



Caterpillar

Service Manual

931 Traxcavator

S/n 10N & 78U

Volume 1 of 2

Service Manual

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CT-S-TRAX931

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GLOSSARY

aeration: Air mixed with the oil.

block, blocking, blocked: To close off a passage; to stop or prevent movement.

cavitation: Air present at the inlet of the pump.

data: Specific information.

flow differential (flow loss): The difference between two oil flows.

stick, sticking, stuck: To prevent free movement; keep open or closed.

tip, tipping, tipped: To move from a vertical position; to slope.

viscosity: The property of a fluid that resists internal flow by releasing counteracting forces.

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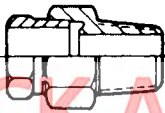
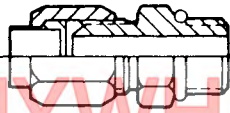
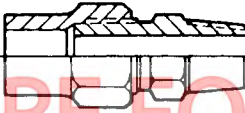
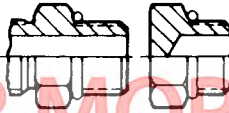
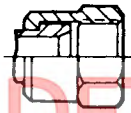
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INVERTED
45° FLARED

37° FLARED

45° FLARED

O-RING
FITTING – PLUG

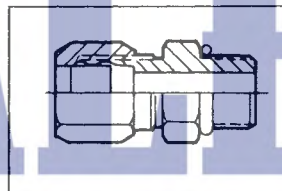
SWIVEL NUTS

TUBE SIZE (O.D.)	mm	3.18	4.78	6.35	7.92	9.52	TUBE SIZE (O.D.)	mm	12.70	15.88	19.05	22.22	25.40	31.75	38.10	50.80
	in.	.125	.188	.250	.312	.375		in.	.500	.625	.750	.875	1.000	1.250	1.500	2.000
THREAD SIZE (in.)		5/16	3/8	7/16	1/2	9/16 5/8	THREAD SIZE (in.)		3/4	7/8	1 1/16 1 1/4	1 3/16 1 1/4	1 5/16	1 5/8	1 7/8	2 1/2
TORQUE N·m		5 ±1	9 ±1	16 ±2	18 ±2	21 ±2	TORQUE N·m		40 ±7	55 ±7	75 ±7	90 ±7	110 ±7	135 ±15	160 ±15	310 ±30
TORQUE lb.in.		45 ±10	80 ±10	145 ±20	155 ±20	190 ±20	TORQUE lb.ft.		30 ±5	40 ±5	55 ±5	65 ±5	80 ±5	100 ±10	120 ±10	230 ±20

TORQUES FOR OTHER FITTINGS

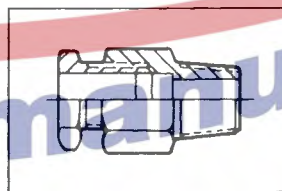
Ermeto Tube Fittings

Put nut and sleeve over the tube with head or shoulder end of sleeve next to nut. Push tube into counterbore of fitting body as far as possible. Turn nut clockwise until sleeve holds tube and prevents movement. Tighten the nut 1 1/4 turns more to seat sleeve and give a locking action. When necessary to assemble again, put sleeve over tube and tighten nut until a sudden increase in torque is felt. Then tighten 1/6 to 1/3 turn more to seat the sleeve.



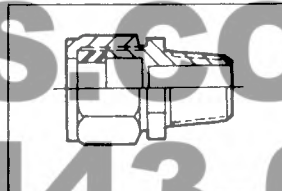
Flex Fittings

Put nut and sleeve over tubing and push tube into counterbore of fitting body as far as possible. Tighten the nut until it is against the hex part of the fitting body.



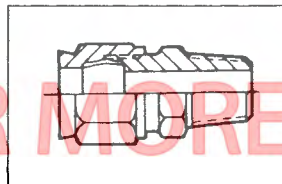
Hi Duty (shear sleeve) Tube Fittings

After tube has been put through the nut and makes contact against the tube shoulder in the fitting body, turn the nut with a wrench until a small decrease in torque is felt. This is an indication that the sleeve has been broken off of the nut. Hold the tube to prevent turning and tighten the nut 1 and 1/2 turns.



Hi Seal Fittings

Put nut and sleeve over the tubing with the short heavy end of the sleeve facing the end of tubing. Put the tube end against the counterbore in the body of the fitting and tighten until nut is over the last thread on the body. The remainder of space is used whenever the fitting is removed and installed again.



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HYDRAULIC CYLINDERS

NOTE: See SPECIAL INSTRUCTIONS Form FM055100 for installation of seal assembly (7).

9. Install seal assembly (7) with tooling (C) and wear ring (8) on the piston.

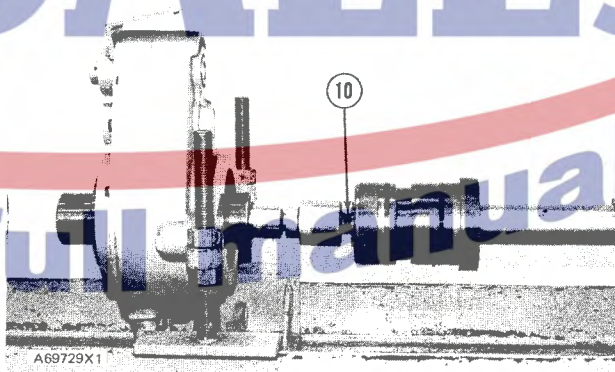


NOTE: Put lubricant to be sealed on the lip of the lip type seal in the head.

10. Put head (4) and piston (9) in position on the rod.

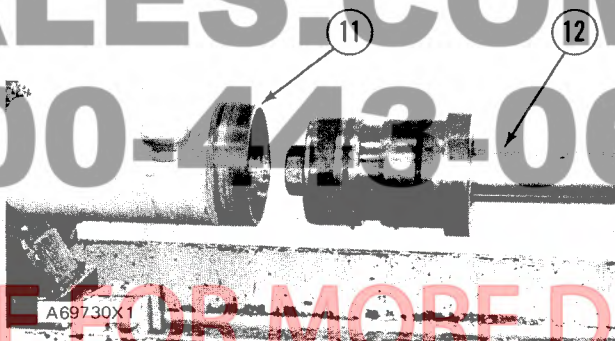


11. Put lubricant on the threads of the bolt. Install the washer and bolt (10) with tool (D). Tighten the bolt to the correct torque shown on Page 62.



NOTE: Put clean grease on the outside diameter of the head and the inside diameter of the crown.

12. Install rod assembly (12) in tube assembly (11) with tooling (C) and (E).



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**WARNING**

**DISCONNECT BATTERIES
BEFORE PERFORMANCE
OF ANY SERVICE WORK.**

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ENGINE, TORQUE CONVERTER AND TRANSMISSION

13. Put pedal assembly in position on frame and install bolts (11).

14. Connect spring (9) and linkage (10) on both sides.

15. Connect lines (12) on steering control valves.

16. Connect governor control linkage.

17. Install engine oil cooler.

18. Connect line (13) for water temperature gauge. Connect wire for glow plugs.

19. Connect line for air cleaner gauge.

20. Connect line for oil pressure gauge.

21. Connect lines (14) to hydraulic pump.

22. Install clamp on hydraulic lines.

23. Connect wires to starter.

24. Fill transmission and hydraulic tank with oil to correct level.

end by:

- install drive shaft
- install muffler
- install air cleaner housing
- install radiator and guard assembly



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 WARNING

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INTRODUCTION

The specifications given in this book are on the basis of information available at the time it was written. The specifications torques, pressures of operation, measurements, adjustments and other items can change at any time. These changes can effect the service given to the product. Get the complete and most current information before you start any job. Caterpillar Dealers have the most current information which is available. For a list of the most current modules and form numbers available for each Service Manual, see the SERVICE MANUAL CONTENTS MICROFICHE REG1139F.

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.

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NOTE: The "C" is an indication of a change from the former issue.

NOTE: For Systems Operation and Testing and Adjusting, make reference to the 3204 Vehicular Engine, Form No. REG01222.

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NOTE: This book has been completely changed from the former issue.

2. Put No.1 piston at top center (TC) on the compression stroke. Make reference to FINDING TOP CENTER COMPRESSION POSITION FOR NO.1 PISTON.
3. Install 5P143 Timing Fixture Plate (1) on the rear face of the accessory housing with dowel alignment and bolts installed as illustrated.



5P143 TIMING FIXTURE PLATE INSTALLED

1. 5P143 Timing Fixture Plate.

NOTE: If the timing fixture plate can be installed, the timing is correct. If the timing fixture plate can not be installed, use the procedure that follows.

4. Remove plug (2) from the front cover.



LOCATION OF PLUG

2. Plug.

5. Loosen the bolt that holds the drive gear to the accessory drive shaft.
6. Use a hammer and punch to hit the head of the loosened bolt. This will separate the accessory drive shaft from the gear.



SEPARATION OF SHAFT AND GEAR

7. Turn the accessory shaft far enough to allow installation of 5P143 Timing Fixture Plate (1).

8. With the timing fixture plate installed correctly, tighten the bolt that holds the gear for the accessory drive shaft to a torque of:

PC Engines 75 ± 10 lb. ft.
(100 ± 14 N·m)

DI Engines 110 ± 5 lb. ft.
(149 ± 7 N·m)



**TIGHTENING THE BOLT THAT HOLDS THE
ACCESSORY DRIVE GEAR**

9. Remove 5P143 Timing Fixture Plate (1) and install plug (2) in the front cover.
10. Turn the camshaft of the injection pump so it is in alignment with the end of the accessory drive shaft. Install the pump housing. Make all necessary connections.
11. Remove the timing bolt from flywheel. Install plug in flywheel housing.
12. The injection pump camshaft is now timed to No.1 cylinder.

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**DISCONNECT BATTERIES
BEFORE PERFORMANCE
OF ANY SERVICE WORK.**

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SPECIFICATIONS

NOTE: For Specifications with illustrations, make reference to the POWER TRAIN SPECIFICATIONS FOR 931 TRACK-TYPE LOADER, Form No. REG01327. If the Specifications in Form REG01327 are not the same as in the Systems Operation and the Testing and Adjusting, look at the printing date on the back cover of each book. Use the Specifications given in the book with the latest date.

INTRODUCTION

The specifications in this book are given on the basis of information that was current at the time the book was written. These specifications give the torques, operating pressures, measurements of new parts and other items. When the word "permissible" is used in the description, the specification value given is the "maximum or minimum" normally permitted before adjustment, repair and/or new parts are needed. Make a comparison of the measurements of a worn part with the specifications of a new part to find the amount of wear. The wear factor is not the only basis for the replacement of parts. The expected service life of the worn part is a factor. A part that is worn can be safe to use if an estimate of the remainder of its service life is good. When a disassembly is made for the purpose of reconditioning, the recommendation is the replacement of parts not completely worn out if a short service life is expected.

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NOTE: For Systems Operation and Testing and Adjusting, make reference to 931 POWER TRAIN, Form No. REG01325.

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INTRODUCTION

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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.

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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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NOTE: For Systems Operation and Testing and Adjusting, make reference to:

D3 Tractor Hydraulics, Form No. REG01264.
910 Loader Hydraulic System, Form No. REG01225.
931 Loader Hydraulic System, Form No. REG01328.

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NOTE: For Specifications with illustrations, make reference to the Specifications for D3 AND 931 BACKHOE HYDRAULIC SYSTEM, Form No. REG01352. If the Specifications given in Form REG01352 are not the same as given in the Systems Operation and the Testing and Adjusting, look at the printing date on the back cover of each book. Use the Specifications given in the book with the latest date.

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NOTE: For Systems Operation and Testing and Adjusting, make reference to the D3 and 931 BACKHOE HYDRAULIC SYSTEM, Form No. REG01351.

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