

DRY SYSTEMS TECHNOLOGIES®

DRY SYSTEM® DIESEL POWER PACKAGE PERMISSIBILITY CHECKLIST M291-001-01

Page 1 of 5

DST DRY SYSTEM® MODEL M291 MSHA PART 36 CERTIFIED SUB-ASSEMBLY FOR DIESEL POWER PACKAGE AIR INTAKE

**RETROFITTED TO
150 HP CATERPILLAR 3306 PCNA DIESEL ENGINES
OR
100 HP CATERPILLAR 3304 PCNA DIESEL ENGINES**

DRY SYSTEMS TECHNOLOGIES®

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DO NOT CHANGE WITHOUT MSHA APPROVAL

REVISION 01 * DATED SEPTEMBER 2005

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DRY SYSTEM® AIR INTAKE SUB-ASSEMBLY FOR CATERPILLAR 3304 & 3306 PCNA DIESEL ENGINES

Caterpillar 3304 PCNA or 3306 PCNA Diesel Engine

1. It has been determined that the area, in which tests are to be performed, is in **FRESH AIR**.
2. The machine is equipped with a four-cylinder **Caterpillar 3304 PCNA** or a six-cylinder **Caterpillar 3306 PCNA**, naturally aspirated diesel engine.

DST Air Intake System

The **Model M291 Air Intake System** was derived from the MSHA Part 7F-020-0 approved DST Model M201 Diesel Power Package. It includes a Caterpillar supplied engine integrated intake manifold, and the following DST components: an inlet gasket, an intake pipe and flame arrestor assembly, an air shut-off valve with an actuating cylinder and two flanges, an optional flame-proof port, and an intake air cleaner with rubber connecting hoses or elbows. The six-cylinder engine also includes a plate and a gasket to cover the second intake opening of the engine.

Illustration No. 1 depicts the components of the intake system.

3. All components appear to be the same as shown on Illustration No. 1 in this Permissibility Checklist. There is no visible damage, cracks, or dents on the intake system.
[WEEKLY]

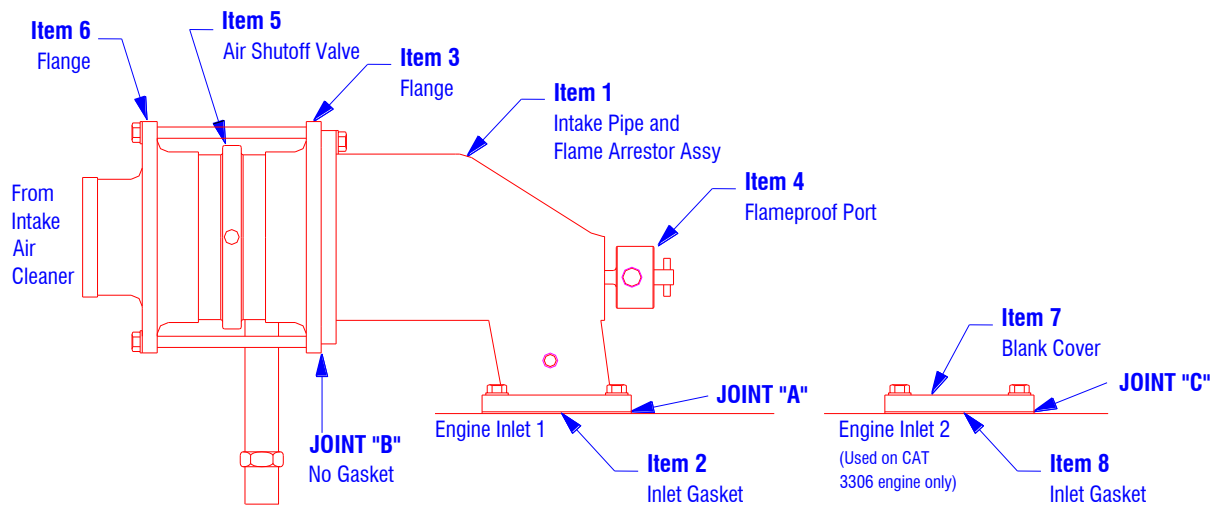


Illustration No. 1: Air Intake System

4. Item No. 1 is the intake pipe and intake flame arrestor assembly. It is securely attached to the Caterpillar 3304 or 3306 PCNA engine. Item No. 2 is a copper gasket installed between the components and all fasteners and locking devices are in place and tight. (**Joint "A"**)
[WEEKLY]

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5. [] A 0.0015" feeler gage cannot be inserted greater than 1/8" into the **Joint "A"**.
[WEEKLY]
6. [] Item No. 3 is a flange. It is securely attached to the intake side of the flame arrestor and all fasteners and locking devices are in place and tight. No gasket is used on this joint and no further check is required, as this is not a flameproof joint. (**Joint "B"**)
[WEEKLY]
7. [] Item No. 4 is an **optional** flameproof port for monitoring the intake restriction. It is tightly installed in the end of the intake pipe and flame arrestor assembly. A hose is connected to the flameproof port and the center plug is securely held in place with a retaining ring. If not installed, a pipe plug must be securely installed in its place.
[WEEKLY]
8. [] If the intake pipe and flame arrestor assembly is fitted with a second OPTIONAL threaded port, a pipe plug must be securely installed.
[WEEKLY]
9. [] Item No. 5 is an intake air shut-off valve. It is securely mounted between the flange, Item No. 3, and a second flange, Item No. 6, and all fasteners and locking devices are in place and tight. No gaskets are installed and no further check is required, as these are not flameproof joints.
[WEEKLY]
10. [] If an air compressor is installed, the air supply connection to the compressor must be located out-by (upstream) of the air intake flame arrestor and in-by (downstream) of the intake air cleaner, or the compressor must be fitted with its own intake air cleaner.
[WEEKLY]
11. [] The intake air cleaner housing, not shown, is connected to the inlet of flange No. 6 with rubber hoses, elbows or piping. The rubber hoses and elbows must be securely attached with hose clamps and must have no damage or leakage.
[WEEKLY]
12. [] Once every twelve-month, remove the inlet flanges and intake air shut-off valve from intake pipe and flame arrestor assembly to expose the intake flame arrestor for inspection. The core of the flame arrestor consists of a 4" wide stainless steel crimped ribbon element that can not be removed. There is no apparent damage and a 0.038" Plug Gage will not pass through any of the triangular openings. Remove the intake pipe and flame arrestor for inspection outlined on Illustration No. 2. Reinstall the intake pipe and flame arrestor and copper gasket after inspection, reattach the flanges and intake air shut-off valve and make sure all fasteners and locking devices are in place and tight.
[12 MONTH]
13. [] For the six cylinder engine only: Item No 7 is a cover to close the second intake opening on the engine. It is securely attached to the Caterpillar 3306 PCNA engine. Item No. 8 is a copper gasket installed between the components and all fasteners and locking devices are in place and tight. (**Joint "C"**)
[WEEKLY]
14. [] A 0.0015" feeler gage cannot be inserted greater than 1/8" into the **Joint "C"**.
[WEEKLY]

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System Operation

15. [] With the throttle pedal fully depressed, the transmission in neutral and all accessories dis-
[WEEKLY] engaged, the engine speed indicated on the gauge in the operator's cab does not exceed 2,350 RPM
16. [] Run engine at high idle speed of 2,250-2,350 RPM. The total intake restriction shown on the
[WEEKLY] gauge in the operator's cab must not exceed 30 inches H₂O.

Shut Down Device

17. [] With the engine at idle speed of 650 RPM, activate the emergency shutdown valve. On
[WEEKLY] equipment that has the same control for the fuel rack and the intake air shutoff, bind the fuel rack shutoff lever on the fuel pump in the open position before checking the intake air shutoff. Upon activation, the intake air shutoff valve must operate immediately and the engine shall stop within 15 seconds.

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Flame Arrestor Inspection Procedure

1. Remove the Flame Arrestor and Intake Pipe Assembly
2. Adequate lighting is required. Cap lamp lighting is not sufficient.
3. Visually inspect the inlet side of the Flame Arrestor for openings or spaces obviously greater than the triangular openings of the core. These kinds of openings may have been caused by prying a screwdriver or another such object against or through the Flame Arrestor core during routine maintenance.
4. Visually inspect inlet side of the core for places where the windings of the flame arrestor core appear to be separated such that gaps can be seen. If such gaps exist, they must be checked as following:
 - a.) The only measuring tool considered acceptable for performing this evaluation is a 0.038 inch diameter calibrated plug gage, sometimes called wire gage. The Plug Gage is to be mounted in a Gage Holder must project at least 1.0 inch out of the end.
 - b.) Grasp the gage holder lightly between the index finger and the thumb. Place the wire tip at the point in question, making sure the plug gage is vertical. Using only the weight of the gage and holder, see if it will enter the apparent gap. Do not attempt to wiggle or push the gage through the opening.
 - c.) If the plug gage enters any opening, the flame arrestor core must not be used on permissible equipment.
5. Visually inspect the triangles in the inlet of the flame arrestor core for triangles that appear to be larger than the rest. If such conditions exist, these openings must be checked as previously described in section 4-a, 4-b and 4-c.
6. Finally, if the flame arrestor core passes all the above evaluations, a final check should be performed on at least 5 randomly selected triangles on each side (Inlet side only on intake flame arrestor) of the core with the procedure described in section 5 a, b and c. In performing this check, the tip of the plug gage must be placed against a specific triangular opening. If this special care is not taken, the evaluation will be invalid.

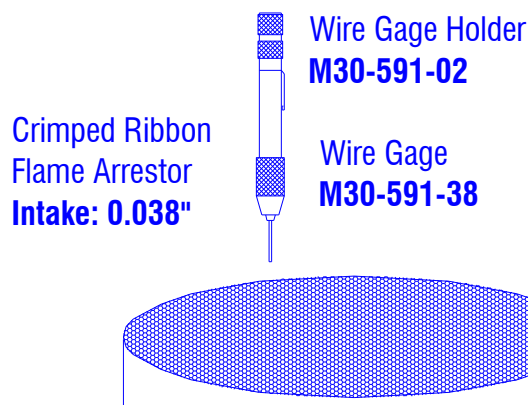


Illustration No 2: Flame Arrestor Checking Procedure

This Permissibility Checklist contains 17 Items on 5 Pages with 2 Illustrations.

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