

Perkins **POWER SERVICE**

Fault Finding Guide for Diesel Engines

Perkins
**POWER
SERVICE**

All information in this guide is substantially correct at the time of printing but may be altered subsequently by the Company.

 **Perkins**
 **POWER**

Perkins Engines Limited,
Peterborough PE1 5NA, England

Printed in England by Warners (Midlands) Ltd., Bourne • London



 **Perkins**
 **POWER**

Fault Finding Guide for Diesel Engines

Publication 801 TPD 0484 1126

© All rights reserved

May 1982

FDI Engineering Ltd.,
Peterborough, England

AUSTRALIA

Perkins Engines Australia Pty. Ltd.,
P.O. Box 156, Dandenong 3175, Victoria, Australia.
Telephone: 792 0431. Telex: 30816.
Cables: 'Perkoil' Melbourne.

FRANCE

Moteurs Perkins S.A.,
9-11 Ave. Michelet, Boite Postale 69,
93402 Saint Ouen, Cedex, France.
Telephone: 257 14 90. Telex: 'Perkoil' 642924.

GERMANY

Perkins Motoren G.m.b.H.,
8752 Kleinostheim, Postfach 1180, Germany.
Telephone: 06027 5010. Telex: 4188869.

GREAT BRITAIN

Perkins Engines Limited,
Peterborough, PE1 5NA, England.
Telephone: Peterborough 67474. Telex: 32501.
Cables: 'Perkoil' Peterborough.

ITALY

Motori Perkins S.p.A.,
Via Gorizia II, P.O. Box 12,
22070 Portichetto/Luisago (Como), Italy.
Telephone: (031) 927364. Telex: 380658 Perkit I.
Cables: 'Perkoil' Portichetto.

JAPAN

Perkins Engines K.K.,
6th Floor, Reinanzaka Building, 14-2 Akasaka, 1-chome,
Minato-ku, Tokyo 107, Japan.
Telephone: (03) 586 7377. Telex: J2424823 Perkoil J.

U.S.A.

Perkins Engines Inc.,
P.O. Box 697, Wayne, Michigan 48184, U.S.A.
Telephone: 313 595 9600. Telex: 23-4002.
Cables: Perkeng Wane.

In addition to the above, there are Perkins distributors in most countries. Perkins Engines Ltd., Peterborough or one of the above companies can give details.

INTRODUCTION	Page 4
STARTING PROBLEMS	5
— Low cranking speed	6
— Cold engine will not start	8
— Engine is difficult to start	10
— Engine starts and stops	12
— Engine will not start cold or hot	14
ENGINE MISFIRES	16
LACK OF POWER	18
EXCESSIVE FUEL CONSUMPTION	20
BLACK EXHAUST	22
ENGINE KNOCKING	24
BLUE/WHITE EXHAUST	26
EXCESSIVE LUBRICATING OIL CONSUMPTION	28
POOR COMPRESSION	30
OVERHEATING	32
EXCESSIVE CRANKCASE PRESSURE	34
ERRATIC RUNNING	36
VIBRATION	38
LOW OIL PRESSURE	40
HIGH OIL PRESSURE	42
EXAMPLES OF SERVICE ASSISTANCE	44

INTRODUCTION

This Fault Finding Guide should assist in the identifying of the probable cause of the problems which can occur. Having identified the problem, a remedy can be applied.

The relevant Workshop Manual should be consulted for any required detail.

The fuel injection equipment fitted to diesel engines is manufactured to extremely tight tolerances and cannot tolerate the ingress of any dirt particles. Therefore, if the fuel injection equipment, such as the lift pump, the fuel injection pump or the atomisers are suspect, then the equipment should be removed from the engine to the specialised fuel injection equipment workshop for testing and repair, or new replacement components fitted.

WARNING

Removal of the seals, or the breaking of the seals, on fuel injection pumps, will render any warranty claim on an engine, null and void.

Before commencing any work on a Perkins engine, ensure that you understand what the complaint is. For example, if the user complains that the engine is knocking, can you hear the knock which is being complained about.

If it becomes necessary to use new parts, ensure that the parts you use are genuine Perkins Parts. Your authorised Perkins parts counter will supply the proper part against the Perkins engine serial number.

LOW CRANKING SPEED

p.6

COLD ENGINE WILL NOT START

p.8

ENGINE IS DIFFICULT TO START

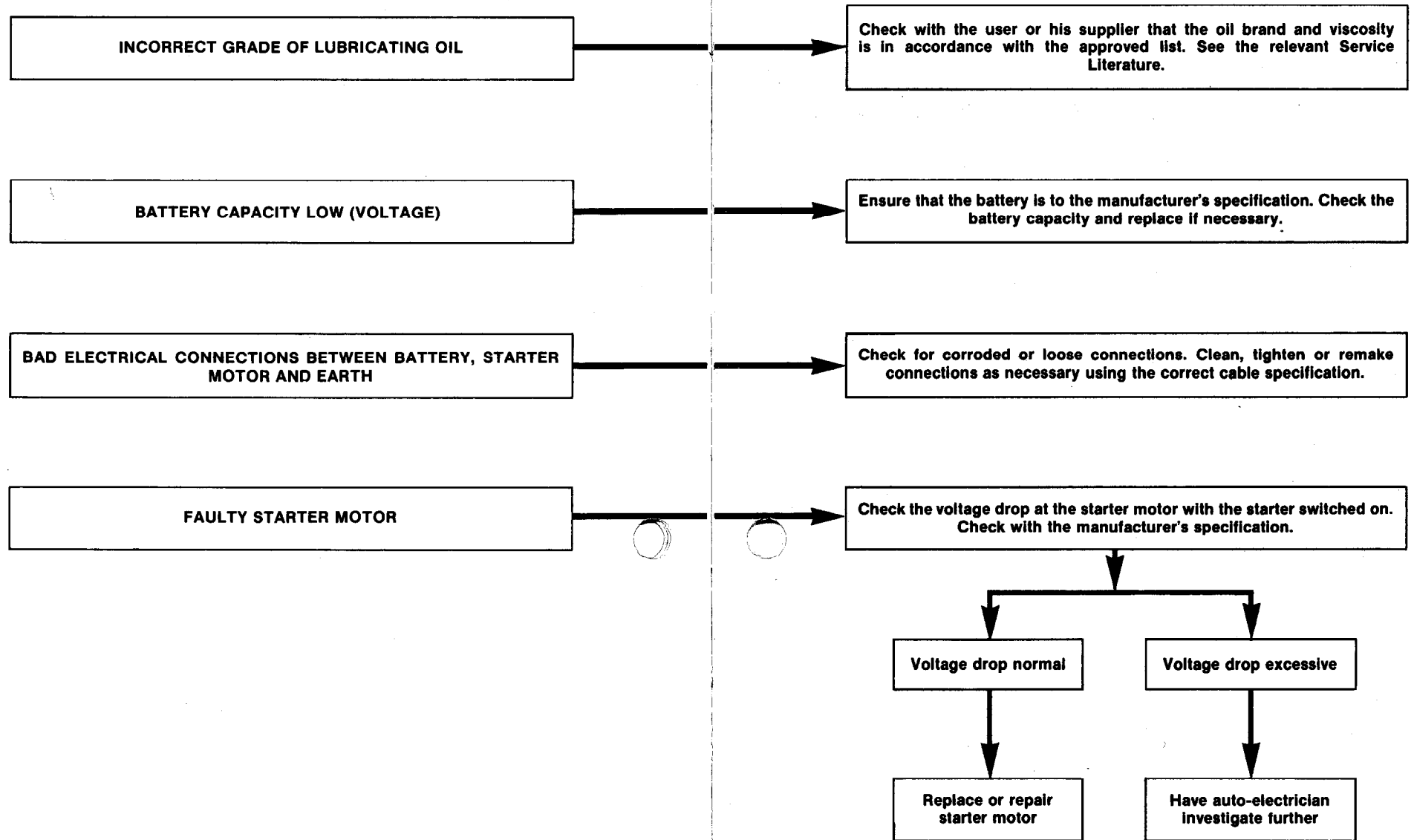
p.10

ENGINE STARTS AND STOPS

p.12

**ENGINE WILL NOT START
COLD OR HOT**

p.14



INCORRECT USE OF COLD STARTING EQUIPMENT

Refer to the Perkins handbook, check that the book being used is relevant to the engine type with the problem.

FAULTY COLD STARTING EQUIPMENT

Check the continuity of the electrical circuit in the cold starting equipment by an indicated voltage at the heater terminals when switched on.

The CAV "Thermostart" is fitted to many types of Perkins engines and with the air cleaner or hose removed from the induction manifold, the functioning of the unit can usually be seen.

When the unit is switched to the "heat" or "H" position, the "Thermostart" should glow and as the fuel valve in the unit opens, a flame should appear. If not, then there is either no fuel available, or the "Thermostart" is faulty.

Glow plugs can also be found fitted in Perkins engines. When 12 volt glow plugs are first switched on, there is an initial current of about 40 amperes settling to about 10 amperes after about 10 seconds, with a terminal voltage of 11-12 volts.

Some in-line fuel injection pumps are fitted with an excess fuel device. Check that the remote controls are operating satisfactorily.

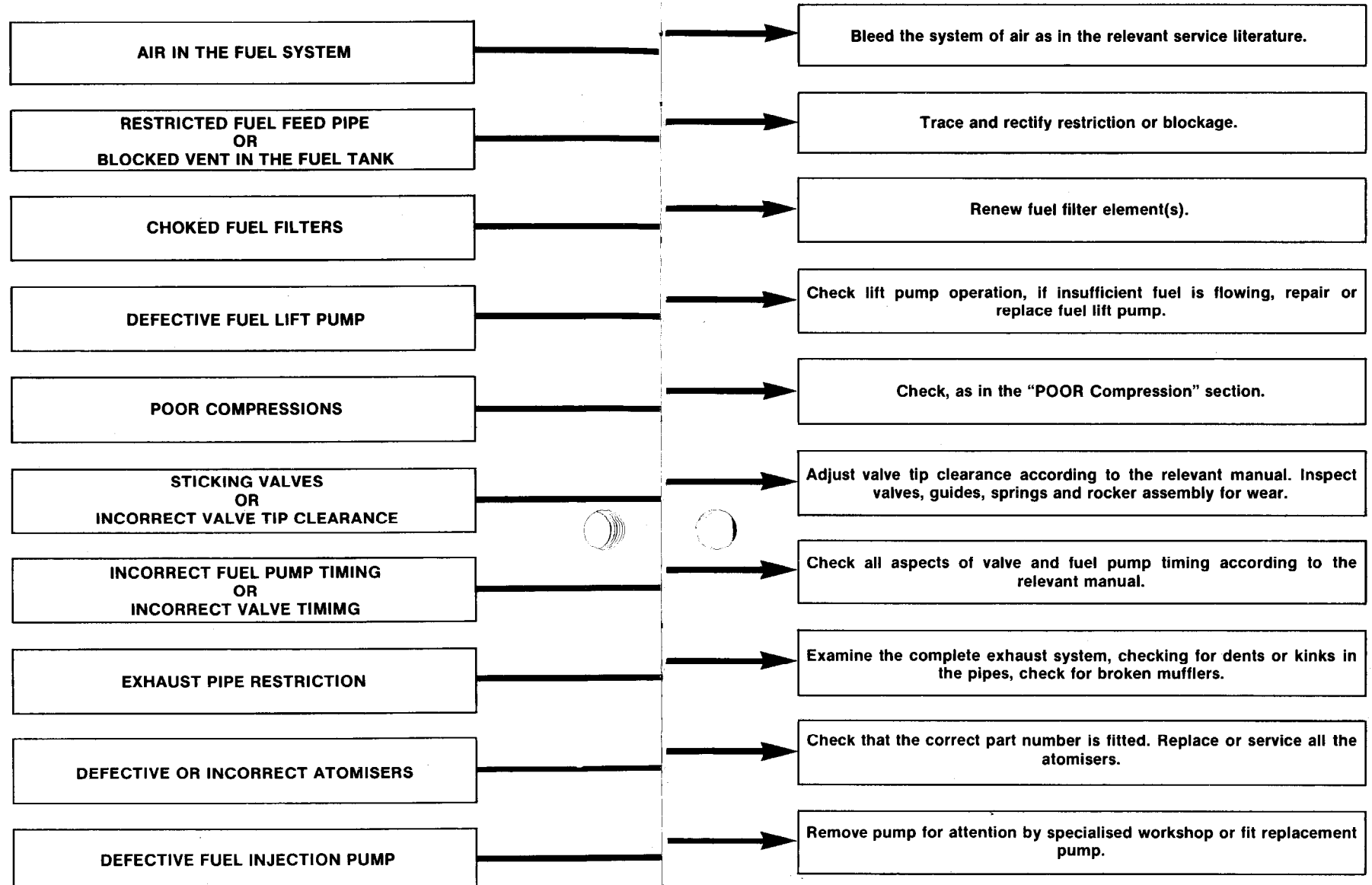
If "Start Pilot" aids are used, ensure the equipment is used strictly according to the manufacturers instructions. Never attempt to use heaters in conjunction with ether type starting aids.

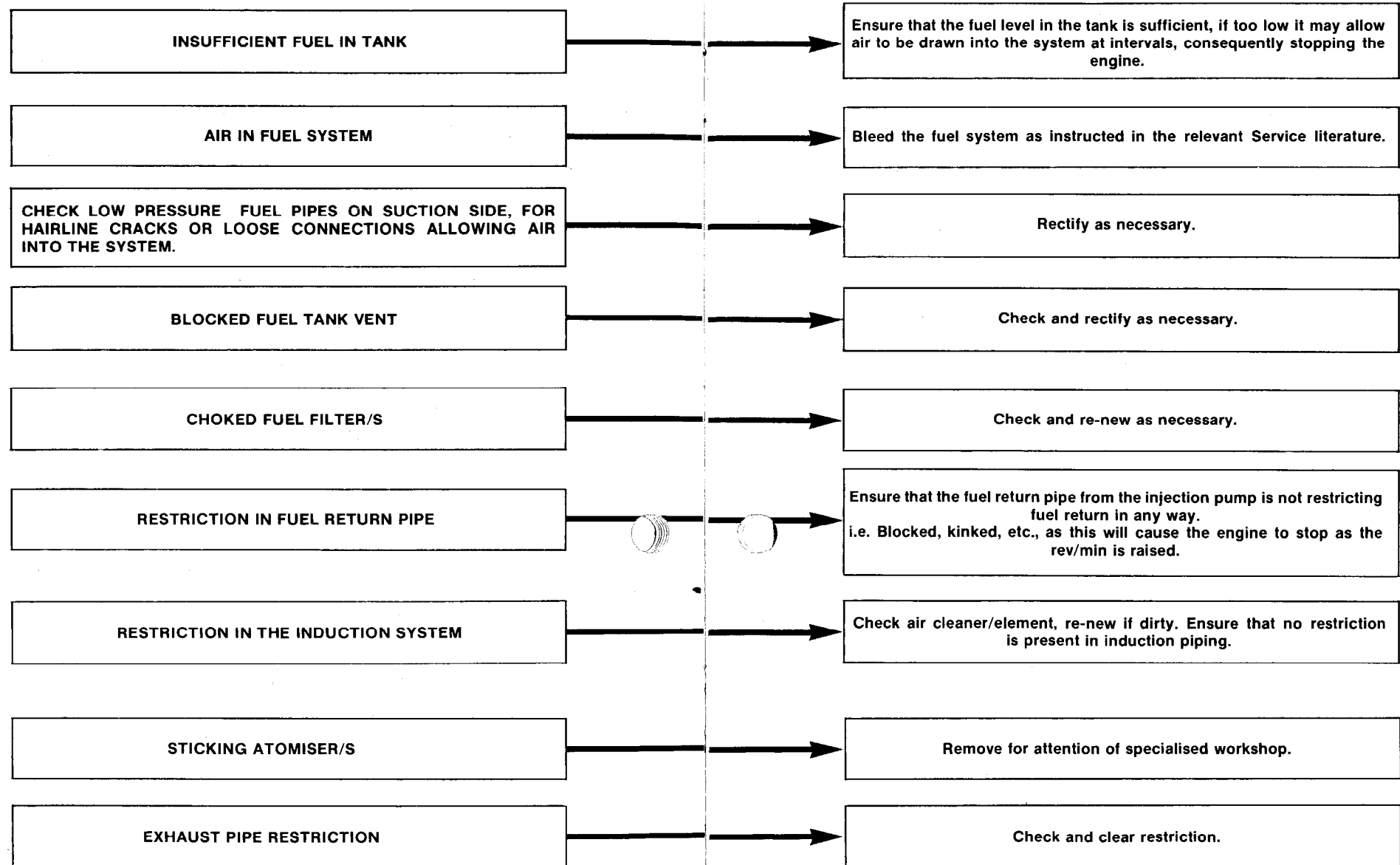
INCORRECT GRADE OF FUEL

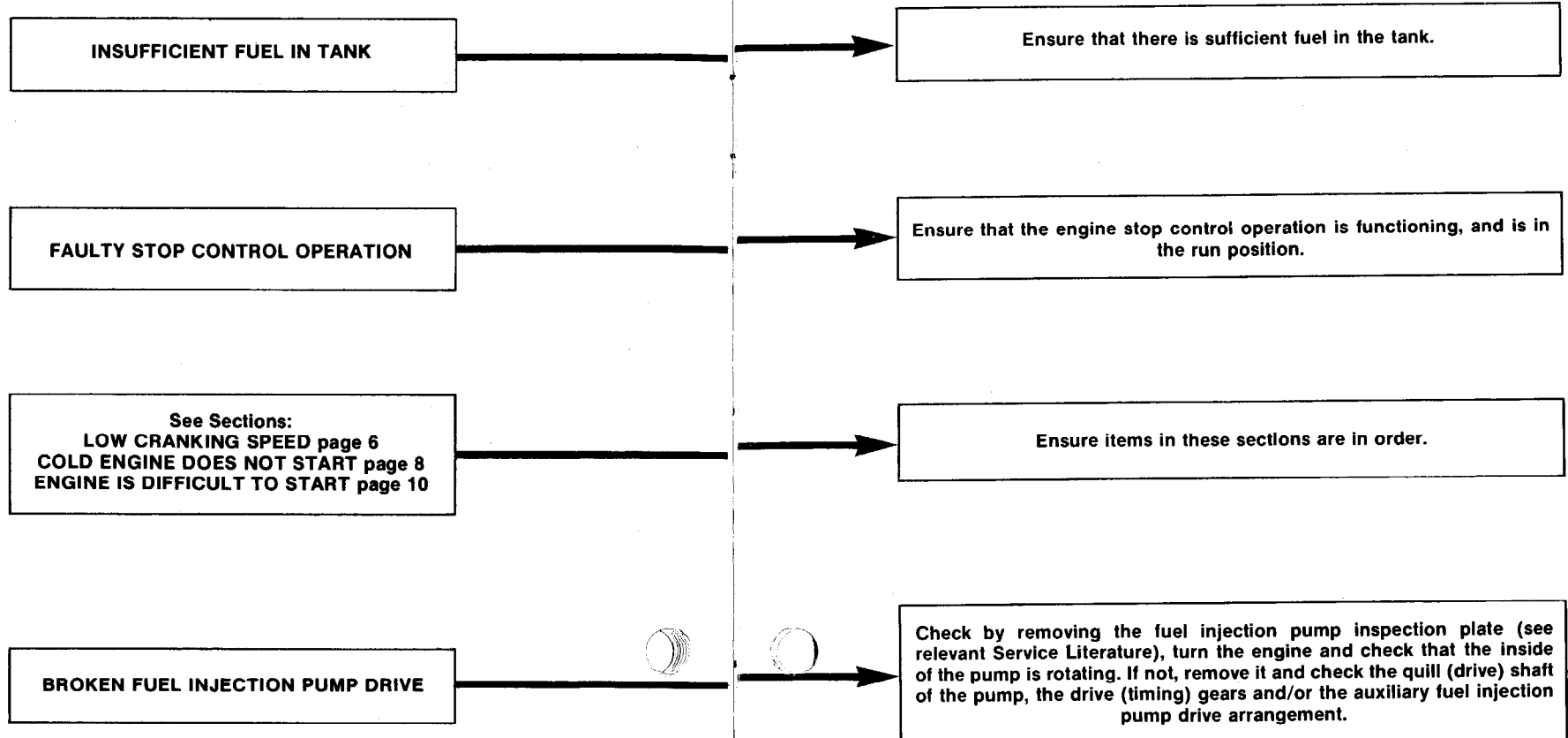
Where necessary, check the specification of the fuel with the supplier, against the relevant Service Literature.

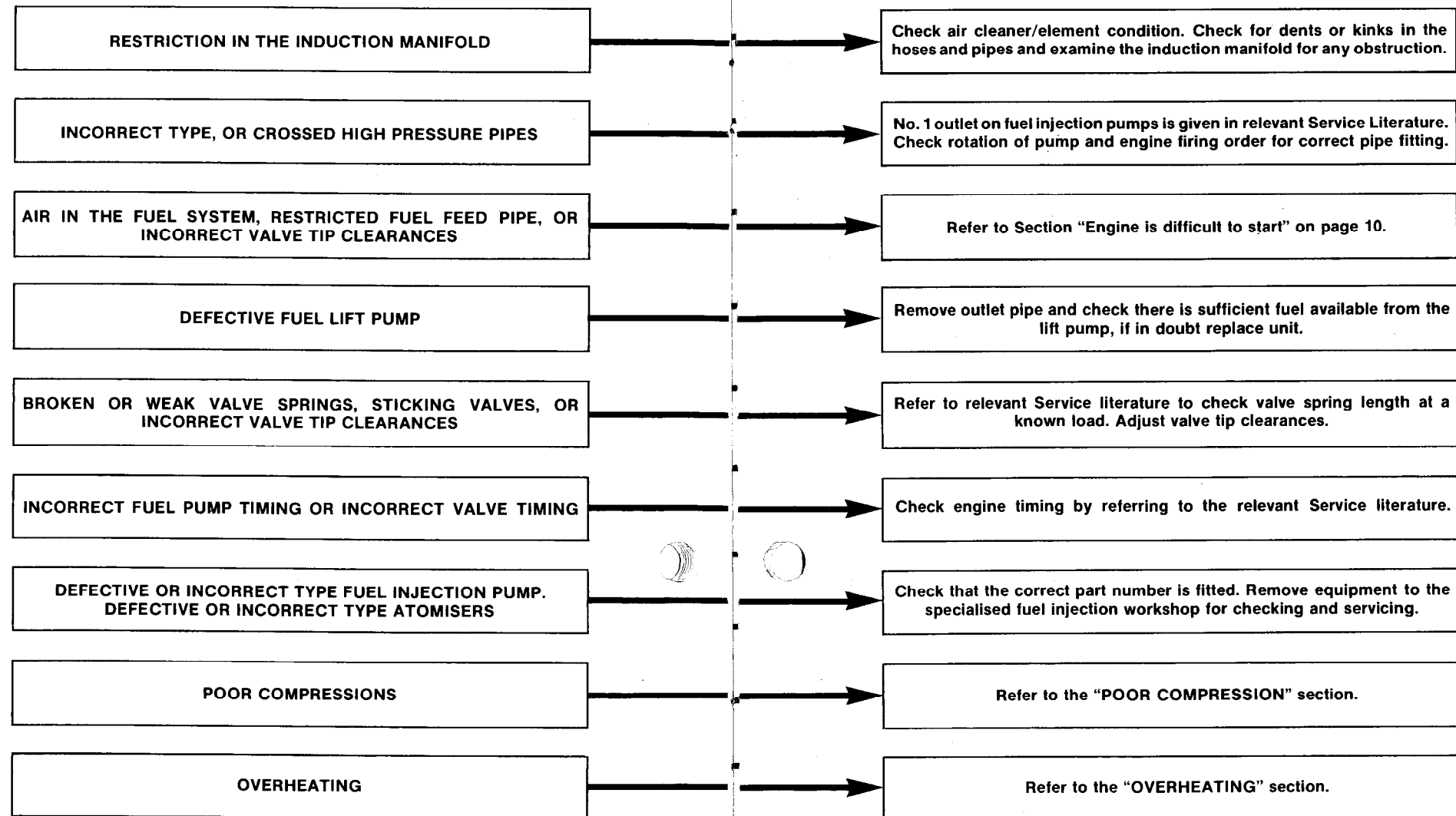
See sections
"LOW CRANKING SPEEDS" on page 6
"ENGINE IS DIFFICULT TO START" on page 10
"ENGINE WILL NOT START" on page 14

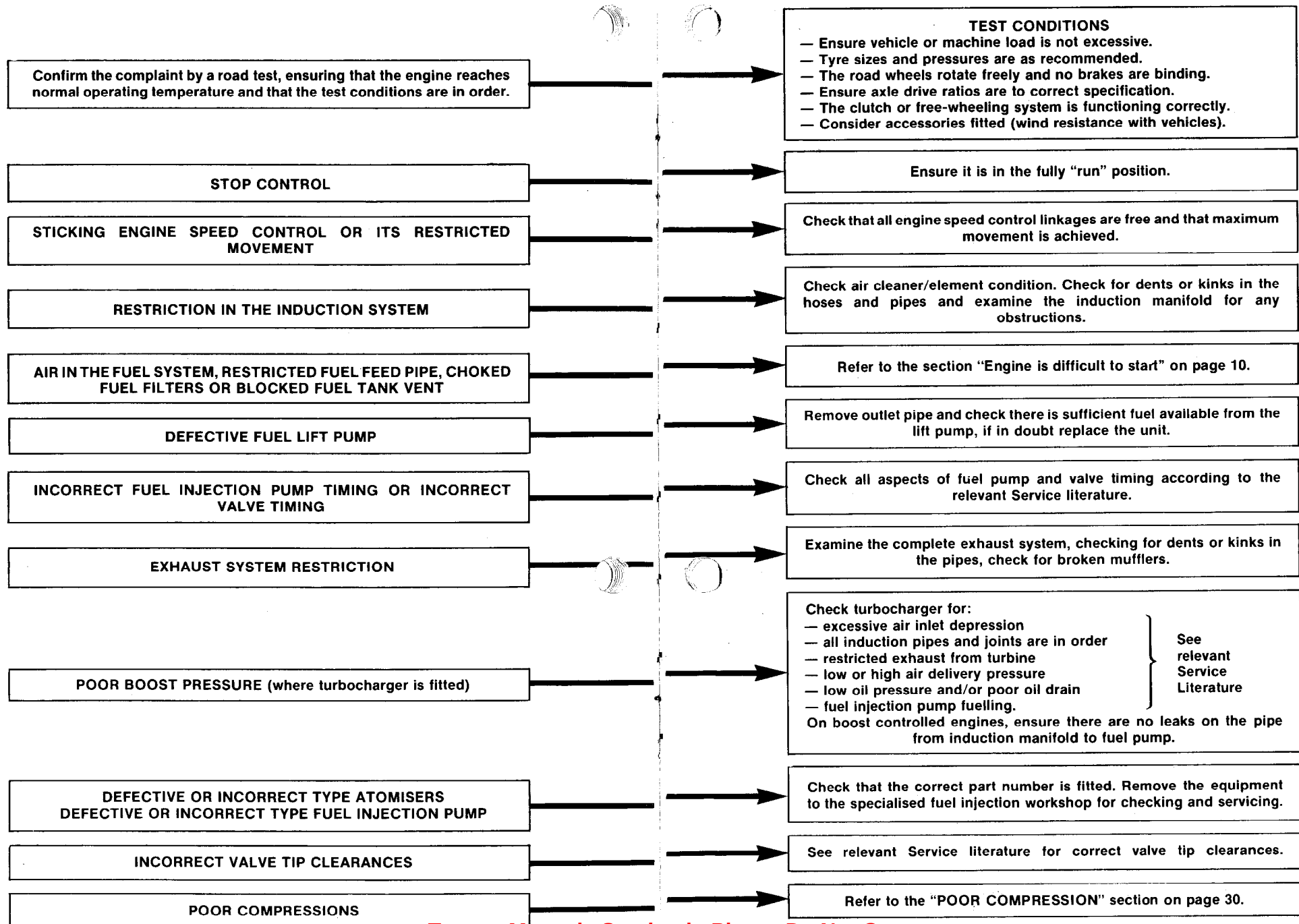
Assuming that the problems
LOW CRANKING SPEED
and
COLD ENGINE WILL NOT START
have been resolved, proceed as follows:

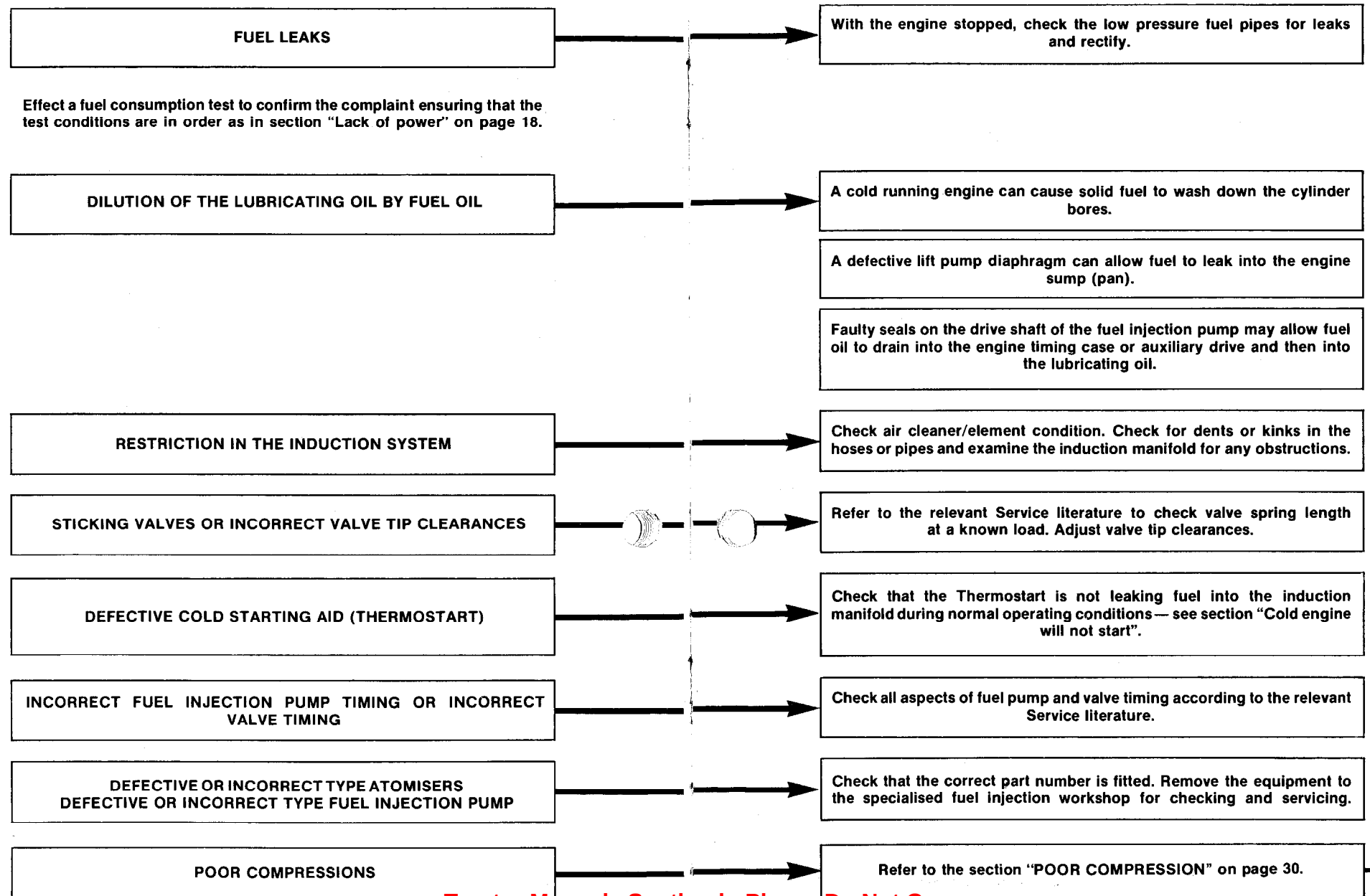




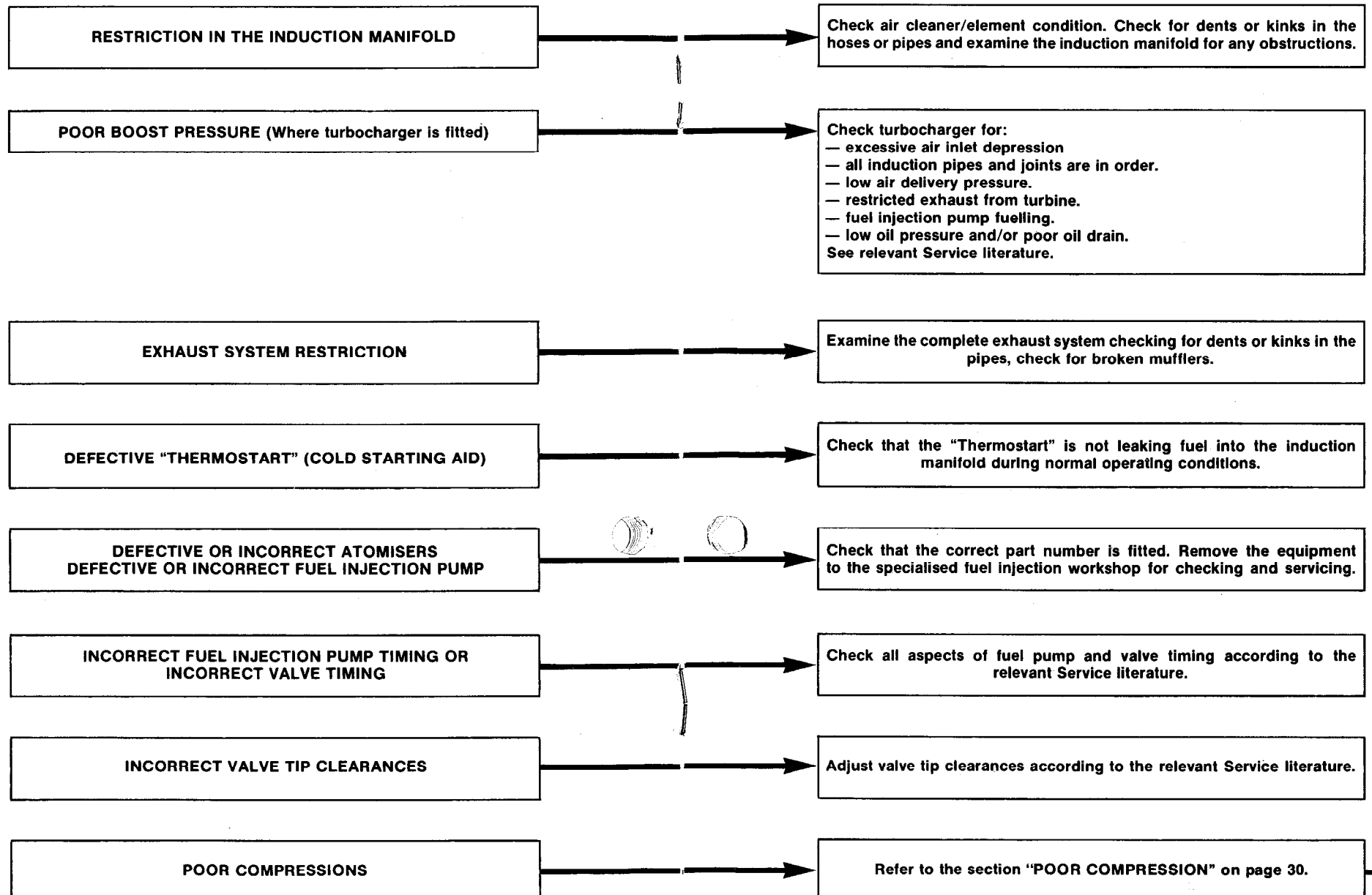


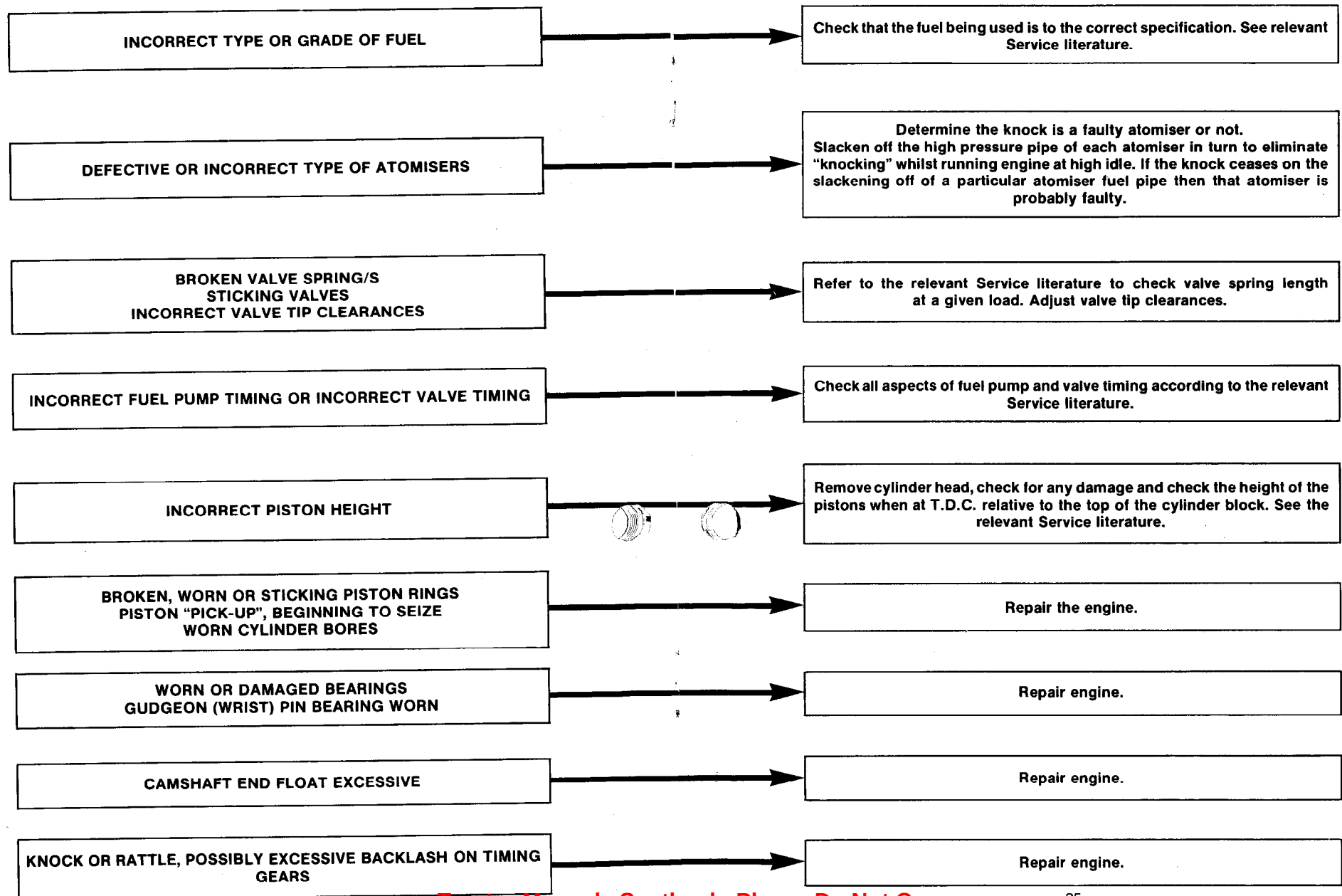




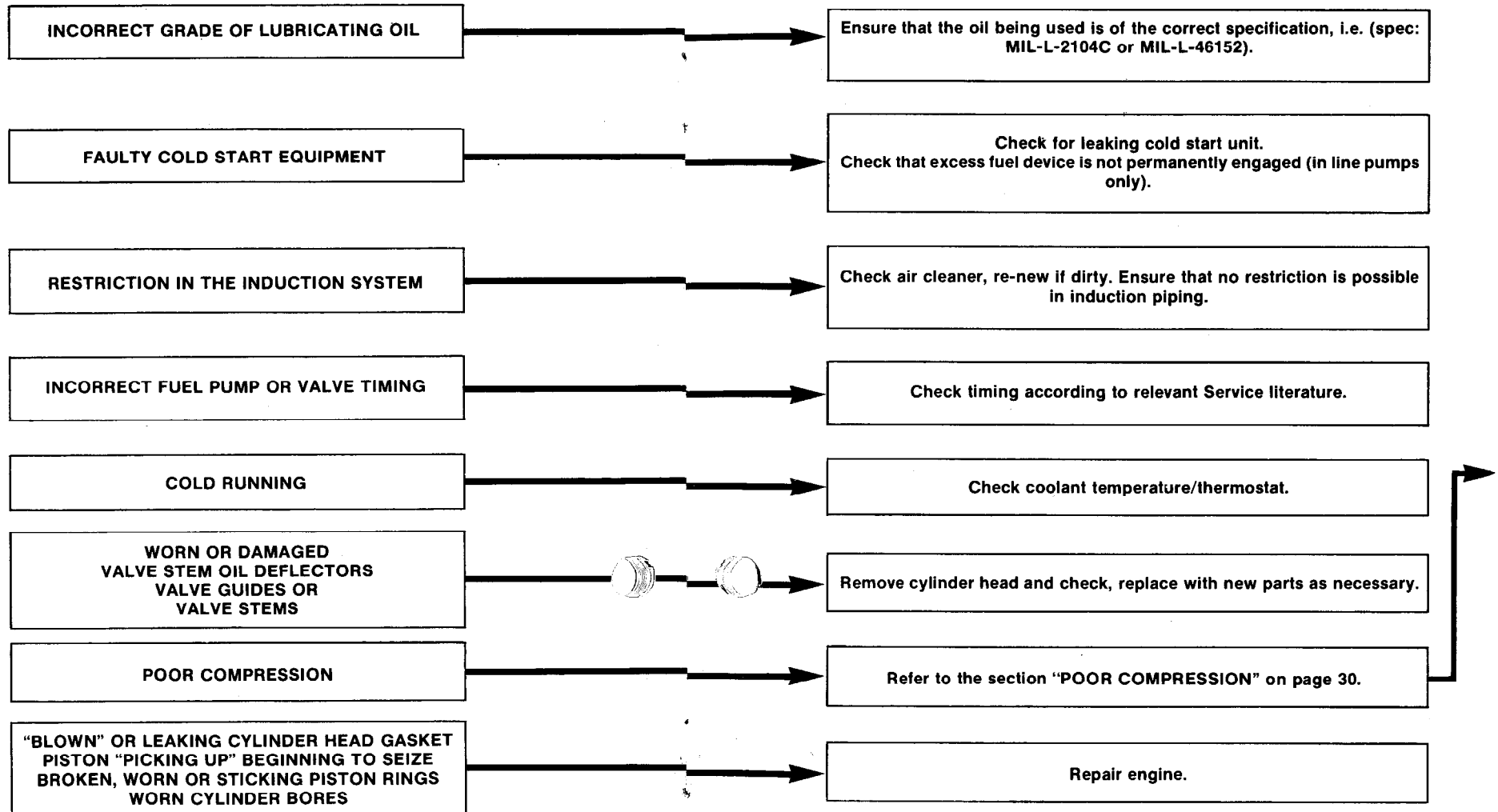


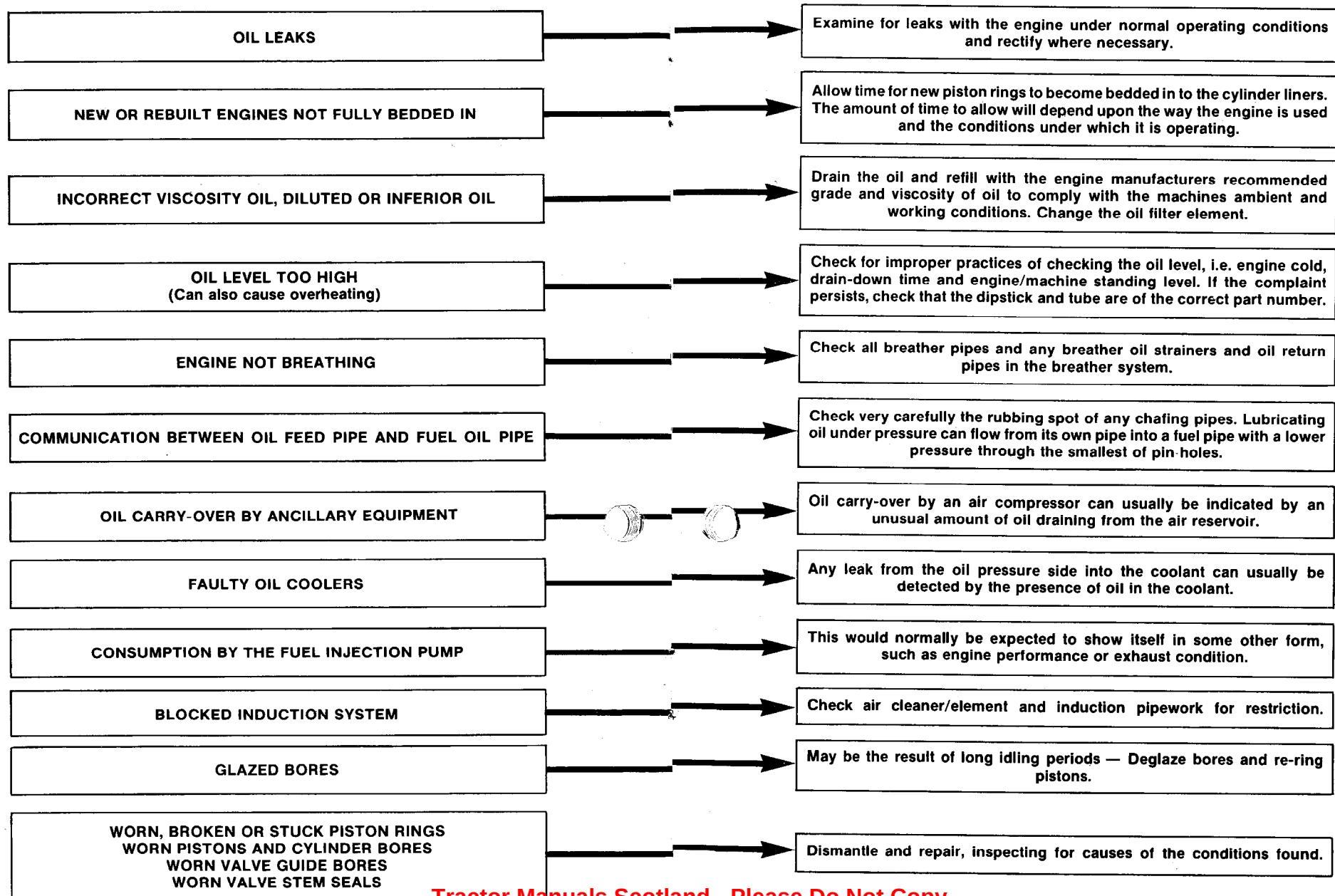
Confirm the complaint by a road test, ensuring that the engine reaches normal operating temperature and that the test conditions are in order as in the section "Lack of power" on page 18.

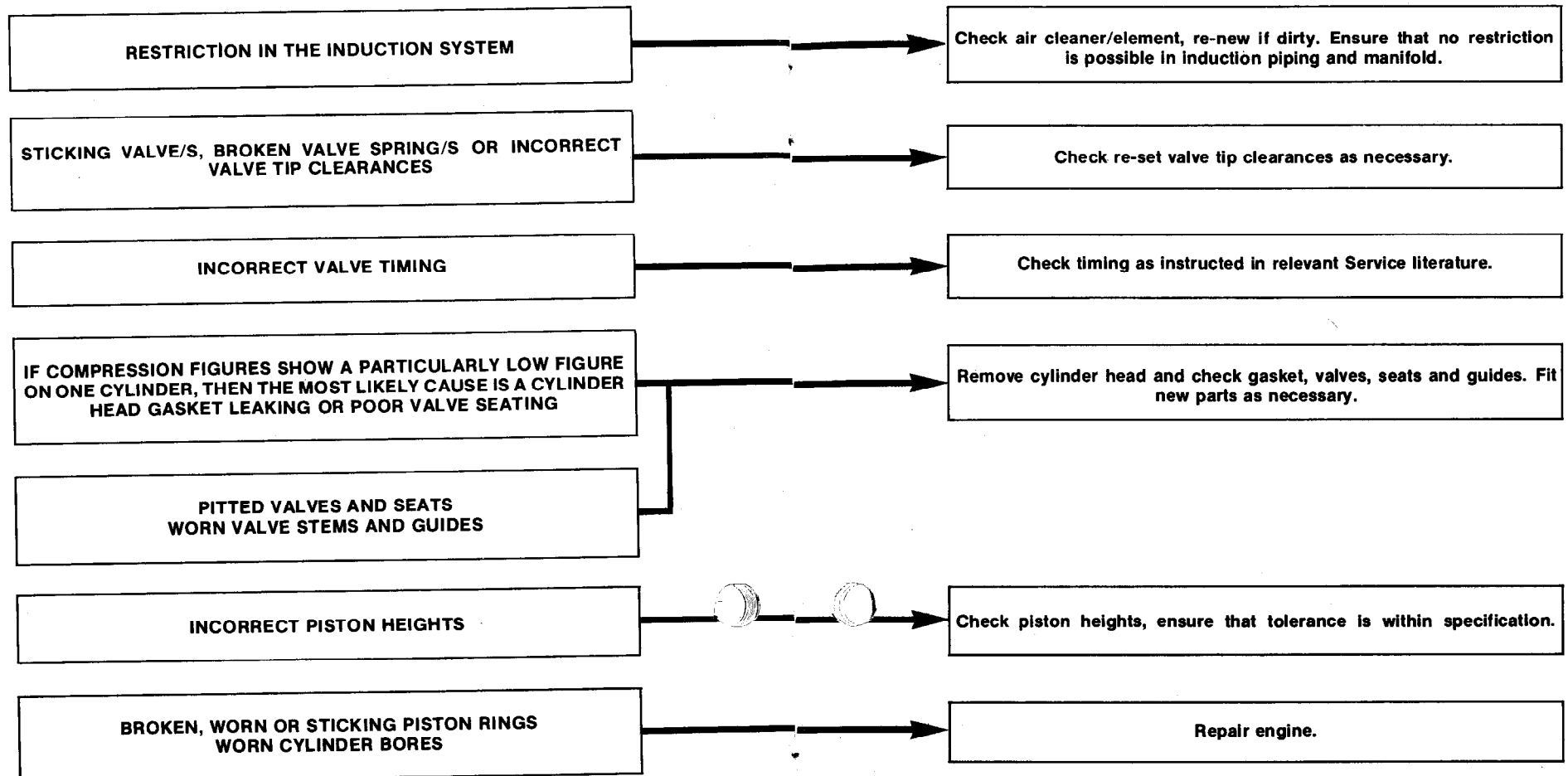




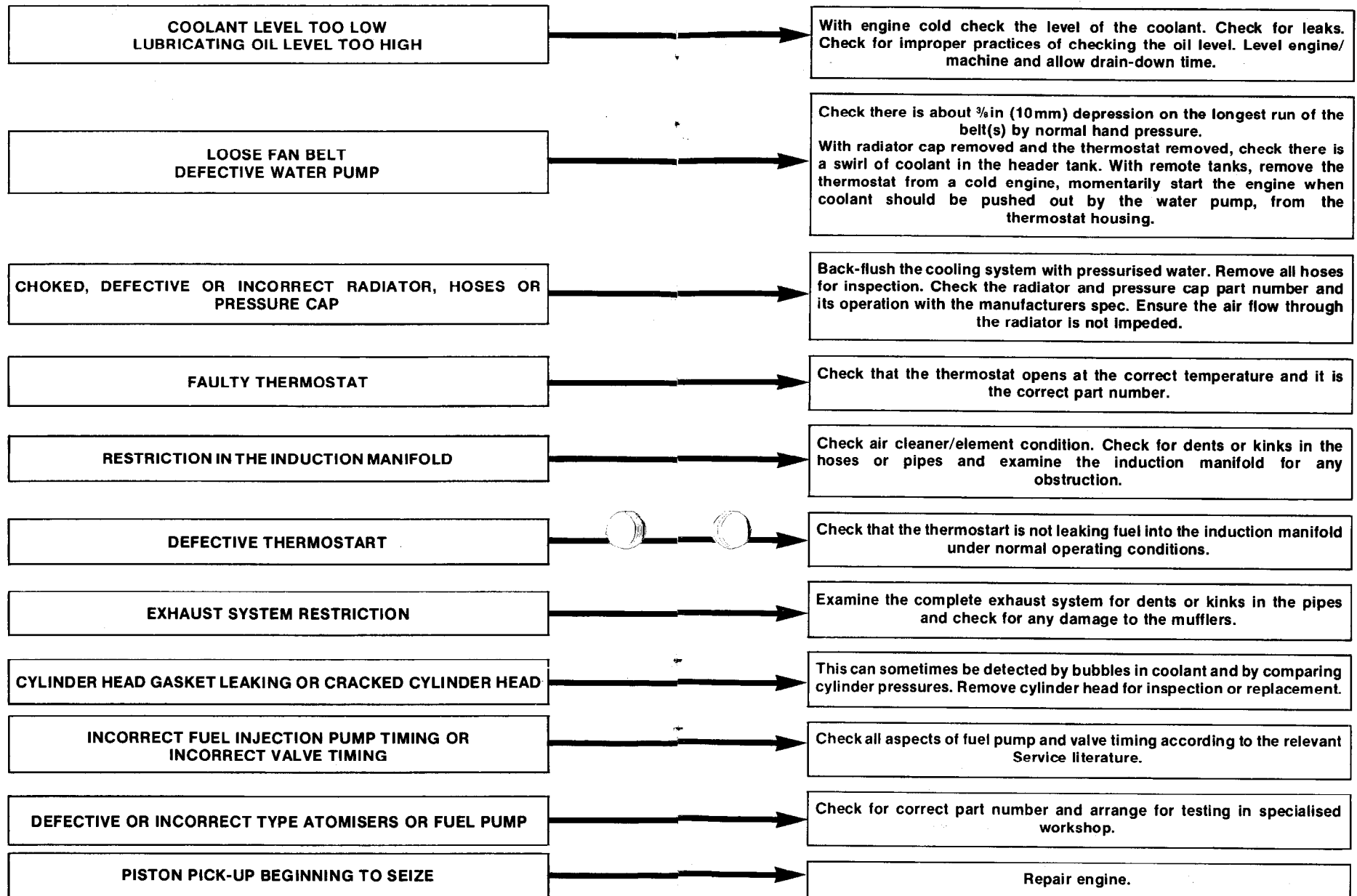
NOTE
CONFIRM COMPLAINT BY ROAD TEST, ENSURING ENGINE
REACHES NORMAL OPERATING TEMPERATURE







Check that the machine or vehicle is not being overloaded.
Check that any temperature gauge fitted to the machine is not faulty, by removing the radiator pressure cap, run the engine until coolant warms up and using a thermometer in the radiator compare its reading to that of the gauge fitted to the machine.



NOTE
IT IS ASSUMED THAT ON A COMPLAINT OF THIS NATURE, OIL IS
BEING BLOWN OUT EXTERNALLY, i.e. OUT OF DIPSTICK TUBE,
ETC.

CHOKED BREATHER OR PIPE

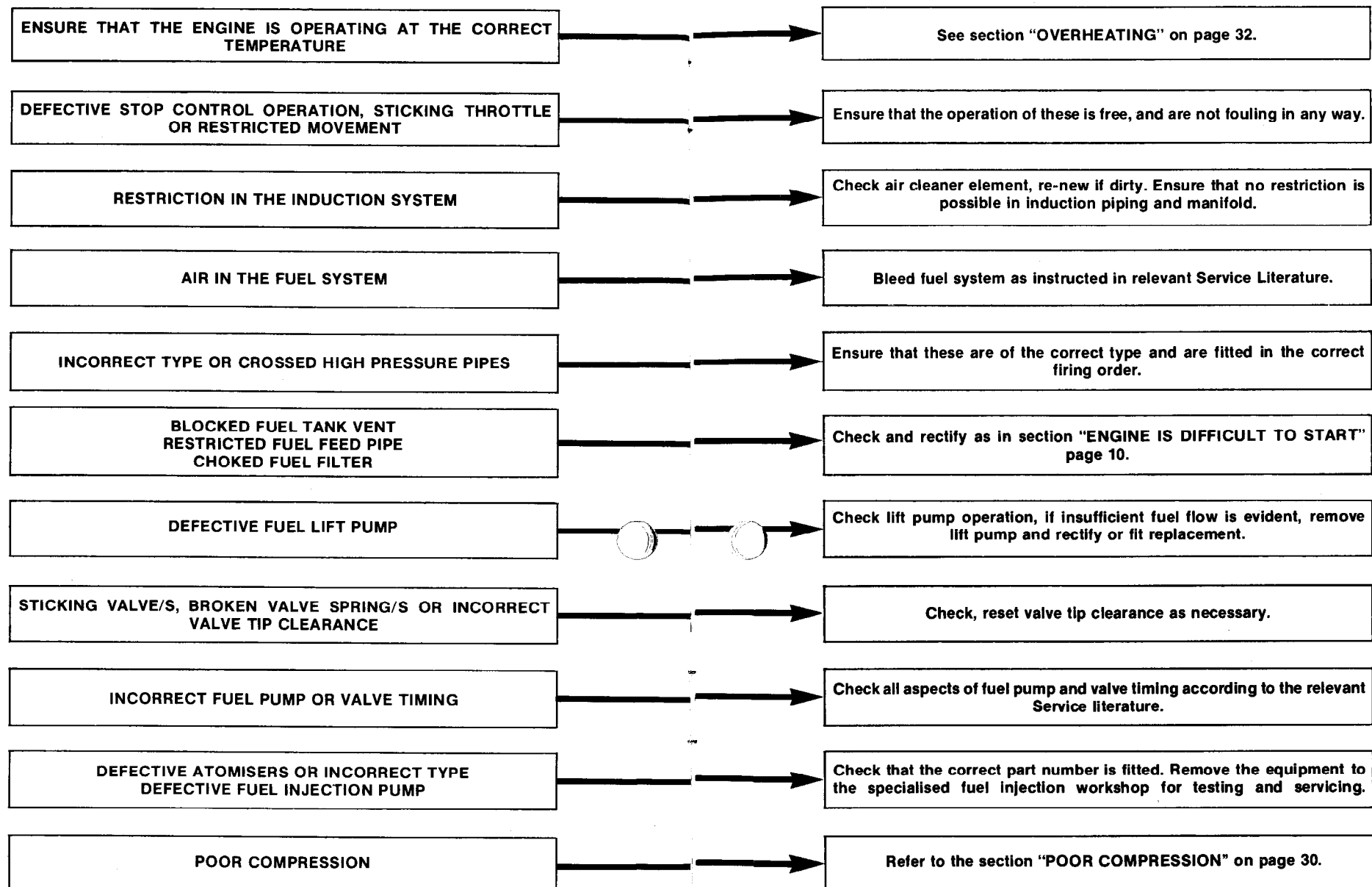
Remove the engine breather and pipe and check for restriction. Rectify
as necessary.

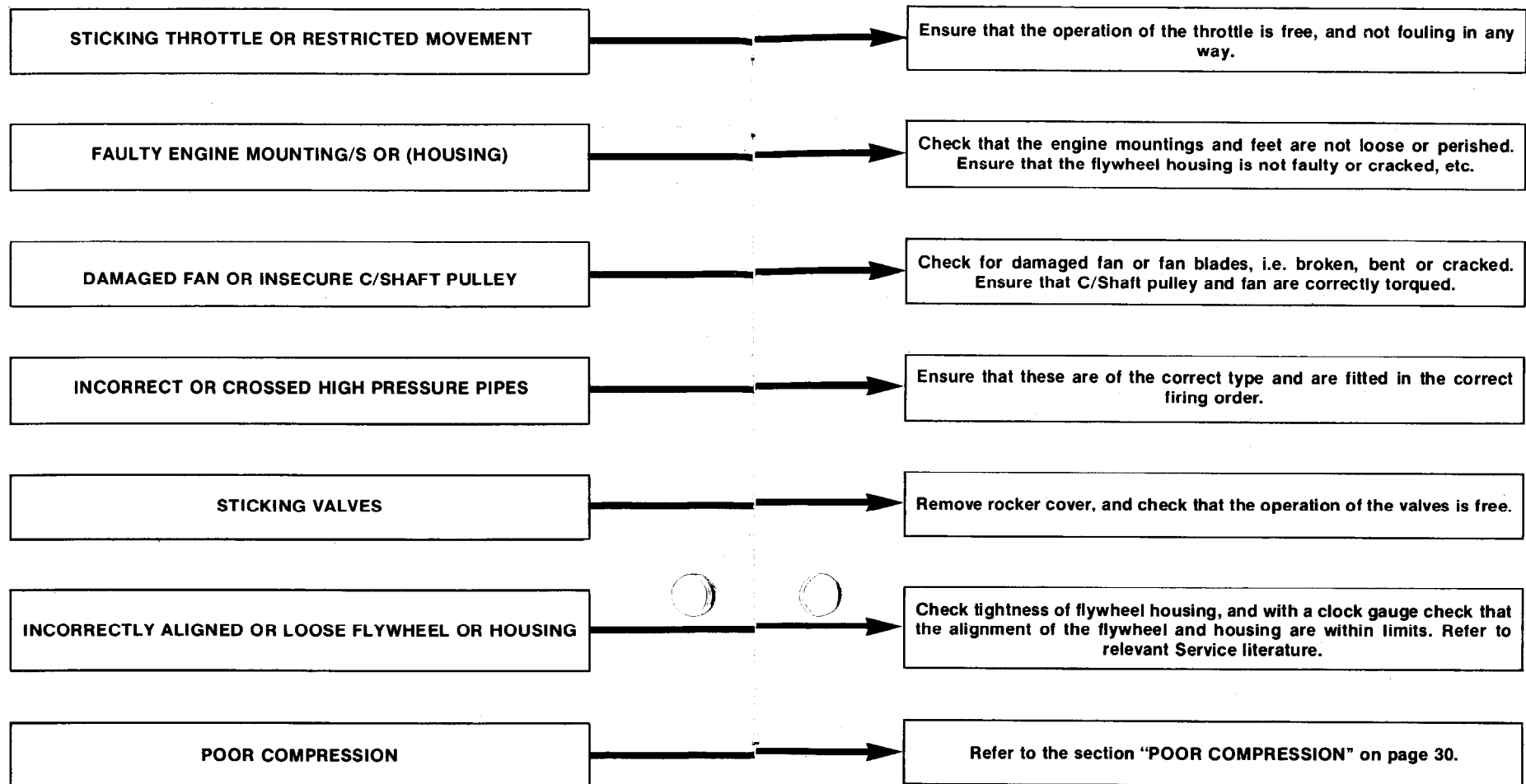
DEFECTIVE EXHAUSTER (if fitted)

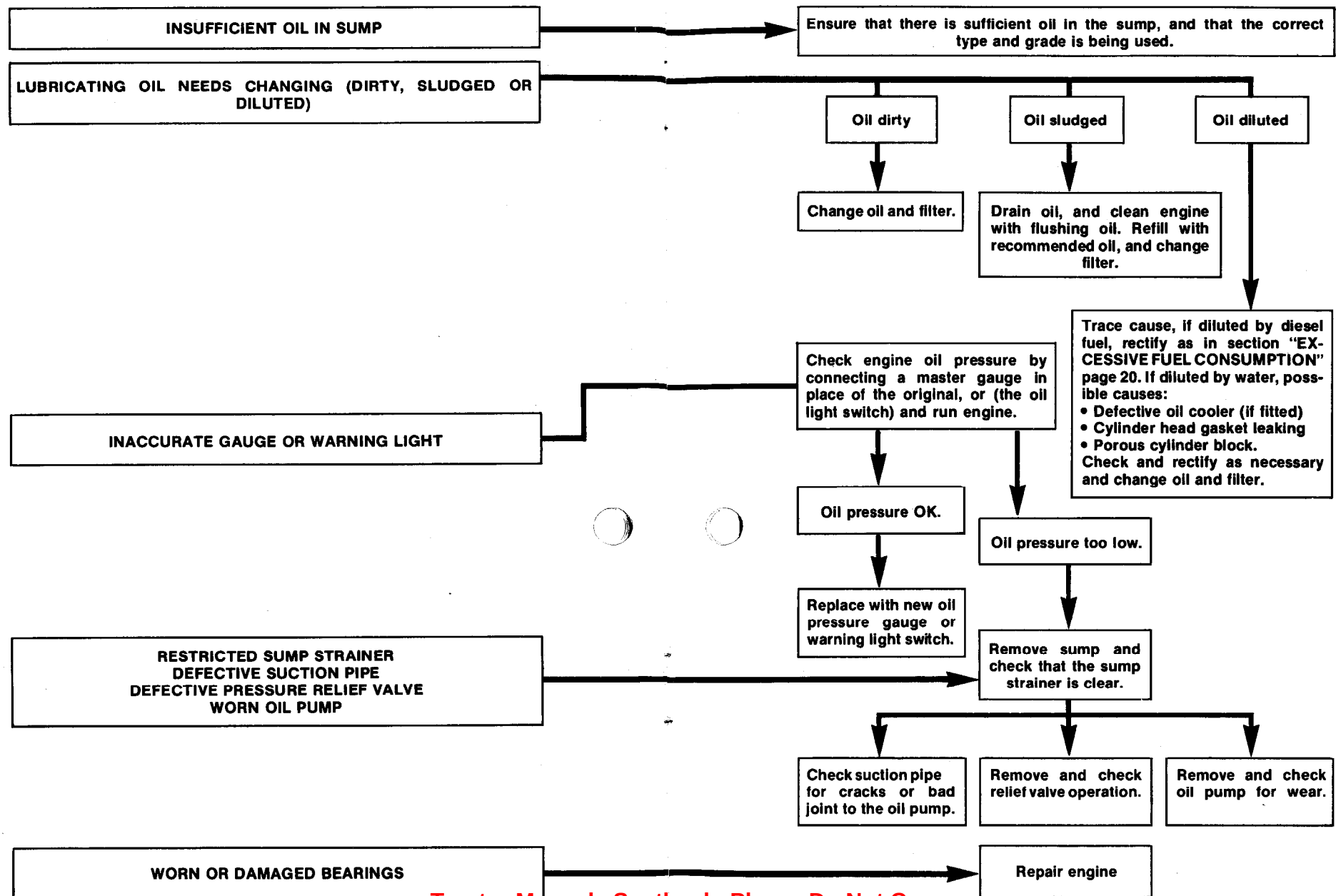
Ensure that there are no leaks in the vacuum system or exhaust, as
this would permit air to enter the engine causing crankcase pressure.

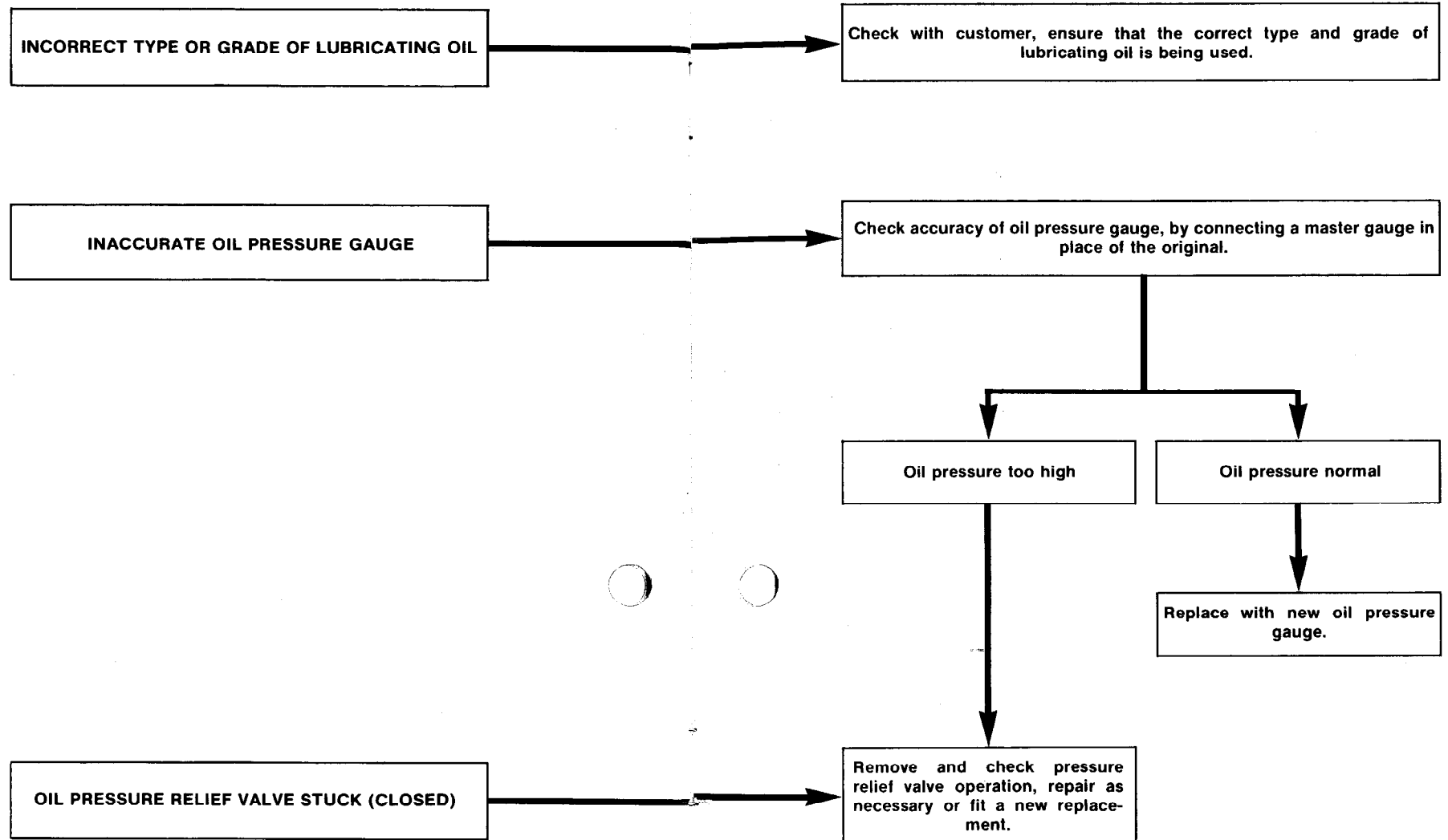
**PISTON PICK-UP BEGINNING TO SEIZE
WORN CYLINDER BORES
BROKEN, WORN OR STICKING PISTON RINGS
CYLINDER HEAD GASKET LEAKING**

Repair engine.









EXAMPLES OF SERVICES ASSISTANCE

Service

If any problems occur with your engine or the components fitted to it, your Perkins distributor can make the necessary repairs and will ensure that only the correct parts are fitted and that the work is done correctly.

Certain components can be supplied by your Perkins distributor through the Perkins Power Exchange system. These will enable you to reduce the cost of some repairs.

Extended warranty

The engine warranty period can be extended to two years. For details get in contact with your nearest Perkins distributor.

Service literature

Workshop manuals and other service publications are available from your Perkins distributor at a nominal cost.

Training

Local training on correct engine operation, overhaul and service is available at some Perkins distributors. If special training is needed, your Perkins distributor can give details of how to get this at the Product Education Department, Peterborough, or other main centres.