the starter, alternator, and the battery isolator.

Engine Control Panel	Inspect the connections and tighten if necessary. Be careful not to ground any circuits.
Heat Exchanger (CAC)	Inspect the heat exchanger conduits
Engine Operation Test	<ol style="list-style-type: none"> 1. Start the engine: Run the engine for no less than 30 minutes 2. Check for proper gauge readings 3. Check for noises and vibrations. Tighten loose components. 4. Perform backpressure test on the exhaust system.
Engine Over-speed Test	Perform over-speed test using the “Over speed” switch
Post-operation Inspection	<ol style="list-style-type: none"> 1. Stop the engine 2. Verify that the Mode Selector switch has been returned to “Automatic” 3. Ensure that the fuel tank is at least two-thirds full 4. Check for leaks in coolant hoses, fuel supply and return lines etc. 5. Verify proper oil level

5.3. Maintenance Schedule (Every 2 Years)

The items below are to be checked every 2 years in addition to the yearly maintenance schedule.

Item	THE ITEMS BELOW ARE TO BE CHECKED EVERY 2 YEARS
Cooling System	Replace coolant & coolant thermostat
Cooling System	Replace engine block heater thermostat

5.4. Maintenance Schedule (Every 5 Years)

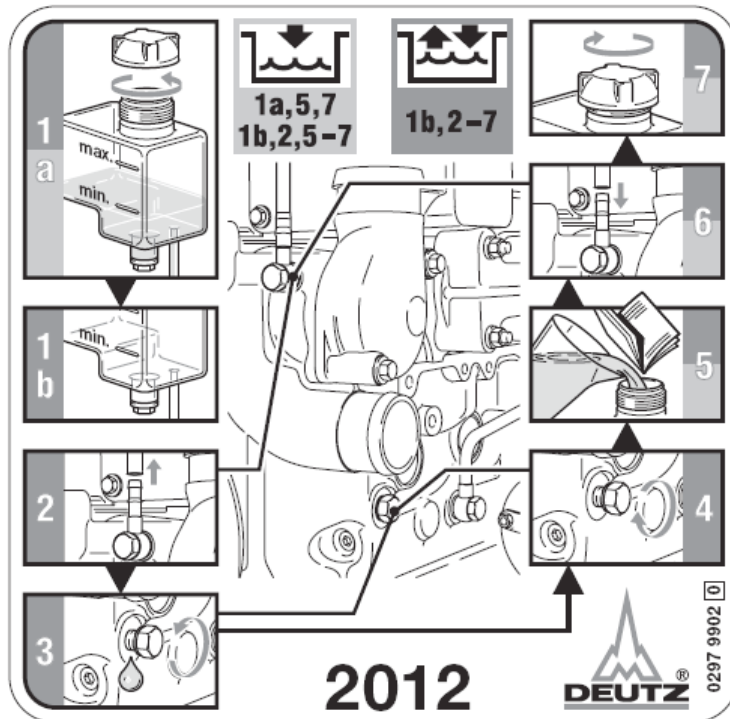
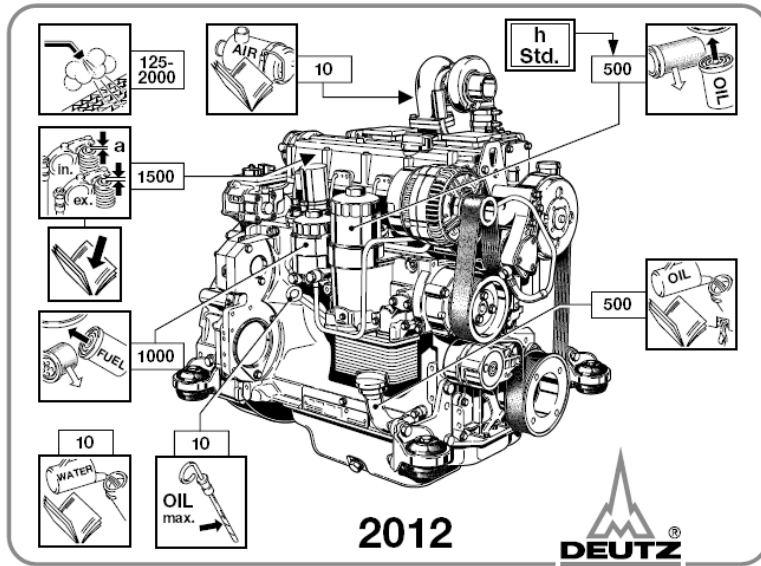
The items below are to be checked every 5 years in addition to the yearly maintenance schedule.

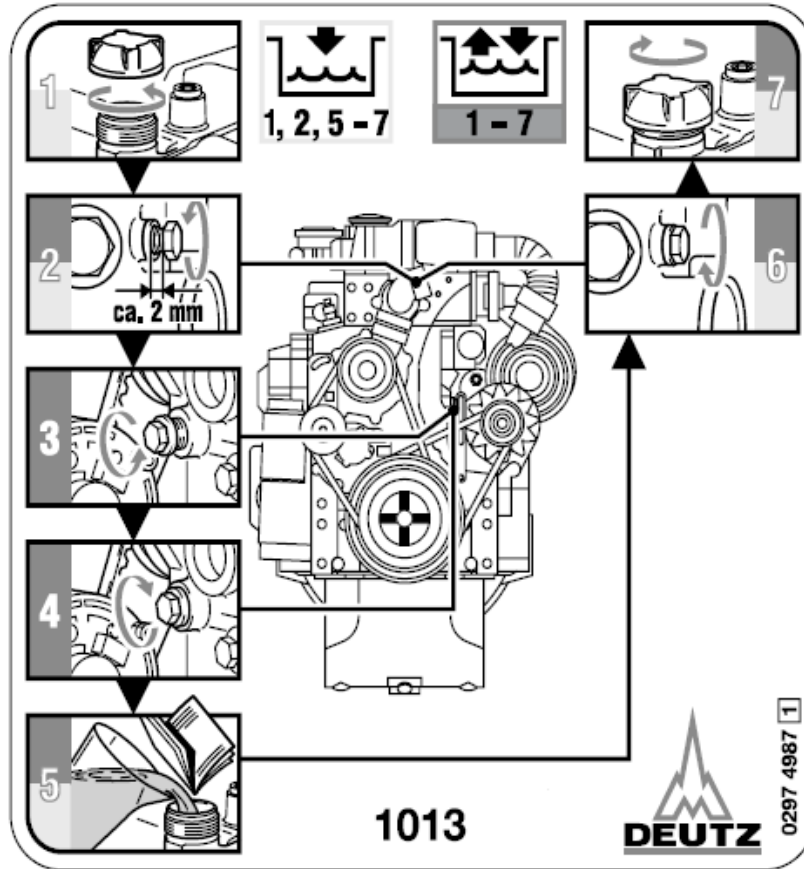
Item	THE ITEMS BELOW ARE TO BE CHECKED EVERY 5 YEARS
General Inspection	Replace V-Belts Replace all batteries
Air Filter	Replace Air Filters
Fuel Lines	Replace fuel supply and fuel return lines
Injectors	Check
Valve Clearance	Adjust if necessary
Cooling System	Clean
Aftercooler	Clean
Heat Exchanger	Replace coolant hoses: replace both heat exchanger supply and return hoses.

5.5. Maintenance Charts for the 2012 and 1013 Engine

NOTE: Routine work should be carried out according to the schedule outlined in section 5.1.

The three maintenance charts seen below are supplied as self-adhesive labels with each relevant engine. Each label should be placed where they can be seen clearly on the engine or driven equipment. Please check to ensure that this has been done. If necessary, ask your engine or equipment supplier for a fresh supply of labels.





5.6. Maintenance Work Completed

Please use the chart below to keep a log of the maintenance that has been done on your engine.

OP. Hours	Date	Signature	OP. Hours	Date	Signature
25			325		
50			350		
75			375		
100			400		
125			425		
150			450		
175			475		
200			500		
225			525		
250			550		
275			575		
300			600		

6. Service and Maintenance

This section describes the different maintenance procedures that are required for your engine.

6.1. Lubrication System

The following information pertains to the maintenance of your engines' lubrication system.

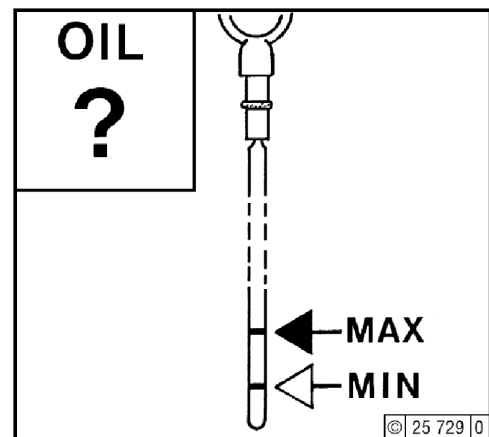
6.1.1. Oil Change Intervals

The following are some key issues when considering oil change intervals:

- If the fuel that you are using contains **more than 1% sulfur** please contact your service representative.
- Change the oil with the engine **OFF** but still warm (lube oil temperature approximately 80 degrees C)

6.1.2. Checking the Oil Level

1. For a cold engine follow the step(s) below:
 - a. No need to wait, check the oil (go to step 2b below)
2. For a warm engine follow the step(s) below:
 - a. Switch the engine off (wait 5 minutes)
 - b. Wipe the dipstick with a clean non-fibrous cloth
 - c. Insert the dipstick fully and remove it again
 - d. Check the oil level and fill up to “**MAX**” on the dipstick (if necessary)
 - e. If the oil level is only just above the “**MIN**” mark, then more oil must be added.



NOTE: The oil level should never fall below the “**MIN**” mark or above the “**MAX**” mark.

6.1.3. Changing the Engine Oil

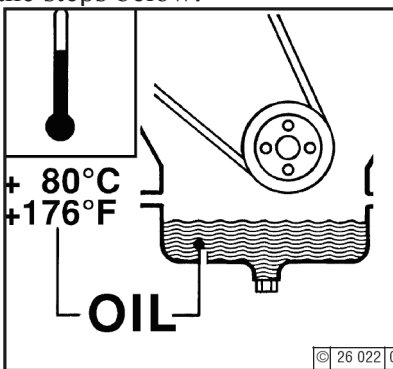


Use caution when draining hot oil: Risk of scalding!

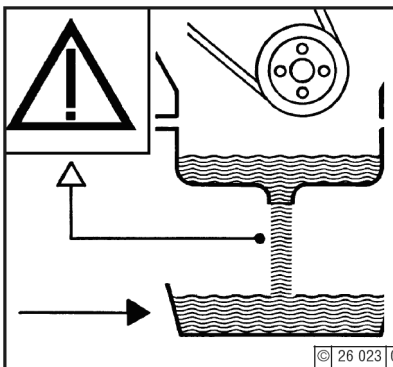


Collect the oil in a container. Do not allow the drained oil to run into the soil. Dispose of the oil in accordance with environmental regulations.

To change the oil, please follow the steps below:



1. Start the engine
2. Allow the engine to warm up
 - a. Lube oil temperature should be approximately 80 degrees C
3. Switch the engine off



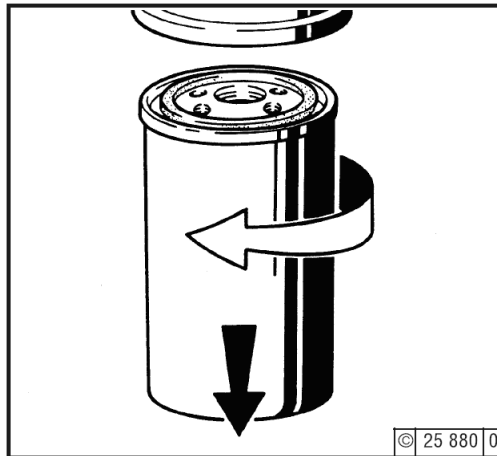
4. Place an oil tray under the engine
5. Unscrew the oil drain plug
6. Drain the oil
7. Fit the oil drain plug with a new seal ring and tighten firmly (for torque, see section 8.4.1 – 8.4.2)
8. Pour in fresh lube oil
 - a. For grade / viscosity information see section 4.1
 - b. For quantity information see section 8.1
9. Check the oil level, see section 6.1.2

6.1.4. Changing the Oil Filter

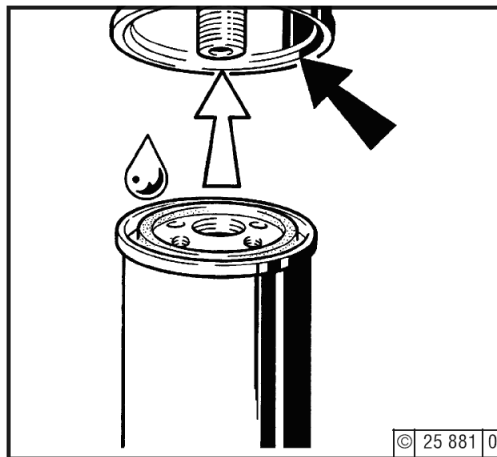
Please follow the steps below to change the oil filter:



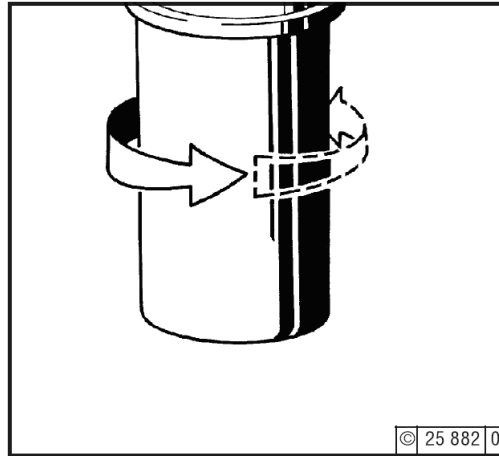
Risk of scalding!



1. Then unscrew the lube oil filter cartridge using a commercial tool and spin it off.
2. Catch any oil that may spill out.



3. Clean any dirt from the filter carrier sealing surface
4. Lightly oil the rubber gasket of the new cartridge
5. Manually screw in the new cartridge until the gasket is flush



6. Tighten the lube oil filter cartridge with another half-turn by hand
7. Check the oil level, see section 6.1.2
8. Start the engine
9. Check the oil pressure, see section 3.3.2
10. Check the lube oil filter cartridge seal for leaks
11. Shut down the engine and wait a minimum of 5 minutes
12. Check the oil level, see section 6.1.2

6.2. Fuel System

The following section provides information about the maintenance of the fuel system.

6.2.1. Replacing the Fuel Filter



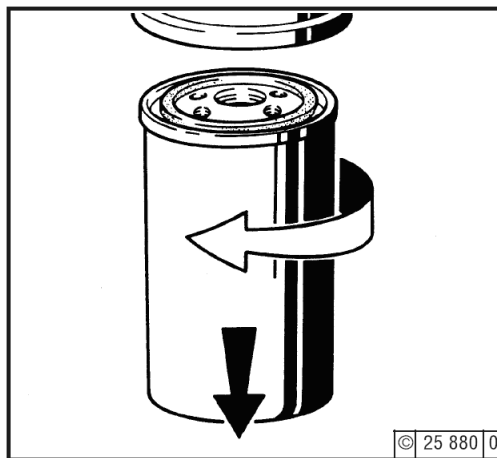
Keep open flames away when working on the fuel system.



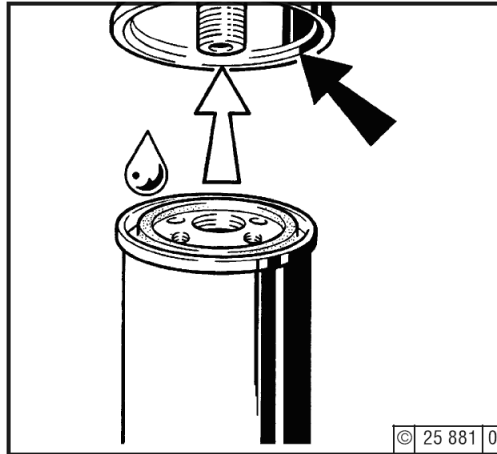
Do not smoke!



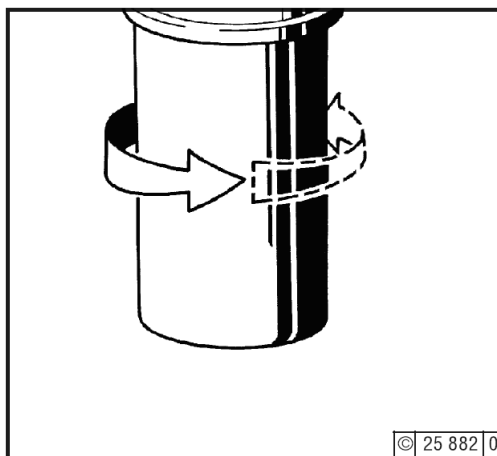
The fuel system does not have to be bled unless certain situations have occurred (see section 6.2.2.).



1. Close the fuel shut-off valve
2. Unscrew the fuel filter cartridge using a commercial tool and spin it off.
3. Catch any fuel that may spill out.



4. Clean any dirt from the filter carrier sealing surface
5. Apply a light film of oil or diesel fuel to the rubber gasket of the new cartridge.
6. Manually screw in the new cartridge until the gasket is flush.



7. Tighten the fuel filter cartridge with another half-turn by hand
8. Open the fuel shut-off valve
9. Run the engine and check for leaks

6.2.2. Bleeding the Fuel System

NOTE: Only bleed the fuel system if the following has occurred:

- Maintenance on the engine
- Re-commissioning of the engine
- The fuel tank has been run dry



Keep open flames away when working on the fuel system.

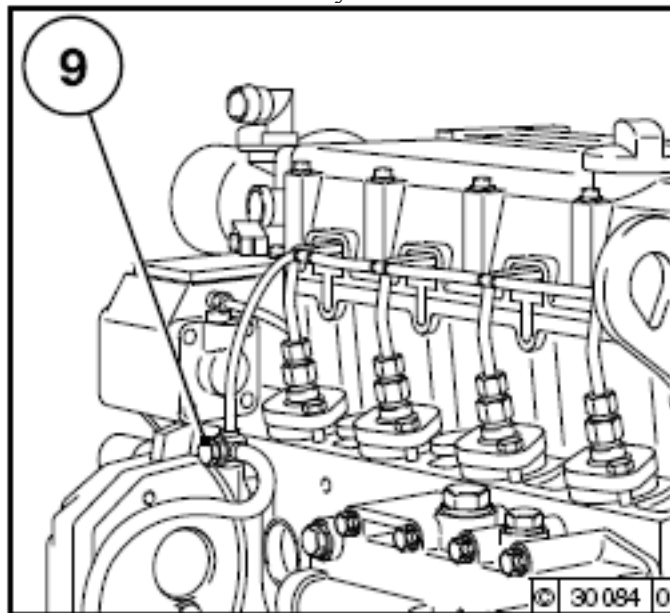


Do not smoke!

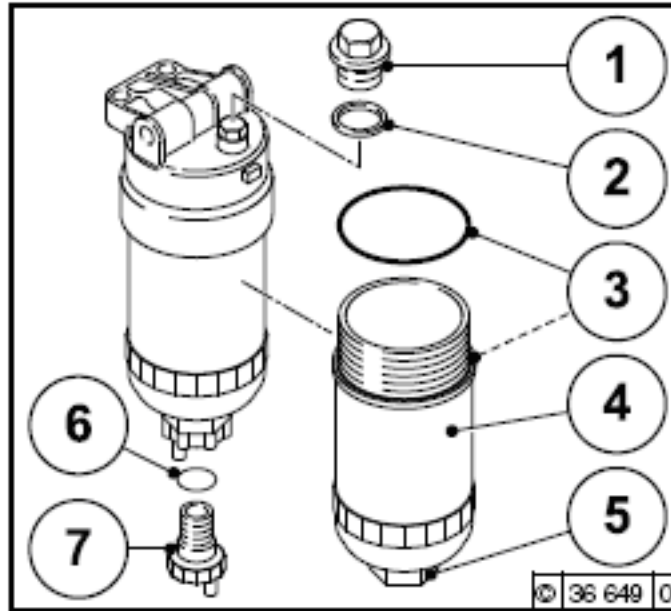


Dispose of used fuel in an environmentally-friendly-manner

Please follow the steps below to bleed the fuel system:



1. Place a fuel collection container beneath the fuel pre-filter
2. Position the fuel collection container beneath the pre- filter housing and the fuel return fitting (9)



3. Open the fuel shut-off valve.
4. Crack open the fuel return fitting (9) and bleeder screw (1) on the pre-filter
5. Crank the engine over (using the starter) until fuel is seen escaping through the bleeder screw and fuel return fitting is **bubble-free**.
6. Stop the engine.
7. Firmly tighten the bleeder screw (1) and fuel return fitting (9)
8. Restart the engine
9. Then check for leaks while the engine is running

6.3. Cooling System

This section contains information on draining your cooling system



There is a risk of scalding when draining and collecting the coolant.



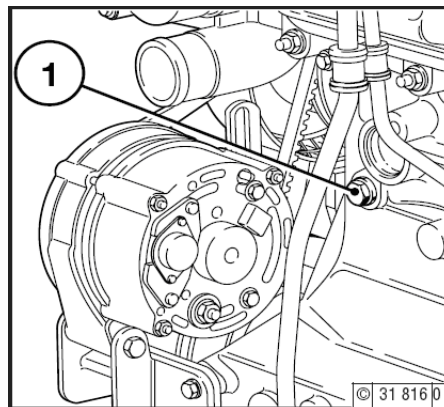
Dispose of the coolant in accordance with environmental regulations.

6.3.1. Engine Cooling System (2012)

The following sections pertain to the cooling system on the 2012 engine.

6.3.1.1. Draining the Cooling System

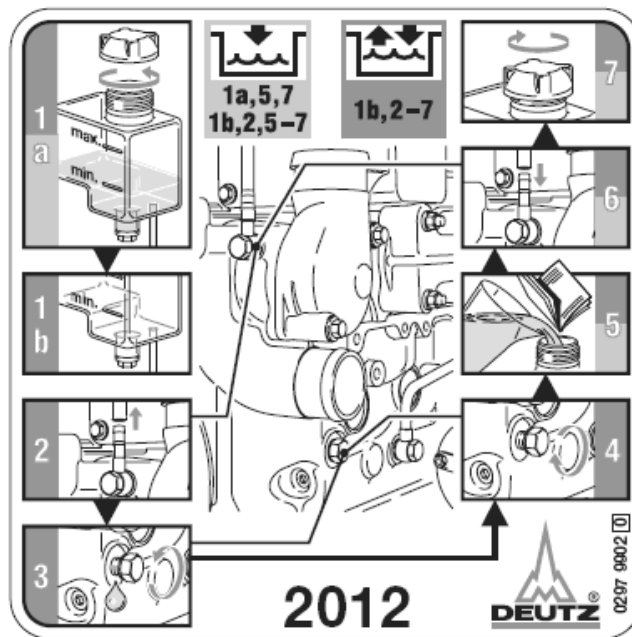
Follow the steps below to drain the engine's cooling system.



1. Position a collecting pan beneath the screw plug (1)
2. Remove the screw plug (1) at the crankcase and remove the radiator cap
3. Drain the coolant
4. Tighten the screw plug (1) again
5. Re-fill and bleed the cooling system (see section 6.3.1.1 – 6.3.1.2 or 6.3.2.1 – 6.3.2.2)

6. Filling and Bleeding the Cooling System

Follow the steps and chart below to fill and bleed the cooling system.



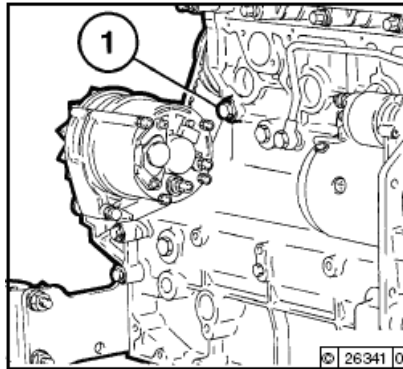
FILLING:

1. Open the radiator cap (see item 1)
2. Loosen the vent hose (see item 2)
3. Loosen the drain plug (see item 4) but do not remove it.
4. Fill with coolant (item 1b) up to the filling limit until coolant drips out of the vent fitting (item 2).
5. Connect the vent hose (see item 6), and tighten the screw plug (see item 4)
6. Screw the radiator cap back on (see item 7)
7. Start the engine and allow it to warm up until the thermostat opens
8. Switch off the engine
9. Check the coolant level (when the engine is cold) and top off if necessary.
10. Screw the radiator cap back on (see item 1)

6.3.2. Engine Cooling System (1013)

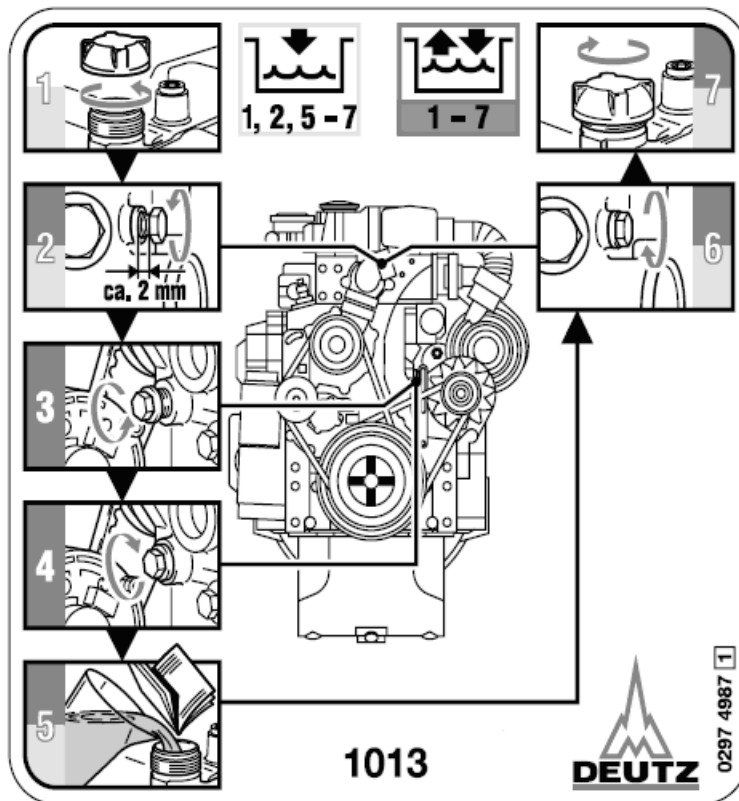
The following sections pertain to the cooling system on the 1013 engine.

6.3.2.1. Draining the Cooling System



1. Place a container under the sealing plug (1)
2. Remove the sealing plug (1) from the crankcase and remove the radiator cap
3. Drain off the coolant
4. Tighten the sealing plug (1) again

6.3.2.2. Filling and Bleeding the Cooling System



Follow the steps below while referring to the diagram above:

1. Open the radiator cap (item 1)
2. Loosen the vent plug (item 2) and closing plug (item 3) but do not remove it.
3. Add coolant (item 5) up to the maximum filler limit
4. Tighten the vent plug (item 6) and the sealing plug (item 4)
5. Close the radiator cap (item 1)
6. Start the engine and allow it to heat up until the thermostat opens
7. Then turn off the engine
8. Check the coolant level when the engine is cold and top off if necessary
9. Close the radiator cap (item 1)

6.4. Belt Drives

The following section contains information about checking, tightening and changing your engine's V-belts.

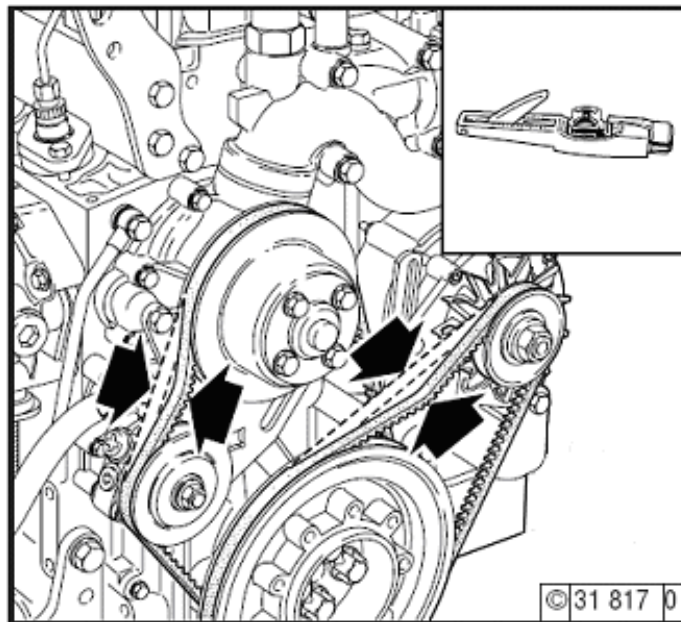


Check, tighten and replace belts with the engine **OFF**.

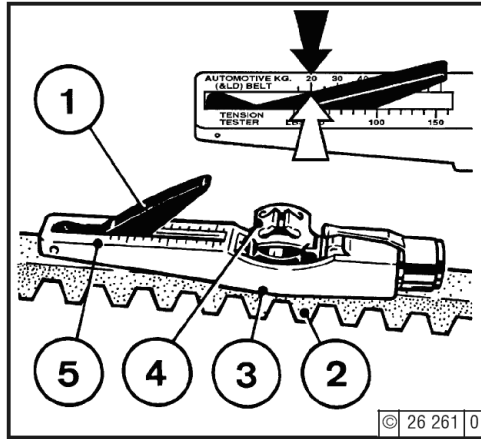
6.4.1. V-belts

The following section refers to your engine's V-belts.

6.4.1.1. Checking the V-belts

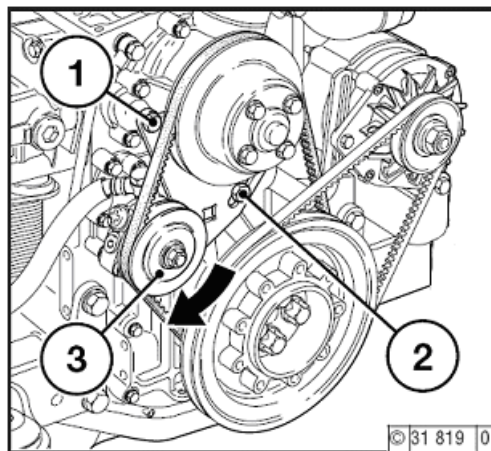


1. Visually inspect the entire V-belt for damage
2. Replace the belt if it's damaged
3. After installing new V-belts, run the engine for 15 minutes



4. Check the belt tension:
 - A. Place the indicator arm (1) into the gage
 - B. Position the guide (3) on the V-belt (2), midway between the pulleys, with the stop against the edge of the belt
 - C. Push slowly on the black pad (4) at right angles toward the V-belt (2) until the spring is heard or is felt having been triggered.
 - D. Carefully remove the gauge without altering the position of the indicator arm (1)
 - E. Read off the value on the gauge where the black indicator arm (1) intersects with the scale (5). For settings see section 9.1
 - F. If necessary, pretension the belt and measure again

6.4.1.2. Tensioning the V-belts (Coolant and Fuel Pump)

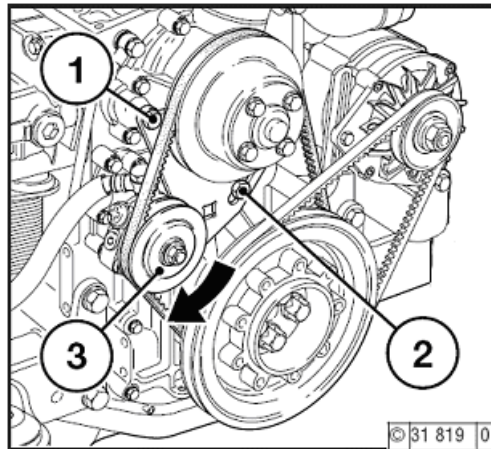


Please follow the steps below to tension your engine's V-belts.

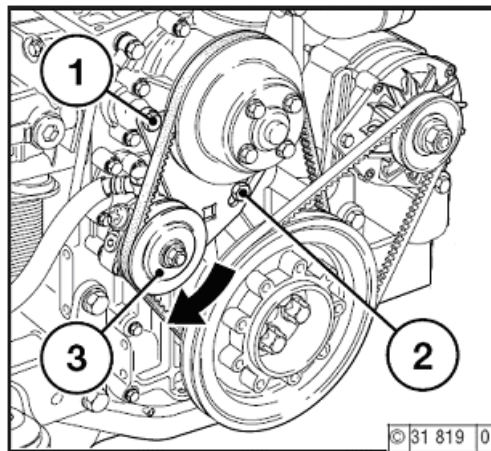
1. Loosen screws (1) and (2)
2. Move the fuel pump (3) in the direction indicated by the arrow until the correct tension is achieved.
3. Retighten screws (1) and (2)

6.4.1.3. Replacing the V-belts (Coolant and Fuel Pump)

Follow the steps below to replace your engine's V-belts.

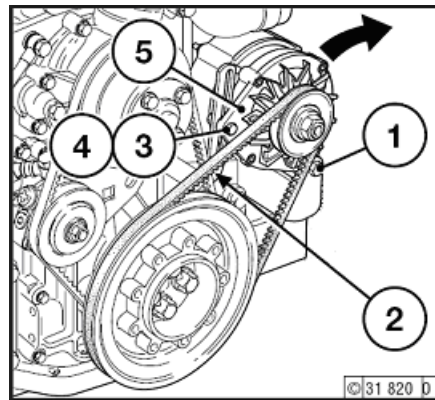


1. Loosen screws (1) and (2)
2. Move the fuel pump (3) in the direction indicated by the arrow above
3. Remove the V-belt and position the new one



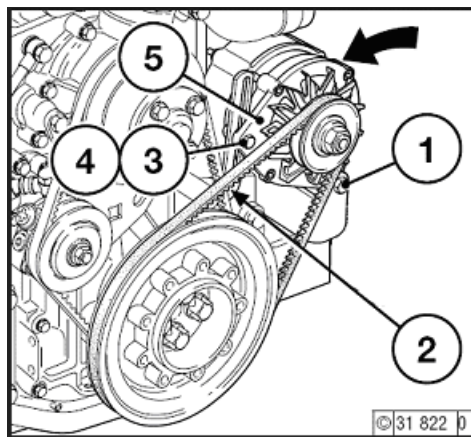
4. Move the fuel pump in the direction of the arrow above until the correct tension is achieved.
5. Retighten screws (1) and (2) again.

6.4.1.4. Tensioning the V-belts (Alternator)



1. Loosen screws (1), (2) and (4).
2. Adjust the alternator (5) as indicated by the above arrow by turning screw (3) until the correct tension is achieved.
3. Retighten screws (1), (2) and (4).

6.4.1.5. Replacing the V-belts (Alternator)

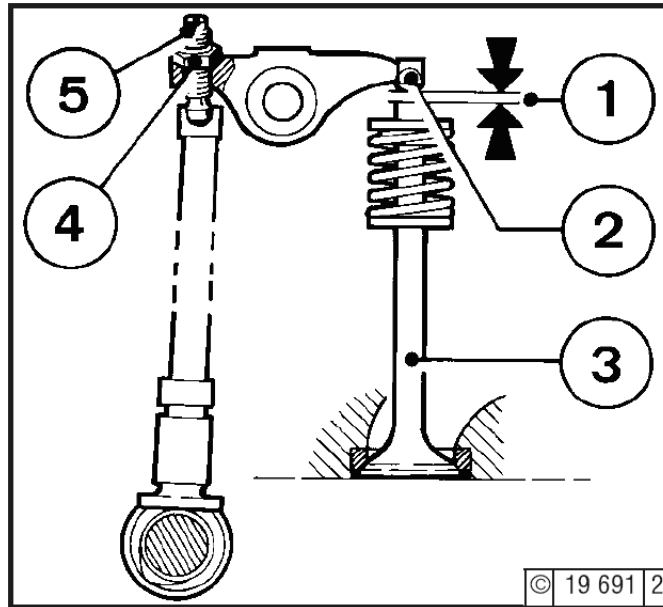


1. Loosen the fuel pump V-belt (see section 6.4.1.3)
2. Loosen screws (1), (2) and (4)
3. Adjust screw (3) until the V-belt can be removed.
4. Position the new V-belt
5. Adjust screw (3) until the correct V-belt tension is achieved
6. Retighten screws (1), (2) and (4)
7. Retighten the fuel pump V-belt

6.5. Adjustments

The following section contains information on adjustments that should be made to your engine at given service and maintenance periods.

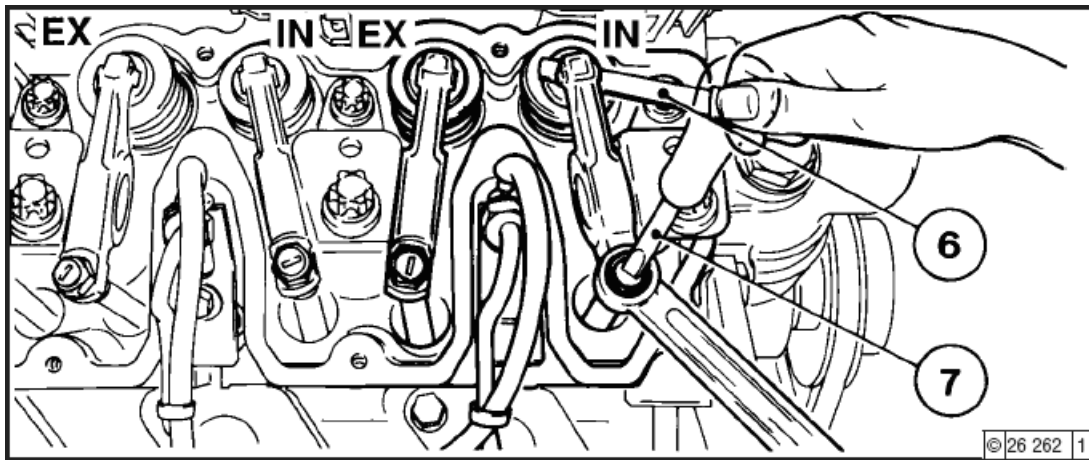
6.5.1. Checking the Valve Clearance



Using the above diagram, please follow the steps below to check your engine's valve clearance:

1. Remove the cylinder head cover
2. Position the crankshaft as directed by the schematic in section 6.5.2.1.
3. Before adjusting the valve clearance, allow the engine to cool down for at least 30 minutes. The oil temperature should be below 80 degrees C
4. Check the valve clearance labeled (1) between the rocker arm / tappet contact face (2) and valve stem (3) with a feeler gage (6) (see diagram below). NOTE: There should only be a slight amount of resistance when the feeler gage is inserted. See section 8.1 for the permissible valve clearance.

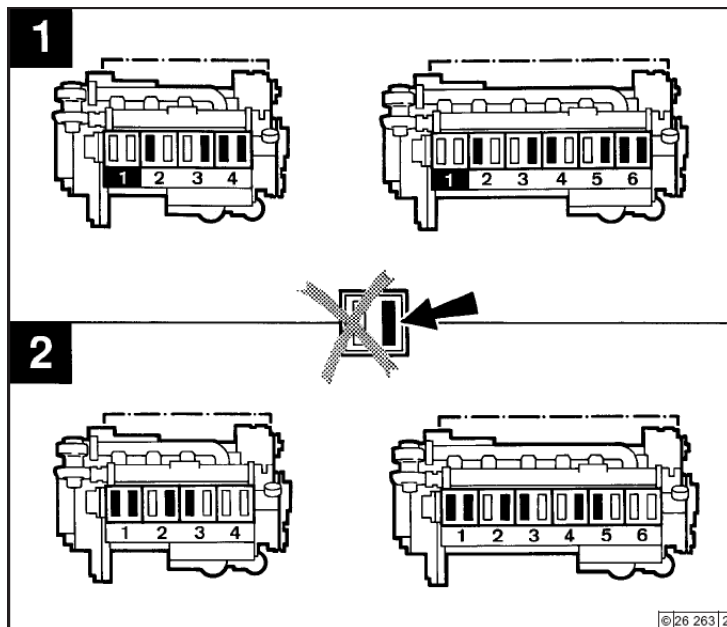
6.5.2. Adjusting the Valve Clearance



Use the above diagram and the steps below to properly adjust the valve clearance.

1. Release locknut (4), as seen on the previous page
2. Use an Allen key (7) to turn the set screw (5), on previous page, so that the correct clearance is attained after locknut (4) has been tightened.
3. Check and adjust the valve clearance on all cylinders.
4. Reinstall the cylinder head cover, with a new gasket, if necessary.

6.5.2.1. Valve Clearance Adjustment Schematic



Crankshaft Position 1:

Turn the crankshaft until both valves in cylinder 1 overlap (with the exhaust valve about to close and the inlet valve about to open). Adjust the clearance of the valves (**marked in black**) on the schematic. After adjusting each rocker arm, mark them with chalk to indicate that they have been adjusted.

Crankshaft Position 2:

Turn the crankshaft one full revolution (360 degrees). Then adjust the clearance of the valves (**marked in black**) indicated on the schematic.

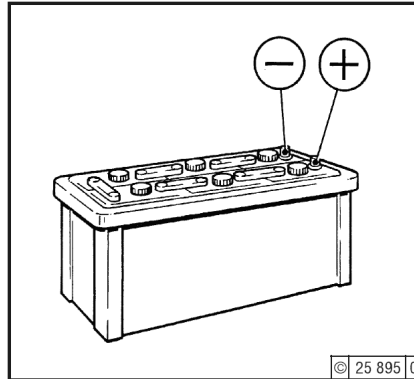
6.6. Accessories

The following section describes the service and maintenance of your engine's accessories.

6.6.1. Battery

The following sections describe the service and maintenance of your engine's battery.

6.6.1.1. Checking the Battery and Connectors



1. Keep the battery clean and dry
2. Undo the dirty clamps
3. Clean the terminal posts (+ and -) and clamps.
4. Grease the posts with acid-free and acid resistant grease.
5. Place the clamps back onto the posts (ensure good contact with the posts)
6. Use a wrench to tighten the clamp bolts.

6.6.1.2. Checking the Electrolyte Level



The gases emitted by the battery are explosive! Keep sparks and open flames away from the battery!



Do not allow battery acid to come in contact with skin or clothing!

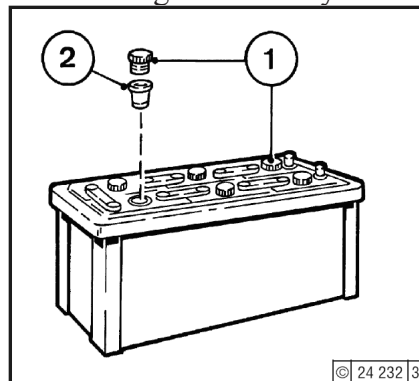


Wear protective goggles!



Do not rest tools on the battery!

Please follow the steps below when checking the electrolyte level in the battery.



For batteries with testers:

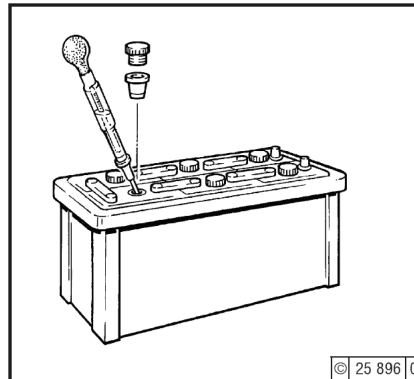
1. Remove the sealing caps (1)
2. Check to see if the electrolyte level reaches the bottom surface of the tester (2)
3. If necessary top off the battery with **distilled water**
4. Put the tester back into place
5. Screw the sealing caps back into place

For batteries without testers:

1. Remove the sealing caps (1)
2. The electrolyte should be 10 to 15mm above the top of the plates
3. If necessary top off the battery with **distilled water**
4. Screw the sealing caps back into place

6.6.1.3. Checking the Electrolyte Density

- Measure the density of the electrolyte in each of the cells using a commercial hydrometer.
- The hydrometer reading indicates the battery's state of charge.
- The temperature of the electrolyte should be +20 degrees C when taking the measurement.



The following chart is used to determine the charge status of the battery based on the electrolyte density.

Electrolyte Density				
in [kg/l]		in [Be' (Baume' scale)*]		Charge status
Normal	Tropical	Normal	Tropical	
1.28	1.23	32	27	well charged
1.2	1.12	24	16	semi-charged, re-charge
1.12	1.08	16	11	dis-charged, immediately charge

* NOTE: The Baume scale is out of date and is rarely used today.

6.6.2. Battery Cable

Notes on Battery Cable Sizing:

- For battery cable lengths up to 15' 2/0 AWG is required.
- For battery cable lengths from 15-30' 4/0 AWG is required.

6.6.3. Alternator


Notes on a three phase electrical system (if equipped):

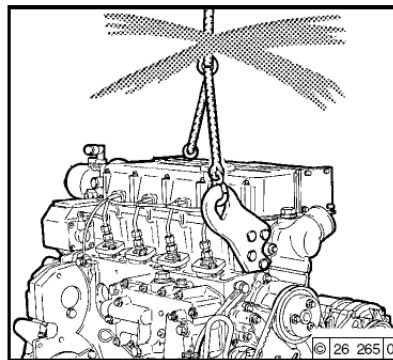
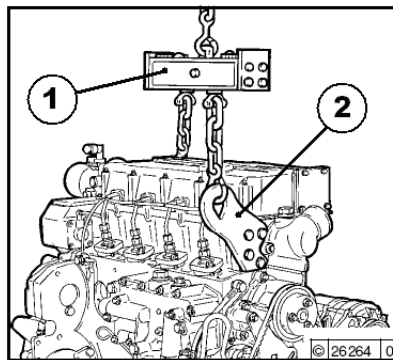
1. Never disconnect cables between the battery, alternator and regulator while the engine is running.
2. However, if it's necessary to start and operate the engine without a battery then disconnect the regulator from the alternator before starting.
3. Be sure not to confuse the battery terminals (e.g. positive "+" and negative "-")
4. Replace a defective charge pilot lamp bulb immediately

5. Cover up the alternator and regulator before washing the engine
6. Do not touch live leads against the frame if you have a motor with a three phase electrical system.
7. In the case of electric welding, connect the welder grounding cables directly to the work piece to be welded.

6.6.4. Transportation Shackles

Follow the guidelines below to transport your engine safely.

 Use only the correct lifting gear.



- Always use the proper lifting tackle (1) and attach it to the lifting points (2) when transporting the engine.

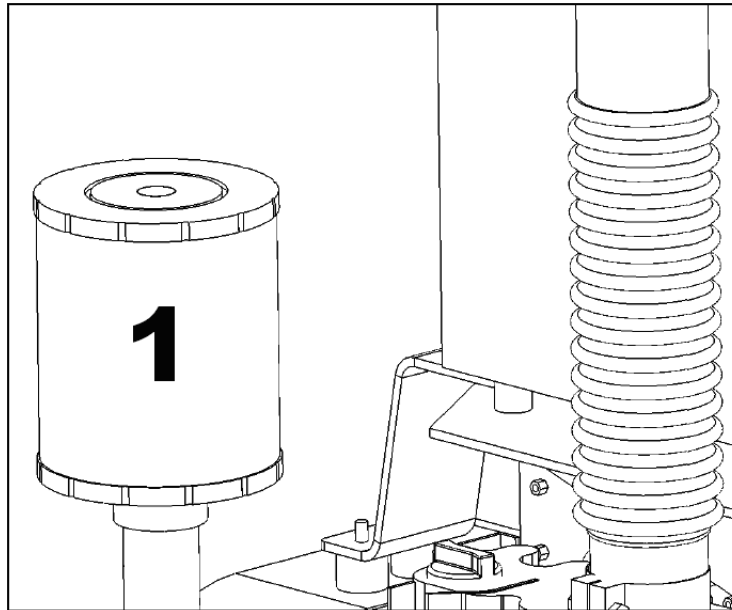
6.6.5. Air Cleaner



DO NOT attempt to open or disassemble the air filter

NO maintenance of any kind is to be done with the **disposable** air filter that is supplied with the engine. The filter is to be removed and a new one installed in its place. Please see section 9 entitled “*Tools and Parts*” for the correct part number when ordering a new air filter.

1. Remove the air filter **1** by loosening the clamp beneath it.



2. Then install the new filter and tighten the clamp to prevent it from becoming loose.

6.6.6. Engine Cleaning

The following section contains guidelines for cleaning your engine.

6.6.6.1. Cleaning the Engine



Turn the engine **OFF** before cleaning.

Preparation:

1. Switch off the engine
2. Remove the engine guards (replace them after cleaning)
3. Cover all electrical / electronic components and connectors (e.g. alternator, starter, governor and solenoids)

4. Clean with compressed air to dislodge loose particles

Cleaning with a cold-cleaning solution:

1. Spray the engine with a commercial cold-cleaning solution and allow it to react for approximately 10 minutes.
2. Spray the engine clean with a strong water jet, repeat if necessary.
3. Allow the engine to run warm so the remaining water can evaporate.

Cleaning with a high-pressure device:

1. Clean the engine with a jet stream (max spray pressure of 60 bar or 870 psi), max temperature of 90°C or 194°F).
2. Do not directly spray electrical devices, wiring or sensors.
3. Start engine and allow the engine to run warm so that remaining water evaporates.

7. Faults, Causes and Remedies

The following section contains information that will help diagnose common problems that could occur with your engine.



DO NOT start the engine with people standing in the immediate vicinity of it.



DO NOT start the engine if the speed regulator has been removed from the engine



Disconnect the battery before doing any kind of work on the engine.

NOTE:

- Faults are often caused by the engine not being properly operated or maintained.
- Each time a fault occurs, check whether all operating and servicing regulations have been followed.
- If you cannot find and fix the problem, please contact DEUTZ SERVICE.

7.1. Fault Tables

Use the table on the following page to diagnose and fix problems with your engine.

Engine does not start or is difficult to start (Starting speed is not achieved on starting)										Recommended Action		
Engine starts, but runs irregularly or fails										Check	P	
Engine becomes excessively hot. Temperature warning system responds										Adjust	E	
Engine output is below normal										Replace	W	
Engine does not run on all cylinders										Clean	R	
Engine oil pressure is below normal										Top off	A	
Engine oil consumption is excessive										Bleed	L	
Engine smokes:												
Blue												
White												
Black												
Cause										Section		
•										Check to see the fire pump or shaft is jammed	Engine Operation	P
•									•	Below starting limit temperature		P
•		•								Shut-off lever still in stop position (shutoff solenoid defective)		P
	•			•						Oil level too low		A
	•	•			•	•				Oil level to high		S
	•	•							•	Air cleaner clogged / turbocharger defective	Combustion air	P / W
	•	•							•	Charge air line leaking		P / W
	•									Coolant pump defective	Cooling System	P / R
	•								•	Intercooler soiled		P / R
	•									Coolant heat exchanger defective		P / R
•	•	•	•	•						Torn or loose V-belt (fuel and water pump belt drive)		P / W
	•	•								Raw water supply not turned on		P
•										Battery defective or discharged	Electrics	P
•										Cable connections, starter, electrical circuit loose or oxidised		P
•										Starter defective or pinion does not engage		P
•	•		•						•	Incorrect valve clearance	Engine	E
•	•		•	•						Incorrect valve leaks		P
	•									Ventelation line blocked (coolant heat exchanger)		P / R
•	•	•	•	•					•	Injector defective		P / W
•	•		•	•						Air in the fuel system		P / W
•	•		•	•						Fuel filter / fuel pre-cleaner soiled		P / R / W
	•									Oil filter defective		W
•	•		•	•	•				•	Fuel quality not as per operation manual	Operating media	P / W
	•									Coolant level below normal		P / A

8. Technical Specifications

This section contains technical specifications for the various 2012 and 1013 engines

8.1. Engine Specifications and Settings

Please refer to **Appendix A** for charts on each of the following engines:

- DFP4-2012-T10
- DFP4-2012-C10
- DFP4-2012-C15
- DFP4-2012-Cm30
- DFP4-2012-Cm31
- DFP4-2012-Cm32
- DFP4-2012-Cm33
- DFP4-2012-Cm34
- DFP6-2012-T10
- DFP6-2012-C10
- DFP6-2012-C13
- DFP6-2012-C15
- DFP6-1013-C10
- DFP6-1013-C13
- DFP6-1013-C15
- DFP6-1013-C20
- DFP6-1013-C25
- DFP6-1013-C27

8.2. Oil Fill & Coolant Volumes

DFP4 2012 T10

Oil Volumes		Coolant Volumes
Initial Fill Volume	Oil Change Volume (with filter)	Fill Volume
Liters / Quarts	Liters / Quarts	Liters / Quarts
12 / 12.7	11.5 / 12.2	11.8 / 12.5

DFP4 2012 C10/C15/Cm30-34

Oil Volumes		Coolant Volumes
Initial Fill Volume	Oil Change Volume (with filter)	Fill Volume
Liters / Quarts	Liters / Quarts	Liters / Quarts
12 / 12.7	11.5 / 12.2	11.8 / 12.5

DFP6 2012 T10

Oil Volumes		Coolant Volumes
Initial Fill Volume	Oil Change Volume (with filter)	Fill Volume
Liters / Quarts	Liters / Quarts	Liters / Quarts
16.0 / 17	15.5 / 16.4	13.9 / 14.7

DFP6 2012 C10/C13/C15

Oil Volumes		Coolant Volumes
Initial Fill Volume	Oil Change Volume (with filter)	Fill Volume
Liters / Quarts	Liters / Quarts	Liters / Quarts
16.0 / 17	15.5 / 16.4	13.9 / 14.7

DFP6 1013 C10/C13/C15/C20/C25/C27

Oil Volumes		Coolant Volumes
Initial Fill Volume	Oil Change Volume (with filter)	Fill Volume
Liters / Quarts	Liters / Quarts	Liters / Quarts
19.0 / 20	17.5 / 18.5	16.1 / 17

8.3. Screw Tightening Torques

Use the charts below as a guide to tighten the various fasteners on your engine.

8.3.1. 2012 Engine

Installation location	Pre-tension [Nm]		Re-tension [Nm]		Total [Nm]	Comments
	1. Stg	2. Stg	1. Stg	2. Stg		
Cylinder head screw					8.5	
Rocker arm adjustment screw					21	
Foot on flywheel side					187	M16x40 8.8.8 A 4 C
Foot on fan side		30		45	187	M16x40 8.8.8 A 4 C
Intake manifold					8.5	
Exhaust manifold					21	
Oil drain screw					50	
Injection valve attachment					16	Torx
Injection line attachment					30	M14x1.5
Oil pan (cast)						29
Oil pan (sheet metal)					21	

8.3.2. 1013 Engine

Installation location	Total [Nm]	Comments
Rocket cover	8.5	
Rocker arm setscrew	21	
Mount, flywheel side	187	M16x40 8.8.8 A 4 C
Mount, turbocharger side	187	M16x40 8.8.8 A 4 C
Air intake manifold	8.5	
Exhaust Manifold	21	
Oil drain plug	50	
Injector mounting	16	
Injection line mounting	30	Torx
Oil pan (cast iron)	29	M14x1.5
Oil pan (sheet metal)	21	

8.4. Noise Data

	1470	1800	2100	2350	2650	2800
DFP4-2012-Txx / Cxx	99	101	103	105	106	107
DFP4-2012-Cm3x		100	102	103		
DFP4-2012-C3x		101	102.5	103.5		
DFP6-2012-Txx / Cxx	101	103	105	107	109	110
DFP6-2012-C3x		103	106	107		
DFP6-1013-Cxx	103	107	108	109	111	
DFP6-2013-C3x		105	107	108		

Sound Power Level in dB (A) at Full Load

9. Tools and Parts

9.1. Spare Parts List(s)

The following pages contain part numbers for your DEUTZ engine.

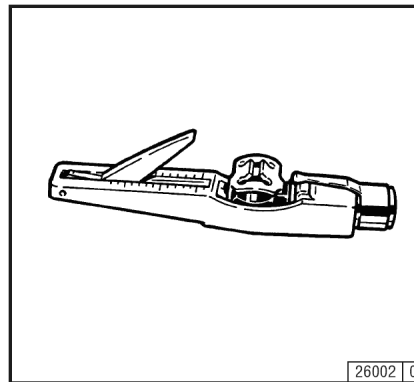
For DFP 2012 Series Engines		
Part #	Part Description	Model Related To
030-5283	Air Filter	DFP4 2012 Txx/Cxx/Cmxx
030-0487	Air Filter	DFP6 2012 Txx/Cxx
118-0597	Fuel Filter	All Models
117-4421	Oil Filter	All Models
211-3159	Fuel Pre-Filter	All Models
117-9777	V-Belt – Alternator	All Models
117-9479	V-Belt – Water Pump/Fuel Pump	All Models
118-2037	12V Alternator	All Models
118-0928	12V Starter (Until 10/2009)	All Models
118-3235	12V Starter (Post 10/2009)	All Models
030-5251	12V Shutdown Solenoid	All Models
118-2042	24V Alternator	All Models
118-0999	24V Starter (Until 10/2009)	All Models
118-3239	24V Starter (Post 10/2009)	All Models
030-5168	24V Shutdown Solenoid	All Models
211-3133	Fuel Injector	DFP4 2012 Txx
211-3547	Fuel Injector	DFP4 2012 Cmxx
211-2994	Fuel Injector	DFP4 2012 Cxx, DFP6 2012 Txx/Cxx
211-2405	Injection Pump	DFP4 2012 Txx/Cmxx
211-3002	Injection Pump	DFP4 2012 Cxx
211-2405	Injection Pump	DFP6 2012 Txx/Cxx
211-1918	High Pressure Pipe	All Models
211-1299	Fuel Lift Pump	All Models
422-4846	Thermostat	All Models
030-3744	Hose – Vent	All Models
030-5194	Hose – Top	All Models
030-5195	Hose – Bottom	All Models
030-1452	Hose – Compensation	All Models
030-0476	Coolant Preheater – 120V (Until 11/2010)	All Models
030-1599	Coolant Preheater – 220V (Until 11/2010)	All Models
030-2658	Coolant Preheater – 120V (Post 11/2010)	All Models
030-2659	Coolant Preheater – 220V (Post 11/2010)	All Models
030-3210	Coolant Preheater Thermostat	All Models
030-0465	Heat Exchanger – Coolant (Until 11/2010)	All Models
030-2640	Heat Exchanger – Coolant (Post 11/2010)	All Models
030-5198	Charge Air Cooler	DFP4 2012 Cxx/Cmxx
030-5184	Charge Air Cooler	DFP6 2012 Cxx
118-2702	Coolant Temperature Switch	All Models
118-2794	Oil Pressure Switch	All Models
425-8199	Turbocharger	DFP4 2012 Txx
425-8205	Turbocharger	DFP4 2012 Cxx
450-0363	Turbocharger	DFP4 2012 Cmxx
425-8659	Turbocharger	DFP6 2012 Txx/Cxx
030-0492	Overspeed Switch/Crank Termination	All Models

030-0477	Control Panel & Instruments	All Models
211-1262	Governor – 2800 RPM	All Models
211-1435	Governor – 2650 RPM	All Models
211-1294	Governor – 2350 RPM	All Models
211-2890	Governor – 2100 RPM	All Models
211-2893	Governor – 1800 RPM	All Models
211-1378	Governor – 1470 RPM	All Models

For DFP 1013 Series Engines		
Part #	Part Description	Model Related To
030-0487	Air Filter	All Models
211-1121	Fuel Filter	All Models
118-2552	Oil Filter	All Models
211-3159	Fuel Pre-Filter	All Models
117-9777	V-Belt – Alternator	All Models
117-9479	V-Belt – Water Pump/Fuel Pump	All Models
118-2151	12V Alternator	All Models
118-0928	12V Starter	All Models
030-5251	12V Shutdown Solenoid	All Models
118-0999	24V Alternator	All Models
030-5168	24V Starter	All Models
211-2957	24V Shutdown Solenoid	All Models
211-2860	Fuel Injector	All Models
211-1918	Injection Pump	All Models
211-1299	High Pressure Pipe	All Models
422-1386	Fuel Lift Pump	All Models
030-3744	Thermostat	All Models
030-1520	Hose – Vent	All Models
030-1521	Hose – Front	All Models
030-1522	Hose – Rear	All Models
030-1522	Hose – Compensation	All Models
030-0476	Coolant Preheater – 120V (Until 11/2010)	All Models
030-1599	Coolant Preheater – 220V (Until 11/2010)	All Models
030-2660	Coolant Preheater - 120V (Post 11/2010)	All Models
030-2661	Coolant Preheater - 220V (Post 11/2010)	All Models
030-3210	Coolant Preheater Thermostat (Post 11/2010)	All Models
030-0465	Heat Exchanger – Coolant (Until 11/2010)	All Models
030-2640	Heat Exchanger - Coolant (Post 11/2010)	All Models
030-5184	Charge Air Cooler	All Models
118-2702	Coolant Temperature Switch	All Models
118-2794	Oil Pressure Switch	All Models
425-9605	Turbocharger	All Models
030-0492	Overspeed Switch/Crank Termination	All Models
030-0477	Control Panel & Instruments	All Models
211-1262	Governor – 2650 RPM	All Models
211-1435	Governor – 2350 RPM	All Models
211-1294	Governor – 2100 RPM	All Models
211-2893	Governor – 1800 RPM	All Models
211-1494	Governor – 1470 RPM	All Models

9.2. Tools

V-belt Tension Gage



The V-belt tension gauge can be obtained under order number 8115 from:

FA.WILBAR
Postfach 14 05 80
D-42826 Remscheid

10. Service

10.1. Knowing it's DEUTZ

DEUTZ has always stood for excellence in motor construction, pioneering many developments in the industry. As an independent motor manufacturer, we offer – world wide – diesel and gas motors ranging from 4kW to 500kW that are modifiable to meet our customers' requirements.

Over 1.4 million DEUTZ engines are used throughout the world. We are determined to preserving the high standard of performance and reliability of our motors. DEUTZ is represented worldwide through a network of highly skilled and reputable service partners who will meet the customers' needs, where ever they are.

On the web at:
<http://www.deutzfireprotection.com>

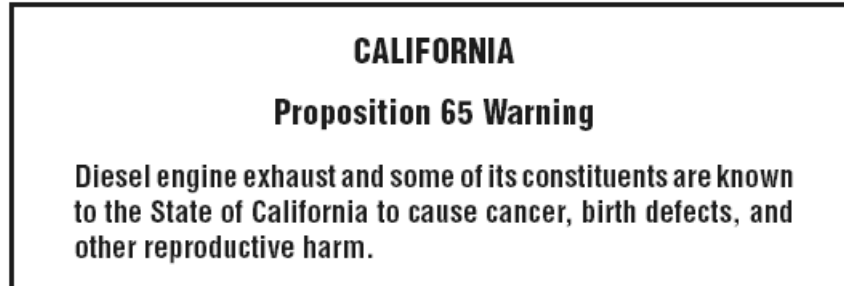
Deutz Corp.
3883 Steve Reynolds Blvd.
Norcross, Ga, 30093

Phone: (800) 241-9886

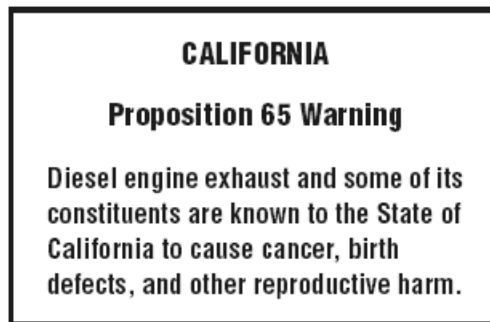
DEUTZ AG – at your service.

11. Notes

Warnings to be placed on equipment:



Warnings in the Manual:



CALIFORNIA PROPOSITION 65 INFORMATION

TO CALIFORNIA CUSTOMERS AND TO CUSTOMERS SELLING DIESEL ENGINE EQUIPMENT INTO OR FOR USE IN CALIFORNIA.

Proposition 65, a California law, requires warnings on products which expose individuals in California to chemicals listed under that law, including certain chemicals in diesel engine exhaust.

Obligations of Manufactures of Diesel-Powered Off-Road Equipment. The California Superior Court has approved either of the following two methods of compliance with Proposition 65 requirements by manufactures of off-road equipment containing diesel engines. (The court order containing these provisions is attached.)

1. **On-Equipment Warning.** Place the warning pictured in attachment 1 on all equipment shipped by you into or for sale in California after January 1, 1996. The warning must be in a location where it is easily visible to the operator of the equipment when (s)he is operating the equipment. The warning must be secured to the equipment. If warnings or operating instructions are provided through a digital display, you may use that method of providing warning.
2. **Operator Manual Warning.** When the operator manual is next revised or by December 31, 1995 whichever is earlier, place the warning in attachment 2 in the operator manual. The warning may be either printed in the manual or on a sticker.

The warning must appear in one of the following locations:

- Inside The front cover
- Inside the back cover
- Outside the front cover
- Outside the back cover
- As the first page of text

Under either alternative, the warning must appear in the same size, print and format as the attachment selected or be of an equally conspicuous size and format. If the warning is provided in an on-screen display, the warning must contain the language in the attachment and must be provided at the time of or in connection with ignition in the same manner as other safety warnings electronically communicated on screen.

Obligation of Resellers of Diesel Engines. This letter must accompany any loose diesel engine sold in California. Should you have any questions, please call Deutz Corporation Product Support Department.

Appendix A:

Firepump Engine Performance Datasheets



EPA Tier 1
Technical
Data Sheet

General

Cylinders	4
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	4.04 liter 246.5 in ³
Compression ratio	18.4:1
Combustion system	Direct Injection
Aspiration	Turbocharged

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	180.0 l/min 47.6 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in system	5.6 liter 5.9 qt

Combustion Air System

Combustion air flow @ max rating	525 m ³ /h 305 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	60 mbar 24 in H2O

Exhaust System

Exhaust gas flow @ max rating	1428 m ³ /h 840 CFM
Exhaust temp @ max rating	560°C 1040°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	49.5 l/min 13.1 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	6 341
1800	8 455
2100	8 455
2350	9 512
2650	9 512
2800	7 398

Certified Gross Power – EPA Tier 1

Engine RPM:	1470	1800	2100	2350	2650	2800
kW	59.7	71.6	78.4	82.8	82.8	70.9
Hp	80	96	105	111	111	95

Certified Fuel Consumption

g/kW-hr	220	227	227	233	252	272
lb/hp-hr	0.362	0.373	0.373	0.384	0.414	0.448
Liters/hr	17	21	23	25	27	25
Gal/hr	4.5	5.5	6.1	6.6	7.1	6.6

Exhaust Gas

m ³ /h	680	1026	1078	1376	1412	1428
CFM	400	604	634	810	831	840

Raw Water Flow (GPM)

Water Temperature:	GPM					
60°F	12	12	12	12	12	13
90°F	14	14	14	14	14	15

Dimensions

A	58.6 in
B	37.0 in
C	15.0 in
D	29.8 in
E	26.5 in
F	24.0 in

Weight

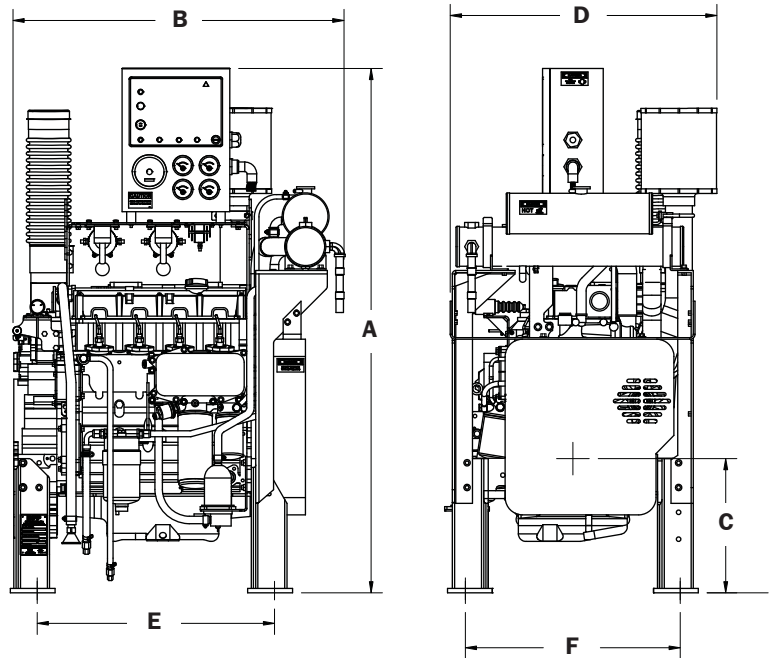
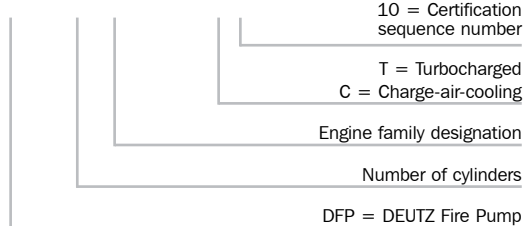
lbs (kg)

DFP4-2012-Txx	1194 (538)
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Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation

DFP4 2012 T10



DEUTZ Corporation

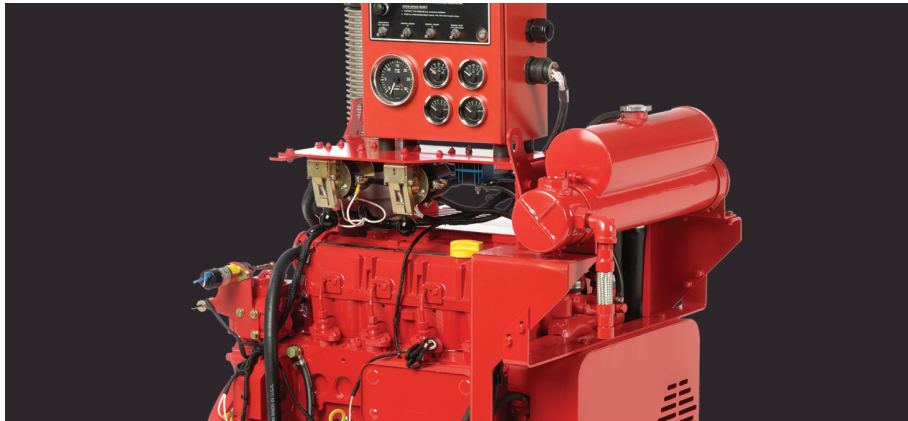
3883 Steve Reynolds Blvd, Norcross, GA 30093

Phone (770) 564-7100

www.deutzamericas.com

E-mail: engines@deutzusa.com

Jan 2009



EPA Tier 2 / CARB Technical Data Sheet

General

Cylinders	4
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	4.04 liter 246.5 in ³
Compression ratio	18.4:1
Combustion system	Direct Injection
Aspiration	Turbocharged

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	180.0 l/min 47.6 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in system	5.6 liter 5.9 qt

Combustion Air System

Combustion air flow @ max rating	525 m ³ /h 305 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	60 mbar 24 in H2O

Exhaust System

Exhaust gas flow @ max rating	1428 m ³ /h 840 CFM
Exhaust temp @ max rating	560°C 1040°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 4"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	49.5 l/min 13.1 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1 kW 24V, 4.0 kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	6 341
1800	8 455
2100	8 455
2350	9 512
2650	9 512
2800	7 398

Certified Gross Power – EPA Tier 2 / CARB*

Engine RPM:	1470	1800	2100	2350	2650	2800
kW	59.7	71.6	75.0	75.0	75.0	70.9
Hp	80	96	100	100	100	95

*Complies with California ATCM 93115.6(a)(4)

Certified Fuel Consumption

g/kW-hr	220	227	227	233	252	272
lb/hp-hr	0.362	0.373	0.373	0.384	0.414	0.448
Liters/hr	17	21	23	25	27	25
Gal/hr	4.5	5.5	6.1	6.6	7.1	6.6

Exhaust Gas

m ³ /h	680	1026	1078	1376	1412	1428
CFM	400	604	634	810	831	840

Raw Water Flow (GPM)

Water Temperature:	GPM					
60°F	12	12	12	12	12	13
90°F	14	14	14	14	14	15

Dimensions

A	58.6 in
B	37.0 in
C	15.0 in
D	29.8 in
E	26.5 in
F	24.0 in

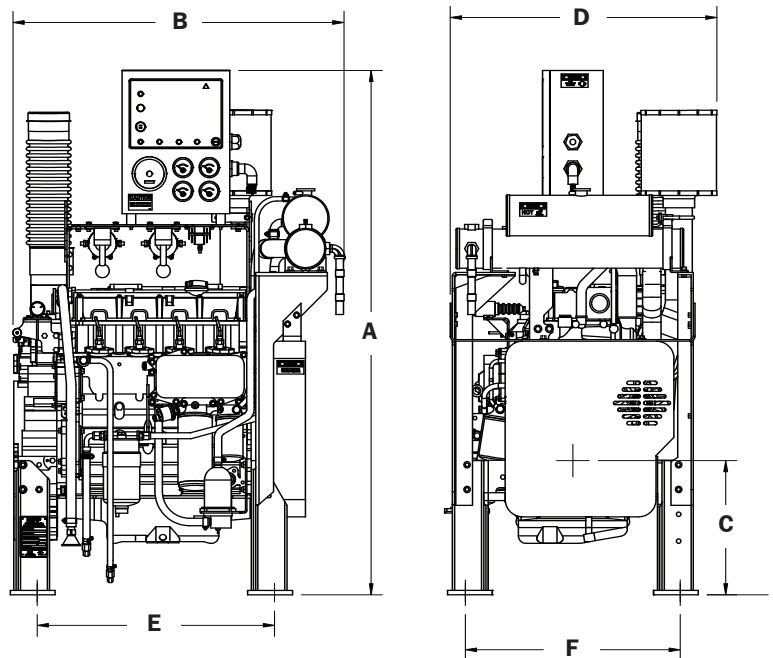
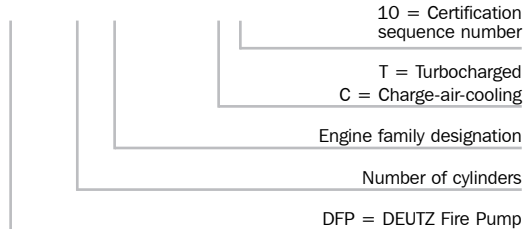
Weight

	lbs (kg)
DFP4-2012-Txx	1194 (538)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation

DFP4 2012 T15



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Jan 2009



EPA Tier 1 Technical Data Sheet

General

Cylinders	4
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	4.04 liter 246.5 in ³
Compression ratio	18.4:1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge
Fuel Consumption @ max rating	37 l/h 9.8 GPH

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	180.0 l/min 47.6 GPM
Coolant heat rejection % of gross power	50%
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in system	5.6 liter 5.9 qt

Combustion Air System

Combustion air flow @ max rating	630 m ³ /h 371 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O
Temperature after charge air cooler	1.5 bar 21.8 psi
Charge air heat % of gross power	22%

Exhaust System

Exhaust gas flow @ max rating	1772 m ³ /h 1043 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 4"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	49.5 l/min 13.1 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1kW 24V, 4.0 kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	7 398
1800	9 512
2100	11 626
2350	11 626
2650	12 683
2800	11 626

Certified Gross Power – EPA Tier 1

Engine RPM:	1470	1800	2100	2350	2650	2800
kW	70.9	87.3	100.7	108.2	109.7	109.0
Hp	95	117	135	145	147	146

Certified Fuel Consumption

g/kW-hr	207.0	230.0	100.7	108.2	109.7	109.0
lb/hp-hr	0.341	0.379	0.391	0.388	0.406	0.432
Liters/hr	19	26	31	33	35	37
Gal/hr	5.0	6.9	8.2	8.7	9.2	9.8

Exhaust Gas

m ³ /h	825	1395	1537	1664	1724	1772
CFM	486	821	905	979	1015	1043

Raw Water Flow (GPM)

Water Temperature:	GPM					
60°F	20	20	20	20	20	20
90°F	22	22	22	22	22	22

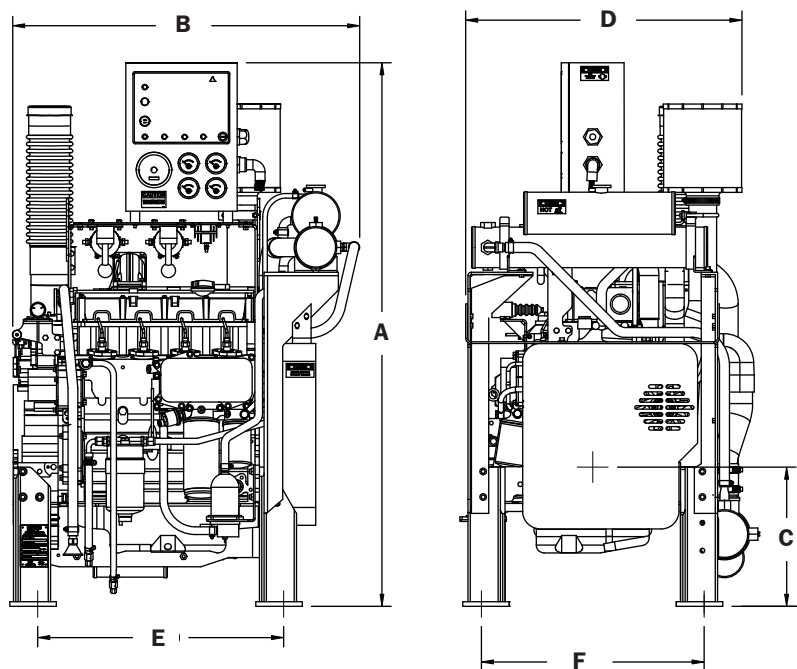
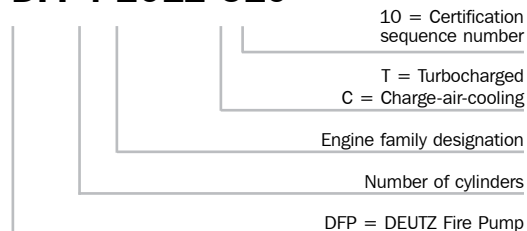
Dimensions

A	58.6 in
B	37.4 in
C	15.0 in
D	29.8 in
E	26.5 in
F	24.0 in

Weight

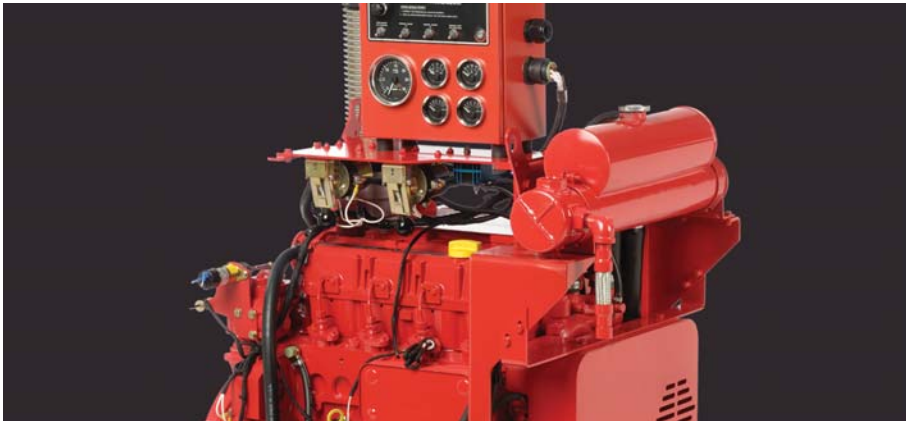
	lbs (kg)
DFP4-2012-Cxx	1308 (589)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation
DFP4 2012 C10


DEUTZ Corporation
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 E-mail: engines@deutzusa.com

Jan 2009



EPA Tier 2 / CARB Technical Data Sheet

General

Cylinders	4
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	4.04 liter 246.5 in ³
Compression ratio	18.4:1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge
Fuel Consumption @ max rating	37 l/h 9.8 GPH

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	180.0 l/min 47.6 GPM
Coolant heat rejection % of gross power	50%
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in system	5.6 liter 5.9 qt

Combustion Air System

Combustion air flow @ max rating	630 m ³ /h 371 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O
Temperature after charge air cooler	1.5 bar 21.8 psi
Charge air heat % of gross power	22%

Exhaust System

Exhaust gas flow @ max rating	1772 m ³ /h 1043 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 4"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	49.5 l/min 13.1 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1kW 24V, 4.0 kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	7 398
1800	9 512
2100	11 626
2350	11 626
2650	12 683
2800	11 626

Certified Gross Power – EPA Tier 2 / CARB*

Engine RPM:	1470	1800	2100	2350	2650	2800
kW	70.9	87.3	100.7	108.2	109.7	109.0
Hp	95	117	135	145	147	146

*Complies with California ATCM 93115.6(a)(4)

Certified Fuel Consumption

g/kW-hr	207.0	230.0	100.7	108.2	109.7	109.0
lb/hp-hr	0.341	0.379	0.391	0.388	0.406	0.432
Liters/hr	19	26	31	33	35	37
Gal/hr	5.0	6.9	8.2	8.7	9.2	9.8

Exhaust Gas

m ³ /h	825	1395	1537	1664	1724	1772
CFM	486	821	905	979	1015	1043

Raw Water Flow (GPM)

Water Temperature:	GPM					
60°F	20	20	20	20	20	20
90°F	22	22	22	22	22	22

Dimensions

A	58.6 in
B	37.4 in
C	15.0 in
D	29.8 in
E	26.5 in
F	24.0 in

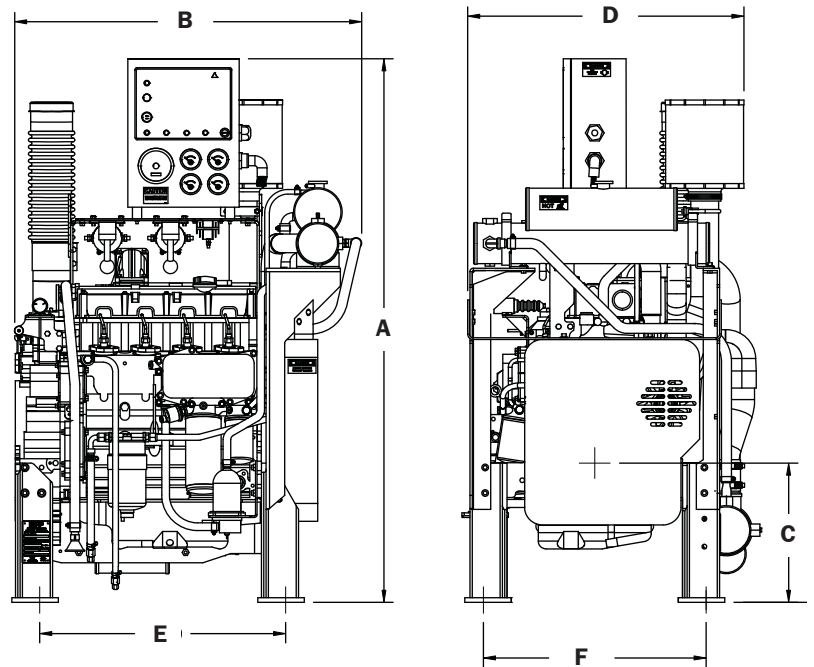
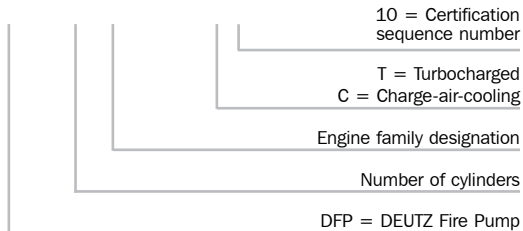
Weight

	lbs (kg)
DFP4-2012-Cxx	1308 (589)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation

DFP4 2012 C15



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Jan 2009



EPA Tier 1 Technical Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	6.06 liter 369.7 in ³
Compression ratio	18.4 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	190.0 l/min 50.2 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in engine (std. oil sump)	7.6 liter 8.0 qt

Combustion Air System

Combustion air flow @ max rating	695 m ³ /h 409 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O

Exhaust System

Exhaust gas flow @ max rating	1889 m ³ /h 1112 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	74.3 l/min 19.6 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12 V, 3.1 kW 24V, 4.0 kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	10 569
1800	12 683
2100	13 739
2350	13 739
2650	12 683
2800	12 683

Certified Gross Power – EPA Tier 1

Engine RPM:	1470	1800	2100	2350	2650	2800
kW	92.5	113.4	127.6	125.4	118.7	116.4
Hp	124	152	171	168	159	156

Certified Fuel Consumption

g/kW-hr	225	211	218	228	241	246
lb/hp-hr	0.371	0.347	0.359	0.375	0.396	0.404
Liters/hr	27	31	36	37	37	37
Gallons/hr	7.1	8.2	9.5	9.8	9.8	9.8

Exhaust Gas

m ³ /h	1033	1560	1755	1835	1889	1853
CFM	608	918	1033	1080	1112	1091

Raw Water Flow (GPM)

Water Temperature:	GPM					
60°F	11	11	12	12	12	15
90°F	13	13	14	14	14	17

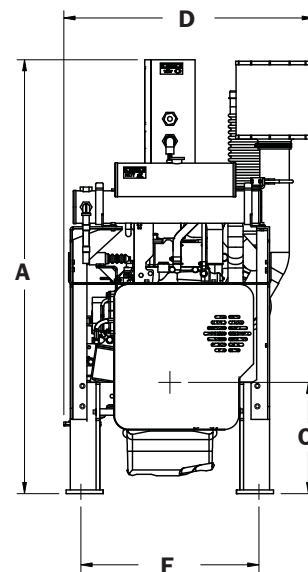
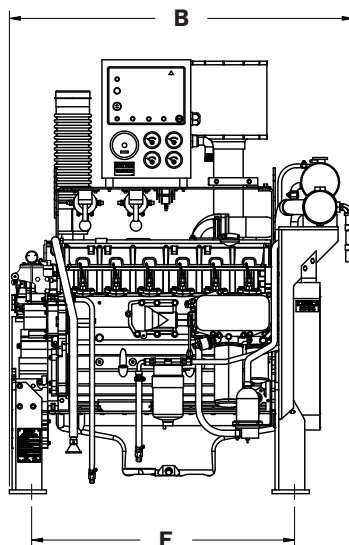
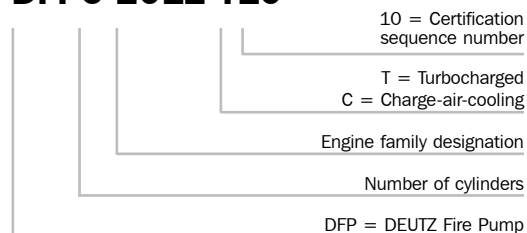
Dimensions

A	58.5 in
B	46.4 in
C	15.0 in
D	33.7 in
E	35.5 in
F	24.0 in

Weight

	lbs (kg)
DFP6-2012-Txx	1502 (677)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation
DFP6 2012 T10


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Jan 2009



EPA Tier 1
Technical
Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	6.06 liter 369.7 in ³
Compression ratio	18.4 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air Cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	190.0 l/min 50.2 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in system	7.6 liter 8.0 qt

Combustion Air System

Combustion air flow @ max rating	997 m ³ /h 587 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O

Exhaust System

Exhaust gas flow @ max rating	2778 m ³ /h 1635 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	74.3 l/min 19.6 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical System

Starter Motor	12V, 3.1 kW 24V, 4.0 kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	12 683
1800	14 796
2100	16 910
2350	16 910
2650	16 910
2800	18 1024

Certified Gross Power – EPA Tier 1

Engine RPM:	1470	1800	2100	2350	2650	2800
kW	111.2	132.1	153.0	154.5	153.7	167.9
Hp	149	177	205	207	206	225

Certified Fuel Consumption

g/kW-hr	208	199	217	220	236	244
lb/hp-hr	0.343	0.327	0.357	0.362	0.389	0.401
Liters/hr	30	34	43	44	47	53.0
Gal/hr	7.9	9.0	11.4	11.6	12.4	14.0

Exhaust Gas

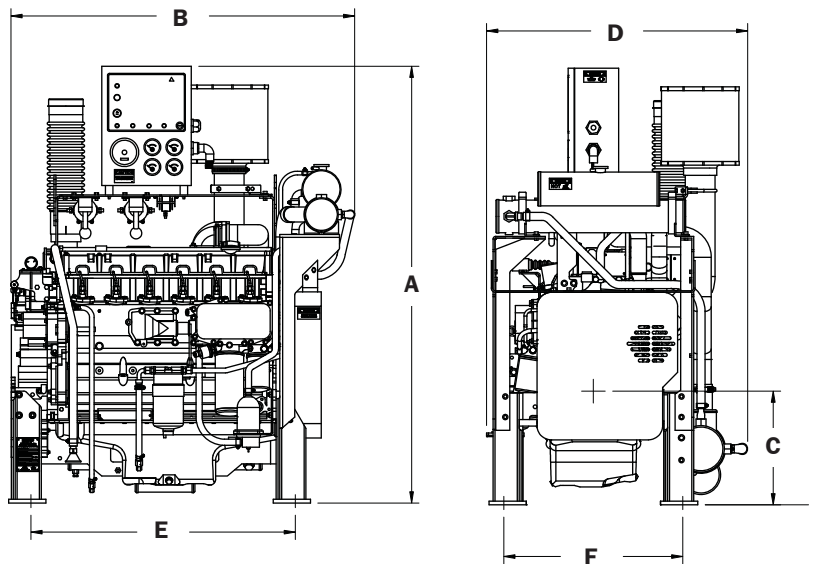
m ³ /h	1261	2120	2298	2466	2566	2778
CFM	742	1248	1353	1451	1510	1635

Raw Water Flow (GPM)

Water Temperature:	GPM					
60°F	12	13	14	15	16	17
90°F	14	15	16	17	18	19

Dimensions

A	58.6 in
B	46.1 in
C	15.0 in
D	35.0 in
E	35.5 in
F	24.0 in



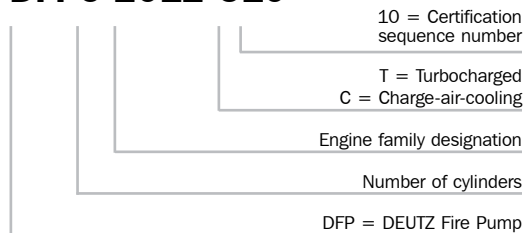
Weight

	lbs (kg)
DFP6-2012-Cxx	1701 (766)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

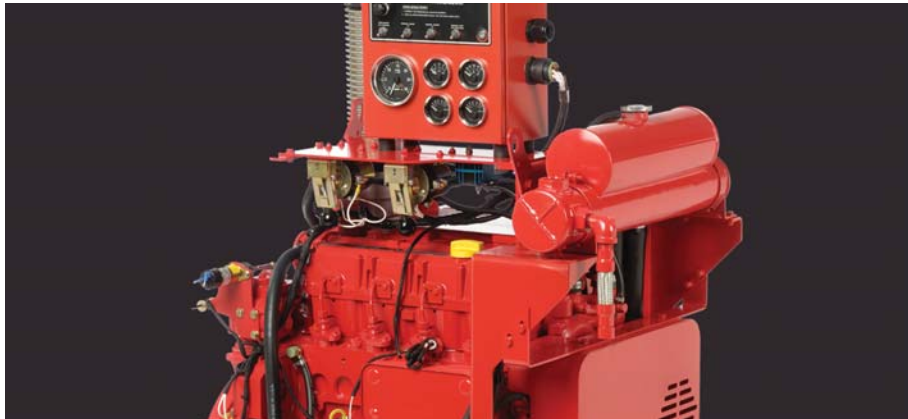
Model Designation

DFP6 2012 C10



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Jan 2009



EPA Tier 2 / CARB Technical Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	6.06 liter 369.7 in ³
Compression ratio	18.4 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air Cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	190.0 l/min 50.2 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in system	7.6 liter 8.0 qt

Combustion Air System

Combustion air flow @ max rating	997 m ³ /h 587 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O

Exhaust System

Exhaust gas flow @ max rating	2778 m ³ /h 1635 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	74.3 l/min 19.6 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical System

Starter Motor	12V, 3.1 kW 24V, 4.0 kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1800	14 796
2100	16 910
2350	16 910
2650	16 910
2800	18 1024

Certified Gross Power – EPA Tier 2 / CARB*

Engine RPM:	1800	2100	2350	2650	2800
kW	130	130	130	130	130
Hp	174	174	174	174	174

*Complies with California ATCM 93115.6(a)(4)

Certified Fuel Consumption

g/kW-hr	199	217	220	236	244
lb/hp-hr	0.327	0.357	0.362	0.389	0.401
Liters/hr	34	37	41	40	41
Gal/hr	9.0	9.8	10.8	10.6	10.8

Exhaust Gas

m ³ /h	2120	2298	2466	2566	2778
CFM	1248	1353	1451	1510	1635

Raw Water Flow (GPM)

Water Temperature:	GPM				
60°F	13	14	15	16	17
90°F	15	16	17	18	19

Dimensions

A	58.6 in
B	46.1 in
C	15.0 in
D	35.0 in
E	35.5 in
F	24.0 in

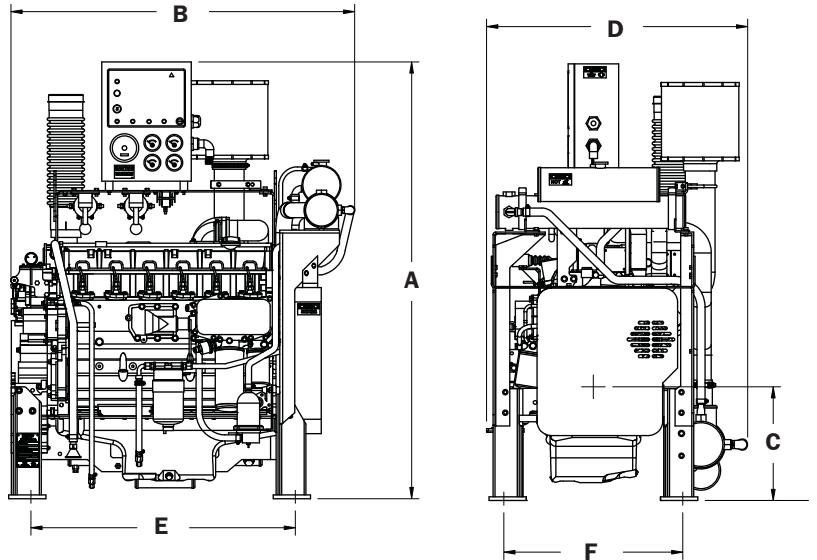
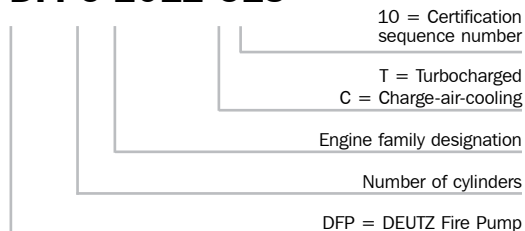
Weight

	lbs (kg)
DFP6-2012-Cxx	1701 (766)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation

DFP6 2012 C13



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Jan 2009



EPA Tier 2 / CARB Technical Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder displacement	1.01 liter 61.6 in ³
Total displacement	6.06 liter 369.7 in ³
Compression ratio	18.4 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air Cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	190.0 l/min 50.2 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.5 bar 21.8 psi
Coolant volume in system	7.6 liter 8.0 qt

Combustion Air System

Combustion air flow @ max rating	997 m ³ /h 587 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O

Exhaust System

Exhaust gas flow @ max rating	2778 m ³ /h 1635 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	74.3 l/min 19.6 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical System

Starter Motor	12V, 3.1 kW 24V, 4.0 kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	12 683
1800	14 796
2100	16 910
2350	16 910
2650	16 910
2800	18 1024

Certified Gross Power – EPA Tier 2 / CARB*

Engine RPM:	1470	1800	2100	2350	2650	2800
kW	111.2	132.1	153.0	154.5	153.7	167.9
Hp	149	177	205	207	206	225

*Complies with California ATCM 93115.6(a)(4)

Certified Fuel Consumption

g/kW-hr	208	199	217	220	236	244
lb/hp-hr	0.343	0.327	0.357	0.362	0.389	0.401
Liters/hr	30	34	43	44	47	53.0
Gal/hr	7.9	9.0	11.4	11.6	12.4	14.0

Exhaust Gas

m ³ /h	1261	2120	2298	2466	2566	2778
CFM	742	1248	1353	1451	1510	1635

Raw Water Flow (GPM)

Water Temperature:	GPM					
60°F	12	13	14	15	16	17
90°F	14	15	16	17	18	19

Dimensions

A	58.6 in
B	46.1 in
C	15.0 in
D	35.0 in
E	35.5 in
F	24.0 in

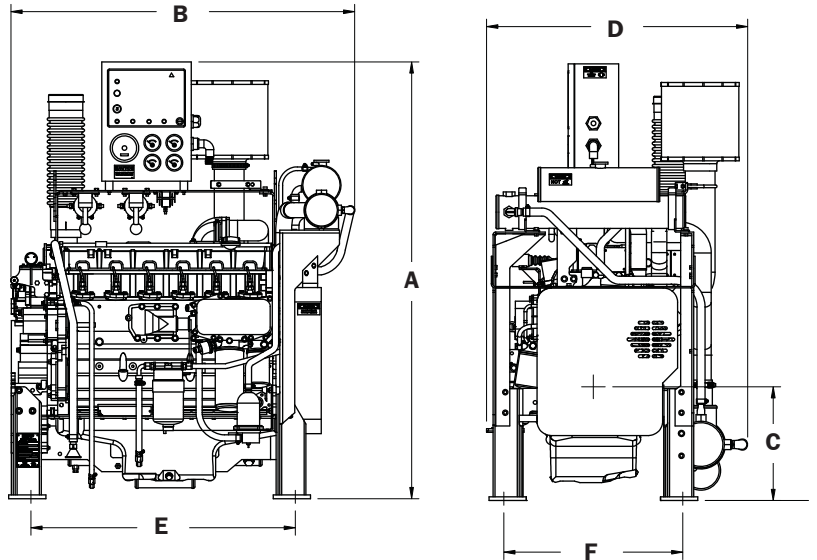
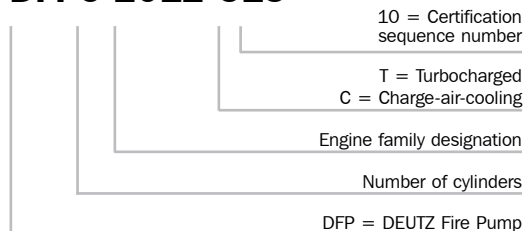
Weight

	lbs (kg)
DFP6-2012-Cxx	1701 (766)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation

DFP6 2012 C15



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Jan 2009



EPA Tier 1 Technical Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	108 mm 4.3 in
Stroke	130 mm 5.1 in
Cylinder displacement	1.191 liter 72.67 in ³
Total displacement	7.146 liter 436 in ³
Compression ratio	17.5 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	198.0 l/min 52.31 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.2 bar 17.4 PSI
Coolant volume in system	9.8 liter 10.4 qt

Combustion Air System

Combustion air flow @ max rating	1352 m ³ /h 795 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O
Temperature after charge air cooler	50°C 122.0°F

Exhaust System

Exhaust gas flow @ max rating	3143 m ³ /h 1850 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	91.1 l/min 24.1 GPM
Oil pump relief valve setting	10 bar 145 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1kW 24V, 4.8kW
Voltage Drop, Battery (+), Max	1.0V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	14 796
1800	18 1024
2100	20 1138
2350	20 1138
2650	20 1138

Certified Gross Power – EPA Tier 1

Engine RPM:	1470	1800	2100	2350	2650
kW	138.1	167.9	186.6	186.6	186.6
Hp	185	225	250	250	250

Certified Fuel Consumption

g/kW-hr	201	205	215	224	250
lb/hp-hr	0.331	0.337	0.354	0.369	0.411
Liters/hr	33	40	47	49	55
Gal/hr	8.6	10.7	12.5	13.0	14.5

Exhaust Gas

m ³ /h	1607	2135	2491	2787	3143
CFM	946	1257	1466	1640	1850

Raw Water Flow (GPM)

Water Temperature:	GPM				
60°F	25	26	30	30	32
90°F	27	28	32	32	34

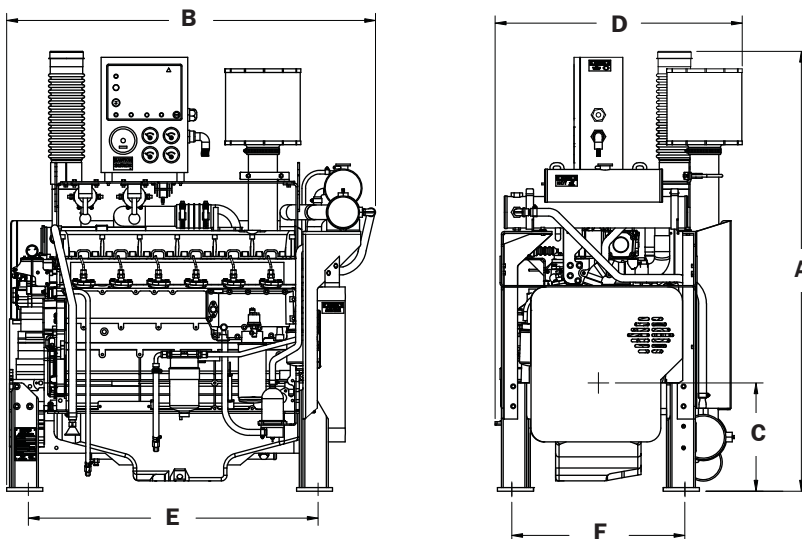
Dimensions

A	61.0 in
B	51.1 in
C	15.0 in
D	34.3 in
E	40.2 in
F	24.0 in

Weight

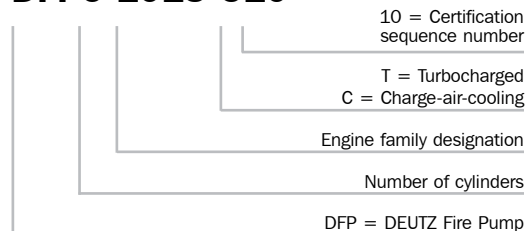
	lbs (kg)
DFP6-1013-Cxx	1882 (848)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.



Model Designation

DFP6 1013 C10



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Jan 2009



**EPA Tier 2 / CARB
Technical
Data Sheet**

General

Cylinders	6
Cylinder arrangement	Inline
Bore	108 mm 4.3 in
Stroke	130 mm 5.1 in
Cylinder displacement	1.191 liter 72.67 in ³
Total displacement	7.146 liter 436 in ³
Compression ratio	17.5 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	198.0 l/min 52.31 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.2 bar 17.4 PSI
Coolant volume in system	9.8 liter 10.4 qt

Combustion Air System

Combustion air flow @ max rating	1352 m ³ /h 795 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O
Temperature after charge air cooler	50°C 122.0°F

Exhaust System

Exhaust gas flow @ max rating	3143 m ³ /h 1850 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	91.1 l/min 24.1 GPM
Oil pump relief valve setting	10 bar 145 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1kW 24V, 4.8kW
Voltage Drop, Battery (+), Max	1.0V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	14 796

Certified Gross Power – EPA Tier 2 / CARB*

Engine RPM:	1470
kW	130
Hp	174

*Complies with California ATCM 93115.6(a)(4)

Certified Fuel Consumption

g/kW-hr	201
lb/hp-hr	0.331
Liters/hr	33
Gal/hr	8.6

Exhaust Gas

m ³ /h	1607
CFM	946

Raw Water Flow (GPM)

Water Temperature:	GPM
60°F	25
90°F	27

Dimensions

A	61.0 in
B	51.1 in
C	15.0 in
D	34.3 in
E	40.2 in
F	24.0 in

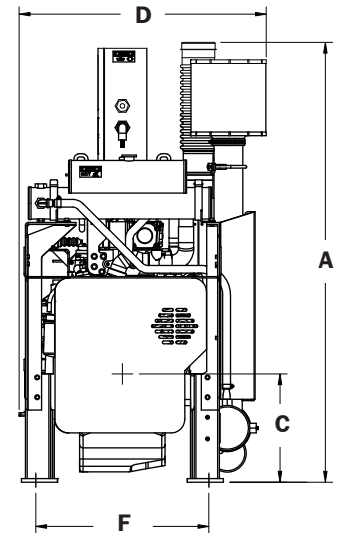
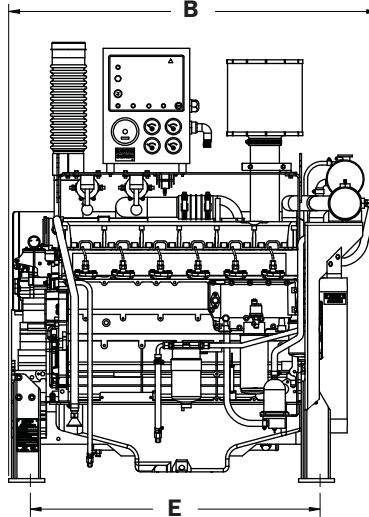
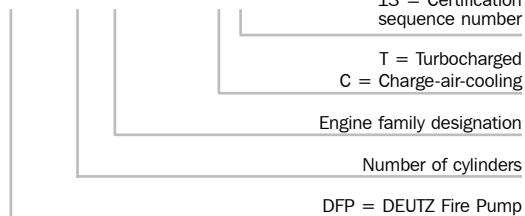
Weight

	lbs (kg)
DFP6-1013-Cxx	1882 (848)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

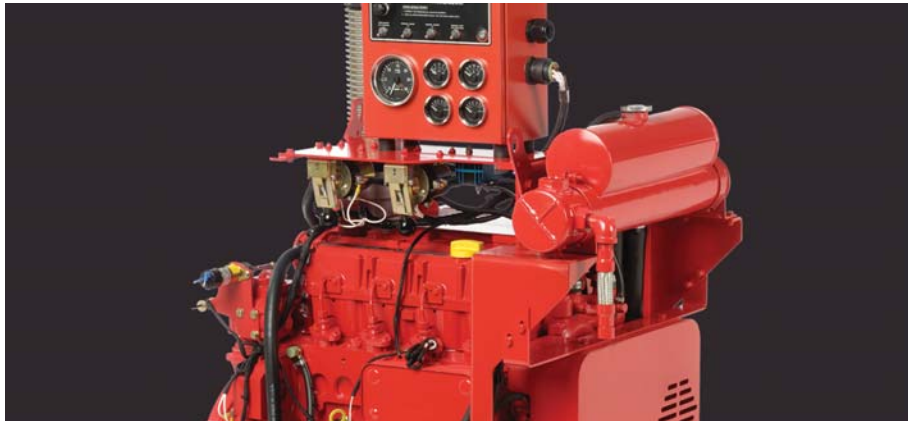
Model Designation

DFP6 1013 C13



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Jan 2009



EPA Tier 2 / CARB Technical Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	108 mm 4.3 in
Stroke	130 mm 5.1 in
Cylinder displacement	1.191 liter 72.67 in ³
Total displacement	7.146 liter 436 in ³
Compression ratio	17.5 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	198.0 l/min 52.31 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.2 bar 17.4 PSI
Coolant volume in system	9.8 liter 10.4 qt

Combustion Air System

Combustion air flow @ max rating	1352 m ³ /h 795 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O
Temperature after charge air cooler	50°C 122.0°F

Exhaust System

Exhaust gas flow @ max rating	3143 m ³ /h 1850 CFM
Exhaust temp @ max rating	540°C 1004°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	91.1 l/min 24.1 GPM
Oil pump relief valve setting	10 bar 145 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1kW 24V, 4.8kW
Voltage Drop, Battery (+), Max	1.0V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	14 796
1800	18 1024
2100	20 1138
2350	20 1138
2650	20 1138

Certified Gross Power – EPA Tier 2 / CARB*

Engine RPM:	1470	1800	2100	2350	2650
kW	138.1	167.9	186.6	186.6	186.6
Hp	185	225	250	250	250

*Complies with California ATCM 93115.6(a)(4)

Certified Fuel Consumption

g/kW-hr	201	205	215	224	250
lb/hp-hr	0.331	0.337	0.354	0.369	0.411
Liters/hr	33	40	47	49	55
Gal/hr	8.6	10.7	12.5	13.0	14.5

Exhaust Gas

m ³ /h	1607	2135	2491	2787	3143
CFM	946	1257	1466	1640	1850

Raw Water Flow (GPM)

Water Temperature:	GPM				
60°F	25	26	30	30	32
90°F	27	28	32	32	34

Dimensions

A	61.0 in
B	51.1 in
C	15.0 in
D	34.3 in
E	40.2 in
F	24.0 in

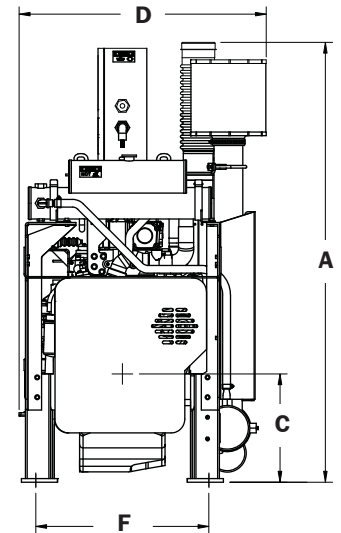
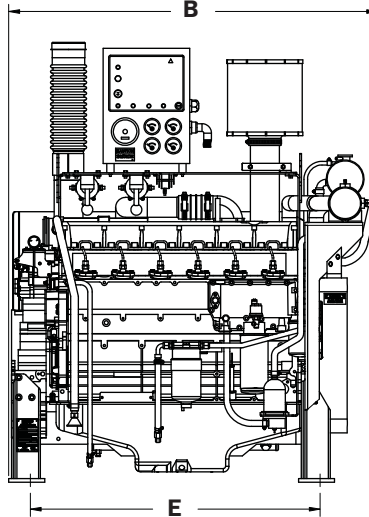
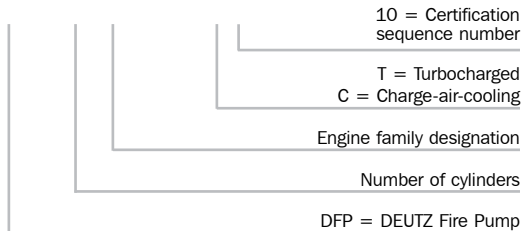
Weight

	lbs (kg)
DFP6-1013-Cxx	1882 (848)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

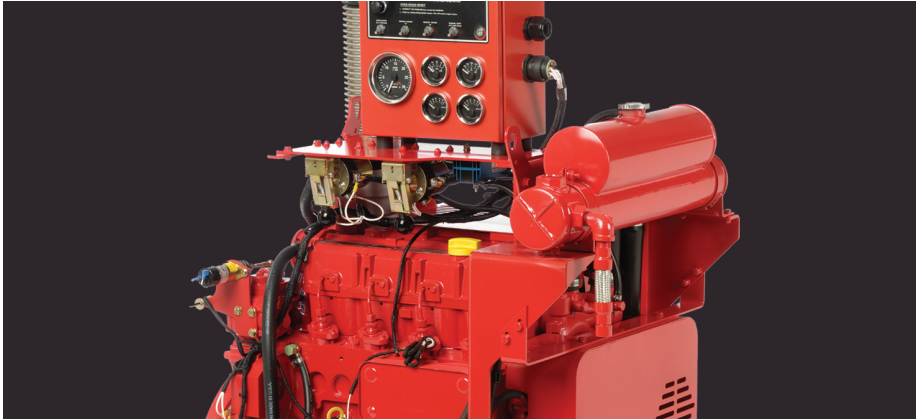
Model Designation

DFP6 1013 C15



DEUTZ Corporation
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Jan 2009



EPA Tier 1 Technical Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	108 mm 4.3 in
Stroke	130 mm 5.1 in
Cylinder displacement	1.191 liter 72.67 in ³
Total displacement	7.146 liter 436 in ³
Compression ratio	17.5 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	198.0 l/min 52.31 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.2 bar 17.4 PSI
Coolant volume in system	9.8 liter 10.4 qt

Combustion Air System

Combustion air flow @ max rating	1352 m ³ /h 795 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O
Temperature after charge air cooler	50°C 122.0°F

Exhaust System

Exhaust gas flow @ max rating	3143 m ³ /h 1850 CFM
Exhaust temp @ max rating	580°C 1076°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	91.1 l/min 24.1 GPM
Oil pump relief valve setting	10 bar 145 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1 kW 24V, 4.8kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	17 967
1800	23 1308
2100	22 1251
2350	22 1251
2650	22 1251

Certified Gross Power – EPA Tier 1

Engine RPM:	1470	1800	2100	2350	2650
kW	164.9	214.9	208.2	213.4	207.5
Hp	221	288	279	286	278

Certified Fuel Consumption

g/kW-hr	201	205	215	224	250
lb/hp-hr	0.331	0.337	0.354	0.369	0.411
Liters/hr	43	57	58	62	67
Gal/hr	11	15	15	16	18

Exhaust Gas

m ³ /h	1607	2135	2491	2787	3143
CFM	946	1257	1466	1640	1850

Raw Water Flow (GPM)

Water Temperature:	GPM				
60°F	25	26	30	30	32
90°F	27	28	32	32	34

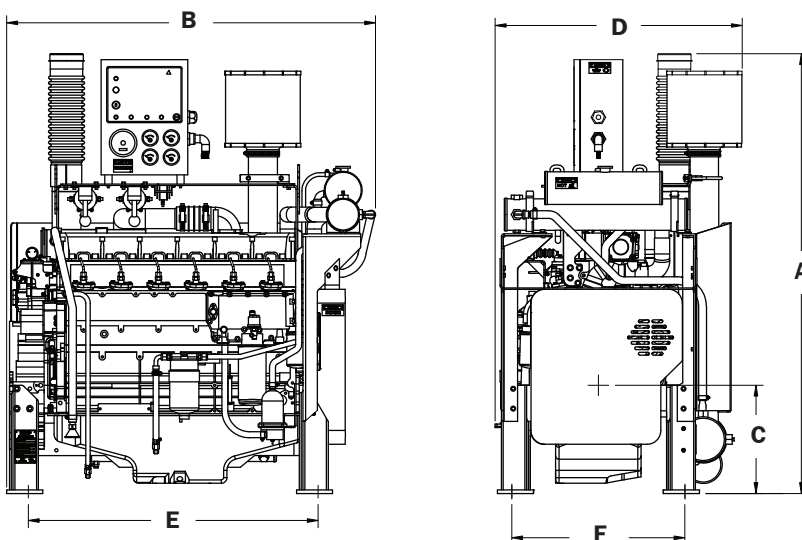
Dimensions

A	61.0 in
B	51.1 in
C	15.0 in
D	34.3 in
E	40.2 in
F	24.0 in

Weight

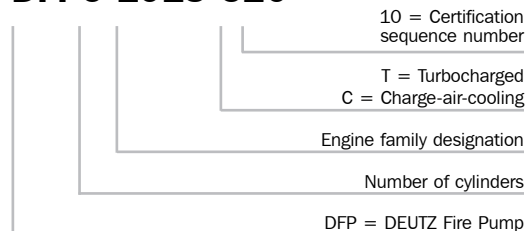
	lbs (kg)
DFP6-1013-Cxx	1882 (848)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.



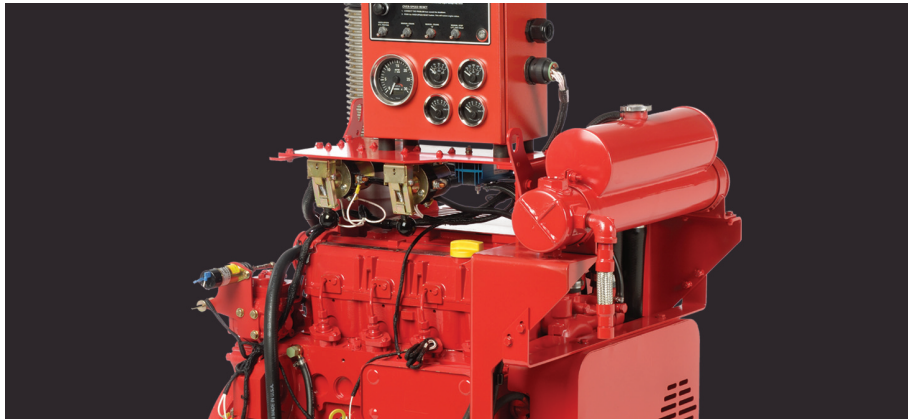
Model Designation

DFP6 1013 C20



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Jan 2009



EPA Tier 2 / CARB Technical Data Sheet

General

Cylinders	6
Cylinder arrangement	Inline
Bore	108 mm 4.3 in
Stroke	130 mm 5.1 in
Cylinder displacement	1.191 liter 72.67 in ³
Total displacement	7.146 liter 436 in ³
Compression ratio	17.5 : 1
Combustion system	Direct Injection
Aspiration	Turbocharged & Charge-Air cooled

Fuel System

Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 l/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in H2O
Max restriction in fuel return line	500 mbar 200 in H2O
Max restriction in fuel pre-filter	200 mbar 80 in H2O
Fuel filter type	Replaceable Cartridge

Cooling System

Type	Heat Exchanger
Coolant flow rate @ max rpm	198.0 l/min 52.31 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.2 bar 17.4 PSI
Coolant volume in system	9.8 liter 10.4 qt

Combustion Air System

Combustion air flow @ max rating	1352 m ³ /h 795 CFM
Max allowable clean restriction	50 mbar 20 in H2O
Max allowable dirty restriction	65 mbar 26 in H2O
Temperature after charge air cooler	50°C 122.0°F

Exhaust System

Exhaust gas flow @ max rating	3143 m ³ /h 1850 CFM
Exhaust temp @ max rating	580°C 1076°F
Max allowable back pressure	75 mbar 30 in H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System

Lubrication type	Forced feed lubrication
Oil flow at max rpm	91.1 l/min 24.1 GPM
Oil pump relief valve setting	10 bar 145 psi
Max oil temperature in oil sump	130°C 266°F
Filter volume	1.5 liter 1.6 qt

Electrical

Starter Motor	12V, 3.1 kW 24V, 4.8kW
Voltage Drop, Battery (+), Max	1.0 V

Radiant Heat for Engine/Speed Combination

RPM	kW BTU/min
1470	17 967
1800	23 1308
2100	22 1251
2350	22 1251
2650	22 1251

Certified Gross Power – EPA Tier 2 / CARB*

Engine RPM:	1470	1800	2100	2350	2650
kW	164.9	214.9	208.2	213.4	207.5
Hp	221	288	279	286	278

*Complies with California ATCM 93115.6(a)(4)

Certified Fuel Consumption

g/kW-hr	201	205	215	224	250
lb/hp-hr	0.331	0.337	0.354	0.369	0.411
Liters/hr	43	57	58	62	67
Gal/hr	11	15	15	16	18

Exhaust Gas

m ³ /h	1607	2135	2491	2787	3143
CFM	946	1257	1466	1640	1850

Raw Water Flow (GPM)

Water Temperature:	GPM				
60°F	25	26	30	30	32
90°F	27	28	32	32	34

Dimensions

A	61.0 in
B	51.1 in
C	15.0 in
D	34.3 in
E	40.2 in
F	24.0 in

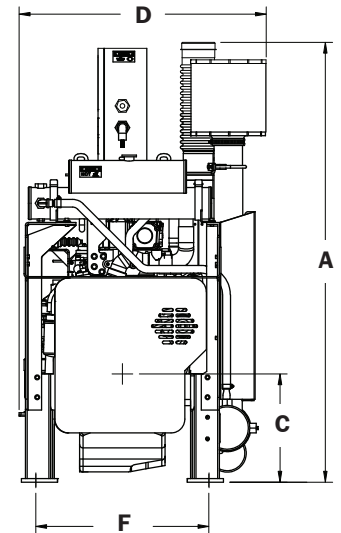
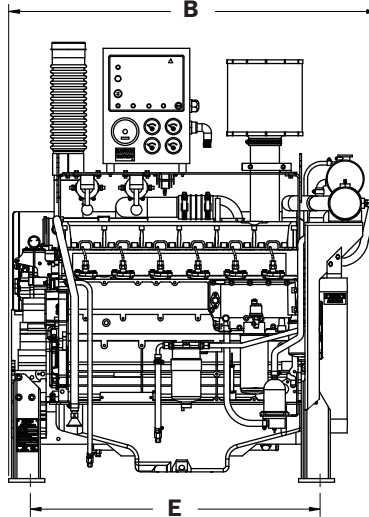
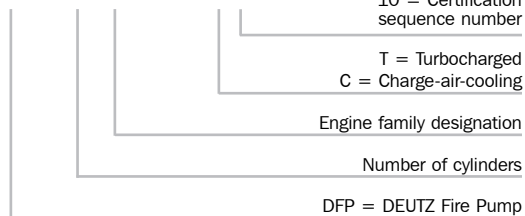
Weight

	lbs (kg)
DFP6-1013-Cxx	1882 (848)

Weights [lb, (kg)] include lube oil, exclude coolant and exclude shipping skid.

Model Designation

DFP6 1013 C25



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Jan 2009

DFP6 1013 C27

General	
Cylinders	6
Cylinder arrangement	Vertical in-line
Bore	108 mm 4.3 in
Stroke	130 mm 5.1 in
Cylinder Displacement	1.19 liter 72.67 in
Total displacement	7.15 liter 436 in ³
Compression ratio	17.5 : 1
Combustion system	Direct injection
Aspiration	Turbocharged and Charge Air Cooled
Injection System	Mechanical

Fuel System	
Lift pump suction head, max	1.5 m 59.1 in
Lift pump flow @ max rpm	600 L/h 2.6 GPM
Max restriction in fuel supply line	200 mbar 80 in. H2O
Max restriction in fuel return line	500 mbar 200 in. H2O
Max restriction in fuel pre-filter	200 mbar 80 in. H2O
Fuel filter type	Replaceable cartridge
Fuel Consumption @ max rating	65.7 l/h 17.4 GPH

Cooling System	
Type	External Heat Exchanger
Coolant flow rate @ max rpm	198 l/min 52.3 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.2 bar 17.4 psi
Coolant volume in system	15 liter 16 qt.

Combustion Air System	
Combustion air flow @ max rating	1470 m ³ /h 867 CFM
Max allowable clean restriction	50 mbar 20 in. H2O
Max allowable dirty restriction	65 mbar 26in. H2O
Charge air press @ max rating	2.5 bar 36.25 psi
TurboOutlet Temp @ max rating	194°C 381 °F
Temp after charge air cooler	50°C 122°F
Charge air heat % gross power	22%
Max pressure drop across cooler	100 mbar 40 in. H2O

Exhaust System	
Exhaust gas flow @ max rating	3455 m ³ /h 2033 CFM
Exhaust temp @ max rating	580°C 1076°F
Max allowable back pressure	75 mbar 30 in. H2O

Exhaust Note:

- Recommended exhaust size 6"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System	
Lubrication type	Forced feed lubrication
Oil flow at max rpm	91.1 l/min 24.1 GPM
Oil pump relief valve setting	10 bar 145 psi
Max oil temperature	130°C 266°F
Filter volume	1.5 liter 1.6 qt.
Oil change interval	500 hours or 1 year

Electrical	
Starter motor	12V, 3.1kW 24V, 4.8kW
Batteries	Size 8D, Min 1200 cca
Voltage drop, battery (+), max	1.0V

Radiant Heat	
RPM	kW BTU/min
2100	23 1308
2350	23 1308
2650	23 1308

DFP6 1013 C27

Engine RPM	2100		2350		2650	
Power	Hp	(kW)	Hp	(kW)	Hp	(kW)
DFP6 1013 C27	310	231	312	233	312	233

Fuel Consumption	lb/hphr	g/kWhr	lb/hphr	g/kWhr	lb/hphr	g/kWhr
DFP6 1013 C27	0.360	217.0	0.375	226.0	0.398	239.9
	Gal/Hr	Liters/Hr	Gal/Hr	Liters/Hr	Gal/Hr	Liters/Hr
DFP6 1013 C27	15.6	59.0	16.4	61.9	17.4	65.7

Exhaust Gas Flow	CFM	M3/h	CFM	M3/h	CFM	M3/h
DFP6 1013 C27	2020	3433	2033	3455	2033	3455

Raw Water Flow (GPM)

Water Temperature:

60°F	30	30	32
90°F	32	32	34

Fuel Required for 8 Hours Full Rated Power

Minimum Required	Gallons	Liters	Gallons	Liters	Gallons	Liters
DFP6 1013 C27	125	472	131	495	139	526

WARNING!! Diesel fuel must be consumed or disposed of within 1 year or damage may occur to fuel injection system.

Weight	lbs	(kg)
DFP6 1013 C27	1882	(854)

DFP4 2012 Cm3X

Engine RPM	1760		2100		2350	
Power	Hp	(kW)	Hp	(kW)	Hp	(kW)
DFP4 2012 Cm30	82	61	82	61	82	61
DFP4 2012 Cm31	86	64	91	68	91	68
DFP4 2012 Cm32	100	75				
DFP4 2012 Cm33			100	75	100	75
DFP4 2012 Cm35			113	84	118	88

Fuel Consumption	lb/hphr	g/kWhr	lb/hphr	g/kWhr	lb/hphr	g/kWhr
	Gal/Hr	Liters/Hr	Gal/Hr	Liters/Hr	Gal/Hr	Liters/Hr
DFP4 2012 Cm3X	0.414	249	0.414	250	0.473	285
DFP4 2012 Cm30	4.7	18.0	4.7	18.0	5.4	20.5
DFP4 2012 Cm31	5.0	18.8	5.3	19.9	6.0	22.8
DFP4 2012 Cm32	5.8	21.9				
DFP4 2012 Cm33			5.8	21.9	6.6	25.0
DFP4 2012 Cm35			6.5	24.8	7.8	29.5

Exhaust Gas Flow	CFM	M3/h	CFM	M3/h	CFM	M3/h
DFP4 2012 Cm30	550	935	550	935	550	935
DFP4 2012 Cm31	577	980	611	1037	611	1037
DFP4 2012 Cm32	671	1140				
DFP4 2012 Cm33			671	1140	671	1140
DFP4 2012 Cm35			758	1288	792	1345

Raw Water Flow (GPM)

Water Temperature:

60°F	21	21	22
90°F	23	23	24

Fuel Required for 8 Hours Full Rated Power

Minimum Required	Gallons	Liters	Gallons	Liters	Gallons	Liters
DFP4 2012 Cm30	38	144	38	144	43	164
DFP4 2012 Cm31	40	151	42	160	48	182
DFP4 2012 Cm32	46	175				
DFP4 2012 Cm33			46	175	53	200
DFP4 2012 Cm35			52	198	62	236

WARNING!! Diesel fuel must be consumed or disposed of within 1 year or damage may occur to fuel injection system.

Weight	lbs	(kg)
DFP4 2012 Cm3X	1308	(593)

DFP4 2012 Cm3X

General	
Cylinders	4
Cylinder arrangement	Vertical in-line
Bore	101 mm 4.0 in
Stroke	126 mm 5.0 in
Cylinder Displacement	1.01 liter 61.62 in ³
Total displacement	4.04 liter 246.5 in ³
Compression ratio	18.0 : 1
Combustion system	Direct injection
Aspiration	Turbocharged and
	Charge Air Cooled
Injection System	Mechanical

Fuel System	
Lift pump suction head, max	1.0 m 39.4 in
Lift pump flow @ max rpm	550 L/h 12.4 GPM
Max restriction in fuel supply line	200 mbar 80 in. H2O
Max restriction in fuel return line	500 mbar 200 in. H2O
Max restriction in fuel pre-filter	150 mbar 60 in. H2O
Fuel filter type	Replaceable cartridge
Fuel Consumption @ max rating	29.5 l/h 7.8 GPH

Cooling System	
Type	External Heat Exchanger
Coolant flow rate @ max rpm	173 l/min 45.7 GPM
Max coolant temp @ engine outlet	110°C 230°F
Max coolant operating pressure	1.0 bar 14.5 psi
Coolant volume in system	10 liter 11.2 qt.

Combustion Air System	
Combustion air flow @ max rating	500 m ³ /h 394 CFM
Max allowable clean restriction	50 mbar 20 in. H2O
Max allowable dirty restriction	65 mbar 26in. H2O
Charge air press @ max rating	2.5 bar 36.25 psi
TurboOutlet Temp @ max rating	190°C 374 °F
Temp after charge air cooler	50°C 122°F
Charge air heat % gross power	23%
Max pressure drop across cooler	100 mbar 40 in. H2O

Exhaust System	
Exhaust gas flow @ max rating	1345 m ³ /h 792 CFM
Exhaust temp @ max rating	515°C 959°F
Max allowable back pressure	100 mbar 40 in. H2O

Exhaust Note:

- Recommended exhaust size 4"
- Maximum of (4) 90° elbows and 50' straight pipe
- Please contact the factory for deviations

Lubrication System	
Lubrication type	Forced feed lubrication
Oil flow at max rpm	49.5 l/min 13.1 GPM
Oil pump relief valve setting	6 bar 87 psi
Max oil temperature	130°C 266°F
Filter volume	1.5 liter 1.6 qt.
Oil change interval	500 hours or 1 year

Electrical	
Starter motor	12V, 3.1kW 24V, 4.8kW
Batteries	Size 8D, Min 1200 cca
Voltage drop, battery (+), max	1.0V

Radiant Heat	
RPM	kW BTU/min
1760	9 512
2100	11 626
2350	12 683

Appendix B:

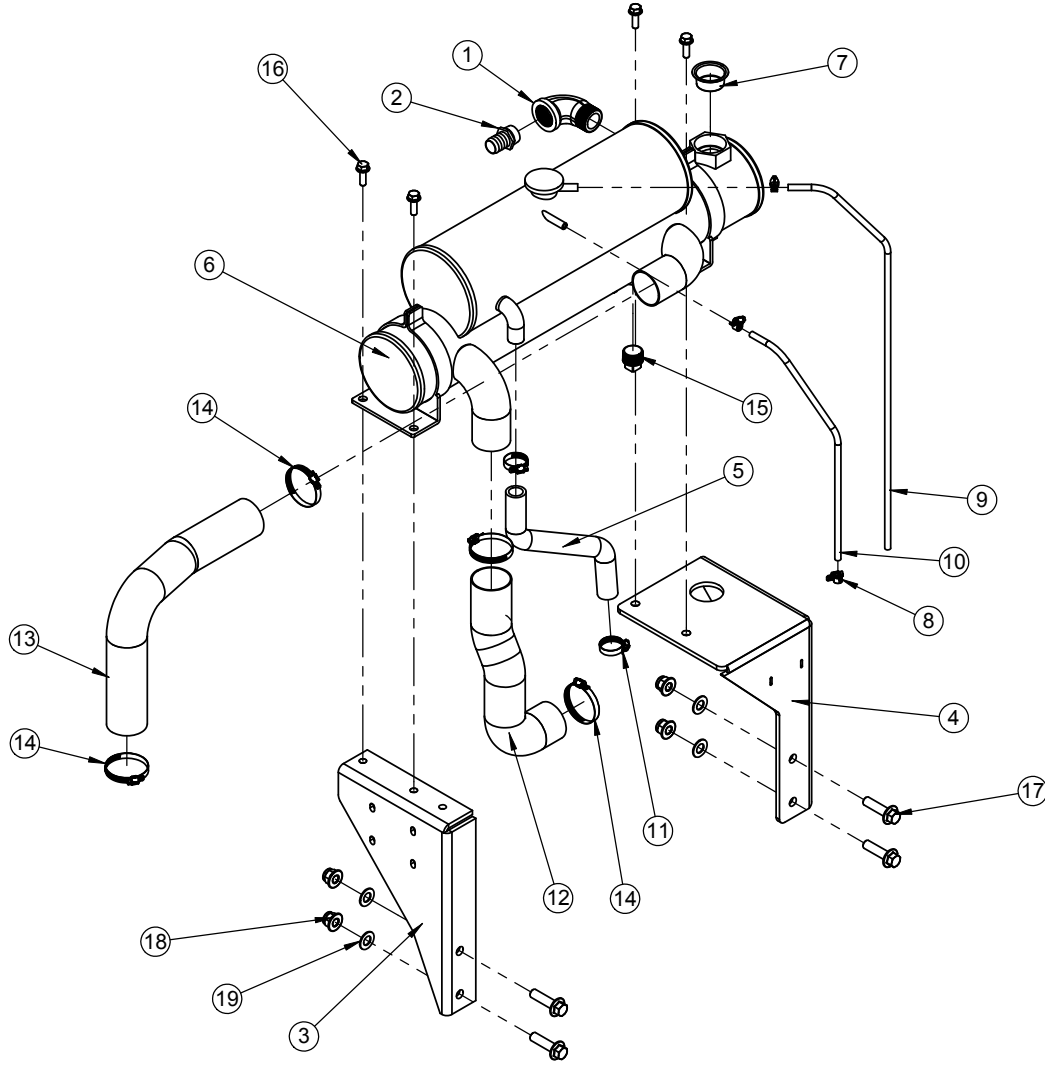
Standard Equipment, Engine Construction and Materials List

Item	Description	Details
BASIC CONFIGURATION		DFP4 2012 inline 4 DFP6 2012 / DFP6 1013 inline 6
MOUNTING	Type	Pedastal Feet
Cooling and Lubrication		
HEAT EXCHANGER	Type	Water to Water Shell and Tube Air to Water Shell and Tube
LUBRICATION / COOLANT PUMP	Type	Engine Mounted Centrifugal Vane
	Drive	V-belt
LUBE OIL FILTER	Type	Spn on: (1.5 liters)
ENGINE HEATER	Type	1500 Watt Passive Recirculating Heater
Fuel System		
FUEL PUMP	Type	Gear Rotor
	Drive	V-belt
INJECTION PUMP	Type	Unit pump (1 per cylinder)
	Drive	Engine Camshaft
INJECTOR	Type	6 hole nozzle
AIR CLEANER	Type	Dry type, Disposable
FUEL FILTER	Type	Spin on: (0.6 liter)
Engine Components		
CYLINDER HEAD	Type	1 piece block type for 4 or 6 cylinders
	Material	Grey cast iron
CYLINDER BLOCK	Type	One piece vertical inline
	Material	Grey cast iron
CAMSHAFT	Drive	Gear driven
	Material	Forged steel
CRANKSHAFT	Material	Nodular cast iron
	Balance	Integral counterweights

Item	Description	Details
PISTON	Type	Re-entrant bowl
	Material	Aluminium alloy
ALTERNATOR	Type	Standard 12V Optional 24V
	Drive	Belt Drive
STARTER	Type	Standard 12V, 3.0KW Optional 24V, 4.0 Kw
FLYWHEEL	Type	SAE 8/10 industrial over center clutch style
GOVERNOR	Type	Flywheel & spring
THROTTLE CONTROL	Type	Factory preset for required speed and power
Engine Control Panel and Components		
INSTRUMENT PANEL	Type	Includes Tachometer, hourmeter, Oil Pressure gage, Coolant Temp gage, Dual Voltmeters, Overspeed Test and Reset switches, Dual Start Switches and Shutdown switch, Charge Indicator Light
RUN-STOP CONTROL	Type	Standard: 12V Energized to shutdown solenoid Optional: 24V Energized to shutdown solenoid
OVERSPEED CONTROL	Type	Woodward ESSE-1 with 67% overspeed test and starter lockout function.

9990793 HEAT EXCHANGER ASSY,C,2012,2013

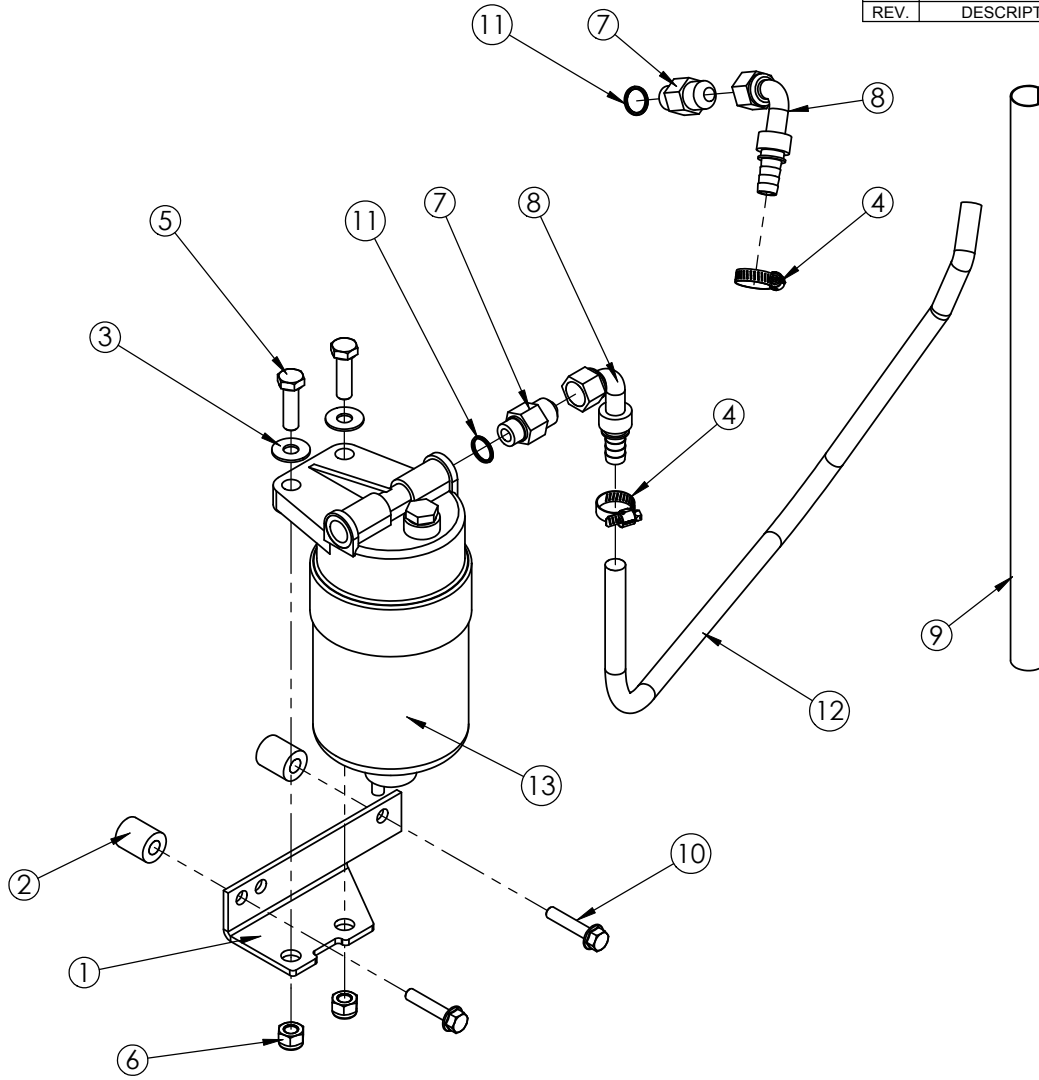
000	90-00282	4/8/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0301457	STREET-L GALV. 1"
2	1	0301481	FITTING,1"NPTMx1" BARB
3	1	0302560	BRKT, RT HEAT EXCHANGER T3
4	1	0302561	BRKT, LFT HT EXCHANGER T3
5	1	0302567	COOLANT HOSE,3/4",MLD
6	1	0302640	HEAT EXCHANGER,4-PASS,2012/2013
7	1	0302679	PLUG,PLASTIC,1"dia RED
8	3	0303707	SAE#5 Hose Clamp
9	1	0303744	HOSE,5/16",2.5FT
10	1	0303744	HOSE,5/16",1.25FT
11	2	0304005	CLAMP,WORM,SAE #12
12	1	0305194	COOLANT HOSE
13	1	0305195	HOSE,MOLDED,REAR
14	4	1173941	Hose Clamp
15	1	0302849	3/4"plug,sq.galv.
16	4	0305246	BOLT,HH FLANGE,M8x25
17	4	0301589	BOLT,HH FLANGE,M12X45
18	4	0301495	NUT,M12,CENTERLOC,FLANGED
19	4	0303871	WASHER,FLAT,NARROW,1/2

9990817 FUEL PRE FILTER ASSY,4/6-2012 T/C

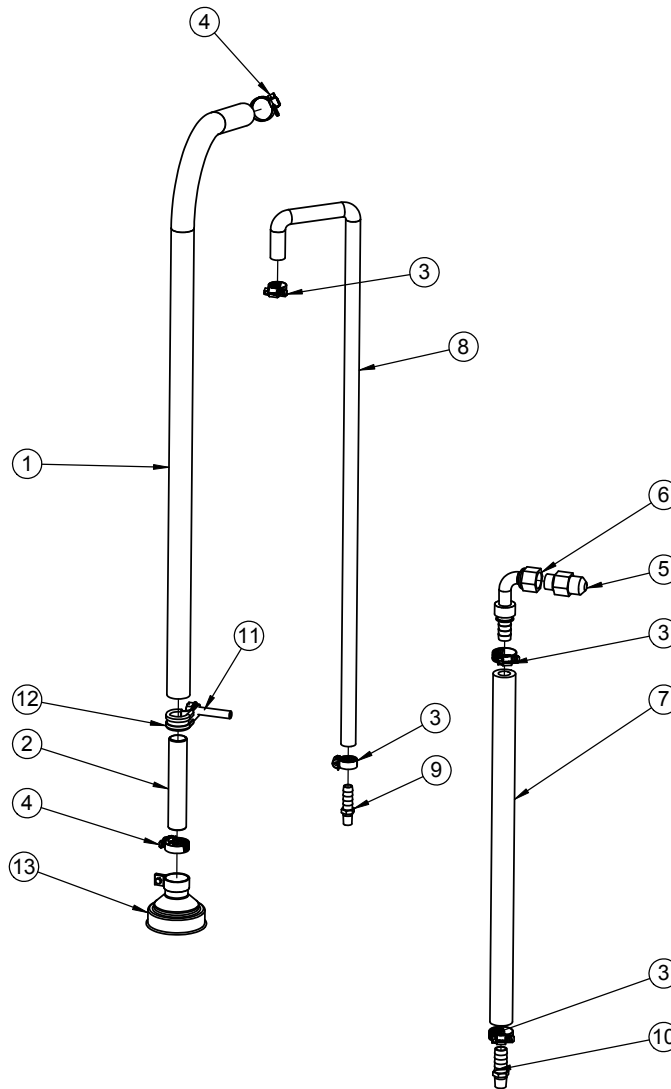
001	90-00282	9/17/2010	PAS
000	90-00238	3/18/2009	EJM
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0300463	BRACKET,PRE-FILTER
2	2	0300464	SPACER,0.87 x 1"
3	2	0303698	WASHER,FLAT,3/8"
4	2	0303707	SAE#5 Hose Clamp
5	2	0303740	HHCS,M10X35,8.9,ZP
6	2	0304301	NUT,HEX,LOCKING,M10X1.5
7	2	0304690	ADAPTOR STRAIGHT,3/4-16 JIC x M16-1.5
8	2	0304691	ADAPTOR,90DEG,3/4-16 JIC SWV x 1/2"HOSE BARB
9	1	0304944	LOOM,3/4",1.5FT
10	2	0305374	BOLT,HH FLANGE,DIN6921,M8x40,8.8
11	2	1118700	SEALING RING
12	1	0304911	FUEL SUPPLY LINE,1/2",1FT
13	1	2113159	FUEL PRE-FILTER (SUPPLIED W/ENGINE)

9990818 FUEL SUPPLY/RETURN ASSY,2012/1013

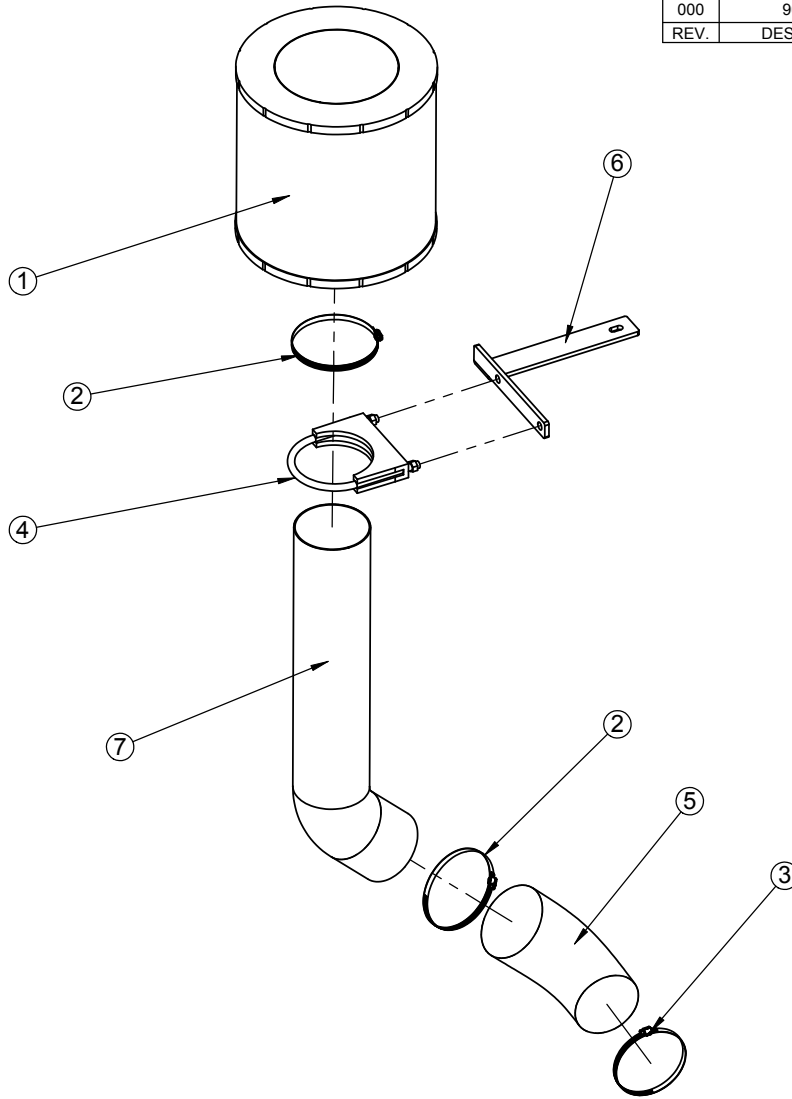
001	90-00282	9/17/2010	PAS
000	90-0238	3/18/2009	EJM
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0301452	HEATER HOSE,SILICONE,3/4",2FT
2	1	0301476	CRANK CASE VENT TUBING,SS,3/4x.049 WALL
3	4	0303707	SAE#5 Hose Clamp
4	2	0304005	CLAMP,WORM,SAE #12
5	1	0304690	ADAPTOR STRAIGHT,3/4-16 JIC x M16-1.5
6	1	0304691	ADAPTOR,90DEG,3/4-16 JIC SWV x 1/2"HOSE BARB
7	1	0304911	FUEL SUPPLY LINE,1/2",1.3FT
8	1	0304912	FUEL SUPPLY LINE,3/8"BULK,2FT
9	1	0305189	FITTING,3/8" BARB
10	1	0305190	FITTING,1/2" BARB
11	1	0305374	BOLT,HH FLANGE,DIN6921,M8x40,8.8
12	1	0303109	PIPE CLAMP,PADDED,3/4 OD PIPE
13	1	1260560	WET AIR CLEANER
14	1	0302533	CAP, ROUND,3/8" PUSH-ON, SHIPPING (NOT SHOWN)
15	1	0302535	CAP, ROUND,1/2" PUSH-ON, SHIPPING (NOT SHOWN)

9990836 AIR CLEANER ASSY,6-2012 T

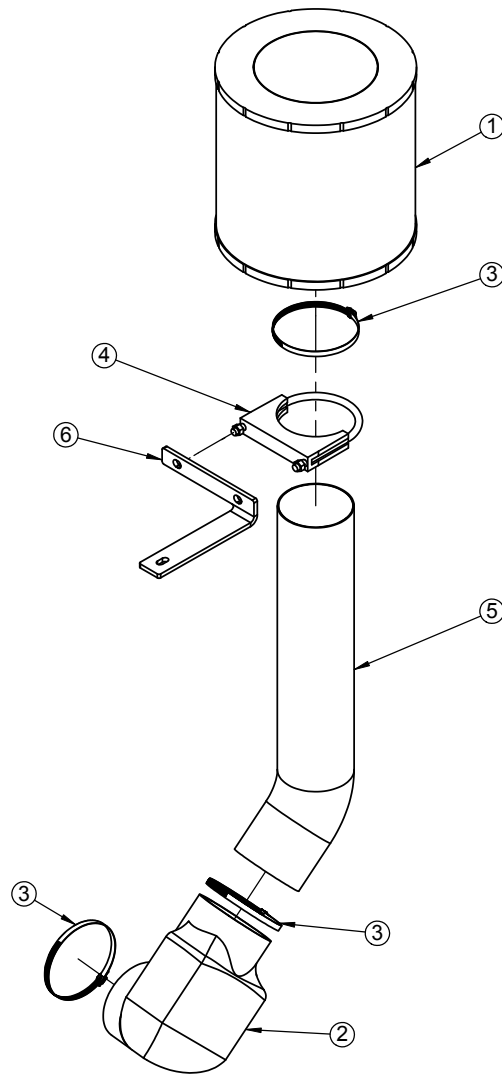
001	90-00282	7/7/2010	PAS
000	90-00238	3/18/2009	EJM
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0300487	AIR FILTER,10.5
2	2	0304780	Clamp,Hose,#72
3	1	0304780	Clamp,Hose,#72
4	1	0305280	4" HEAVY DUTY EXHAUST CLAMP
5	1	0305294	FP-INTAKE ELBOW, 3.5" - 4.00"
6	1	0305321	BRACKET,4" TUBE,2012C
7	1	0305334	AIR CLEANER TUBE,45DEG

9990851 AIR CLEANER ASSY,6-1013 FC

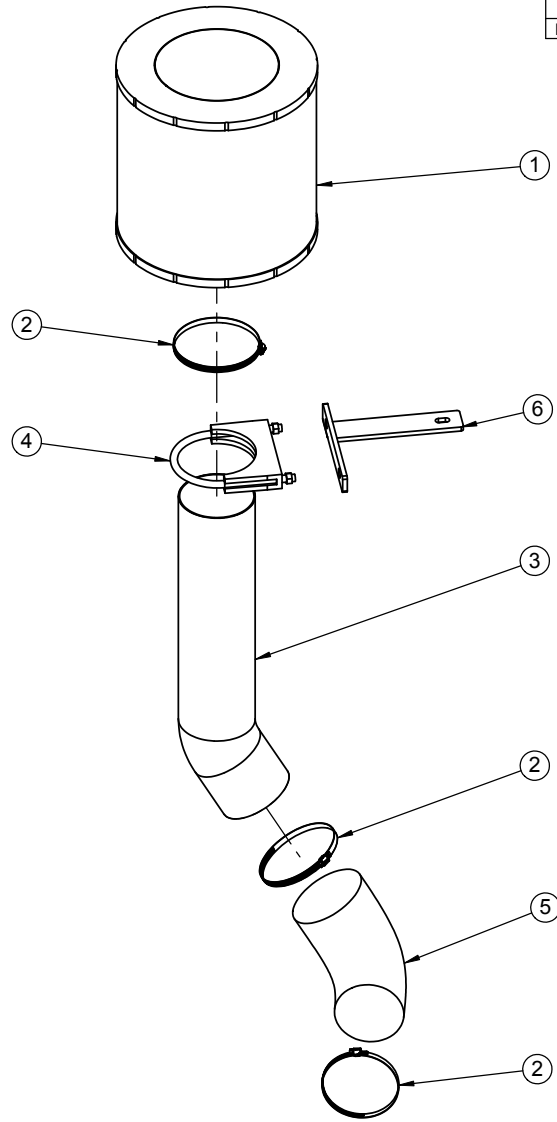
001	90-00282	7/6/2010	PAS
000	90-00238	3/18/2009	EJM
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0300487	AIR FILTER,10.5
2	1	0300489	INTAKE ELBOW, 4.0 - 4.0"
3	3	0304780	Clamp,Hose,#72
4	1	0305280	4" HEAVY DUTY EXHAUST CLAMP
5	1	0305334	AIR CLEANER TUBE,45DEG
6	1	0305359	4" AIR TUBE BRACKET

9990878 AIR CLEANER ASSY,6-2012 C

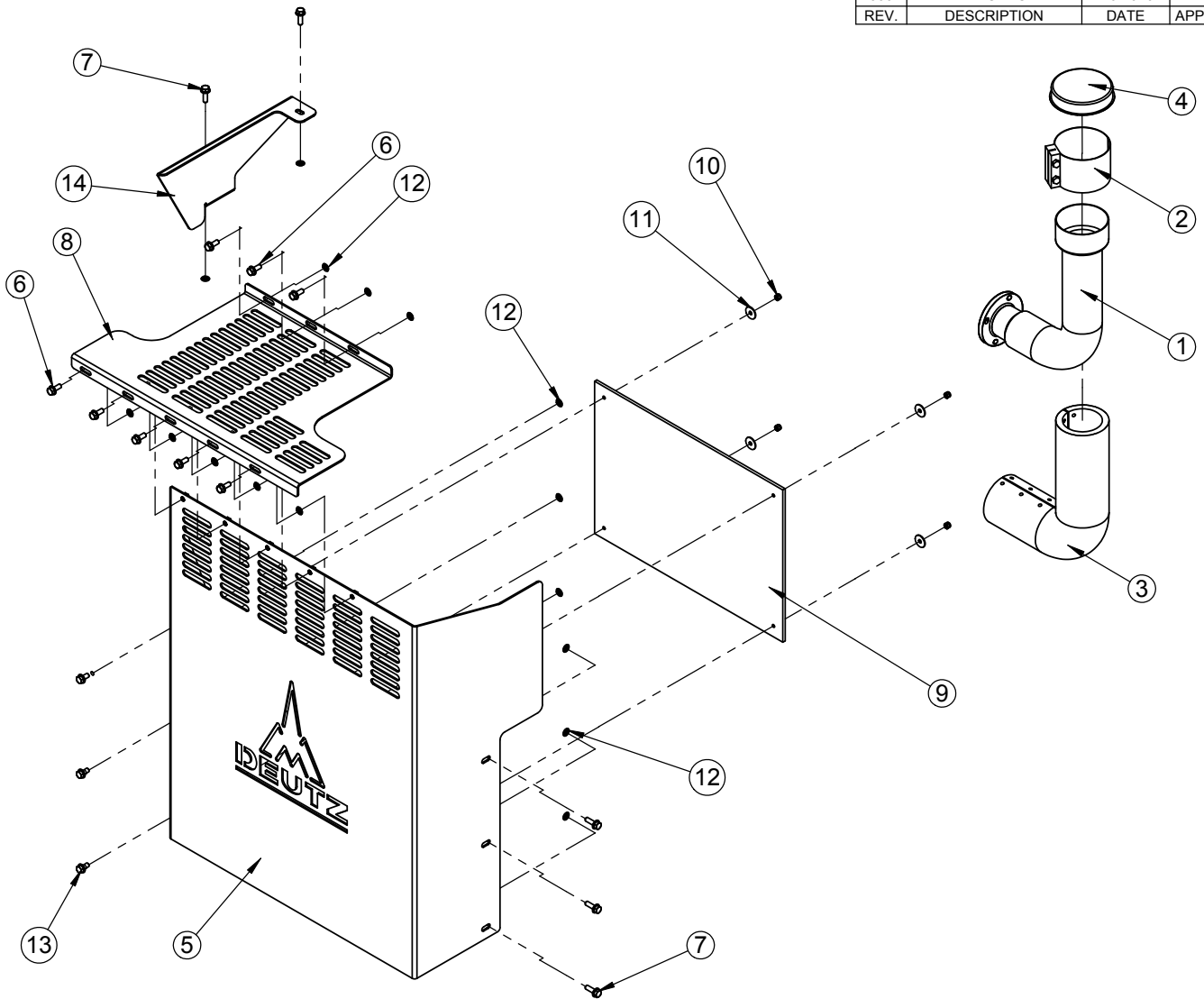
001	90-00282	7/7/2010	PAS
000	90-00238	3/18/2009	EJM
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0300487	AIR FILTER,10.5
2	3	0304780	Clamp,Hose,#72
3	1	0305278	AIR CLEANER TUBE,30DEG
4	1	0305280	4" HEAVY DUTY EXHAUST CLAMP
5	1	0305294	FP-INTAKE ELBOW, 3.5" - 4.00"
6	1	0305359	4" AIR TUBE BRACKET

9990924 EXHAUST GUARD ASSY

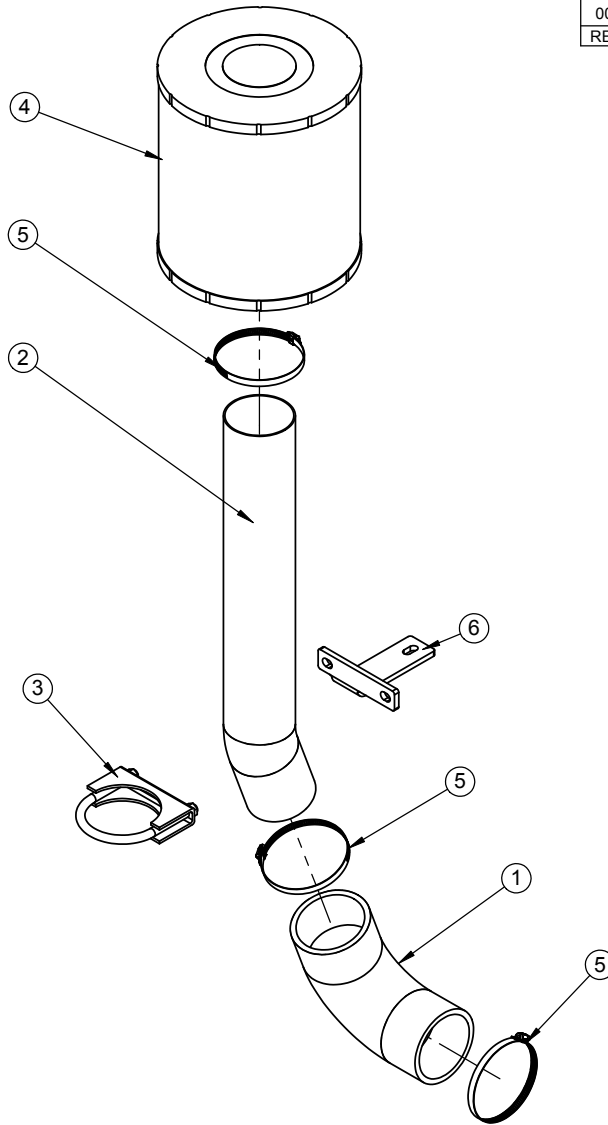
001	90-00282	7/7/2010	PAS
000	INITIAL CHECK IN	4/9/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	PART NUMBER	DESCRIPTION	PB PAGE/QTY.
1	0303151	EXHAUST TUBE W/FLANGE EU	1
2	0300479	SEAL CLAMP,4"	1
3	0303158	EXHAUST BOOT, 2012-4 EU	1
4	0305261	CAP PLUG FOR 4" NPT PIPE, EXTERNAL	1
5	0302964	HEAT SHIELD	1
6	0305218	BOLT,HH FLANGE,SER,M8X20	8
7	0305246	BOLT,HH FLANGE,M8x25	5
8	0303140	TOP EXHAUST GUARD	1
9	0303160	HEAT PAD, 14' X 20" CERAMIC	1
10	0305059	NUT,M6,NYLOC	4
11	0303161	WASHER,1/4" FENDER,ZP	4
12	0303150	M8 RETAINER WASHER	16
13	0302445	BOLT,HH FLANGE,M8X16	3
14	0303194	Heat Shield Left, 2012	1

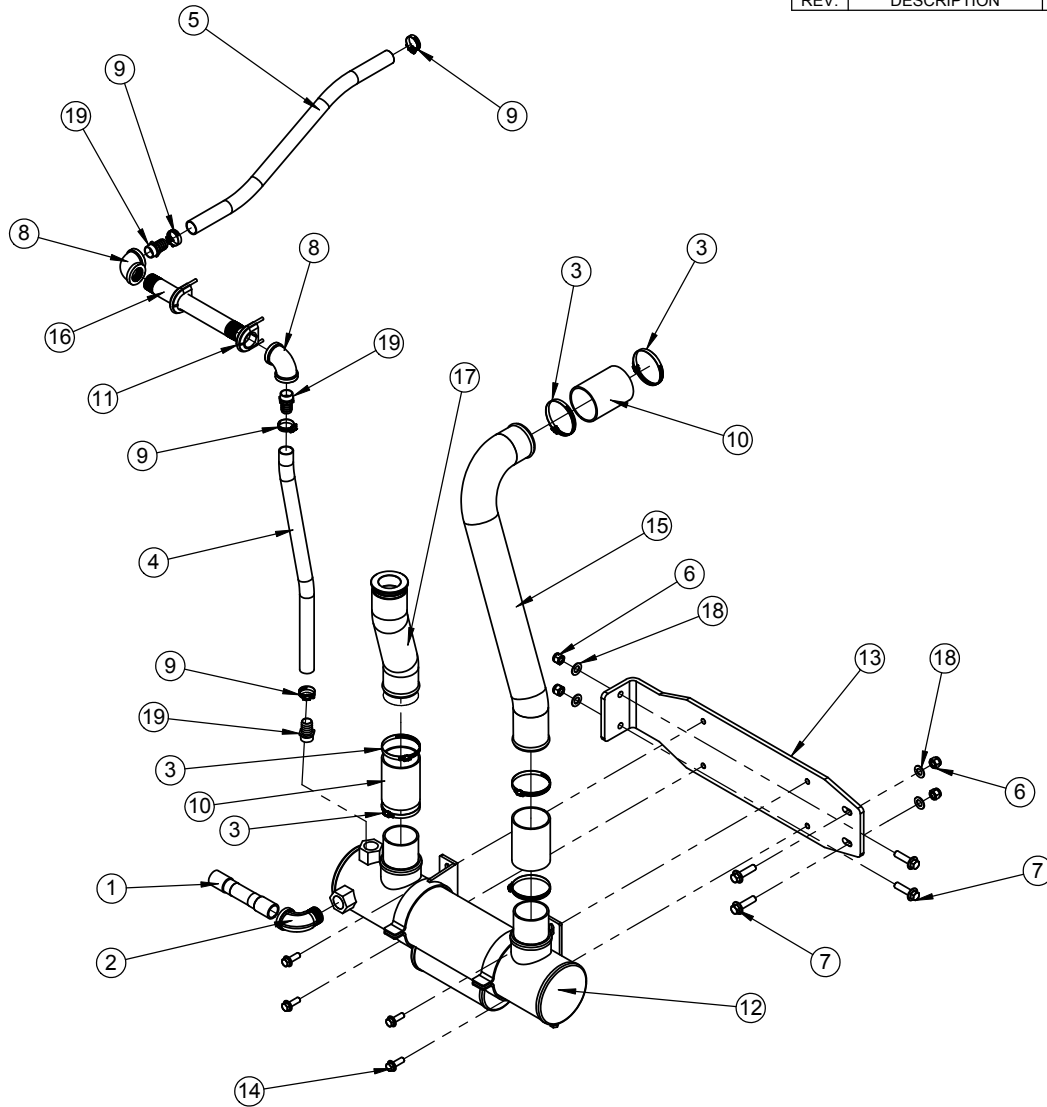
9990929 AIR CLEANER ASSY,2012-4 T1-T3 MECH.

001	90-00282	7/7/2010	PAS
000	INITIAL CHECK IN	4/8/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0303861	ELBOW,RUBBER,ADAPTER,MOLDED
2	1	0305277	AIR CLEANER TUBE
3	1	0305279	3" EXHAUST CLAMP
4	1	0305283	AIR FILTER
5	3	1148605	HOSE CLIP
6	1	0305320	BRACKET, 3" TUBE

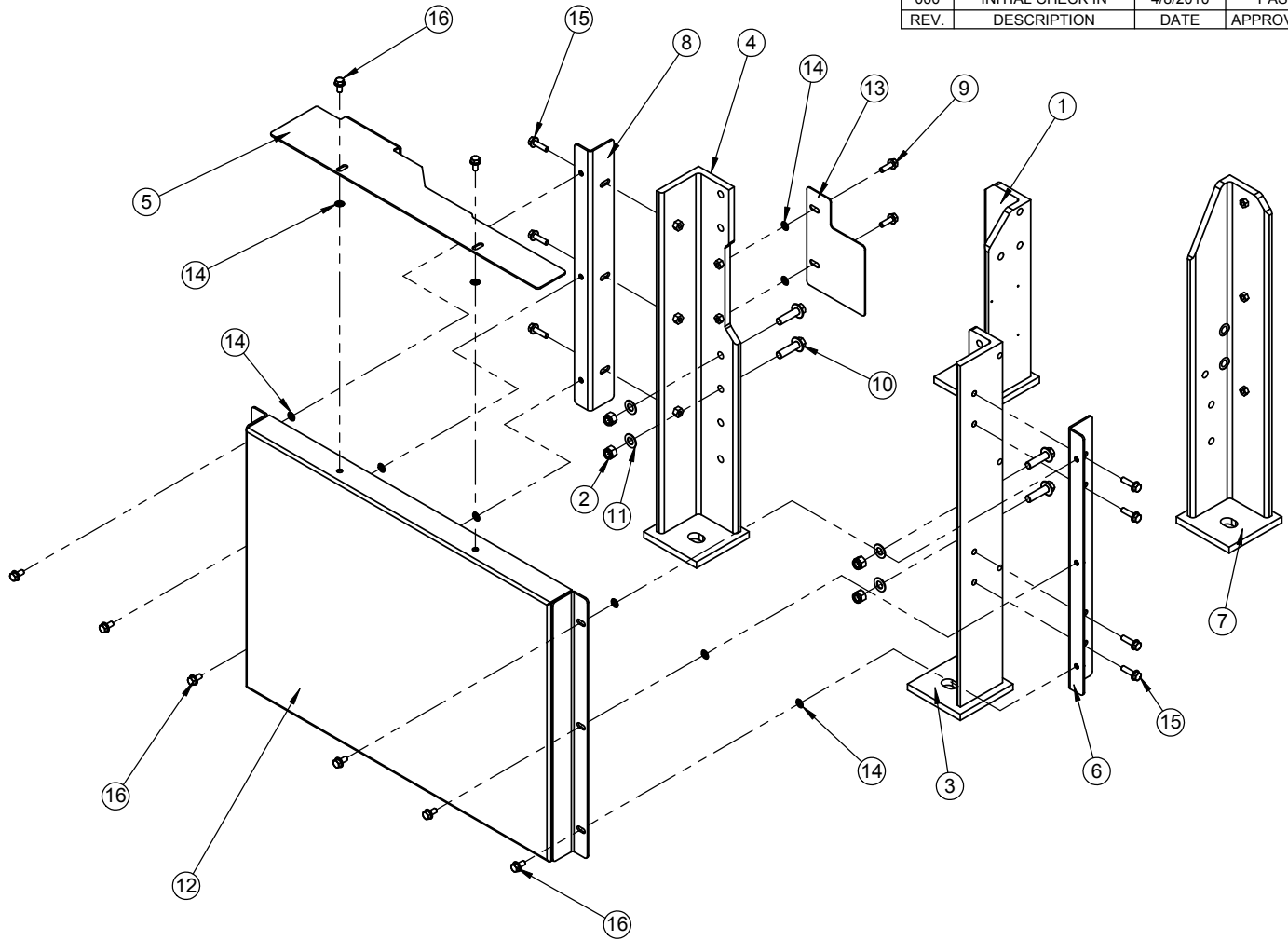
002	90-00282 EU CHANGES	9/15/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0301454	WATER FLEX CONNECTOR, 1" NPT
2	1	0301457	STREET-L GALV. 1"
3	6	0301474	Hose Clamp Constant Force
4	1	0301488	HEATER HOSE,1" SILICONE,2'
5	1	0301488	HEATER HOSE,1" SILICONE,2'
6	4	0301495	NUT,HEX,CENTER LOCKING,M12X1.75
7	4	0301589	BOLT,HH FLANGE,M12X45
8	2	0301664	1" ELBOW GALV
9	4	0304005	CLAMP,WORM,SAE #12
10	3	0304259	SLEEVE,2.75x4,CAC CONNECT
11	2	0304448	U-BOLT
12	1	0305198	CHARGE AIR COOLER
13	1	0305199	CAC BRKT SMALL
14	4	0305247	BOLT,HH FLANGE,SER,M10X30
15	1	0305291	TUBE,CAC REAR
16	1	0305443	1" X 10" NIPPLE GALV
17	1	0302817	CAC TUBE, FRONT
18	4	0303871	WASHER,FLAT,NARROW,1/2
19	3	0301481	FITTING,1"NPTMx1" BARB

9990937 PEDESTAL MNT/BELT GUARD ASSY

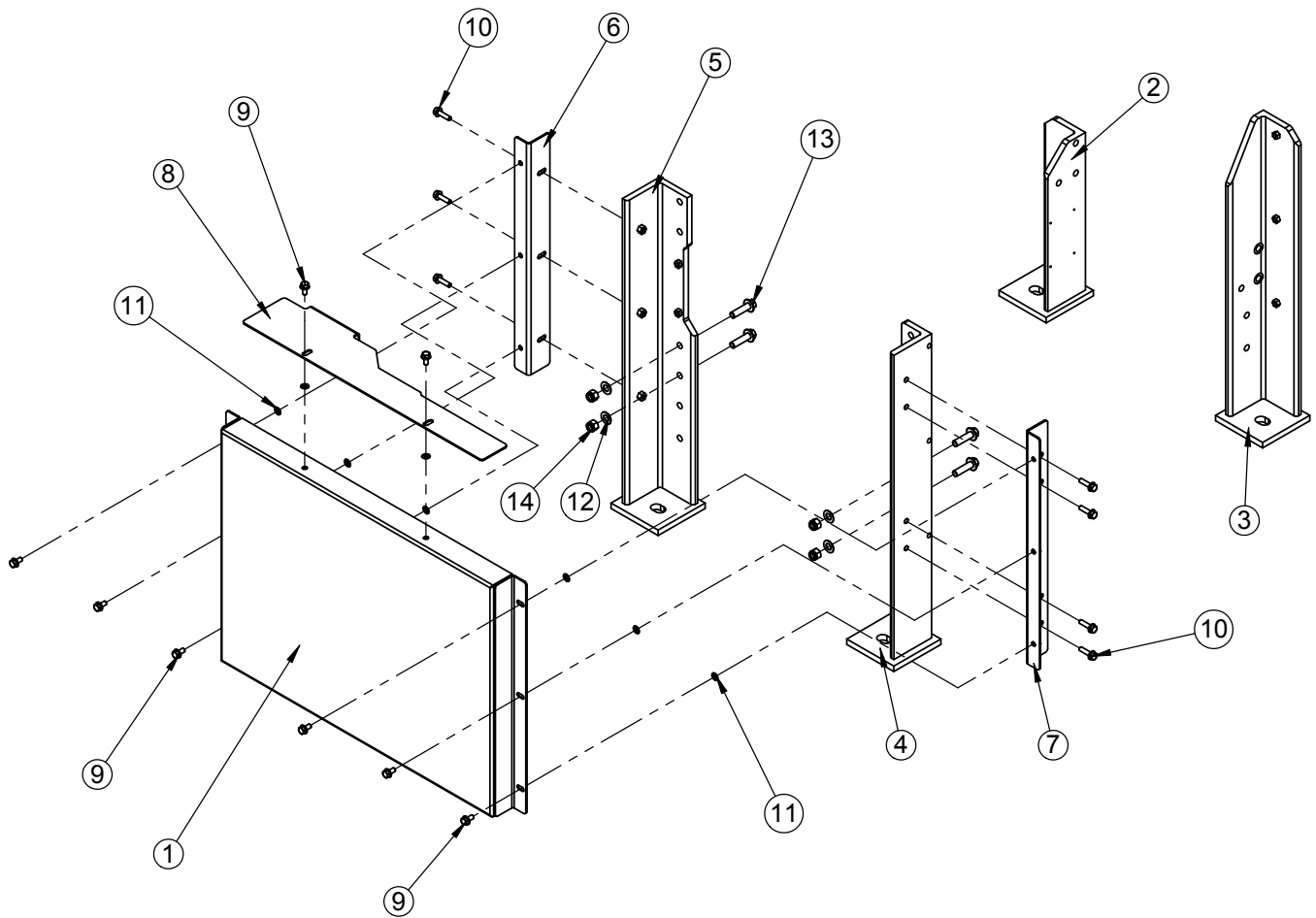
001	INITIAL CHECK IN	7/7/2010	PAS
000	INITIAL CHECK IN	4/8/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	2012-4/QTY.	PART NUMBER	DESCRIPTION
1	1	0300459	FOOT, RIGHT REAR,2012/1013
2	4	0301495	NUT,HEX,CENTER LOCKING,M12X1.75
3	1	0302558	DFP-FOOT,LEFT FRT,2012/2013,T3
4	1	0302559	FP-FOOT, RIGHT FRONT,2012/2013
5	1	0302647	TOP GUARD PLATE,2012
6	1	0303142	BRACKET, LEFT FOOT BELTGUARD
7	1	0302968	FP-FOOT, LEFT REAR,2012/1013
8	1	0303141	BRACKET, RT. FOOT BELTGUARD
9	2	0305246	BOLT,HH FLANGE,M8x25
10	4	0301589	BOLT,HH FLANGE,M12X45
11	4	0303871	WASHER,FLAT,NARROW,1/2
12	1	0303146	EU DOOR FOR 2012 - 1013
13	1	0303147	RT. LEG GUARD PLATE
14	10	0303150	M8 RETAINER WASHER
15	7	0305245	BOLT,HH FLANGE,M8X30
16	8	0302445	BOLT,HH FLANGE,M8X16

9991030 PEDESTAL MNT/BELT GUARD ASSY,1013-6

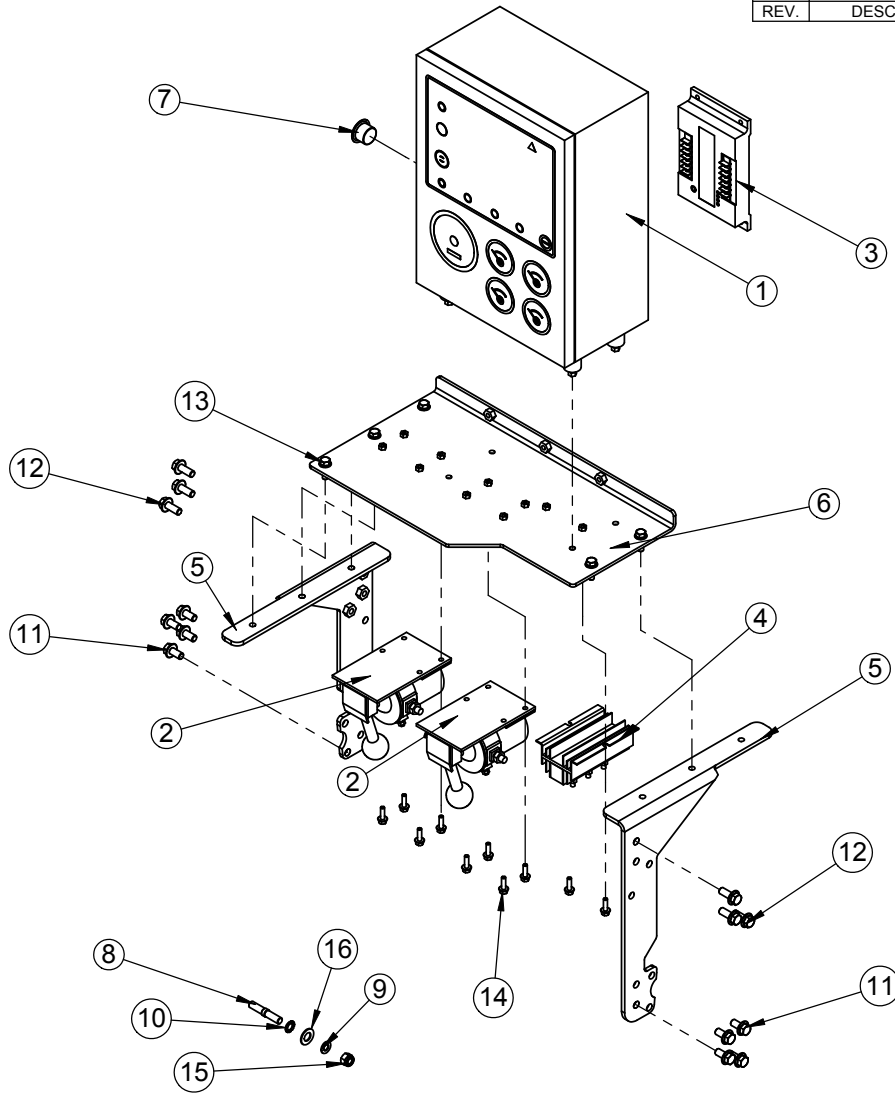
000	INITIAL CHECK IN	9/14/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0303146	LIGHTWEIGHT DOOR
2	1	0300459	FOOT, RIGHT REAR,2012/1013
3	1	0302968	FP-FOOT, LEFT REAR,2012/1013
4	1	0302558	DFP-FOOT,LEFT FRT,2012/2013,T3
5	1	0302559	FP-FOOT, RIGHT FRONT,2012/2013
6	1	0303141	BRACKET, RT. FOOT BELTGUARD
7	1	0303142	BRACKET, LEFT FOOT BELTGUARD
8	1	0302648	TOP GUARD PLATE,2013
9	8	0302445	BOLT,HH FLANGE,M8X16
10	7	0305245	BOLT,HH FLANGE,M8X30
11	8	0303150	M8 RETAINER WASHER
12	4	0303871	WASHER,FLAT,NARROW,1/2
13	4	0301589	BOLT,HH FLANGE,M12X45
14	4	0301495	NUT,HEX,CENTER LOCKING,M12X1.75

9991032 CONTROL PANEL 12V ASSY,4-2012 T/C, EU

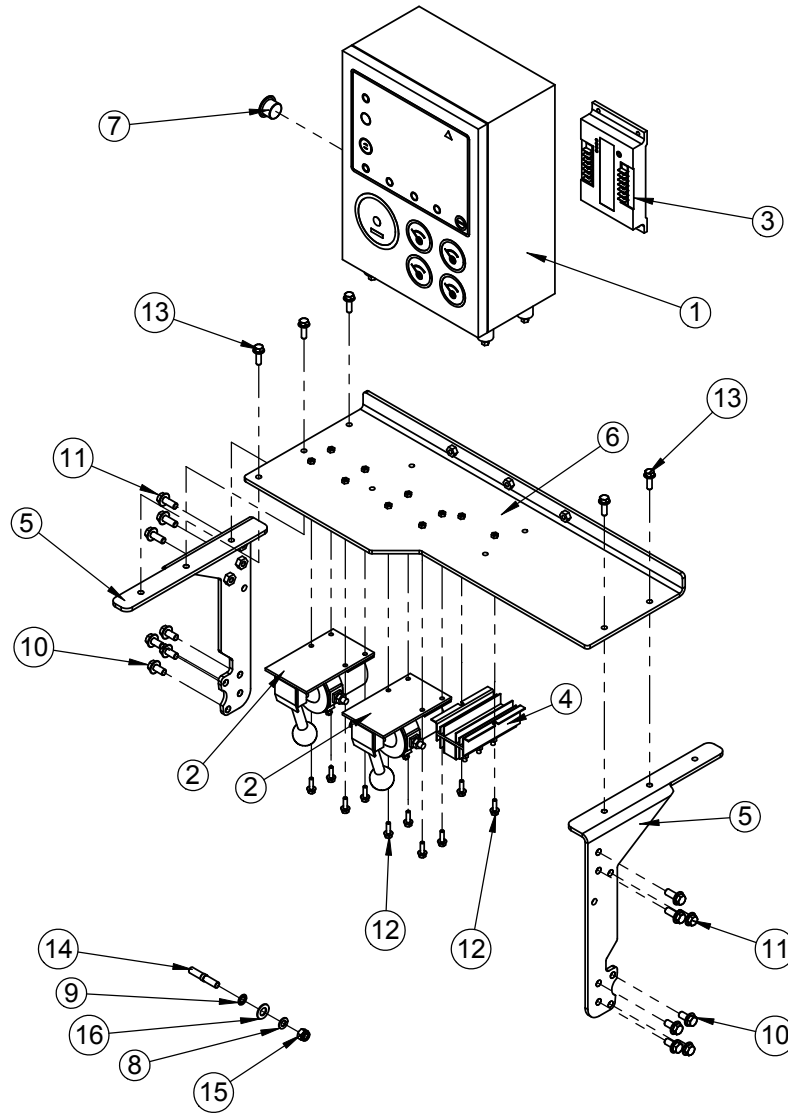
000	90-00282	9/15/2010	pas
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	drawing/QTY.	PART NUMBER	DESCRIPTION
1	1	0303164	ENGINE CONTROL PANEL 12 VDC EU
2	2	0300480	MANUAL START SOLENOID 12V
3	1	0300492	SPEED CONTROL
4	1	0300493	BATTERY ISOLATOR, 3-POST, 70A
5	2	0300507	BRACKET, CONTROL PANEL
6	1	0300515	PLATE,CONTROL PANEL MNT
7	1	0302576	PLUG,PLASTIC,3/4"x1-1/16" RED
8	1	1143285	STUD,M10
9	1	0303746	3/8" flat washer,narrow
10	1	0304236	WASHER,TOOTHED LOCK,M10
11	4	0302447	BOLT,HH FLANGE,M10X20
12	6	0302448	BOLT,HH FLANGE,M10X25
13	5	0305246	BOLT,HH FLANGE,M8x25
14	10	0305212	BOLT,HH FLANGE,M6X20
15	1	0304301	NUT,HEX,LOCKING,M10X1.5
16	1	0303871	WASHER,FLAT,NARROW,1/2

9991033 CONTROL PANEL 12V ASSY,6-2012 T/C,EU

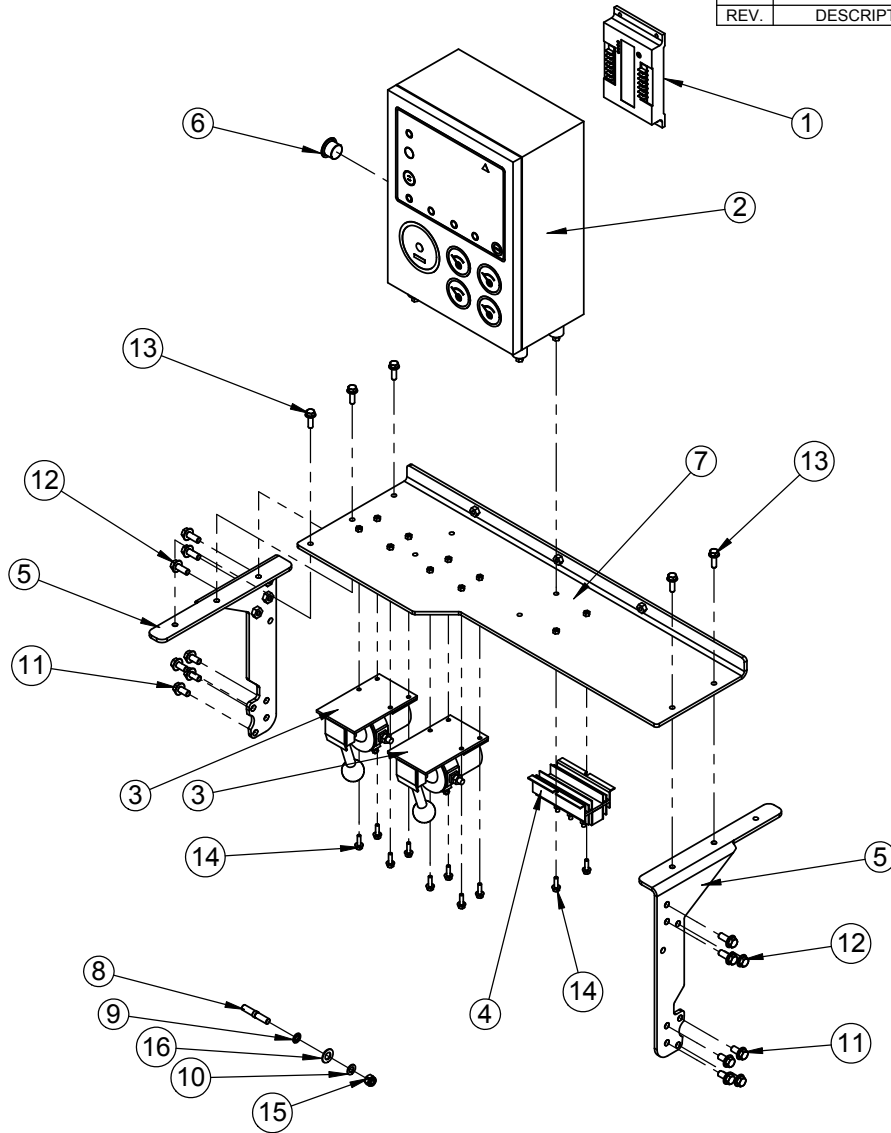
000	90-00282	9/15/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	DRAWING/QTY.	PART NUMBER	DESCRIPTION
1	1	0303164	ENGINE CONTROL PANEL 12 VDC EU
2	2	0300480	MANUAL START SOLENOID 12V
3	1	0300492	SPEED CONTROL
4	1	0300493	BATTERY ISOLATOR, 3-POST, 70A
5	2	0300507	BRACKET, CONTROL PANEL
6	1	0300516	PLATE, CONTROL PANEL MNT
7	1	0302576	PLUG,PLASTIC,3/4"x1-1/16" RED
8	1	0303746	3/8" flat washer,narrow
9	1	0304236	WASHER,INT TOOTH,3/8
10	8	0302447	BOLT,HH FLANGE,M10X20
11	6	0302448	BOLT,HH FLANGE,M10X25
12	10	0305212	BOLT,HH FLANGE,M6X20
13	5	0305246	BOLT,HH FLANGE,M8x25
14	1	1143285	STUD,M10
15	1	0304301	NUT,HEX,LOCKING,M10X1.5
16	1	0303871	WASHER,FLAT,NARROW,1/2

9991034 CONTROL PANEL 12V ASSY,6-1013 FC EU

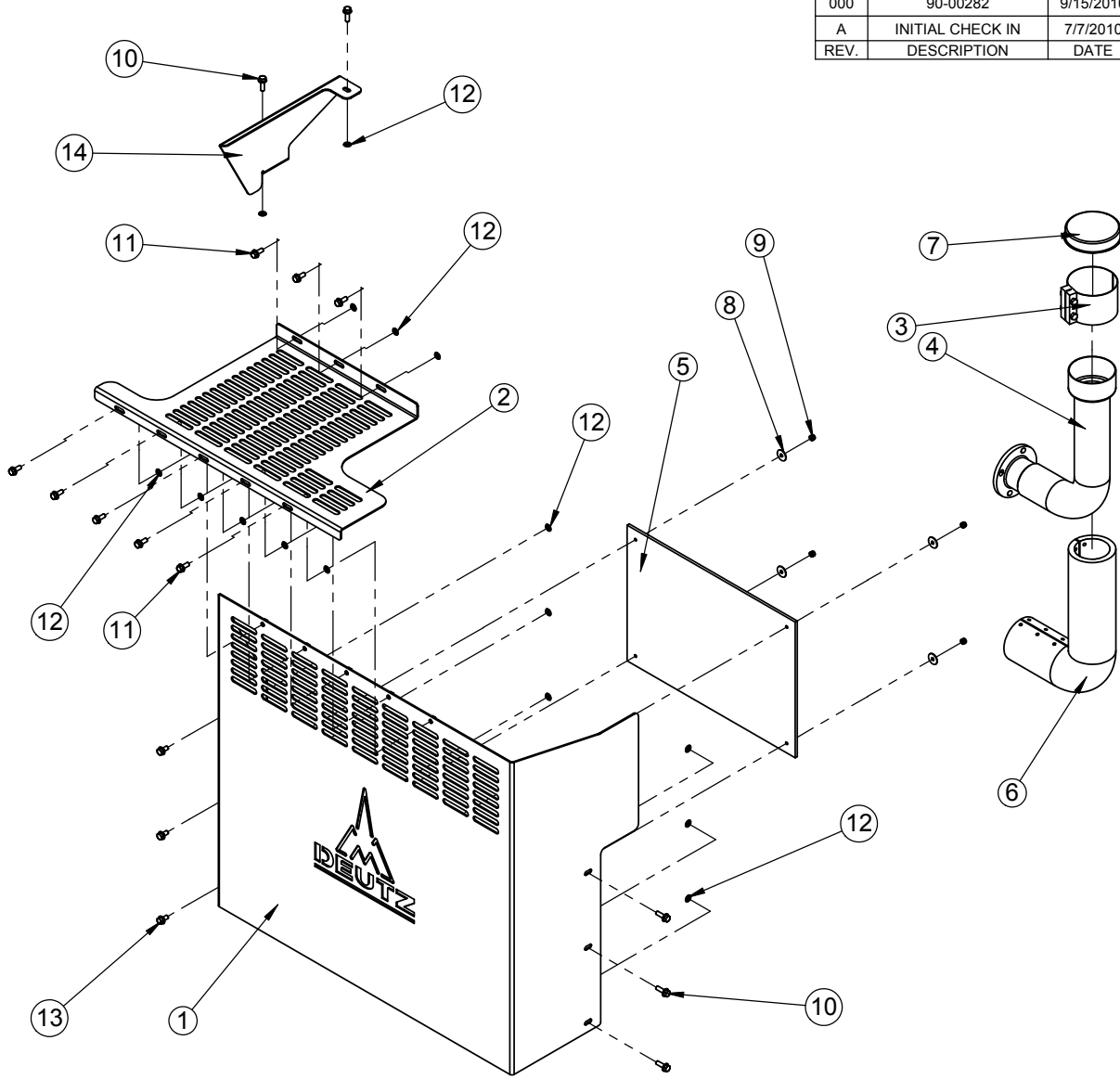
000	90-00282	9/15/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	DRAWING/QTY.	PART NUMBER	DESCRIPTION
1	1	0300492	SPEED CONTROL
2	1	0303164	ENGINE CONTROL PANEL 12 VDC EU
3	2	0300480	MANUAL START SOLENOID 12V
4	1	0300493	BATTERY ISOLATOR, 3-POST, 70A
5	2	0300507	BRACKET, CONTROL PANEL
6	1	0302576	PLUG,PLASTIC,3/4"x1-1/16" RED
7	1	0305182	PLATE,CONTROL PANEL,1013/2013
8	1	1143285	STUD,M10
9	1	0304236	WASHER,INT TOOTH,3/8
10	1	0303746	3/8" flat washer,narrow
11	8	0302447	BOLT,HH FLANGE,M10X20
12	6	0302448	BOLT,HH FLANGE,M10X25
13	5	0305246	BOLT,HH FLANGE,M8x25
14	10	0305212	BOLT,HH FLANGE,M6X20
15	1	0304301	NUT,HEX,LOCKING,M10X1.5
16	1	0303871	WASHER,FLAT,NARROW,1/2

9991035 EXHAUST GUARD ASSY,2012-6-EU

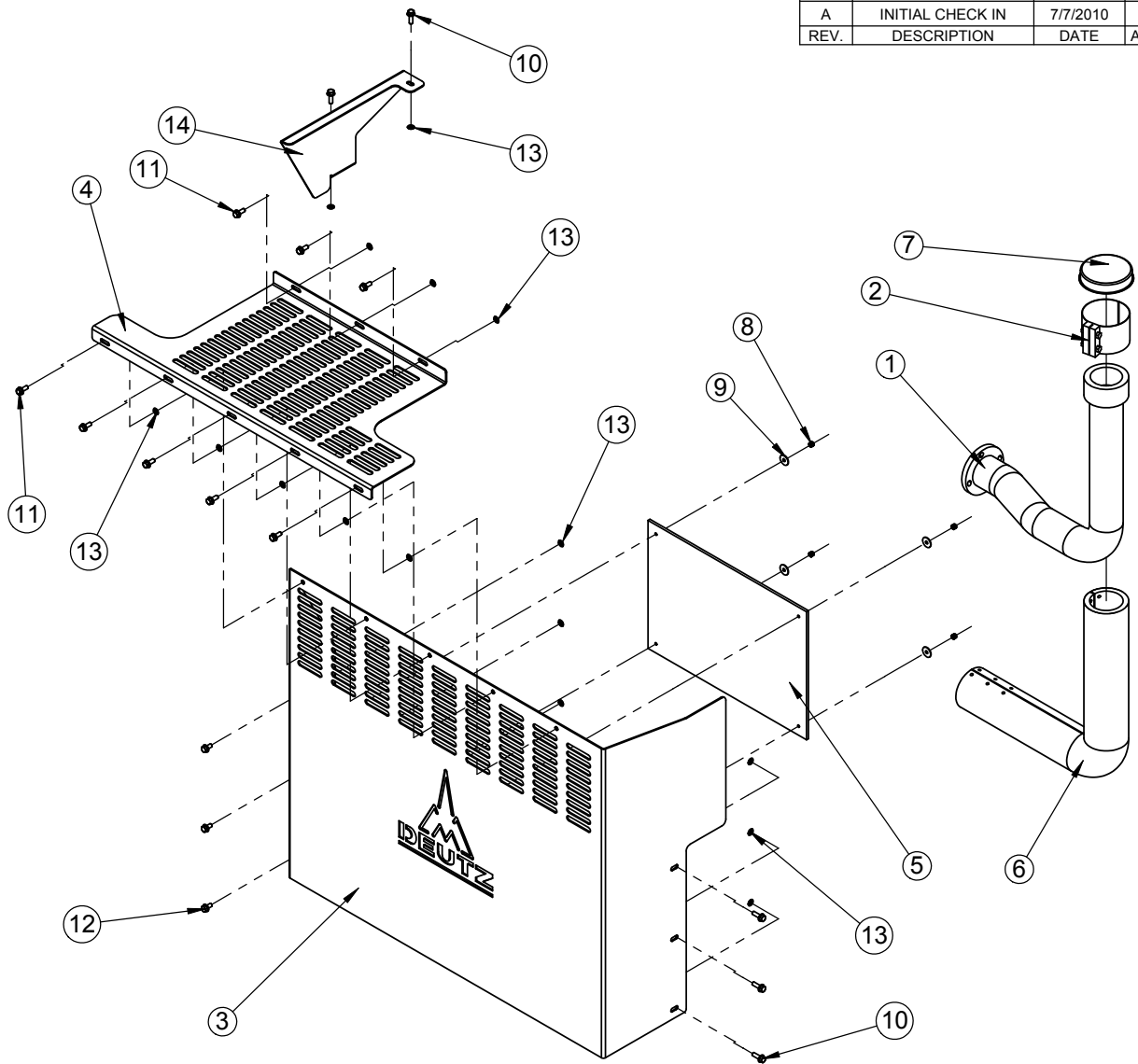
000	90-00282	9/15/2010	pas
A	INITIAL CHECK IN	7/7/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	drawing/QTY.	PART NUMBER	DESCRIPTION
1	1	0302965	HEAT SHIELD
2	1	0303143	TOP EXHAUST GUARD
3	1	0300479	SEAL CLAMP,4"
4	1	0303156	EXHAUST STACK, EU
5	1	0303160	HEAT PAD, 14' X 20" CERAMIC
6	1	0303159	EXHAUST BOOT,2012-6 EU
7	1	0305261	CAP PLUG FOR 4" NPT PIPE, EXTERNAL
8	4	0303161	WASHER,1/4" FENDER,ZP
9	4	0305059	NUT,M6,NYLOC
10	5	0305246	BOLT,HH FLANGE,M8x25
11	8	0305218	BOLT,HH FLANGE,SER,M8X20
12	16	0303150	M8 RETAINER WASHER
13	3	0302445	BOLT,HH FLANGE,M8X16
14	1	0303194	Heat Shield Left, 2012

9991036 EXHAUST ASSY-1013-6-EU

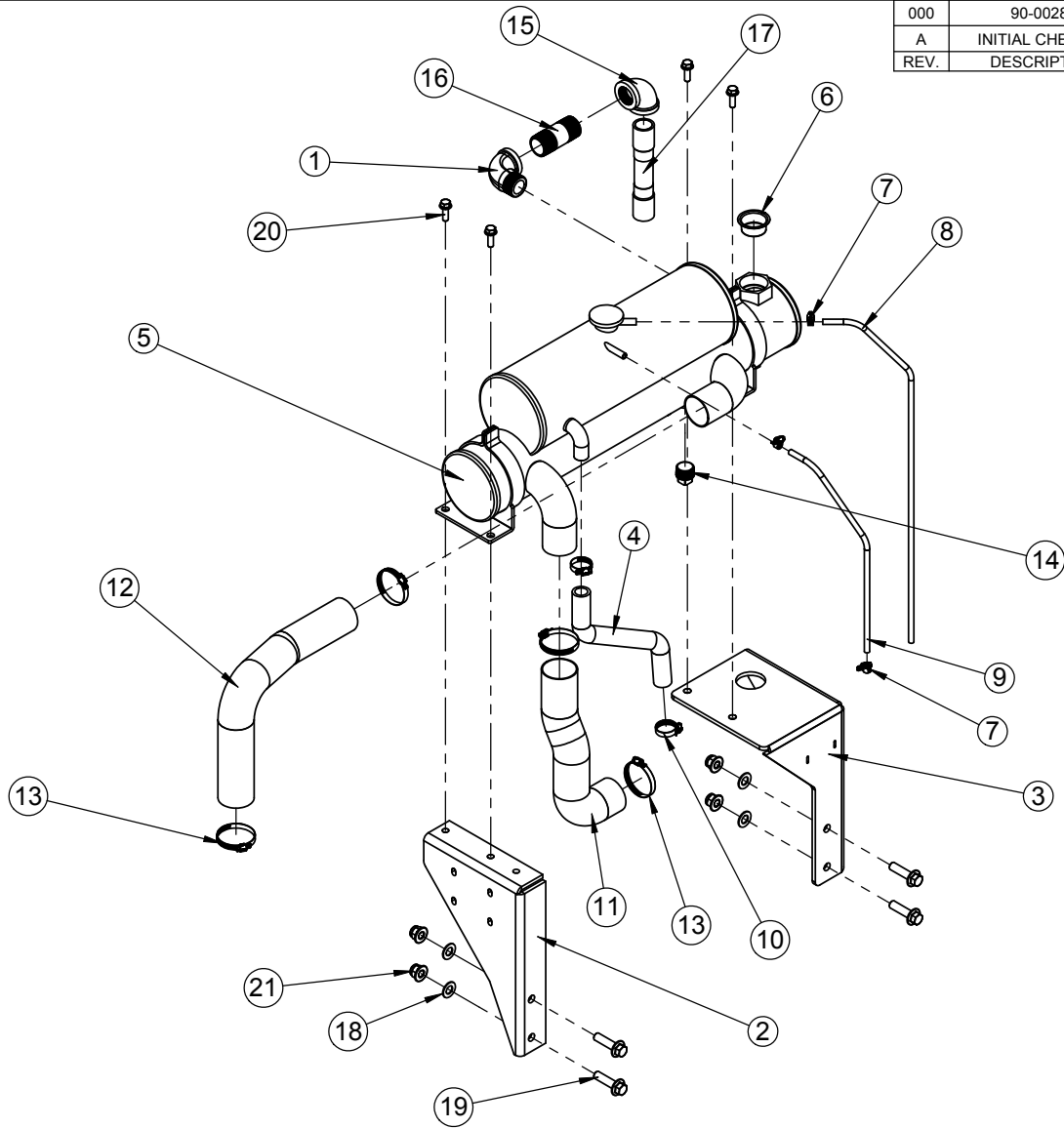
000	90-00282	9/15/2010	pas
A	INITIAL CHECK IN	7/7/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0300520	EXHAUST STACK W/FLANGE
2	1	0300479	SEAL CLAMP,4"
3	1	0302966	HEAT SHIELD
4	1	0303144	TOP EXHAUST GUARD
5	1	0303160	HEAT PAD, 14' X 20" CERAMIC
6	1	0301451	EXHAUST BOOT
7	1	0305261	CAP PLUG FOR 4" NPT PIPE, EXTERNAL
8	4	0305059	NUT,M6,NYLOC
9	4	0303161	WASHER,1/4" FENDER,ZP
10	5	0305246	BOLT,HH FLANGE,M8x25
11	8	0305218	BOLT,HH FLANGE,SER,M8X20
12	3	0302445	BOLT,HH FLANGE,M8X16
13	16	0303150	M8 RETAINER WASHER
14	1	0303193	Heat Shield Left, 6Cyl

9991037 HEAT EXCHANGER ASSY,2012,T1-T3 WO/CAC

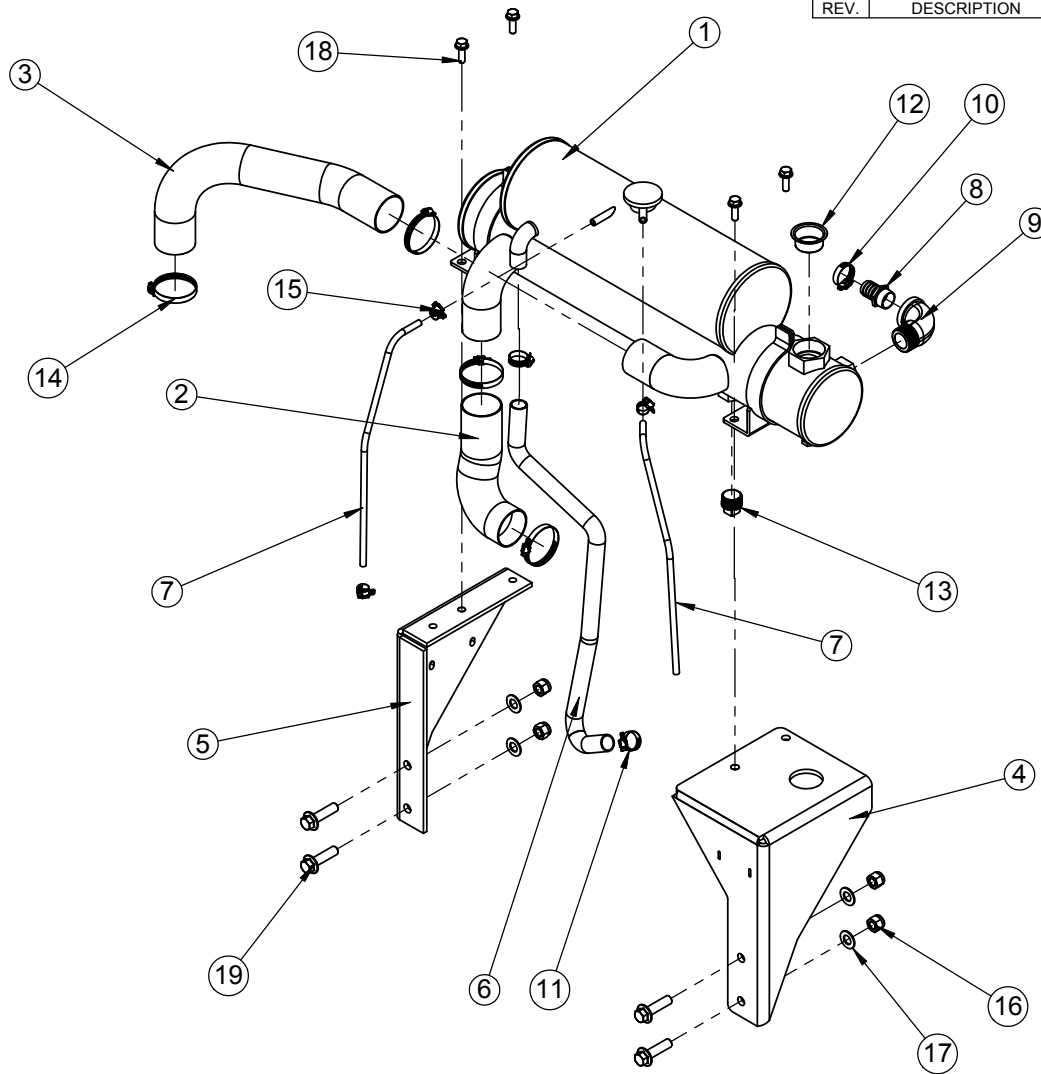
000	90-00282	9/15/2010	PAS
A	INITIAL CHECK IN	7/7/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0301457	STREET-L GALV. 1"
2	1	0302560	BRKT, RT HEAT EXCHANGER T3
3	1	0302561	BRKT, LFT HT EXCHANGER T3
4	1	0302567	COOLANT HOSE,3/4",MLD
5	1	0302640	HEAT EXCHANGER,4-PASS,2012/2013
6	1	0302679	PLUG,PLASTIC,1"dia RED
7	3	0303707	SAE#5 Hose Clamp
8	1	0303744	HOSE,5/16",2.5FT
9	1	0303744	HOSE,5/16",1.25FT
10	2	0304005	CLAMP,WORM,SAE #12
11	1	0305194	COOLANT HOSE
12	1	0305195	HOSE,MOLDED,REAR
13	4	1173941	Hose Clamp
14	1	0302849	3/4"plug,sq,galv.
15	1	0301664	1" ELBOW GALV
16	1	0301662	1" X 3" NIPPLE
17	1	0301454	WATER FLEX CONNECTOR, 1" NPT
18	4	0303871	WASHER,FLAT,NARROW,1/2
19	4	0301589	BOLT,HH FLANGE,M12X45
20	4	0305246	BOLT,HH FLANGE,M8x25
21	4	0301495	NUT,M12,CENTERLOC,FLANGED

9991038 HEAT EXCHANGER,1013-6 EU

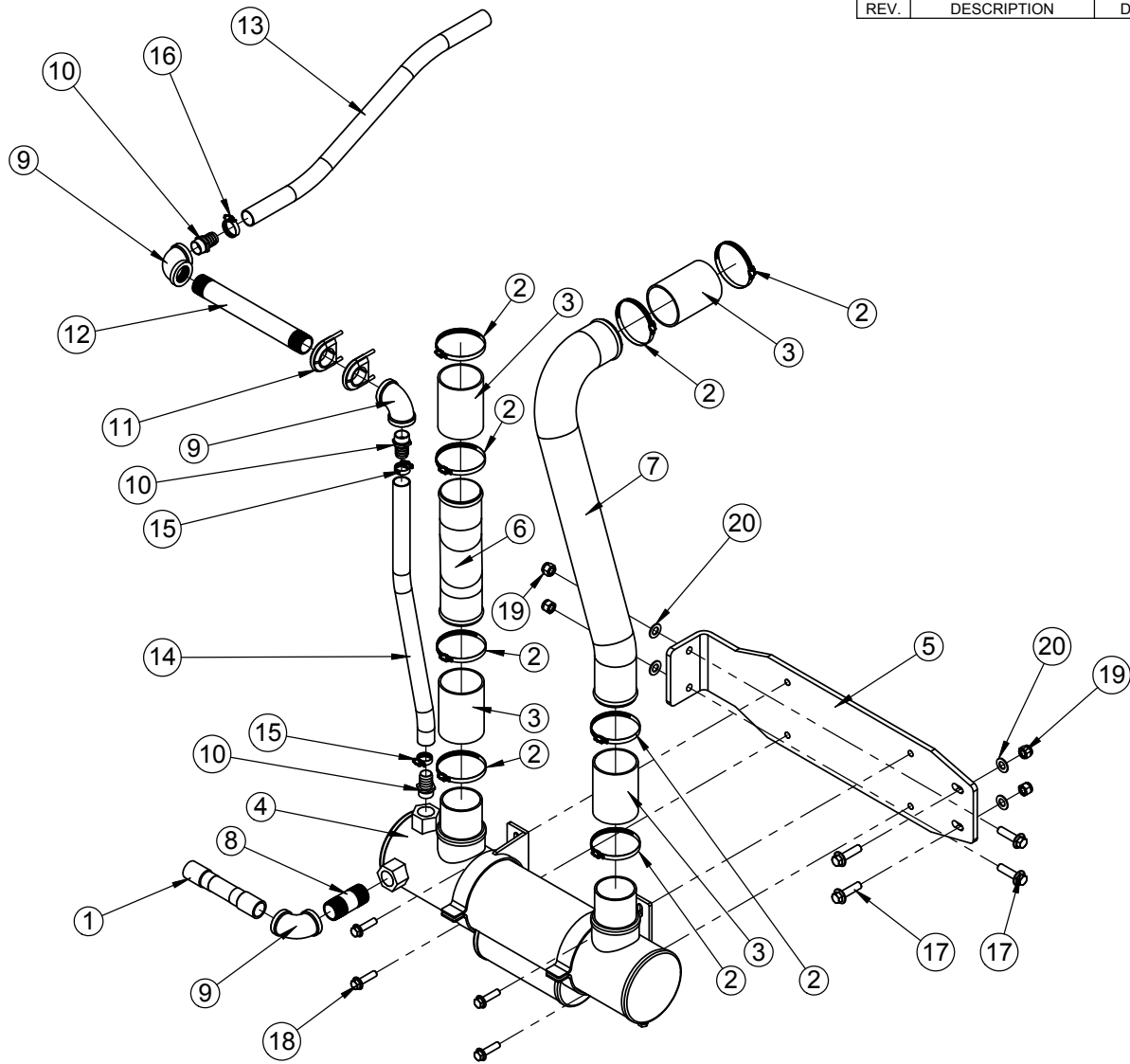
000	90-00282	9/15/2010	PAS
A	INITIAL CHECK IN	7/7/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0302640	HEAT EXCHANGER,4-PASS,2012/2013
2	1	0301520	HOSE,MOLDED,FRONT,1013FC-6
3	1	0301521	HOSE,MOLDED,REAR,1013FC-6
4	1	0302561	BRKT, LFT HT EXCHANGER T3
5	1	0302560	BRKT, RT HEAT EXCHANGER T3
6	1	0301522	COOLANT HOSE,3/4",MLD
7	2	0303744	HOSE,5/16",1.25FT
8	1	0301481	FITTING,1"NPTMx1" BARB
9	1	0301457	STREET-L GALV. 1"
10	1	0304005	CLAMP,WORM,SAE #12
11	2	0304005	CLAMP,WORM,SAE #12
12	1	0302679	PLUG,PLASTIC,1"dia RED
13	1	0302849	3/4"plug,sq,galv.
14	4	1173941	Hose Clamp
15	3	0303707	SAE#5 Hose Clamp
16	4	0301495	NUT,HEX,CENTER LOCKING,M12X1.75
17	4	0303871	WASHER,FLAT,NARROW,1/2
18	4	0305246	BOLT,HH FLANGE,M8x25
19	4	0301589	BOLT,HH FLANGE,M12X45

9991039 CAC COOLER ASSY,2012-4 CXX EU

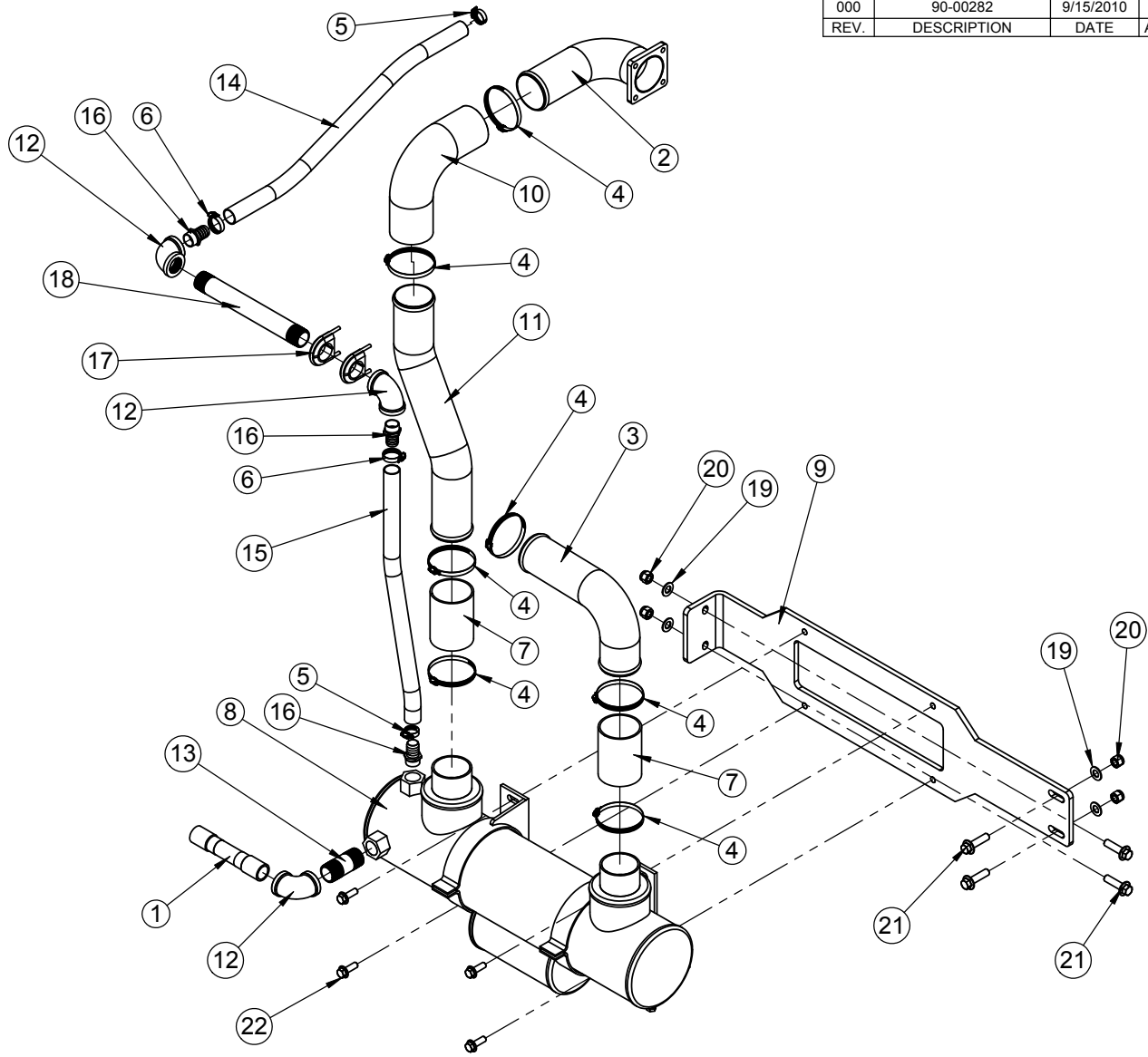
000	90-00282	9/15/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	DRAWING/QTY.	PART NUMBER	DESCRIPTION
1	1	0301454	WATER FLEX CONNECTOR, 1" NPT
2	8	0301474	Hose Clamp Constant Force
3	4	0304259	SLEEVE,2.75x4,CAC CONNECT
4	1	0305198	CHARGE AIR COOLER
5	1	0305199	CAC BRKT SMALL
6	1	0305290	TUBE,CAC FRONT
7	1	0305291	TUBE,CAC REAR
8	1	0301662	1" X 3" NIPPLE
9	3	0301664	1" ELBOW GALV
10	3	0301481	FITTING,1"NPTMx1" BARB
11	2	0304448	U-BOLT
12	1	0305443	1" X 10" NIPPLE GALV
13	1	0301488	HEATER HOSE,1" SILICONE,2'
14	1	0301488	HEATER HOSE,1" SILICONE,2'
15	2	0304005	CLAMP,WORM,SAE #12
16	1	0304005	CLAMP,WORM,SAE #12
17	4	0301589	BOLT,HH FLANGE,M12X45
18	4	0304342	BOLT,HH FLANGE,M10X40
19	4	0301495	NUT,HEX,CENTER LOCKING,M12X1.75
20	4	0303871	WASHER,FLAT,NARROW,1/2

9991040 CAC COOLER ASSY,2012-6 EU

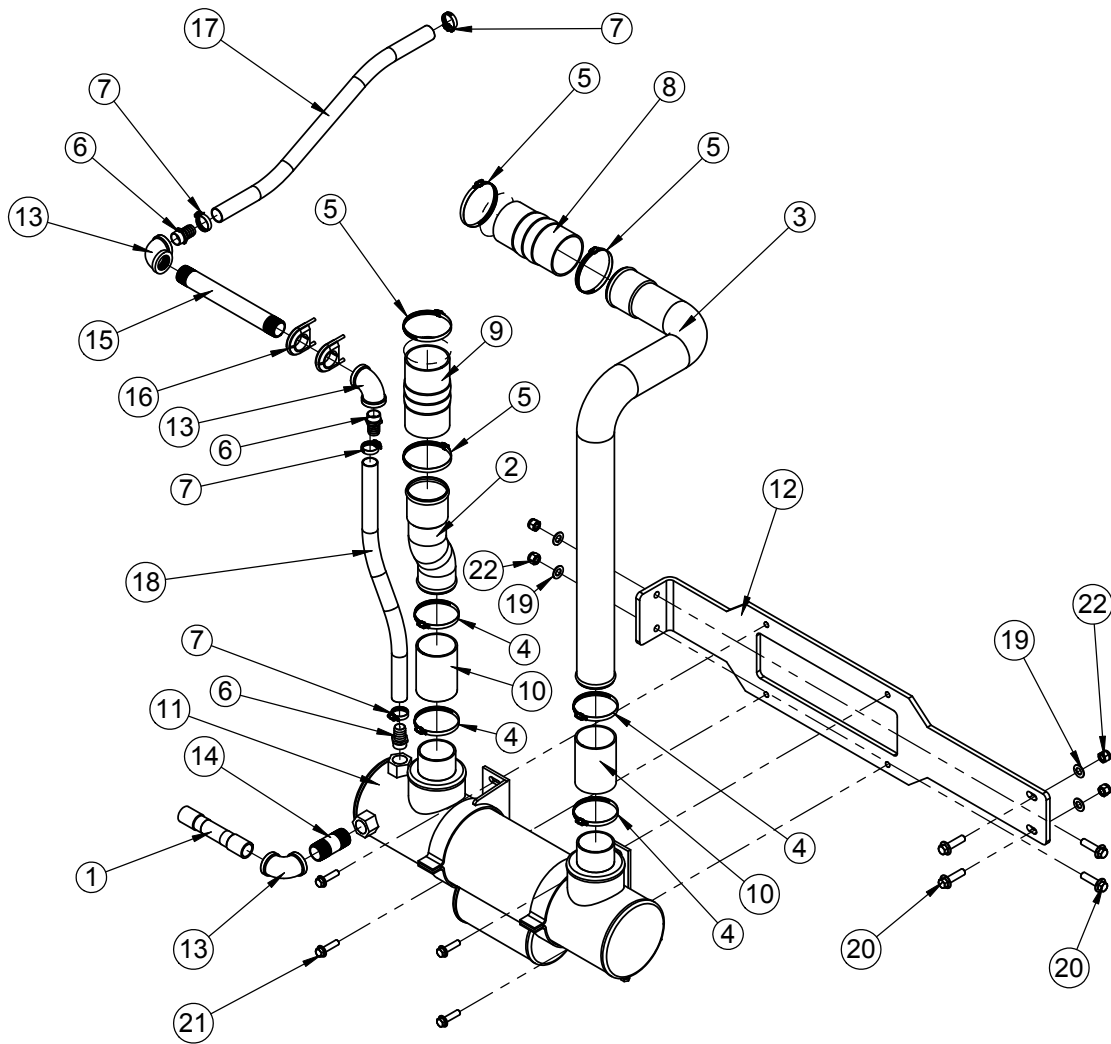
000	90-00282	9/15/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	DRAWING/QTY.	PART NUMBER	DESCRIPTION
1	1	0301454	WATER FLEX CONNECTOR, 1" NPT
2	1	0301458	CAC FRONT TUBE
3	1	0301459	CAC REAR TUBE
4	7	0301474	Hose Clamp Constant Force
5	2	0304005	CLAMP,WORM,SAE #12
6	2	0304005	CLAMP,WORM,SAE #12
7	2	0304259	SLEEVE,2.75x4,CAC CONNECT
8	1	0305184	CHARGE AIR COOLER
9	1	0305300	CAC BRKT LARGE
10	1	0305437	ELBOW,90DEG
11	1	0305438	CAC FRONT TUBE BOTTOM
12	3	0301664	1" ELBOW GALV
13	1	0301662	1" X 3" NIPPLE
14	1	0301488	HEATER HOSE,1" SILICONE,2'
15	1	0301488	HEATER HOSE,1" SILICONE,2'
16	3	0301481	FITTING,1"NPTMx1" BARB
17	2	0304448	U-BOLT
18	1	0305443	1" X 10" NIPPLE GALV
19	4	0303871	WASHER,FLAT,NARROW,1/2
20	4	0301495	NUT,HEX,CENTER LOCKING,M12X1.75
21	4	0301589	BOLT,HH FLANGE,M12X45
22	4	0305247	BOLT,HH FLANGE,SER,M10X30

9991041 CAC COOLER ASSY,1013-6 EU

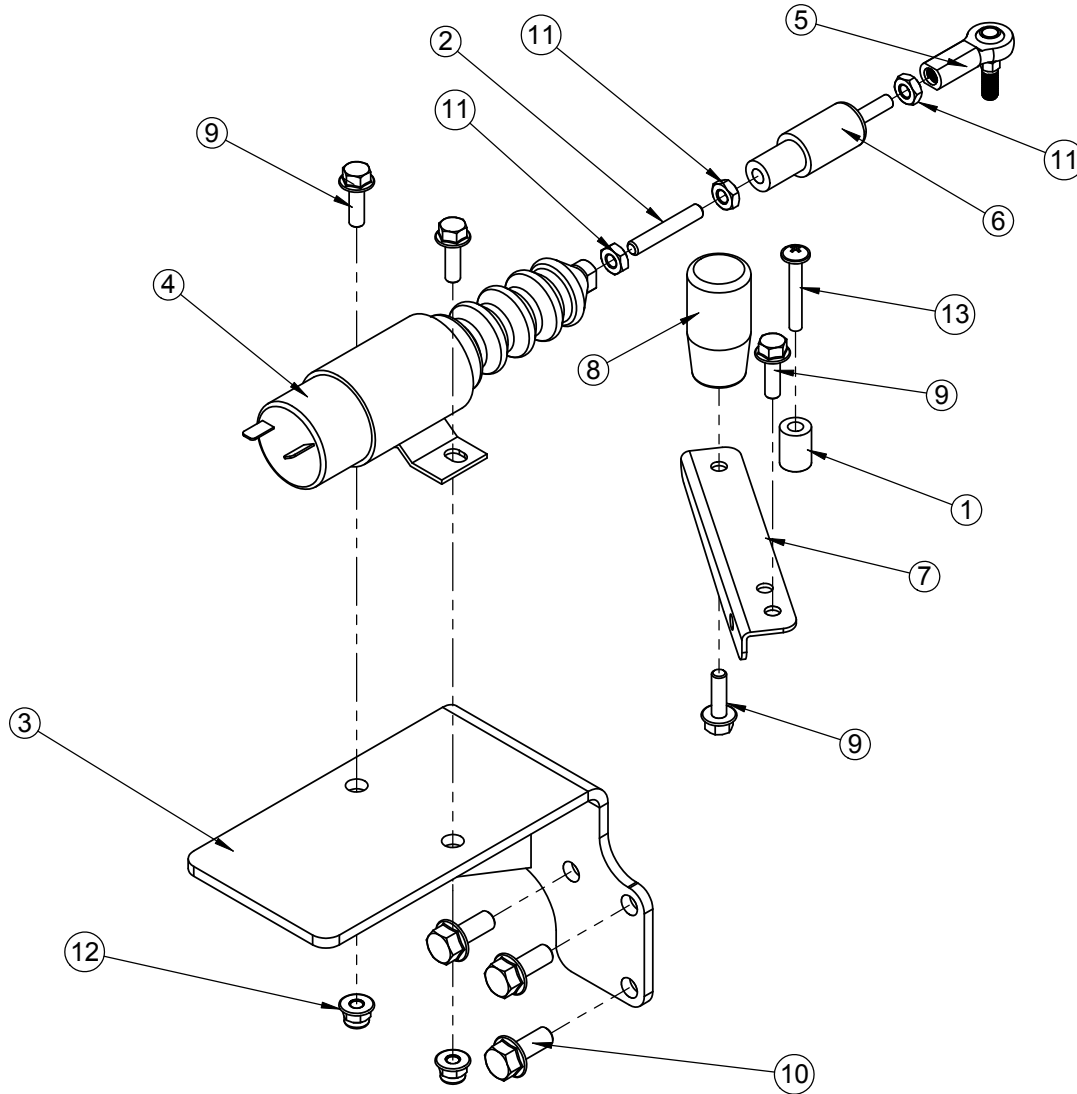
000	90-00282	9/15/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	DRAWING/QTY.	PART NUMBER	DESCRIPTION
1	1	0301454	WATER FLEX CONNECTOR, 1" NPT
2	1	0301471	TUBE,CAC,FRONT
3	1	0301472	TUBE,CAC,REAR
4	4	0301474	Hose Clamp Constant Force
5	4	0301474	Hose Clamp Constant Force
6	3	0301481	FITTING,1"NPTMx1" BARB
7	4	0304005	CLAMP,WORM,SAE #12
8	1	0304258	SLEEVE,3.0,CAC CONNECT, BLU/COLD
9	1	0304257	SLEEVE,3.0,CAC CONNECT,HOT/RED
10	2	0304259	SLEEVE,2.75x4,CAC CONNECT
11	1	0305184	CHARGE AIR COOLER
12	1	0305186	CAC BRKT LARGE
13	3	0301664	1" ELBOW GALV
14	1	0301662	1" X 3" NIPPLE
15	1	0305443	1" X 10" NIPPLE GALV
16	2	0304448	U-BOLT
17	1	0301488	HEATER HOSE,1" SILICONE,2'
18	1	0301488	HEATER HOSE,1" SILICONE,2'
19	4	0303871	WASHER,FLAT,NARROW,1/2
20	4	0301589	BOLT,HH FLANGE,M12X45
21	4	0304342	BOLT,HH FLANGE,M10X40
22	4	0301495	NUT,HEX,CENTER LOCKING,M12X1.75

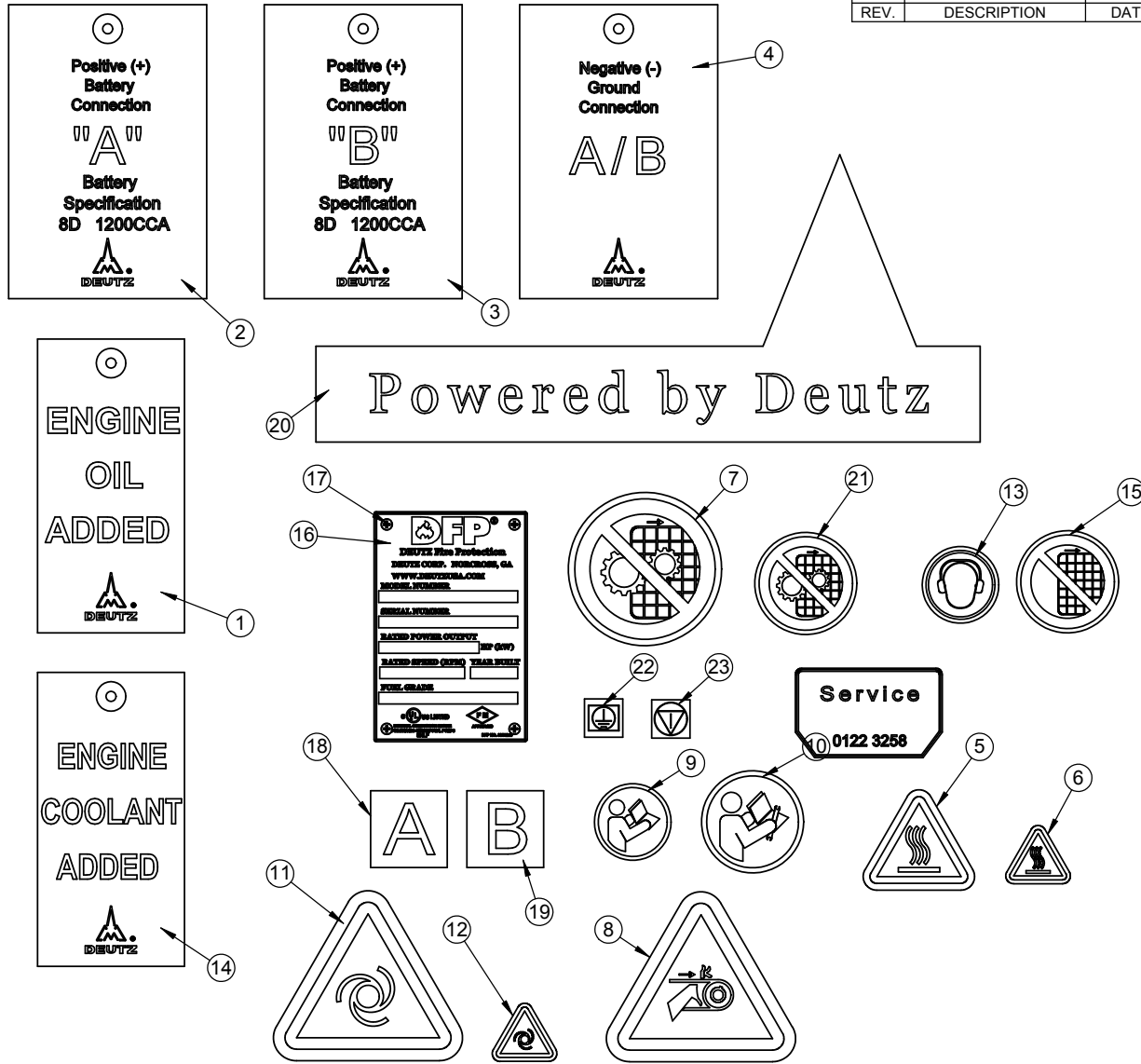
9991043 STOP SOLENOID ASSY,2012/1013 EU

000	90-00282	9/16/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	0301646	SPACER,1/2"ODx1/4"IDx11/16LG,ALUM
2	1	0301648	STUD,1/4-28,FULL THREAD,1-1/2L
3	1	0302914	BRACKET,SOLENOID SPRING
4	1	0305251	SOLENOID
5	1	0305253	BALL JOINT, 90DEG,M6 BALL,1/4-28
6	1	0302917	SPRING SWIVEL
7	1	0303162	BRACKET, PULL TO STOP
8	1	0303163	HANDLE, PULL TO STOP
9	4	0305212	BOLT,HH FLANGE,M6X20
10	3	0305218	BOLT,HH FLANGE,SER,M8X20
11	3	0301672	NUT,HEX,JAM,1/4-28
12	2	0305202	NUT,M6,NYLOC,FLANGED
13	1	0301675	SCREW,BTN HEAD,M5X35

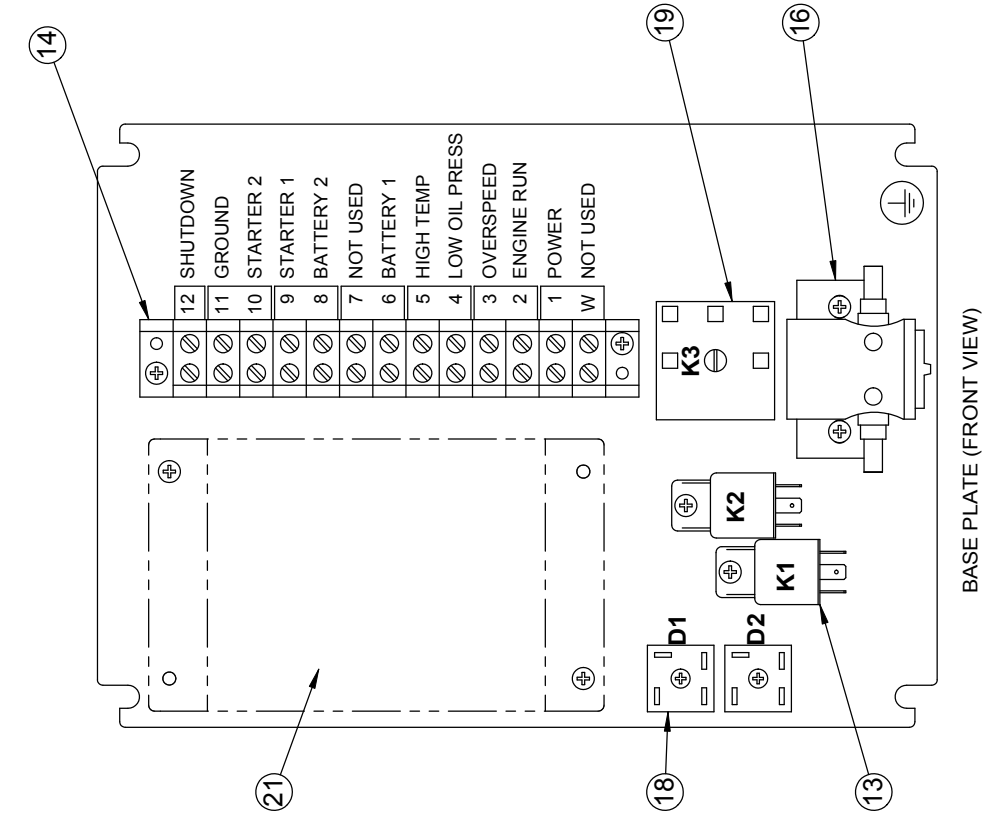
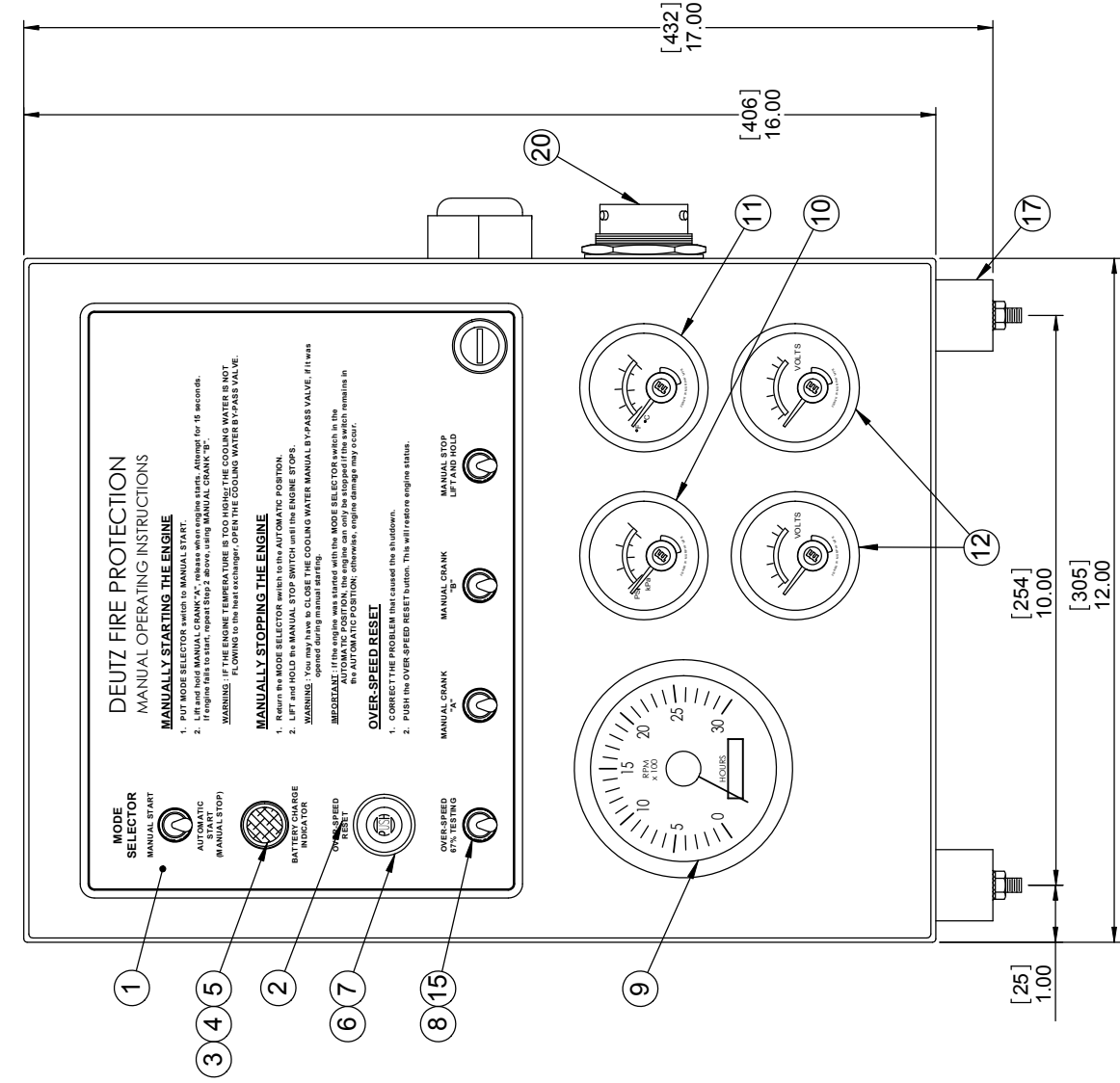
000	90-00282	9/17/2010	PAS
REV.	DESCRIPTION	DATE	APPROVED



ITEM NO.	Qty	PART NUMBER	DESCRIPTION
1	1	0302574	TAG, SHIPPING, "ENGINE OIL ADDED"
2	1	0302642	LABEL, BATTERY A POS CONNECTION
3	1	0302643	LABEL, BATTERY B POS CONNECTION
4	1	0302644	LABEL, BATTERY NEG/GROUND CONNECTION
5	5	0303167	Warning Label, High Temp, ISO Size B
6	2	0303168	Warning Label, High Temp, ISO Size C
7	1	0303170	Warning Label, Do Not Operate Without Guards, ISO Size A
8	1	0303172	Warning Label, Entanglement - Belt, ISO Size A
9	1	0303173	Warning Label, Read Instructions, ISO Size C
10	1	0303174	Warning Label, Read Maintenance Instructions, ISO Size B
11	1	0303175	Warning Label, Machine Starts Automatically, ISO Size A
12	1	0303176	Warning Label, Machine Starts Automatically, ISO Size C
13	1	0303180	Warning Label, Hearing Protection Req., ISO Size C
14	1	0303182	TAG, SHIPPING, "ENGINE COOLANT ADDED"
15	3	0303185	Warning Label, Do Not Operate Without Guards, ISO Size B
16	1	0305284	DFP METAL LABEL
17	4	0305285	SCREW, PAN CROSS HEAD, #4-40x5/16
18	1	0305287	LABEL, "A"
19	1	0305288	LABEL, "B"
20	1	310979	Decal, Powered by Deutz
21	1	0303171	Warning Label, Do Not Operate Without Guards, ISO Size B
22	1	0303178	Warning Label, Ground, IEC Size D
23	1	0303181	Warning Label, Emergency Stop, Size D
24	1	01223258	Service Label
25	7"	0302575	TAPE, DBL-SIDE FOAM, (NOT SHOWN)

Appendix C:

Fire Pump Control Panel Layout and Wiring Schematic



BASE PLATE (FRONT VIEW)

NOTES:
 1. SEE DC1163 FOR WIRING DIAGRAM
 2. DIMENSIONS IN [] ARE MILLIMETERS
 3. INTERNAL COMPONENTS OMITTED FRONT, SIDE, AND BOTTOM LAYOUTS FOR CLARITY

- W - Not used
- 1 - Main Power to Panel - Must be energized for cooling loop solenoid valve to function
- 2 - Crank Termination/Engine Run Signal - Will output 12v when engine is above 300rpm
- 3 - Engine Overspeed - Will close a contact when the engine has exceeded 115% of its rated speed
- 4 - Low Oil Pressure Switch - Will close contact when the oil pressure is too low
- 5 - High Temp Switch - Will output if the engine has exceeded its safe operating temperature
- 6 - Battery # 1 - Wired to battery # 1 for charging
- 7 - Not Used
- 8 - Battery # 2 - Wired to battery # 2 for charging
- 9 - Starter # 1 - Will cause starter solenoid # 1 to engage
- 10 - Starter # 2 - Will cause starter solenoid # 2 to engage
- 11 - Ground - Ground for the control panel to controller
- 12 - Shutdown - **REQUIRED** 12v signal to stop the engine running

ITEM	DEUTZ PART NUMBER	DESCRIPTION
1	302536	OVERLAY
2	302537	TOGGLE SWITCH, DPST
3	302538	LAMP BASE
4	302539	LENS, RED
5	302540	BULB, 14VDC
6	302541	SWITCH,PUSHBUTTON STOP
7	302542	PUSHBUTTON BOOT,BLACK
8	302543	TOGGLE SWITCH,OFF/(M)ON
9	302544	TACH/HOUR METER
10	302545	PRESSURE GAUGE
11	302546	TEMPERATURE GAUGE
12	302547	VOLTMETER, 12VDC
13	302548	RELAY,SPDT,40A,12VDC
14	302549	TERMINAL BLOCK,13 POSITION
15	302550	TOGGLE SWITCH BOOT
16	302551	SOLENOID,12V
17	302552	SHOCK MOUNT
18	302553	BRIDGE RECTIFIER
19	302554	TIME DELAY RELAY,.80 SEC
20	302555	CONNECTOR KIT
21	300492	SPEED SWITCH,ENGINE RUN OVERSPEED

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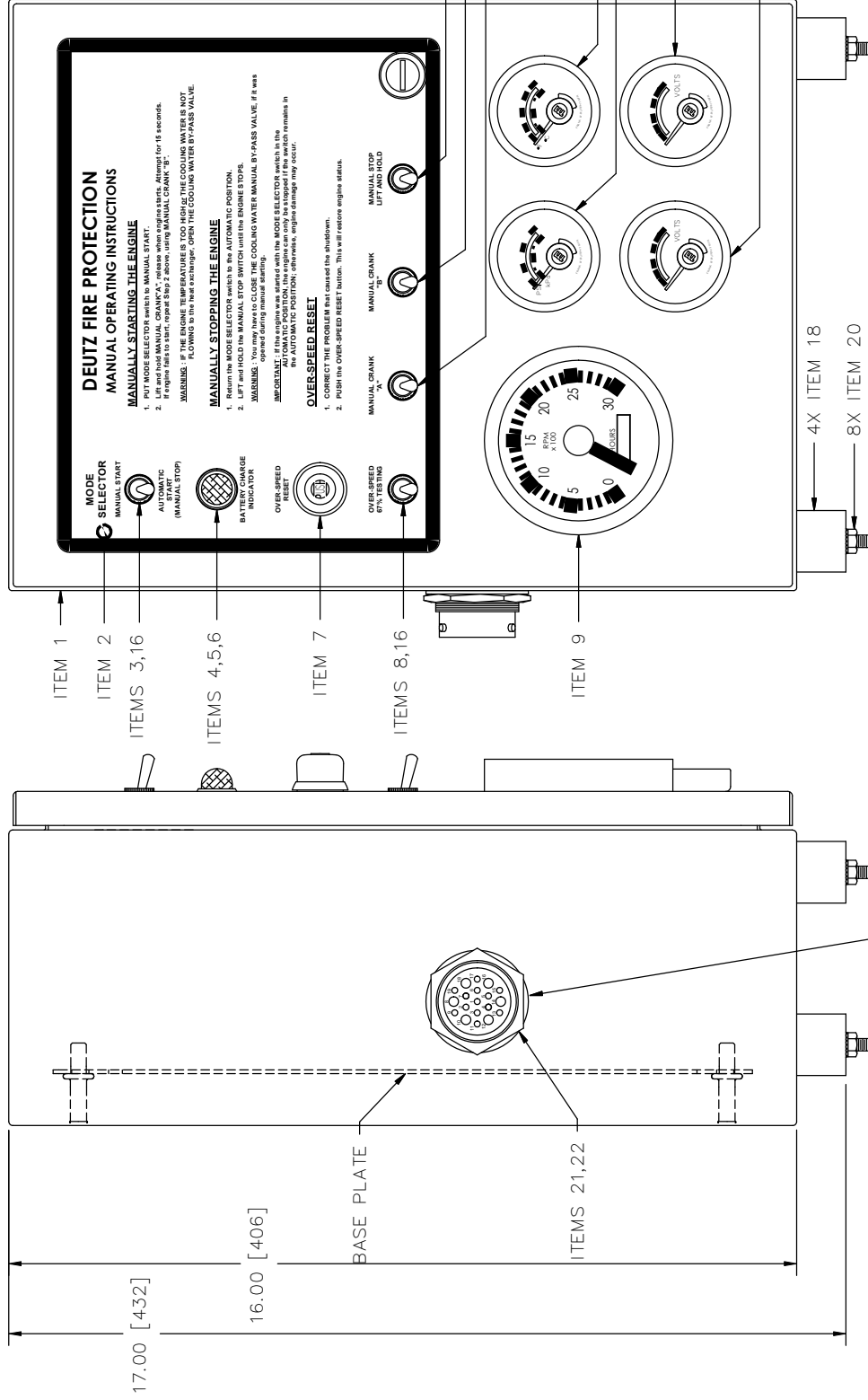
SIZE B 11x17 PART FORMAT

PRODUCTION
 release
 01/09/09
 ECN# 35-00175

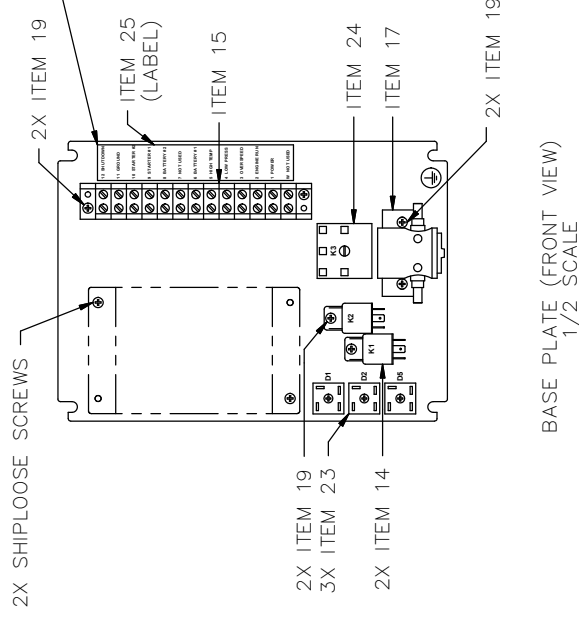
DEUTZ CORPORATION NORCROSS, GA USA		UNLESS OTHERWISE NOTED GEOMETRIC TOLERANCES: 0.XX +/0.2 MM 0.XXX +/0.06 MM 0.XXXX +/0.013 MM +/0.1 IN +/0.01 IN +/0.003 IN	
DR BY:	EJM	DATE	2/12/2009
ECN ORIGIN:	35-00231	SURFACE TEXTURE PER ISO 1302	
MATERIAL:	VENDOR	CORNERS PER DIN 6784	
CK BY:	CH	DESCRIPTION	ENGINE PANEL, 12V (0300477)
DATE	2/12/2009	DRAWING NUMBER	DS0014
APPROVED:	DATE	PROJECT	DFP ALL 12V
REV.	DESCRIPTION	SCALE:	SHEET
000	35-00231	1:1	1 of 1
	2/12/2009		
	EJM		

BOM 30-35-0774 SERVICE PARTS

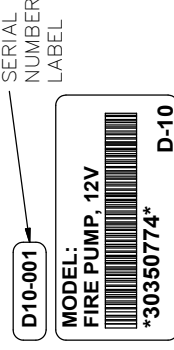
ITEM	DESCRIPTION	MODEL NO.	QTY.
3	TOGGLE SWITCH, DPST	0302537	1
4	LAMP BASE	0302538	1
5	LENS, RED	0302539	1
6	BULB, 14VDC	0302540	1
7	PUSHBUTTON	0302541	1
8	TOGGLE SWITCH, MOM	0302543	4
9	TACH/HOURMETER	0303187	1
10	PRESSURE GAGE	0303189	1
11	TEMPERATURE GAGE	0303190	1
12	VOLTMETER, 12VDC	0302955	2
*	DIODE, SINGLE	0303139	2
*	BRIDGE RECTIFIER	0302553	2



12 SHUTDOWN
11 GROUND
10 STARTER #2
9 STARTER #1
8 BATTERY #2
7 NOT USED
6 BATTERY #1
5 HIGH TEMP
4 LOW PRESS
3 OVERSPEED
2 ENGINE RUN
1 POWER
W NOT USED



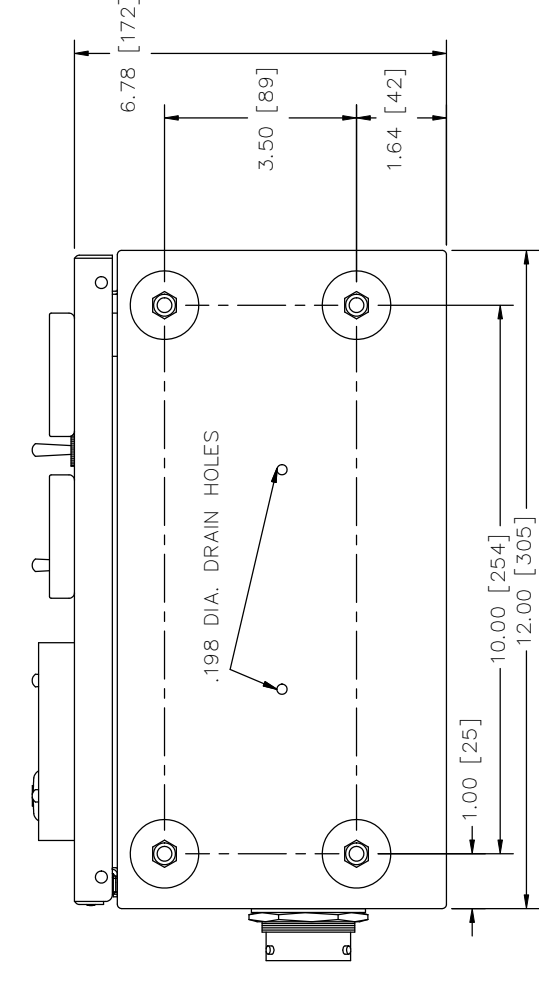
BASE PLATE (FRONT VIEW)
1/2 SCALE



SAMPLE LABELS
SEE ALSO " DC1298 " SCHEMATIC

CONTROL DOCUMENT
ENGINEERING ACTION REQUIRED

PROPRIETARY PART
NO SUBSTITUTIONS ALLOWED



- NOTES:
- SEE " DC1298 " FOR WIRING DIAGRAM.
 - ITEM NUMBERS REFER TO SERVICE PARTS LIST AND BILL OF MATERIAL (NOT INCLUDED).
 - USE MODEL NO. WHEN ORDERING SERVICE PARTS.
 - DIMENSIONS IN [] ARE MILLIMETERS.
 - INTERNAL COMPONENTS OMITTED FROM FRONT, SIDE, AND BOTTOM LAYOUTS FOR CLARITY.

VENDOR : # 100296
VENDOR PART # 30-35-0774

DEUTZ CORPORATION
NORCROSS, GA USA

DR BY: DATE 8/23/2010
PAS 8/23/2010

ECN ORIGIN: 90-00282
MATERIAL: ASSY

DESCRIPTION: MECH.CONTROL PANEL, 12V

DATE: 8/23/2010
DATE: 8/23/2010
DATE: 8/23/2010

APPROVED: DATE

DRAWING NUMBER: 0303164

SCALE: 2:1

SHEET: 1 of 1

UNLESS OTHERWISE NOTED

GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167

GENERAL TOLERANCES:
0.XX ±0.2 MM
0.XXX ±0.06 MM
0.XXX ±0.013 MM
0.XXX ±0.003 IN

SURFACE TEXTURE PER ISO 1302

CORNERS PER DIN 6784

PROJECTION:

REV.	DESCRIPTION	DATE	APPROVED
000	PRODUCTION CHECK IN	9/10/2010	PAS

Appendix D:

Fire Pump Manufacturer and Installation Contractor Start-up and Installation Check Lists

Return Completed Form To:

DEUTZ Fire Protection
 Warranty Administration Department
 3883 Steve Reynolds Boulevard, Norcross, GA 30093
 Phone 1-800-241-9886 | E-mail: DFPStartup@deutzusa.com

Customer and Pump Location Information

Name		
Mailing Address		
City	Postal Code	
State/Region	Country	
Contact Name		
Phone	Fax	Email
Jobsite Address		
City	Postal Code	
State/Region	Country	

Engine Information

Model	S/N
Speed (RPM)	Rating

Pump Information

Name (Mfr)	Model	S/N
Rating (gpm)	Pressure (psi)	Speed (RPM)

OEM Manufacturer of Fire Pump Package

Name (Mfr)	City	State
------------	------	-------

Controller Information

Name (Mfr)	Model
------------	-------

Installation Contractor

Name	Phone	City/State
------	-------	------------

Engine Pre-Run

- Oil level, engine crankcase (see operators manual for approved oils & volumes)
 - Coolant level, (see operators manual for approved coolant & volumes)
 - Coolant system antifreeze protection **(Not applicable to oil cooled 2011)**
 - Coolant hoses checked for tightness and proper installation
 - Check belt tightness
 - Air intake system, check tightness, etc.
 - Exhaust System, check tightness, etc.
 - Fuel supply and return line connections, check tightness, etc.
 - Fuel tank full, other _____
 - Hose length from fuel tank to engine: _____
 - Fuel suction line diameter: _____
 - Fuel return line diameter: _____ **(Note: Do not use galvanized or copper fuel lines, fittings or fuel tanks)**
 - Verify raw water flow with cooling loop in Manual modes (visually inspect discharge)
 - Check external bolts, fittings, coupling, etc.
- Engine block heater connected to dedicated power supply: Yes No N/A

Exhaust System Description

- Total length of pipe: _____
- Diameter of pipe: _____
- Number of elbows: 45° _____ 90° _____
- Rain protection: Yes No
- Includes flex pipe and supported by building structure: Yes No

- Check for fuel leaks
- Test High coolant temperature alarm (must pull plug and ground-out wiring) (Mechanical engines only)
- Test Low oil pressure alarm (Mechanical engines only)
- Test Over-speed shutdown (Mechanical engines only)
- Engine gauges functioning properly

Engine Post-Run

- Hour meter reading at start of test (hrs): _____
- Hour meter reading at end of test (hrs): _____
- Stamp start-up date on upper right corner of engine name plate
- Review with customer on whom to contact for engine parts and service
- Customer acceptance of a maintenance contract: Yes No Pending
- Coolant level full

General

- Room air supply and ventilation equipment complete and adequate. List total dimension of inlet air opening:
W _____ x H _____
- List total dimension of discharge air opening: W _____ x H _____
- Controller wired per supplier's instructions, "1" terminal in instrument panel used for cooling water solenoid
- Batteries filled, secured and connected:
Cable size: _____
Total length of battery cable (incl pos & neg): _____
Size of batteries: Number of batteries: _____

FOR ENGINES EQUIPPED WITH ELECTRONIC INJECTION CONTROL ONLY

Note: Electronic Control Injection Engines display Engine RPM on a square electronic LCD display. Mechanical models are differentiated by a round analog Engine RPM display gauge.

- Switch to ECU 2 (power engine off before switching ECU)
- Start Engine and verify ECU 2 speed setting
- Check for active error codes and clear inactive error codes from ECU 2 (Must have DEUTZ SERDIA interface tool)
- Switch back to ECU 1 and check for active error codes and clear inactive error codes
- Verify and leave spare control relays in the ECU control panel

TO BE COMPLETED BY INSTALLING CONTRACTOR OR END USER AND SUBMITTED TO DEUTZ CORPORATION PRIOR TO SCHEDULING START-UP INSPECTION

► **Return Completed Form To:**

DEUTZ Fire Protection
 Warranty Administration Department
 3883 Steve Reynolds Boulevard, Norcross, GA 30093
 Phone 1-800-241-9886 | E-mail: DFPStartup@deutzusa.com

Part 1: Jobsite Project & Equipment Data

Facility Name _____

Mailing Address _____

City _____ Postal Code _____

State/Region _____ Country _____

Contact Name _____

Phone _____ Fax _____ Email _____

Jobsite Address _____

City _____ Postal Code _____

State/Region _____ Country: _____

Engine Information

Model _____ S/N _____

Speed (RPM) _____ Rating _____

OEM Manufacturer of Fire Pump Package

Name (Mfr) _____ Model _____ S/N _____

Rating (gpm) _____ Pressure (psi) _____ Speed (RPM) _____

Controller Information

Name (Mfr) _____ Model _____ S/N _____

Installation Contractor

Name _____ Phone _____ City/State _____

Postal Code _____

Signature _____ Date _____

Part 2: Checklist for Pump Representative or Installing Contractor*

	Initial	Date
A.) Engine-Pump alignment check; Service coupling/shaft as required.	_____	_____
B.) Unit properly mounted & secured; base grouted.	_____	_____
C.) Controller wiring connected to engine instrument panel.	_____	_____
D.) Batteries serviced and charged 24 hours; connected to engine.	_____	_____
E.) Cooling water connections properly installed on engine heat exchanger, both inlet and outlet; Confirm cooling water by-pass solenoid operation	_____	_____
F.) Exhaust system properly sized, routed and connected to engine.	_____	_____
G.) Cooling system filled to proper level with DEUTZ approved coolant. NOT APPLICABLE TO OIL-COOLED 2011 (See DEUTZ engine operation manual)	_____	_____
H.) Add DEUTZ approved engine oil to proper level. (See DEUTZ engine operation manual)	_____	_____
I.) Fuel lines (both supply and return) connected to fuel tank and engine.	_____	_____
J.) Fuel tank filled with clean #2 diesel fuel; drain water & sediment from tank.	_____	_____
K.) Engine jacket water heater connected to correct AC power (after item G) or oil pan heater on 2011 engines (after item H).	_____	_____
L.) Air inlet filter installed on engine; fresh air supply adequate for engine combustion and room ventilation.	_____	_____

***These items are to be completed before DEUTZ CORPORATION FIRE PUMP START-UP AND INSTALLATION inspection**

Start-Up Performed By:

Company Name _____

Mailing Address _____

City _____ Postal Code _____

State/Region _____ Country _____

Phone _____ Email _____

Distributor Name _____

Individual Performing Start-up _____ Date: _____



Appendix E:

Installation and Incorporation Drawings

The following Instructions must be followed to insure the engine is properly incorporated into the final machine.



Warning: The Deutz Fire Protection engine is not operational as a stand alone component. It is sold as “Partially Completed Machinery” and must be incorporated into a finished machine.

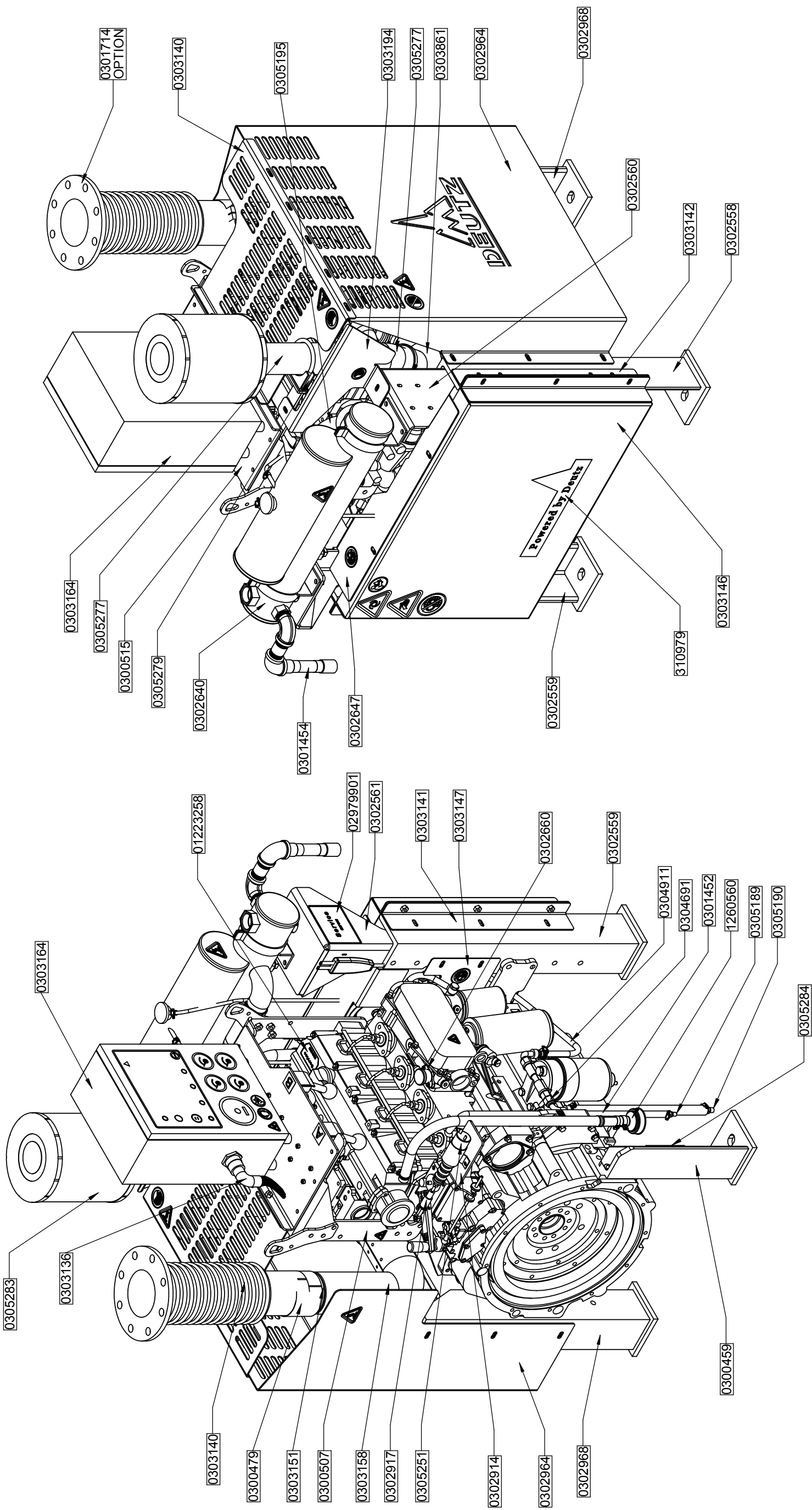
The engine must be mounted to a supporting structure capable of handling the transmitted forces of the engine and pump. The engine to pump connection must be aligned per the instructions of the coupling or shaft. The flywheel and coupling/shaft must be guarded to prevent injury to operators.

The raw water connections must be made per NPT and local standards. See the drawing for connection sizes. See the performance data sheets for required flow. Maximum pressure is 60 psi. To meet NFPA standards, a NFPA compliant cooling loop must be applied with a pressure regulator to maintain pressure below 60 psi and an automatic water valve to be wired into the control panel.

The control panel must be connected to a Firepump Controller that is configured to operate with an “Energized to Stop” firepump engine. See the wiring diagrams for termination points.

The Engine ONLY is to be lifted by the lifting eyes using appropriate spreader bars and following all safety standards. The lifting eyes are not rated to carry any additional equipment beside the engine.

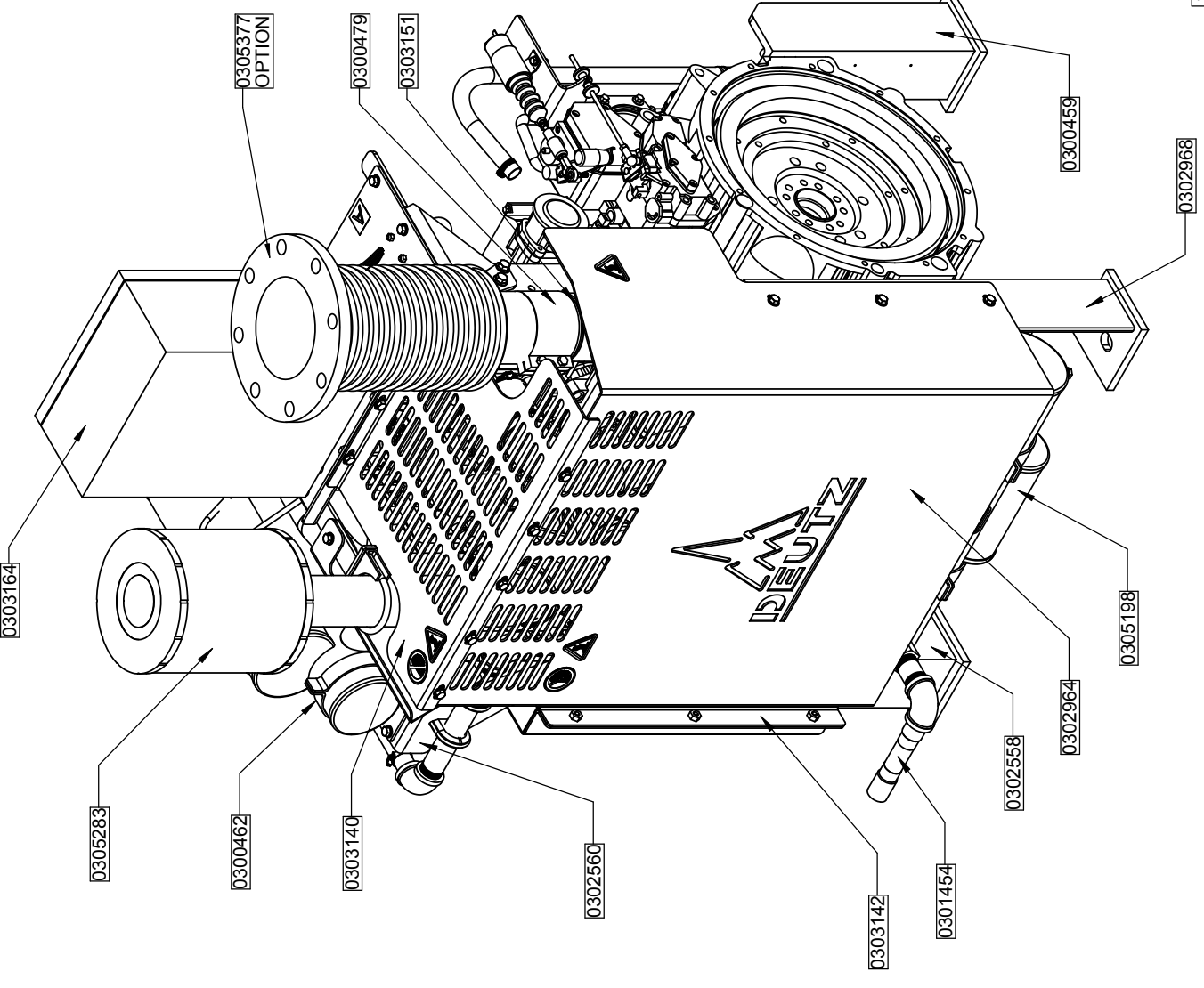
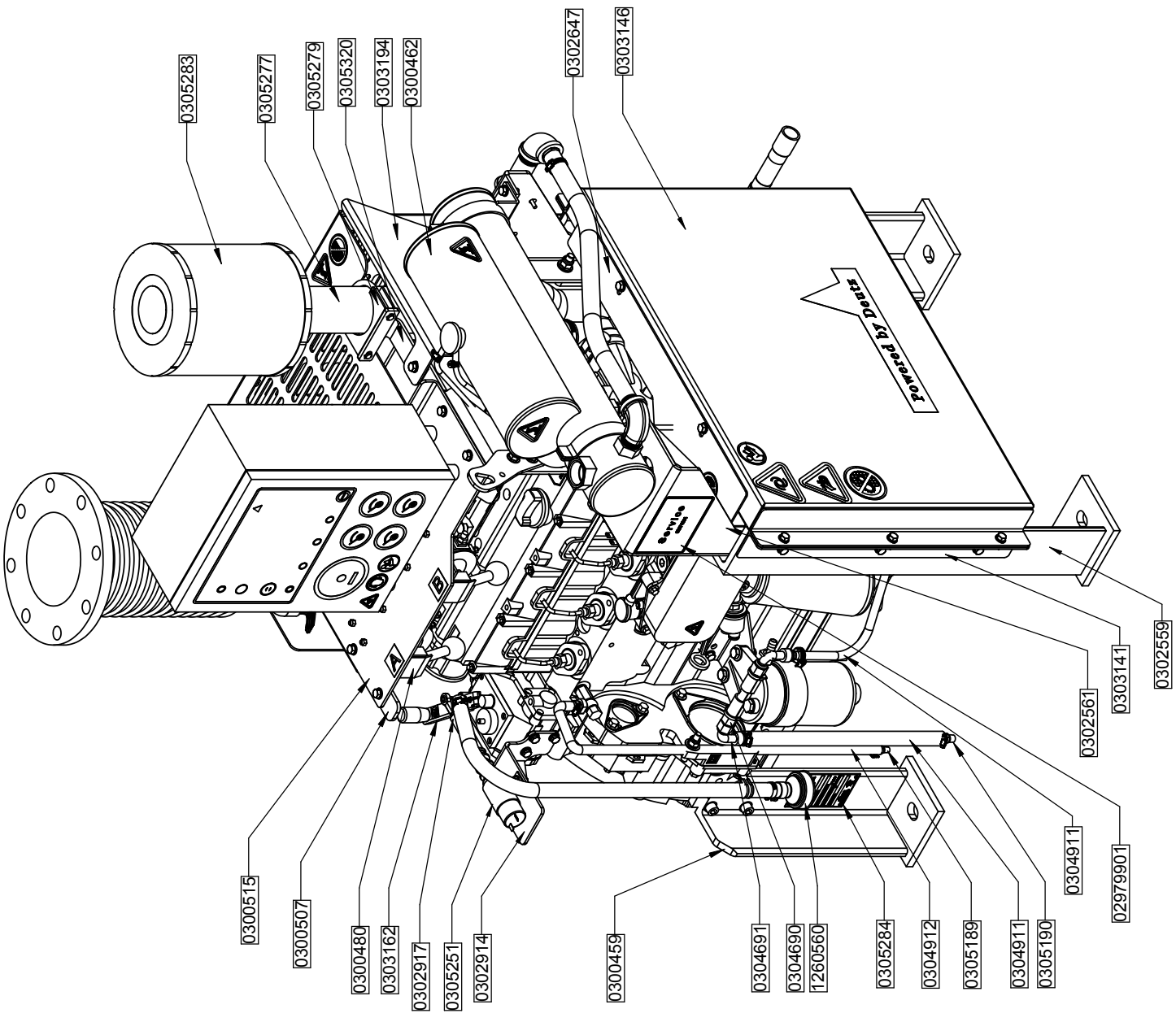
Follow the mounting instructions on the following pages for each engine model.



PRODUCTION
release
01/18/08
ECN# 90-00123

DEUTZ CORPORATION NORCROSS, GA USA		UNLESS OTHERWISE NOTED GEOMETRIC TOLERANCES: PER ISO 1101 AND DIN 7167 0.X +/-0.2 MM +/-0.1 IN 0.XX +/-0.06 MM +/-0.01 IN 0.XXX +/-0.013 MM +/-0.003 IN SURFACE TEXTURE PER ISO 1302 CORNERS PER DIN 6784	
DR BY: PAS DATE: 9/3/2010	ECN ORIGIN: 90-00282 MATERIAL: SEE BOM	PROJECT: DFP4 2012 SCALE: 1:10	SHEET: 1 of 1
CK BY: PAS DATE: 1/14/2008	DESCRIPTION: DFP4 2012 TXX-EU DRAWING NUMBER: DC1209		
APPROVED: PAS DATE: 8/27/2008	PAS DATE: 9/3/2010	PAS DATE: 8/27/2008	APPROVED: EJM DATE: 8/27/2008

CONTROL DOCUMENT
ENGINEERING ACTION REQUIRED



CONTROL DOCUMENT
ENGINEERING ACTION REQUIRED

REV.	DESCRIPTION	DATE	APPROVED
003	90-00282	9/3/2010	PAS
002	90-00250	5/15/2009	EJM
001	90-00123	7/23/2008	EJM

DEUTZ CORPORATION
NORCROSS, GA USA

DR BY:	DATE	ECN ORIGIN:	90-00282
PAS	10/26/2007	MATERIAL:	SEE BOM
CK BY:	DATE	DESCRIPTION	
PAS	1/13/2008	DFP4 2012 CXX-EU	
APPROVED:	DATE	DRAWING NUMBER	DC1211
UD	2/17/2008		

PROJECT	DFP-2012-4C-EU
SCALE:	SHEET
1:10	1 of 1

PRODUCTION
release
05/06/08
ECN# 90-00123

UNLESS OTHERWISE NOTED
GEOMETRIC TOLERANCES
PER ISO 1101 AND DIN 7167
SURFACE TEXTURE PER
ISO 1302
CORNERS PER DIN 6784

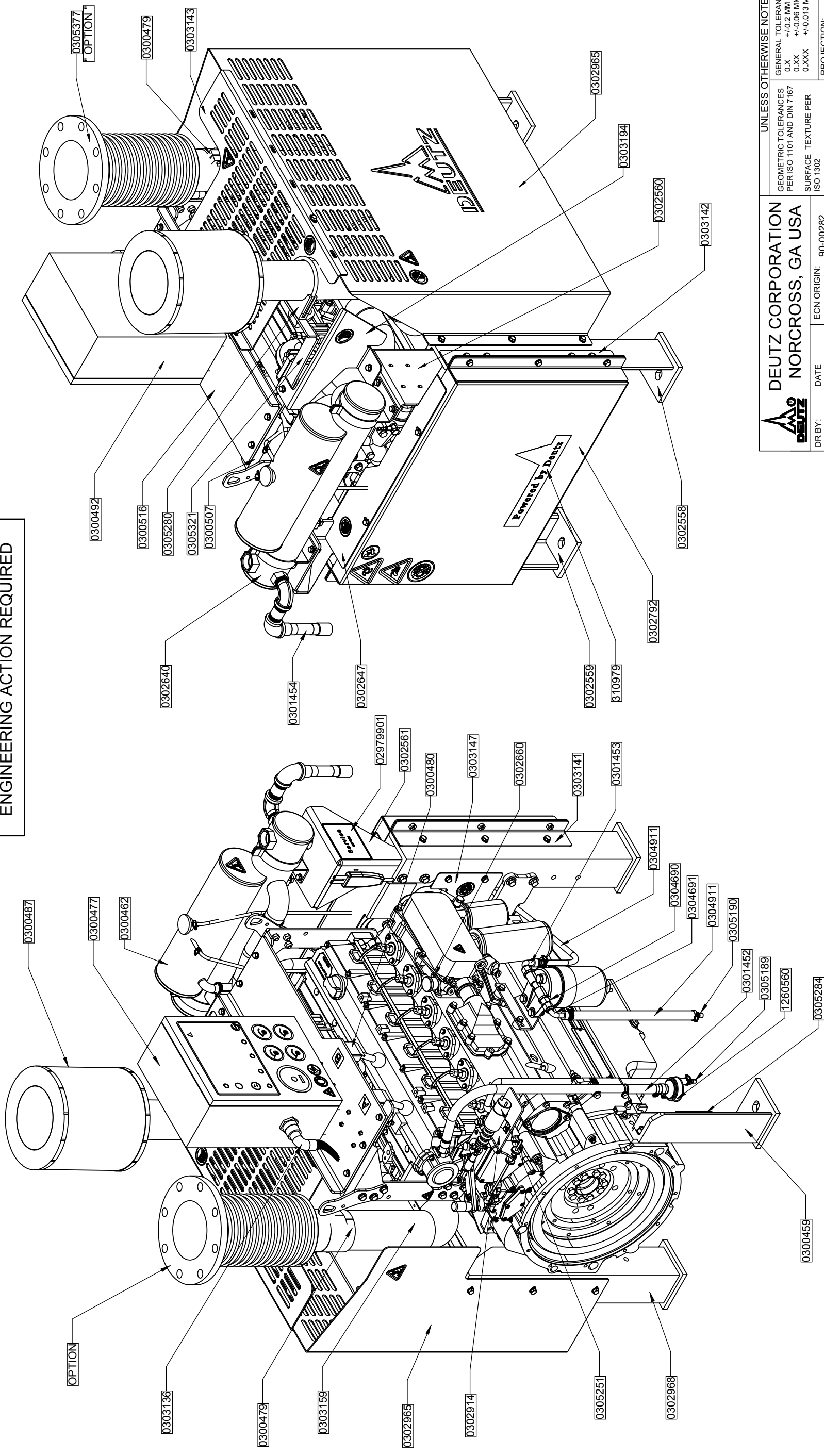
GENERAL TOLERANCES:
0.XX +/-0.2 MM
0.XXX +/-0.06 MM
0.XXXX +/-0.013 MM
+/-0.003 IN

PROJECTION:
FIRST ANGLE

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SIZE B 11x17 PART FORMAT

**CONTROL DOCUMENT
ENGINEERING ACTION REQUIRED**



**DEUTZ CORPORATION
NORCROSS, GA USA**

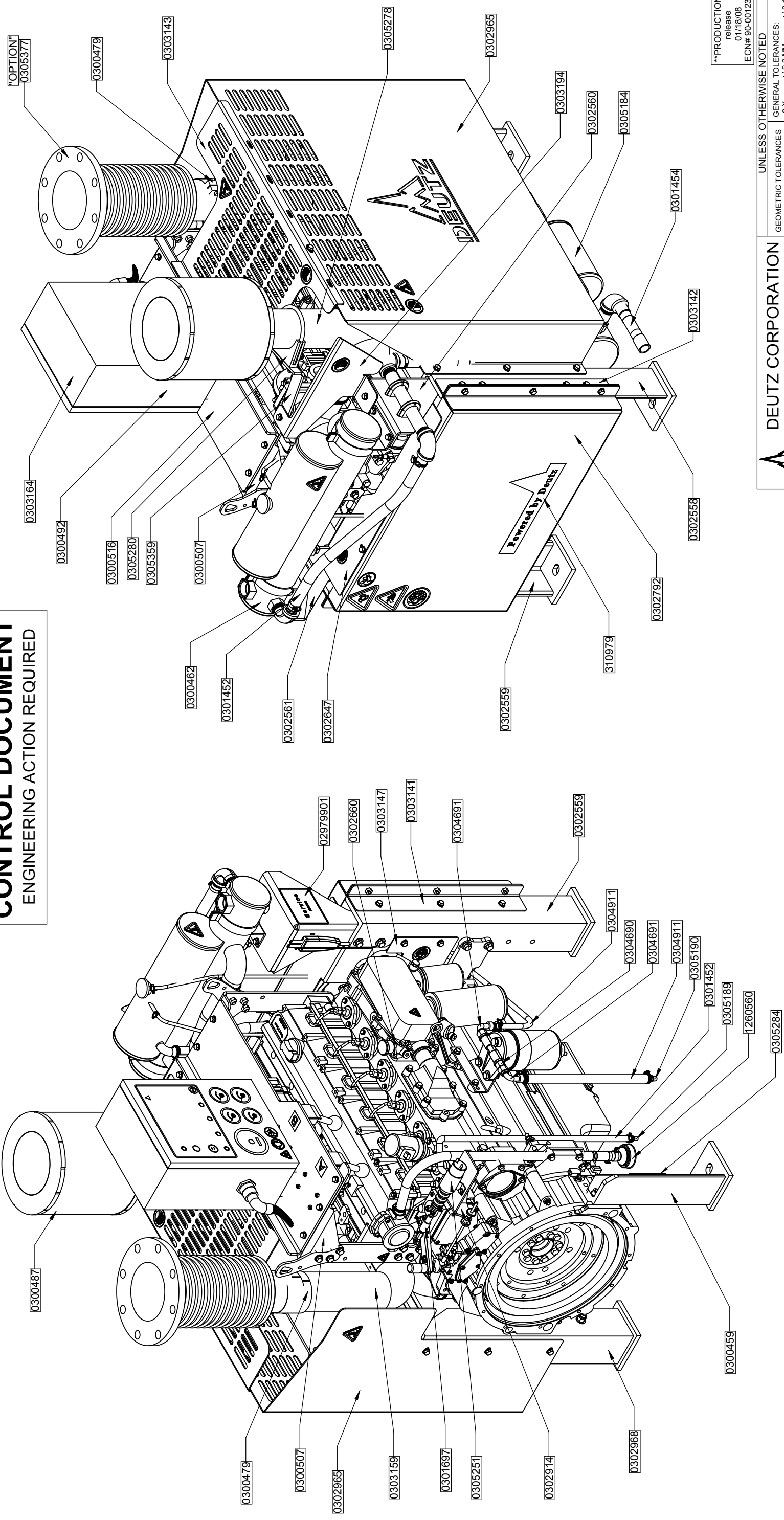
DR BY: PAS DATE: 90-00282
 CK BY: PAS DATE: 1/10/2008
 APPROVED: PAS DATE: 5/15/2009
 APPROVED: EJM DATE: 7/23/2008
 APPROVED: EJM DATE: 7/23/2008

UNLESS OTHERWISE NOTED
 GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167
 0.XX ±0.2 MM
 0.XXX ±0.06 MM
 0.XXXX ±0.013 MM
 SURFACE TEXTURE PER ISO 1302
 CORNERS PER DIN 6784

PROJECT: DFP
 SCALE: 1:10
 SHEET: 1 of 1

DESCRIPTION: DFP6 2012 TXX ASSEMBLY
 DRAWING NUMBER: DC1213
 REV: 1

CONTROL DOCUMENT
ENGINEERING ACTION REQUIRED



OPTION
0305377

0300479

0303143

0305278

0302965

0303194

0302560

0305184

0301454

0303142

0302558

0302792

310979

0303164

0300492

0300516

0305280

0305359

0300462

0301452

0302561

0302647

0302559

02979901

0302660

0303147

0303141

0304691

0302559

0304911

0304690

0304691

0304911

0305190

0301452

0305189

1260560

0305284

0300487

0300479

0300507

0302965

0303159

0301697

0305251

0302914

0302968

0300459

PRODUCTION
release
01/18/08
ECN# 90-00123

DEUTZ CORPORATION
NORCROSS, GA USA

UNLESS OTHERWISE NOTED
GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167
0.X +/-0.2 MM
0.XX +/-0.06 MM
0.XXX +/-0.013 MM
SURFACE TEXTURE PER ISO 1302
CORNERS PER DIN 6784

DR BY: PAS

DATE

ECN ORIGIN: 90-00282

MATERIAL: SEE BOM

DESCRIPTION

PROJECT

SCALE: SHEET

1:10 1 of 1

90-00282

9/8/2010

9/8/2010

9/8/2010

9/8/2010

9/8/2010

9/8/2010

9/8/2010

90-00250

5/15/2009

5/15/2009

5/15/2009

5/15/2009

5/15/2009

5/15/2009

5/15/2009

001

7/23/2008

7/23/2008

7/23/2008

7/23/2008

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7/17/2008

7/17/2008

7/17/2008

7/17/2008

7/17/2008

7/17/2008

7/17/2008

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SIZE B 11x17 PART FORMAT



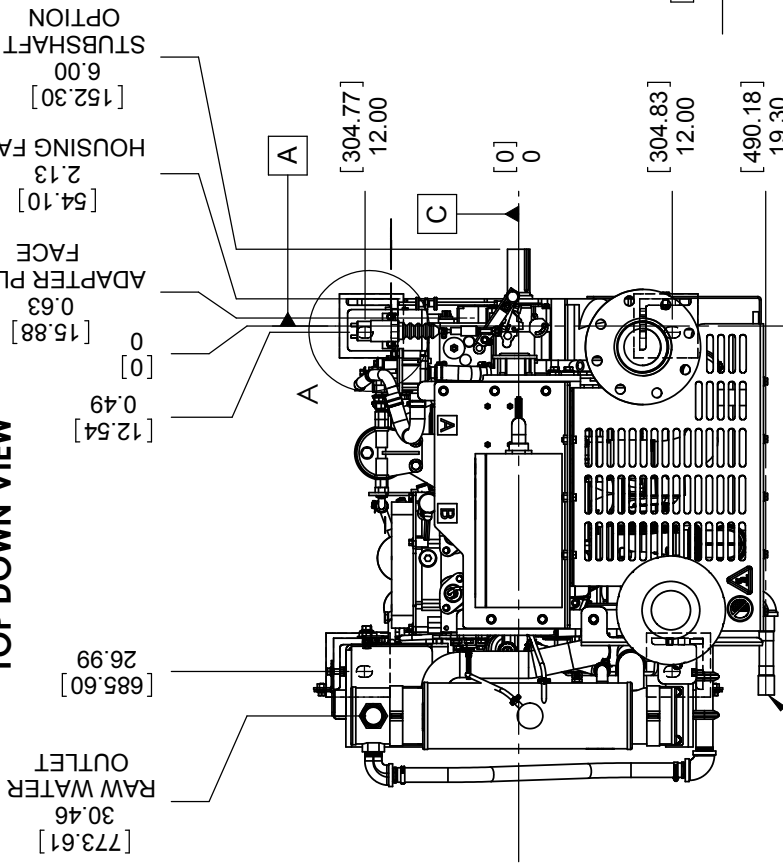
DATUMS

- A** - MOUNTING FACE OF FLYWHEEL
- B** - ENGINE CRANK HORIZONTAL ϕ
- C** - ENGINE CRANK VERTICAL ϕ

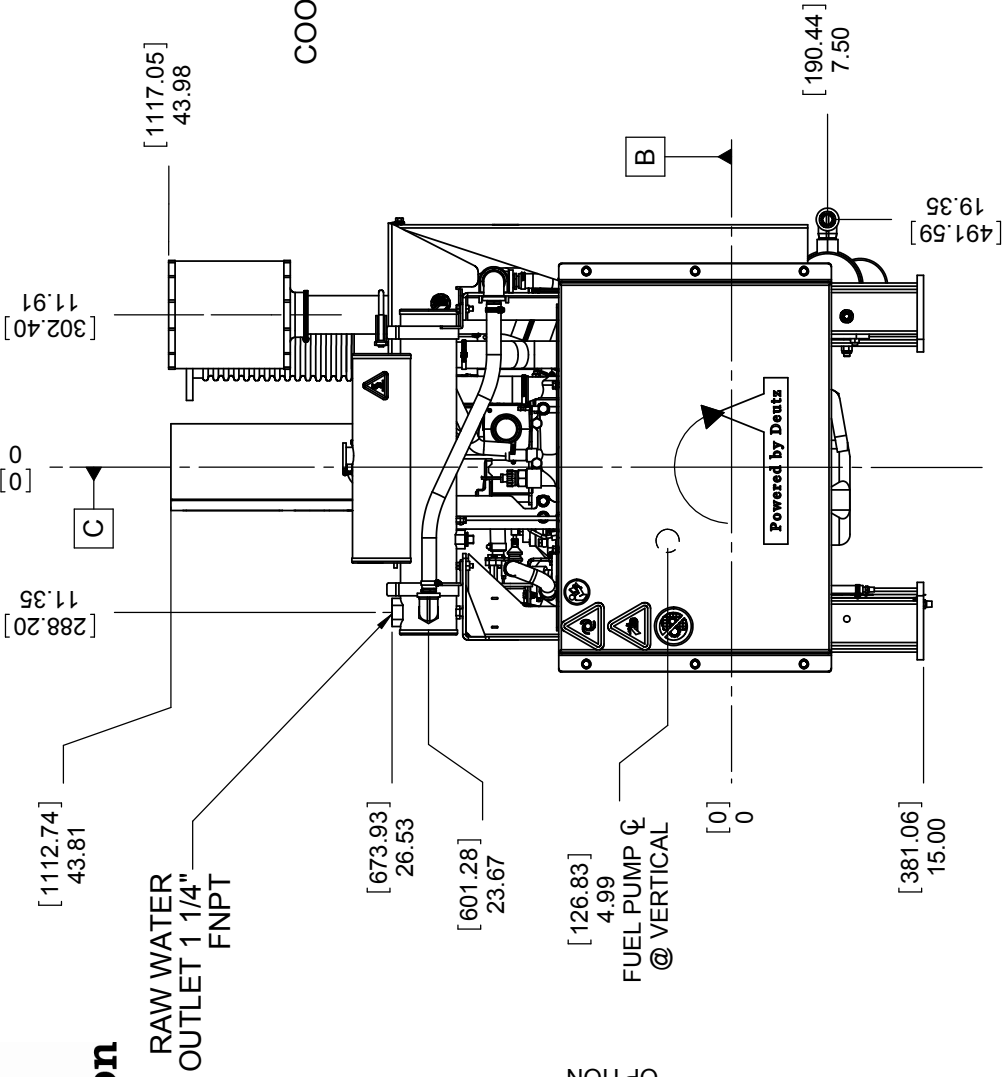
- CLOCKWISE ROTATION WHEN VIEWED FROM FRONT OF ENGINE

- CENTER OF GRAVITY estimated

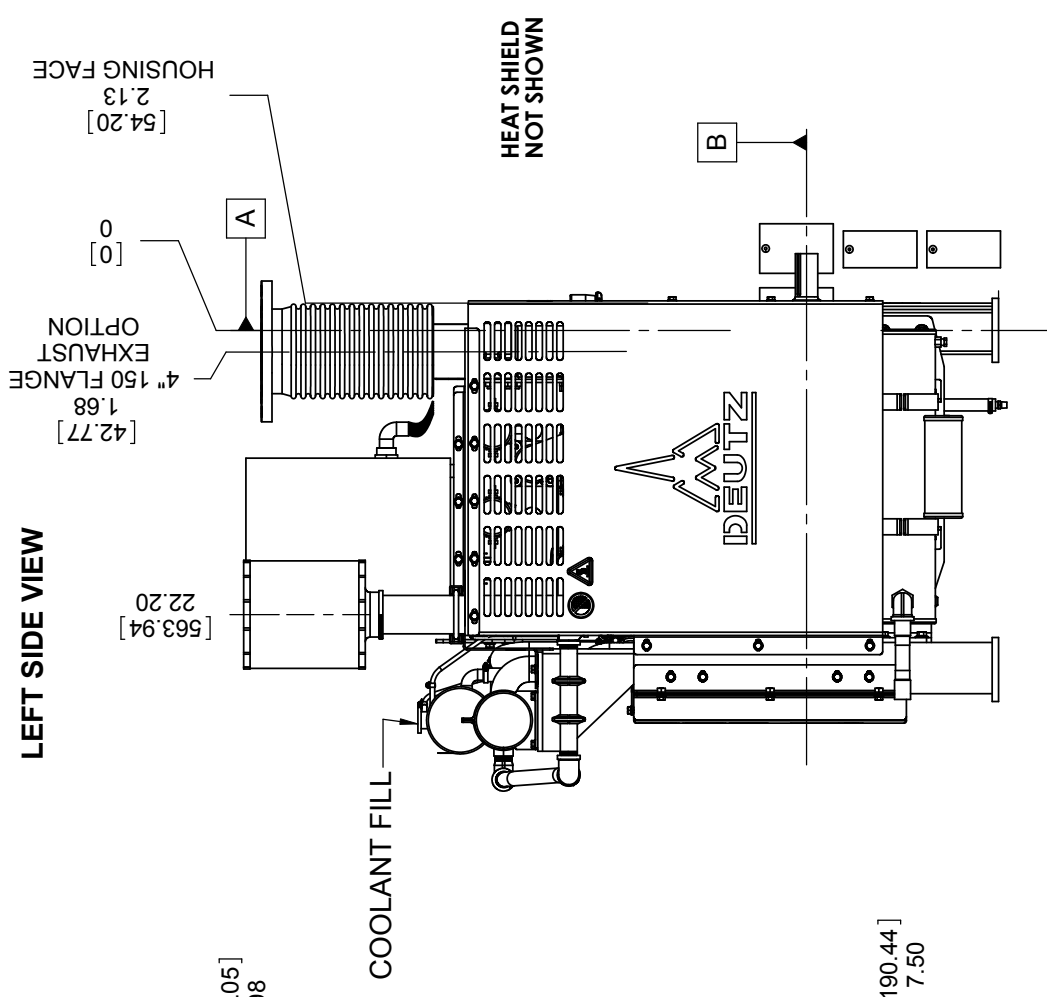
TOP DOWN VIEW



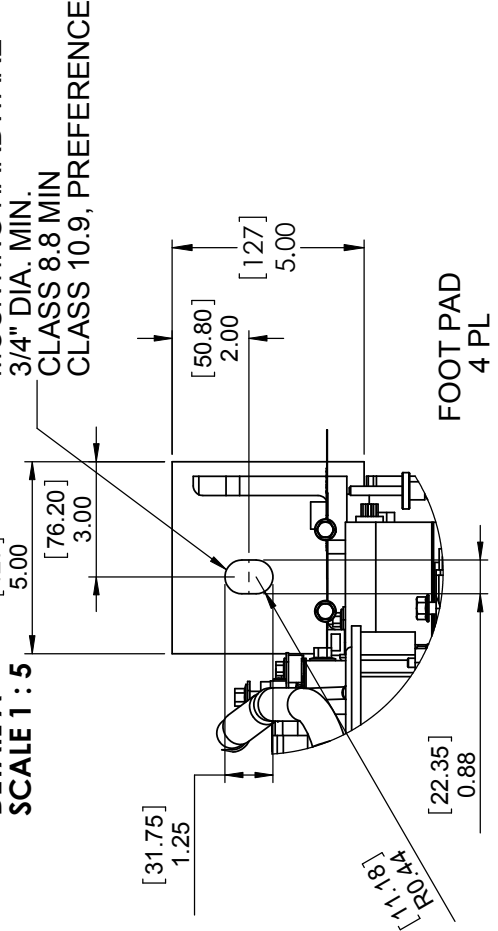
FRONT VIEW



LEFT SIDE VIEW



DETAIL A SCALE 1 : 5



DO NOT SCALE PRINT

- NOTES:**
1. RAW WATER SUPPLY: MINIMUM 1" DIAMETER PIPE
MAXIMUM WORKING PRESSURE: 60psi
 2. SEE SPECIFIC ENGINE DATA SHEET FOR REQUIRED FLOW
 3. 12V AUTOMATIC VALVE (24V OPTIONAL) WIRED TO ENGINE CONTROL PANEL WITH MANUAL BYPASS
 4. SEE NFPA 20 11.2.6.3 HEAT EXCHANGER WATER SUPPLY INSTALLATION FOR STANDARD CONFIGURATIONS

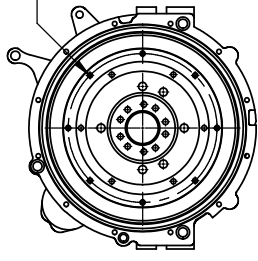
**DEUTZ CORPORATION
NORCROSS, GA USA**

DR BY:	PAS	DATE	10/28/2009
CK BY:	PAS	DATE	12/1/2009
APPROVED:	PAS	DATE	12/9/2009
ECN ORIGIN:	90-00227		
MATERIAL:	SEE BOM		
DESCRIPTION	DFP4 2012 Cm3X INSTALLATION		
DRAWING NUMBER	DC1274		
PROJECT	DFP4 2012Cm		
SCALE:	1:20		
SHEET	1		2

UNLESS OTHERWISE NOTED
 GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167
 0.XX +/0.2 MM
 0.XXX +/0.06 MM
 0.XXXX +/0.013 MM
 ISO 1302
 SURFACE TEXTURE PER ISO 1302
 CORNERS PER DIN 6784

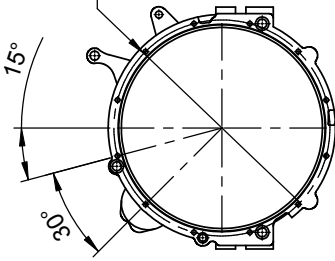
DIMS IN [] ARE MM

SAE 8/10



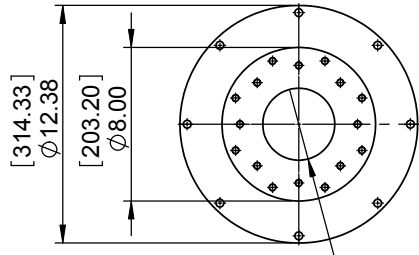
[295.30]
Ø11.63 BC
MINIUM HARDWARE- 10.9
FOR ALL FLYWHEEL CONNECTIONS

SAE 3 HOUSING

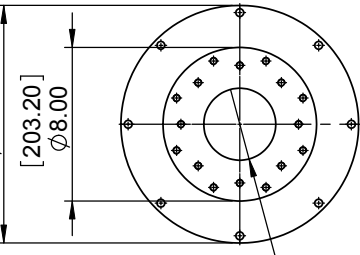


[428.60]
Ø16.87 BC

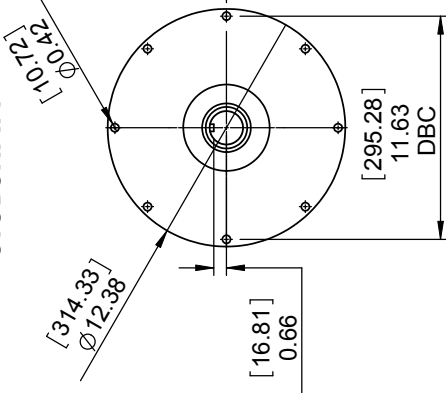
**OPTIONAL
ADAPTER PLATE DETAIL**



[314.33]
Ø12.38

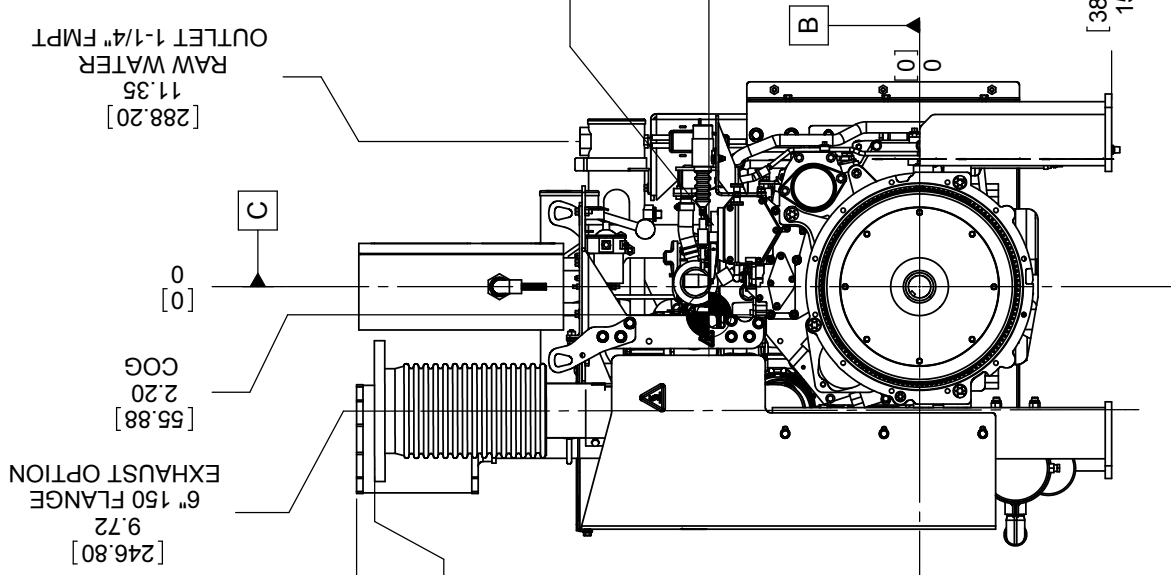


**OPTIONAL
STUBSHAFT**



[1072]
Ø0.42

REAR FLYWHEEL VIEW



[246.80]
9.72
6" 150 FLANGE
EXHAUST OPTION
[55.88]
2.20
COG
[0]
0

[288.20]
11.35
RAW WATER
OUTLET 1-1/4" FMP

[1117.05]
43.98
[1081.37]
42.57
EXHAUST OPTION

[0]
0
MOUNTING FACE
[16.21]
0.64
DRIVESHAFT FACE
[17.78]
0.70
ADAPTER FACE

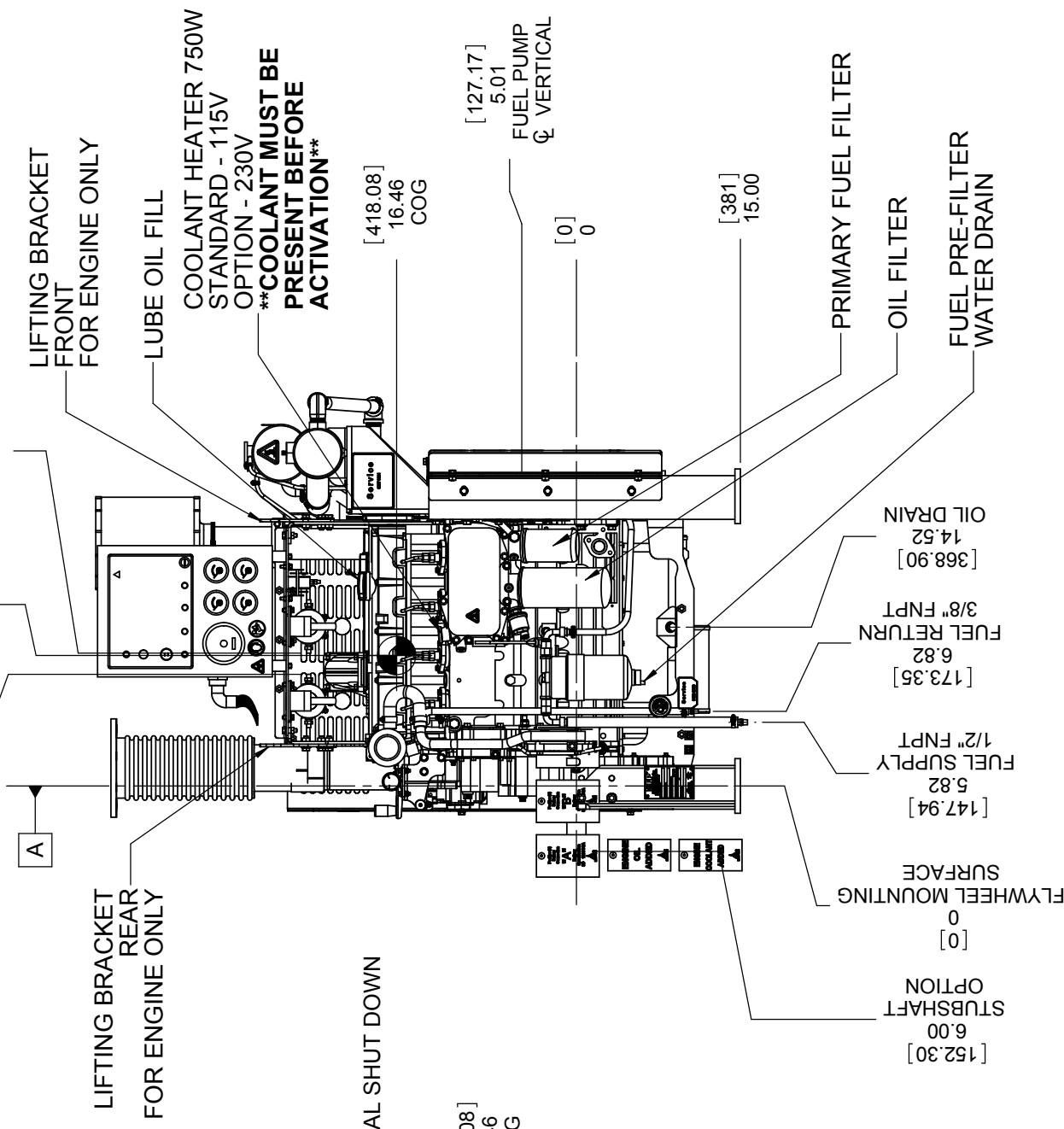
[174.63]
6.88
61
[203.20]
Ø8.00
71

CAUTION

**ALL PLUMBING/EXHAUST
CONNECTIONS MUST BE SUPPORTED
OR ISOLATED WITH NO STRESS
LOADING ON ENGINE UNIT**

[259.35]
10.21
BATTERY #1
CONN. POSITIVE
M10 STUD
[303.02]
11.93
COG
[308.38]
12.14
BATTERY
CONN. POSITIVE
M10 STUD

RIGHT SIDE VIEW



LIFTING BRACKET
REAR
FOR ENGINE ONLY

LIFTING BRACKET
FRONT
FOR ENGINE ONLY

LUBE OIL FILL
COOLANT HEATER 750W
STANDARD - 115V
OPTION - 230V
****COOLANT MUST BE
PRESENT BEFORE
ACTIVATION****

MANUAL SHUT DOWN

[418.08]
16.46
COG

[127.17]
5.01
FUEL PUMP
Ø VERTICAL

[0]
0

[152.30]
6.00
STUBSHAFT
OPTION
[0]
0
FLYWHEEL MOUNTING
SURFACE
[147.94]
5.82
FUEL SUPPLY
1/2" FNPT
[173.35]
6.82
FUEL RETURN
3/8" FNPT
[368.90]
14.52
OIL DRAIN

PRIMARY FUEL FILTER
OIL FILTER

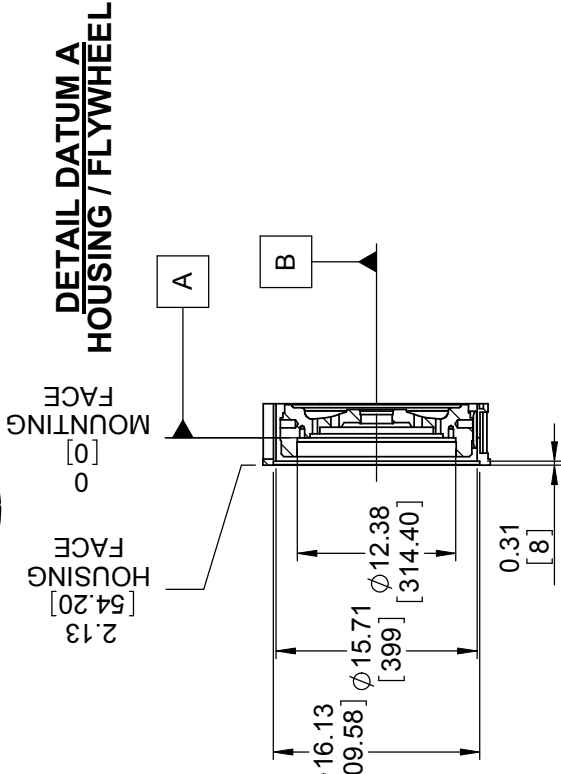
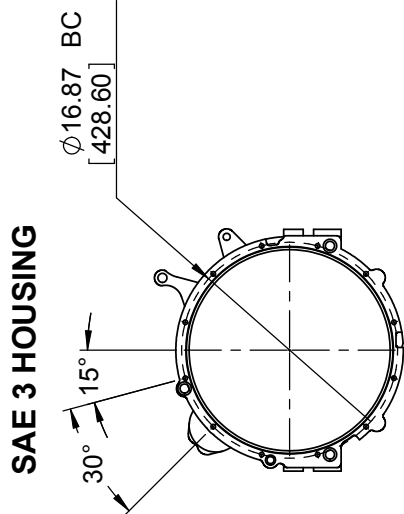
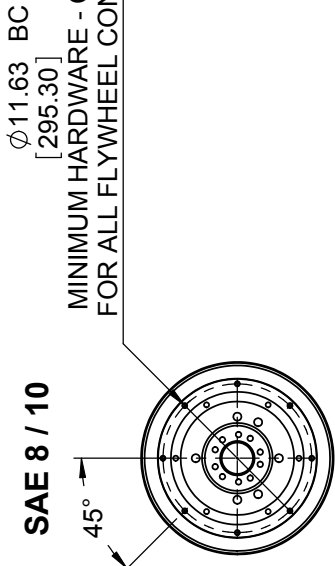
FUEL PRE-FILTER
WATER DRAIN

[381]
15.00

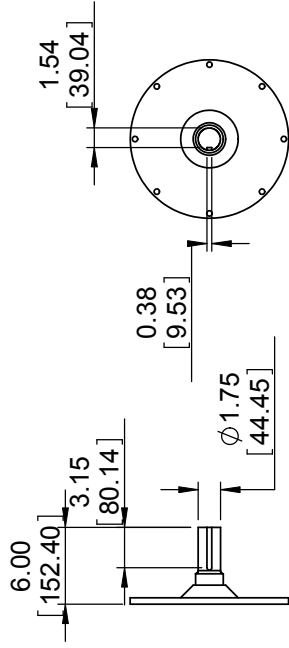
DO NOT SCALE PRINT

DEUTZ CORPORATION NORCROSS, GA USA		UNLESS OTHERWISE NOTED GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167 0.X +/0.2 MM +/0.1 IN 0.XX +/0.06 MM +/0.001 IN 0.XXX +/0.013 MM +/0.0003 IN SURFACE TEXTURE PER ISO 1302 PROJECTION: 	
DR BY:	DATE	ECN ORIGIN:	CORNERS PER DIN 6784
PAS	10/28/2009	90-00227	
CK BY:	DATE	MATERIAL:	SEE BOM
PAS	12/1/2009		
APPROVED:	DATE	DESCRIPTION	PROJECT
		DFP4 2012 Cm3X INSTALLATION	DFP4 2012Cm
		DRAWING NUMBER	SHEET
		DC1274	2 of 2

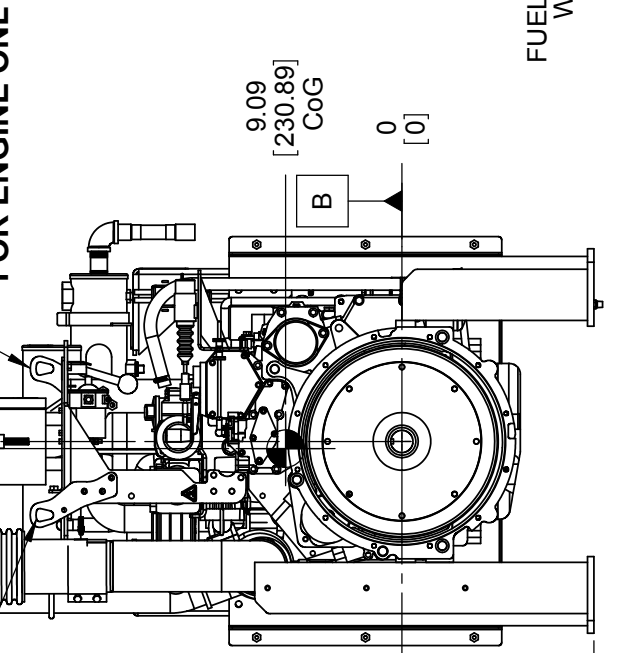
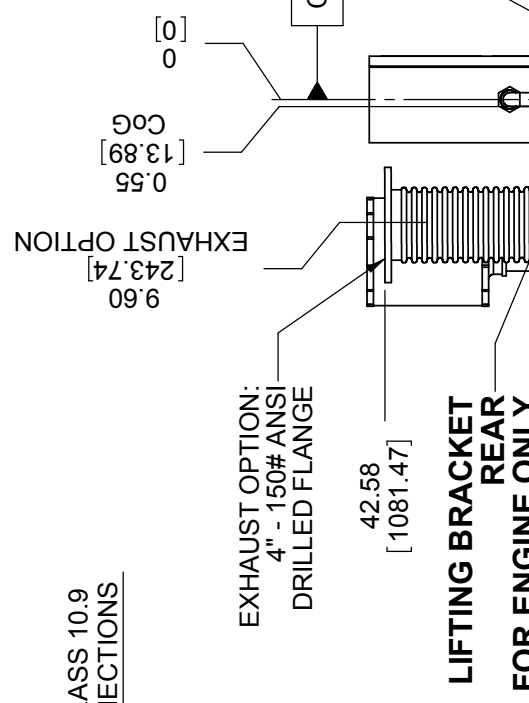
DIMS IN [] ARE MM



OPTIONAL STUB SHAFT DETAIL
 ENGAGEMENT FACTOR 3" MIN

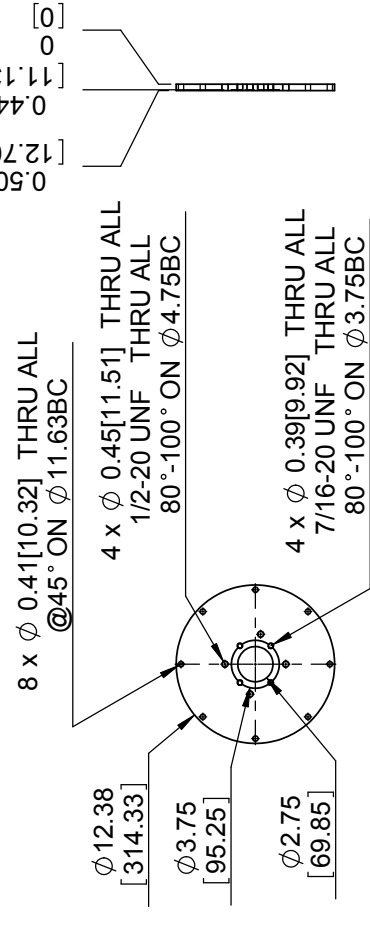


CAUTION
 ALL PLUMBING / EXHAUST CONNECTIONS MUST BE SUPPORTED OR ISOLATED WITH NO STRESS LOADING ON ENGINE UNIT

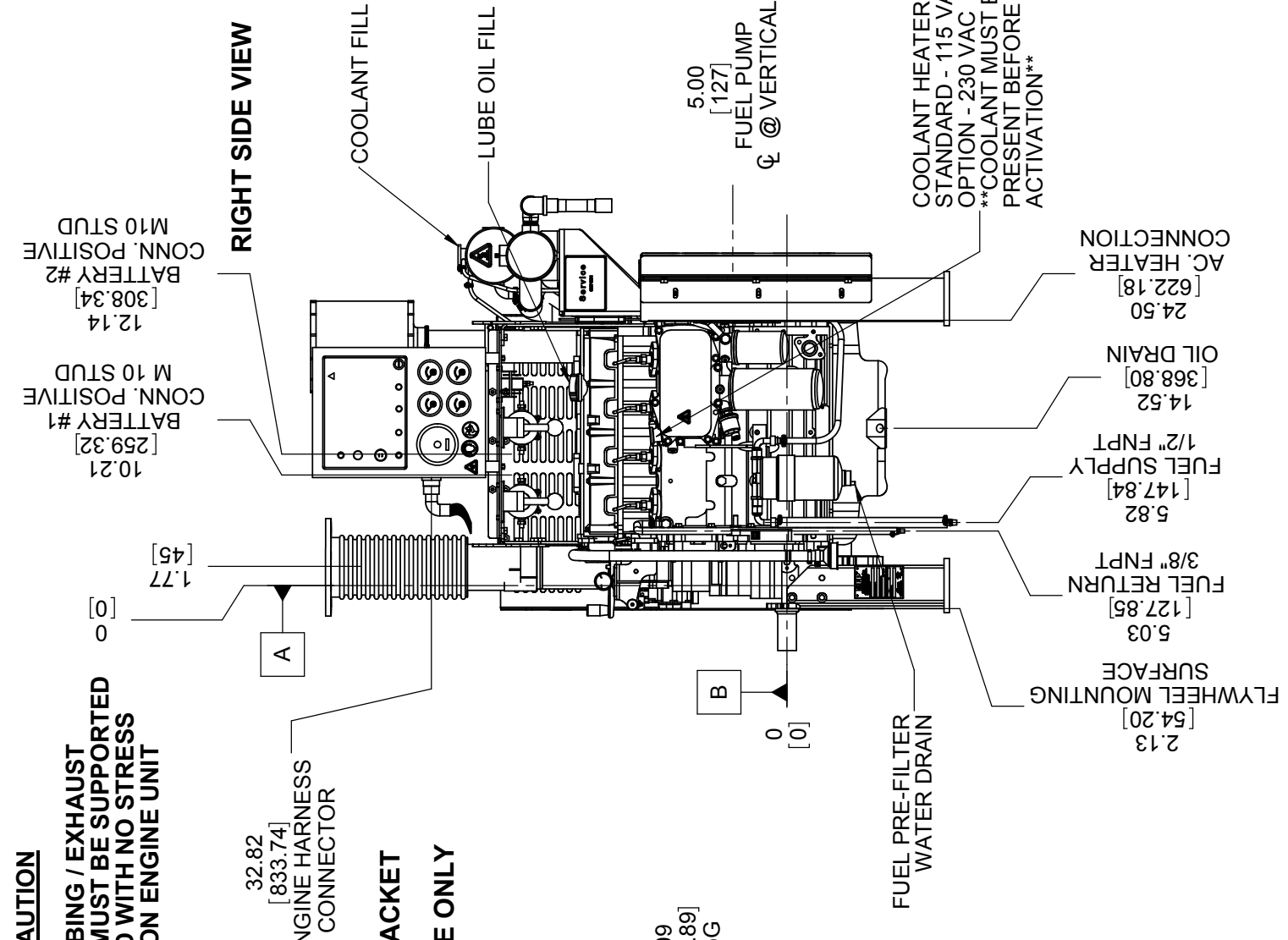


REAR FLYWHEEL VIEW

OPTIONAL ADAPTOR PLATE DETAIL



DIMENSIONS IN [] ARE MM



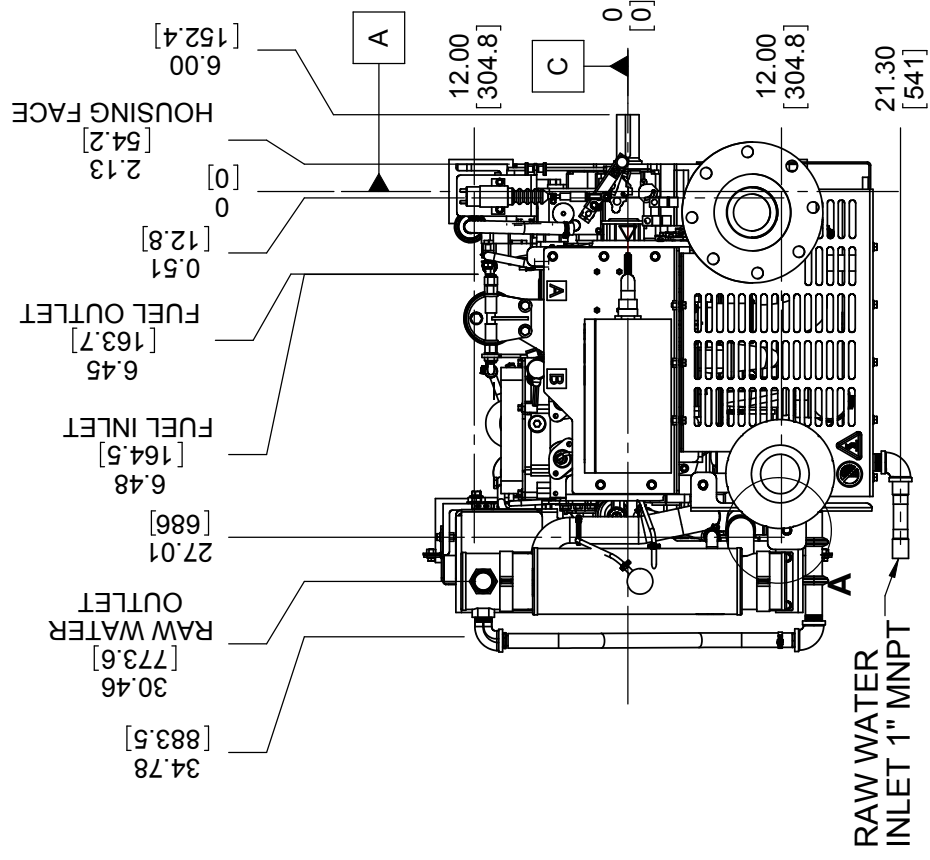
DO NOT SCALE PRINT

DEUTZ CORPORATION NORCROSS, GA USA		UNLESS OTHERWISE NOTED	
DR BY: EJM	DATE: 8/26/2010	ECN ORIGIN: 90-00282	GENERAL TOLERANCES: 0.XX ±0.2 MM 0.XXX ±0.06 MM 0.XXXX ±0.013 MM ISO 1302
CK BY: PAS	DATE: 09-10/2010	MATERIAL: SEE BOM	SURFACE TEXTURE PER ISO 1302
APPROVED: [Signature]	DATE: [Blank]	DESCRIPTION: DFP4 2012 TXX INSTALLATION	CORNERS PER DIN 6784
REV. [Blank]	DESCRIPTION [Blank]	PROJECT: DFP4 2012 T	PROJECTION: [Symbol]
SEE PAGE 1	DATE [Blank]	APPROVED [Blank]	SCALE: 1:15
DRAWING NUMBER: DC-1293		SHEET 2 of 2	

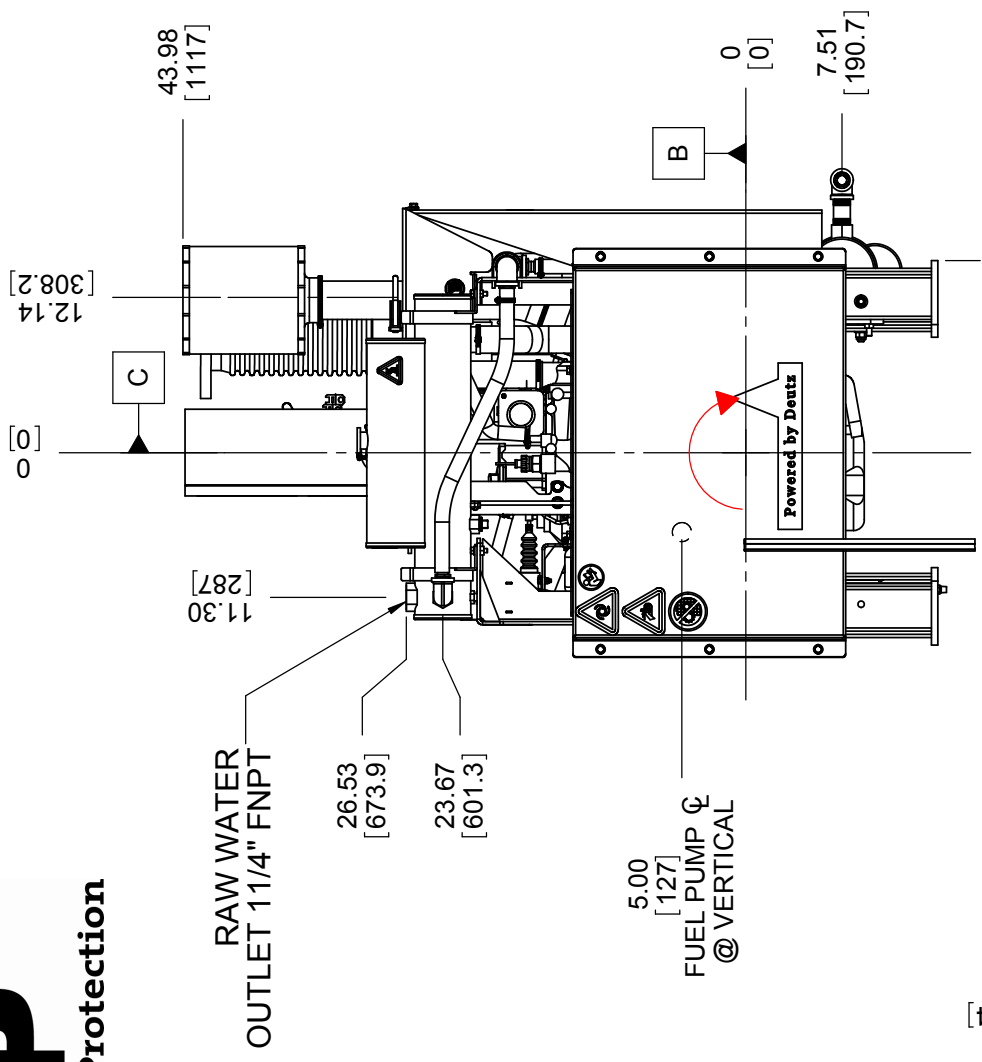


DATUMS

- A - MOUNTING FACE OF FLYWHEEL
- B - ENGINE CRANK HORIZONTAL ϕ
- C - ENGINE CRANK VERTICAL ϕ
- CLOCKWISE WHEN VIEWED FROM FRONT OF ENGINE
- CENTER OF GRAVITY estimated

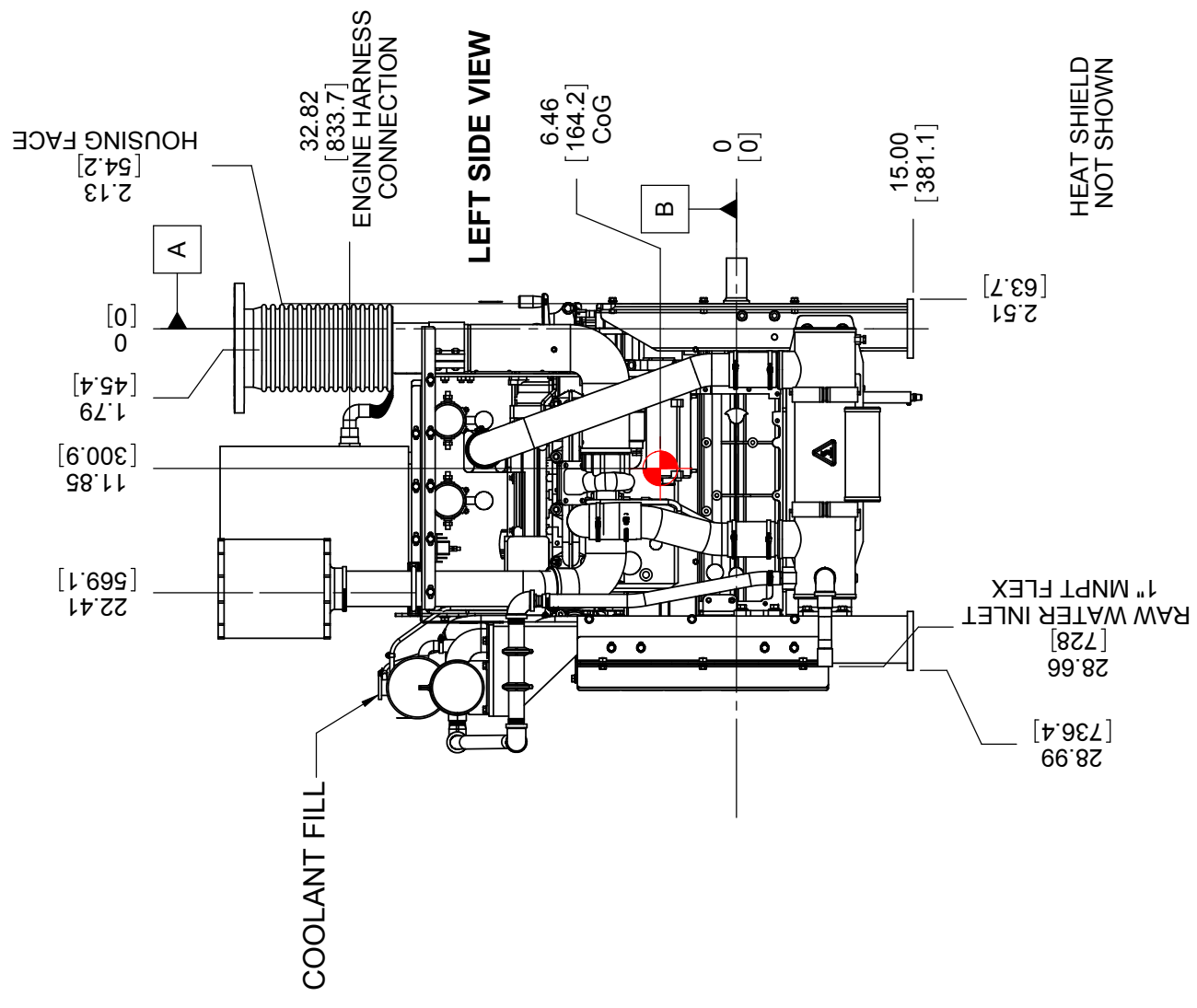
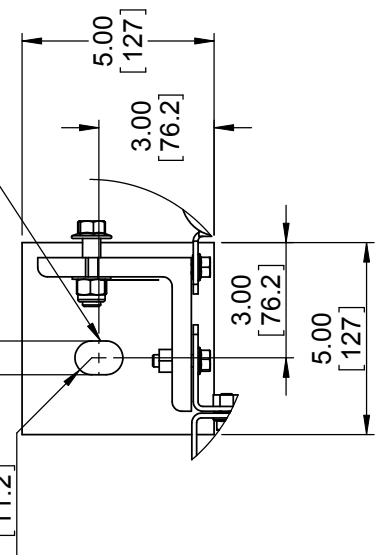


TOP DOWN VIEW



FRONT VIEW

DETAIL A
SCALE 1:5
FOOT PAD
4 PL
MOUNTING HARDWARE
3/4" DIA. MINIMUM,
CLASS 8.8, MINIMUM
CLASS 10.9, PREFERENCE



LEFT SIDE VIEW

UL US LISTED
INTERNAL COMBUSTION ENGINE FOR DRIVING CENTRIFUGAL PUMPS 3NLF
APPROVED

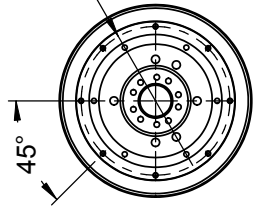
DO NOT SCALE PRINT

DEUTZ CORPORATION NORCROSS, GA USA		UNLESS OTHERWISE NOTED GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167 0.X +/0.2 MM +/0.1 IN 0.XX +/0.06 MM +/0.001 IN 0.XXX +/0.013 MM +/0.0003 IN SURFACE TEXTURE PER ISO 1302 CORNERS PER DIN 6784	
DR BY: EJM	DATE: 8/26/2010	ECN ORIGIN: 90-00282	PROJECTION:
CK BY: PAS	DATE: 09-10/2010	MATERIAL: SEE BOM	
APPROVED: UD	DATE:	DESCRIPTION: DFP4 2012 CXX INSTALLATION	PROJECT: DFP4 2012C
		DRAWING NUMBER: DC1294	SCALE: 1:15
			SHEET 1 of 2

REV.	DESCRIPTION	DATE	APPROVED
000	PRODUCTION CHECK IN	9/10/2010	PAS

DIMENSIONS IN [] ARE MM

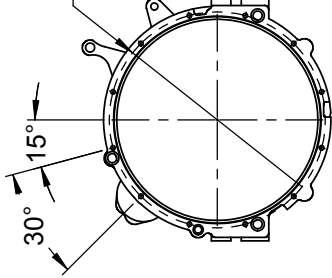
SAE 8 / 10



MINIMUM HARDWARE - CLASS 10.9
FOR ALL FLYWHEEL CONNECTIONS

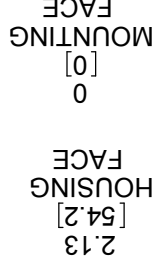
$\phi 11.63$ BC
[295.3]

SAE 3 HOUSING

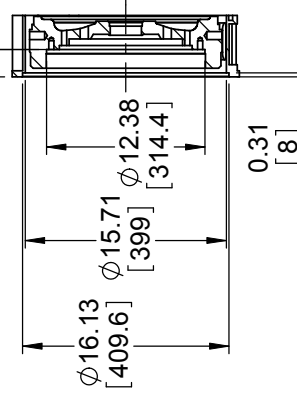


$\phi 16.87$ BC
[428.6]

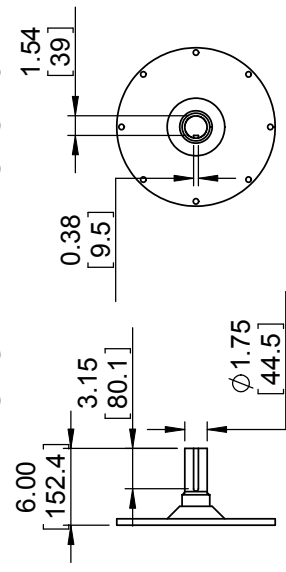
**DETAIL DATUM A
HOUSING / FLYWHEEL**



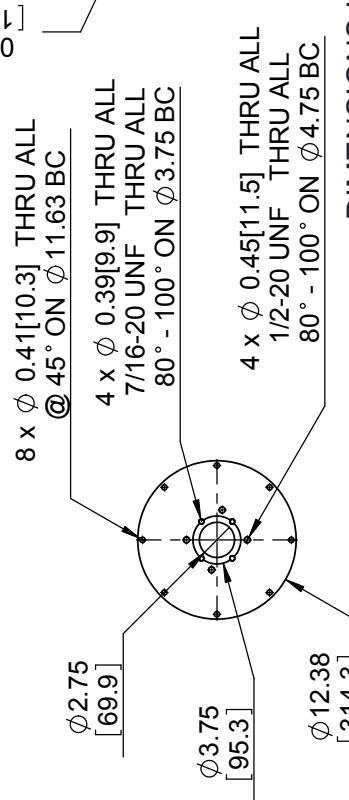
HOUSING FACE [54.2] 2.13
MOUNTING FACE [0] 0



**OPTIONAL STUB SHAFT DETAIL
ENGAGEMENT FACTOR 3" MIN**



OPTIONAL ADAPTOR PLATE DETAIL



DIMENSIONS IN [] ARE MM

CAUTION

ALL PLUMBING / EXHAUST CONNECTIONS MUST BE SUPPORTED OR ISOLATED WITH NO STRESS LOADING ON ENGINE UNIT

LIFTING BRACKET FRONT FOR ENGINE ONLY

ENGINE HARNESS CONNECTOR

32.82 [833.7]

BATTERY #1 & #2 CONN. NEGATIVE M12 BOLT W/STAR WASHER

6.46 [164.2] CoG

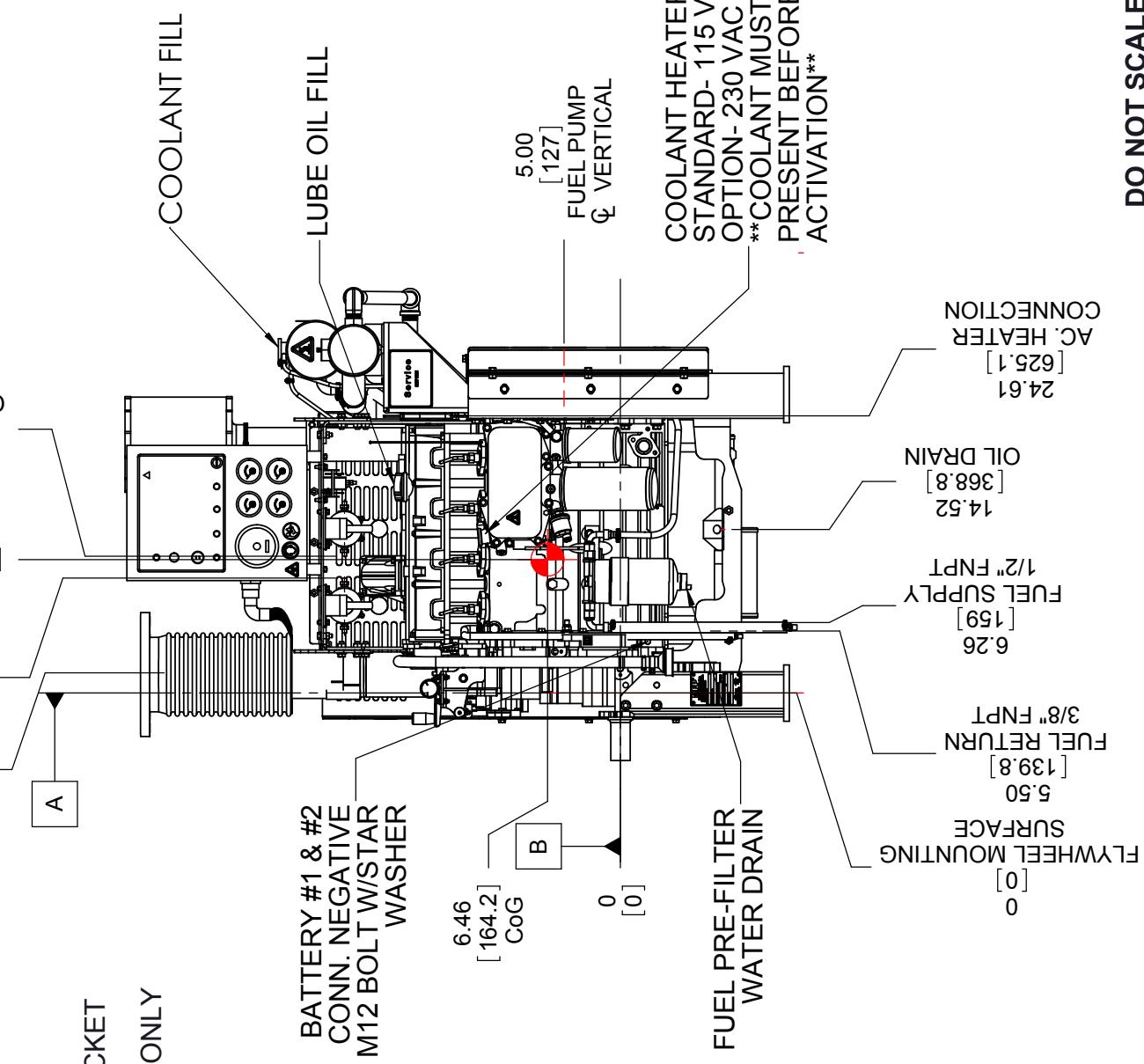
0 [0]

REAR FLYWHEEL VIEW

RAW WATER INLET 1" MNPT FLEX

BATTERY #1 CONN. POSITIVE [259.3] 10.21 [45.4] 1.79
M10 STUD
BATTERY #2 CONN. POSITIVE [308.3] 12.14 [300.9] 11.85
CoG
M10 STUD

RIGHT SIDE VIEW



COOLANT FILL

LUBE OIL FILL

5.00 [127]

FUEL PUMP ϕ VERTICAL

COOLANT HEATER 750W STANDARD- 115 VAC
OPTION- 230 VAC
COOLANT MUST BE PRESENT BEFORE ACTIVATION

FLYWHEEL MOUNTING SURFACE [0] 0
FUEL RETURN 3/8" FNPT [139.8] 5.50
FUEL SUPPLY 1/2" FNPT [159] 6.26
OIL DRAIN [368.8] 14.52
AC. HEATER CONNECTION [625.1] 24.61

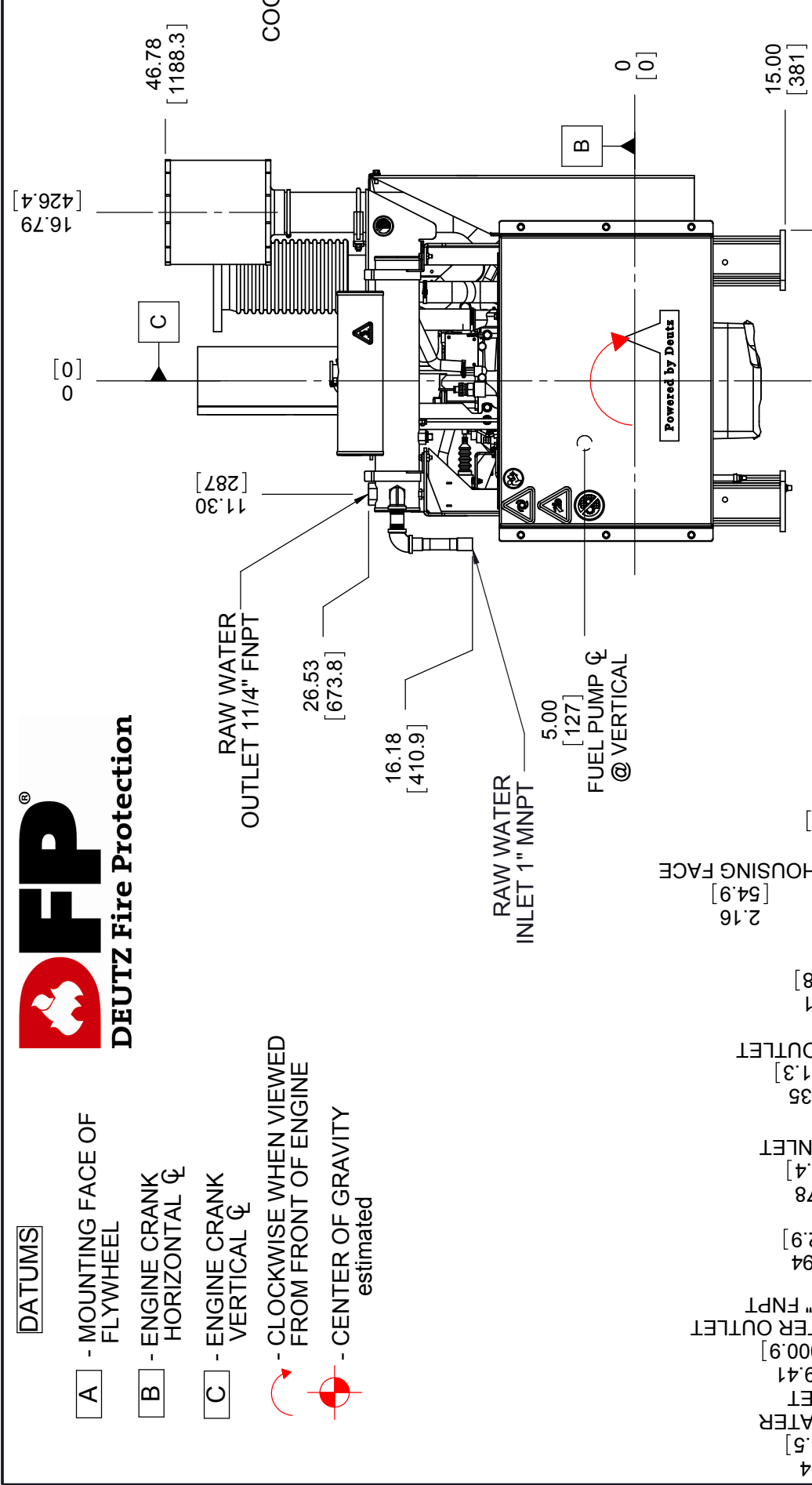
DO NOT SCALE PRINT

<p>DEUTZ CORPORATION NORCROSS, GA USA</p>		<p>UNLESS OTHERWISE NOTED</p> <p>GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167 0.XX ± 0.2 MM ± 0.1 IN 0.XXX ± 0.06 MM ± 0.001 IN 0.XXXX ± 0.013 MM ± 0.0003 IN</p> <p>SURFACE TEXTURE PER ISO 1302 CORNERS PER DIN 6784</p>	
DR BY:	EJM	DATE:	8/26/2010
CK BY:	PAS	DATE:	09-10/2010
APPROVED:	UD	DATE:	
ECN ORIGIN:	90-00282	MATERIAL:	SEE BOM
DESCRIPTION:	DFP4 2012 CXX INSTALLATION	PROJECT:	DFP4 2012C
DRAWING NUMBER:	DC1294	SCALE:	1:15
SHEET:	2	of	2



DATUMS

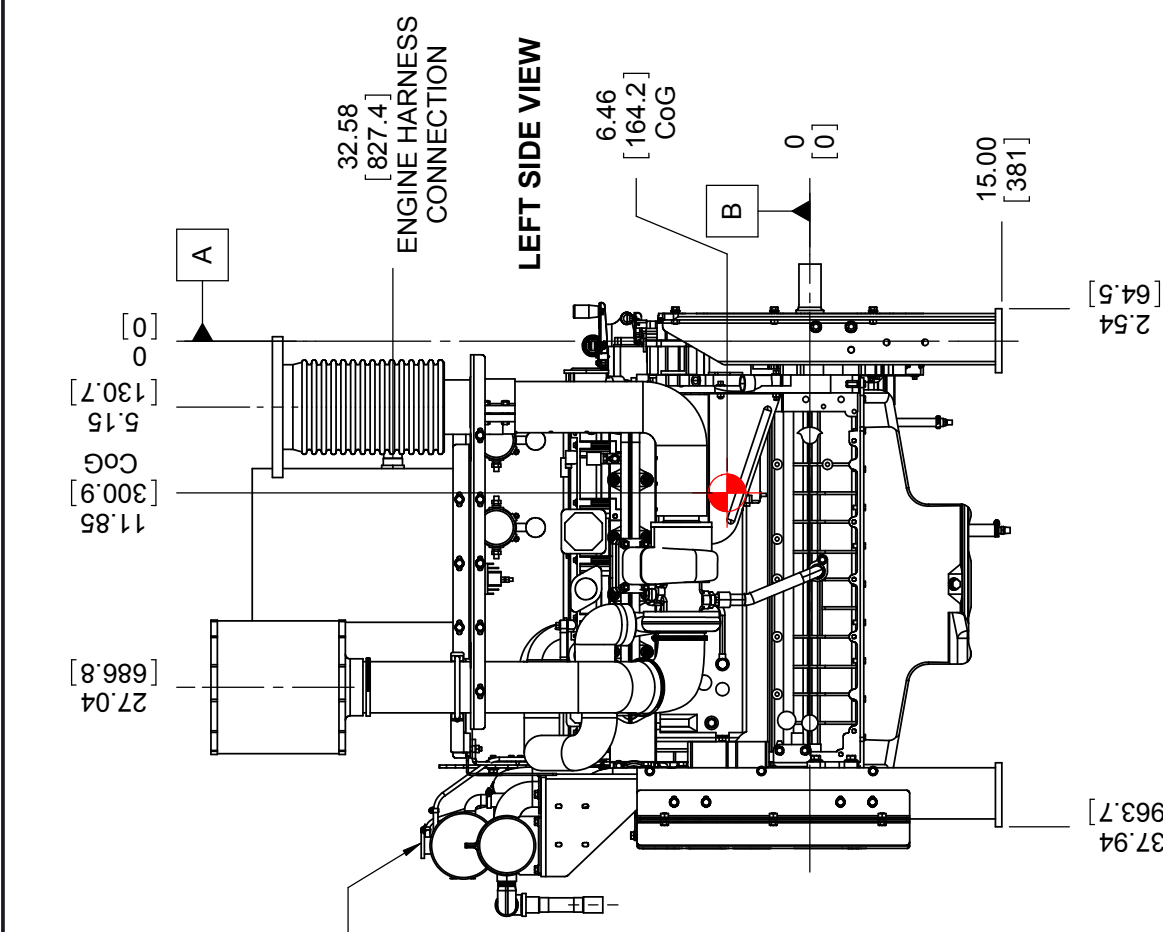
- A - MOUNTING FACE OF FLYWHEEL
- B - ENGINE CRANK HORIZONTAL ϕ
- C - ENGINE CRANK VERTICAL ϕ
- CLOCKWISE WHEN VIEWED FROM FRONT OF ENGINE
- CENTER OF GRAVITY estimated



FRONT VIEW

MOUNTING HARDWARE
3/4" DIA. MINIMUM,
CLASS 8.8, MINIMUM
CLASS 10.9, PREFERENCE

DETAIL A
SCALE 1:5
FOOT PAD
4 PL



LEFT SIDE VIEW

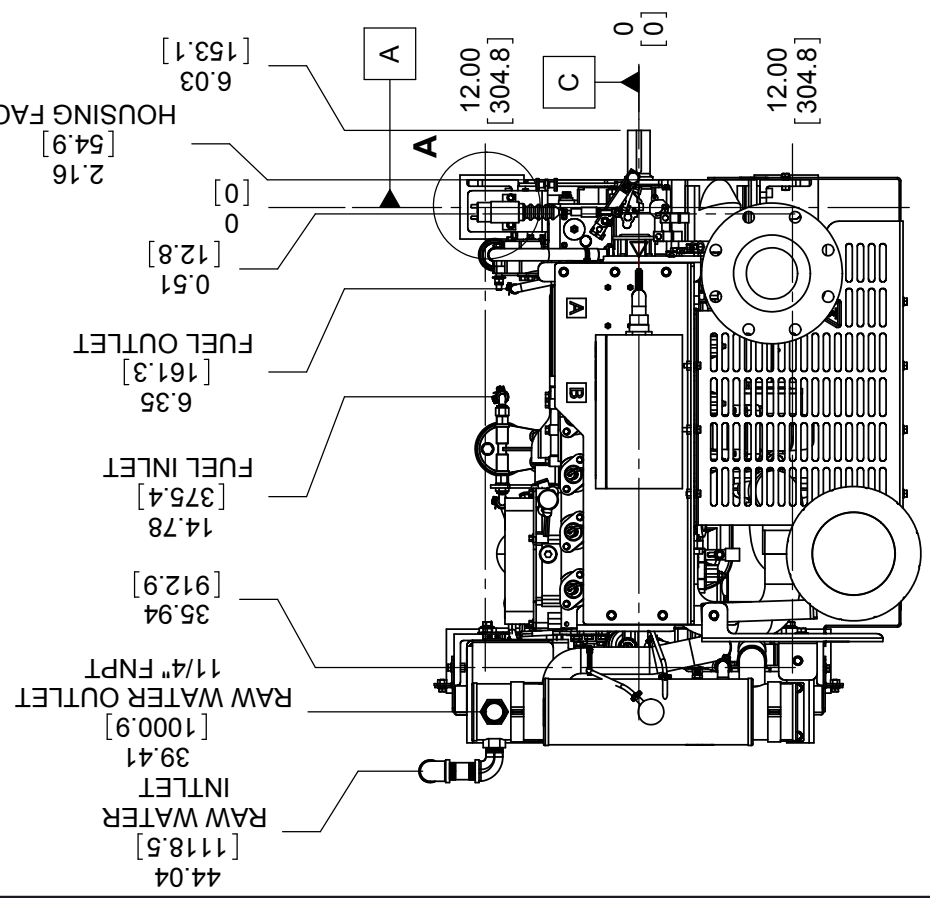
HEAT SHIELD
NOT SHOWN

UL US LISTED
F M APPROVED
INTERNAL COMBUSTION ENGINE
FOR DRIVING CENTRIFUGAL PUMPS
3NLF

DO NOT SCALE PRINT

DEUTZ CORPORATION NORCROSS, GA USA		UNLESS OTHERWISE NOTED GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167 0.XX +/0.2 MM 0.XXX +/0.06 MM 0.XXXX +/0.013 MM +/0.003 IN	
DR BY: EJM	DATE: 8/26/2010	ECN ORIGIN: 90-00282	PROJECTION:
CK BY: PAS	DATE: 09/10/2010	MATERIAL: SEE BOM	CORNERS PER DIN 6784
APPROVED: UD	DATE:	DESCRIPTION: DFP6 2012 TXX INSTALLATION	PROJECT: DFP4 2012C
		DRAWING NUMBER: DC1295	SCALE: 1:15
			SHEET 1 of 2

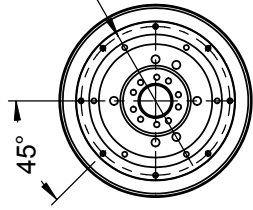
TOP DOWN VIEW



REV.	DESCRIPTION	DATE	APPROVED
000	PRODUCTION CHECK IN	9/10/2010	PAS

DIMENSIONS IN [] ARE MM

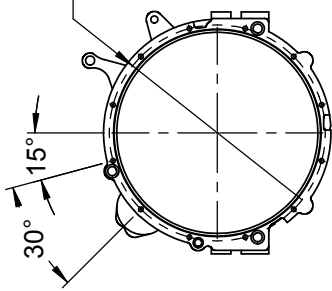
SAE 8 / 10



MINIMUM HARDWARE - CLASS 10.9 FOR ALL FLYWHEEL CONNECTIONS

$\phi 11.63$ BC [295.3]

SAE 3 HOUSING



$\phi 16.87$ BC [428.6]

LIFTING BRACKET REAR FOR ENGINE ONLY

41.99 [1066.6]

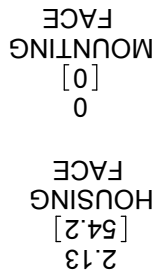
6" 150# ANSI FLANGE EXHAUST "OPTION" [264] 10.39 [294] 2.65 [67.3] CoG [0] 0 [0]

C

LIFTING BRACKET FRONT FOR ENGINE ONLY

ENGINE HARNESS CONNECTOR 32.58 [827.4]

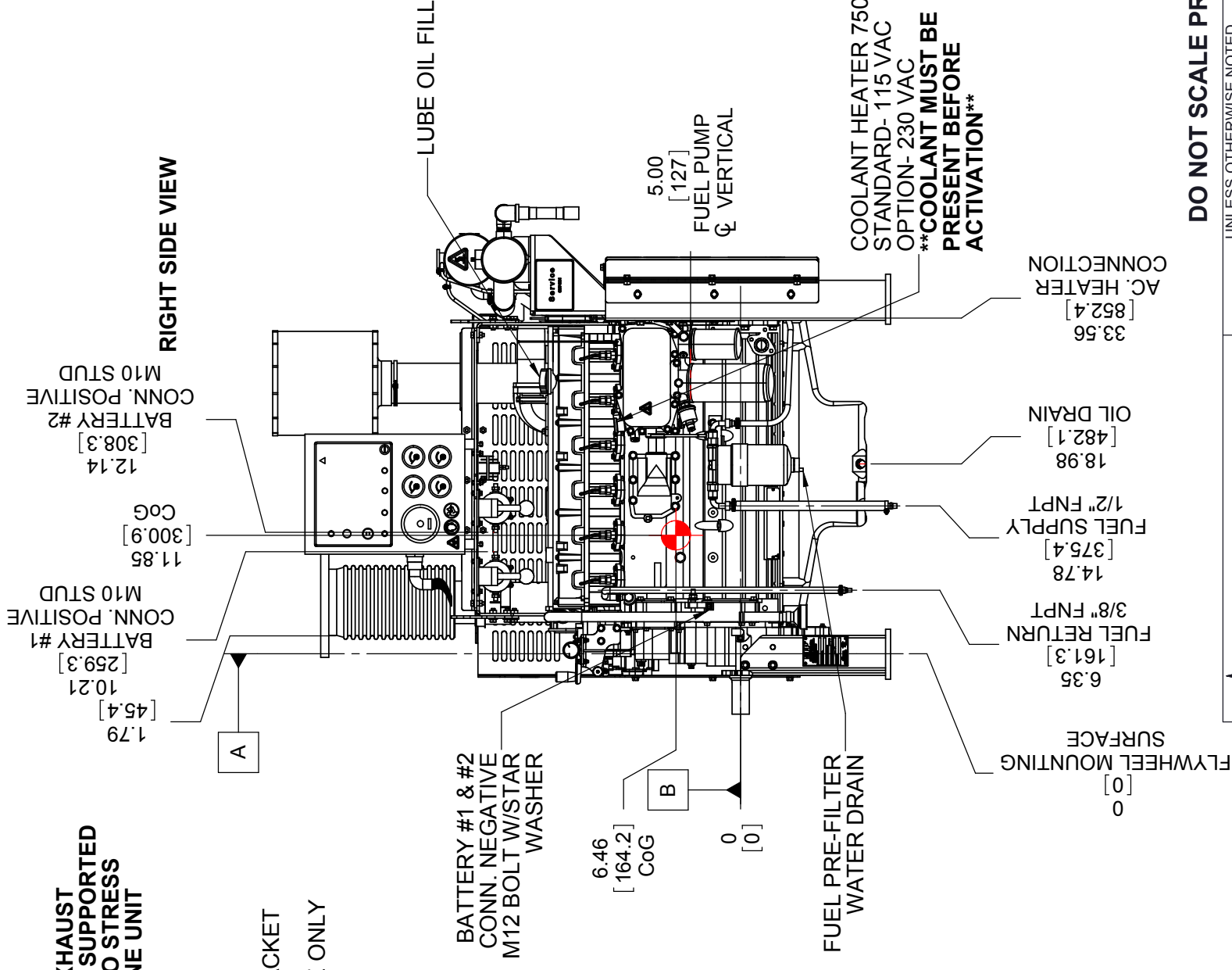
DETAIL DATUM A HOUSING / FLYWHEEL



HOUSING FACE [54.2] 2.13 [4.2] MOUNTING FACE [0] 0 [0]

CAUTION
ALL PLUMBING / EXHAUST CONNECTIONS MUST BE SUPPORTED OR ISOLATED WITH NO STRESS LOADING ON ENGINE UNIT

RIGHT SIDE VIEW



BATTERY #1 [259.3] 10.21 [45.4] 1.79 [0] 0 [0] CoG [300.9] 11.85 [308.3] 12.14 [0] 0 [0] BATTERY #2 [308.3] 12.14 [0] 0 [0] M10 STUD [0] 0 [0] M10 STUD [0] 0 [0]

BATTERY #1 & #2 CONN. NEGATIVE M12 BOLT W/STAR WASHER 6.46 [164.2] CoG [0] 0 [0]

B

FUEL PRE-FILTER WATER DRAIN

FLYWHEEL MOUNTING SURFACE [0] 0 [0]

FUEL RETURN 3/8" FNPT [161.3] 6.35 [0] 0 [0]

FUEL SUPPLY 1/2" FNPT [375.4] 14.78 [0] 0 [0]

OIL DRAIN [482.1] 18.98 [0] 0 [0]

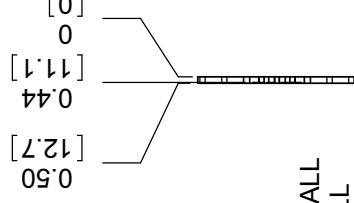
AC. HEATER CONNECTION [852.4] 33.56 [0] 0 [0]

COOLANT HEATER 750W STANDARD- 115 VAC OPTION- 230 VAC ****COOLANT MUST BE PRESENT BEFORE ACTIVATION****

FUEL PUMP ϕ VERTICAL 5.00 [127]

LUBE OIL FILL

REAR FLYWHEEL VIEW



0.50 [12.7] 0.44 [11.1] 0 [0] 0 [0]

OPTIONAL ADAPTOR PLATE DETAIL

8 x $\phi 0.41$ [10.3] THRU ALL @ 45° ON $\phi 11.63$ BC

4 x $\phi 0.39$ [9.9] THRU ALL 7/16-20 UNF THRU ALL 80° - 100° ON $\phi 3.75$ BC

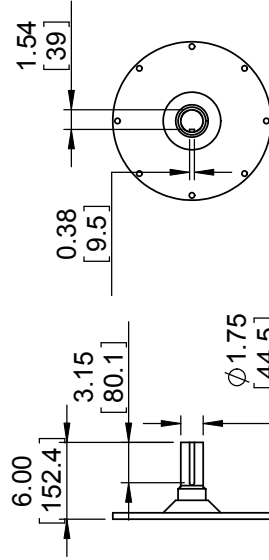
4 x $\phi 0.45$ [11.5] THRU ALL 1/2-20 UNF THRU ALL 80° - 100° ON $\phi 4.75$ BC

$\phi 2.75$ [69.9]

$\phi 3.75$ [95.3]

$\phi 12.38$ [314.3]

OPTIONAL STUB SHAFT DETAIL ENGAGEMENT FACTOR 3" MIN



6.00 [152.4] 3.15 [80.1] 0.38 [9.5] 1.54 [39]

$\phi 1.75$ [44.5]

DIMENSIONS IN [] ARE MM

REV.	DESCRIPTION	DATE	APPROVED
1	SEE PAGE 1		

DC1295

1:15 2 of 2

DO NOT SCALE PRINT

DEUTZ CORPORATION
NORCROSS, GA USA

UNLESS OTHERWISE NOTED
GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167
0.X ±0.2 MM
0.XX ±0.06 MM
0.XXX ±0.013 MM
ISO 1302
CORNERS PER DIN 6784

DR BY: EJM DATE: 8/26/2010
ECN ORIGIN: 90-00282

CK BY: PAS DATE: 09/10/2010
MATERIAL: SEE BOM

APPROVED: UD

PROJECT: DFP6 2012 TXX INSTALLATION

DRAWING NUMBER: DFP4 2012C

SHEET: 2 of 2

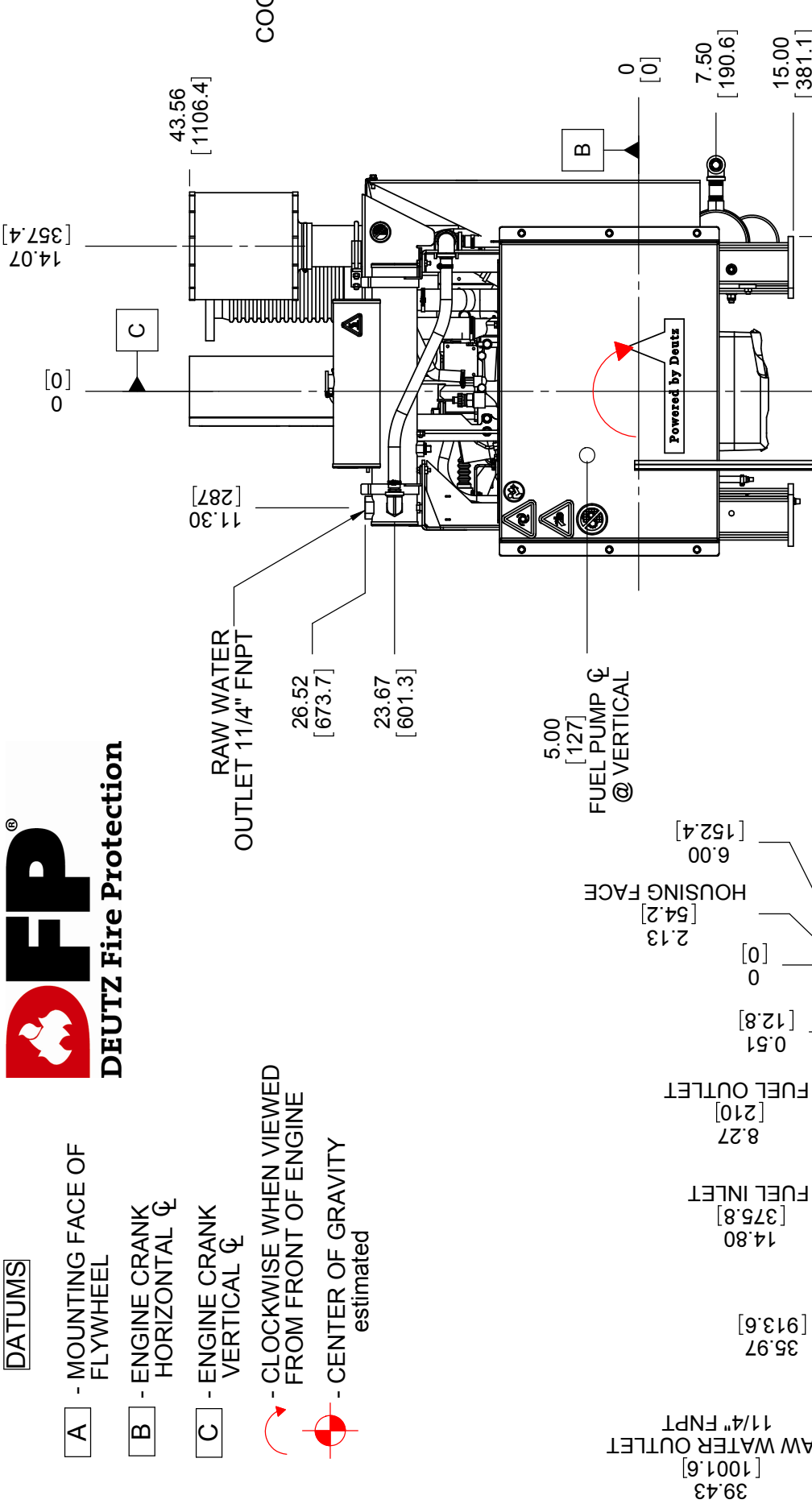
SCALE: 1:15

SIZE B 11x17 PART FORMAT

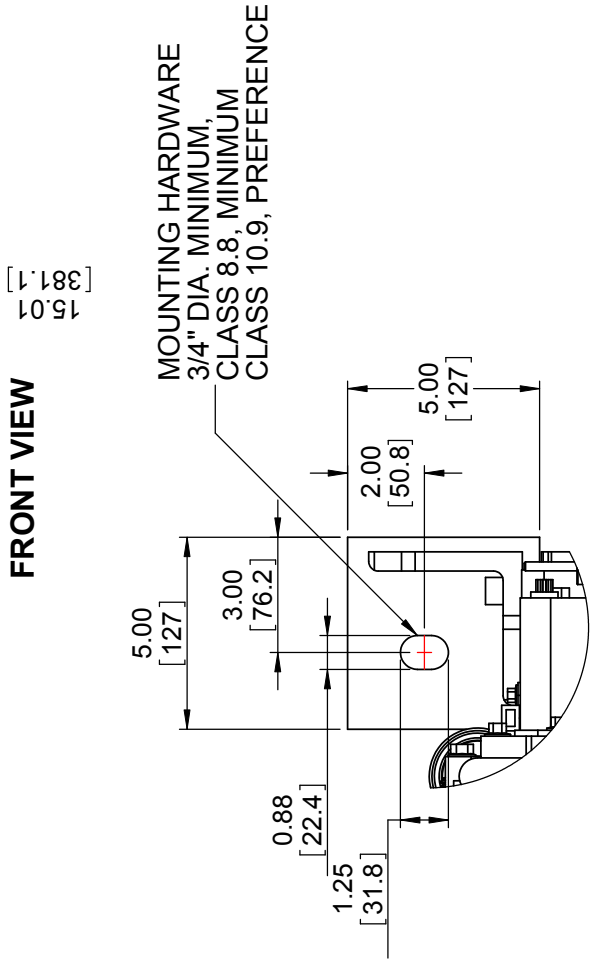


DATUMS

- A - MOUNTING FACE OF FLYWHEEL
- B - ENGINE CRANK HORIZONTAL ϕ
- C - ENGINE CRANK VERTICAL ϕ
- CLOCKWISE WHEN VIEWED FROM FRONT OF ENGINE
- CENTER OF GRAVITY estimated



FRONT VIEW



DETAIL A
SCALE 1:5
FOOT PAD
4 PL

HEAT SHIELD NOT SHOWN

DO NOT SCALE PRINT

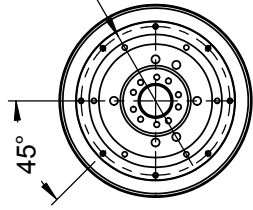
UL US LISTED
INTERNAL COMBUSTION ENGINE FOR DRIVING CENTRIFUGAL PUMPS 3NLF
F M APPROVED

DEUTZ CORPORATION NORCROSS, GA USA		UNLESS OTHERWISE NOTED GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167 0.X +/0.2 MM +/0.1 IN 0.XX +/0.06 MM +/0.001 IN 0.XXX +/0.013 MM +/0.0003 IN	
DR BY: EJM	DATE: 9/2/2010	ECN ORIGIN: 90-00282	PROJECTION:
CK BY:	DATE: 09/10/2010	MATERIAL: SEE BOM	CORNERS PER DIN 6784
APPROVED:	DATE:	DESCRIPTION: DFP6 2012 CXX INSTALLATION	PROJECT: DFP6 2012C
		DRAWING NUMBER: DC1296	SCALE: 1:15
			SHEET 1 of 2

REV.	DESCRIPTION	DATE	PAS	APPROVED
000	PRODUCTION CHECK IN	9/10/2010		

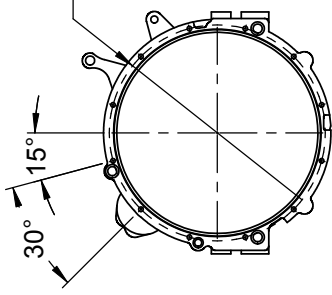
DIMENSIONS IN [] ARE MM

SAE 8 / 10

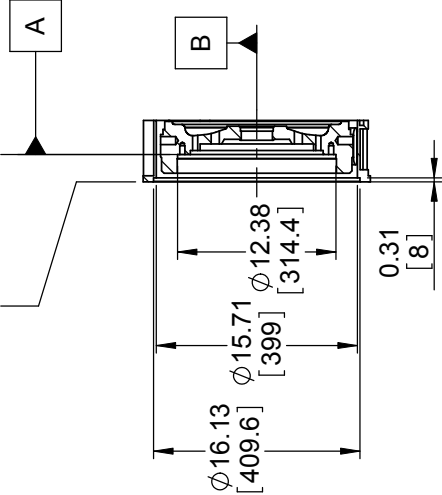


MINIMUM HARDWARE - CLASS 10.9
FOR ALL FLYWHEEL CONNECTIONS

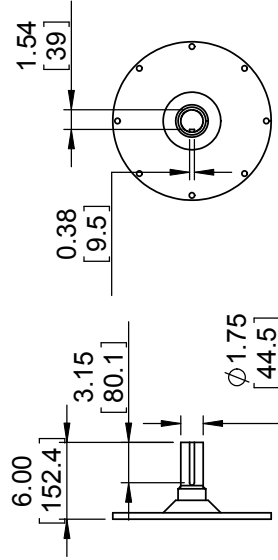
SAE 3 HOUSING



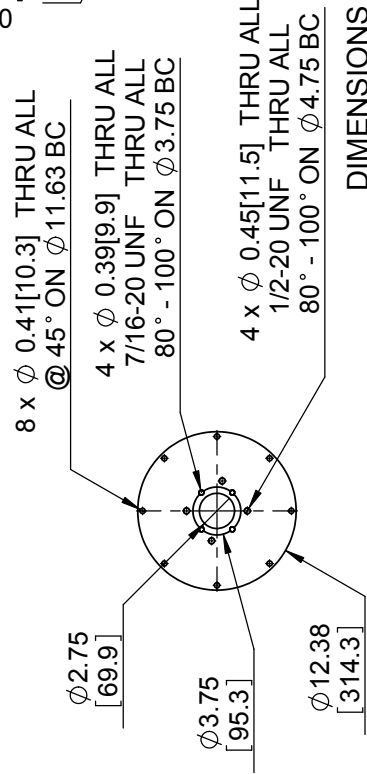
HOUSING FACE [54.2] [2.13]
MOUNTING FACE [0]
DETAIL DATUM A
HOUSING / FLYWHEEL



OPTIONAL STUB SHAFT DETAIL
ENGAGEMENT FACTOR 3" MIN



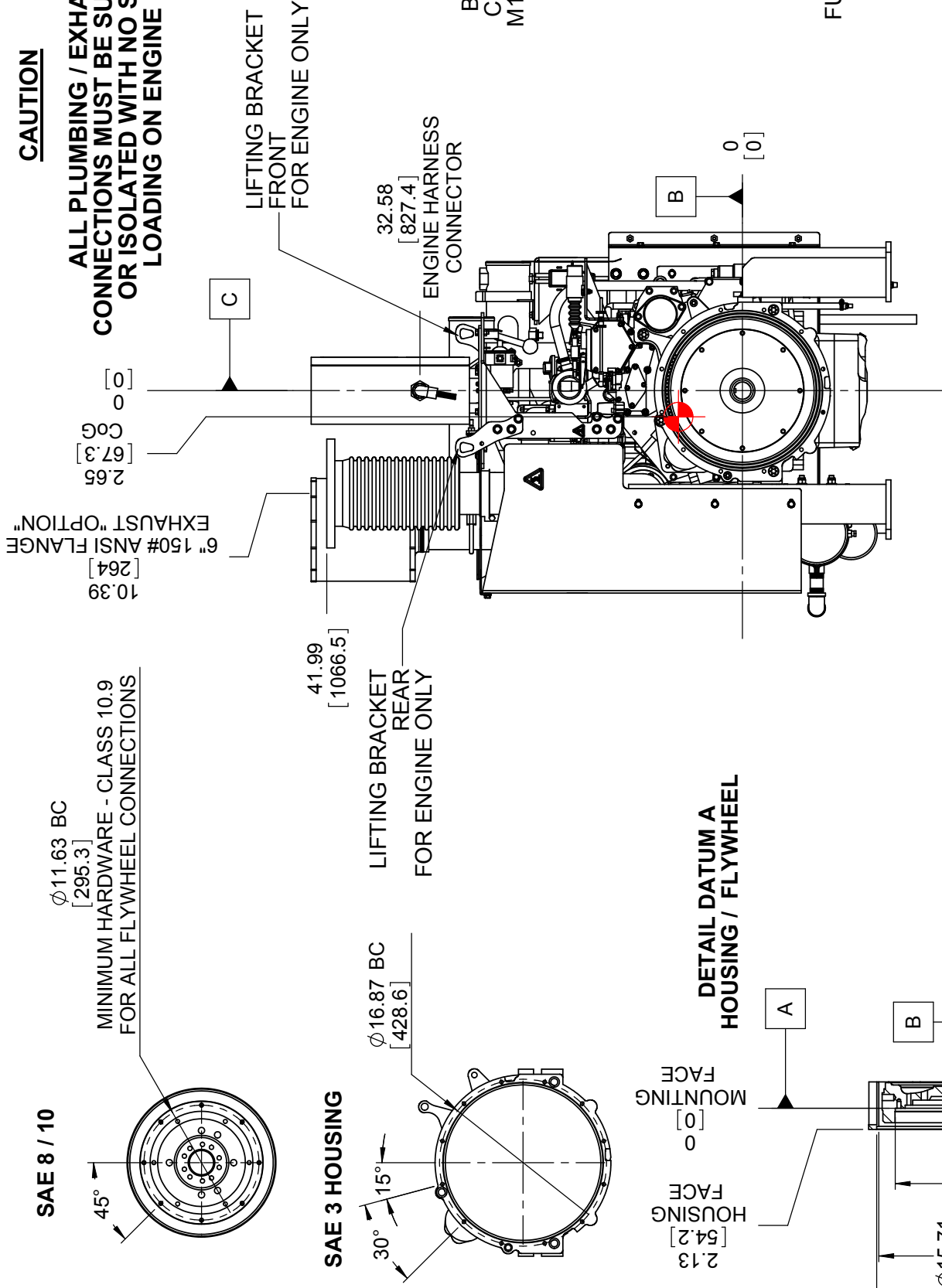
OPTIONAL ADAPTOR PLATE DETAIL



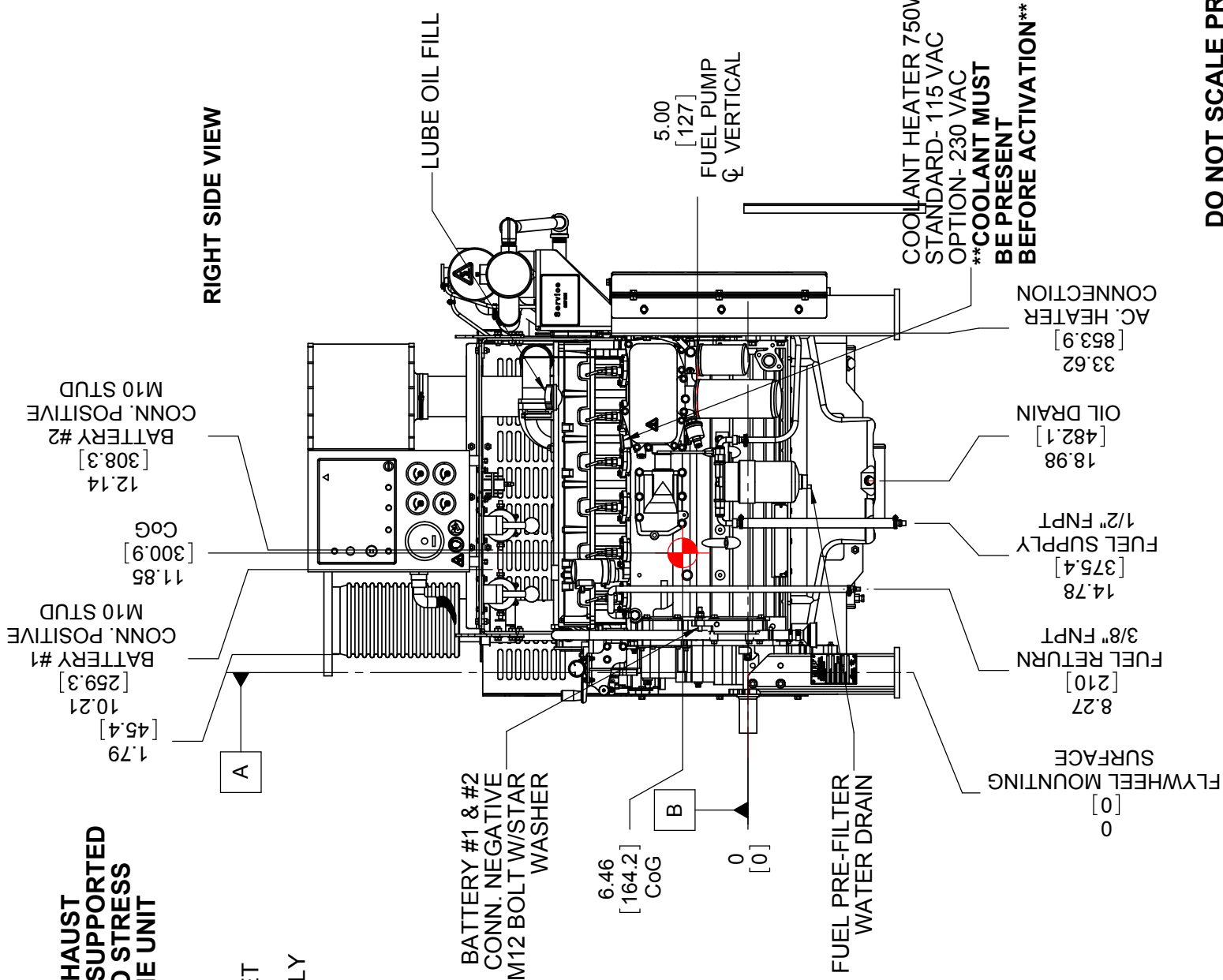
DIMENSIONS IN [] ARE MM

CAUTION

ALL PLUMBING / EXHAUST CONNECTIONS MUST BE SUPPORTED OR ISOLATED WITH NO STRESS LOADING ON ENGINE UNIT



REAR FLYWHEEL VIEW



RIGHT SIDE VIEW

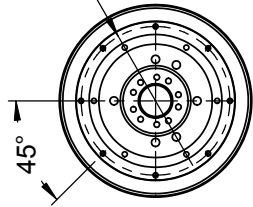
6" 150# ANSI FLANGE EXHAUST "OPTION" [264] [10.39]
LIFTING BRACKET REAR FOR ENGINE ONLY 41.99 [1066.5]
LIFTING BRACKET FRONT FOR ENGINE ONLY [0]
ENGINE HARNESS CONNECTOR 32.58 [827.4]
BATTERY #1 & #2 M12 BOLT W/STAR WASHER
FUEL PRE-FILTER WATER DRAIN
FLYWHEEL MOUNTING SURFACE [0]
FUEL RETURN 3/8" FNPT [210] [8.27]
FUEL SUPPLY 1/2" FNPT [375.4] [14.78]
OIL DRAIN [482.1] [18.98]
AC HEATER CONNECTION [853.9] [33.62]
COOLANT HEATER 750W STANDARD- 115 VAC OPTION- 230 VAC **COOLANT MUST BE PRESENT BEFORE ACTIVATION**
FUEL PUMP & VERTICAL 5.00 [127]
LUBE OIL FILL
BATTERY #1 POSITIVE M10 STUD [259.3] [10.21]
BATTERY #1 COG [300.9] [11.85]
BATTERY #2 POSITIVE M10 STUD [308.3] [12.14]
BATTERY #2 COG [300.9] [11.85]

DO NOT SCALE PRINT

		UNLESS OTHERWISE NOTED GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167 0.XX ±0.2 MM 0.XXX ±0.06 MM 0.XXXX ±0.013 MM SURFACE TEXTURE PER ISO 1302 CORNERS PER DIN 6784	
DR BY: EJM	DATE: 9/2/2010	ECN ORIGIN: 90-00282	PROJECT: DFP6 2012 CXX INSTALLATION
CK BY:	DATE: 09/10/2010	MATERIAL: SEE BOM	SCALE: 1:15
APPROVED: DATE	DESCRIPTION	DRAWING NUMBER	SHEET 2 of 2
		DC1296	

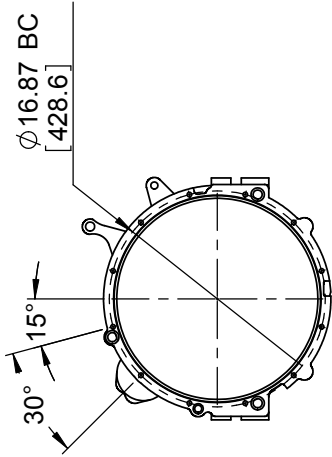
REV.	DESCRIPTION	DATE	APPROVED
SEE PAGE 1			

SAE 8 / 10



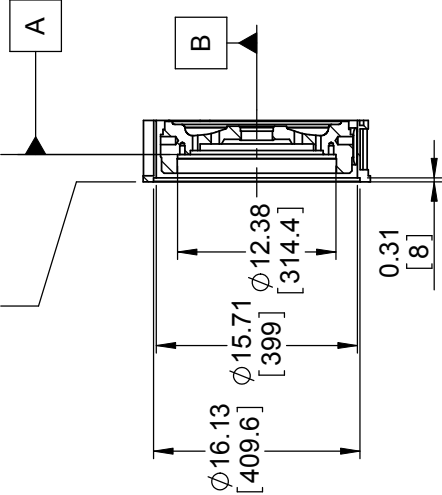
MINIMUM HARDWARE - CLASS 10.9
FOR ALL FLYWHEEL CONNECTIONS

SAE 3 HOUSING

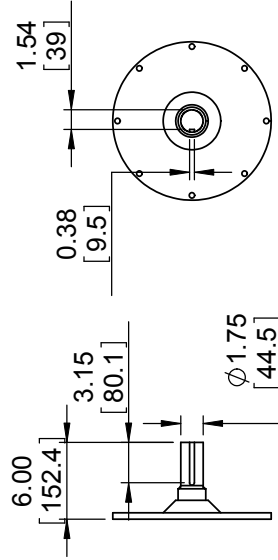


HOUSING FACE
[54.2]
2.13
MOUNTING FACE
[0]
0

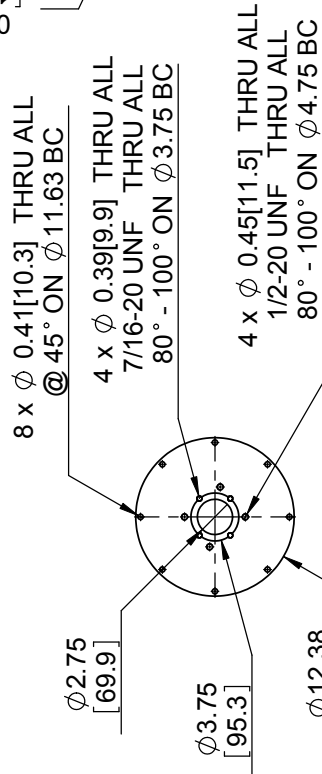
DETAIL DATUM A
HOUSING / FLYWHEEL



OPTIONAL STUB SHAFT DETAIL
ENGAGEMENT FACTOR 3" MIN



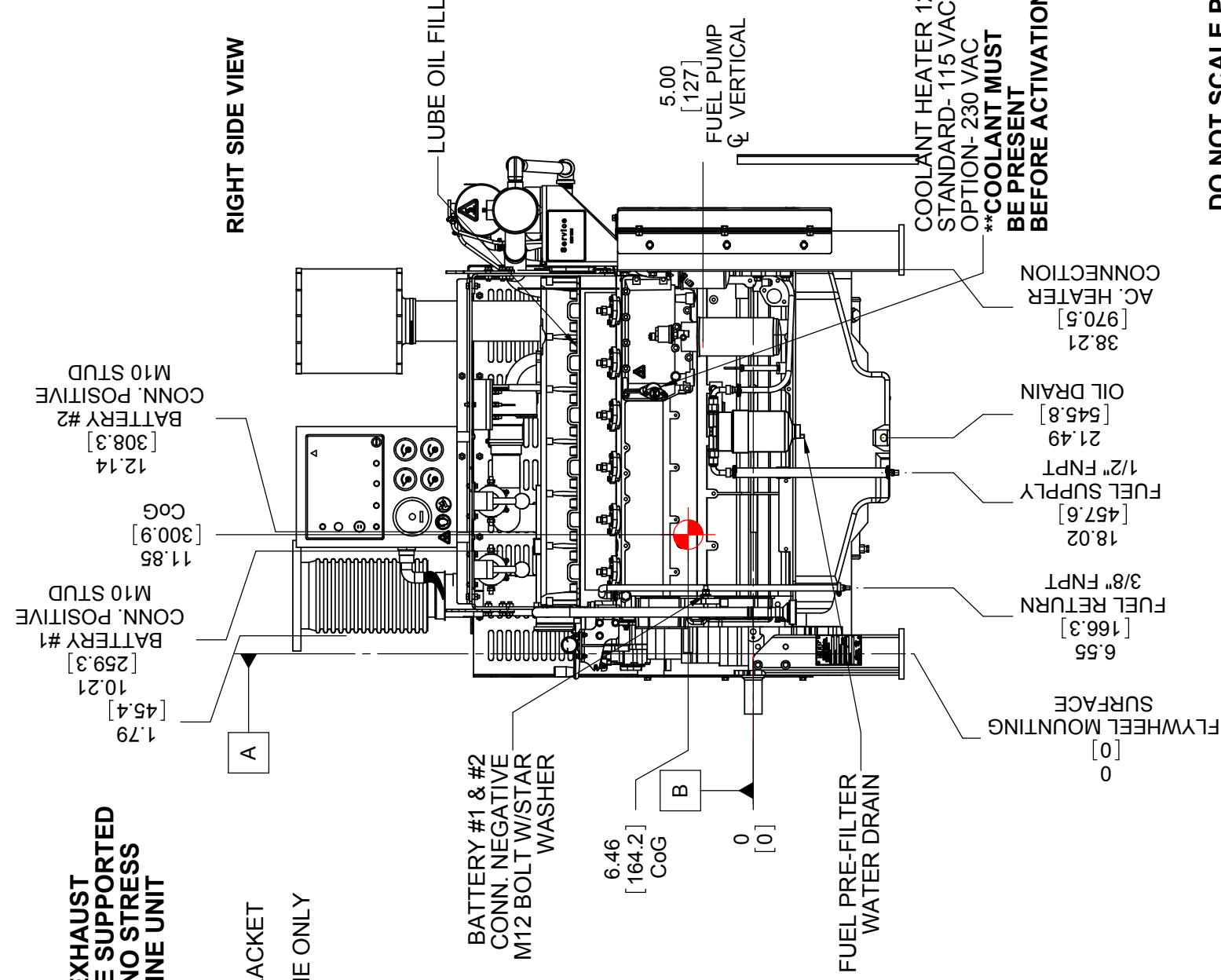
OPTIONAL ADAPTOR PLATE DETAIL



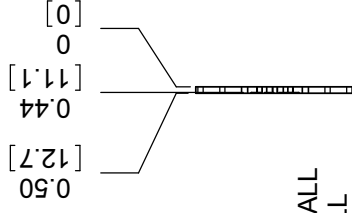
DIMENSIONS IN [] ARE MM

CAUTION

ALL PLUMBING / EXHAUST CONNECTIONS MUST BE SUPPORTED OR ISOLATED WITH NO STRESS LOADING ON ENGINE UNIT



REAR FLYWHEEL VIEW



DO NOT SCALE PRINT

UNLESS OTHERWISE NOTED

GEOMETRIC TOLERANCES PER ISO 1101 AND DIN 7167		GENERAL TOLERANCES: +0.1 IN / +0.2 MM, 0.XX, +0.006 MM, +0.001 IN, 0.XXX, +0.013 MM, +0.003 IN	
SURFACE TEXTURE PER ISO 1302		CORNERS PER DIN 6784	
PROJECTION:			
DR BY:	EJM	DATE:	9/2/2010
ECN ORIGIN:	90-00282	MATERIAL:	SEE BOM
CK BY:	PAS	DATE:	09/10/2010
APPROVED:	DATE:	DESCRIPTION:	DFP6 1013 CXX INSTALLATION
PROJECT:	DFP6 1013C	DRAWING NUMBER:	DC1297
SCALE:	1:15	SHEET:	2 of 2