



Doosan Infracore

COMPRESSOR TRAINING

12/150



Specifications

| COMPRESSOR | | ENGINE | |
|-----------------------------|----------------|-----------------------------|--------------------|
| FAD | 14.9m³/min | Type | Ingersoll Rand |
| Discharge pressure | 12 bar | No. Cylinders | 6 inline |
| Maximum allowable pressure | 12.7 bar | Oil capacity | 16.7 litres |
| Safety valve setting | 15 bar | Speed @ full load | 2000 revs/min |
| Maximum pressure ratio | 13 : 1 | Speed @ idle | 1300 revs/min |
| Operating ambient temp | - 10 to + 46°C | Electrical system | 24V negative earth |
| Maximum discharge temp | 120°C | Power @ 2000 rpm | 164Kw |
| Cooling system | Oil injection | Fuel tank capacity | 310 litres |
| Oil capacity | 53 litres | Coolant capacity | 10 litres |
| Max oil system temp | 120°C | | |
| Max oil system pressure | 12.7 bar | | |
| Fixed Height Running Gear | | Variable Height RG | |
| Shipping weight | 2840 kg | Shipping weight | 2900 kg |
| Maximum weight | 2940 kg | Maximum weight | 3000 kg |
| Max horizontal towing force | 3100 kg | Max horizontal towing force | 2690 kg |
| Max vertical coupling load | 150 kgf | Max vertical coupling load | 150 kgf |
| Wheels & Tires | | Sound Data | |
| No. Off wheels | 2 | Rated load | 83dB(A) |
| Tire size | 205/75 R17.5 | Sound power level | 99dB(A) |
| Tire pressure | 6.5 bar | Avg sound level | 71dB(A) |



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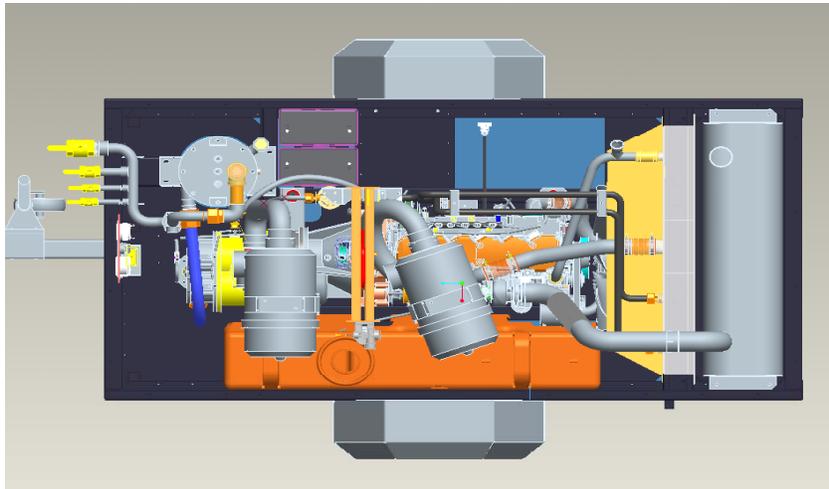
Layout



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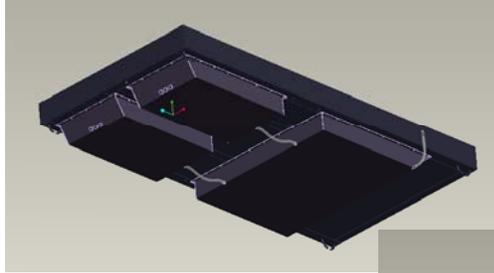
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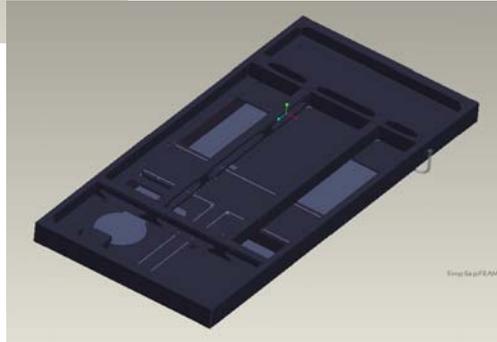
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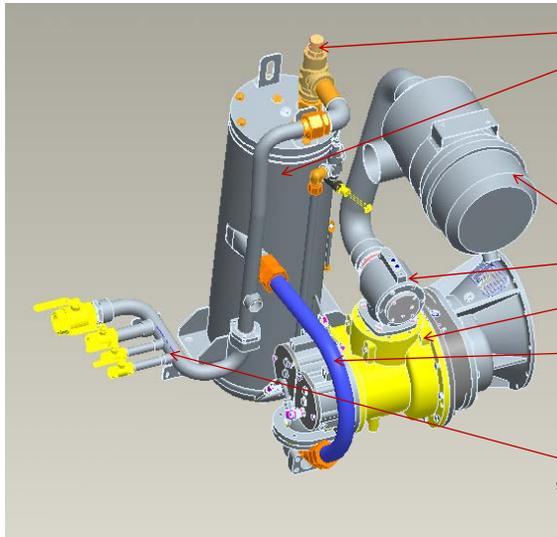
Layout – Bunded Base Frame



The bunded base frame does not allow any fluid spills .
The entire amount of fluids present in the machine (coolant-fuel-oil) , will in case of a leak be contained in the base frame.



Layout – Compressor System



Minimum Pressure Valve
Separator Vessel

Intake Filter

Unloader

Airend

Airend out to separator

Outlet Valves



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ENGINE Tier 3 (12/150)

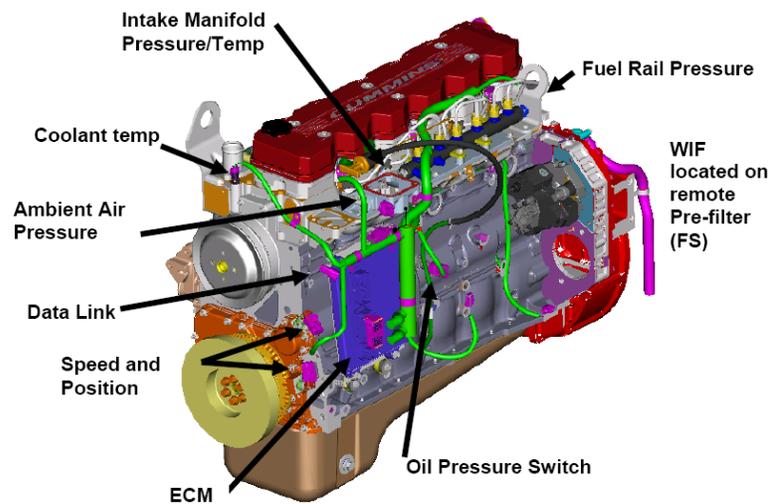
- 6IRF8AE – Cummins QSB 6.7
- 6 cylinders
- 6.7L displacement
- 220hp(164Kw)@2000 rpm
- Bosch HPCR – 1600bar
- Turbocharged
- Emission Tier III certified
- 24 Volt Electrics



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ENGINE Tier 3 (12/150)

QSB6 Harness Connections and their Locations



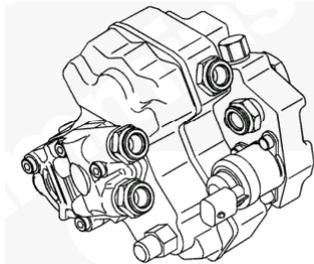
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ENGINE QSB 6.7 – safety system

The electronic system includes the following sensors to monitor the engine system parameters:

- Fuel pressure, located in the high pressure rail.
- Intake manifold pressure/temperature, located in the intake manifold cover.
- Coolant temperature located at the front exhaust side of the cylinder head.
- Crankshaft speed sensor located on front of engine.
- Camshaft speed sensor located on front gear cover.
- Ambient air pressure sensor - located near the top of ECM, as part of wiring harness.
- Water in fuel sensor - located in bottom of spin on fuel filter.
- Oil pressure switch is used.

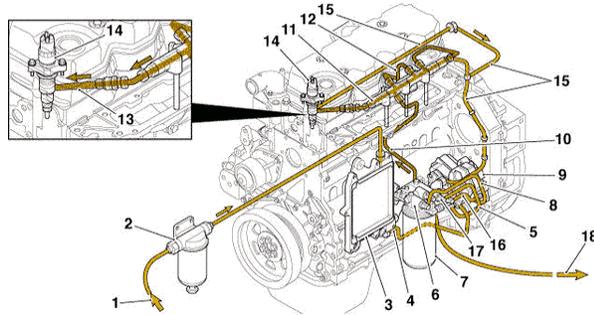
QSB6.7 – Fuel system



⚠ WARNING ⚠

The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel. Do not loosen any fittings while the engine is running. Personal injury and property damage can result. Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to decrease to a lower level.

QSB6.7 – Fuel system

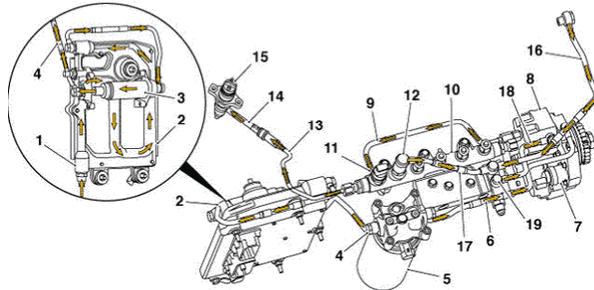


1. From fuel supply tank
2. Water/fuel separator (**not** mounted on engine)
3. ECM cooling plate*
4. To fuel gear pump
5. To fuel filter
6. Fuel filter head
7. Fuel filter
8. To high-pressure pump
9. High-pressure pump
10. To fuel rail
11. Fuel rail
12. To injectors
13. High-pressure connector
14. Injector
15. Fuel return from injectors and fuel rail to fuel filter head
16. Fuel return from high-pressure pump to fuel filter head
17. Fuel return manifold
18. To fuel supply tank.



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QSB6.7 – Fuel system

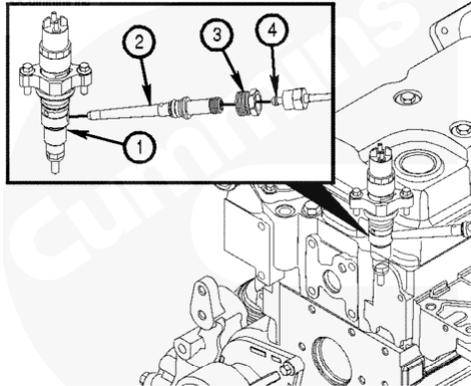


1. Fuel inlet - ECM cooling plate
2. ECM cooling plate
3. Lift pump
4. Fuel line (from lift pump to fuel filter)
5. Fuel filter
6. Fuel pump inlet to gear pump
7. EFC actuator
8. Fuel pump
9. High-pressure fuel line (fuel pump to rail)
10. Fuel rail
11. Fuel rail pressure sensor
12. Fuel pressure relief valve
13. High-pressure fuel line (fuel rail to fuel injector)
14. High-pressure connector to fuel injector
15. Fuel injector
16. Injector return line
17. Pressure relief return line
18. Fuel pump return line
19. Fuel return manifold.

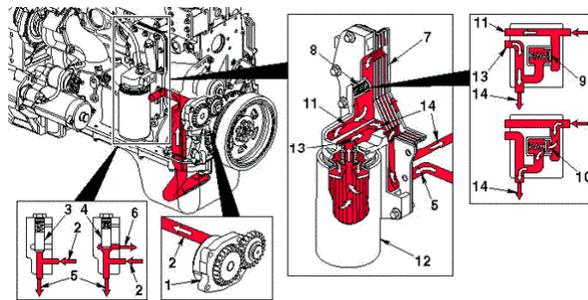


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QSB6.7 – Fuel system

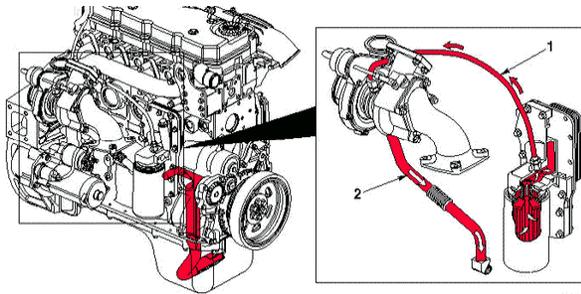


QSB6.7 – Lubricating system



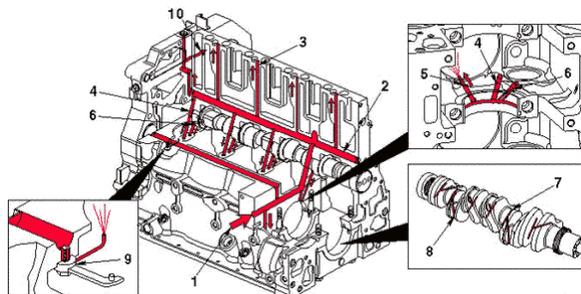
1. Gerotor lubricating oil pump
2. From lubricating oil pump
3. Pressure regulating valve closed
4. Pressure regulating valve open
5. To lubricating oil cooler
6. To lubricating oil pump supply
7. Lubricating oil cooler
8. Filter bypass valve
9. Filter bypass valve closed
10. Filter bypass valve open
11. To lubricating oil filter
12. Full-flow lubricating oil filter
13. From lubricating oil filter
14. Main lubricating oil rifle.

QSB6.7 – Lubricating system



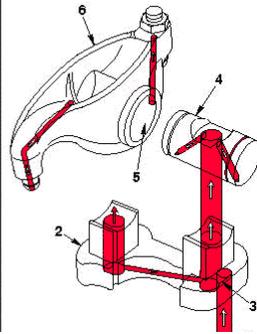
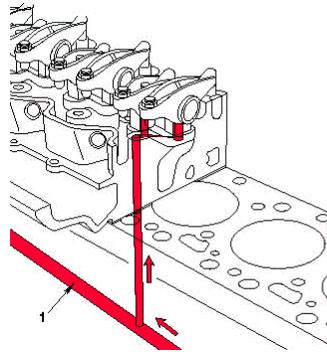
- 1.Turbocharger lubricating oil supply
- 2.Turbocharger lubricating oil drain.

QSB6.7 – Lubricating system



- 1.From lubricating oil cooler
- 2.Main lubricating oil rifle
- 3.To valve train
- 4.From main lubricating oil rifle
- 5.To piston-cooling nozzle
- 6.To camshaft
- 7.Crankshaft main journal
- 8.Oil supply to rod bearings
- 9.Directed piston-cooling nozzle
- 10.To internal lubrication of air compressor.

QSB6.7 – Lubricating system

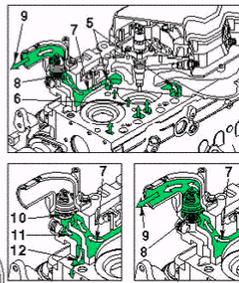
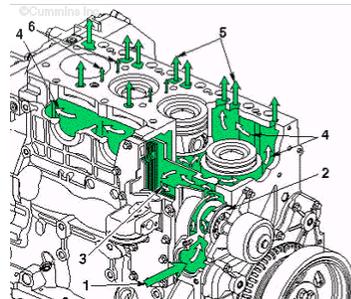


- 1.Main lubricating oil rifle
- 2.Rocker lever support
- 3.Transfer slot
- 4.Rocker lever shaft
- 5.Rocker lever bore
- 6.Rocker lever.



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QSB6.7 – Cooling system

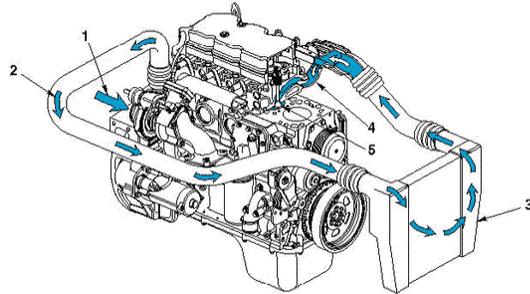


- 1.Coolant inlet
- 2.Pump impeller
- 3.Coolant flow past lubricating oil cooler
- 4.Coolant flow past cylinders
- 5.Coolant flow from cylinder block to cylinder head
- 6.Coolant flow between cylinders (engines **without EGR only**)
- 7.Coolant flow to thermostat housing
- 8.Coolant bypass passage
- 9.Coolant flow back to radiator
- 10.Bypass open
- 11.Coolant bypass in cylinder head
- 12.Coolant flow to water pump inlet.

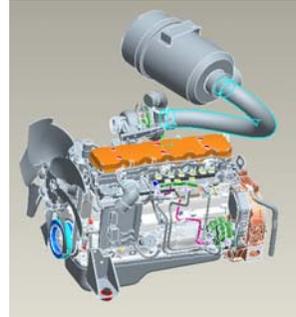


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QSB6.7 – Air Intake system

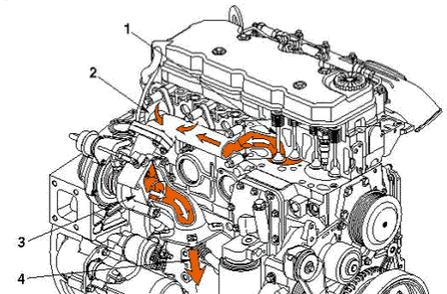


- 1.Intake air inlet to turbocharger
- 2.Turbocharger air to charge air cooler
- 3.Charge air cooler
- 4.Intake manifold (integral part of the cylinder head)
- 5.Intake valve.

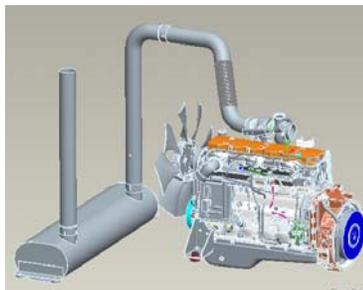


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QSB6.7 – Exhaust system



- 1.Exhaust valve
- 2.Exhaust manifold
- 3.Turbocharger
- 4.Turbocharger exhaust outlet.



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Maintenance – Engine specific

Maintenance Procedures at Daily Interval

| | |
|---------------------------------|---------|
| •Air Intake Piping - | Check |
| •Engine Lubricating Oil Level - | Check |
| •Air Tank and Reservoirs - | Drain |
| •Crankcase Breather Tube - | Inspect |
| •Engine Coolant Level - | Check |
| •Fuel-Water Separator - | Drain |



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Maintenance – Engine specific

Maintenance Procedures at 250 Hours or 3 Months

| | |
|------------------------------------|---------|
| Air Cleaner Restriction - | Check |
| Air Compressor Mounting Hardware - | Check |
| Charge-Air Cooler - | Check |
| Charge-Air Piping - | Check |
| Radiator Hoses - | Check |
| Air Intake Piping - | Inspect |
| Fan, Cooling - | Check |
| Coolant Level - | Check |
| Drive Belts - | Check |



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Maintenance – Engine specific

Maintenance Procedures at 500 Hours or 6 Months

| | |
|-------------------------------|------------------|
| Engine Coolant - | Antifreeze Check |
| Fuel Filter (Spin-On Type) - | Replace |
| Lubricating Oil and Filters - | Change |
| Radiator Pressure Cap - | Check |



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Maintenance – Engine specific

Maintenance Procedures at 1000 Hours or 1 Year

| | |
|------------------------------|-------|
| Cooling Fan Belt Tensioner - | Check |
| Fan Hub, Belt-Driven - | Check |



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Maintenance – Engine specific

Maintenance Procedures at 2000 Hours or 2 Years

| | |
|---------------------------------|-------|
| Air Compressor Discharge Line - | Check |
| Cooling System - | Drain |
| Vibration Damper, Rubber - | Check |
| Vibration Damper, Viscous - | Check |



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Maintenance – Engine specific

Maintenance Procedures at 5000 Hours or 4 Years

| | |
|----------------|--------|
| Overhead Set - | Adjust |
|----------------|--------|



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Maintenance – Engine Fuel Recommendation

Cummins Inc. recommends the use of ASTM number 2D fuel. The use of number 2D diesel fuel will result in optimum engine performance. At operating temperatures below 0°C [32°F], acceptable performance can be obtained by using blends of number 2D and number 1D.

The following chart lists acceptable substitute fuels for this engine.

| Acceptable Substitute Fuels | | | | | | | | | |
|--|-------------------------|-----------------------|-------|--------|------|------|--------|--------|--------|
| Number 1D Diesel ⁽¹⁾ (2) (3) | Number 2D Diesel (3) | Number 1K Kerosene | Jet-A | Jet-A1 | JP-5 | JP-8 | Jet-B | JP-4 | CITE |
| A | OK | Not OK | A | A | A | A | Not OK | Not OK | Not OK |
| An "A" means OK only if fuel lubricity is adequate. This means the BOCLE number is 3100 or greater as measured by ASTM specification D6078, Scuffing Load Ball On Cylinder Evaluator (SLBOCLE). Lubricity can also be measured by ASTM, specification D6079, ISO 12150, High Frequency Reciprocating Rig (HFRR) in which the fuel must have a wear scar diameter of 0.45 mm [0.02 in] or less. | | | | | | | | | |
| Any adjustment to compensate for reduced performance with a fuel system using alternate fuel is not warrantable. | | | | | | | | | |
| Winter blend fuels, such as found at commercial fuel-dispensing outlets, are combinations of number 1D and 2D diesel fuels and are acceptable. | | | | | | | | | |



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Maintenance – Engine Oil Recommendation

Cummins Inc. recommends the use of a high-quality SAE 15W-40 heavy-duty engine oil, such as Valvoline Premium Blue™, which meets or exceeds the American Petroleum Institute (API) performance classification CH-4/SJ or CI-4/SK and the Association des Constructeurs Européen d'Automobiles (A.C.E.A.) performance classification E5 or E7.

| Cummins® Engine Standard Classifications (CES) | American Petroleum Institute Classification (API) | European Classification (ACEA) | Comments |
|--|---|--------------------------------|---|
| | API CD API CE | ACEA E-1, ACEA E-2 | OBSOLETE. DO NOT USE. |
| CES-20075 | API CF-4/SG, API CG-4/SH | ACEA E-3 | Minimum acceptable oil classification for Midrange engines. (1) |
| CES-20071, CES-20072, CES-20076, CES-20077 | API CH-4/SJ | ACEA E-5, E-7 | Good oil classification for Midrange engines without EGR. |
| CES-20078 | API CI-4/SK | | Excellent oil for Midrange engines. |
| 1. CG-4/SH and E-3 oils can be used in areas where none of the recommended oils are available, but the oil drain interval must be reduced by one half of the interval given in the maintenance schedule. See the oil drain interval information in Section 2. | | | |



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Maintenance – Engine Coolant Recommendation

Fully formulated antifreeze **must** be mixed with good-quality water at a 50/50 ratio (40- to 60-percent working range).

A 50/50 mixture of antifreeze and water gives a -36°C [-33°F] freezing point and a 108°C [226°F] boiling point, which is adequate for locations in North America. The actual lowest freezing point of ethylene glycol antifreeze is at 68 percent. Using higher concentrations of antifreeze will raise the freezing point of the solution and increase the possibility of a silica gel problem.

Typically, antifreeze/coolants meeting ASTM4985 (GM6038M specification) or ASTM D6210 criteria are acceptable antifreeze/coolants for QSB6.7.

| Water Quality | |
|------------------------------|---|
| Calcium Magnesium (hardness) | Maximum 170 ppm as (CaCO ₃ + MgCO ₃) |
| Chloride | 40 ppm as (Cl) |
| Sulfur | 100 ppm as (SO ₄) |



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Maintenance - Compressor

| ecn | Qty. | Description | ecn | Qty. | Description |
|-----|----------|------------------------------------|-----|----------|------------------------------------|
| | | | | | |
| 1-4 | 46550523 | 1 KIT - 500 HOUR | | | |
| 1 | 23190200 | 1 Element, oil filter (engine) | 1 | 23190200 | 1 Element, oil filter (engine) |
| 2 | 36897346 | 1 Element, oil filter (airend) | 2 | 36897346 | 1 Element, oil filter (airend) |
| 3 | 23190192 | 1 Element, fuel filter (primary) | 3 | 23190192 | 1 Element, fuel filter (primary) |
| 4 | 23190184 | 1 Element, fuel filter (secondary) | 4 | 23190184 | 1 Element, fuel filter (secondary) |
| | | | 5 | 23126311 | 2 Element, air filter |
| | | | 6 | 23126329 | 2 Element, air filter (safety) |
| | | | 7 | 22111975 | 1 Element, oil separator |



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Maintenance - Compressor

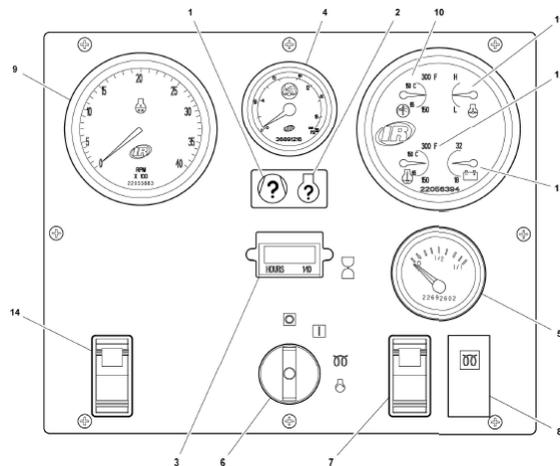
| | Initial 500 miles /850 km | Daily | Weekly | Monthly | 3 Monthly, 250 hrs. | 6 Monthly, 500 hrs | 12 Monthly, 1000 hrs | 18 Monthly, 1500 hrs |
|-----------------------------------|---------------------------|-------|--------|---------|---------------------|--------------------|----------------------|----------------------|
| *Fuel/Water Separator Element | | | | | | R | | |
| Compressor Oil Filter Element | | | | | | R | | |
| Compressor Oil | | | | | | R | | |
| Engine Oil Change | | | | | | R | | |
| Engine Oil Filter | | | | | | R | | |
| *Water Pump Grease. | | | | | | | R | |
| *Wheels (Bearings, Seals, etc.) | | | | | | C | | |
| *Engine Coolant | | | | | | C | R | |
| Fuel Filter Element | | | | | | R | | |
| *Injection Nozzle Check | | | | | | | | C |
| Shutdown Switch Settings | | | | | | | T | |
| Scavenger Orifice & Related Parts | | | | | | | C | |
| Oil Separator Element | | | | | | | R | |
| *Feed Pump Strainer Cleaning. | | | | | | | C | |
| Coolant Replacement | | | | | | | R | |

Maintenance intervals are on **time or hours**, whichever comes first!!



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Electronics – Control Panel



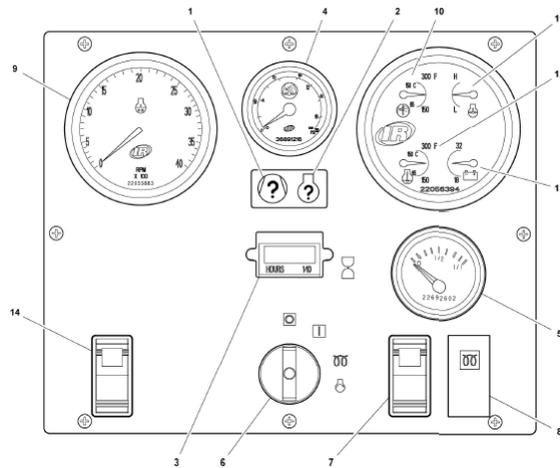
DIAGNOSTIC/AUTO SHUTDOWN (STANDARD)

- 1. Compressor fault** – Needs attention. See Wedge diagnostic panel for more detail.
- 2. Engine Fault** – Needs attention. See Wedge diagnostic panel for more detail.
- 3. Hourmeter** – Records running time for maintenance.
- 4. Compressor Discharge Pressure Gauge** – Indicates pressure in receiver tank, psi (kPa).
- 5. Fuel Level Gauge** – Indicates amount of fuel in tank.



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Electronics – Control Panel



CONTROLS (STANDARD)

- 6. Power Switch** – Flip .ON. to activate systems prior to Starting. Flip .OFF. to stop engine.
- 7. Service Air Switch** – After warm-up, PUSH. Provides full air pressure at the service outlet.
- 8. Wait To Start Lamp.**
- 9. Engine Speed Gauge** – Indicates engine speed.
- 10. Discharge Air Temp. Gauge** – Indicates in F and C. Normal operating range: 185F/85C to 248F /120C.
- 11. Engine Oil Pressure Gauge** – Indicates engine oil pressure (psi (kPa)).
- 12. Engine Water Temp Gauge** – Indicates coolant temperature, with normal operating range from 180F/82C to 210F /99C.
- 13. Voltmeter** – Indicates battery condition.

OPTIONAL CONTROLS

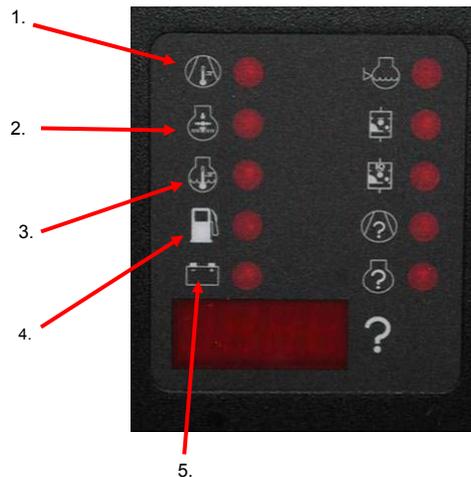
- 14. Dual Pressure Switch**



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INSTRUMENT/CONTROL PANEL

- 1. HIGH COMPRESSOR TEMP.**
Indicates shutdown due to high comp. Temp.
- 2. LOW ENGINE OIL PRESSURE.**
Indicates shutdown due to low oil P.
- 3. HIGH ENGINE COOLANT TEMP.**
Indicates shutdown due to high water Temp.
- 4. LOW FUEL LEVEL.**
Indicates shutdown due to low fuel level.
- 5. LOW BATTERY VOLTS.**
Indicates battery/charging system needs service.



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INSTRUMENT/CONTROL PANEL



1. LOW ENGINE COOLANT LEVEL.
Alarm indicator lamp. Indicates coolant needs service.
2. RESTRICTED AIR FILTER.
Alarm indicator. Indicates eng/comp air filter need service.
3. RESTRICTED IQ FILTERS.
Shutdown indicator (If equipped)
4. COMPRESSOR MALFUNCTION.
Indicates shutdown due to compressor system fault. Refer to fault code list.
5. ENGINE MALFUNCTION.
Engine fault. Refer to engine fault codes.
6. FAULT CODE & DIAGNOSTICS DISPLAY.
Refer to fault code and parameters lists.

Warranty – Cummins QSB 6.7

Base Warranty.

QSB engines come with a full 2-year/2,000-hour warranty that covers all Cummins branded components, including electrics such as starters and alternators.

Major components coverage continues into the third year, up to 10,000 hours of operation from the time your QSB engine goes in service.

Three simple steps explain everything you need to know:

Step One: Full coverage on all Cummins industrial engines and branded components with unlimited hours during the first year of operation. This includes Cummins branded electrics such as alternators, starters, etc.

Step Two: Full coverage is extended for the second year, up to 2,000 hours of operation. Total hours are cumulative from the time the engine goes in service.

Step Three: Major components coverage including block, crankshaft, camshaft and rods on all products for the third year or up to 10,000 hours of operation. Total hours are cumulative from the time the engine goes in service.