FIATALLIS®

FX220LC

CRAWLER EXCAVATOR

OPERATION AND MAINTENANCE MANUAL

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ISSUE 01

INTRODUCTION

In this file you will find most valuable information concerning operation, lubrication, and maintenance of your FIAT HITACHI excavator.

Observe the instructions in this manual for:

- your personal safety
- operating safety
- ready and efficient performance of your excavator.

Periodic preventive inspections and maintenace are the surest means of keeping the machine in proper working order.

Prompt detection and correction of minor irregularities, and immediate replacement of worn out or broken parts will prevent failures and avoid expenses. Replace damaged graphics.

Observe safety precautions to prevent injury and damage.

If you find errors when reading this manual or if you have some suggestions or hints please contact:

FIAT HITACHI STABILIMENTO DI IMOLA
Strada Statale 610 Selice, 43/A
40026 Imola (BO) - ITALY
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Note:
The informations given in this manual are based on the development state of the machine at the time when this manual was written.

Deviations in technical data, illustrations, and dimensions are possible, due to the progress in technical development.

Damages and defects caused by incorrect operation and maintenance are not covered by the manufacturers guarantee.

Delivery of the excavator

The excavator is delivered ready for work including ten per cent fuel and hydraulic oil. All lubrication points are greased.

If the excavator has been coated with a paint protection (preservation wax) in the plant, this coating must not necessarily be removed. It offers an additional corrosion prevention.
The paint protection may be removed with:

- cleaning agent, e.g. Conrad solvent RV 5339 E 45430,
- solvents, e.g. Allpur 150 K or Purtex 65,
- vapour blast apparatus.

Prior to first operation, inspect the excavator thoroughly with our service engineer.

Note:

If the excavator is equipped with a fire suppression system, make sure that the system is ready for operation.

For your spare part orders please refer to the "Information for use of the catalogue" on the pages of the spare parts catalogue.

USE ONLY GENUINE FIAT HITACHI SPARE AND WEAR PARTS!

For all questions related to your excavator please contact our **FIAT HITACHI** STABILIMENTO DI IMOLA Service Department indicating the model and serial number of your excavator.

This manual contains instructions for the correct care and maintenance of the machine.

Note:

The informations given in this manual are based on the development state of the machine at the time when this manual was written.

Deviations in technical data, illustrations, and dimensions are possible, due to the progress in technical development.

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Definitions:

Service points: Unit or system where the prescribed maintenance work has to be performed (e.g. engine, lubrification point).

Service intervals: Number of operating hours after which the maintenance work has to be performed (e.g. every 10 Operating Hours, at 10, 20, 30 hours, etc...).

General recommendations

Thoroughly clean all grease fittings, caps and plugs before lubricating.

Replace oil drain plugs and oil level plugs seals before removing filters.

Fill up fuel tank at the end of every workday to prevent condensation of moisture.

It is recommended to carry out oil change in assemblies when they are still at operating temperature to speed up draining.

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Fire- prevention

Important

In order to prevent risks of possible fire break out observe the following items:

1) Keep the excavator clean, especially from inflammable materials. Clean the excavator after servicing the hydraulic system, engine and fuel system by means of a steam jet.

2) Clean engine compartment, hydraulic pump department and service platform of the superstructure. Thereafter check fuel lines, engine oil lines and hydraulic oil lines for leakage, loose fastenings and damage.
If any leakage, damage, or loose fastening is found, corrective action must be taken immediately.

3) Check all electrical cables terminals and connections for loose fastenings, damage and wear. Replace or repair defective or worn parts without delay.

4) Check the turbocharger for correct mounting and tight exhaust, intake and lube oil connections. Carry out all necessary repairs without delay.

5) On machines equipped with a fire detection and suppression system refer to the following:

- for correct maintenance and inspection refer to the manufacturers Service Manual

- when cleaning the power compartment take care the heat detection sensors do not come in contact with hot steam or other hot agent. Otherwise the fire suppression system may be triggered.

6) Make sure fire extinguishers are charged and ready for use.

7) On delivery the excavator is not equipped with a fire suppression system, or estinguishers. Provide for installation of such devices.

SAFETY INSTRUCTIONS

Before starting any lubrication and maintenance work, lower the equipment to the ground, disconnect all hydraulic control levers, stop the engine and remove key.

Note:

Some checks and adjustments can only be done with engine running. For such jobs two men are necessary since the controls must not be left unattended during lubrication and maintenance work.

The man in the operator's seat must keep constant visual contact with the other one and they must agree on suitable communication signals before they start their work.

- A warning plate must be fixed in the operator's cab before lubrication and maintenance work is started.

- Switch off battery main switch and remove key before working on the electrical system.

- Cycle all hydraulic control levers to relieve all pressure before servicing the hydraulic system. Make sure all connections are tight and hoses and lines are in good condition.
  To locate a leak under pressure use a small piece of cardboard or wood. Never use hands.
  Hydraulic fluid escaping under pressure can have enaugh force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once.

- Block the machine to prevent machine movement.

- Keep work area organized and clean. Wipe up or spills of any kind. Keep tools and parts off the floor. Eliminate the possibility af a fall which could result in a serious injury.
- Wear safety clothing, goggles, respirator and other safety devices, whenever working conditions make this necessary.
- Never allow unauthorized persons access to the machine during lubrication and maintenance work.
- Work which influences operational and traffic safety must be carried out only by trained servicemen.
- Oily cloth and inflammable material must be removed from the machine. Clean the excavator before starting maintenance work.
- Oil drained must be collected in containers, preventing that it enters the groundwater.
- When using an acetylene torch akways wear welding goggles and gloves. Keep a "charged" fire extinguisher within reach. Be sure the acetylene and oxigen tanks are separeted by metal shield and are chained to the cart. Do not weld or heat areas near fuel tanks or fuel lines and utilize proper shielding around hydraulic lines.
- Always use safety devices to block hydraulic cylinders. Never rely on the machine hydraulic system to hold when working on loaders, etc. A hydraulic line or cylinder could fail or someone could accidently strike the control levers causing the loader to fall.
- Be sure to reinstall safety devices, guards or shields after adjusting and/or servicing the machine.
- After servicing, be sure all tools, parts, or servicing equipment are removed from the machine.

Clean the excavator with a steam jet, especially after servicing the fuel system, engine and hydraulic system.
- Observe safety instructions during every servicing.
  After cleaning the excavator lubricate all lubrication points by means of central lube system or manually.
  Lubricate slew ring gear after drying by means of the automatic spray grease system or manually.

Repair weldings

Before carrying out repair weldings contact our Service Department in order to avoid improper welding operations and unnecessary expenses.

Note:

If cracks are found in the steel construction of your excavator, please inform our Service Department as soon as possible. Attach suitable information material (photos, respective catalogue page, drafts) showing the location and nature of the crack.
If you have questions concerning your machine, please contact our Service Department:

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1. DESCRIPTION

1.01 DESCRIPTION OF CRAWLER EXCAVATOR

The fully hydraulic crawler excavator consists of the following main sections:

- Undercarriage with crawlers and final drive.

- Superstructure with drive motor, pump unit, control valves, swivelling gear, operator's cab, fuel tank, hydraulic oil tank.

- Equipment with adjustable boom and mono-boom, dipperstick and backhoe bucket.

The superstructure is connected to the undercarriage through a ball bearing slewing ring.
A rotating joint, installed on excavator swing axis connects the hydraulic system of the superstructure to the one of the undercarriage.
The diesel hydraulic drive forms a sealed unit which is built onto the superstructure platform. It consists of a diesel engine coupled to a hydraulic pump, equipped with a power-sum governor at constant horsepower; that means at any moment of the operating cycle the power delivered by the two axial pistontype pumps will be constant and the resulting advantages for the diesel engine and the operating cycle will be evident.

The mono-boom, and dipperstick together with the bucket are the basic structures to dig the ground. The mono-boom can be mounted on two different positions according to the prevailing job conditions. The dipperstick is available as standard in three diffferent lenghts.

The bucket is equipped with two positions for bucket linkage to suit different job requirements.

1.02 BASIC COMPONENTS OF THE CRAWLER EXCAVATOR WITH MONO-BOOM

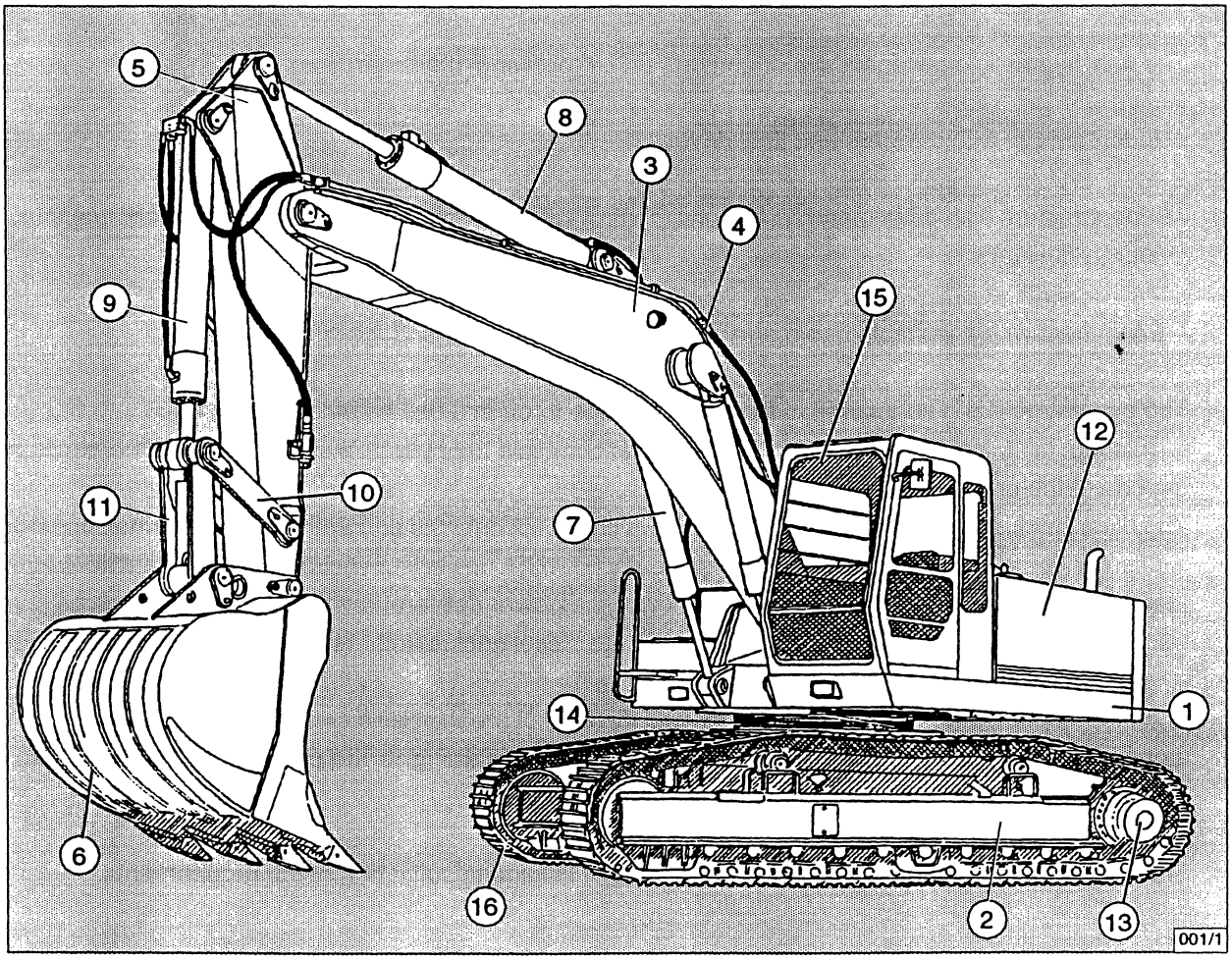

Fig. 1

1) Rotating upperstructure
2) Undercarriage
3) Mono-boom
4) Boom hydraulic installations
5) Dipperstick
6) Bucket
7) Hydraulic cylinders, boom lift
8) Hydraulic cylinder, dipperstick
9) Hydraulic cylinder, bucket
10) Linkage
11) Linkage tie rod
12) Power plant bonnet
13) Travel reduction gear and hydraulic motor
14) Slewing ring
15) Cab and operator's compartment
16) Track

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2. TECHNICAL SPECIFICATIONS

2.01 ENGINE

Make.....CUMMINS
Model 6 BT5.9
Cylinders, number 6
Cycle.....4
Injection .....direct
Gross horsepower
(SAE J 1349) at 2500 r.p.m .....154 HP (113 kW)
* Net flywheel horsepower
(SAE J 1349) at 2200 r.p.m .....145 HP (108 kW)
Bore and stroke .....102 x 120 mm.
Displacement.....5880 cm^3
Cooling system .....water
Electric starter .....24 V
Aspiration .....turbocharged
Fuel consumption (max. output) .....156 g/HP h
*Net flywheel horsepower as specified in SAE J 1349 under standard SAE conditions 25°C/77°F ambient temperature and 100 KPA/29,61 HG barometric conditions, using diesel fuel 1D or 2D (ASTM) after deduction for fan, air cleaner, fuel pump, water pump, lubricating oil pump and alternator.

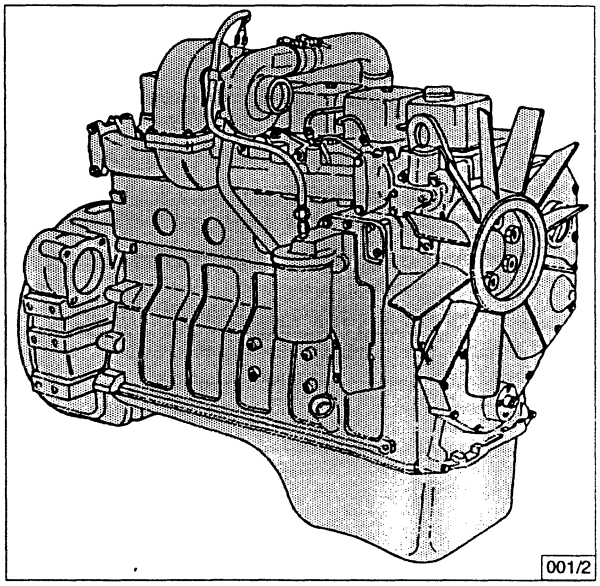


Fig. 2

2.02 HYDRAULIC SYSTEM "BHS"

Two axial-piston pumps with pilot-controlled regulator giving variable flow at constant torque; "hyperbolic" control characteristics. The regulator automatically adapts to the power used according to the running speed of the diesel engine.
One-piece, multi-function control valve (with logic valves) for pressure relief, port relief, cavitation, braking. Proportional hydraulic control.
Maximum delivery. .....2 x 180 litres/min.
Relief valve settings
Digging implement circuits.....300/350 bar
Travel system .....300 bar
Swing system.....300 bar
The pilot control circuit is fed by a gear pump with a preloaded accumulator for movements with engine off.
Operating pressure.....30 bar
Delivery .....19 litres/min.
Hydraulic cylinders, bore and stroke
Boom (2) .....120 x 950 mm.
Dipperstick (1).....140 x 1260 mm.
Bucket (1) .....120 x 950 mm.
Articulation (1).....140 x 1045 mm.

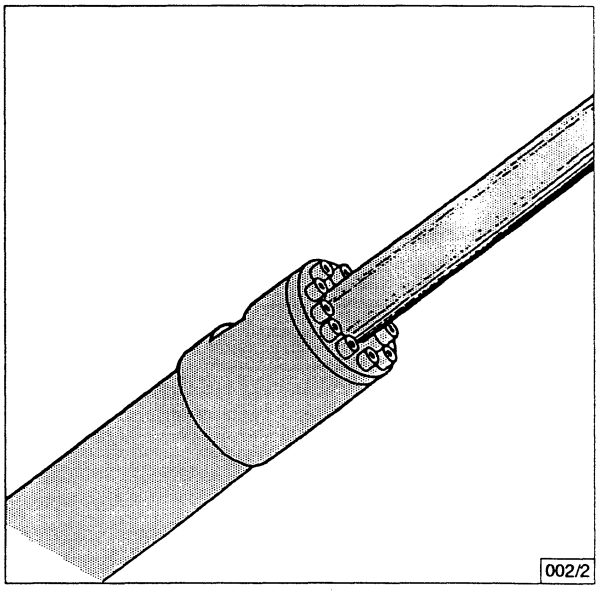


Fig. 3

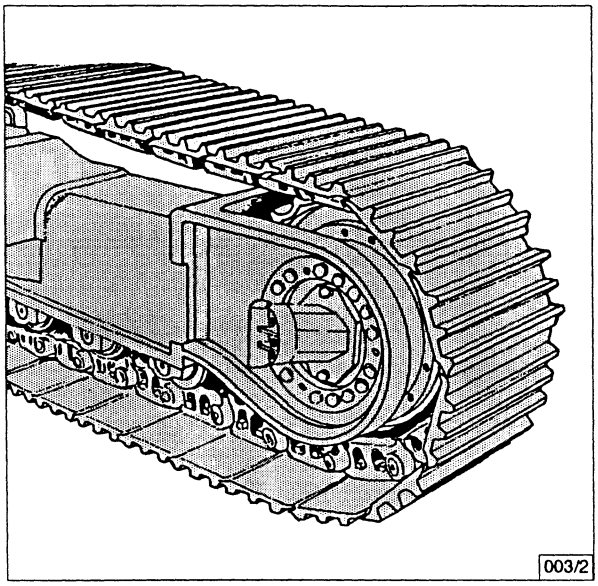


Fig. 4

2.03 DRIVE

Fully hydrostatic type - each track driven by an independent hydraulic motor through a three-stage planetary final drive.
Splash lubricated.
Oil/water tight floating ring seals.

Drawball pull
LCS and LC version ..... 18000 kg.
Maximum travel speed at rated diesel engine rpm (forward and reverse) .....3,00 km/h

Two oil bath disc brakes are applied on the input shafts of the final drives. They are spring-operated and released by the hydraulic disconnect control provided. When the machine stops, the brakes automatically come into action. The brakes are instantly released by pressing one of the two travel pedals. Two integrated brake valves prevent the travel motors from going out of control when machine is traveling down steps slopes, thus ensuring maximum safety.

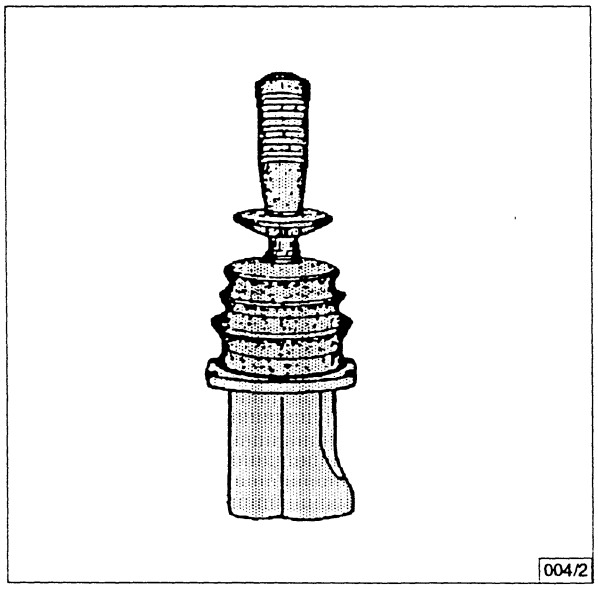


Fig. 5

2.04 CONTROLS

Fully power-assisted controls: two single-lever joystick controls govern the digging equipment and the swing mechanism. Two pivot pedals control forward and reverse travel and counter-rotation. Two levers attached to the pedals allow machine travel to be manually controlled.
Moving the control levers diagonally, the two functions can be performed simultaneously. A safety lever on the left-hand side of the panel neutralizes the whole control system.

2.05 UNDERCARRIAGE

Specific undercarriage for crawler excavators.
Strong rollerframe ideal for heavy-duty jobs.
Hermetically sealed tracks.
Lifetime lubricated rollers and idlers.
Triple track-shoes.
Hydraulic track adjustment.
Front and central track guides.
Nr. rollers - each track ..... 10 + 2
Nr. track-shoes - each track 54
Standard track-shoes width ..... 500 mm.
Total track lenght ..... 4410 mm..
Gauge - LC version..... 2350 mm.

Ground contact area
Track-shoes 500 mm ..... 3,82 m²
Track-shoes 600 mm ..... 4,59 m²
Track-shoes 700 mm ..... 5,35 m²
Track-shoes 900 mm ..... 6,88 m²

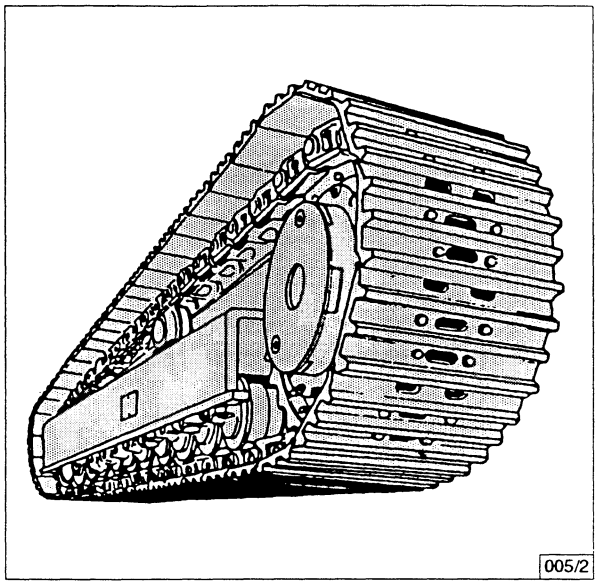


Fig. 6

2.06 SWING MECHANISM - 360°

Swing mechanism operated by a self-braking hydraulic motor and a splash lubricated hardened gear drive.

Double swing bearing with case hardened internal gear.
Ring gear and main pinion grease lubricated in tank.
No daily lubrication is requested.
Swing speed ..... 9,6 r.p.m.
Swing torque ..... 6240 Kgm.
Oil bath multidisk brakes automatically come into action when control-lever is in neutral position.

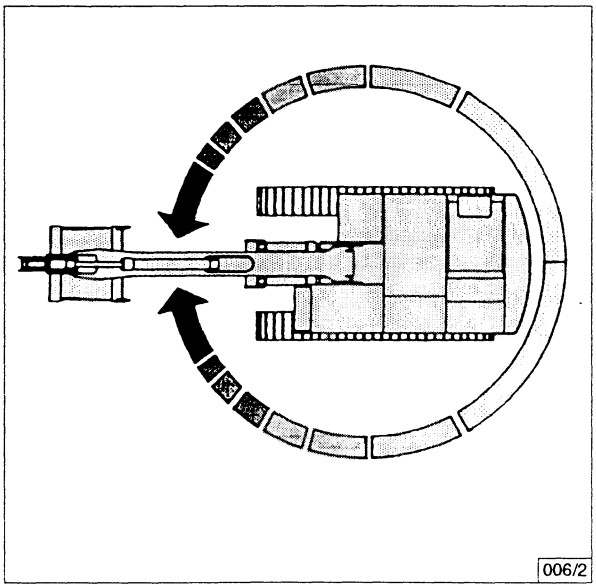


Fig. 7

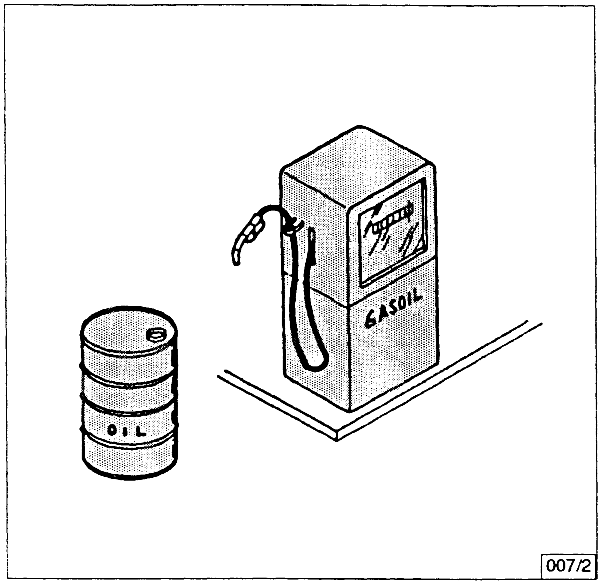


Fig. 8

2.07 SERVICE REFILL CAPACITIES

Fuel tank ....333 litres
Cooling system ....34 litres

Lubrication
Engine oil (total) ....15 litres
Final drives (each) ....3 litres
Swing drive ....4 litres
Hydraulic system (total) ....270 litres
Hydraulic reservoir ....177 litres

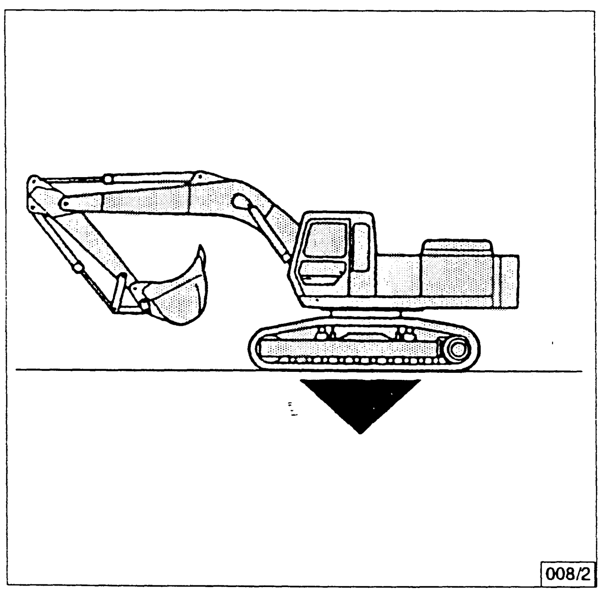


Fig. 9

2.08 OPERATING WEIGHT* /kg.

Dipperstick	Triple track-shoes			
	500 mm	600 mm	700 mm	900 mm
1950 mm	21500	21850	22200	22900
2450 mm	21560	21910	22260	22960
2950 mm	21620	21970	22320	23020
Specif. ground pressure dipperstick 1950 mm	0,57 bar	0,48 bar	0,42 bar	0,34 bar

***Machine equipped with LC mono-boom and 1150 mm. bucket.
Shipping weight - subtract : 80 Kg. (operator's weight) , 200 kg. for the fuel tank (10%).**

2.09 STANDARD EQUIPMENT

- Alternator 40A.
- Mono-boom.
- Standard dipperstick.
- Exhaust muffler.
- Standard counterweight.
- Dry-type air-cleaner.
- Electric horn.
- Cab with adjustable seat.
- Cab heating.
- Diesel engine instruments.
- Service warning lights.
- Hourmeter.
- All windows provided with windshield wipers and tinted safety glass.
- Work lights.
- Life-time lubricated rollers and idlers.
- Hydraulic track adjusters.
- 500 mm. triple-grouser track-shoes.
- Front track guiding guard.
- Central track guiding guard.
- Tow eye.
- Tool box.
- Travel motor guard.
- Automatic multidisk emergency brakes, oil bath lubricated.
- Refuelling pump.
- Sound suppression kit.
- Cab top window.
- Slewing ring permanent lubrication.

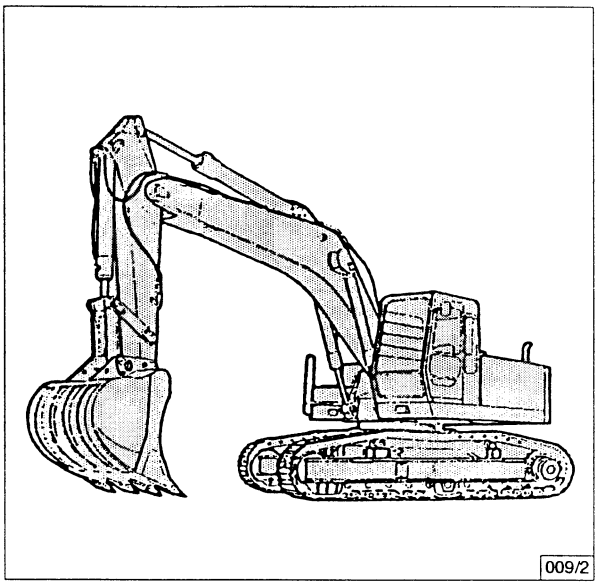
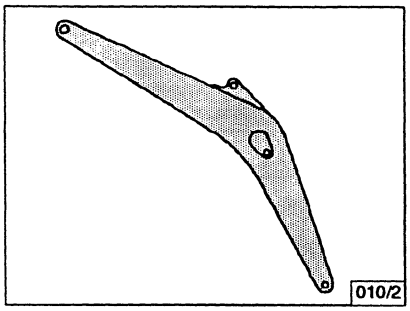


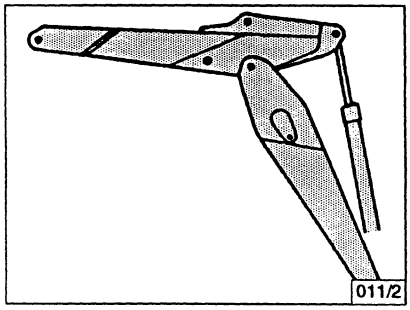
Fig. 10

2.10 OPTIONAL EQUIPMENT

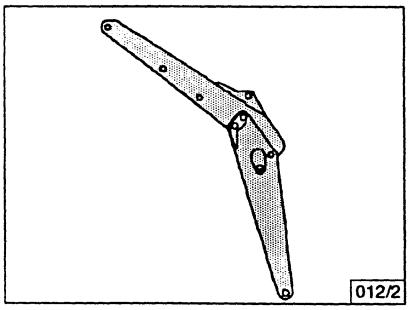
- Two-piece boom.
- Hydraulic triple articulation.
- Long and extra-long dipperstick.
- Backhoe buckets.
- Bucket teeth.
- Front loading stick.
- Front loading buckets .
- Track-shoe options.
- Air conditioner.
- Pressurizer.
- Radio set.
- Fops.
- Ditching boom.
- Clamshell attachment.
- Hydraulic hammer.
- Hydraulic hammer system.



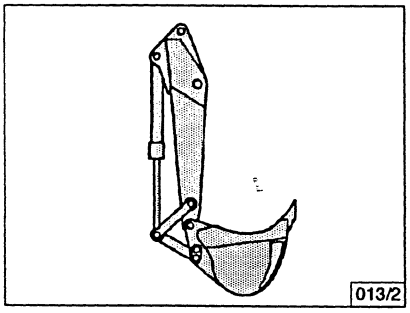
Mono- boom
recommended when job conditions require maximum reach and depth such as for trenching and sewerage digging. Its reduced weight results in increased lifting capacity.



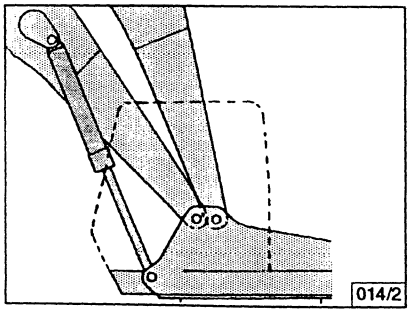
Hydraulic triple articulation boom
new design recommended where versatility and possibility of using different attachments is needed, as the intermediate arm can be connected angularly to the pre-boom by hydraulic independent control.



Two-piece boom (on request)
new design recommended where versatility and possibility of using different attachments is needed, as the intermediate arm can be connected to the pre-boom in two different positions. The intermediate arm can be extended or retracted to 3 different positions to vary reach and digging depth.
When retracted, buckets of larger capacity can be used whilst, when fully extended, the working performance is the same as for a mono- boom.



Dipperstick
available in a choice of three different leghts allows to cope with prevailing job demand, from high tearout force to maximum reach. With the short stick a bucket of larger capacity can be used.



Mono-boom with possibility of front and rear mounting hole
this special arrangement allows to increase by approximately 25% the hydraulic lifting capacity.
This feature gives great advantages when a face shovel attachment is fitted or when the maximum depth is not needed.

2.11 WORKING DIAGRAM

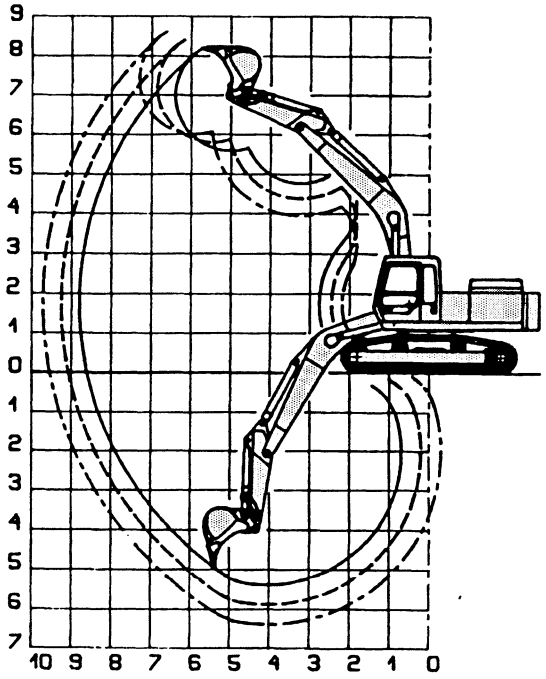


Fig. 11
Working diagram with mono-boom.

OPERATING PERFORMANCES	Mono-boom 5,20 m			
Dipperstick	m	1,95	2,45	2,95
Reach, ground level	m	8,70	9,10	9,55
Digging depth	m	5,40	5,90	6,40
Dump height	m	5,60	5,80	6,00
Breakout force (SAE J 1179)	kg	14000	14000	14000
Arm crowd force (SAE J 1179)	kg	12000	10500	9300

When the mono-boom is attached to the rear mounting hole, the digging depth is reduced by 1,40 m.

2.12 TRANSPORT DIMENSIONS

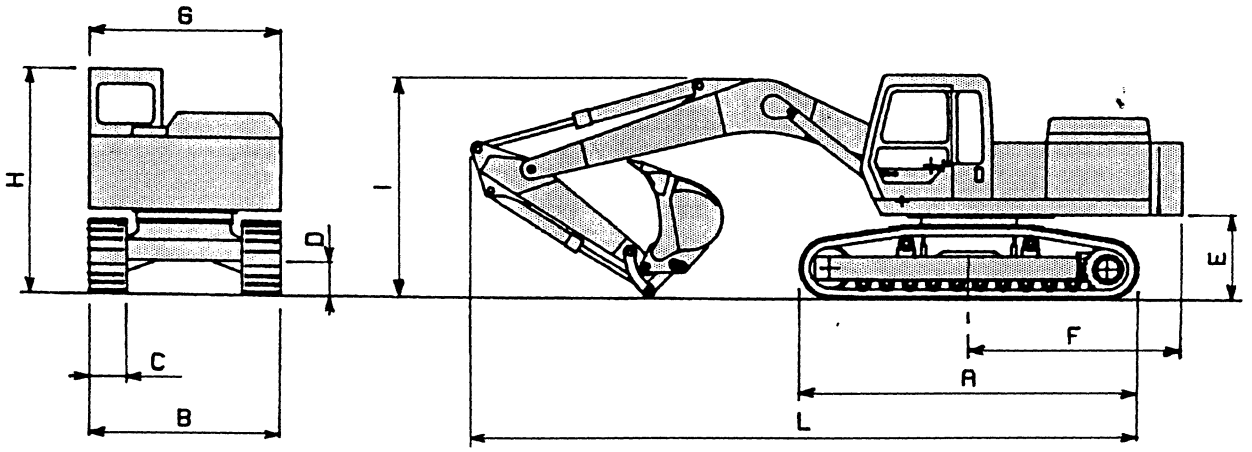


Fig. 12

Dipperstick	A	B	C	D	E	F	G	H	I	L
1950	4410	2850	500	450	1100	2750	2500	2950	2870	8690
2450	4410	2850	500	450	1100	2750	2500	2950	3140	8720
2950	4410	2850	500	450	1100	2750	2500	2950	3400	8750

Increasing the width of the track-shoes will increase the width of the undercarriage to the same degree.

2.13 BUCKETS RANGE

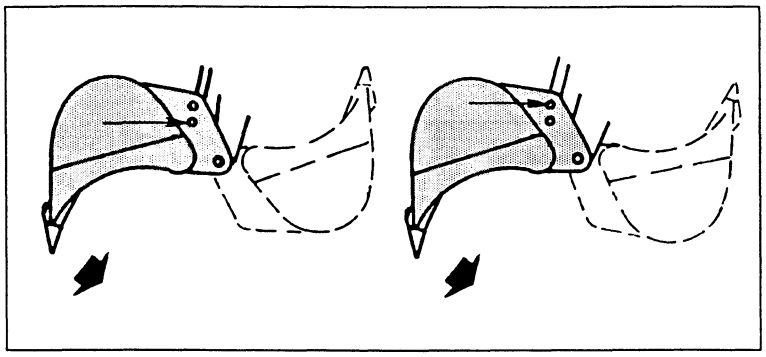


Fig. 13

In all buckets the attaching link can be in two different positions. In the outer position maximum crowd force is obtained whilst, when attached in the inner position, an increased bucket rotation allows to dig vertical walls up to maximum depth.
Bucket teeth with different design to cope with different digging applications.
The size of bucket connection to the dipperstick and linkbar is standard. This allows the buckets to be fitted in a backating position for light-duty digging and/or for front loading.

Width		mm	550	700	850	1000	1150	1300	1450
Capacity (SAE J 296)		m3	0,40	0,60	0,75	0,90	1,10	1,20	1,40
Number of teeth		N°	3	3	4	4	5	5	5
Weight		Kg	510	580	670	760	830	880	930
Mono-boom	Dipperstick m.1,95	LC	●	●	●	●	●	●	▲
	Dipperstick m. 2,45	LC	●	●	●	●	●	▲	■
	Dipperstick m. 2,95	LC	●	●	●	●	▲	■	

For use with bulk material weights: ● = 2 t/m³; ▲ = 1,8 t/m³; ■ =1,5 t/m³.

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2.14 LIFTING CAPACITIES DIAGRAM - MONO-BOOM

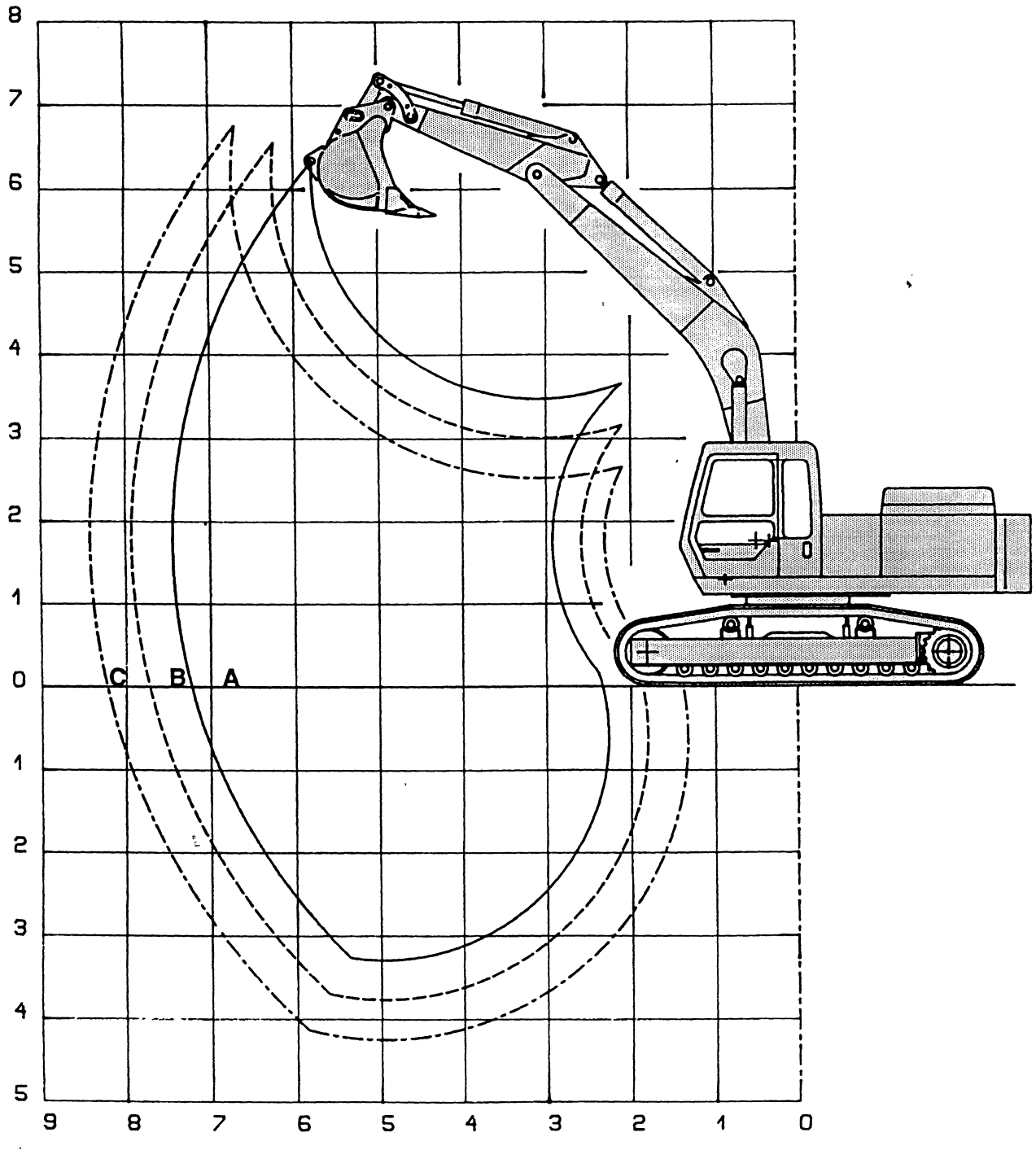

Fig. 14

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ELBOW (A)

All lifting capacities are in metric tons, over ends and sides (360°). They do not exceed 75% of tipping load in compliance with DIN 15019.
When using a load hook on the stick-where bucket, bucket-cylinder and linkage must be removed 1,23 t -may be added to the loads in the CRANE-CAPACITY CHART.

- Mono-boom 5200 mm
- Dipperstick (**A**) 1950 mm
- Bucket 1,20 m^3

Height Radius (m)

m	7,5	7,0	6,0	5,0	4,0	3,0
6,0			4,42			
5,0			4,38			
4,0		3,12	4,24	5,57		
3,0		3,63	4,04	5,51	7,88	
2,0	2,32	2,92	3,83	5,14	7,23	
1,0	2,47	2,81	3,65	4,85	6,78	
0		2,74	3,52	4,67	6,58	8,33
-1,0		2,72	3,47	4,60	6,55	10,86
-2,0			3,49	4,62	6,63	9,66
-3,0				4,75		

ELBOW (B)

All lifting capacities are in metric tons, over ends and sides (360°). They do not exceed 75% of tipping load in compliance with DIN 15019.
When using a load hook on the stick-where bucket, bucket-cylinder and linkage must be removed 1,18 t -may be added to the loads in the CRANE-CAPACITY CHART.

- Mono-boom 5200 mm
- Dipperstick (**B**) 2450 mm
- Bucket 1,10 m^3

Height — Radius (m)

m	8,0	7,0	6,0	5,0	4,0	3,0
5,0		3,31	4,25*			
4,0		3,23	4,36			
3,0	2,98	3,11	4,14	5,68	7,29*	10,31*
2,0	2,29	2,97	3,91	5,28	7,50	
1,0	2,82	2,85	3,70	4,93	6,94	7,33*
0	2,77	2,75	3,54	4,70	6,62	8,75*
-1,0		2,69	3,44	4,57	6,50	10,69
-2,0		2,70	3,43	4,55	6,52	10,77*
-3,0			3,50	4,63	6,64	

* Hydraulic - system pressure is the limiting factor.

ELBOW (C)

All lifting capacities are in metric tons, over ends and sides (360°). They do not exceed 75% of tipping load in compliance with DIN 15019.
When using a load hook on the stick-where bucket, bucket-cylinder and linkage must be removed 1,11 t -may be added to the loads in the CRANE-CAPACITY CHART.

- Mono-boom 5200 mm
- Dipperstick (**C**) 2950 mm
- Bucket 0,9 m^3

Height — Radius (m)

m	8,5	8,0	7,0	6,0	5,0	4,0	3,0	2,0
6,0			3,50					
5,0			3,46					
4,0		2,52	3,36	4,24*				
3,0		2,45	3,22	4,29	5,41*			
2,0	2,08	2,36	3,06	4,03	5,46	7,81*	11,35*	
1,0		2,27	2,91	3,79	5,07	7,15	9,43*	
0		2,20	2,79	3,59	4,77	6,72	9,29*	
-1,0		2,16	2,70	3,46	4,59	6,50	10,60	6,90*
-2,0			2,67	3,40	4,52	6,45	10,65	9,34*
-3,0				3,43	4,55	6,52	10,28*	
-4,0					4,68			

* Hydraulic - system pressure is the limiting factor.

3. IDENTIFICATION

In case of maintenance assistance it shall be necessary to inform our technical Service Department (or any authorized Repair Shop).

To facilitate a fast and efficient service in case of possible failures, it is advisable to quote the following details for reference of our Service Department:
a) model of excavator (fig. 15)
b) serial number (fig. 16)
c) serial number of diesel engine (fig. 17)
d) number of hours worked
e) purchase date of excavator

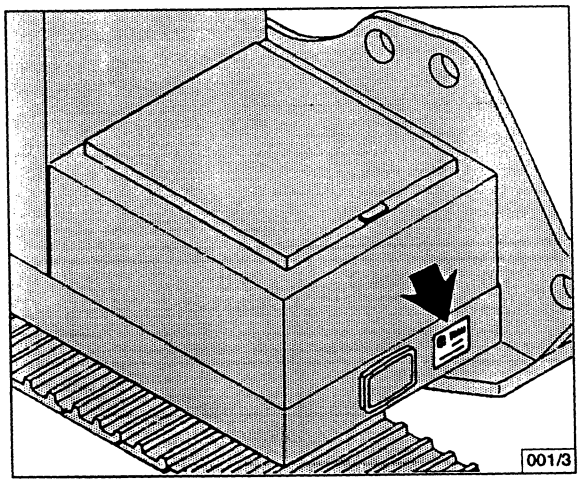

Fig. 15 Model of excavator

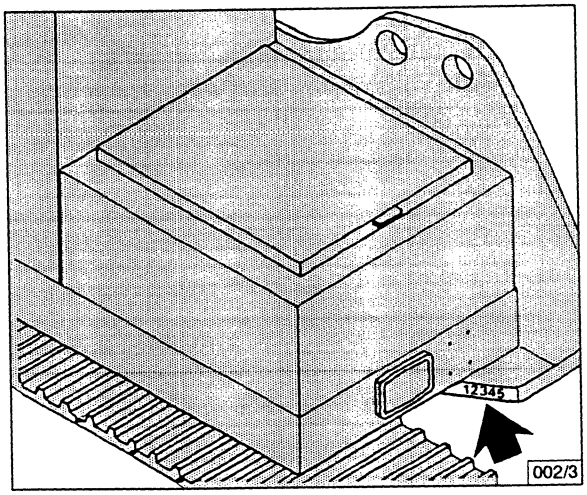

Fig. 16 Serial number

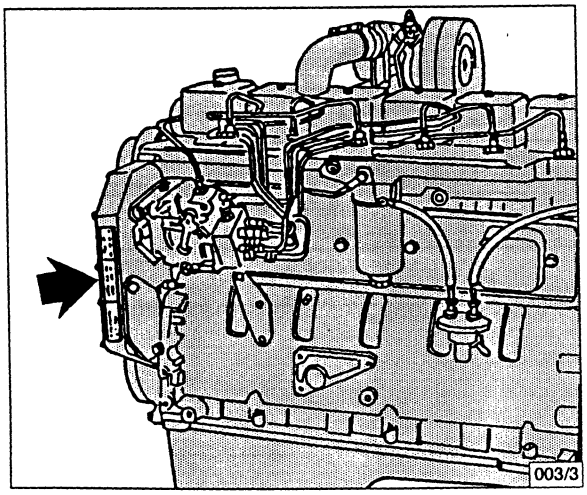

Fig. 17 Serial number of diesel engine

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4. CONTROLS POSITION

4.01 OPERATOR'S COMPARTMENT

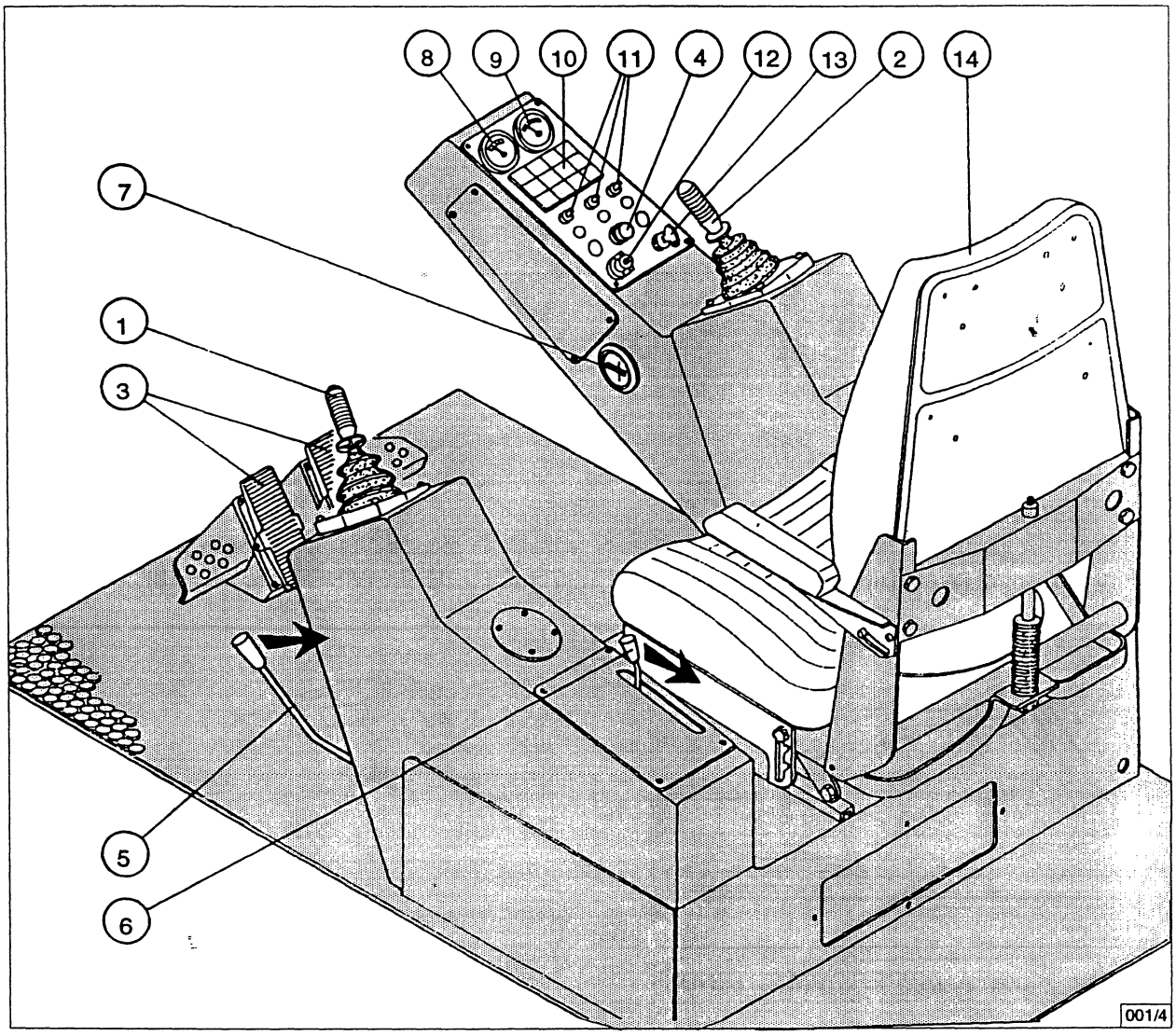

Fig. 18

1) Control lever dipperstick and upperstructure slewing
2) Control lever boomlift and bucket
3) Travel control pedal
4) Automatic idling speed control
5) Hand lever, disconnects all controls
6) Hand accelerator
7) Hourmeter
8) Engine coolant gauge
9) Engine oil manometer
10) Instrument control panel
11) Control switches
12) Lighting switch and horn
13) Ignition switch and starter
14) Seat

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4.02 CONTROLS

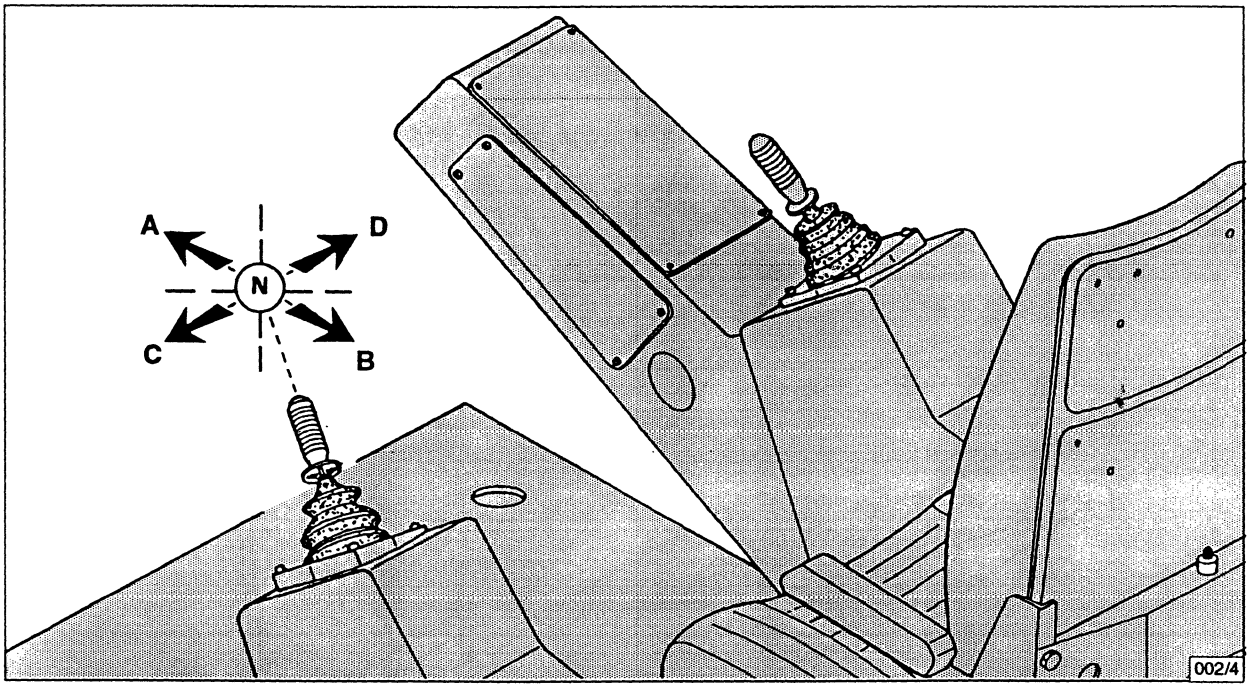
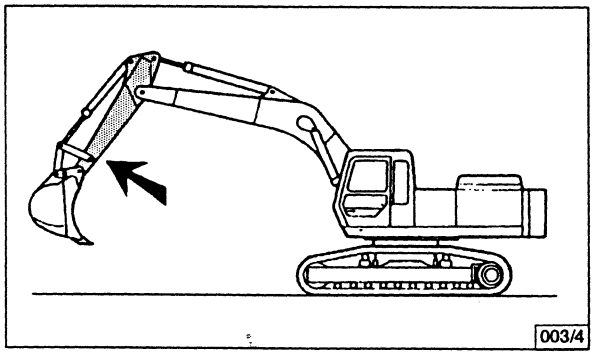
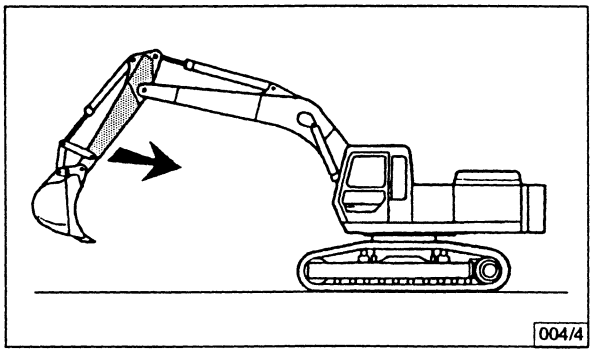


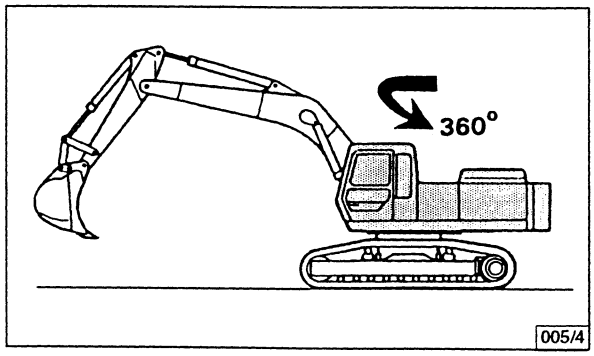
Fig. 19 Control lever - DIPPERSTICK AND UPPERSTRUCTURE SLEWING (pos. 1 fig. 18)



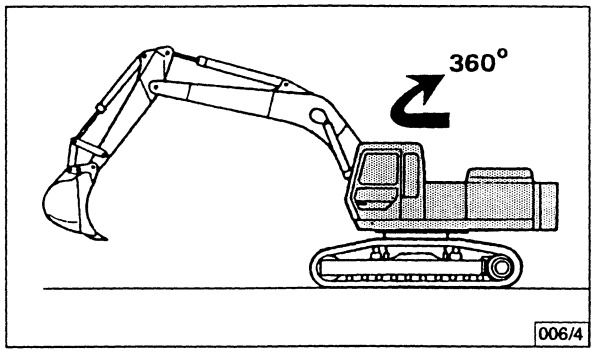
Lever in pos. A DIPPER ARM EXTENDS



Lever in pos. B DIPPER ARM RETRACTS



Lever in pos. C UPPERSTRUCTURE SLEWS ANTICLOCKWISE



Lever in pos. D UPPERSTRUCTURE SLEWS CLOCKWISE

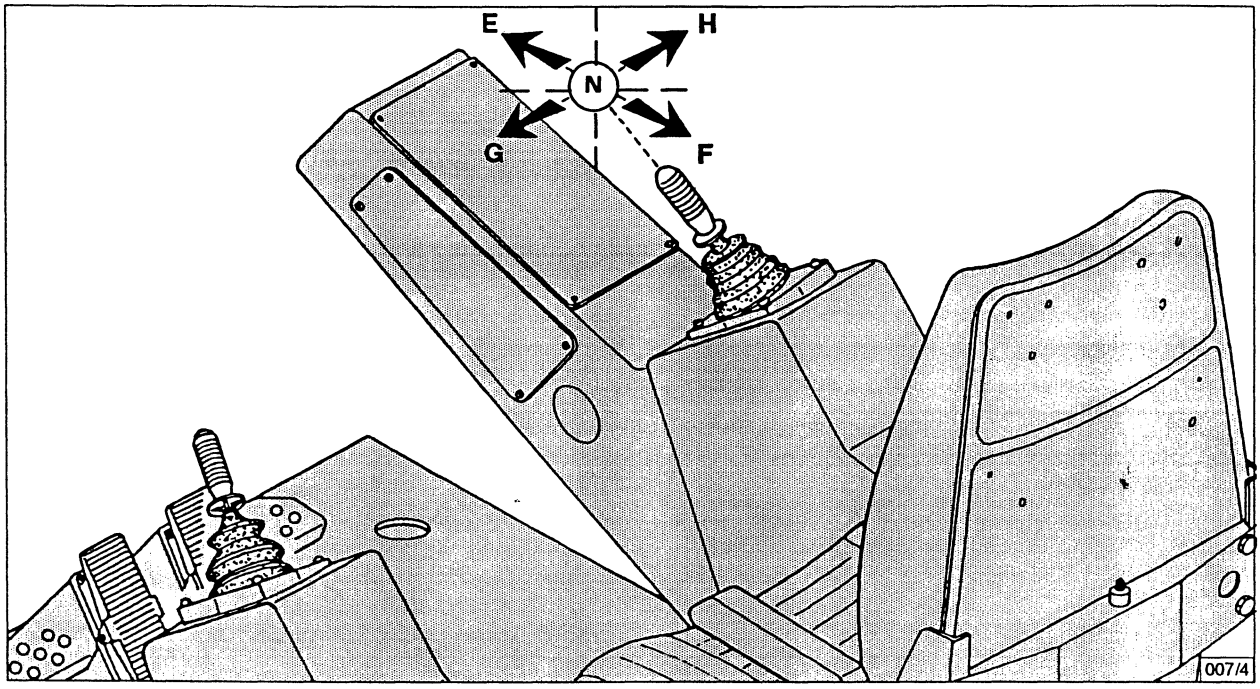
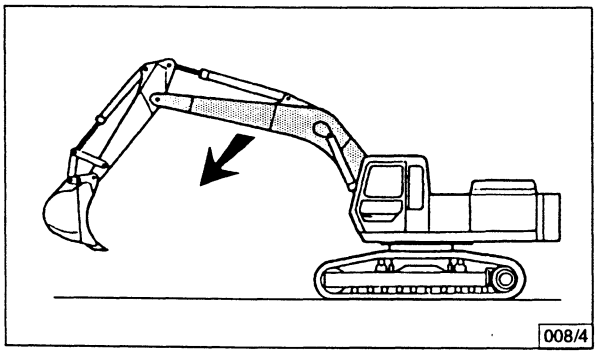
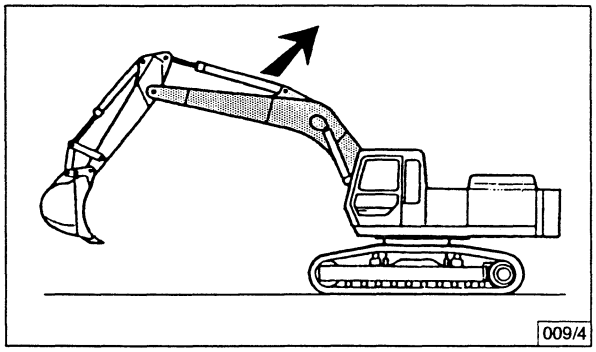


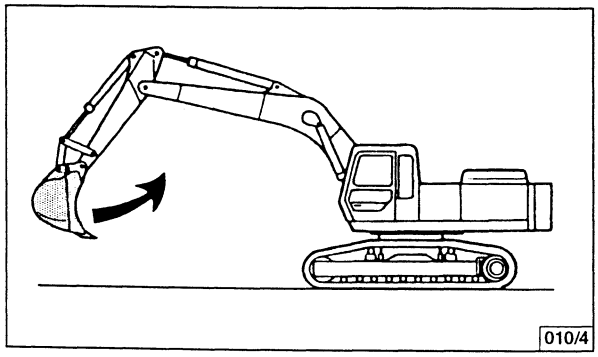
Fig. 20 Control lever - BOOM LIFT AND BUCKET (pos. 2 fig. 18)



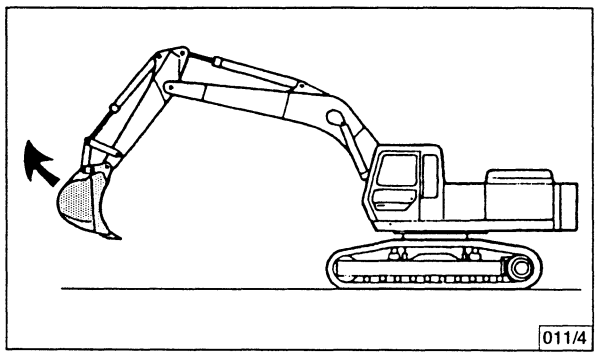
Lever in pos. E BOOM LOWERS



Lever in pos. F BOOM RAISES



Lever in pos. G BUCKET IN



Lever in pos. H BUCKET EXTENDS

N.B.: Lever in position N has no motion. (Neutral)

POSSIBILITY OF TWO MOVEMENTS AT THE SAME TIME

Control lever in intermediate position will make possible two movements at the same time according to required positions.

Es. Lever (fig. 20) in position F.H. will make possible boom raising and extension bucket.

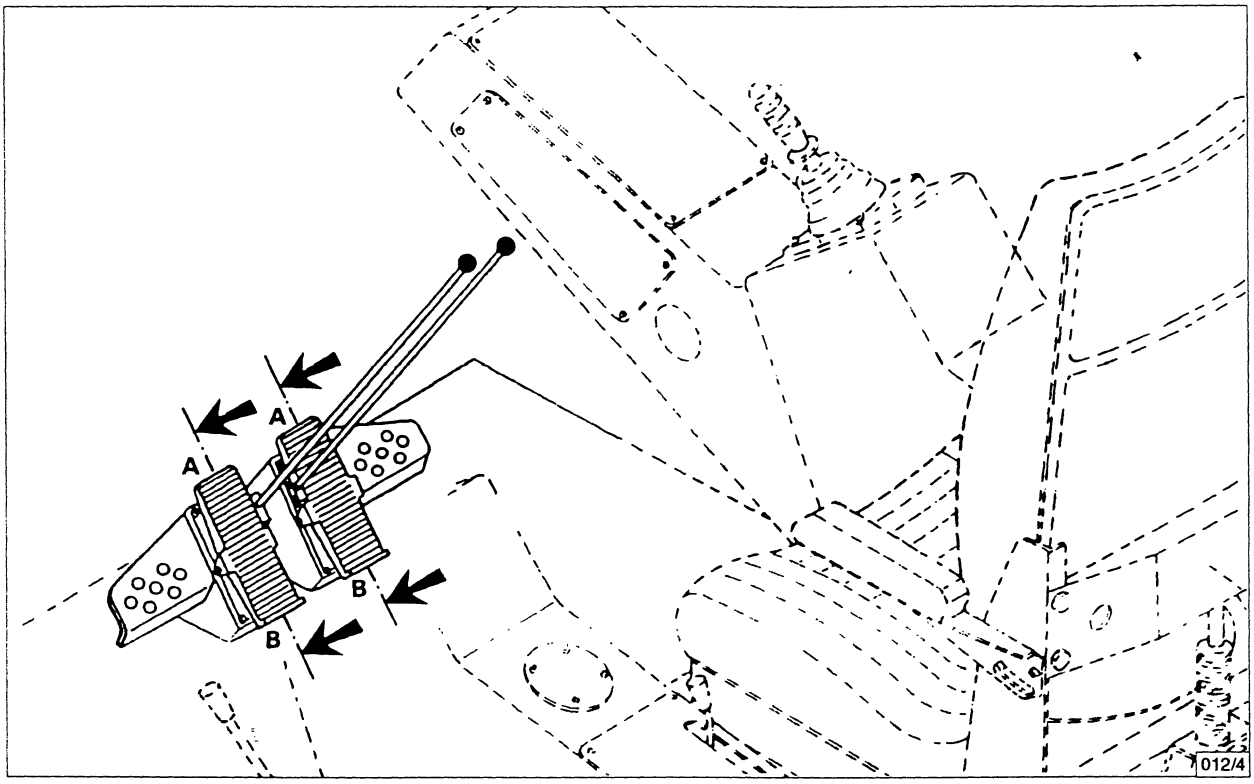
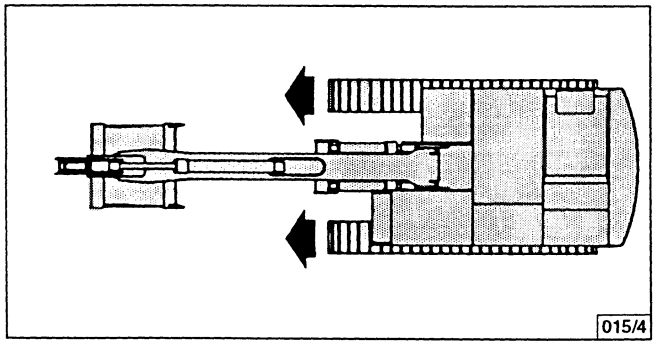
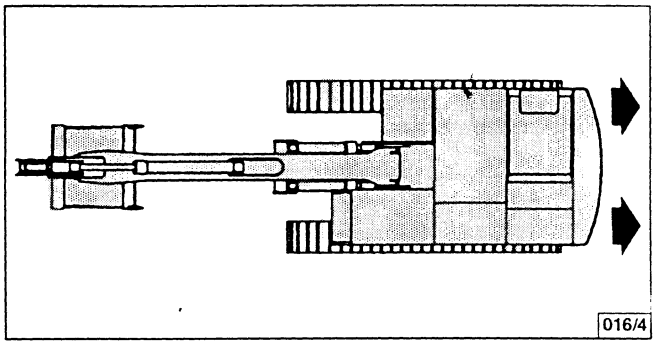


Fig. 21 TRAVEL CONTROL PEDALS

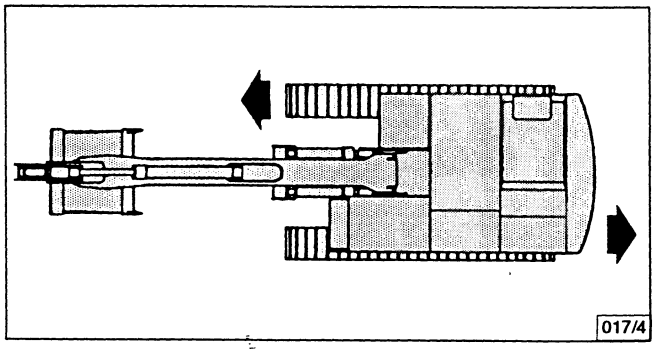
IMPORTANT NOTE - The following instructions, relevant to controls use, shall be referred to rear drive-motors as to running condition. "Right", "Left", "Forward", "Reverse", "Clockwise", "Anticlockwise", indications shall be referred to the correct operator's position.



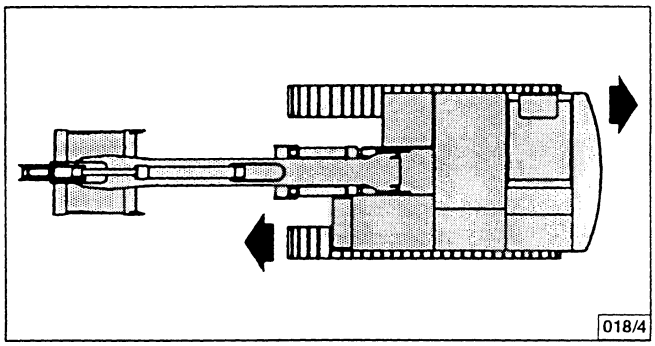
Both pedals in position A - EXCAVATOR TRAVELS FORWARD



Both pedals in position B - EXCAVATOR TRAVELS BACKWARDS



Dx pedal in position A. Sx pedal in position B EXCAVATOR TRAVELS BACKWARDS TO LEFT



Sx pedal in position A. Dx pedal in position B. EXCAVATOR TRAVELS BACKWARDS TO RIGHT

4.03 HAND ACCELERATOR LEVER (6, fig. 18)

Lever in position as shown in figure 20, the engine will run at idling speed; to accelerate, move the lever as shown by the arrow.

4.04 HAND LEVER, DISCONNECTS ALL HYDRAULIC CONTROLS (5, fig. 18)

Lever in position as shown in figure 20, all main controls can be operated, moving the lever as shown by arrow, it will not be possible to operate any excavator service.

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4.05 DASHBOARD

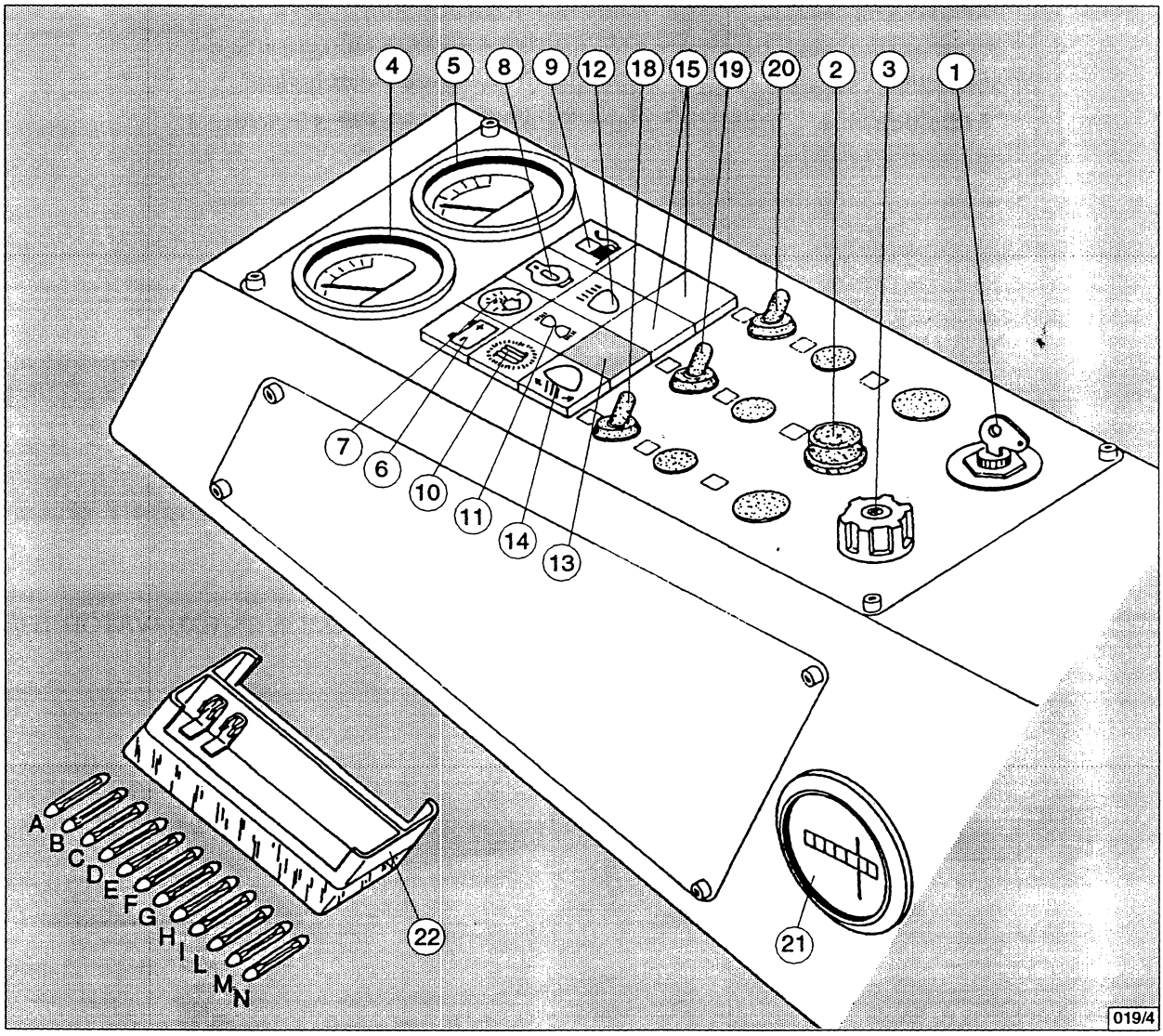

Fig. 22

FUXE BOX (22, fig. 22)

A) → Optional acessory (8A)
B) → Optional acessory (12V 8A) (Radio set)
C) → Main headlight (8A)
D) → Traffic light (8A)
E) → Working headlight boom (8A)
F) → Warning electric horn (8A)
G) → Optional acessory (8A) (lighter)
H) → Optional acessory (8A) (hammer)
I) → Windscreen wiper motor (8A)
L) → Switches and warning lights (8A)
M) → Optional acessory (25A) (Diesel oil pump)
N) → Starting engine (25A)

IGNITION AND STARTER SWITCH (1, fig. 22)
When the key is in position "0" all circuits are off; when the key is turned to position "1" all circuits are on; turning the key to position "2" operates the thermostart unit; turning the key operates the starter motor; turning the key to position "0" all circuits are off again.

AUTOMATIC IDLING SPEED CONTROL (2, fig. 22)
Pushing this control device, the automatic idling speed function is on.

LIGHTING SWITCH (3, fig. 22)
This control device has various functions:
1) Moving the switch lever clockwise, it will control the dashboard lights.
2) In position 2 it will operate the traffic lights; in position 3 it will operate the main headlight located on the right front of the upperstructure.
3) Pressing the switch, it will operate the warning horn.

THERMOMETER, ENGINE COOLANT (4, fig. 22)
This instrument indicates the temperature of coolant of diesel engine.

MANOMETER, ENGINE OIL PRESSURE (5, fig. 22)
This instrument indicates the engine oil pressure.

WARNING LIGHT, ALTERNATOR (6, fig. 22)
This warning light "ON", indicates the alternator is discharged.

WARNING LIGHT, AIR CLEANER CLOGGING (7, fig. 22)
This warning light "ON", will indicate the air filter is clogged.

WARNING LIGHT, HYDRAULIC OIL TEMPERATURE (8, fig. 22)
This warning light, "ON", indicates the engine lubrication is fault: stop any operation until the problem is corrected.

WARNING LIGHT, FUEL LEVEL (9, fig. 22)
This warning light "ON", indicates the minimum fuel level. It is advisable to avoid it, as it would be necessary the bleeding of feed system.

WARNING LIGHT, HEATING (10, fig. 22)
This warning light, "ON", indicates the heating is functionning.

WARNING LIGHT, TRAFFIC LIGHTS (11, fig. 22)
When "ON", indicates the light on the right and on the left front upperstructure.

WARNING LIGHT, MAIN HEADLIGHTS (12, fig. 22)
When "ON", indicates the high light on the right and on the left front upperstrucure.

WARNING LIGHT, AUTOMATIC IDLING SPEED (13, fig. 22)
When "ON", indicates the automatic idling speed is connected.

WARNING LIGHT, WORKING HEADLIGHT (14, fig. 22)
When "ON", indicates the lighting of working headlight.

WARNING LIGHTS (15, fig.22)
These warning lights can be used for optional accessories.

SWITCHES (18,19,20, fig.22)
18 Working headlight
19 Heating equipment
20 Windscreen wiper

HOURMETER (21 fig.22)
This instrument will be an efficient guide to check maintenance and inspection operations listed in this Manual. This instrument is connected only when diesel engine is working.