

---

**INSTALLATION INSTRUCTIONS**

---

Original Issue Date: **10/95**

Model: **50/60ROZJ**

Market: **Industrial**

Subject: **Emission Kit PA-336697, Best Available Control Technology (B.A.C.T.)**

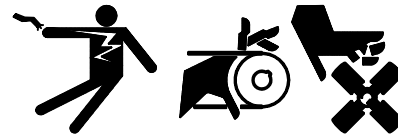
The B.A.C.T. emission kit provides the components necessary to satisfy emission standards in certain localities requiring aftercoolers and turbochargers on generator sets over 50 hp. This kit includes an aftercooler and necessary mounting hardware.

If the generator set has a block heater, order the substitute kit listed in the chart below to accommodate the installation of the B.A.C.T. kit.

To simplify installation, this instruction refers to all part numbers in the B.A.C.T. kit by the part number of the kit's manufacturer. To order any of the B.A.C.T. kit parts from Kohler, use the B.A.C.T. kit parts list on the last page of this instruction to find the Kohler part number.

<b>Kit Description</b>	<b>Standard Kit Part Number</b>	<b>B.A.C.T.-Compatible Kit Part Number</b>
Block Heater 120V	336180	336764
Block Heater 240V	336181	336765

---

**⚠ WARNING**

**Accidental starting.  
Can cause severe injury or death.**

Disconnect battery cables before working on generator set (negative lead first and reconnect it last).

**Accidental starting can cause severe injury or death.** Turn generator set master switch to OFF position, disconnect power to battery charger, and remove battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator set. The generator set can be started by automatic transfer switch or remote start/stop switch unless these precautions are followed.

## **⚠ WARNING**



**Explosive fuel vapors.**  
**Can cause severe injury or death.**

Use extreme care when handling, storing, and using fuels.

**Explosive fuel vapors can cause severe injury or death.** All fuels are highly explosive in a vapor state. Use extreme care when handling and storing fuels. Store fuel in a well-ventilated area away from spark-producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running since spilled fuel may ignite on contact with hot parts or from ignition spark. Do not smoke or permit flame or spark to occur near potential sources of spilled fuel or fuel vapors. Keep fuel lines and connections tight and in good condition. Do not replace flexible fuel lines with rigid lines. Flexible sections are used to avoid breakage due to vibration. If any fuel leakage, fuel accumulation, or electrical sparks are noted, **DO NOT OPERATE GENERATOR SET**. Repair systems before resuming generator set operation

**Explosive fuel vapors can cause severe injury or death.** Spilled fuel can cause an explosion. Use a container to catch fuel when draining fuel system. Wipe up all spilled fuel after draining system.

## **⚠ WARNING**



**Hot coolant and steam.**  
**Can cause severe injury or death.**

Before removing pressure cap, stop generator set and allow it to cool. Then loosen pressure cap to relieve pressure.

## **⚠ WARNING**



**Hot engine and exhaust system.**  
**Can cause severe injury or death.**

Do not work on generator set until it is allowed to cool.

**Hot coolant can cause severe injury or death.** Allow engine to cool and release pressure from cooling system before opening pressure cap. To release pressure, cover the pressure cap with a thick cloth; then slowly turn it counterclockwise to the first stop. Remove cap after pressure has been completely released and the engine has cooled. Check coolant level at tank if generator set is equipped with a coolant recovery tank.

**Hot parts can cause severe injury or death.** Do not touch hot engine parts. An engine gets hot while running and exhaust system components get extremely hot.

# Installation

1. Place the generator set master switch in the OFF position.
2. Disconnect the generator set engine starting battery, negative (–) lead first.

## NOTE

Dispose of all waste materials (engine oil, fuel, coolant, etc.) in an environmentally safe manner. Contact local authorities for correct procedures and location.

3. Drain radiator coolant into a suitable container. Keep coolant clean for reuse.
4. Disconnect turbocharger oil supply line clamp from cylinder head. Mounting hardware will not be reused.
5. Remove clamp from turbocharger oil supply line. Clamp will not be reused.
6. Remove the air intake tube from the air intake manifold. Save the air intake hose and hose clamps. Mounting hardware and air intake tube will not be reused.

## NOTE

Use caution when disconnecting fuel lines. Fuel from factory testing may be in the fuel lines.

7. Disconnect and remove the fuel line between the fuel pump and fuel filter assembly. The fuel line will not be reused.

8. Disconnect and remove the clamp and fuel line between the injector pump and fuel filter assembly. Fuel line and clamp will not be reused. Save mounting hardware.

9. Remove the fuel filter assembly from the engine block. Mounting hardware will not be reused.

10. Disconnect the fuel filter assembly from the mounting bracket. Save the mounting hardware and discard the bracket.

11. Bolt the fuel filter assembly to the engine block where the bracket was secured. Use hardware removed in step 10. Do not final tighten.

12. Remove the 90-degree brass elbow from the outlet side of the fuel filter assembly. Replace with o-ring (R26286) and fitting (R27272).

13. Connect fuel line (RE64610) to the inlet side of the fuel filter assembly and fuel pump. Torque fuel line fittings to 22 ft. lbs. (29.8 Nm).

14. Connect fuel line (RE64611) to the outlet side of the fuel filter assembly and injector pump. Torque fuel line fittings to 22 ft. lbs. (29.8 Nm).

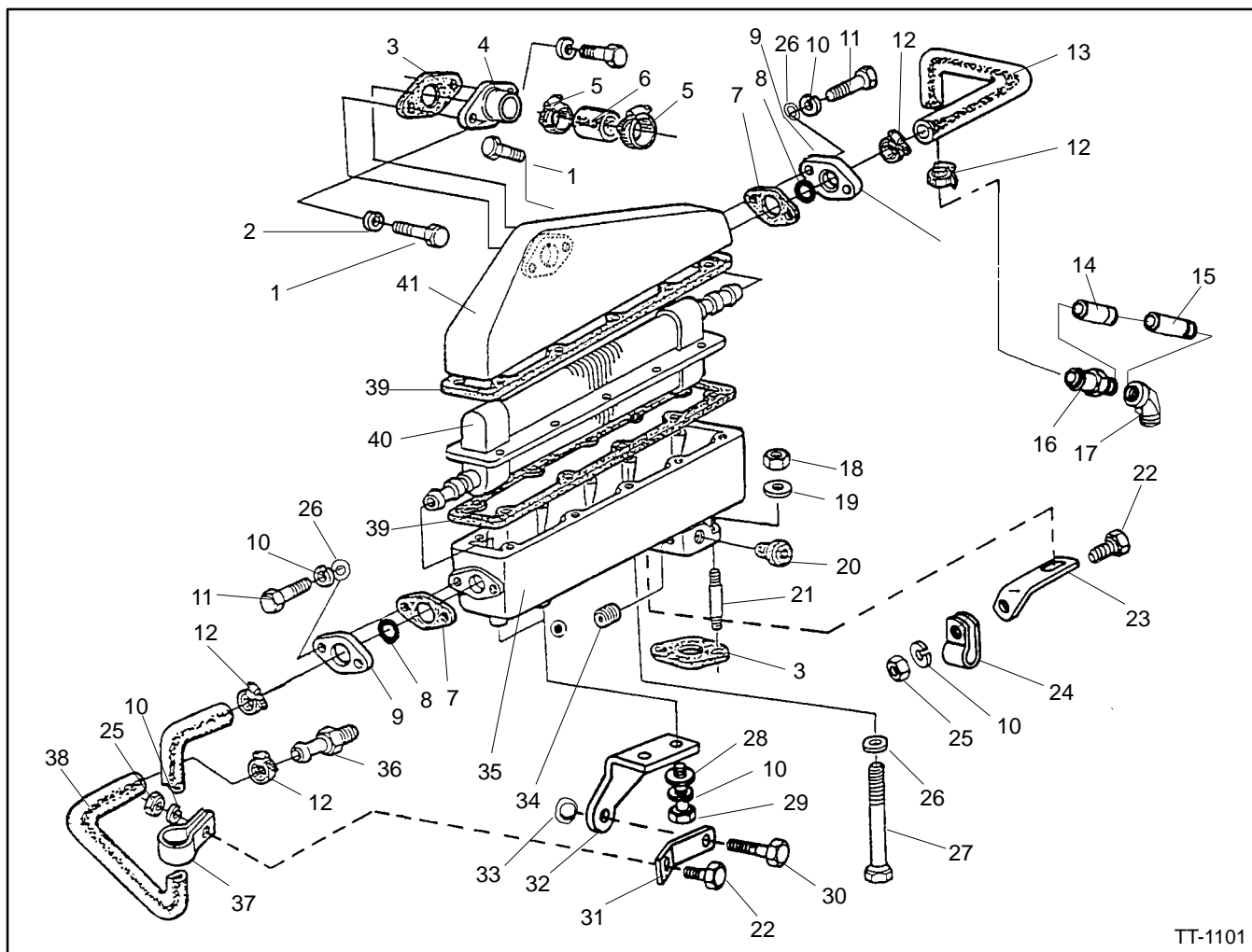
15. Connect clamp (R109872) to fuel line. Attach fuel line to engine block using hardware saved in step 8.

16. Final tighten fuel filter to engine block. Torque mounting bolts to 37 ft. lbs. (50.2 Nm).

17. Assemble the aftercooler's three major parts: air intake manifold (R89815), aftercooler (RE29201), and air intake manifold cover (R89814). For steps 15-29 see Figure 1.

- a. Place gasket (R97358) on the lower half assembly and align the holes.
- b. Slide the end of the core through the hole in the lower assembly and align the holes.

- c. Place gasket (R97358) on top of the core flange and align the holes.
- d. Slide the core end through the hole in the upper assembly. Set the upper assembly on the core flange and align the holes.
- e. Attach turbocharger oil line bracket (R82869) to the aftercooler assembly bolt located on the left of the air inlet and closest to the engine.

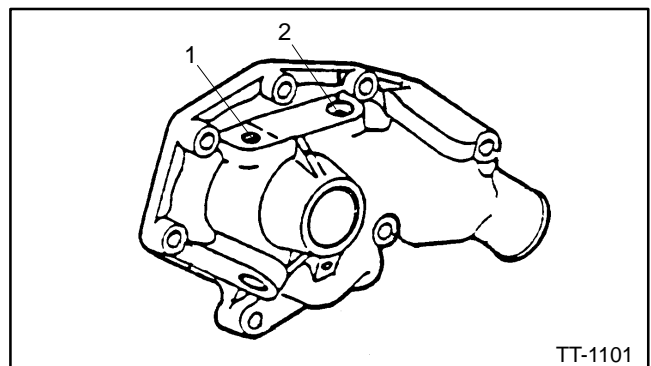


TT-1101

- |  |   |
|--|---|
| 1. Screw, cap (3) (19H218)                           | 22. Screw, cap (5/16 x 3/4) (2) (19H1900)                   |
| 2. Washer, lock (2) (12H304)                         | 23. Bracket (turbo oil supply line) (R82869)                |
| 3. Gasket (2) (R81275)                               | 24. Clamp (R46414)  |
| 4. Tube, air intake (RE22266)                        | 25. Nut, hex (2) (5/16) (14H785)                            |
| 5. Clamp, hose (2) (turbo outlet)                    | 26. Washer, flat (5/16) (14) (24H1136)                      |
| 6. Hose (turbo to air intake tube)                   | 27. Screw, cap (5/16 x 3 3/4) (10) (19H3300)                |
| 7. Gasket (2) (R97346)                               | 28. Washer, plain (5/16) (2) (24H1822)                      |
| 8. O-ring (2) (R52811)                               | 29. Screw, cap (5/16 x 1) (2) (19H1905)                     |
| 9. Adapter (2) (R47314)                              | 30. Screw, cap (1/2 x 1 1/4) (19H1815)                      |
| 10. Washer, lock (5/16) (8) (12H303)                 | 31. Bracket (R89820)  |
| 11. Screw, cap (5/16 x 1 3/8) (4) (19H2661)          | 32. Bracket, aftercooler support (R109641)                  |
| 12. Clamp, hose (4) (AR21839)                        | 33. Washer, plain 1/2 in. (2)                               |
| 13. Hose (aftercooler to water pump) (R89816)        | 34. Plug (15H558)   |
| 14. Pipe coupling (X-216-20)                         | 35. Manifold, air intake (R89815)                           |
| 15. Pipe (X-209-15)                                  | 36. Fitting, hose (R100914)                                 |
| 16. Adapter, restricted hose (R109643)               | 37. Clamp (H85741)  |
| 17. Elbow, 45 degree street (15H627)                 | 38. Hose (aftercooler to block) (R89817)                    |
| 18. Nut, hex (3/8) (2) (14H1076)                     | 39. Gasket (2) (aftercooler to cover and manifold) (R97358) |
| 19. Washer, flat (13/32) (2) (24H1304)               | 40. Aftercooler (RE29201)                                   |
| 20. Pipe, plug (R84982)                              | 41. Cover, air intake manifold (R89814)                     |
| 21. Stud (aftercooler to cylinder head) (2) (M1112T) |   |

**Figure 1. Aftercooler Assembly**

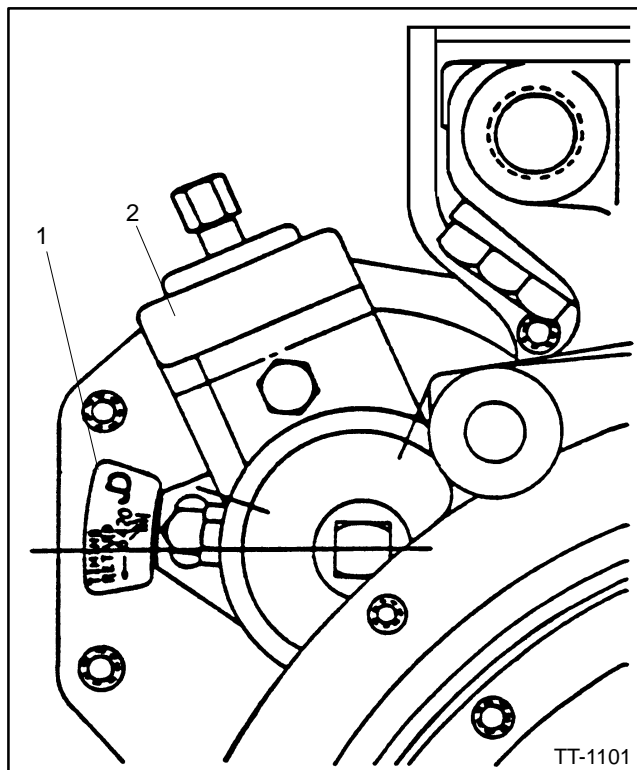
- f. Bolt the assembly together with ten 5/16-18 x 3 3/4 in. bolts (19H3300) and flat washers (24H1136).
18. Clean air intake manifold mounting surface for aftercooler installation. Surface must be free of the old gasket, dirt, and grease.
19. Insert two studs (M1112T) into the manifold for aftercooler attachment. See Figure 1.
20. Attach aftercooler to manifold with gasket (R81275), two 3/8 in. nuts (14H1076), and flat washers (24H1304).
21. Attach clamp (R46414) to turbocharger oil supply line.
22. Attach clamp to oil line bracket installed in step 17e using 5/16 x 3/4 in. bolt (19H1900), nut (14H785), and flat washer (12H303). Make sure oil line is not restricted or rubbing against aftercooler.
23. Remove plastic plugs from the ends of the aftercooler core.
24. Slide one rubber o-ring (R52811) over both ends of the aftercooler core into groove provided.
25. Position new gaskets (R97346) and adapters (R47314) on aftercooler core inlet and outlet.
26. Secure adapters to aftercooler ends with 5/16-18 x 1 3/8 in. bolts (19H2661), flat washers (24H1136), and lock washers (12H303). Flat washers must be against the adapter.
27. Connect air intake tube (RE22266) to aftercooler assembly with a new gasket (R81275), two 3/8 x 1 in. bolts (19H218) and lock washers (12H304).
28. Loosen the six bolts holding the bearing section of the turbocharger to the compressor housing.
29. Rotate turbocharger until it lines up with the aftercooler air intake.
30. Slide hose clamps over ends of connecting hose saved in step 6.
31. Slide connecting hose onto the air intake tube.
32. Slide opposite end over turbocharger inlet; rotate turbocharger as needed. Position hose clamps 1/4 in. (6.35 mm) from edge of hose and tighten.
33. Tighten the six bolts loosened in step 28. Torque the bolts to 100-130 in. lbs. (11.3-14.7 Nm).
34. Apply pipe sealant to pipe plug (R84982) and install in air inlet of the aftercooler assembly.
35. Apply pipe sealant to pipe plug (15H558) and install on left side of air inlet.
36. Apply pipe sealant to a 3/8 x 7/8 in. bolt (19H218) and install in the open hole located on the back of the upper aftercooler assembly.
37. Attach aftercooler support bracket (R109641) to the bottom left of the aftercooler assembly with two 5/16 x 1 in. bolts (19H1905), flat washers (24H1822), and lock washers (12H303). If the bracket's lower mounting hole does not line up with the hole in the block use flat washers between the aftercooler and support bracket.
38. Secure bracket (R89820) to aftercooler support bracket and engine block with one 1/2 x 1 1/4 in. bolt (19H1815) and 1/2 in. flat washers (if needed). Place the spacer between the bracket and engine block.
39. Remove the 1/2 in. pipe plug from the left-hand alternator end of the engine, below the exhaust manifold.
40. Apply pipe sealant to fitting (R100914) and install where the pipe plug was removed.
41. Slide hose clamps (AR21839, and H85741) over hose (R89817).
42. Connect hose to alternator end of aftercooler.
43. Connect other end of hose to fitting installed in step 40. Position hose clamps 1/4 in. (6.35 mm) from hose ends and tighten.
44. Disconnect the upper and lower radiator hoses from the radiator.
45. Disconnect the coolant bypass hose from the fitting in the water pump. See Figure 2.
46. Disconnect the opposite end of the coolant bypass hose from water manifold and discard. Save the hose clamps.
47. Remove all belt guards and fan guard.
48. Remove the pipe plug from the top of the water pump. See Figure 2.



1. Coolant bypass hose fitting location
2. Pipe plug location

**Figure 2. Water Pump**

49. Apply pipe sealant to the threads of 45-degree elbow (15H627) and install where pipe plug was removed.
50. Apply pipe sealant to pipe nipple (X-209-15) and install in 45 degree elbow.
51. Apply pipe sealant to opposite end of pipe nipple installed in step 50.
52. Install coupling (X-216-20) onto pipe nipple.
53. Apply pipe sealant to the threads of restricted hose adapter (R109643) and install into coupling.
54. Slide hose clamps (AR21839) over the aftercooler to water pump hose (R89816).
55. Cut the aftercooler to water pump hose to fit between the coupling and the aftercooler.
56. Connect the aftercooler to water pump hose to the radiator end of the aftercooler.
57. Connect other end of the aftercooler to water pump hose to the restricted pipe adapter installed in step 53.
58. Slide 2 hose clamps saved in step 46 over the ends of hose (X-612-19).
59. Connect one end of hose to fitting in water pump and the other end to fitting in water manifold. Position hose clamps 1/4 in. (6.35 mm) from ends of hose and tighten.
60. Reinstall fan guard and belt guards. Replace top belt guard with belt guard (336699) supplied in kit.
61. Reconnect the upper radiator hose to the radiator.
62. Reconnect the lower radiator hose to the radiator.
63. Clean the plate surface beside the injection pump mounting screws. See Figure 3.
64. Place label (R109936) on plate beside injection pump mounting screws. See Figure 3.
65. Scribe a line on pump flange at the zero mark.
66. Loosen the screws on the injection pump and rotate in direction of arrow on label. Rotate the injection pump 2 marks (4 degrees).
67. Tighten the injection pump mounting screws and leave the label in place.
68. Refill the engine cooling system.
69. Reconnect generator set engine starting battery, negative (-) lead last.



1. Label (R109936)
2. Injection pump

**Figure 3. Injection Pump Timing**

B.A.C.T. Emission Kit Parts List			
KIT 336697			
Qty.	Description	Reference Number	Part Number
6	Clamp, hose	AR21839	336705
1	Clamp	H85741	336708
2	Stud	M1112T	336709
1	Tube, air intake	RE22266	336711
1	Intercooler	RE29201	336712
1	Fitting, hose	R100914	336715
1	Bracket, intercooler support	R109641	336717
1	Connector, special	R109643	336718
1	Label, timing retard	R109936	336719
1	Clamp	R46414	336721
2	Adapter	R47314	336722
2	Packing, o-ring	R52811	336723
1	Hose, turbocharger to air intake tube	R56551	336725
2	Gasket, air inlet	R81275	336727
1	Bracket	R82869	336728
1	Plug, cap	R84982	336729
1	Cover, air intake manifold	R89814	336730
1	Manifold, air intake	R89815	336731
1	Hose, aftercooler to engine block	R89817	336732
1	Bracket	R89820	336733
2	Gasket, aftercooler inlet and outlet	R97346	336736
2	Gasket, aftercooler assembly	R97358	336737

Qty.	Description	Reference Number	Part Number
12	Washer, lock	12H304	336738
2	Nut, hex 3/8	14H1076	336739
2	Nut, hex 5/16	14H785	336740
2	Nut, hex 3/8	14H812	336726
1	Plug	15H558	336750
1	Screw, 1/2 x 1 1/4	19H1815	336753
2	Screw, 5/16 x 3/4	19H1900	336754
2	Screw, 5/16 x 1	19H1905	336755
3	Screw, 3/8 x 1	19H218	336756
4	Screw, 5/16 x 1 3/8	19H2661	336757
10	Screw, 5/16 x 3 3/4	19H3300	336758
16	Washer, flat 5/16	24H1136	336759
10	Washer, flat 13/32	24H1304	336760
3	Washer, flat	24H1305	336770
2	Washer, flat 5/16	24H1822	336761
1	Fitting	R27272	336741
1	O-ring	R26286	336742
1	Line, fuel	RE64610	336743
1	Line, fuel	RE64611	336744
1	Hose, aftercooler to water pump	R89816	336745
6	Washer, lock	12H303	336748
4	Screw, 3/8-16 x 1 3/4	19H246	336768
1	Clamp	R109872	336749
1	Pipe		X-209-15
1	Pipe, coupling		X-216-20
1	Spacer		336772
1	Guard, belt		336699
1	Elbow 45 degree	15H627	