



INTERNAL COMBUSTION ENGINE, PISTON TYPE
NON-EMERGENCY & NON-COGENERATION -
NATURAL GAS FUEL (LEAN BURN) (>2000 H.P.) - Fee Schedule 34D

The BACT Control Options which have been determined to be technologically feasible (T/F - demonstrated but not necessarily proven in field application) or have achieved the BACT emission rate limits in practice (A/P - demonstrated in use for the specific equipment category) are listed below. The BACT Control Options are listed in descending order of control stringency. If the top-listed T/F control option is proposed, no further analysis is required. If the first T/F control option is not chosen, then the applicant must review and determine the cost-effectiveness of each T/F control option in the order listed. The first control option determined to be cost-effective must be installed to meet the BACT requirement. A control option is considered cost-effective if the annualized cost of implementing that control option is equal to or less than the reference cost-effectiveness value for the same pollutant shown in Table 2-4. If none of the T/F control options are determined to be cost-effective, the applicant must propose the A/P control option, propose an alternative technology that meets the BACT emission rate limit or perform a full Top-down BACT Analysis as described in Section 4. The applicant is responsible for ensuring that the installed equipment meets the specified BACT Emission Rate Limit. (See Section 2 for further guidance.)

Natural Gas Fuel¹:

	VOC	NO _x	SO _x	PM
BACT Control Option²	Lean burn technology (T/F) BACT Emission Rate Limit – 0.6 grams/ bhp-hr	Lean burn with selective catalytic reduction (SCR) (T/F) BACT Emission Rate Limit- 0.07grams/ bhp-hr	Low Sulfur Fuel 10 grains/100 cf natural gas (A/P)	PCV filter, engine design (A/P) BACT Emission Rate Limit - 0.1 grams/ bhp-hr
BACT Control Option	Lean Burn Technology (A/P) BACT Emission Rate Limit – 1.0 grams/ bhp-hr	Lean Burn with selective catalytic reduction (SCR) (A/P) BACT Emission Rate Limit – 0.15 grams/ bhp-hr	Low Sulfur Fuel 10 grains/100 cf natural gas (A/P)	PCV filter, engine design (A/P) BACT Emission Rate Limit - 0.1 grams/ bhp-hr

The applicant may choose to limit the Potential to Emit (PTE) from the equipment to less than 10 pounds per day for each pollutant in lieu of meeting the stated BACT requirement.

¹ This table does not apply to gasoline-powered engines

² Electric motors need not be considered as a control option for:

- (a) Engines at stationary sources located more than 1/2 mile from utility service lines,
- (b) Engines located at any site and providing direct or electrical power for a non-repeating activity or process which requires no more than 3,000 hours of engine operation.
- (c) Engines mounted on moving equipment, such as cranes or drills, which are required to move around the facility during each workday as a function of that equipments purpose.

BACT LOOK-UP TABLE

INTERNAL COMBUSTION ENGINE, PISTON TYPE
NON-EMERGENCY & NON-COGENERATION -
NATURAL GAS FUEL (RICH BURN) (≥200 H.P.) - Fee Schedule 34D

The BACT Control Options which have been determined to be technologically feasible (T/F - demonstrated but not necessarily proven in field application) or have achieved the BACT emission rate limits in practice (A/P - demonstrated in use for the specific equipment category) are listed below. The BACT Control Options are listed in descending order of control stringency. If the top-listed T/F control option is proposed, no further analysis is required. If the first T/F control option is not chosen, then the applicant must review and determine the cost-effectiveness of each T/F control option in the order listed. The first control option determined to be cost-effective must be installed to meet the BACT requirement. A control option is considered cost-effective if the annualized cost of implementing that control option is equal to or less than the reference cost-effectiveness value for the same pollutant shown in Table 2-4. If none of the T/F control options are determined to be cost-effective, the applicant must propose the A/P control option, propose an alternative technology that meets the BACT emission rate limit or perform a full Top-down BACT Analysis as described in Section 4. The applicant is responsible for ensuring that the installed equipment meets the specified BACT Emission Rate Limit. (See Section 2 for further guidance.)

Natural Gas Fuel¹:

	VOC	NOx	SOx	PM
BACT Control Option²	Rich burn with non-selective catalytic reduction (NSCR) (T/F) BACT Emission Rate Limit – 0.15 grams/ bhp-hr	Rich burn with non-selective catalytic reduction (NSCR) (T/F) BACT Emission Rate Limit – 0.07 grams/ bhp-hr	Low Sulfur Fuel 10 grains/100 cf natural gas (A/P)	PCV filter, engine design (A/P) BACT Emission Rate Limit - 0.1 grams/ bhp-hr
BACT Control Option	All Rich Burn (A/P) BACT Emission Rate Limit – 0.15 grams/ bhp-hr	Rich Burn with non-selective catalytic reduction (NSCR) BACT Emission Rate Limit – 0.15 grams/ bhp-hr	Low Sulfur Fuel 10 grains/100 cf natural gas (A/P)	PCV filter, engine design (A/P) BACT Emission Rate Limit - 0.1 grams/bhp-hr

The applicant may choose to limit the Potential to Emit (PTE) from the equipment to less than 10 pounds per day for each pollutant in lieu of meeting the stated BACT requirement.

¹ This table does not apply to gasoline powered engines

² Electric motors need not be considered as a control option for:

- (a) Engines at stationary sources located more than 1/2 mile from utility service lines,
- (b) Engines located at any site and providing direct or electrical power for a non-repeating activity or process which requires no more than 3,000 hours of engine operation.
- (c) Engines mounted on moving equipment, such as cranes or drills, which are required to move around the facility during each workday as a function of that equipments purpose.

BACT LOOK-UP TABLE

INTERNAL COMBUSTION ENGINE, PISTON TYPE
NON-EMERGENCY & NON-COGENERATION - DIESEL FUEL
(200 H.P.-750 H.P.) - Fee Schedule 34D

The BACT Control Options which have been determined to be technologically feasible (T/F - demonstrated but not necessarily proven in field application) or have achieved the BACT emission rate limits in practice (A/P - demonstrated in use for the specific equipment category) are listed below. The BACT Control Options are listed in descending order of control stringency. If the top-listed T/F control option is proposed, no further analysis is required. If the first T/F control option is not chosen, then the applicant must review and determine the cost-effectiveness of each T/F control option in the order listed. The first control option determined to be cost-effective must be installed to meet the BACT requirement. A control option is considered cost-effective if the annualized cost of implementing that control option is equal to or less than the reference cost-effectiveness value for the same pollutant shown in Table 2-4. If none of the T/F control options are determined to be cost-effective, the applicant must propose the A/P control option, propose an alternative technology that meets the BACT emission rate limit or perform a full Top-down BACT Analysis as described in Section 4. The applicant is responsible for ensuring that the installed equipment meets the specified BACT Emission Rate Limit. (See Section 2 for further guidance.)

Diesel:

	VOC	NOx	SOx	PM ⁴
BACT Control Option ^{1,2}	Oxidation Catalyst (T/F)	California Clean diesel fuel and Selective Catalytic Reduction (SCR) ³ (T/F) BACT Emission Rate Limit – 90 % reduction	Low Sulfur Fuel (California Clean Diesel fuel) 0.05 % by weight (A/P)	Catalyst guard bed, PCV filter, engine design, diesel catalytic particulate filter (T/F) BACT Emission Rate Limit - 90 % reduction of uncontrolled particulate matter emission
BACT Control Option ²	California Clean diesel fuel and EPA or ARB certified engine (A/P)	California Clean Diesel fuel and Turbocharger, Low Temperature Aftercooler, and Retardation of Fuel Injection Timing 4 Degrees from manufacturer's specification, EPA or ARB certified engine. (A/P) BACT Emission Rate Limit - 6.9 grams/ bhp-hr	Low Sulfur Fuel (California Clean Diesel fuel) 0.05 % by weight (A/P)	Low Sulfur Fuel (California Clean Diesel fuel) and PCV filter (A/P) BACT Emission Rate Limit - 0.1 grams/ bhp-hr

The applicant may choose to limit the Potential to Emit (PTE) from the equipment to less than 10 pounds per day for each pollutant in lieu of meeting the stated BACT requirement.

¹Alternative controls for consideration include: gaseous fuel with NSCR or lean burn configuration or the use of electric motors using electricity from the serving utility.

Electric motors need not be considered as a control option for:

- (a) Engines at stationary sources located more than 1/2 mile from utility service lines,
- (b) Engines located at any site and providing direct or electrical power for a non repeating activity or process which requires no more than 3,000 hours of engine operation.
- (c) Engines mounted on moving equipment, such as cranes or drills, which are required to move around the facility during each work day as a function of that equipments purpose.

² For engines from 300 to 600 bhp, the use of Tier II certified engine need not be considered as a control option if demonstrated not to be cost-effective.

³SCR may be cost-effective for units with an uncontrolled potential to emit greater than 10 tons per year

⁴This table addresses BACT. Further particulate controls may be required as T-BACT pursuant to Rule 1200 or a State Air Toxics Control Measure for Diesel Particulates.

BACT LOOK-UP TABLE

INTERNAL COMBUSTION ENGINE, PISTON TYPE
NON-EMERGENCY & NON-COGENERATION - DIESEL FUEL
(<200 H.P.) - Fee Schedule 34G

The BACT Control Options which have been determined to be technologically feasible (T/F - demonstrated but not necessarily proven in field application) or have achieved the BACT emission rate limits in practice (A/P - demonstrated in use for the specific equipment category) are listed below. The BACT Control Options are listed in descending order of control stringency. If the top-listed T/F control option is proposed, no further analysis is required. If the first T/F control option is not chosen, then the applicant must review and determine the cost-effectiveness of each T/F control option in the order listed. The first control option determined to be cost-effective must be installed to meet the BACT requirement. A control option is considered cost-effective if the annualized cost of implementing that control option is equal to or less than the reference cost-effectiveness value for the same pollutant shown in Table 2-4. If none of the T/F control options are determined to be cost-effective, the applicant must propose the A/P control option, propose an alternative technology that meets the BACT emission rate limit or perform a full Top-down BACT Analysis as described in Section 4. The applicant is responsible for ensuring that the installed equipment meets the specified BACT Emission Rate Limit. (See Section 2 for further guidance.)

Diesel:

	VOC	NO_x	SO_x	PM
BACT Emission Rate Limit	1.5 grams/ bhp-hr	7.2 grams/ bhp-hr		0.40 grams/ bhp-hr
BACT Control Option ¹	California Clean diesel fuel; Engine design, (A/P)	California Clean diesel fuel; Turbocharger, Aftercooler, Air to Air Intercooler (or air to water) and Retardation of Fuel Injection Timing 4 Degrees from Manufacturers Specification (A/P)	Low Sulfur Fuel 0.05 % by weight (A/P)	Low Sulfur Fuel and PCV filter (A/P)

The applicant may choose to limit the Potential to Emit (PTE) from the equipment to less than 10 pounds per day for each pollutant in lieu of meeting the stated BACT requirement.

¹Alternative controls for consideration include: gaseous fuel with NSCR or lean burn configuration or the use of electric motors using electricity from the serving utility.

Electric motors need not be considered as a control option for:

- (a) Engines at stationary sources located more than 1/2 mile from utility service lines,
- (b) Engines located at any site and providing direct or electrical power for a non repeating activity or process which requires no more than 3,000 hours of engine operation.
- (c) Engines mounted on moving equipment, such as cranes or drills, which are required to move around the facility during each work day as a function of that equipment's purpose.