IDENTIFICATION OF TRACTOR

The serial number of the machine is stamped on the right side of the gear box (Fig. 11).
Always state the tractor serial number when placing an order for spare parts and asking for technical assistance.

Figure 1 Identification of tractor

FOREWORD AND RECOMMENDATIONS

The following technical literature is delivered with each Ferrari tractor:
- OWNER'S MANUAL Inspection and maintenance instructions
- ENGINE HANDBOOK
- DIRECTIONS AND SUGGESTIONS FOR USERS OF FERRARI TRACTORS
- CERTIFICATE OF GUARANTEE

TECHNICAL ASSISTANCE

FERRARI MACCHINE AGRICOLE place their Technical Assistance Service at Customer's disposal in order to solve any problem concerning use and maintenance of their machines.
CUSTOMERS may send their requests in writing to

O.M. FERRARI F. S.p.A.
Via Valbruna, 414
42045 LUZZARA (Reggio Emilia - ITALIA)
Tel. (0522) 835524 (5 lines)
Telex B30144 FERMAC

The Makers reserve the right to modify the machine for any requirement of a commercial, constructive and character without obligation to update this publication promptly.

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ENGINE
The tractor is normally equipped with a Johnson
LDA 678 engine. Engine main specifications are the
following:

- Type: four cylinder, four stroke, air cooled diesel engine.
- Maximum rate: 3000 rpm.
- Maximum power: 15 HP.

Upon request, different types of engines are available.

CLUTCH
Dry single plate clutch
Upon request, large diameter double clutch controlled
through a single pedal to disengage the wheel drive from
the power take off.
**SPEED SELECTION**

Speed selection is allowed through a range selector (HIGH, LOW, REVERSE) and three speed gearing. The speed box is provided also at the 7th speed used for road movement operations.

<table>
<thead>
<tr>
<th>TYPE SIZE</th>
<th>SPEED km/h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td></td>
<td>1.2.3.7.12.3.7.12</td>
</tr>
<tr>
<td>9.5-20</td>
<td>1.50</td>
</tr>
</tbody>
</table>

*Note: with 750-18 tyres, the rear speed decreases slightly, 10%.*

**DRIVE AND STEERING**

Drive on the front and rear wheels through selection differentials. Hydraulic steering with pick acting on the central joint.

**WHEELS AND TYRES**

From wheels: 9.5-20 tyres

Front wheels: 9.5-20 tyres

Track variation is allowed on both sides.

Tyres 750-18 are available on request.

<table>
<thead>
<tr>
<th>TYPE SIZE</th>
<th>TYPE</th>
<th>INFLATING PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5-20</td>
<td>Tractor Agriculture</td>
<td>1.4 to 1.6 kg/cm²</td>
</tr>
<tr>
<td>9.5-20</td>
<td>Tractor Agriculture 2</td>
<td>1.4 to 1.6 kg/cm²</td>
</tr>
<tr>
<td>9.5-20</td>
<td>Tractor Agriculture 4</td>
<td>1.4 to 1.6 kg/cm²</td>
</tr>
<tr>
<td>9.5-20</td>
<td>Tractor Agriculture 4</td>
<td>1.4 to 1.6 kg/cm²</td>
</tr>
</tbody>
</table>

**HYDRAULIC LIFTER**

Independent hydraulic circuit.

Pump directly coupled to engine. Control valve ensuring an automatic adjustment of work depth and effort.

Hydraulic lift for 1 Tm. 2 or 3 point connection.

Allowable load at arm: 1000 kg approx.

**FOXXER TAKE-OFF**

The tractor is normally equipped with two four-power take-off:

- A upper power take-off providing two-speed range independent from tractor speed, a clutch reduces: assume the synchronized rotation with all gears in high speed range.

- A lower power take-off providing two-speed range independent from the tractor speed range in the same as the upper power take-off.

The two power take-off are standardized according ASAE 1°-201. Dimensions are given in fig. 2. Rotation is clockwise.

**BRAKES**

Service brakes: hydraulic type at front and rear wheels.

A pedal controls the special service-controlled pump for simultaneous break in all wheels.

Parking and emergency brakes: same lever controlled, mechanism design, acting on rear wheels.

**ELECTRIC EQUIPMENT**

Rated voltage 12 Volt

Battery capacity 200 Amp (two 45 Amp batteries are provided)

Batteries are recharged through alternator and voltage regulator.

Lighting system are horn are tested and approved for road circulation.

**UPPER AND LOWER TAKE-OFF SPEED**

<table>
<thead>
<tr>
<th>POSITION OF CONTROL LEVER</th>
<th>ENGINE RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2400</td>
</tr>
<tr>
<td>2</td>
<td>640</td>
</tr>
<tr>
<td>3</td>
<td>750</td>
</tr>
</tbody>
</table>

**TOWING HOOK**

Adjustable in two sections. Chain "B" approved for road travel.

Dimensions are shown in fig. 2.

**TRACTOR WEIGHT**

Weight of the tractor in running order is 1300 kg.

Allowable ballast: 200 kg.
Figure 3: Comparison of power take-off and towing hook
SERVICING

TYRE INFLATION
1. FRONT WHEELS ............................... Tyres type Tractor Agritec 4 pr. B 520
- inflation pressure 1.4 to 1.6 kg/cm²
2. REAR WHEELS ............................... Tyres type Tractor Agritec 4 pr. B 520
- inflation pressure 1.5 to 1.8 kg/cm²

FILLING
1. FUEL TANK ................................. Capacity 16 litres
   Use Diesel fuel (Benzin fuel if possible)
2. ENGINE AND AIR FILTER ............................ For lubricant type and capacity see engine
   handbook
3. GEAR BOX ................................. Capacity 1.5 kg
   Use BP Energol GR-XP 220 (ISO) oil, or all
   AGIP F1 ROTRA HYDRO SAE 90
4. REAR AXLE HOUSING ........................... Capacity 16 kg
   Use BP Energol GR-XP 220 (ISO) oil, or AGIP F1 ROTRA HYDRO SAE 90
5. HYDRAULIC SYSTEM ........................... Capacity 7 kg
   Use BP Energol HL 68 oil or AGIP ISO 55
   oil
6. TILLER HOUSING ............................ Capacity 1.5 kg
   Use BP Energol GR-XP 220 (ISO) oil, or AGIP F1 ROTRA HYDRO SAE 90
7. BRAKING SYSTEM RESERVOIR ........................ Capacity 6.25 kg
   Use BP 750 BRAKE FLUID oil or AGIP
   BRAKE FLUID oil
CONTROLS AND INSTRUMENTS OF TRACTOR

CONTROLS AND INDICATORS ON DASHBOARD

1. Signal of directional lights on (GREEN);
2. Signal of directional lights for trailers (GREEN);
3. Signal of headlights fully on (BLU/WHI);
4. Signal oil level reserve in use (RED);
5. Signal oil in reserve for battery recharge (RED) (optional);
6. Signal of low oil pressure to engine (RED);
7. Key switch
   E. Lights circuit on
   C. No circuit
   1. All circuits low
   2. Engine starting
8. Switch for directional lights and flashers
9. Switch for right and left
10. Multiple revolution-counter and hour-meter (dashboard instruments)
   • Outer scale reads engine rpm
   • Intermediate red scale reads power take-off rpm - 2nd speed. Whatever the equipment used, it is recommended to keep constantly at about 750 rpm (see reference note)
   • Inner red scale reads power take-off rpm in 1st speed. Whatever the equipment used it is recommended to keep constantly at about 550 rpm (see reference note)
   • The second hour-meter records the actual hours of engine operation.

Figure 4: Controls and indicators on dashboard
CONTROLS FOR DRIVE AND WORK OPERATIONS

1. Steering wheel
2. Dashboard (see fig. 41)
3. Key switch for engine ignition and starting
4. Manual accelerator control lever
5. Range lever control lever (HI, LOW, REV.)
6. Gearshift control lever (1st - 2nd - 3rd - 4th)
7. Clutch pedal
8. Brake pedal
9. Accelerator pedal
10. Parking and emergency brake control lever
11. Parking brake unlocking pushbutton
12. Engine stop knob
13. Independent power take-off lever
14. Synchronized power take-off lever
15. Differential locking lever
16. Work pump control lever (position and effort control)
17. Hydraulic lifter lever
18. Driver seat adjusting knob

* The suspension is adjusted through knob 18.
  In turning knob clockwise, suspension will be increased, counter clockwise turning will decrease.
USE OF TRACTOR

RUNNING-IN

During the running-in period, at first 80 hours of operation, special care should be taken throughout the beginning.

**A** ENGINE

- After 20 hours: change oil
- After 50 hours: clean and set fuel injection
- During the first 80 hours: avoid heavy-duty and extended work.

**B** AIR FILTER

- After 20 hours: clean the first element
- After 30 hours: change oil

**C** HYDRAULIC SYSTEM

- During the first 80 hours: inspect frequently
- Required maintenance or adjustment as prescribed in the beginning of the operating hours.
- After 80 hours: change oil (Mobil 600 or AGI 400)

**D** MAIN UNITS

- During the first 80 hours: inspect all main units before setting, gear box, drive system, attachments, control linkage, etc.; for security of attachments, frequently.

For detailed instructions consult "Directions and Suggestions for Users".

![Diagram of tractor]

**Figure 0** Instructions for running-in

STARTING OF ENGINE

- For additional information about engine operation, refer to the appropriate instruction booklet (owner's manual).
- For normal starting, proceed as follows (Figure 7):
  1. Make sure that the engine switch is fully pushed in.
  2. Make sure that all control levers (2) are in NEUTRAL position.
  3. Bring accelerator control lever (13) to half-way position.
  4. Insert key in switch (4) and turn to position "2".
  5. When motor is started, release key which will revert automatic to position "1".

**Note**

In case of failure to start, wait a few seconds prior to doing the starting sequence again, not to cause battery running down.

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Consult the engine handbook for additional information.

**STOPPING THE ENGINE**

1. Bring all control levers to NEUTRAL position.
2. Before turning off the engine, let it run for a few minutes at low RPM to make cooling easier (this is most advisable after a long run or trip).
3. Pull emergency stop switch (Fig. 7, detail 11).

**WARNING**

Do not try to stop the engine by pressing clutch key to coast on "O" because the engine may keep on running. Some operation of engine with power off may visibly change the condition.

4. Remove key from switch.
5. After the engine stops, fully push the stop knob (11) otherwise the engine will not start next time.

**USE OF TRACTOR**

**OPERATION SEQUENCE**

1. Press clutch pedal (Fig. 8, detail 11).

**Figure 8. Operation sequence**

2. Select the needed forward range (Low, Hi, Reverse) through lever (21).
3. Select the desired speed using 1st, 2nd or 3rd through lever (21).
4. Gradually release the clutch lever.
5. Regulate the position of the accelerator hand wheel so that the engine runs evenly and without exhaust smoke.
6. For all subsequent operations and measurements, use the accelerator pedal on "O".

**WARNING**

1. In the event any resistance is encountered when engaging the correct gear or position, particularly during running in, always depress
**WARNING**

If the gearshift lever is brought back from the 7th speed to any other gear setting, the range selector automatically returns to its previous position.

Therefore, for example, shifting from the 7th speed to the 3rd speed, if the range selector was in the reverse position, the tractor will switch from a speed of about 25 km/h forward to a speed of about 9 km/h in reverse.

Thus, before shifting from 7th speed to others, it is ESSENTIAL TO CHECK THE SPEED ENGAGED IN THE RANGE SELECTOR BY OBSERVING THE POSITION OF THE POINTED. It is recommended as well to keep the range selector even in the "NEUTRAL" position when shifting to 7th speed.

The manufacturer is not responsible for any damage caused by operator to third parties due to improper use of the range selector and gearshift lever.

**POWER TAKE-OFF**

The tractor is equipped with two power take-off (see fig. 10). They are used for various implements.

- Lower power take-off provides two independent speeds for operating in small implements.
- Upper power take-off provides two independent speeds as the lowest small and medium and additional provisions for synchronizing in various implements with the entire gearshift range.

All specifications relating to the power take-off's dimensions and operating speed are listed on the "TRACTOR DATA SHEET" and fig. 3.

**SYNCHRONIZATION OF UPPER POWER TAKE-OFF**

The synchronized power take-off is driven by the bevel pinion of the rear axle when the rotating belt is engaged (fig. 10, BETA 13). When the tractor is at stop, power take-off does not rotate, switching from forward to reverse, but in direction as the power take-off is reversed as well.

Whenever the speed engaged, synchronized power take-off performs 4,280 revolutions per revolution of the engine.

---

Figure 9. Use of 7th speed

USE OF 7TH SPEED (See figure 9)

Whenever the speed previously engaged in the range selector (6th, 7th) LOW REV, it is increased by engagement of the lever in the 7th gearbox position. This position makes the tractor proceed forward only at maximum speed and hence is used for fast road movement operations.

1. Selector control lever
2. Gear control lever
3. Working gears
4. Neutral
5. Transfer gear
6. 1-2-3 Working gears
7. Neutral
8. Transfer gear

---

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The synchronized power take-off essential scope is rowing drawbared tractors. The tractor type trim and reduction ratios must be selected on the basis of the number of revolutions made by the power take-off.

**POWER TAKE-OFF SYNCHRONIZER CONTROL LEVER**

The control lever is located on the right-hand side of the rear axle box (see Fig. 105). Control lever is in two positions as follows:

1. Depress clutch pedal.
2. To have power take-off engaged, push lever "UP" DOWN.
3. To have a neutral, pull lever "UP" UP.

**IMPLEMENTS POWER TAKE-OFF**

(NEITHER UPPED OR DOWN)

**OPERATING SEQUENCE**

1. Depress clutch pedal.
2. Engage power take-off in the desired speed by bringing the proper lever Fig. 105 to position 1 (Lower speeds) or to "UPPER" (All speeds).

---

**CAUTION**

Make sure the control lever is properly engaged.

3. Gradually release clutch pedal.

**FRONT AND REAR DIFFERENTIAL Locking Lever**

The proper control lever to be actuated as follows (see Fig. 111).

1. For LOCKING the differentials, stop tractor and pull control lever (UP) beyond the detent (12).
2. To UNLOCK the differentials, release the control lever (11) from the detent (22) and take it DOWN.

---

**WARNING**

- When engaging the differentials locking lever, slightly steer the tractor in right hand and left hand to make locking engagement easier.

---

1. Upper power take-off independent or synchronized
2. Guided power take-off to be put in either power take-off when not in use
3. Synchronized power take-off control lever
4. Independent power take-off control lever
5. Gear shift lever
6. Range selector lever
7. Electrical connector for trailer
8. Towing hitch

---

**Figure 16. Power take-off and controls**

---

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- DO NOT ENGAGE differential locking when tractor is under stress.
- TO DISengage locking, depress & hold pedal to un-latch the wheels thereby allowing the locking dispersal to disengage.
- Do not go round corners with the differential locked.
- Do not keep the differential locked when unnecessary.

**HYDRAULIC LIFTER LEVER**

The control lever acts as follows (see Fig. 12):
1. LEVER UP: the implement header raises.
2. LEVER DOWN: the implement header lowers.
3. LEVER FULLY DOWN: the implement header gets "Floating".

**Figure 12. Control system of implement header: hydraulic lever**

"STATIONARY" OR "FLOATING" POSITION

**Note**

Make sure the controlled effort lever (Fig. 13, item 13) is adjusted (position 10 of graduated scale).

"STATIONARY" USE

"Stationary" position makes it possible to load and hold the implement in any position inside or outside the ground according to the position selected with the lever. See Fig. 12, item 11. Implement movement depends upon lever position.

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CONTROLLED EFFORT LEVER

The controlled effort lever makes it possible adjusting the hydraulic effort sensitivity as follows (see fig. 13):

1. LEVER AT END No. 1 of graduated scale, the implement acts with full power and highest sensitivity when resistance is encountered.

2. LEVER BACK the number "0" of graduated scale; the implement gets more sensitive and tends to raise when resistance is encountered.

Note

The controlled effort lever can be used only in conjunction with the 3-point hitch.

APPLICATION OF CONTROLLED EFFORT

The controlled effort provision is particularly designed for all controlled implements (no wheel and no heading gear units) which should work in even deep soil or work in very deep soil.

With an appropriate setting of the effort control lever, the implement height varies according to the resistance offered by the soil. The terrace runs more smoothly and the speed is almost constant.

Operate the controls as follows (see fig. 13):

1. Lower the implement by gradually bringing the lever control lever to "Down" position.

2. Keep adjusting the lever until the implement gets steadily in required depth.

3. Lock the lever fully to bring it to same position in starting any stroke.

4. Adjust the lever sensitivity actuating lever (1) as shown in figure 13.

CONNECTION FOR IMPLEMENTS

The tractor is equipped with a two or three point hitch. Consult inside "DIRECTIONS AND SUGGESTIONS FOR USERS" for instructions concerning connection provision.

CONNECTION OF A TILLER

(Sec. 11)

1. Connect the tiller joint (1) to the tractor implement holder by means of pins (2).
2. Connect the tiller arm (3) to joint (1) by means of the appropriate pins (4).
3. Connect the tine attachment to tiller arm (3) through the appropriate bars (5). Adjust the position of the implement with the adjustment nuts (6). The working depth of tiller is controlled according to requirements in moving the side slides of a bar. This is done removing screw (8) and gliding it into another hole. Make sure adjustments on both sides of the tiller.
4. Connect universal joint (9) to the power take-off shaft. Depress the safety button (10) and make sure the joint goes beyond the catch. Then insert the chuck end of universal shaft provided with a safety button (10) onto the tiller shaft and bring the universal shaft (10) back to catch position.

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1. Tiller arm
2. Connecting arm
3. Tiller arm
4. Connecting arm
5. Vertical tie-rods
6. Tiller arm
7. Adjustment nuts
8. Screw for work on depth arrangement
9. Universal joint
10. Safety button
11. Tie rod side side

**Figure 14** Tiller connection

**PLough CONNECTION**

(see fig. 15)

1. Connect arms (1) to tractor flanges located in the lower portion of rear hub and insert through appropriate pins.
2. Connect retaining cables (2) to arms (1) and flanges located on the axle shaft supports of rear wheel.
3. Connect sprag (3) to tractor implement holder through appropriate pins (4).
4. Connect plough to arms (1) and sprag (3) locking it through pins (5).
5. Connect plough to lifter arms through vertical tie bars (6).
6. Adjust the length of the two lifting tie-rods so that plough lifting is limited to a strictly essential level only.

**CONNECTION FOR DRIVING WHEEL TRAILERS**

1. Connect the trailer universal joint to the synchronized power take-off shaft (upper shaft).
2. Engage the parking brake lever of trailer into the corresponding position.
3. Connect the tractor electrical system to the trailer through a 7-pole connector (fig. 15, item 12).
4. Engage the synchronized power take-off control lever as described and shown (see fig. 13).
5. If the trailer is a dump body model provided with hydraulic load, waive connection of tractor hydraulic system to trailer body equipment through the appropriate quick hydraulic intake (fig. 10), then it is fitted on the tractor (see detail).

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LIFTING OF TRAILER BODY

For body lifting follow procedure summarised below:

1. Actuate the hydraulic loader control lever until arms (24) are fully raised.

2. Move outer end controlled effort lever (31) to a 10° position on the graduated scale.

3. Lift the dump body of trailer by pushing FORWARD lever (34) of the control valve.

TOWING HOOK

The tractor is provided with a road towing hook. See Fig. 3 for these dimensions.

The towing hook can be located either under or above the power take-off (PTO) shown in Fig. 101.
TRACK VARIATION

GENERAL

To meet the working requirements of the various implements and attachments, all tractor models provide track variation.

ADJUSTMENT OF FRONT AND REAR TRACKS

The sides of rear and front wheels can be adjusted to position of wheels and rotating tracks as shown in Fig. 17.

To dismantle wheel and disc, lift the tractor rear or front portion by means of a jack placed beneath the tractor body.

Note

In arranging for adjustment of front and rear tracks, make sure the wheel is not be positioned in the forward movement rotation direction shown by an arrow on tire sidewall.

Front and rear wheels should be constantly symmetrical about the tractor longitudinal axis.

---

SECTION VIEW OF FRONT AND REAR WHEELS

---

<table>
<thead>
<tr>
<th>POSITION</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 9.50</td>
<td>1300 mm</td>
<td>1140 mm</td>
<td>1185 mm</td>
<td>1065 mm</td>
<td></td>
</tr>
<tr>
<td>Type 7.50-16</td>
<td>310 mm</td>
<td>1140 mm</td>
<td>1185 mm</td>
<td>250 mm</td>
<td></td>
</tr>
</tbody>
</table>

Figure 17 Variation of front and rear tracks
MAINTENANCE

LUBRICATION AND INSPECTIONS

Make prescribed operations as stated hereinafter at the intervals stated. The hours are meant to be the actual working hours of the machinery. Lubricants to be used are quoted in table "SERVICING INSTRUCTIONS" at the beginning of present manual.

EVERY 8 HOURS (DAILY)

ENGINE: check oil level, keep saturated.

AIR FILTER: under exceptional dusty conditions the filtering element should be cleaned. Procedure to be as follows:
- remove cleaning cover (1) and remove cup (2);
- clean the filtering element (3) by means of gasoline or solvent. If the filtering screen is plugged or damaged, replacement will be necessary;
- clean cup (2) with gasoline and fill it with fresh oil (same oil as for engine - up to level (4));
- where a "cylinder" filter is installed, clean pre-cleaner with gasoline or solvent.

POINTS TO BE GREASED EVERY 25 HOURS!

- GEAR PLATE - grease 1 point
- SLIDING JACK JOINTS - grease 2 points
- HYDRAULIC LIFT ARMS - grease 2 points
- UNIVERSAL JOINTS - grease 2 points
- WIRODIX GEARS: PIVOT, SELECTOR LEVER, POWER TAKE-OFF LEVERS - grease 3 points
- PIVOTS OF BRAKE AND CLUTCH CONTROLS - grease 2 points.

EVERY 60 HOURS (MAXIMUM INTERVAL)

AIR FILTER: cartridge should be cleaned in accordance with the foregoing and if it be damaged. Intervals for cleaning depend upon ambient conditions, however never exceed 60 hours.

EVERY 100 HOURS

ENGINE: change oil.
- HYDRAULIC SYSTEM: RESERVOIR, check the level, with implement raised and storage control packs fully drawn back, oil level should be at spacer 20 mm from bottom edge (Fig. 19).

![Figure 19. General view of hydraulic system and brake system reservoir](https://tractormanualz.com/)

1. Hydraulic oil reservoir
2. Hydraulic oil filling plug
3. Brakes system oil reservoir
4. Brakes system oil level
5. Filling plug

Figure 18. Engine oil filter

1. Oil or filter
2. Cup
3. Filtering element
4. Oil level
EVERY 200 HOURS

**FUEL SYSTEM:** clean the filtering elements, in following procedure outlined here (fig. 221).

1. Drain the outlet tube filling.
2. Unscrew bolt (1) and remove cup (2) and filtering cartridge (3).
3. Remove filtering element (3) with gasoline or solvent and replace it if screen is found to be clogged or damaged.
4. Screw cup (2) with gasoline or Diesel fuel.
5. Reassemble filtering element (3) in making sure seal (4) is in order and accurately seated in groove.

**HYDRAULIC SYSTEM:** replace filtering cartridge of hydraulic system reservoir. Operating sequence (fig. 221):

1. Remove range (11) and filter unscrewing screw (12).
2. Screw in oil filling cartridge (31) from flange (11).
3. Screw down the new cartridge onto the flange. Reinstall the flange and fasten it through screws (21).

**BRAKES:** verify efficiency of service brakes and parking brake. If necessary take action for correction in following procedure outlined later in the B64H163.
CLUTCH verify efficiency of control system. If necessary take action for adjustment in following procedure outlined later in the booklet.

1. Flange
2. Fastening screw
3. Filtering element
4. Seal
5. Return piping of hydraulic oil
6. Fastening screws

Figure 23. Adjustment of the differential locking control

EVERY 500 HOURS

HYDRAULIC SYSTEM: change oil (see fig. 101)
GEARBOX: change oil (see fig. 241)
REAR AXLE BOX: change oil (see fig. 261)

Figure 24. Oil fitting plug for gearbox

Figure 25. Oil fitting plug for rear axle box

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INSPECTIONS AND ADJUSTMENTS

GENERAL

Information and specifications given here below refer to equipment manufactured to be used only on "Ferron 88" tractors exclusively.

Directions for any overhaul and repairs are contained in a separate service manual.

BRAKES

Service Brakes

1. SYSTEM INSPECTION: If the braking action is found to be delayed, bleed the system through bleed valves located on the brake cylinder heads (Fig. 26, item 21). When bleeding is complete, top off oil level in reservoir by adding fresh oil.

   **WARNING**

To bleed air from the braking system, disconnect pipe line [1] from the pump fitting and have air exhausted in the rear circuit. Connect bleed pipe [15] again until blue action for bleeding the front circuit.

2. BRAKES ADJUSTMENT: If the pedal stroke of pedal is found to be excessive, adjust the brake shoes as follows (Fig. 25):
   - Turn screw [3] to cause internal cam to get in touch with shoe.
   - Verify brake pedal stroke and make sure that when cam turns,
   - Assume the brake pedal when machine is running,
   - Check adjustment of the control cables of the parking brake. If necessary follow procedure outlined.

Parking brake (see Fig. 26)

If the braking action is found to be poor, adjust control cables through nuts [18] fitted on control lever of the parking or emergency brake.

Note

If braking shoes are found to be worn out, the internal lever of the hand brake is allowed to come in touch with brake. This will eliminate the braking action. Replacement of shoes is then necessary.

---

1. On-cylinder pipe to cylinder
2. Bleed valve
3. Actuating, draw for breaking gross opening
4. Exhause pipe
5. Oil pipe from pump reservoir
6. Servo-controlled brake valve
7. Oil reservoir for braking system
8. Actuating line for control cables

Figure 25. Bleeding of brake system and brake adjustment.
CLUTCH

1. The clutch pedal should make an ideal stroke of approx. 15 mm prior to obtaining disengagement of clutch.

2. If the ideal stroke is insufficient (clutch slipping), or excessive (interference is not complete) adjust the lever control rod using Fig. 27 through adjusting nut (21), till an ideal stroke of 15 mm is obtained.

3. In the event of unsuccessful adjusting procedure, have the clutch disassembled and inspected in a specialized workshop.

![Figure 27: Clutch adjustment]

LOCKING OF THE DIFFERENTIALS

Periodically make sure the differential locking system is properly adjusted. A correct adjustment is achieved by following procedure outlined (see Fig. 28).

1. Make sure that equalizer springs (1) are 2 mm approx. from spring return rings (2). Control lever to be in "LOCKED" position.

![Figure 28: Differential locking adjustment]

HYDRAULIC SYSTEM

GENERAL

A schematic diagram of the hydraulic system is shown in Fig. 29.

In the event of unextraneous or improper failure of implement, despite of smooth operation of the engine, the same procedure as described in pages concerning the hydraulic system maintenance to be followed.

ELECTRICAL EQUIPMENT

Tractor circuits are provided with protective fuses located under the engine hood (see Fig. 30).

The elementary wiring diagram including appliance supplied on request, is shown in Fig. 31.
Figure 29. Hydraulic system diagram

1. Hydraulic pump
2. Hydraulic oil reservoir
3. Filter on oil return
4. Relief valve
5. Steering jack
6. Hydraulic steering valve
7. Main control valve
8. Lift jack
9. Control lever for implement up and down
10. Working depth adjusting lever

Figure 30. Fuse-box of electrical equipment
HYDRAULIC SYSTEM

SYSTEM INSPECTION

GENERAL

All necessary operations for an accurate inspection are described here below. Overhaul of the hydraulic system will ensure its satisfactory performance. Recommended steps for setting valves are outlined as well. Strictly follow prescribed procedure.

CHECKING OF OPERATING PRESSURE

Preliminary operations

1. Install a pressure gauge with 250 kPa or 375 psi on end of scale manifold in the hydraulic pump delivery fitting (see fig. 32).

Note

Location of hydraulic pump on engine body may be different from that indicated in fig. 32. Location may vary according to the engine installed on tractor.

2. Start the tractor engine and maintain operating at 2000 RPM approx.

STANDING SYSTEM OPERATING PRESSURE

(See fig. 33 and fig. 34)

1. Through the steering wheel steer tractor wheels in right or left as far as practicable (steering lock to be fully extended or retracted).

2. Make sure pressure gauge reading is 100 to 110 kPa. If reading is different, adjust settings through valve (fig. 33 or fig. 34, item 11 of the hydraulic power steering unit), by screwing unit on or off adjusting screw (121) after removing valve cap (53).

![Figure 32. Installation of pressure gauge on the hydraulic pump delivery](https://tractormanualz.com/)

![Figure 33. Setting of the hydraulic power steering valve (example A1)](https://tractormanualz.com/)

![Figure 34. Setting of the hydraulic power steering valve (example B1)](https://tractormanualz.com/)
OPERATING PRESSURE OF HYDRAULIC LIFTER

* Place lever (2) in the "LIFT" position and lever (11) in "C" on the graduated scale.
* Fully depress lever (3) to direction shown in the figure and hold it in place. Make sure that pressure gauge reads 100 to 120 kg/cm².
* If leak, make sure that no oil or leakage occurs in the main control valve. Remove cover (4) and clean valves located beneath.

**CAUTION**

Do not tamper with adjusting nut (5) on main control valve. ADJUSTMENT HAS BEEN ACCOMPLISHED BY TRACTOR MANUFACTURER AT TIME OF INSTALLATION.

RELIEF VALVE OPERATING PRESSURE

a. Fully depress lever (fig. 39, item 3); pressure shown and hold it in place.

b. Slowly release (fig. 39, item 3) until the approximate range is reached. Make sure that pressure gauge reading is 150 to 180 kg/cm².

c. If necessary, set the hydraulic system relief valve (fig. 39, item 5) to a screwing or setting of adjusting nut with a screwdriver. Remove cap prior to testing action.

**WARNING**

Operating pressure in the hydraulic system never to exceed 180 kg/cm².

---

1. Relief valve
2. Adjusting nut responsible for cap

Figure 35: Inside of hydraulic lift operating pressure

Figure 36: Setting of the hydraulic system relief valve

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### TROUBLE SHOOTING

**HYDRAULIC LIFTER**

*Note:

Any failure in lifter operation is generally caused by improper or contaminated oil. When changing or replenishing, only use oil as recommended by manufacturer and always observe cleaning and housekeeping practices.*

<table>
<thead>
<tr>
<th>TROUBLE</th>
<th>PROBABLE CAUSE AND REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lifter will not come up level at crank.</td>
<td>Insufficient oil level. Fill oil reser voir.</td>
</tr>
<tr>
<td>2. Lifter does not lower. (This may be encountered in the case of a new apparatus after a very extended operation from initial test.)</td>
<td>Insufficient oil level. Fill oil reservoir.</td>
</tr>
<tr>
<td>3. Lifter not returning from pump.</td>
<td>Insufficient oil level. Fill oil reservoir.</td>
</tr>
<tr>
<td>4. Lifters does not remain in place, slips or falls with little pressure. When engine is still, and pump down.</td>
<td>Insufficient oil level. Fill oil reservoir.</td>
</tr>
<tr>
<td>5. fearless system pressure.</td>
<td>Insufficient oil level. Fill oil reservoir.</td>
</tr>
<tr>
<td>6. Check valves appear “up”</td>
<td>Insufficient oil level. Fill oil reservoir.</td>
</tr>
<tr>
<td>7. Engine runs at high rpm.</td>
<td>Insufficient oil level. Fill oil reservoir.</td>
</tr>
<tr>
<td>8. Cushion pad worn, weak, or loose.</td>
<td>Insufficient oil level. Fill oil reservoir.</td>
</tr>
</tbody>
</table>

*For troubleshooting, refer to the diagram.*

---

https://tractormanualz.com/
Figure 37. Hydraulic lift control valve

Figure 38. Adjustment of UP lift stop rod
### Hydraulic Steering

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause and Remedy</th>
</tr>
</thead>
</table>
| Incorrect steering movement | 1. Air in the system. Bleed the system.  
2. Jack packings are faulty. Replace all jack seals.  
3. Hydraulic steering valve dirty. Where valve of Fig. 33 is fitted, disassemble and clean restrictions. Where valve of Fig. 34 is fitted, disassemble and clean valve piston and verify that springs are not broken. |
| Excessive force required to rotate the steering wheel | 1. Differential locking engaged. Release it.  
2. Improper alignment of lifter tilt setup. Lower the lifter. If trouble is not solved, follow suggestions given under section 17 concerning trouble shooting of hydraulic lift. |

**CAUTION**

In the event the above described inspection or other hydraulic steering and replacement of worn out packings are not sufficient to solve the trouble encountered, HAVE THE HYDRAULIC POWER STEERING UNIT REPLACED WITHOUT DISMANTLING. ANY HYDRAULIC POWER STEERING UNIT REPAIR SHALL BE MADE EXCLUSIVELY BY MANUFACTURER OR AUTHORIZED PERSONNEL. THE MANUFACTURER DISCLAIMS ALL LIABILITY ON REQUEST OF WARRANTY IF HYDRAULIC POWER STEERING UNIT APPEARS TO BE TAMPERED WITH.
HOW TO ORDER SPARE PARTS

NOTE

When ordering always state:
- TYPE AND MODEL OF THE MACHINE
- SERIAL NUMBER OF THE MACHINE
- CODE NUMBER OF THE PART
- REQUIRED QUANTITY
- REQUIRED DELIVERY TERMS
- ADDRESS OF THE ORDERING PARTY

HOW TO IDENTIFY A PART

Identify the parts required on the figure by the whole machine. It has been split into individual sub-units as shown by the ordering of the figures.

- Read the code number. If the code number does not have any symbol alongside it, it is valid for all similar items on the top part of the figure. If the code number has one or more symbols alongside it, each part has more than one number and symbol alongside them; the right one must be identified by reading the meaning of the symbols.

For better machine-running, greater security and guarantee, always ask for ORIGINAL SPARE PARTS.

SYMBOLS USED IN THE SPARE PARTS CATALOGUE

The numbers mentioned are only an indication:

- ROUND [ ]
- SQUARE [ ]

Indications of meaning of the symbol are as follows:

Example:

[ ] 3000

Indicates a part for a machine

[ ] 12000

Indicates a part for a machine

[ ] 8556001

- Indicates a part indicated is valid for machines from Serial No. 8556001 onwards

TRIANGULAR [ ]

Subsequently symbols

- ENGINE
- ROTATOR WITH FIXED HOOD
- ROTATOR WITH ADJUSTABLE HOOD
- ADJUSTABLE DISC WHEEL
- FOTE 6516
- PUMP
- ELECTRIC SYSTEM
- JUNCTION
- CUTTING BARS
- CUTTING BARS TEETH
- TYPE OF MACHINE

ASTERISKS

Indications of validity of spare parts:

- STANDARD: The parts thus indicated are standard parts made by the manufacturer
- SPECIAL: The parts thus indicated are supplied as per customer's request

ABBREVIATIONS

- Left [ ]
- Right [ ]
SPARE PARTS CATALOGUE

INDEX OF ILLUSTRATIONS

Fig. C*099A-1  Body 1st party
Fig. C*099B-1  Body 12th party
Fig. C*099C  Clutch and control
Fig. C*109A  Double clutch 1st party
Fig. C*109B  Double clutch 2nd party
Fig. C*109E  Gear case
Fig. C*1305A  Gearbox 1st party (for all machines)
Fig. C*1305B  Gearbox 12th party (straight tooth gear)
Fig. C*1306C  Gearbox 12th party (Helical gear)
Fig. C*1306D  Gearbox 12th party (Straight - tooth gear)
Fig. C*1306E  Gearbox 12th party (Helical gear)
Fig. C*1407B  Gearbox shifting mechanism 1st party
Fig. C*1407E  Gearbox shifting mechanism 12th party
Fig. C*1611  Differential, front
Fig. C*1605  Intermediate housing
Fig. C*1705A  Pto housing
Fig. C*1705B  Pto axle, gears and control
Fig. C*1705C  Pto axle, shaft and differential
Fig. C*2130A-1  Front hydronic brakes
Fig. C*2207B-1  Rear hydronic brakes
Fig. C*2207A  Implement after - Two part hitch
Fig. C*2207B  Implement after - Three part hitch
Fig. C*2605A  Electrical system 11th part
Fig. C*2605B  Electrical system 12th part
Fig. C*2803  Accessories
Fig. C*2903  Wheels
Fig. F1123-2  Rotary cultivator, drive shaft
Fig. F1301A-1  Rotary cultivator, case and components
Fig. F1301C-2  Rotary cultivator, frame

HYDRAULIC EQUIPMENT

Refer to figures H20007 through H20033

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[Diagram of parts and assembly]
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**Diagram**

- **A**: Diagram of the hydraulic components and their connections.
- **B**: Close-up view of the hydraulic hose connections.
- **C**: Schematic representation of the hydraulic system.

---

**Legend**

- **N1**: Hydraulic fluid reservoir.
- **V1**: Hydraulic valve.
- **U1**: Hydraulic cylinder.
- **NI**: Hydraulic pump.
- **DI**: Hydraulic piston.

---

**Translated Section**

- **H00529**: Hydraulic hose connection point.
- **H00530**: hydraulic fluid supply line.
- **H00531**: hydraulic fluid return line.

---

**Additional Notes**

- **LDA**: Hydraulic line diagram.
- **LDB**: Lubrication diagram.
- **LDC**: Electrical diagram.

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