# GENERAL T.I. BULLETIN INDEX

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# TECHNICAL INFORMATION

General

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

**SUBJECT:** **Tappet Adjustment**



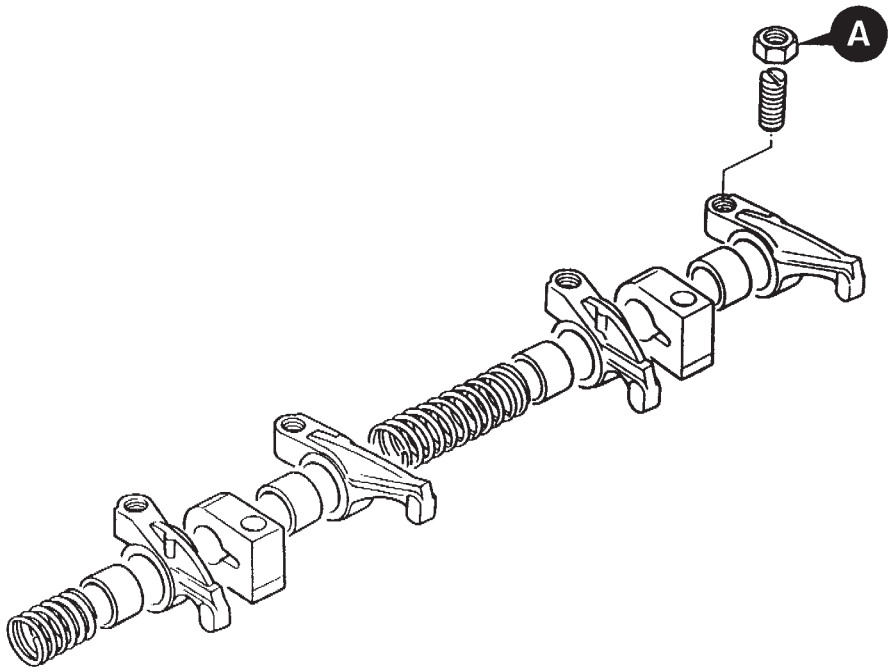
**PRODUCTS AFFECTED:** **All Perkins 1000 series Engines**

**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**



**PRODUCTS AFFECTED:** **All Perkins 1000 Series Engines**

**TO BE CARRIED OUT:** **Information Only**

**SERVICE INFORMATION:**

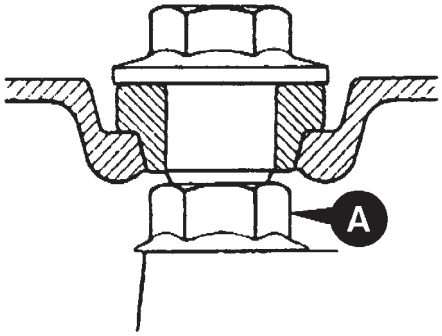
Introduction of new fasteners for the rocker assembly.

**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**



**PRODUCTS AFFECTED:** **All Perkins 1000 Series Engines**

**TO BE CARRIED OUT:** **Information Only**

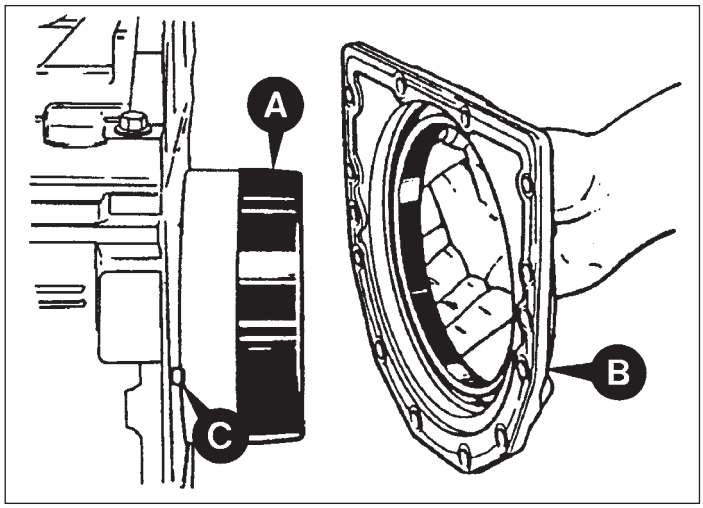
A number of reports by Perkins have been received concerning crankshaft rear main oil seal leaks. Little or no detail is completed in the comments section of the warranty claim form. Information given in the comments section will enable Perkins to identify the exact fault and take the correct remedial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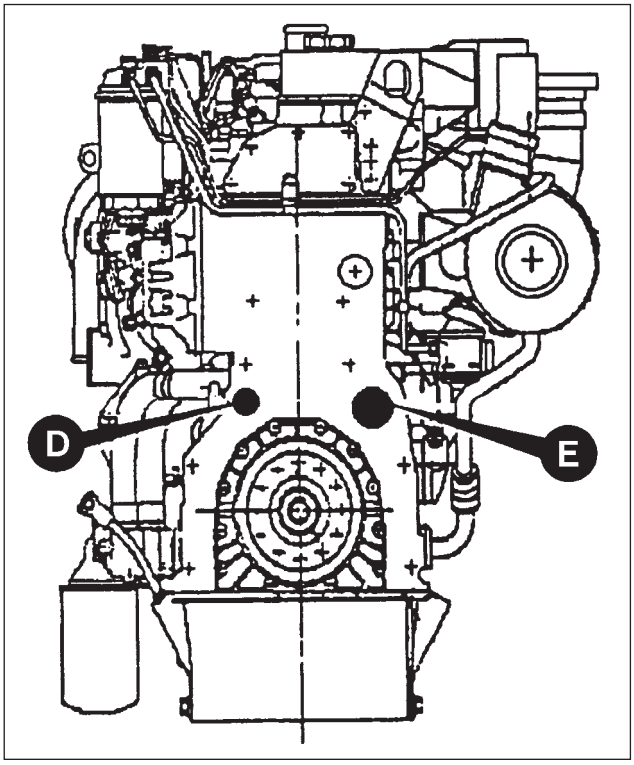
**OIL LEAKAGE FROM REAR OF ENGINE**

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

1.3 Removethe 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)

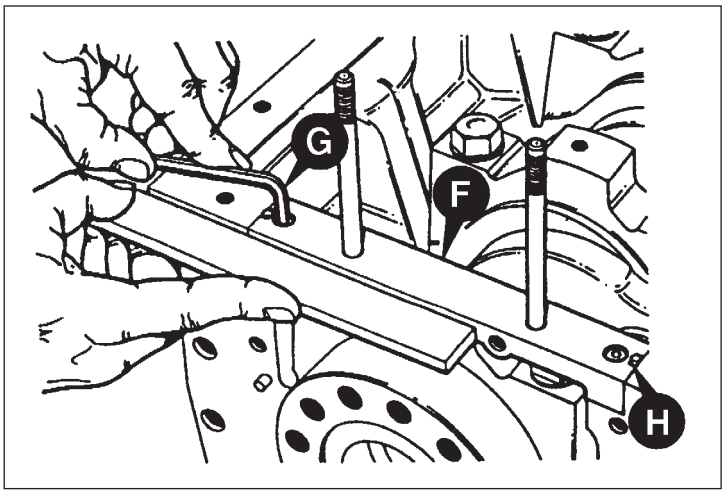
2.8 Refit flywheel using guide studs and torque retaining bolts to 105 Nm (77 lbf ft).

**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 trom 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**

**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**

1 To assist in the correct diagnosis of general faults, please refer to the attached fault finding charts.

2 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):

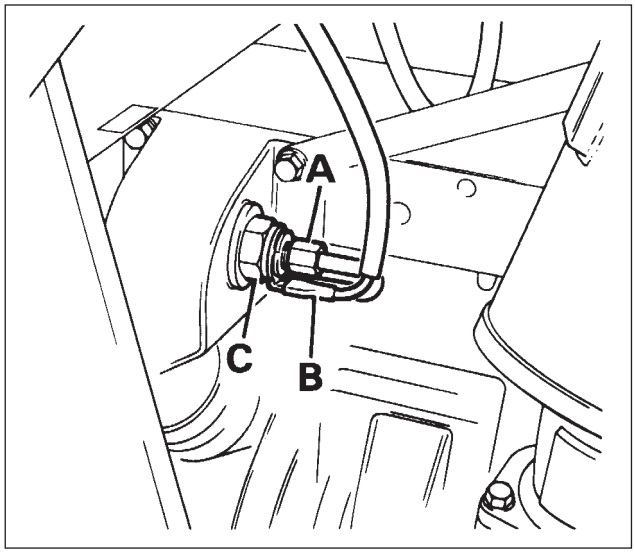
2.1 How to check the fuelled starting aid

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, 1 1 ,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, 1 1, 13, 14, 15, 1 7, 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, dirly 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**



**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 Hiqh 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**



**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**



**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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# TECHNICAL INFORMATION

General

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



**SUBJECT:** **Alternator Connectors on the Mainframe Harness**

**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.

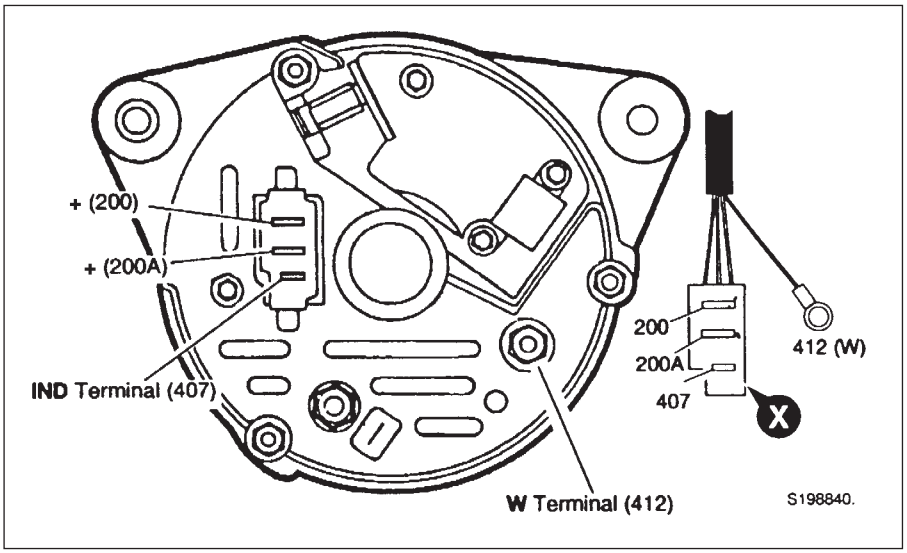


**FIG 1**

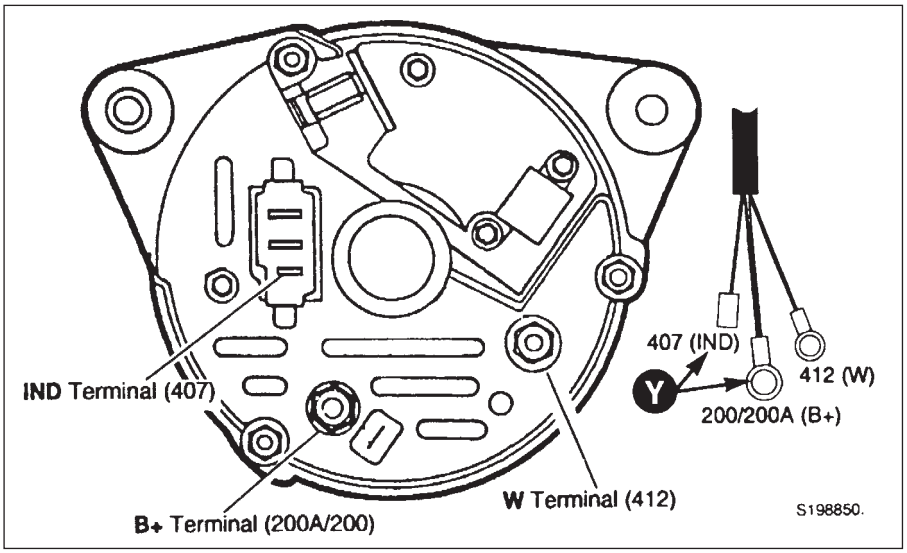


**FIG 2**



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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**

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

**SUBJECT:** **Brake Master Cylinder Kits**



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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General

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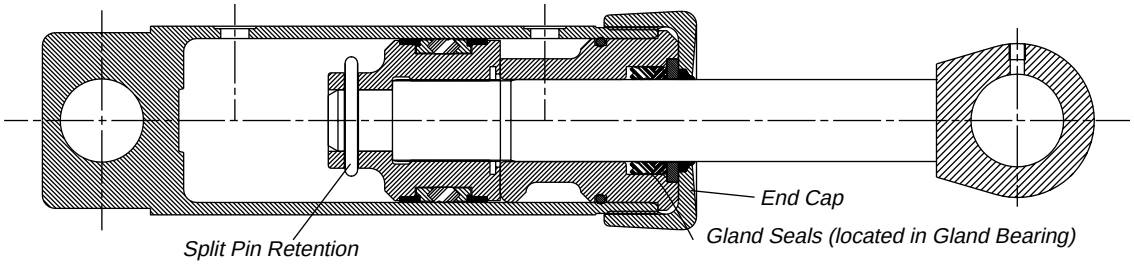
| | |
|---|---|
| **Number** | **Gn011** |
| **(JCB MI452/H,423/E;E114N.Am)** | |
| **Issue** | **1** |
| **Date** | **June 1994** |

**SUBJECT:** **Hydraulic Ram Identification**

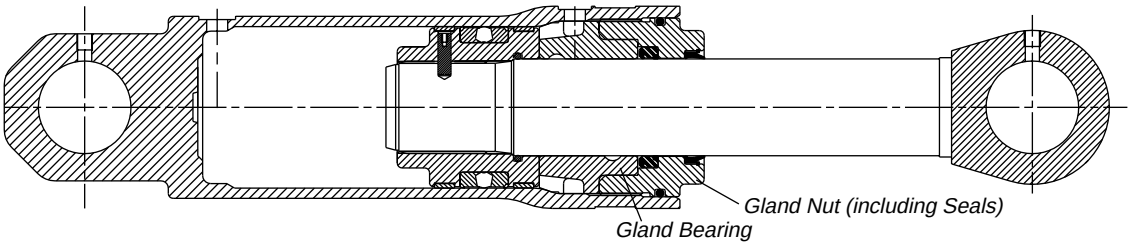


Over the last twenty years JCB has made a number of design and manufacturing improvements to hydraulic rams. Some difficulty is being experienced identifying the various rams for parts ordering purposes. The following illustrations show some different types of ram fitted to JCB machines. It is important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



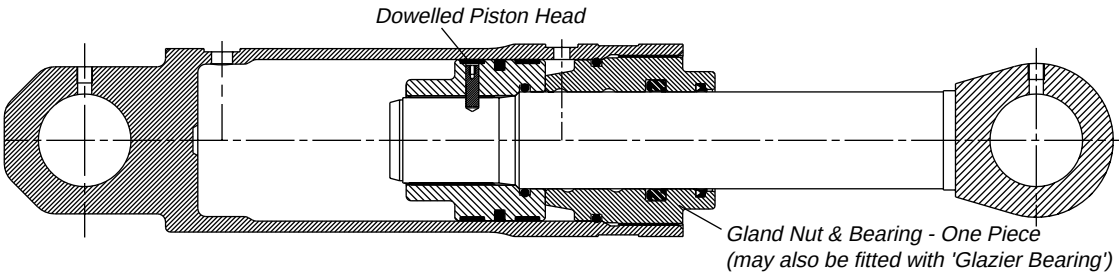

**IMPERIAL RAM**
4 in x 2 in.

1972 to 1979



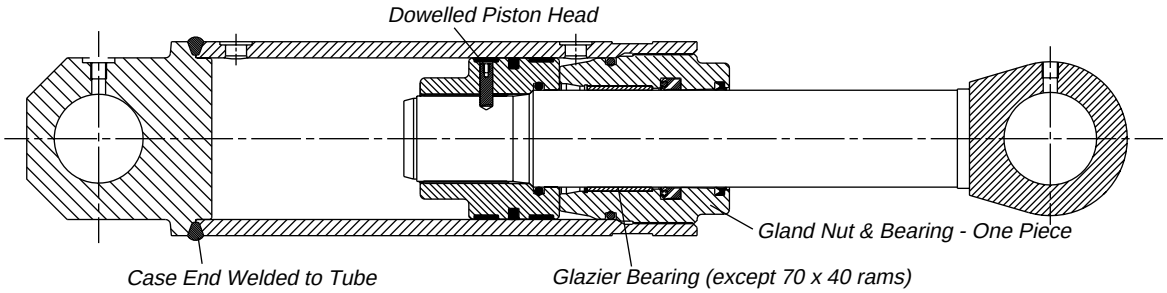

**UN SERIES RAM**
100 mm x 60 mm

Loctite Piston '80 - '87
Wire Clip Piston '87 - '90
Dowel Piston '90 - '92




**METRIC SERIES RAM**
100 mm x 60 mm

1992 to 1993




**METRIC FABRICATED RAM**
100 mm x 60 mm

Current (1994)

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



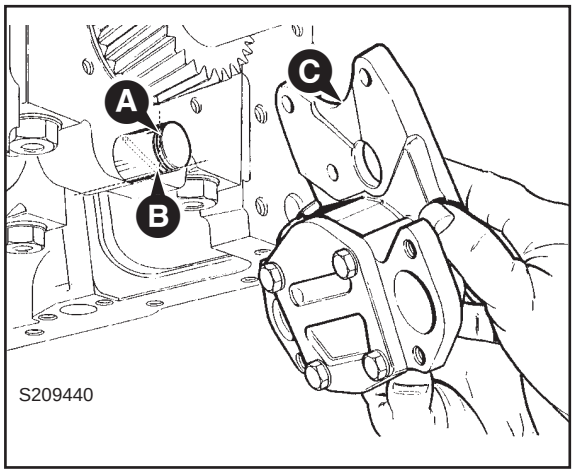
**SUBJECT:** **Oil Pump - Idler Gear**

**PRODUCTS AFFECTED:** **All Fitted with a Perkins 1000 Series Engine**

**TO BE CARRIED OUT:** **As Required**

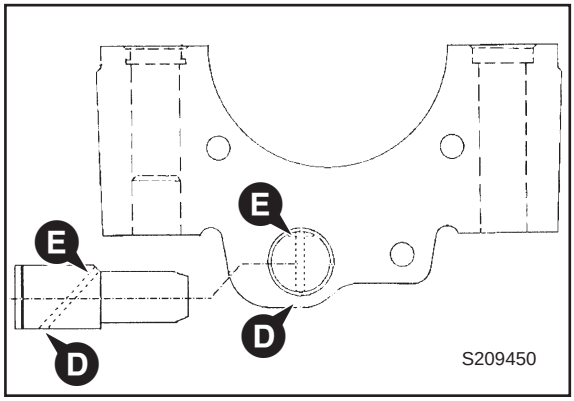
It has been found in service that excessive wear can occur to the bush for the idler gear of the lubricating oil pump. This wear may occur on four and six cylinder engines.

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 |
|---|---|
| 02/290006 | Bush |
| 02/201131 | Shaft |
| 4101/0651 | Loctite 648 Retainer |

| Part No. | Description |
|---|---|
| 02/201050 | Pump (4 Cylinder Engines) |
| 02/201130 | Pump (6 Cylinder Engines) |

**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**



**PRODUCTS AFFECTED:** **All ITL Transmissions and Axles**

**TO BE CARRIED OUT:** **Information Only**

**SERVICE INFORMATION**

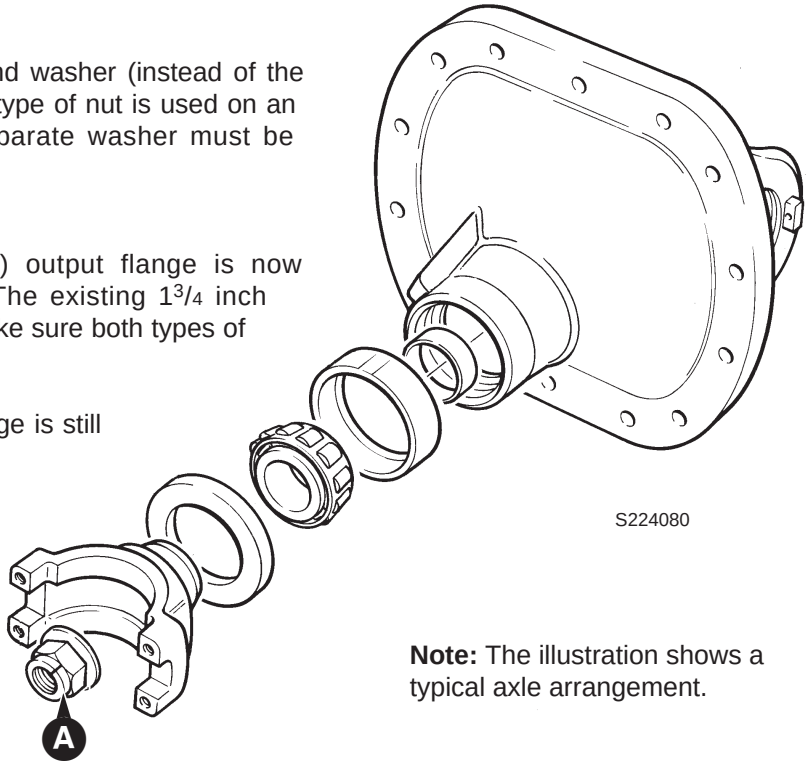
**1 AXLES**

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 $1^{3}/_{4}$ 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.




**Note:** The illustration shows a typical axle arrangement.

**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 |



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

**SUBJECT:** **Fuel Injection Pump - Seal Failure**



**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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**SERVICE PROCEDURES (continued)**

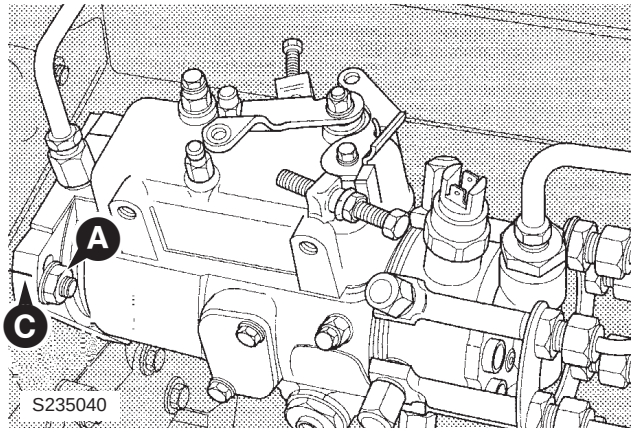
**4** Remove the injection pump:

**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.

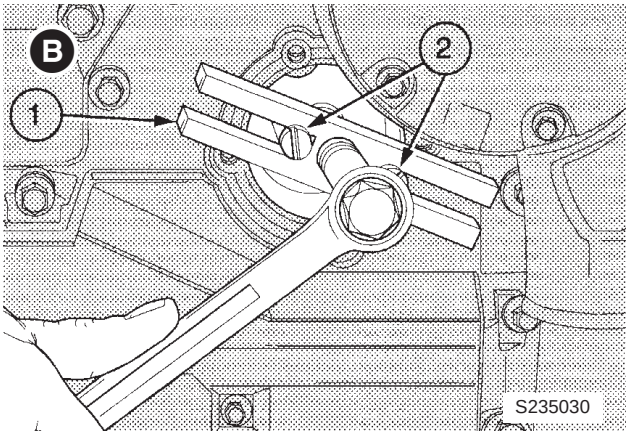
**4.4** Remove the setscrew and the nut of the support bracket below the fuel pump. Release the flange nuts **A** of the fuel pump (see note). If access to the flange nuts is restricted, use tool PD199.




**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**



**PRODUCTS AFFECTED:** **All Fitted with Perkins 1000 Series Engines**

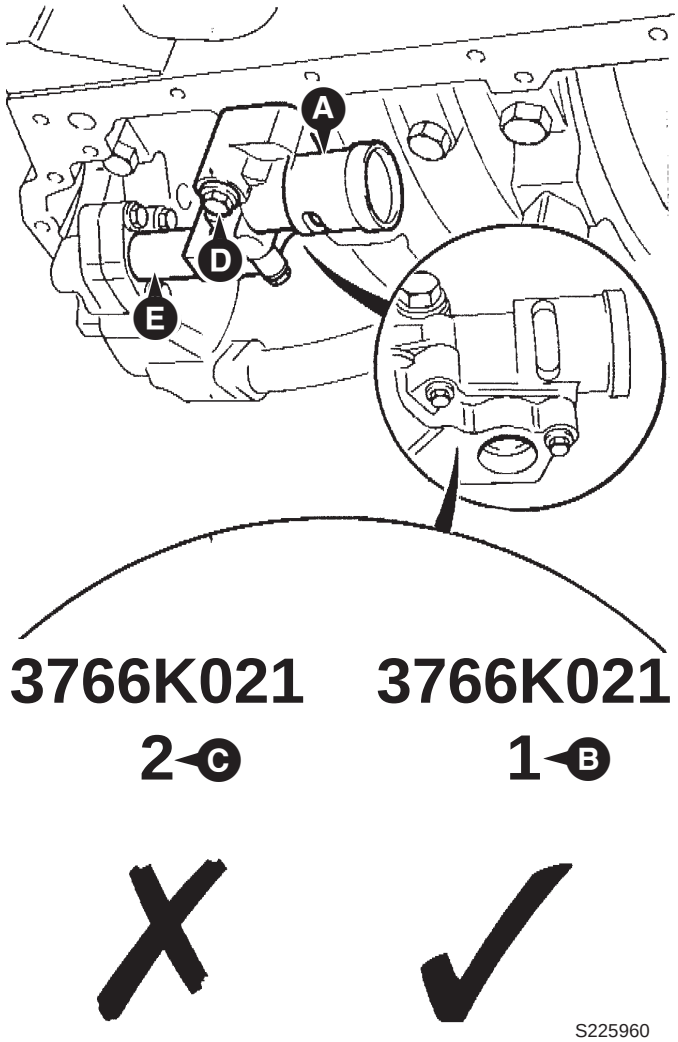
**TO BE CARRIED OUT:** **By Perkins Dealers**

**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.

## SPECIAL INSTRUCTIONS

**Refer to Perkins dealers for warranty information and repairs.**

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ENGLISH

**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**

**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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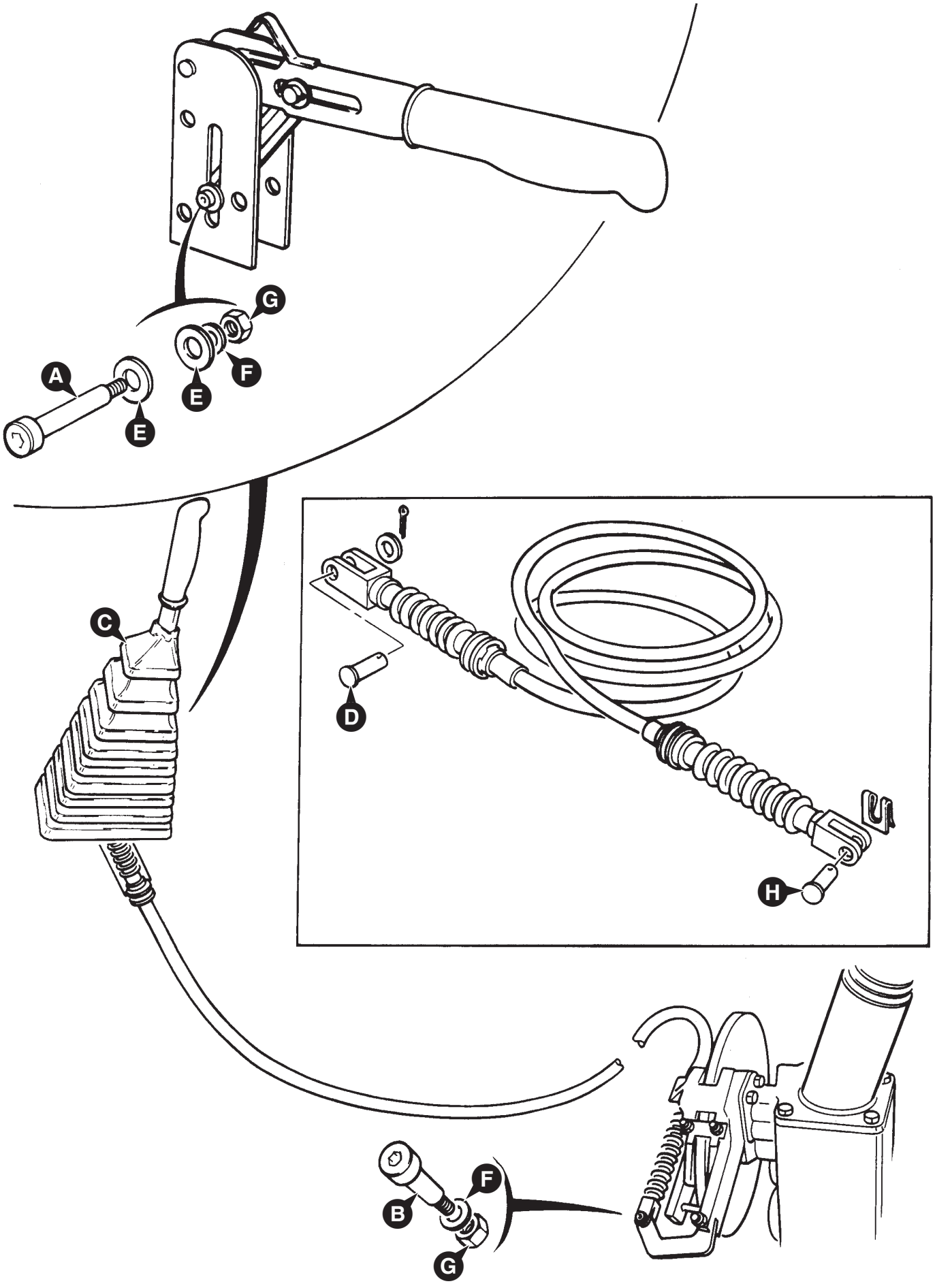
A
E
E
F
G
C
D
H
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G

# TECHNICAL INFORMATION

## General

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



**SUBJECT** **Starter Motors**

**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) |



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

# TECHNICAL INFORMATION

## 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.

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

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



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

From 1st January 1996, Service Warranty Support for Magnetti Marelli electrical equipment fitted on Perkins Engines will be provided by Magnetti 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 | 357 Bath Road | Brislington | Bristol | Avon | BS4 3EU | 0117-971-2242 |
| Gloucester Automotive | Unit 4 Locksbrook Court | Locksbrook Road | Bath | Avon | BA1 3EN | 01225-483882 |
| **BEDFORDSHIRE** | | | | | | |
| Electrodiesel Services Ltd | Murdock Road | | Bedford | Bedfordshire | MK41 7RA | 01234-217025 |
| Radial Ltd | 42-44 Hasting Street | | Luton | Bedfordshire | LU1 5BQ | 01582-22431 |
| **BERKS** | | | | | | |
| Cafco Automotive Ltd | 13 The Paddock | Hambridge Road | Newbury | Berks | RG14 5TQ | 01635-580707 |
| Cafco Automotive Ltd | 4 Nimrod Way | Elgar Road | 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 | Downmill Road | Bracknell | Berks | RG12 1QS | 01344-51011 |
| **BUCKS** | | | | | | |
| Cafco Automotive Ltd | 2 Bridgegate Business Park | Gatehouse Way | 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 | 2b Alma Road Ind. Estate | | Chesham | Bucks | HP5 3HB | 01494-772635 |
| Hereward Car & Truck | | | | | | |
| **CAMBRIDGESHIRE** | | | | | | |
| Components Ltd | 19 Harvester Way | Fengate | 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 | 42 West Hill | St Austell | Cornwall | PL25 5EY | 01726-73063 |
| Mill Auto Supplies | Church Works | Mount Street | Penzance | Cornwall | TR13 2EU | 01736-60301 |
| Mill Auto Supplies | 49-51 Wendron Street | | Helston | Cornwall | | 01326-561222 |
| Mill Auto Supplies | Penmarrin House | Commercial Road | Penryn | Cornwall | | 01326-373343 |
| Mill Auto Supplies | Trevenna House | Nettles Hill | Redruth | Cornwall | TR15 1AL | 01209-218774 |
| Mill Auto Supplies | Units 1 & 2, Old Sation Yard | Berrycombe Road | Bodmin | Cornwall | | 01208-78166 |
| Mill Auto Supplies | Eddystone Rd Ind. Estate | | Wadebridge | Cornwall | | 01208-813254 |
| Mill Auto Supplies | 1 Miller Bus Park | Station Road | Liskeard | Cornwall | PL14 4DA | 01579-346555 |
| **DEVON** | | | | | | |
| Autolec Services | Marsh Green Road | Marsh Green Trading Est. | 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 | Hurricane Way | 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 | Parkend | Lyndey | 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 | 16 Connaught Road | 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. | Frenchmans Road | 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 | Naas Road | Dubln 12 | Ireland | | 00-353-1-4502866 |
| Edmunds Walker | College Commercial Park | Dennehys Cross | Cork | Ireland | | 00-353-21-344688 |
| Edmunds Walker | 23 Nicholas Street | | Limerick | Ireland | | 00-353-61-419200 |
| **KENT** | | | | | | |
| Cafco Automotive Ltd | 43 Sittingbourne Ind. Park | Crown Quay Lane | 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 | Greenacres Road | 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 | Walton Summit Ind Est. | Preston | Lancashire | PR5 8AL | 01772-629639 |
| Leyland Auto Elec. & Diesel Ltd | Unit 220, Bamber Bridge | Walton Summit Ind. Est. | 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 | Denham | 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 | James Street | York | North Yorkshire | YO1 3DP | 01904-414466 |
| Andrew Page Ltd | Unit 6 Thirsk Ind. Park | York Road | Thirsk | North Yorkshire | YO7 3TA | 01845-526688 |
| S.A.S. Ltd | Unit 17 Provincial Works | The Avenue | Harrogate | North Yorkshire | HG1 4QE | 01423-889021 |
| S.A.S. Ltd | Westgate | | Otley | North Yorkshire | LS21 3AT | 01943-467514 |
| **NOTTS** | | | | | | |
| Midland Magneto | Trent Works | Canel Street | 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 whitefriars | | 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 | Intercity Way | 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 | Linden Road | Brownhills | Staffs | WS8 7BW | 01543-375156 |
| Potteries Diesel | Mason Street | Fenton | 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. | Goldworth Road | 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 | 139 Worplesdon Road | Guildford | Surrey | GU2 6XA | 01483-573311 |

| 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 | Guildford Road | Chertsey | Surrey | KT16 9BQ | 01932-570820 |
| A.R.E. Ltd | 78 Holmethorpe Avenue | Holmethorpe Ind. Est. | Redhill | Surrey | RH1 2NL | 01737-767000 |
| A.R.E. Ltd | Walton Motor Factors | 151-153 Hersham Road | Hersham | Surrey | KT12 5NR | 01932-231298 |
| **TYNE AND WEAR** | | | | | | |
| Andrew Page Ltd | Unit 15 Brough Park | Fossway | 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 | Barton Park Ind. Estate | 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 | Brandon Way Ind. Estate | West Bromwich | West Midlands | B70 9PW | 0121-525-4775 |
| **WEST YORKSHIRE** | | | | | | |
| Andrew Page Ltd | Apson House | 53/59 Mabgate | Leeds | West Yorkshire | LS9 7DY | 0113-200-1010 |
| Andrew Page Ltd | Grantley Way | Stanley Road | Wakefield | West Yorkshire | WF1 4PY | 01924-365727 |
| Andrew Page Ltd | Unit 5 | Hall Lane | Bradford | West Yorkshire | BD4 7DG | 01274-723156 |
| Andrew Page Ltd | Units 29-30 Beck Road | Ringway Ind. Estate | Huddersfield | West Yorkshire | HD1 5DG | 01484-420077 |
| Andrew Page Ltd | Units 15/17 Ashley Ind. Est. | Elmfield Road | 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 | Easton Lane | Winnall | Wincester | 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 Helenski |
| **Denmark -** Dybbroe A/S | Tomsagervey 8-10 | 08230 Aabyhoj (Aarhus) |

# TECHNICAL INFORMATION

## General

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

**SERVICE DEPARTMENT - COMPUTER DIAGNOSTIC EQUIPMENT**



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<br>RS 232 and TTL Serial Interfaces | PSION Part No.<br>1800 0006-11 | ITL/JCB part No.<br>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

**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.

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**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@satlink.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 WALS 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 0482 | (514) 521 0949 | |
| RADIO-HOLLAND CARIBBEAN N.V. | CARIBBEAN | ATHDLLIDGEROAD 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 | |
| POINT X S.R.O. | CZECH REP. | TRUHLARSKA 3, 11000 PRAGUE 1 | (42) 2 231 9395 | (42) 2 2481 0821 | pointx@login.cz |
| 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, TSIMSHATSUI, 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, JAKATA | (62) 3 61756248 | (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 COLLEGNO | (39) 11 403 4828 | (39) 11 403 3325 | |
| PSION JAPAN | JAPAN | NISHI SHINJUKU FOREST BLD., LB 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 LUMPAR, 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) 14970226/7 | (234) 14970228/9 | |
| UCOM | NORWAY | | (47) 32203300 | (47) 32203459 | |
| OHI ELECTRONICS & TRADING CO LLC | OMAN | PO BOX 889, MUSCAT 113,SULTANATE OF OMAN | (968) 959 085 | (968) 603 467 | |
| CHARLES FREWEN | PARAGUAY | VALIANA SAL, PAETONALCORONELMONELOS 135, CASI AV SAN BLAS | (55) 45522 1451 | (55) 45522 1451 | |
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| CIE CENTRUM INFORMATYKI ENERGETY | POLAND | UL MYSIA 2, SKR- POCZT 143, 00-950 WARSZAWA 1 | (48) 22 625 3397 | (48) 22 693 1357 | ciesm@elmo.nask.waw.pl |
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| EXCOM AG | SWITZERLAND | MOOSACHER STRASSE 6, CH 8820 WADENSWIL | (41) 1 782 2111 | (41) 1 781 1361 | infos@excom.ch |
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| PSION UK PLC | UK | 1 RED PLACE, MAYFAIR, LONDON W1Y 3RE | 0171 317 4100 | | |
| PSION UK SERVICE CENTRE | UK | 6 DERBY ROAD, METROPOLITAN CENTRE, GREENFORD, MIDD'X, UB6 8UJ | 0181 566 6162 | 0181 566 6268 | |
| PSION INC., | USA | 150 BAKER AVENUE, CONCORD, MA 01742 | (001) 508 371 0310 | (001) 508 371 9611 | |
| AL AHMAR GROUP | YEMEN | AL SALAM EST. , YEMEN | (967) 271506 | (967) 273990 | |

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

**ENGINE WORKSHOP MANUALS**



**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



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# TECHNICAL INFORMATION

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

**SUBJECT** **Axle Propshafts**



**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.

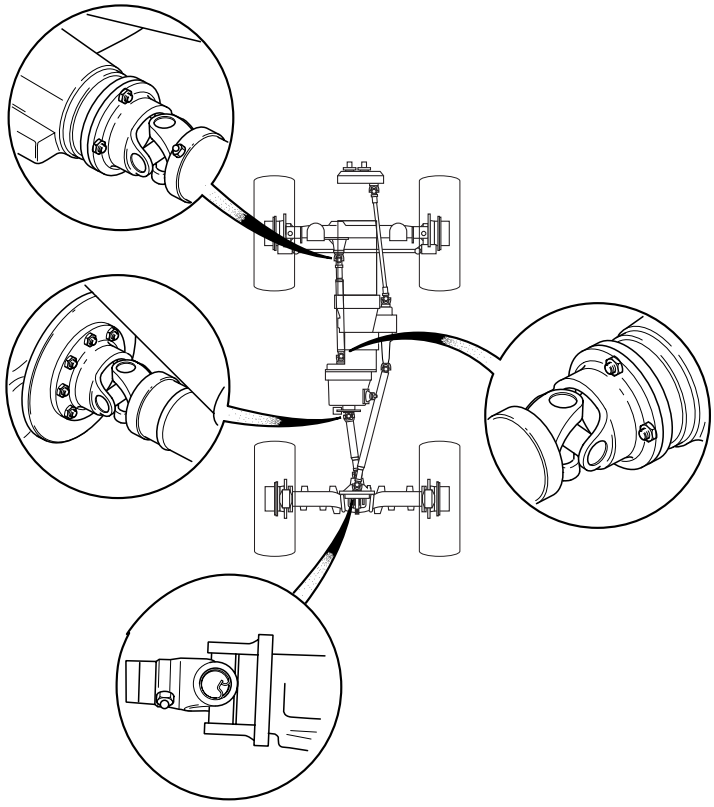
**1 Lubrication**

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



**SUBJECT:** **Engine Silencer Improvements**

**PRODUCTS AFFECTED:** **Perkins Engines**

**TO BE CARRIED OUT:** **For Information Only**

**Product Improvement**

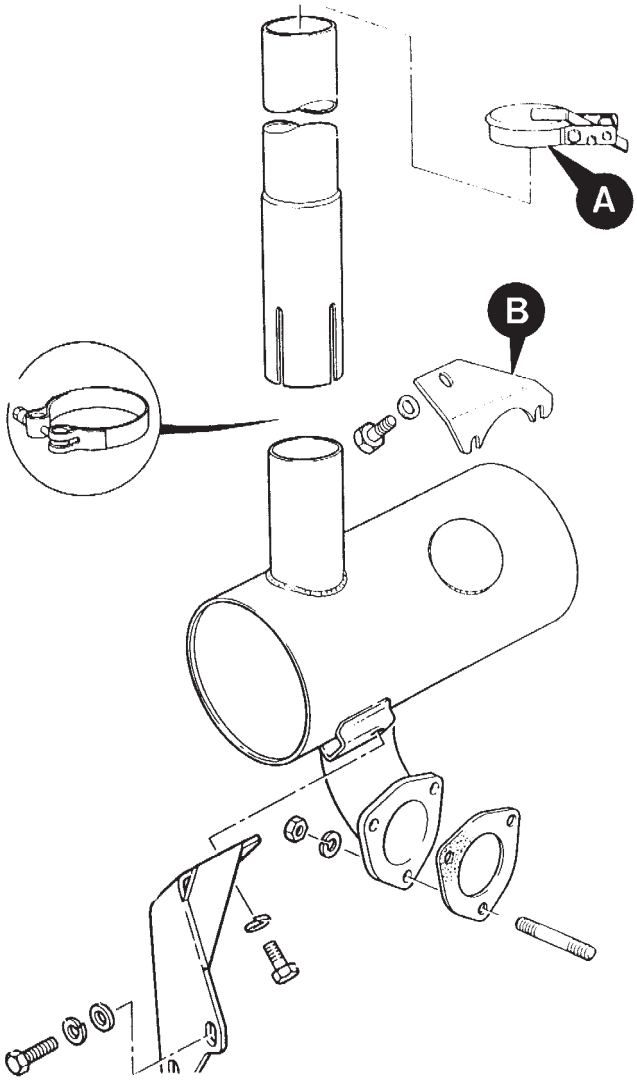
The quality of ITL Silencers has been improved:

**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 and123/01136

Naturally Aspirated Engine

Silencer x 1 - 993/66200 replaces 123/01481 and123/00741
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**



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

**TO BE CARRIED OUT:** **For information**

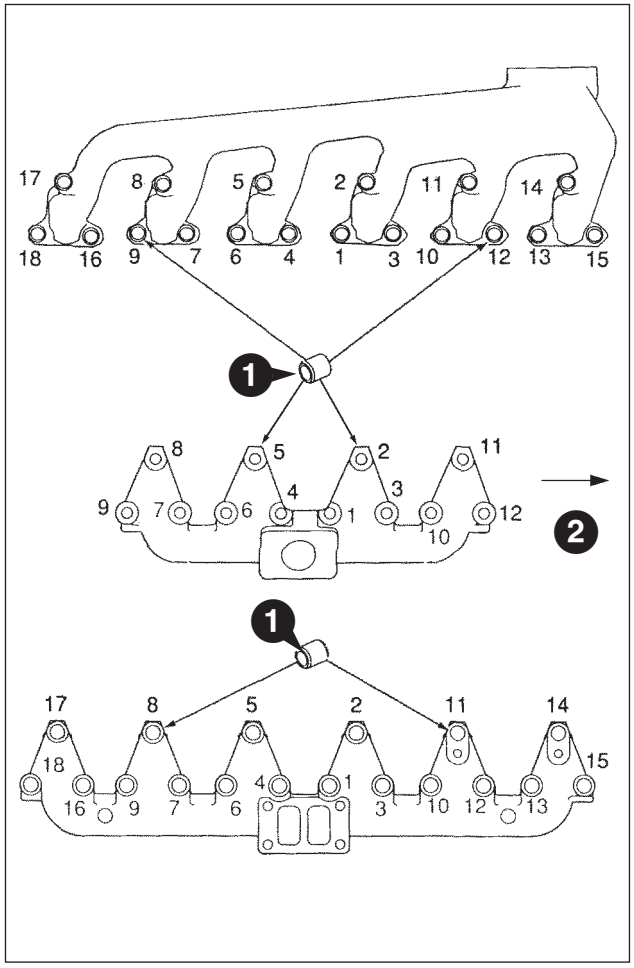
**SERVICE INFORMATION:**

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**



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

**TO BE CARRIED OUT:** **For Information Only**

**SERVICE INFORMATION:**

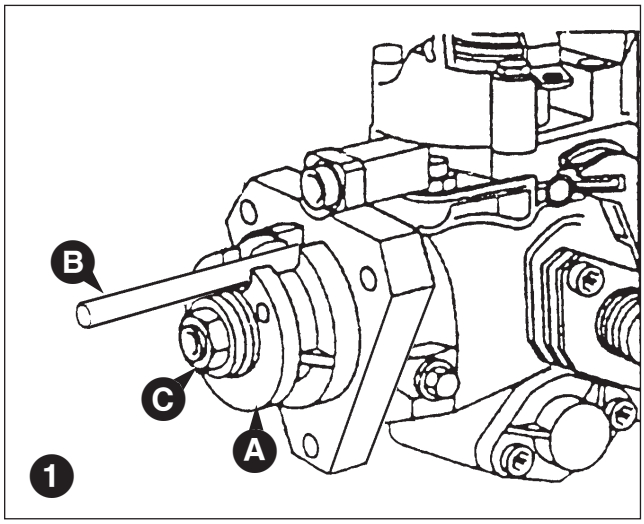
The latest fuel injection pumps have a hub **A** which is **mounted permanently** onto the drive shaft.

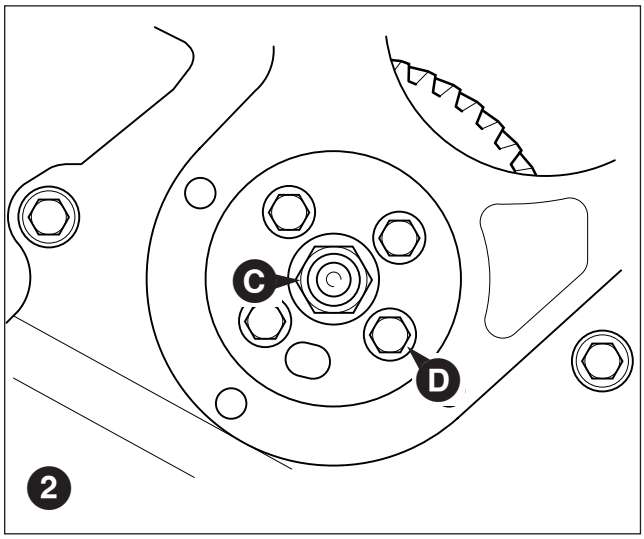
The manufacturer fits the hub to the pump to ensure very accurate timing. Engines that have this arrangement, require a pin **B** (part no. 892/00956) to accurately time the pump in service.

**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** |



**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.

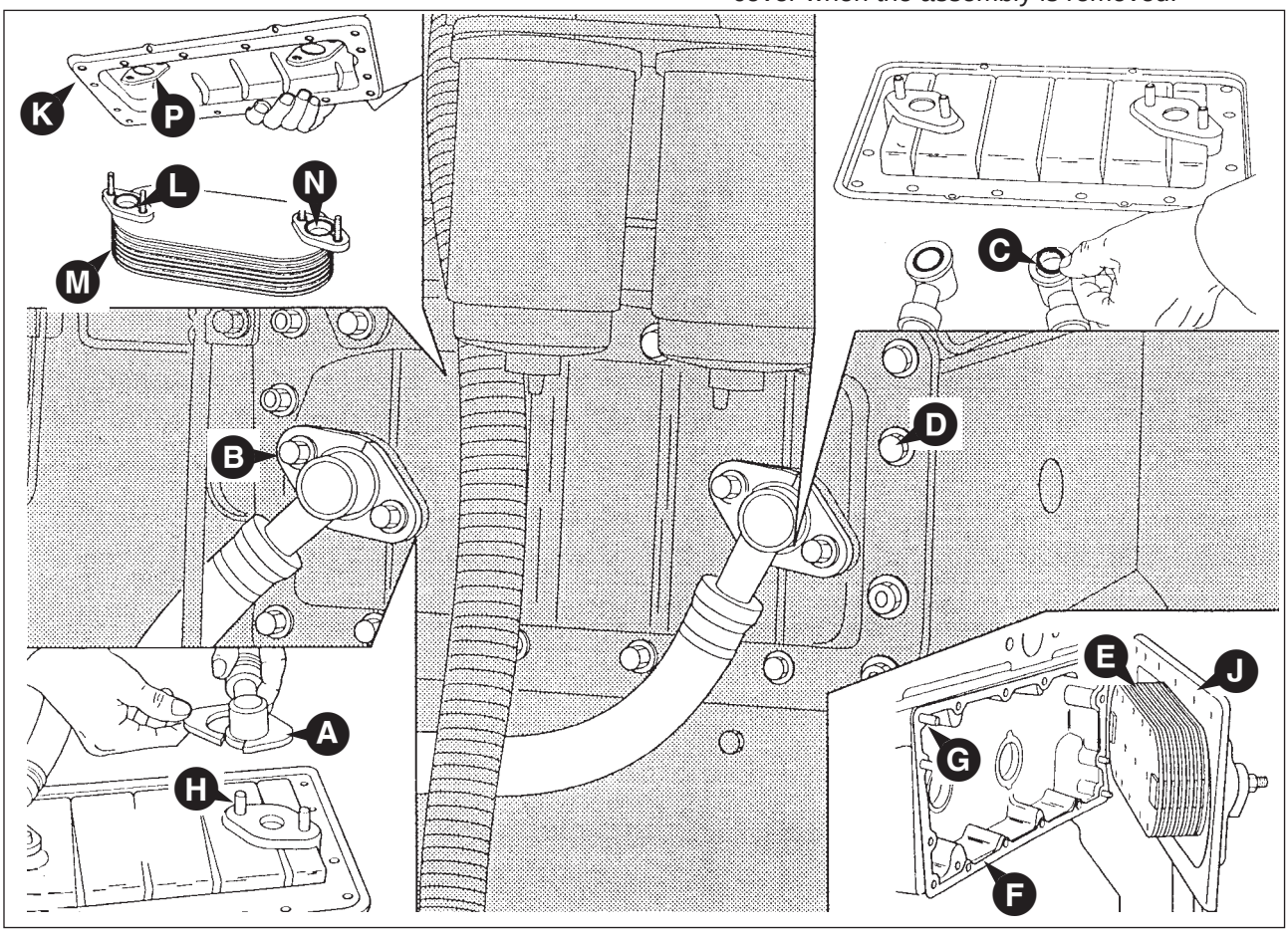
**To Remove**

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.

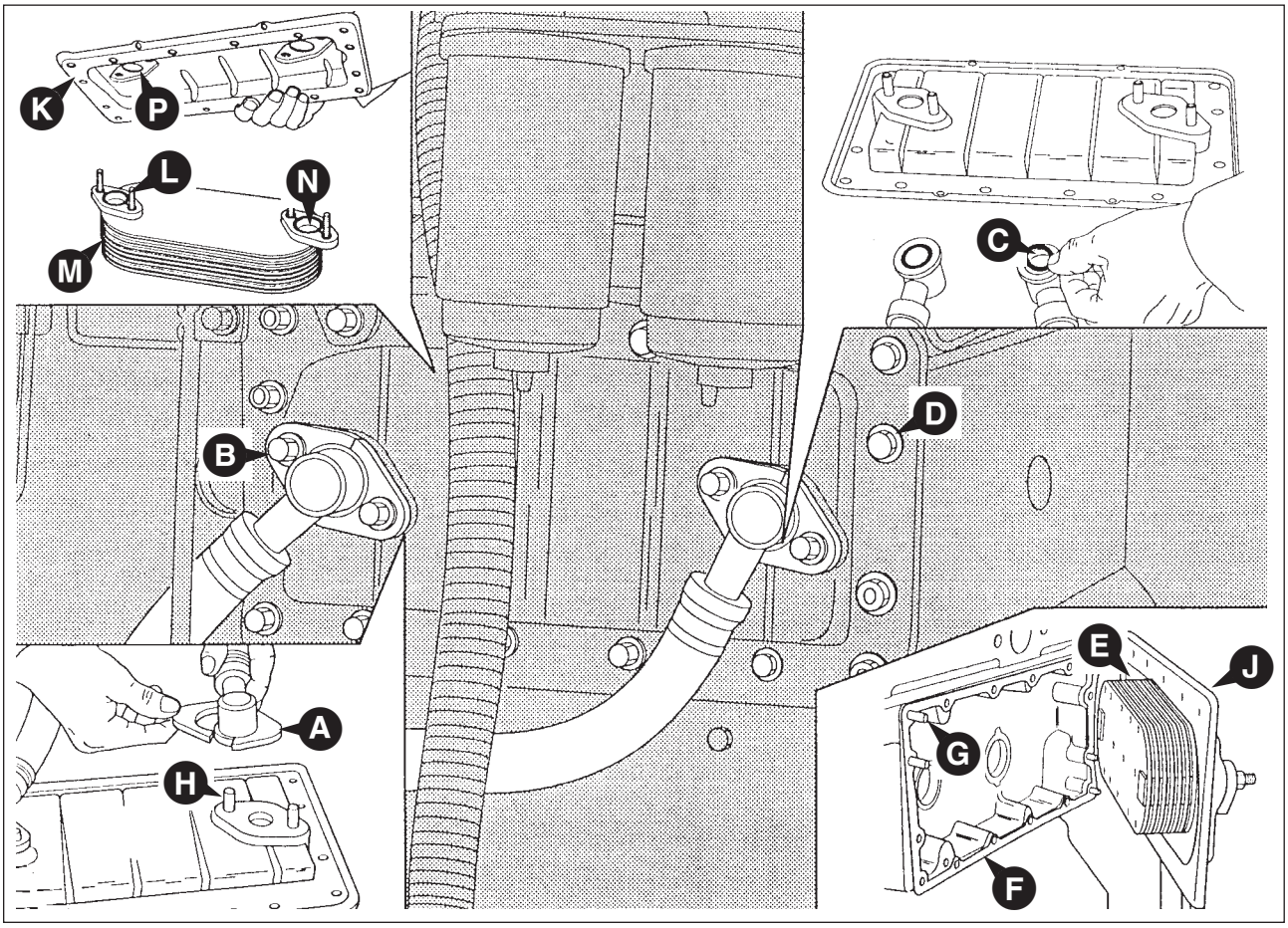
6 Operate the engine and check for oil or coolant leakage.

**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**

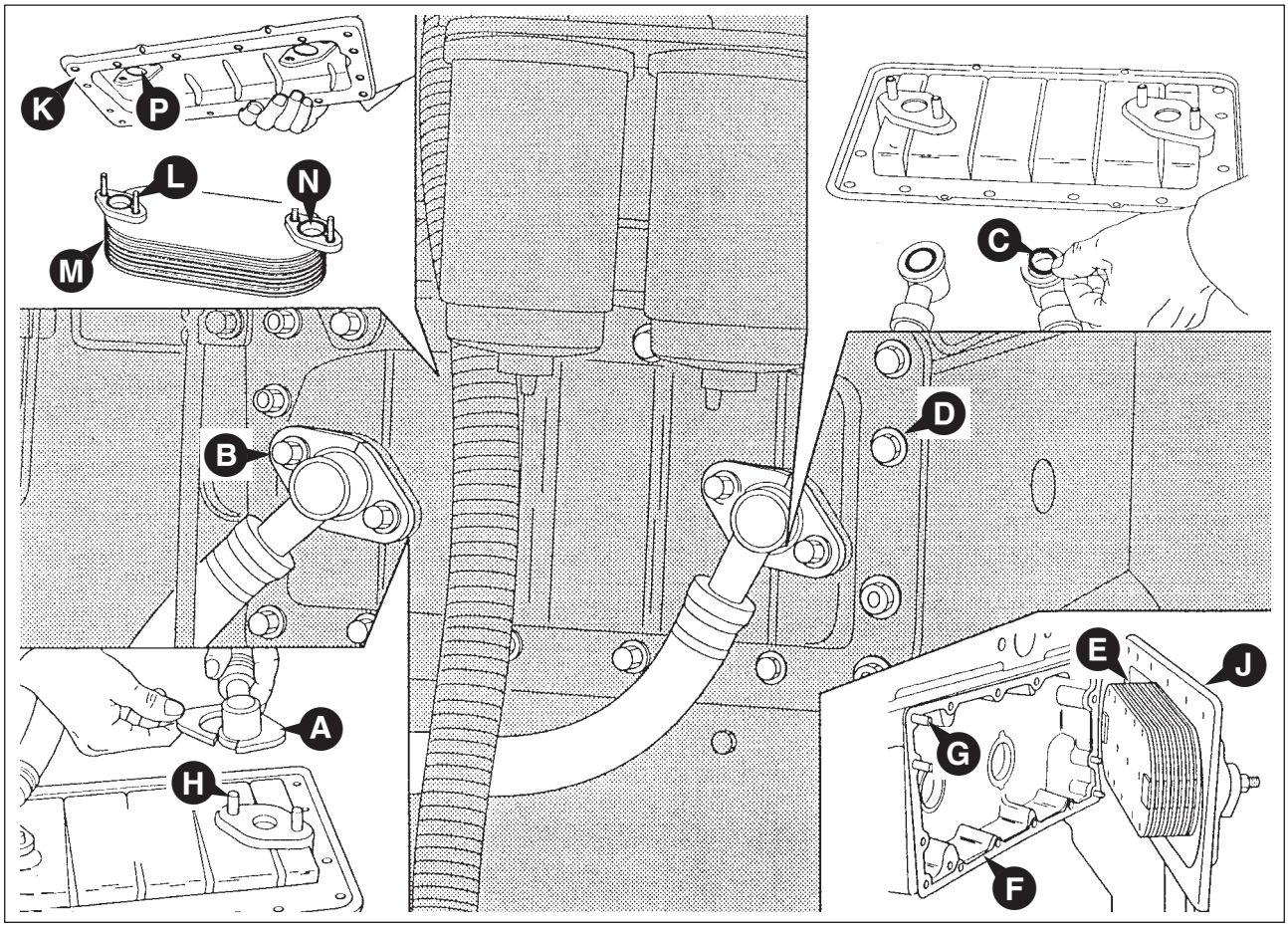
1 Clean the seats of the three-piece ‘O’ ring and renew the ‘O’ rings **N**.

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

### 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.

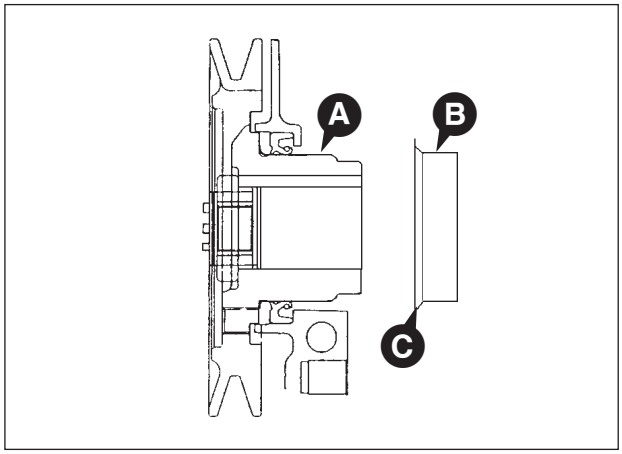
To renew a worn crankshaft pulley, for engines with the latest timing case, a wear sleeve **B** part number 02/202027 is fitted over the spigot.

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)

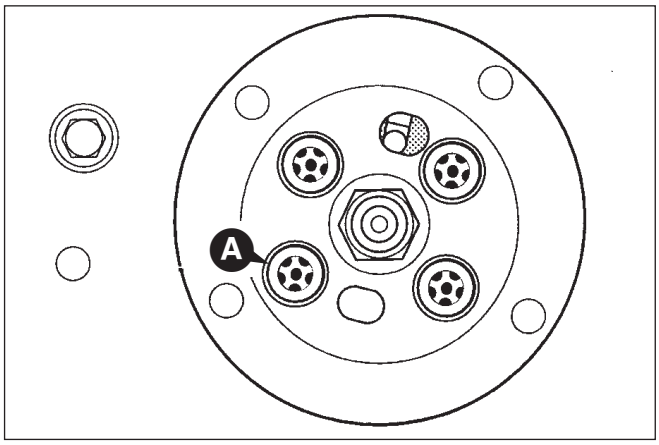
### Washers for the Fuel Injection Pump Gear

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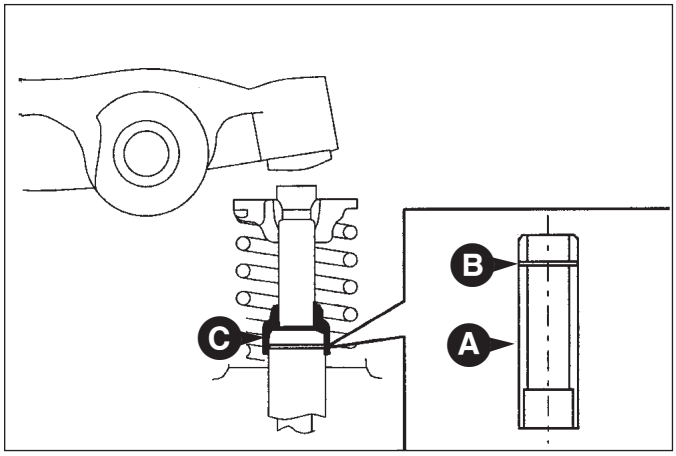
**Number** **Gn028**
**(JCB Gen 093; K98/N.Am)**
**Issue** **1**
**Date** **February 1999**



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

### 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**



**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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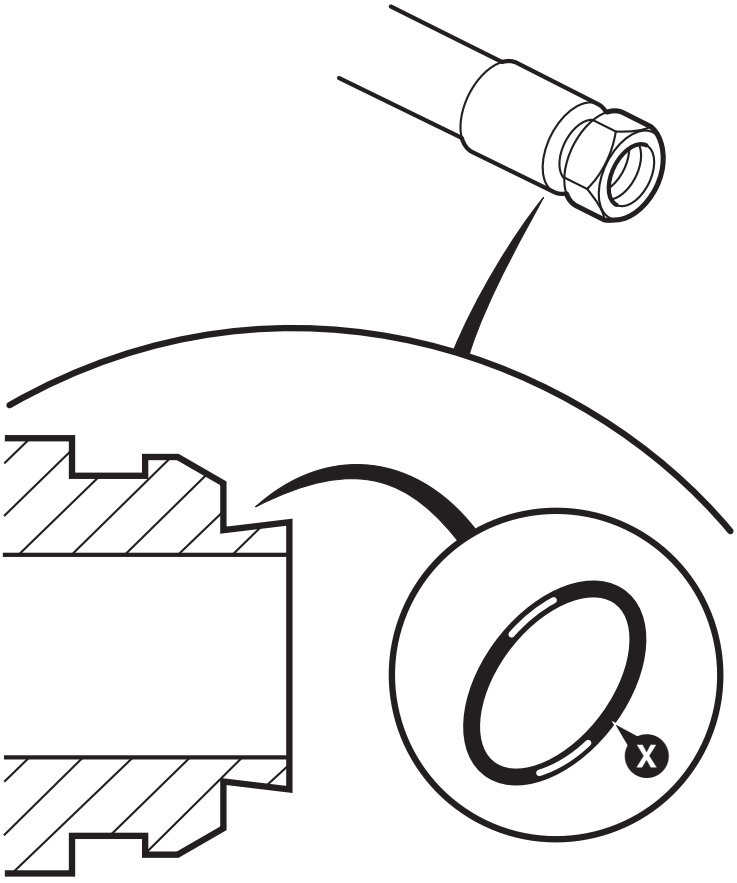


**WARRANTY INFORMATION**

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.

# TECHNICAL INFORMATION

## General

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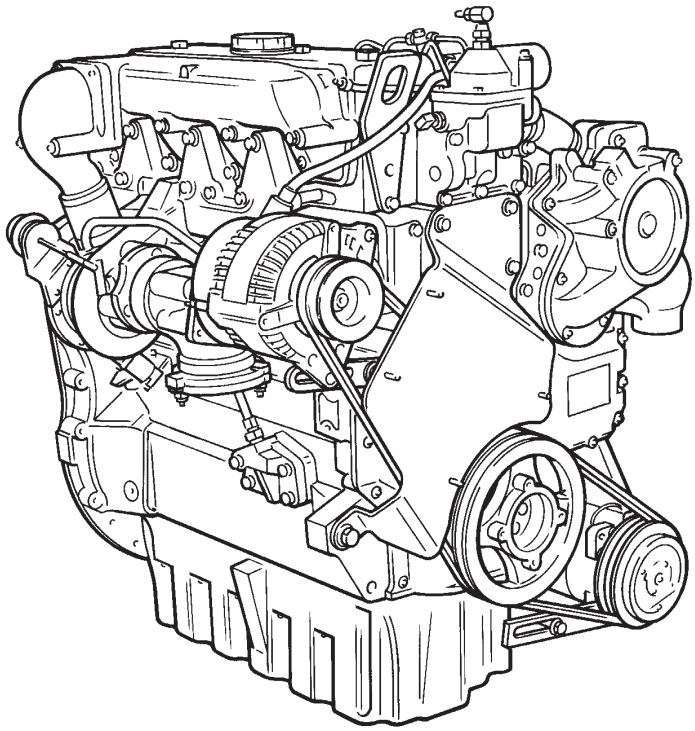
| | |
|---|---|
| **Number** | **Gn030** |
| **(JCB MI642/H)** | |
| **Issue** | **1** |
| **Date** | **April 1999** |



### 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:

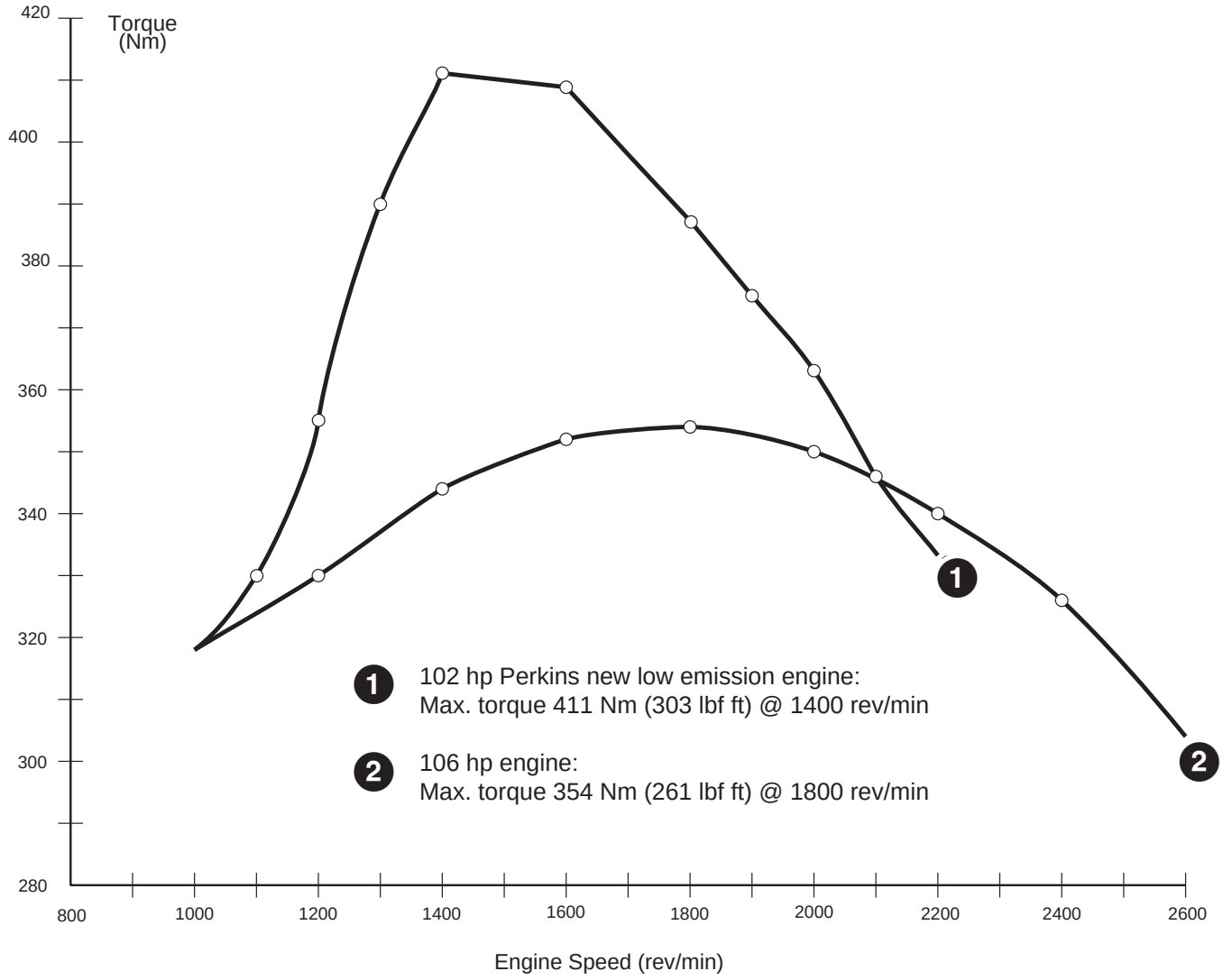
- Revised cylinder head
- Four branch inlet and exhaust manifolds
- Revised piston design with modified combustion chamber
- Wastegated turbo charger
- Improved fuel injection pump
- Increased compression ratio

The previous 75 hp (56 kW) engine is now uprated 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 teh 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.

# TECHNICAL INFORMATION

## General

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

**SUBJECT:** **Hydraulic Ram Sealing Procedure**



**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.

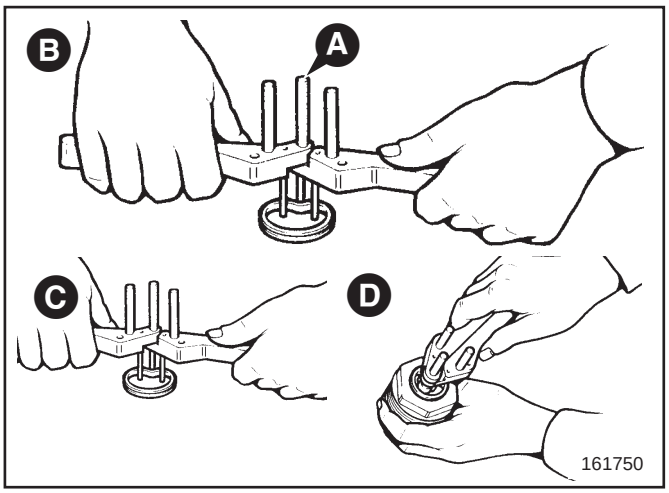
**SERVICE PROCEDURE:**

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.

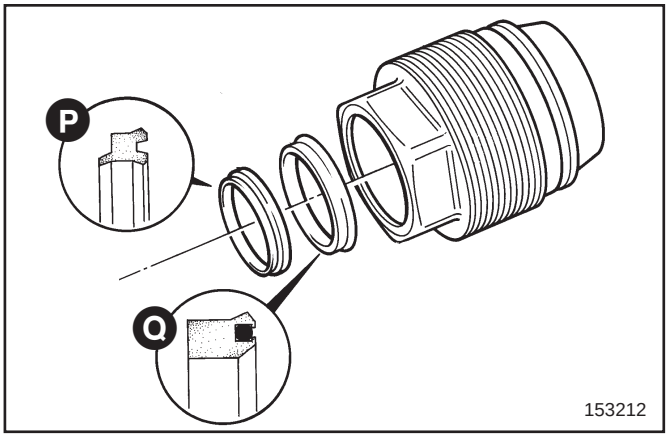
**Note**: Some rod wipers, ie power track rod, may use a metal encased seal which is pressed into the housing. Care must be taken to ensure the seal is square before it is pressed in.

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.



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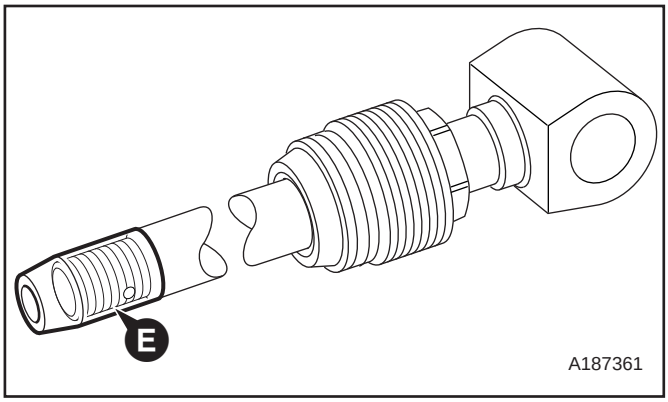

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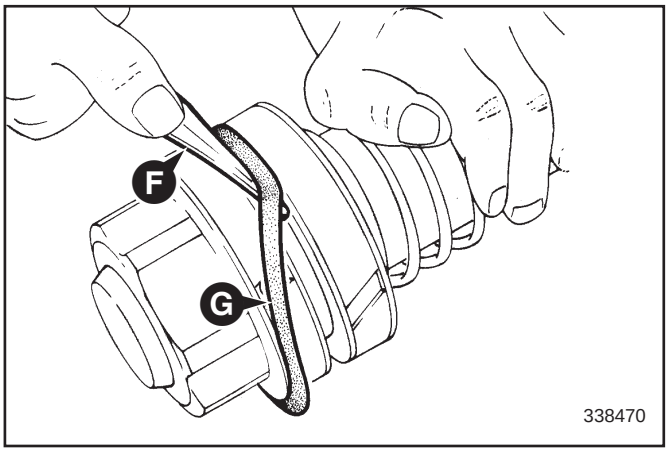

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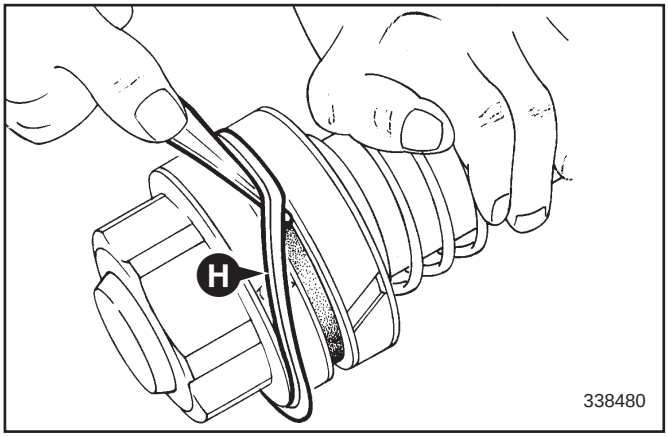
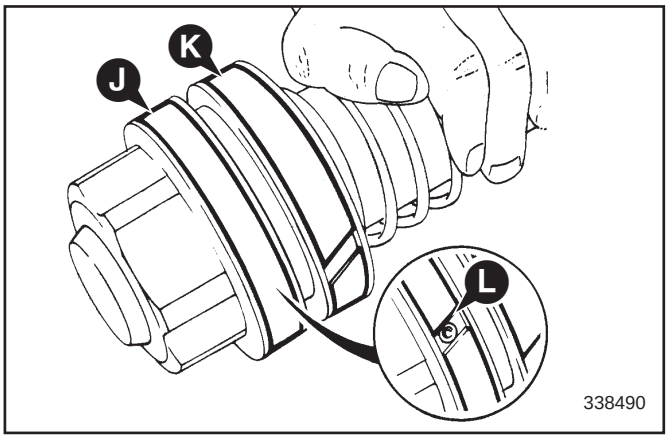


338480

**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**.

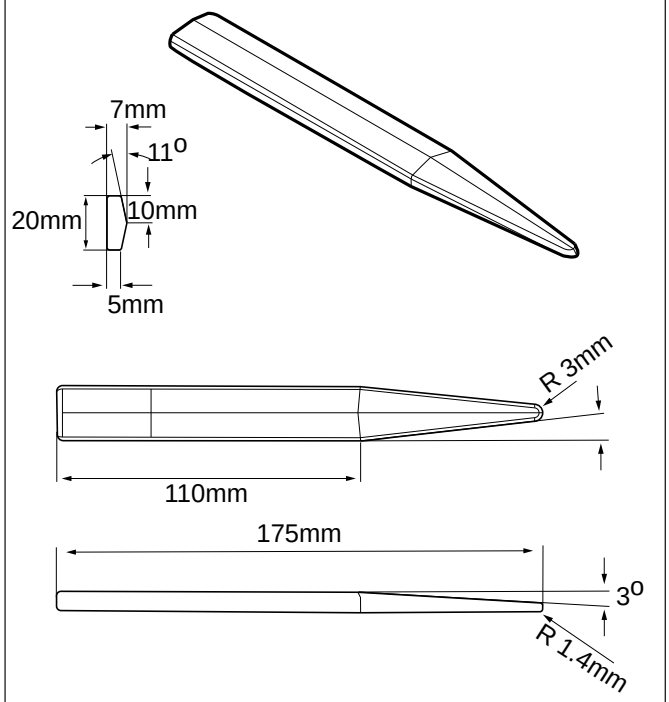



Fit the piston rod and head assembly into the cylinder:

**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.

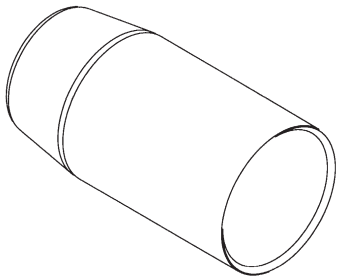
**12** Fit the end cap, refer to the relevant section for torque figure and completion of ram assembly.

**PARTS INFORMATION**




892/01027 Piston Seal Assembly Tool

338500



S338410

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 |

# TECHNICAL INFORMATION

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



**SUBJECT:** **Oil Control Rings**

**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.

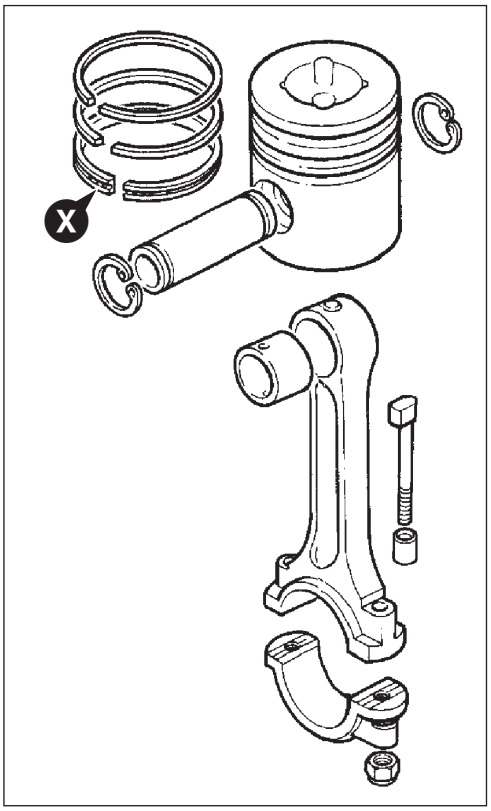
The oil control ring is a component of a ring kit (see part numbers listed below). The ring kit could be supplied with either the earlier or the later oil control ring.

### 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**

**PRODUCTS AFFECTED:** **All 1000 series engines**

**TO BE CARRIED OUT:** **For Information Only**

### SERVICE INFORMATION

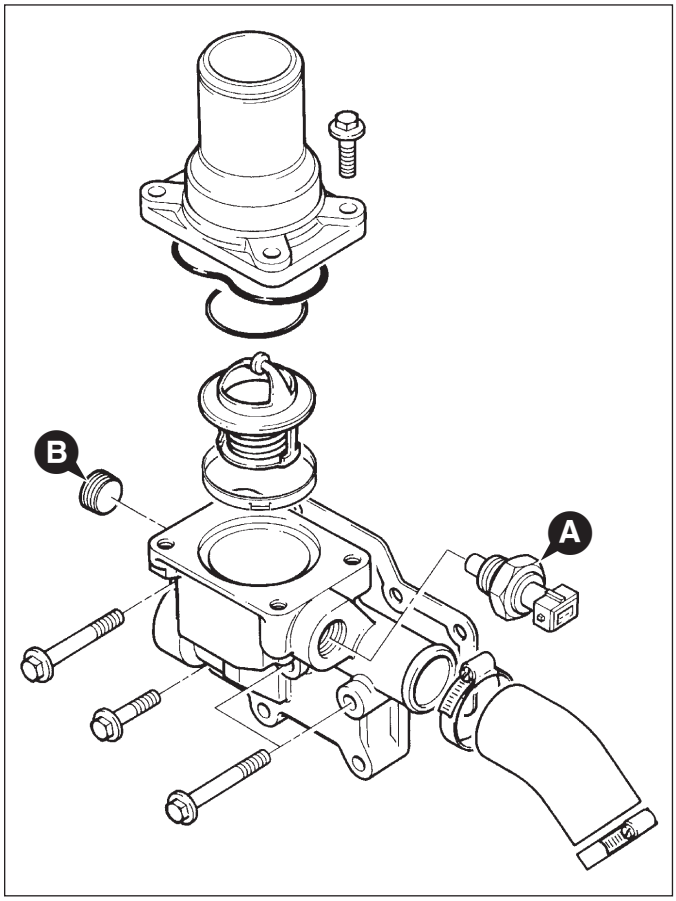
Plastic thermostat housings, fitted to some engines, will be damaged if temperature senders or blanking plugs are overtightened.

### 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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# TECHNICAL INFORMATION

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



**SUBJECT:** **Introduction of Improved Fuel Lift Pump**

**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.

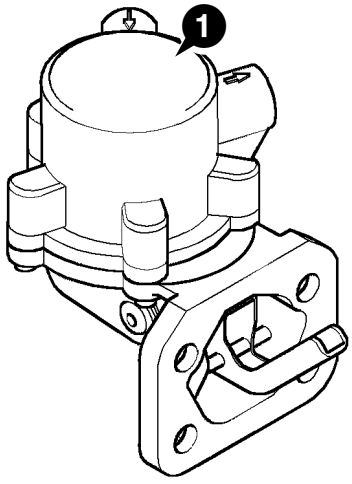
**2** Unscrew the fuel filter **A**. Remove strainer **2** and O-ring **3**.

**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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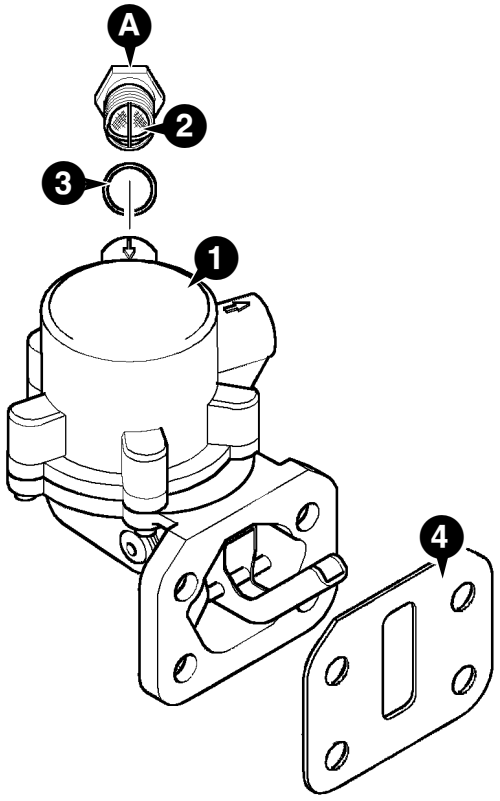
**PARTS INFORMATION**

| 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 |

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# TECHNICAL INFORMATION

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



**SUBJECT:** **Coolant Pressure Cap**

**PRODUCTS AFFECTED:** **All Perkins 1000 Series Engines**

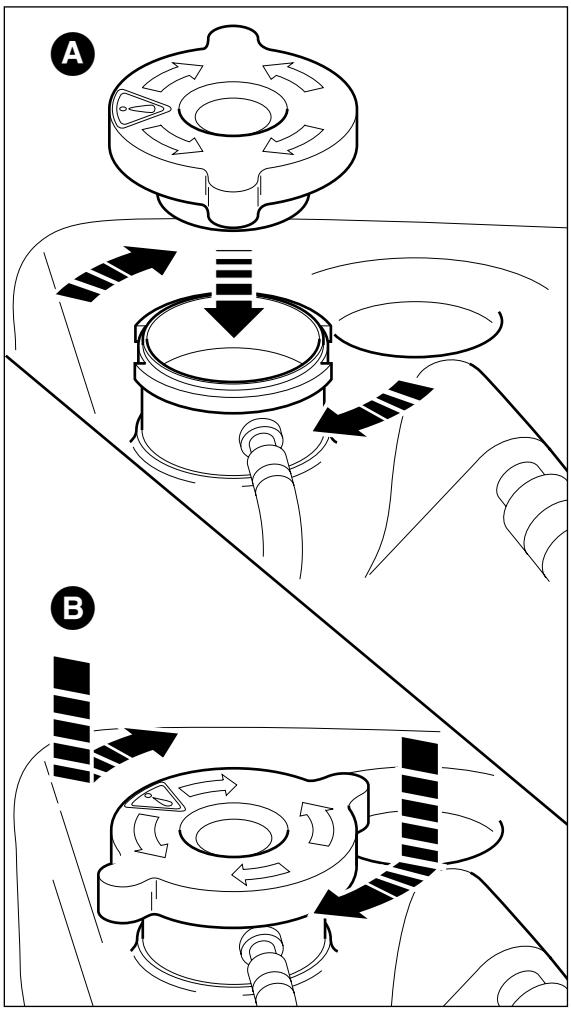
**TO BE CARRIED OUT:** **Information Only**

**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**

**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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**4** Fill fuel tank to the maximum.

**5** Record the hour meter reading and date, return the machine to service.

**6** Record all amounts of fuel and engine oil added during the test period on the chart below, excluding the initial fill.

**Note**: Only add oil when the level reaches or is near the MIN mark.

**7** On completion of test, replenish oil level to the original MAX mark on the dipstick. Replenish the fuel tank as required.

**8** Total all fuel and lubricating oil used during test, excluding the initial fill.

**9** Record machine hour meter reading on completion of test.

**10** If the oil consumption exceeds the limit specified at beginning of the Service Procedure, contact your Regional Service Manager for further advice.

| **MACHINE TYPE** | **MACHINE SERIAL No.** | **ENGINE SERIAL No.** |
|---|---|---|
| **TEST COMMENCED** | **Date:** | |
| | **Hour meter reading** | |
| **DISTRIBUTOR:** | | |

| **OPERATOR:** | | | |
|---|---|---|---|
| **Date** | **Hours** | **Amount of engine oil added** | **Amount of fuel added** |
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| | | | |
| | **TOTAL** | | 1000 litres, 220 UK gal, 264 US gal |

**TEST TERMINATED**

**Date:** **Hour meter reading:** **Signed:**

**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.

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



**SUBJECT:** **Rocker Cover**

**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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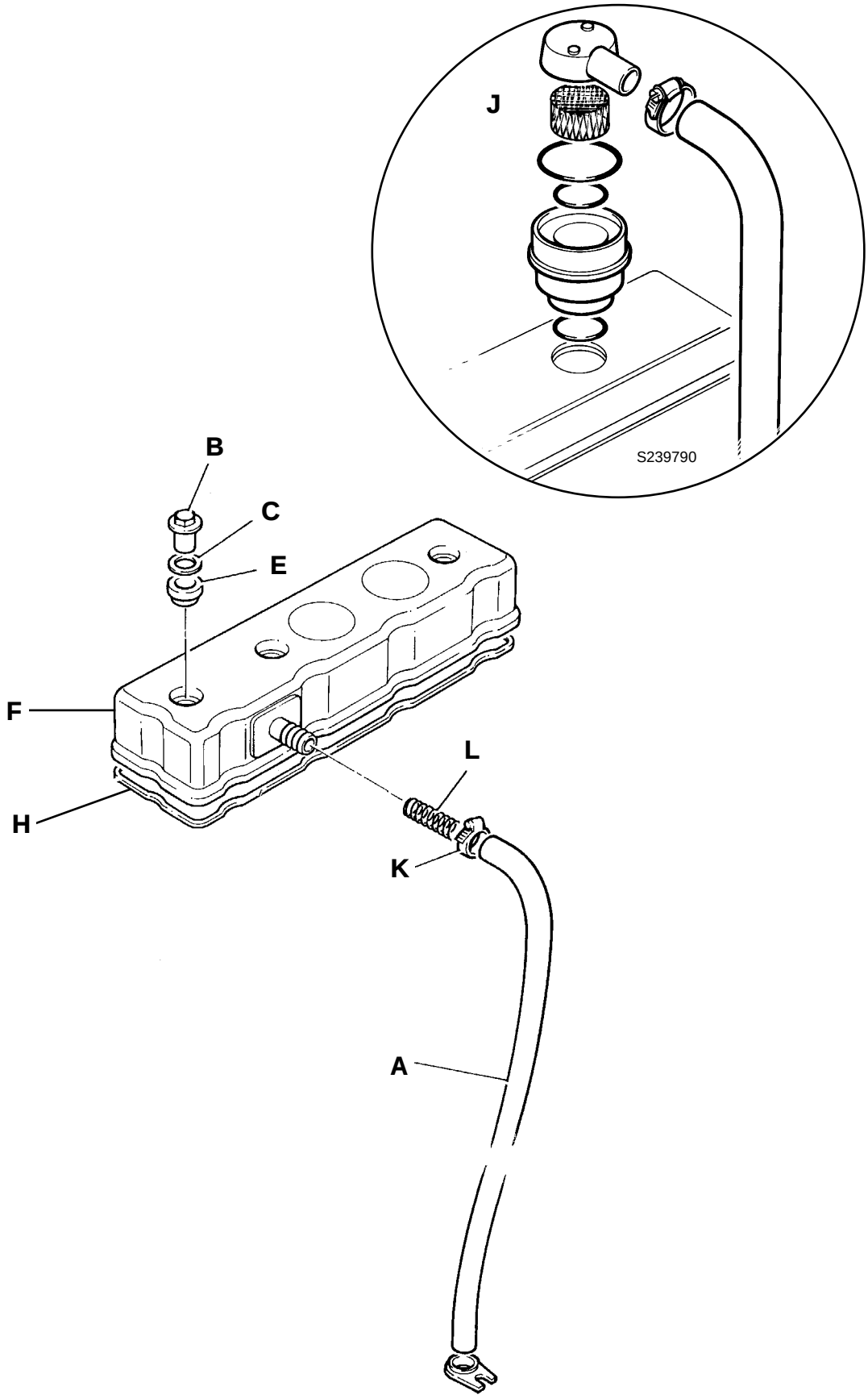
**WARRANTY INFORMATION**
This improvement will not be considered for warranty



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|---|---|
| **Number** | **Gn038** |
| **Issue** | **1** |
| **Date** | **Jan 2002** |

**SUBJECT:** **New ITL NAPSC Network**



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 **N**orth **A**merican **P**roduct **S**upport **C**enter, PO Box 1000, Harrow, Ontario, NOR 1GO.

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 **P**rincipal **S**ervice **C**enters

**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 Danieldale 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.

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



**SUBJECT:** **Safety precautions when an engine is cleaned**

**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 altemator, 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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