MDF1411A

TRACTORS
JX1070U – JX1080U – JX1090U – JX1100U
SERVICE MANUAL

SECTIONS

S E R V I C E

INTRODUCTION

◊ *This manual is divided into sections identified by two-figure numbers and each section has independent page numbering.*
For easy reference, these sections have the same numbers and names as the Repairs Rate Book sections.

◊ *The different sections can easily be found by consulting the table of contents on the following pages.*

◊ *The document number of the manual and the edition/update dates are given at the bottom of each page.*

◊ *The information contained in this manual was current on the date printed on each section. As CASE IH constantly improves its product range, some information may be out of date subsequent to modifications implemented for technical or commercial reasons, or to meet legal requirements in different countries.*
In the event of conflicting information, consult the CASE IH Sales and Service Departments.

IMPORTANT WARNINGS

◊ *All maintenance and repair work described in this manual must be performed exclusively by CASE IH service technicians, in strict accordance with the instructions given and using any specific tools necessary.*

◊ *Anyone performing the operations described herein without strictly following the instructions is personally responsible for any eventual injury or damage to property.*

◊ *The Manufacturer and all organisations belonging to the Manufacturer's distribution network, including but not restricted to national, regional or local distributors, will accept no responsibility for personal injury or damage to property caused by abnormal function of parts and/or components not approved by the Manufacturer, including those used for maintenance and/or repair of the product manufactured or marketed by the Manufacturer.*
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CONTENTS

GENERAL INSTRUCTIONS

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SHIMMING

For each adjustment operation, select adjusting shims and measure individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value indicated for each shim.

ROTATING SHAFT SEALS

For correct rotating shaft seal installation, proceed as follows:

- before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes;
- thoroughly clean the shaft and check that the working surface on the shaft is not damaged;
- position the sealing lip facing the fluid; with hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will deviate the fluid towards the inner side of the seal;
- coat the sealing lip with a thin layer of lubricant (use oil rather than grease) and fill the gap between the sealing lip and the dust lip on double lip seals with grease;
- insert the seal in its seat and press down using a flat punch; do not tap the seal with a hammer or mallet;
- whilst inserting the seal, check that it is perpendicular to the seat; once settled, make sure that it makes contact with the thrust element, if required;
- to prevent damaging the seal lip on the shaft, position a protective guard during installation operations.

"O-RING" SEALS

Lubricate the O-RING seals before inserting them in the seats, this will prevent them from overturning and twisting, which would jeopardise sealing efficiency.

SEALING COMPOUNDS

Apply one of the following sealing compounds on the mating surfaces marked with an X: RTV SILMATE, RHODORSIL CAF 1 or LOCTITE PLASTIC GASKET.

Before applying the sealing compound, prepare the surfaces as follows:

- remove any incrustations using a wire brush;
- thoroughly de-grease the surfaces using one of the following cleaning agents: trichlorethylene, petrol or a water and soda solution.

BEARINGS

When installing bearings it is advised to:

- heat the bearings to 80 ÷ 90 °C before fitting on the shafts;
- allow the bearings to cool before installing them.

SPRING PINS

When fitting split socket spring pins, ensure that the pin notch is positioned in the direction of the force required to stress the pin.

Spiral spring pins do not require special positioning.

SPARE PARTS

Use solely **genuine parts**, which guarantee the same quality, duration and safety as the original parts as they are identical to the ones fitted during production.

Only **genuine parts** can offer this guarantee.

When ordering spare parts, always provide the following information:

- tractor model (commercial name) and frame number;
- engine type and number;
- part number of the ordered part, which can be found in the “Microfiches” or the “Spare Parts Catalogue”, used for order processing.

TOOLS

The tools that CASE IH offer and illustrate in this manual are:

- specifically researched and designed for use with CASE IH vehicles;
- essential for reliable repair operations;
- accurately built and rigorously tested so as to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- operating in optimal technical conditions;
- obtaining the best results;
- saving time and effort;
- working in safe conditions.

IMPORTANT NOTES

Wear limit values indicated for certain parts are recommended, but not binding. The terms “front”, “rear”, “right-hand” and “left-hand” (when referred to different parts) are intended as seen from the driving position with the vehicle in the normal direction of movement.

MOVING THE TRACTOR WITH THE BATTERY REMOVED

External power supply cables should only be connected to the respective positive and negative cable terminals, using efficient clamps that guarantee adequate and secure contact.

Disconnect all services (lights, windshield wipers, etc.) before starting the vehicle.

If the vehicle electrical system requires checking, carry out operations with the power supply connected. Once checking is completed, disconnect all services and switch off the power supply before disconnecting the cables.

SAFETY REGULATIONS

PAY ATTENTION TO THIS SYMBOL

This warning symbol points out important messages concerning your safety.

Carefully read the following safety regulations and observe advised precautions in order to avoid potential hazards and safeguard your health and safety.

In this manual the symbol is accompanied by the following key-words:

***CAUTION** - Warnings concerning unsuitable repair operations that may jeopardise the safety of Service personnel.*

***DANGER** - Specific warnings concerning potential hazards for operator safety or for other persons directly or indirectly involved.*

ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of non-observance of simple and fundamental safety regulations.

For this reason, IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED by foreseeing possible causes and consequently acting with the necessary caution and care.

Accidents may occur with all types of vehicle, regardless of how well it was designed and built.

A careful and judicious service technician is the best guarantee against accidents.

Precise observance of the most basic safety rule is normally sufficient to avoid many serious accidents.

DANGER. Never carry out any cleaning, lubrication or maintenance operations when the engine is running.

SAFETY REGULATIONS

GENERAL GUIDELINES

- Carefully follow specified repair and maintenance procedures.
- Do not wear rings, wristwatches, jewellery, unbuttoned or loose articles of clothing such as: ties, torn clothing, scarves, open jackets or shirts with open zips that may remain entangled in moving parts.

  It is advised to wear approved safety clothing, e.g.: non-slip footwear, gloves, safety goggles, helmets, etc.
- Do not carry out repair operations with someone sitting in the driver's seat, unless the person is a trained technician who is assisting with the operation in question.
- Operate the vehicle and use the implements exclusively from the driver's seat.
- Do not carry out operations on the vehicle with the engine running, unless specifically indicated.
- Stop the engine and check that the hydraulic circuits are pressure-free before removing caps, covers, valves, etc.
- All repair and maintenance operations must be carried out using extreme care and attention.
- Service steps and platforms used in a workshop or in the field should be built in compliance with the safety rules in force.
- Disconnect the batteries and label all controls to indicate that the vehicle is being serviced. Any parts that are to be raised must be locked in position.
- Do not check or fill fuel tanks, accumulator batteries, nor use starting liquid when smoking or near naked flames, as these fluids are inflammable.
- Brakes are inoperative if manually released for repair or maintenance purposes.

  Use blocks or similar devices to secure the machine in these conditions.
- The fuel nozzle should always be in contact with the filling aperture. Maintain this position until filling operations are completed in order to avoid possible sparks caused by the accumulation of static electricity.

- Only use specified towing points for towing the tractor, connect parts carefully. Make sure that all pins and/or locks are secured in position before applying traction.

  Never remain near the towing bars, cables or chains that are operating under load.

- Transport vehicles that cannot be driven using a trailer or a low-loading platform trolley, if available.

- When loading or unloading the vehicle from the trailer (or other means of transport), select a flat area capable of sustaining the trailer or truck wheels, firmly secure the tractor to the truck or trailer and lock the wheels in the position.

- Electric heaters, battery-chargers and similar equipment must only be powered by auxiliary power supplies with efficient ground insulation to avoid electrical shock hazards.

- Always use suitable hoisting or lifting devices when raising or moving heavy parts.

- Take extra care if bystanders are present.

- Never pour gasoline or diesel oil into open, wide and low containers.

- Never use gasoline, diesel oil or other inflammable liquids as cleaning agents. Use non-inflammable, non toxic commercially available solvents.

- Wear safety goggles with side guards when cleaning parts with compressed air.

- Limit the air pressure to a maximum of 2.1 bar, according to local regulations.

- Do not run the engine in confined spaces without suitable ventilation.

- Do not smoke, use naked flames, or cause sparks in the area when fuel filling or handling highly inflammable liquids.

- Never use naked flames for lighting when working on the machine or checking for “leaks.”

- All movements must be carried out carefully when working under, on or near the vehicle and wear protective equipment: helmets, goggles and special footwear.

- When carrying out checks with the engine running, request the assistance of an operator in the driver’s seat. The operator must maintain visual contact with the service technician at all times.

- If operating outside the workshop, position the vehicle on a flat surface and lock in position. If working on a slope, lock the vehicle in position and move to a flat area as soon as is safely possible.

- Damaged or bent chains or cables are unreliable. Do not use them for lifting or towing.

  Always use suitable protective gloves when handling chains or cables.

- Chains should always be safely secured. Make sure that the hitch-up point is capable of sustaining the load in question.

  Keep the area near the hitch-up point, chains or cables free of all bystanders.

- Maintenance and repair operations must be carried out in a CLEAN and DRY area, eliminate any water or oil spillage immediately.

- Do not create piles of oil or grease-soaked rags as they represent a serious fire hazard; store them in a closed metal container.

  Before starting the vehicle or implements, make sure that the driver’s seat is locked in position and always check that the area is free of persons or obstacles.

- Empty pockets of all objects that may fall unobserved into the vehicle parts when disassembled.

- In the presence of protruding metal parts, use protective goggles or goggles with side guards, helmets, special footwear and gloves.

- When welding, use protective safety devices: tinted safety goggles, helmets, special overalls, gloves and footwear. All persons present in the area where welding is taking place must wear tinted goggles.

  NEVER LOOK DIRECTLY AT THE WELDING ARC WITHOUT SUITABLE EYE PROTECTION.

- Metal cables tend to fray with repeated use. Always use suitable protective devices (gloves, goggles, etc.) when handling cables.

- Handle all parts carefully, do not put your hands or fingers between moving parts, wear suitable safety clothing - safety goggles, gloves and shoes.

START UP

- Never start the engine in confined spaces that are not equipped with adequate ventilation for exhaust gas extraction.
- Never bring your head, body, arms, legs, feet, hands, fingers near fans or rotating belts.

ENGINE

- Always loosen the radiator cap slowly before removing it to allow any remaining pressure in the system to be discharged. Coolant should only be added when the engine is stopped or idling, if hot.
- Never fill up with fuel when the engine is running, especially if hot, in order to prevent the outbreak of fire as a result of fuel spillage.
- Never check or adjust fan belt tension when the engine is running.

  Never adjust the fuel injection pump when the vehicle is moving.
- Never lubricate the vehicle when the engine is running.

ELECTRICAL SYSTEMS

- If it is necessary to use auxiliary batteries, remember that both ends of the cables must be connected as follows: (+) with (+) and (-) with (-).
- Avoid short-circuiting the terminals. GAS RELEASED FROM BATTERIES IS HIGHLY INFLAMMABLE.
- During charging, leave the battery compartment uncovered to improve ventilation.
- Never check the battery charge using “jumpers” (metal objects placed on the terminals).
- Avoid sparks or flames near the battery zone to prevent explosion hazards.
- Before servicing operations, check for fuel or current leaks. Eliminate any eventual leaks before starting work.
- Never charge batteries in confined spaces. Make sure that there is adequate ventilation in order to prevent accidental explosion hazards as a result of the accumulation of gases released during charging operations.
- Always disconnect the battery before performing any kind of servicing on the electrical system.

HYDRAULIC SYSTEMS

- A liquid leaking from a tiny hole may be almost invisible but, at the same time, be powerful enough to penetrate the skin. Check for leaks using a piece of cardboard, **NEVER USE HANDS**.
- If any liquid penetrates skin tissue, call for medical aid immediately.
- Serious skin infections may result if medical attention is not given.
- Use the specific tools when checking pressure values on the hydraulic system.

WHEELS AND TYRES

- Check that the tyres are correctly inflated at the pressure specified by the manufacturer.

  Periodically check possible damages to the rims and tyres.
- Stand away from (at the side of) the tyre when checking inflation pressure.
- Only check pressure when the tractor is unloaded and the tyres are cold, to avoid incorrect readings as a result of over-pressure.
- Do not re-use parts of recovered wheels as incorrect welding or brazing may heat the material, causing it to weaken and eventually damage or break the wheel.
- Never cut or weld a rim mounted with an inflated tyre.
- When removing the wheels, lock both the front and rear vehicle wheels.
- Always position support stands when raising the vehicle, in order to conform to current safety regulations.
- Deflate the tyre before removing any object caught in the tyre tread.
- Never inflate tyres using inflammable gases; this could cause an explosion and put operator safety at risk.

REMOVAL AND INSTALLATION

- Lift and handle all heavy parts using suitable lifting equipment and make sure that all slings and hooks are correctly secured.
- Handle all parts carefully during lifting operations, keep an eye on the personnel working near the load to be lifted. Never insert hands or fingers between parts, always wear approved accident prevention clothing (goggles, gloves and work boots).
- Avoid twisting chains or metal cables and always wear safety gloves when handling cables or chains.

CONSUMABLES

COMPONENT TO BE FILLED OR TOPPED UP	QUANTITY litres (dm^3)	RECOMMENDED CASE IH PRODUCT	INTERNATIONAL SPECIFICATION
Cooling system: without cab: . . . . . 14 with cab: 16		Water and antifreeze fluid 50% + 50% **AKCELA** **PREMIUM ANTIFREEZE MS 1710**	-
Windscreen washer reservoir	2	Water and liquid detergent	-
Fuel tank models JX1070U, JX1080U . . mod. JX1090U, JX1100U	105 127	Decanted and filtered diesel fuel	-
Engine sump: without filter: . . . . . 8,9 with filter: 9,5		**AKCELA fluid** **No 1 ENGINE OIL** MS 1121 SAE 15W-40 or MS 1121 SAE 10W-30	API CH-4 ACEA E5 SAE 15W-40 API CH-4 SAE 10W-30
Brake control circuit (without front brakes)	0,4	**AKCELA LHM FLUID**	ISO 7308
Hydrostatic steering circuit	2,0	**AKCELA NEXPLORE** MAT 3525 fluid	API GL4 ISO 32/46 SAE 10W-30
Front axle: axle casing: model JX1070U . . . . . 4,5 mod. JX1080U, JX1090U and JX1100U . . . . . 7,0 final drives (each): mod. JX1070U . . . . . 0,8 mod. JX1080U, JX1090U and JX1100U 1,25			
Rear axle (bevel drive, final drives and brakes), transmission, hydraulic lift, power take-off and hydrostatic steering: mod. JX1070U . . . . . 49 mod. JX1080U, JX1090U and JX1100U 55			
Front wheel hubs	-	**AKCELA** **MULTI-PURPOSE GREASE 251H EP**	NLGI 2
Grease fittings	-		

SECTION 10 - ENGINE

Chapter 1 - Engine

CONTENTS

GENERAL SPECIFICATIONS	4 Cylinders
Engine, technical type:	
- model TJX1070U - type F4CE0404D*D601 (BOSCH pump)	See data on page
- model JX1070U - type F4CE0404D*D681 (BOSCH pump)	See data on page
- model JX1080U- type F4CE0404C*D601 (BOSCH pump)	See data on page
- model JX1080U - type F4CE0404C*D681 (BOSCH pump)	See data on page
- model JX1090U - type F4CE0454E*D601 (BOSCH pump)	See data on page
- model JX1090U - type F4CE0454E*D681 (BOSCH pump)	See data on page
- model JX1100U - type F4CE0454D*D601 (BOSCH pump)	See data on page
- model JX1100U - type F4CE0454D*D681 (BOSCH pump)	See data on page
Cycle	diesel, 4-stroke
Fuel injection	direct
Number of cylinders in line	4
Piston diameter	
- model JX1070U - JX1080U - JX1090U - JX1100U	4.0944 in. (104 mm)
Piston stroke	5.1968 in. (132 mm)
Total displacement:	
- model JX1070U - JX1080U - JX1090U - JX1100U	273.67 in^3. (4485 cm^3)
Compression ratio for Models JX1070U - JX1080U - JX1090U - JX1100U	17.5:1
Maximum power:	
- model JX1070U - type F4CE0404D*D601	53 kW (70 HP)
- model JX1070U - type F4CE0404D*D681	53 kW (70 HP)
- model JX1080U - type F4CE0404C*D601	60 kW (80 HP)
- model JX1080U - type F4CE0404C*D681	60 kW (80 HP)
- model JX1090U - type F4CE0454E*D601	67 kW (90 HP)
- model JX1090U - type F4CE0454E*D681	67 kW (90 HP)
- model JX1100U - type F4CE0454D*D601	73,5 kW (100 HP)
- model JX1100U - type F4CE0454D*D681	73,5 kW (100 HP)
Maximum power speed	2500 rev/min
- Maximum torque: model JX1070U - type F4CE0404D*D601	280 (Nm)
- Maximum torque: model JX1070U - type F4CE0404D*D681	280 (Nm)
- Maximum torque: model JX1080U - type F4CE0404C*D601	320 (Nm)
- Maximum torque: model JX1080U - type F4CE0404C*D681	320 (Nm)
- Maximum torque: model JX1090U - type F4CE0454E*D601	350 (Nm)
- Maximum torque: model JX1090U - type F4CE0454E*D681	350 (Nm)
- Maximum torque: model JX1100U - type F4CE0454D*D601	370 (Nm)
- Maximum torque: model JX1100U - type F4CE0454D*D681	370 (Nm)
Maximum torque speed	1400 rev/min
Number of main bearings	5
Sump	structural, cast iron

(continued)

(cont)

GENERAL SPECIFICATIONS	4 Cylinders
Lubrication	forced, with lobe pump
Pump drive	camshaft
Engine speed/oil pump speed ratio	1:1
Oil cleaning	mesh filter on oil intake and filtering cartridge on delivery line
Normal oil pressure with motor warmed-up	
at slow idling speed	17.4 psi (1.2 bar)
at fast idling speed	55.1 psi (3.8 bar)
Cooling system	coolant circulation
Radiator on Models JX1070U - JX1080U - JX1090U - JX1100U	4 lines of vertical pipes with copper fins
Fan, attached to the pulley	intake, in plastic with 11 blades
Coolant pump	centrifugal vane-type
Engine speed/coolant pump speed ratio	1:1.977
Coolant thermometer	coloured scale divided into 3 sections
Temperature ranges corresponding to each section:	
- Initial blue section	104 to 140 °F (40° to 60 °C)
- Middle green section (normal working conditions)	140 to 230 °F (60° to 110 °C)
- Final red section	230 to 248 °F (110° to 120 °C)
Temperature control	via thermostat valve
- initial opening	177.0 ± 35.6 °F (81 ± 2 °C)
Timing system	overhead valves operated by tappets, rods and rocker arms via the camshaft located in the engine block; the camshaft is driven by the crankshaft using straight-tooth gears
Intake:	
- start: before T.D.C.	10° ± 30'
- end: after B.D.C.	10° ± 30'
Exhaust:	
- start: before B.D.C.	64°
- end: after B.D.C.	26°
Valve-rocker arm clearance (with engine cold):	
- intake	(0.30 ± 0.05 mm)
- exhaust	(0.55 ± 0.05 mm)
For further timing system technical data	see page 8

(continued)

(cont)

GENERAL SPECIFICATIONS	4 Cylinders
Fuel system	
Air cleaning	dual cartridge dry air filter, with clogged filter indicator with centrifugal pre-filter and automatic dust ejector
Fuel pump	with double diaphragm
Fuel filtering	through wire filter in fuel supply pump, and replaceable cartridge on delivery line to injection pump
Minimum fuel flow rate with pump shaft rotating at 1800 rpm	127.6 l/h
Cam operated	engine timing
BOSCH injection pump	rotating distributor type
All-speed governor, incorporated in pump:	
BOSCH	centrifugal counterweights
Automatic advance regulator, incorporated in pump:	
BOSCH	hydraulic
For further fuel system technical data:	
Fixed advance (pump setting for start of delivery before TDC) - Pressure setting - Injection order, and other information regarding the BOSCH pump	refer to the data for the relevant engine type in the table on page 2

FUEL SYSTEM DATA

Turbo Charger:	
- For versions F4CE0454D*D601 - F4CE0454D*D681: - type HOLSET HX25W	TB11H/A085BXL
- For versions F4CE0454E*D601 - F4CE0454E*D681: - type HOLSET HX25W	TB11K/A11CXL
Injection pump	rotating distributor with speed governor and advance regulator incorporated
BOSCH pump:	
- model JX1070U - type F4CE0404D*D601	VE 4/12 F1250 L1023 (S/N 504073609)
- model JX1070U - type F4CE0404D*D681	VE 4/12 F1250 L1023-1 (S/N 504073610)
- model JX1080U - type F4CE0404C*D601	VE 4/12 F1250 L1018 (S/N 504073611)
- model JX1080U - type F4CE0404C*D681	VE 4/12 F1250 L1018-1 (S/N 504073612)
- model JX1090U - type F4CE0454E*D601	VE 4/12 F1250 L1024 (S/N 504073613)
- model JX1090U - type F4CE0454E*D681	VE 4/12 F1250 L1024-1 (S/N 504068397)
- model JX1100U - type F4CE0454D*D601	VE 4/12 F1250 L1013 (S/N 504073614)
- model JX1100U - type F4CE0454D*D681	VE 4/12 F1250 L1013-1 (S/N 504068392)
Direction of rotation	anticlockwise
Injection order	1-3-4-2 (For all models)

	JX1070U	JX1080U	JX1090U	JX1100U
BOSCH-type injectors:				
- F4CE0404D*D601 / D681	504073703 DLLA 145 P 1338	-	-	-
- F4CE0404C*D601 / D681	-	504073703 DLLA 145 P 1338	-	-
- F4CE0454E*D601 / D681	-	-	500390441 DSLA 145 P 1255	-
- F4CE0454D*D601 / D681	-	-	-	500390441 DSLA 145 P 1255
Number of nozzle holes	7	7	6	6
Nozzle hole diameter mm.				
- F4CE0404D*D601 / D681	0.162	-	-	-
- F4CE0404C*D601 / D681	-	0.162	-	-
- F4CE0454E*D601 / D681	-	-	0.237	-
- F4CE0454D*D601 / D681	-	-	-	0.237
Calibration pressure bar	260 to 274	260 to 274	260 to 274	260 to 274

CRANKCASE/CYLINDER BLOCK DATA		in. (mm)
Crankcase		cast-iron monobloc with cylinder liners, crankshaft, camshaft and tappets
Cylinder bore diameter		4.09944 to 4.0954 (104.000 to 104.024)
Oversized cylinder bore diameter		4.1141 to 4.1151 (104.500 to 104.524)
Main journal half bearing seat diameter	external no. 1-5	3.4638 to 3.4648 (87.982 to 88.008)
	internalno. 2-3-4	3.4636 to 3.4650 (87.977 to 88.013)
Camshaft bushing seat diameter:		
- front		2.3315 to 2.3325 (59.222 to 59.248)
- intermediate		2.3315 to 2.3325 (59.222 to 59.248)
- rear		2.3315 to 2.3325 (59.222 to 59.248)
Diameter of standard tappet bores in crankcase		0.6299 to 0.6311 (16.000 to 16.030)

CRANKSHAFT AND BEARINGS DATA		in. (mm)
Crankshaft		balanced with integral counterweights
Standard journal diameter		3.2671 to 3.2682 (82.987 to 83.013)
Journal undersizes		0.0098 to 0.0196 (0.250 - 0.500)
Main journal half bearing thickness		0.0966 to 0.0970 (2.456 to 2.464)
Main half bearing undersizes (internal diameter)		0.0098 to 0.0196 (0.250 - 0.500)
Clearance between bearings and main journal	no. 1-5	0.0016 to 0.0046 (0.041 to 0.119)
	n. 2-3-4	0.0016 to 0.0040 (0.041 to 0.103)
Standard crankpin diameter		2.7160 to 2.7170 (68.987 to 69.013)
Crankpin undersizes		0.0098 to 0.0196 (0.250 - 0.500)
Standard connecting rod half bearing thickness		0.0769 to 0.0774 (1.955 to 1.968)
Connecting rod half bearing undersizes (internal diameter)		0.0098 to 0.0196 (0.250 - 0.500)
Bearing to crankpin clearance		0.0012 to 0.0016 (0.033 to 0.041)
Standard crankshaft thrust washer width		1.4677 to 1.4716 (37.280 to 37.380)
Width of main bearing for thrust		1.0228 to 1.0425 (25.980 to 26.480)
Width of corresponding crankshaft journal		1.4753 to 1.4783 (37.475 to 37.550)
Crankshaft assembly endfloat		0.0067 to 0.0094 (0.172 to 0.240)

CONNECTING ROD DATA	in. (mm)
Connecting Rods	printed in steel, oblique-cut type
Diameter of small end bushing seat	1.6136 to 1.6146 (40.987 to 41.013)
Outside diameter of small end bushing	1.6251 to 1.6359 (41.279 to 41.553)
Interference between small end bushing and seat	0.0104 to 0.0222 (0.266 to 0.566)
Inside diameter of small end bushing (measured after fitting)	1.4968 to 1.4973 (38.019 to 38.033)
Diameter of big end bearing seats	2.8734 to 2.8745 (72.987 to 73.013)
Connecting rod-crankpin end float	0.0039 to 0.0129 (0.100 to 0.330)

PISTON DATA	in. (mm)	
	JX1070U JX1080U	JX1090U JX1100U
Pistons	light alloy with three compression rings, including two seal rings and one scraper ring	
Standard piston diameter, measured at 2.4015 in. (61 mm) from skirt base and perpendicularly to the gudgeon pin axis	4.0848 to 4.0857 (103.755 to 103.779)	4.0838 to 4.0845 (103.730 to 103.748)
Piston clearance in cylinder liner	0.0087 to 0.0105 (0.221 to 0.269)	0.0099 to 0.0115 (0.252 to 0.294)
Piston oversizes	0.0196 (0.500)	
Piston protrusion at T.D.C. from cylinder block face	0.0110 to 0.0204 (0.280 to 0.520)	
Gudgeon pin diameter	1.4958 to 1.4960 (37.994 to 38.000)	
Diameter of gudgeon pin seat in piston	1.4964 to 1.4966 (38.010 to 38.016)	
Gudgeon pin to seat clearance	0.0003 to 0.0008 (0.010 to 0.022)	
Gudgeon pin to small end bearing clearance	0.0007 to 0.0015 (0.019 to 0.039)	
Piston ring groove depth:		
- 1° ring	0.1023 to 0.1031 (2.600 to 2.620)	0.1064 to 0.1076 (2.705 to 2.735)
- 2° ring	0.1003 to 0.1011 (2.550 to 2.570)	0.0960 to 0.0968 (2.440 to 2.460)
- 3° ring	0.1586 to 0.1594 (4.030 to 4.050)	
Piston ring thickness:		
- 1° ring	0.0972 to 0.0984 (2.470 to 2.500)	0.1007 to 0.1025 (2.560 to 2.605)
- 2° ring	0.0975 to 0.0980 (2.478 to 2.490)	0.0925 to 0.0937 (2.350 to 2.380)
- 3° ring	0.1565 to 0.1570 (3.977 to 3.990)	

(continued)

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PISTON DATA	in. (mm)	
	JX1070U JX1080U	JX1090U JX1100U
Piston ring groove clearance (measured vertically):		
- 1° ring	0.0039 to 0.0059 (0.100 to 0.150)	0.0039 to 0.0068 (0.100 to 0.175)
- 2° ring	0.0023 to 0.0039 (0.060 to 0.092)	0.0023 to 0.0043 (0.060 to 0.110)
- 3° ring	0.0015 to 0.0028 (0.040 to 0.073)	
Assembly clearance between piston ring ends in cylinder sleeves:		
- 1° ring	0.0098 to 0.0216 (0.25 to 0.55)	0.0118 to 0.0157 (0.30 to 0.40)
- 2° ring	0.0118 to 0.0216 (0.30 to 0.55)	0.0236 to 0.0314 (0.60 to 0.80)
- 3° ring	0.0118 to 0.0216 (0.30 to 0.55)	
Spare piston ring oversizing	0.0196 (0.500)	

VALVE TIMING GEAR DATA	in. (mm)
Inside diameter of camshaft bearings (fitted and reamed):	
- front	2.1292 to 2.1317 (54.083 to 54.147)
- intermediate	2.1292 to 2.1317 (54.083 to 54.147)
- rear	2.1292 to 2.1317 (54.083 to 54.147)
Diameter of camshaft journals:	
- front	2.1257 to 2.1277 (53.995 to 54.045)
- intermediate	2.1257 to 2.1277 (53.995 to 54.045)
- rear	2.1257 to 2.1277 (53.995 to 54.045)
Clearance between camshaft journals and bushings	0.0014 to 0.0059 (0.038 to 0.152)
Camshaft end float	0.0090 ± 0.0051 (0.230 ± 0.130)
Crankshaft to camshaft teeth clearance	0.0029 to 0.0110 (0.076 to 0.280)

TAPPET DATA	in. (mm)
Tappet bore in crankcase	0.6299 to 0.6311 (16.000 to 16.030)
Outside diameter of standard tappet	0.6271 to 0.6283 (15.929 to 15.959)
Tappet running clearance	0.0016 to 0.0039 (0.041 to 0.101)

ROCKER ARM - VALVE DATA	in. (mm)
Rocker-arm shaft diameter	0.7465 to 0.7470 (18.963 to 18.975)
Rocker-arm shaft seat diameter	0.7480 to 0.7490 (19.000 to 19.026)
Rocker arm bore to shaft clearance	0.0009 to 0.0024 (0.025 to 0.063)
Valve clearance for normal running (engine cold):	
- inlet valve	0.0118 to 0.0019 (0.300 to 0.050)
- exhaust valve	0.0216 to 0.0019 (0.550 to 0.050)
Cam lift:	
- inlet valve	0.2379 (6.045)
- exhaust valve	0.2849 (7.239)

CYLINDER HEAD DATA	in. (mm)
Cylinder Head	in cast iron with fitted valve seats and seats for injectors and thermostat valve
Maximum face re-grinding depth that can be removed from the cylinder head in the event of reboring	0.0051 (0.130)
Diameter of valve stem seat in cylinder head	0.3157 to 0.3164 (8.019 to 8.039)
Valve stem diameter	0.3133 to 0.3141 (7.960 to 7.980)
Assembly clearance between valve stem and seat	0.0015 to 0.0031 (0.039 to 0.079)
Valve seat angle in head:	
- inlet valve	60°
- exhaust valve	45°
Valve face angle:	
- inlet valve	60°
- exhaust valve	45°
Diameter on head for fitting valve seat:	
- inlet valve	1.8498 to 1.8509 (46.987 to 47.013)
- exhaust valve	1.7178 to 1.7190 (43.637 to 43.663)
Valve seat insert outside diameter:	
- inlet valve	1.8528 to 1.8538 (47.063 to 47.089)
- exhaust valve	1.7209 to 1.7220 (43.713 to 43.739)
Valve stand-in relative to cylinder head face:	
- inlet valve	0.0132 to 0.0422 (0.336 to 1.072)
- exhaust valve	0.0434 to 0.0330 (0.104 to 0.840)
Interference between valve seat and head:	
- inlet valve	0.0019 to 0.0040 (0.050 to 0.102)
- exhaust valve	0.0019 to 0.0040 (0.050 to 0.102)

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CYLINDER HEAD DATA	in. (mm)
Valve head diameter:	
- inlet valve	1.7665 to 1.7767 (44.870 to 45.130)
- exhaust valve	1.6484 to 1.6586 (41.870 to 42.130)
Inlet and exhaust valve springs:	
- free length	2.4999 (63.500)
- length under load of 329 N	1.9299 (49.020)
- length under load of 641 N	1.5039 (38.200)
Injector protrusion relative to head face:	
● injectors: BOSCH DLLA 145 P 1338 - BOSCH DSLA 145 P 1255	Not adjustable