PANDROL "FAST CLIP" MACHINE with braking system

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ENGLISH

OPERATION AND MAINTENANCE

MANUAL

Cod. 6261264

Certified Environmental Management System
Certified Occupational Health & Safety Management System
Certified Quality Management System
WARNINGS

1 Before using the machine read the instructions contained in this manual carefully. SAVE THESE INSTRUCTIONS: this manual contains important safety and operating instructions for the machine.

2 During operation keep your hands outside the danger area.

3 Always wear protective glasses and working gloves.

Avoid wearing clothes which may present a risk to personal safety.

Only authorised personnel shall start or operate the machine.

The user shall not modify the design or configuration of the machine.

Cannot be used over switches and crossings.

Not to be used near live d.c. conductor rail.

Not to be used for any purpose other than for which machine is designed.

Do not exceed walking pace when pushing the machine.

9. RETURN TO Cembre FOR OVERHAUL

In the case of a breakdown contact our Area Agent who will advise you on the problem and give you the necessary instructions on how to dispatch the machine to our nearest service Centre; if possible, attach a copy of the Test Certificate supplied by Cembre together with the machine or, if no other references are available, indicate the approximate purchase date and machine serial number.

ADJUSTMENTS:
We suggest recording all adjustable ring nut settings in the table alongside to facilitate quick 'resetting' in future.

<table>
<thead>
<tr>
<th>EXTRACTIN</th>
<th>INSERTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>From «parking position» to «installation position».</td>
<td>From «insulator change position» to «installation position».</td>
</tr>
<tr>
<td>Complete insertion of the Fastclip.</td>
<td>Complete extraction of the Fastclip.</td>
</tr>
</tbody>
</table>

RING NUT SETTINGS

<table>
<thead>
<tr>
<th>RAIL:</th>
<th>RAIL:</th>
<th>RAIL:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ring nut upper</td>
<td>Ring nut lower</td>
<td>Ring nut upper</td>
</tr>
<tr>
<td>Ring nut upper</td>
<td>Ring nut lower</td>
<td>Ring nut upper</td>
</tr>
<tr>
<td>Ring nut upper</td>
<td>Ring nut lower</td>
<td>Ring nut upper</td>
</tr>
</tbody>
</table>

1. GENERAL CHARACTERISTICS

- **Application range**: suitable for inserting and removing Pandrol Fast clips* on standard-gauge rails (1435 mm).
- **Developed force** (single clamp) ........................................................................ 29,000 N
- **Dimensions**: (see Fig. 15, page 22)
- **Resistance between rail and wheel**: ................................................................ 1 Ω
- **Weight**:
  - complete machine: ............................................................................................. 129 kg
  - pump unit: ........................................................................................................... 50 kg
  - clamp unit: .......................................................................................................... 65 kg
  - carriage: ............................................................................................................... 9 kg
  - 3rd wheel bar: ..................................................................................................... 5 kg
- **Combustion engine**:
  - type: ........................................................................................................ 4-stroke, overhead valves, one cylinder
  - model: ........................................................................................................... Honda GX 160K1-QMD6
  - displacement: .................................................................................................... 163 cm³
  - power: ............................................................................................................... 4 kW
  - revs.: ................................................................................................................. 3700 rpm
  - exhaust emissions: ......................................................................................... HC+NOx = 10,53 gr/kW.h and CO = 433,37 gr/kW.h
  - fuel consumption: ............................................................................................ 0.9 litres/hour
  - fuel: .................................................................................................................. unleaded regular grade petrol
  - tank capacity: .................................................................................................. 3.6 litres
  - recommended oil: .............................................................................................. SAE 10W-30 (0.6 litres)
  - clutch: ............................................................................................................... centrifugal with automatic intervention
  - start: ................................................................................................................... by rope pull with automatic rewind
- **Hydraulic pump**:
  - max. pressure: ................................................................................................. 42 MPa
  - oil supply: ......................................................................................................... 5.6 litres/minute
  - speed: ............................................................................................................... 3700 rpm
  - recommended oil: ............................................................................................. AGIP ARNICA 32 or equivalents
- **Acoustic noise** (Directive 2006/42/EC, annexe 1, point 1.7.4.2 letter u)
  - The continuous equivalent weighted level (A) of noise pressure at the working place is equal to ...................... 95.3 dB (A), uncertainty K_{WA} ± 0.9 dB
  - The maximum value of instantaneous weighted noise pressure at the working place is less than 130 dB (C)
  - The level of noise force produced by the machine is equal to 95.3 dB (A), uncertainty K_{WA} ± 0.9 dB
- **Risks due to vibration** (Directive 2006/42/EC, annexe 1, point 2.2.1.1)
  - Tests carried out in compliance with the indications contained in ISO 5439 Standard, and under operating conditions much more severe than those normally found, certify that the weighted root mean square in frequency of the acceleration the upper limbs are exposed is 3.7 m/sec².

(*) "Pandrol Fast clip" is a Pandrol Ltd trademark.
2. MACHINE DESCRIPTION (Ref. to Fig. 1)

01 – TRANSPORT HANDLES
02 – MACHINE LIFTING POINT IN NEUTRAL POSITION
03 – HYDRAULIC PUMP OIL TANK
04 – ACCELERATOR
05 – WORKLIGHT ON/OFF SWITCH
06 – STOP/EMERGENCY BUTTON
07 – CLAMP CONTROL LEVER
08 – HANDLEBAR
09 – QUICK RELEASE MALE AUTOMATIC HYDRAULIC COUPLER
10 – QUICK RELEASE FEMALE AUTOMATIC HYDRAULIC COUPLER
11 – HYDRAULIC PUMP
12 – PUMP UNIT FASTENING/RELEASE KNOB
13 – WORKLIGHT
14 – ELECTRICAL TERMINAL BOX
15 – ENGINE
16 – PUMP UNIT FASTENING/RELEASE KNOB
17 – OIL COOLING RADIACTOR
18 – FRAME
19 – CLAMP UNIT LOCATING PINS
20 – PUMP UNIT LOCATING PINS
21 – TRANSPORT HANDLES
22 – HYDRAULIC RAM FOR MOVING THE LEFT CLAMP
23 – KNOB FOR REGULATING THE POSITION OF THE LEFT CLAMP
24 – QUICK RELEASE MALE AUTOMATIC HYDRAULIC COUPLER
25 – QUICK RELEASE FEMALE AUTOMATIC HYDRAULIC COUPLER
26 – HYDRAULIC RAM FOR MOVING THE RIGHT CLAMP
27 – GAS SPRING LEFT SIDE
28 – GAS SPRING RIGHT SIDE
29 – WHEEL LOCK/RELEASE KNOB
30 – KNOB FOR REGULATING THE POSITION OF THE RIGHT CLAMP
32 – BRAKE RELEASE DEVICE LOCK
33 – TRANSPORT HANDLE
34 – WHEEL
35 – FLEXIBLE HOSES
36 – EXTRACTION HOOK FASTENING/RELEASE KNOB
37 – RAM OVERRUN SPACER
38 – RING NUT FOR REGULATING RAM END OF STROKE
39 – ROD
40 – SUPPORT WHEEL ADJUSTMENT LEVER
41 – SUPPORT WHEEL
42 – INSERTING TOOTH
43 – CONTRAST JAWS
44 – EXTRACTION HOOK
45 – TRANSPORT HANDLES
46 – CONNECTING ROD FASTENING/RELEASE KNOB
47 – HORIZONTAL ALIGNMENT ADJUSTER
48 – CLAMP UNIT FASTENING/RELEASE KNOBS
49 – FRONT CARRIAGE WHEELS
50 – BRAKE RELEASE HANDLE
51 – BRAKE RELEASE DEVICE
FIG. 1 – MACHINE DESCRIPTION

PUMP UNIT

CLAMP UNIT

3rd WHEEL BAR

CARRIAGE

Clamp unit serial number
3. UNPACKING THE MACHINE

To reduce overall dimensions and weight during transport, the machine is supplied disassembled in sturdy wooden crates. The four component units are easily reassembled (see Fig. 1):

- **Pump unit:** combustion engine/hydraulic pump for clamp operation.
- **Clamp unit:** for inserting and extracting Fastclips.
- **Carriage:** for supporting and moving the machine along the track.
- **3rd wheel bar:** for stability and vertical positioning.

*The machine is supplied complete with:*

- 1pc spark plug key.
- 1litre hydraulic pump oil (do not use in engine).
- 1pc 12V - 21W spare bulb.

3.1) Transporting the units

The four units are well balanced for easy transportation in accordance with the table and diagrams in Fig. 2. For uniform weight distribution and to transport the pump and clamp units, always use the transportation handles provided.

<table>
<thead>
<tr>
<th>Distributed Load per Person (kg)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>5</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>25</td>
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<tr>
<td>G</td>
<td>25</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
4.1) Assembly of the machine

Select the rail to be worked on and the direction of operation, then assemble the machine as follows, referring to fig. 4:

With knob (29) engaged and wheel (34) blocked, raise the clamp unit by means of the handles (31 and 33) and rest this on the selected rail, positioning it in line with a sleeper for stability.

Rest the support carriage on the track and then pull and turn the fastening/release knobs (48). Lift the clamp unit by means of the handle (21) and locate (19) pins fully into their carriage housings as far as the stop.

Release the knobs (48) to lock the clamp unit.

4. INSTRUCTIONS FOR USE

PERIODIC OVERHAUL

Performed at the prescribed intervals or at the number of indicated working hours or at the occurrence of indicated extraordinary events

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ACTION</th>
<th>At every use</th>
<th>50 hours</th>
<th>Presence of evident signs of wear</th>
<th>In case of breakage</th>
<th>Long periods of inactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete machine</td>
<td>General cleaning with a clean cloth; paying attention to remove settled dirt</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Store the machine in dry place protecting it from shocks and dust</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolts and nuts</td>
<td>Visual &amp; manual checks of integrity</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete tightening</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible hose</td>
<td>Visual check of integrity</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Replacement</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic couplers</td>
<td>Visual &amp; manual checks of integrity</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete tightening</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubber dampers of the machine</td>
<td>Visual &amp; manual checks of integrity</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Replacement</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inserting teeth (42)</td>
<td>Visual &amp; manual checks of integrity</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extracting hooks (44)</td>
<td>Visual &amp; manual checks of integrity</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contrast jaws (43)</td>
<td>Visual &amp; manual checks of integrity</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic oil</td>
<td>Check reservoir level (Top up if necessary)</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light bulbs and fuse</td>
<td>Replacement</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas springs</td>
<td>Replacement</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braking device &amp; wheels</td>
<td>Visual &amp; manual checks of integrity</td>
<td>Ref. to § 7.1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 – Pull and turn the knob (46), insert the 3rd wheel bar in the carriage housing as far as the stop, aligning the hole in the end of the rod with the pin knob. Release the knob (46) so the wheel (41) can act as a support on the opposite rail so the assembly is stable and able to slide along the rail; the rod can be fitted to the carriage from either side for convenience in selecting the direction of work.

4 – Pull and turn the knobs (12 and 16) at the base of the pump unit. Lift the pump unit by means of the handles (01) and handlebar (08). Rest the pump unit on the clamp unit and align the pins (20) with the relevant locating holes on the under side of the pump unit. Release the knobs (12 and 16) for locking.

5 – Restore the oil delivery/return hydraulic circuit, connecting the flexible hoses by means of the quick couplings (09 and 10) to the respective connectors (25 and 24) on the clamp unit.

6 – Connect the brake release device (51) (ref. to § 4.1.1)

4.1.1) Braking device  (Ref. to Fig. 3a, 3b, 3c, 5)

To run the machine along the rail, it is necessary to connect the brake release device (51); proceed as follows:
– Introduce end part (A) into slot seat (B) located above the rear wheel of the clamp unit.
– Pull the handle (C) upwards, release it in position than push until is locked.
– Press the grip (50) to verify the correct engagement and disengagement of release pin (P) from the wheel. During the disassembly of the machine, before removal of the pump unit, the brake release device must be disassembled as follows:
– Pull the handle (C) and disconnect the end part (A) from slot seat (B).

7.1.4) Changing the gas springs  (Ref. to Fig. 23)
Replace the gas springs when required as follows:
– Using a flat-blade screwdriver, lift the retention collar at the end of the spring, pulling with force at the same time to release the spring from its locating pins.
– Fit the new spring on the same pins and press with force until this is properly fitted in the original position.

Note: the two springs differ from one another.

7.1.5) Maximum pressure valve  (Ref. to Fig. 24)
The hydraulic pump features a maximum pressure valve, factory set and sealed at 42 Mpa.

**NEVER CHANGE THE MAXIMUM PRESSURE VALVE SETTING AS THIS MAY CAUSE SERIOUS DAMAGE TO THE MACHINE.**

To check correct valve setting, a special pressure testing gauge is available (see § 8).

7.2) Routine maintenance of the engine
Checks and periodical assistance are indispensable to ensure smooth engine operation. Refer to the "HONDA owner’s manual" supplied with the machine, for the following operations:
– Oil change
– Air filter assistance (see double-element type)
– Cleaning sediment from sump
– Spark plug cleaning: recommended plugs BPR6ES (NGK) or W20EPR-U (DENSE)
– Minimum carburettor setting

7.3) Long periods of inactivity
– Store the machine in a dry environment, and adequately protect it against accidental damage and contamination (see § 8).
– For information on the combustion engine, refer to the "HONDA owner’s manual".
7.1.2) Topping up the oil in the hydraulic pump (Ref. to Fig. 19)

Periodically check the level of the oil in the hydraulic pump. The oil should always be visible inside the tank (03). If the level is low, **top up with the specific oil recommended:**

- Unscrew the cap and add sufficient oil to fill the tank; do not exceed the oil level.
- After topping up, tightly screw the cap back on.

*Always use clean recommended oil, see § 1. Do not use old or recycled oil. Do not use hydraulic brake fluid.*

7.1.3) Changing worklight bulbs

- Loosen the locking nut (Ref. to Fig. 20).
- Turn worklight upwards and remove the two screws in the lens (Ref. to Fig. 21) using a screwdriver.
- Remove the faulty bulb and replace with another having the same specifications: 12V - 21W
- Replace lens and tighten the two screws.
- Reset worklight to original position and tighten the nut.

*The light bulb power circuit is protected by a fuse against overcurrents and short-circuits. In case of a fault:*

- Remove the 4 screws from the lid of the terminal box (14) using a screwdriver.
- Pull out fuse carrier and open it (Ref. to Fig. 22).
- Replace faulty fuse with a new one with the same specifications: 6,3A - 250V.
- Push fuse carrier back, replace lid and tighten 4 screws.
4.1.2) Disassembly of the machine (Ref. to Fig. 4 and 4a)
To disassemble the machine:
- First lower the rear part and lock with pin (29), block wheel (34) then reverse the process described in § 4.1.
- Before disconnecting the pump unit, make sure to have disconnected the hydraulic circuit and the braking device; locate the hoses in support (S) got on the frame of the pump unit.

**NOTE:** Under normal conditions, the time taken to remove the machine from the rail is approximately 60 seconds.

FIG. 4a – SUPPORT

4.2) Moving the machine (Ref. to Fig. 4b)
To move the machine along the track, the rear part must be raised to prevent the clamps knocking against the Fastclip. To do this, simply:
1 - Pull and turn knob (29). The wheel arm will be freed.
2 - Slightly raise the machine by means of handlebar (08); lifting will be made easier by the two gas springs, then release the knob (29) to lock the machine fully up.
3 - Press brake release handle (50) against the handlebar (08).
4 - Push the machine along the rail.

**Before every use:**
- Check wheel for resistance, wheel should not be free rotating.
- Ensure wheel is clean, removing any dirt or mud.
- Check for signs of damage.

**Every 6 months:**
- Check for excessive braking on wheel. Wheel should roll along track when pushed, wheel will slide if excessive braking occurs.

Clamp unit wheel

**Before every use:**
- Check cable, linkages, springs and wheel for signs of damage.
- Check linkages are free moving.
- Ensure brake cable moves without resistance.
- With brake released, check that wheel rotates freely.
- Check that when handlebar lever is in the raised position, the brake is engaged.
- Ensure that wheel is clean of dirt and mud.
- Check that, before assembly, the wheel does not rotate one full turn in either direction.
- Ensure coupling is free of dirt and mud.

**Every 6 months**
- Check wheel pockets for excessive wear. If braking effectiveness is compromised, replace wheel.
- Check extension spring (see figure) on brake release handle (50) are undamaged.
- Check for wear on pivots.
- Ensure fasteners are secure.
- Check for wear on coupling, parts should mate securely.
- Clean all moving parts and lubricate as required.
4.3) Controls (Ref. to Fig. 5)
After gripping the handlebar (08), the operator can easily access all the unit controls and, more specifically:

- **Accelerator control lever (04):** changes engine rpm.
- **Worklight ON/OFF switch (05):** in case of night work or bad lighting, the clamping area can be illuminated by these side mounted lamps.
- **Stop/emergency button (06)** in a very visible position and easy to operate to stop the unit normally and in case of an emergency.

**Note:** when this button is pressed it remains in OFF position. To start the engine, the button should be turned clockwise so that it lifts automatically into the ON position.

**The engine will not start unless the red button (06) is lifted.**

- **Clamp control lever (07)** with swinging movement, for operating the clamps:
  - right side for inserting rail clips, "INSERT" position
  - left side for extracting rail clips, "EXTRACT" position
- **Brake release lever (50):** for safety reasons, the machine is equipped with an automatic braking device. This device is always engaged within the rear wheel. By pressing handle (50), the brake is released enabling movement of the machine along the rail.

7. MAINTENANCE

All electrical and mechanical maintenance shall only be carried out by authorised persons in accordance with a safe system of work and Cembre instructions.

Before servicing or removing any parts of the machine, stop the engine and allow it to cool. Always remove the spark plug cap from the spark plug when servicing the engine to prevent accidental starting.

7.1) Routine maintenance of the machine

At the end of each day, clean the machine carefully using a clean cloth, being careful to eliminate all dirt, especially near the moving parts such as the clamp teeth, piston rods and wheels. Do not rest the machine or units directly on dusty or muddy ground.

Regularly perform the following operations or inspections:
- Tighten all bolts.
- Check the integrity of the rubber dampers which reduce vibration caused by the engine-pump.
- If necessary, replace the insertion teeth (42), the hooks (44) and jaws (43) as these could become worn or damaged by long or improper use.

7.1.1) Maintenance of braking device (only for versions of machine with braked wheels)

The braking system is of robust construction and will require very little maintenance, however the following routine checks should be performed.

Dust, sand and dirt are a danger for any mechanical device. Avoid putting the machine on muddy ground. After every use, the machine must be wiped with a clean cloth, taking care to remove any residue, especially around moving parts.

Rear Carriage wheel (A):
4.4) Description of the "Pandrol Fastclip" (Ref. to Fig. 6)

The "FASTCLIPS" have three positions:

**PARKING POSITION**
All components are captive.

**INSTALLED POSITION:**
The Fastclip holds the rail.

**INSULATOR CHANGE POSITION :**
The Fastclip is withdrawn to the rear detent so that the side post insulator can be removed.

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**TROUBLESHOOTING**

When the starting cable is pulled, the engine fails to start:
- Is the Stop/Emergency button (06) released? (see § 4.3).
- Is there enough oil in the combustion engine?
  - The engine features an oil alert system to prevent damage caused by too little oil. Before the level drops below safe limits, the alarm system automatically stops the engine.
  - Refer to the "HONDA owner’s manual" for the type of recommended oil and topping up.
  - THE HYDRAULIC OIL SUPPLIED WITH THE MACHINE IS INTENDED ONLY FOR USE IN THE HYDRAULIC PUMP AND IS MUST NOT BE USED IN THE ENGINE.
- Is the fuel stopcock open?
- Is there fuel in the tank?
- Is fuel reaching the carburettor?
  - To check, loosen the carburettor drainage screw with fuel cock open and refer to the "HONDA owner’s manual".
- Is the spark plug producing a spark?
  - Remove the plug cap, clean around of the plug and remove the plug using the spanner provided.
  - Fit the plug back in the cap.
  - Move button (06) to **ON**.
  - After earthing the side electrode, pull the starting cable and check to see whether the plug produces a spark.

If the engine still fails to start, contact Cembre (see § 9).
6. STARTING THE ENGINE

- Move the stop button (06) (see § 4.3) to “ON” position (see Fig. 18a).

⚠️ The engine will not start unless the red button (06) is lifted.

- Move the fuel cock to “ON” position (see Fig. 18b).

- Move the air lever to “CLOSE” position (see Fig. 18b). Do not use the air lever if the engine is hot and the air temperature is high enough.

- Move the accelerator control lever (04) to mid stroke (see Fig. 18c).

- Start the engine by pulling the starting cable until a certain resistance is felt and then pull with force (see Fig. 18d).

**IMPORTANT:** Do not allow the cable knob to return forcefully and knock against the engine. Return this slowly to its original position. This will prevent damage to the starting device.

- As the engine heats up, gradually move the air lever to “OPEN” position (see Fig. 18b).

- Move the accelerator control lever (04) fully forward to achieve the correct rpm (see Fig. 18c).

- To stop the engine in emergency condition, press button (06).

- To stop the engine in normal conditions: move the accelerator control lever (04) fully back. Press the button (06). Move the fuel cock to “OFF”.

4.5) Preliminary machine adjustments (to be made with the engine switched OFF)

**MACHINE ADJUSTMENT IS ESSENTIAL TO ENSURE CORRECT OPERATION.**

The machine is extremely versatile and adaptable to the many operating situations to be found along a railway line (different types of rails, UIC60 etc. with different flange heights and widths, different types of Fastclips and anchoring supports); for this reason, before using, some initial adjustment will be required to define the correct machine setup during work.

It is most important that the following conditions be met for subsequent Fastclip insertion and extraction operations:

- Contrast jaws of both clamps centred on the shoulders of the Fastclip supports and resting perfectly on their top (§ 4.5.1 and § 4.5.3).
- Movement of the machine parallel with the rail (§ 4.5.2).

4.5.1) Centred positioning of contrast jaws (Ref. to Fig. 7)

The two clamps are independent of each other, so it will be necessary to adjust knobs (23 and 30) to set the positions of both the contrast jaws (43).

- Move the machine up to a pair of Fastclips.
- Lower the machine completely to determine the position of the contrast jaws (43).
- If necessary, turn the knobs (23 and 30) clockwise to move the clamps away from the rail or anti clockwise to move them closer to the rail (see Fig. 7).
- Continue adjusting until the moving jaws centre on the top of the support shoulders.
- Lower the machine to make sure it is correctly supported as shown in Fig. 8.
4.5.2) Adjusting the height of the front of the machine  
(Ref. to Fig. 9)

After making the adjustments described in § 4.5.1 proceed to adjust the machine vertically as follows:

- Fully lower the machine so it is resting on the support shoulders.
- View the machine from the side to check the clamp unit is parallel with the upper surface of the rail head.
- If necessary, turn adjuster (47) (see Fig. 9) anticlockwise to raise the front of the machine or clockwise to lower it, using the graduated scale to achieve precise positioning (e.g. set at 1.4 for UIC 60).

Note: It may be easier to use the adjuster (47) with the clamp unit partially disconnected from the carriage.

4.5.3) Stable rest of both the contrast jaws  
(Ref. to Fig. 10)

Both contrast jaws (43) must be supported in the same way on the top of the support shoulders.

- Fully lower the machine so it is resting on the support shoulders.
- View the machine from the side to check the contrast jaws (43) must be supported in the same way on the top of the support shoulders.
- If this is not the case, after making the adjustments described in § 4.5.1 and § 4.5.2 proceed to adjust the machine vertically by means of the support wheel (41):
  - Fully lower the machine so it is resting on the support shoulders.
  - Loosen handle (40).
  - Lower or raise the rod (39) to change the vertical angle of the machine and achieve correct alignment.
  - After making adjustments, fully retighten handle (40).

If this is not the case, turn the lower ring nut anticlockwise to increase the ram stroke or clockwise to reduce it, then try another extraction; several attempts may be necessary to achieve exact Fastclip position. Use the graduated scale for fine and precise adjustment.

- Once exact adjustment has been made on a ram, position the ring nut of the other ram on the same graduated scale value.

5.2.2) "Insulator change position" of the Fastclips:

Follow the instructions at § 5.2.1 being careful to regulate the lower ring nut so as to increase ram stroke, thereby favouring greater Fastclip return movement.

5.2.3) "Complete extraction" of the Fastclips from shoulders;

For all the operating stages described so far, the spacers (37) must be in the position shown in Fig. 17a, for total extraction of the Fastclips only. Ram overrun will be necessary. This can be obtained in the following way:

- Move the clamps fully forward by pulling the control lever (07) to the right to "INSERT" position.
- Lift the spacers (37) (see Fig. 17a), turn them by 90° (see Fig. 17b) and move them back down (see Fig. 17c) so the long slot fits into the stop; this will ensure complete exit of the Fastclip.

We suggest recording all adjustable ring nut settings in the table on page 29.
4.6) Operation

Before use, always check:
- Integrity of the machine.
- The correct coupling of the units making up the machine.
- Correct connection of the quick couplings and the braking device.
- Correct level of oil in pump.
- For any oil leaks in the hydraulic circuit (radiator, hoses, pump).
- Flexible hoses are in good condition and show no signs of wear or crushing.
- Protection devices in the clamp areas are firm and show no signs of damage.
- That the engine fuel tank cap is tight. Petrol is highly inflammable and can explode.

- Start the engine (see § 6)
- With knob (29) released, push the machine to the rail clips points on which operations are to be performed (see § 4.2)

4.6.1) SIMULTANEOUS INSERTION OF 2 FASTCLIPS

Make sure the locking knob (29) of the wheel is released (see § 4.2).

An “insertion operation” means (see § 4.4):
1 - Moving from “parking position” to “installation position”.
2 - Moving from “insulator change position” to “installation position”.
3 - In exceptional cases, the complete insertion of the Fastclip.

- Push the machine to the Fastclips on which operations are to be performed (see § 4.2).

IMPORTANT: when performing the first insertion operation, the correct stroke of the rams will have to be established so the Fastclips are positioned precisely (see § 5.1).

- Make sure the clamps are open by pulling the clamp control lever (07) to the left in “EXTRACT” position.
- Fully lower the machine at the Fastclip points.
- Pull and turn knob (36) to release the extraction hook (44) which will position horizontally (see Fig. 15).
- Move the extraction hook (44) fully forward by pulling the control lever (07) to the right to “INSERT” position.
- Check the position of the hook (44) at the end of stroke; if necessary, adjust the ring nut by turning anticlockwise to increase the stroke and position the fastener just after the Fastclip hood (see Fig. 12a).
- Once exact adjustment has been made on a ram, position the ring nut of the other ram on the same graduated scale value.

The lower ring nut establishes the ram stroke during extraction. To adjust, proceed as follows:
- Turn the lower ring nut of a ram until the reference line is in intermediate position of the graduated scale, POS. 2.

5.2.1) “Parking position” of the Fastclips:

- Perform a removal operation (see § 4.6.2) and check the position of the Fastclip.
- When in “parking position” the Fastclip hood must normally be 6 - 12 mm from the edge of the side post insulator (see Fig. 16), unless otherwise indicated.

5.2) Adjusting ram stroke for the extraction operations

During extraction, the upper ring nut establishes ram stroke during movement of the clamp towards the rail; to adjust this, proceed as follows:
- Fully turn the upper ring nut clockwise until the reference line is in proximity to POS. 4.
- Make sure the clamps are open by pulling the clamp control lever (07) to the left in “EXTRACT” position.
- Fully lower the machine at the Fastclip points.
- Pull and turn knob (36) to release the extraction hook (44) which will position horizontally (see Fig. 15).
- Move the extraction hook (44) fully forward by pulling the control lever (07) to the right to “INSERT” position.
- Check the position of the hook (44) at the end of stroke; if necessary, adjust the ring nut by turning anticlockwise to increase the stroke and position the fastener just after the Fastclip hood (see Fig. 12a).
- Once exact adjustment has been made on a ram, position the ring nut of the other ram on the same graduated scale value.

The lower ring nut establishes the ram stroke during extraction. To adjust, proceed as follows:
- Turn the lower ring nut of a ram until the reference line is in intermediate position of the graduated scale, POS. 2.

### FIG. 14

Diagram showing the graduated scale for the upper and lower ring nuts with reference lines for maximum (0) and minimum (4) stroke.

### FIG. 15

Diagram showing the extraction hook (44) being released and moved forward to the “INSERT” position.

NOTE: Because the two clamps are independent, their movement may be different, with different reaction times.

Movement of one of the clamps is schematically shown in the illustration; the other will have an identical and opposite movement.
4.6.2) SIMULTANEOUS EXTRACTION OF 2 FASTCLIPS

Make sure the the locking knob (29) of the wheel is released (see § 4.2).

An "Extraction operation" means (see § 4.4):
1 - Moving from “installation position” to “parking position”.
2 - Moving from “installation position” to “insulator change position”.
3 - In exceptional cases, the complete extraction of the Fastclip.

- Push the machine to the Fastclips on which operations are to be performed (see § 4.2).

**IMPORTANT:** when performing the first extraction operation, the correct stroke of the rams will have to be established so the Fastclips are positioned precisely (see § 5.2).

- Make sure the clamps are open by pulling the clamp control lever (07) to the left “EXTRACT” position.
- Pull and turn knob (36) to release the extraction hook (44) which will position horizontally (see Fig. 15).
- Fully lower the machine and position the jaws (43) so these rest on the top of the support shoulders (see Fig. 12a).
- Move the extraction hook (44) fully forward by pulling the control lever (07) to the right “INSERT” position (see fig. 12a).
- After positioning on the Fastclip, pull the control lever (07) to the left to “EXTRACT” position and keep it pressed until clamp movement stops: the hooks (44) will gradually move back, with consequent removal of both the Fastclips (see Fig. 12b). After removal, pull the control lever (07) to the right to “INSERT” position until the machine is released.
- Lift the machine, move to the next Fastclips and repeat the above operations.
- Having completed the operation, return the hooks (44) to the vertical position and block these with knobs (36).

**NOTE:** Because the two clamps are independent, their movement may be different, with different reaction times.

Movement of one of the clamps is schematically shown in the illustrations; the other will have an identical and opposite movement.

5.1) Adjusting ram stroke for the insertion operations

The upper ring nut establishes the stroke of the ram during forward movement of the clamp towards the rail during Fastclip installation; to adjust this, proceed as follows:
- Turn the upper ring nut of a ram until the reference line is in the intermediate position of the graduated scale, POS. 2 (see Fig. 14).
- Perform an insertion operation (see § 4.6.1) and check the position of the Fastclip. When in installation position, the Fastclip must normally be at 1-3 mm from the edge of the side post insulator (see Fig. 13), unless otherwise indicated.
- If this is not the case, turn the upper ring nut clockwise to increase the stroke of the ram or anticlockwise to decrease it, then try another insertion: several attempts may be necessary to obtain the exact position of the Fastclip. Use the graduated scale for fine and precise adjustment.
- Once exact adjustment has been made on a ram, position the ring nut of the other ram on the same graduated scale value.

The lower ring nut establishes ram stroke during clamp opening, after installation of the Fastclip; to avoid any wasteful empty stroke of the ram, we suggest regulating the stroke until the reference line is in the intermediate position of the graduated scale, POS. 2, so the clamp opens just enough to release the machine from the Fastclips and allow placement on to the next Fastclips. If necessary, proceed to make an even finer adjustment. Once exact adjustment has been made on a ram, position the ring nut of the other ram on the same graduated scale value.