

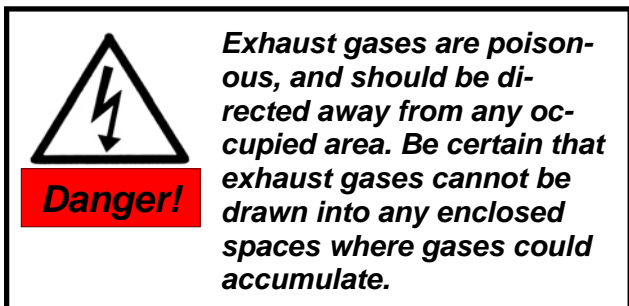
## 10.0 Installation Instructions

### 10.1 General Mounting Instructions

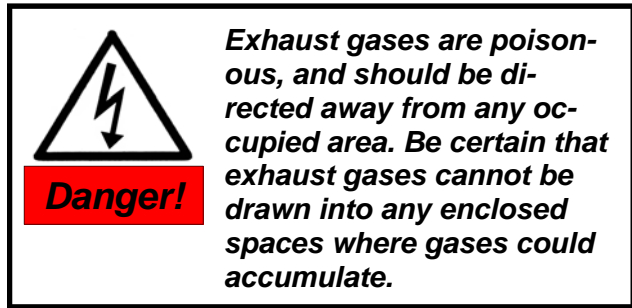
The framework must be constructed in accordance with good mechanical design so that the weight of the generator system will not stress the compartment construction. Plan the location to be large enough to permit set removal. Allow additional clearance for easy access to the oil fill, oil filter, oil drain, fuel filter, air filter, as well as the voltage regulator and main load circuit breaker. Allow enough clearance so that the exhaust system may be disconnected for future service work. Design the compartment large enough for the generator system. Install the generator system in its own compartment. Separate the compartment area from the storage areas, fuel supply areas and personnel.

**See Section 4.0 for genset drawing.**

Construct the compartment floor in a manner so as to prevent oil, fuel, or water accumulation. Secure the modular generator system to the supporting frame using 1/2-13 UNC, grade 5 bolts.



## 10.0 Installation Instructions



### 10.2 Exhaust Gas System

Typically the exhaust gas system consists of exhaust gas manifold, muffler and tailpipe. All of this will necessarily restrict the flow of the exhaust gas; such restriction must not exceed the limits specified for the particular engine,

#### **Additionally:**

- The exhaust system must prevent the entrance of rain, road sprays or other water sources into the engine.
- To prevent recirculation of exhaust gases into the engine combustion or cooling air system locate the exhaust outlet as far as possible from these systems.
- Use flexible tubing to connect the engine exhaust to any rigid pipe extensions. This is used to prevent transmission of vibration.

#### **Exhaust Backpressure**

The exhaust system will produce a certain resistance to the exhaust gas flow (“exhaust backpressure”) consisting of the total resistance of the system, including the pipes, pipe bends, muffler, tailpipe and/or exhaust accessories. The exhaust system design must ensure that the total system flow resistance does not exceed the maximum permissible backpressure, Refer to Section 10.5 for Specifications.

The engine exhaust manifold I.D. constitutes the reference value for designing the exhaust piping. It is not permissible to reduce the I.D. beyond this size.

#### **Mufflers**

An exhaust kit with muffler is supplied from Stadco. If you are going to supply your own muffler for the genset, the following are factors that govern the selection of the muffler:

- 1) Exhaust volume flow at rated output and speed.

- 2) maximum permissible engine exhaust backpressure.
- 3) degree of noise reduction required in dB(A).
- 4) configuration required.

Whenever the muffler is not mounted on the engine, suitable engine-muffler connections must be provided. These connections must be kept as short as possible.

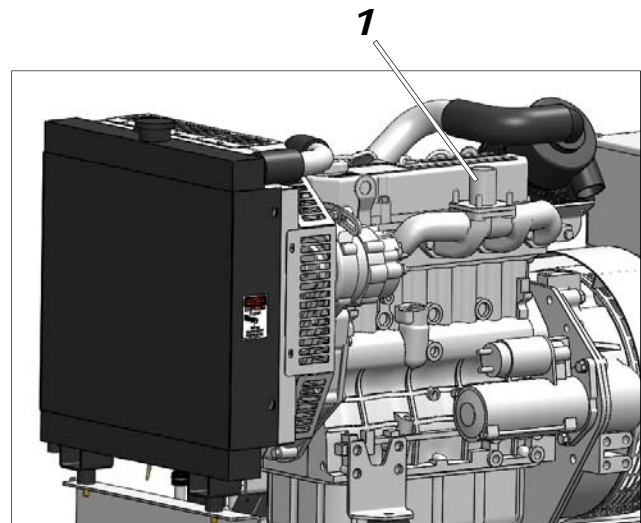
#### **Elbows**

Provide sweeping bends to minimize exhaust backpressure. 90° elbows should have a radius not smaller than the pipe I.D.

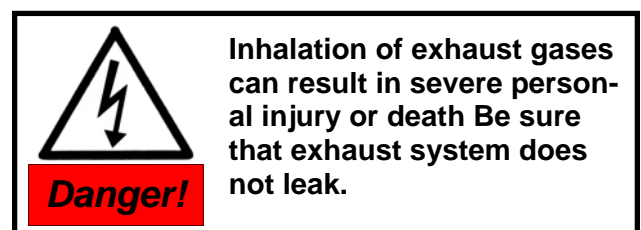
**NOTE: Use of short radius waterpipe elbows and/or miter cut elbows is strictly forbidden and may void engine warranty.**

#### **Exhaust Connections**

Connect the exhaust piping to the connector provided on the exhaust manifold **Item#1 Figure 10.2.1**. The exhaust outlet should be installed so the exhaust is directed away from any operator station and shall be properly guarded to protect the operator.



**Figure 10.2.1**



## 10.0 Installation Instructions

### 10.3 Fuel System

Refer to Figure 10.3.2 on next page.

The fuel system for the Mitsubishi SL engines require a fuel suction & return line. Connect the Suction hose to the fuel pump **Item#1** Figure 10.3.1 and the return line to the engine return connection **Item#2**. The minimum inside diameter for the suction line is 1/4".

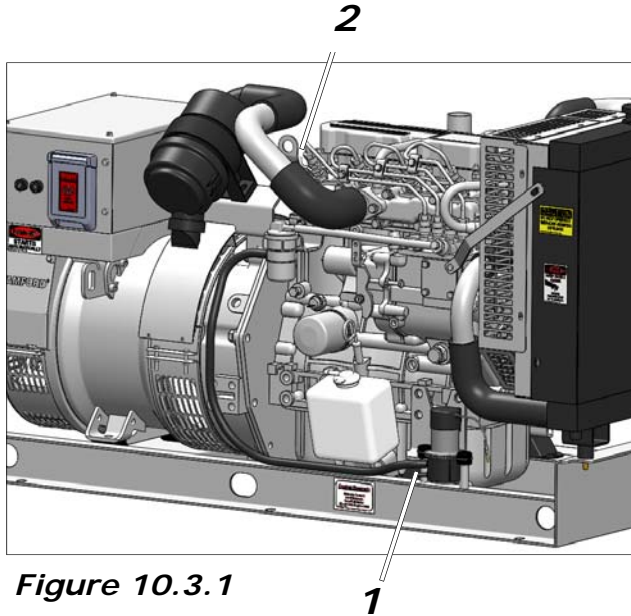
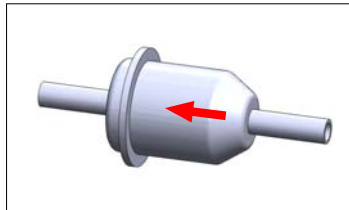


Figure 10.3.1

#### Inline Fuel Filter

Install the inline fuel filter in the Fuel Suction Line, between the fuel tank and the 12VDC fuel pump, in an accessible location (preferably inside the genset compartment) for easy service. Install with arrow in direction of the fuel flow. Use screw clamps on hoses to prevent leakage and to allow for easy replacement.



The fuel piping system may consist of both rigid and flexible material. Rigid lines can be made of seamless copper or stainless steel. Metal lines must be thoroughly cleaned prior to installation. When using rigid lines use an approved flexible line to make the connection from rigid lines to fuel connections on engine. The flexible hoses should be capable of operating in a temperature range from -40°F to +200°F without deteriorating and should be compatible with diesel fuel.

All fuel pipes must be located in protected areas, away from intensive heat sources (engine exhaust system) and securely fastened (especially rigid pipes). The fuel piping routing must also be carefully designed. Avoid any sharp bend, keep the number of connections to a minimum and do not use excessively long runs.

Any air which has found its way into the fuel system can cause irregular running of the engine and decrease its performance, even leading to stopping of the genset and preventing its restarting. Bleed trapped air from the fuel system as instructed in **Section 11.3**.

Fuel dip tube and/or fuel connections at the fuel tank should be located below fuel level at all times to prevent air cavitation of the fuel system. Fuel suction point in fuel supply tank should be located a minimum of 1 to 1-1/2 inches above the floor of the tank to minimize the pick up of fuel sediment and tank condensate material into the fuel system. The return line must also return below the fuel level to prevent drain back of the fuel system. If the return line does not return below the fuel level a check valve must be installed in the supply line near the fuel tank.

**Note:** If the fuel for the generator is being supplied by the vehicle tank, the supply line must be configured so that it can only utilize 75% of the total tank volume. A fuel check valve can be installed to prevent fuel drain back.

#### IMPORTANT

Air cavitation causes engine starting problems by virtue of fuel starvation. To avoid this condition, make sure that all joints and connections in the fuel system are 100% air tight.



**Do not install fuel shut-off valves in the return line of the engine fuel system.**

**Warning!**

10.0 Installation Instructions

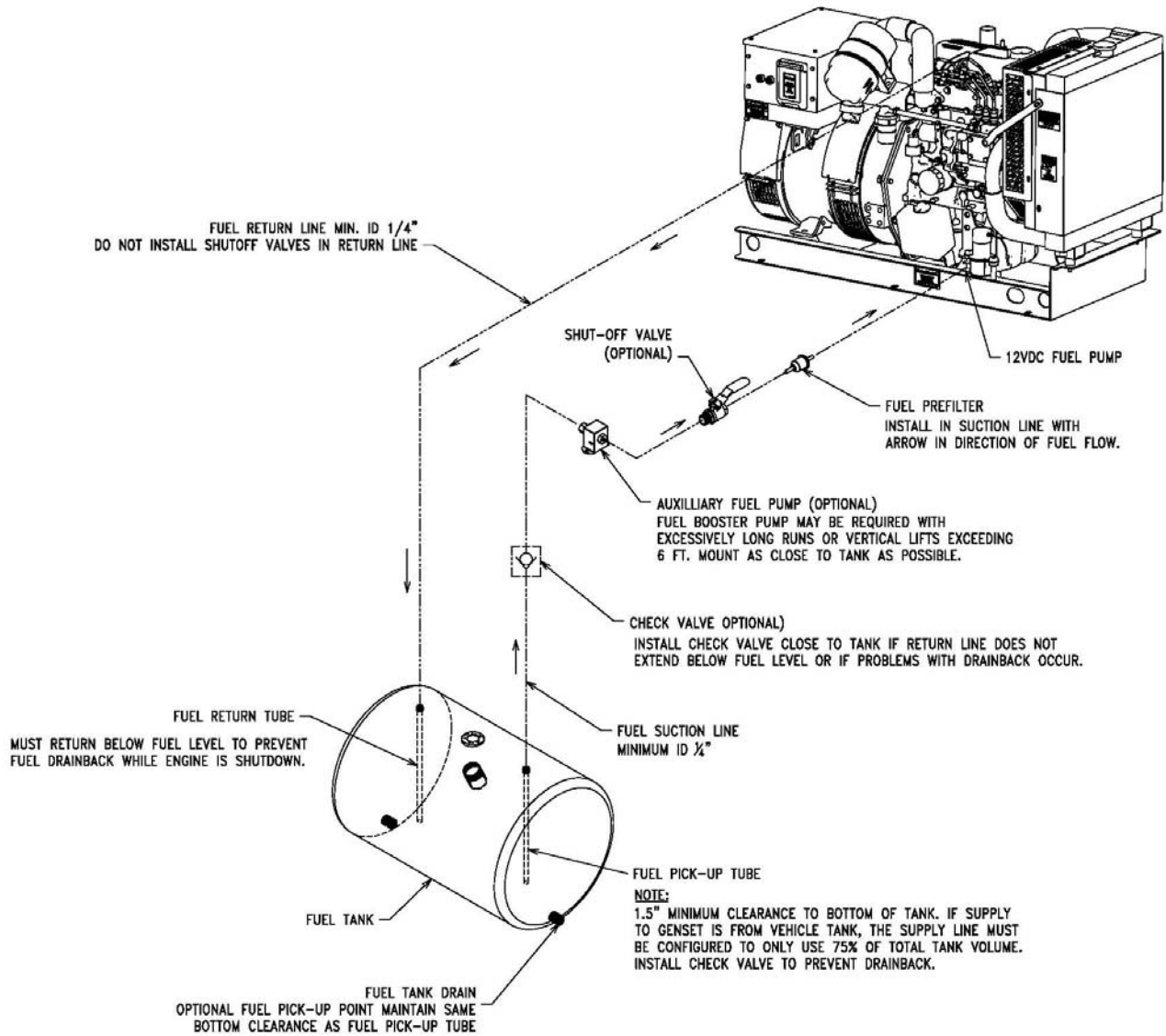
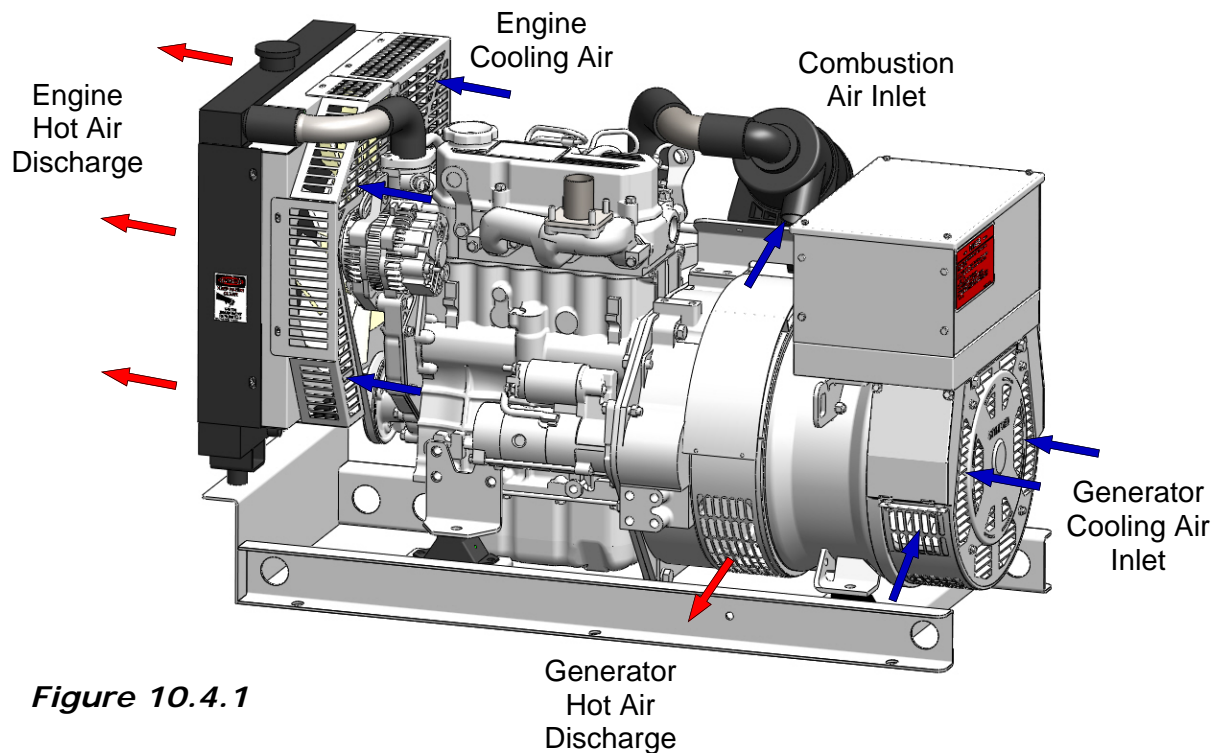


Figure 10.3.2

## 10.0 Installation Instructions

### 10.4 Cooling System

The CD10/15 gensets are powered by liquid-cooled diesel engines. The genset is complete with a vertically mounted radiator with an engine driven cooling fan. It is critical to supply adequately sized openings for cooling air flow to both the engine and the AC generator. See **Figure 10.4.1** for diagram of air intake and discharge locations. It must be assured that these areas are not covered or blocked.



**Figure 10.4.1**

## 10.0 Installation Instructions

### 10.5 Design Features and Specifications

<i>Item</i>	<i>Unit</i>	<b>CD10</b>	<b>CD15</b>
Engine Speed	RPM	1800	1800
Engine Model		S3L2	S4L2
Recommended Battery Capacity	CCA	550	550
* Engine Lube oil Capacity including filter	Quarts	<b>*4.4</b>	<b>*5.7</b>
Combustion Air Flow	CFM	36	48
Maximum Intake Restriction	In. H2O	20	20
Exhaust Gas Flow	CFM	63	127
Max. Exhaust Backpressure	In. H2O	27.6	27.6
Engine cooling Air Flow	CFM	2100	2450
AC Alternator cooling Air Flow	CFM	286	286
<b>Generator Rating 3-phase, 480/240V, 60HZ</b>			
Standby Rating	Watts	10,000	15,000
Continuous Rating	Watts	9,000	13,000
<b>Generator Rating 1-phase, 240V, 60HZ</b>			
Standby Rating	Watts	10,000	14,500
Continuous Rating	Watts	9,000	13,000
13056 specifications.xls			

**Figure 10.5.1**

\* Refer to Section 11.2 for oil fill procedures. Fill to upper marking on dipstick.

## 10.0 Installation Instructions

### 10.6 Installation Checks

#### **Prestart Checks**

Before starting the generator set, perform these steps:

- Check oil level in oil pan (Section 11.2) See Section 9.1 for the recommended oil and quantity Section 10.5.
- Bleed air from fuel system (Section 11.3).
- Check coolant level (Section 11.6).
- Check Battery connections for tightness.
- Check to make sure that the Load circuit breaker is in the “OFF” position.
- Check all electrical connections and be sure that all bolts have been securely tightened.
- Refer to Installation Review, this section.
- Follow the Start-Up Section in Section 6.

Do not attempt to start generator system until all Installation Review questions have been answered satisfactorily. Once this has been done, proceed to the Operator’s Section for the Start-Up sequences.

#### **Installation Review**

Prior to initial start-up of the generator system, address each of the following installation review items; correct as necessary.

- Is the generator mounted securely? (**Section 10.1**)
- Is there adequate airflow openings both for inlet airflow and discharge airflow? (**Section 10.4 & 10.5**)
- Are all the generator power output cables routed in such a way as to prevent chaffing?
- Are the power output cables of the generator connected properly & tightened? (See Wiring Diagrams **Section 8.3**)
- Are the battery cables connected properly & tightened? (**Section 7.2**)
- Are the 12VDC control system plugs wired & connected properly? (**Section 7.3 & 7.4**)

#### **Can the following Routine Maintenance be Performed?**

- Change oil & filter, fuel filter and air filter.
- Check the valve clearance.
- Check oil level in engine.
- Check coolant level.
- Fill & Drain the radiator.
- Operate main load circuit breaker.

**NOTE** Are electrical junction boxes adequately sealed, and of adequate size for the power circuit?