*TECHNICAL COURSE HANDOUTS FOR:*

# MINI DUMPER HS 400

# MINI DUMPER HS 850

# MINI DUMPER HS 1100

# MINI DUMPER HS 1150

# MINI DUMPER HS 1200

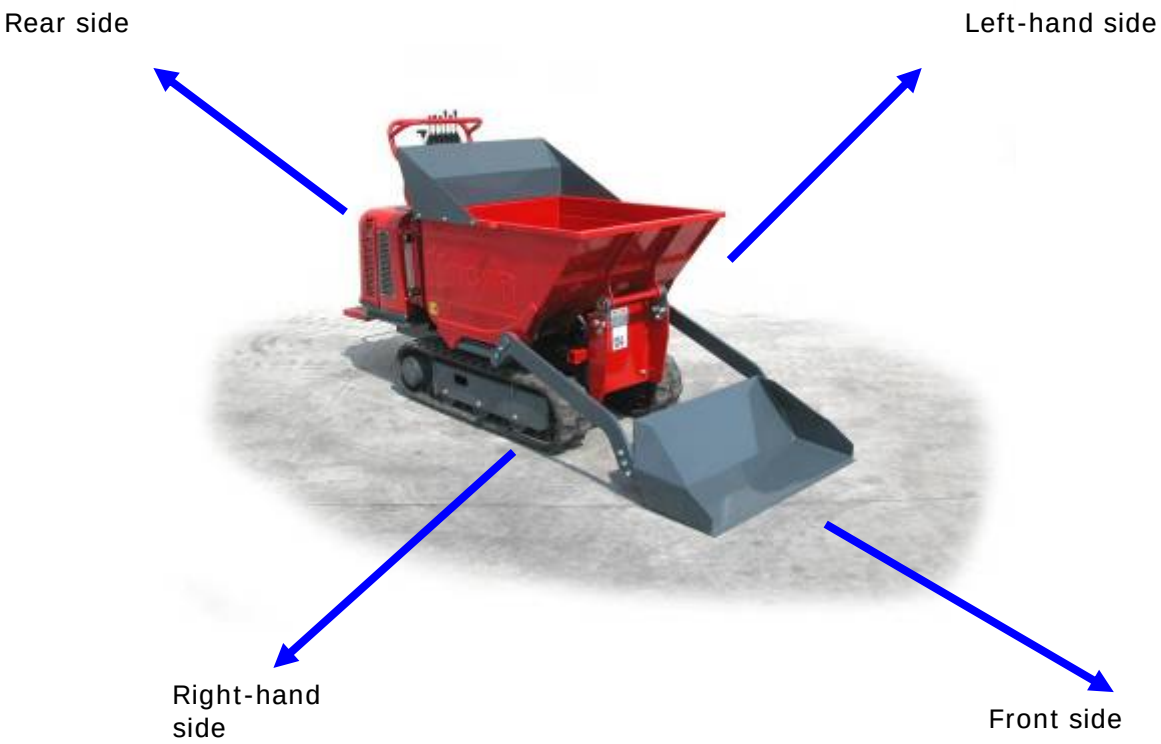
# MINI DUMPER HP 1500

# FORKLIFT KIT FOR HS 1200/1500/2500

DMADUMP20508

This handout has the purpose of summarising the main differences between the models, as well as providing information on the operation of the Hinowa mini dumpers.
It in no way replaces the operation and maintenance manual, but rather supplements and summarises some parts of this, with the aim of simplifying the troubleshooting operations.

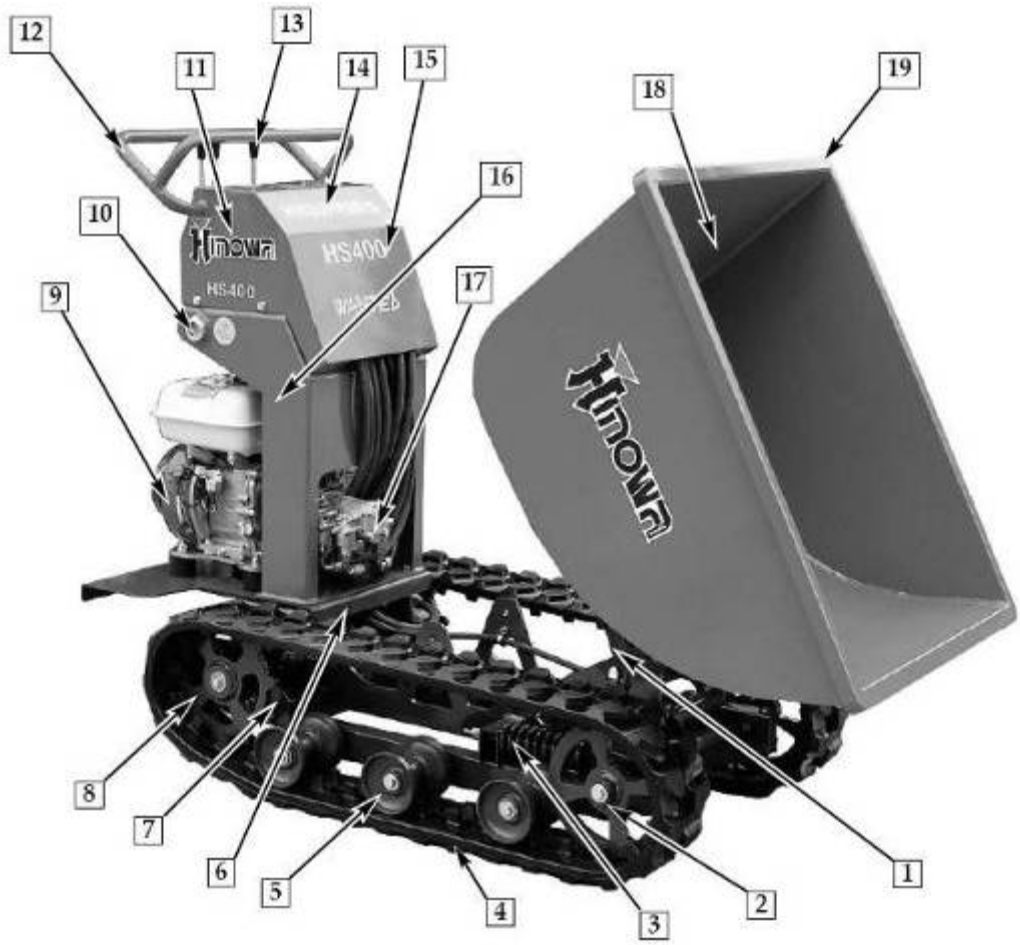
The driving position for all Hinowa mini dumpers is the rear of the vehicle, and as a result the following layout is used:



# HS400

## NOMENCLATURE HS400 FOR BUILDING APPLICATIONS

To facilitate the understanding of the safety warnings and the operating and maintenance instructions for the mini dumper HS400 FOR BUILDING APPLICATIONS, below are the names of the various assembled components:




**1** BODY TIPPING CYLINDER
**2** TENSIONER WHEEL
**3** TENSIONER SPRING
**4** TRACK
**5** ROLLER
**6** CHASSIS
**7** DRIVE MOTOR
**8** COGWHEEL
**9** ENGINE
**10** HYDRAULIC OIL LEVEL GAUGE
**11** HYDRAULIC DISTRIBUTOR (BEHIND THE GUARD)
**12** CONTROL POSITION
**13** HYDRAULIC DISTRIBUTOR CONTROL LEVERS
**14** DISTRIBUTOR GUARD
**15** HYDRAULIC OIL FILTER (BEHIND THE GUARD)
**16** HYDRAULIC OIL TANK
**17** HYDRAULIC PUMP
**18** BODY
**19** BODY SPOILER
**15** FILTRO OLIO IDRAULICO (DIETRO LA PROTEZIONE)
**16** SERBATOIO OLIO IDRAULICO
**17** POMPA IDRAULICA
**18** CASSONE
**19** SPOILER CASSONE

## KIT STANDARD DUMPER BED

## KIT SELF-LOADING

## KIT FARM BED

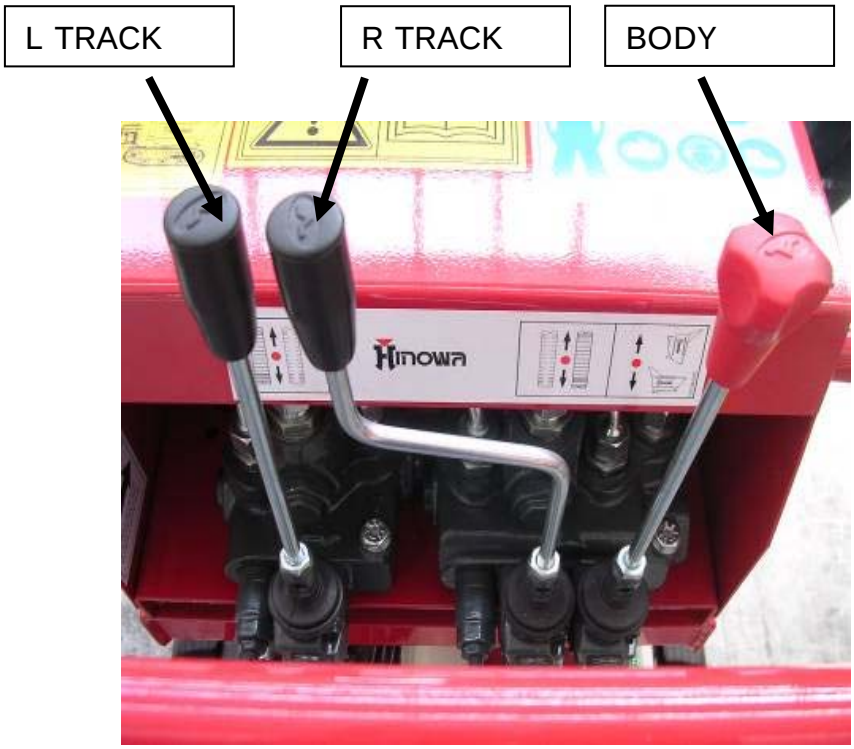
## KIT HIGH-TIP

# HS 400 - SPECIFICHE TECNICHE

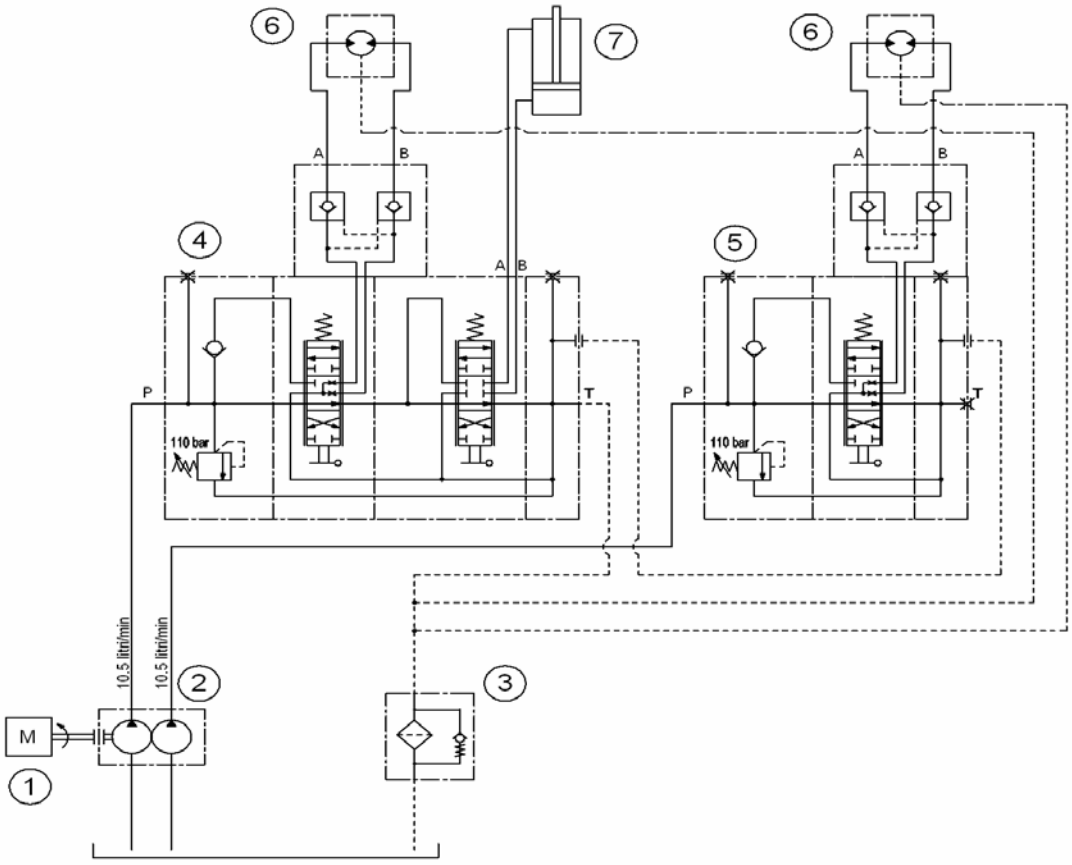
| | |
|---|---|
| **Petrol engine** | |
| Brand and type: | Honda GX200 |
| Cylinders and capacity: | 1 – da 199 cm3 |
| Max Gross Horsepower: | 6.5 HP a 3600 rpm |
| Calibration speed: | 3500 rpm |
| Starting: | pull start |
| **Hydraulic system** | |
| Flow rate: | 2 x 10,5 litres/minute each |
| Pressure: | 110 bars |
| **Undercarriage** | |
| Track width: | 680 mm |
| Support rollers per side: | 3 + slide |
| Travel speed: | 1,7 Km/h |
| **Operating weight** | |
| Fixed carriage: | 240 Kg |
| **Performance** | |
| Capacity: | 450 Kg |
| Body capacity: | 0,165 m3 |
| Dumping height | 1,1 metri |

# OPERATING THE HS400

The levers and controls are highlighted below. To work safely, the operator must control the machine from the control position, as shown in the operation and maintenance manual.




# HS400 – HYDRAULIC SYSTEM DIAGRAM




### 6.3.1 Key to the hydraulic system diagram

1 – Honda GX200 engine 6.5 HP at 3500 RPM
2 - Double gear pump
3 - Filter on the exhaust
4 - Right track distributor
5 - Left track distributor
6 - OMRN 250 hydraulic motor
7a - Building body tipping cylinder
7b - Farm flat bed tipping cylinder

# HS 850

## TECHNICAL SPECIFICATIONS

### Petrol engine

| | |
|---|---|
| Brand and type: | Honda GX270 |
| Cylinders and capacity: | 1 – da 270 cm3 |
| Max gross horsepower: | 9 HP a 3500 rpm |
| Calibration speed: | 3500 rpm |
| Electric starter: | Optional on diesel only |

### Diesel engine

| | |
|---|---|
| Brand and type: | Yanmar L100AE |
| Cylinders and capacity: | 1 – da 406 cm3 |
| Max gross horsepower: | 10 HP a 3600 rpm |
| Calibration speed: | 3500 rpm |
| Electric starter: | standard |

### Hydraulic system

| | |
|---|---|
| Pumps, numbers and type: | 3 gear pumps, 4 cm3 |
| Flow rate: | 14,5 litres/minute each |
| Pressure: | 150 bar |

### Undercarriage

| | |
|---|---|
| Track width: | 180 mm |
| Support rollers per side: | 3 + slide |
| Travel speed: | 2,0 – 3,0 km/h |
| Optional hydraulic extension: | 750/1050 |

### Operating weight

| | |
|---|---|
| Fixed undercarriage (excluding operaor): | 400 Kg |
| Extensible undercarriage (excluding operator): | 460 Kg |

### Performance

| | |
|---|---|
| Max travel gradient : | 20° (45%circa) |
| Capacity (including Kit): | 850 Kg |

Guaranteed sound power level: 101 dB (A)

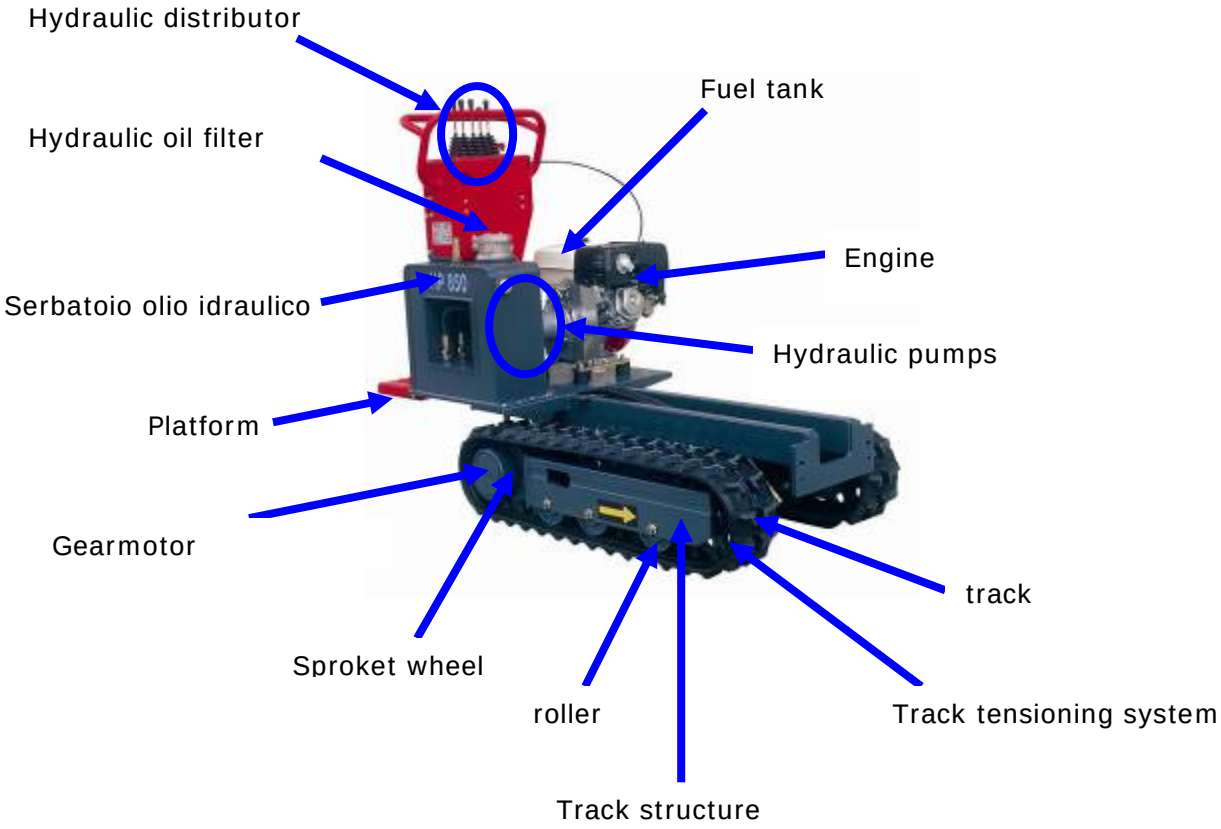
### Standard Supply

Second travel speed
Hydraulic couplings for kit
Spring-loaded, non-slip platform

# HS850

## HS 850 – general information

To simplify the interpretation of the hydraulic diagram and the wiring diagram, the location of the various components on the HS 850 mini dumper is described below




## HS850 – main new features compared to the HP850

- Drain line on the hydraulic oil filter

- Platform with springs to dampen vibrations

- Perfect interchangeability of the kits between diesel-petrol and HS1100 – HS1200 (on all the HS models, holes on the kit and pins on the machine for quick coupling)

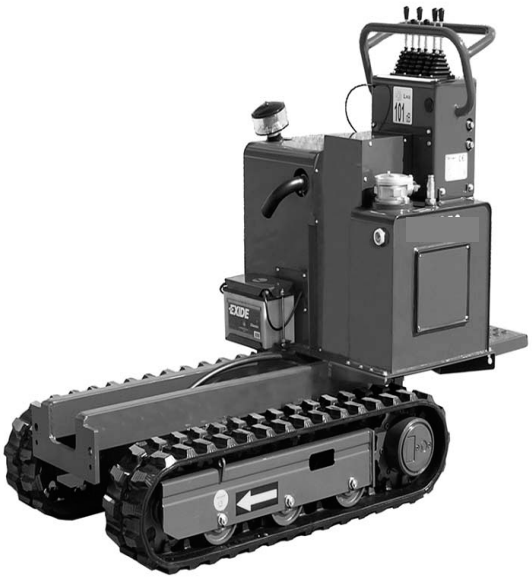
## HS 850 – remarks

Evolution of the HP850 dumper, supplied with diesel or petrol engine.
Despite the engines being mounted in the opposite direction to each other, the hydraulic system is the same, and the position of the quick couplings is in both cases to the left of the operator. This ensures perfect interchangeability of all the kits between the diesel and petrol versions. Two different distributors can be fitted on the machines:

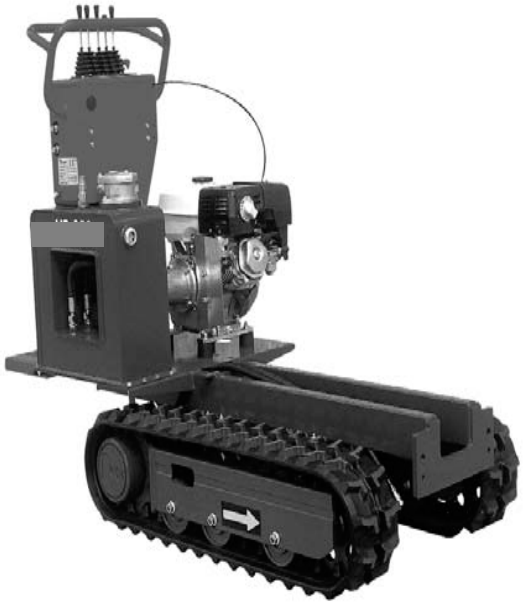
1. Without undercarriage extension (5 sections)
2. With undercarriage extension (6 sections)

The diesel versions have engine hoods, so as to keep noise levels below the legal limits. The hood is not fitted on the machines petrol version.

diesel



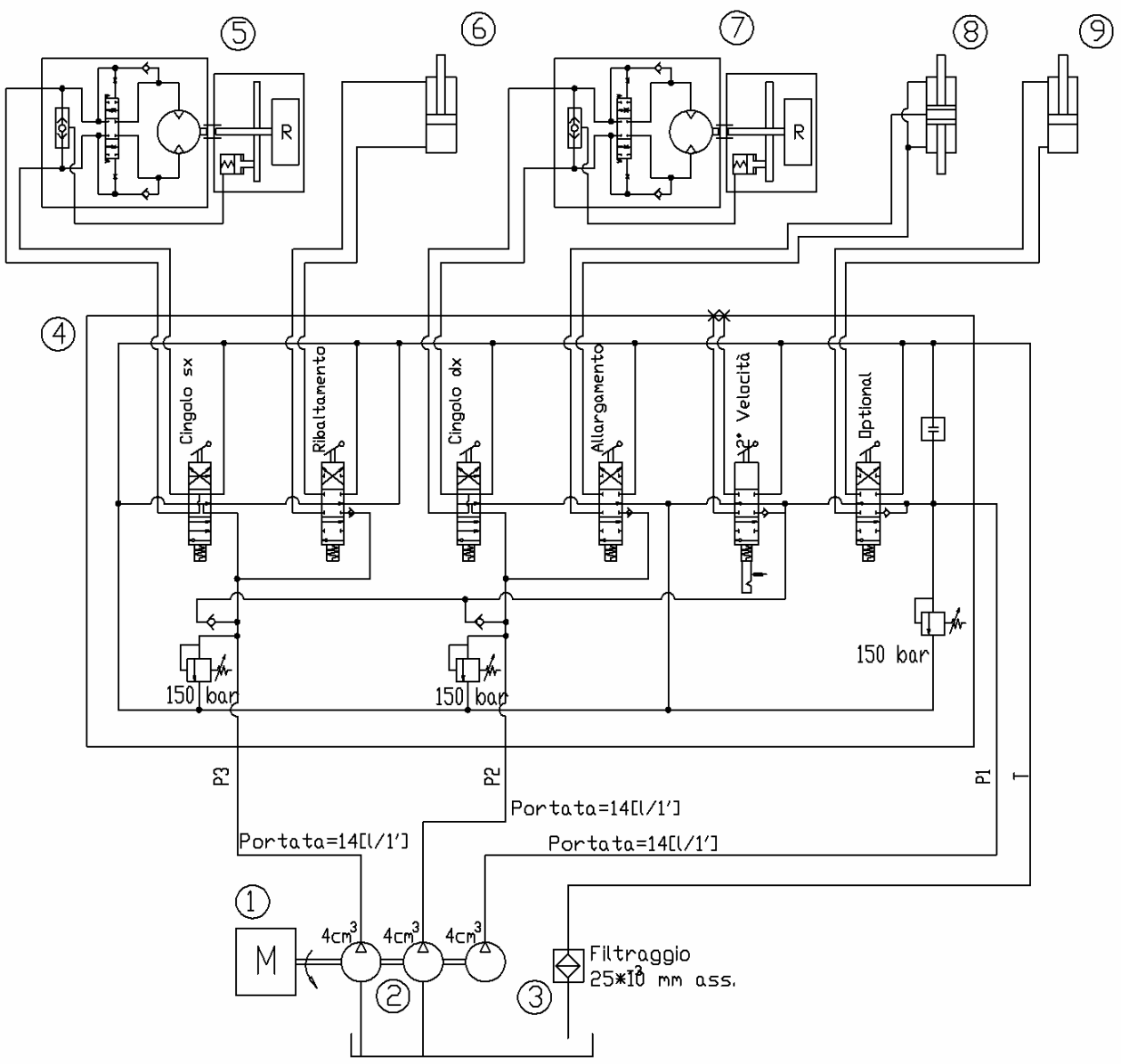

petrol



## HS850 – Controls

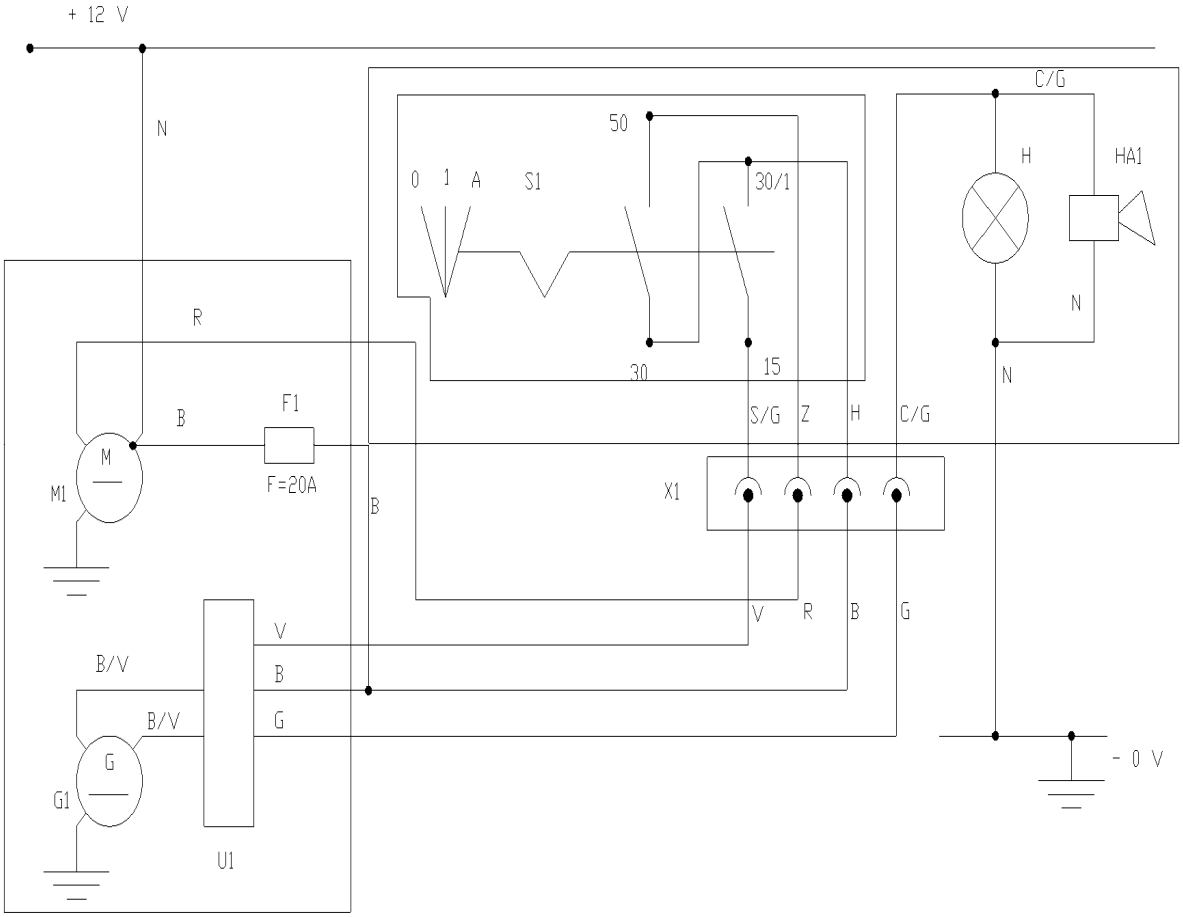
• The second speed is activated by delivering the oil from the third hydraulic pump to the two rotation motors
• The electrical equipment on the HP 850 mini dumper is very simple, and varies according to the engine installed and the type of starting (electric or manual) requested by the customer.

## HS 850 - HYDRAULIC SYSTEM, VERSION WITH EXTENSIBLE UNDERCARRIAGE




1 – Engine
2 – Gear pump assembly
3 – Discharge filter
4 – Distributor
5 – L track gear motor
6 – Tipping
7 - R track gear motor
8 – Undercarriage extension
9 – Optional

## HS 850 – WIRING DIAGRAM, DIESEL VERSION




| | |
|---|---|
| B – White | M1– Starter motor |
| C – Orange | G1 - Alternator |
| G – Yellow | U1 – Voltage regulator |
| N – Black | F1 – 20A fuse |
| R – Red | X1 – 4-pin connector |
| S – Pink | H – Battery indicator light |
| V – Green | HA1 - Buzzer |
| Z - Purple | S1 – Starter panel |

## HS850 – kits available

- Body for building applications (with self-loader or standard)
- Mini-escavator
- Farm flat bed (with and without tipping) NEW SIDES
- Spray kit (MORE POWERFUL: 25-bar motor even at max flow-rate)
- Log splitter
- Levelling blade
- Winch

# HS 1100

## TECHNICAL SPECIFICATIONS

### Petrol engine

| | |
|---|---|
| Brand and type: | Honda GX390 |
| Cylinders and capacity: | 1 – 389 cm3 |
| Max gross horsepower: | 13 HP a 3600 rpm |
| Calibration speed: | 3500 rpm |
| Electric starting: | Optional |

### Diesel engine

| | |
|---|---|
| Brand and type: | Yanmar L100AE |
| Cylinders and capacity: | 1 – 406 cm3 |
| Max gross horsepower: | 10 HP a 3600 rpm |
| Calibration speed: | 3500 rpm |
| Electric starting: | di serie |

### Hydraulic system

| | |
|---|---|
| Pumps, number and type | 3 gear pumps, 5 cm3 |
| Flow-rate: | 16 litri/minute each |
| Pressure: | 155 bar p1-p2 /140 bar P3 |

### Undercarriage

| | |
|---|---|
| Track width: | 180 mm |
| Support rollers per side: | 3 + slitta |
| Travel speed: | 2,6 – 4,0 km/h |
| Optional hydraulic extension: | 758/1058 mm |

### Operating weight

| | |
|---|---|
| Fixed undercarriage (excluding operator): | 500 Kg |
| Extensible undercarriage (excluding operator): | 585 Kg |

### Performance

| | |
|---|---|
| Capacity (including kit): | 1100 Kg |

### Standard supply

Second travel speed
Hydraulic couplings for kit
Spring-loaded, non-slip platform
Heat exchanger
Reinforced track

# HS1100 – Main new features compared to the HP

- Triangular tracks

APPEARANCE
CLEAN
FAST
SAFE

- Higher flow-rate pumps

VERY FAST

- Counter as standard on machines with electric starter

EASY MAINTENANCE

- Diesel engine shut-down lever and beeper

EASY TO USE
COMFORT

- Ergonomic control levers


APPEARANCE
EASY TO USE
COMFORT

- Hood on diesel and petrol engines

LOW NOISE
CLEAN
PROTECTED
EASY ACCESS

- Platform with shock absorption


COMFORT
SAFETY

## **HS 1100 –** *remarks*

• The hydraulic distributor may have 5 or 6 sections, depending on whether the undercarriage extension is fitted. The second speed is activated by delivering oil from the third hydraulic pump to the two rotation motors.

• The electrical equipment on the HS 1100 mini dumper varies according to the engine installed and the type of starting (electrical or manual) requested by the customer.

• The kits are completely interchangeable with the HS850, thanks to the quick coupling system with hole on the kit and the screw on the machine.

### MAIN DIFFERENCES FROM THE HS 850

• *More powerful petrol engine*

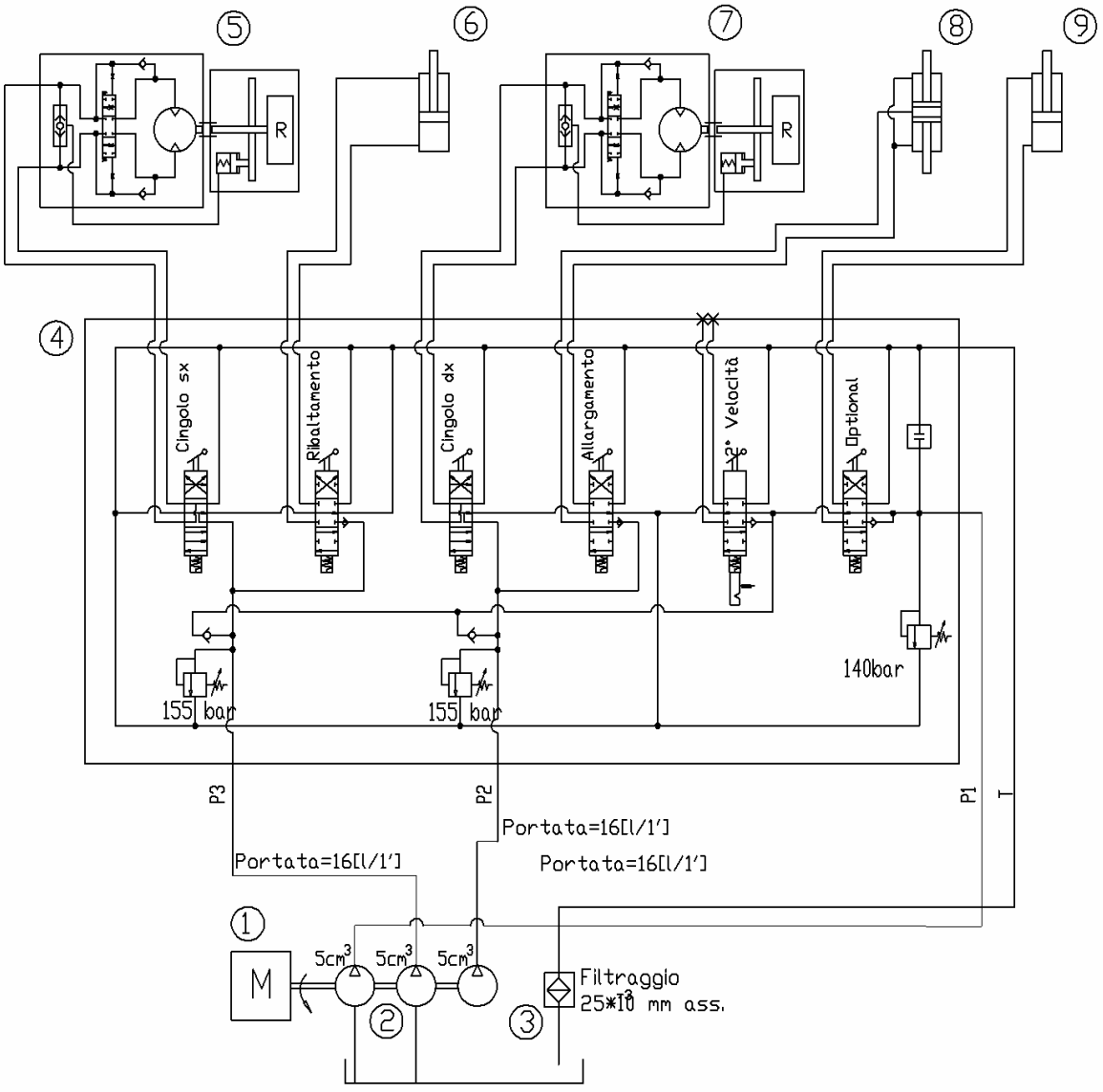
• *Longer undercarriage.* This feature increases the stability of the vehicle, which as a consequence is fitted with flanges for the application of special kits (e.g.: high dumping).

• *Exchanger for cooling the hydraulic oil.* This feature makes the HS 1100 mini dumper much more suitable for use in situations where the hydraulic system is operated in extreme conditions (e.g. continuous use of the self-loading system) or the application of kits that require continuous and extended work in a stationary position (e.g.: concrete mixer).

• *Oil pumps with higher flow-rate.* This feature allows higher travel speeds without using two-cylinder engines.

• *Hood as standard.* The hood fitted as standard significantly reduces the noise level of the mini dumper. The special shape allows all routine maintenance operations to be performed quickly and easily.

## HS 1100 – HYDRAULIC SYSTEM DIAGRAM – EXTENSIBLE UNDERCARRIAGE



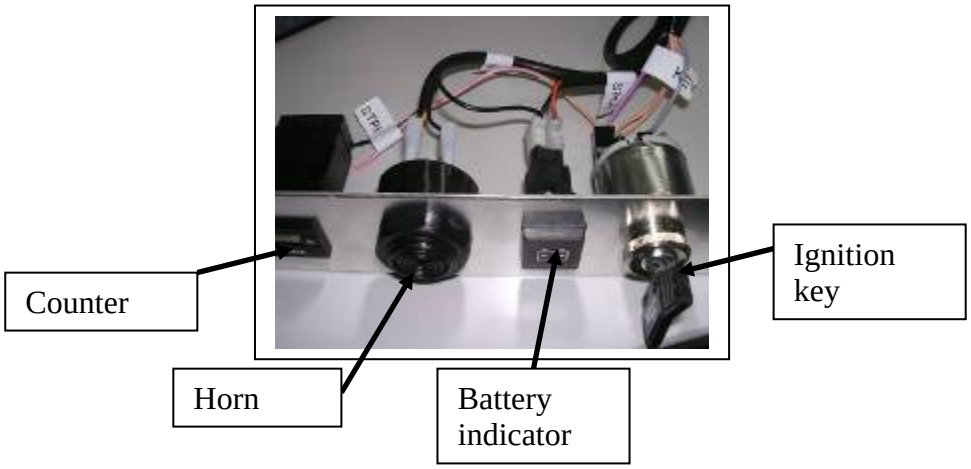

1 – Engine
2 – Gear pump assembly
3 – Discharge filter
4 – Distributor
5 – L track gear motor
6 – Tipping
7 - R track gear motor
8 – Undercarriage extension
9 – Optional
10 - Exchanger

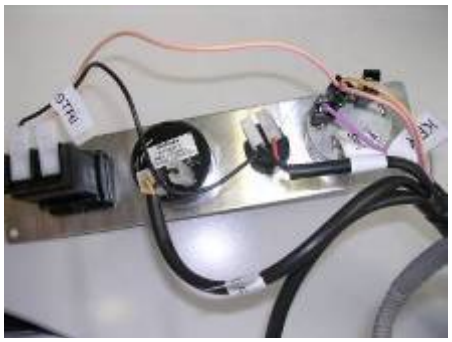
# HS1100 – Electrical system (electric start)

**Petrol**: the electrical system is very simple and essential, with the battery cutout and the counter, the latter supplied directly by the positive on the engine (red wire), with the blue wire that is connected to the chassis.

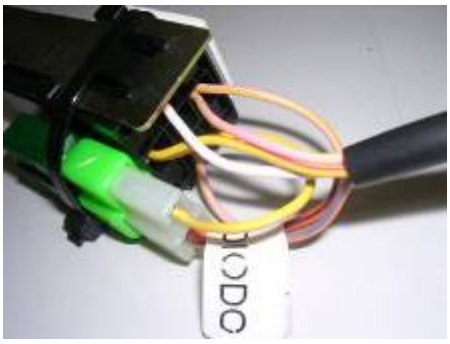
**Diesel**: the electrical system is a little more complex due to the battery indicator light, the ignition block on the panel, the horn, as well as obviously the counter.
The wiring diagram is shown on the following page. The positive yellow-pink wire runs to the key block directly from the plastic connector on the voltage regulator.

*Photo of the HS1100 diesel control panel*



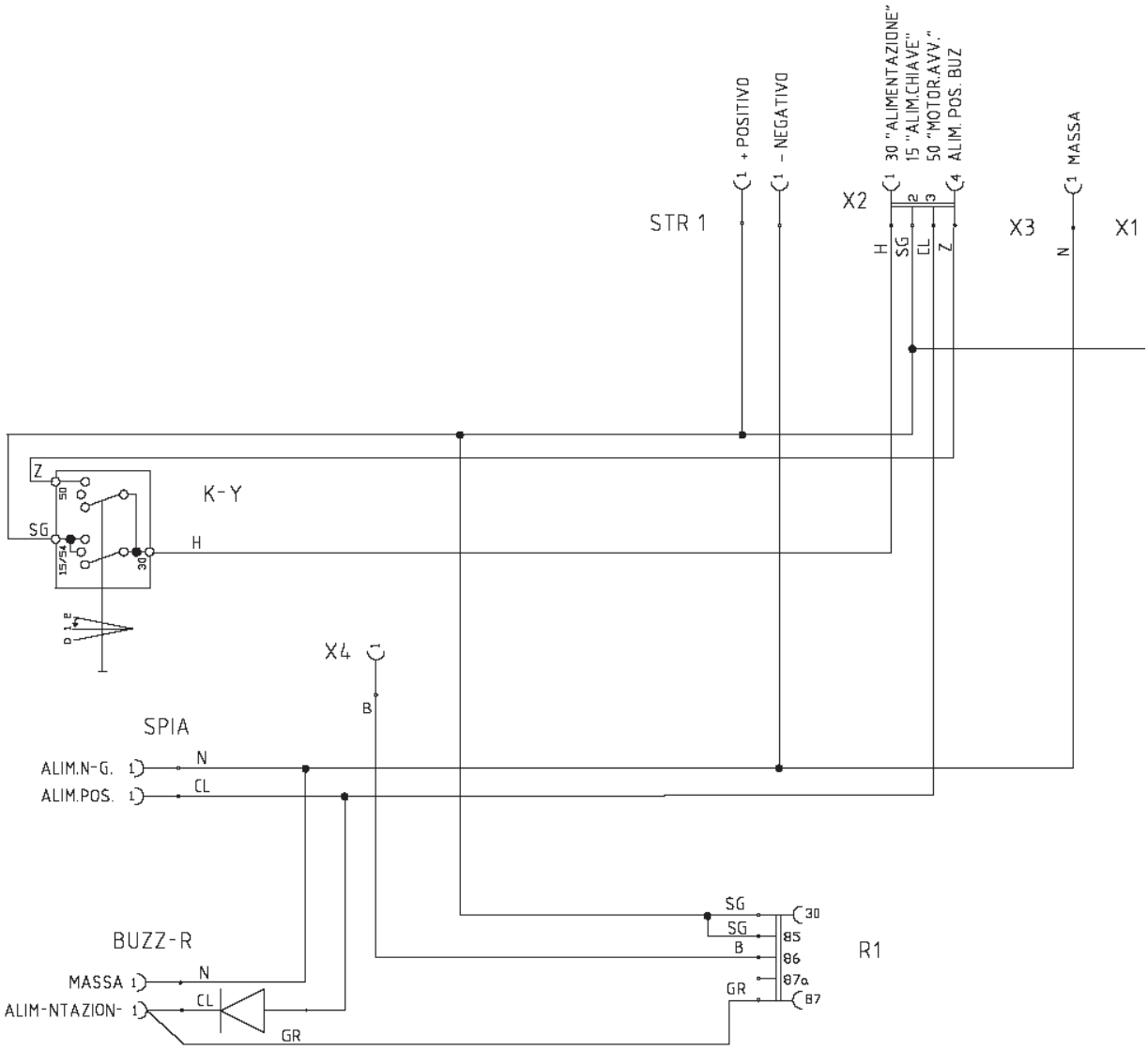



*Connections on the control panel*



*Connections on the relay*

## HS 1100 – WIRING DIAGRAM, DIESEL VERSION




**Key to the wiring diagram**
X1- Ignition key power supply
X2 – Voltage regulator
X3 – Chassis
X4 – Oil bulb
R1 – Relay
STR1 - Counter

## **HS1100 –** Kits available

- **As for the HS850**
  - Dumper Bed (with self-loader or standard)
  - Miniexcavator
  - Farm flat bed (with and without tipping)
  - Kit spray
  - Log splitter
  - Levelling blade
  - Winch

**Plus**

- High-tip dumper bed (self-loading body)
- Rhinetta standard
  - With agricultural shears
  - Bucket
  - Pallet forks
- Concrete mixer kit with self-loader (recommended on extensible undercarriage)

# HS 1150

## TECHNICAL SPECIFICATIONS

### Petrol engine

| | |
|---|---|
| Brand and type: | Honda GX390 |
| Cylinders and capacity: | 1 – da 389 cm3 |
| Max gross horsepower: | 13 HP a 3600 rpm |
| Calibration speed: | 3500 rpm |
| Electric starting: | optional |

### Diesel engine

| | |
|---|---|
| Brand and type: | Yanmar L100AE |
| Cylinders and capacity: | 1 – da 406 cm3 |
| Max gross horsepower: | 10 HP a 3600 rpm |
| Calibration speed: | 3500 rpm |
| Electric starting: | standard |

### Hydraulic system

| | |
|---|---|
| Pumps, number and type: | 3 a ingranaggi da 5 cm3 |
| Flow-rate: | 16 litri/minuto cad |
| Pressure: | 155 bar P1-P2 / 140 bar P3 |

### Undercarriage

| | |
|---|---|
| Track width: | 180 mm |
| Support rollers per side: | 3 + slitta |
| Travel speed: | 2,0 – 4,0 km/h |
| Optional hydraulic extension: | 758/1058 mm |

### Operating weight

| | |
|---|---|
| Fixed undercarriage (excluding operator): | 500 Kg |
| Extensible undercarriage (excluding operator): | 585 Kg |

### Performance

| | |
|---|---|
| Max travel gradient: | 20° (36,4%) |
| Capacity (including kit): | 1100 Kg |

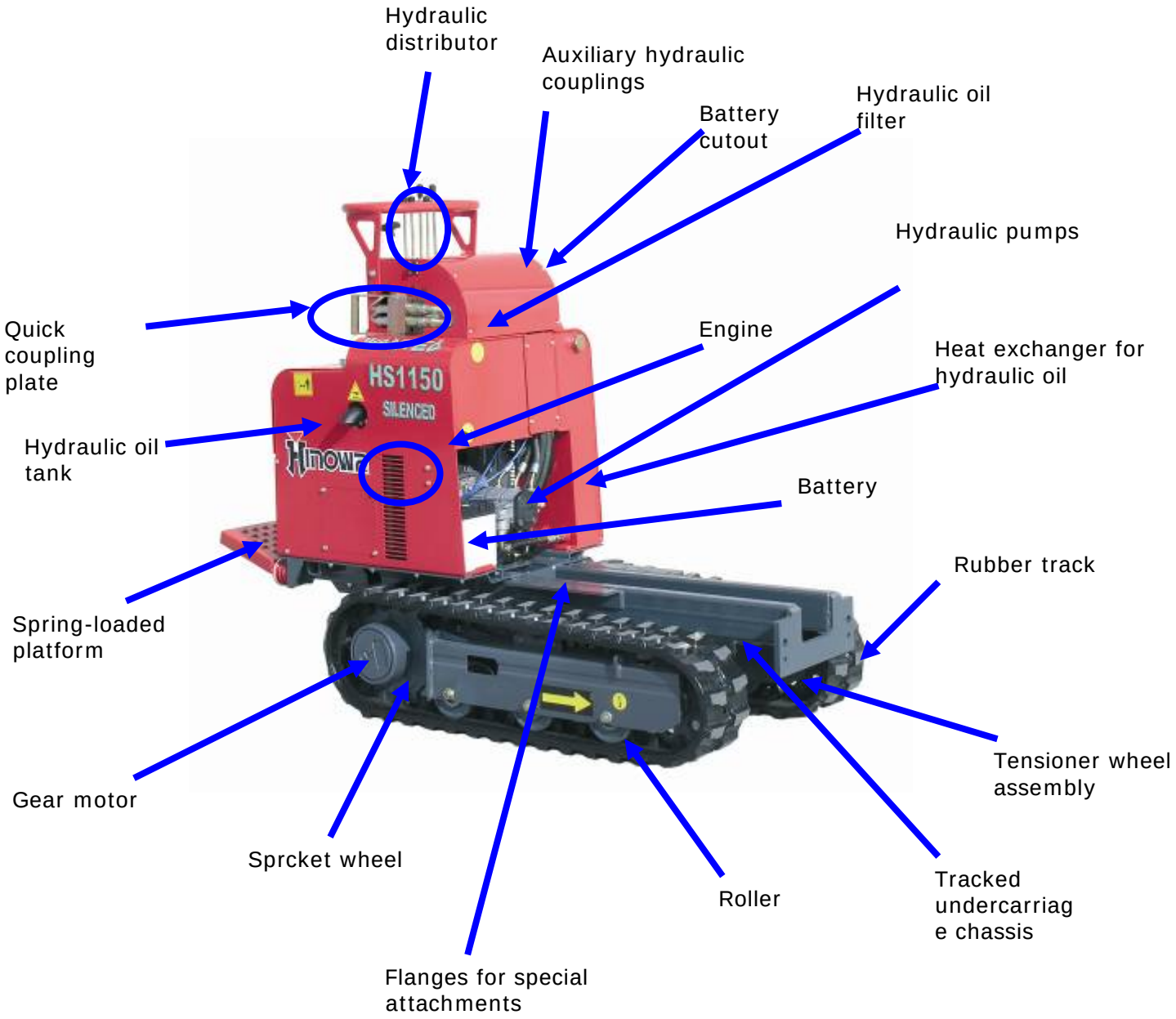
Level guaranteed sound power: 101 dB (A)

### Standard supply

Second travel speed
Hydraulic couplings for kit
Multiple coupling plate
Spring-loaded, non-slip platform
Heat exchanger
Reinforced track
Battery

# HP 1150 – general information

To simplify the interpretation of the hydraulic diagram and the wiring diagram, the location of the various components on the HP 1150 mini dumper is described below



## HS 1150 – REMARKS

• The hydraulic distributor may have 5 or 6 sections, depending on whether the undercarriage extension is fitted. The second speed is activated by delivering oil from the third hydraulic pump to the two rotation motors.
• When the multiple coupling plate is not used, the hydraulic system is much the same as the system used on the HS 1100.
• All the kits that can be used on the HS 850 mini dumper and on the HS 1100 mini dumper, can also be used on the HS 1150 mini dumper, but not vice-versa.

## MAIN DIFFERENCES FROM THE HS 1100

- *Use of the multiple coupling plate.* This part has been designed for the application of a number of kits that cannot be used on the HP 1100 mini dumper (e.g.: Rhinetta Power and hammer)

- *Use of the proximity connector.* When using the Rhinetta power kit, this supplies the solenoid valve on the SuperFlow system.

- *Petrol and diesel engines fitted with electric starting and counter as standard.*

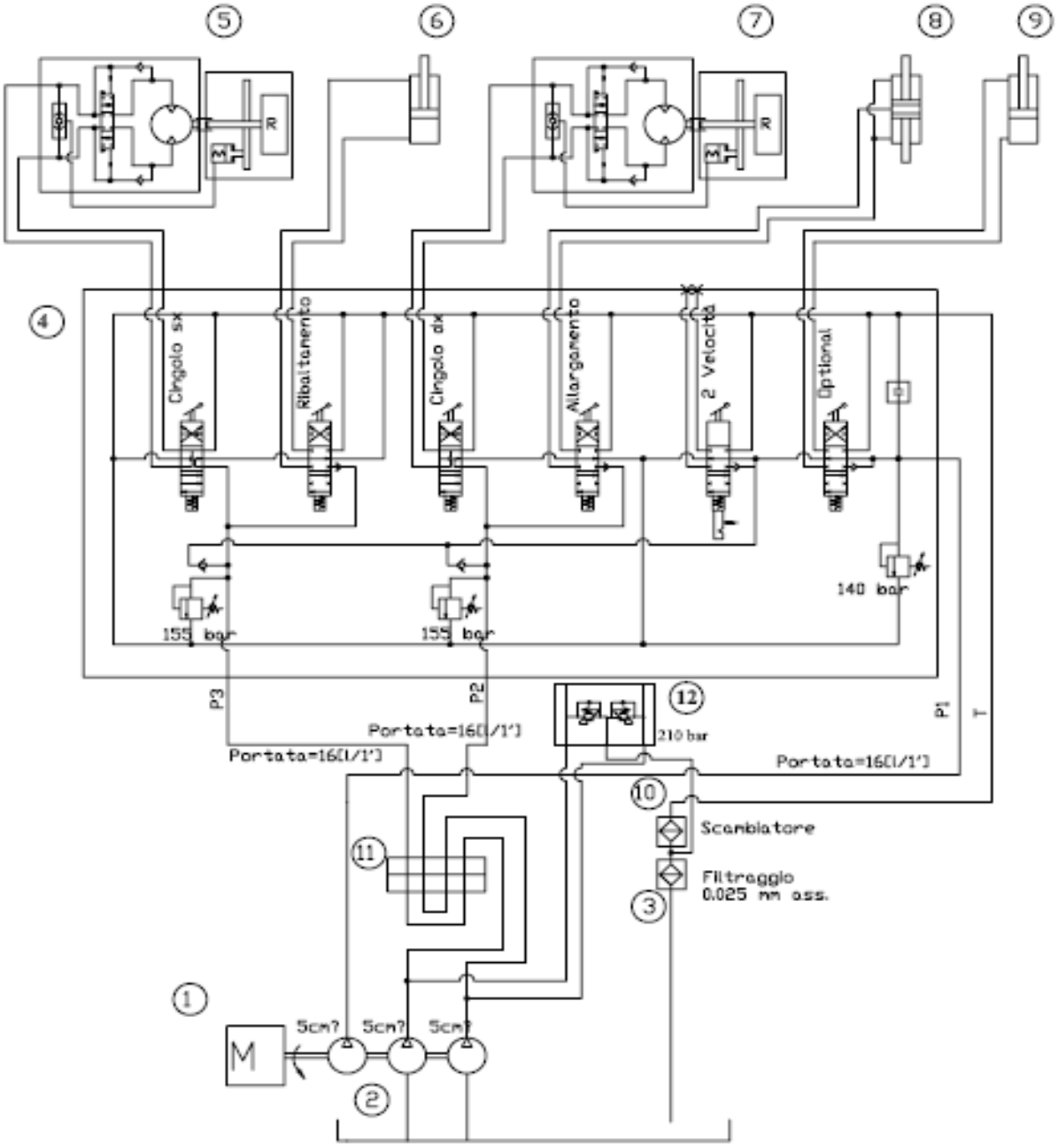
## HS 1150 - REMARKS ON THE HYDRAULIC SYSTEM

The hydraulic system is very similar to the one already described for the HS1100, with the addition of:

- Multiple coupling plate, which takes some of the oil from the second and third pumps (delivered to the tracks), and sends it to the special kits that require higher oil flow-rates.

- Shockproof valve block, which protects the second and third pump against any damage due to peaks in pressure (e.g. caused by the detachment of the multiple coupling with the engine running). The block is also fitted with attachments for measuring the pressure in the circuit, in an easily accessible position.

## HS 1150 – HYDRAULIC SYSTEM

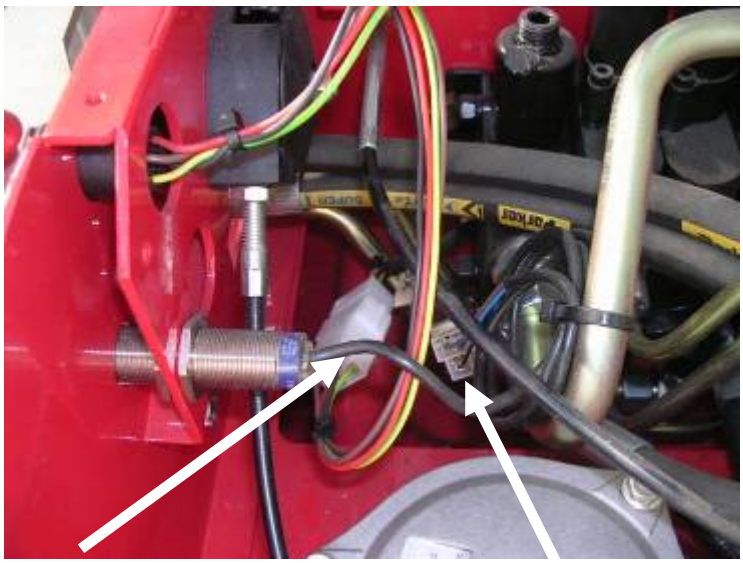



**Key to the hydraulic system diagram**

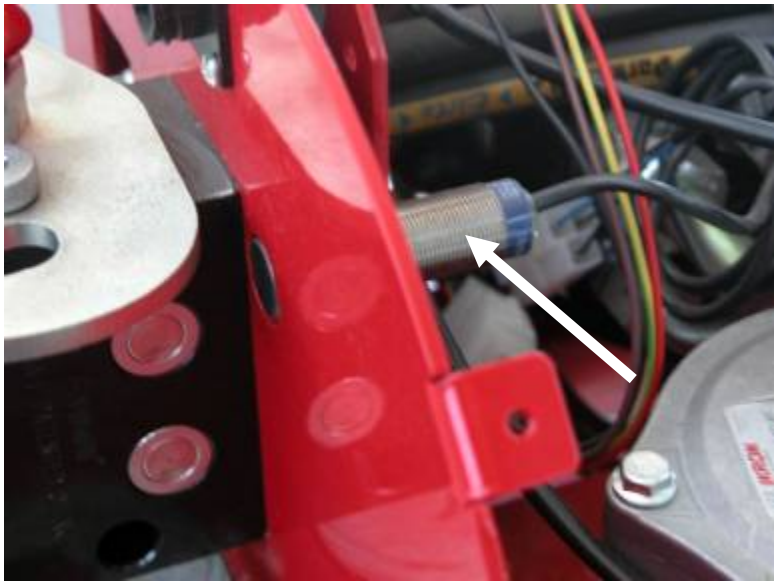
1. Engine
2. Three pumps with fixed flow-rate
3. Filter
4. Distributor
5. L drive gear motor
6. Tipping cylinder
7. R drive gear motor
8. Extension cylinder
9. Optional control cylinder
10. Heat exchanger for hydraulic oil
11. Multiple coupling plate
12. Shockproof valve

**HS1150 – REMARKS**

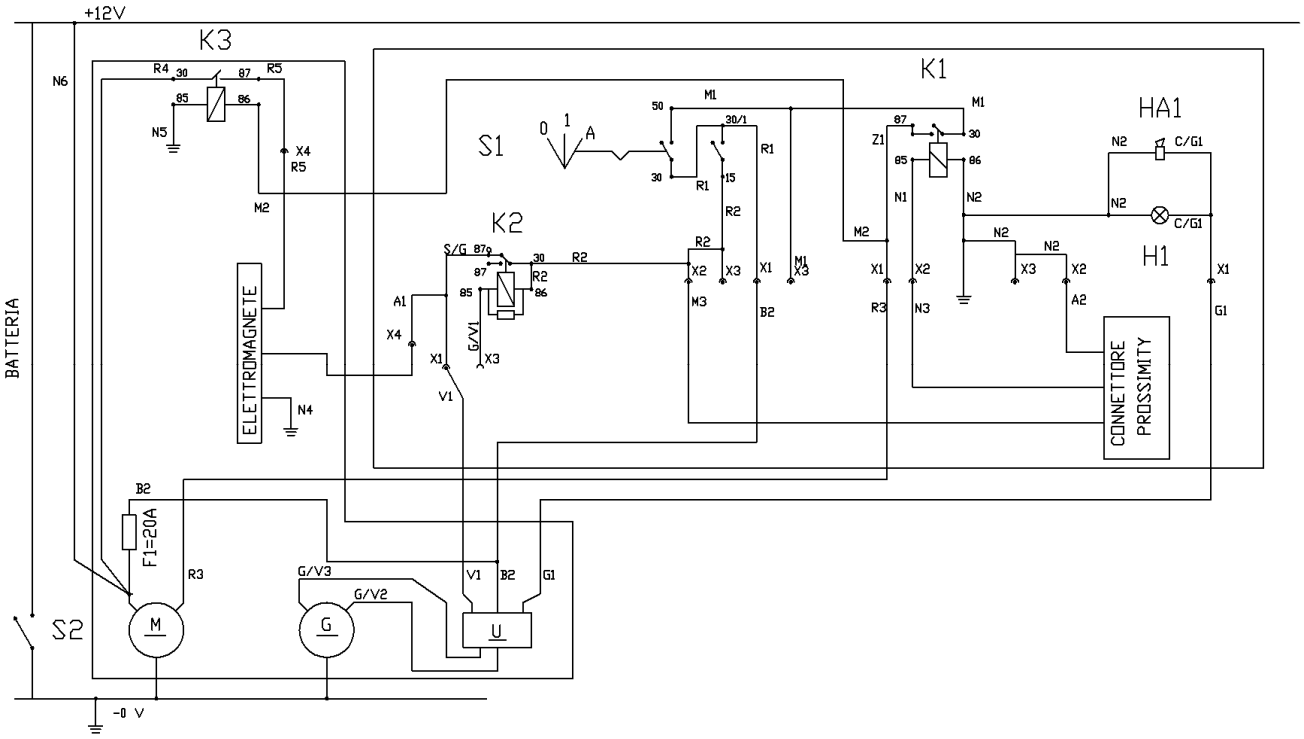
Compared to the HP version, in addition to the counter as standard, 2 plastic connectors have been added (indicated by the arrows in the photo below) on the proximity device and the kit electrical connector, so as to simplify repairs or checks.



The proximity device (indicated in the photo below) detects the presence of the hydraulic connection on the multiple coupling plate, preventing the engine from starting if the hydraulic connection is missing (relay K3 + K1). Removing the plate also immediate stops the engine (relay K2), however inertia of the engine would in any case damage the pumps due to peaks in pressure if the shockproof valves described above were not fitted.



## HS 1150 - WIRING DIAGRAM




F1 – 10 A fuse
M – Starter motor
G – Alternator
U – Voltage regulator
K1 – Proximity relay
K2 – Relay
K3 – Relay
S1 – Starter panel
S2 – Battery cutout
H1 – Battery indicator light
HA1 – Horn
X1 – 4-pin connector, engine line
X2 – 3-pin connector, proximity line
X3 – 3-pin connector, proximity line
X4 – 4-pin connector, electromagnet

A – Blue
B – White
C – Orange
G – Yellow
M – Brown
N – Black
R – Red
S – Pink
V – Green
Z - Purple

## HS1150 – Kits available

- **As for the HS1100**
  - Body for building applications (with self-loader or standard)
  - Miniexavator
  - Farm flat bed (with and without tipping)
  - Kit spray
  - Log splitter
  - Levelling blade
  - Winch
  - High dumping self-loading body for building applications (or simple self-loading only)
  - Rhinetta standard with
    - Agricultural shears
    - Bucket
    - Pallet forks
  - Concrete mixer kit with self-loader (recommended on extensible undercarriage)

- **Plus**
  - Rhinetta Power kit with
    - Jack hammer
    - Drill
    - Grass cutter
    - Trench digger with hoes or pick
    - Cutter

# HS 1200 – HS 1200E

## TECHNICAL SPECIFICATIONS

### Diesel Engine

| | |
|---|---|
| Brand and type: | PERKINS 402.5 double cilinder |
| Max gross horsepower: | 14 HP a 3500 rpm |
| Diesel tank: | 10 lt |
| Electric starting: | standard |

### Hydraulic system

| | |
|---|---|
| Pumps, number and type: | 3 gear pumps, 5 cm3 |
| Flow rate: | 16 litres/minute each |
| Pressure: | 2 x 170 bar(P1,P2)–1 x 150 bar(P3) |
| Hydraulic oil tank: | 10 lt |

### Undercarriage

| | |
|---|---|
| Track width: | 180 mm |
| Undercarriage length: | 1240 mm |
| Ground pressure: | 0,2 Kg/cm3 |

### Chassis

| | |
|---|---|
| Max length: | 1830 mm |
| Width: | 750 mm |
| Variable width (optional): | 750/1050 mm |
| Max height (to the levers): | 1345 MM |

### Operating weight

| | |
|---|---|
| Fixed undercarriage (excluding operator): | 550 Kg |
| Extensible undercarriage (excluding operator): | 610 Kg |

### Performance

| | |
|---|---|
| Travel speed: | 1°) 2,0 Km/h – 2°) 3,9 Km/h |
| Capacity (including kit): | 1200 Kg |

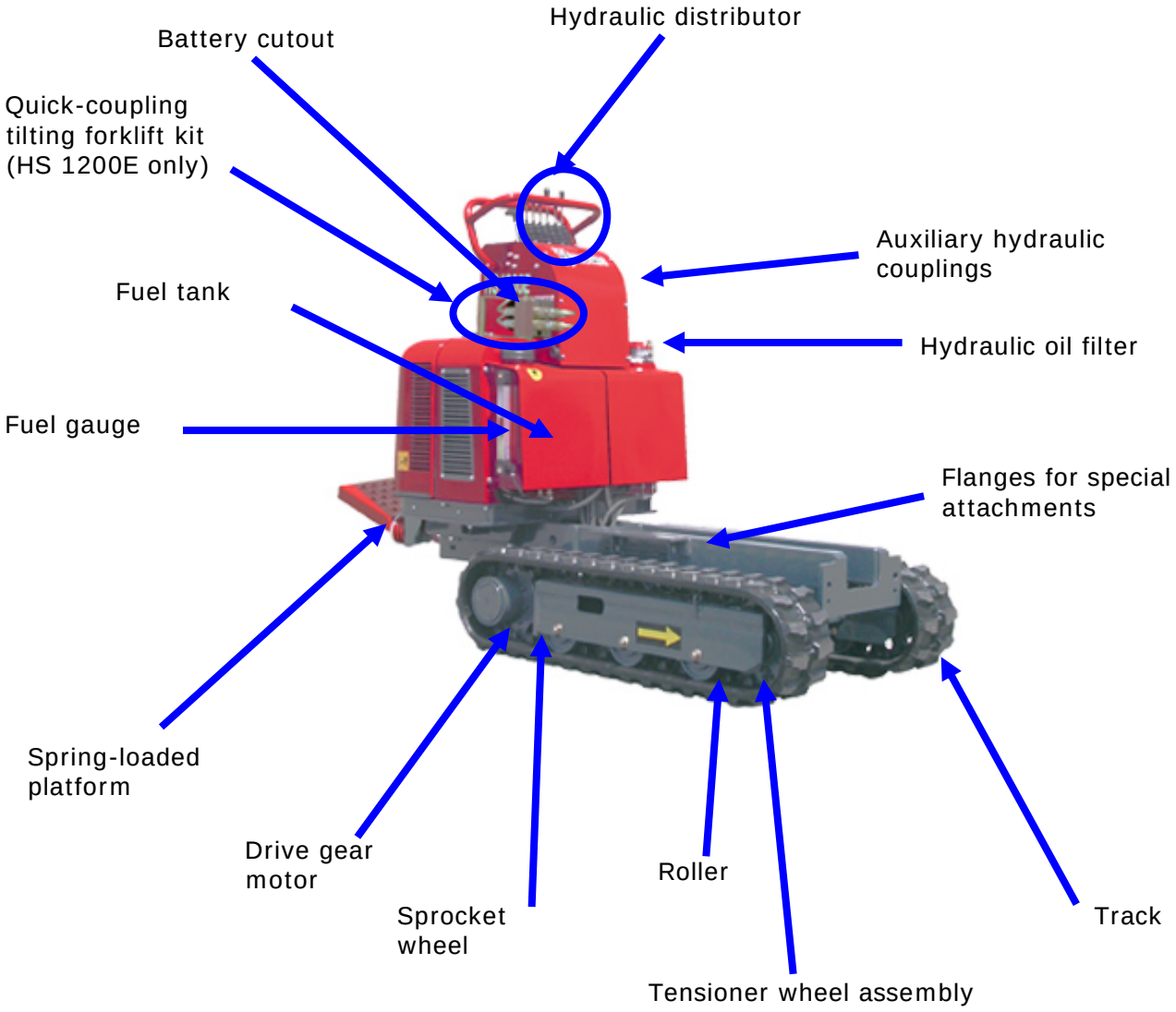
### Vibrations

| | |
|---|---|
| Upper limbs: | ≤ 2,5 m/s2 |
| Entire body: | ≤ 0,5 m/s2 |

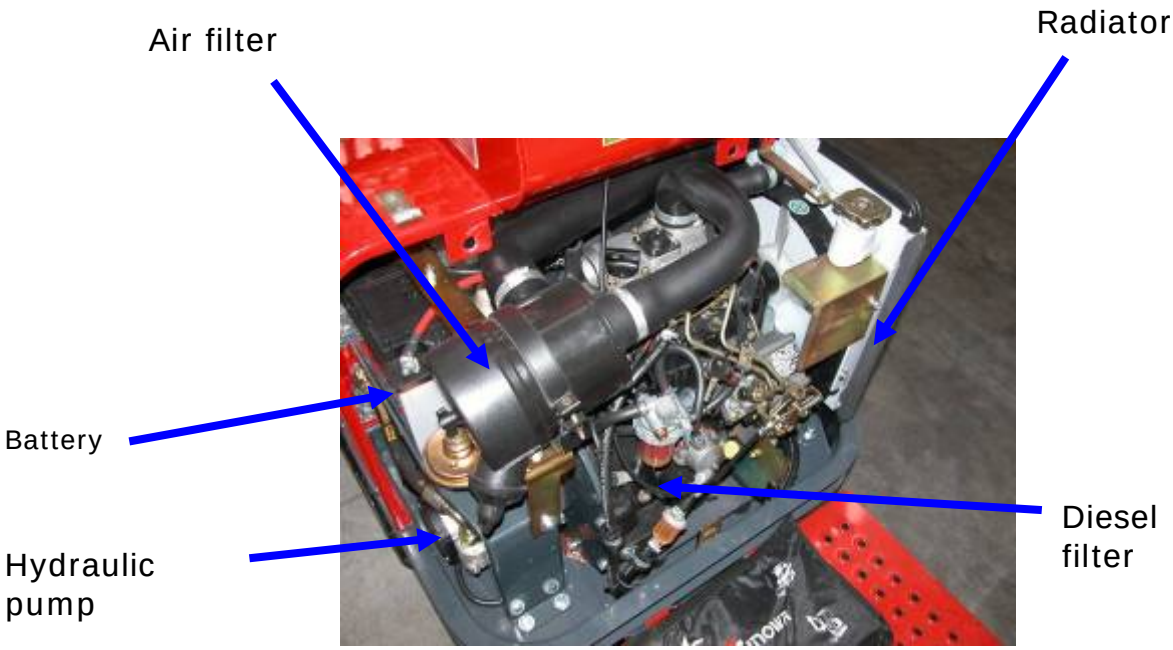
| | |
|---|---|
| Noise level: | Depends on the kit installed |

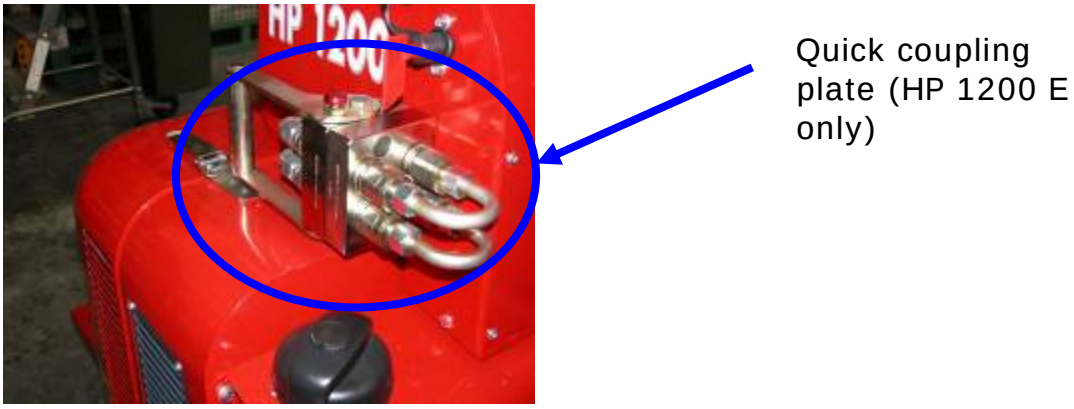
## HS 1200 – HS 1200E

To simplify the interpretation of the hydraulic diagram and the wiring diagram, the location of the various components on the HS 1200 and HS 1200E mini dumpers is described below.
The difference between the two versions involves the multiple quick-coupling plate and the proximity connector used on the HS 1200E. These features allow the application of a number of kits that cannot be used on the HS 1200 (Rhinetta Power and GoldLift 8.35 elevating work platform), while there is no difference as regards the use of the kits available for both versions. For further information see the hydraulic diagrams provided in this manual.



**HS 1200 – HS 1200E**




**REMARKS ON THE HS 1200**

• The second speed is activated varying the capacity of the two drive motors. Control is hydraulic and is activated by the distributor and sent directly to the rotation motors.

• The undercarriage on the HS 1200/ HS 1200 E mini dumper, despite having 2 speed motors, has the same overall dimensions as the undercarriage on the HS1100-1150.

• All the kits that can be used on the HS 1200 mini dumper can also be used on the HS 1200E mini dumper, but not vice-versa (e.g.: Rhinetta Power kit with various applications).

• All the kits that can be used on the HS 1100 mini dumper can also be used on the HS 1200/ HS 1200E mini dumper, but not vice-versa (e.g.: forklift kit).

• All the kits that can be used on the HS 1150 mini dumper can also be used on the HS 1200/ HS 1200E mini dumper, except for the kits that require the multiple coupling plate, which can only be used on the HS 1200E mini dumper.

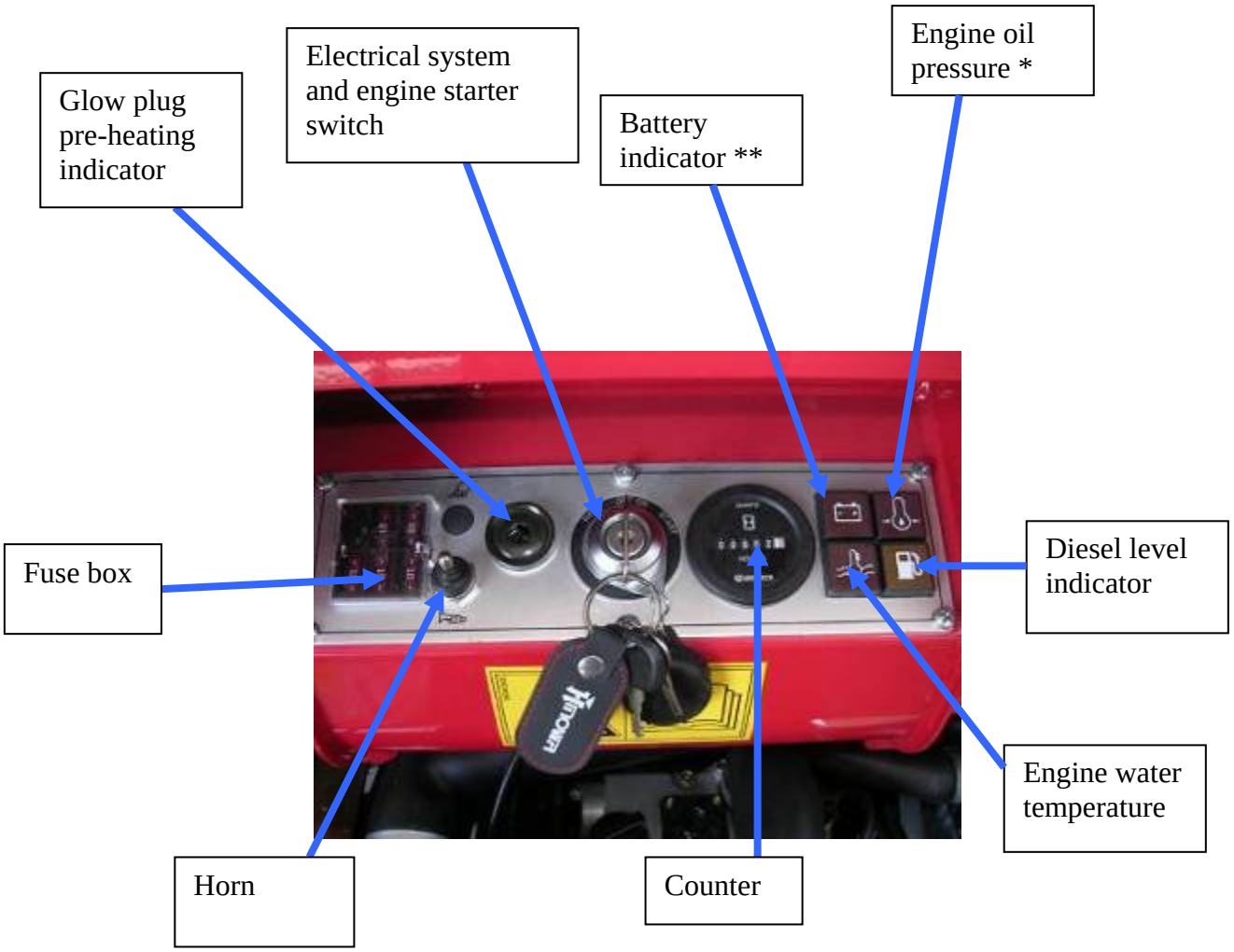
• The forklift kit can only be used on the HS 1200/ HS 1200E mini dumper fitted with extensible undercarriage. It cannot be fitted on the version with standard undercarriage or on other mini dumpers.

**MAIN DIFFERENCES FROM THE HS 1150**

- *Engine.* The engine on the HS 1200/ HS 1200E mini dumper is a two-cylinder Perkins 402.5. The advantages of this engine compared to those installed on the HS 1150 mini dumper are a better torque curve, a reduction in vibrations and a reduction in noise.

- *Engine hood.* The engine hood further reduces noise emissions.

- *Operator panel*. The HS 1200 / HS 1200E mini dumper is fitted with a more complete and more easily viewable operator panel.




***** The engine oil pressure light may come on when the engine is idling too slowly, if there is insufficient oil level, the viscosity of the oil is not suitable for the season temperature, or faults in the circuit (the signal may come on when the engine is very hot at low revs).

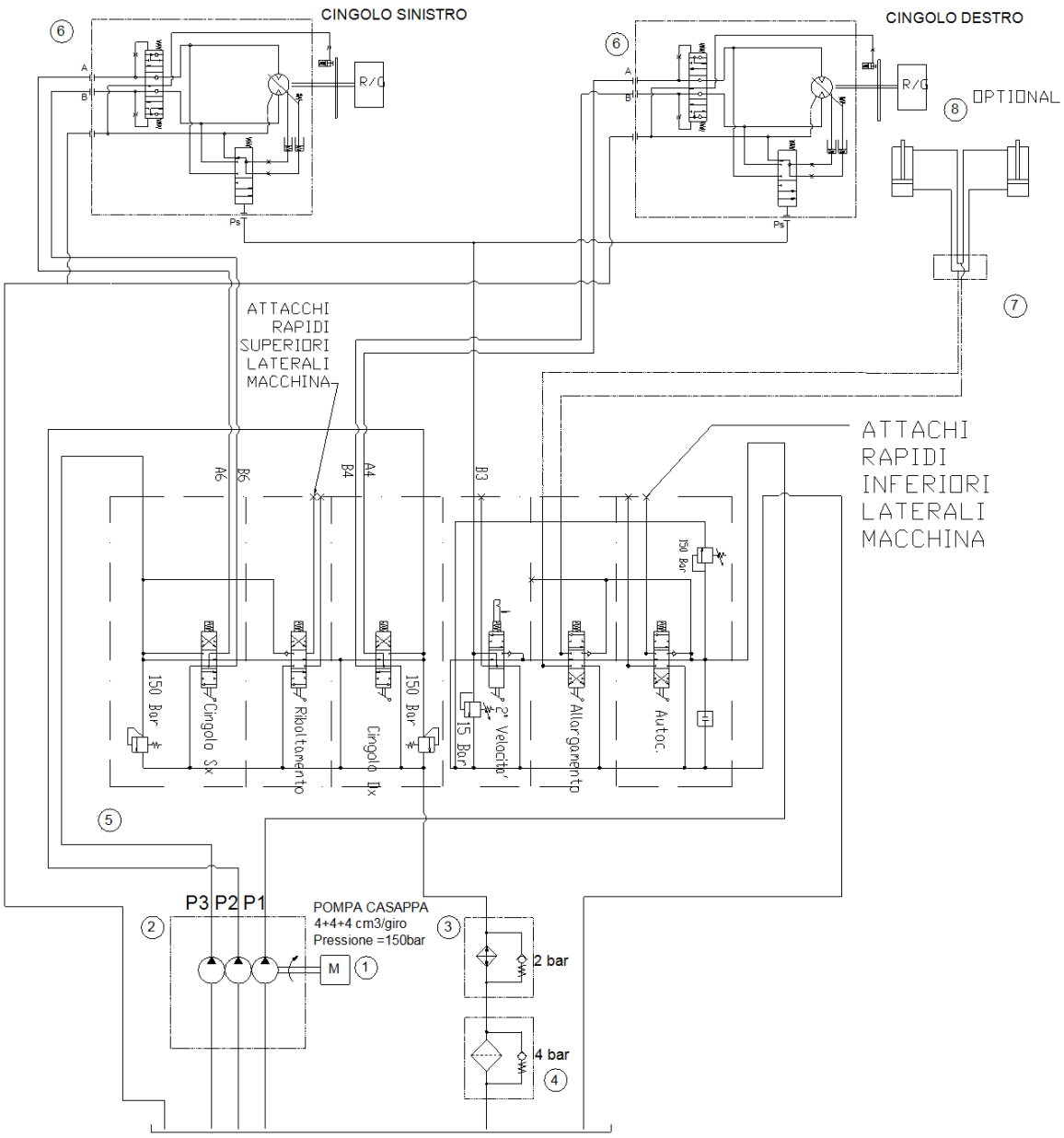
** If everything is OK the battery indicator will come on when electrical system switch is turned and go off when the engine starts. Faults may be indicated when:

- The light remains on with the engine running: check the alternator and alternator belt tension.
- The light is off both with the engine running and off: check the light or the protection fuse.

*** The water may overheat due to:

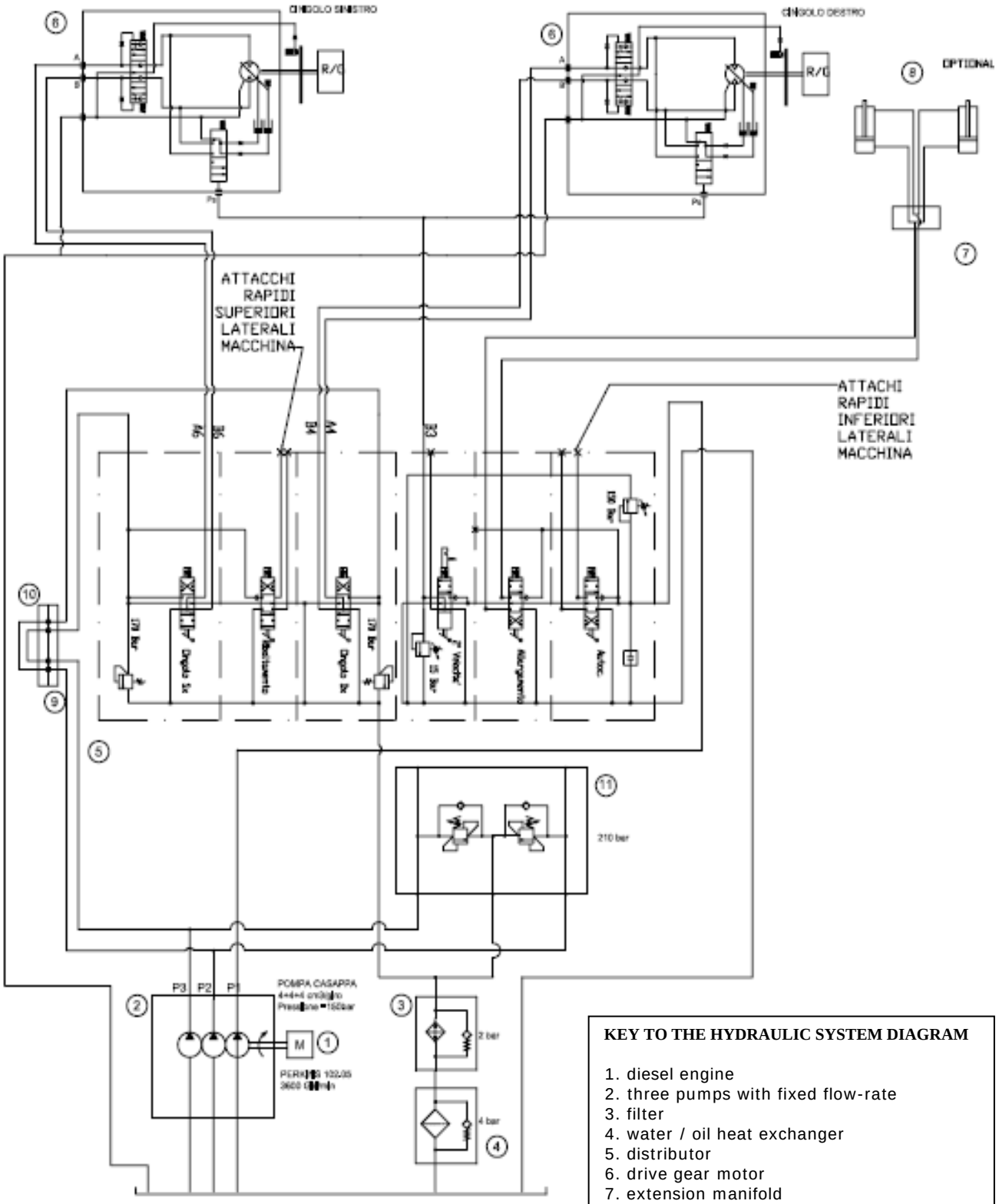
- Insufficient water in the radiator
- Fouling in the cooling circuit
- Fan belt slipping
- Faulty thermostats
- Faults in the cooling circuit

## HP 1200 – HYDRAULIC SYSTEM DIAGRAM




1 – Diesel engine
2 – Three pumps with fixed flow-rate
3 – Filter
4 – Water/oil heat exchanger
5 – Distributor
6 – Drive gear motor
7 – Extension manifold
8 – Extension cylinders (optional)

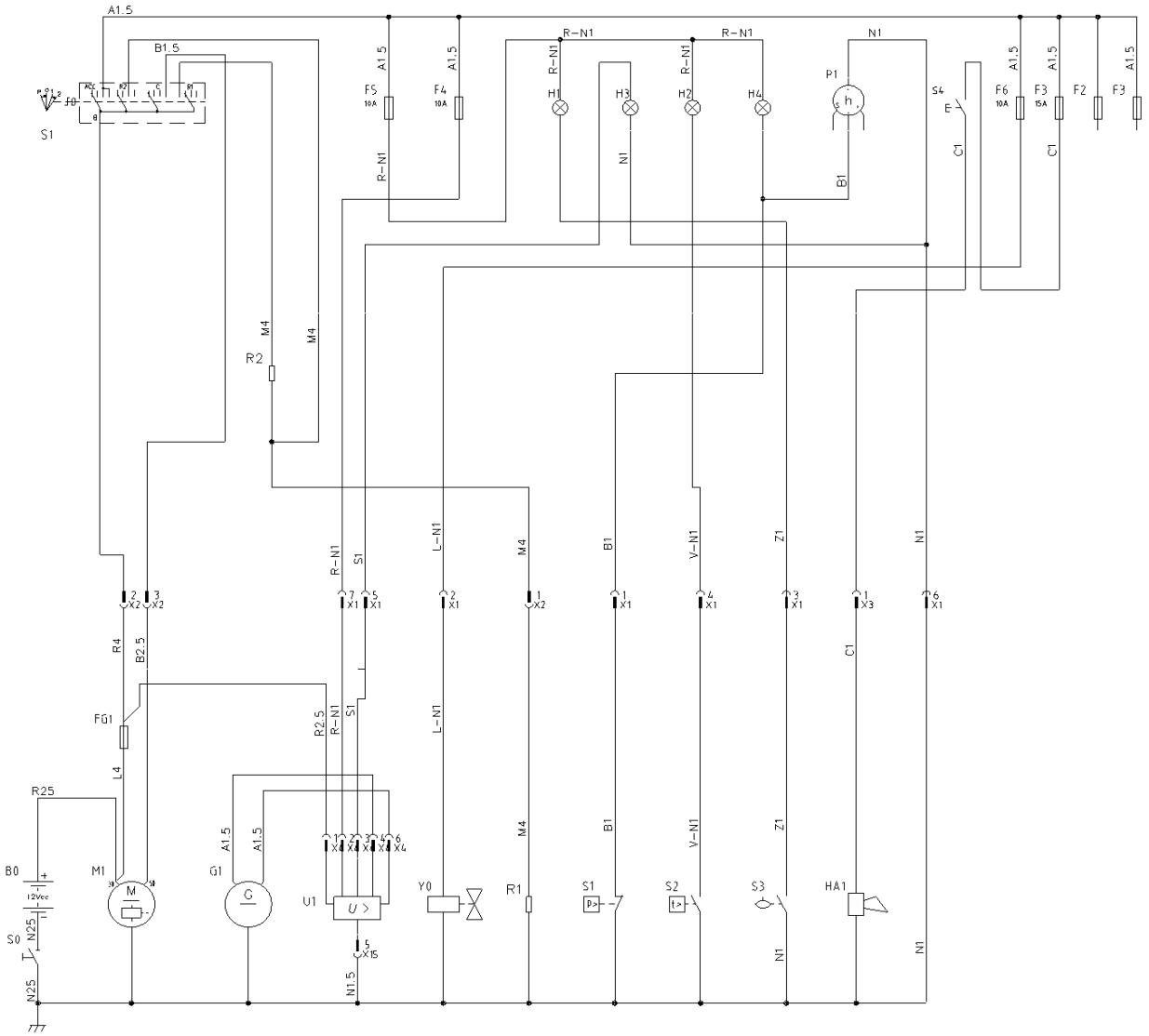
## HP 1200E – HYDRAULIC SYSTEM DIAGRAM




**KEY TO THE HYDRAULIC SYSTEM DIAGRAM**

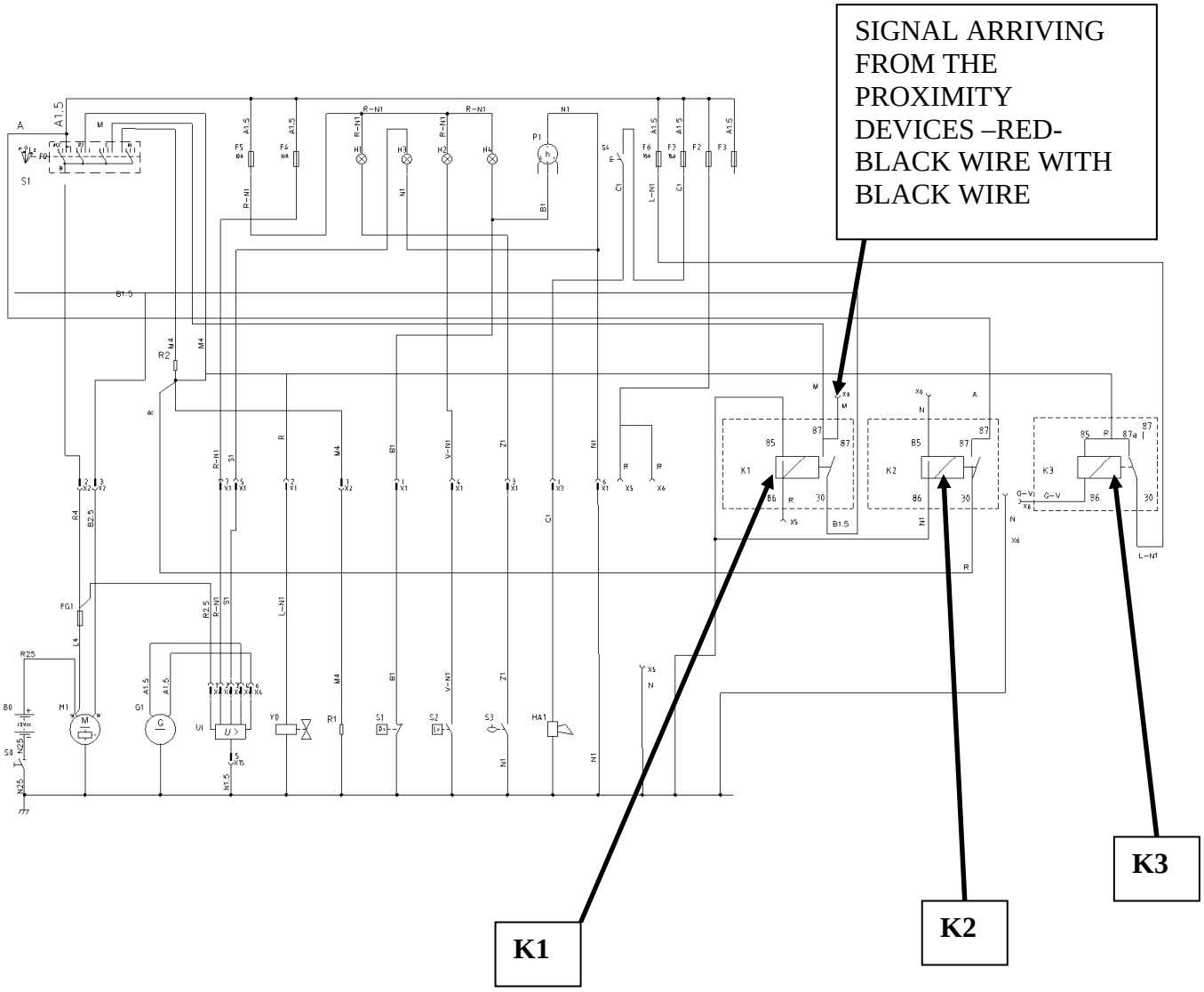
1. diesel engine
2. three pumps with fixed flow-rate
3. filter
4. water / oil heat exchanger
5. distributor
6. drive gear motor
7. extension manifold
8. extension cylinders (optional)
9. multiple quick coupling plate, male
10. multiple quick coupling plate, female
11. Shockproof valve

## HS 1200 – WIRING DIAGRAM

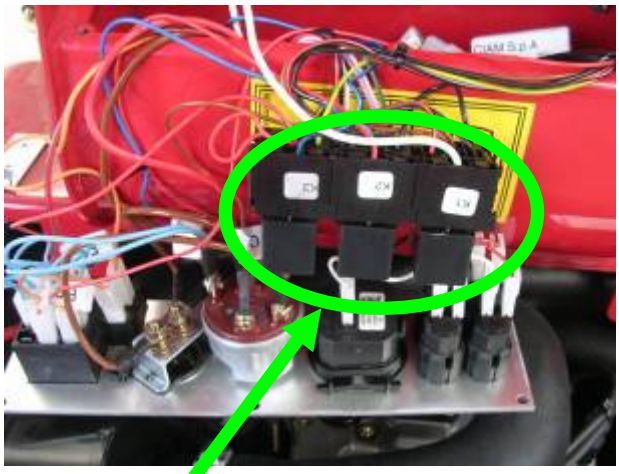


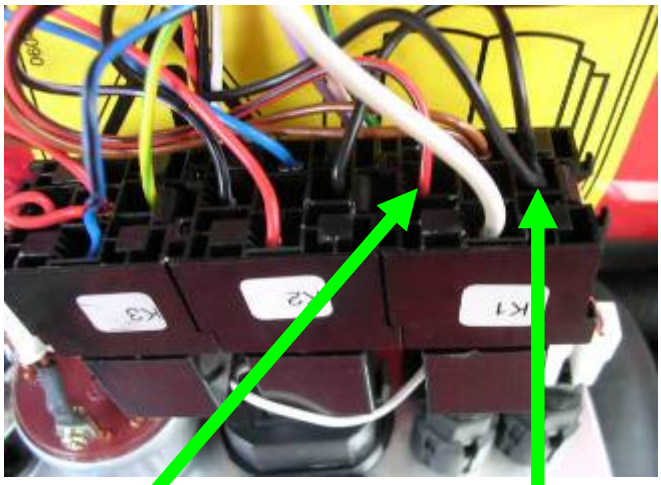

BO – Battery
F1 – Optional fuse
F2 – Optional fuse
F3 – Horn fuse
F4 – Regulator fuse
F5 – Indicator light power fuse
F6 – Engine stop fuse
FG1 – Main fuse
G1 – Alternator
H1 – Fuel reserve indicator light
H2 – High engine water temperature indicator light
H3 – Light
H4 – Low engine oil pressure indicator light
Ha1 – Horn
M1 – Starter motor
P1 – Counter
R1 – Resistor
R2 – Resistor
S0 – Battery cutout
S1 – Minimum engine oil pressure switch
S2 – High temperature thermostat
S3 – Minimum fuel level
S4 – Horn button
U1 – Voltage regulator
Y0 – Engine stop solenoid valve
X1 – 7-pin connector
X15 – 6-pin connector
X2 – 3-pin connector
X3 – 1-pin connector
X4 – 6-pin connector

## HS 1200E – WIRING DIAGRAM




The HP1200E system differs from the HP1200 due to the addition of 3 relays that control whether the multiple coupling plate is fitted (signal from proximity device). Relay K1 prevents the engine from starting if the plate is not fitted, relay K2 switches off the engine glow plugs and relay K3 stops the engine if the plate is detached.

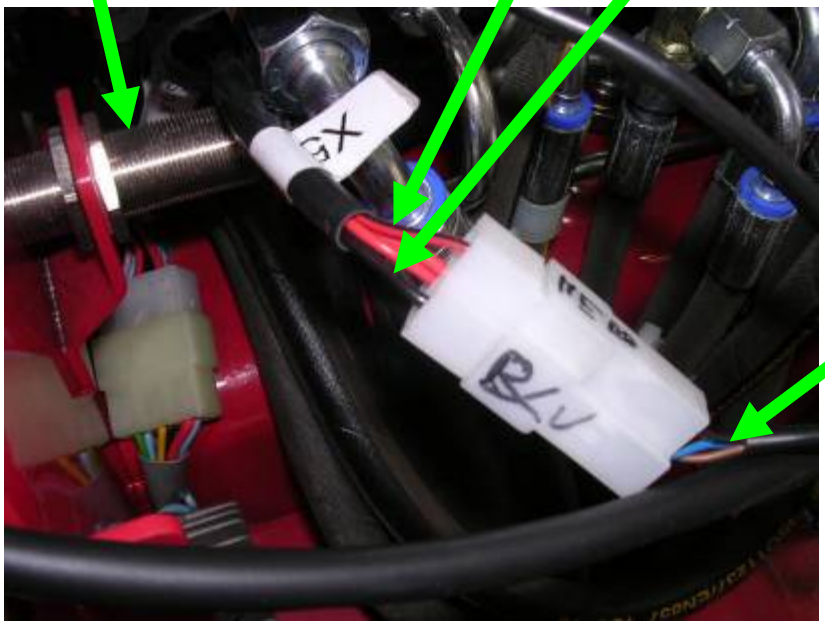




3 RELAYS HP1200E

RED-BLACK AND BLACK WIRES FOR THE SIGNAL FROM THE PROXIMITY DEVICES TO RELAY 1 FOR CONTROLLING WHETHER THE MULTIPLE COUPLING PLATE IS FITTED

PROXIMITY



SIGNAL FROM THE PROXIMITY DEVICE. THE CONTACT BETWEEN BLACK AND BLUE CLOSES IF THE PLATE IS DETACHED

## HS1200 – Kit available

- **As for the HS1100**
  - Body for building applications (with self-loader or standard)
  - Miniexavator
  - Farm flat bed (with and without tipping)
  - Kit spray
  - Log splitter
  - Levelling blade
  - Winch
  - High dumping self-loading body for building applications (or simple self-loading only)
  - Rhinetta standard con
    - Agricultural shears
    - Bucket
    - Pallet forks
  - Concrete mixer kit with self-loader (recommended on extensible undercarriage)
- **Plus**
  - Forklift Kit (on extensible undercarriage only)
- **HS1200E only**
  - Rhinetta Power with
    - Jack hammer
    - Drill
    - Grass cutter
    - Trench digger with hoes or picks
    - Cutter

# HP 1500

## TECHNICAL SPECIFICATIONS

### Diesel engine

| | |
|---|---|
| Brand and type: | YANMAR 3TNE74-YC (water cooled) |
| Max gross horsepower: | 17,6 kW (24 HP) a 3600 rpm |
| Diesel tank: | 20 lt |
| Electric starting: | 12 Volt as standard |

### Hydraulic system

| | |
|---|---|
| Pumps, number and type: | 3 gear pumps, 4 cm3 |
| Flow-rate: | 18,5 l/min each |
| Pressure: | 170 bar |
| Hydraulic oil tank: | 20 lt |

### Undercarriage

| | |
|---|---|
| Track width: | 230 mm |
| Step : | 1400 mm |
| Undercarriage length: | 1750 mm |
| Ground pressure: | 0,2 Kg/cm3 |

### Chassis

| | |
|---|---|
| Max length: | 2000 mm |
| Width: | 1020 mm |
| Variable width (optional): | 1020/1320 mm |
| Max height (to the levers): | 1550 mm |
| maximum height (to the roll-bars): | 2270 mm |

### Operating weight

| | |
|---|---|
| Fixed undercarriage (excluding operator): | 900 |
| Extensible undercarriage (excluding operator): | 1075 |

### Performance

| | |
|---|---|
| Travel speed: | 1°) 1,7 Km/h – 2°) 2,6 Km/h<br>3°) 3,4 Km/h – 4°) 5,1 Km/h |
| Capacity (including kit): | 1200 Kg |

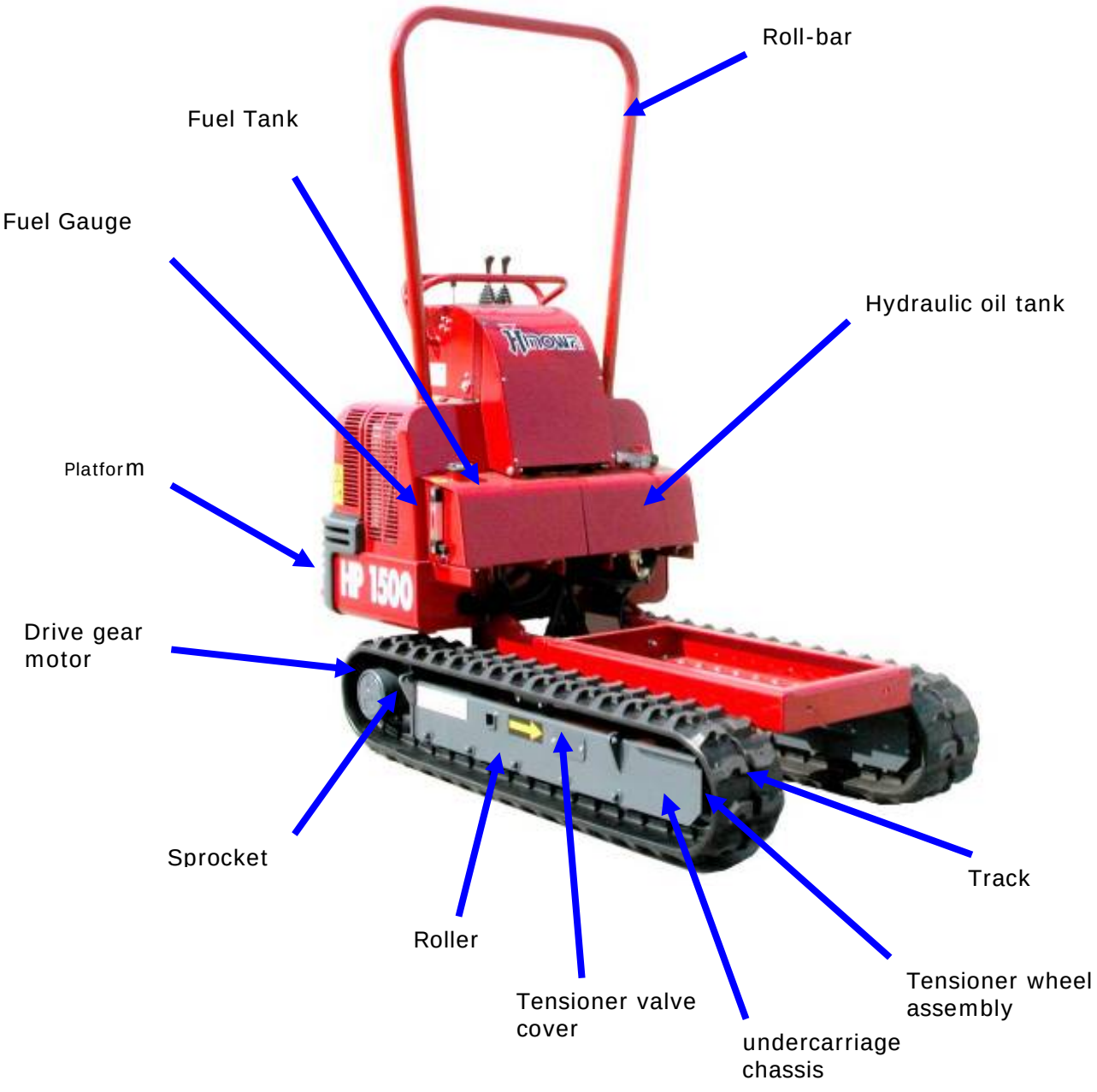
### Vibrations

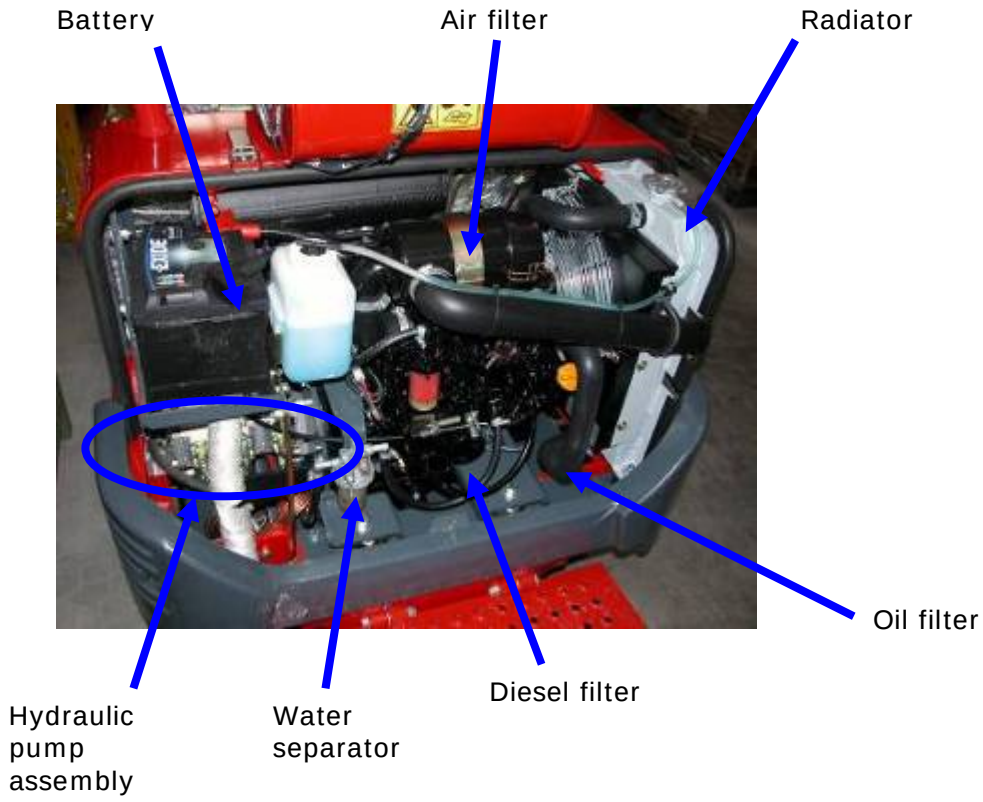
| | |
|---|---|
| Upper limbs: | ≤ 2,5 m/s2 |
| Entire body: | ≤ 0,5 m/s2 |

Noise level: 96 dB

## HP 1500

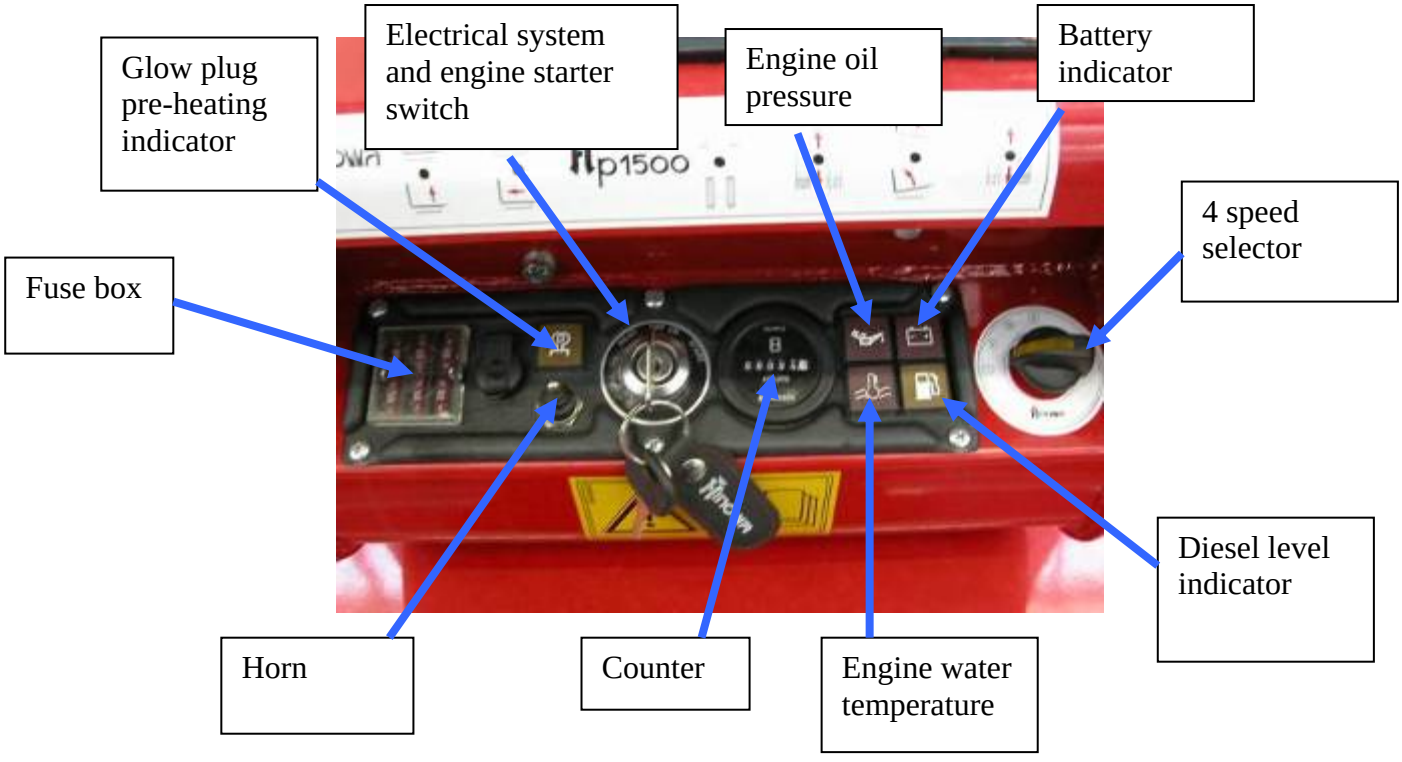
The HP 1500 mini dumper belongs to a different category from the HP 850, HP 1100, HP 1150 and HP 1200(E) mini dumpers. Despite being able to support different dedicated and interchangeable kits, the coupling and release system has been designed for more permanent attachment.
The more heavy-duty operating conditions that the HP 1500 mini dumper has been designed for mean that the engine used is liquid cooled and consequently fitted with a special heat exchanger.
To simplify the interpretation of the hydraulic diagram and the wiring diagram, the location of the various components on the HP 1500 mini dumper is described below






## HP1500 – Control panel

The HP1500 dumper control panel (shown below) has a number of differences compared to the HP1200. The main difference is the 4 speed selector to control the machine's travel speed.



## TECHNICAL OBSERVATIONS:

1- ELECTRICAL SYSTEM FUSE BOX: fuse 1 is positioned at the top left in the box, fuse 6 in the bottom right.

2- INDICATOR (RED): FAULT IN BATTERY RECHARGE SYSTEM
If everything is OK, the indicator light will come on when electrical system switch is turned and go off when the engine starts. Faults may be indicated when:
- the light remains on with the engine running: check the alternator and alternator belt tension;
- the light is off both with the engine running and off: check the light or the protection fuse.

3- INDICATOR (RED): LOW ENGINE OIL PRESSURE
The light signals low oil pressure, which may be caused by:
- the engine idling too slowly;
- insufficient oil level;
- the viscosity of the oil is not suitable for the season temperature;
- faults in the circuit (the signal may come on when the engine is very hot at low revs)
WARNING: even when everything is normal, the signal may come on when the engine is very hot at low revs.

4- INDICATOR (RED): EXCESSIVE ENGINE COOLING WATER TEMPERATURE
The water may overheat due to:
- insufficient water in the radiator;
- fouling in the cooling circuit (wash the circuit);
- fan belt slipping;
- faulty thermostats;
- faults in the cooling circuit.

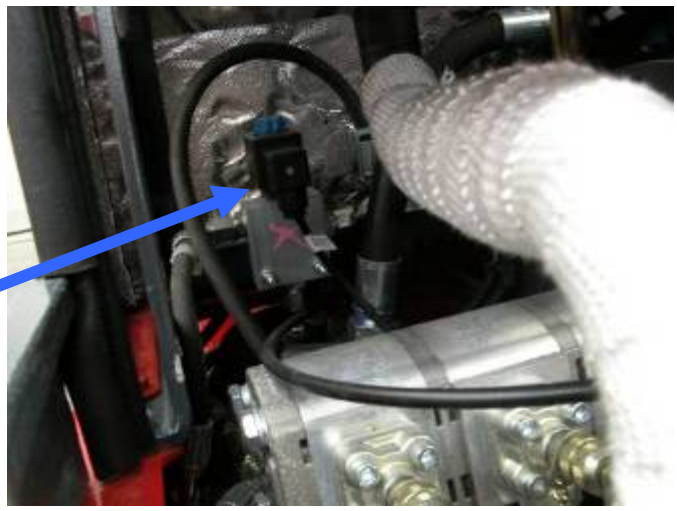
5- INDICATOR (YELLOW): FUEL RESERVE
The light comes on to signal that there is around 5 l of fuel left in the tank.

6- 4 SPEED SELECTOR (summary table)
The HP 1500 mini dumper is fitted with a selector to choose the four operating speeds. The system combines the solutions adopted, for example, on the HP 1100 mini dumper and on the HP 1150 mini dumper. The undercarriage is fitted with drive motors with two speed operation that, using two solenoid valves, can be sent the signal to engage the second gear, or can be supplied by the third hydraulic pump. The possible types of operation conditions are summarised in the following table

| | Third pump | gear motor 2nd speed |
|---|---|---|
| speed1 | OFF | OFF |
| speed 2 | ON | OFF |
| speed 3 | OFF | ON |
| speed 4 | ON | ON |

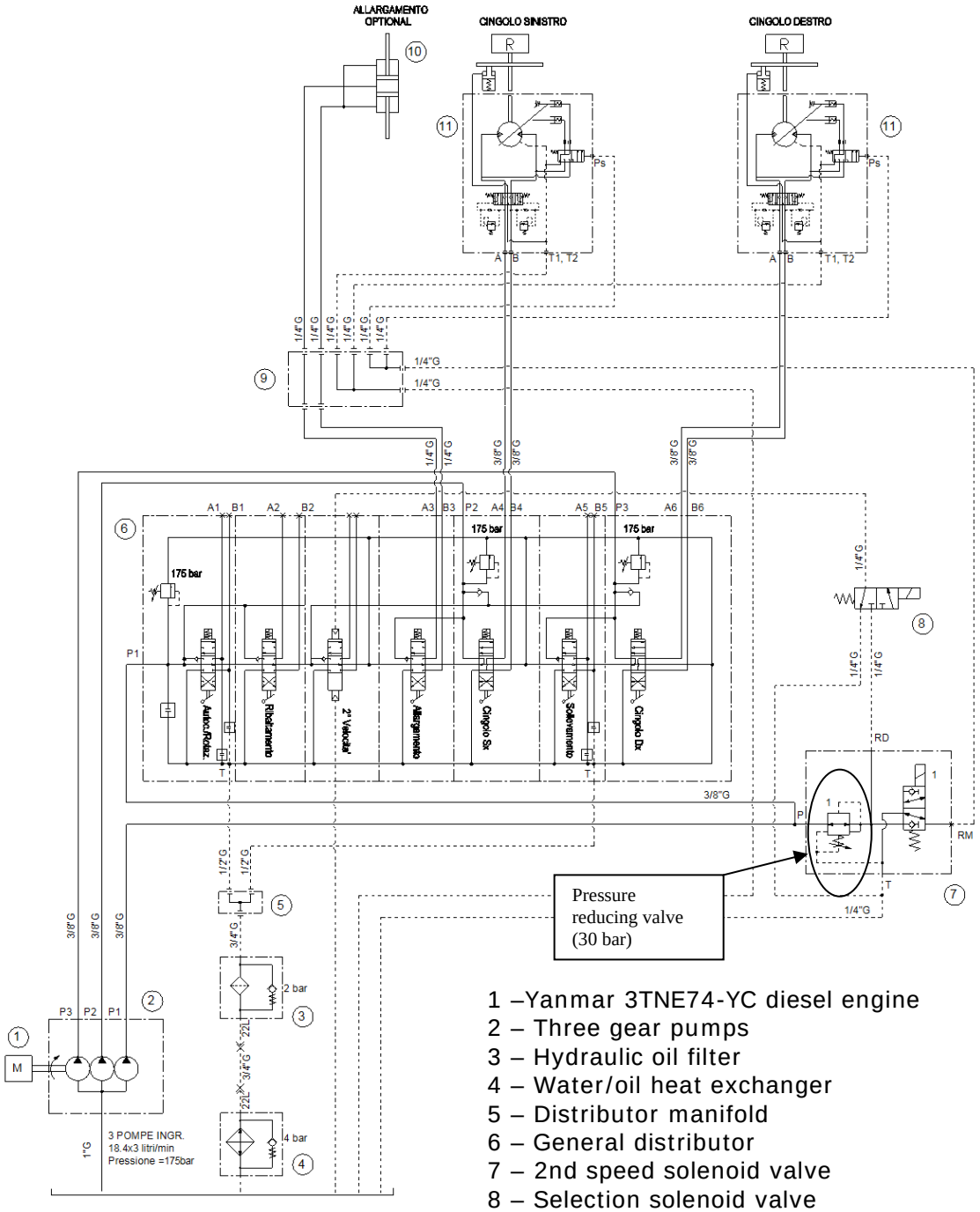
The third pump and the second speed of the motors are managed by two solenoid valves fitted in the engine compartment, shown in the photo below.

Third pump selection solenoid valve



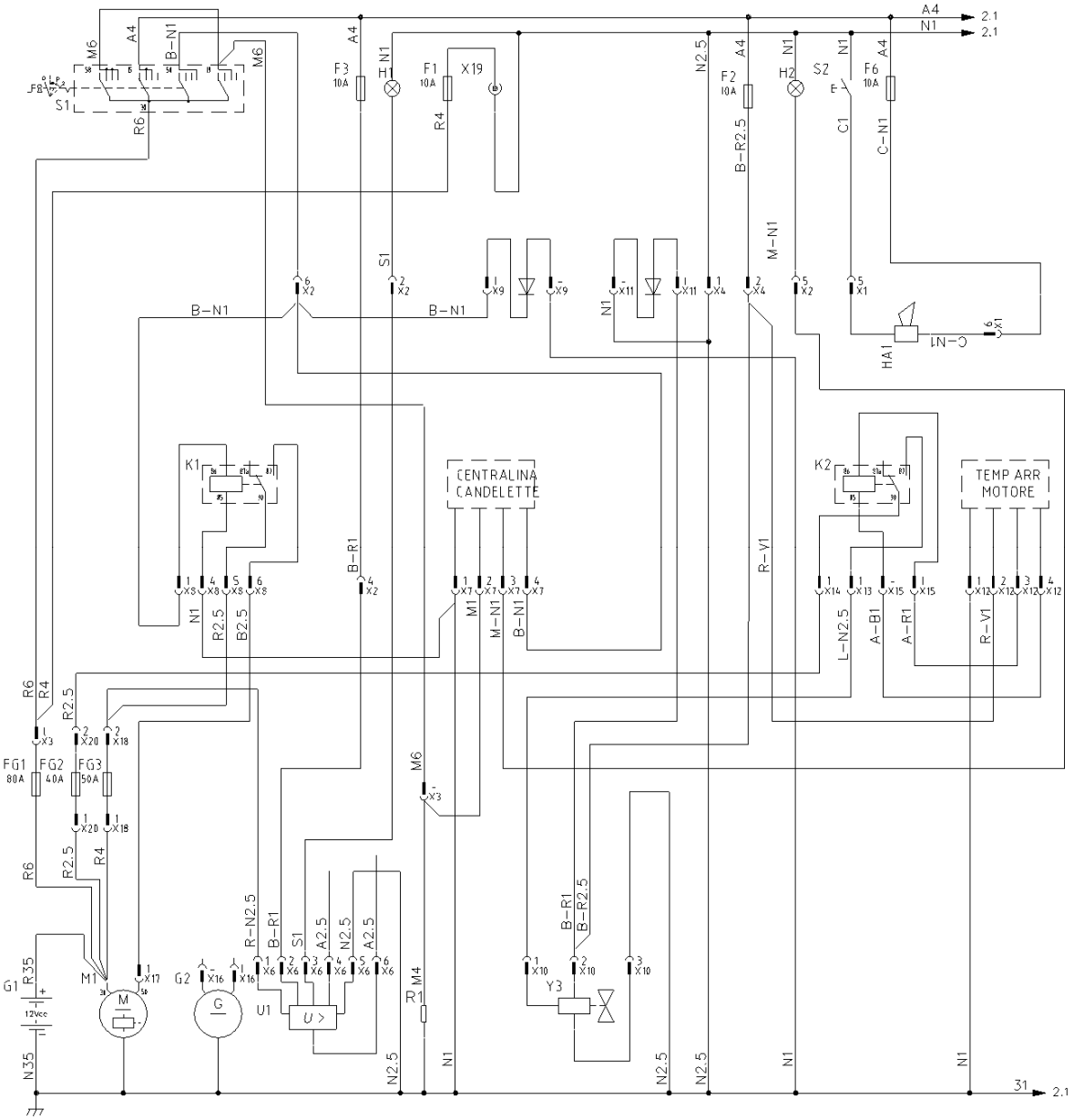
Second motor speed solenoid valve

## HP 1500 – HYDRAULIC SYSTEM DIAGRAM

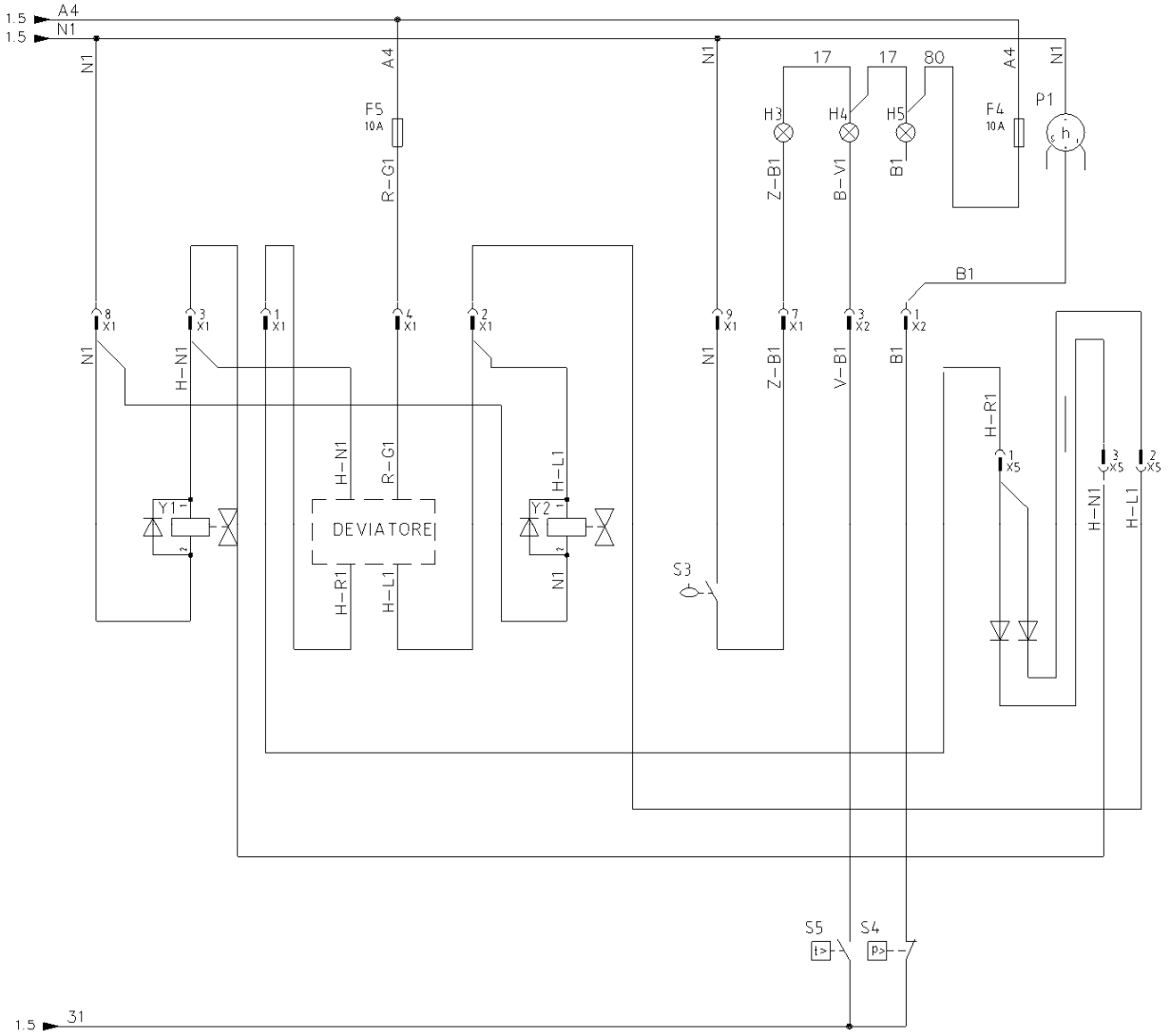



1 –Yanmar 3TNE74-YC diesel engine
2 – Three gear pumps
3 – Hydraulic oil filter
4 – Water/oil heat exchanger
5 – Distributor manifold
6 – General distributor
7 – 2nd speed solenoid valve
8 – Selection solenoid valve
9 – Block
10 – Drive gear motor

## HP 1500 – WIRING DIAGRAM (part one)



## HP 1500 – WIRING DIAGRAM (part two)




F1 – Power outlet fuse, 10A
F2 – Engine stop fuse, 10A
F3 – Fuse + regulator, 10A
F4 – Indicator light fuse, 10A
F5 – Solenoid valve fuse, 10A
F6 – Horn fuse, 10A
FG1 – Main fuse, 80A
FG2 – Glow plug fuse, 40A
FG3 – Main fuse, 50A
G1 – Battery
G2 – Alternator
H1 – Battery indicator light
H2 – Glow plug indicator light
H3 – Reserve indicator light
H4 – Water temperature indicator light
H5 – Oil indicator light
K1 – Starter relay
K2 – Glow plug control unit
M1 – Starter motor
P1 – Counter
R1 – Glow plugs
S1 – Starter panel

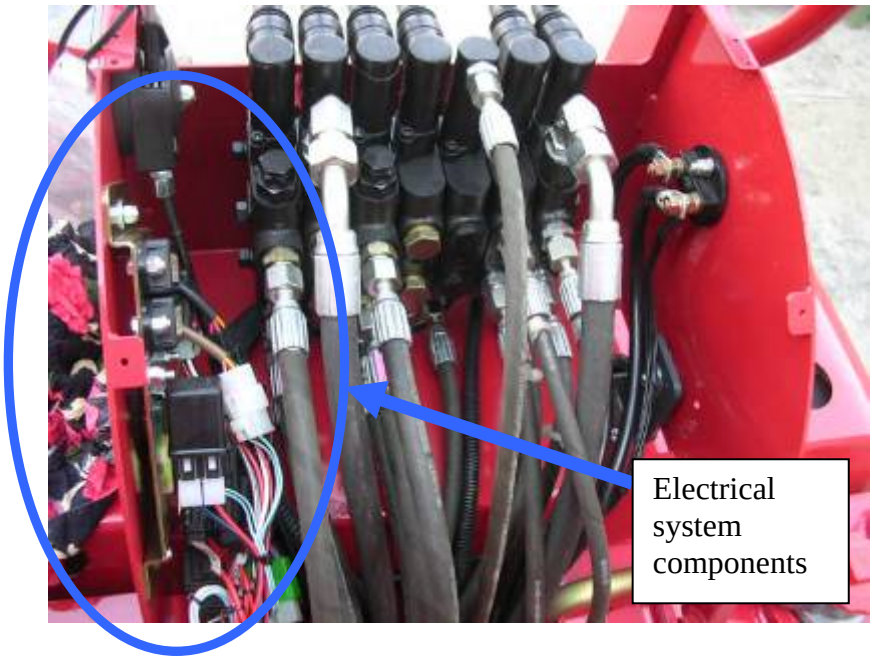
S2 – Horn button
S3 – Fuel level sensor
S4 – Engine oil pressure
S5 – Maximum water temperature
U1 – Voltage regulator
X19 – Power outlet
Y1 – Solenoid valve
Y2 - Solenoid valve
Y3 – Engine stop solenoid valve
X1 – 9-pin connector, dashboard line
X10 – 3-pin connector, engine line
X11 – 2-pin connector, engine line
X12 – 4-pin connector, engine line
X13 – 1-pin connector, engine line
X14 – 1-pin connector, engine line
X15 – 2-pin connector, engine line
X16 – 2-pin connector, engine line
X17 – 1-pin connector, engine line

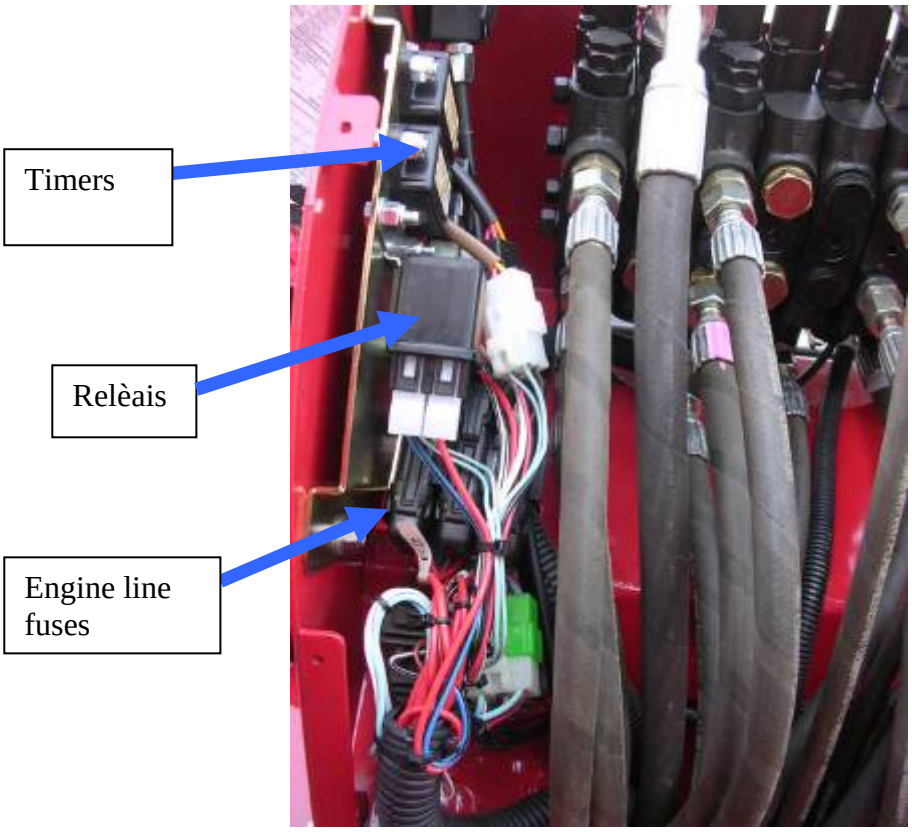
X18 – 2-pin connector, engine line
X2 – 7-pin connector, engine and dashboard line
X20 – 2-pin connector, engine line
X3 – 2-pin connector, engine and dashboard line
X4 – 2-pin connector, engine and dashboard line
X5 – 3-pin connector, dashboard line
X6 – 6-pin connector, engine line
X7 – 4-pin connector, engine line
X8 – 6-pin connector, engine line
X9 – 2-pin connector, engine line

| | |
|---|---|
| A – Blue | N - Black |
| B – White | R - Red |
| C – Orange | S - Pink |
| G - -Yellow | V - Green |
| H - -Grey | Z - Purple |
| L - -Blue | M - Brown |

REMARKS ON THE ELECTRICAL SYSTEM:

The components making up the electrical system, as well as those in the dashboard, are secured to the distributor support and can be easily reached by removing the front guard.

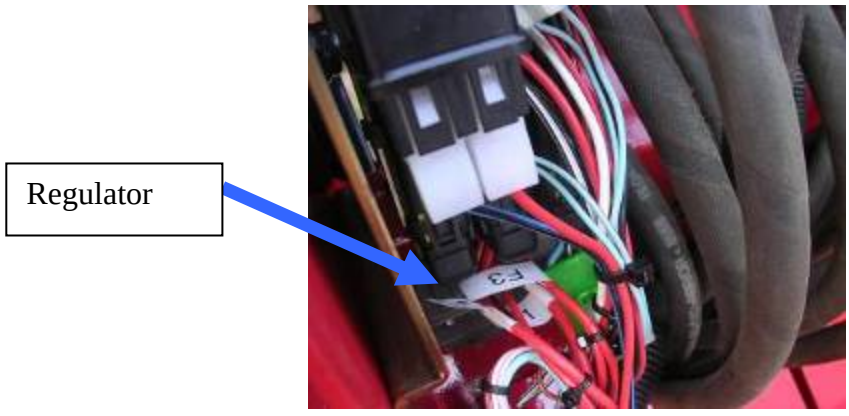


Characteristics of the engine line fuses:

| RATING (A) | COLOUR | PART PROTECTED | POSITION |
|---|---|---|---|
| 80 | YELLOW | MAIN POWER SUPPLY | 1 |
| 40 | ORANGE | ENGINE PRE-HEATING | 2 |
| 50 | RED | MAIN STARTING | 3 |

The voltage regulator is located under the distributor guard, next to the electrical components (see the photo below).




## HP1500 – Kits available

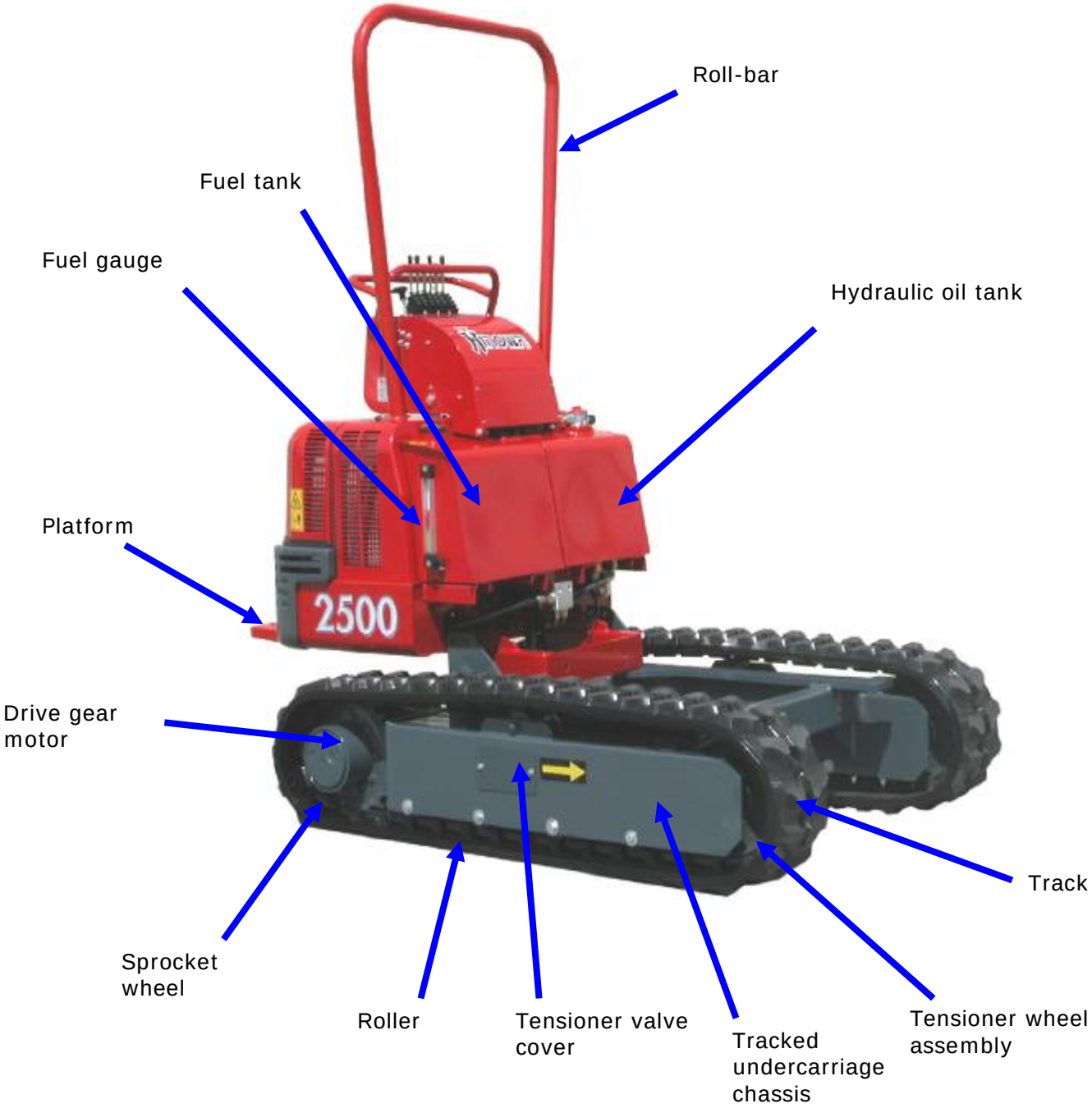
- Body for building applications, tipping from front
- Body for building applications, three-way side tipping
- Self-loading body for building applications
- High dumping self-loading body for building applications
- Forklift kit (900 kg capacity, extensible track only)

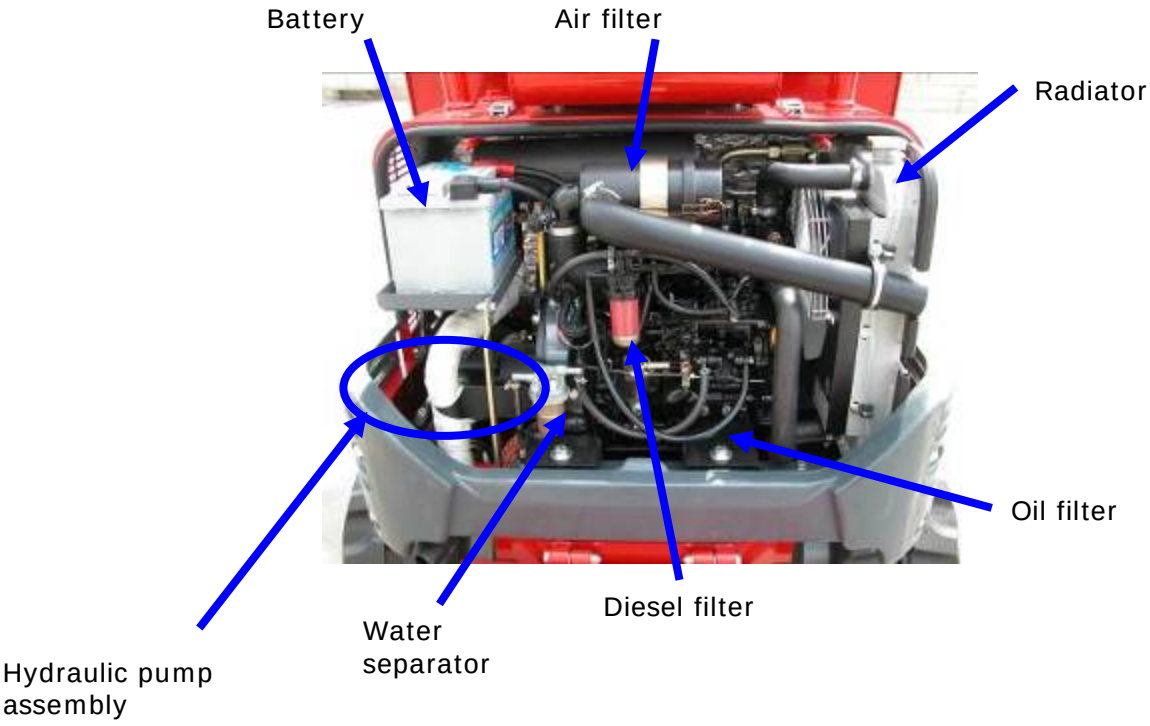
# HP2500
## TECHNICAL SPECIFICATIONS

| | |
|---|---|
| **Weight** | 1250 kg |
| **Engine specification** | YANMAR |
| No-load calibration speed | 2500 g/min |
| Max gross horsepower | 17,7 kW /24 HP a 3600 g/mi |
| Electric starting | 12 Volt |
| Diesel tank | 23 lt |
| **Hydraulic system** | |
| Pumps, number and type | 2 portata variabile + 1 ingranaggi |
| Flow-rate | 34+34+15 l/min |
| Operating pressure | 230 bar |
| Travel Speed | 1a - 2,6 km/h |
| | 2a - 4,7 km/h |
| Hydraulic oil tank | 23 lt |
| **Undercarriage** | |
| Track width | 250 mm |
| Step | 1370 mm |
| Undercarriage length | 1850 mm |
| Noise level (ISO 5131) YANMAR | 96 dB |
| **Chassis** | |
| Max length | 2180 mm |
| Width | 1300 mm |
| Max height to the levers | 1670 mm |
| to the roll-bar | 2420 mm |

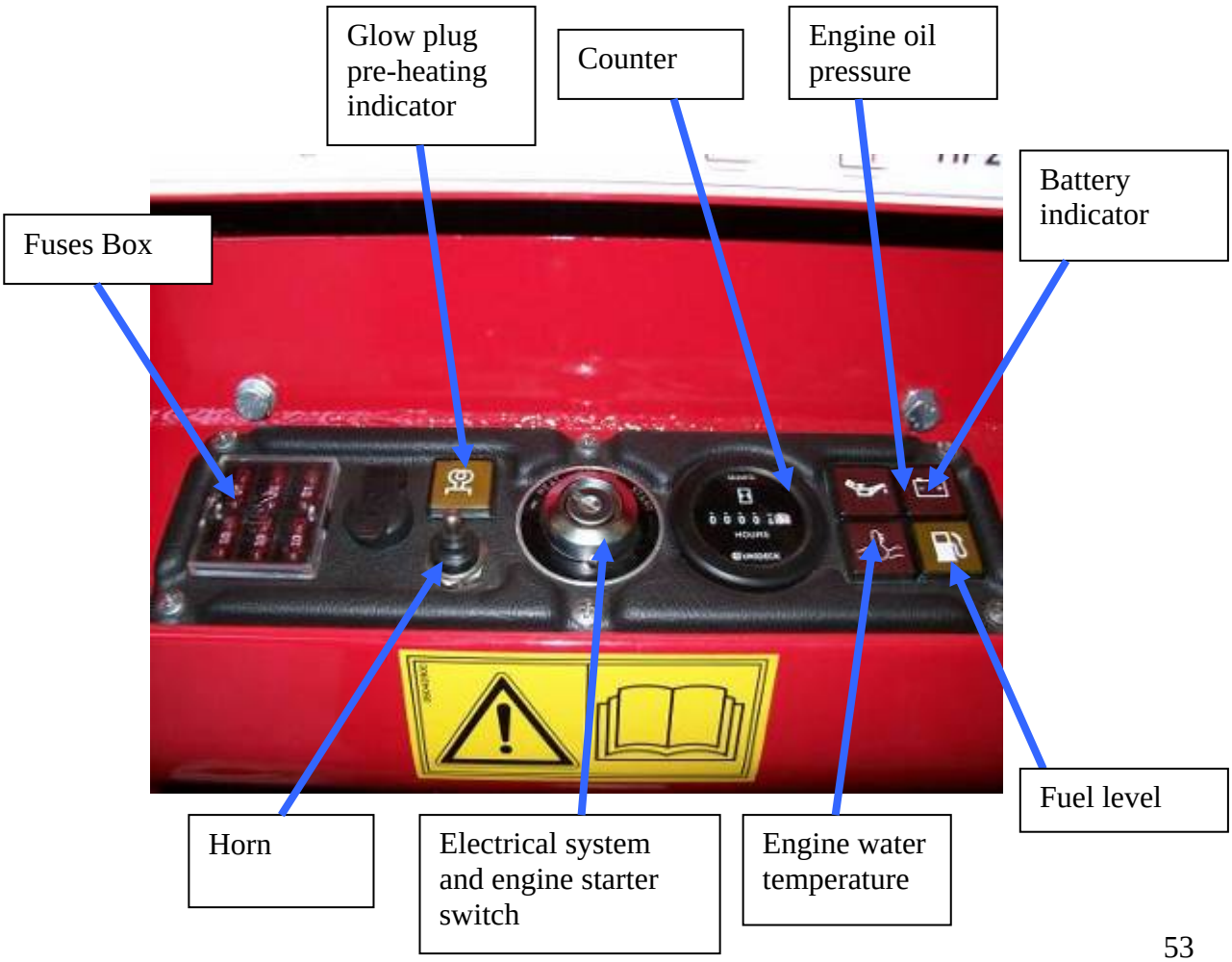
## HP2500

The HP 2500, mini dumper like the HP 1500, belongs to a different category from the HP 850, HP 1100, HP 1150 and HP 1200(E) mini dumpers. Despite being able to support different dedicated and interchangeable kits, the coupling and release system has been designed for more permanent attachment.
The more heavy-duty operating conditions that the HP 2500 mini dumper has been designed for mean that the engine used is liquid cooled and consequently fitted with a special heat exchanger.
To simplify the interpretation of the hydraulic diagram and the wiring diagram, the location of the various components on the HP 2500 mini dumper is described below:





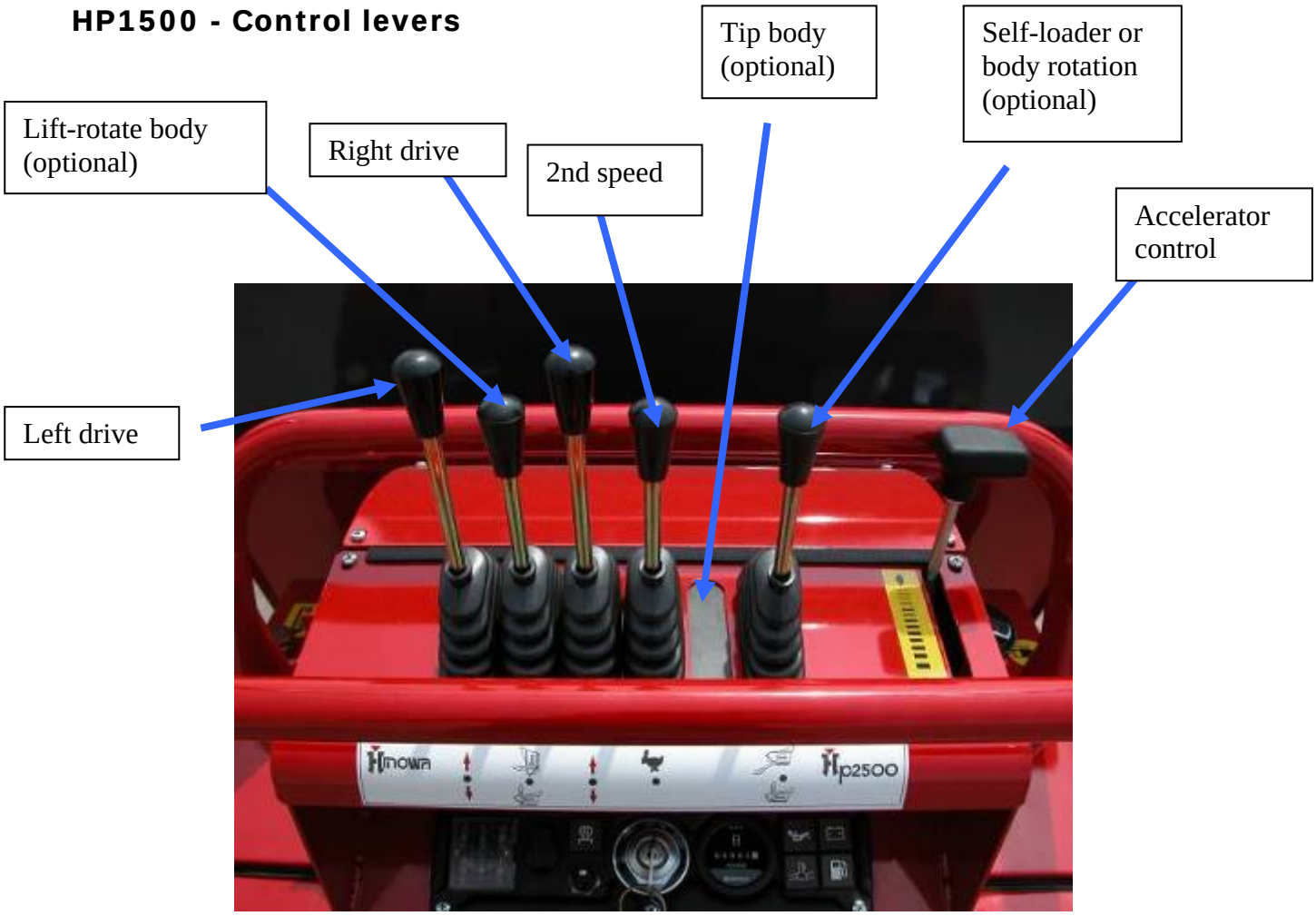

## **HP2500** – Control panel



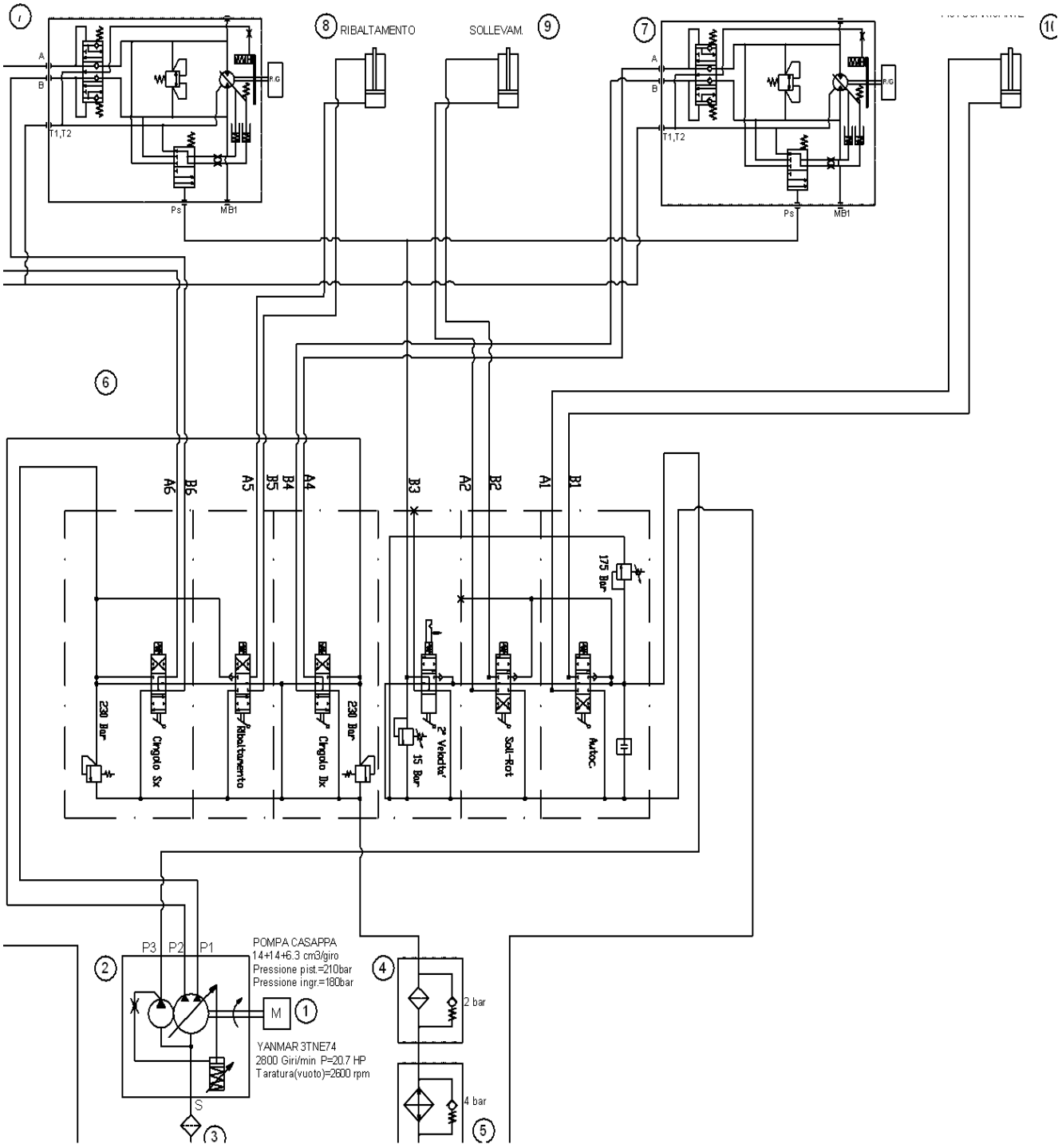
**TECHNICAL OBSERVATIONS:**

- RED battery indicator: if everything is OK the indicator light will come on when electrical system switch is turned and go off when the engine starts. If the light remains on with the engine running, check the alternator and alternator belt tension. If the light always stays off check the light and the protection fuse.
- RED engine oil pressure indicator: the light signals low oil pressure, which may be caused by the engine idling too slowly, insufficient oil level, viscosity of the oil not suitable for the season temperature or faults in the circuit.
- RED excessive engine water temperature indicator: the cause may be due to insufficient water in the radiator, fouling in the cooling circuit (wash the circuit), fan belt slipping, faulty thermostats or faults in the cooling circuit.
- YELLOW fuel reserve indicator: signals that there is around 5 l of fuel left in the tank.

**HP1500 - Control levers**



## HP2500 – Hydraulic system

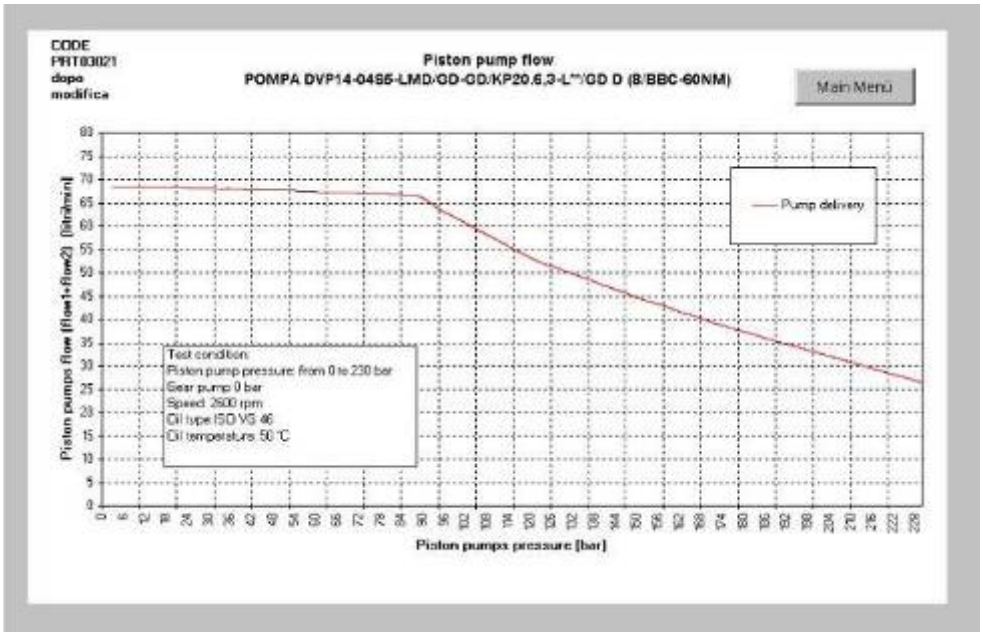


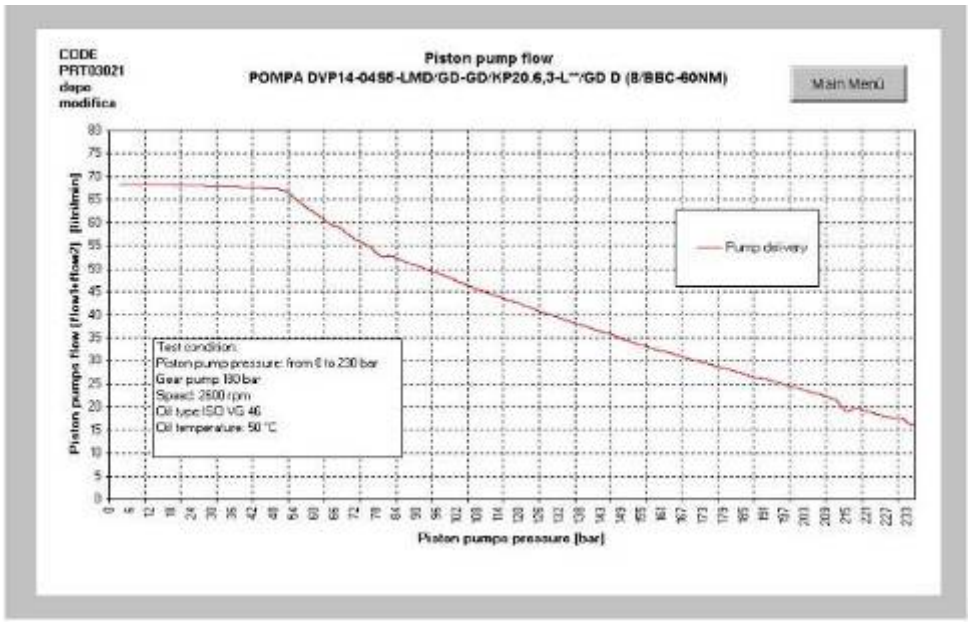

KEY TO THE HYDRAULIC SYSTEM DIAGRAM

1 Diesel engine Yanmar 3TNE74
2 Three pumps (2 with variable flow-rate and 1 gear pump)
3 Hydraulic oil filter
4 Filter
5 Water / oil heat exchanger
6 Distributor
5 Gear motor

*TECHNICAL OBSERVATIONS ON THE HYDRAULIC SYSTEM*:

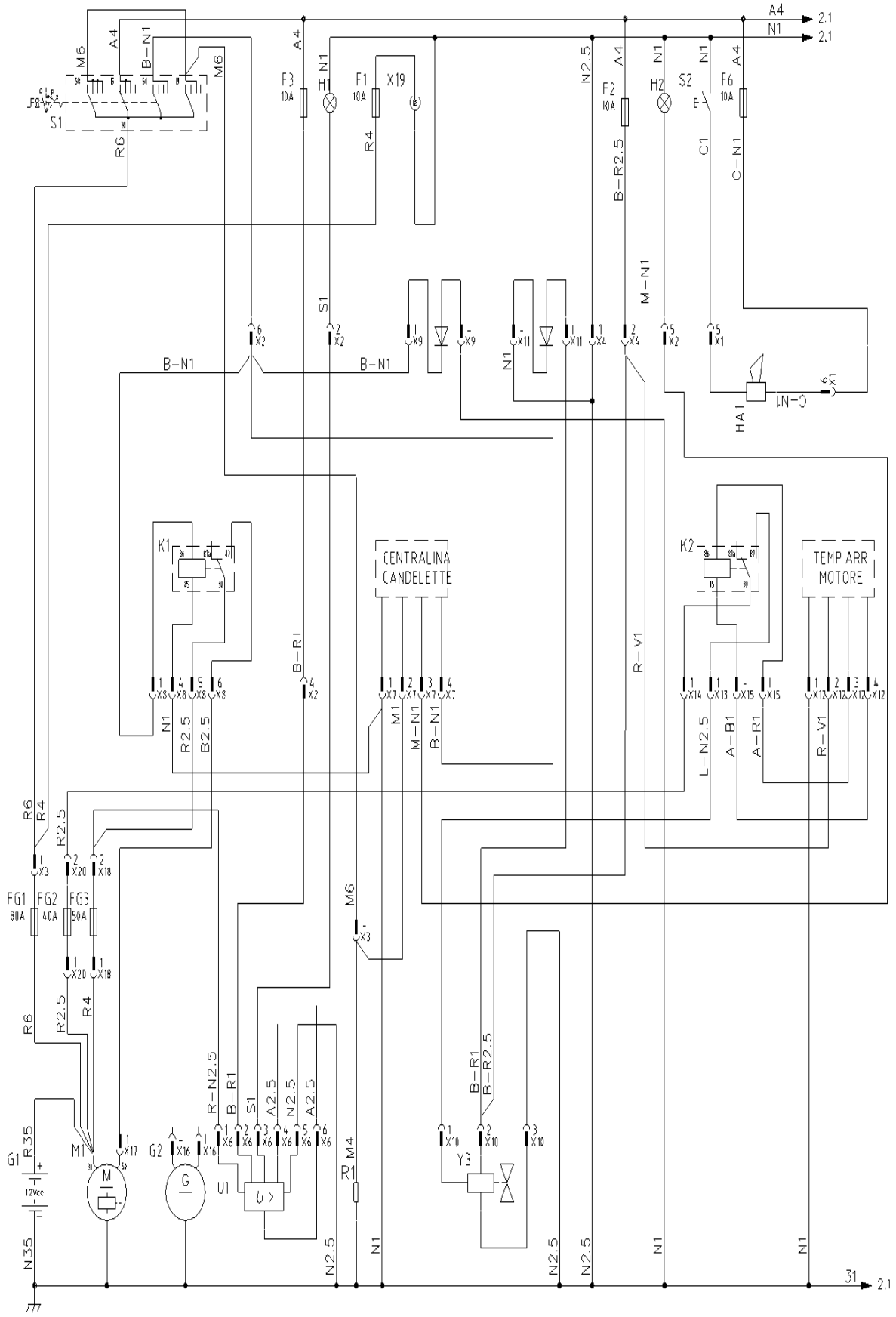
The two variable flow-rate pumps (max flow-rate 34 litres/min each) supply the two gear motors and the body tipping control. The characteristic curves of the pumps are shown below; the first curve considers that the gear pump is not working (0 bars), the second curve considers that the gear pump is working at 180 bars. From the curve it can be seen how when the operating pressure changes, the total oil flow-rate of the two variable flow-rate pumps changes.

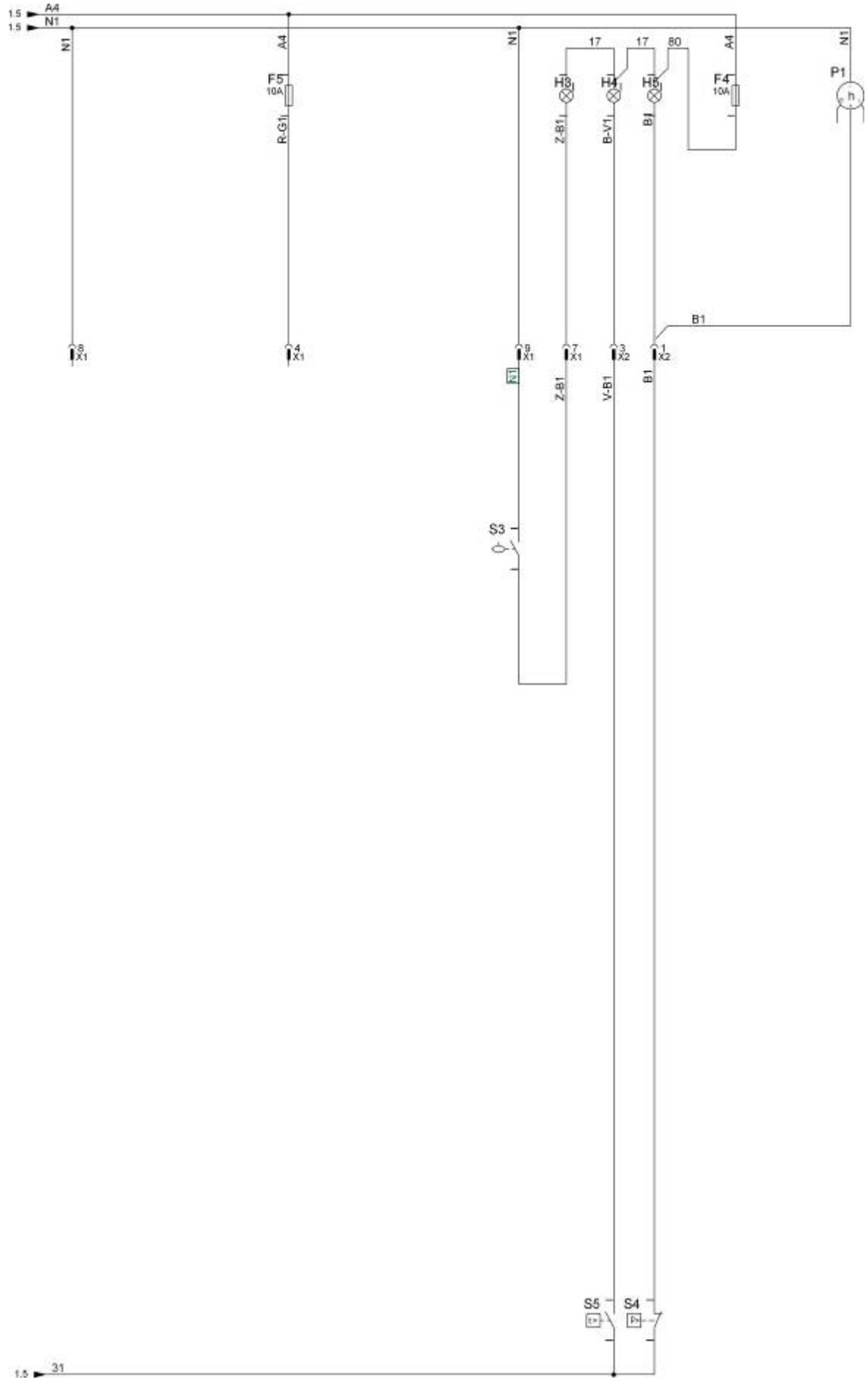



The third pump (gear pump), on the other hand, supplies the options and controls the second speed. A valve limits the pressure of the oil signal sent to the gear motors for the change in capacity to 15 bars.

## HP2500 – Electrical system




1.5 A4
1.5 N1
N1
A4
F5
10A
R-G1
N1
17
17
80
A4
N1
H3
H4
H5
F4
10A
P1
Z-B1
B-V1
B1
B1
X1
X1
X1
X2
X2
K1
Z-B1
V-B1
B1
S3
S5
S4
1.5 31

KEY TO THE WIRING DIAGRAM

F1 Power outlet fuse 10A
F2 Engine stop fuse 10A
F3 Fuse + regulator 10A
F4 Indicator light fuse 10A
F5 Solenoid valve fuse 10A
F6 Horn fuse 10A
FG1 Main fuse 80A
FG2 Main glow plug fuse 40A
FG3 Main fuse 50A
G1 Battery
G2 Alternator
H1 Battery indicator light
H2 Glow plug indicator light
H3 Reserve indicator light
H4 Water temperature indicator light
H Light oil
K1 Starting relay
K2 Glow plug control unit
M1 Starter motor
P1 Counter
R1 Glow plugs
S1 Starter panel
S2 Horn button
S3 Fuel level sensor
S4 Engine oil pressure
S5 Maximum water temperature
U1 Voltage regulator
X19 Power outlet
Y3 Engine stop solenoid valve
X1 9-pin connector, solenoid valve line - dashboard line
X10 3-pin connector, engine line
X11 2-pin connector, engine line
X12 4-pin connector, engine line
X13 1-pin connector, engine line
X14 1-pin connector, engine line
X15 2-pin connector, engine line
X16 2-pin connector, engine line
X17 1-pin connector, engine line
X18 2-pin connector, engine line
X2 7-pin connector, engine line - dashboard line
X20 2-pin connector, engine line
X3 2-pin connector, engine line - dashboard line
X4 2-pin connector, engine line - dashboard line
X5 3-pin connector, dashboard line
X6 6-pin connector, engine line
X7 4-pin connector, engine line
X8 6-pin connector, engine line
X9 2-pin connector, engine line

KEY TO WIRE COLOURS

A BLUE
B WHITE
C ORANGE
G YELLOW
H GREY
L BLUE
M BROWN
N BLACK
R RED
S PINK
V GREEN
Z PURPLE

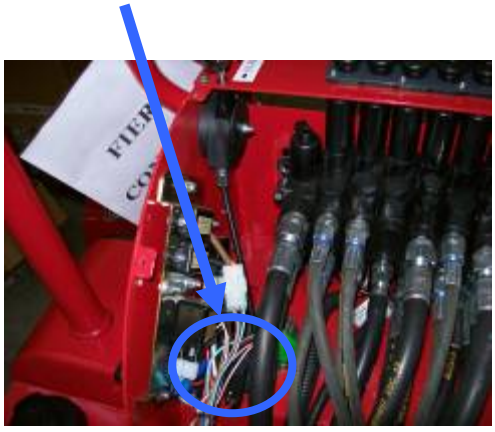
*TECHNICAL OBSERVATIONS ON THE ELECTRICAL SYSTEM*

The electrical system is 12V and is made up of a cabin line and a chassis line, joined together by sealed connectors fastened to the chassis.

Fuses in the dashboard line

| POSITION IN THE BOX | COLOUR | PART OF THE CIRCUIT PROTECTED | CAPACITÁ (A) |
|---|---|---|---|
| 1 | RED | Power outlet | 10 |
| 2 | RED | Engine stop | 10 |
| 3 | RED | Regulator | 10 |
| 4 | RED | Lights | 10 |
| 5 | RED | Electrovalves | 10 |
| 6 | RED | Horn | 10 |

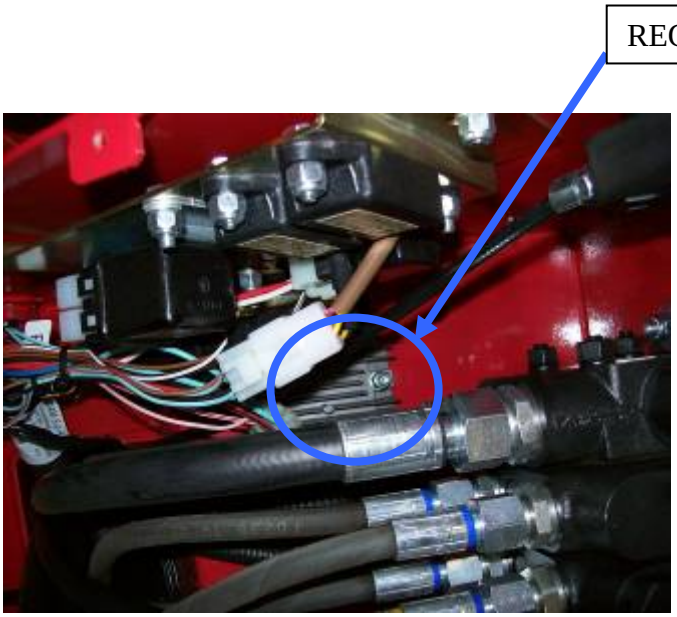
Fuses in the engine line:



| CAPACITÁ (A) | COLORE | PARTE DEL CIRCUITO PROTETTA | POS. |
|---|---|---|---|
| 80 | YELLOW | MAIN POWER SUPPLY | 1 |
| 40 | ORANGE | ENGINE PRE-HEATING | 2 |
| 50 | RED | MAIN STARTING | 3 |

The components making up the electrical system that are not in the dashboard (e.g. timers, diodes and relays) are secured to the distributor support, in the same area as the engine line fuses.


The voltage regulator is located under the front guard on the distributor support, as shown in the photo below



## **HP2500** – Kits available

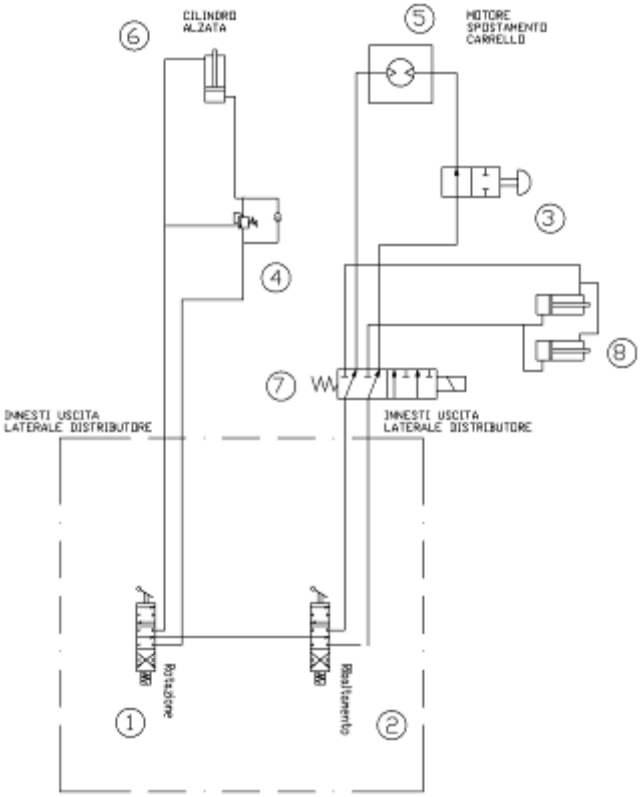
- Self-loading/lifting body for building applications
- Self-loading body for building applications
- Body for building applications
- Body for building applications with rotation

- Forklift kit (1300kg capacity)

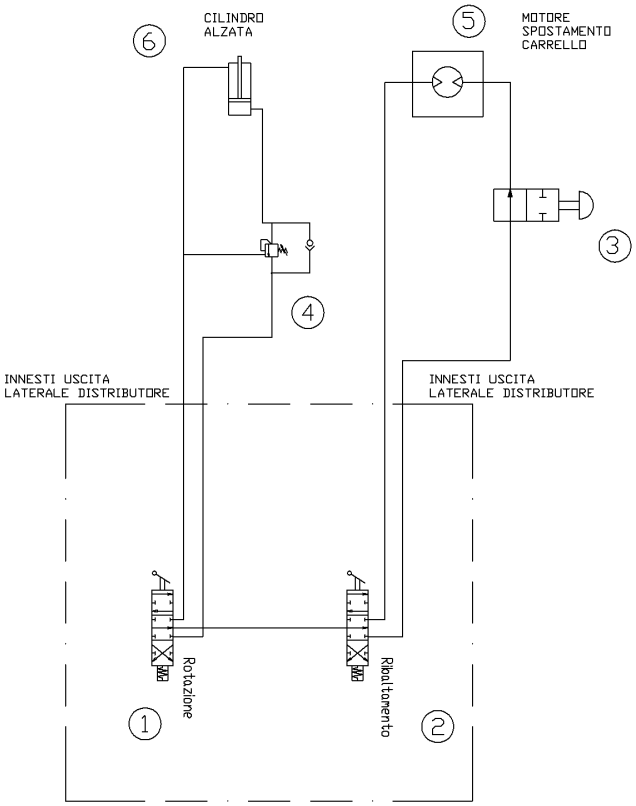
# OVERVIEW OF KIT + DUMPER ASSEMBLY

## FORKLIFT KIT

### 1) FL400 FORKLIFT KIT (HS1200-HS1200E extensible only)




Tilting
forklift kit

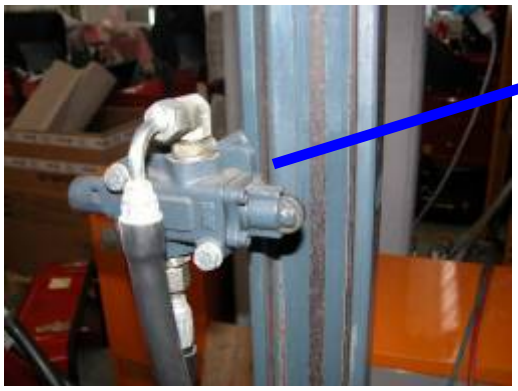



Forklift kit

CHARACTERISTICS:

- Lifting capacity 400 kg
- Kit weight 260 kg (350 kg if tilting)

Forklift kit

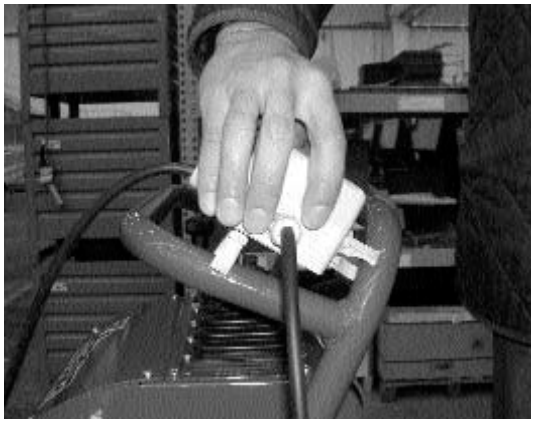


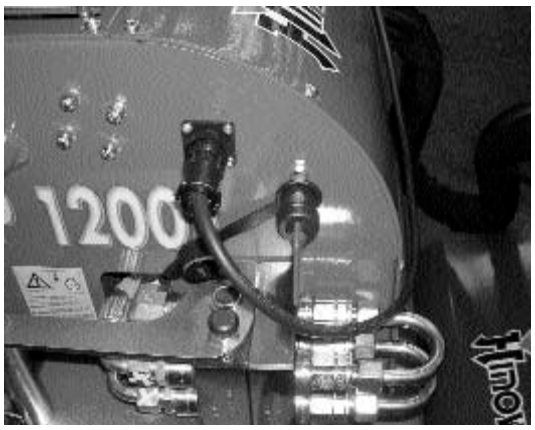
hydraulic switch to enable
horizontal movement of the forks

The forks can only move horizontally when the hydraulic switch is pressed. This occurs when the forks are high enough as to not interfere with the platform of the kit.
This switch in fact prevents the forks from travelling forwards or backwards if the difference in height between the forks and the platform is not sufficient to eliminate any risk of collision between the two.

The FL400 forklift kit is fitted with a maximum pressure valve, located near the fork lifting cylinder, and specially calibrated to lift loads no greater than 400 kg. This valve must not be tampered with in any circumstances; in the event of tampering, the warranty will immediately be void.

If fitting the tilting forklift kit, the button enabling the tilt forks movement must be fitted and plugged in, as shown in the photo below. The tilting movement is performed by pressing the button and moving the fork control lever.



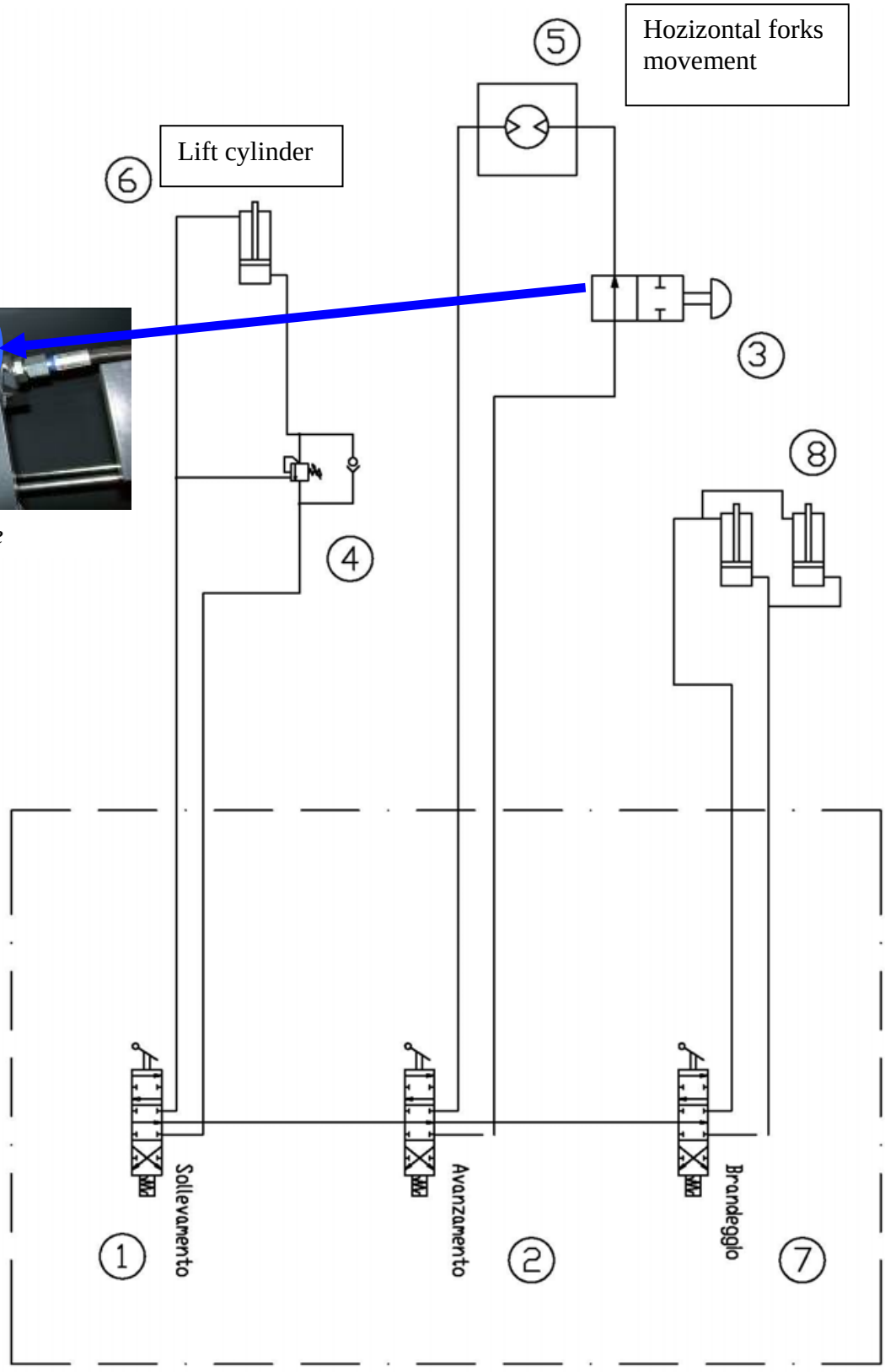


## 2) FM900 FORKLIFT KIT (for HP1500 extensible)


| TECHNICAL SPECIFICATIONS | |
|---|---|
| Working capacity | 900 kg |
| Max allowable distance of the centre of gravity of the load | 500 mm |
| Operating weight FM900 forklift kit | 725 kg |
| Operating weight, excluding operator (Kit + HP1500) | 1800kg |
| Class 2b forklift (width) | 900 mm |
| Maximum lifting height | 1800 mm |

## Hydraulic system diagram

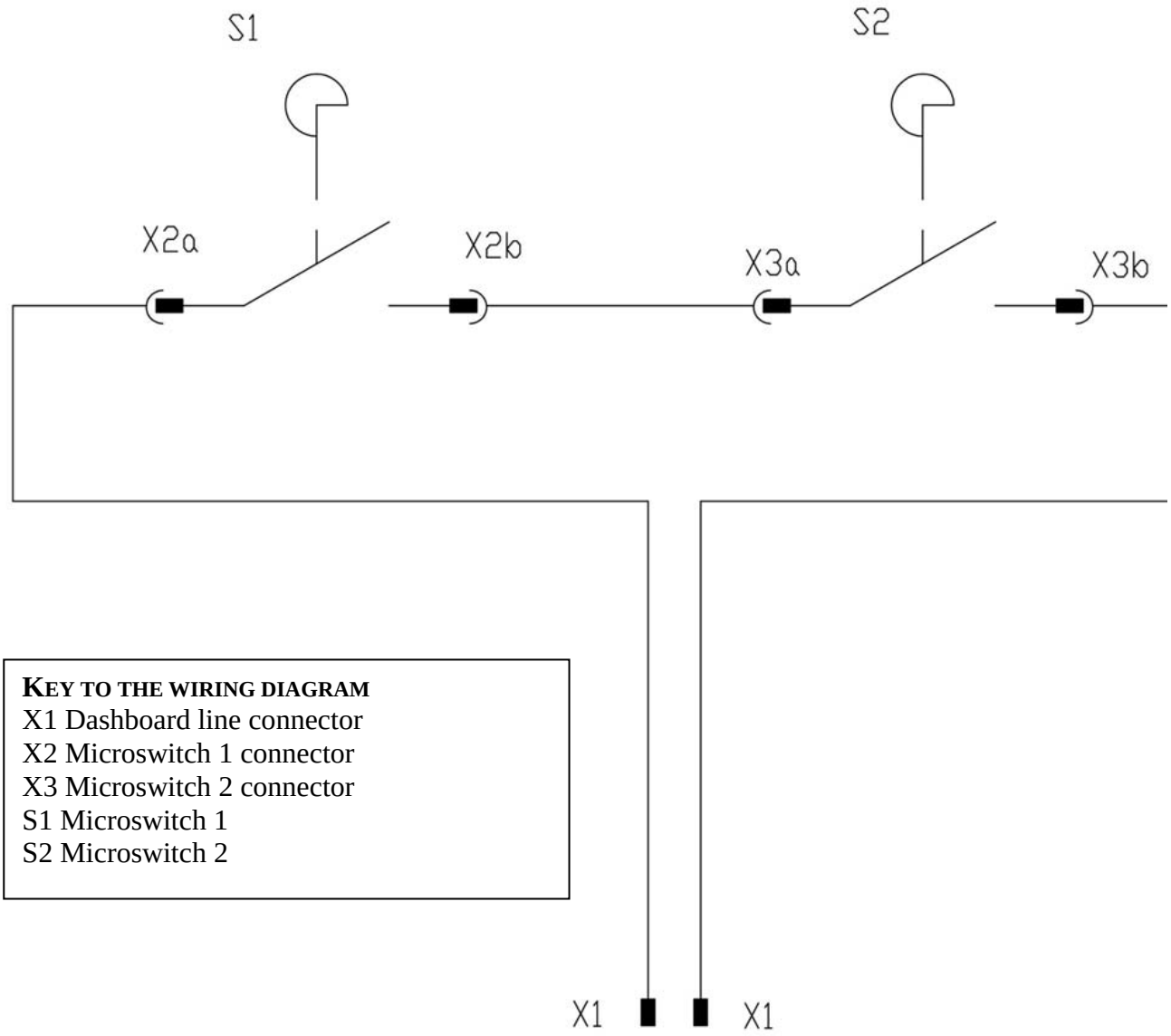
*Mechanical valve*




KEY TO THE HYDRAULIC SYSTEM

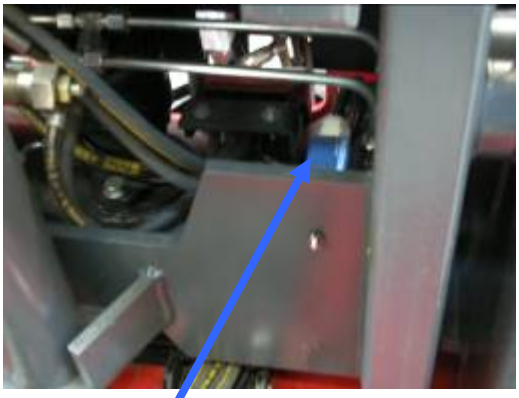
1. Lift
2. Travel
3. Mechanical valve
4. Maximum pressure valve
5. Forklift drive motor
6. Lifting cylinder
7. Tilt
8. Tilt cylinders

## Wiring diagram




**KEY TO THE WIRING DIAGRAM**
X1 Dashboard line connector
X2 Microswitch 1 connector
X3 Microswitch 2 connector
S1 Microswitch 1
S2 Microswitch 2

**S1**

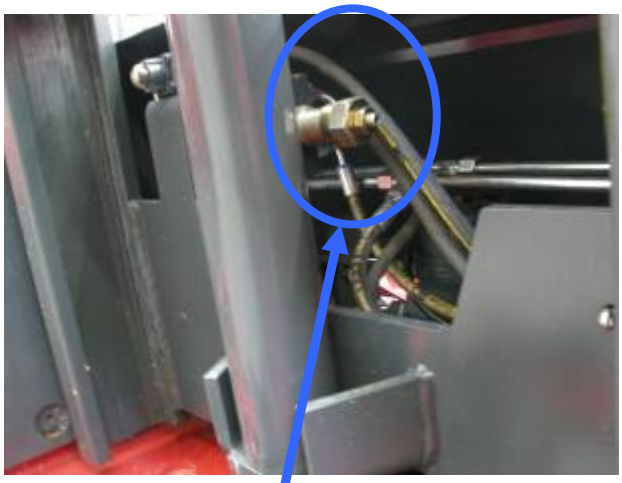


**S2**

OBSERVATIONS ON OPERATION:

- The forwards or backwards movement of the forks is only allowed if the mechanical valve (no. 3 on the hydraulic diagram) is not switched. This switch prevents the forks from travelling forwards or backwards if the difference in height between the forks and the platform is not sufficient to eliminate any risk of collision between the two.
- The two (electrical) switches S1 and S2 force the machine to travel in first speed when it is not in the travel configuration, that is, when both are energised. S1 and S2 are in series and disable the speed selector on the control panel if the forklift is not in the travel configuration.
- The kit is fitted, in addition to the maximum pressure valve that limits the weight lifted to 900 kg, with a hose break valve that stops the forks from lowering if the lifting cylinder hose should break. This valve also stops the forks from lowering further in the event of an excessive increase in the oil flow-rate while the forks are being lowered.

Hose break valve

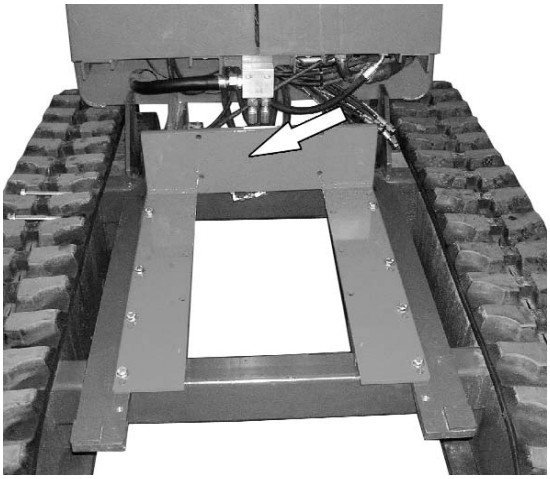


Maximum pressure valve

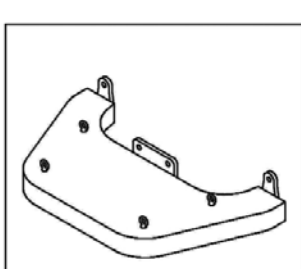
## 3) FM1300 FORKLIFT KIT (for HP2500)

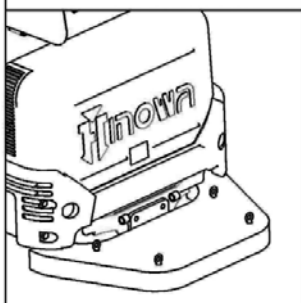
The FM1300 forklift kit differs from the FM900 forklift kit as regards the following aspects:

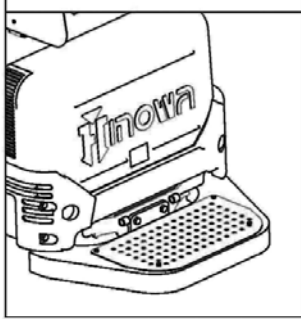
- lifting limit 1300 kg
- an adapter plate needs to be fitted (see the photo below)

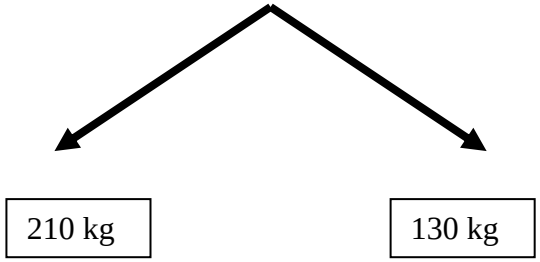


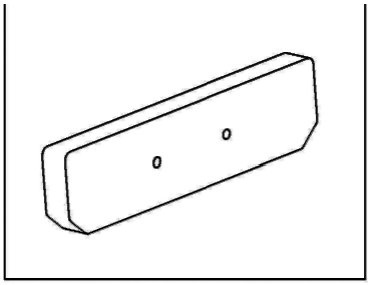
- 2 counterweights need to be fitted

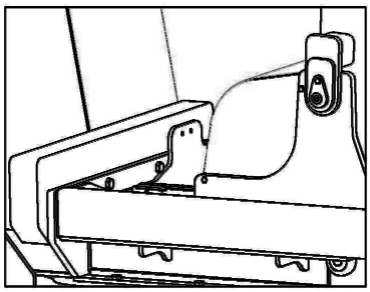




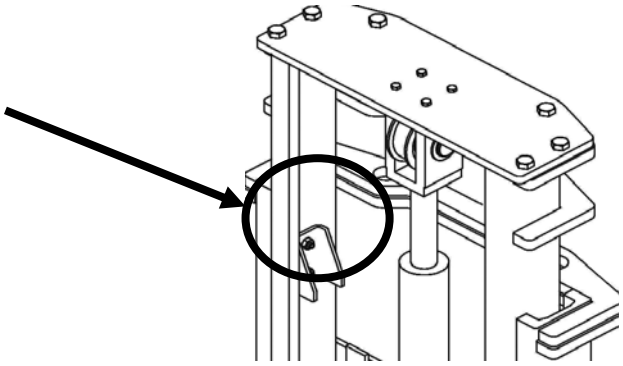



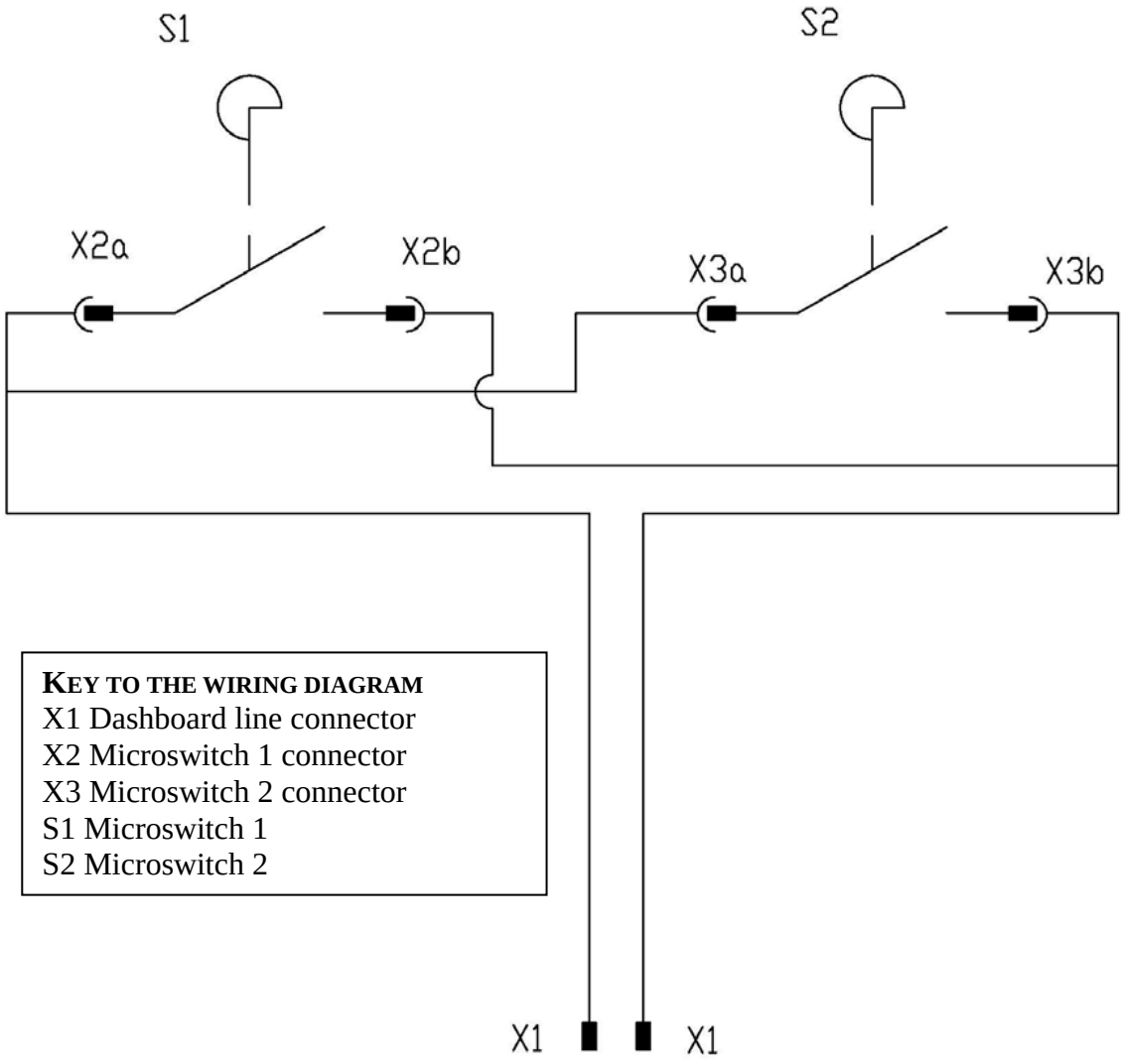





- 2 lift stops that limit the height of the load to 1800 mm



- 2 switches that prevent travel in second speed with the forklift not in the travel configuration, connected in parallel (see the diagram below)



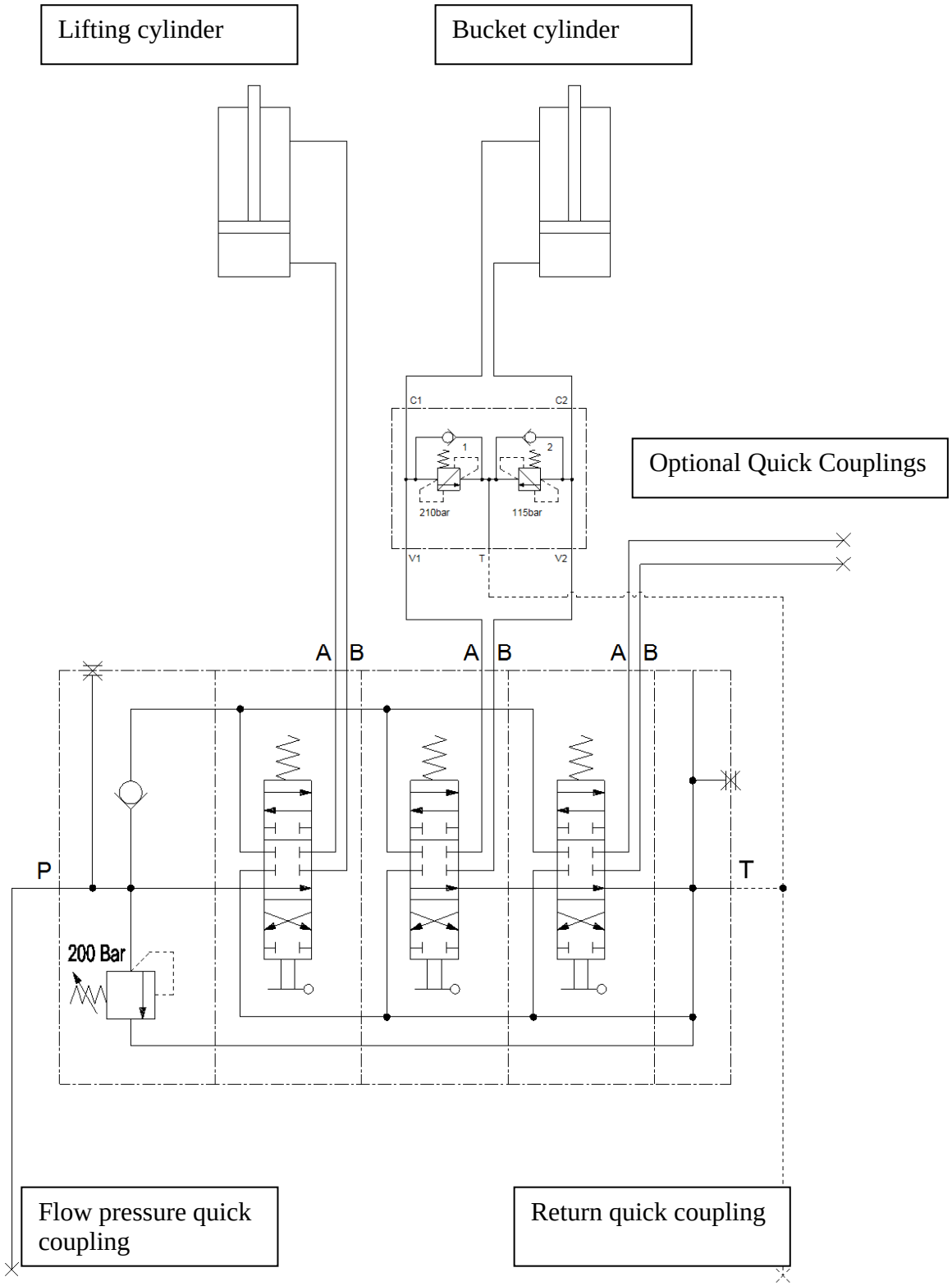

**KEY TO THE WIRING DIAGRAM**
X1 Dashboard line connector
X2 Microswitch 1 connector
X3 Microswitch 2 connector
S1 Microswitch 1
S2 Microswitch 2

## STANDARD RHINETTA KIT

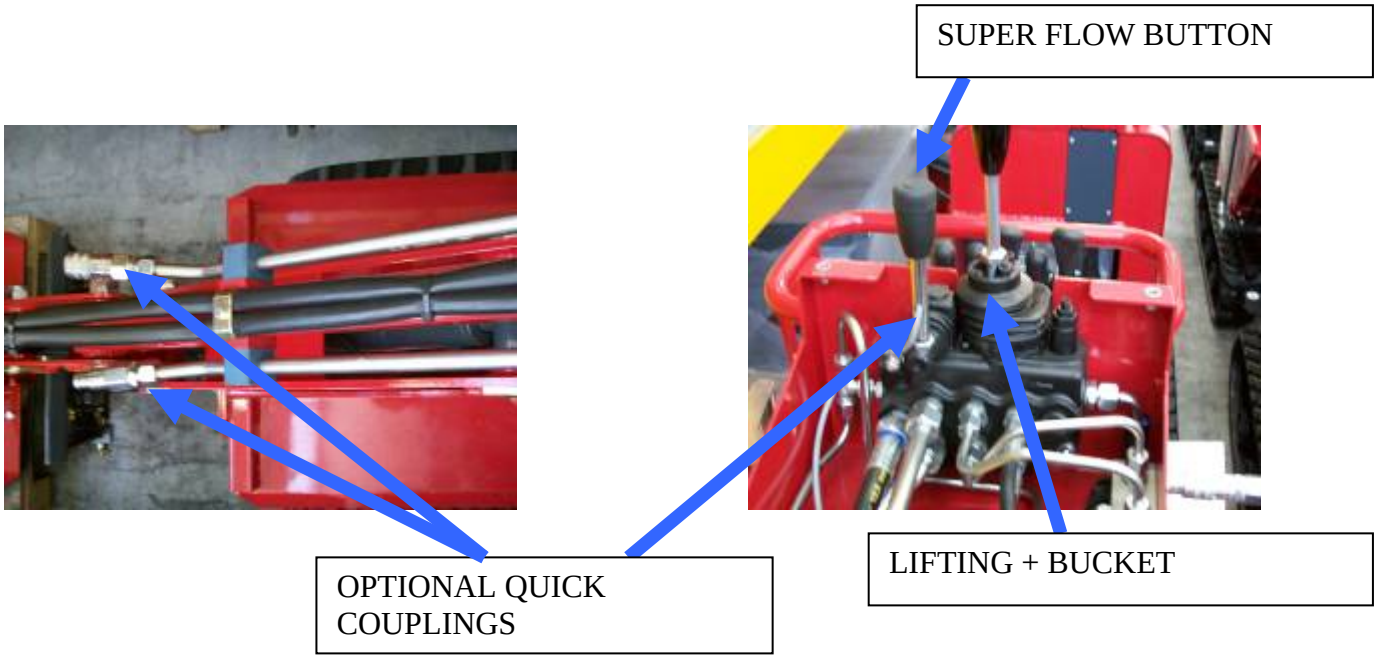
The Rhinetta kit can be used for fitting the following kits:

- Loader kit
- Agricultural shear kit
- Pallet forks kit

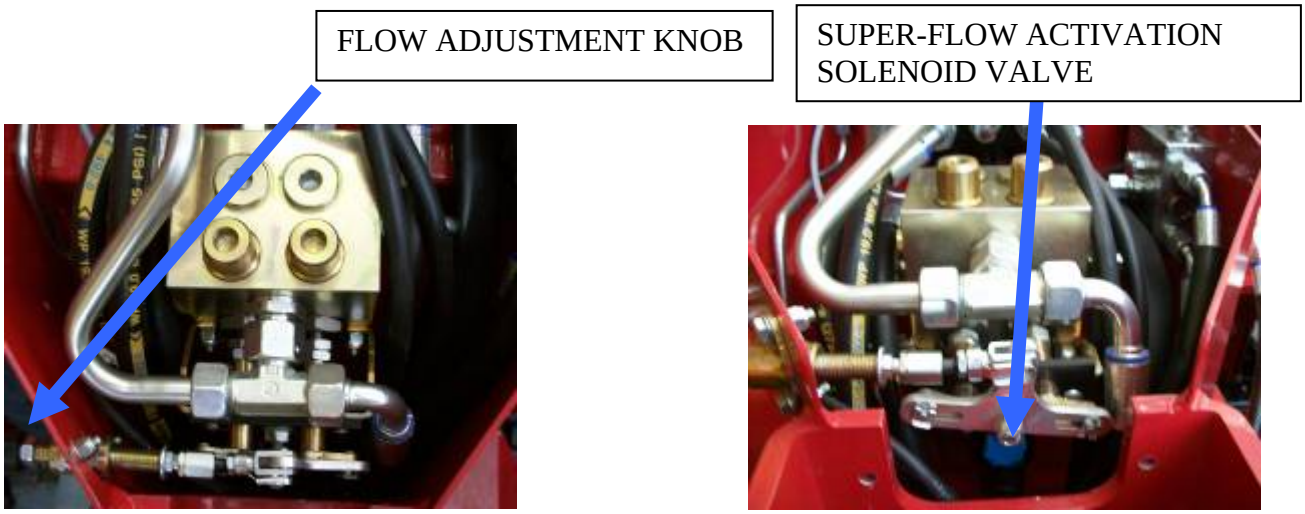
## STANDARD RHINETTA KIT– HYDRAULIC DIAGRAM



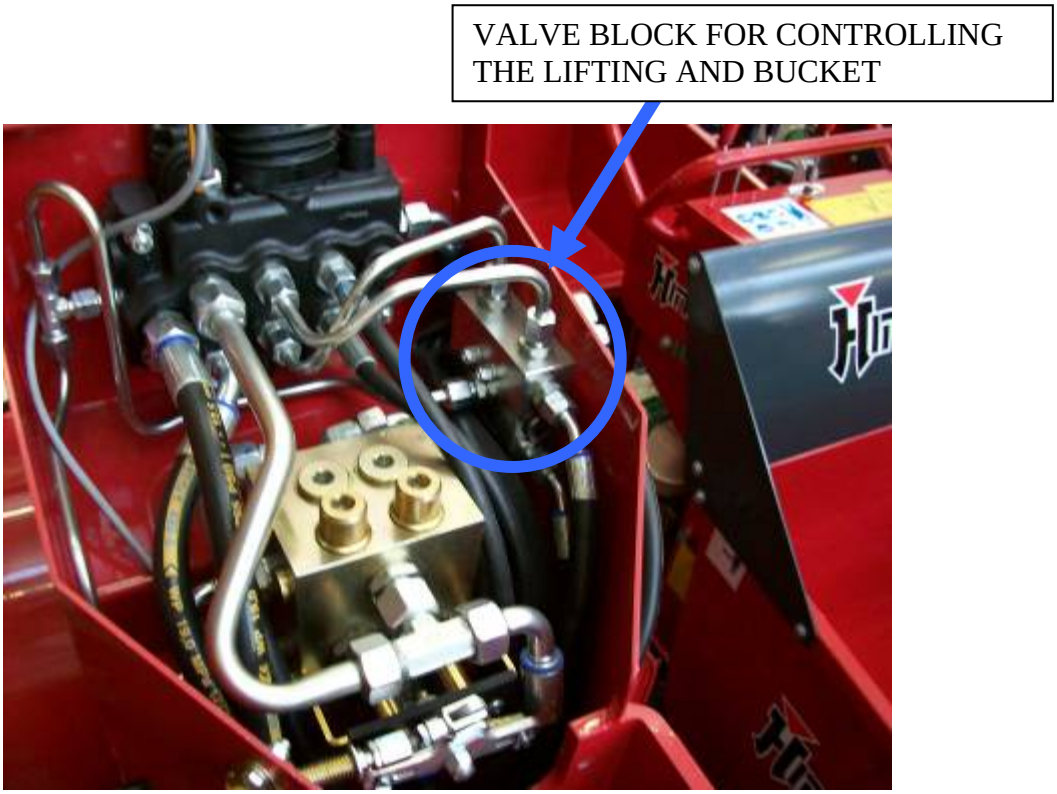
## RHINETTA POWER: OPERATION OF THE HYDRAULIC SYSTEM




The super-flow of oil to the optional quick couplings is managed by a compensating valve block. The oil used for the super-flow comes from the drive pumps, and is deviated to the quick coupling plate. A knob can be used to adjust the flow delivered to the gear motors and to the optional couplings. Turning the knob tighter increases the amount of oil delivered to the tracks and decreases the flow-rate of oil to the optional couplings. Two valves in the compensating valve block allow the machine to maintain straight-line movement in all conditions, even when super-flow is active. When pressing the super-flow control button, a solenoid valve is energised and the compensation block starts working.



Another valve block, located near the distributor, adjusts the correct operation of the bucket cylinder and the lifting cylinder. The block in fact includes an anticavitation valve (calibrated to 210 bars) and a maximum pressure valve, calibrated to 115 bars.




## RHINETTA POWER KIT

The Rhinetta power kit can be used for fitting all the kits available for the standard Rhinetta kit, plus:

- hammer kit
- drill kit
- grass cutting kit
- trencher kit
- cutter kit

# KIT RHINETTA POWER – HYDRAULIC SYSTEM DIAGRAM