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MANUAL PREVIEW

Caterpillar

Service Manual

3406 Diesel

Truck Engine

S/n 92U1 & up

Service Manual

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CT-S-ENG3406

3406 DIESEL TRUCK ENGINE

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SERIAL NUMBERS
92U1-UP

MANUAL PREVIEW

SPECIFICATIONS (Section 1)

SYSTEMS OPERATION (Section 2)

TESTING AND ADJUSTING (Section 3)

TROUBLESHOOTING GUIDE (Section 4)

GENERAL INSTRUCTIONS (D & A) (Section 5)

ENGINE OVERHAUL IN CHASSIS (Section 6)

DISASSEMBLY AND ASSEMBLY (Section 7)

AIR COMPRESSORS (Section 8)

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INTRODUCTION

The specifications given in this book are on the basis of information available at the time the book was written. These specifications give the torques, operating pressure, measurements of new parts, adjustments and other items that will affect the service of the product.

When the words “use again” are in the description, the specification given can be used to determine if a part can be used again. If the part is equal to or within the specification given, use the part again.

When the word “permissible” is in the description, the specification given is the “maximum or minimum” tolerance permitted before adjustment, repair and/or new parts are needed.

A comparison can be made between the measurements of a worn part, and the specifications of a new part to find the amount of wear. A part that is worn can be safe to use if an estimate of the remainder of its service life is good. If a short service life is expected, replace the part.

NOTE: The specifications given for “use again” and “permissible” are intended for guidance only and Caterpillar Tractor Co. hereby expressly denies and excludes any representation, warranty or implied warranty of the reuse of any component.

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SPECIFICATIONS (Section 1)

Accessory Drives		BrakeSaver Components	
Air Compressor Drive	1-48	BrakeSaver	1-46
Drive for Fuel Transfer Pump and Tachometer	1-12	BrakeSaver Control Valve	1-46
Tachometer Drive	1-47	Flywheel	1-44
Air Induction and Exhaust System		Flywheel Runout	1-45
Air Lines	1-25	Oil Cooler Bypass Valve	1-30
Breather Cap	1-25	Oil Filter	1-29
Camshaft	1-16	Oil Pan	1-29
Cylinder Head	1-18	Oil Pump	1-26
Exhaust Elbow	1-25	Electrical System	
Exhaust Manifold	1-19	Alternator	1-51
Exhaust Manifold Shield	1-19	Glow Plug Wiring Connections	1-48
Idler Gear Assembly	1-17	Shut-off Solenoid	1-51
Timing Gears	1-17	Starter Motor	1-49
Turbocharger	1-21	Starter Solenoid	1-50
Turbocharger Impeller Installation	1-20	Engine Design	1-2
Valves	1-15	Fuel System	
Valve Rocker Arms, Lifters, Bridges, and Cover	1-14	Air-Fuel Ratio Control	1-10
Basic Engine Components		Automatic Timing Advance Unit	1-9
Connecting Rod	1-37	Fuel Filter (Primary)	1-13
Connecting Rod and Main Bearing Journals	1-36	Fuel Filter Base	1-13
Crankshaft	1-35	Fuel Filter Base Bracket	1-13
Cylinder Block	1-33	Fuel Injection	1-5
Cylinder Liner	1-34	Fuel Injection Pump Housing	1-4
Cylinder Liner Projection	1-34	Fuel Injection Lines	1-10
Flywheel	1-43	Fuel System Identification	1-3
Flywheel Housing	1-40	Fuel Transfer Pump	1-11
Flywheel Housing Bore	1-41	Fuel Transfer Pump Drive	1-12
Flywheel Housing Runout	1-42	Governor	1-7
Flywheel Runout	1-45	General Tightening Torques	6
Pistons and Rings	1-39	Lubrication System	
Timing Gears	1-17	Oil Cooler Bypass Valve	1-30
Timing Gear Housing	1-47	Oil Filter	1-29
Cooling System		Oil Pan	1-29
Temperature Regulator (Thermostat)	1-31	Oil Pump	1-26
Water Pump	1-32	Torque for Flared and O-Ring Fittings	7
V-Belt Tension Chart	1-31		

SYSTEMS OPERATION (Section 2)

AIR INLET AND EXHAUST SYSTEM	2-8	Shutoff Solenoid	2-21
Aftercooler	2-9	Solenoid	2-20
Turbocharger	2-9	Starting Motor	2-21
Valves and Valve System Components	2-10	Wiring Diagrams	2-22
BRAKESAVER	2-26	FUEL SYSTEM	2-3
BrakeSaver Components	2-26	Automatic Timing Advance Unit	2-7
BrakeSaver Control	2-29	Fuel Injection Pump Operation	2-3
BrakeSaver Lubrication	2-28	Fuel Injection Valve	2-4
BrakeSaver Operation	2-28	Hydraulic Air-Fuel Ratio Control	2-5
Operator Controls	2-32	Hydra-Mechanical Governor	2-4
COOLING SYSTEM	2-17	JAKE BRAKE	2-35
Coolant Conditioner	2-19	Jake Brake Components	2-35
Coolant for Air Compressor	2-18	Jake Brake Controls	2-37
Engines Equipped with Aftercooler	2-17	Jake Brake Operation	2-35
Engines Equipped with BrakeSaver	2-18	LUBRICATION SYSTEM	2-12
ENGINE DESIGN	2-2	Engine with BrakeSaver	2-13
ELECTRICAL SYSTEM	2-20	Engine without BrakeSaver	2-12
Alternator	2-20	Oil Flow in Engine (Earlier)	2-16
		Oil Flow in Engine (Later)	2-15

TESTING AND ADJUSTING (Section 3)

AIR INLET AND EXHAUST SYSTEM	3-34	Fuel Bypass Valve	3-22
Bridge Adjustment	3-36	Fuel Injection Lines	3-22
Compression	3-35	Fuel Injection Service	3-19
Crankcase (Crankshaft Compartment) Pressure	3-35	Fuel Injection Valve	3-19
Cylinder Head	3-35	Fuel Rack Setting	3-27
Exhaust Temperature	3-34	Fuel System Adjustments (Off Engine)	3-28
Jake Brake Adjustment	3-37	Fuel System Adjustments (On Engine)	3-23
Measurement of Pressure in Inlet Manifold	3-34	Fuel System Inspection	3-12
Restriction of Air Inlet and Exhaust	3-34	Governor Adjustments	3-30
Valve Clearance Setting	3-36	Hydraulic Air-Fuel Ratio Control Adjustment	3-32
BASIC BLOCK	3-44	Injection Pump Installation	3-20
Connecting Rod and Main Bearings	3-44	Injection Pump Removal	3-19
Connecting Rods and Pistons	3-44	Measuring Engine Speed	3-31
Cylinder Block	3-44	Measuring Fuel Injection Pump Timing Dimension	
Flywheel and Flywheel Housing	3-46	(On Engine)	3-26
Piston Rings	3-44	Nozzle Tester Preparation	3-13
Projection of Cylinder Liner	3-44	Setting the Injection Pump Timing Dimension	
Vibration Damper	3-48	(Off Engine)	3-28
BRAKESAVER TROUBLESHOOTING	3-3	Testing Capsule-Type Fuel Injection Nozzles	3-12
COOLING SYSTEM	3-40	Test Sequence—	
Testing the Cooling System	3-40	DI Fuel Nozzles	3-15
Vee Belt Tension Chart	3-43	PC Fuel Nozzles	3-14
Visual Inspection of the Cooling System	3-40	FUEL SYSTEM IDENTIFICATION	3-11
FUEL SYSTEM	3-12	ELECTRICAL SYSTEM	3-49
Camshaft Timing for the Fuel Injection Pump	3-23	Battery	3-49
Checking Automatic Timing Advance Unit by		Charging System	3-49
Timing Light Method	3-23	Rack Shutoff Solenoid Adjustment	3-51
Checking Balance Point (Full Load Speed)	3-31	Starting System	3-50
Checking Engine Cylinders Separately	3-12	LUBRICATION SYSTEM	3-38
Checking Plunger and Lifter Washer of an		Increased Oil Temperature	3-39
Injection Pump	3-21	Measuring Engine Oil Pressure	3-38
Finding Top Center Compression Position for		Oil Pressure is High	3-39
No. 1 Piston	3-22	Oil Pressure is Low	3-39
Flow Checking Fuel Injection Pump Timing	3-24	Too Much Bearing Wear	3-39
		Too Much Oil Consumption	3-38

TROUBLESHOOTING GUIDE (Section 4)

Cooling System	4-40	Loss of Coolant	4-43
Difficult Starting (Engine Crankshaft Turns Freely)	4-33	Low Power Troubleshooting	4-7
Difficult Starting (Engine Crankshaft Will Not Turn; Engine Crankshaft Turns Too Slowly)	4-37	Misfiring and Running Rough	4-23
Fuel in Crankcase Oil	4-46	Primary Engine Test for High Fuel Consumption	4-12
High Fuel Consumption Troubleshooting	4-15	Primary Engine Test for Low Power	4-4
Introduction to the Troubleshooting Guide	4-3	Problem with Vehicle or Vehicle Operation	4-19
		Too Much Exhaust Smoke (Black or Grey)	4-26
		Too Much Exhaust Smoke (White or Blue)	4-29
		Vibration Troubleshooting (Engine)	4-48

**GENERAL INSTRUCTIONS
DISASSEMBLY AND ASSEMBLY (Section 5)**

Batteries	5-8	Lines and Wires	5-6
Bearings	5-7	Locks	5-6
Anti-Friction	5-7	Lubrication	5-7
Double Row, Tapered Roller	5-7	Lubrication For a Rebuilt Engine	5-2
Heating Bearings	5-7	Procedure for Pressure Lubrication	5-3
Installation	5-7	Pressing Parts	5-5
Preload	5-7	Removal and Installation	5-2
Sleeve Bearings	5-7	Rules for Use of Tools	5-5
Bolts and Bolt Torque	5-5	Rust Preventive Compound	5-7
Torque Wrench Extension	5-6	Seals (Lip-Type)	5-8
T-T-T Procedure	5-5	Service Tools	5-3
Cleanliness	5-2	Bearing Cup Pulling Attachment	5-5
Conversion Chart (Inches to mm)	5-8	Bearing Pulling Attachment	5-5
Disassembly and Assembly	5-2	Puller Assembly (2 or 3 arm)	5-3
Gaskets	5-7	Push Pullers	5-4
Initial Operation After Engine Reconditioning	5-3	Shims	5-7

ENGINE OVERHAUL IN CHASSIS (Section 6)

Component Inspection and Reconditioning	6-14
Engine Overhaul In Chassis, Disassemble	6-2
Engine Overhaul In Chassis, Assemble	6-15

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DISASSEMBLY AND ASSEMBLY (Section 7)

Accessory Drive	7-16	Fuel Shutoff Solenoid	7-37
Accessory Drive, Disassemble & Assemble	7-17	Fuel Transfer Pump	7-22
Aftercooler Core	7-59	Fuel Transfer Pump (Earlier), Disassemble & Assemble	7-23
Aftercooler Housing	7-58	Fuel Transfer Pump (Later), Disassemble & Assemble	7-26
Air Compressor	7-6	Fuel Valve Adapters	7-113
Air Compressor, Disassemble & Assemble	7-7	General Tightening Torques	6
Air Compressor Governor	7-3	Glow Plugs	7-106
Air Compressor Governor, Disassemble & Assemble	7-4	Governor, Disassemble & Assemble	7-45
Alternator and Bracket	7-90	Inlet Manifold	7-56
Automatic Timing Advance	7-30	Jacobs Engine Brake	7-152
Automatic Timing Advance, Disassemble & Assemble	7-32	Oil Cooler (BrakeSaver)	7-164
BrakeSaver	7-172	Oil Filter Base	7-87
BrakeSaver, Disassemble & Assemble	7-174	Oil Filter Base, Disassemble & Assemble	7-83
BrakeSaver Control Valve	7-167	Oil Pan	7-119
BrakeSaver Control Valve, Disassemble & Assemble	7-169	Oil Pan (BrakeSaver)	7-180
Bridge Dowels	7-114	Oil Pump	7-119
Camshaft	7-141	Oil Pump, Disassemble & Assemble	7-120
Camshaft Bearings	7-148	Oil Pump (BrakeSaver)	7-182
Connecting Rod Bearings	7-123	Oil Pump (BrakeSaver), Disassemble & Assemble	7-183
Crankshaft	7-149	Pistons	7-127
Crankshaft Front Seal and Wear Sleeve	7-138	Pistons, Disassemble & Assemble	7-128
Crankshaft Rear Seal and Wear Sleeve	7-139	Piston Cooling Tubes	7-122
Crankshaft Main Bearings	7-125	Precombustion Chambers	7-107
Cylinder Head Assembly	7-108	Rocker Shafts, Disassemble & Assemble	7-102
Cylinder Liners	7-130	Rocker Shafts and Push Rods	7-98
Engine Oil Cooler	7-86	Spacer Plate	7-111
Electric Starting Motor	7-16	Tachometer Drive	7-18
Exhaust Manifold	7-89	Timing Gear Cover	7-140
Fan Drive	7-132	Timing Gears and Plate	7-143
Fan Drive (Earlier), Disassemble & Assemble	7-133	Torque for Flared and O-Ring Fittings	7
Fan Drive (Later), Disassemble & Assemble	7-135	Turbocharger	7-61
Flywheel	7-146	Turbocharger (AiResearch T12)	7-63
Flywheel (BrakeSaver)	7-166	Turbocharger (AiResearch T18)	7-75
Flywheel Housing	7-147	Turbocharger (AiResearch TV81)	7-79
Fuel Filter Base	7-20	Turbocharger (Schwitzer F552)	7-68
Fuel Injection Lines	7-3	Valves	7-112
Fuel Injection Pump and Governor Drive	7-54	Valve Covers	7-97
Fuel Injection Pump and Governor Drive Disassemble & Assemble	7-55	Valve Guides	7-114
Fuel Injection Pump Housing, Disassemble & Assemble	7-49	Valve Lifters	7-115
Fuel Injection Pump Housing and Governor (Earlier)	7-38	Valve Seat Inserts	7-113
Fuel Injection Pump Housing and Governor (Later)	7-40	Vibration Damper and Pulley	7-137
Fuel Injection Pump Housing and Governor, Separation and Connection	7-43	Water Pump	7-91
Fuel Injection Valves (Direct Injection)	7-104	Water Pump, Disassemble & Assemble	7-93
Fuel Injection Valves (Precombustion Chamber)	7-102	Water Temperature Regulator	7-84
Fuel Priming Pump	7-20		
Fuel Ratio Control	7-33		
Fuel Ratio Control, Disassemble & Assemble	7-34		

AIR COMPRESSORS (Section 8)

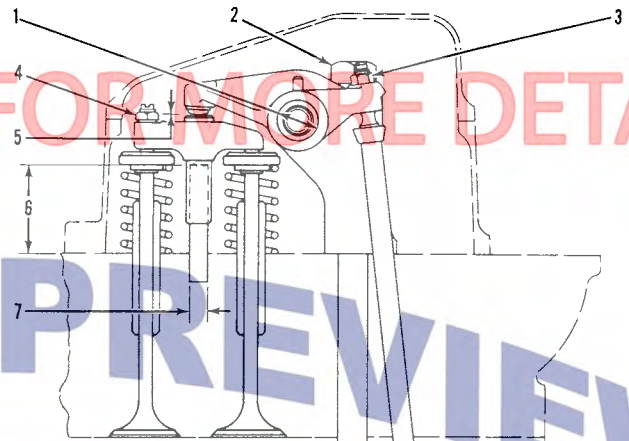
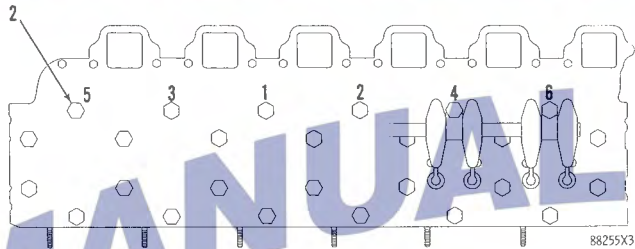
Tu-Flo 500 Air Compressors

Air Leakage Tests	8-5
Assembly	8-9
Description and Operation	8-2
Disassembly	8-5
Preventive Maintenance	8-4
Tabulated Data	8-11
Technical Data	8-12
Troubleshooting	8-10

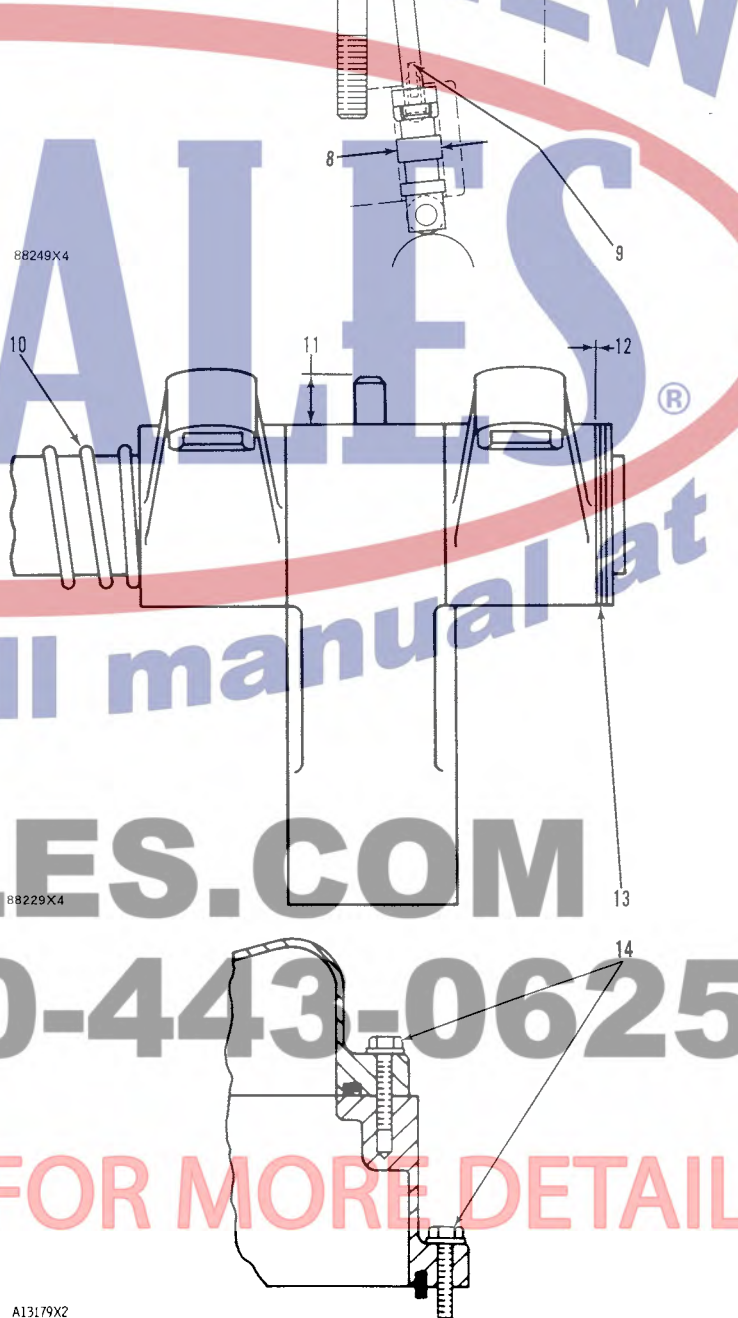
Tu-Flo 501 Air Compressors

Assembly	8-21
Complete Field Maintenance Kit	8-24
Cleaning of Parts	8-19
Description and Operation	8-15
Dimensional Specifications	8-24
General Service Checks	8-17
Inspection of Parts	8-20
Inspection of Rebuilt Unit	8-23
Preventive Maintenance	8-17
Removing and Disassembly	8-18
Repairs	8-21
Technical Data	8-24
Testing Rebuilt Compressor	8-23
Troubleshooting	8-23

VALVE ROCKER ARMS, LIFTERS, BRIDGES AND COVER



- (1) Bore in rocker arm for shaft (new) $.9765 \pm .0005$ in. (24.803 ± 0.013 mm)
- (2) Put engine oil on all the threads of bolts that hold rocker arms shaft and tighten the bolts in the following step sequence:
 Step 1. Tighten bolts from 1 to 6 in number sequence to 200 ± 20 lb. ft. (270 ± 25 N·m)
 Step 2. Tighten bolts from 1 to 6 in number sequence to 330 ± 15 lb. ft. (450 ± 20 N·m)
 Step 3. Tighten bolts from 1 to 6 in number sequence again to . . . 330 ± 15 lb. ft. (450 ± 20 N·m)
- (3) Torque for locknut for valve adjustment screw 22 ± 3 lb. ft. (28 ± 4 N·m)
- (4) Torque for locknut for bridge adjustment screw 22 ± 3 lb. ft. (28 ± 4 N·m)
- (5) Clearance for valves:
 Intake valves $.015$ in. (0.38 mm)
 Exhaust valves $.030$ in. (0.76 mm)
- (6) Height to top of dowel $2.10 \pm .02$ in. (53.3 ± 0.5 mm)
- (7) Diameter of dowel (new) $.4334 \pm .0001$ in. (11.008 ± 0.003 mm)
 Bore in bridge for dowel (new) $.4350 \pm .0012$ in. (11.049 ± 0.030 mm)
 Bore in head for dowel $.4322 \pm .0008$ in. (10.978 ± 0.020 mm)
- (8) Diameter of valve lifter (new) $1.09850 \pm .00025$ in. (27.9019 ± 0.0064 mm)
 Bore in block for valve lifter (new) $1.1005 \pm .0008$ in. (27.953 ± 0.019 mm)
- (9) Guide springs must not be used again. Always install new guide springs.
- (10) 2N7229 Spring:
 Length under test force 2.92 in. (74.2 mm)
 Test force 10 to 12 lb. (45 to 53 N)
 Free length after test 4.50 in. (114.3 mm)
 Outside diameter 1.17 in. (29.7 mm)
- (11) Dowel length above top surface of rocker shaft support to be $.50 \pm .04$ in. (12.7 ± 1.0 mm)
- (12) Clearance for rocker arms (both ends) $.012$ to $.055$ in. (0.30 to 1.40 mm)
- (13) Use 2N7228 Washer as needed to get clearance (12).
- (14) Torque for 26 bolts 120 ± 24 lb. in. (13.6 ± 2.8 N·m)



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NOTE: The timing dimension can also be checked with the 8S7167 Gauge, 6F6922 Depth Micrometer and 4 to 5 in. (101.6 to 127.0 mm) rod.

NOTE: If the timing of the fuel system is different than the correct timing dimension given in the chart, make reference to CAMSHAFT TIMING FOR THE FUEL INJECTION PUMP.

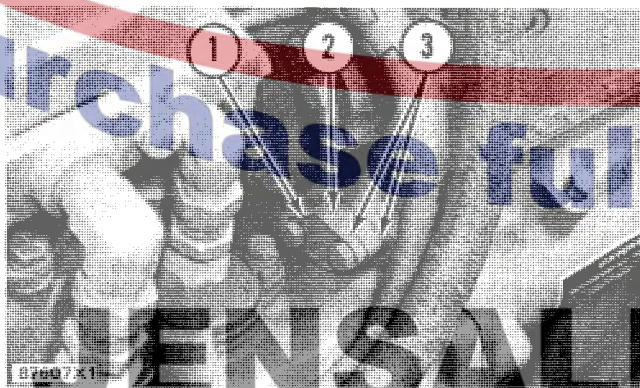
NOTE: If the timing of the fuel system is different than the correct timing dimension given in the chart and the camshaft timing for the fuel injection pump is correct, make reference to FUEL SYSTEM ADJUSTMENTS: OFF ENGINE.

Fuel Rack Setting

Tools Needed:

- 9S240 Rack Position Tool Group.
- 8S4627 Circuit Tester.
- 9S215 Dial Indicator.
- 9S8903 Contact Point (Flat Face with Bevel)
- 3P1565 Collet Clamp.
- 9S7350 Bracket Group.

1. Remove stop (1), spacer (2) and both gaskets (3) from the drive housing for the fuel injection pump.
2. Disconnect the governor control linkage to let the governor control lever move freely through its full travel.



RACK STOP

1. Stop. 2. Spacer. 3. Gaskets.

3. Install the 9S7350 Bracket Group (5) and the 9S215 Dial Indicator (6) on the drive housing for the fuel injection pump.
4. With the governor control lever in the "shut-off" position, put the spacer (4) of the bracket group (the spacer is on the rod connected to the chain) over the rod that makes contact with the rack. Put force on the end of the rod that makes contact with the rack, to hold spacer in position while dial indicator setting is made.



PUTTING FUEL RACK AT CENTER POSITION

4. Spacer. 5. 9S7350 Bracket Group. 6. 9S215 Dial Indicator.

5. Put the dial indicator on zero. Take the spacer away from the rod that makes contact with the rack.
6. Connect the clip end of the 8S4627 Circuit Tester (9) to the brass terminal (8) on the governor housing. Put the other end of the tester to a good ground.
7. Turn governor lever (7) in the "fuel-on" direction until the light in the tester comes on. Now move the governor lever toward the "shut-off" position until the test light goes out. Now slowly, turn the governor lever toward "fuel-on" until the test light has a minimum light output. In this position, rack stop collar (11) is just making a contact with the torque spring or stop bar.
8. Read the measurement on the dial indicator. Look in the RACK SETTING INFORMATION to find the correct measurement for rack setting.
9. If an adjustment is necessary, remove the cover, or air-fuel ratio control (if so equipped), from the rear of the governor.



MEASURING FUEL RACK SETTING

7. Governor lever. 8. Brass terminal. 9. 8S4627 Circuit Tester.

ENGINE OVERHAUL IN CHASSIS

10. Thoroughly clean the spacer plate and cylinder block surface.

NOTE: Earlier model engines do not have O-ring seals (5) and (7).

11. Install a new gasket (8) between the spacer plate and cylinder block. Put O-ring seals (5) and (7) in position and put spacer plate (6) in position on the cylinder block.

CAUTION

Both surfaces of the spacer plate, top of cylinder block, and both sides of the spacer plate gasket must be clean and dry. Gasket adhesives or other substances must not be used on these surfaces.

12. Clean the cylinder liners and the liner bores in the cylinder block.

NOTE: If used liners are installed, put the liners in position as shown in GUIDELINES FOR REUSABLE PARTS Form No. SEBF8001 PISTONS AND LINERS.

13. Install cylinder liners (9) in the block without the O-ring seals or filler band.

14. Check the cylinder liner projection as follows:

- Install the $\frac{3}{4}$ "-16 NF bolts, 3 in. long and the 2F126 washers of tooling (E) on the cylinder block next to each liner. Tighten the bolts evenly, in four steps: 10 lb.ft. (14 N·m), 25 lb.ft. (35 N·m), 50 lb.ft. (70 N·m) and then to 70 lb.ft. (95 N·m).
- Put the adapter plate and one plate of tooling (E) on top of the liner and install the remainder of tooling (E). Be sure the bar is in position at the center of the liner. Tighten the bolts evenly, in four steps: 5 lb.ft. (7 N·m),



15 lb.ft. (20 N·m), 25 lb.ft. (35 N·m) then to 50 lb.ft. (70 N·m).

- Check to be sure the distance from the bottom edge of the bar to the top of the cylinder block is the same on both sides of the liner.

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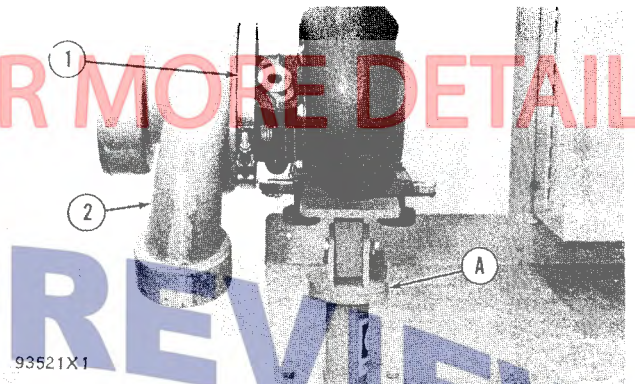
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TURBOCHARGER (AIRESEARCH T12)

DISASSEMBLE TURBOCHARGER (AIRESEARCH T12) 1052-15

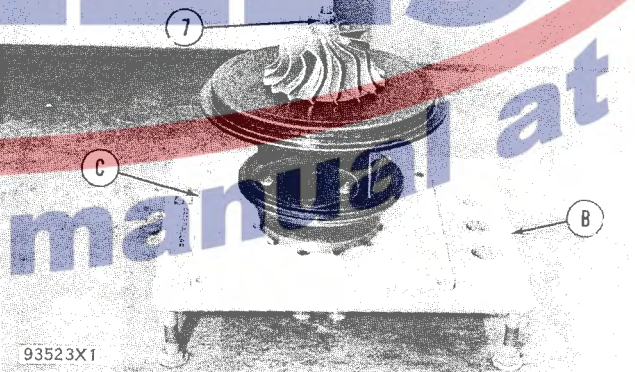
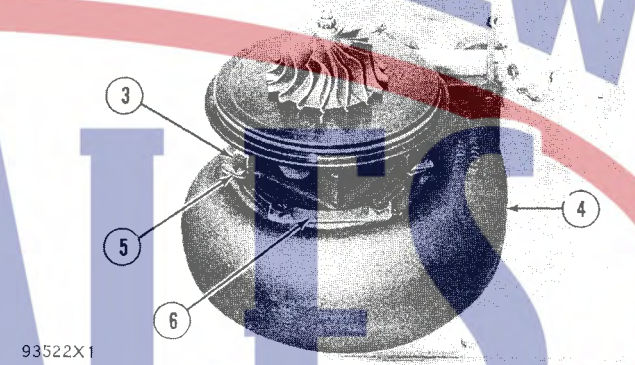
Tools Needed		A	B	C	D	E	F	G
9S6363	Holding and Positioning Fixture	1						
9S6343	Cartridge Fixture	1						
8S9944	Holder		1					
	Oil Cooker (Thermostat Controlled)			1				
FT808	Adapter				1			
FT165	Fixture					1		
FT174	Driver Tool						1	



start by:

a) remove turbocharger

1. Install the turbocharger on tool (A).
2. Put marks on the housings for correct installation at assembly.
3. Loosen clamp (1). Remove compressor housing (2). Remove the clamp.
4. Remove bolts (3), locks (6) and plates (5).
5. Remove the center section from turbine housing (4).
6. Install tool (C) in tool (B). Install the center section in tool (C) as shown.
7. Remove nut (7) that holds the impeller to the shaft and wheel assembly.



CAUTION
When nut (7) is loosened, do not put side force on the shaft.

8. Install tool (E) and tool (D). Heat tool (D) to 350°F (177°C). Install the impeller on tool (E).

CAUTION
Make sure only the impeller is in the oil.

