VAPOURISING OIL TRACTOR INSTRUCTION BOOK

Harry Ferguson Ltd., Coventry, England

TYPES

TE-D 20
(Normal Width)

TE-E 20
(Narrow Width)
WARNING

Keep a new tractor on light work for fifty hours.

Do not attempt to turn sharply using one brake when travelling at high speed.

Drive slowly in difficult going.

Do not carry anything on the implement.

Keep all nuts and bolts tight. This precaution is a general practice with all good operators, who have found that it prolongs the life of the tractor by keeping all parts in perfect alignment.

Use an adequate shield to protect the power take-off universal joints.

Do not use the drawbar without the drawbar stays.

Allow ten seconds to elapse before re-engaging starter if previous attempt at starting has failed.

IT IS HIGHLY DANGEROUS TO PULL ANYTHING FROM THE TOP LINK CONNECTION.

YOU HAVE BEEN WARNED
WARNING AGAINST OVERLOADING

The third gear should not be used with any implement which operates underneath the ground such as a plough, cultivator, etc.

The hydraulic system is designed to operate perfectly in first or second gear but it will not operate perfectly in third gear.

The third gear is too fast for normal implement work. Implements such as ploughs and cultivators, which operate underneath the ground, and which are liable to catch on obstructions, are not designed to stand stresses above $3\frac{1}{2}$ m.p.h. (5·6 k.p.h.). It is a fallacy to think that operating in third gear will save the tractor and save fuel for normal work. This gear for normal work would cause overloading, and overloading is disastrous to the life of a tractor.

The third gear is meant to be used for light work only and for implements which operate above the ground, such as a light roller.

A SIMPLE TEST OF OVERLOADING

With the tractor in motion set the throttle lever about half way open. Then quickly flick the throttle fully open. If the tractor speeds up rapidly the engine is not overloaded—if slowly, the engine is overloaded. These remarks apply to any tractor. The overloading should be remedied at once to avoid serious damage.

When operating up a steep hill the above test might indicate overloading. This is not harmful as it is compensated for when coming downhill.

It is continuous overloading that must be avoided.
KEY TO ANNOTATION

A—OIL PRESSURE GAUGE
B—IGNITION SWITCH
C—GEAR LEVER
D—TRANSMISSION OIL FILLER PLUG
E—FOOTREST
F—CLUTCH PEDAL
G—INDEPENDENT BRAKE PEDALS
H—THROTTLE LEVER
J—TEMPERATURE GAUGE
K—CHOKE CONTROL
L—STEERING GEARBOX OIL FILLER AND LEVEL PLUG
M—STEERING DRAG LINK BALL JOINT
N—BRAKE RATCHET
O—COMBINED BRAKE PEDAL
P—HYDRAULIC SYSTEM CONTROL LEVER

ENGINE STARTING PROCEDURE. Fig. 1

1. Ensure that there is ample fuel in both tanks for the work in hand and that the brake is on and the ratchet engaged.

2. When cold, start the engine on petrol. Ensure the fuel system is fully primed with petrol by:
Operational Section

(a) turning over to petrol 2 minutes before finishing work. This saves fuel and will clear the system of vaporising oil for easy re-starting.

or

(b) if tractor has been stopped on vaporising oil, set fuel tap to PETROL. Drain about half-cup of fuel from the carburetter drain tap. The fuel drained off can be returned to vaporising oil tank.

3. Fully close throttle lever (move anti-clockwise to close).
4. Depress clutch pedal.
5. Turn ignition switch clockwise.
6. Pull out choke control. This action closes the carburetter choke flap and automatically provides sufficient throttle opening for easy starting.
7. Push gear lever over to the right, lift over catch and press forward to engage starter. If engine fails to start wait 10 seconds before re-engaging the starter.
8. Immediately the engine starts release gear lever.
9. Warm up engine at a fast idling speed.
10. Release choke control as soon as is practicable; release clutch pedal.
11. Before starting work check the engine oil pressure. Correct pressure is 40—60 lb. per sq. in. (2.8—4.2 kg. per sq. cm.)

12. When thermometer on dashboard indicates GREEN i.e. over 75°C turn to vaporising oil. Do NOT warm engine on vaporising oil, using choke to prevent stalling. This will cause oil dilution and rapid engine wear.

To stop engine turn ignition switch anti-clockwise.

USE OF FUEL

Although petrol or vaporising oil may be used efficiently, best results for economy and engine life will be obtained as follows:

1. For continuous operation use vaporising oil only.

2. On very light work, involving numerous engine stops, use petrol only. For best results when operating on petrol only, remove induction manifold shield (which is retained by two bolts only). Never operate without shield when using vaporising oil.
HANDLING NOTES

The following notes have been compiled to assist you to obtain maximum service from your tractor by avoiding inadvertent damage.

CLUTCH OPERATION

Use the clutch only when selecting the gear ratio to be used or to engage or disengage P.T.O. drive. If the load on the engine is too great for the gear in use, always stop and select a lower gear. Never slip the clutch in order to increase engine speed. Never attempt to change gear when the tractor is in motion. Avoid resting the left foot on the clutch pedal as this may cause the clutch to slip.

POWER TAKE-OFF SHAFT

The shaft projects from the centre of the rear axle and is enclosed by a removable cap. The operating lever for the P.T.O. clutch is mounted in the left-hand inspection cover of the centre axle housing, as shown in Fig. 2. Movement of the lever towards the rear engages the drive. Engine clutch must be depressed to engage or disengage P.T.O. drive. Do not run with the drive constantly engaged when the Power Take-Off or hydraulic mechanism is not being used.

HYDRAULIC LIFT

As the hydraulic pump is driven by the P.T.O. shaft, the latter must be engaged before the hydraulic system can operate. The hydraulic control lever is situated at the driver's right-hand, as shown in Fig. 1. Rearward movement of this lever raises the hydraulic linkage, forward movement releases the hydraulic pressure, allowing the implement to fall. When an implement is in work the depth at which it operates is governed by the distance that the control lever is moved forward, and an adjustable stop, fitted to the control lever quadrant, ensures that the lever is moved to the same position each time the implement enters work.

The pump has three external delivery points for use with implements which incorporate remote pressure operated hydraulic systems, such as the Ferguson Manure Loader. Before removing plugs, see Fig. 2, to connect up implement, make sure the pump is disengaged (see Power Take-Off Shaft).
Fig. 2

KEY TO ANNOTATION

A—OPERATING LEVER—P.T.O. CLUTCH.
B—DIPSTICK—TRANSMISSION OIL.
C—HYDRAULIC SYSTEM RELIEF VALVE.
D—GREASE NIPPLE—INDEPENDENT BRAKE SHAFT.
E & F—HYDRAULIC PUMP DELIVERY POINTS.
HYDRAULIC PRESSURE RELIEF VALVE

The Relief Valve is constructed so that, when it opens, all the working parts are lubricated and submerged in the discharged oil; it is therefore desirable for the Relief Valve to be discharged at regular intervals. This can best be effected by an occasional short attempt to raise a load on the lower links greater than the system is capable of lifting. The maximum recommended load for normal work is 1000 lbs. (453.6 kg), at the point of implement attachment on the lower links, and this figure should not otherwise be exceeded.

Warning. Adjustment and inspection of the Relief Valve must be strictly entrusted to an authorised service engineer; unskilled attention to this assembly may result in serious damage to the Hydraulic System.

SAFETY DEVICE

A safety device has been incorporated in the design of the hydraulic system to protect the implement if a hidden obstruction is struck. In this event, the sudden impact has the immediate effect of relieving the effective weight of the implement from the tractor rear wheels, which thereby lose traction, and the tractor stops with rear wheels spinning, without damage to the implement. The tractor can be reversed and the implement raised, then the tractor moved forward before lowering the implement at a point beyond the obstruction.

LINKAGE

TOP LINK CONNECTION

Do not in any circumstances attempt to pull or tow directly from the top link connection or to alter the setting of the main control spring located behind the driver's seat.

Adjustment of the upper link assembly is obtained by locating the centre bolt in different pairs of holes in the two members, by this means the length can be raised between 24\(\frac{1}{2}\)" (622 mm.) and 26\(\frac{1}{2}\)" (672 mm.). The shortest adjustment should only be used with certain implements, and in such cases a precise recommendation will be made.

LOWER LINKS

Remember when coupling implements to the lower links, always fit the left side first and use the levelling lever to assist in fitting the right side. The check chains prevent the implement from swinging sideways into the rear wheels. It is particularly important that these chains are not twisted and that the chain anchors are assembled correctly with the chain attached above the centre as shown in Fig. 3.

The right-hand lift rod is marked by a circular groove, which, when level with the top of the fork into which it threads, indicates that both lower links are level.
Fig. 3

KEY TO ANNOTATION

A—LOWER LINKS  
B—CHECK CHAINS  
C—CHAIN ANCHORS  
D—TOP LINK CONNECTION

E—CONTROL SPRING  
F—CIRCULAR GROOVE  
G—P.T.O. CAP  
H—LEVELLING LEVER

J—UPPER LINK ASSEMBLY
ADJUSTABLE DRAWBAR. Figs. 4 & 5.
The normal setting is 18” (457mm.) between drawbar and ground when the lower links are horizontal and the notches in the stays are in line. The height range is between 10” (254mm.) and 23” (584mm.) above ground.

By raising the drawbar i.e. shortening the stays, traction is increased with trailed machinery. Lowering the drawbar will tend to keep the front end of tractor down at expense of some loss of traction.
The height adjustment is particularly useful when working with trailers with high turntables, e.g. four wheel horse-wagon conversions. By raising the drawbar, strain on the turntable is reduced and the line of draft is improved.

When the drawbar is fitted, ensure that the hydraulic control lever is locked in the fully forward position by means of the Safety Stop as shown in Fig. 5, and that the pump gear is disengaged when the Hydraulic Mechanism or Power Take-off is not being used.

When the drawbar is in continuous use, the working parts of the hydraulic system may become stiff through lack of use. To avoid this, disconnect the drawbar each day and by operating the hydraulic control lever, raise and lower the linkage several times.

USE OF BRAKES. Fig. 1
The combined brake pedal operates the brakes on both rear wheels and is fitted with a ratchet for parking.
The independent brake pedals, which are for assisting reduction of the turning circle and operate the brake on the appropriate wheel only, should never be applied when travelling at high speed, as this can cause excessive stress.
Always keep the brakes in a good state of adjustment, see page 19. Unbalanced or slackly adjusted brakes can be dangerous, and, if binding, will cause rapid lining wear and excessive fuel consumption.
REFERENCE SECTION

It is recommended that any adjustments not detailed should be made by mechanics of your Ferguson dealer.

ENGINE LUBRICATION

Engine lubrication is supplied at a pressure of 40—60 lb. per sq. in. (2·8—4·2 kg. per sq. cm.) to the crankshaft, connecting rod and camshaft bearings and also to the timing chain and governor. A pressure feed is also supplied to the overhead valve mechanism. The reading shown on the gauge on the instrument panel may appear high when the engine is cold or is running at speed. On the other hand, a comparatively low reading when the engine is running at a low speed need cause no concern.

OIL FILTER

A replaceable cartridge-type filter (see Fig. 6) mounted on the left-hand side of the crankcase, prevents any dirt and foreign matter in the lubricating oil from reaching working and bearing surfaces.

Access to the filter cartridge can be gained by removal of the long securing bolt and withdrawal of the body to the rear, as shown. After servicing the cartridge, the joint washer between filter body and head should be examined and replaced if there seems to be any possibility of an imperfect joint. To avoid damage to this washer, do not over-tighten the long securing bolt. On re-assembly, refill the cartridge housing one third full with clean engine oil.

Fig. 6

KEY TO ANNOTATION

A—OIL FILTER
B—OIL PRESSURE RELIEF VALVE
C—DISTRIBUTOR
D—COIL
E—ENGINE OIL FILLER
F—STARTER MOTOR
GOVERNOR

The governor is enclosed in the timing case, and lubricated under pressure by the engine lubrication system. It functions throughout the speed-range 400 to 2000 r.p.m. under load, and all settings are obtained by the hand-throttle mounted on the steering column.

AIR CLEANER, Fig. 7

The engine life will be materially affected by the cleanliness of air admitted to the carburettor. The instructions under the Maintenance Section referring to cleaning the air inlet screen (see inset) and changing the oil in the bowl of the air cleaner must be regularly carried out.

Fig. 7

KEY TO ANNOTATION

A—AIR CLEANER
B—AIR CLEANER BOWL
C—AIR INLET SCREEN
D & E—AIR HOSE CONNECTIONS

Ensure that no air is admitted at the rubber hoses and unions connecting the pipes to the air cleaner, carburettor and crankcase at points D and E.
The fuel tank is divided into two compartments, the small rear one, B, for petrol—serving both for cold starting and reserve—the other, A, for vaporising oil.

**Capacities:**
Vaporising Oil—7 gallons (31.5 litres)
Petrol—1 gallon (4.5 litres).

Selection is made by a three-way tap which connects the two compartments to the fuel system. Fig. 8, the illustration shows the tap in the OFF position.

Incorporated in the fuel system is a gauze filter and sediment bulb, easily dismantled for cleaning by unscrewing the wing nut beneath the glass bowl. Remove and clean bulb and gauze whenever sediment or water collects.

**CARBURETTER. Fig. 9**
A special dustproof carburetter is fitted, designed to give maximum power and economy under varying loads.

A slow running and fully-variable main jet is provided to obtain settings for a very wide range of operations.

**Carburetter Adjustments**
Adjustments should only be made when the engine has reached normal working temperature and is using vaporising oil.

**Slow running adjustment.** Turn screw A clockwise until slight hunting (i.e. richness) occurs, then turn screw back slowly approximately one turn
until engine runs evenly. If the screw is turned back too far (i.e. weak) the engine will stall. Slow-running speed is regulated by the throttle stop screw D which is turned inwards to increase and outwards to decrease idling speed.

**Main Jet Setting.** Turn screw B gently clockwise until seated and then unscrew one complete turn, this provides normal setting. One quarter turn less (three-quarter turns open) gives best economy, and one quarter turn more (one and one-quarter turns open) will be found to give maximum power under load.

**Warning.** It is most important that the economy setting is used only when engaged on very light work—or increased engine wear will result.

It is recommended that the carburettor bowl is flushed out at intervals of 60 working hours by unscrewing valve C to drain off a small quantity of fuel. This prevents any possibility of jets becoming blocked. Do not permit an air leak to occur in the pipe or rubber hoses connecting the carburettor to the air cleaner, See Fig. 7.

**COOLING SYSTEM. Fig. 10**

The cooling system incorporates a tubular radiator with pressure type filler cap, thermostat, cylinder head water distribution tube, fan, pump and connections. The bearings of the centrifugal type water pump should be lubricated with grease at the regular intervals recommended in the Maintenance Section. Sufficient grease should be injected at the nipple to force a small amount of the old grease out through the drilling in the bearing housing. A bellows-type thermostat regulates the water temperature and assures rapid warming up of the engine. In extremely cold weather, engine starting and operating is assisted by temporarily blanking off the lower half of the radiator grille. In extremely hot climates engine overheating can be averted by temporarily removing the hood grilles.

Drain taps are fitted to the right-hand side of the cylinder block water jacket, the radiator bottom tank and beneath the water pump body. All three taps must be opened and the radiator filler cap removed to ensure complete drainage of the system. When refilling always use rain water, if available.

The use of glycol type anti-freeze solution is recommended, three pints being the necessary amount to be mixed with the cooling water to give protection against 16°F (-9°C.) of frost.

**Warning.** If anti-freeze solution is not used during frosty weather the cooling system should be drained immediately after work to prevent damage due to freezing.

If the radiator filler cap is removed when the engine is hot it should be loosened gradually and carefully to allow pressure to escape.
FAN & DYNAMO BELT TENSION

The cooling fan and dynamo are belt driven and it is most important that the tension of this belt should be correct. Excessive tautness of the belt can put undue stress on water pump and dynamo bearings, while loss of friction due to a loose belt will adversely affect engine cooling and battery charging and, furthermore, will quickly ruin the belt. Remember that a new belt will ‘bed-in’ and require readjusting after ½–1 hours service.

Belt tension is correct if, when it is depressed by hand midway between the fan pulley and the dynamo, the total deflection is about ¾” (19 mm.). To tighten the belt slacken dynamo securing bolts G and H and swing dynamo outwards, see Fig. 10. Retighten bolts securely.

ELECTRICAL EQUIPMENT

FIGS. 6, 11 AND 12

COIL IGNITION SYSTEM

Comprising high tension coil and direct-driven distributor with fully automatic advance and retard mechanism. The distributor unit and coil are mounted just above the oil filter and require little attention, except keeping the casings clean and free from lubricating and fuel oil and the electrical connections tight. At intervals remove distributor cover, pull off rotor arm from spindle and lubricate exposed screw head with 3 drops thin oil (see Maintenance Section). Do NOT remove screw, which is drilled to allow the oil to pass into the cam bearing.
DYNAMO

The dynamo is supported on a bracket mounted on the right-hand side of the engine crankcase, its charging rate being automatically controlled by a combined cut-out and voltage-control regulator. Through this regulator, the output of the dynamo is inversely proportional to the state of charge of the battery.

The commutator-end of the dynamo armature shaft runs in a plain bronze bearing which should be periodically lubricated by filling the end of the bearing boss at the rear of the dynamo with engine oil through the hole provided, as shown in Fig. 11. Take care to ensure the hole is not clogged with dirt before filling.

Fig. 11.

The ball bearing supporting the drive-end of the armature shaft is pre-packed with grease and needs no attention.
BATTERY

The battery is conveniently located and should be regularly inspected and all traces of dirt and moisture removed from its top surface. Terminal posts should be greased with petroleum jelly to prevent corrosion. The electrolyte should be maintained level with the tops of the separators, and no higher, using distilled water only. A pronounced difference in level in any particular cell should be reported to your Dealer. To top up electrolyte level in cells, uncover battery and screw out vent plugs to allow liquid to be poured in. See Fig. 12.

STARTER

The electrical starter switch is operated by the gear lever, so preventing accidents by starting engine when in gear. Both starter motor bearings are pre-packed with grease and need no attention.
TRANSMISSION AND REAR AXLE ASSEMBLY

A common oil filler hole, serving both the transmission and rear axle assemblies, is situated on the transmission cover plate adjacent to the gear change lever (see Fig. 13). This oil is also circulated through the hydraulic system, and its correct level is indicated on a dipstick located in the right-hand inspection cover of the rear axle centre housing, (see Fig. 13).

**KEY TO ANNOTATION**

A—TRANSMISSION OIL FILLER PLUG  
B—TRANSMISSION OIL DIPSTICK  
C—STEERING GEARBOX OIL FILLER AND LEVEL PLUG  
D—STEERING DRAG LINK BALL JOINT  
E—COMBINED BRAKE PEDAL AND PARKING RATCHET  
F—INDEPENDENT BRAKE PEDAL (R.H.)

Fig. 13. On supplying oil to this assembly, sufficient time should elapse before the dipstick reading is taken, in order that a common level is attained in both gearbox and centre housing. **It is most important that only scrupulously clean oil of the correct grade is used.**

Three drain plugs are fitted: two in the rear axle housing and one in the gearbox section.
Reference Section

All three plugs must be removed for complete drainage.

Grease nipples are provided (see Fig. 14) for lubricating rear axle hub bearings; no more than three shots of the Grease Gun should be applied every 720 working hours, otherwise grease may penetrate into the brake drums.

Owner-service to the transmission and rear axle should be confined strictly to the schedule recommended in Maintenance Section.

CLUTCH

The clutch requires no attention between tractor overhaul periods, other than occasional pedal adjustment, which should be carried out by an authorised service mechanic.

FRONT AXLE AND STEERING MECHANISM

The oil in the steering gearbox should be maintained at the level of the plug, illustrated in Fig. 13. The ball joints at the ends of the steering drag links, illustrated in Figs. 10 and 13, should be regularly lubricated, the amount of grease supplied through the nipples should be restricted to that recommended in Maintenance Section, otherwise there is a danger of damage to the rubber boots. The front axle outer sections are fitted with nipples for lubrication of swivel pins, while the hub bearings run in an oil bath contained in the hub casings. The correct quantity of oil in each hub reaches the level of the filler plug when this is 45° from top position.

Approximately twice yearly an oil can should be introduced through the starting handle hole below the radiator, and a few drops of oil deposited at the bottom of the front axle centre pivot pin.

HYDRAULIC SYSTEM AND LINKAGE

All adjustments should be carried out by authorised mechanics; the only necessary owner-service is recommended in the Maintenance Section. The location of filling and draining points for the hydraulic oil are described on page 17. It is most important that no lubricant is applied to any of the linkage pivots or joints except the levelling gearbox and screw thread on the right-hand lift rod, which should receive a regular supply of grease through the lubricating nipples.

ADJUSTABLE DRAWBAR

In order that implements of other than Ferguson design may be used, an adjustable drawbar is supplied, see page 9.
BRAKE ADJUSTMENTS. Fig. 14

In order to make running adjustments to the brakes, first jack the rear wheels clear of the ground. Make sure that all shafts and pins work freely, and that when brakes are ‘off’, the brake pedals are against their stops.

Slacken off the centraliser nut B, and expand the shoes fully in the drum by means of the adjuster A, until the wheel is locked. Tighten the centraliser B, and slacken adjuster A, until shoes are just free in the drum. Six to eight clicks ‘off’ is the recommended adjustment.

To test the brakes for even balance engage second gear, and driving at slow speed, apply the master brake firmly. Any tendency to veer off course should be counteracted by slackening off the adjusting screw on the side that veering takes place.

Important Notice. The brakes CANNOT be adjusted by altering the length of the operating rods. The brake shoes themselves must be adjusted in the brake drums.

TRACK WIDTHS. Figs. 15 and 16.

In order that the tractor can be used efficiently for row-crop work, the tracks of both front and rear wheels are adjustable in 4” (102mm.) steps. On normal width tractors the rear wheels have a range of settings between 48 and 76 inches (1219 and 1930 mm.) The front wheels between 48 and 80 inches (1219 and 2032 mm.) The corresponding range on narrow width tractors:—Rear wheels 42 to 66 inches (1066 to 1676 mm.) front wheels 44 to 60 inches (1117 to 1524 mm.).
REAR WHEELS

The rear wheel track is adjustable by assembling the disc and rim in different positions as shown in Figs 15 and 16. At the same time interchanging the wheels may be necessary in order to maintain maximum traction.

Normal Width Tractors, TE-D. When changing settings 48, 52, 64 or 68 inches (1219, 1320, 1625 or 1727 mm.) to or from settings 56, 60, 72 or 76 inches (1422, 1524, 1828 or 1930 mm.) interchange wheels.

Narrow Width Tractors, TE-E. When changing settings 42, 54 or 58 inches (1066, 1371 or 1473 mm.) to or from settings 46, 50, 62 or 66 inches (1168, 1270, 1574 or 1676 mm.) interchange wheels.

That the wheels are on the correct side can be confirmed by checking the arrow on the side wall of the tyre is pointing in the direction of forward rotation.

FRONT WHEELS

The front axle is made in three parts which may be assembled to give the track width desired. To alter the setting, loosen the vertical bolt through the radius rod yoke, remove bolts securing axle, and spread as desired. No change in steering connections is necessary. Always assemble axle with at least one hole between bolts holding axle together—never in adjacent holes.

Normal Width Tractors, TE-D. Range of setting 48 to 80 inches (1219 to 2032 mm.) Settings of 76 and 80 inches (1930 and 2032 mm.) are obtained by 68 and 72 inch (1727 and 1828 mm.) axle assemblies but with wheels reversed.

Narrow Width Tractors, TE-E. Range of settings is 44 to 60 inches (1117 to 1524 mm.)
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Fig. 15
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**TRACTOR TE-D ONLY**

The front axle assembled to 72" but with wheels reversed will give a wheel track setting of 80". Similarly, the wheels still reversed but with 68" axle assembly give a track setting of 76".

Fig. 16
MAINTENANCE SECTION

NOT FOR RESALE
FREE DOWNLOAD FROM WWW.OLDENGINE.ORG/MEMBERS/EVANS
Fig. 17

KEY TO ANNOTATION

A—FUEL TAP
B—ENGINE OIL FILLER
C—BATTERY
D—STEERING BOX FILLER AND LEVEL PLUG
E—HYDRAULIC MECHANISM AND TRANSMISSION FILLER PLUG
F—HYDRAULIC MECHANISM AND TRANSMISSION OIL DIPSTICK LOCATED IN RIGHT-HAND INSPECTION PLATE
G—HUB BEARING OIL FILLER PLUG
H—ENGINE OIL FILTER
J—ENGINE DRAIN PLUG
K—HYDRAULIC MECHANISM AND TRANSMISSION DRAIN PLUGS
L—FRONT AXLE CENTRE PIVOT PIN

GREASE NIPPLES, LUBRICATE AS INSTRUCTED.

IMPORTANT

DO NOT LUBRICATE :
Clutch connections
Brake lever pins

Linkage ball joint or pins
Throttle connections

OIL SPECIFICATIONS

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23
PERIODIC ATTENTION

EVERY 10 WORKING HOURS

Engine:
Check oil level to top mark on dipstick. Fill, if necessary, at point B Fig. 17.
Clean and refill air cleaner bowl with engine oil.
Note: In very dusty conditions twice daily.
Inspect inlet screen to air cleaner. Take out and wash if necessary.
Check water level in radiator.

Pulley Attachment:
Check belt pulley oil level when in service; refill, if necessary, to plug level with transmission oil.

Front Axle:
Grease front axle swivel pins and steering connections.

Brakes:
Grease independent brake shaft bearings.

Linkage:
Grease levelling lever gearbox and thread.

Electrical:
Examine, and top-up battery with distilled water as necessary.

Tyres:
Check pressures.

CHANGE ENGINE OIL IN NEW TRACTOR AFTER FIRST THIRTY HOURS.

EVERY 60 WORKING HOURS

Engine:
Change engine oil. Wash and scrub oil filter cartridge in petrol or V.O.
Cleaned at 60-hour intervals, life of cartridge can be extended to 240 hours (see page 10). If cartridge is not washed according to these instructions, change after first 60 hours, and then at every second oil change (i.e. every 120 hours).
Grease water pump bearings.

Fuel System:
Drain carburetter to clear sediment. Remove and clean fuel sediment bowl and gauze.

Transmission:
Check oil level to top mark on dipstick. Fill if necessary at point E Fig. 17. This point supplies transmission, hydraulic system, and rear axle; allow time for oil to reach dipstick.
EVERY 120 WORKING HOURS

Engine:
Change oil filter cartridge after 120 hours and then at every second change of oil (i.e. every 120 hours) if recommended cleaning at 60-hour stage has not been carried out.

Check fan belt tension.

Transmission:
Change transmission oil in new tractor after first 120 hours, again at 720 hours and then every 720 hours thereafter, or at least once a year. Note: Drain oil from all three plugs (K, Fig. 17.)

Front Axle:
Lubricate front axle centre pivot pin after the first 120 hours and every 480 hours thereafter.

Electrical:
Lubricate dynamo commutator end bearing (See Fig. 11). Remove distributor cap and rotor, and lubricate spindle with three drops of thin oil. Grease battery terminals with petroleum jelly to prevent corrosion.

EVERY 720 WORKING HOURS

Transmission: NOT FOR RESALE
Change oil.

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Steering:
Check oil level in steering gearbox and refill, if necessary, with transmission oil to plug level.

Rear Axle:
Grease axle hub bearings. (3 shots of Grease Gun only).

EACH YEAR

Front Axle:
Drain and wash front hub bearings. Refill with transmission oil to level of plug when 45° from top position.

For correct lubricant specifications see page 26 — British Isles, or page 27 — Overseas.
## RECOMMENDED LUBRICANTS—BRITISH ISLES

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<tr>
<th>Assembly</th>
<th>Season</th>
<th>Shell</th>
<th>Esso</th>
<th>B.P. Energol</th>
<th>Duckham's</th>
<th>Wakefield</th>
<th>Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENGINE AIR CLEANER</strong></td>
<td><strong>Summer</strong></td>
<td>Shell Tractor Oil 40 or Shell X-100, 40</td>
<td>Tractorlube (VAP) or Essolube 40</td>
<td>Energol Tractor 40 or Energol SAE 40</td>
<td>Duckham's Commadcol 40 or Duckham's NOL &quot;FORTY&quot;</td>
<td>Agricastro Medium or Castrol XL</td>
<td>Mobiland 640 Tractor Oil</td>
</tr>
<tr>
<td></td>
<td><strong>Winter</strong></td>
<td>Shell Tractor Oil 30 or Shell X-100, 30</td>
<td>Tractorlube (VAP) or Essolube 30</td>
<td>Energol Tractor 30 or Energol SAE 30</td>
<td>Duckham's Commadcol 30 or Duckham's NOL &quot;THIRTY&quot;</td>
<td>Agricastro Medium or Castrol XL</td>
<td>Mobiland 630 Tractor Oil</td>
</tr>
<tr>
<td><strong>TRANSMISSION</strong></td>
<td>Throughout Year</td>
<td>Shell Tractor Oil 40 or Shell X-100, 40</td>
<td>Essolube 50 or Pratts Extra Heavy</td>
<td>Energol Tractor Oil 50 or Energol SAE 50</td>
<td>Duckham's Commadcol 50 or Duckham's NOL &quot;FIFTY&quot;</td>
<td>Agricastro Medium or Castrol XL</td>
<td>Mobiland 650 Tractor Oil</td>
</tr>
<tr>
<td><strong>STEERING GEARBOX</strong></td>
<td>Throughout Year</td>
<td>Shell Tractor Oil 40 or Shell X-100, 40</td>
<td>Essolube 50 or Pratts Extra Heavy</td>
<td>Energol Tractor Oil 50 or Energol SAE 50</td>
<td>Duckham's Commadcol 50 or Duckham's NOL &quot;FIFTY&quot;</td>
<td>Agricastro Medium or Castrol XL</td>
<td>Mobiland 650 Tractor Oil</td>
</tr>
<tr>
<td><strong>FRONT HUBS</strong></td>
<td>Throughout Year</td>
<td>Shell Retinax A</td>
<td>Esso Grease</td>
<td>Energrease C3</td>
<td>Duckham's H.B.B.</td>
<td>Castrolase Heavy</td>
<td>Mobil Hub Grease</td>
</tr>
<tr>
<td><strong>P.T.O. PULLEY</strong></td>
<td>Throughout Year</td>
<td>Shell Retinax A</td>
<td>Esso Grease</td>
<td>Energrease C3</td>
<td>Duckham's H.B.B.</td>
<td>Castrolase Heavy</td>
<td>Mobil Hub Grease</td>
</tr>
<tr>
<td><strong>GREASE GUN</strong></td>
<td>Throughout Year</td>
<td>Shell Retinax A</td>
<td>Esso Grease</td>
<td>Energrease C3</td>
<td>Duckham's H.B.B.</td>
<td>Castrolase Heavy</td>
<td>Mobil Hub Grease</td>
</tr>
<tr>
<td><strong>FLUSHING OIL</strong></td>
<td>Throughout Year</td>
<td>Shell Flushing Oil</td>
<td>Esso Flushing Oil</td>
<td>Energol Flushing Oil</td>
<td>Duckham's NOL &quot;TEN&quot;</td>
<td>Wakefield Flushing Oil</td>
<td>Mobil Engine Flushing Oil</td>
</tr>
</tbody>
</table>

**NOTE.**—On no account must extreme pressure (E.P.) lubricants be used in the hydraulic system or transmission assembly.
# RECOMMENDED LUBRICANTS FOR THE UNION AND S.W. AFRICA

It is most important that the choice of lubricants is strictly limited to the high quality oils listed below, and that the exact grade only of these oils is used.

<table>
<thead>
<tr>
<th>Assembly</th>
<th>Capacity</th>
<th>Tractor</th>
<th>Atlantic</th>
<th>Caltex</th>
<th>Shell</th>
<th>Vacuum</th>
<th>Wakefield</th>
<th>Vigzol</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINE AIR CLEANER</td>
<td>12 pints</td>
<td>Petrol</td>
<td>Atlantic SAE 30</td>
<td>Protex SAE 30</td>
<td>Shell Motor Oil SAE 30</td>
<td>Mobiloil A SAE 30</td>
<td>Castrol XL SAE 30</td>
<td>Y 30 T/O</td>
</tr>
<tr>
<td></td>
<td>½ pint</td>
<td>Paraffin</td>
<td>Atlantic SAE 40</td>
<td>Protex SAE 40</td>
<td>Shell Motor Oil SAE 40</td>
<td>Mobiloil AF SAE 40</td>
<td>Castrol XLH SAE 40</td>
<td>Y 40 T/O</td>
</tr>
<tr>
<td>RUN-IN—30 Hours</td>
<td></td>
<td>Both</td>
<td>Atlantic SAE 20</td>
<td>Protex SAE 20</td>
<td>Shell Motor Oil SAE 20</td>
<td>Mobiloil Arctic SAE 20</td>
<td>Castrolite SAE 20</td>
<td>Y 20 T/O</td>
</tr>
<tr>
<td>GEAR BOX DIFFERENTIAL HYDRAULIC SYSTEM</td>
<td>6.6 gals.</td>
<td>Both</td>
<td>Straight Mineral Gear Oil SAE 90</td>
<td>Straight Mineral Thuban SAE 90 or Protex SAE 50</td>
<td>Shell Dentax SAE 90 or Shell Motor Oil SAE 50</td>
<td>Mobiloil CW Straight Mineral SAE 90 or Mobiloil BB SAE 50</td>
<td>Castrol ST SAE 90</td>
<td>Gearol 90 or Y 50 T/O</td>
</tr>
<tr>
<td>PULLEY</td>
<td>1 ½ pints</td>
<td>Both</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEERING</td>
<td>1.8 pints</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>FRONT WHEEL BEARINGS</td>
<td></td>
<td>Both</td>
<td>Chassis Lubricant No. 17</td>
<td>Marfak No. 1</td>
<td>Retinax A or Retinax CD</td>
<td>Mobilgrease No. 2</td>
<td>Castrolease CL Grease</td>
<td>Heclamel Grease</td>
</tr>
<tr>
<td>WATER PUMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ALL GREASE POINTS</td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

**OIL CHANGES:** Running-in period is 90 hours. Use 5 gals. oil and change every 30 hours.

**ENGINE.** Regular oil changes every 60 hours. Change OIL FILTER every 120 hours.

**NOTE:**

(a) On no account must extreme pressure (E.P.) lubricants be used in the hydraulic system and transmission assembly.

(b) Provided the oil change periods recommended in the Maintenance Section have been carried out, discoloration of the engine oil with use is normal and of no significance.

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# SPECIFICATION

<table>
<thead>
<tr>
<th>Engine</th>
<th>Vaporising oil type.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Cylinders</td>
<td>4.</td>
</tr>
<tr>
<td>Bore</td>
<td>85 mm.</td>
</tr>
<tr>
<td>Stroke</td>
<td>92 mm.</td>
</tr>
<tr>
<td>Piston Displacement</td>
<td>2088 cc. (127.4 cu. ins.)</td>
</tr>
<tr>
<td>Compression Ratio</td>
<td>5.1 : 1.</td>
</tr>
<tr>
<td>Firing Order</td>
<td>1, 3, 4, 2.</td>
</tr>
<tr>
<td>Belt H.P.</td>
<td>25.4 at 2000 r.p.m.</td>
</tr>
<tr>
<td>Cylinder Liners</td>
<td>Wet sleeve type.</td>
</tr>
<tr>
<td>Valves</td>
<td>Overhead high lift, pushrod operated. Exhaust opens 40° before B.D.C. closes T.D.C. Inlet opens T.D.C. closes 40° after B.D.C.</td>
</tr>
<tr>
<td>Valve Clearance</td>
<td>Inlet 0.010&quot; (0.25mm.) exhaust 0.012&quot; (0.30 mm.) cold.</td>
</tr>
<tr>
<td>Governor</td>
<td>Variable speed, mechanically operated, centrifugal type, enclosed. Governor regulation up to 2000 r.p.m. under load.</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Pressure 40—60 lb./sq. in. (2.8 — 4.2 kg. sq. cm.)</td>
</tr>
<tr>
<td>Oil Filter</td>
<td>Replaceable cartridge-type of large capacity. Full flow. External.</td>
</tr>
<tr>
<td>Battery</td>
<td>12 volt, 38 amp. hour capacity at 10 hour discharge rate. Recharge rate 4 amps. Specific gravity, fully charged 1.28—1.30 at 60°F. (16°C).</td>
</tr>
<tr>
<td>Dynamo</td>
<td>12 volt, shunt wound, two brush type, with voltage control regulator.</td>
</tr>
<tr>
<td>Starter</td>
<td>Automobile type. Safety starter switch operated by gear lever.</td>
</tr>
<tr>
<td>Distributor</td>
<td>Anti-clockwise rotation, gap at contact breaker points 0.015&quot; (0.38 mm.)</td>
</tr>
<tr>
<td>Sparking Plugs</td>
<td>Champion type N7 14 mm. Gap width 0.030&quot;—0.035&quot; (0.76—0.89 mm.) Semi-offset points.</td>
</tr>
<tr>
<td>Air Cleaner</td>
<td>Oil-bath type, with dust receptacle removable for cleaning. Supplying carburettor and crankcase breather.</td>
</tr>
</tbody>
</table>
Specification

Carburettor  Up-draught, plain tube type of dust-proof construction.

Cooling  Circulation assisted by centrifugal-type pump through cylinder head water distribution tube and fin and tube type radiator. Pressure relief at 4 lb./sq.in. (0.28 kg/sq. cm.). Thermostat.

Clutch  Single dry plate 9" (229 mm.) diameter.

Gearbox  Constant mesh gears; four forward speeds, one reverse. Reduction between engine and countershaft 2.75 : 1.

Final Drive  Spiral bevel gears with straddle mounted pinion, 6.66 : 1 ratio.

Overall Reductions

<table>
<thead>
<tr>
<th>Selected Ratio</th>
<th>1500 R.P.M.</th>
<th>2000 R.P.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>First, 78.5 : 1</td>
<td>2.5 m.p.h.</td>
<td>3.375 m.p.h.</td>
</tr>
<tr>
<td>Second, 57 : 1</td>
<td>3.5</td>
<td>4.625</td>
</tr>
<tr>
<td>Third, 41.3 : 1</td>
<td>4.75</td>
<td>6.375</td>
</tr>
<tr>
<td>Fourth, 19.8 : 1</td>
<td>9.75</td>
<td>13.25</td>
</tr>
<tr>
<td>Reverse, 68 : 1</td>
<td>3</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Power Take-off  Spline 1 1/8" (28.6 mm.) dia. Reduction between engine and P.T.O. shaft 2.75 : 1.

<table>
<thead>
<tr>
<th>Engine Speed</th>
<th>Power Take-Off Speed</th>
</tr>
</thead>
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<tr>
<td>400 r.p.m.</td>
<td>145 r.p.m.</td>
</tr>
<tr>
<td>1500 r.p.m.</td>
<td>545 r.p.m.</td>
</tr>
<tr>
<td>2000 r.p.m.</td>
<td>727 r.p.m.</td>
</tr>
</tbody>
</table>

Brakes  Girling, 14" x 2". Two shoe internal expanding, floating cam. Individual adjustment; operated together or independently.

Steering  Two bevel gear segments and pinion.

Wheels  Front: Steel disc with 4 x 19 pneumatic tyre on drop centre rim. Tyre pressure, 26 lbs. (1.8 kg.) Toe-in, 0 — 1/8" (3.2 mm). Rear: Steel disc with 10 x 28 traction tread pneumatic tyre on drop centre rim. Tyre pressure, 12 lbs. (0.8 kg.)
Hydraulic Control
Four-cylinder pump, mounted in centre housing, supplies oil under pressure to ram cylinder or to three external pressure take-off points—thread sizes: Top \( \frac{1}{8}'' \) B.S.P. Bottom \( \frac{3}{8}'' \times 20 \) N.F. Relief valve set at 2000 lbs./sq. in. (140.6 kg/sq. cm).

Wheelbase
70" (1778 mm.)

Overall Length
115" (2921 mm.)

Overall Height
52" (1320 mm.)

Ground Clearance
Under centre 13" (330 mm.) Under axle 21" (533 mm.)

Drawbar Height
10"—23" (254 mm.—584 mm.) Normal setting 18" (457 mm) above ground.

Minimum Overall Width
64" (1625 mm.)

Normal Track Front 48" (1219 mm.)
Rear 52" (1320 mm.)

Track Adjmt. Front 48"—80"
(1219 mm—2032 mm)
Rear 48"—76"
(1219 mm—1879 mm)

Turning Circle Dia.
Using Brakes 17' 6" (5334 mm.).
Without Brakes 19' 3" (5867 mm.).

TE-D with track widths 48" rear and front.
TE-E with track widths 42" rear, 44" front.

Weight Dry
2446 lbs. (1110 kg.)
2397 lbs. (1087 kg.)
(without fuel, oil and water)

Fill-Up Data
Fuel Tanks Vaporising oil—7 Imperial gallons (31.5 litres).
Engine Sump 12 pints (6.8 litres).
Air Cleaner Bowl \( \frac{3}{4} \) pint (0.43 litres).
Transmission 5 Imperial gallons (22.8 litres)
Steering Gearbox 5 pints (2.9 litres).
Front Hubs \( \frac{5}{8} \) pint (0.35 litres).
P.T.O. Pulley \( \frac{1}{2} \) pint (0.28 litres)
Cooling System 15 pints (8.5 litres).
The belt pulley attachment adapts the tractor to driving wood-saws, threshing machines and balers, grinding and rolling mills, hammer mills and other machinery. Mounted on the rear of the tractor and driven by the P.T.O. the drive is engaged or disengaged by the lever on the left side of the transmission housing (see Fig. 2). Alternative direction of rotation is obtained by attachment to right or left of rear axle centre. (Figs. 18 and 19).
Accessories Section

Fitting: Remove P.T.O. shaft cap and four nuts securing check chain anchors. Enter pulley attachment on to P.T.O. shaft and secure attachment by the four nuts previously removed.

Detachment: Reversal of fitting procedure but ensure that check chains are not twisted, and anchors are fitted so that chain attachment point is above centre. See Fig. 3.

Specification:
Pulley diameter 9" (228.6mm.)
Pulley width 6½" (165 mm.)
Pulley speed at 2000 engine r.p.m. 1356 r.p.m.
Belt speed at 2000 engine r.p.m. 3190 ft. per min.

Gear ratio to power take-off shaft 1.86:1.
Weight (dry) 41½ lbs. (18.8 kg.)
Oil capacity, approx. ½ pint (0.28 litres.)

TRACTOR JACK. Fig. 20

The tractor jack, by utilising the hydraulic system, makes the simple task of wheel width adjustment even easier. It is made in two parts, front and rear. The rear part locates under the rear axle and engages the lower links, as shown in Fig. 20; the front locates under the engine and radiator support.

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Fig. 20

To lift the tractor simply place the jack in position as instructed, start the engine, and move the hydraulic control lever to LIFT. When fully raised, switch off the engine.
LUCAS LIGHTING SET. Fig. 21.

In order that the tractor can be used both for agricultural work and on the road at night, a lighting kit has been designed which can readily be fitted to all Ferguson tractors. The lighting kit provides side and tail lamps, a head lamp and rear floodlight which illuminates the work, and is available for left or right-hand rule of the road.

The head, side and tail lamps are controlled by a simple and robust switch arranged to be fitted in the instrument panel, while the change-over from the tail lamp to the floodlight is made by a push-operated switch conveniently fitted near the rear number plate. In addition, a two-pin socket is provided, enabling a tail lamp to be connected if the tractor is required for trailer towing purposes.
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THE BANNER LANE WORKS OF
STANDARD MOTOR COMPANY LTD., COVENTRY

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DEVOTED EXCLUSIVELY TO THE
MANUFACTURE OF FERGUSON TRACTORS.
SERVICE INSTRUCTIONS

The Ferguson Tractor is a product of intensive research and experiment, directed toward reliability, economy, ease of operation and simplified maintenance. The installation procedure ensures that the operator fully understands the maintenance and operating instructions contained in this publication, and in his own interests he is requested to give these instructions his careful and regular attention, and to get in touch with an authorised Ferguson Dealer when any service information or assistance is required.

The continued interest after purchase of both Manufacturer and Dealer are considerably beyond normal, in that four Service Inspections of the tractor are available, without charge, during the six months period of warranty.

Included in the following pages are four Service Vouchers enumerating detail of operations that will normally be carried out automatically by the Dealer who has supplied the tractor, charging only for the materials used. Should the tractor be moved into another Dealer's territory during warranty, or if another Dealer is situated very much closer than the one who supplied the tractor, these vouchers will be honoured on presentation to them as appointed Ferguson Dealers.

It is strongly recommended that the nominal cost of continuing similar Dealer Inspections after warranty be accepted, to ensure the greatest possible amount of tractor reliability between major overhauls.

When replacements are required, insist on genuine Ferguson Service Parts. All Dealers have agreed not to sell Service Parts other than those which are manufactured or recommended by the Company, and, as extensive damage is liable to result from parts of inferior quality being used, users are advised to buy Service Parts only from an authorised Ferguson Dealer.

In the event of your requiring information as to the name and address of the Ferguson Dealer in any particular district, apply to Harry Ferguson, Ltd., Service Department, Coventry.
WARRANTY

WARRANTY. The Company warrants and guarantees as regards all new tractors, implements and accessories supplied of its manufacture that all precautions that are usual and reasonable have been taken by it to secure excellence of materials and workmanship and that each such tractor, implement and accessory is free from defects in material and workmanship under normal use and service, its obligations under this Warranty being limited to making good at a factory to be nominated by it any part or parts thereof including equipment and accessories (except tyres, electrical equipment and proprietary accessories and other articles and parts not of its manufacture) which shall within six months after delivery of such tractor, implement or accessory to the original purchaser be returned to it with transportation charges pre-paid and which its examination shall disclose to its satisfaction to have been thus defective. The above Warranty does not extend or apply to any tractor, implement or accessory which shall have been repaired, altered, neglected or used in any way so as in the judgment of the Company (whose decision is final) to affect adversely its stability or reliability or to any tractor, implement or accessory any of whose identification numbers shall have been altered or removed.

The Company does not give any warranty in respect of its tractors, implements and accessories except the Warranty contained above which is given expressly in lieu of all other warranties or conditions expressed and implied and of all other obligations or liabilities on its part.

Tractors which are sent for repair will be driven at the risk and responsibility of the owners only. Repairs of tractors are undertaken only on the assumption that the owners give authority to drive them on their behalf. The Company accepts no responsibility for loss of or damage to customers’ goods howsoever occasioned whilst such goods are in the Company’s, Manufacturer’s, Distributor’s, Main Dealer’s, Dealer’s or Agent’s possession.

HARRY FERGUSON LTD.,
COVENTRY,
England.

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