



ON THE ROAD TO A GREENER WORLD

EFFECTIVE SOLUTIONS FOR EXHAUST EMISSIONS



- Meet new EPA requirements for diesel engines
- Control nitrogen oxide emissions
- Eliminate environmental contamination
- Optimize performance and value with Gates hose products

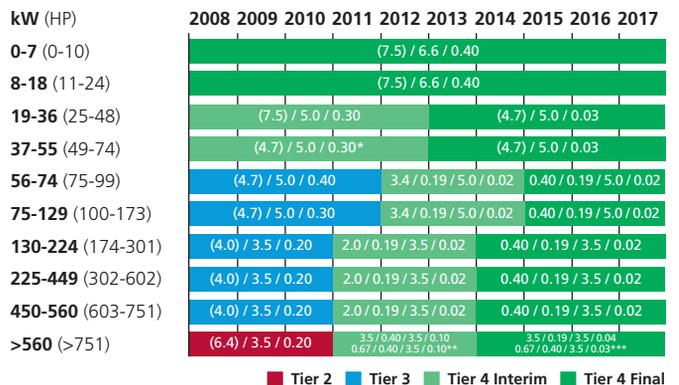
REDUCE POLLUTION, MEET EMISSION STANDARDS WITH GATES SPECIALTY HOSES



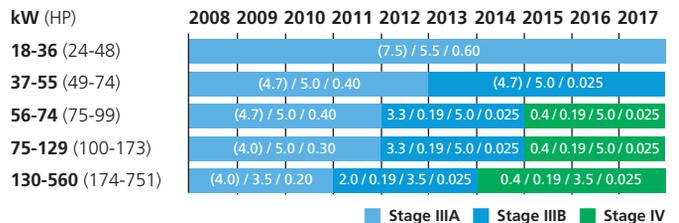
On January 1, 2010, new and tougher EPA emission standards went into effect related to the release of noxious nitrogen oxide gas (NO_x) into the atmosphere by diesel-powered vehicles including trucks, buses, construction and agricultural equipment. Between 2011 and 2015, additional regulations will go into effect.

Compliance with these standards presents an ongoing challenge to all manufacturers of diesel engines. With engine optimization options fully developed and implemented, new requirements can only be met through effective methods for handling and treating exhaust gases. In response, engine makers are utilizing advanced technologies designed to meet the need and ensure compliance. These solutions require specialty hose assemblies to handle hot gases and process fluids.

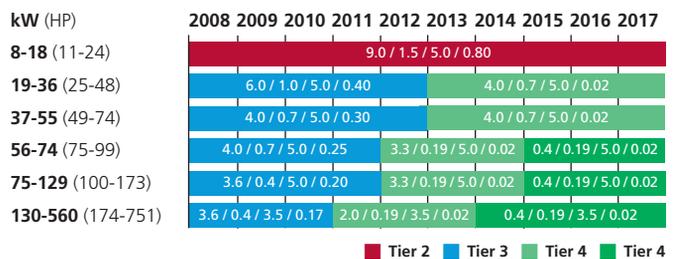
U.S. EPA



EUROPE



JAPAN (Introduction dates are October of year listed.)



NO_x/HC/CO/PM (g/kW-hr)
 (NO_x+HC)/CO/PM (g/kW-hr)
 (Conversion: [g/kW-hr] x 0.7457 = g/bhp-hr)

*Tier 4 Interim Option 1 PM Standard
 **Applies to portable power generation >1200 hp
 ***Applies to portable power generation >751 hp

The charts above are displayed for reference purposes only and do not depict the various options available to engine and equipment manufacturers. See the appropriate regulations for specific details and options related to that region's emissions standards and implementation dates.

COUNT ON GATES FOR EPA COMPLIANCE

Gates hose products designed for SCR and EGR emissions control systems will help vehicle manufacturers and end-users meet the toughest EPA regulations – now and in the years ahead. And Gates application engineers will provide assistance in choosing the right hose assemblies and designing the most efficient systems to ensure compliance. To meet new standards and get on the road to a greener world, contact your Gates representative today.

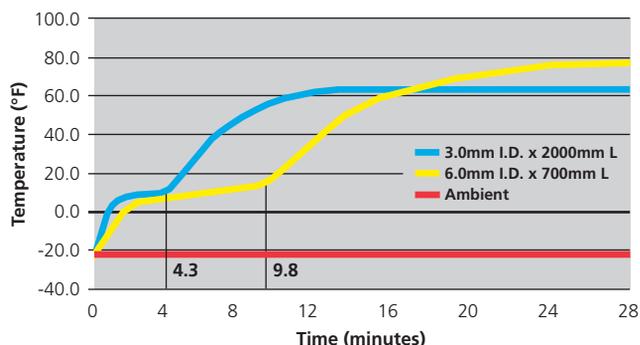
SELECTIVE CATALYTIC REDUCTION (SCR)

An SCR system is comprised of a special catalytic chamber built into the exhaust system of a diesel engine. SCR uses a Diesel Emissions Fluid (DEF) as a means of converting noxious nitrogen oxides (NO_x) in engine exhausts into harmless diatomic nitrogen gas and water.

In a typical SCR system, a 32.5 percent aqueous urea solution (DEF) is injected into the hot exhaust gas. The solution is

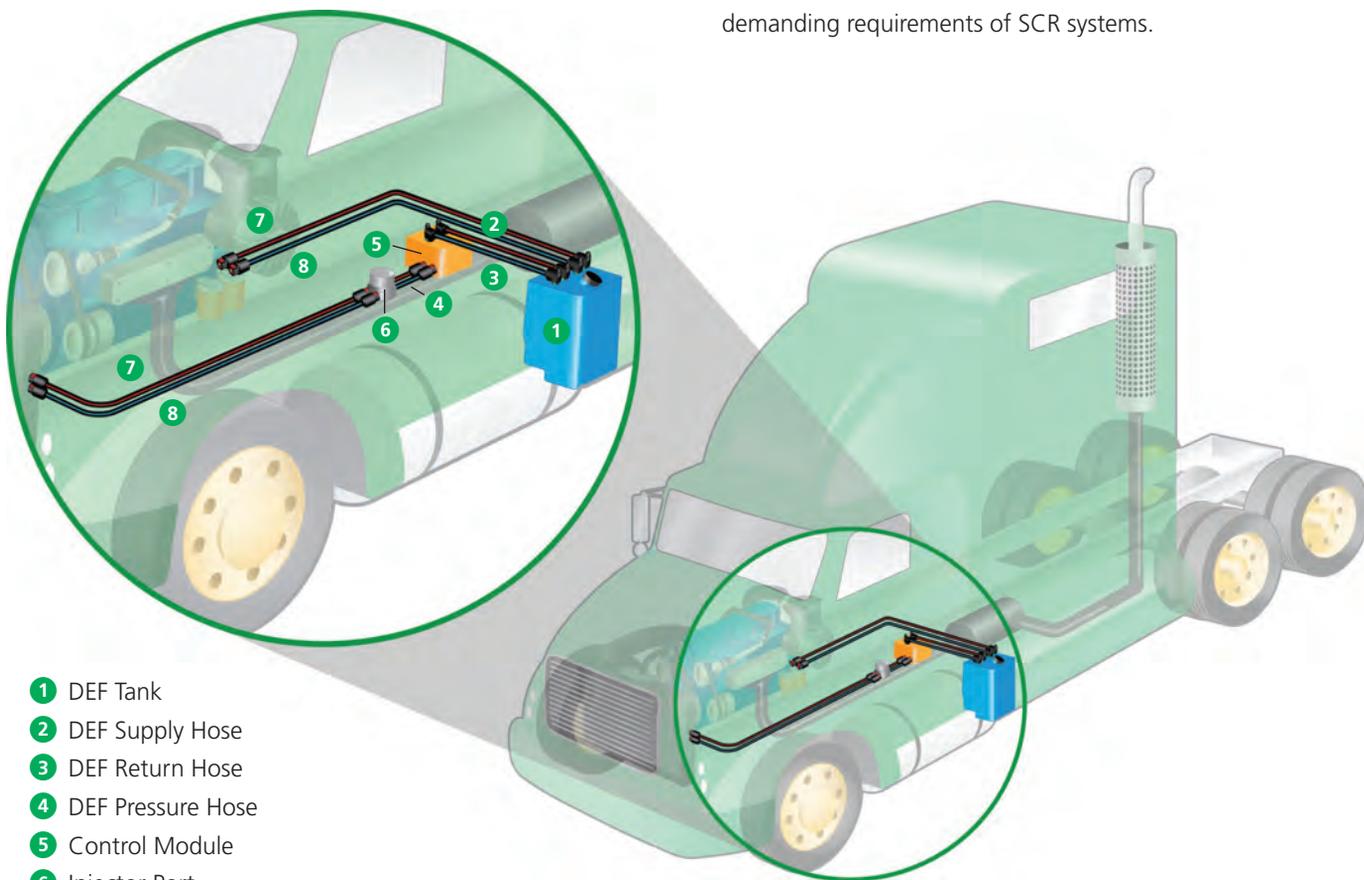
hydrolyzed above approximately 356°F (180°C) forming ammonia, which in turn reacts with the gas to produce harmless nitrogen and water.

SCR Typical Heat Curves
Time to Complete Thaw from -20°F



To be effective, it is essential to avoid any contamination of the urea solution, which must remain free of zinc, calcium carbonate and other substances.

Conveying fluids and gases throughout the SCR system requires high-quality hoses designed for or suited to SCR applications. Gates offers high-quality hoses that meet the demanding requirements of SCR systems.



- 1 DEF Tank
- 2 DEF Supply Hose
- 3 DEF Return Hose
- 4 DEF Pressure Hose
- 5 Control Module
- 6 Injector Port
- 7 Coolant Supply Hose
- 8 Coolant Return Hose

HOTLINE™ SCR HOSES

Gates provides hose assemblies specially designed and manufactured to convey DEF. Because DEF freezes at +11°F (-12°C), hoses and couplings are electronically heated using

Gates revolutionary carbon fiber heating system. This patent-pending technology allows for more uniform fluid heating compared to heated-wire designs. Customizable hose lengths offer greater flexibility in design while thermoplastic over-molds protect electrical connections against moisture and corrosion.

HotLine™ Rubber SCR Suction & Return Line

- Non-zinc, peroxide-cured EPDM tube
 - Textile reinforcement
 - Dense closed-cell EPDM cover
 - 6.0mm and 8.0mm I.D. (other sizes available on request)
 - 170 psi (11.7 bar) maximum working pressure
 - Temperature range -40°F (-40°C) to 200°F (93°C)
- Three-plus meters (10 feet) with center tap
 - Carbon fiber heating (patent pending)
 - Heated SAE J2044 quick connect couplings
 - 12V or 24V power sources
 - Heating and electrical connections per customer specification



HotLine™ Nylon SCR Suction & Return Line

- Nylon tube
 - Dense closed-cell EPDM cover
 - 6.0mm I.D. (other sizes available on request)
 - 200 psi (13.8 bar) maximum working pressure
 - Temperature range -40°F (-40°C) to 257°F (125°C)
- Three-plus meters (10 feet) with center tap
 - Carbon fiber heating (patent pending)
 - Heated SAE J2044 quick connect couplings
 - 12V or 24V power sources
 - Heating and electrical connections per customer specification



HotLine™ Nylon SCR Pressure Line

- Nylon tube
 - Dense closed-cell EPDM cover
 - 3.0mm and 6.0mm I.D. (other sizes available on request)
 - 200 psi (13.8 bar) maximum working pressure
 - Temperature range -40°F to +257°F (-40°C to +125°C)
- Three-plus meters (10 feet) with center tap
 - Carbon fiber heating (patent pending)
 - Heated SAE J2044 quick connect couplings
 - 12V or 24V power sources
 - Heating and electrical connections per customer specification



DEF TANK TRANSFER HOSES

Tank Return – Blue Stripe™ Heater Hose

Premium heater hose for high performance and long service life at higher temperatures

- 3/8" to 1" standard I.D. sizes
- Temperature range -40°F to +302°F (-40°C to +150°C)
- Meets SAE J20R3 EC Class D1
- Couplings: PowerGrip® SB® clamps
- Custom shapes and diameters available



Tank Supply – Red Stripe™ Heater Hose

Premium heater hose for high performance and long service life at higher temperatures

- 3/8" and 5/8" standard I.D. sizes
- Temperature range -40°F to +302°F (-40°C to +150°C)
- Meets SAE J20R3 EC Class D1
- Couplings: PowerGrip® SB® clamps
- Custom shapes and diameters available



DEF Dispensing/Tank Fill Hose

- 3/4" and 1" standard I.D. sizes
- Temperature rating: -40°F to +212°F (-40°C to +100°C)
- Non-zinc, peroxide-cured EPDM
- Custom shapes and diameters available

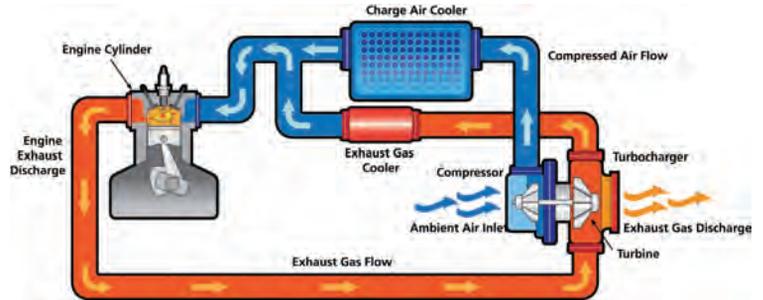


SELECTIVE CATALYTIC REDUCTION (SCR)





An EGR system (sometimes known as a Charge Air Cooler) operates by recirculating some of the engine's hot exhaust gases back into the engine cylinders where it is mixed with fuel, oxygen and combustion products.

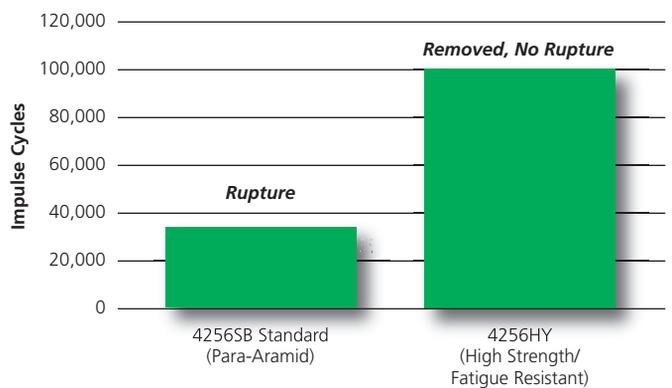


In a diesel engine EGR system, the exhaust gases are cooled via a heat exchanger, allowing the introduction of a greater mass of recirculated gases into the engine cylinders. This, in turn, reduces the heat generated by combustion. Because the formation of nitrogen oxide gas occurs much faster at higher temperatures, the EGR process reduces the amount of NO_x generated by combustion in the engine.

It should be noted that an EGR system results in decreased fuel economy and engine horsepower with a corresponding increase in particulate matter generation, requiring additional emission controls.

Gates offers a line of high-quality, long-lasting, flexible engine hose products ideally suited for hot-side and cold-side applications in an EGR system. These molded and straight hoses can replace rigid tube and boot assemblies in EGR systems to better absorb engine movements for reliable operation and longer service life.

**Coolant Hose – 2.5" I.D.
Hot Air Impulse – 60 psi/302°F (4.1 bar/150°C)**



GATES EGR HOSE SOLUTIONS

Curved Hose (4289E)

Curved hose for engine air inlet connection to air cleaner

- Meets SAE J200 M3CA 707 A25 B35 C32 F17 Z1(EPDM) Z2(Duro 60-75)
- Temperature rating: -40°F to 302°F (-40°C to 150°C)
- Available in 3/8" to 6" I.D. sizes
- Available in selected wall thicknesses
- Custom shapes and diameters available



High Fatigue-Resistant Curved Hose (4256HY)

Curved hose with superior flex and impulse fatigue resistance

- 2", 2-1/4", 2-1/2", 3", 3-1/2" and 4" standard I.D. sizes
- Meets SAE 20R4 Class D1
- Gates patented fatigue-resistant reinforcement (U. S. Patent #7,572,745)
- Temperature rating: -40°F to +257°F (-40°C to +125°C)
- 50 psi (3.4 bar) maximum working pressure
- Custom shapes and diameters available



Oil-Resistant Curved Hose (4278AC)

Cold-side CAC curved hose with recirculated crank case fumes (closed breather) or heavy exposure to oil or fuel

- Sizes thru 4" standard I.D.
- Similar to SAE 20R4 Class D1
- Gates patented fatigue-resistant reinforcement
- Temperature rating: -40°F to +275°F (-40°C to +135°C)
- 40 psi (2.8 bar) maximum working pressure
- Custom shapes and diameters available



High Temperature Silicone Hose (4171H)

Straight hose for flexible connection in turbocharger air systems (hot or cold side)

- Orange silicone tube and cover with multiple plies of high-temperature resistant fabric
- Temperature rating: -40°F to 550°F (-40°C to 288°C)
- Available in 1" to 5" I.D. sizes
- Standard 10' lengths; custom lengths available



Silicone Hump Hose (4177S)

Straight hose for flexible connection in turbocharger air systems (hot or cold side) for heavy-duty diesel engines; single hump isolates vibration

- Multiple plies of silicone and polyester fabric
- Temperature rating: -60°F to 350°F (-51°C to 177°C)
- Available in 1-1/4" to 4" standard I.D. sizes and standard lengths





**The World's Most Trusted Name
in Belts, Hose and Hydraulics.**

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