

Technical Information for YALE Servicing Centres

This manual is intended solely for the specialised technicians of the Yale servicing network

MP20X
MS12X

Yale 
Europe

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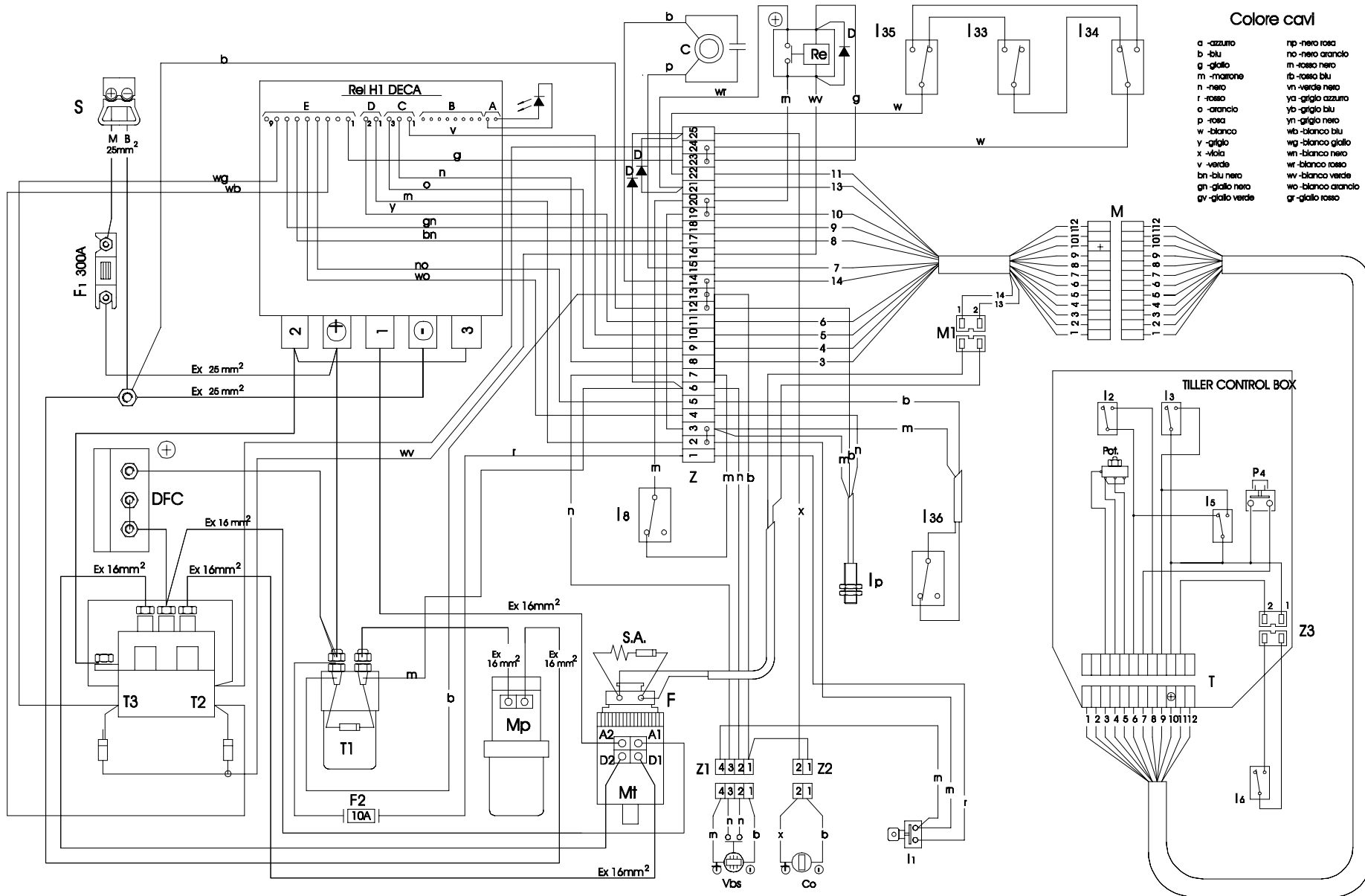
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**ELECTRICAL FUNCTIONAL DIAGRAM
MOD. MS12X**



Colore cavi

- | | |
|------------------|--------------------|
| a -azzurro | np -nero rosa |
| b -blu | no -nero arancio |
| c -giallo | m -rosso nero |
| m -marone | rb -rosso blu |
| n -nero | vn -verde nero |
| r -rosso | ya -grigio azzurro |
| o -arancio | yb -grigio blu |
| p -rosa | yn -grigio nero |
| w -bianco | wb -bianco blu |
| y -grigio | wg -bianco giallo |
| x -viola | wn -bianco nero |
| v -verde | wr -bianco rosso |
| bn -blu nero | ww -bianco verde |
| gn -giallo nero | wo -bianco arancio |
| gv -giallo verde | gr -giallo rosso |

2.3 H1 CHOPPER GENERAL FEATURES

ELECTRICAL

The H1 Chopper is available in a single version, with a maximum operating current of 300A and supplied with a power supply voltage of 24V. Listed below are the technical data, followed by a diagram of the basic connections for a 1-field motor connected for series excitation.

Power supply voltage	⇒	24 V
Maximum permissible current	⇒	300 A
Operating frequency of the Mosfet	⇒	18 KHz
Motors (feature)	⇒	Series excitation motors, 3 or 4 terminals in D-C.
Operating environment temperature	⇒	-30° ÷ +40°
Maximum attainable temperature of the Chopper body	⇒	+85°

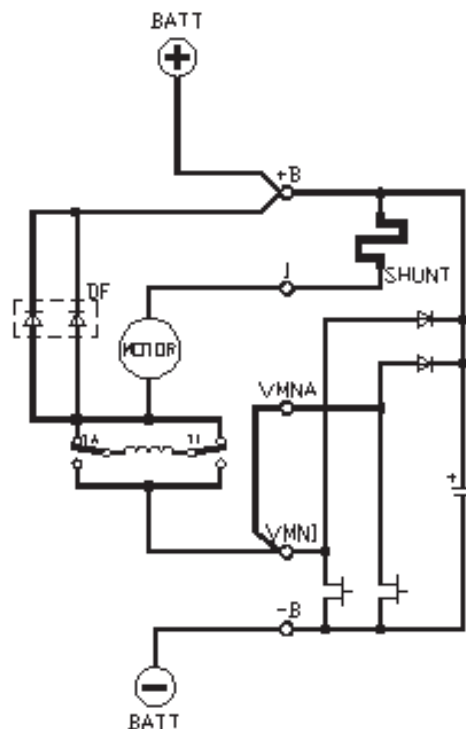
The Chopper can be set at any of 4 different operating configurations:

1. Traction control for 2-field motors and therefore 3 wires (H1 3 WIRES);
2. Traction control for 1-field motors without direction contactors (H1 4 WIRES S);
- 3. Traction control for 1-field motors with direction contactors (H1 4 WIRES T);**

The latter (H1 4 WIRES T) is the configuration used on the trucks dealt with in this manual.

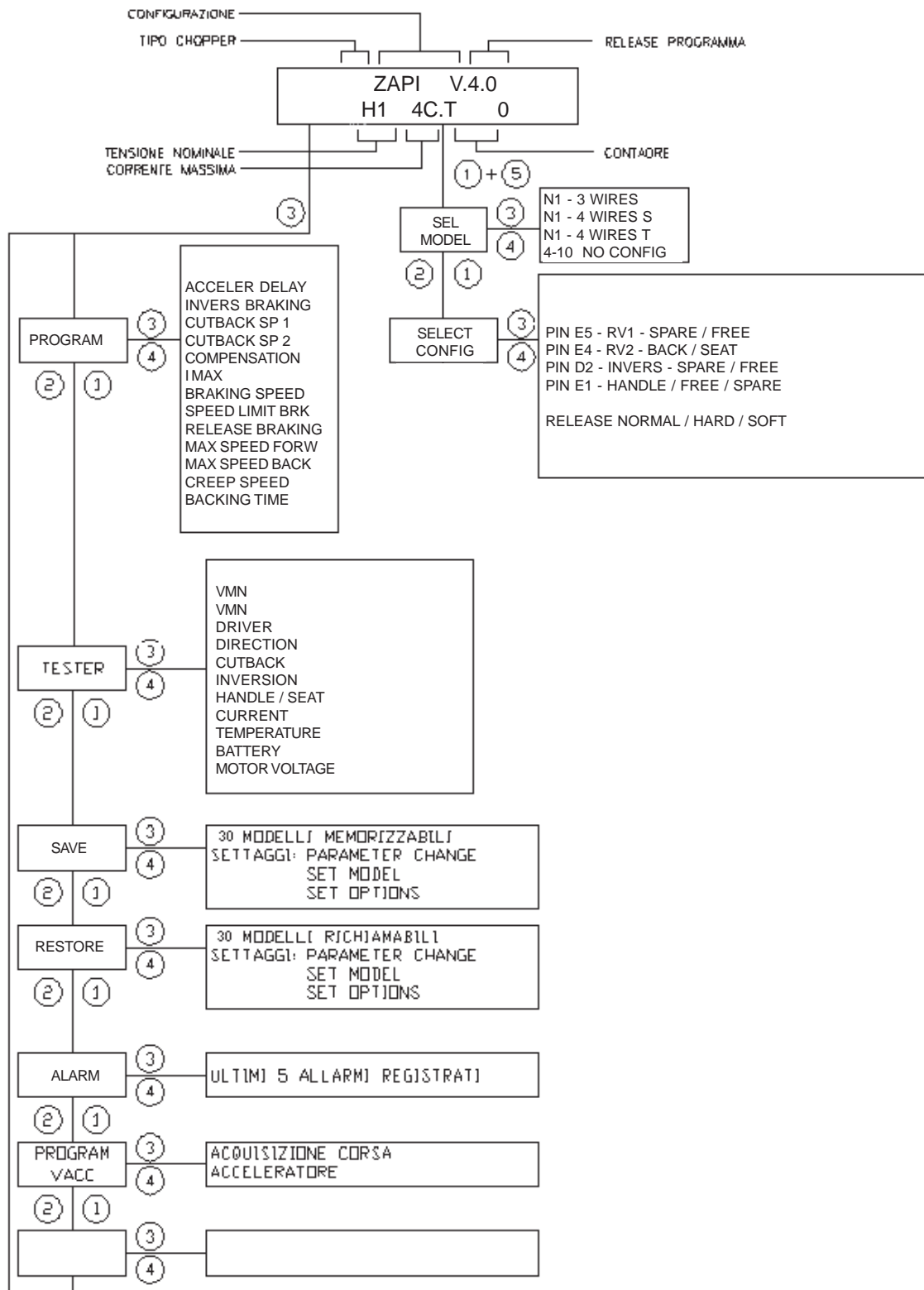
Below is the basic diagram for the H1 4 WIRES T configuration :

- Series excitation motor with 1 field and travel direction contactors.



4.0 HANDSET FUNCTION MAP

ELECTRICAL



A-200001

4.1.6

MAIN MENU / RESTORE



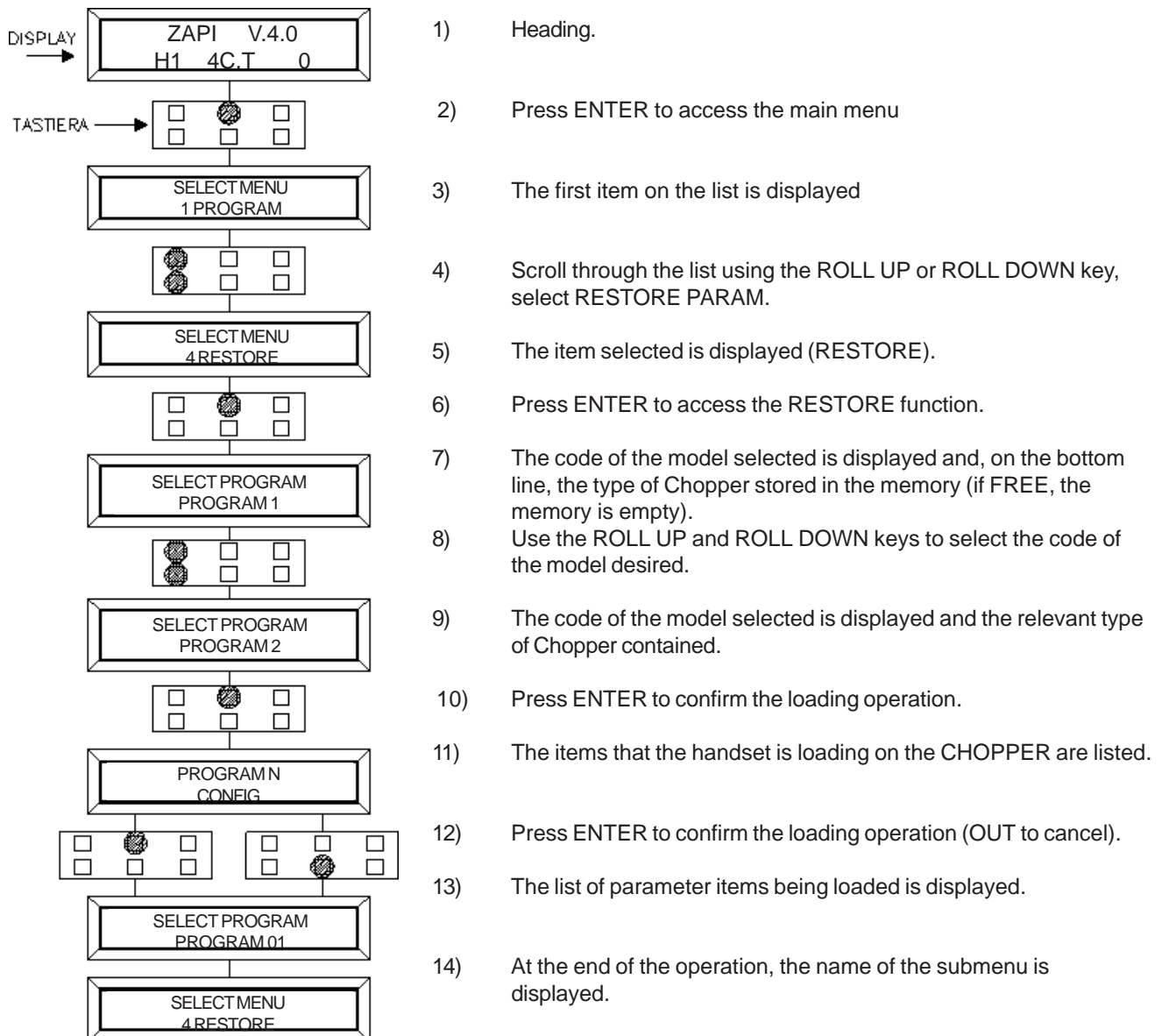
The RESTORE function can be used to transfer the programs of each model stored on the handset by means of the SAVE function, so that all the data for a truck model can be loaded on the Chopper in a single operation.

The data loaded into the Chopper through the RESTORE function are:

- all the parameter values (PROGRAM);
- settings of the options (CONFIG. I/O);
- setting of the model (SEL MODEL);

WARNING the RESTORE operation rewrites all the Chopper data; accordingly, after this operation, all the data items previously present in the Chopper memory are deleted.

Instructions for execution of the RESTORE function through the handset:



18) BATTERY

The battery is exhausted.

This alarm is given simultaneously with stopping of the truck, at this point the travel request must be repeated to be able to start again.

The maximum current is reduced by 50%.

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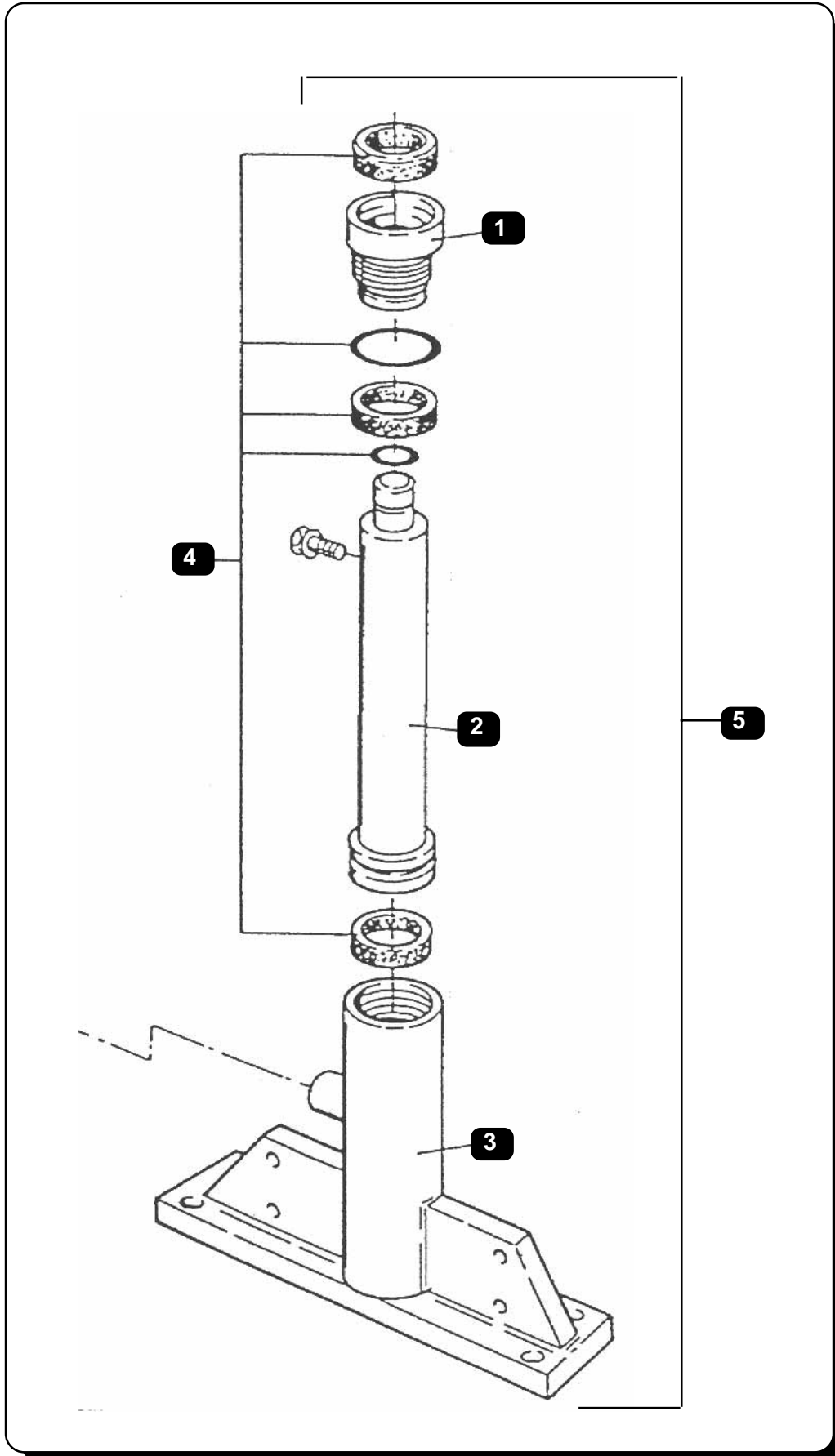


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3.0 LIFTING CYLINDER COMPONENTS
MOD. MP20X

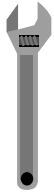
HYDRAULIC



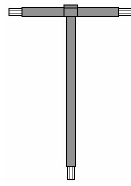
**4.3 ADJUSTMENT OF THE MAXIMUM PRESSURE LIFTING VALVE
MOD. MS 12X**

The regulations require the installation of a maximum pressure valve in the hydraulic system of the truck in order to safeguard the system from sudden rises in pressure that could seriously damage the components. The maximum pressure valve is fitted on the distributor on the left of the lever.

STANDARD TOOLS NEEDED



SOCKET WRENCH
10 mm



ALLEN WRENCH
3 mm

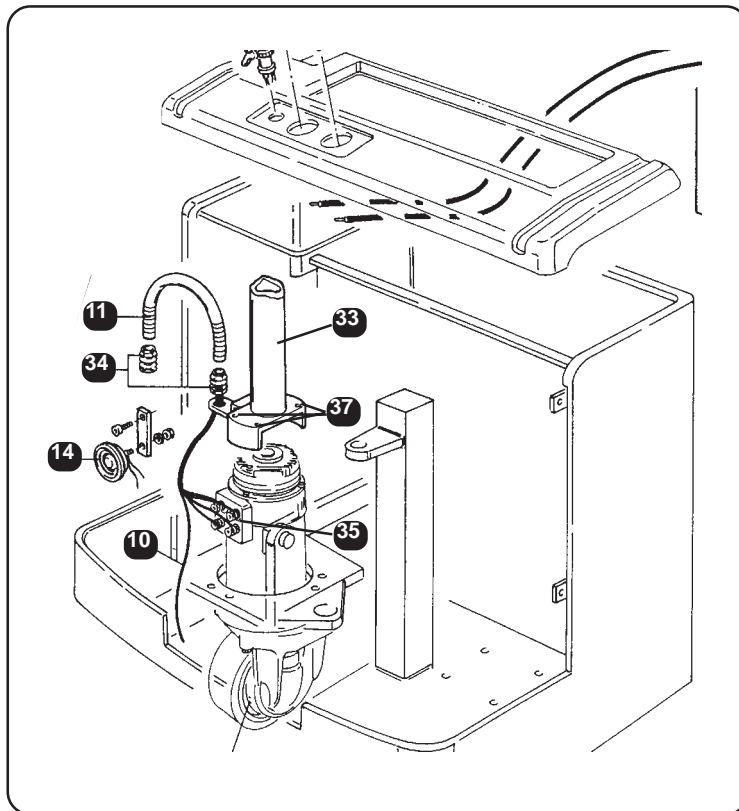
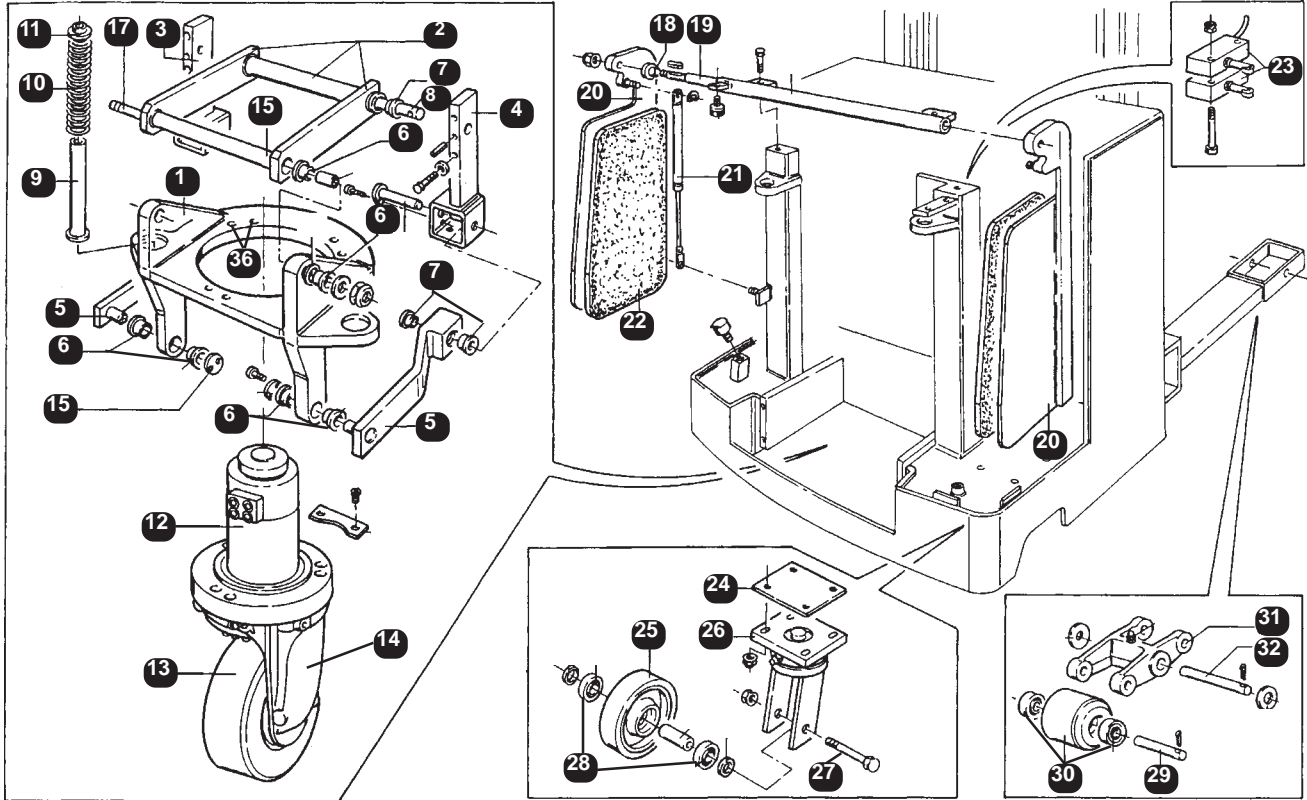
ADJUSTMENT PROCEDURE

- 1) Drive the truck to a safe place, far from the movement of other vehicles or passers-by. Before commencing any repair work, put on suitable safety clothing.
- 2) Lower the forks to the ground and place a nominal load on the forks.
- 3) WRENCH 10 mm - Unscrew the counter-nut of the adjustment screw.
- 4) ALLEN WRENCH 3 - Place the nominal load on the forks. Unscrew the adjustment screw until the cylinders just stop lifting; at this point, invert the direction of rotation, pull the distributor lever to actuate lifting, tighten the screw until the cylinders start lifting, and bring the load to the max. height.
- 5) Try lifting the load several times, ensuring the adjustment made remains unaltered.
- 6) UNIVERSAL WRENCH 10 - Tighten the locking counter-nut.

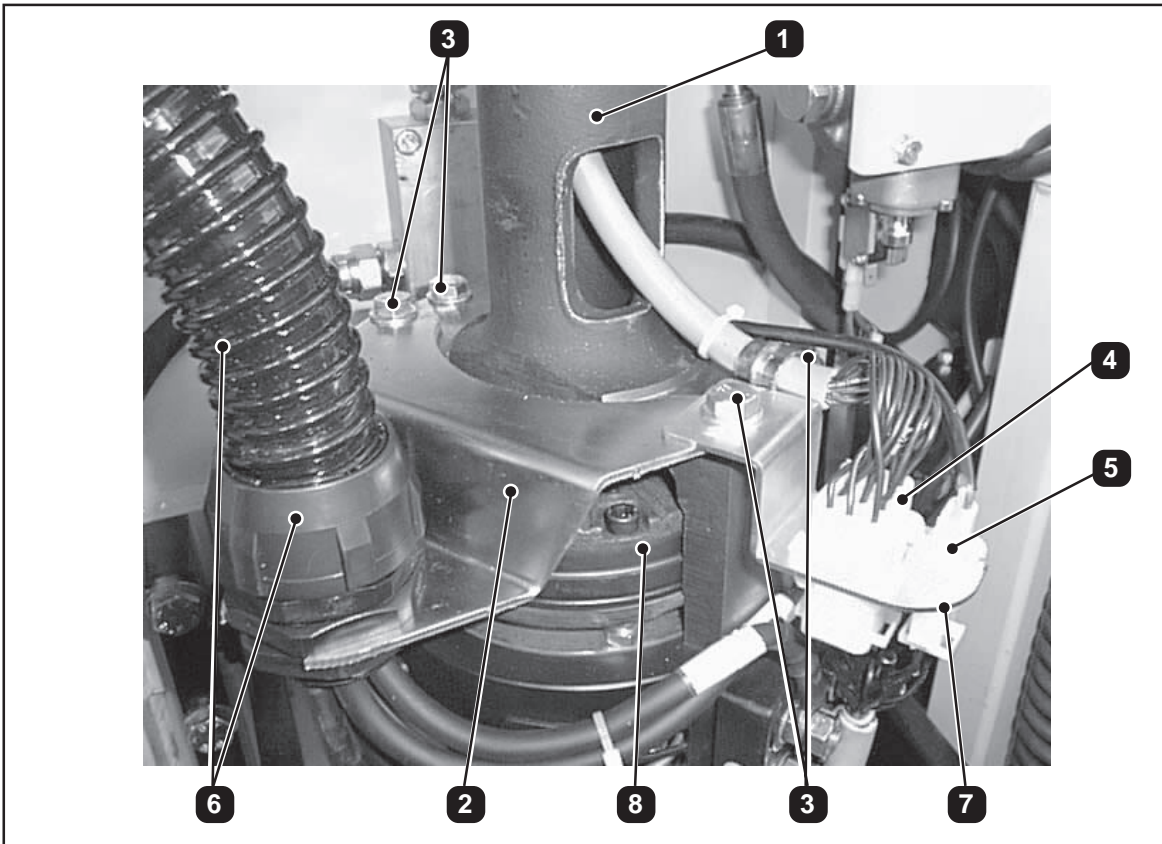
Truck model / Tipo carrello / Modèle chariot / Staplertyp / Tipo de carretilla **MP20X / MS12X**

1.2 REAR CHASSIS COMPONENTS
MOD. MS12X

CHASSIS



4.0 DISASSEMBLY OF TILLER
MOD. MP20X / MS12X



The various components shown on the adjacent page are described in the table below.

Key to understanding:

Ref. Reference of the component in the figure
Component description Function of component

Ref.	Component description
1	Tiller column
2	Motor cable sheath support
3	Tiller fastening bolts
4	Tiller sheath connector
5	Electromagnetic brake sheath connector
6	Motor cable sheath
7	Sheath connector support
8	Electromagnetic brake

Tab.03

NOTE: All Yale codes of the components may be looked up in the spare parts catalogue.

CHASSIS

9.0 DISASSEMBLY OF THE MOTOR PUMP

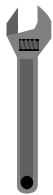
MOD. **MS12X**

The motor pump is attached to the oil tank and located between the chassis and the tank.

SPECIAL TOOLS NEEDED

- Oil can 10 lt.
- Average-size funnel

STANDARD TOOLS NEEDED



SOCKET WRENCH
13-17-19-22mm



MEDIUM SIZE PHILIPS
SCREWDRIVER



SLOT
SCREWDRIVER

DISASSEMBLY PROCEDURE

- 1) Drive the truck to a safe place, far from the movement of other vehicles or passers-by. Before commencing any repair work, put on suitable safety clothing.
- 2) Lower the forks to the ground using the down push button. Turn the key switch to OFF, disconnect the battery.
- 3) **HYDRAULIC JACK** - Lift the platform, insert the jack under the fixed chassis local to the platform. Lift the truck until the wooden blocks can fit underneath. Insert the blocks on either side of the jack and lower the jack. Let the chassis rest on the blocks and take away the jack.
- 4) **PHILIPS SCREWDRIVER** - Lower the platform: loosen the bolts securing the motor compartment hood (2 at the platform, 2 at the top part near the instrument compartment) and take off the hood.
- 5) **Socket wrench 13** - Unscrew the nuts locking the pump motor feed cables.
- 6) **WRENCH 19** - Unscrew the hydraulic coupling for oil supply to the distributor.
- 7) **WRENCH 17** - Unscrew the 1st bolt securing the tank at the base of the chassis (Fig. 2), lift the battery compartment, unscrew the 2nd tank securing bolt located above the battery compartment (Fig. 1), take out the tank with motor pump.
- 8) Put the tank in a raised position to let the oil drain off.
- 9) **SLOT SCREWDRIVER** - Unscrew the metal fastening strap of the pump suction pipe on the tank side.
- 10) Put the oil can with funnel underneath, loosen the pipe, drain off the oil, emptying the tank completely.
- 11) **WRENCH 13** - Unscrew the bolts (2) securing the motor pump support bracket, take out the motor.

Reassemble by inverting the steps of the disassembly procedure.

3.2 DISASSEMBLY OF FORK FRONT UNIT FROM SIMPLEX MASTS

MOD. **MS12X**

DISASSEMBLY PROCEDURE

- 1) Perform the operations described for disassembly of the forks from the triplex, duplex and single masts (Paragraph 3.1 steps 1 - 2 - 3).
- 2) **PLIERS** - Remove the cotter pins from the chain pins on the tightener located on the fixed mast, take the pins out, take the chains off and place them on the forks.
- 3) Connect the battery, turn the key switch to the ON position.
- 4) Pull the lifting lever, lift the mast carefully until the front unit has come completely out of the bottom part of the internal mast.

3.3 DISASSEMBLY OF INTERNAL TRIPLEX MAST

MOD. **MS12X**

DISASSEMBLY PROCEDURE

- 1) Disassemble the fork front unit (see Paragraph 3.1).
- 2) **WRENCH 22** - Unscrew the coupling of the hydraulic pipe of the cylinder at the by-pass block located at the base of the internal mast, unscrew the coupling of the hydraulic feed pipe from the pulley at the by-pass block of the internal mast.
- 3) **WRENCH 24** - Unscrew the coupling of the hydraulic pipe located on the fixed mast, remove the pipe, screw a plug in place of the coupling to prevent oil leaking out.
- 4) **WRENCH 19** - Unscrew the bolts (4) securing the cylinder to the internal mast, remove the cylinder.
- 5) Connect the battery, turn the key switch to the ON position.
- 6) Pull the lifting lever, lift the internal mast 20 - 30 cm., put the 100 x 100 x 200 wooden block under the internal mast; lower the lever, discharge the hydraulic cylinders until the lifting chains slacken.
- 7) Turn the key switch to the OFF position, disconnect the battery.
- 8) **PLIERS** - The lifting chains of the internal mast are attached to the chain-tightener on the fixed mast and to the comb welded at 300 mm from the base of the mast. With the pliers, remove the cotter of the chain pins in the comb, remove the pins, take off the chains from the chassis side of the truck.
- 9) **ALLEN WRENCH 6** - Unscrew the screws (2 + 2) securing the contrast rollers at the top part of the intermediate mast, take out the rollers.
- 10) **LIFTING SLING** - Put the sling around the mast horizontal member, hook the sling to the hook of the overhead crane, tighten the ropes and check that everything is perpendicular. Lift until removal is completed.

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