SERVICE MANUAL

BACKHOE LOADER
3CXG

EN - 9813/4250 - ISSUE 6 - 03/2018

This manual contains original instructions, verified by the manufacturer (or their authorized representative).

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Foreword

The Operator's Manual

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You and others can be killed or seriously injured if you operate or maintain the machine without first studying the Operator's Manual. You must understand and follow the instructions in the Operator's Manual. If you do not understand anything, ask your employer or JCB dealer to explain it.

Do not operate the machine without an Operator's Manual, or if there is anything on the machine you do not understand.

Treat the Operator's Manual as part of the machine. Keep it clean and in good condition. Replace the Operator's Manual immediately if it is lost, damaged or becomes unreadable.

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Technical Data

Table 99.

Crankshaft Position Sensor	
Type	Hall effect.

Table 100.

Camshaft Position Sensor	
Type	Hall effect.

Table 101.

Coolant Temperature Sensor		
Type	Temperature dependant resistance.	
Tightening torque	22N·m max	
Thread diameter	M12 x 1.5.	
Temperature v Resistance Table		
Temperature °C (°F)	Resistance Ω	+/- %
25 (77.0)	2,062	5.7
50 (121.9)	833	4.3
100 (211.9)	187	2
110 (229.8)	144	2.4

Table 102.

Inlet Manifold Air Pressure and Temperature Sensor (TMAP)		
Fixing screw tightening torque	22N·m max	
Fixing screw thread diameter	M6	
Supply voltage	5V	
Temperature Sensor		
Type	Temperature dependant resistor.	
Temperature v Resistance Table		
Temperature °C (°F)	Resistance Ω	+/- %
5 (41.0)	4,707	4.66
10 (50.0)	3,791	4.55
15 (59.0)	3,075	4.44
20 (68.0)	2,510	4.33
25 (77.0)	2,062	4.22
30 (86.0)	1,715	4.12
Pressure Sensor		
Type	Piezo-resistive	
Atmospheric Pressure v Voltage		
Inlet Manifold Air Pressure and Temperature Sensor (TMAP)		
Atmospheric pressure bar (psi)	Output voltage V	+/- V
0.98 -0.025/ +0.025 (14.2 -0.4/+0.4)	1.84	0.05

Table 103.

Knock Sensor	
Type	Piezo crystal.
Fixing screw tightening torque	24N·m
Fixing screw thread diameter	M8

Table 104.

Throttle Position Sensor (TPS)(1)	
Type	Two channel ratio metric voltage output sensor.
Supply voltage	5V
Rotational range	75°
Output range	Linear output voltage over the rotational range.

(1) The throttle position sensor is not supplied as part of the engine assembly. The technical data given is compatible with the specification required.

Table 105.

Rail Pressure Sensor	
Type	The rail pressure sensor is integral with the common rail.

Table 106.

High Pressure Rail Fuel Valve	
Type	The HPV (High Pressure Valve) is integral with the common rail.

Table 107.

Fuel Temperature Sensor	
Type	The fuel temperature sensor is integral with the high pressure fuel pump.

Table 108.

Oil Pressure Switch	
Set pressure	0.6bar (8.7psi) falling.
Switch mode	Normally open.
Max pressure	27.5bar (398.5psi)

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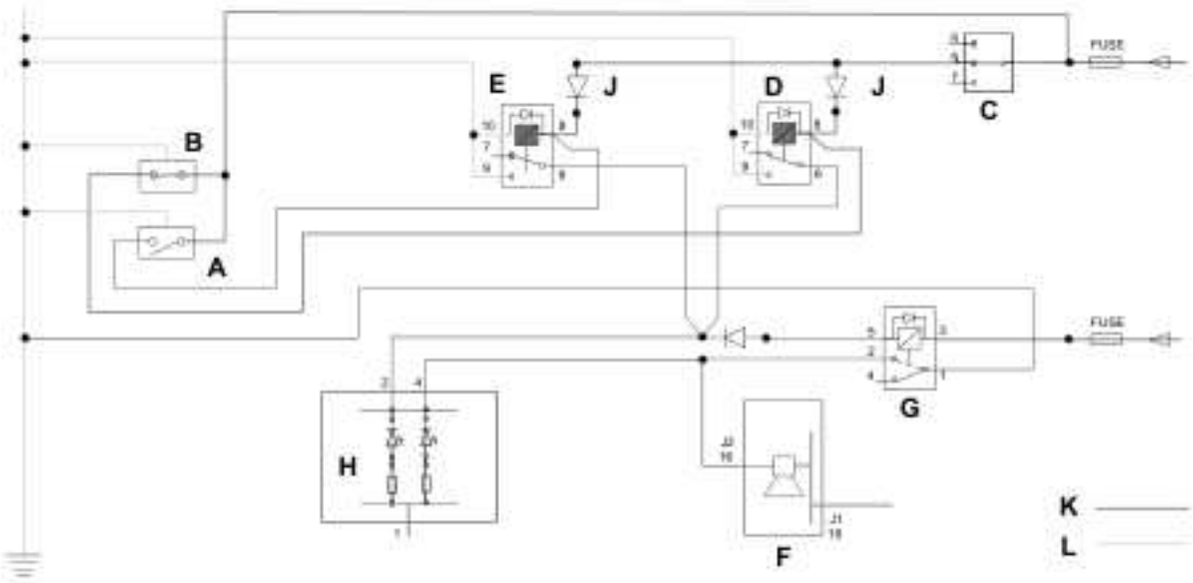
Operation

Neutral Position

Each stabiliser leg has a sensor switch that detects if the leg is extended or fully retracted. The schematic diagram shows the circuit with the left stabiliser extended (sensor switch contacts A open), and the right stabiliser fully retracted (sensor switch B contacts closed). Refer to Figure 953.

With the column mounted forward/reverse lever set at neutral position, the stabiliser leg alarm relays are energised by a live feed through the diodes. The relay contacts break the return to earth circuit for the warning relay, so that it cannot energise. While the forward/reverse lever remains at neutral position, the warning buzzer will not operate when either stabiliser leg is extended. Refer to Figure 953.

Figure 953.



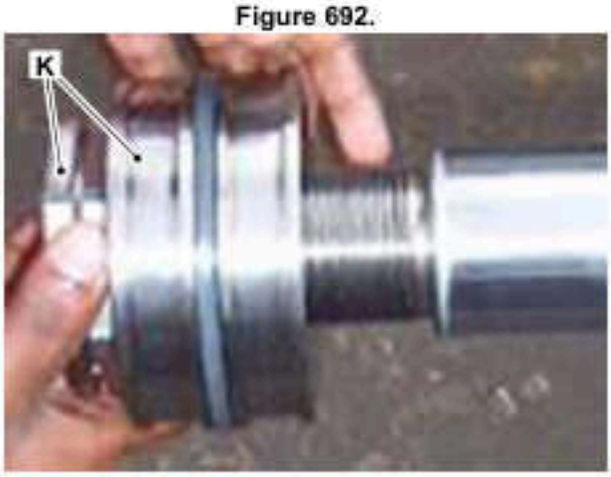
A Sensor switch - Left stabiliser leg
B Sensor switch - Right stabiliser leg
C Forward/Neutral/Reverse lever (column switch)
D Right stabiliser leg alarm relay
E Left stabiliser leg alarm relay
F Warning buzzer (Right instrument ECU (Electronic Control Unit))
G Warning relay
H Warning lights (Front steering console)
J Diode
K Electrical return
L Electrical feed

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Fault Code	Description	Severity
P2BAA9A	Consumption Level3 Enacted	Critical
P2BAAF0	Consumption Level2 Requested	Critical
P2BAAF1	Consumption Level3 Requested	Critical
P2BAB00	EGR Warning Requested	Operator
P2BAB68	EGR Level2 Enacted	Critical
P2BAB92	EGR Level1 Enacted	Service
P2BAB94	EGR Level1 Requested	Service
P2BAB9A	EGR Level3 Enacted	Critical
P2BABF0	EGR Level2 Requested	Critical
P2BABF1	EGR Level3 Requested	Critical
P2BAD00	Inducement Override	Service
P2BAD16	Undershooting the limit value long term adaptation factor	Service
P2BAD17	Exceeding the limit value of long term adaptation factor	Service
P2BAD68	Level 2 is active due to "Repeat Offense Error"	Service
P2BAD92	Level 1 is active due to "Repeat offense error"	Service
P2BAD9A	Level 3 is active due to "Repeat offense error"	Service
P2BAE00	Driver Warning for System tampering	Operator
P2BAE68	System Tampering Level 2 Enacted	Critical
P2BAE92	System Tampering Level 1 Enacted	Service
P2BAE94	System Tampering Level 1 Requested	Service
P2BAE9A	System Tampering Level 3 Enacted	Critical
P2BAEF0	System Tampering Level 2 Requested	Critical
P2BAEF1	System Tampering Level 3 Requested	Critical
P340187	excessive ambient/operating temperature error for aftertreatment 1 scr catalyst reagent property	Service
P340287	Concentration too high for aftertreatment 1 scr catalyst reagent properties	Service
P340387	Concentration too low for aftertreatment 1 scr catalyst reagent properties	Service
P340487	excessive ambient/operating temperature error for aftertreatment 1 scr catalyst reagent property	Service
P340587	Temperature too high for aftertreatment 1 scr catalyst reagent properties	Service
P340687	Temperature too low for aftertreatment 1 scr catalyst reagent properties	Service
P340787	Sensor Open Circuit Error Aftertreatment1 SCR catalyst reagent temperature	Service
P340887	Sensor short Circuit Error Aftertreatment1 SCR catalyst reagent temperature	Service
P340987	excessive ambient/operating Level error for aftertreatment 1 scr catalyst reagent property	Service
P341087	Level too high for aftertreatment 1 scr catalyst reagent properties	Service
P341187	Level too low for aftertreatment 1 scr catalyst reagent properties	Service
P341287	Tank Level Open Circuit Error Aftertreatment1 SCR catalyst reagent temperature	Service
P341387	Tank Level short Circuit Error Aftertreatment1 SCR catalyst reagent temperature	Service
P341487	Errorneous signal for Engine Boost pressure	Service
P341587	Data Length Error for IC1 frame	Service
P341687	Time out error for IC1 frame	Service
P341787	Erroneous signal for Intake manifold temperature	Service

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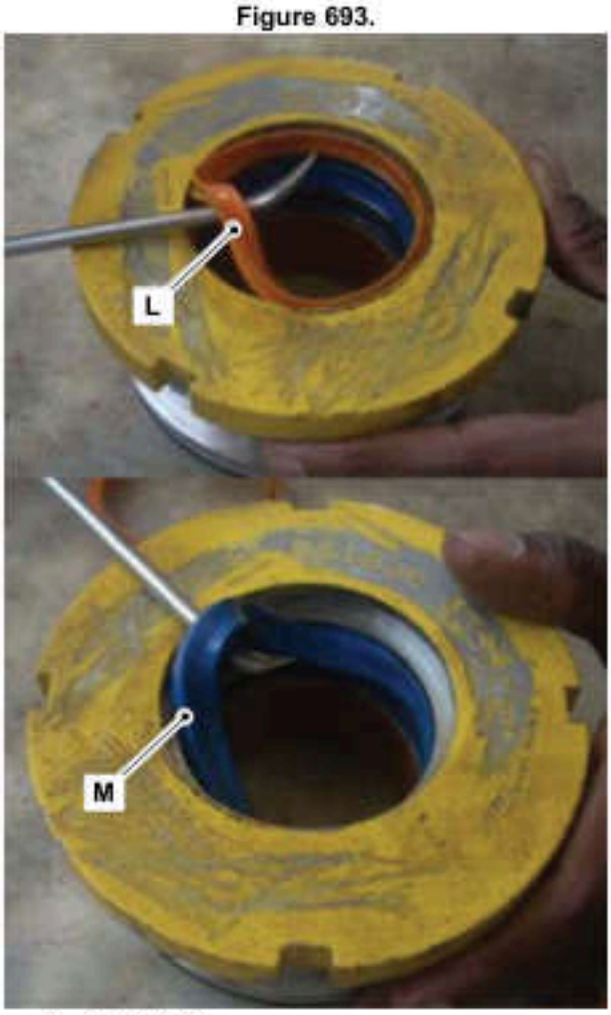
Figure 692.



K Piston

14. Remove the head end cover. Refer to Figure 693.
15. Use a bent screwdriver to remove the wiper seal and the secondary rod seal. Refer to Figure 693.

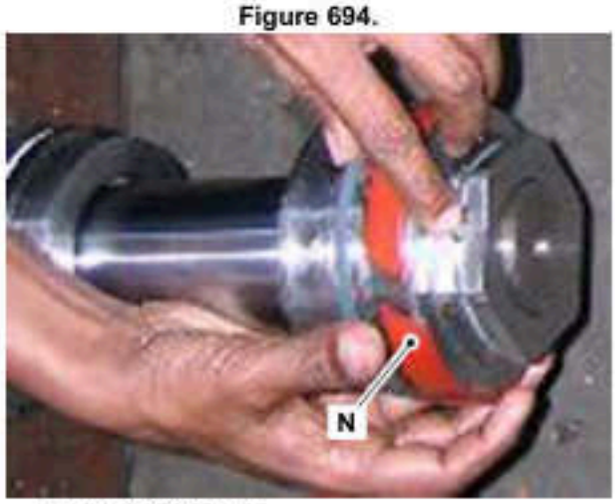
Figure 693.



L Wiper seal
M Secondary rod seal

16. Remove the piston bearing. Refer to Figure 694.

Figure 694.



N Piston bearing

17. Use a bent screwdriver to remove the piston seal. Refer to Figure 695.

Figure 695.

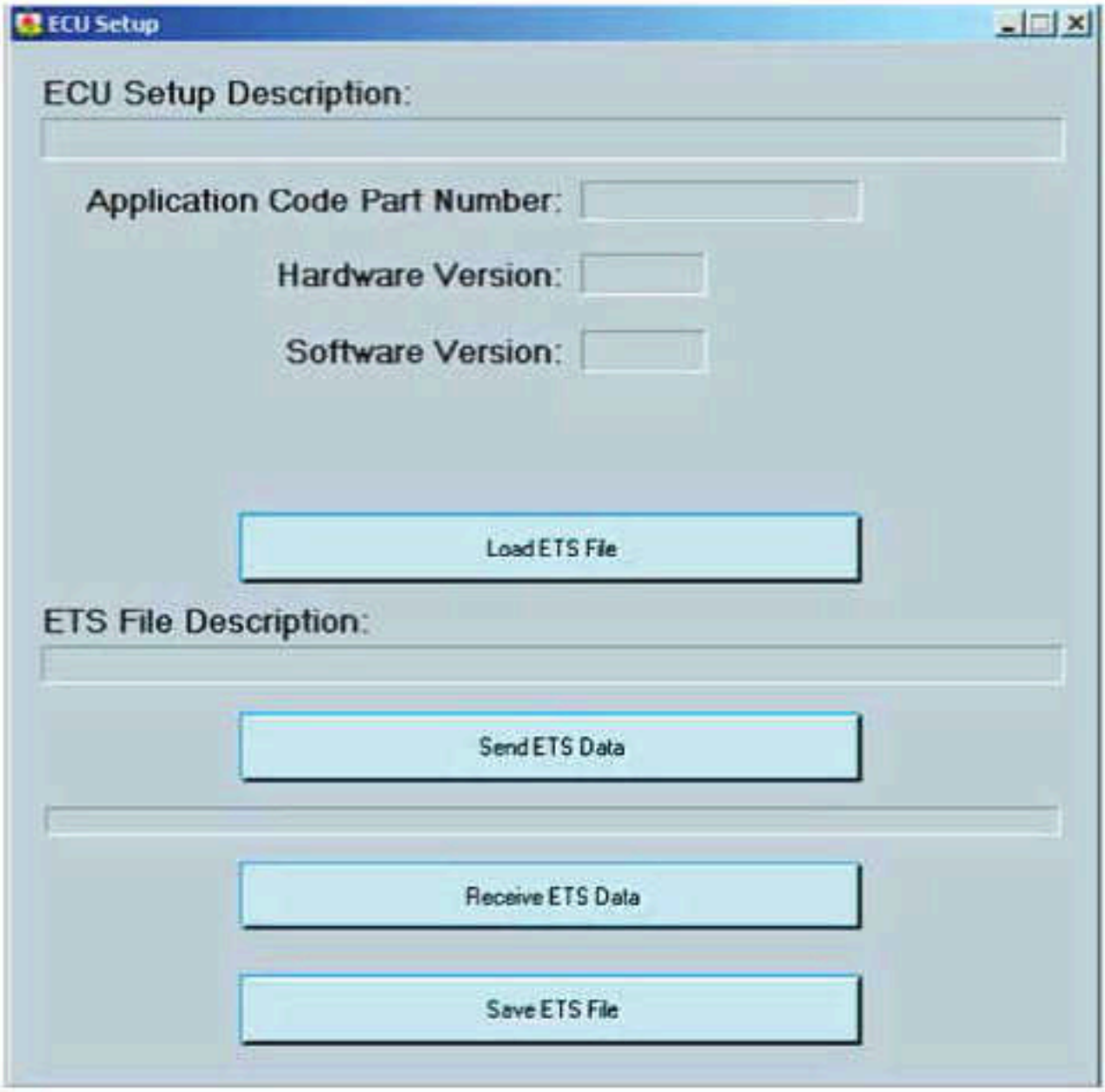


P Piston seal

18. Remove the piston O-ring and the piston backup ring. Refer to Figure 696.

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Figure 991.



ETS Function

The ETS function provides a means of loading and uploading gearbox ECU software setup files between the ECU and the computer. On earlier versions of servicemaster a separate program was required to perform this function. This is now incorporated within shiftmaster diagnostics 2.3. The setup files have a file name extension of ets.

- Load ETS File: A revision to the gearbox ECU software file may be supplied by JCB for installation on particular ECU models. Store the file on the computer which is to be connected to the gearbox ECU. The shiftmaster diagnostic program needs to open this file and obtain the software version and other applicable information to make sure it is compatible with the ECU connected to the computer.
- Send ETS Data: This allows the computer to send a software setup file to the gearbox ECU.
- Receive ETS Data: This reads the existing setup file from the gearbox ECU.
- Save ETS File: This saves the data received from the ECU onto the computer.

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