

Diesel Power Package Permissibility Checklist

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This document lists components and functions that must be maintained in order for this diesel power package to be considered permissible. This checklist must be used in conjunction with an Electrical System Checklist and a Machine Checklist for a complete equipment permissibility evaluation.

All function checks listed in this document must be performed in fresh moving air, in an area where permissible machines are not required.

The component and function checks in this document that are designated as **“WEEKLY”** must be performed during each weekly maintenance examination in accordance with 30 CFR, Section 75.1914.

Machine Serial No. or Property No. _____
MSHA Approval Number _____
Date of Examination _____
Examination Conducted By _____

This checklist may be used for the following machine:

Model No. ST-3.5S (with Cat 3306 PCNA engine)
Approval No. 31-90-0,-1 , -2,-3,-4
Certification No. 31/D79-0,-1,-2

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Diesel Power Package Permissibility Checklist

INTAKE SYSTEM

1. () **(WEEKLY)** Components appear to be the same as shown in figures 1 & 2.
(Older machines have components like those shown in figures 3 & 4)

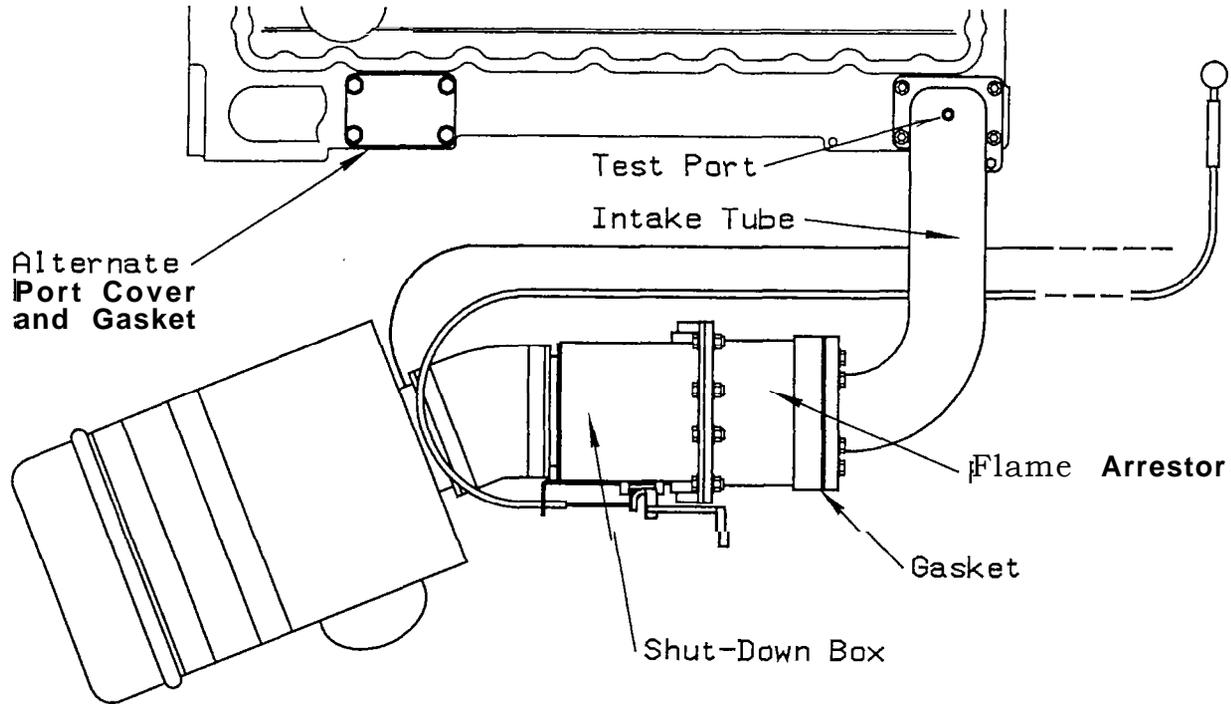


Figure 1 (Top View)

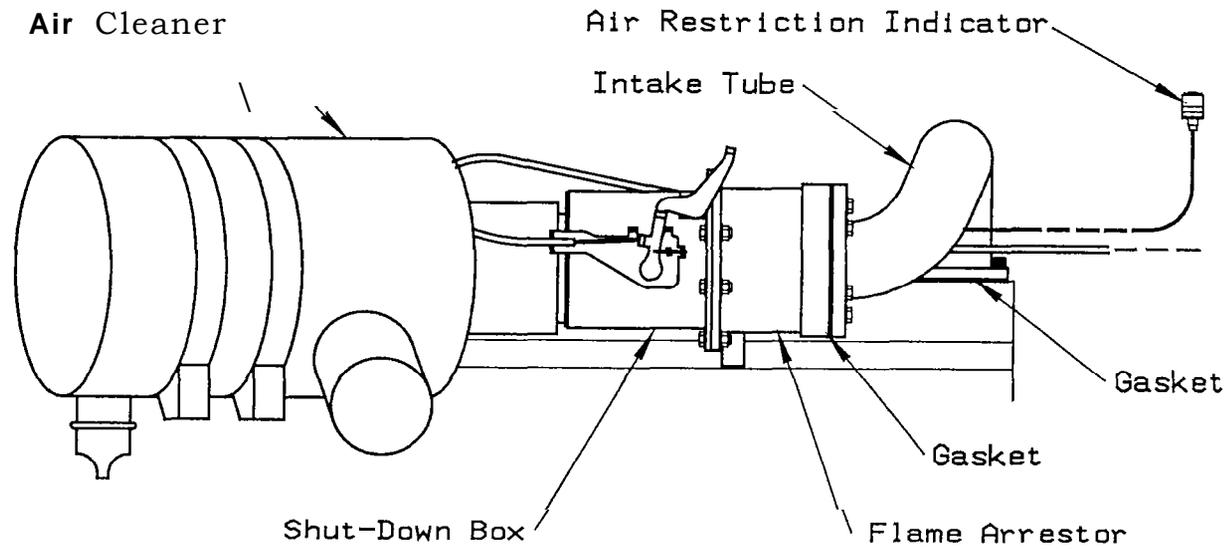


Figure 2 (Side View)

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INTAKE SYSTEM (continued)

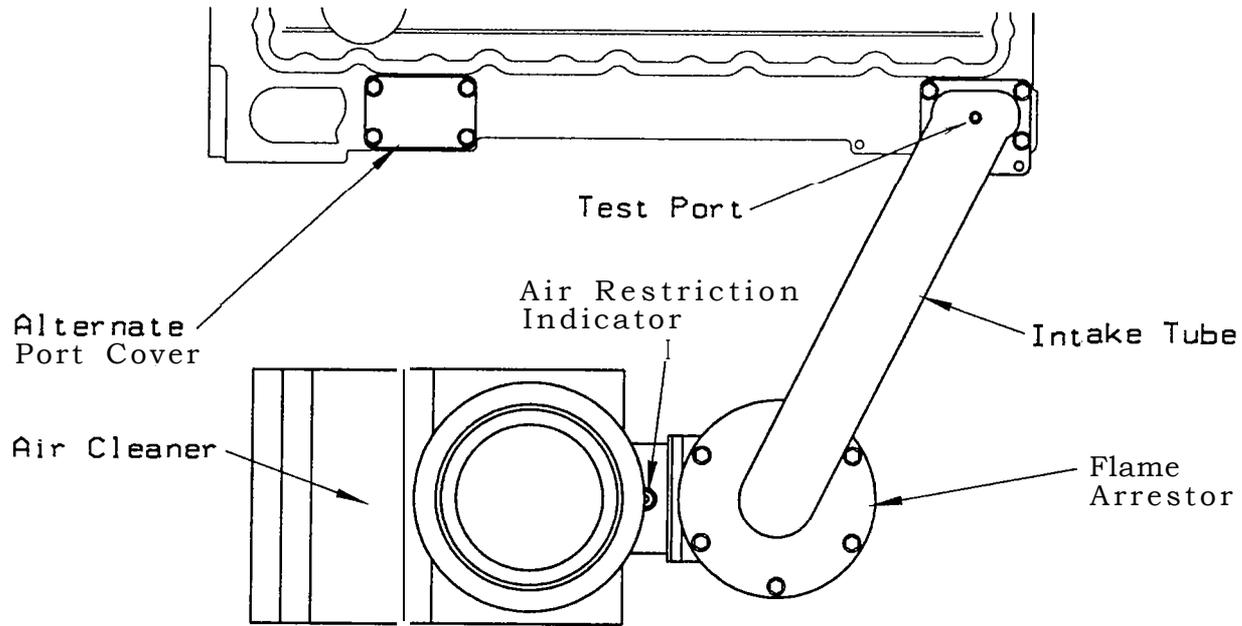


Figure 3 (Top View)

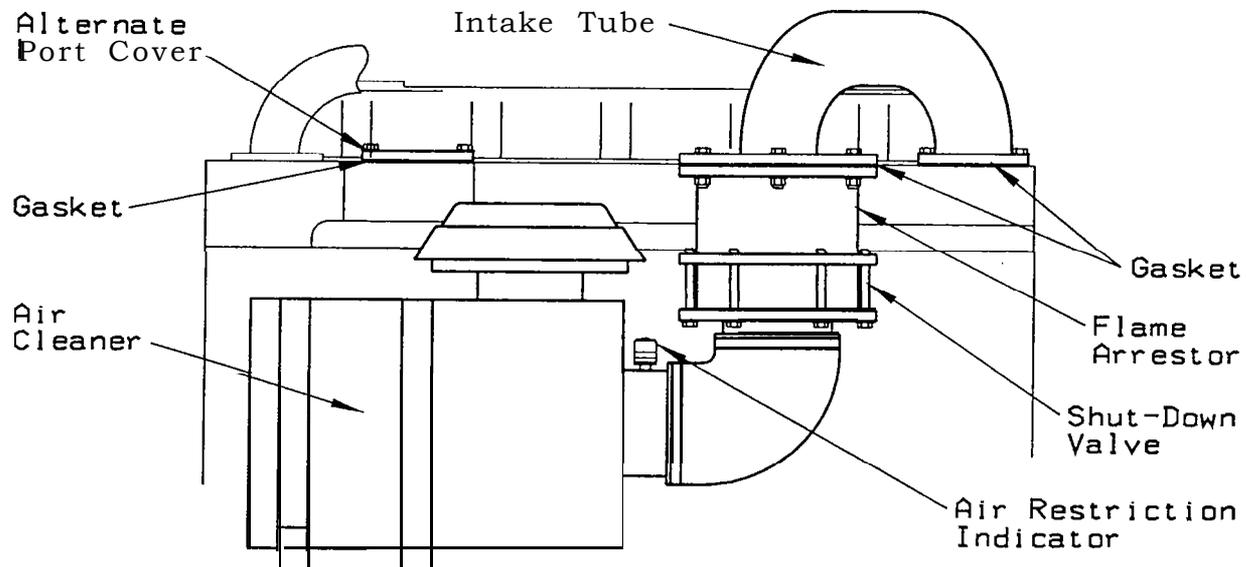


Figure 4 (Side View)

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INTAKE SYSTEM (continued)

2. () **(WEEKLY)** The air cleaner housing, air filter, connecting tubes, rubber elbows, and clamps are in place and in good condition.
3. () **(WEEKLY)** The intake air shut-down box (or valve) is in place and the connecting fasteners are in place, secured with nuts and lockwashers or nylon insert locknuts, and are tight.
4. () **(WEEKLY)** The intake air flame arrestor is in place and the fasteners for connecting the flame arrestor to the intake tube are in place, secured with locking devices*, and are tight.
5. () **(WEEKLY)** A copper clad gasket is installed between the intake air flame arrestor and the intake tube.
6. () **(WEEKLY)** The intake tube is in good condition with no dents or holes.
7. () **(WEEKLY)** The intake tube test port plug is in place, tight, and secured with lockwire.
8. () **(WEEKLY)** A copper clad gasket is installed between the intake tube and the intake manifold.
9. () **(WEEKLY)** All fasteners for connecting the intake tube to the intake manifold are in place, secured with lockwashers, and are tight.
10. () **(WEEKLY)** The intake manifold is in good condition with no holes or missing plugs.
11. () **(WEEKLY)** A copper clad gasket is installed between the intake manifold and the cover plate for the alternate air intake location.
12. () **(WEEKLY)** All fasteners for connecting the alternate air intake cover plate to the intake manifold are in place, secured with locking devices*, and are tight.

(* Locking devices are considered to be lockwashers or serrated flange capscrews)

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EXHAUST SYSTEM

1. () (WEEKLY) Components appear to be the same as shown in figures 5 & 6.

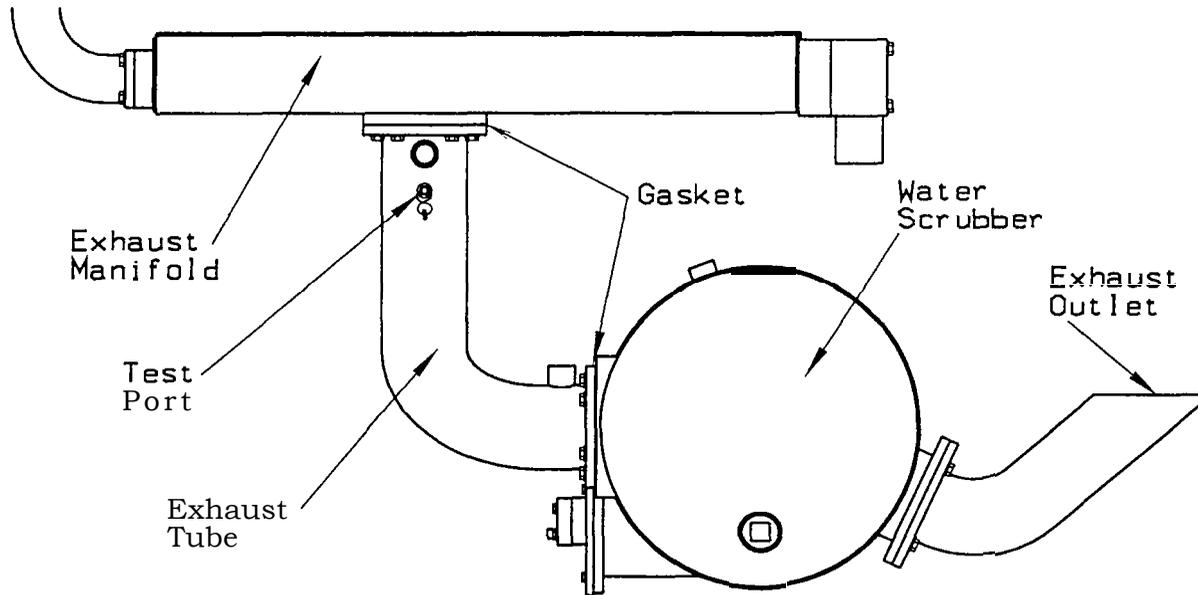


Figure 5 (Top View)

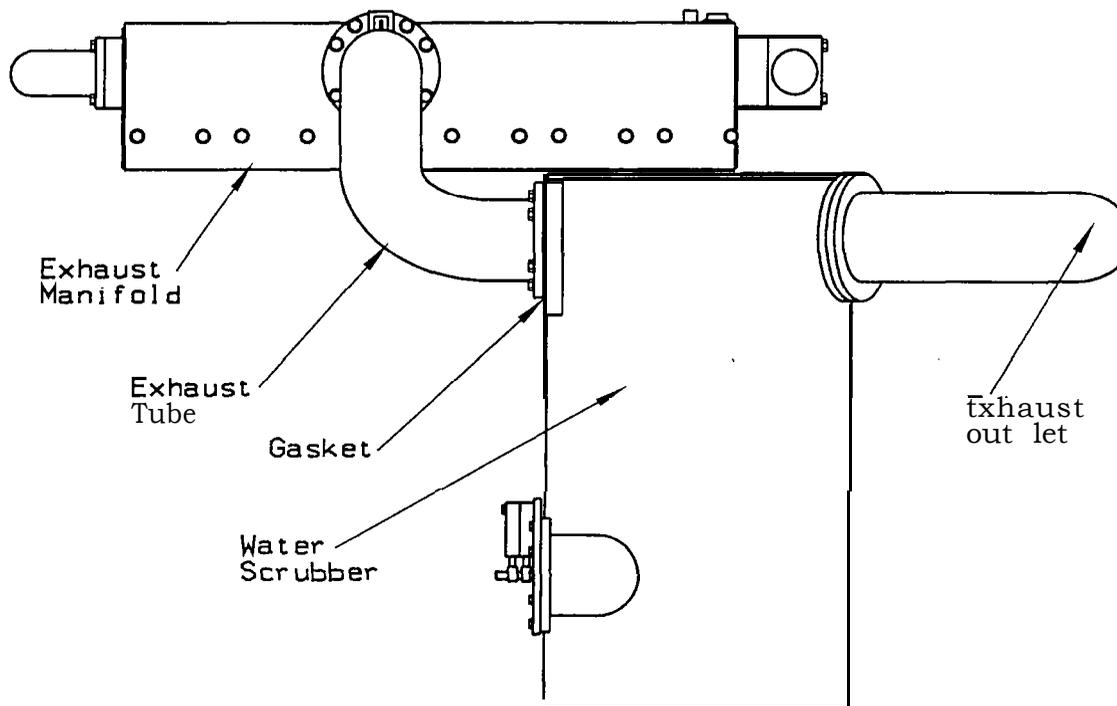


Figure 6 (Side View)

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EXHAUST SYSTEM (continued)

- 2 . () **(WEEKLY)** The exhaust manifold, water jacketed exhaust tube, and exhaust scrubber are in good condition with no holes due to corrosion, accidents or missing plugs.
- 3 . () **(WEEKLY)** A copper clad gasket is installed between the cylinder head and the water-cooled exhaust manifold and there is no evidence of exhaust leakage.
- 4 . () **(WEEKLY)** All fasteners for connecting the exhaust manifold to the cylinder head are in place and tight.
- 5 . () **(WEEKLY)** A copper clad gasket is installed between the exhaust manifold and the water jacketed exhaust tube and there is no evidence of exhaust leakage.
- 6 . () **(WEEKLY)** All fasteners for connecting the water jacketed exhaust tube to the exhaust manifold are in place, secured with locking devices*, and are tight.
- 7 . () **(WEEKLY)** The exhaust tube test port plug is in place, tight, and secured with lockwire.
- 8 . () **(WEEKLY)** A copper clad gasket is installed between the water jacketed exhaust tube and the exhaust scrubber and there is no evidence of exhaust leakage.
- 9 . () **(WEEKLY)** All fasteners for connecting the water jacketed exhaust tube to the exhaust scrubber are in place, secured with locking devices*, and are tight.
- 10 . () The flame arrestor that is part of the vacuum breaker check valve in the scrubber is in place and is in good condition. Inspect by unbolting the exhaust outlet tube from the scrubber exit flange. Reinstall the exhaust outlet tube. All fasteners are in place and tight.

(* Locking devices are considered to be lockwashers or serrated flange capscrews)

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FUNCTION CHECKS

All function checks must be performed in fresh moving air, in an area where permissible machines are not required.

1. () **(WEEKLY)** The intake air restriction indicator does not show red when the engine is running at high idle. If the indicator shows red, replace the air filter and reset the indicator.
2. () **(WEEKLY)** The engine stops when the "On-Off" control in the operator's compartment is placed in the "Off" position.
3. () **(WEEKLY)** The engine automatically stops when the water in the exhaust scrubber is drained slowly. Perform this check with the engine operating at low idle. CAUTION! The scrubber water may be HOT!
 - a. Shift the transmission control to "Neutral" and apply the parking brake.
 - b. Shut off the scrubber water make-up tank valve.
 - c. Loosen the scrubber drain plug enough for water to run out slowly.
 - d. Slowly drain the water from the scrubber until the engine stops.
 - e. Immediately tighten the drain plug and stop draining the water.
 - f. Check the water level in the scrubber with a dip stick thru the fill port. The water level after shutdown must be at least 5 1/2" deep.
 - g. Attempt to restart the engine. The engine may turn over but must not start.
 - h. Replace and tighten all plugs, refill the scrubber to normal operating level (9" to 10" deep), and open the scrubber water make-up tank valve.
4. () **(WEEKLY)** Actuating the emergency intake air shut-off stops the engine within 15 seconds.

**Warning! The following test procedure must be followed.
Failure to do so can result in extensive damage to the engine.**

- a. Shift the transmission control to "Neutral" and apply the parking brake.
- b. Shut off the scrubber water make-up tank valve.
- c. Drain the scrubber completely by removing the drain plug.
- d. While manually holding the scrubber float shaft so the outer cam-operated valve is in the closed position (roller on the high part of the cam), start the engine.
- e. Operate the engine at high idle for approximately 10 seconds to empty the remaining water from the scrubber.
- f. Release the throttle and let the engine return to low idle.

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- g. Actuate the emergency air intake shut-off control. The engine must stop within 15 seconds. (On older machines with an automatic air intake shut-off valve, hold the fuel shut-off on the injector pump open and move the "On-Off" control to the "Off" position).
 - h. Reset the trip lever on the air intake box.
 - i. Replace and tighten all plugs, refill the scrubber to normal operating level (9" to 10" deep), and open the scrubber water make-up tank valve.
5. () The air intake vacuum does not exceed 30 inches of water.
- a. Remove the plug from the air intake check port and install a vacuum gauge.
 - b. With the engine running at high idle, note the intake vacuum.
 - c. If the intake vacuum exceeds 30 inches of water with a clean air filter, remove the intake flame arrestor for cleaning and inspection. (see page 9)
 - d. Reinstall the flame arrestor. The connecting fasteners are in place, secured with locking devices, and are tight.
 - e. Replace the check port plug and secure it with lockwire.
6. () The exhaust back pressure does not exceed 34 inches of water.
- a. Remove the plug from the exhaust test port on the water jacketed exhaust tube and install a manometer.
 - b. With the engine running at high idle and the scrubber water level at normal operating depth, note the exhaust back pressure.
 - c. If the back pressure is excessive, drain and flush the scrubber, and correct any other problems. Retest the exhaust back pressure to verify that any problems have been corrected.
 - d. Replace the check port plug and secure it with lockwire.
7. () The engine coolant temperature sensor valve is installed at the exhaust manifold water outlet and is adjusted to stop the engine before the coolant temperature exceeds 212 degrees F.
- a. To test the temperature sensor valve, remove the sensor valve from the exhaust manifold and replace it with a pipe plug.
 - b. Reconnect the safety system hoses to the sensor valve.
 - c. Start the engine and immerse the sensor valve into a heated and agitated water-antifreeze bath.
 - d. The sensor valve must stop the engine before the heated bath exceeds 212 degrees F.
 - e. Reinstall the temperature sensor valve and reconnect the hoses.

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Inspection Procedure for Crimped Ribbon Flame Arrestors

1. Remove the flame arrestor from the air intake system.
2. Place the flame arrestor on a flat surface with a white background in an area where there is good lighting.
3. Inspect both sides of the flame arrestor core for gaps, irregularities, separations, damage or openings that appear larger than normal.
4. All abnormalities must be checked with a plug gauge like the one shown in figure 7. The gauge holder must weigh at least 1 ounce but not more than 1.5 ounces. The gauge must be a calibrated 0.018" diameter wire projecting at least 1 inch out of the gauge holder.

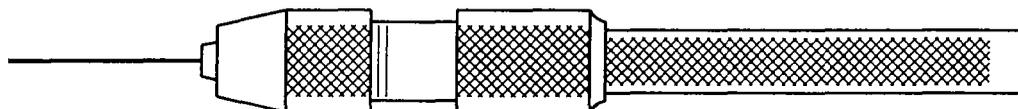


Figure 7

5. To check any opening in the core, use the following technique:
 - a. Grasp the gauge holder lightly between the thumb and index finger.
 - b. Place the tip of the gauge wire on the opening in question.
CAUTION! The gauge must be vertical and square with the core.
 - c. Do not force or wiggle the gauge, use only the weight of the gauge holder.
6. The gauge wire must not be able to enter any opening in the flame arrestor core.
7. On each side of the flame arrestor core, check at least five openings that appear normal.
8. **If there are any openings in the core that the gauge wire will enter, the flame arrestor is not useable on permissible equipment and must be replaced.**