



a clear direction for the future



Cylindrical Silencers

A200 Series and 300 Series

Installation and Operation Manual



Rev. B

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NOTICE

The instructions herein must be expressly carried out in order to preserve **WARRANTY COVERAGE**. Ensure that all periodic checks and maintenance schedules are adhered to as directed.

IMPORTANT SAFETY WARNINGS



IF THERE IS ANY CONCERN ABOUT THE SAFETY OF THIS OR ANY SYSTEM, CLEAR THE AREA IMMEDIATELY OF ALL PERSONNEL AND CONTACT THE APPROPRIATE PERSON FOR FURTHER INSTRUCTIONS.

WARNING: ANYONE WORKING AROUND OR NEAR THE INSTALLATION SHOULD BE TRAINED IN THE PROPER SAFETY PRECAUTIONS AND PROCEDURES INCLUDING EMERGENCY SHUTDOWN. THESE PRECAUTIONS AND PROCEDURES MUST BE FOLLOWED.

WARNING: WORK ON THE INSTALLATION IS TO BE DONE ONLY BY TRAINED, QUALIFIED INDIVIDUALS. THIS INCLUDES ALL ELECTRICAL AND MECHANICAL WORK. ALL WORKERS MUST BE TRAINED IN THE PROPER SAFETY PRECAUTIONS AND PROPER ATTIRE MUST BE WORN AT ALL TIMES INCLUDING HARD HATS, SAFETY GLASSES, PROTECTIVE OUTERWEAR, EAR PROTECTION AND STEEL-TOED BOOTS.

Introduction

Congratulations on your decision to partner with GT Exhaust through your recent purchase of the GT Exhaust A200 Series or Compact Series Silencers. Whether your purchase will be installed within an enclosure for backup power generation or in the harsh environments of off-shore, you can be sure that your purchase will be manufactured to the highest quality and will perform as specified. This guide will walk you through the necessary steps to successfully install and maintain the A200 Cylindrical Series and Compact Series Silencers and provide all other relevant information to ensure optimal effectiveness of your exhaust system's operation.

Affected Models:

A201 Series

- **A201-2100 Commercial Grade Cylindrical Silencer (14-20 dB(A) Attenuation)**
- **A201-4100 Residential Grade Cylindrical Silencer (19-25 dB(A) Attenuation)**
- **A201-5100 Critical Grade Cylindrical Silencer (25-35 dB(A) Attenuation)**
- **A201-5600 Critical Plus Grade Cylindrical Silencer (30-38 dB(A) Attenuation)**
- **A201-6100 Super Critical Grade Cylindrical Silencer (32-42 dB(A) Attenuation)**
- **A201-7100 Extreme Grade Cylindrical Silencer (45-52 dB(A) Attenuation)**
- **A201-8100 Super Extreme Grade Cylindrical Silencer (45-60 dB(A) Attenuation)**

A202 Series

- **A202-2100 Commercial Grade Spark Arrestor Cylindrical Silencer (12-20 dB(A) Attenuation)**
- **A202-4100 Residential Grade Spark Arrestor Cylindrical Silencer (18-25 dB(A) Attenuation)**
- **A202-5100 Critical Grade Spark Arrestor Cylindrical Silencer (25-35 dB(A) Attenuation)**
- **A202-6100 Super Critical Grade Spark Arrestor Cylindrical Silencer (32-42 dB(A) Attenuation)**

A203 Series

- **A203-2100 Industrial Grade Cylindrical Silencer (14-20 dB(A) Attenuation)**
- **A203-4100 Residential Grade Cylindrical Silencer (20-25 dB(A) Attenuation)**

A205 Series

- **A205-5100 Critical Grade Cylindrical Silencer (25-35 dB(A) Attenuation)**
- **A205-6100 Super Critical Grade Cylindrical Silencer (32-42 dB(A) Attenuation)**

300 Series

- **301-4100 Residential Grade Compact Silencer (19-25 dB(A) Attenuation)**

READ THROUGH THE ENTIRE MANUAL BEFORE PROCEEDING WITH ACTUAL INSTALLATION.

Selection and Description

A full list of specification and application sheets for the full line of GT Exhaust Cylindrical and Compact Series Silencers can be found at www.gtexhaust.com.

A201 Cylindrical Silencers

The A201 series of Silencers are available in a variety of sizes and sound attenuation grades suited to meet the needs of your application. Standard construction is heavy duty carbon steel and can be vertically or horizontally mounted. These units are available in Inlet/Outlet styles 1, 2, and 3. Proven design, quality, and reliability ensure the A201 Series will last the life of the exhaust system.

IMAGE 1: Picture of A200 Series Cylindrical Silencer



A202 Spark Arrestor Cylindrical Silencers

A spark arresting silencer for use on exhaust of internal combustion engines where fire hazards exist. Centrifugal force separates solids from the exhaust gas stream and deposits them in easily accessible cleanouts.

A203 Cylindrical Silencers

The A203 Series of Silences are primarily for use on turbo charged engines where it is critical for back pressure must be minimized. Available in both Industrial and Residential Grades, the A203 provides between 14 and 25 dB(A) reductions and are available in inlet sizes from 2 inches to 24 inches.

A205 Cylindrical Silencers

The A205 Series Annular flow Silencers are capable of servicing a variety of applications through a range of 200 to 5,000 Horsepower. Utilizing special acoustical packing adjacent to perforated cylinders, the A205 achieves annular flow silencing. In addition to standard engine applications, the A205 is used extensively in gas turbine, blower, compressor, vacuum pump, and Dyno-Room exhaust applications.

300 Compact Series Silencers

Advance design provides residential grade performance and low pressure drop in a spacing saving compact size. The 300 series are ideal for use where ambient noise levels are moderate and features all welded heavy-duty steel construction and are internally insulated throughout with high density compressed fiberglass insulation.

Sound Attenuation

Sound attenuation refers to the ability to reduce the noise of the exhaust before it is released to the atmosphere. Unlike emissions, sound is regulated at the local level through state and municipalities setting the limits for acceptable noise levels. As such, the required degree of silencing depends on the location and customer preference; such as the noise of engine exhaust is objectionable in a hospital area but is generally not as objectionable in an isolated pumping station. Engine noise and exhaust sound levels are best attenuated by a quality silencer. Attenuation curves are provided, as the effect of the silencer varies with the speed and frequencies of the engine. The A200 Series are available in a variety of grades, from Commercial to Super Extreme; the 300 Series Compact is available in Residential Grade. Examples of representative A201 Series sound attenuation curves are found below. For a complete list and more information on sound attenuation, please visit www.gtexhaust.com.

IMAGE 2: Picture of A201-2100 Commercial Grade Sound Attenuation Curve

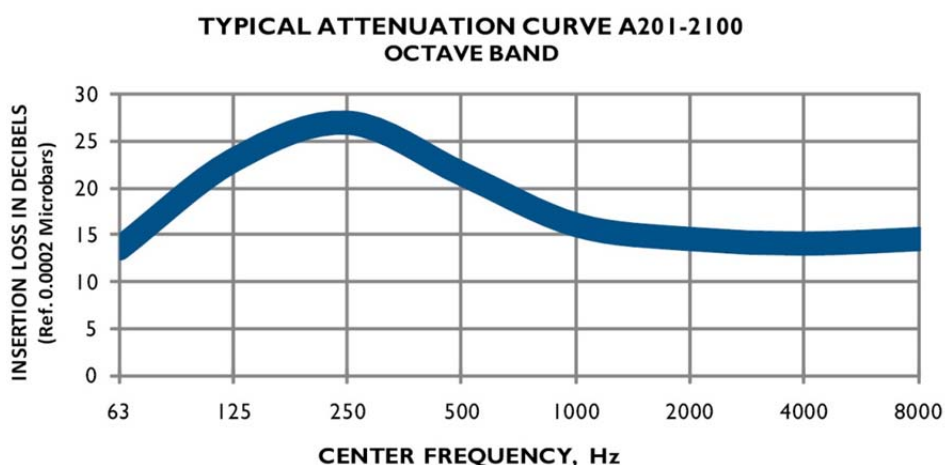
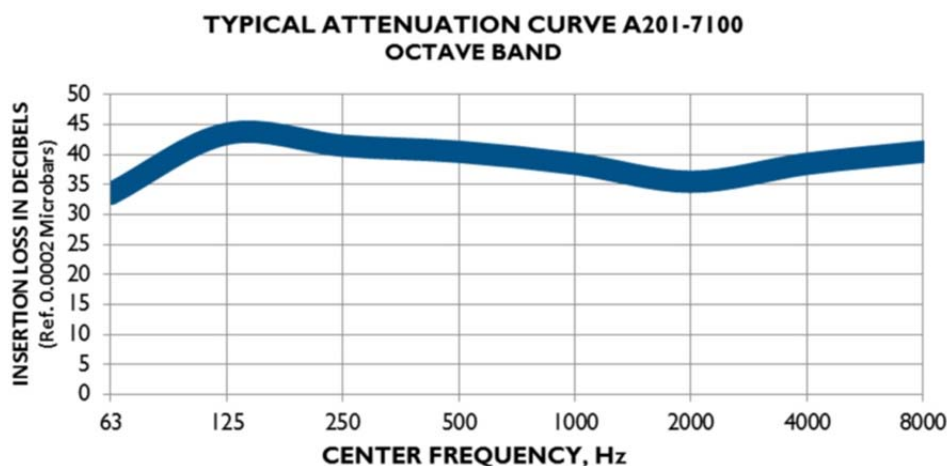


IMAGE 3: Picture of A201-7100 Extreme Grade Sound Attenuation Curve



Receiving Inspection

- Upon receipt of the system, check the nameplate against the packing list to verify the correct part numbers are received. Verify all items on the packing list are present.
- Keep the shipping container to protect the unit until installation has been completed.
- Prior to unpacking, check all components for shipping damage.
- Advise care@gtexhaust.com of shipping damage within three days of receipt of the product.

Storage

- Leave any cardboard boxing, plywood covering, crating, and/or plastic covering intact until ready to install.
- Be sure that all openings are closed so that no debris, vermin, rain, snow and/or ice can get into the unit.
- Store the Silencer on blocks, a minimum of 4" high, so that air can freely circulate around the unit.
- Do not store the Silencer in contact with the ground or in a wet, humid or flooded area.
- Inspect the Silencer's body and mounting surfaces prior to installation. If there are any areas of significant damage, i.e. large dents, deep scratches, contact the factory before proceeding with installation.
- Clean and remove any minor corrosion and refinish per GT Exhaust recommendations. If major corrosion has occurred such that the integrity of the unit is in question, contact care@gtexhaust.com

Installation

Installation of GT Exhaust Cylindrical and Compact Silencers requires that the user ensure the entire exhaust system is properly designed and laid out before installing parts. Exhaust components such as expansion joints, rain caps, elbows, supports, etc. are critical installation pieces which, if they fail, may compromise the integrity of the system as well as damage other components and, possibly the engine and surrounding components.

Mounting, Alignment, and General Guidelines for Installation:

- Ensure that the necessary equipment to install the unit, including support brackets, gaskets, flange bolts, outlet elbows and expansion joints, are available before beginning.
- **IMPORTANT:** The unit is not designed to serve as a support for any piping, additional mounting pads or additional loads on the inlet or outlet. Ensure the unit is mounted evenly and securely and must be mounted on structural supports. For the final installation, do not support the unit by the flanges.
- Observe all OSHA mandated regulations for the safe rigging of exhaust equipment.
- **Note:** No part of the exhaust system should be in the vicinity of flammable materials. Exhaust system components inside the building should be covered with suitable insulation wrap to protect personnel and reduce room temperature. Standard and custom insulation wraps are available through GT Exhaust.
- In order to minimize turbulence and backpressure, it is recommended that at least 5 diameters of straight pipe upstream of the Silencer and 2.5 diameters downstream of the Silencer be maintained.
- Ensure runs of exhaust piping are sloped away from the engine to prevent condensation and outside moisture from entering the engine. Drain traps should be installed at the lowest point in the line.
- Review typical Silencer Installation Illustrations and Mounting Options; Images 4, 5, and 7.
- Be sure to orient the unit in the proper manner for the **indicated flow direction**.
- If supplied, use all lifting lugs when hoisting the Silencer into place.
- If supplied, use all mounting feet when securing the Silencer into its operating position. Ensure the unit is mounted evenly across the support.
- Make sure all ports, openings, and connections are clear from obstruction.
- Align the unit with the engine and/or piping connections. Follow any associated installation guidelines for GT Exhaust accessories.
- Install a suitable expansion joint (Bellows or Wye) between the silencer and the engine to reduce the likelihood of vibration or thermal growth damage to the unit.
- Ensure exhaust system piping is in alignment prior to tightening flange connections.
 - **CAUTION: Pre-loading flange connections due to misalignment will result in premature failure and will void the Warranty.**
- Use gaskets on all flanged connections contained in the GT Exhaust Nut-Bolt-Gasket (NBG) kit (Purchased Separately). If you replace bolts, gaskets, or clamps, use the same size and material as the originals. Contact GT Exhaust at care@gtexhaust.com for approved replacement parts.
- Mount the product securely to the application.
- **Note:** If insulation wrap is used, do not wrap connections in order to facilitate post-installation checklist.

Flanged Connections

- Apply high temperature anti-seize to bolts – use Loctite® 34517 or equivalent.
- To ensure uniform flange pressure, tighten bolts in a star-shaped pattern until all are snug. Following the same star-shaped pattern, torque the bolts to the specified torque. Never torque bolts directly to the left or right of the previously torqued bolt.
- When tightening fittings, torque to specifications listed below in Table 1. Re-check torque prior to and subsequent to initial engine start and system commissioning.

Cuffed Connections

- **Note:** Ensure the clamp is loosely attached to either the cuff or the exhaust piping prior to fitting the exhaust piping to the cuff.
- Insert the exhaust piping securely into the cuffed portion of the connection, ensuring that the exhaust piping is uniformly bottomed out.
- Position the clamp towards the edge of the cuff, allowing a min. of 0.5” from the edge of the clamp to the edge of the pipe.
- Torque the clamp bolts until tight. Re-check tightness prior to and subsequent to initial engine start and system commissioning.
- Complete the post installation check list to verify the connection does not leak exhaust gas.

Table 1: Table showing Bolt Torque Specifications

Nominal Bolt Diameter (in.)	Dry Torque (Ft-Lbs)
0.375	20
0.50	47
0.625	96
0.75	155
0.875	206
1.00	310
1.125	480
1.25	375
1.5	1100

IMAGE 4: Picture of Typical Silencer Installation

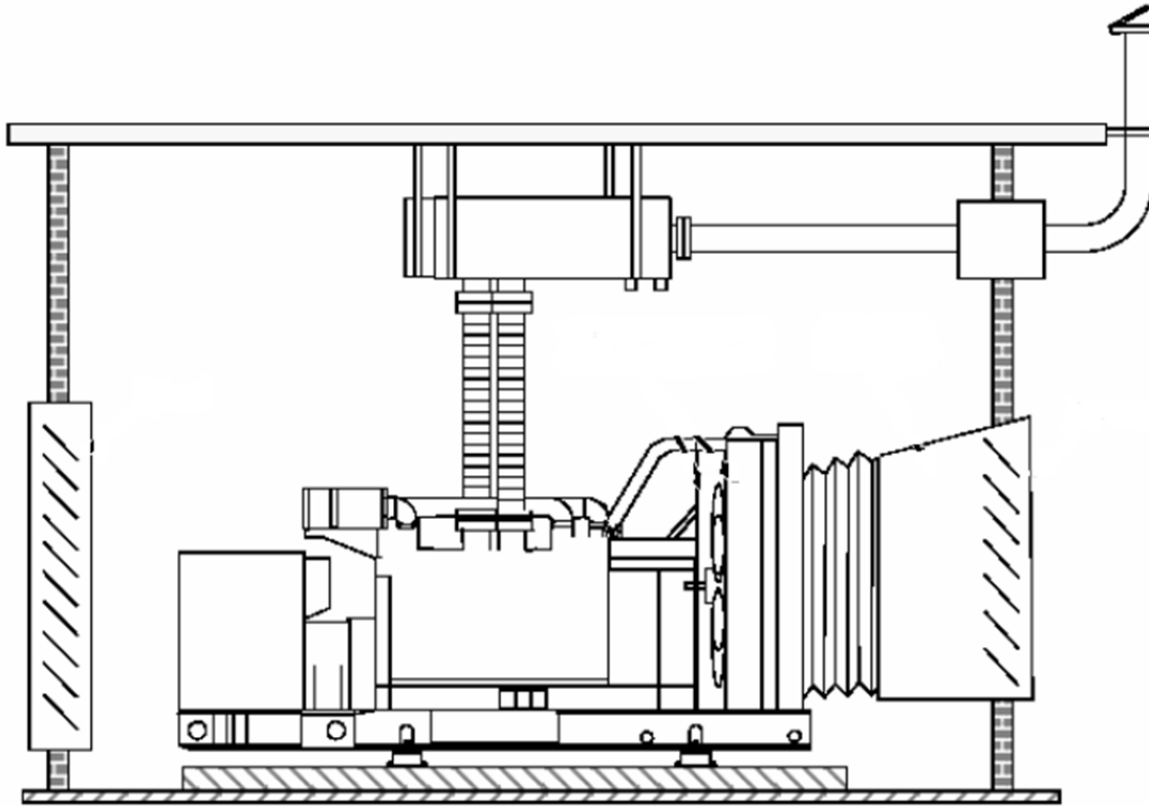


IMAGE 5: Picture of Silencer Installation Mounting Options

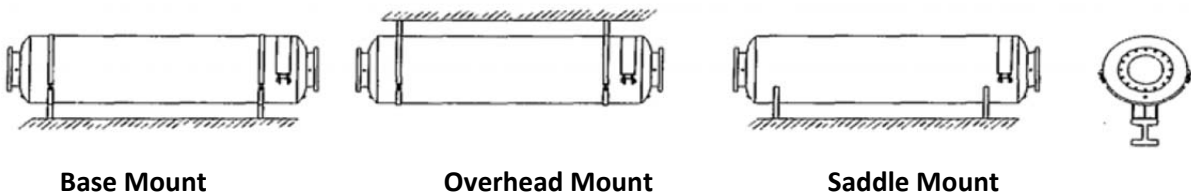


IMAGE 6: Picture of A201 with Elbow, NBG Kit, Elbow, and Rain Cap



IMAGE 7: Picture of Typical Silencer Installation

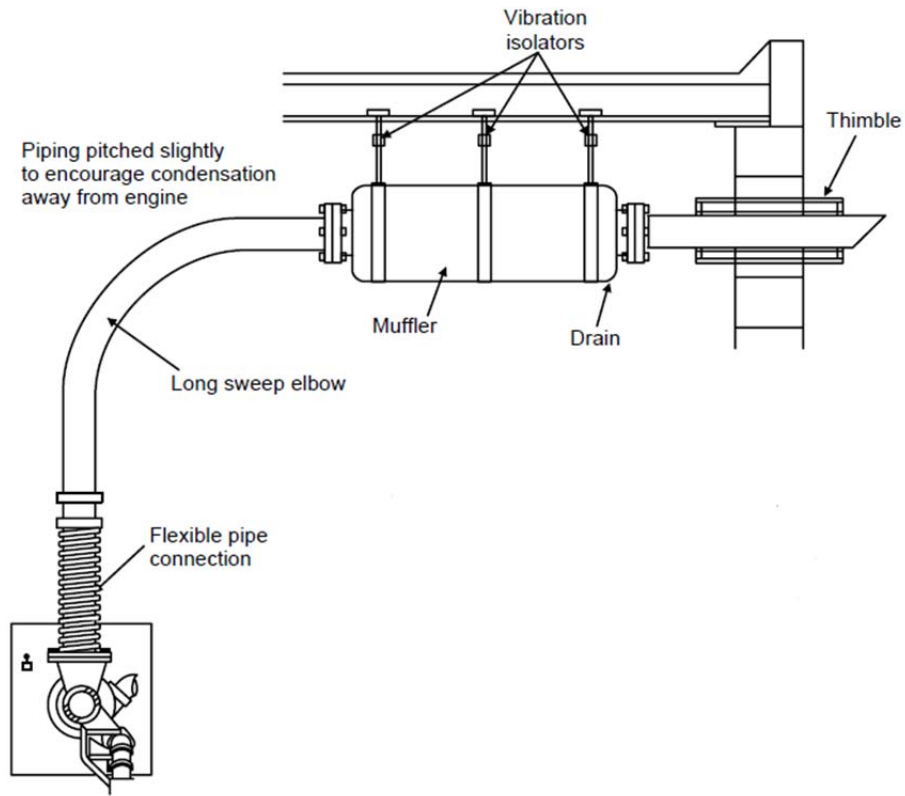
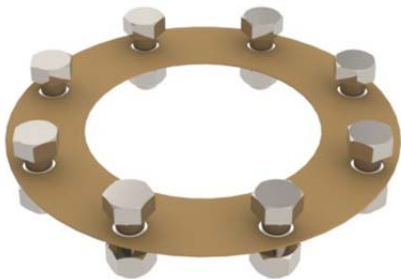


IMAGE 8: Picture of a typical Nut-Bolt-Gasket Kit with Fiber Gasket



Post Installation Checklist

Subsequent to following the above procedure, review the following check list to ensure that all components of your exhaust system are properly installed and ready for operation:

- If your exhaust system has an insulation wrap installed over any fittings or connections from the factory, pull the insulation back, and check the tightness of the bolted connections and torque to the specifications provided in Table 1. Ensure there is no debris in the joint that would prevent a secure and tight fit. Re-install the insulation.
- After the initial engine run and cool down, re-check all bolts for tightness and torque as required in Table 1.
- Exhaust backpressure must not exceed the allowable backpressure specified by the engine manufacturer. Excessive exhaust backpressure reduces engine power and engine life and may lead to high exhaust temperatures and smoke. Engine exhaust backpressure should be estimated before the layout of the exhaust system is finalized, and is recommended to be measured at the exhaust outlet under full-load operation, as needed. Consult GT Exhaust Technical Support if actual backpressure exceeds engine manufacturer's limits.

Maintenance

Note: Ensure exhaust components are cool prior to inspection and maintenance activities.

The recommended maintenance schedule for a typical Silencer installation will consist of:

1. **Weekly:** Physically examine the Silencer and exhaust system for any sign of gas leakage, cracks, or significant areas of damage.
2. **Quarterly:** Examine the Silencer for corrosion. Clean and remove any minor corrosion and refinish per GT Exhaust recommendations. If major corrosion has occurred such that the integrity of the unit is in question, contact GT Exhaust for recommendation and resolution. Examine connecting flanges and support bolting – retighten any loose nuts as required. For Spark Arrestor Silencers clean the spark box by removing the plugs and vacuuming or blowing the spark box clean.

Product Registration / Warranty

To register your GT Exhaust product and claim your warranty, please visit www.gtexhaust.com.

Sourcing of Spare or Replacement Parts

For spare or replacement parts, a full-line of accessories, warranty details, and other questions about the GT Exhaust Products, contact:



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