



GENERAL T.I. BULLETIN INDEX

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Number	Gn001
(JCB Gen 003)	
Issue	1
Date	March 1990

SUBJECT: Tappet Adjustment

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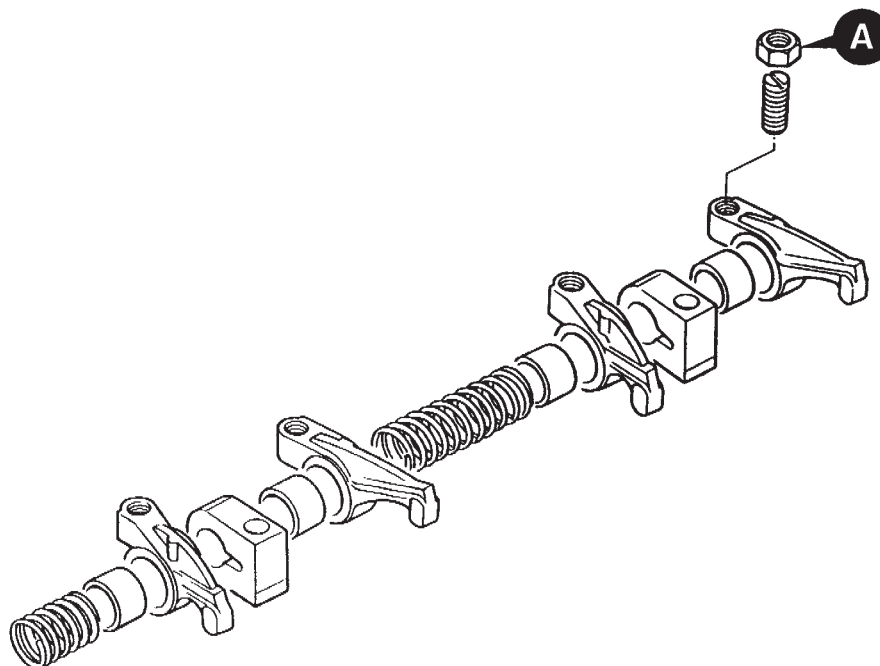
PRODUCTS AFFECTED: All Perkins 1000 series Engines

TO BE CARRIED OUT: At Next Service / As Required

SERVICE PROCEDURE:

When tappet adjustment is required, it is important to re-torque the adjusting screw lock nut **A**. If this is not correctly actioned the adjusting screw will become loose which could cause damage to the tappet assembly and push rod.

Lock Nut Torque - 20 lbs ft.



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Number	Gn002
(JCB Gen 005)	
Issue	1
Date	July 1990

SUBJECT: Rocker Shaft Security

Page 1 of 1

PRODUCTS AFFECTED: All Perkins 1000 Series Engines

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION:

Introduction of new fasteners for the rocker assembly.

SERVICE PROCEDURE:

Flanged nuts **A** replace the three nuts and washers securing the rocker shaft to the cylinder head. The single bolt and washer is replaced by a flanged bolt.

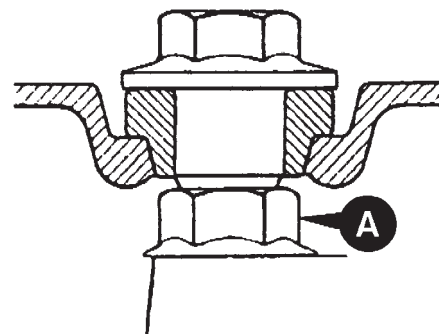
If the new fasteners are fitted to earlier engines the washers must be removed.

Torque tighten the new fasteners to 40 Nm (30 lbf ft).

PARTS INFORMATION

Cut-in from engine serial number U544908U.

02/291060	NUT	replaces	1370/0401Z
02/291048	SET SCREW	replaces	02/291125
02/291064	WASHER	-	Not Required



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Number	Gn003
(JCB Gen 010)	
Issue	1
Date	March 1991

SUBJECT: Crankshaft Rear Main Oil Seal and Housing

Page 1 of 3

PRODUCTS AFFECTED: All Perkins 1000 Series Engines

TO BE CARRIED OUT: Information Only

A number of reports by Perkins have been received concerning crankshaft rear main oil seal leaks. Little or no detail is completed in the comments section of the warranty claim form. Information given in the comments section will enable Perkins to identify the exact fault and take the correct remedial action.

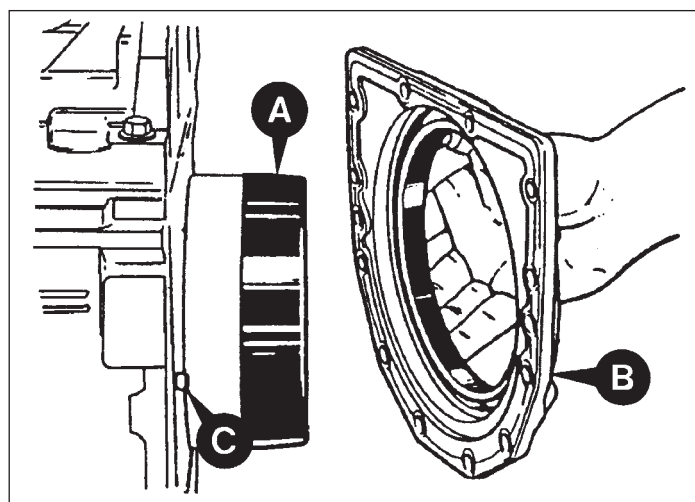
The following instructions will enable you to locate and rectify the exact fault, this fault should then be stated in the comments section of all warranty claims, failure to do so will invalidate the warranty claim.

REAR OIL SEAL/HOUSING

If oil is leaking past the rear seal, oil will normally be found inside the flywheel housing with some evidence of leakage from the low inspection plate.

To rectify

- 1 Remove the transmission.
- 2 Remove the flywheel using guide studs (remove two diametrically opposite bolts and temporarily fit guide studs).
- 3 Remove seal housing **B** setscrews. Using an appropriate lever gently pry the seal housing away from cylinder block, taking care not to damage the housing.
- 4 Press out old seal and fit replacement, using tool number PD.145D (see Perkins Service Manual), this will pre-set the seal depth as required.



Note: The service tool will set seal to 4 different depths, on new engines position 1 should be used.

- 5 Make sure that the two dowels **C** are fitted in the cylinder block. PUT A NEW JOINT in position on the dowels.
- 6 Put the seal guide **A** on the crankshaft flange. Lubricate the crankshaft flange, the seal lip and the seal guide with clean engine oil.
- 7 Put the seal housing **B** complete with seal on the seal guide **A** (PD.145D). Carefully push the assembly into position on the crankshaft flange and onto the two dowels **C**. Remove the seal guide, fit and torque the housing securing setscrews M8 to 22 Nm (16 lbf ft) and the capscrews M8 to 18 Nm (13 lbf ft).
- 8 Refit flywheel using guide studs and torque retaining bolts to 105 Nm (77 lbf ft).

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OIL LEAKAGE FROM REAR OF ENGINE

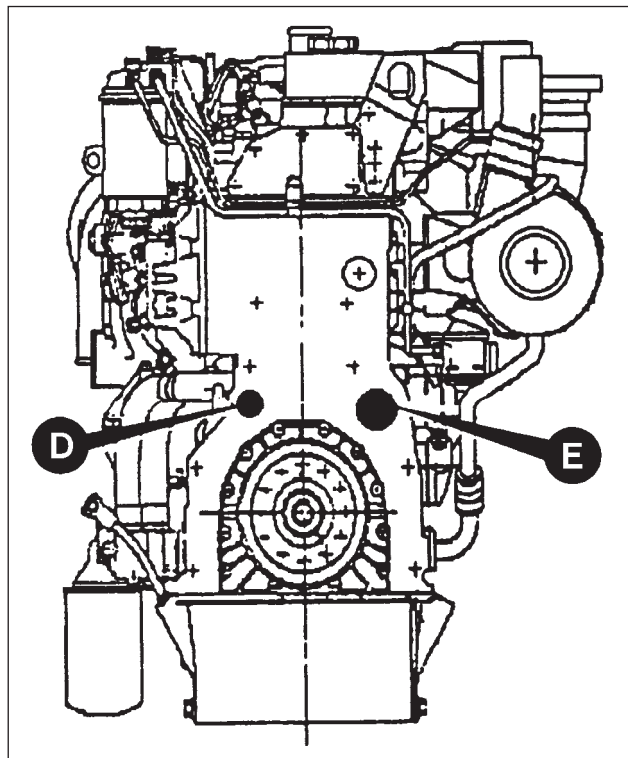
When investigating oil leakage at the rear of the engine the following areas should be checked and corrected as found necessary.

1 Main Oil Gallery Plug/Washer

A leak from this area can usually be identified by a trace of oil along the contact face of block and flywheel housing on the fuel pump side of the engine.

This can be rectified as follows

- 1.1 Remove the transmission.
- 1.2 Remove the flywheel using guide studs (remove two diametrically opposite bolts and temporarily fit guide studs).
- 1.3 Remove the starter motor.
- 1.4 Remove the flywheel housing (it may be necessary to tap the housing using a soft hammer to disengage the housing dowels).
- 1.5 Remove the threaded gallery plug **D** located top left of cylinder block using appropriate allen key.
- 1.6 Fit a new plug/washer using Loctite 574 Multigasket and torque to 85 Nm (62.5 lbf ft).
- 1.7 Refit flywheel housing and torque securing screws M10 to 44 Nm (33 lbf ft) and M12 to 75 Nm (55 lbf ft).
- 1.8 Refit flywheel using guide studs and torque retaining bolts to 105 Nm (77 lbf ft).



2 Camshaft Rear End Plug

Leakage from the cam end plug will normally produce a trace of oil at the contact face between block and flywheel housing on the manifold side.

To rectify:

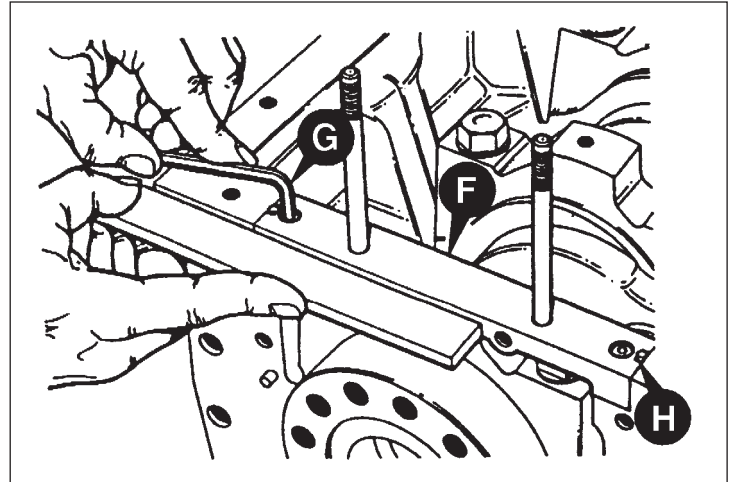
- 2.1 Remove the transmission.
- 2.2 Remove the flywheel using guide studs (remove two diametrically opposite bolts and temporarily fit guide studs).
- 2.3 Remove the starter motor.
- 2.4 Remove the flywheel housing (it may be necessary to tap the housing using a soft hammer to disengage the housing dowels).
- 2.5 Remove camshaft end plug **E** located top right of the cylinder block.
- 2.6 Fit new plug using Loctite 574 Multigasket.
- 2.7 Refit flywheel housing and torque securing screws M10 to 44 Nm (33 lbf ft) and M12 to 75 Nm (55 lbf ft).
- 2.8 Refit flywheel using guide studs and torque retaining bolts to 105 Nm (77 lbf ft).

OIL LEAKAGE FROM REAR OF ENGINE (cont'd)**3 Bridge Piece.**

Lubrication oil leakage from the bridge piece **F** can be identified in two ways; oil may be seen around the sump rear face or oil will be evident inside the flywheel housing. There are two possible causes for leakage from the bridge piece, misalignment and/or lack of sealant.

To rectify misalignment:

- 3.1 Remove the flywheel using guide studs (remove two diametrically opposite bolts and temporarily fit guide studs).
- 3.2 Remove the starter motor.
- 3.3 Remove the flywheel housing (it may be necessary to tap the housing using a soft hammer to disengage the housing dowels).
- 3.4 Remove the rear seal housing as described in the section titled 'REAR OIL SEAL HOUSING'.
- 3.5 Remove the lubrication oil sump.



- 3.6 Release the two securing capscrews **G** in the bridge piece remove the bridge piece and old sealant from all faces. Loosely refit the bridge piece and align the face of the bridge piece to the rear block face using a straight edge as shown. Alignment to be within 0.05 mm (0.002 in). Tighten the securing cap screws to 9 Nm (6 lbf ft).
- 3.7 Apply Loctite 574 Multigasket to bridge piece end slots **H** using applicator gun until sealant can be seen coming from the chamfered edges of the bridge piece contact face with the cylinder block.
- 3.8 Refit flywheel housing and torque securing screws M10 to 44 Nm (33 lbf ft) and M12 to 75 Nm (55 lbf ft).
- 3.9 Refit flywheel using guide studs and torque retaining bolts to 105 Nm (77 lbf ft).

To rectify lack of sealant:

- 3.10 Remove lubrication oil sump.
- 3.11 Complete sealing process as described in step 3.7 above.
- 3.12 Refit lubrication oil sump using a new joint.

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Number	Gn004
(JCB Gen 013)	
Issue	1
Date	Dec. 1991

SUBJECT: Turbocharger Fault Diagnosis

Page 1 of 3

PRODUCTS AFFECTED: All Perkins Turbo Engines (AB and AC Builds)

TO BE CARRIED OUT: Information Only

A number of turbochargers have been replaced unnecessarily. When inspected by the supplier, no fault has been found or the fault differs from the failure code and/or description on the claim.

Service Procedure

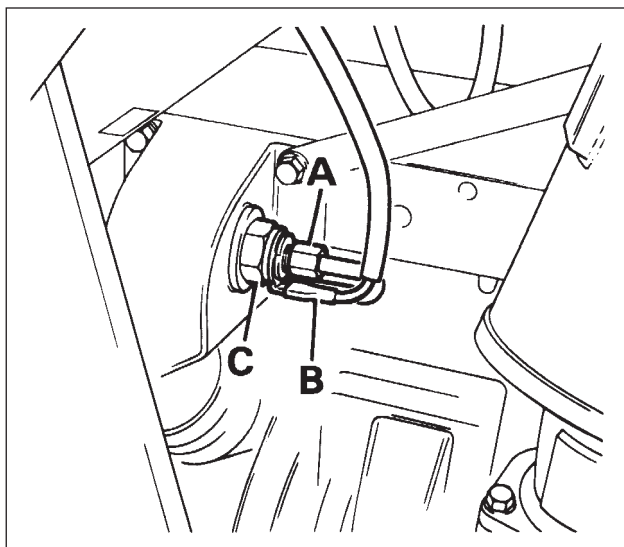
- To assist in the correct diagnosis of general faults, please refer to the attached fault finding charts.
- Fuel Starting Aid (Thermostart)

A problem has occurred several times where the inside of the induction manifold has been found to be wet and the turbocharger has been returned as faulty. After investigation, the turbocharger was found to have no fault.

If the inside of the induction manifold is wet, check that there is not a fuel leak from the fuelled starting aid (if fitted):

2.1 How to check the fuelled starting aid

- 2.1.1 Disconnect the fuel pipe **A** and the electrical connector **B** at the starting aid **C**. Remove the starting aid from the manifold and fit a suitable plug in the manifold.
- 2.1.2 Connect the fuel pipe to the starting aid, but leave the union nutconnection loose. Do not fit the electrical connection, but ensure that the connector is covered with a suitable insulator. Operate the lever of the fuel lift pump until fuel free of air - comes from the union nut connection. Tighten the union nut at the starting aid.
- 2.1.3 Start the engine and operate it at low speed. Check that there is no fuel leakage from the valve of the starting aid.
- 2.1.4 If there is no leakage, remove the plug from the induction manifold and fit the starting aid. Connect the fuel pipe to the starting aid and remove the air from the pipe as described above. Connect the electrical connector to the starting aid.



- 2.1.5 If there is a leak from the valve of the starting aid, fit a new starting aid.

3 Warranty Claim Procedure

All Perkins warranty claims must state clearly the symptom and cause in the comments section of the claim form. If there is insufficient space on the claim form, then attach a written report. Failure to follow this procedure may result in the warranty claim being rejected.

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Fault Finding Charts

Items A to O below describe possible general faults associated with turbochargers. Opposite the faults is a column titled 'Possible Causes Code Numbers'; these code numbers refer to a description of possible cause(s) associated with the fault. The descriptions for possible causes can be found on page 3.

FAULT	POSSIBLE CAUSES CODE NUMBERS
A. Not enough power	1,4,5,6,7,8,9,10,11,18,20,21, 22,25,26,27,28,34,35,36
B. Black smoke	1,4,5,6,7,8,9,10,11,18,20,21, 22,25,26,27,28,34,35,36
C. Blue smoke	1,2,4,6,8,9,17,19,20,21,22, 30,31,32,34
D. High lubricating oil consumption	2,8,15,17,19,20,28,29,31,32,34
E. Too much lubricating oil at turbine end	2,7,8,17,19,20,22,28,30,31,32
F. Too much lubricating oil at compressor end	1,2,4,5,6,8,19,20,21,28,31,32
G. Not enough lubrication	8,12,14,15,16,23,24,29,32,33, 37,38
H. Lubricating oil in the exhaust manifold	2,7,17,18,19,20,22,28,31,32
I. Inside of the induction manifold wet	1,2,3,4,5,6,8,10,11,17,18,19, 20,21,28,32,34,39,40
J. Damaged compressor impellor	3,4,6,8,12,15,16,20,21,23,24, 29,32,33,37,38
K. Damaged turbine rotor	7,8,12,13,14,15,16,18,20,22, 23,24,25,27,29,32,33,37,38
L. Rotating assembly does not turn freely	3,6,7,8,12,13,14,15,16,18,20, 21,22,23,24,29,32,33,37,38
M. Worn - bearings, bearing bores, journals	6,7,8,12,13,14,15,16,23,24, 29,33,37,38
N. Noise from turbocharger	1 , 3, 4, 5, 6, 7, 8, 9,10, 11 ,12,13,14,15,16,18, 20,21,22,23,24, 29,32,33,34,37,38
O. Sludge or carbon deposit in bearing housing	2, 11, 13, 14, 15, 17, 18, 24, 29, 33, 37, 38

Fault Finding Charts (cont'd)

DESCRIPTION OF POSSIBLE CAUSES/SYMPTOM

1. Element of the air filter dirty
2. Restricted crankcase breather
3. Element of the air filter missing, leaking, or not sealing correctly. Loose connection to turbocharger.
4. Internal distortion or restriction in pipe from air filter to turbocharger.
5. Damaged/restricted crossover pipe - turbocharger to induction manifold.
6. Restriction between air filter and turbocharger.
7. Restriction in exhaust system.
8. Turbocharger loose or clamps/setscrews loose.
9. Induction manifold cracked or loose, flanges distorted.
10. Exhaust manifold cracked or loose, flanges distorted.
11. Restricted exhaust system.
12. Delay of lubricating oil to turbocharger at engine start.
13. Insufficient lubrication.
14. Dirty lubricating oil.
15. Incorrect lubricating oil.
16. Restricted lubricating oil supply pipe.
17. Restricted lubricating oil drain pipe.
18. Turbine housing damaged or restricted.
19. Leakage from turbocharger seals.
20. Worn turbocharger bearings.
21. Excessive dirt in compressor housing.
22. Excessive carbon behind turbine rotor.
23. Engine speed raised too rapidly at initial start.
24. Insufficient engine idle period.
25. Faulty fuel injection pump.
26. Worn or damaged atomisers.
27. Valves burned.
28. Worn piston rings.
29. Lubricating oil leakage from supply pipe.
30. Excessive preservation fluid (on initial engine start).
31. Excessive engine idle period.
32. Restriction in turbocharger bearing housing.
33. Restriction in lubricating oil filter.
34. Wet type air cleaner: Restricted, dirty element, viscosity of oil too low/high.
35. Wastegate (if fitted) actuator faulty or damaged.
36. Wastegate (if fitted) valve not free.
37. Engine stopped too soon from high load.
38. Insufficient lubricating oil.
39. Fuel leakage from fuelled starting aid.
40. Crack in backplate of compressor.

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Number	Gn005
(JCB Gen 002)	
Issue	1
Date	March 1992

SUBJECT: HEALTH & SAFETY RECOMMENDATIONS -
FLUOROELASTOMERIC MATERIALS

Page 1 of 2

PRODUCTS AFFECTED: ALL

⚠ WARNING

Due to recent publicity regarding the potential hazards associated with the handling of fluoroelastomeric materials ('Viton', 'Fluorel', 'Technoflon', etc.), commonly used in the production of oil seals and gaskets for the automotive industry, the following health and safety statement should be noted.

Note: Examples of the use of these materials on ITL products are the 'Viton' crankshaft oil seals on Perkins engines and 'Viton' shaft and brake seals in the axles.

New Components

The normal handling of new cured fluoroelastomeric components at ambient temperature presents no known hazard and requires no special handling precautions.

Removal of Old Components during Servicing

No special precautions are required when handling old fluoroelastomeric material that has been subjected only to normal service conditions. However, before removal, a preliminary visual examination should establish whether normal service temperatures have been exceeded giving rise to thermal degradation. If evidence of decomposition (charring etc.) is found, the material and surrounding areas should not be touched without observing the precautions detailed below.

Removal of Old Material Subjected to Abnormally High Temperatures

At temperatures in excess of 300° C, e.g. engine fires, fluoroelastomeric materials can decompose, producing small but significant amounts of hydrofluoric acid. This acid is highly corrosive and will cause SEVERE BURNS if in contact with the skin.

Vehicles or components that have been subjected to abnormally high temperatures should be subjected to the following decontamination procedure which must be conducted by competent personnel. This will require the use of appropriate safety equipment (neoprene rubber or heavy duty gloves, plus special safety glasses are essential).

- 1 Ensure that components have cooled then carefully remove and transfer suspect material to plastic bags.
- 2 Wash the contaminated area with a 10% calcium hydroxide or other suitable alkali solution, if necessary using wire wool to remove residual adherent decomposition products.
- 3 Thoroughly wash contaminated area with detergent and water.

cont'd

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- 4 Place all removed material, protective gloves and wire wool used in the operation, in sealed plastic bags prior to landfill disposal in accordance with Local Authority Regulations.
- 5 Fluoroelastomeric materials should NOT be incinerated.

If there is contamination of the skin or eyes, wash the affected area with a continuous supply of clean water or with calcium hydroxide solution for 15-60 minutes. Obtain immediate medical attention.

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Number	Gn006
(JCB Gen 021)	
Issue	1
Date	Feb. 1993

SUBJECT: Turbochargers

Page 1 of 1

PRODUCTS AFFECTED: Turbocharged Perkins (90 BHP) Engines

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION:

From engine serial number No. AB50440U610051X (28/1/93), a 'Garret' turbocharger is fitted; this replaces the 'Schwitzer' unit. The Garret turbocharger gives improved service reliability.

SERVICE PROCEDURE:

If for any reason a warranty repair is to be completed on the turbo unit, then a full written report on the repair/fault must be submitted with the claim or the Perkins Service Information. ITL T.I. Gn004 can be used to aid fault diagnosis and specifying the fault.

Perkins dealers should carry out this work.

Failure to follow this instruction may result in the claim being rejected.

PARTS INFORMATION

DESCRIPTION	PART NO.	COMMENTS
'Garret' Unit	02/200460	was 'Schwitzer' unit - part no. 02/200340 (applicable to 90BHP only)

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Number (JCB 2/085)	Gn007
Issue	1
Date	Feb. 1993

SUBJECT: Piston and Piston Ring Improvements

Page 1 of 1

PRODUCTS AFFECTED: 4-Cylinder Turbocharged Engines

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION:

A new improved oil control piston and ring pack has been fitted to the Perkins 4-cylinder turbocharged engines from January 1993. Engine cut-in numbers: AB 50424U 608291 W
AB 50440U 608301 W

One of the advantages of the new design is that it reduces oil consumption after the initial 'bedding-in' period. The average oil to fuel used consumption is reduced from 0.5% to 0.2%. The following information should be covered during new machine installation:

- i Engine 'running-in' is not a requirement.
- ii Periods of engine idling/tick over should be kept to a minimum to prevent cylinder bore glazing.

SERVICE PROCEDURE:

- 1 The new piston and ring pack can be used as service replacements - in sets of 4 pistons and ring kits.
- 2 When fitting the new piston and ring pack in service, there is no need to de-glaze the cylinder bore (glaze busting).
- 3 JCB Technical Information Bulletin 2/004 (issue 2) details the service procedure to be completed if oil consumption concerns are raised by the customer before contacting the Perkins Dealer:
 - i On engines prior to the new piston and ring pack, normal oil consumption remains at 0.3% to 0.5% of fuel used, further investigation may be required if the oil consumption exceeds 0.7%.
 - ii On engines fitted with the new piston and ring pack, further investigation may be required if the oil consumption exceeds 0.5%.

PARTS INFORMATION

VENDOR PART NO.	BHP	DESCRIPTION
AB50440	90	Engine
AB50441	96	Engine
AB50459	96	Engine

- 1 Piston Assembly - 02/200860
- 2 Ring Kit - 02/200859

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Number	Gn008
(JCB 2/109; C26/N. Am.)	
Issue	1
Date	Nov. 1993

SUBJECT: Alternator Connectors on the Mainframe Harness

Page 1 of 1

PRODUCTS AFFECTED: Perkins Engines as applicable

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION:

Two types of alternator connectors have been supplied. The alternator 'euro plug' connector (item **X** - FIG 1) is no longer supplied. Instead, a ring terminal and lucar connector (item **Y** - FIG 2) are now supplied.

Align the harness connectors and the corresponding alternator connections using the wire numbers.

If the harness has a 'euro plug' connector (item **X**) fitted, install the harness as shown in FIG 1. If the harness has a ring terminal and lucar connector (item **Y**) fitted, install the harness as shown in FIG 2.

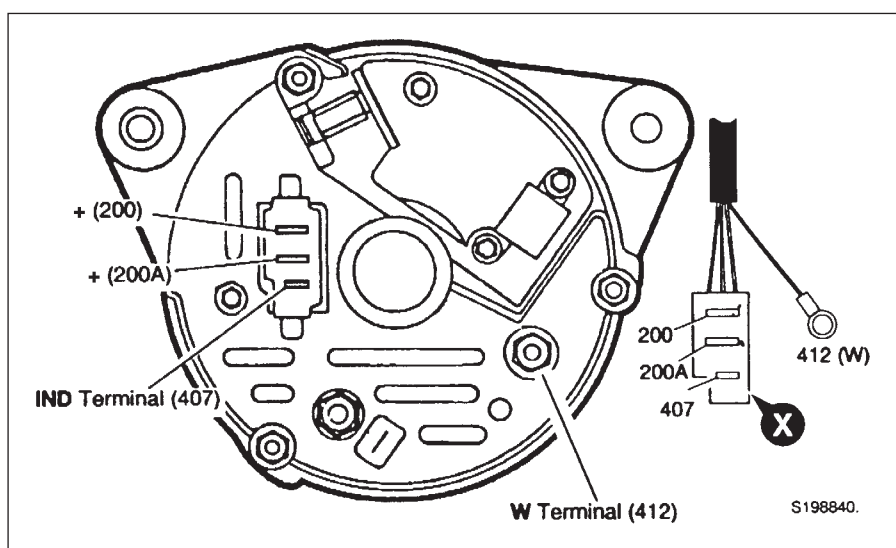


FIG 1

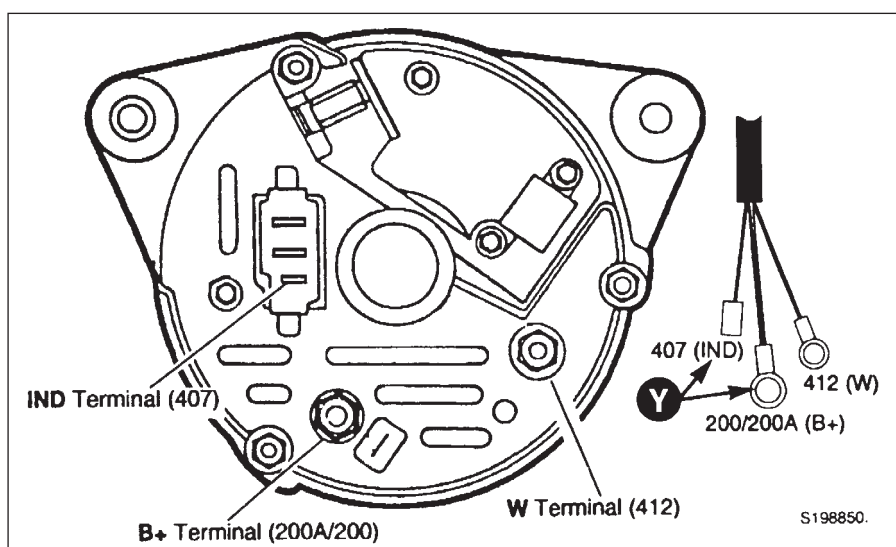


FIG 2

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Number	Gn009
(JCB Gen 028; K58/N. Am.)	
Issue	1
Date	March 1994

SUBJECT: Low Sulphur Fuels

MACHINES AFFECTED: All Perkins 1000 Series Engines

TO BE CARRIED OUT: Information Only

Page 1 of 1

SERVICE INFORMATION

Low sulphur fuels are commonly used throughout the world. These fuels contain fewer lubrication additives. The DPA and DPS fuel pumps currently fitted to the Perkins 1000 Series engine are lubricated by the diesel fuel, therefore using low sulphur fuels may, in the long term, affect the pump.

If you are using a low sulphur diesel fuel, it is recommended that additional lubrication is added to the diesel.

Customers should contact their local fuel supplier to obtain a locally supplied and recommended additive. There is no current 'MIL' or 'FORD' standard, so the customer must be guided by the fuel supplier.

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ISSUED BY THE TECHNICAL SERVICE DEPARTMENT OF I.T.L., WREXHAM, CLWYD, LL13 9UF, UNITED KINGDOM

⚠ SAFETY NOTICE - Instructions in the Service Bulletins assume that the engineer has a sound knowledge of safety procedures and has been trained in the maintenance and repair of ITL equipment. If you are unsure or do not understand information contained in the Service Bulletins then ask your supervisor for advice. Remember SAFETY MUST COME FIRST.

Number	Gn010
(JCB MI428/H,401/E;M97N.Am)	
Issue	1
Date	Mar. 1994

SUBJECT: Brake Master Cylinder Kits

Page 1 of 1

Master cylinder seal repair kits should no longer be supplied. Any kits in Distributor stocks should be returned to the OEM. Contact Mr. P. Hassall at JCB Service for return/disposal instructions for JCB supplied seals.

In the near future, master cylinder kits listed below will no longer be available. Only the master cylinder assemblies will be available for replacement, this is because it is not good practice to re-seal old master cylinders, also seal replacement by untrained customers is not recommended.

The relevant Service Manual procedures will be updated accordingly.

Master Cylinder Seal Kit Part Numbers.

15/107001
15/104700
15/106600
15/903803
15/904102
15/904301
15/908201

Note: Master cylinder 15/908200 is no longer available. If a master cylinder is required then part number 15/910800 must be used (either singly or in pairs).

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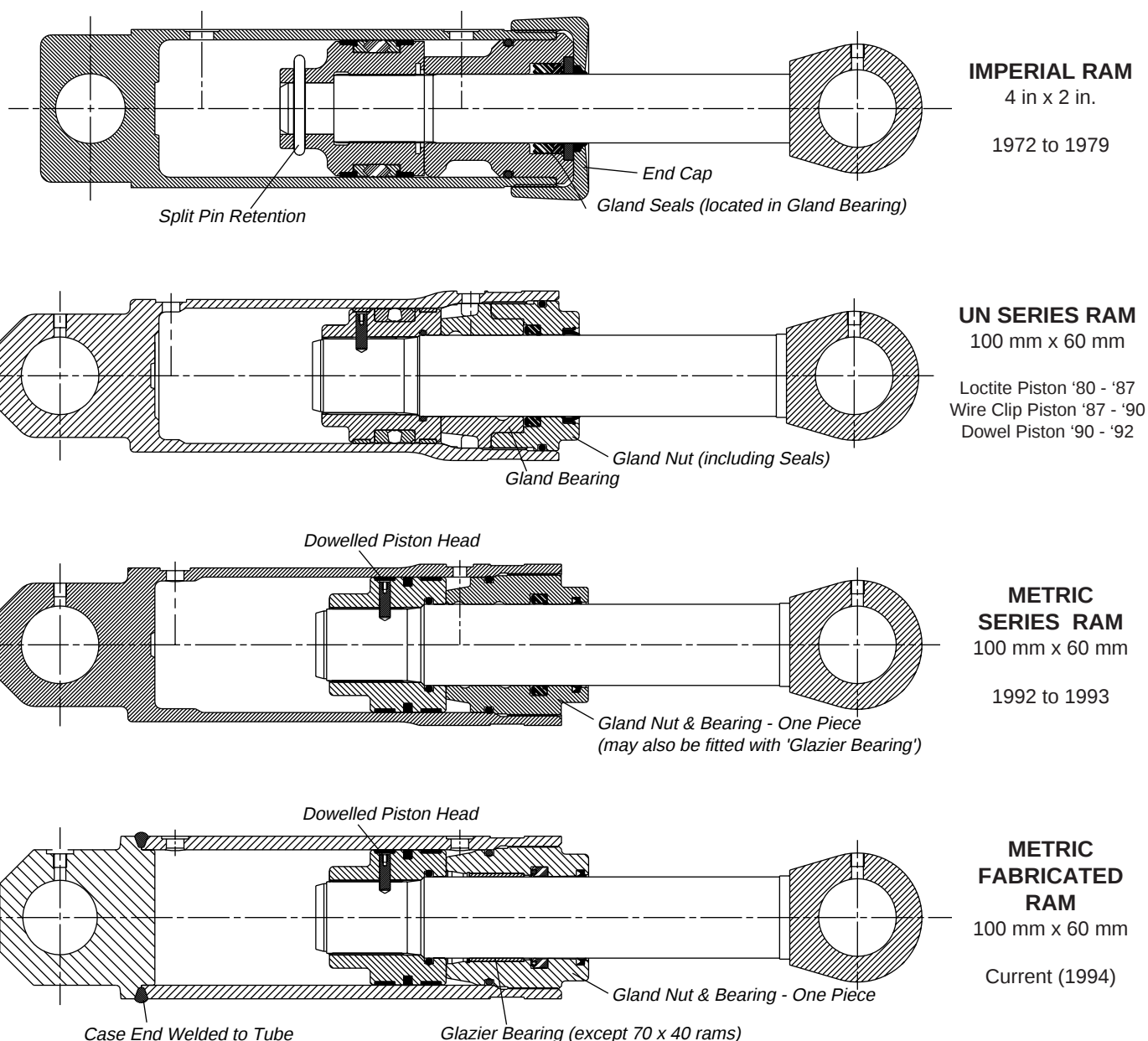
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Number	Gn011
(JCB MI452/H,423/E;E114N.Am)	
Issue	1
Date	June 1994

SUBJECT: Hydraulic Ram Identification

Page 1 of 1

Over the last twenty years JCB has made a number of design and manufacturing improvements to hydraulic rams. Some difficulty is being experienced identifying the various rams for parts ordering purposes. The following illustrations show some different types of ram fitted to JCB machines. It is important to correctly identify the type of ram fitted prior to ordering spare parts because in most instances parts will not be interchangeable.



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Number	Gn012
(JCB Gen 031; K60/N. Am.)	
Issue	1
Date	July 1994

SUBJECT: Oil Pump - Idler Gear

Page 1 of 1

PRODUCTS AFFECTED: All Fitted with a Perkins 1000 Series Engine

TO BE CARRIED OUT: As Required

It has been found in service that excessive wear can occur to the bush for the idler gear of the lubricating oil pump. This wear may occur on four and six cylinder engines.

A new idler shaft **A** has been introduced which has an oil hole **B** to provide more lubrication to the bush for the idler gear. Also a new lubricating oil pump has been introduced which has a channel **C** in the body of the pump. Lubricating oil from the front main bearing passes down the channel in the body of the pump to the oil hole in the idler shaft. The lubricating oil then passes through the hole in the idler shaft to the bush in the idler gear.

If it is found in service that more lubrication is necessary for the bush of the idler gear, renew the bush, part # 02/290006. Fit the new idler shaft part # 02/201131 and the new lubricating oil pump, part # 02/201050 (four cylinder engines) or 02/201130 (six cylinder engines).

Fit the lubricating oil pump and the idler shaft in accordance with the procedure given in operations 19A-06 and 19A-06A respectively of the workshop manual. In addition to these instructions ensure that the hole **D** in the idler shaft is at the bottom and that the flat **E** is at the top before the shaft is pressed into the bearing cap.

Caution: The idler shaft for the lubricating oil pump used on four cylinder engines is not retained in the bearing cap by a pin, but is retained by Loctite 648 Retainer, part # 4101/0651.

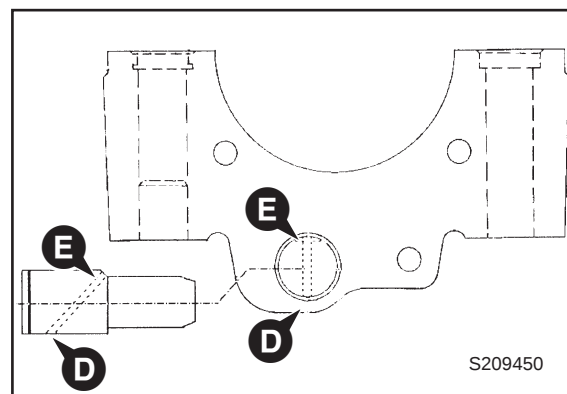
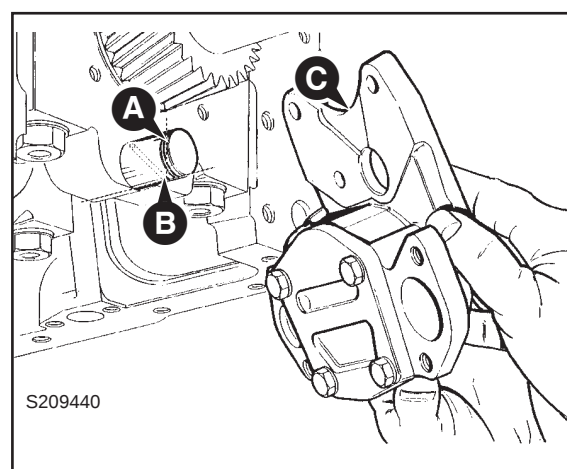
If the new lubricating oil pump is fitted the end-float for the idler gear is as follows:

- Four cylinder engines 0.012/0.643 mm (0.0005/0.0253 in)
- Six cylinder engines 0.020/0.650mm (0.0008/0.0256 in)

PARTS INFORMATION

Part No.	Description	Part No.	Description
02/290006	Bush	02/201050	Pump (4 Cylinder Engines)
02/201131	Shaft	02/201130	Pump (6 Cylinder Engines)
4101/0651	Loctite 648 Retainer		

Note: The above information can be implemented only when excessive wear is evident.



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Number	Gn013
(JCB Gen 035; F47/N. Am.)	
Issue	1
Date	Feb. 1995

SUBJECT: Stake Nuts, Input and Output Flanges

Page 1 of 1

PRODUCTS AFFECTED: All ITL Transmissions and Axles

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION

1 AXLES

Axle stake nuts **A** are now a combined nut and washer (instead of the separate nut and washer arrangement). If this type of nut is used on an earlier type axle or 4WD flange, the old separate washer must be discarded.

2 TRANSMISSIONS

The stake nut for the gearbox rear (2WD) output flange is now manufactured from 46 mm hexagonal bar. The existing 1³/₄ inch socket can not be used on the 46 mm nuts. Make sure both types of socket are available in the event of site repair.

Note: The transmission rear (2WD) output flange is still retained by the separate nut and washer arrangement, the washer should be replaced with a new one if damaged or distorted.

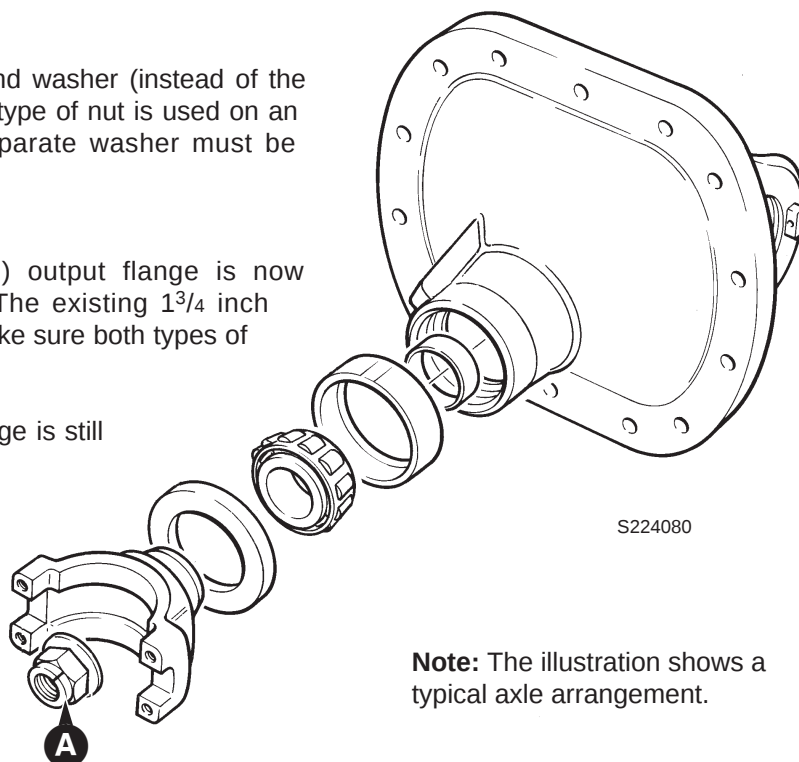
Input & Output Flanges -

The axle flanges and transmission output flanges are now hardened (at the sealing area). The hardened flanges prevent possible oil leaks and loss of bearing pre-load by reducing the risk of fretting and subsequent loosening of the flanges.

In the event of a flange becoming loose or wearing, a new hardened type flange and new seal should be fitted. Apply a small bead of Loctite 936 around the shaft spline. Full details for removing and replacing output flanges are given in the relevant Workshop Manual.

PARTS INFORMATION

Part No.	Description	Qty	Comments
826/01482	Combine Stake Nut/Washer A/R	M22	
826/01483	Combine Stake Nut/Washer A/R	M24	
826/01551	Stake Nut A/R	46 mm - Gearbox	



Note: The illustration shows a typical axle arrangement.

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Number	Gn014
(JCB Gen 041; K68/N. Am.)	
Issue	1
Date	August 1995

SUBJECT: Fuel Injection Pump - Seal Failure

Page 1 of 2

PRODUCTS AFFECTED: Perkins 1000 Series Engines

TO BE CARRIED OUT: By Perkins Dealers

SERVICE INFORMATION:

The possibility exists that the shaft seal of the fuel injection pump has been damaged during the assembly process. The seal must be replaced with a new one otherwise serious damage to the engine could occur. Replacement of the seal is a specialised task and must only be done by the C.A.V. engineer; therefore please note the following:

- 1 The OEM Distributor must contact the local C.A.V. agent and quote reference number **D137**.
- 2 The OEM Dealer and the C.A.V. agent then arrange with the machine owner a suitable time to complete the repair procedures (repair time 3.0 hours).
- 3 On arrival at the machine, the OEM engineer will remove the injection pump (see SERVICE PROCEDURES), once the pump has been removed it is given to the C.A.V. agent who will then replace the shaft seal.
- 4 The injection pump (complete with new seal) must then be refitted to the machine by the OEM engineer.

SERVICE PROCEDURES

Fuel Injection Pump Removal

Special Tools Required: Gear Puller - part number PD155C
Adaptors - part number PD155B/5
Spanner - part number PD199

Note: Existing workshop special tools - these items are not reclaimable on this FSI

- 1 Park the machine on firm level ground, engage the parking brake and set the transmission to neutral.
- 2 Raise the loader arms or the boom if necessary to access engine and fit safety strut.
- 3 Switch off the the engine and remove the starter key. Disconnect the battery.

....continued

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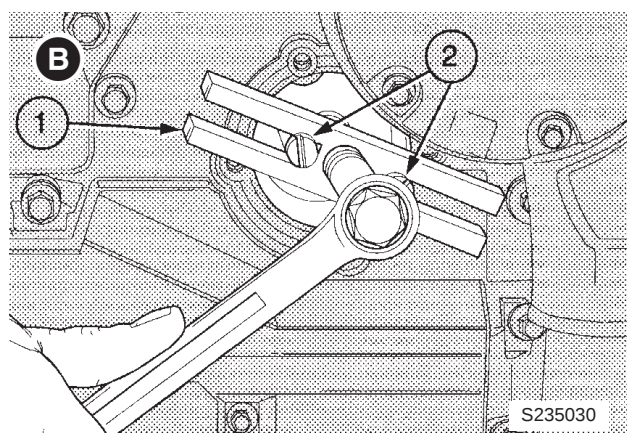
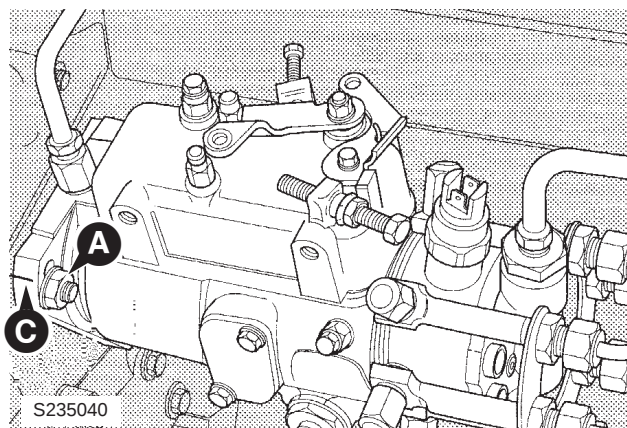
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SERVICE PROCEDURES (continued)**4 Remove the injection pump:**

- 4.1** Remove all the pipes, cables and electrical connections from the pump.
- 4.2** Remove the gear cover from the cover of the timing case. Remove the gear nut and spring washer.
- 4.3** Rotate the crankshaft to ensure that the keyway in the drive gear of the fuel pump is at or near to the top.
- 4.4** Remove the setscrew and the nut of the support bracket below the fuel pump. Release the flange nuts **A** of the fuel pump (see note). If access to the flange nuts is restricted, use tool PD199.

Note: Leave one flange nut loose on the end of the thread, this will prevent the pump from falling when the gear is removed (step 4.5).

- 4.5** Loosen the drive gear of the fuel injection pump with the puller PD155C and adaptors PD155B/5, as shown at **B** (items 1 and 2).
- 4.6** Remove the fuel pump; ensure that the key does not fall from the drive shaft.

**Fuel Injection Pump Replacement**

- 1** Rotate the drive shaft of the fuel injection pump to align the key with the keyway in the drive gear. Ensure that the key is correctly fitted and fit the fuel pump to the gear.
- 2** Align the mark on the flange of the fuel pump with the mark on the rear face of the timing case, shown at **C**. Fit the flange nuts **A** and the setscrew and the nut of the support bracket. Ensure that force is not applied to the fuel pump when the support bracket is fitted.
- 3** Fit the spring washer and the nut to the drive shaft of the fuel pump and tighten the nut to 80 Nm (59 lbf ft) 8,2 kgf m. Fit the gear cover to the cover of the timing case together with a new joint.
- 4** Fit all the pipes, cables and electrical connections. Reconnect the battery.
- 5** Eliminate air from the fuel system. Operate the engine and check for leakage. With the engine at the normal temperature of operation, check that the idle speed is correct.

SERVICE PARTS:

Part No.	Description	Qty	Comments
02/200976	Gasket	1	Injection Pump to Timing Case
02/200029	Gasket	1	Injection Pump Gear Cover

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Number	Gn015
(JCB Gen 038; F66/N. Am.)	
Issue	1
Date	Feb. 1996

SUBJECT: Engine Lubrication System - Relief Valve Housing

Page 1 of 2

PRODUCTS AFFECTED: All Fitted with Perkins 1000 Series Engines

TO BE CARRIED OUT: By Perkins Dealers

SERVICE INFORMATION:

The possibility exists that engine relief valve housing **A** may fail. The relief valve controls the engine lubricating system oil pressure, therefore a failure of the housing could result in the loss of engine oil pressure and cause subsequent damage to the engine.

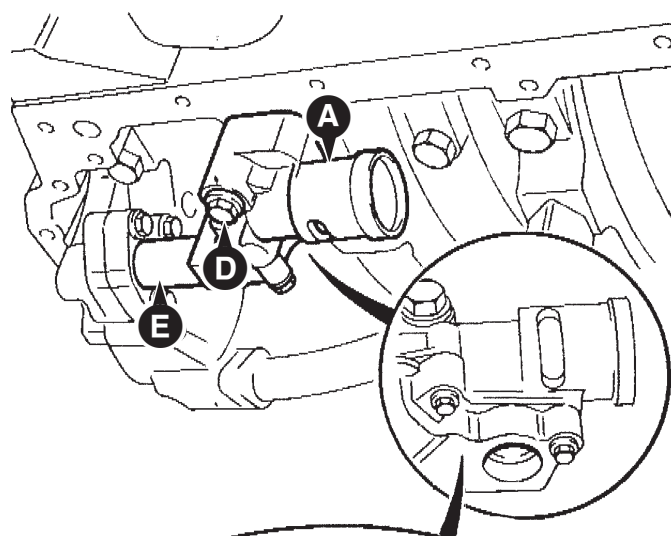
Investigation has shown that the relief valve housing has been machined incorrectly and remedial procedures have already been implemented to ensure all relief valve housings are now machined to the correct specification.

Check the relief valve housing as described in SERVICE PROCEDURES.

SERVICE PROCEDURE:

Note: The following procedures apply to a typical machine, the method for gaining access to the engine oil relief valve may differ slightly.

- 1 Park the machine on firm level ground, engage the parking brake and set the transmission to neutral. Lower the attachments to the ground and stop the engine.
- 2 Place a clean suitable size container underneath the engine oil drain plug (located in the sump).
- 3 Remove the sump drain plug and its 'O' ring. Drain the engine oil into the container.
- 4 Remove the engine oil dipstick and the dipstick tube.



3766K021

2-C



3766K021

1-B



S225960

SPECIAL INSTRUCTIONS

Refer to Perkins dealers for warranty information and repairs.

SERVICE PROCEDURE (continued):

- 5** Provide a support for the sump and remove the sump retaining bolts. Lower the sump and remove the sealing gasket.
- 6** Inspect the relief valve housing:
- 6.1** Look at the side of the relief valve housing **A** for the manufacturer's number.
- 6.2** If the number has a '1' below it as shown at **B**, then the housing is made to the correct specification, move to step **9**.
- 6.3** If the number has a '2' below it as shown at **C**, then the housing is made to the wrong specification and must be replaced with a new one, move to step **7**.

Important note: Relief valves obtained from service parts stock with a number '2' are manufactured to the correct specification.

- 7** Remove the relief valve housing retaining bolt **D**, and then remove the relief valve housing **A**.
- 8** Fit a new replacement relief valve housing, torque tighten the retaining bolt to 22 Nm (16 lbf ft). Make sure that the 'O' ring at each end of tube **E** are in good condition and securely in place before tightening the retaining bolt.
- 9** Refit the engine sump together with a new gasket. Tighten the sump retaining bolts to 22 Nm (16 lbf ft). Fit the sump drain plug together with a new 'O' ring, torque tighten the plug to 34 Nm (25 lbf ft). Refit the dipstick and dipstick tube.
- 10** Using the engine oil drained at step **3** refill the engine sump, make sure that the engine oil reaches the 'MAX' mark on the dipstick, top up as required.

PARTS REQUIRED

Part No.	Description	Qty	Comment
02/200102	Relief Valve Assy	1	Turbo Engine
02/200106	Relief Valve Assy	1	Naturally Aspirated Engine
02/102069	Engine Sump Gasket	1	Cast Iron Sump
02/200875	Engine Sump Gasket	1	Alloy Sump
02/200198	Drain Plug 'O' ring	1	available only in units of 50 - part number 02/200198A

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Number	Gn016
(JCB 2/156; D19/N. Am.)	
Issue	1
Date	Feb. 1996

SUBJECT: Parkbrake Clevis Pin Improvements

Page 1 of 2

PRODUCTS AFFECTED: Transmissions with Clysdale Type Park Brake

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION

A new method of retaining the parkbrake cable to the lever and the caliper has been introduced. In place of the existing clevis pin arrangement, new type shouldered bolts (items **A** and **B**) are used. The shouldered bolts are directly interchangeable with the clevis pin arrangement. When required, the shouldered bolts can be fitted as described in SERVICE PROCEDURES.

SERVICE PROCEDURES

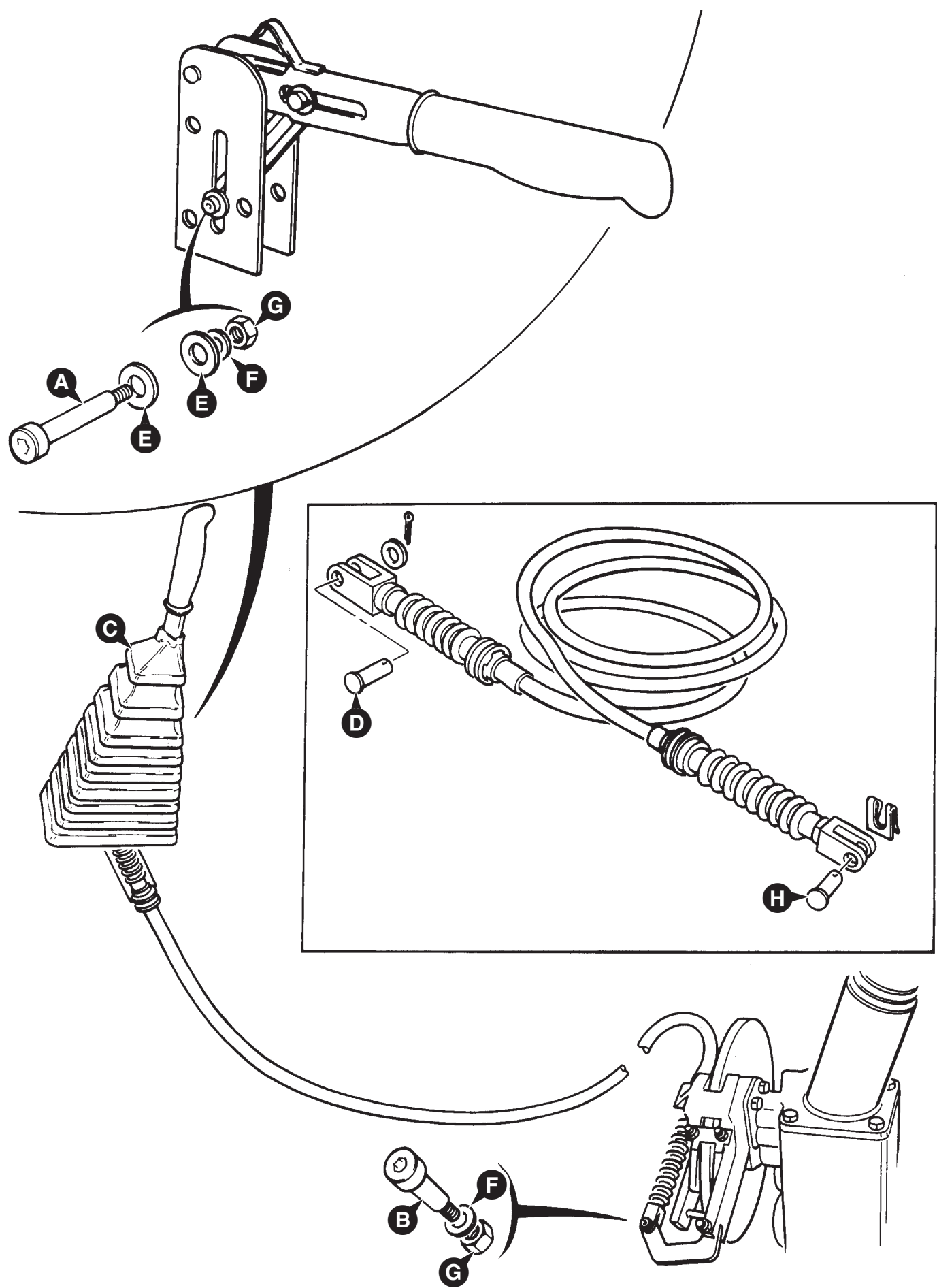
- 1 Park the machine on firm level ground, engage the parking brake and set the transmission to neutral. Lower the equipment to the ground and stop the engine.
- 2 Remove the parkbrake lever gaiter (item **C**).
- 3 Remove the clevis that holds the cable to the lever (item **D**), and in its place fit a new shouldered bolt (item **A**), washers (items **E** and **F**) and retaining nut (item **G**).
- 4 Remove the clevis that holds the cable to the caliper (item **H**), and in its place fit a new shouldered bolt (item **B**), washer (item **F**) and retaining nut (item **G**).
- 5 Check that the parkbrake fully engages (do a parkbrake test - refer to Operator Handbook). If necessary adjust the parkbrake as required.
- 6 Refit the parkbrake lever gaiter.

PARTS INFORMATION

Item No.	Part No.	Description	Qty	Comments
A	826/01596	Shouldered Bolt	1	Parkbrake cable to parkbrake lever
B	826/01597	Shouldered Bolt	1	Parkbrake cable to caliper
E	1420/0007Z	8 mm Flat Washer	2	
F	1420/0006Z	6 mm Flat Washer	2	
G	1370/0103Z	6 mm Nut	2	

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Number	Gn017
(JCB Gen 045)	
Issue	1
Date	March 1996

SUBJECT Starter Motors

Page 1 of 1

PRODUCTS AFFECTED All Perkins engines

SERVICE INFORMATION

A new specification of starter motor having a larger and stronger inertia clutch has been introduced in two forms for either left hand or right hand mounting.

The engine serial cut-in numbers are:

Right hand mounting on four cylinder engines: U 746654 B

Left hand mounting on four cylinder engines: U 747324 B

Six cylinder engines: U 620352 B.

The two new part numbers are fully interchangeable with the earlier starter motors as detailed below. For specific machine applications, refer to the parts information.

Note that all starter motors failing within the warranty period should be repaired by the nearest Magnetti Marelli distributor. See T.I. Gn018 for list of Magneti Marelli distributors.

Contact Perkins or Perkins Dealer for further information.

Parts Required

Part No	Description
714/29300	Starter motor, left hand mounting (supersedes 714/09100)
714/29500	Starter motor, right hand mounting (supersedes 714/14300)

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Number	Gn018
(JCB MI 461/H, 431/E)	
Issue	2
Date	Feb. 1999

SUBJECT: **Magneti Marelli Service/Warranty Support**

Page 1 of 5

PRODUCTS AFFECTED: **All Fitted with Magneti Marelli Alternators and/or Starter Motors**

From 1st January 1996, Service Warranty Support for Magneti Marelli electrical equipment fitted on Perkins Engines will be provided by Magneti Marelli Distributors.

The addresses of the Magneti Marelli European main headquarters are listed below. The remaining pages identify distributors in your country, so for instance, the translated JCB French version of this bulletin will only list the French distributor network, the German the German network, and so on. If there is no local Magneti Marelli agent, the starter/alternator can either be repaired by a local electrical agent and the repair invoice submitted with a Warranty claim to a Perkins Dealer, or if required, a new unit can be supplied by a Perkins Dealer.

MAGNETI MARELLI SERVICE HEADQUARTERS

U.K. - Magneti Marelli Aftermarket
Shaftsmoor Lane
Hall Green
Birmingham
B28 8SW

Tel: 0121-6258788
Fax: 0121-6258625

ITALY - Magneti Marelli
Viale Aldo Borletti 61/63
20011 Corbetta
Milano
Italia

Tel: 00-39-0297200602
Fax: 00-39-0297200500

FRANCE - Magneti Marelli France
19 Rue Lavoisier
92000 Nanterre
France

Tel: 00-33-147297000
Fax: 00-33-147297274

GERMANY - Magneti Marelli KV
Wannenackerstrasse 71
74078 Heilbronn
Germany

Tel: 00-49-71312910
Fax: 00-49- 7131176928

SPAIN - Magneti Marelli Iberica
Avda de Roma 80-82
08015 Barcelona
Spain

Tel: 00-34-32263176
Fax: 00-34-32262109

Note: If difficulty is experienced in finding support or overseas warranty cover, contact Perkins U.K. on:

Tel: (UK 44)(0) 1733 567474
Fax: (0) 1733 582240

Note: For JCB Language versions, only the front page is issue raised. When filing, replace the front sheet only.

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NAME	ADDRESS	TOWN	COUNTY	POST CODE	TELEPHONE NUMBER
AVON					
Bristol Auto Electrical Gloucester Automotive	357 Bath Road Unit 4 Locksbrook Court	Bristol Bath	Avon Avon	BS4 3EU BA1 3EN	0117-971-2242 01225-483882
BEDFORDSHIRE					
Electrodiesel Services Ltd Radial Ltd	Murdock Road 42-44 Hasting Street	Bedford Luton	Bedfordshire Bedfordshire	MK41 7RA LU1 5BQ	01234-217025 01582-22431
BERKS					
Cafco Automotive Ltd	13 The Paddock	Newbury	Berks	RG14 5TQ	01635-580707
Cafco Automotive Ltd	4 Nimrod Way	Reading	Berks	RG2 0EB	01734-868456
Cafco Automotive Ltd	13 Eastheath Avenue	Wokingham	Berks	RG11 2PP	01734-784321
Cafco Automotive Ltd	6 Bracknell Business Centre	Bracknell	Berks	RG12 1QS	01344-51011
BUCKS					
Cafco Automotive Ltd	2 Bridgegate Business Park	Aylesbury	Bucks	HP19 3XN	01296-392955
Cafco Automotive Ltd	9 Wessex Road	Bourne End	Bucks	SL8 5DT	01628-525544
Cafco Automotive Ltd	22a Buckingham Avenue	Slough	Bucks	SL1 3EA	01753-692030
Cafco Automotive Ltd Hereward Car & Truck	2b Alma Road Ind. Estate	Chesham	Bucks	HP5 3HB	01494-772635
CAMBRIDGESHIRE					
Components Ltd	19 Harvester Way	Peterborough	Cambridgeshire	PE1 5UT	01733-346564
CHESHIRE					
Auto Battery Services Ltd	100/102 King Street	Dukinfield	Cheshire	SK16 4JZ	0161-330-2236
CLEVELAND					
Electrodiesel North East Ltd	Portrack Grange Road	Stockton on Tees	Cleveland	TS18 2PH	01642-679741
CORNWALL					
Mill Auto Supplies	Head Office	St Austell	Cornwall	PL25 5EY	01726-73063
Mill Auto Supplies	Church Works	Penzance	Cornwall	TR13 2EU	01736-60301
Mill Auto Supplies	49-51 Wendron Street	Helston	Cornwall	01326-561222	
Mill Auto Supplies	Penmarrin House	Penryn	Cornwall	01326-373343	
Mill Auto Supplies	Trevenna House	Redruth	Cornwall	01209-218774	
Mill Auto Supplies	Units 1 & 2, Old Saton Yard	Bodmin	Cornwall	01208-78166	
Mill Auto Supplies	Eddystone Rd Ind. Estate	Wadebridge	Cornwall	01208-813254	
Mill Auto Supplies	1 Miller Bus Park	Liskeard	Cornwall	PL14 4DA	01579-346555
DEVON					
Autolec Services	Marsh Green Road	Exeter	Devon		01392-54931

NAME	ADDRESS	TOWN	COUNTY	POST CODE	TELEPHONE NUMBER
ESSEX					
GP Auto	119 Victoria Road	Romford	Essex	RM1 2LX	01708-722913
Motex Express Auto Factors	14 Oban Court	Wickford	Essex	SS11 8YB	01268-561562
GLOUC ESTER					
Central Motor Factors	9-13 High Street	Lydney	Gloucester	GL15 4DP	01594-845011
Central Motor Factors	New Road	Lydney	Gloucester	GL15 4JA	01594-563499
Gloucester Automotive	53 St. Catherine Street		Gloucester	GL1 2BS	01452-302989
Gloucester Automotive	Unit 5 Lower Mill Street	Cheltenham	Gloucester	GL51 8JN	01242-584494
Gloucester Automotive	Riverside Works	Severn Road	Gloucester	GL1 2LE	01452-415555
HAMPSHIRE					
A.R.E. Ltd	Aldershot Truck Spares	Aldershot	Hampshire	GU12 4RN	01252-343228
A.R.E. Ltd	Eastern Road	Aldershot	Hampshire	GU12 4TD	01252-331448
A.R.E. Ltd	Unit 1 Amey Ind. Est.	Petersfield	Hampshire	GU32 3AN	01730-268431
HERTS					
Radial Ltd	103 Longspring	Watford	Herts	WD2 5PO	01923-232311
Radial Ltd	7 Railway Place	Hertford	Herts	SG13 7BS	01992-581493
IRELAND					
Edmunds Walker	JFK Industrial Estate	Dublin 12	Ireland		00-353-1-4502866
Edmunds Walker	College Commercial Park	Cork	Ireland		00-353-21-344688
Edmunds Walker	23 Nicholas Street	Limerick	Ireland		00-353-61-419200
KENT					
Calco Automotive Ltd	43 Sittingbourne Ind. Park	Sittingbourne	Kent	ME10 3JG	01795-475321
LANCASHIRE					
Auto Battery Services Ltd	School Lane	Rochdale	Lancashire	OL16 1QR	01706-522522
Auto Battery Services Ltd	Elliot House	Oldham	Lancashire	OL4 1HB	0161-627-5638
PF Jones (Diesel Service) Ltd	Nuttall Street	Manchester	Lancashire	M16 9JA	0161-872-4755
Ribblesdale Distribution	Cocker Road, Bamber Bridge	Preston	Lancashire	PR5 8AL	01772-629639
Leyland Auto Elec. & Diesel Ltd	Unit 220, Bamber Bridge	Preston	Lancashire	PR5 5AL	
LINCS					
Hereward Car & Truck	Brownlow Street	Stamford	Lincs	PE9 2EL	01780-481234
LONDON					
Motor Trade Services	246/250 Cavendish Road	Balham	London	SW12 0BY	0181-673-5555
Radial Ltd	Hillway	Highgate	London	N6 6QE	0181-341-0553
MID GLAMORGAN					
Autoparts South Wales	Ynysangharad Road	Pontypridd	Mid Glamorgan	CF37 4DA	01443-405726

NAME	ADDRESS	TOWN	COUNTY	POST CODE	TELEPHONE NUMBER
MIDDLESEX					
Cafco Automotive Ltd	96 Oxford Road	Uxbridge	Middlesex	UB8 1LV	01895-256451
NORFOLK					
Panks Auto Electrical	15 Higham Street	Norwich	Norfolk	NR2 4TE	01603-629967
NORTH YORKSHIRE					
Andrew Page Ltd	Unit 25 Raylor Centre	York	North Yorkshire	YO1 3DP	01904-414466
Andrew Page Ltd	Unit 6 Thirsk Ind. Park	Thirsk	North Yorkshire	YO7 3TA	01845-526688
S.A.S. Ltd	Unit 17 Provincial Works	Harrogate	North Yorkshire	HG1 4QE	01423-889021
S.A.S. Ltd	Westgate	Otley	North Yorkshire	LS21 3AT	01943-467514
NOTTS					
Midland Magneto	Trent Works	Nottingham	Notts	NG1 7HL	0115-9552233
OXFORDSHIRE					
Cafco Automotive Ltd	29b Milton Park	Abingdon	Oxon	OX14 4RT	01235-834888
Cafco Automotive Ltd	59 Murdock Road	Bicester	Oxon	OX6 7PP	01869-244612
SCOTLAND					
D & A Factors Ltd	2 West Hendersons Wynd	Dundee	Scotland	DD1 5BT	01382-228202
D & A Factors Ltd	42 Canmore Street	Forfar	Scotland	01307-464914	
D & A Factors Ltd	13 Baltic Street	Montrose	Scotland	01674-676260	
D & A Factors Ltd	Unit 7 whitefiars	Perth	Scotland	01738-636409	
European Vehicle Equipment	13 Scotland Street	Glasgow	Scotland	G5 9PU	0141-429-2704
Stanley R Harris Ltd	24/40 Seaward Street	Glasgow	Scotland	G41 1HL	0141-429-3141
SOUTH YORKSHIRE					
Andrew Page Ltd	Unit 4 Silver Court	Bramley	South Yorkshire	L13 4LY	0113-236-2122
Sutton Auto Factors	Newcross Street	Sutton in Ashfield	South Yorkshire		01623-441331
STAFFS					
Car Bar Components Ltd	Kettlebrook Road	Tamworth	Staffs	B77 1AG	01827-60111
Car Bar Components Ltd	1 Horninglow Street	Burton-on-Trent	Staffs	DE14 1NG	01283-534066
Midwest Motor Factors	Brownhills Business Park	Brownhills	Staffs	WS8 7BW	01543-375156
Potteries Diesel	Mason Street	Stoke on Trent	Staffs	ST4 3NE	01782-744556
SURREY					
A.R.E. Ltd	285 Worplesdon Road	Guildford	Surrey	GU2 6XN	01483-233003
A.R.E. Ltd	Unit 1 Goldsworth Ind. Est.	Woking	Surrey	GU21 1LY	01483-722424
A.R.E. Ltd	Hare Lane	Goldalming	Surrey	GU7 3EG	01483-428585
A.R.E. Ltd	Unit 1 Weydown Road	Halsmere	Surrey	GU27 1DW	01428-654061
A.R.E. Ltd	1-3 East Street	Farnham	Surrey	GU9 7RX	01252-737654
A.R.E. Ltd	Guildford Truck Spares	Guildford	Surrey	GU2 6XA	01483-573311
	139 Worplesdon Road				

NAME	ADDRESS	TOWN	COUNTY	POST CODE	TELEPHONE NUMBER
SURREY					
A.R.E. Ltd	282 Walton Road	East Molesey	Surrey	KT8 0HU	0181-941-7955
A.R.E. Ltd	Unit 1 Downside	Chertsey	Surrey	KT16 9BQ	01932-570820
A.R.E. Ltd	78 Holmethorpe Avenue	Redhill	Surrey	RH1 2NL	01737-767000
A.R.E. Ltd	Walton Motor Factors	Hersham	Surrey	KT12 5NR	01932-231298
TYNE AND WEAR					
Andrew Page Ltd	Unit 15 Brough Park	Newcastle-upon-Tyne	Tyne and Wear	NE6 2YF	0191-224-2345
Tyneside Auto Electrical Ltd	St Lawrence Road	Newcastle-upon-Tyne	Tyne and Wear	NE6 1AQ	0191-265-4426
WEST MIDLANDS					
Midwest Motor Factors	Units 10/11 Eruria Way	Bilston	West Midlands	WV14 7AH	01902-353515
Midwest Motor Factors	Walsall Road	Willenhall	West Midlands	WV13 2ED	01902-633005
Midwest Motor Factors	Units 2, 3 & 6	West Bromwich	West Midlands	B70 9PW	0121-525-4775
WEST YORKSHIRE					
Andrew Page Ltd	Apson House	Leeds	West Yorkshire	LS9 7DY	0113-200-1010
Andrew Page Ltd	Grantley Way	Wakefield	West Yorkshire	WF1 4PY	01924-365727
Andrew Page Ltd	Unit 5	Bradford	West Yorkshire	BD4 7DG	01274-723156
Andrew Page Ltd	Units 29-30 Beck Road	Huddersfield	West Yorkshire	HD1 5DG	01484-420077
Andrew Page Ltd	Units 15/17 Ashley Ind. Est.	Morley	West Yorkshire	LS27 0EL	0113-252-6600
WILTS					
Melksham Motor Spares Ltd	16 Church Street	Melksham	Wilts	SN12 6LS	01225-790123
WINCESTER					
H.A.E. Ltd	Wykeham Industrial Estate	Winnall	Winchester	SO23 7RX	01962-841010
WORCESTER					
Mobile Electric (Worcester) Ltd	Gregorys Mill Street	Worcester	Worcestershire	WR3 8BS	01905-25284
SCANDINAVIA					
Norway - Jahre Motor A/S	Brynsveien 2-4	0602 Oslo 6			
Finland - Atoy OY1	Lauttasaarenti 54	0200 Helsinki			
Denmark - Dybbroe A/S	Tomsagervej 8-10	08230 Aabyhoj (Aarhus)			

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Number	Gn019
(JCB M.I. 525/HA)	
Issue	2
Date	Dec. 1998

SERVICE DEPARTMENT - COMPUTER DIAGNOSTIC EQUIPMENT

Page 1 of 3

Electronic Control Units (ECU) have been introduced to control the functions of Transmissions.

Service Marketing is becoming increasingly important in generating distributor revenue. Introduction of ECU and EMS units incorporating Service Indicators represents a major opportunity for distributors to ensure they obtain all routine service work.

To support transmissions fitted with these systems, Distributor Service Personnel need to have the appropriate Computer Diagnostic equipment. All new ITL electronic systems will use the PSION Workabout hand held computer for this purpose.

This bulletin describes the requirements for and technical specification of these computerised diagnostic tools.

1 PSION WORKABOUT

This low cost, rugged, hand held computer is now the ITL and JCB Group Diagnostic Tool. It is widely used in service industries for in-field use.

All new ITL and JCB products with electronic systems requiring support from Service personnel will use software running on the PSION.

Electronic units requiring the PSION workabout will be as follows:-

Transmission ECU

Fitted to: PS700 four and five speed transmissions

Function: Control of powershift gearbox.

Use of PSION: Fault finding of ECU inputs and outputs.

The technical details of the PSION Workabout are:

Specification	PSION Workabout RS 232 and TTL Serial Interfaces	PSION Part No. 1800 0006-11	ITL/JCB part No. 892/00924
Docking Holster	One required per depot for transferring software from PC to PSION Workabout	1801 0003-01	892/00925
PsiWin Link and Software	To transfer JCB software from PC to PSION Workabout - one per depot	1601 0039-10	892/00926

ITL Software

This will be provided on the Parts CD ROM and will be transferred from a desktop computer via PsiWin software to the PSION Workabout. A Psion disc is also available, JCB part No. 892/00963.

Cable links to machine

Connecting cable for connecting the PSION Workabout to any ITL machine is part no. 892/00952, available from JCB Service

A service kit comprising the above items is available, JCB part No. 892/00962

ISSUED BY THE TECHNICAL SERVICE DEPARTMENT OF I.T.L., WREXHAM, CLWYD, LL13 9UF, UNITED KINGDOM

Availability

A list of PSION agents worldwide is attached.

PSION Support

Technical Support for the PSION Workabout can be obtained from Psion Corporate Support, telephone: (44) 1713174122.

Technical details of the Notebook PC are:**Specification:**

Preferably a ruggedised portable computer having:
Pentium processor
16 Meg memory or greater.
1 Gb hard drive or greater.
Internal CD ROM drive (4 speed or greater)

Operating System:

Windows 3.11 or Windows 95

ITL Software:

Will be provided on the Parts CD ROM

Cable links to machine:

ITL part numbers will be advised in workshop manuals.

Availability:

Any reputable computer supplier, JCB Service or ITL direct.

The facts about Workabout

Processor:	16-bit NEC V30H (80C86 compatible), multi-tasking, windowing environment. MS-DOS compatible file formats.
Memory:	256k -1 MByte RAM, 2 Solid State Disk drives for additional 16Mbytes
LCD Screen:	39 characters x 12 lines (240x100 pixels) Black and grey scale Backlight.
Keyboard:	57 key alphanumeric
Power Supply:	2 AA batteries, Rechargeable battery pack (optional) Lithium backup battery External power via mains adaptor or Docking Station.
Integral applications:	OPL language, Database, Spreadsheet and Calculator
Optional interfaces:	Barcode wand and RS-232; TTL and RS-232 (for scanners)
Accessories:	Elasticated strap
Operating Conditions:	-20 to +60 Celsius, Humidity 90% max non-condensing
Drop resistance:	One metre onto concrete
Weatherproofing:	Standard model splashproof, optional on expansion interfaces
Dimensions:	180mm x 90mm x 35mm; 325g (including batteries)



PSION DISTRIBUTOR	Country	Address	Telephone Number	Fax Number	E-mail
ASK INTERNATIONAL S.A.R.L.	ALGERIA	94 RN 133, 42380 SOUIDANIA, W.TIPASA	(213) 2791130	(213) 2791130	
PSIAR	ARGENTINA	AVENIDA DE MAYO 963, 3RD FLOOR, BUENOS AIRES1084	(541) 345 2351	(541) 345 3605	psiar@satink.com
PSITECH PTY	AUSTRALIA	RMB 3585, VALLEY ROAD, KANGY ANGY, NEW SOUTH WALES 2258	(61) 4362 2014	(61) 4362 2014	
HAYWARD COMPUTER-PERIPHERIE	AUSTRIA	POSTFACH 79, A-5071 WALLS 405	(43) 662 8587 0	(43) 662 8587 80	mschinwald@hayward.co.at
COMPUTER WORLD	BAHRAIN	273 EXHIBITION AVENUE, HOORA PO BOX 26178, MANAMA	(973) 293 493	(973) 292 253	
SHARANEE LTD	BANGLADESH	B-172 LANE-23, NEW D.O.H.S, DHAKA 1206	(880) 2885 219	(880) 2881 470	
MICROCONNECTION DISTRIBUTION	BELGIUM	KORTE WINKLESTRAAT 15, B-2000 ANTWERPEN	(32) 3232 3468	(32) 3226 1749	
KPF CONSERVE CO	BRUNEI	DARUSSALANO 117 BANGUNAN KUMBANG PASANG JALAN GADONG 3180, BANDER SERI BEGAWAN	(673) 2448101	(673) 2 220988	psf@brunet.bn
IMIC	CAMBODIA	2 BLVD NORODOM, PHNOM PENH, CAMBODIA	(855) 23 362 392	(855) 23 721 756	craigm@uni.fi
SYSCAN INTERNATIONAL INC.	CANADA	2775 SHERBROOKE EAST, MONTREAL, QUEBEC, H2K 1B9	(514) 521 0942	(514) 521 0949	
RADIO-HOLLAND CARIBBEAN N.V.	CARIBBEAN	ATHLLIDGEROAD 106, PO BOX 1102, ST.MAARTENS	(599) 525 414	(599) 522 589	merkus@ibm.net
BINARIA SA	CHILE	COMPANIA 1357, PISO 7, SANTIAGO	(562) 696 2133	(562) 696 9368	pointx@login.cz
POINT X S.R.O.	CZECH REP.	TRUHLARSKA 3, 11000 PRAGUE 1	(42) 2 231 9395	(42) 2 2481 0821	
MOBI DATA A/S	DENMARK	FUGLEBAKKEVEJ 88-90, DK-2000 FREDRIKESBURG	(45) 38 33 55 01	(45) 38 33 55 85	
PROTRADE	EGYPT	11 SHEHAB STREET, MOHANDESSEEN, CAIRO	(20) 2 35481847	(20) 2 3607638	
OY ANGLO-NORDIC AB	FINLAND	HYTTIMESTARINTIE 3, 02780 ESPOO	(358) 9 819211	(358) 9 811338	psion@anglo.fi
PSION FRANCE	FRANCE	78 RUE CHAMPIONNET, F 75018 PARIS	(33) 1 53411 200	(33) 1 53411 201	
PSION GMBH	GERMANY	DAIMLERSTRASSE 16, D-61352 BAD HOMBURG	(49) 6172 6630	(49) 6172 663100	
INT ELECTRONIC	GREECE	72 SYNGROU AVENUE, GR - 11742, ATHENS	(30) 1 9233013	(30) 1 9234273	int@hol.gr
ONFLO INTERNATIONAL LTD	HONG KONG	SUITE 1818 18/F MIRAMAR TOWER 1 KIMBERLEY RD, TSMISHATSUI, KOWLOON	(852) 2314 5550	(852) 2377 3261	dominic@onflo.com.hk
PSION MAGYARORSZAG KFT	HUNGARY	SZT. GELLERT TER 3, 1111 BUDAPEST	(36) 1209 3804	(36) 1209 3805	100324.102@compuserve.com
PT KOMTELINDO HITEK INTI	INDONESIA	WISMA MULTI BINLANG, JL DR SOEPOMO SH NO 44, JAKARTA	(62) 3 61756284	(62) 3 61756284	komtel@ibm.net
SIS SURVEY	IRELAND	UNIT 6A, BALLYMOUNT CROSS INDUSTRIAL ES, DUBLIN 12	(353) 456 8650	(353) 456 8653	hem@cix.compulink
VIDEO COMPUTER	ITALY	VIA ANTONELLI 36,10093 COLLEGGNO	(39) 11 403 4828	(39) 11 403 3325	
PSION JAPAN	JAPAN	NISHI SHINJUKU FOREST BLD., 1B FLOOR NISHI SHINJUKU 4-32-1SHINJUKU-KU, TOKYO	(81) 3 3378 5933	(81) 3 3378 5943	
ANWAR ESSA AL SALEH ESTAB.	KUWAIT	AL-RABIE BLDG.SALMIYA, PO BOX 4704, SAFAT, 13048	(965) 573 7684	(965) 571 6674	esaleh@kuwait.net
COMPUTEL S.A.R.L.	LEBANON	JUSTINIAN CENTRE, JUSTINIAN ST, SANAYEH, PO BOX 113 6413, BE	(961) 1 353 748	(961) 1 602 193	COMP@DM.NET.LB
ALCHEMY TECHNOLOGY SDN BHD	MALAYSIA	MUI PLAZA 3RD FLOOR, KUALA LUMPUR, 50250	(60) 3248 3318	(60) 3245 6318	
BDS	MALTA	CASA LEONE, PIAZZA ROBERT SAMUT, FLORIANNA VLT 14	(356) 239200	(356) 248693	
TDT	MEXICO	PASA FLORENTINO 47, SANTA FE, CP 01 260	(52) 5 397 8290	(52) 5 361 3755	
PSION NEDERLAND BV	NETHERLANDS	AVIO TRADE PARK, ZANDSTEEN 54, 2132 MR HOOFDDORP	(31) 20 4469444	(31) 20 4469446	
POCKET SOLUTIONS	NEW ZEALAND	11 RUTHERFORD STREET, PO BOX 44070, LOWER HUT WELLINGTON	(64) 4566 7808	(64) 4569 6452	psol002@ibm.net
DEBIS	NIGERIA	110 OBAFEMI AWOLOWO WAY, IKEJA, LAGOS STATE	(234) 14970228/9	(234) 14970228/9	
UCOM	NORWAY	PO BOX 889, MUSCAT 113,SULTANATE OF OMAN	(47) 32203300	(47) 32203459	
OHI ELECTRONICS & TRADING CO LLC	OMAN	VALIANA SAL, PAETONALCORONELMONELOS 135, CASI AV SAN BLAS	(968) 959 085	(968) 603 467	
CHARLES FREWEN	PARAGUAY	G & A BLDG, 2303 PASONG TAMO BLDG	(55) 45522 1451	(55) 45522 1451	
BORROMEO	PHILIPPINES	UL MYRIA 2, SKR- POCZT 143, 00-950 WARSZAWA 1	(63) 2 893 7722	(63) 2 816 4107	bthinktg@globe.com.ph
CIE CENTRUM INFORMATYKI ENERGETY	POLAND	RUA AUGUSTO GILL 30 A/B, 1100 LISBON	(48) 22 625 3397	(48) 22 693 1357	ciesm@elmo.nask.waw.pl
COMP 3 LDA	PORTUGAL	INTERNATIONAL UNIVERSITY OF ENG6 LENINSKY PROSPEKT, GSP, MOSCOW 117933	(351) 1 795 1872	(351) 1 795 1928	
PSI-RUSSIA	RUSSIA	PO BOX 2951, JEDDAH 21461	(966) 2 6829454	(966) 2 6828801	kenmore@roditi.co.uk
NABIL ALI SINDI TRADING ESTABLIS	SAUDI ARABIA	25 KALLANG AVENUE#02 01/03, KALLANG BASIN INDUSTRIAL ESTAT339416	(65) 299 2933 x236	(65) 299 9688	systech@singnet.com.sg
SYSTECH	SINGAPORE	PO BOX 36233, GLOSDEY, CAPE TOWN 7700	(27) 21 683 1192	(27) 21 683 1196	
PSYNET DISTRIBUTORS CC	SOUTH AFRICA	RAMLA CATALUNYA 35, PRAL, 08007 BARCELONA	(34) 3 4516505	(34) 3 4872516	
PARESA	SPAIN	12 TICKELL ROAD, COLOMBO 8, SRI LANKA	(94) 1 695395	(94) 1 695874	dhama@sri.lanka.net
KINGSLAKE ENG SYSTEMS	SRI LANKA	F O PETERSONS GATA, 421 31 VASTRA FROLUNDA, SWEDEN	(46) 31 709 1605	(46) 31 47 8520	sten.sohle@industrielektronik.se
SVENSKA INDUSTRIELEKTRONIC AB	SWEDEN	MOOSACHER STRASSE 6, CH 8820 WADENSWIL	(41) 1 781 1361	(41) 1 781 1361	infos@excom.ch
EXCOM AG	SWITZERLAND	PO BOX 1054, DAMASCUS	(963) 11 23174 60	(963) 11 4421966	
O.ABOU KHALIL TRADING CO	SYRIA	1779/1 NEW PETCHBURI RD, BANGKOK 10320, THAILAND	(66) 2 253 1290	(66) 2 253 1705	
JEBSEN & JESSEN	THAILAND	GALAXIE 2000, RUE D'IAK BLOC A 7 EME ETAGE,1002 TUNIS	(216) 1 793 939	(216) 1 794 949	
INSTITUT MASSMEDIA	TUNISIA	1st Floor BIN KHEDIA CENTER, AL GARHOUD, DUBAI	(971) 4 822267	(971) 4 822265	
ALPHA 55 CO. L.L.C.	UAE	1 RED PLACE, MAYFAIR, LONDON W1Y 3RE	0171 317 4100		alpha55@emirates.net.ae
PSION UK PLC	UK	6 DERBY ROAD, METROPOLITAN CENTRE, GREENFORD, MIDD'X, UB6 8UJ	0181 566 6162	0181 566 6268	
PSION UK SERVICE CENTRE	UK	150 BAKER AVENUE, CONCORD, MA 01742	(001) 508 371 0310	(001) 508 371 9611	
PSION INC.,	USA	AL SALAM EST.,, YEMEN	(967) 271506	(967) 273990	
AL AHMAR GROUP	YEMEN				

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Number	Gn020
(JCB M.I. 612/H, 548/E)	
Issue	1
Date	April 1998

ENGINE WORKSHOP MANUALS

Page 1 of 1

Perkins New 1000 Series ("Darwin")

With the introduction of the 'New 1000' Series range of engines, Perkins produced a new Workshop Manual which is available under publication number 9806/2140.

Issue 3 of this publication is now available incorporating two additional engine models (AR and AS) which are for machines sold primarily in North America and Scandinavia. The new issue also incorporates various general revisions.

Any future orders for 9806/2140 will be supplied as issue 3.

French and German translations of issue 3 should be available by the end of May. Other languages will follow later.

Translated part numbers are:	French:	9806/2141
	German:	9806/2142
	Spanish:	9806/2143
	Italian:	9806/2144

Note: Replacement pages are not supplied for engine service manuals. To obtain the latest issue a new manual must be ordered.

Engine models now covered by the new manual will be: 4 Cylinder: Models AJ to AS

THIS BULLETIN IS ISSUED FOR THE PURPOSE OF CIRCULATING TECHNICAL INFORMATION AND DOES NOT CONSTITUTE AN INSTRUCTION TO CARRY OUT WARRANTY REPAIRS ON MACHINES

ISSUED BY THE TECHNICAL SERVICE DEPARTMENT OF I.T.L., WREXHAM, CLWYD, LL13 9UF, UNITED KINGDOM

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Number (JCB 10/107)	Gn021
Issue	1
Date	April 1998

SUBJECT **Axle Propshafts**

Page 1 of 1

PRODUCTS AFFECTED **All Machine Installations**

SERVICE INFORMATION

On installation of any machine it is important to ensure that the following points regarding propshaft lubrication and protection are highlighted to the operator. Failure to do so may result in premature wear or consequential damage to transmission components.

1 Lubrication

Propshafts must be greased as follows:

- a) Interval
 - Every 50 hours of operation
 - Daily if working in muddy conditions
 - Immediately after washing the machine
- b) Ensure that all bearing caps are purged with grease
- c) Only High Pressure Grease such as Mobil HP222 should be used.

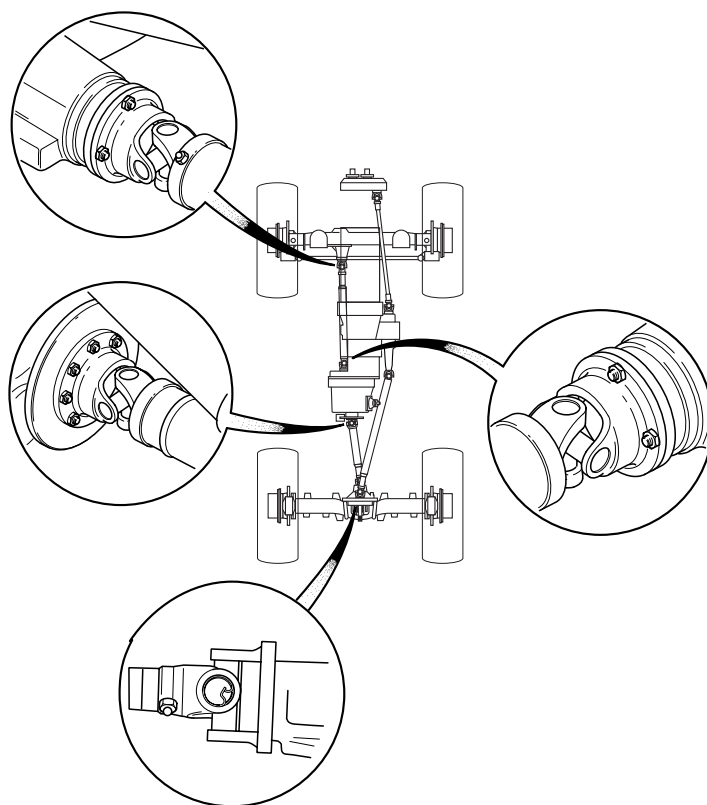
2 Washing

Do not direct high pressure water jets at universal joints.

3 Protection

When working in loose straw or grass it is important that an undershield is fitted to the machine to prevent material wrapping around the propshafts.

Failure to protect the propshafts adequately may result in damage to oil seals, propshafts and other transmission components.



Parts Information

Part No	Description	
4003/2017	JCB HP Grease (400 g cartridge)	Available from JCB Service and Dealers

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Number (JCB 2/029)	Gn022
Issue	1
Date	Nov. 1990

SUBJECT: Engine Silencer Improvements

Page 1 of 1

PRODUCTS AFFECTED: Perkins Engines

TO BE CARRIED OUT: For Information Only

Product Improvement

The quality of ITL Silencers has been improved:

1 Turbo Engine Build Silencers

- a The end plates have been strengthened by increasing the section width. A rain cap **A** must be fitted on the new silencers as the water drain hole is now deleted.
- b The gauge has been increased from 1.6mm to 2.0mm.

2 Naturally Aspirated Silencers

- a A secondary support bracket **B** is fitted to silencers installed on naturally aspirated engines, this will reduce failures caused by vibration. The bracket is bolted to the silencer and mounted on the exhaust manifold studs.
- b The gauge has been increased from 1.6mm to 2.0mm.

Parts Required

Turbo Engine

Silencer x 1 - 993/66300 replaces 123/01468 and 123/01136

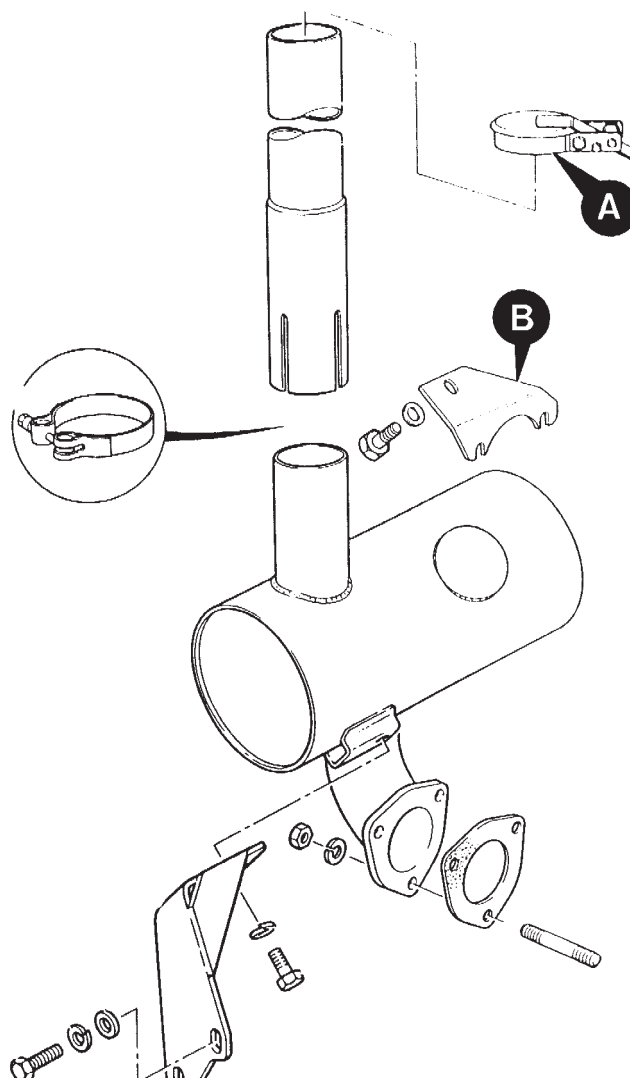
Naturally Aspirated Engine

Silencer x 1 - 993/66200 replaces 123/01481 and 123/00741

Support x 1 - 123/01482

Bolt x 1 - 1305/0204Z

Washer x 1 - 1411/0003Z



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Number	Gn023
(JCB Gen 087, N.Am K91)	
Issue	1
Date	Oct. 1998

SUBJECT: Change of position for the exhaust manifold alignment bushes

Page 1 of 1

PRODUCTS AFFECTED: New Perkins 1000 Series Engines (Models AJ to AS and YG to YK)

TO BE CARRIED OUT: For information

SERVICE INFORMATION:

The information published in section 12 of the New Perkins 1000 Series Workshop manual, 9806/2140 has changed. New alignment bushes must be fitted in accordance with this Service Bulletin.

Note: Always use the engine identification number to order new parts, alignment bushes are not fitted to all engines.

The exhaust manifolds fitted to some four and six cylinder engines have large clearance holes for the setscrews. It is important that these manifolds are correctly fitted to the cylinder head.

Caution: Damage to the exhaust manifold can occur if it is not aligned and tightened correctly.

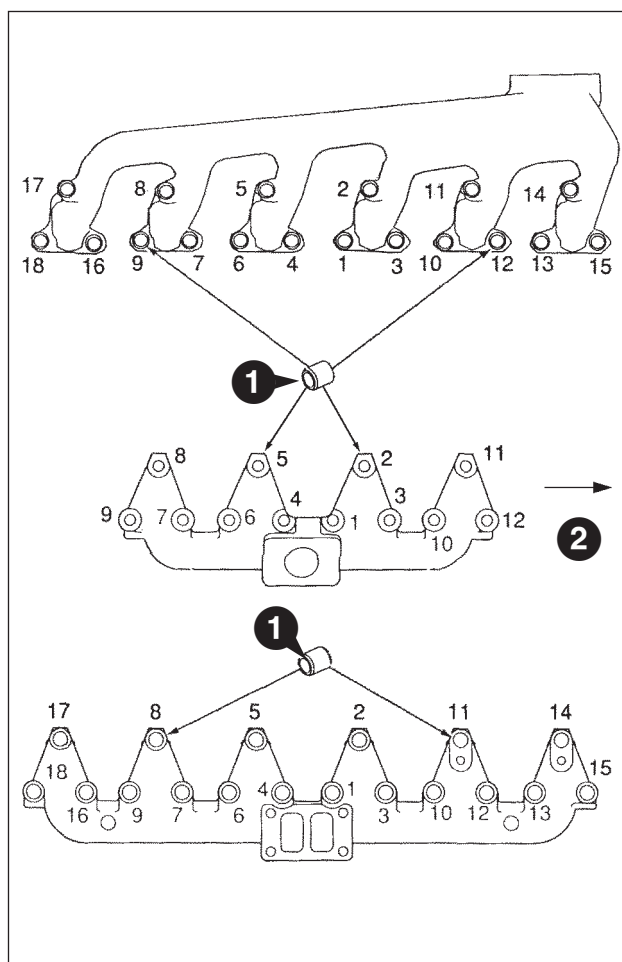
SERVICE PROCEDURE:

If the manifold is renewed, it is important that the two alignment bushes (1), JCB part number 02/201783 are in position. New alignment bushes are not necessary when the original manifold is removed and fitted.

Tighten the exhaust manifold setscrews evenly and gradually to 44 Nm (33 lbf ft, 4.5 kgf m) in the sequence shown). Use the same sequence and torque tighten the setscrews again.

The front of the engine is shown by the arrow (2).

Refer to Perkins or a Perkins dealer for Perkins part numbers or further information.



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Number	Gn024
(JCB Gen 089; K94/N.Am)	
Issue	1
Date	Jan. 1999

SUBJECT: Pin-timed Fuel Injection Pumps

Page 1 of 1

PRODUCTS AFFECTED: All Perkins New 1000 Series Engines (Models AJ to AS & YG to YK)

TO BE CARRIED OUT: For Information Only

SERVICE INFORMATION:

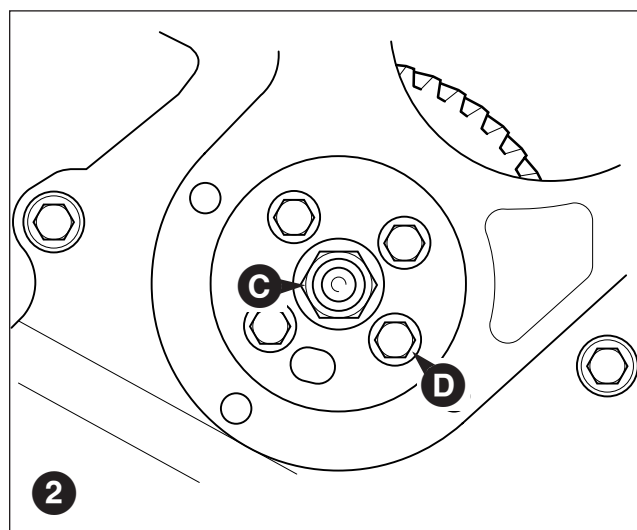
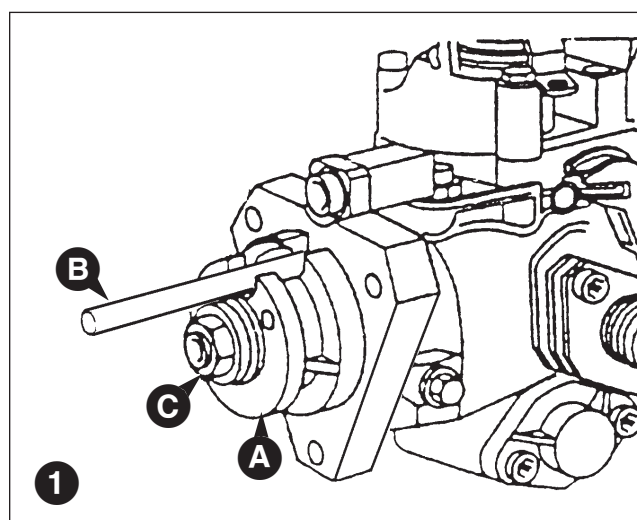
The latest fuel injection pumps have a hub **A** which is **mounted permanently** onto the drive shaft.

The manufacturer fits the hub to the pump to ensure very accurate timing. Engines that have this arrangement, require a pin **B** (part no. 892/00956) to accurately time the pump in service.

Caution: Do not release the nut **C** from the fuel injection pump. Illustration 2 shows the nut **C** in position when the fuel pump is fitted to the engine. The fuel pump hub is fitted to the shaft in the factory to ensure that the fuel pump is in the correct position for timing. If the nut is removed and the hub moves, the hub will need to be accurately fitted to the pump by use of specialist equipment before the pump can be fitted to the engine.

Always refer to the relevant workshop manual (publication no. 9806/2140) for the correct procedure before you start to work on the engine.

To remove the fuel injection pump from the engine it is only necessary to remove the four setscrews **D** which secure the fuel pump gear to the hub. It is important to follow the instructions in the workshop manual to ensure the engine timing is correct.



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Number	Gn025
(JCB Gen 090; K95/N.Am)	
Issue	1
Date	January 1999

Page 1 of 3

All Perkins 1000 Series Engines Models YA to YK

Introduction of an improved Oil Cooler with a Pressed Steel Cover

An improved oil cooler with a pressed steel cover has been introduced with effect from engine serial number YB-----U647452C.

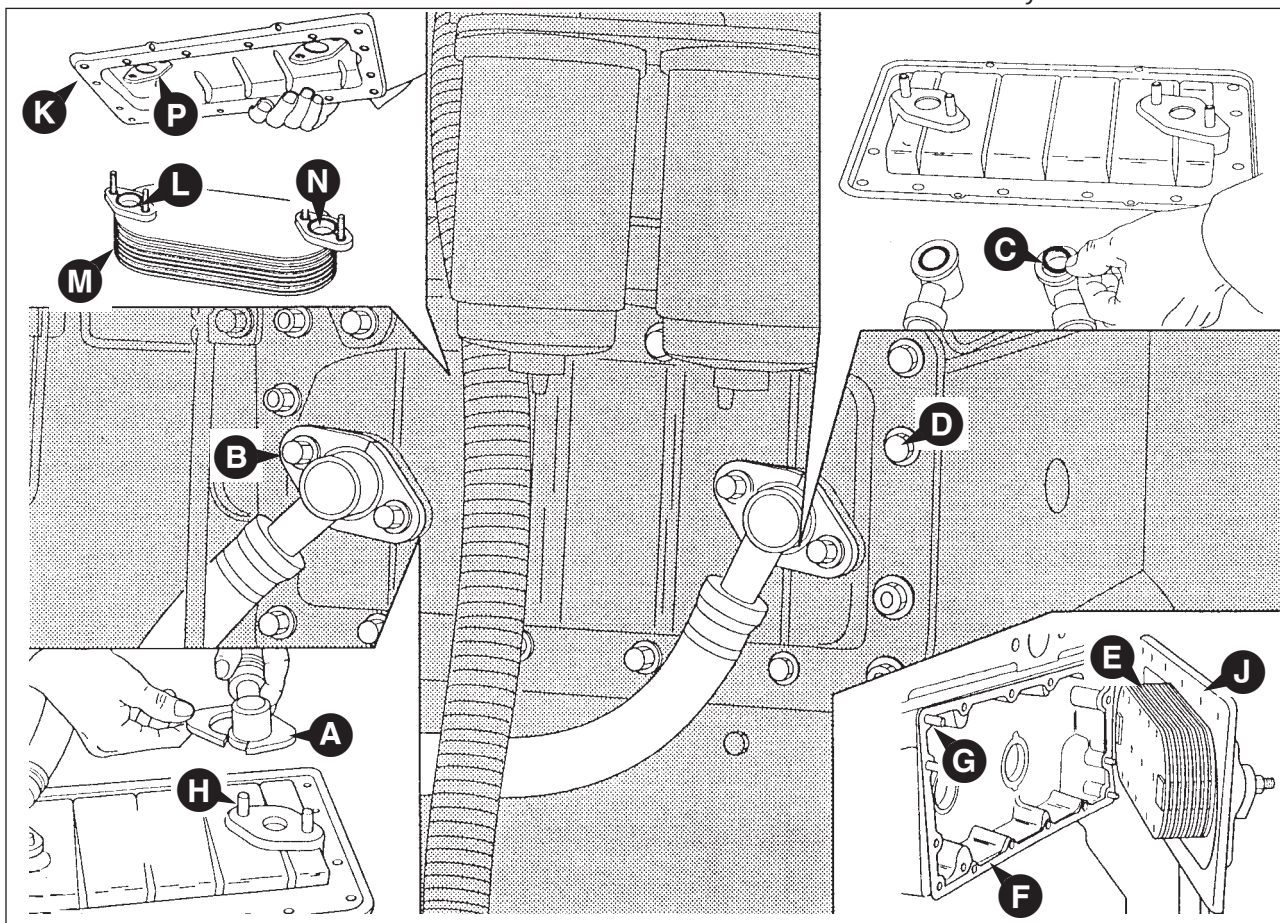
To Remove

- 1 Drain the cooling system; refer to the relevant service manual.

Warning! The engine oil may be hot. Allow the engine to cool down before the oil pipes are released.

Caution! Do not remove both of the oil pipes together.

- 2 Put a drip tray under the cooler and remove the lubricating oil pipes from the oil cooler. Do not remove both of the oil pipes together. Remove one of the pipes, then fit the flanges **A** and nuts **B** onto the studs again before the other pipe is removed. This will ensure that the element is fastened to the cover when the assembly is removed.



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- 3 Discard the 'O' rings **C**.
- 4 Release the fasteners **D** from the cover of the oil cooler and remove the oil cooler assembly **E**.
- 5 Thoroughly clean the flange face of the cover and of the cylinder block.

Note: A liquid joint is used in the factory. This must be removed and a new paper joint **F**, JCB part number 02/201718, fitted in its place.

- 6 If an overhaul of the oil cooler is necessary, see **To Dismantle** and **To Assemble** on pages 2 and 3 of this bulletin.

To Fit

- 1 If the four studs **G** have been removed from the cylinder block flange and are to be fitted again, clean the threads in the cylinder block and on the studs. Apply High Strength Retainer before the studs are fitted to the cylinder block to prevent leakage of the coolant.
- 2 Put a new paper joint into position on the studs; the joint is fitted dry. Fit the oil cooler assembly **E** to the cylinder block. Gradually and evenly tighten the fasteners **D** to 22 Nm (16 lbf ft, 2.2 kgf m).

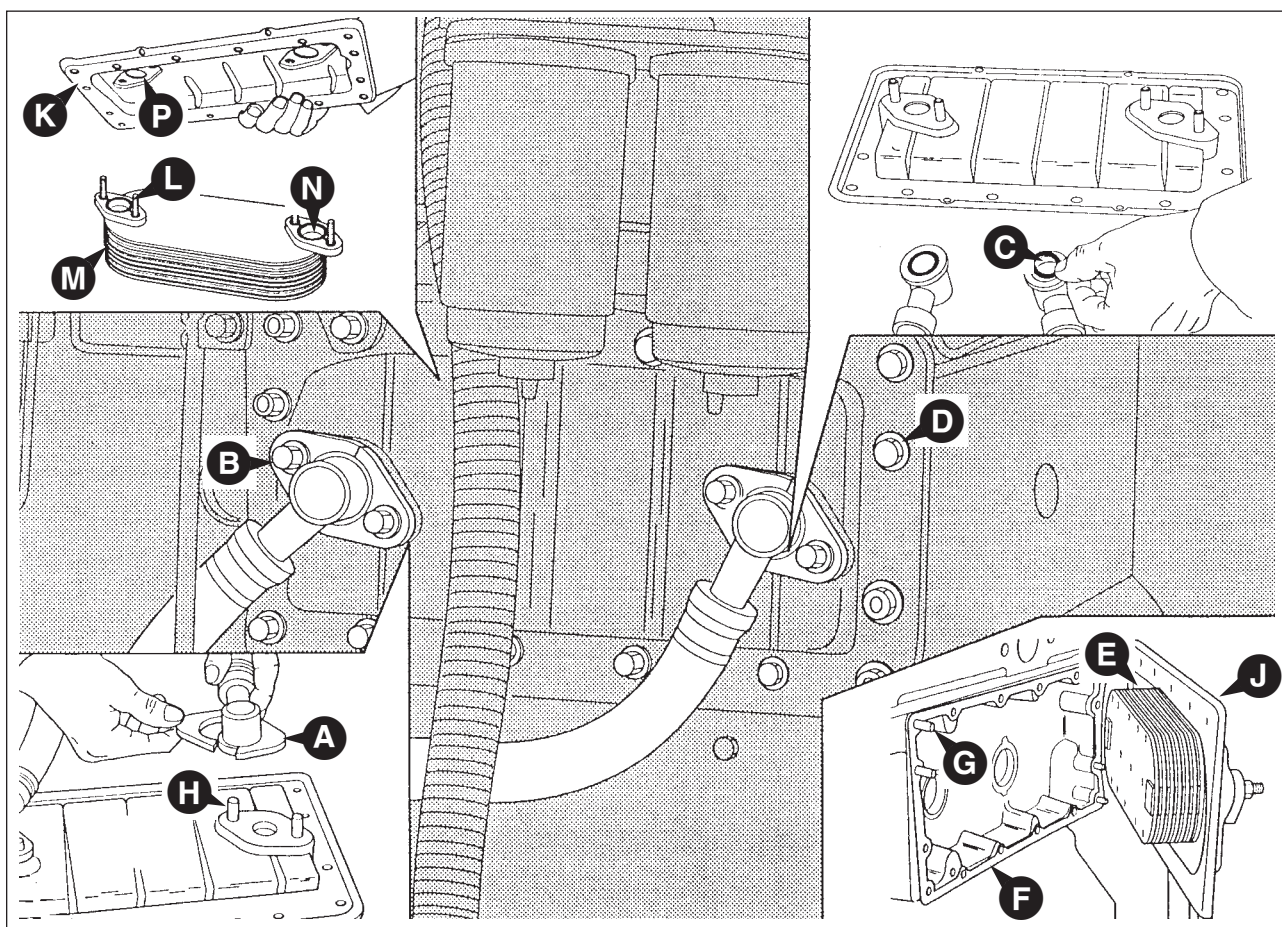
- 3 Clean the seats for the 'O' rings and renew the 'O' rings **C** of the pipe connections.

Caution! Do not remove the flanges **A** and nuts **B** from the studs **H** before one of the oil pipes is fitted to the cover. This will ensure that the element is held in position on the cover **J** while the oil pipes are fitted.

- 4 Fit the oil pipes to the cooler and tighten the nuts to 22 Nm (16 lbf ft, 2.2 kgf m).
- 5 Fill the cooling system.
- 6 Operate the engine and check for oil or coolant leakage.

To Dismantle

- 1 Remove the oil cooler from the cylinder block, refer to page 1 of this bulletin.
- 2 Put the oil cooler assembly **E** on a clean work surface. Release the four nuts **B** that retain the flanges for the lubricating oil pipes. The pipe flanges **A** are in two pieces.
- 3 Remove the cover **K** from the four studs **L** of the oil cooler element **M**.



- 4 Remove and discard the three-piece 'O' ring **N** from the element.

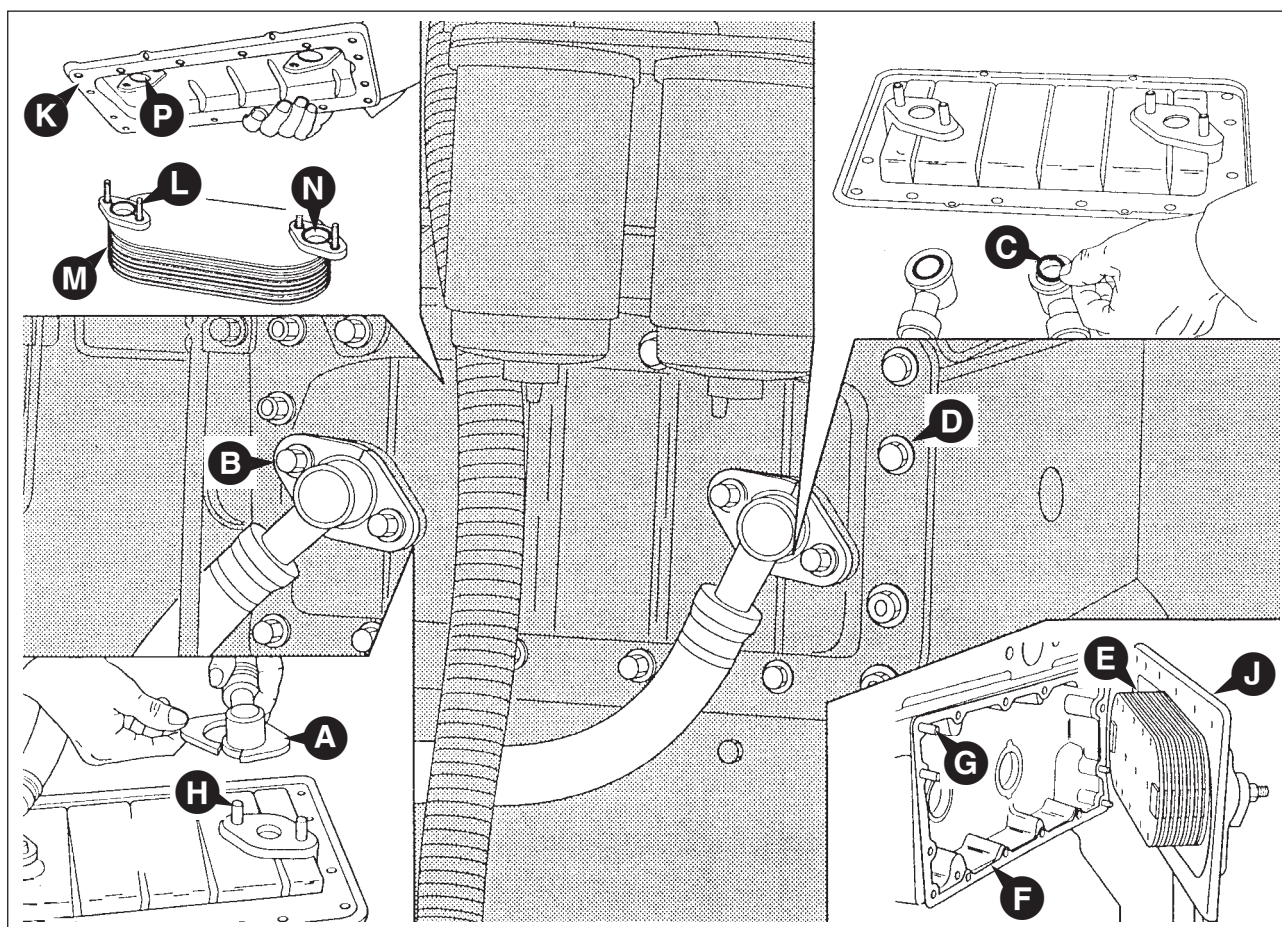
Warning! Do not allow compressed air to contact your skin. If compressed air enters your skin, obtain medical help immediately.

- 5 Clean the element and check for cracks. If a solution is used to clean the outside of the element, ensure that this does not enter the element. Check that there is nothing to restrict the flow of lubricating oil through the element of the oil cooler. If the inside of the element needs to be cleaned, use a solvent which is suitable for copper. Dry the element with low pressure air and then flush it with clean engine lubricating oil.

To Assemble

- 1 Clean the seats of the three-piece 'O' ring and renew the 'O' rings **N**.
- 2 Clean the flange face **P** for the three-piece 'O' rings on the inside of the cover.
- 3 Fit the cover of the oil cooler to the element **M**.

- 4 Fit the two-piece flanges **A** onto the studs **H**. Tighten the nuts to retain the element when the oil cooler assembly is fitted to the engine.
- 5 Fit the oil cooler to the cylinder block, see page 2 of this bulletin.



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Number	Gn026
(JCB Gen 091; K96/N.Am)	
Issue	1
Date	February 1999

Perkins 4.236 or 1000 Series Engines

Page 1 of 1

Introduction of a Wear Sleeve for the Front Oil Seal

The latest timing case fitted to 4.236 and 1000 Series engines, does not have a service position for the front oil seal, as shown in section 15 of the relevant workshop manual.

The change improves the efficiency of the oil seal in service and was introduced from engine number:

L-----U786357C for 4.236 engines.

A-----U802612C for 4 cylinder 1000 series.

Caution: If the lip of the oil seal has worn a groove in the spigot **A** of the crankshaft pulley, oil will continue to leak after the new oil seal is fitted.

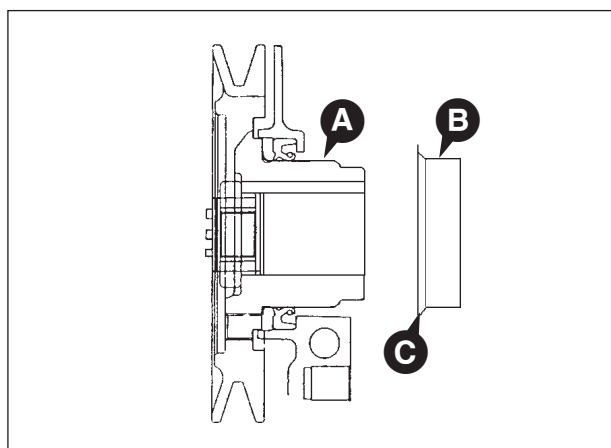
To renew a worn crankshaft pulley, for engines with the latest timing case, a wear sleeve **B** part number 02/202027 is fitted over the spigot.

Full instructions and a special tool to fit the wear sleeve are in each service kit.

The dimension to press the new oil seal into the timing case, with or without a wear sleeve fitted, is 9.3 mm (0.366 in), from the front face of the timing case. The special tool supplied in the kit can be used to set the correct depth.

It is not necessary to remove the flange **C** of the wear sleeve after it has been fitted.

A new front oil seal must be used when a wear sleeve is fitted.



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Number	Gn027
(JCB Gen 092; K97/N.Am)	
Issue	1
Date	February 1999

New Perkins 1000 Series Engines (Models AJ to AS & YG TO YK)

Page 1 of 1

Washers for the Fuel Injection Pump Gear

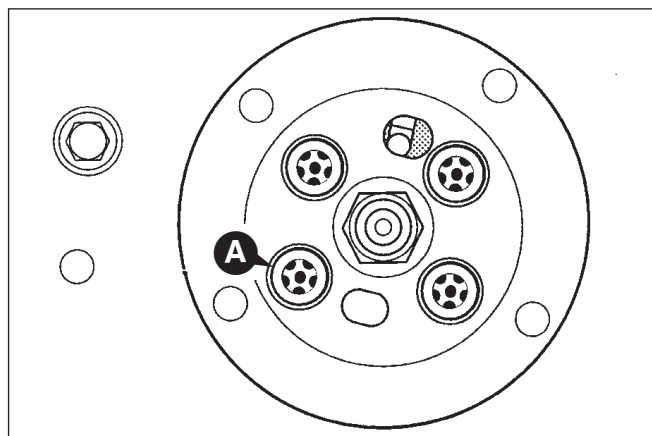
Caution: Ensure that the washers are fitted before the screws are tightened.

A washer, part number 02/101686, is fitted to each of the screws **A** with effect from the following engine serial numbers:

A----U812611C for 4 cylinder engines

Y----U660846C for 6 cylinder engines

Engines before the above numbers do not need to have these washers fitted.



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Number	Gn028
(JCB Gen 093; K98/N.Am)	
Issue	1
Date	February 1999

New Perkins 1000 Series Engines (Models AJ to AS & YG to YK)

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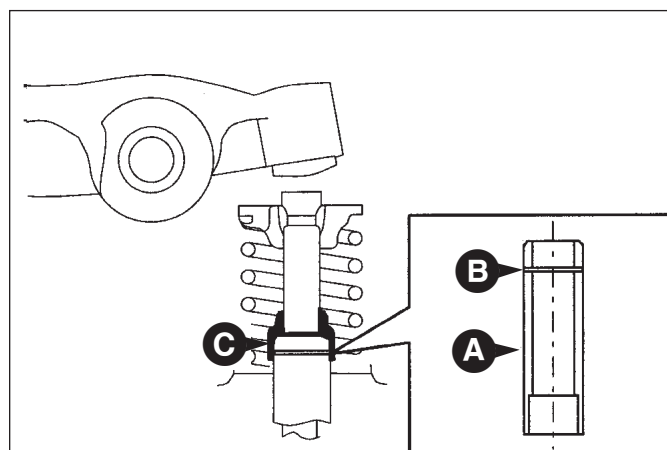
Improved Exhaust Valve Guide

An improved exhaust valve guide **A** has been introduced. The new guide has a groove **B** to retain the valve seal **C**.

To remove and fit the valve guides, refer to Section 12 of the Workshop Manual.

Notes:

- 1 Valve guides are supplied partially finished and must be reamed and the valve seats cut in one operation with a special tool. The valve seat and the guide are cut in one operation to ensure the concentricity of the valve seat to the valve guide. This will ensure a good seal between the valve and its seat. A new valve and new valve seat insert must be fitted each time a new valve guide is fitted. Refer to the Workshop Manual.
- 2 If all or most of the original valve guides need to be renewed, it may be cost effective to overhaul or exchange the cylinder head.
- 3 It is important that all the lubricant is removed from the outside diameter of inlet and exhaust valve guides before the valve seal is fitted.



Parts Information

Item	Part Number	Description	Supersedes
A	02/202064	Valve guide	02/201511 and 02/201817

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Number	Gn029
(JCB Gen 096; E194/N. Am)	
Issue	1
Date	March 1999

SUBJECT: ITL Hydraulic Hose Fittings and O-rings

Page 1 of 2

PRODUCTS AFFECTED: All ITL Products

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION

ITL products use their own type of special BSP hydraulic hose fitting. This fitting combines the standard BSP type coned connector with an O-ring seal **X** fitted in the face of the taper.

The O-ring is bonded to the fitting to ensure its security. However, if for any reason the O-ring becomes damaged or separated from the fitting, it can be replaced.

It is very important to use the correct O-ring size for the fitting. Any deviation in O-ring size or specification (eg. O-ring taken from a selection kit that appears to be the correct size and material) will cause joint integrity and leaking problems.

The correct O-rings **X** required for the various sizes of hydraulic fitting are shown below:

Hydraulic Fitting Size		O-ring Part Number	O-ring Inner Diameter (mm)	O-ring Section Diameter (mm)	Material Type
1/4"	BSP fitting	828/00237	6.5 (± 0.15)	1.0 (± 0.08)	A
3/8"	BSP fitting	2301/0006	8.1 (± 0.15)	1.6 (± 0.08)	A
1/2"	BSP fitting	2301/0010	12.1 (± 0.2)	1.6 (± 0.08)	A
5/8"	BSP fitting	2301/0011	13.1 (± 0.2)	1.6 (± 0.08)	A
3/4"	BSP fitting	2301/0015	17.1 (± 0.2)	1.6 (± 0.08)	A
1"	BSP fitting	2301/0018	22.1 (± 0.25)	1.6 (± 0.08)	A
1 1/4"	BSP fitting	2302/0907	29.1 (± 0.25)	1.6 (± 0.08)	B
1 1/2"	BSP fitting	2302/0908	35.1 (± 0.3)	1.6 (± 0.08)	B

Material Type:

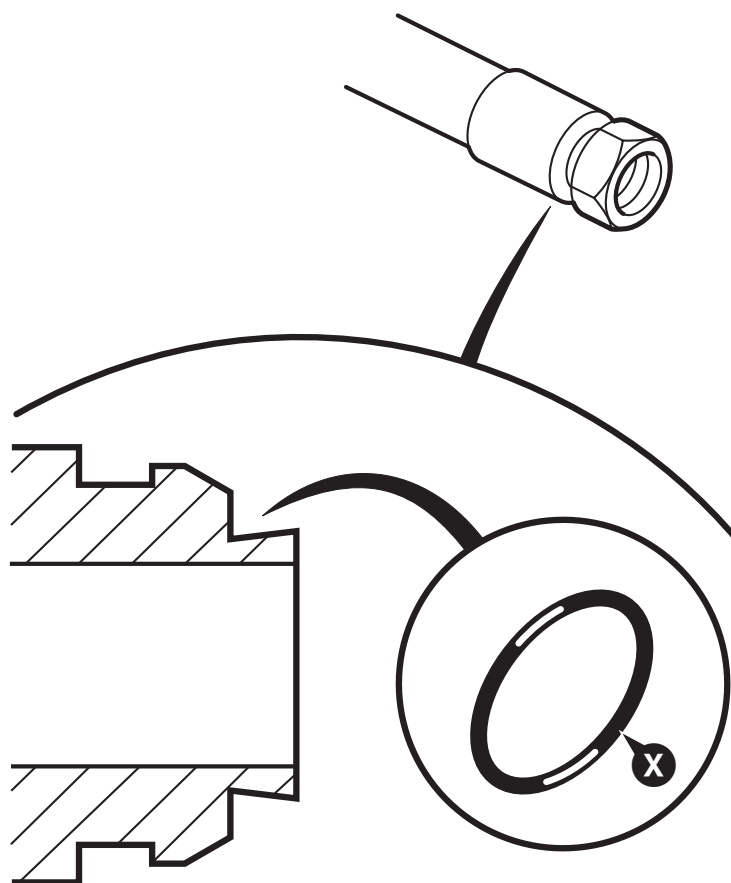
A - Nitrile synthetic rubber suitable for use between -40° and +135° Celsius with a hardness value of 80 IRHD.

B - Polyurethane material suitable for use between -40° and +130°Celsius with a Shore hardness value of 93A.

Ensure that only the above O-ring part numbers are used as replacements in ITL hydraulic hose fittings.

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WARRANTY INFORMATION

If submitting a warranty claim for rectification of a problem with a hydraulic fitting O-ring (eg. oil leak), ensure the correct O-ring part number is specified within the claim as the failed part. Incorrect O-ring part number claims will not be accepted.

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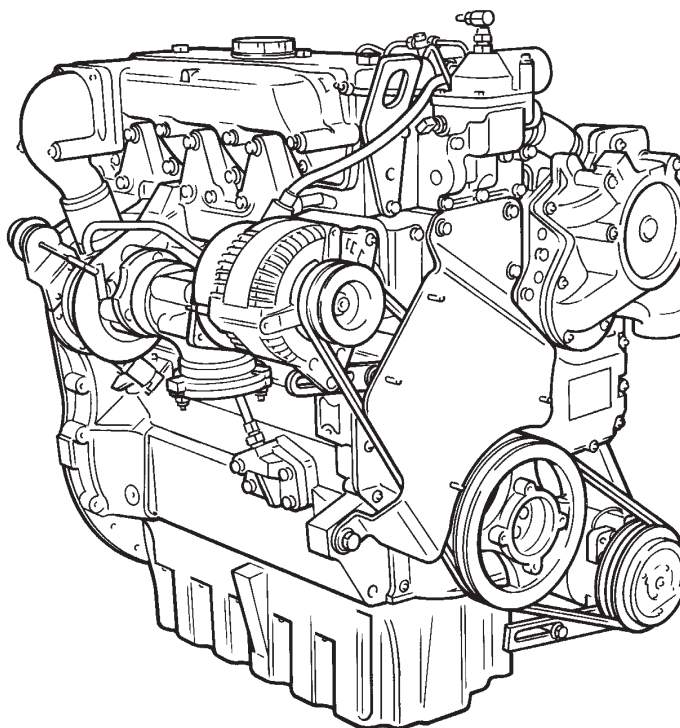
Number	Gn030
(JCB MI642/H)	
Issue	1
Date	April 1999

Page 1 of 3

PERKINS LOW EMISSION DIESEL ENGINE - ITL PRODUCT IMPROVEMENTS

New Perkins Diesel Engine

- Improved exhaust emissions
- Wastegated turbo charger
- Improved injection pump
- Increased peak torque
- Improved cold starting performance



THIS BULLETIN CONTAINS INFORMATION WHICH SHOULD BE COVERED DURING CUSTOMER MACHINE INSTALLATION AND SHOULD BE COPIED TO ALL MACHINE INSTALLATION PERSONNEL.

Please ensure a copy of this bulletin is distributed to field based service engineers and make sure that a copy is posted on your technical information notice boards.

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The Perkins low emission diesel engine has been introduced for all Powertrains with turbo-charged engines sold in the EEC after 1st January 1999, and for all Powertrains with naturally aspirated engines sold in the EEC after 1st April 1999. These dates apply to the engine build date and not the machine build date.

The engines comply with mandatory emission legislation and incorporate the following changes:

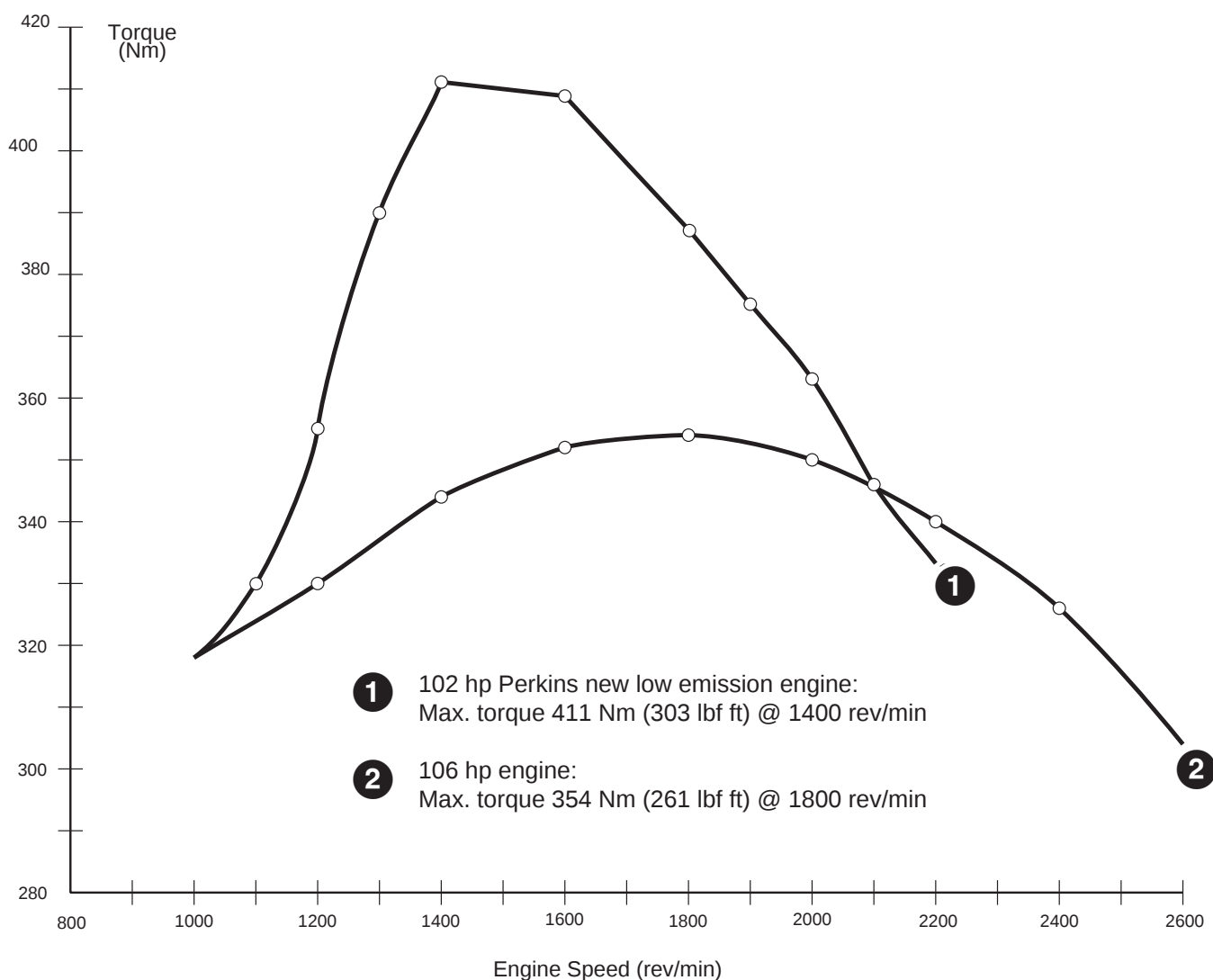
- Revised cylinder head
- Four branch inlet and exhaust manifolds
- Revised piston design with modified combustion chamber
- Wastegated turbo charger
- Improved fuel injection pump
- Increased compression ratio

The previous 75 hp (56 kW) engine is now updated to 80 hp (59 kW) and develops 290 Nm (214 lbf ft) peak torque.

The previous 106 hp (79 kW) engine is replaced by a 100 hp (74 kW) turbo charged engine which develops 402 Nm (296 lbf ft) peak torque.

Torque Comparison

The comparison shows the increased back-up torque at lower engine speed produced by the new low emission engine. Peak torque is increased up to a possible 411 Nm (lbf ft) from 354 Nm (261 lbf ft) depending on air filter and exhaust silencer specification.



1 Engine Specifications

	Nat. Asp. Build	Turbo Build
Horsepower:	80hp	102hp
Injection pump type:	DP203	DP203
Governing:	Mechanical	Mechanical
Pump setting code:	2644G521/YG/1/2350	2644C705/BG/1/2350
Static timing:	Pre-set	Pre-set
Idle speed:	800 rpm	800 rpm
Max. rated speed:	2200 rpm	2200 rpm
Max. no-load speed:	2350 rpm	2350 rpm
Injector codes:	KW	KN
Injector setting pressure:	294 atm	294 atm

Note: Either 65A or 85A alternators may be fitted (refer to ITL Technical Sales).

2 Regulations

The new engines meet EEC Stage 1 emission regulations. Smoke emission is dramatically reduced and now meets ECE R24.03.

3 Servicing

Routine engine service intervals remain unchanged at initial 100 hour and 500 hour periods. Valve clearance must be checked every 1000 hours. There is no change to the engine oil or fuel filter part numbers. Only use oil meeting or exceeding CF4/SG specification for the low emission engine. The fuel injector pump is significantly more sophisticated and because the emissions are reduced by increasing the accuracy of the timing, alterations to the fuel pump are not possible. Any alteration to the fuel pump settings will invalidate the emission certification.

4 Starting

Cold start performance has been improved. This is achieved via an additional temperature switch situated in the rear of the timing case which causes fuel injection timing to advance in cold conditions. In line with these cold start improvements, the diameter of the battery leads has been increased.

5 Special Tool Requirement

All essential special tool requirements are incorporated into the relevant Perkins engine service manuals.

6 Technical Publications

With the introduction of the new low emission range of engines, a new engine workshop manual is available from the organisation using the following publication numbers:

	English	French	German	Spanish	Italian
Engine Workshop Manual	9806/2140	9806/2141	9806/2142	9806/2143	9806/2144

7 Mandatory and Recommended Distributor Parts Lists

Contact Perkins Service for mandatory and recommended parts list requirements.

8 Training

Contact Perkins Service/Dealers.

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Number	Gn031
(JCB Gen 105; E215/N.Am)	
Issue	1
Date	Nov. 1999

SUBJECT: Hydraulic Ram Sealing Procedure

Page 1 of 3

PRODUCTS AFFECTED: All Machines with ITL Rams

TO BE CARRIED OUT: Information Only

SERVICE INFORMATION:

In an effort to reduce the number of hydraulic leaks on ITL rams a revised procedure has been introduced for fitting seals to the ram end cap and piston head.

The introduction of the new procedure also introduces new tools which are detailed on sheet 3.

Service Manuals will be revised at the next convenient Replacement Page Set.

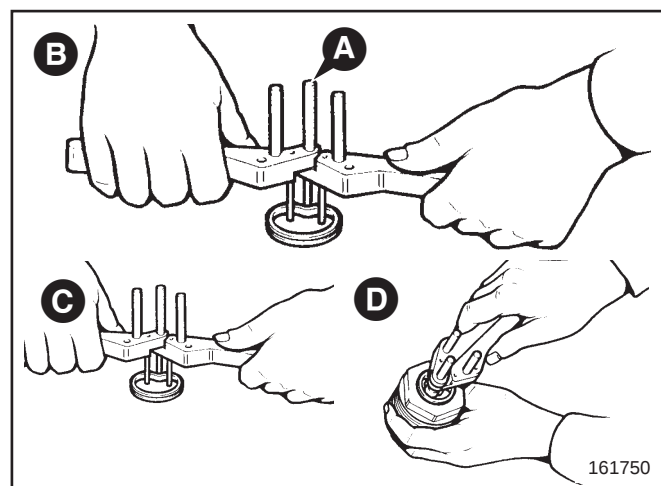
SERVICE PROCEDURE:

To fit new rod seal:

Use seal fitting tool (892/00334) to fit rod seals, the size (diameter) and position of pins **A** is determined by the diameter and radial width of the rod seal being fitted.

The pins are screwed into threaded holes in the tool body, the spacing of the holes is designed to suit small or large diameter rod seals.

- 1 Open the tool as shown at **B** and insert the new rod seal, the seal must be fitted behind the two front pins but in front of the rear pin as shown.



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Note: Later ram end caps and piston heads have metric threads. The seals are also different, make sure the correct seals are fitted. On metric threaded rams make sure the seals are fitted the correct way round, as shown at **P** and **Q**.

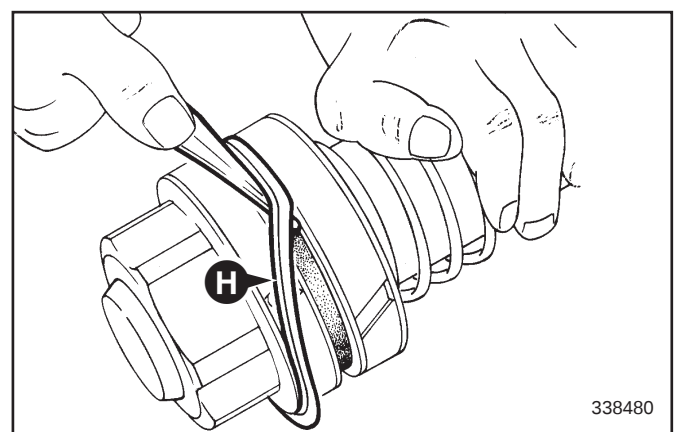
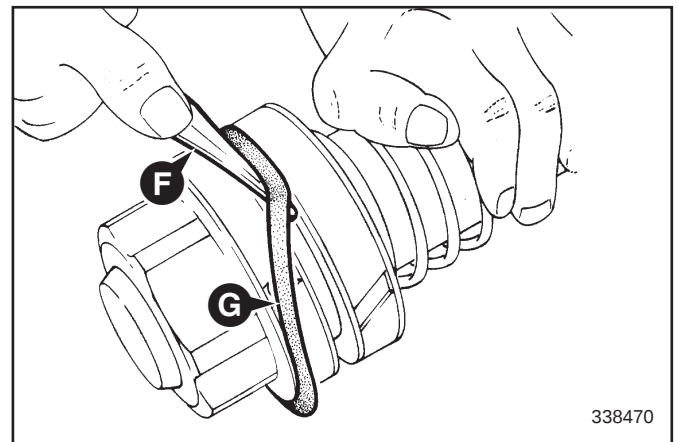
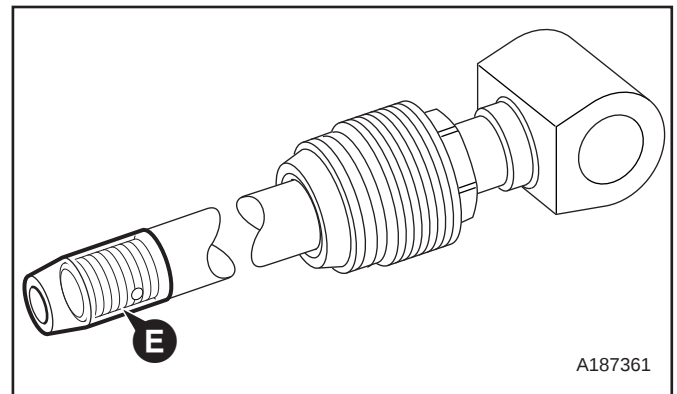
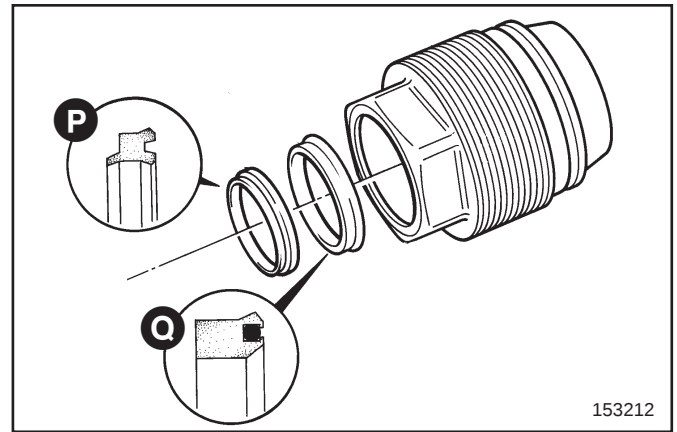
- 2 Close the tool as shown at **C**. The seal must form a reniform (kidney shape).
- 3 Before fitting the rod seals check the seal grooves are free of contamination and sharp edges,
- 4 Locate the seal in the end cap groove, shown at **D**, when the seal is in position, open the tool to release the seal. Make sure the seal is correctly installed in its groove and remove the tool.
- 5 Fit rod wiper seal **P** into seal groove. Make sure the seal is correctly installed as shown.

Note: Some rod wipers, ie power track rod, may use a metal encased seal which is pressed into the housing. Care must be taken to ensure the seal is square before it is pressed in.

Sleeve **E** must be used to protect the rod seals from damage when fitting end cap onto the piston rod. There are various sizes of sleeve, see Parts Information. Make sure the hexagon on the end cap is towards the eye end of the rod.

Fit new piston head seals:

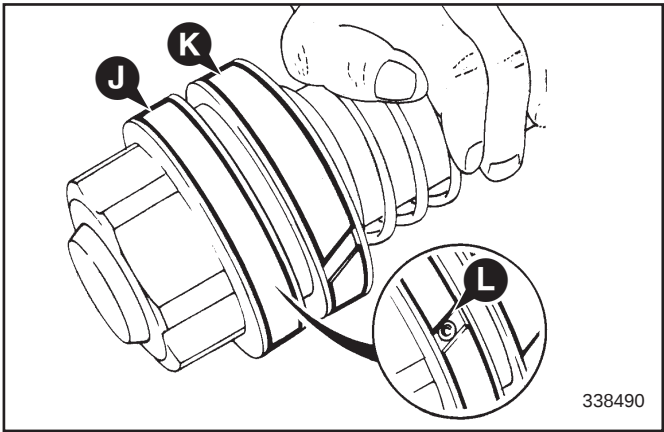
- 6 Use a blunt instrument (892/01027) shown at **F**, lever the inner seal **G** into the piston head seal groove, do not let the seal twist. There are identification marks on the outer diameter of the seal, make sure the marks are visible and the seal is free to rotate, if not remove the seal and refit
- 7 Fit outer seal **H** using the same procedure as step 6. Check the external grooves are visible.



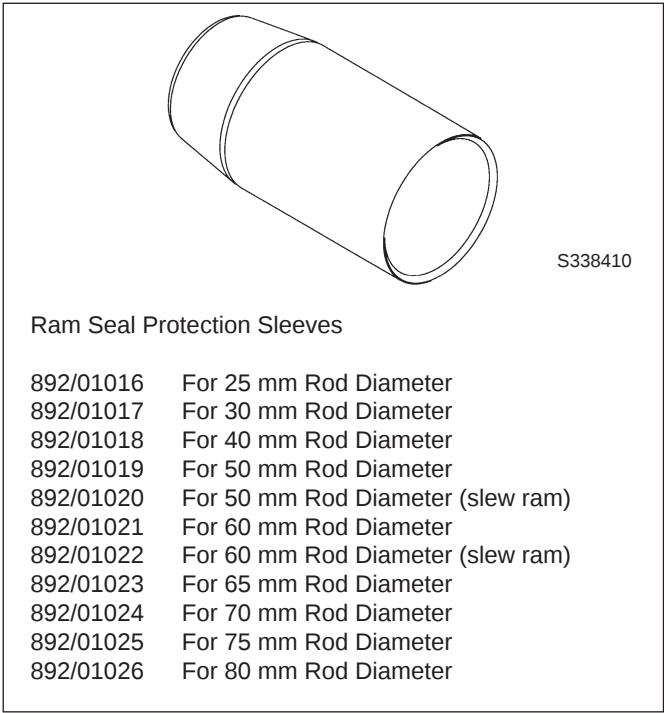
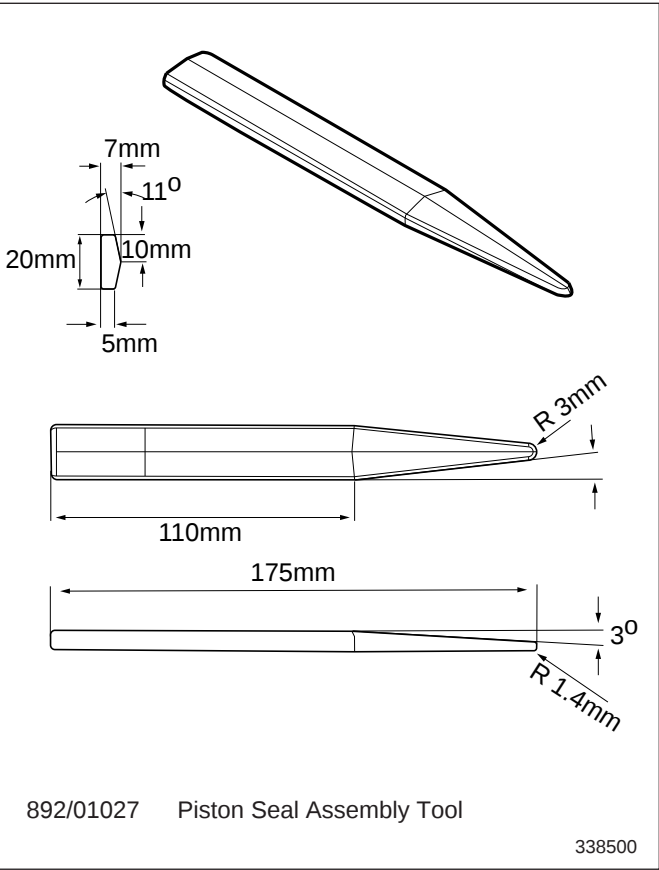
- 8 Ensure O ring is fitted into the internal seal groove on the piston head. Screw the piston head onto the thread of the piston rod, refer to the relevant section for torque figure and completion of ram assembly.
- 9 Fit the piston head retaining dowel, see ram dismantling and assembling relevant section.
- 10 Fit wear rings J and K. Rotate the wear rings so that the piston retention dowel is covered by the wear ring, NOT as shown at L.

Fit the piston rod and head assembly into the cylinder:

- 11 Insert the piston/rod assembly into the cylinder. Align the rod and head assembly until parallel with the cylinder then push the assembly into the cylinder.
- 12 Fit the end cap, refer to the relevant section for torque figure and completion of ram assembly.



PARTS INFORMATION



Ram Seal Protection Sleeves

892/01016	For 25 mm Rod Diameter
892/01017	For 30 mm Rod Diameter
892/01018	For 40 mm Rod Diameter
892/01019	For 50 mm Rod Diameter
892/01020	For 50 mm Rod Diameter (slew ram)
892/01021	For 60 mm Rod Diameter
892/01022	For 60 mm Rod Diameter (slew ram)
892/01023	For 65 mm Rod Diameter
892/01024	For 70 mm Rod Diameter
892/01025	For 75 mm Rod Diameter
892/01026	For 80 mm Rod Diameter

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Number	Gn032
(JCB Gen 110; K110 N/Am)	
Issue	1
Date	Jan. 2001

SUBJECT: Oil Control Rings

Page 1 of 1

PRODUCTS AFFECTED: 1000 series engine models AR & AS only

TO BE CARRIED OUT: For Information Only

SERVICE INFORMATION

A small taper has been added to the face of the oil control ring to reduce oil consumption during the early life of the engine. The ring is marked 'TOP' on the top face and a blue mark has been added to the left of the ring gap.

The oil control ring is a component of a ring kit (see part numbers listed below). The ring kit could be supplied with either the earlier or the later oil control ring.

SERVICE PROCEDURE

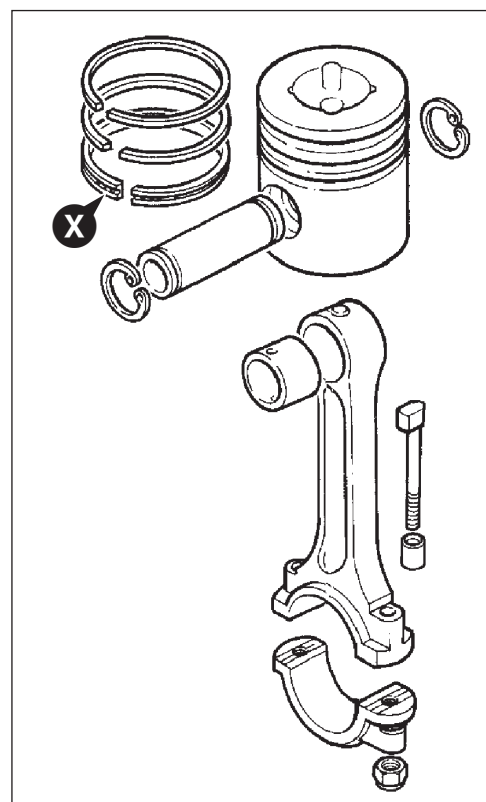
When fitting the oil control ring, check if there is a blue mark at **X**.

If there is a blue mark at **X**, the ring must be fitted with the mark to the left of the ring gap. The word 'TOP' will then be towards the top of the piston.

If there is no blue mark, the ring can be fitted either way up.

Ring Kit Part Numbers

Standard	02/201804
0.5 mm oversize	02/201791
1.0 mm oversize	02/201793



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Number	Gn033
(JCB Gen 112; K112 N.Am)	
Issue	1
Date	Jan. 2001

SUBJECT: Plastic Thermostat Housings

Page 1 of 1

PRODUCTS AFFECTED: All 1000 series engines

TO BE CARRIED OUT: For Information Only

SERVICE INFORMATION

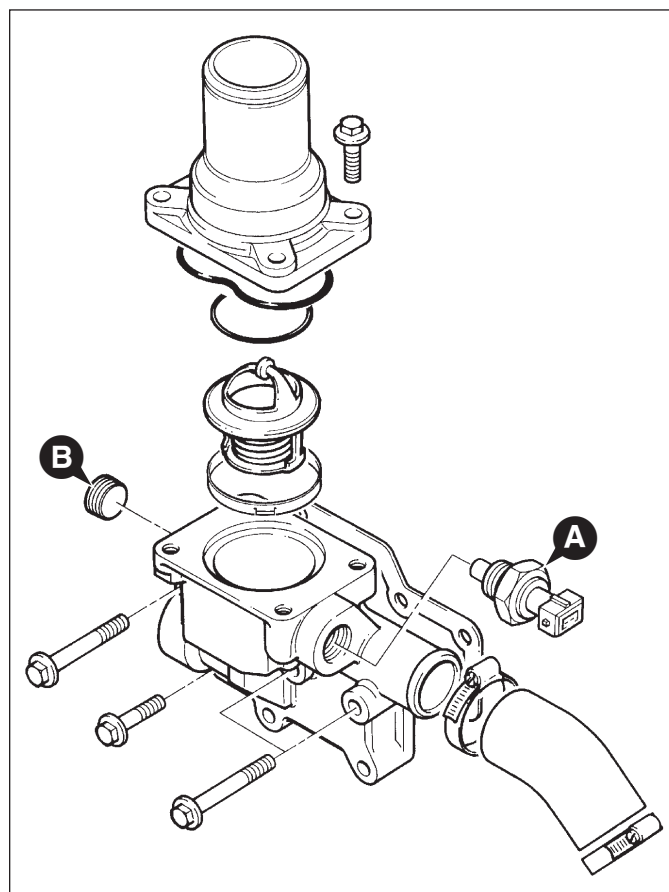
Plastic thermostat housings, fitted to some engines, will be damaged if temperature senders or blanking plugs are overtightened.

SERVICE PROCEDURE

When fitting the items listed, ensure that the following torque settings are used:

Item	Nm	kgf m	lbf ft
A - Sender (aluminium)	16	12	12
A - Sender (brass)	24	2.4	18
B - 1/2 inch Plug (metal or plastic)	4	0.4	3
B - 3/4 inch Plug (metal or plastic)	4	0.4	3

Note: The illustration shows a typical installation which may differ from some engines.



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Number	Gn034
(JCB Gen 114; K109/N. Am)	
Issue	1
Date	Feb. 2001

SUBJECT: Introduction of Improved Fuel Lift Pump

Page 1 of 2

PRODUCTS AFFECTED: All Perkins Four Cylinder 1000 Series Engines

TO BE CARRIED OUT: Information only

SERVICE INFORMATION:

An improved fuel lift pump has been introduced for use on Perkins four-cylinder 1000 Series diesel engines. The new pump is a one piece assembly and cannot be dismantled. The new pump is interchangeable with the earlier pump.

The procedure to remove and fit the new pump has not changed. Remove and clean fuel inlet strainer **2** if this procedure is recommended in the relevant machine handbook or service manual.

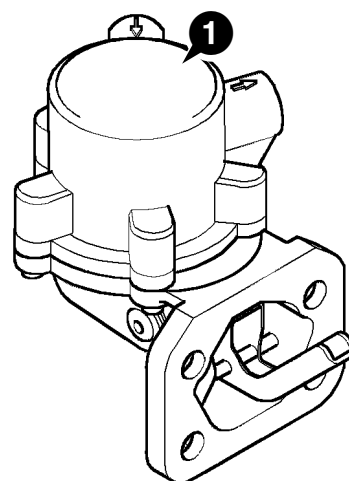
Cleaning the Strainer

- 1 Allow the engine to cool. Remove the fuel filler cap to vent the system and reduce loss of fuel. Disconnect the fuel inlet pipe to the lift pump.
- 2 Unscrew the fuel filter **A**. Remove strainer **2** and O-ring **3**.
- 3 Clean the strainer in clean diesel fluid and dry with low pressure compressed air. Renew the strainer and O-ring if damaged.
- 4 Fit the strainer into the fuel inlet connection. Fit the fuel filter **A** and tighten to 20Nm (15 lbf ft). Fit the fuel inlet pipe carefully to prevent damage to the strainer, and tighten the union nut.

IMPORTANT: The fuel strainer can be damaged and fuel flow can be restricted if the fuel pipe is inserted too far into the inlet connection. This should be checked if a fuel restriction is suspected.

Make sure the olive on the fuel inlet pipe is in good condition and forms an effective seal. Renew the olive or pipe if necessary to prevent air entering the fuel system.

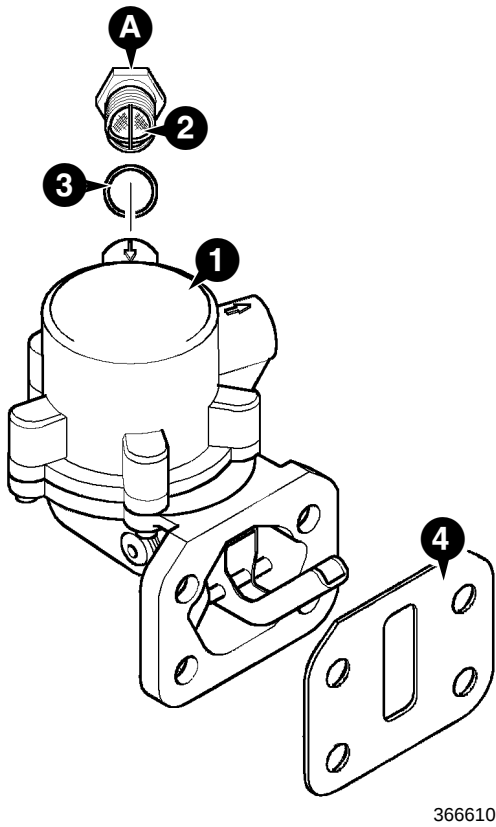
- 5 Fit the tank cap and prime the fuel system. Start the engine and check for fuel leakage.



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PARTS INFORMATION

Item	Part No.	Description
1	17/913600	Fuel Lift Pump Kit (complete with Gasket)
2 & 3	17/913601	Fuel Strainer & O-ring Kit
4	02/201189	Gasket only



366610

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Number	Gn035
(JCB 5/217; K119/N.Am.)	
Issue	1
Date	April 2001

SUBJECT: Coolant Pressure Cap

Page 1 of 1

PRODUCTS AFFECTED: All Perkins 1000 Series Engines

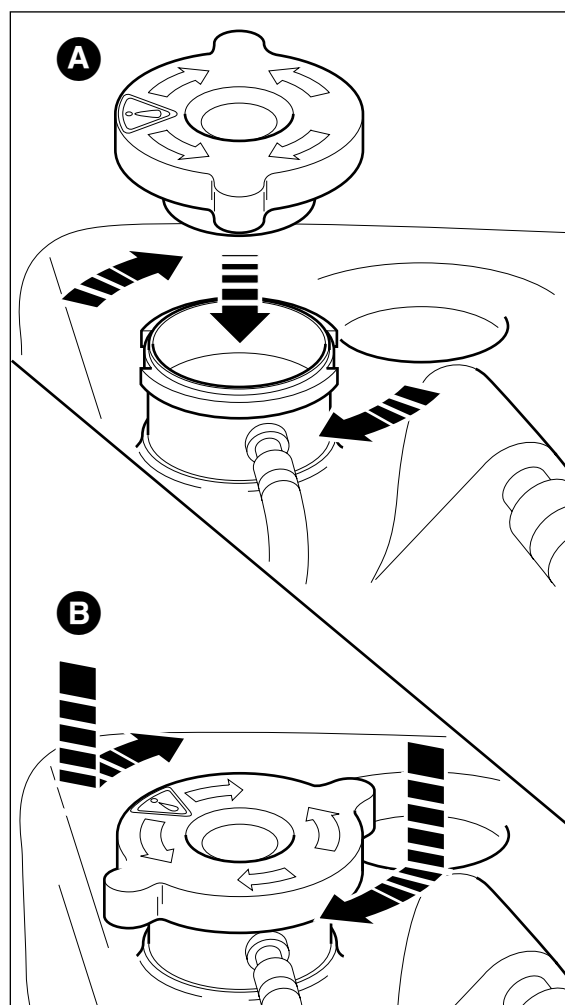
TO BE CARRIED OUT: Information Only

SERVICE INFORMATION:

Some instances of overheating have been reported which were caused by the engine coolant filler cap not being correctly fitted. This results in the coolant system failing to pressurise, so reducing its efficiency.

SERVICE PROCEDURE:

When fitting the filler cap, ensure that the cap is correctly fitted. Fit and turn the cap to the first notch, as shown at **A**, then PRESS DOWN and continue turning FULLY clockwise, as shown at **B**, until the end stop is met. Failure to do this will result in inefficient cooling and may result in injury when the cap is removed.



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Number	Gn036
(JCB Gen 120; K120N.Am.)	
Issue	1
Date	April 2001

SUBJECT: Engine Oil Consumption

Page 1 of 2

PRODUCTS AFFECTED: Perkins Low Emission Engines (AJ to AS and YG to YK)

TO BE CARRIED OUT: For Information Only

SERVICE INFORMATION:

Engine oil consumption can only be **correctly** measured as a percentage against fuel used under controlled conditions. If, after consideration of the observations below the oil consumption appears to exceed the expected amount, carry out the **Service Procedure** as detailed.

Oil consumption does not normally exceed 4.5 litres (1.0 UK gal., 1.19 US gal) per 100 hours average machine use.

No test should be carried out on new engines prior to the bedding in period, minimum of 100 hours.

Engines should not be idled for long periods and should be worked hard from new, (for example, engine speed should be above 1500 rev/min.).

Extended periods of idle and/or high speed roading will dramatically increase the hourly consumption rates.

Dust ingress via leaks in the air intake system, poor hose hoses, clips etc.

Incorrect servicing of air filters, ie. elements damaged during cleaning or use of non recommended elements.

Incorrect grade and quantity of oil, not as specified in the owners handbook.

SERVICE PROCEDURE:

Normal oil consumption after running in should be between 3 and 5 litres of oil per 1000 litres of fuel consumed (0.66 and 1.1 UK gal per 220 UK gal: 0.79 and 1.32 US gal per 264 US gal) OR 0.30 and 0.50% of fuel consumption.

- 1 Position the machine on level ground. Drain and refill with the correct grade and quantity of oil as specified in the owners handbook.
- 2 Allow time for the oil level to settle and check level on dipstick. If oil level is either above or below existing MAX mark, re-mark dipstick at this level.
- 3 Record the dimensions of any change to the MAX mark. Do not alter the MIN mark on the dipstick.

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Signed:

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Number (JCB TSDB 390)	Gn037
Issue	1
Date	May 2001

SUBJECT: **Rocker Cover**

Page 1 of 2

PRODUCTS AFFECTED: **Perkins AR, AJ, AK Low Emission 1000 Series 4-Cylinder Engines**

TO BE CARRIED OUT: **Only with Authorisation from ITL**

SERVICE INFORMATION

Reports have been received of excessive oil loss from the rocker cover breather tube. It should be noted that oil showing at the breather tube is a normal function caused by vapourised oil in the crank case escaping to atmosphere. However, for 'green' countries where strict limitations on oil emission are enforced, an improved rocker cover is now available from ITL. The new cover has an integral oil separator which greatly reduces the amount of oil showing at the breather tube.

SERVICE PROCEDURE (refer to fig on page 2):

- 1 Park the machine on firm level ground, engage the parking brake and set the transmission to neutral. Lower any attachments to the ground and stop the engine.
- 2 Gain access to the engine compartment, if necessary remove any ancillary equipment such as the exhaust stack, pre-cleaner, air filter etc.
- 3 Remove and discard the breather pipe (item **A**), remove the rocker cover cap nuts (item **B**) together with the steel washers (item **C**) and sealing washers (item **E**).
- 4 Remove the old rocker cover (item **F**) together with joint (item **H**).

IMPORTANT NOTE: When the rocker cover is fitted, the cap nuts are tightened onto the nuts of the rocker brackets. During removal of the cap nuts, it is possible to loosen the nuts of the rocker brackets. The nuts of the rocker brackets should be tightened to the correct torque every time the cover is removed.

- 5 Fit the new rocker cover with its new joint. Torque tighten cap nuts to 20 Nm; 15 lbf ft.
- 6 Fit new breather pipe (item **A**) to the breather assembly (item **J**) using new hose clip (item **K**).

PARTS REQUIRED

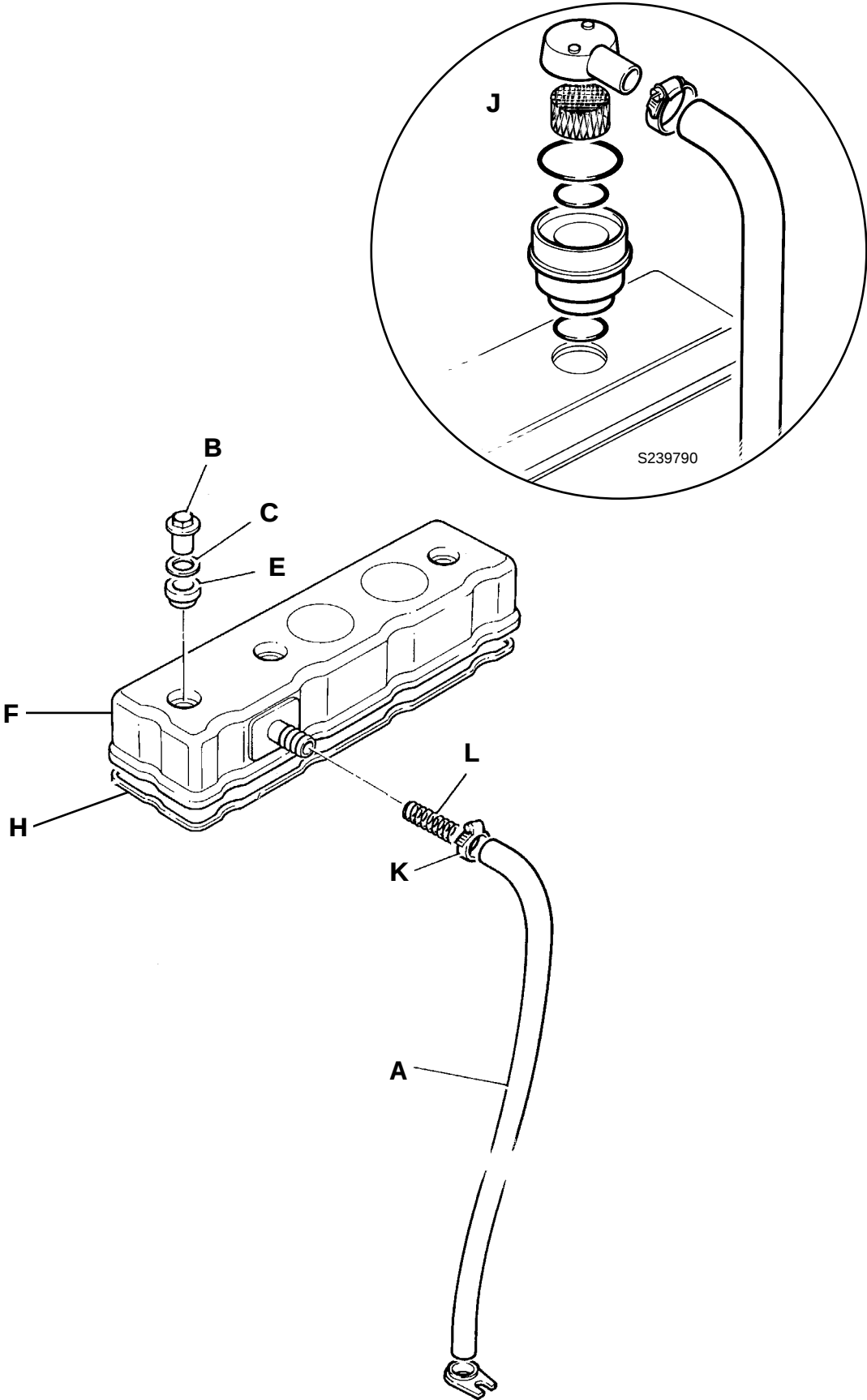
Item	Part Number	Description	Qty
A	02/201338	Hose	1
F	02/202220	Rocker Cover	1
J	02/202217	Breather	1
K	2201/0007	Clip	1

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WARRANTY INFORMATION

This improvement will not be considered for warranty





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Number	Gn038
Issue	1
Date	Jan 2002

SUBJECT: New ITL NAPSC Network

Page 1 of 2

Introduction of a new service and parts support network for International Transmissions Limited from February 17th 2002. All previous parts ordering through JCB Burlington, Canada and JCB Savannah USA will be discontinued, and new accounts for each OEM will be opened with ITL **NAPSC**.

ITL North American Product Support Center, PO Box 1000, Harrow, Ontario, NOR 1G0.

Services available to the OEM -

- 1) 1 866 734 8562 (1 866 73 ITL NA) toll free number, Fax 519 738 3477, or e-mail seltech@mnsi.net.
- 2) Parts supply availability and pricing information- Contact Colin Sellick (ext. 226).
- 3) Shipping out of Harrow, Ontario or USA address - PO Box 312547, Detroit MI 48231-2547.
- 4) Help ensuring correct parts needed are identified.
- 5) Technical support - contact Ron Peters (ext. 238).
- 6) All Warranty claims to be submitted on the normal ITL claim form, but to be sent to NAPSC address for the attention of Garth Doey. Claims will be loaded electronically onto the local database enabling the UK ITL service desk to view the claim simultaneously. Consequently, time to settlement of claims will be speeded up with target of 15 to 45 days max.
- 7) Parts discount level - ITL list less 30%. Emergency parts orders shipped next Business day 5% Surcharge. Critical/VD (vehicle down) orders placed before 3.00 p.m. (local NAPSC time), shipped with 7% premium. 40% discount on stock orders, minimum value £5,000.00 (excluding shipping costs). Orders limited to 2 stock orders per year and terms CIF at the OEM. Lead-time for stock orders despatch 6 weeks. Any type of shipping method can be specified and orders can be drop shipped to any address specified in North America.

Also Note the introduction of 3 New ITL **Principal Service Centers**

ITL PSC - California, Texas and Michigan.

Approved for ITL Warranty repair work.

Complete ITL component strip down, repair and test facilities available.

Remanufactured units

Competent to carry out repairs from the end user, subject to OEM approval.

Principal Service Centers

Leaman Equipment Co.

16550 Railroad Ave. (L)

Morgan Hill CA 95037 Tel 408 778 9677 Fax 408 778 9646

CIA Machinery INC

3199 West Daniieldale St

Lancaster, TX 75134

Tel 972 224 5501 or 800 527 6406

Fax 972 224 8204

continued

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Great Lakes Power Products
2006 Tobsal Court
Warren, MI 48091

Tel 810 759 5500

Fax 810 759 0879

ITL Service Centers

Centers throughout USA and Canada. In the event of repair work needed contact ITL Service Department (Keith Bridges) in UK (Tel 01144 1978 666513).

- 1) Approved for ITL Warranty work
- 2) Provide Support for OEM vehicle repairs.
- 3) Competent to carry out repairs, for the end user, subject to ITL, and OEM approval.

OEM's capable of carrying out repairs through their own dealership, should continue to operate as normal. They may find the ITL Principal Service Centers particularly useful in those cases where expert internal repairs are required.

OEM's, with or without their own dealer back up, can take full advantage of the ITL Service Centers. **However, before initially approaching a Service Center, we ask that our Service Department be contacted first** in order that ITL can give the OEM or your customer an introduction and help ensure that the Service Centers are fully aware of any special instructions or needs you may have.

In any event of warranty being requested of a Service Center we ask that ITL authorize any work to be carried out.



TECHNICAL INFORMATION



INDEX

General

⚠ SAFETY NOTICE - Instructions in the Service Bulletins assume that the engineer has a sound knowledge of safety procedures and has been trained in the maintenance and repair of ITL equipment. If you are unsure or do not understand information contained in the Service Bulletins then ask your supervisor for advice. Remember SAFETY MUST COME FIRST.

Number	Gn039
(JCB Gen 151)	
Issue	1
Date	Sep 2002

SUBJECT: Safety precautions when an engine is cleaned

Page 1 of 1

PRODUCTS AFFECTED: All Engines

TO BE CARRIED OUT: Information only

SERVICE INFORMATION:

Care should be taken when an engine is cleaned with the use of a high pressure hose.

Cautions:

- Do not wash an engine while it is running or it is hot. If cold cleaning fluids are applied to a hot engine, certain components on the engine could be damaged.
- Leave the engine to cool for at least one hour and disconnect battery connections before cleaning.
- Do not wash any part of the Fuel Injection Pump.
- Ensure that the alternator, starter motor and any other electrical components are shielded and not directly cleaned by high pressure hose.
- Do not wash the Electrical Shut-off Solenoid (ESOS) or any electrical components of the FIP when the engine is hot.

If these cautions are ignored, the engine or certain components could be damaged, fail to operate and also make the manufacturer's warranty invalid.

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