

**F5AE5484A / F5AE9454A /
F5AE9454D / F5AE9454J /
F5AE9454L / F5AE9484A /
F5AE9484B / F5AE9484G /
F5AE9484K / F5CE5454B*A005 /
F5CE5454B / F5CE5454C*A003 /
F5CE5454G*A00I / F5CE9454C /
F5CE9454E / F5CE9454G /
F5CE9484C / F5CE9484E**
Engine

SERVICE MANUAL

Part number 84465357

English

March 2011

Replaces part number 84283922

CASE
CONSTRUCTION

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INTRODUCTION

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manual**

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admin@servicemanualperfect.com**

Foreword

This publication contains data, features instructions and methods for performing repair operations on the assembly and its components and is addressed to qualified, specialized personnel.

Check to make sure you have the right publication related to the component you are about to work on before you start. Make sure that you have all the necessary safety equipment: safety glasses, helmet, gloves, footwear, etc. Check that the working lifting and transport equipment is available and in working order. Make sure that vehicle is secured. Proceed by carefully observing the instructions contained in this publication and use the indicated specific tools to ensure correct repair procedures and safety of operators.

NOTE: *This manual applies to multiple applications, therefore images may not all be accurate.*

Safety rules

Standard safety precautions

Be informed and notify personnel of the laws in force regulating safety, and provide documentation available for consultation.

- Keep working areas as clean as possible.
- Ensure that working areas are provided with emergency boxes. They must be clearly visible and always contain adequate sanitary equipment.
- Fire extinguishers must be properly identified and always be clear of obstructions. Their efficiency must be checked on a regular basis and personnel must be trained on proper interventions and priorities.
- Keep all emergency exits free of obstructions and clearly marked.
- Smoking in working areas subject to fire danger must be strictly prohibited.

Prevention of injury

- Wear suitable work attire and safety glasses with no jewelry such as rings and chains when working close to engines and equipment in motion.
- Wear safety gloves and goggles when performing the following operations:
 - Topping off or changing lubrication oils.
 - Using compressed air or liquids at a pressure greater than **2 bar (29 psi)**.
- Wear a safety helmet when working close to hanging loads or equipment working at head level.
- Always wear safety shoes and fitting clothes.
- Use protection cream for hands.
- Change wet clothes as soon as possible.
- In the presence of voltages exceeding **48 - 60 V**, verify the efficiency of the ground and mass electrical connections. Ensure that hands and feet are dry and use isolating foot boards. Workers should be properly trained to work with electricity.
- Do not smoke or start an open flame close to batteries and any fuel material.
- Place soiled rags with oil, diesel fuel or solvents in specially provided anti-fire containers.
- Do not use any tool or equipment for any use other than what it was originally intended for. Serious injury may occur.
- If running an engine indoors, make sure there is a sufficient exhaust fan in use to eliminate exhaust fumes.

During maintenance

- Never open the filler cap of the cooling system when the engine is hot. High temperature liquid at operating pressure could result in serious danger and risk of burn. Wait until the temperature decreases under **50 °C (122 °F)**.
- Never add coolant to an overheated engine and use only appropriate liquids.
- Always work when the engine is turned off. Certain circumstances require maintenance on a running engine. Be aware of all the risks involved with such an operation.
- Always use adequate and safe containers for engine fluids and used oil.
- Keep engine clean of any spilled fluids such as oil, diesel fuel, and or chemical solvents.
- Use of solvents or detergents during maintenance may emit toxic vapors. Always keep working areas aerated. Wear a safety mask if necessary.
- Do not leave soiled rags that may contain any flammable substances close to the engine.
- Always use caution when starting an engine after any work has been performed. Be prepared to cut off intake air in case of engine runaway.
- Never disconnect the batteries while the engine is running.

- Disconnect the batteries prior to performing any work on the equipment.
- Disconnect the batteries to place a load on them with a load tester.
- After any work is performed, verify that the battery clamp polarity is correct and that the clamps are tight and safe from accidental short circuit and oxidation.
- Before disconnecting any pipelines (pneumatic, hydraulic, fuel pipes, etc.), verify that all pressure has been released. Take all necessary precautions bleeding and draining residual pressure. Always wear the proper safety equipment.
- Do not alter the lengths of any wires.
- Do not connect any electronic service tool to the engine electrical equipment unless specifically approved by Iveco.
- Do not modify the fuel system or hydraulic system unless approved by Iveco, Any unauthorized modification will compromise warranty assistance and may affect engine operation and life span.

For engine equipped with an electronic control unit

- Do not weld on any part of the equipment without removing the control unit.
- Remove the in case of work requiring heating over **80 °C (176 °F)**.
- Do not paint the components and the electronic connections.
- Do not alter any data filed in the electronic control unit driving the engine. Any manipulation or alteration of electronic components will void engine warranty assistance and may affect the correct working order and life span of the engine.

Respect of the Environment

- Respect of the environment should be of primary importance. Take all necessary precautions to ensure personnel's safety and health.
- Inform the personnel of the laws regarding the dispensing of used engine fluids.
- Handle batteries with care, storing them in a well ventilated environment and within anti-acid container.

Torque

F5CE5454B, F5CE9454C, F5CE9454E, F5CE9454G, F5CE9484C, F5CE9484E, F5CE5454G*A001, F5CE5454B*A005, F5CE5454C*A003

DESCRIPTION	SIZE	TORQUE
Oil Pan		
Threaded cap with O-ring		45 - 55 N·m (33 - 41 lb ft)
Oil pan spacer	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Engine Block		
Crankshaft caps - Pre torque - Torque - Angle torque		45 - 55 N·m (33 - 41 lb ft) 75 - 85 N·m (55 - 63 lb ft) 85 - 95 °
Piston cooling nozzle		16 - 20 N·m (12 - 15 lb ft)
Conical thread cap	3/8"	35 - 45 N·m (26 - 33 lb ft)
Conical thread cap	1/8"	10 - 20 N·m (7 - 15 lb ft)
Water drainage cap		20 - 30 N·m (15 - 22 lb ft)
Oil turbo supply pipe fitting		35 - 45 N·m (26 - 33 lb ft)
Timing gearcase		
Conical thread cap		10 - 20 N·m (7 - 15 lb ft)
Gear cooling nozzle		10 - 20 N·m (7 - 15 lb ft)
Cover	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Ignition pump screw stud		3 - 5 N·m (27 - 44 lb in)
Timing pin seat cap		20 - 30 N·m (15 - 22 lb ft)
Gearcase	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Inspection cover		20 - 30 N·m (15 - 22 lb ft)
Flywheel housing		
Housing	M8x1.25 M12x1.75	30 - 40 N·m (22 - 30 lb ft) 115 - 125 N·m (85 - 92 lb ft)
Cylinder head		
Cylinder head - Stage 1 - Stage 2 - Stage 3	M15x1.5	120 - 140 N·m (89 - 103 lb ft) 85 - 95 ° 85 - 95 °
Cylinder head - Stage 1 - Stage 2 - Stage 3	M12x1.5	60 - 70 N·m (44 - 52 lb ft) 85 - 95 ° 55 - 65 °
Threaded cap		35 - 45 N·m (26 - 33 lb ft)
Overhead		
Rocker arm dowel		20 - 30 N·m (15 - 22 lb ft)
Overhead	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Valve adjusting nut		15 - 25 N·m (11 - 18 lb ft)
Intake Manifold		
Intake manifold	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Throw fastening to intake manifold		20 - 30 N·m (15 - 22 lb ft)
Exhaust Manifold		
Exhaust manifold		10 - 20 N·m (7 - 15 lb ft)

INTRODUCTION

Turbocharger mounting stud		10 - 20 N·m (7 - 15 lb ft)
EGR Unit		
Heat exchanger fastening to valve unit		20 - 30 N·m (15 - 22 lb ft)
Heat exchanger fastening to throw		20 - 30 N·m (15 - 22 lb ft)
EGR fastening to intake manifold		20 - 30 N·m (15 - 22 lb ft)
Valve		5 - 15 N·m (4 - 11 lb ft)
Manifold fastening nuts		20 - 30 N·m (15 - 22 lb ft)
Manifold fastening rings		5 - 15 N·m (4 - 11 lb ft)
Pulley		
Engine crankshaft pulley		335 - 365 N·m (247 - 269 lb ft)
Connecting Rod		
Connecting rod cap - Pre-torque - Angle torque		45 - 55 N·m (33 - 41 lb ft) 65 - 75 °
Flywheel		
Flywheel - Pre-torque - Angle torque		25 - 35 N·m (18 - 26 lb ft) 85 - 95 °
Timing		
Phonic wheel		12 - 18 N·m (9 - 13 lb ft)
Thrust block		20 - 30 N·m (15 - 22 lb ft)
Gear		31 - 41 N·m (23 - 30 lb ft)
Injector		
Injector stud screw		21 - 29 N·m (15 - 21 lb ft)
Injector fastening nut - Pre-torque - Angle torque		10 - 20 N·m (7 - 15 lb ft) 25 - 35 N·m (18 - 26 lb ft)
LDA		
Manifold side		15 - 25 N·m (11 - 18 lb ft)
Pump side		15 - 25 N·m (11 - 18 lb ft)
Sensors		
Crankshaft speed sensor		5 - 15 N·m (4 - 11 lb ft)
Camshaft speed sensor		5 - 15 N·m (4 - 11 lb ft)
Water temperature sensor		31 - 41 N·m (23 - 30 lb ft)
Oil temperature sensor		20 - 30 N·m (15 - 22 lb ft)
Air pressure sensor		5 - 15 N·m (4 - 11 lb ft)
Fuel filter		
Union fixing to support		20 - 30 N·m (15 - 22 lb ft)
Fuel filter		20 - 30 N·m (15 - 22 lb ft)
Supply Pump		
Supply pump		20 - 30 N·m (15 - 22 lb ft)
Inlet		20 - 30 N·m (15 - 22 lb ft)
Fast clutch		20 - 30 N·m (15 - 22 lb ft)
Turbocharger		

INTRODUCTION

Collector fastening screw nuts		20 - 30 N·m (15 - 22 lb ft)
Oil delivery inlet		20 - 30 N·m (15 - 22 lb ft)
Delivery pipe fastening screw		20 - 30 N·m (15 - 22 lb ft)
Drain pipe to heat exchanger		20 - 30 N·m (15 - 22 lb ft)
Drain pipe to turbo		10 - 20 N·m (7 - 15 lb ft)
Cooling pipe		
Water pipe to heat exchanger		20 - 30 N·m (15 - 22 lb ft)
Water pipe to the support		20 - 30 N·m (15 - 22 lb ft)
Conical threaded cap	3/8"	35 - 45 N·m (26 - 33 lb ft)
Oil		
Oil pressure control valve		40 - 50 N·m (30 - 37 lb ft)
Oil dipstick		20 - 30 N·m (15 - 22 lb ft)
Oil inlet pipe		10 - 20 N·m (7 - 15 lb ft)
Pickup tube to block		8 - 12 N·m (6 - 9 lb ft)
Pickup tube support		30 - 40 N·m (22 - 30 lb ft)
Oil filter cartridge union		40 - 50 N·m (30 - 37 lb ft)
Oil filter		20 - 30 N·m (15 - 22 lb ft)
Oil filter cartridge		16 - 20 N·m (12 - 15 lb ft)
Oil pump		
- Stage 1		10 - 20 N·m (7 - 15 lb ft)
- Stage 2		20 - 30 N·m (15 - 22 lb ft)
Heat exchanger		
Threaded caps		40 - 50 N·m (30 - 37 lb ft)
Exchanger unit		20 - 30 N·m (15 - 22 lb ft)
Heat exchanger		20 - 30 N·m (15 - 22 lb ft)
Thermostat		
Thermostat unit		20 - 30 N·m (15 - 22 lb ft)
Bleed vent		35 - 45 N·m (26 - 33 lb ft)
Fan support		
Water pump		20 - 30 N·m (15 - 22 lb ft)
Bearing		35 - 45 N·m (26 - 33 lb ft)
Fan support		20 - 30 N·m (15 - 22 lb ft)
Pulley		35 - 45 N·m (26 - 33 lb ft)
Alternator		
Alternator support		45 - 55 N·m (33 - 41 lb ft)
Alternator		45 - 55 N·m (33 - 41 lb ft)
Lifting		
Front hook		45 - 55 N·m (33 - 41 lb ft)
Rear hook		65 - 75 N·m (48 - 55 lb ft)
Injection Pump		
Pump gear		
- Pre-torque		16 - 20 N·m (12 - 15 lb ft)
- Torque		85 - 95 N·m (63 - 70 lb ft)

Torque

F5AE9454A, F5AE9454D, F5AE9484A, F5AE9484B, F5AE9484G, F5AE5484A, F5AE9454J, F5AE9454L, F5AE9484K

DESCRIPTION	SIZE	TORQUE
Oil Pan		
Side cap	M6	35 - 45 N·m (26 - 33 lb ft)
Side caps	M22	45 - 55 N·m (33 - 41 lb ft)
Front cap	M35	35 - 45 N·m (26 - 33 lb ft)
Fixing of sump		65 - 75 N·m (48 - 55 lb ft)
Engine Block		
Crankshaft caps - Pre torque - Torque - Angle torque		45 - 55 N·m (33 - 41 lb ft) 75 - 85 N·m (55 - 63 lb ft) 85 - 95 °
Piston cooling nozzle		16 - 20 N·m (12 - 15 lb ft)
Conical thread cap	3/8"	35 - 45 N·m (26 - 33 lb ft)
Conical thread cap	1/8"	10 - 20 N·m (7 - 15 lb ft)
Water drainage cap		20 - 30 N·m (15 - 22 lb ft)
Oil turbo supply pipe fitting		35 - 45 N·m (26 - 33 lb ft)
Timing gearcase		
Conical thread cap		10 - 20 N·m (7 - 15 lb ft)
Gear cooling nozzle		10 - 20 N·m (7 - 15 lb ft)
Cover	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Ignition pump screw stud		3 - 5 N·m (27 - 44 lb in)
Timing pin seat cap		20 - 30 N·m (15 - 22 lb ft)
Gearcase	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Inspection cover		20 - 30 N·m (15 - 22 lb ft)
Flywheel housing		
Housing	M8x1.25 M12x1.75	30 - 40 N·m (22 - 30 lb ft) 115 - 125 N·m (85 - 92 lb ft)
Cylinder head		
Cylinder head - Stage 1 - Stage 2 - Stage 3	M15x1.5	120 - 140 N·m (89 - 103 lb ft) 85 - 95 ° 85 - 95 °
Cylinder head - Stage 1 - Stage 2 - Stage 3	M12x1.5	60 - 70 N·m (44 - 52 lb ft) 85 - 95 ° 55 - 65 °
Threaded cap		35 - 45 N·m (26 - 33 lb ft)
Overhead		
Rocker arm dowel		20 - 30 N·m (15 - 22 lb ft)
Overhead	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Valve adjusting nut		15 - 25 N·m (11 - 18 lb ft)
Intake Manifold		
Intake manifold	M8x1.25	20 - 30 N·m (15 - 22 lb ft)
Throw fastening to intake manifold		20 - 30 N·m (15 - 22 lb ft)

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Exhaust Manifold		
Exhaust manifold		30 - 40 N·m (22 - 30 lb ft)
Turbocharger mounting stud		10 - 20 N·m (7 - 15 lb ft)
Pulley		
Engine crankshaft pulley		335 - 365 N·m (247 - 269 lb ft)
Connecting Rod		
Connecting rod cap - Pre-torque - Angle torque		45 - 55 N·m (33 - 41 lb ft) 65 - 75 °
Flywheel		
Flywheel - Pre-torque - Angle torque		25 - 35 N·m (18 - 26 lb ft) 85 - 95 °
Timing		
Phonic wheel		12 - 18 N·m (9 - 13 lb ft)
Thrust block		20 - 30 N·m (15 - 22 lb ft)
Gear		31 - 41 N·m (23 - 30 lb ft)
Injector		
Injector stud screw		21 - 29 N·m (15 - 21 lb ft)
Injector fastening nut - Pre-torque - Angle torque		10 - 20 N·m (7 - 15 lb ft) 25 - 35 N·m (18 - 26 lb ft)
LDA		
Manifold side		15 - 25 N·m (11 - 18 lb ft)
Pump side		15 - 25 N·m (11 - 18 lb ft)
Sensors		
Crankshaft speed sensor		5 - 15 N·m (4 - 11 lb ft)
Camshaft speed sensor		5 - 15 N·m (4 - 11 lb ft)
Water temperature sensor		31 - 41 N·m (23 - 30 lb ft)
Oil temperature sensor		20 - 30 N·m (15 - 22 lb ft)
Air pressure sensor		5 - 15 N·m (4 - 11 lb ft)
Fuel filter		
Union fixing to support		20 - 30 N·m (15 - 22 lb ft)
Fuel filter		20 - 30 N·m (15 - 22 lb ft)
Supply Pump		
Supply pump		20 - 30 N·m (15 - 22 lb ft)
Inlet		20 - 30 N·m (15 - 22 lb ft)
Fast clutch		20 - 30 N·m (15 - 22 lb ft)
Turbocharger		
Collector fastening screw nuts		20 - 30 N·m (15 - 22 lb ft)
Oil delivery inlet		20 - 30 N·m (15 - 22 lb ft)
Delivery pipe fastening screw		20 - 30 N·m (15 - 22 lb ft)
Drain pipe to heat exchanger		20 - 30 N·m (15 - 22 lb ft)
Drain pipe to turbo		10 - 20 N·m (7 - 15 lb ft)

INTRODUCTION

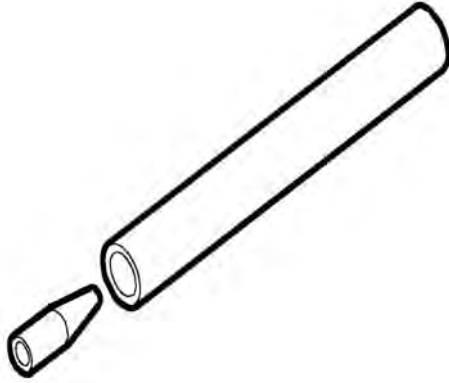
Cooling pipe		
Water pipe to heat exchanger		20 - 30 N·m (15 - 22 lb ft)
Water pipe to the support		20 - 30 N·m (15 - 22 lb ft)
Conical threaded cap	3/8"	35 - 45 N·m (26 - 33 lb ft)
Oil		
Oil pressure control valve		40 - 50 N·m (30 - 37 lb ft)
Oil dipstick		20 - 30 N·m (15 - 22 lb ft)
Oil inlet pipe		10 - 20 N·m (7 - 15 lb ft)
Pickup tube to block		8 - 12 N·m (6 - 9 lb ft)
Pickup tube support		30 - 40 N·m (22 - 30 lb ft)
Oil filter cartridge union		40 - 50 N·m (30 - 37 lb ft)
Oil filter		20 - 30 N·m (15 - 22 lb ft)
Oil filter cartridge		16 - 20 N·m (12 - 15 lb ft)
Oil pump		
- Stage 1		10 - 20 N·m (7 - 15 lb ft)
- Stage 2		20 - 30 N·m (15 - 22 lb ft)
Heat exchanger		
Threaded caps		40 - 50 N·m (30 - 37 lb ft)
Exchanger unit		20 - 30 N·m (15 - 22 lb ft)
Heat exchanger		20 - 30 N·m (15 - 22 lb ft)
Thermostat		
Thermostat unit		20 - 30 N·m (15 - 22 lb ft)
Bleed vent		35 - 45 N·m (26 - 33 lb ft)
Fan support		
Water pump		20 - 30 N·m (15 - 22 lb ft)
Bearing		35 - 45 N·m (26 - 33 lb ft)
Fan support		20 - 30 N·m (15 - 22 lb ft)
Pulley		35 - 45 N·m (26 - 33 lb ft)
Alternator		
Alternator support		45 - 55 N·m (33 - 41 lb ft)
Alternator		45 - 55 N·m (33 - 41 lb ft)
Lifting		
Front hook		45 - 55 N·m (33 - 41 lb ft)
Rear hook		65 - 75 N·m (48 - 55 lb ft)
Injection Pump		
Pump gear		
- Pre-torque		16 - 20 N·m (12 - 15 lb ft)
- Torque		85 - 95 N·m (63 - 70 lb ft)

Special tools

F5CE5454B, F5CE9454C, F5CE9454E, F5CE9454G, F5CE9484C, F5CE9484E, F5CE5454G*A001, F5CE5454B*A005, F5CE5454C*A003

380000134

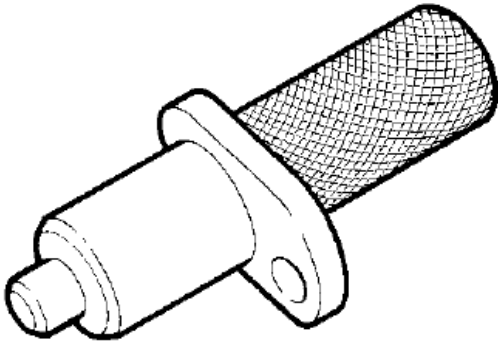
Valve guide gasket assembly tool



380000134 1

380000150

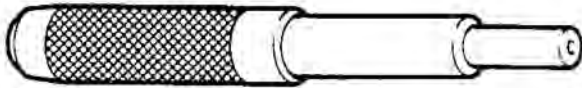
Tool for engine T.D.C. positioning



380000150 2

380000219

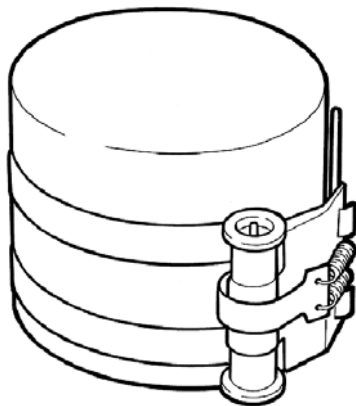
Valve guide disassembly and reassembly tool



380000219 3

380000220

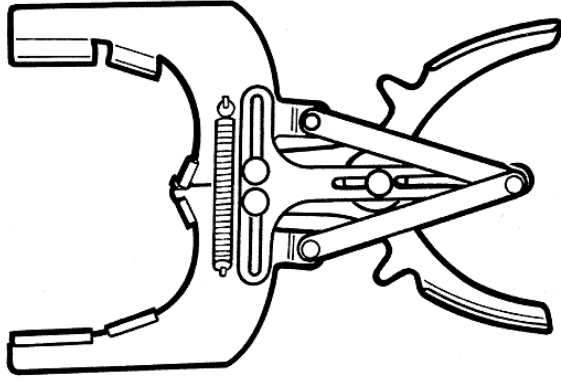
Piston ring compressor - 60 - 125 mm, procure locally



380000220 4

INTRODUCTION

380000221



Piston ring expander tool for removing and installing piston rings - 60 - 125 mm, procure locally

380000221 5

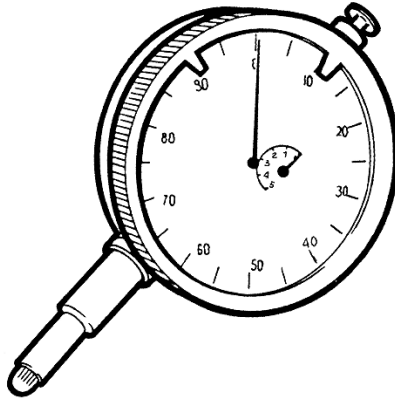
380000222



Valve guide reamer

380000222 6

380000228



Dial gauge - 0 - 5 mm

380000228 7

380000229

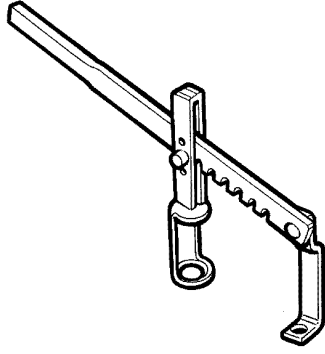


Dial gauge holding tool for rotatory injection pump phasing (use with 380000228)

380000229 8

INTRODUCTION

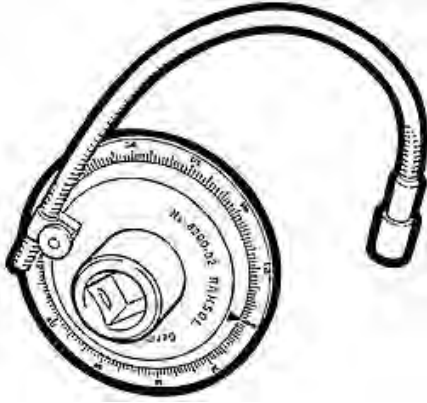
380000302



Tool for engine valve disassembly and reassembly, procure locally

380000302_3A 9

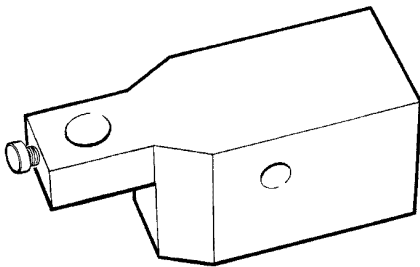
380000304



Measuring device for angular torque, procure locally

380000304 10

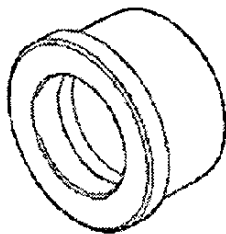
380000364



Dial gauge holding base for miscellaneous measures (use with 380000228)

380000364_3A 11

380000667

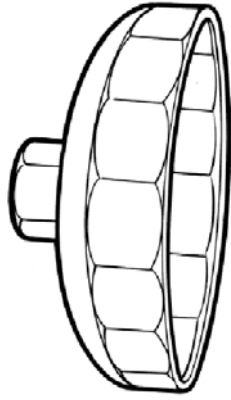


Camshaft bushing removal and installation tool

380000667 12

INTRODUCTION

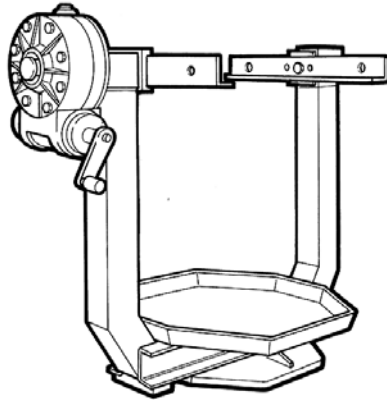
38000670



38000670 13

Oil filter removal tool

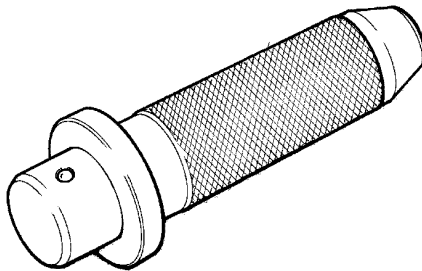
38000978



38000301 14

Rotary stand for overhauling units, use OEM 4135 or a 2000 lb capacity engine stand

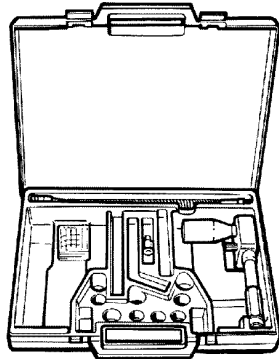
38000999



38000999_3-2 15

Handle for interchangeable bushing tools, use appropriate tool

38001006



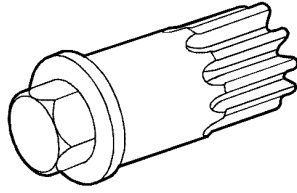
38001006_3 16

Diesel engine cylinder compression tester, procure locally

INTRODUCTION

380000732

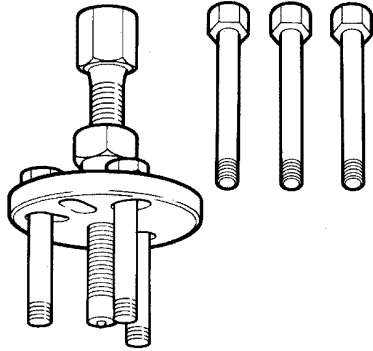
Tool for rotating the engine flywheel, barring tool



380002385_3A 17

380100072

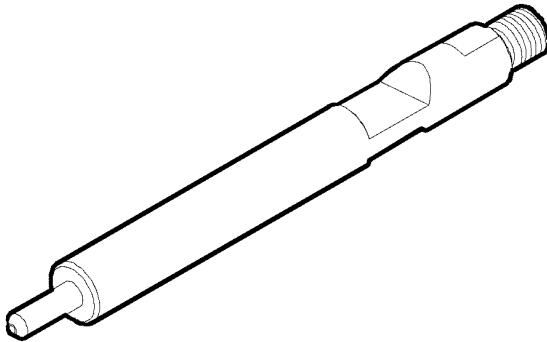
Injection pump gear puller



380100072_3A 18

380100074

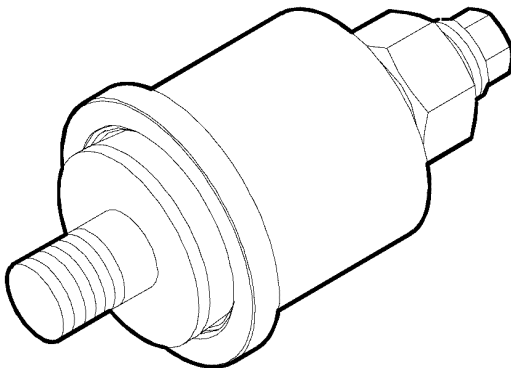
Compression test adapter



380100074_3-2 19

380100075

Front main seal installation tool

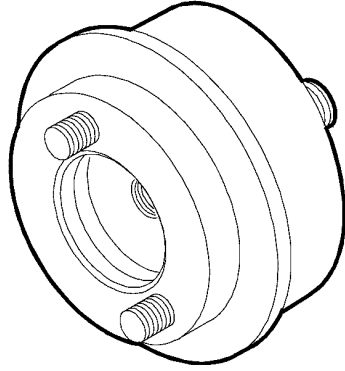


380100075_3-2 20

INTRODUCTION

380100076

Rear main seal installation tool



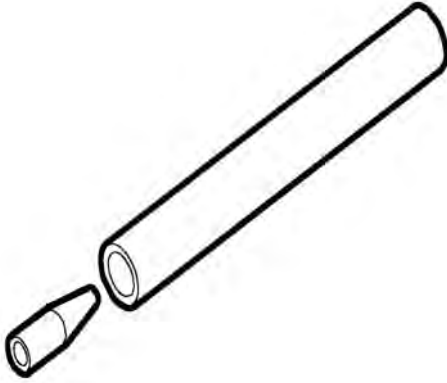
380100076_3-2 21

Special tools

F5AE9454A, F5AE9454D, F5AE9484A, F5AE9484B, F5AE9484G, F5AE5484A, F5AE9454J, F5AE9454L, F5AE9484K

380000134

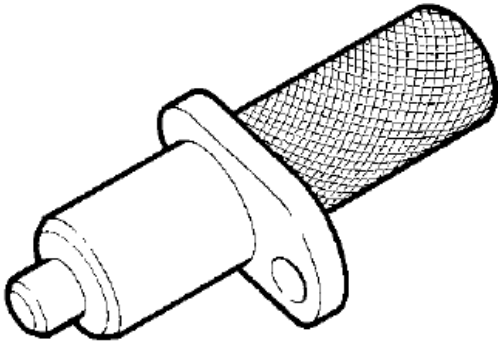
Valve guide gasket assembly tool



380000134 1

380000150

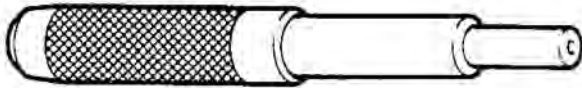
Tool for engine T.D.C. positioning



380000150 2

380000219

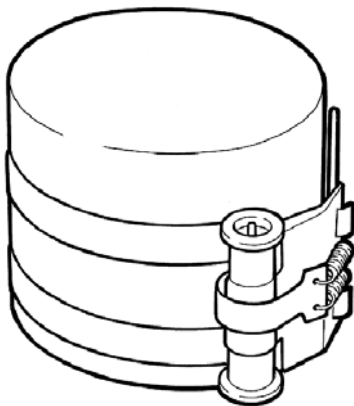
Valve guide disassembly and reassembly tool



380000219 3

380000220

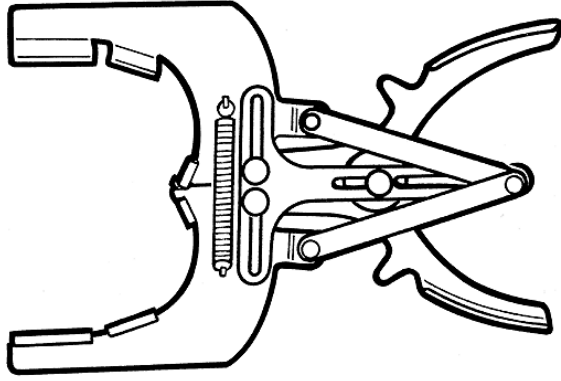
Piston ring compressor - 60 - 125 mm, procure locally



380000220 4

INTRODUCTION

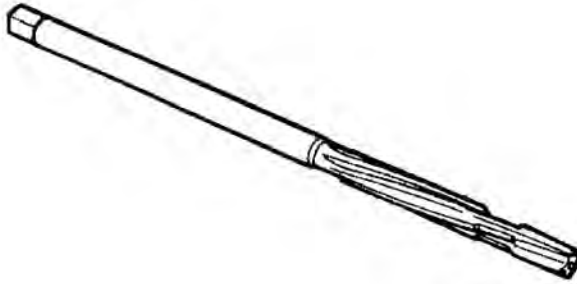
380000221



Piston ring tool for disassembly and reassembly of piston rings - 60 - 125 mm, procure locally

380000221 5

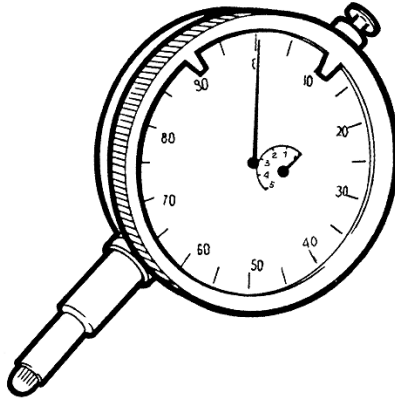
380000222



Valve guide reamer

380000222 6

380000228



Dial gauge - 0 - 5 mm

380000228 7

380000229



Dial gauge holding tool for rotatory injection pump phasing (use with 380000228)

380000229 8