



Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

**COMBUSTION SYSTEM
IMPROVEMENT**

CODE 372

(no)

DEFINITION

Replace, repower, or retrofit an agricultural combustion system and related components or devices.

PURPOSE

This practice is to accomplish one or more of the following purposes:

- Improve air quality by reducing emissions of oxides of nitrogen (NO_x)
- Improve air quality by reducing emissions of particulate matter (PM)
- Reduce energy use by increasing the efficiency of the combustion system

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to existing, in-use agricultural combustion systems, including stationary, portable, and self-propelled mobile units.

For a combustion system associated with a pumping plant (e.g., pumping plant power unit), when the only change to the pumping plant is the replacement, repowering, or retrofit of the power unit for an air quality or energy purpose, use this conservation practice standard (CPS). For all other scenarios involving a pumping plant combustion system, use CPS Pumping Plant (Code 533).

CRITERIA

General Criteria Applicable to All Purposes

The replacement, repower, or retrofit combustion system and related components or devices must serve roughly the same function and perform similar type of work as the original equipment. Additionally, the replacement, repower, or retrofit combustion system and related components or devices must be sized appropriately to perform an essentially equivalent amount of work as the original equipment and must meet or exceed currently applicable Federal, State, and local standards and guidelines.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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Replacement and Repower

After replacement or repower, destroy the existing units at a dismantling facility approved by NRCS. An approved dismantling facility is capable of scrapping and disposing of the units by shearing, crushing, or shredding. Destruction removes the existing high-emitting units from service and prevents the old units from reuse or movement into another locale.

If there are no local dismantling facilities, disable and properly dispose of the existing units by the following:

- To disable an engine, make a minimum of a 3-inch-diameter hole in the engine block including a portion of the oil pan rail (sealing surface).
- For mobile units, in addition to disabling the engine, completely sever the vehicle frame railings or destroy the bell-housing and transmission components if not equipped with a frame. Additional means may include compromising the drivetrain components by knocking holes in the transmission casing and cutting axles and axle housings.
- For other units, disable the units using an approved NRCS method.
- Dispose of units and associated materials or contents in accordance with environmental laws and regulations. Ensure that any equipment remaining onsite does not create a nuisance or habitat for vectors.

Destruction (or disabling, if applicable) and proper disposal must be documented. This documentation must include:

- The existing unit types.
- The existing unit serial numbers or mobile unit vehicle identification numbers.
- The date the existing units were destroyed or disabled.
- How the existing units were destroyed or disabled.
- Specifying that no parts or components were or will be parted-out, used, or sold as parts, or used to rebuild an engine or equipment.
- Date-stamped photographs.

Additional Criteria Applicable to Improve Air Quality

Any replacement, repower, or retrofit must demonstrate a reduction of either PM or NO_x emissions, or both.

For a replacement or repowered combustion system and related components or devices, utilize a noncombustion power source or a combustion power source that utilizes any combination of cleaner burning technologies, techniques, or fuels.

When installing a replacement or repower diesel powered engine, use the newest available U.S. Environmental Protection Agency engine TIER technology.

Additional Criteria Applicable to Reduce Energy Use

Estimate reduced energy use that results directly from the application of this practice. Calculate the estimated annual difference in energy use on an after-practice minus before-practice basis. Use a documented methodology as approved by NRCS.

CONSIDERATIONS

Installation of replacement or repower combustion systems with noncombustion renewable energy sources, such as solar, wind, and water, are preferred means of reducing air emissions associated with agricultural combustion systems. Noncombustion renewable energy sources do not release air emissions directly and do not increase air emissions from

offsite electricity generation. Consider the impacts of noncombustion renewable energy sources on other resources to analyze their overall conservation benefit.

Examples of individual retrofit actions include—

- Adding one or more emissions control devices.
 - Altering air/fuel mixtures to achieve more complete combustion and less emissions.
 - Adding a device that allows for reduced combustion of fuel to accomplish the same intended task.
 - Adding a device that allows for reduced operation of an existing combustion system, such as automated sensors and controls.
 - Accommodating the use of a cleaner burning fuel.
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- Other physical modifications or changes in combustion techniques that reduce emissions formation or release.

Reduced emissions of volatile organic compounds (VOCs) are a secondary benefit of improving combustions systems.

Utilizing noncombustion technology and nonfossil fuels can reduce greenhouse gas (GHG) emissions.

PLANS AND SPECIFICATIONS

Prepare specifications for application of this practice for each site or planning unit according to the criteria, considerations, and operations and maintenance described in this standard. Record specifications for this practice using approved specification sheets, job sheets, narrative statements from the conservation plan, or other documentation.

As a minimum, in the plans and specifications—

- Identify and describe the existing unit and related components or devices.
- Identify and describe the replacement or repower unit and related components or devices.
- Identify and describe the units retrofitted and the type of modifications made to the existing system.
- Document the destruction or disabling, if applicable, of the replaced units and related components or devices.
- For air quality, document the methodology and analysis used to estimate air emissions reductions.
- For energy, document the methodology and analysis used to estimate the energy use reduction.

OPERATION AND MAINTENANCE

Develop an operation and maintenance plan that is consistent with the purposes of this practice, its intended life, safety requirements, and the criteria used for its design.

This practice will require performance of periodic maintenance and operational items to maintain satisfactory performance. The plan must contain requirements including, but not limited to—

- Operating and maintaining all components in accordance with manufacturers' recommendations. In addition, observe all warnings, cautions and safety protocols.
- Repairing or replacing all items, as needed to maintain the system in good working order.
- Retaining installation records, including certifications, and all manufacturers' installation, operation, maintenance, and user guides. Provide copies to NRCS upon request.
- Documenting maintenance conducted on any components.
- Maintaining records throughout the practice lifespan to document improvements in emissions or energy efficiency from the beginning of operation. Records may include actual operating hours, monthly utility bills (electric), types and amounts of fuel used in the units, and energy production data. Provide copies to NRCS upon request.

REFERENCES

No References