

Identifying your Machine

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Data Plate

Your machine has a Data Plate, located on the outside of the cab as shown at **A**. The machine serial number is inscribed at **B** which is the baseplate of the rear frame and the engine number is at **C**.

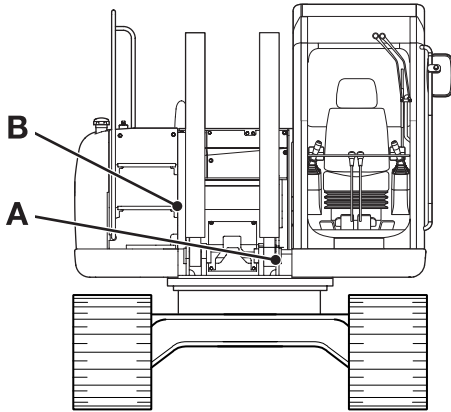


Fig 1.

Typical Product Identification Number (PIN)

1	2	3	4	5
JCB	JS13C	C	6	1018354

- 1 World Manufacturer Identification (JCB)
- 2 Machine Type and Model (JS13C = JS130 Tracked)
- 3 Randomly generated check letter.
- 4 Year of Manufacture (1 = 2001, 2 = 2002, 3 = 2003, 4 = 2004, 5 = 2005, 6 = 2006)
- 5 Machine Serial Number (1018354)

	JCB HEAVY PRODUCTS LTD LAKESIDE WORKS ROCESTER UNITED KINGDOM ST14 5JP	
<input type="text"/>		
PIN	Product Identification Number	ISO 10261
MACHINE TYPE	<input type="text"/>	
OPERATING MASS kg ISO 6016	<input type="text"/>	
ENGINE SERIAL No.	<input type="text"/>	
ENGINE POWER kw / RPM ISO 14396	<input type="text"/>	
CONSTRUCTION YEAR	<input type="text"/>	

Fig 2.

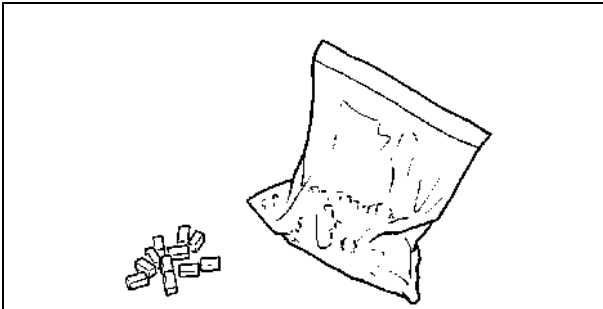


Fig 17. 926/15500

Note: - (unit quantity = 500 off) used to provide the correct set clearance between glass edge and cab frame.

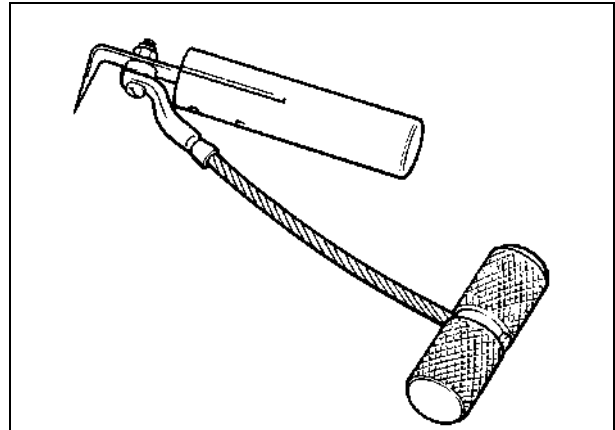


Fig 20. 992/12800

Note: - used to remove broken glass.

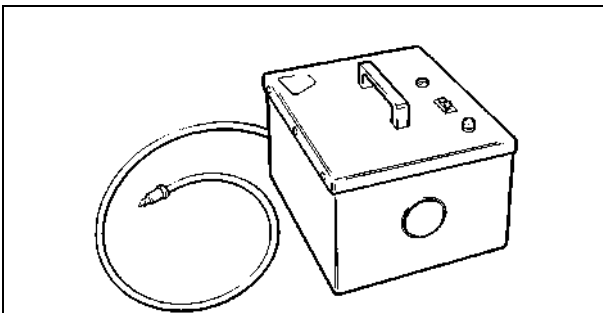


Fig 18. 992/12300

Note: - 1 cartridge capacity - required to pre-heat adhesive prior to use. It is fitted with a male plug (703/23201) which fits into a female socket (715/04300).

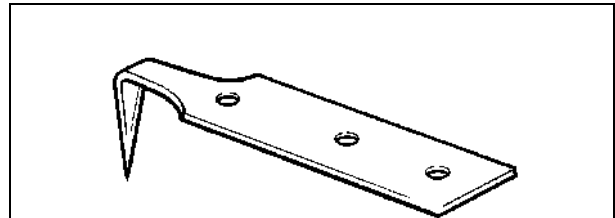


Fig 21. 992/12801

Note: - (unit quantity = 5 off) 25 mm (1 in) cut - replacement blades for cut-out knife (above)..

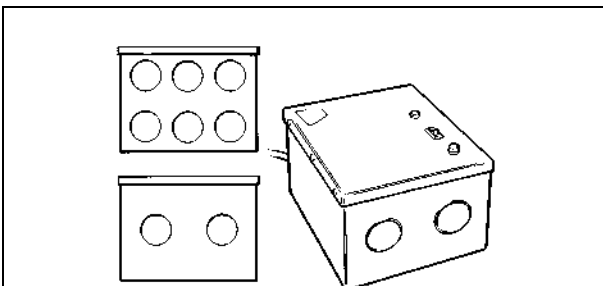


Fig 19.

Note: -available with 2 or 6 cartridge capacity (992/12400 - 2 Cartridge x 240V, 992/12600 - 6 Cartridge x 240V) - required to pre-heat adhesive prior to use. No plug supplied. 110V models available upon request - contact JCB Technical Service.

General Safety

WARNING

Handbook

You and others can be injured if you operate or maintain the machine without first studying this handbook. Read the safety instructions before operating the machine. If you do not understand anything, ask your employer or JCB dealer to explain it. Keep this handbook clean and in good condition. Do not operate the machine without a handbook in the cab, or if there is anything on the machine you do not understand.

INT-1-3-2

WARNING

Decals

Decals on the machine warn you of particular hazards. You can be injured if you do not obey the decal safety instructions.

Each decal is attached close to a part of the machine where there is a possible hazard. Make sure replacement parts include warning decals where necessary.

Keep all decals clean and readable. Replace lost or damaged decals. Each decal has a part number printed on it, use this number to order a new decal from your JCB distributor.

INT-3-3-3_1

WARNING

Care and Alertness

All the time you are working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards.

INT-1-3-5

WARNING

Alcohol and Drugs

It is extremely dangerous to operate machinery when under the influence of alcohol or drugs. Do not consume alcoholic drinks or take drugs before or whilst operating the machine or attachments. Be aware of medicines which can cause drowsiness.

INT-1-3-9

WARNING

Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained.

INT-1-3-6

WARNING

Lifting Equipment

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that lifting tackle complies with all local regulations and is suitable for the job. Make sure that lifting equipment is strong enough for the job.

INT-1-3-7

WARNING

Raised Equipment

Raised equipment can fall and injure you. Do not walk or work under raised equipment unless safely supported.

13-1-1-6

DANGER

Before removing the boom from the machine, ensure that the counterweight is adequately supported as in certain ground conditions the machine could tip backwards. Never travel or transport the machine with the boom removed.

BF-6-3

Identification of Machine Components

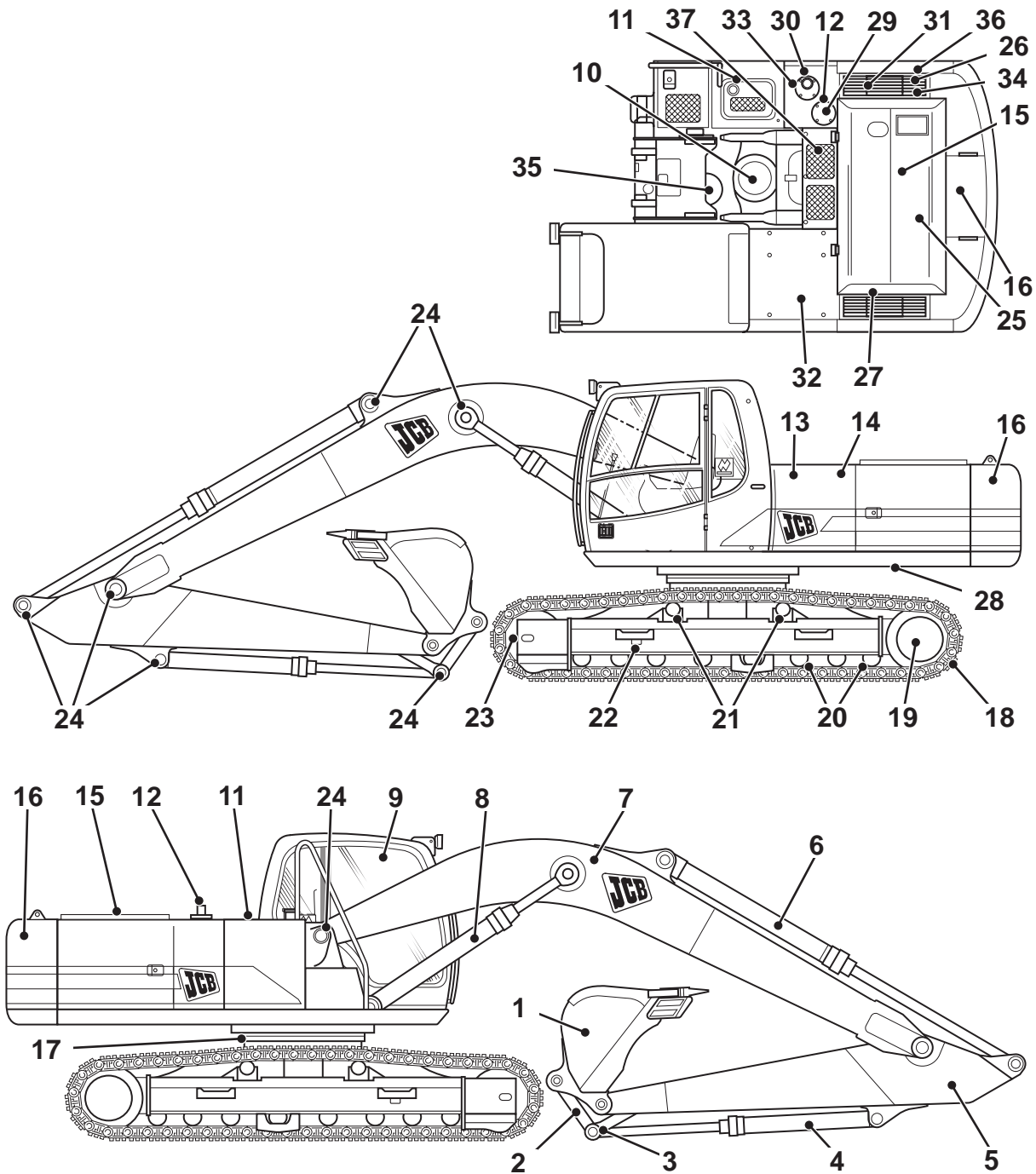


Fig 1.

- d Fit the self sealing drain kit threaded union (with attached pipe) **D**. Drain sump oil into a suitable container.
 - e Remove the self seal drain kit, clean and refit the outer cover. (Do not over tighten the cover).
- 4** Change the filter
- a Remove the filter **E**.

- 6** Check for leaks
 - a Before starting the engine, turn the engine over with the Emergency Stop Button ON until the oil pressure warning light goes out.
 - b Allow the engine to stand before checking the oil level → [Checking the Oil Level \(□ 3-38\)](#).

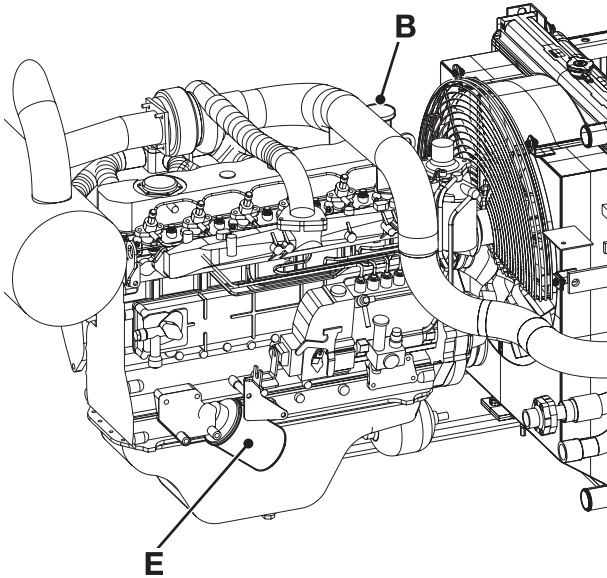


Fig 26.

- b Clean the filter head.
 - c Smear the seal on the new filter **E** with oil.
 - d Tighten the filter until the seal bites onto the filter housing.
 - e Tighten the filter a minimum of one more full turn.
- 5** Fill the System.
- a Fill the engine with new oil through filler **B** → [Lubricants and Capacities \(□ 3-16\)](#).
 - b Wipe off any spilt oil.
 - c Check for leaks.
 - d Make sure the filler cap is correctly refitted.

Slew

Table 42. Insufficient slew force

Cause	Remedy
Performance reduction of slew motor	Replace slew motor ⁽¹⁾
Thermal seizure of slew shaft	Supply grease or replace the slew shaft ⁽¹⁾

Table 43. Idle slew during slew braking

Cause	Remedy
Low setting of brake valve	Adjust the pressure ⁽¹⁾
Clogged valve	Wash the valve ⁽¹⁾
Performance reduction of slew motor	Replace slew motor ⁽¹⁾
Internal oil leakage of control valve	Repair or replace valve assembly ⁽¹⁾

Table 44. Idle slew during slew stopping

Cause	Remedy
Low setting of brake valve or port relief	Adjust the pressure ⁽¹⁾
Clogged valve	Wash the valve ⁽¹⁾
Performance reduction of slew motor	Replace slew motor ⁽¹⁾
Internal oil leakage of control valve	Repair or replace valve assembly ⁽¹⁾

Table 45. Abnormal noise during slew

Cause	Remedy
Air in slew motor	Refill with oil
Insufficient greasing of slew bearing	Add grease

Hydraulic ram

Table 46. Insufficient force of hydraulic ram

Cause	Remedy
Low pressure setting for the relief valve	Adjust the pressure ⁽¹⁾
Oil leakage inside the hydraulic ram	Replace the ram seals ⁽¹⁾
Damage of the hydraulic ram or rod	Replace the hydraulic ram or rod ⁽¹⁾
Oil leakage inside the control valve	Repair or replace the valve assembly ⁽¹⁾

Table 47. Oil leakage outside the hydraulic ram

Cause	Remedy
Defective hydraulic ram seals	Replace hydraulic ram seals ⁽¹⁾
Hydraulic cylinder rod damage*	Replace hydraulic ram rod ⁽¹⁾

(1) Indicates jobs which should be done by a specialist. Refer to Service Manual.

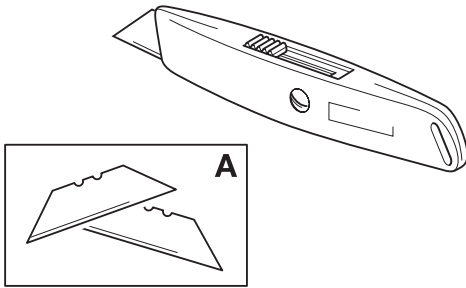


Fig 24. Craft Knife

Note: There are other tools available to cut out the old sealant. For example, there is a long handle type craft knife to give extended reach. Refer to **Service Tools**, for details of this and any other tools.

- 4 Laminated glass - lift out the broken pane using glass lifters.

Toughened glass - remove the cut off sealant and all remaining particles of shattered glass.
- 5 If necessary, trim off the remaining old sealant to leave approximately 1 to 2 mm on the upright face of the cab frame aperture. → [Fig 25.](#) ([□ B-46](#))

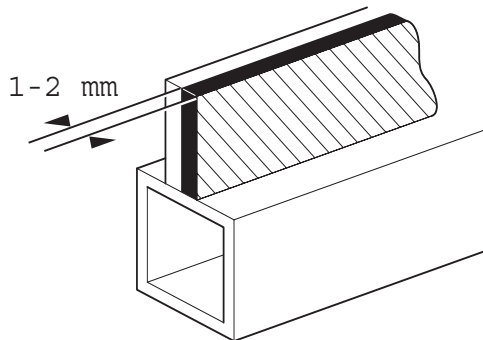


Fig 25.

- 6 Apply a coat of 'Black Primer 206J' to the paintwork if:
 - a Paintwork was damaged or scratched during the glass/sealant removal procedures.
 - b The old sealant was inadvertently cut back to the cab frame during the glass/sealant removal procedures.

Preparing the Cab Frame Aperture

- 1 If damp or wet, dry the aperture area using a hot air gun (sourced locally).
- 2 Use 'Active Wipe 205' to thoroughly clean and 'prime' the trimmed sealant. Use a lint free cloth to apply the 'Active Wipe 205', allow 5 minutes flash off (drying) time.

Note: Do not use any other type of cleaning fluids, otherwise they may be absorbed into the old sealant and ultimately prevent the new glass from bonding.

Preparing the New Glass

WARNING

Laminated glass must be handled with extra care to prevent breakage. Wherever possible, store and handle it in a vertical attitude. When placing or lifting the glass in a horizontal attitude it must be supported over its whole area, not just at the edges.

BF-1-8_1

- 1 Make sure that the new glass correctly fits the frame aperture **26-A**.
 - a Put two spacer blocks **26-B** onto the bottom part of the frame aperture.
 - b Install the new glass on the spacer blocks - Always use glass lifters **26-C**. Check that there is an equal sized gap all round the edge of the glass.

Note: The spacer blocks are rectangular in section to give two common gap widths. If necessary they can be trimmed to a smaller size to give an equal sized gap around the glass.

Important: The glass edges must not touch the frame, otherwise movement of the frame will chip and eventually break the newly installed glass.

Outputs

There are three main types of outputs Low side output, High side output and Modulated output.

In the Low side output circuit the actuator (solenoid, relay etc) which is being driven already has a positive feed available, the ECU then provides the ground side of the circuit.

In the High side output circuit the actuator which is being driven already has a ground available, the ECU provides the positive side of the circuit.

In the Modulated Output circuit the ECU provides a PWM (Pulse Width Modulation) signal to a proportional valve. As the ECU varies the duty cycle of the signal the proportional valve will select more or less depending on the change in duty cycle.

- 1 Low side output. Circuits using low side output are pre heat relay, stop solenoid relay and work lights.

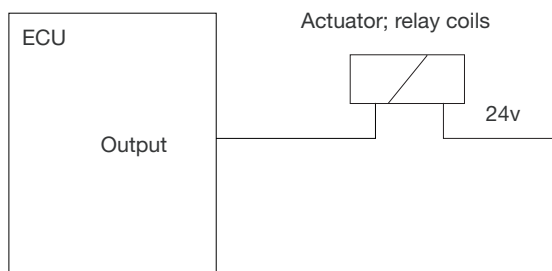


Fig 34.

- 2 High side output. The high side output is used to operate solenoids, bulbs and horn.

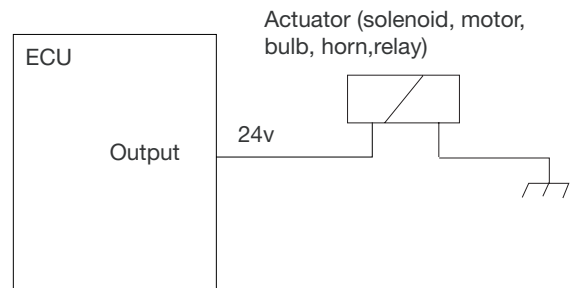


Fig 35.

- 3 Modulated outputs. Circuits using the modulated output are throttle control, pump control and boom priority.

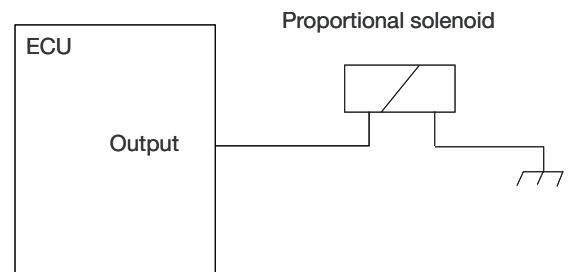


Fig 36.

Hammer

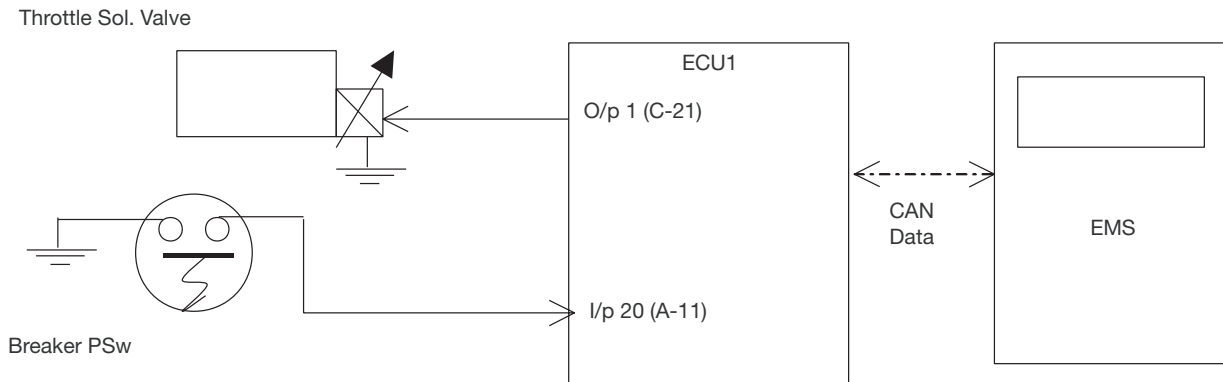


Fig 119.

Operation

The hammer is operated by means of a foot pedal which gives a pilot pressure signal to the main valve. A pressure switch in the pilot line senses the hammer operation. When the hammer pilot switch ECU1 I/p A 11) is grounded, the engine speed is reduced to a level which is preset in set menu.

If the engine revolutions are greater than the pre-set hammer revolutions then the engine speed is automatically reduced to the preset value. The throttle potentiometer has the ability to increase/decrease the engine revs up to but not exceeding the preset hammer value, regardless of its maximum position. The maximum hammer revolutions can be set by the operator via the "Set" menu on the EMS. The up and down buttons will increase/decrease the rev/min. value by 25 for a single press. What ever value is set by the operator is stored and becomes the new default. The original default value for hammer revolutions is 1,200 rev/min.

Fault Finding Without using the JCB Service Master Diagnostic Tool

Introduction

The AMS system is designed so that all of the components that are connected to the system are able to communicate with each other. This means not only are the machine hours displayed on the Electronic Monitor (EMS) but also they are recorded in the Electronic Control Unit 1 (ECU-1).

Changing Machine Components

Under such circumstances where fault diagnosis is not possible by using the JCB Service Master Diagnostic Tool then the following actions must be taken in circumstances where a change of the Electronic Control Unit 1 (ECU-1) and/or the Electronic Monitor System (EMS) is unavoidable.

- 1 If either a new ECU-1 or new EMS. is fitted to either a new or old machine, the machines working hours will pass automatically to the new units and upgrade them when the machines ignition is switched on.

Note: This includes stock machines with over 1 hour recorded by the AMS system.

- 2 Only under extreme circumstances should either the ECU-1 or the EMS be transferred to a machine with lower working hours than the donor machine. The effect of this would be to automatically transfer the higher hours information to the recipient machine.

Note: This process is not reversible.

- 3 When either an ECU-1. or EMS is changed on a machine, the machine system must be set up again using the Set Up Service Tool. Without this action some options previously active would not function and the throttle system would not be calibrated.

- 4 To remove the EMS unit, carefully pull the unit away from the facia panel. The unit is held in place by a retaining seal only and is a tight fit, do not attempt to lever the unit out as this could cause damage to the the E.M.S and the facia panel. Reassembly is a reversal of this procedure.

- 5 To access the ECU-1,remove the seven panel screws from the panel behind the seat and remove panel.

- 6 To remove the ECU-1, remove the three Allen screws which fasten the computers to a frame. To remove the machine harnesses from the computers, undo the Allen screw integral to each connector. Reassembly is a reversal of this procedure.

Note: On the ECU-1 the identification letters for the individual harness connectors and the fixed harness connections on the computer itself, are the cast letters (A,B,C) on the body of the computer.This is vital when identifying connectors and pins during fault diagnosis.

- 7 The Facia Switch Panel (FSP) is not affected by any changes of other components.

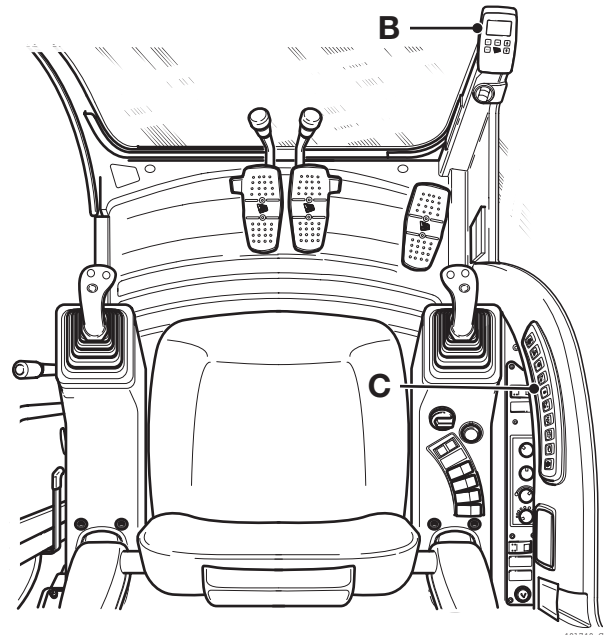


Fig 180.

The system comprises of the following main electronic components:

- | | |
|--------------|------------------------------------|
| 181-A | Electronic Control Unit -1 (ECU-1) |
| 180-B | Electronic Monitoring System (EMS) |
| 180-C | Fascia switch panel (FSP). |



Cab Harness Data

Wire Number	Colour	Connector	Destination
1	SB	C1	C10
2	UY	C1	C10
3	OW	C1	C10
4	LGW	C1	C10
5	UW	C1	C10
6	RG	C1	C10
7	BG	C1	C115
8	OG	C1	C10
9	UR	C1	C10
10	UB	C1	C10
11	G	C37	C10
12	SR	C1	C10
13	YU	C1	C8
14	YW	C1	C8
15	UB	C1	C8
16	YG	C1	C8
17	GB	C1	C168
18	NB	C1	C10
19	SB	C1	C8
20	UG	C1	C10
21	O	C1	C8
22	UO	C1	C8
23	OB	C1	C8
24	NY	C1	C8
25	LG	C1	C4
26	YR	C1	C10
27	WR	C1	C8
28	RS	C1	C10
29	RW	C1	C10
30	GN	C1	C10
31	G	C1	C21
32	W	C1	C21
33	O	C1	C21
34	GN	C1	C8

Wire Number	Colour	Connector	Destination
35	RU	C1	C10
36	RG	C1	C224
37	NW	C1	C10
38	GU	C1	C160
39	R	C2	C10
40	U	C180	C2
41	SG	C22	C2
42	S	C22	C2
43	UR	C160	C2
44	WG	C2	C8
45	BR	C2	C10
46	BU	C23B	C2
47	BW	S/JOINT 14	C2
48	YB	C2	C8
49	WY	C2	C8
50	SG	CTAP A41	C2
51	YR	C2	C8
52	NW	C2	C8
53	K	C2	C10
54	GU	C2	C8
55	G	C202	C2
56	R	C2	C42
57	W	C2	C42
58	B	Earth Header	C2
59	YB	C4	C10
60	YU	C4	C10
61	Y	C4	C10
62	YG	C4	C10
63	PS	C4	C10
64	-	-	-
65	-	-	-
66	UR	C30	C8
67	SG	CTAP A41	C8
68	LGR	C8	C112
69	RB	C23B	C8

Merged Flow

For schematic, → [Fig 39. \(□ E-73\)](#) .

This option allows the flow of both pumps to come together where the attachment requires high oil flow.

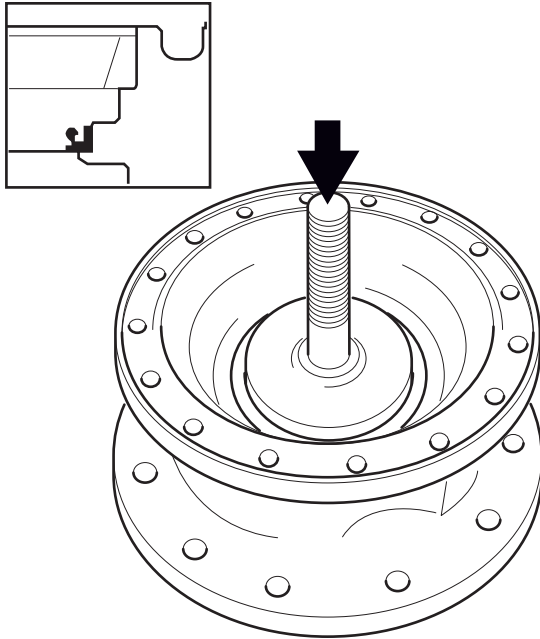
The operation is similar to auxiliary except, a shuttle valve **9** is placed between the direction hoses, which allows pressure from either side of the option pedal to be available to the merge solenoid **47**.

When the merged option is selected, using the auxiliary switch in the cab, the merge solenoid **47** is energised. Pressure from either side of the pedal crosses the solenoid and selects the arm 2 spool, which blocks the flow of oil to tank from pump **A2**. Oil from pump **A2** is now forced through the merge hose at port P3, over the non-return valve **27** and the shut off valve **26** and re-enters the valve block at port P4 where it merges with the flow of oil from pump **A1**.

Assembly

Note: Apply clean hydraulic fluid to all sliding contact faces during assembly. New seals must be used on assembly.

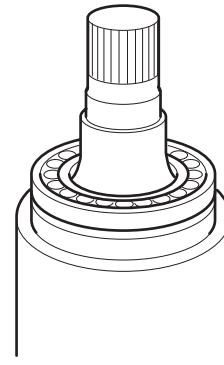
- 1 Place seal **172-12** on to it's seat in the gearbox housing **172-13**.
- 2 Using the Seal Ring Tool and a soft faced hammer, see **Service Tools, Section 1**. Push the seal **172-12** against it's seat.



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Fig 179.

- 3 Turn the gear box housing **172-13** upside down and apply with grease.
- 4 Place the nylon ring **172-15** over the pinion shaft **172-17**. Apply a coat of grease to the nylon ring **172-15**.
- 5 Place bearing **172-14** on the pinion shaft **172-17**.



A406400

Fig 180.

- 6 Using the Stopper Tool and a press, see **Service Tools, Section 1**. Push the bearing against the pinion shaft shoulder.
- 7 Apply grease to the bearing **172-14**.
- 8 Using suitable lifting equipment, lift the pinion shaft **172-17** into the tube of the Bearing Rig, see **Service Tools, Section 1**.
- 9 Using suitable lifting equipment, place the gearbox housing **172-13** onto the pinion shaft **172-17**. Using the Stopper Tool and a press, see **Service Tools, Section 1**. Push the gearbox housing **172-13** against the pinion shaft shoulder **172-17**.
- 10 Insert bearing **172-11** onto the pinion shaft **172-17** and using the Stopper Tool (see **Service Tools, Section 1**) and a press, assemble the output unit.
- 11 Apply JCB Threadlocker to the thread of a NEW ring nut **172-10**.

Assemble the Socket Box Wrench and Nut Adapter (see **Service Tools, Section 1**) on the ring nut **172-10**. Tighten the ring nut **172-10** (see **Torque Settings** at end of this section)

Test 016: Flow testing Hydraulic Pumps

Install flow meter and load valve as close as possible to pump outlet in one of the pump lines.

Fit pressure test gauges 0 - 600 bar (8700 lb in²) to main pump test points.

Start engine and warm up hydraulic oil at least 50 °C (122 °F).

To Confirm Minimum Flow Setting

Set machine to A mode.

Stall boom up service and record pressure in each pump, flow on flow meter and engine rpm's (record this on sheet attached).

Repeat this test for E mode, L mode and P mode.

To Confirm Maximum Flow Setting

Disconnect negative control pilot hose from pump which is being tested, plug the hoses and leave ports on pump open to atmosphere.

Set machine to max engine rpm's in A mode with the Auto Pressure Switch shorted out. Have the load valve the on flow meter fully open and do not operate any services.

Record the pressure on both pumps, the flow on flow meter and the engine rpm's (record this on sheet attached).

Repeat this test for E mode, L mode and P mode.

To Confirm Horse Power Control

Disconnect negative control pilot hoses and max flow cut pilot hoses from both pumps.

Plug the hoses and leave ports on pump open to atmosphere.

Start the engine and set the machine to max engine rpm's in A mode, make sure the load valve is fully open.

Record the pressure on both pumps on the flow on flow meter, engine rpm's and proportional solenoid current (record this on sheet attached).

SLOWLY increase the pressure using the load valve up to approx 100 bar (1450 lb in²).

Record the pressure on both pumps, flow on flow meter, engine rpm's and proportional solenoid current (record this on sheet attached).

Increase the pressure in steps of 25 bar (362.5 lb in²) each time recording the pressure on both pumps, flow on the meter, engine rpm's and proportional solenoid current (record this on sheet attached).

DO NOT increase pressure above 350 bar (5075 lb in²).

Reset the load valve to fully open.

Repeat test for E mode and P mode (record all results on sheet attached).

Remove flow meter from pump being tested and fit into second pump carry out tests to confirm minimum flow, maximum flow and horsepower control.