

**SERVICE MANUAL**

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Engines

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6T-830  
6TA-830

---

7-65441

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

**SERVICE MANUAL**

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Engines

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6T-830  
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TYPE 1-4

**SERVICE MANUAL**

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Engines

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6T-830  
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TYPE 1-4

# 6T-830 and 6TA-830 Engine Service Manual 7-65441 Table of Contents

Description	Section No.	Form No.
Tab 1		
Standard Torque Specifications	1001	7-71601
Loctite Product Chart		8-98900
Tab 2		
Aftercooler	2011	8-91703
Specification Details	2403	8-28426
Cylinder Head and Valve Train	2415	8-28434
Cylinder Block		
Crankshaft, Pistons, Rod, Sleeves, Camshaft, Bearings, Seals and Flywheel	2425	8-28444
Lubrication System		
Oil Pan, Oil Pump, Oil Cooler and Oil Filter Housing	2445	8-28453
Cooling System		
Thermostat, Water Pump, Fan Pulley and Belt Tensioner	2455	8-28464
Turbocharger	2465	8-28471
HX40W Turbocharger	2470	7-65590
Tab 3		
Fuel System and Filters	3410	8-28482
Injection Pump		
Pump Drive Gear, Timing Pin, Fuel Shutoff Solenoid, Primer Pump and Pump Timing	3412	8-28494
Fuel Injectors	3413	8-28503

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# Section

# 1001

## STANDARD TORQUE SPECIFICATIONS

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## TABLE OF CONTENTS

TORQUE SPECIFICATIONS - DECIMAL HARDWARE ..... 2


TORQUE SPECIFICATIONS - METRIC HARDWARE ..... 3


TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS ..... 4

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS ..... 5

### TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphities, Molydisulfide greases, or other extreme pressure lubricants are used.

<b>Grade 5 Bolts, Nuts, and Studs</b>		
		
Size	Pound-Inches	Newton metres
1/4 inch	108 to 132	12 to 15
5/16 inch	204 to 252	23 to 28
3/8 inch	420 to 504	48 to 57
Size	Pound-Feet	Newton metres
7/16 inch	54 to 64	73 to 87
1/2 inch	80 to 96	109 to 130
9/16 inch	110 to 132	149 to 179
5/8 inch	150 to 180	203 to 244
3/4 inch	270 to 324	366 to 439
7/8 inch	400 to 480	542 to 651
1.0 inch	580 to 696	787 to 944
1-1/8 inch	800 to 880	1085 to 1193
1-1/4 inch	1120 to 1240	1519 to 1681
1-3/8 inch	1460 to 1680	1980 to 2278
1-1/2 inch	1940 to 2200	2631 to 2983


<b>Grade 8 Bolts, Nuts, and Studs</b>		
		
Size	Pound-Inches	Newton metres
1/4 inch	144 to 180	16 to 20
5/16 inch	288 to 348	33 to 39
3/8 inch	540 to 648	61 to 73
Size	Pound-Feet	Newton metres
7/16 inch	70 to 84	95 to 114
1/2 inch	110 to 132	149 to 179
9/16 inch	160 to 192	217 to 260
5/8 inch	220 to 264	298 to 358
3/4 inch	380 to 456	515 to 618
7/8 inch	600 to 720	814 to 976
1.0 inch	900 to 1080	1220 to 1465
1-1/8 inch	1280 to 1440	1736 to 1953
1-1/4 inch	1820 to 2000	2468 to 2712
1-3/8 inch	2380 to 2720	3227 to 3688
1-1/2 inch	3160 to 3560	4285 to 4827


**NOTE:** Use thick nuts with Grade 8 bolts.

## TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

<b>Grade 8.8 Bolts, Nuts, and Studs</b>		
		
Size	Pound-Inches	Newton metres
M4	24 to 36	3 to 4
M5	60 to 72	7 to 8
M6	96 to 108	11 to 12
M8	228 to 276	26 to 31
M10	456 to 540	52 to 61
Size	Pound-Feet	Newton metres
M12	66 to 79	90 to 107
M14	106 to 127	144 to 172
M16	160 to 200	217 to 271
M20	320 to 380	434 to 515
M24	500 to 600	675 to 815
M30	920 to 1100	1250 to 1500
M36	1600 to 1950	2175 to 2600

<b>Grade 10.9 Bolts, Nuts, and Studs</b>		
		
Size	Pound-Inches	Newton metres
M4	36 to 48	4 to 5
M5	84 to 96	9 to 11
M6	132 to 156	15 to 18
M8	324 to 384	37 to 43
Size	Pound-Feet	Newton metres
M10	54 to 64	73 to 87
M12	93 to 112	125 to 150
M14	149 to 179	200 to 245
M16	230 to 280	310 to 380
M20	450 to 540	610 to 730
M24	780 to 940	1050 to 1275
M30	1470 to 1770	2000 to 2400
M36	2580 to 3090	3500 to 4200

### Grade 12.9 Bolts, Nuts, and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

## TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound- Inches	Newton metres
<b>37 Degree Flare Fitting</b>			
1/4 inch 6.4 mm	7/16-20	72 to 144	8 to 16
5/16 inch 7.9 mm	1/2-20	96 to 192	11 to 22
3/8 inch 9.5 mm	9/16-18	120 to 300	14 to 34
1/2 inch 12.7 mm	3/4-16	180 to 504	20 to 57
5/8 inch 15.9 mm	7/8-14	300 to 696	34 to 79
Tube OD Hose ID	Thread Size	Pound- Inches	Newton metres
3/4 inch 19.0 mm	1-1/16-12	40 to 80	54 to 108
7/8 inch 22.2 mm	1-3/16-12	60 to 100	81 to 135
1.0 inch 25.4 mm	1-5/16-12	75 to 117	102 to 158
1-1/4 inch 31.8 mm	1-5/8-12	125 to 165	169 to 223
1-1/2 inch 38.1 mm	1-7/8-12	210 to 250	285 to 338

Tube OD Hose ID	Thread Size	Pound- Inches	Newton metres
<b>Straight Threads with O-ring</b>			
1/4 inch 6.4 mm	7/16-20	144 to 228	16 to 26
5/16 inch 7.9 mm	1/2-20	192 to 300	22 to 34
3/8 inch 9.5 mm	9/16-18	300 to 480	34 to 54
1/2 inch 12.7 mm	3/4-16	540 to 804	57 to 91
Tube OD Hose ID	Thread Size	Pound- Inches	Newton metres
5/8 inch 15.9 mm	7/8-14	58 to 92	79 to 124
3/4 inch 19.0 mm	1-1/16-12	80 to 128	108 to 174
7/8 inch 22.2 mm	1-3/16-12	100 to 160	136 to 216
1.0 inch 25.4 mm	1-5/16-12	117 to 187	159 to 253
1-1/4 inch 31.8 mm	1-5/8-12	165 to 264	224 to 357
1-1/2 inch 38.1 mm	1-7/8-12	250 to 400	339 to 542

<b>Split Flange Mounting Bolts</b>		
Size	Pound- Inches	Newton metres
5/16-18	180 to 240	20 to 27
3/8-16	240 to 300	27 to 34
7/16-14	420 to 540	47 to 61
Size	Pound- Feet	Newton metres
1/2-13	55 to 65	74 to 88
5/8-11	140 to 150	190 to 203

## TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	Thread Size	Pound-Inches	Newton metres
<b>O-ring Face Seal End</b>					<b>O-ring Boss End Fitting or Lock Nut</b>		
-4	1/4 inch 6.4 mm	9/16-18	120 to 144	14 to 16	7/16-20	204 to 240	23 to 27
-6	3/8 inch 9.5 mm	11/16-16	216 to 240	24 to 27	9/16-18	300 to 360	34 to 41
-8	1/2 inch 12.7 mm	13/16-16	384 to 480	43 to 54	3/4-16	540 to 600	61 to 68
					Thread Size	Pound-Inches	Newton metres
-10	5/8 inch 15.9 mm	1-14	552 to 672	62 to 76	7/8-14	60 to 65	81 to 88
Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	1-1/16-12	85 to 90	115 to 122
					1-3/16-12	95 to 100	129 to 136
-12	3/4 inch 19.0 mm	1-3/16-12	65 to 80	90 to 110	1-5/16-12	115 to 125	156 to 169
-14	7/8 inch 22.2 mm	1-3/16-12	65 to 80	90 to 110	1-5/8-12	150 to 160	203 to 217
-16	1.0 inch 25.4 mm	1-7/16-12	92 to 105	125 to 140	1-7/8-12	190 to 200	258 to 271
-20	1-1/4 inch 31.8 mm	1-11/16-12	125 to 140	170 to 190			
-24	1-1/2 inch 38.1 mm	2-12	150 to 180	200 to 254			

**NOTE:** Case Corporation reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

# Section

# 2011

## AFTERCOOLER

### 6-830 Diesel Engine

**IMPORTANT:** *This engine was made using the metric measurement system. All measurements and checks must be made with metric tools to make sure of an accurate reading when inspecting parts.*

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# TABLE OF CONTENTS

SPECIAL TOOLS ..... 2

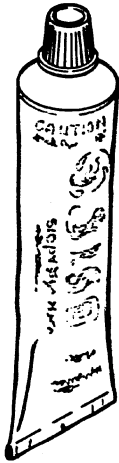
SPECIAL TORQUES ..... 2

SERVICING THE AFTERCOOLER ..... 3

    Removal ..... 3

    Installation ..... 4

## SPECIAL TOOLS



404L94

THREAD SEALANT WITH TEFLON - B17503 6ml TUBE



485L94

THREE BOND SILVER RTV SEALER  
J823494 - 3 oz TUBE

## SPECIAL TORQUES

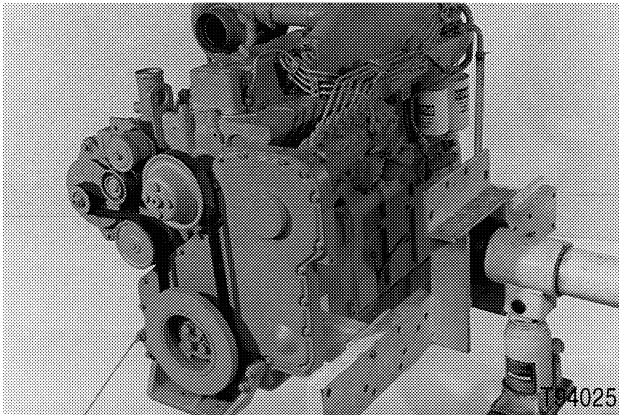
Aftercooler Mounting Bolts ..... 21 to 27 Nm

Crossover Tube Clamps ..... 4 to 6 Nm

**NOTE:** Case Corporation reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

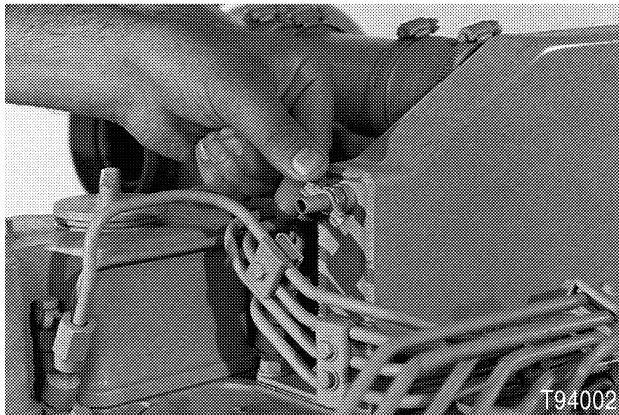
## SERVICING THE AFTERCOOLER Removal

### STEP 1



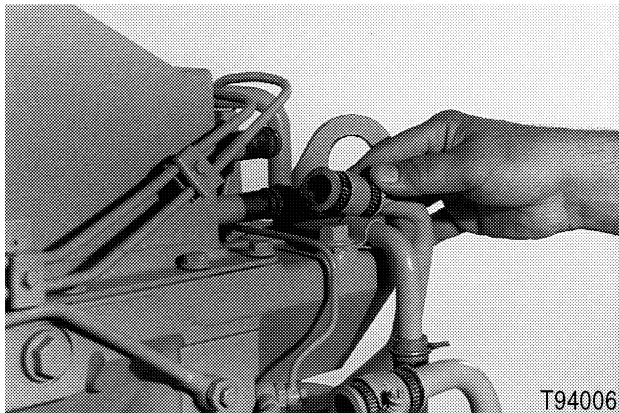
Case 6TA 830 engine.

### STEP 2



Drain the coolant from the engine. Open the air vent valve on the aftercooler to help drain the coolant.

### STEP 3



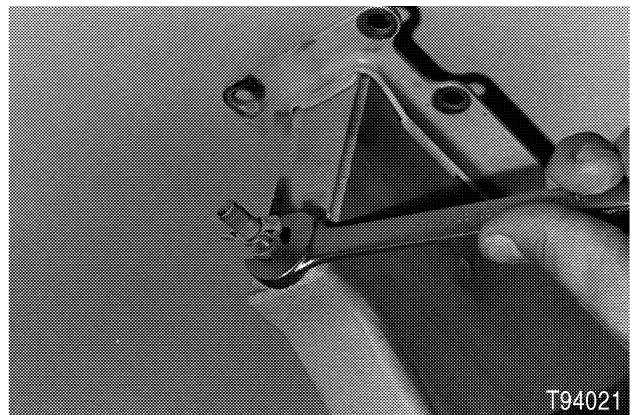
Remove all fuel lines and water hoses from the aftercooler.

### STEP 4



Remove the bolts and aftercooler. Discard the gasket. Clean the gasket surfaces. Inspect the housing and core for damage.

### STEP 5



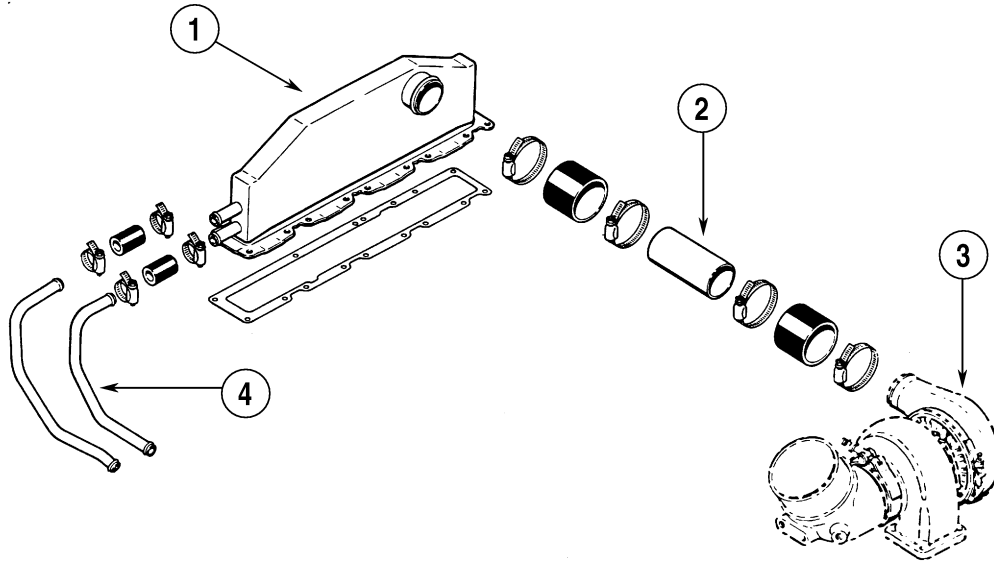
Remove the air vent valve from the aftercooler.

### STEP 6



Install a plug in the air vent valve and put a cap on one of the aftercooler water hose tube. Attach regulated air pressure to the other water hose tube. Pressurize the core to 206 kPa (2 bar) (30 PSI) and submerge the aftercooler in water. Inspect for any air leaks. If there leaks or damage, the aftercooler must be replaced.

## Installation

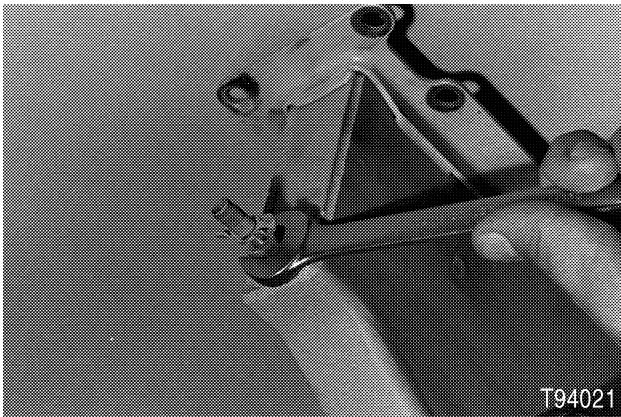


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- 1. Aftercooler
- 2. Crossover Tube

- 3. Turbocharger
- 4. Water Line

### STEP 7



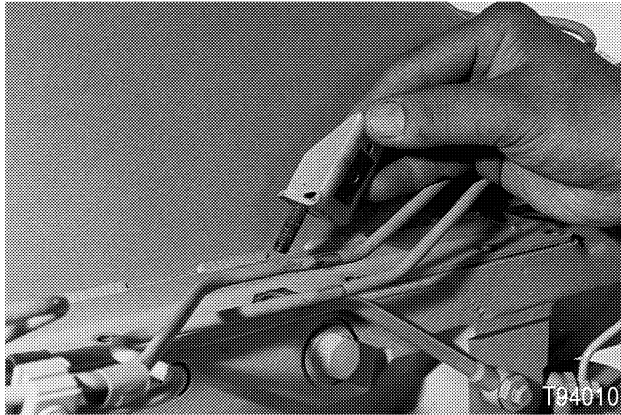
Apply teflon thread sealant to threads of air vent valve and install in the aftercooler.

### STEP 8



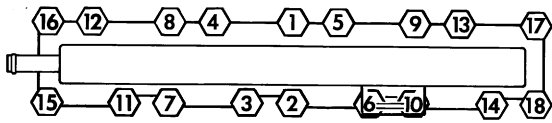
Apply a thin layer of Three Bond RTV Silver Sealer to both sides of a new gasket. Install the gasket and aftercooler on the cylinder head.

**STEP 9**

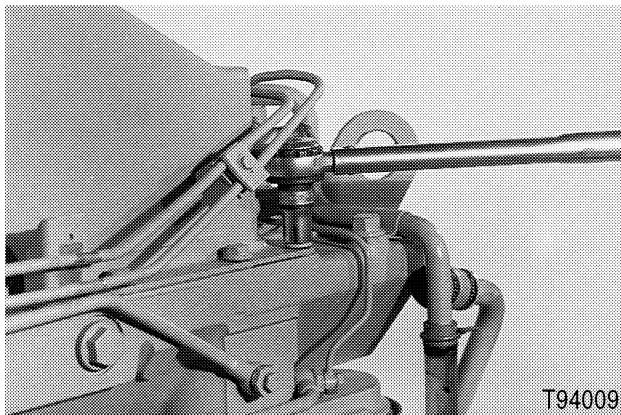


Apply Loctite liquid teflon thread sealer on the injector line mounting bracket bolts. Install the injector line mounting brackets on the aftercooler.

**STEP 10**

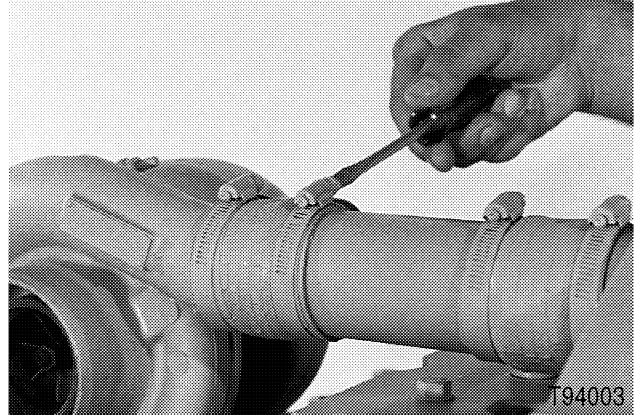


78L91



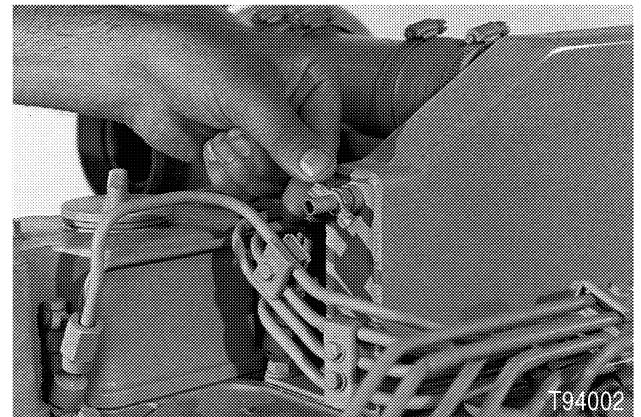
Apply Loctite liquid teflon thread sealer to the remaining aftercooler bolts. Install the aftercooler mounting bolts and tighten to a torque of 21 to 27 Nm following the torque sequence shown above.

**STEP 11**



Install the crossover tube, injector tubes and water hoses on the aftercooler and turbocharger. Tighten the water hose clamps to a torque of 4 to 6 Nm.

**STEP 12**



Fill the cooling system with coolant. Open the air vent valve to remove trapped air. Close the valve when coolant appears.

## Induction System Leak Check

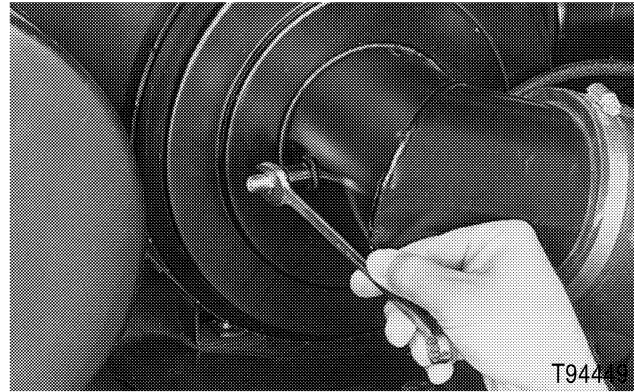
**NOTE:** The induction system must be checked for air leaks anytime that there has been service work done on the system.

### STEP 13



Remove both air cleaner filter elements. Completely wrap the mesh area of a used secondary element with duct tape. No air should be able to pass through this element during the test. Install the wrapped element into the air cleaner housing and install the cover.

### STEP 14

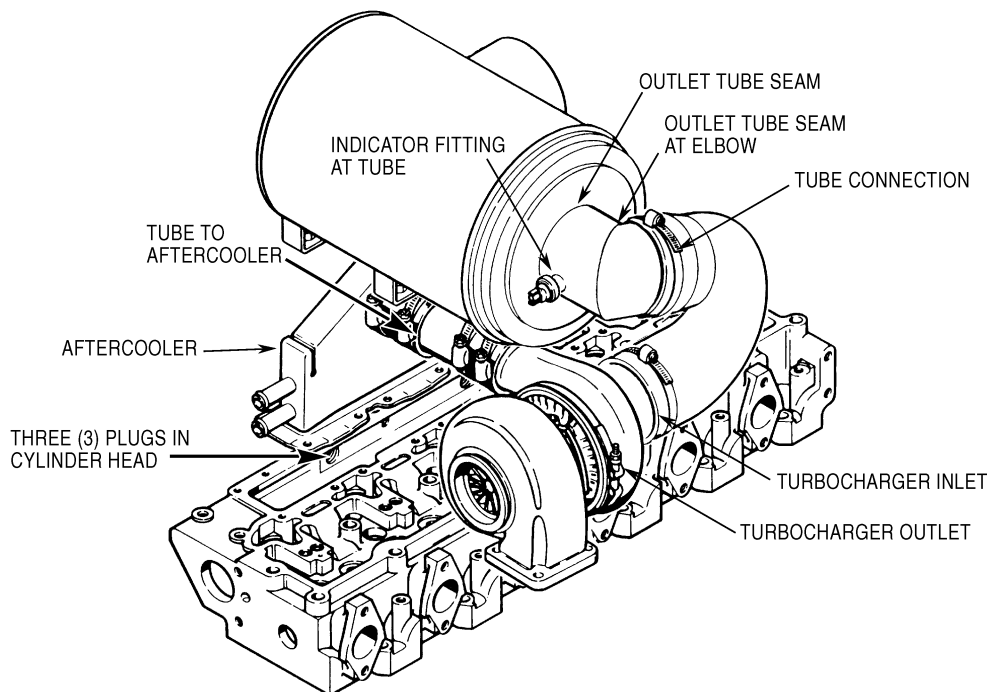


Remove the restrictor indicator and install a fitting to connect a source for compressed air. Regulate the air source to a maximum of 20 to 30 kPa (3 to 5 PSI).

**IMPORTANT:** Do not exceed a maximum pressure of 20 to 30 kPa (3 to 5 PSI) or damage to induction components could result.

**NOTE:** The restrictor indicator is designed to see a vacume and not pressure and therefor must not be in the system when the leak check is performed.

### STEP 15



1. Make a solution of liquid soap and water.
2. With the induction system pressurized, apply the solution to the complete air induction system as shown above.
3. There must not be any signs of air leakage except for the turbocharger center housing ends.
4. Correct any leaks and test the system again.
5. When the test is done, install the restrictor indicator and a new secondary filter element.

150L96

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