DAVID BROWN

4600 SELECTAMATIC

Instruction book

SAFETY POINTS

Don't operate the independent foot brake when travelling at high speed.

Don't run on the highway without locking the two foot brake pedals together.

Don't run the PTO or Belt Pulley without a guard.

Don't wear loose clothing near moving parts of the tractor, engine or implements.

Don't leave the ignition/starter key in the tractor when unattended, especially where children have access.

Don't swerve or turn sharply at speed.

Don't let the clutch in suddenly on a slope, or brake fiercely if running backwards down hill, or the tractor may rear up.

Don't use the differential lock on the public highway.

Don't try to make a sharp turn unless the differential lock is out of engagement.

Don't operate the tractor on dangerously steep ground. Move cautiously on steep slopes, the sudden swing of a heavy implement, or the pull of a trailer, may cause trouble. Use the clutch, brakes, throttle and steering *slowly*. Beware especially of slippery surfaces.

Don't carry passengers on the tractor or linkages.

Don't turn with a projecting implement without making sure there is room for it.

Don't hitch trailed implements above the centre line of the rear axle.

DAVID BROWN

4600 Selectamatic Livedrive

INSTRUCTION BOOK

4600/1 — Livedrive

With 3-cylinder Gasoline Engine

DAVID BROWN TRACTORS LIMITED

MELTHAM · YORKSHIRE · ENGLAND

HD7 3AR

Publication No. TP655

INTRODUCTION

The 4600 Selectamatic tractor with 3-cylinder gasoline engine incorporates the latest refinements of technical design and is the culmination of many years of development and rigorous field testing. In fact, it is a tractor which does a wide range of farming jobs well, reliably and efficiently.

Good design is backed up by skilled manufacture on some of the most modern machines currently available in Europe. The potential life and efficiency which is built into the tractor by careful choice of materials, close manufacturing limits and expert assembly, requires the co-operation of the user whose responsibility it is to carry out the *regular* lubrication and maintenance outlined in this book.

Almost any but the complete novice will be able to carry out the various work which a tractor driver is required to do. But to do this in the easiest, quickest and most efficient way, not to mention the *safest* way because a tractor can be a dangerous machine if handled carelessly and without thought, requires knowledge and skills which have to be acquired. This book gives the necessary information, armed with which the user will quickly gain skill after a little practice.

It is suggested that time spent in reading the Operation and Regular Maintenance sections of this book *before* the new tractor is put into use, will be amply repaid. It is appreciated that the tractor will only be used occasionally for some tasks and the book should be kept readily available at all times so that one's memory may be refreshed. For ease of use the book is divided into 4 sections as indicated in the contents list opposite.

In case of difficulty of any kind, the person most fitted to assist you is your David Brown dealer. Besides having specialist knowledge of the product, he has a great experience of local conditions which will be especially useful to you. In any query always quote the full *prefix* and *serial number* of the tractor and also the *engine type* and *number.*

Note : A list of abbreviations used in this book is given on page 86

First Edition April 1968

Second Edition November 1969

CONTENTS

PRECAUTIONS WITH A NEW TRACTOR

Although every engine is tested and part run-in at the factory care should be taken during the first 25 to 50 hours' use. Avoid excessive speeds or heavy loading. Do not allow the engine to labour, change to a lower gear instead. Use the middle range of engine speeds from 1200 to 1800 rev/min. If possible use light loads to begin with and gradually increase the loading until the engine is fully run-in. If higher speed or heavy loading must be used, keep this down to very short periods interspersed with periods of light load.

FIFTY-HOUR SERVICE

After 50 hours, change the engine oil and filter element, drain and flush the transmission gearbox and final drive reduction housings and change the full-flow filter element. Refill with new oil. Check the valve clearances and tightness of cylinder head and main external nuts and bolts.

Note — The transmission gearbox is filled at the factory with special oil having inhibitors to prevent corrosion and assist initial bedding in. This oil **must** be discarded after 50 hours and the gearbox refilled with new oil of the type recommended on pages 48 to 50.

SECTION 1. OPERATION

⚠ IMPORTANT

To start the engine it is essential that the hand-throttle lever is fully closed and that the foot throttle is lifted upwards with the shoe toe to return the governor and carburettor butterfly to the fully closed position.

STARTING THE GASOLINE ENGINE (FROM COLD)

1. With fuel in the tank.
2. Pull out the choke control.
3. Put the gear shift in neutral (the right-hand lever).
4. ⚠ Depress the clutch pedal fully. The starter cannot be energised until this is done because of the safety switch.
5. Switch on the ignition and operate the starter by turning the ignition key to the right against the spring.

Release the ignition key as soon as the engine fires and immediately it runs push the choke control part way in to prevent over rich mixture with erratic running and smoky exhaust.

Leaving the choke part way out will ensure a fast idling speed to give a quick warm-up. The choke may be pushed home as soon as the engine is warm enough to idle slowly.

RESTARTING WHEN WARM

When the engine is still warm, or the weather very hot the engine will start without use of the choke. Do not use the choke unnecessarily as this causes wear due to dilution of the lubricating oil by fuel.

If the choke has been used excessively and flooding occurs, a start may be made by opening the throttle wide with the choke pushed in. Close the throttle immediately on starting.

STOPPING THE ENGINE

Close the throttle. If the engine has been working hard, allow it to idle for 2 minutes. Switch off the ignition and pull out stop knob. Do not attempt to re-start engine before ensuring that knob is pushed in. Remove the key when leaving the tractor unattended.

STOPPING THE TRACTOR

Reduce travel speed by closing the throttle and apply the foot brakes. Just before the tractor comes to a halt, disengage the clutch and stop the engine. Apply the handbrake securely and park the tractor in a low gear ratio. To prevent accidental starting, ensure that the ignition key is removed.

CONTROLS

The engine and tractor controls are shown in Fig. 1/1 and 1/2.

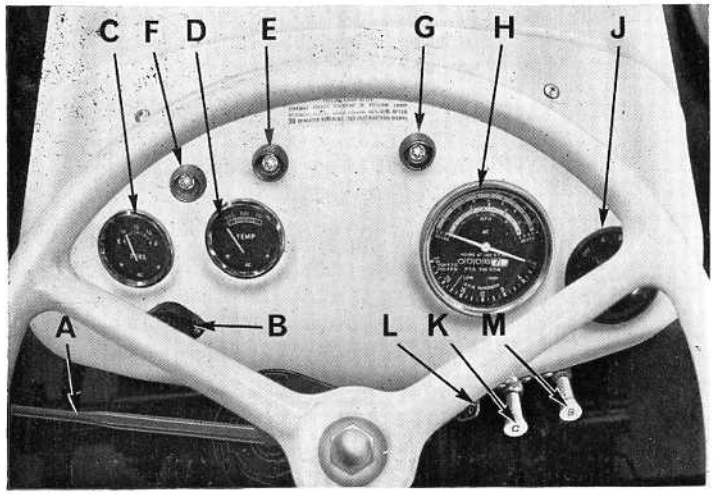


FIGURE 1/1. INSTRUMENT PANEL

A. Throttle lever
B. Horn button
C. Fuel gauge
D. Temperature gauge
E. Oil pressure warning light (Green)
F. Filter warning light (Yellow)
G. Charge warning light (Red)
H. Tractormeter
J. Light switch
K. Choke
L. Ignition/starter key
M. Engine stop knob

OIL WARNING LIGHT

The green light is illuminated when oil pressure is too low. Ensure that it lights when the isolating switch is turned on and goes out when the engine runs.

NO CHARGE WARNING LIGHT

The red light is illuminated when the isolating switch is turned on but should extinguish as soon as the dynamo commences to charge.

TRANSMISSION FILTER WARNING LAMP

When the fall in pressure across the full flow filter element in the hydraulic system is high enough to open the valve and allow oil to by-pass the filter element, the yellow warning lamp illuminates. This may occur (*a*) when the filter element is blocked with dirt and requires changing for a new one or (*b*) when the oil is cold and engine speed is high.

It is also arranged to light when the isolating switch is turned on and the driver should check that the bulb lights each time before starting the engine. A faulty bulb should be replaced as soon as it fails.

If the bulb glows or flickers at idling speeds, this should be ignored.

The warning lamp may illuminate at less than full engine speeds when the oil is cold. The engine speed should be adjusted so that the light is not kept on for more than a few minutes otherwise proper filtering of the oil will not take place.

When the filter element becomes blocked with dirt it will be found impossible to run the engine at high speeds, even when the oil is warm, without the warning lamp illuminating. When the bulb lights at 1800 rev/min after a warming up period of 30 minutes the full flow filter element **must** be changed for a new one at the first opportunity.

THROTTLE CONTROL LEVER

When fully rearwards the engine is governed to its maximum speed. The rated speed of the engine is 1800 rev/min and may be set by observing the tractormeter. This speed should be used for most purposes to conserve fuel and engine life. It also gives a PTO speed of 532 rev/min.

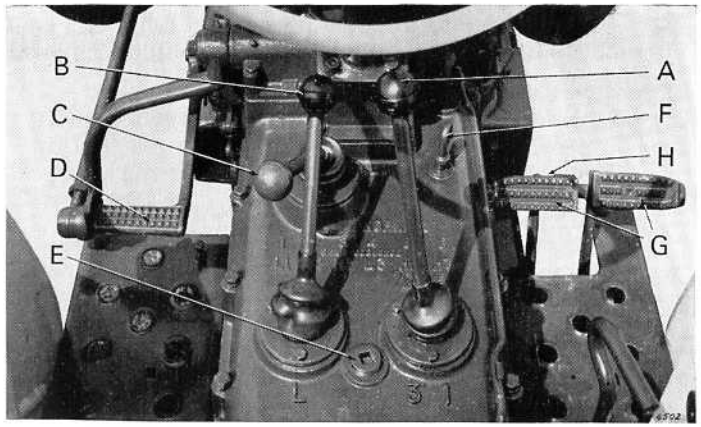


FIGURE 1/2. CONTROLS

A. Gear (shift) lever
B. H/L range lever
C. S/N (creep) lever
D. Clutch pedal
E. Transmission filler plug
F. Transmission dip stick
G. Brake pedals
H. Locking bar

LIGHT SWITCH

This has 4 positions, and depending on whether single or double filament headlamps are fitted, gives the following positions.

Single filament	*Double filament*
1. Off	1. Off
2. Side and Tail*	2. Side and Tail*
3. Side and Tail*	3. Side, tail and head (low beam)*
4. Side, tail and head*	4. Side, tail and head (high beam)*

* The rear plough lamp may be switched on by its own switch in these position.

BRAKES

Twin foot pedals at the right-hand side give independent control of the brakes to assist steering in confined spaces. To ensure full braking power on the road, the locking bar H, Fig. 1/2 should be used on the highway. However, the balance of the braking system should be checked each week or whenever the tractor is taken on the road after working extensively where one brake is used much more than the other for turning at headlands, etc. If this precaution is not taken, an unexpected and dangerous swerve may occur.

LIVEDRIVE CLUTCH

There are two main stages of pedal movement. Stage 1 — Complete disengagement of the transmission clutch is denoted by an increase in pedal pressure at point A, Fig. 1/3. In practice the pedal should always be pressed to this point.

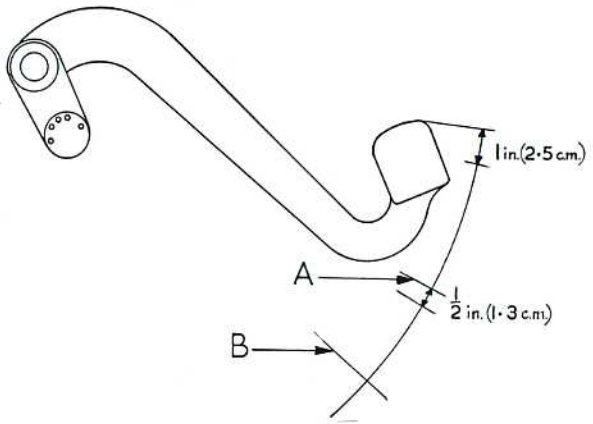


FIGURE 1/3. LIVEDRIVE CLUTCH

A. Transmission disengaged
B. Transmission and PTO disengaged

"Easing" of the clutch to reduce forward speed, when baling etc., to allow the implement to clear a heavy patch, is detrimental to the life of the clutch plates. When moving off with a loaded trailer on road haulage, engine speed should be kept as low as possible. Full engagement of the clutch should be obtained as quickly as possible, **then,** the throttle opened. **The clutch should not be operated at full engine speed or excessive wear will result.**

Stage 2 — Fully depressing the clutch pedal also disengages the PTO (B, Fig. 1/3). Between stages 1 and 2 there is a short buffer stage of constant pressure to prevent accidental slipping of the PTO clutch when using the transmission clutch. If the PTO clutch is not used frequently, the pedal should be fully operated once a week and the PTO "freed" to prevent binding of the plates.

ENGINE SPEED INDICATOR

The engine speed indicator fitted to the instrument panel should be used in conjunction with the chart attached to the bonnet (hood).
The travel speed in any gear can be obtained by reading the engine speed on the indicator and transferring this to the bottom line of the chart. The speed can be read off where a vertical line projected upwards crosses the required horizontal gear line.

Alternatively any travel speed in an appropriate gear can be projected downwards and the necessary engine speed determined. The throttle can then be set to give the required engine speed as observed on the engine speed indicator.
The vertical red lines indicate the engine speed to be set to obtain standard PTO speeds of 540 or 1000 rev/min in high PTO ratio. The blue line shows the setting for 540 rev/min in low PTO ratio. Any desired travel speed may be obtained by noting which gear line bears the nearest desired speed where it crosses the vertical line. This gear should then be selected. Note that belt pulley work should be carried out at 1000 rev/min PTO in high ratio. The 1000 rev/min setting in high ratio should also be used for transmitting high horsepowers on PTO work.

6-SPEED TRANSMISSION GEARBOX

The main transmission gearbox controlled by the right-hand (shift) lever has 3 forward and 1 reverse speed. The secondary transmission gearbox, controlled by the left-hand (shift) lever has two ratios — high and low (H and L). The combination of these two ratios gives a choice of 6 forward and 2 reverse speeds. The order of the speeds 1 to 6 and the necessary combination of the gear (shift) lever settings is shown on top of the transmission cover.

The H/L gear (shift) lever also has a neutral position mid-way and should be used when the tractor is stationary for belt pulley or PTO work.

Experience is the best guide to the choice of speeds for any particular requirement, but if the engine is labouring, denoted by loss of speed when the load is applied, select a lower gear ratio.

The transmission is of the sliding gear type, and gear changing (shifting) while the tractor is in motion must only be undertaken by an experienced driver.

12-SPEED TRANSMISSION GEARBOX

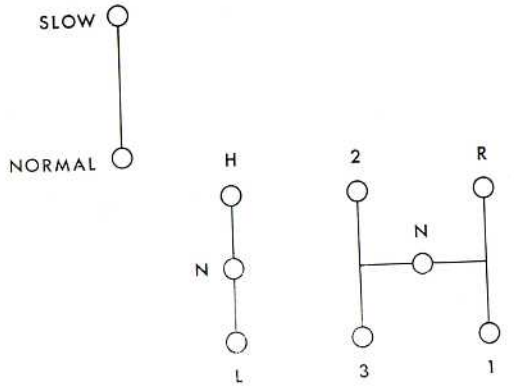


FIGURE 1/4. POSITIONS OF GEAR (SHIFT) LEVERS

Twelve-speed tractors have three shift levers. The H/L range and main levers are as shown in Fig. 1/2 with a third lever on the left. The extra lever has two positions: normal (marked "N") and slow (marked "S"). In the normal rearward position "N", the speeds obtainable are the same as the 6-speed gearbox. In the forward position "S", an additional slower range of speeds is available.

The 12 forward speeds and the positions of the gear (shift) levers are shown on the chart on the instrument panel. Direct drive (Normal) with the gear (shift) lever rearward, is shown in the yellow or white sections of the chart. The slow speeds, with the gear (shift) lever forward, are shown in the red sections of the chart.

The first 3 speeds in the red section give slow speeds for planting, transplanting, hedging and ditching and similar operations. The higher ratios in the red part of the chart (speeds 5, 6 and 9) provide speeds fairly close to the direct drive speeds and are suitable for light traction and PTO work.

It is recommended that the direct drive gears (gear (shift) lever rearwards in the Normal position) be used for continuous heavy traction such as 3-and 4-furrow (bottom) ploughing.

THE SELECTAMATIC HYDRAULIC SYSTEM

INTRODUCTION

The David Brown Selectamatic System embodies a most advanced system of implement control devised for tractor mounted equipment. This is achieved with the utmost simplicity of operation. The following points have been catered for in its design.

1. **Simple control** — Whatever mode of operation is required, the implement is fully controlled by a single hand lever. Lift, hold, drop, height position, depth position, and TCU (weight transfer) are all available at the hand lever.
2. **Simple change from one service to another** — Selection is by means of a 3-position pointer.
3. **Ease of control of the implement** — The sensitivity of the hand lever is automatically adjusted to suit the mode of operation. A large movement of the hand lever is used for adjustments requiring precise setting. Finger guides are provided for repetition of settings. The depth and height settings of the hand lever are not affected by variations in engine speed.
4. **Reliability** — In order to ensure satisfactory reliability a full-flow oil filter has been included in the hydraulic oil system. This will remove particles of dirt which could interfere with the working of high pressure hydraulic valves.
5. **Ease of service** — The control valve has been designed as a single separate unit which can be fully bench tested before fitting to the tractor. There are a minimum number of connections and three simple adjustments to be made after fitting to the tractor, only one of which need be made with the engine running.
6. **Variable rate of drop** — The rate of drop can be adjusted by the user to suit the type of work. When set by a small handwheel, the rate is fixed at the chosen speed and is constant regardless of load.

DESCRIPTION OF THE SELECTAMATIC CONTROLS

Before turning to the operation of the four services available with the Selectamatic hydraulic system it is useful to have a knowledge of the action of each of the units of the mechanism.

HAND LEVER

This operates in a quadrant and controls the hydraulic system according to the mode determined by the selector dial pointer.

SELECTOR DIAL POINTER

A small pointer on a dial mounted on the rear axle casing is turned to one of three positions, "DEPTH", "HEIGHT" or "EXTERNAL/TCU", to select the mode of operation required. To ensure the dial pointer is free to turn, the hand lever should be held rearwards in the **"select"** position. When set, the control valve receives information from the appropriate source, *i.e.* the sensing unit for depth control, from the ramshaft (rockshaft) for height control, or from the hand lever for TCU and external equipment. The "EXTERNAL/TCU" position is equally applicable to depth wheel (gauge wheel) controlled implements on the linkages and external hydraulic equipment.

SENSING UNIT

The top (upper) link is attached to a spring loaded sensing unit which is connected to the control valve by a cable which transmits information regarding the implement draught. When the selector pointer is in the "DEPTH" position, the cable causes the control valve to adjust the depth of the implement to maintain a constant draught. The hand lever overrides the sensing unit to determine the draught around which the control valve operates and thus the depth can be determined by the operator.

FINGER GUIDES

Two finger guides are provided which can be clamped to the quadrant by thumb screws in any suitable position so that the hand lever may be returned quickly to the same place when required.

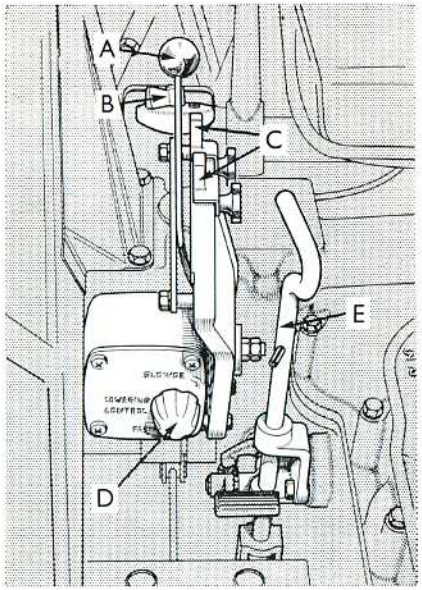


FIGURE 1/5. CONTROLS
A. Hand lever
B. Dial pointer
C. Finger guides
D. Lowering adjustment
E. Parking brake

3-WAY VALVE

This optional unit provides two oil supply points for operation of external equipment controlled by the Selectamatic control lever. It is mounted on the rear axle case at the left-hand side of the seat. Selection of internal or either of the external supply points with an additional position where supply is to the internal and one external point, is by means of a 4-position lever.

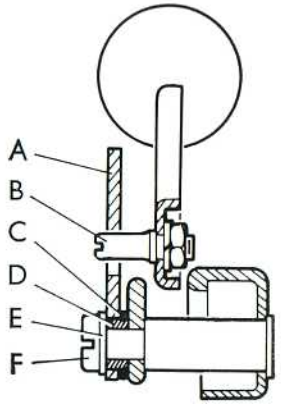
Lubrication of the gearbox and PTO is supplied by overflow oil from the hydraulic pump. When using external equipment which uses a large and continuous flow of oil (*i.e.* mower), lubrication to the gearbox and PTO may be reduced to a critical level unless the return oil is fed back into the lubrication system. This is done by returning the oil to the point provided on top of the rear axle case at the right-hand side of the seat. Provision is also made at this point for mounting an external hydraulic valve (see page 67).

CATCH UNIT

When external equipment is being used which includes its own hydraulic control valve, a continuous pressure of oil is required from the internal system. In order to hold the hand lever in the lift position against the spring, a Catch Unit-

U730 is available for fitting to the rear setscrew of the quadrant as shown in Fig. 1/6.

FIGURE 1/6.
CATCH UNIT
A. Catch
B. Peg
C. Rubber ring
D. Bush
E. Washer
F. Existing screw



LOWERING ADJUSTMENT

The rate of lowering may be adjusted by turning a knob on the front of the axle casing. Lowering is governed by a flow control valve and the speed is independent of the load on the system.

LIFT LATCH

A latch is provided on the left-hand ramshaft (rockshaft) bracket for stowing the links in the top position when not in use. **Never pass the hand under the lift rod and ramshaft (rockshaft) arm to release the lift catch. Serious injury will occur if the links should fall.** When the latch lever is pushed downwards the links will be automatically held at the top when fully raised. To raise the links fully when a load is attached, it will be necessary to pull the hand lever fully rearwards past the spring loaded stop to override the automatic hold which occurs just before the lift latch is reached.

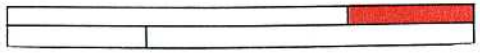
Before attempting to release the latch the linkages must be fully raised, either by pulling the hand lever fully rearwards or, if there is no weight on the links, by hand if preferred. The latch lever is then pulled upwards to release the latch.

The lift latch should be used whilst transporting implements. **Care should be taken to avoid impact loads by driving carefully and slowly over rough ground.**

OPERATION OF SERVICE 1

Implements with depth wheel (gauge wheel) and use of TCU

SETTINGS

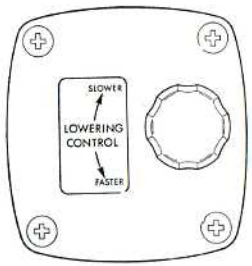


Red band — Select

1. Pull the hand lever fully rearwards in the red band to "select" and while holding there against the spring, turn the selector dial pointer to "TCU".

2. With the engine running, pull the hand lever fully rearwards against the spring and pull the lift latch upwards to disengage it.

3. Set the lowering adjustment temporarily to mid-position and adjust later by trial to give the required rate of lowering for the work in hand.



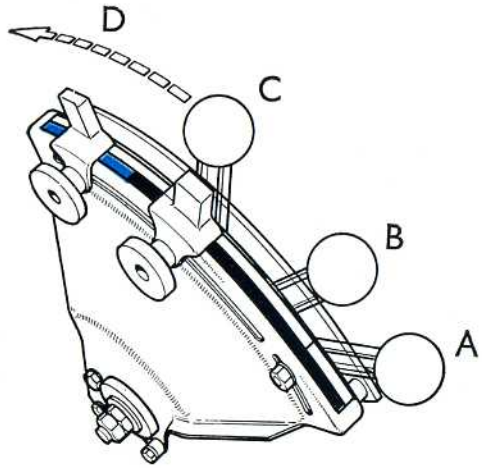
4. Set the first finger guide to the lower position. *

5. Set the second finger guide approximately 1 inch in front of the first guide.

* Lowering will occur over a range of movement of the hand lever but only one position will give maximum rate of drop with completely free evacuation to the sump. This is most easily found without anything attached to the linkages and is correct when they will fall under their own weight after having been raised hydraulically. Once found in this way, the position should be noted for future reference.

OPERATION

At the beginning of the furrow, push the hand lever forward to the lower position. When the plough has reached its full working depth any required amount of TCU (weight transfer) may be applied by pushing the hand lever further forward. Maximum TCU is obtained when the hand lever is fully forward. When the correct amount of TCU has been determined, the second finger guide should be re-positioned into line with the hand lever for future reference.



Black band — Lift, hold, lower
Blue band — TCU

FIGURE 1/7.
HAND LEVER POSITIONS WITH DIAL POINTER AT TCU

A. Lift position *B. Hold position*
C. Lower position *D. Range of TCU*

At the headland, pull the hand lever fully rearward past the spring loaded stop. Release it when the implement has fully lifted. The hand lever will spring back to the hold position.

To avoid variation in depth, TCU should be maintained to the end of the furrow. In order to get proper penetration the hand lever should not be pushed forward to the TCU position until the proper working depth has been reached. On the other hand, application of TCU should not be delayed too long or

wheel slip will occur before TCU becomes effective. Once wheel spin has occurred it is difficult to stop. The correct timing and anticipation of the required quantity of TCU is a matter of skill which comes very quickly with a little practice.

LINKAGE ADJUSTMENT WHEN USING TCU

Because of the different forces acting on the plough when using TCU a slight re-adjustment to the settings may be required.

1. The top (upper) link should be shortened slightly to counteract the tendency of the plough to ride out of the ground. It should however, be used as long as possible consistent with obtaining the required depth.
2. To correct a tendency of the front furrow to become shallow, lengthen the right-hand levelling lever slightly.
3. On soft ground raise the depth wheel slightly to maintain the correct depth. Some of the weight is taken off the depth wheel and so it will not sink so deeply into soft earth as it would without TCU.

OPERATION OF SERVICE 2 "DEPTH CONTROL"

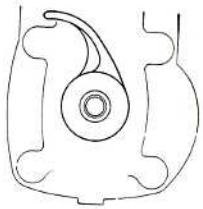
Implements without depth wheel (gauge wheel)

SETTINGS

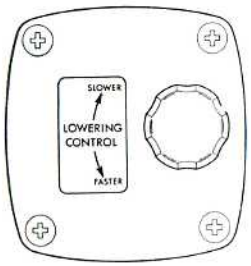
Red band — Select

1. Pull the hand lever fully rearwards in the red band to "select" and while holding it there against the spring, turn the selector dial pointer to "DEPTH".

2. With the engine running, pull the hand lever fully rearwards against the spring and pull the lift latch upwards to disengage it.



3. Set the lowering adjustment temporarily to mid-position and adjust later by trial to give the required rate of lowering for the work in hand.

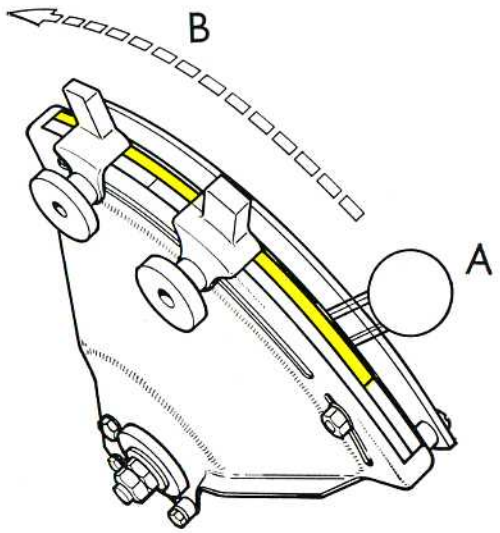


4. Set the first finger guide temporarily to a mid-position.

5. Push the second finger guide to the front of the quadrant.

OPERATION

At the beginning of the furrow, push the hand lever forward to the finger guide. Adjust the hand lever forward to increase depth and rearward to decrease depth until the required depth has been found by trial. Set the finger guide in line with the hand lever so that the same depth can be found easily on subsequent furrows. At the headland, pull the lever rearwards up to the spring loaded stop to lift the implement. If wheel slip occurs, differential lock should be used as described on page 28.



Yellow band — Range of depth

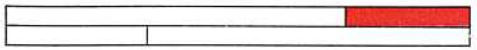
FIGURE 1/8.
HAND LEVER POSITIONS WITH DIAL POINTER AT DEPTH

A. Lift position *B. Range of depth*

OPERATION OF SERVICE 3 "HEIGHT CONTROL"

Light draught, or implements working above ground level

SETTINGS

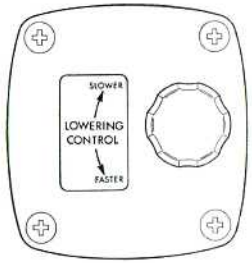


Red band — Select

1. Pull the hand lever fully rearwards in the red band to "select" and while holding it against the spring, turn the selector dial pointer to "HEIGHT".

2. With the engine running, pull the hand lever fully rearwards against the spring and pull the lift latch upwards to disengage it.

3. Set the lowering adjustment temporarily to mid-position and adjust later by trial to give the required rate of lowering for the work in hand.

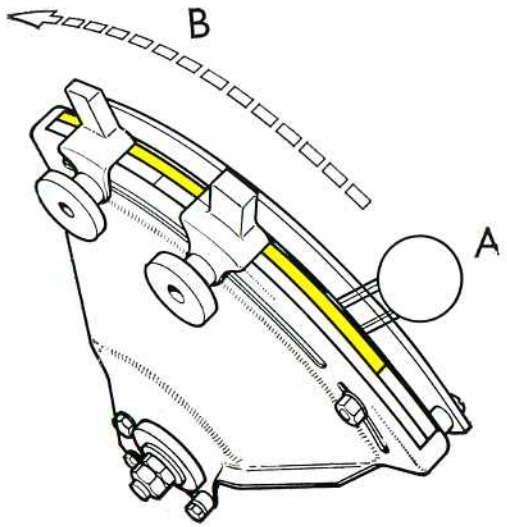


4. Set the first finger guide temporarily to mid-position.

5. Set the second finger guide fully forward to the front of the quadrant.

OPERATION

Raise the implement by pulling the hand lever rearwards up to the spring loaded stop. Push the lever forward until the implement is lowered to the required height. Set the finger guide into line with the hand lever so that the same height may be found again easily.



Yellow band — Range of height

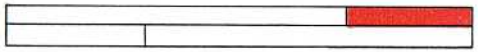
FIGURE 1/9.
HAND LEVER POSITIONS WITH DIAL POINTER AT HEIGHT

A. Lift position *B. Range of height*

OPERATION OF SERVICE 4

External Equipment operated by the tractor hydraulic supply

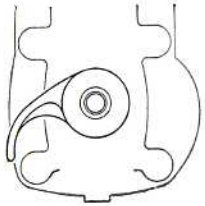
SETTINGS



Red band — Select

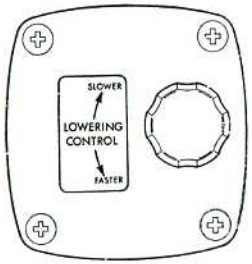
1. Pull the hand lever fully rearwards in the red band to "select" and while holding it against the spring, turn the selector dial pointer to "EXTERNAL".

2. Stow the links on the lift latch (push the lift latch downwards and pull the hand lever fully rearward against the spring until the linkages rise above the latch).



3. Set the 3-way valve lever to the external system required See page 25.

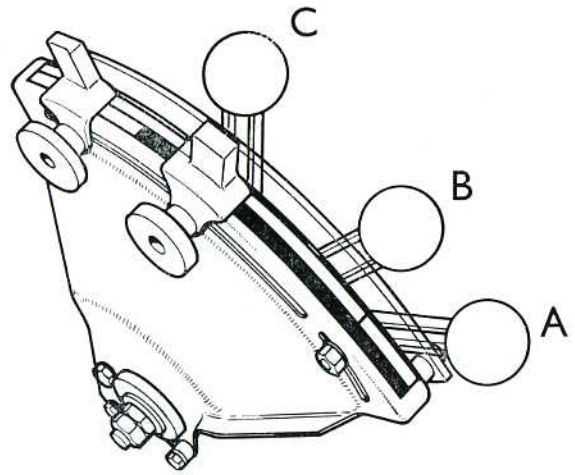
4. The lowering adjustment should be set by trial to give the required rate of lowering for the work in hand.



5. Set the first finger guide to the lower position.*

6. Push the second finger guide fully forward to the front of the quadrant.

*See footnote on page 16.



Black band — Lift, hold, lower

FIGURE 1/10.
HAND LEVER POSITIONS WITH DIAL POINTER AT EXTERNAL

A. Lift position *B. Hold position* *C. Lower position*

OPERATION

It is advisable to ensure that there is sufficient oil in the sump to feed the external system, approximately half a gallon extra will be needed for a trailer or loader. Up to one gallon extra may be added when necessary. To pump oil to the external equipment, pull the hand lever fully rearward past the spring loaded stop. To stop the flow of oil, release the hand lever which will spring back to the hold position (in this position the pump is unloaded and the oil locked in the external equipment). To return oil to the sump, push the hand lever forward to the finger guide. **Do not go forward beyond the lower position** or TCU pressure will be applied and this is sufficient to drive a mower or raise an empty loader.

For external equipment with its own hydraulic controls and requiring continuous pressure, hold the hand lever in the rear position by using the Catch Unit-U730 (see page 15).

3-WAY VALVE

Connections

The two external connections are available on the front of the unit and are supplied sealed with $\frac{3}{4}$ UNC plugs. The upper connection is designated No. 1 and the lower one No. 2.

Any equipment which requires a continuous supply of oil, such as a hydraulic mower, should have its return oil taken to a point which enters the gearbox lubrication system, otherwise the gearbox and PTO will not be properly lubricated. See page 67.

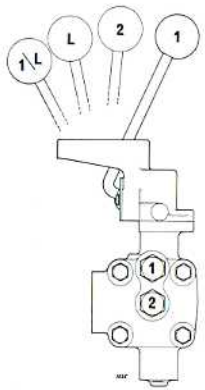


FIGURE 1/11.
3-WAY VALVE

1. *Output connection 1*
2. *Output connection 2*

Operation

The selector lever moves sideways and it is only necessary to place it in line with the symbol on the transfer referring to the equipment required as follows:

1. Connects to outlet 1.
2. Connects to outlet 2.
L. Connects to internal ram to operate linkages.
1/L. Connects to outlet 1 and linkages at the same time.

Control is then carried out by the Selectamatic hand lever as described on the previous page. For use of dump valve (where fitted) see page 27.

OPERATION OF LIVE EXTERNAL EQUIPMENT

(Optional Unit)

Either a single (U844) or twin (U845) live double-acting take-off valve may be fitted in place of the external hydraulic connection housing at the right-hand side of the seat on top of the rear axle case.

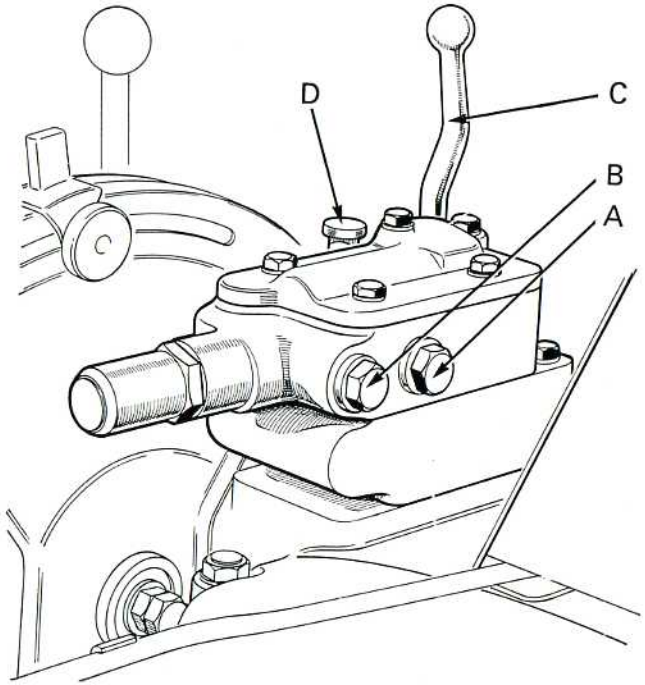


FIGURE 1/12. LIVE, DOUBLE-ACTING, TAKE-OFF VALVE MOUNTED ON THE DISTRIBUTOR BLOCK

A. Output to this connection when lever C is forward
B. Output to this connection when lever C is rearward
C. Operating lever
D. Dump valve

Connections to the double-acting take-off valve are shown at A and B in Fig. 1/12. When the control lever is pushed forward, oil is fed to connection A and returned to the sump via connection B. When the control lever is pulled rearward the oil flow is reversed. Both positions have an indent so that the

lever is retained when pushed to the extreme of its movements. An automatic reject valve is incorporated so that the lever is returned to the centre position and cuts off the oil flow when the external ram reaches the end of its travel and the pressure increases.

When connecting external equipment it is advisable to arrange the connections so that when the lever is pulled rearwards the implement raises, and lowers when the lever is pushed forward.

When a second live-valve is fitted, this is identical to the first; connections and operation are similar. It works quite independently.

DUMP VALVE (Optional fitment)

This valve allows a much quicker rate of lowering of external ram operated equipment such as trailers. It must *not* be used for linkage mounted implements although it may be used to lower the pick-up hitch to facilitate quick coupling.

The valve control knob is situated on top of the rear axle case to the right of the seat, adjacent to the "select" portion of the hydraulic control lever, D Fig. 1/12.

OPERATION

1. Push the hydraulic control into the 'lower' position.
2. Press down the dump valve knob and turn through 90° (either direction) and pull upward.
3. When the implement is fully lowered, push the knob down and twist about 90° until it locates in the retention indent.

DIFFERENTIAL LOCK

This locks the drive so that both rear wheels turn at the same speed, thus one wheel cannot slip unless the other one does.

ENGAGING

To engage differential lock, press the pedal firmly with the right heel **before** slip occurs. **If slip has occurred, close the throttle or de-clutch before pressing the differential lock pedal.** Re-engage the clutch gradually. Maintain a steady pressure on the pedal until the differential lock engages. Ensure that the pedal is pressed down the full amount. Retain the lock in engagement by resting the heel on the pedal.

DISENGAGING

The differential lock is spring loaded so as to push it out of engagement but any tendency to slip will create a binding action which will prevent it from disengaging. To disengage it is only necessary to momentarily relieve the load or reverse the load. This is done by pressing quickly first on one brake pedal, then on the other. When ploughing it is usually only necessary to press on the landwheel brake.

If differential lock is used for trailer work with the brakes locked together, disengagement can be obtained by steering first to one side then to the other.

Note. If the tractor is stopped and the differential lock remains in engagement, it may be released by momentarily reversing the tractor.

Warning. The differential lock must not be used in the higher gears, at high speeds, or on the public highway.

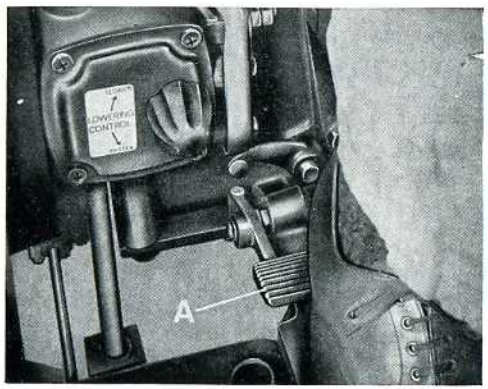


FIGURE 1/13.
DIFFERENTIAL LOCK
A. Pedal

BALLAST

Wheel slip is expensive, not only because of wear but also because it wastes fuel. It should be reduced by use of TCU where possible. If extra traction is required, resort to ballasting by means of wheel and chassis weights. Alternatively, or in addition, water ballast in the tyres may be used. A special anti-freeze solution should be used where temperatures below freezing are encountered. The tyre should never be completely filled. For full details and for the correct apparatus for filling, consult your Dealer or the tyre manufacturer's literature.

WHEEL WIDTH ADJUSTMENT

TRACK SETTINGS FOR PLOUGHING

For 12 in. to 16 in. ploughs (30·5 to 40·6 cm) the rear track should be set to 56 in. (142 cm) and the front track to 52 in. (132 cm). This brings the insides of the front and rear tyres into line.

For ploughs of 8 in. to 12 in. widths (20 cm to 30·5 cm), the rear wheels should be set to 52 in. (132 cm) and the front axle to 52 in. (132 cm) width but off-set to the left-hand side to bring the inside of the right-hand front tyre into line with the inside wall of the rear tyre.

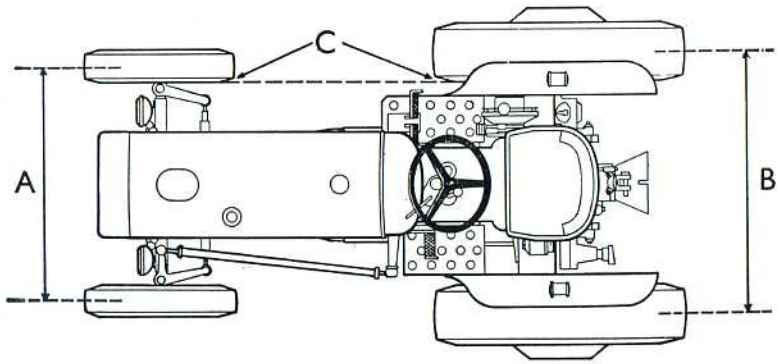


FIGURE 1/14. WHEEL SETTINGS FOR PLOUGHING
Front setting A, 4 in. (10 *cm*) *less than rear setting B*
C — Tyre wall in-line

REAR TRACK ADJUSTMENT

The rear track width can be varied by 4 in. (10 cm) steps. The wheel centres are dished so that they can be fitted to the hub either way round. The lugs on the wheel rim are off-centre so that by fitting the wheel either way round, a variation is obtained. A further variation is obtained by fitting the wheel rim lugs either side of the dished centre. The full range of settings are shown in Fig. 1/15.

Note. When fitting rear wheels observe the correct direction of rotation of pneumatic tyres. The tread pattern must be such that when looking down on top of the tyre, the Vee of the tread points forward.

Important. Take care to place the jack on firm ground under a solid part of the tractor. Before removing a wheel, place some pieces of stout wood under the tractor frame to support it should the jack become dislodged.

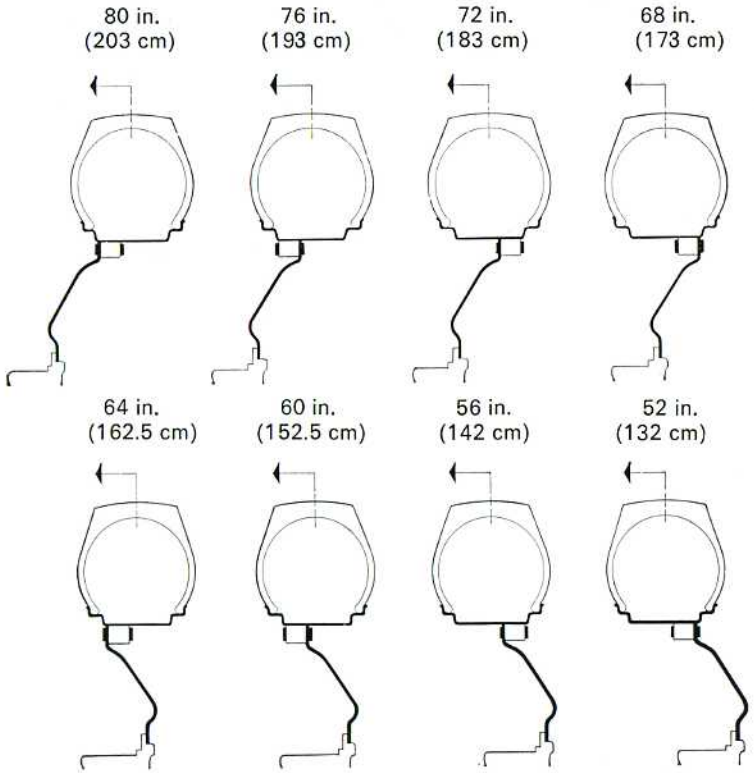


FIGURE 1/15. REAR WHEEL-POSITIONS OF RIMS AND CENTRES

FRONT TRACK ADJUSTMENT

The axle extension is secured by two bolts A Fig. 1/16. These are screwed into threaded holes in the axle and do not require the use of nuts. To adjust the track width, jack up the axle, remove the adjustment nut and bolt from the track rod, remove completely the two bolts A and slide the axle extension to the required position and re-fit the bolts. (When adjusting the left-hand half of the axle, the wheels should be turned to the right so that the steering arm B does not obstruct removal of the bolts.) Ensure that the spring washers are used and the bolts fully tightened. When both halves of the axle have been adjusted, re-fit the nut and bolt through the track rod to position the wheels parallel when straight ahead. All exposed holes should be plugged with the plastic plugs provided in the tool box.

Note. On no account should the front wheel be fitted with the wheel centre dish outwards to give increased track width. Doing this upsets the steering geometry causing poor steering and heavy tyre and pivot wear.

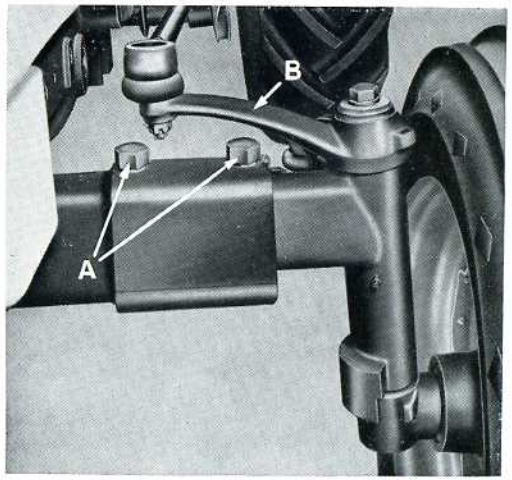


FIGURE 1/16.

FRONT AXLE TRACK ADJUSTMENT

A. Axle securing bolts *B. Steering arm*

TYRE PRESSURES

Tyres are expensive and it pays to check the pressure frequently. Incorrect pressure, either too high or too low, is the chief cause of tyre wear and damage. Check pressures once a week. If water ballasted the pressures should be checked very frequently.

Front tyres—all conditions	..	25 lb/in² (1·76 kg/cm²)
Rear tyres—field work	..	12 lb/in² (0·84 kg/cm²)
Rear tyres—road work	..	14 lb/in² (0·98 kg/cm²)

LINKAGE SETTINGS

LINKAGE SETTINGS FOR CATEGORY I IMPLEMENTS

The uncranked end of the lower link with the larger ball is fitted on the **inside** of the hitch bracket using the sleeve supplied in the tool box to bring the pin to the diameter of the hole in the ball. Ensure that the links are correctly handed so that the crank at the rear end is turned inwards.

The lift rods should be connected using the pin on the check chain which gives the shorter length of chain. The end of the chain and the other pin is allowed to hang loose.

Note. If the check chain is excessively tight when marking out a field, temporarily fit the right-hand lower link on the outside of the hitch bracket.

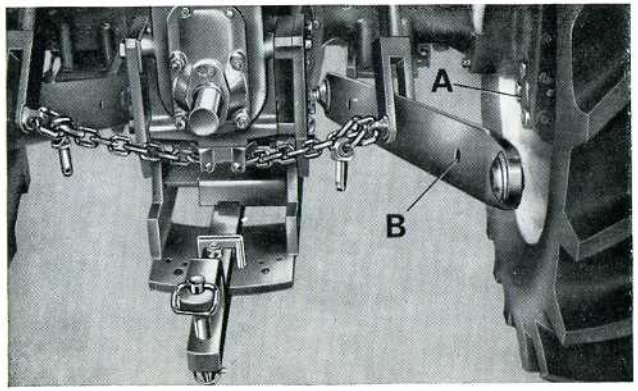


FIGURE 1/17. POSITIONS OF LINKAGE, CHECK CHAINS AND STABILISER BAR

A. Mounting pad for linkage stabiliser

B. Hole for linkage stabiliser

LINKAGE SETTING FOR CATEGORY II IMPLEMENTS

The cranked end of the lower link is fitted on the **outside** of the hitch bracket with the crank turning outwards using the pins provided through the small ball.

The lift rod is attached using the end pin on the check chain.

When side movement must be avoided, a stabiliser bar may be fitted as shown in Fig. 1/17 using the rearmost hole in the lower link. The links are still free to lift up and down.

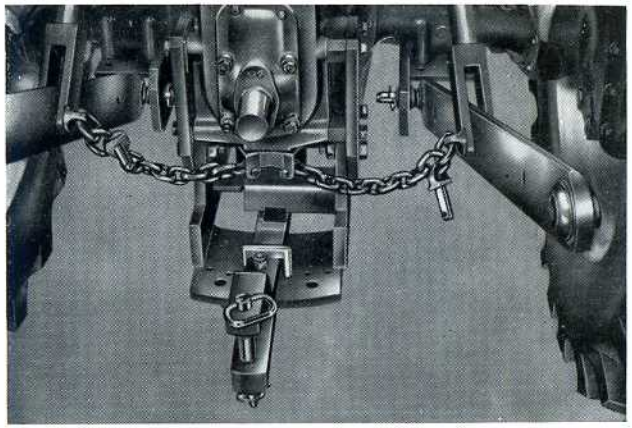


FIGURE 1/18. POSITION OF LINKAGE AND CHECK CHAINS

LIFT RODS

For ploughing the lift rod and levelling lever should be set initially to 19 in. (48·3 cm) measured between the pivot centres.

N.B. The lift rod must not be extended to more than 21 in. (53·4 cm) between pivot centres, otherwise there will be excessive strain on the remaining thread. Similarly the levelling lever must not be extended beyond 21 ¼ in. (54 cm).

When not attached to the lower links *i.e.* when the drawbar is used and the lower links removed, the check chain pins should be inserted to prevent the lift rods unscrewing and falling off.

PERMANENT DRAWBAR

A simple drawbar with two positions, a normal towing position with a weight limit of 2200 lb (1000 kg), and an extended position 14 in. (35·6 cm) behind the PTO with a weight limit of 1200 lb (545 kg).

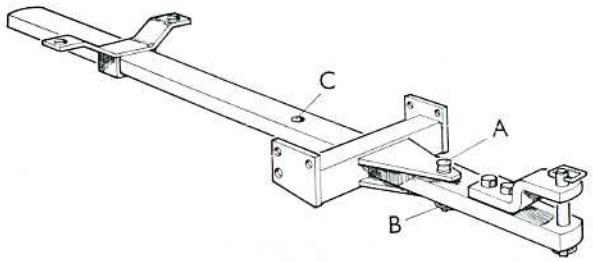


FIGURE 1/19. PERMANENT DRAWBAR

A. Securing pin B. Linch pin
C. Pin A secures here in extended position

SWINGING DRAWBAR

STOWED POSITION

The front end of the bar is pushed through the "U" support bracket on the left-hand side and secured with the towing pin.

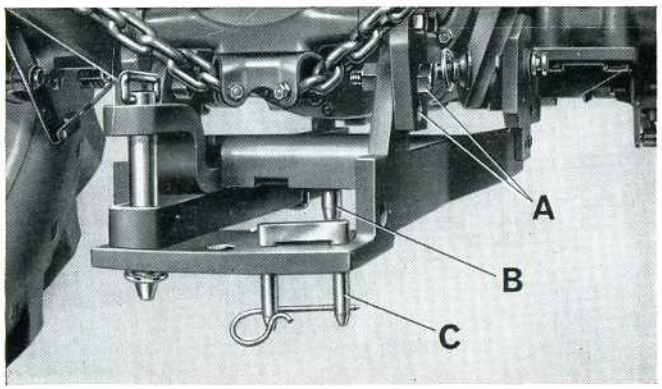


FIGURE 1/20. DRAWBAR — STOWED POSITION

A. Alternative height positions
B. Front securing pin-towing position
C. Rear securing bracket-towing position

TRAILER TOWING POSITION

For trailers exerting a downward load at the clevis up to a maximum of 3000 lb (1360 kg) the forward towing position should be used. The drawbar is secured at the 2nd hole from the front by the downward projecting pin under the drawbar frame. The linch pin must be used to fasten the bar.

The rear of the drawbar is held by an inverted "U" shaped clamp and secured by the pin as shown in Fig. 1/21. This clamp can be fitted in several positions either centrally or to each side.

FULLY EXTENDED POSITION

Attachment is similar to the trailer position described above except that the front hole in the drawbar is used. This gives a towing position in relation to the PTO shaft which conforms to the British Standard for PTO driven implements. The maximum downward load at the clevis in this position is 2500 lb (1133 kg).

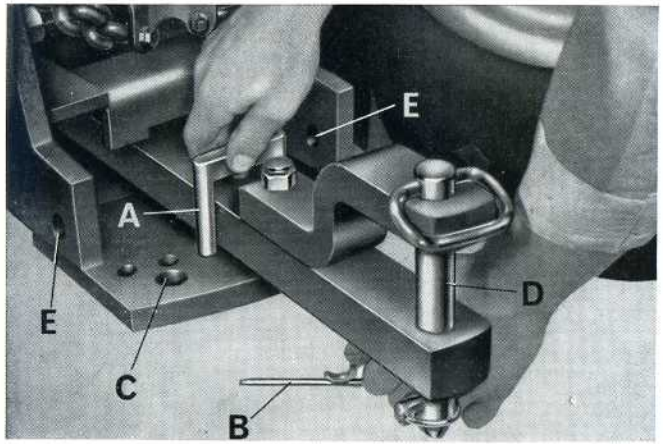


FIGURE 1/21. DRAWBAR

A. Securing bracket
B. Pin
C. Drawpin secures drawbar through this hole in stowed position
D. Drawpin
E. Holes for pick-up hitch lift rods

HEIGHT ADJUSTMENT

When in the fully extended position the clevis can be adjusted to 4 heights. The rear of the drawbar frame can be bolted at two different positions and in either position the drawbar may be fitted either way up giving heights of 9 in. (22·9 cm), 11 in. (27·9 cm), 13 in. (33 cm) and 15 in. (38·1 cm) on 14·9/13-28 tyres.

PICK-UP HITCH

A pick-up hitch may be fitted to the drawbar frame when the drawbar is in the stowed position.

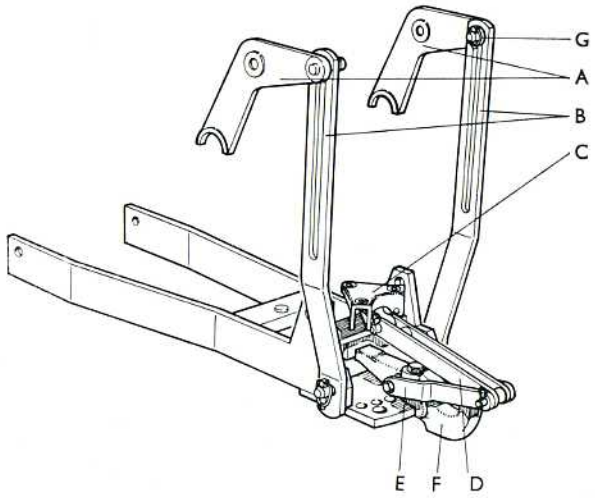


FIGURE 1/22. PICK-UP HITCH

A. Extension arms
B. Lift rods
C. Anchor bracket
D. Draw link
E. Jaw plate
F. Jaw
G. Washer

FITTING INSTRUCTIONS

Bolt the towing hook firmly to the centre of the drawbar frame. Remove the check chain anchor bracket from under the PTO housing and bolt the new anchor bracket and jaw plate in its place. Transfer the check chains to the new bracket. Fit the jaw and jaw link using the pins and spring clips provided.

Bolt the left- and right-hand lift arms to the inside of the ram arms (rockshaft arms) using the 4¼ in. (10·8 cm) long bolts in place of those through the lift rods. The pins welded to the ends of the lift arms should be on the inside of the arms.

Fit the cranked lift rods with the slotted ends uppermost, fitting a ⅞ in. (2·2 cm) washer between the drawbar frame and the lift rod at the bottom end and between the lift rod and securing linch pin at the top end.

The linkages may be used without interference in this position. To use the pick-up hitch, remove the 2 bolts securing the drawbar frame to its rear support brackets.

OVERLOAD RELEASE

When an implement attached to the linkages strikes an obstacle, the impulse from the top link is transmitted through a cable to release the clutch. This stops the tractor and prevents excessive damage to the tractor or implement.

The load at which the clutch is released is set by compressing the spring in the top link by an adjustable collar. It should be tightened sufficiently to prevent an excessive number of releases but not so tight that the implement would be damaged before the release operates. Adjust by trial and error, erring on the slack side to begin with and tighten a little at a time until unnecessary releases are just eliminated. The clutch is re-engaged by re-engaging the hand lever B with the latch C after putting the gear into neutral. Negotiate the obstacle before putting the implement to work again.

Note. Never operate the overload release except from the driving position. To avoid wear on the clutch put the gear lever into neutral and re-engage the overload release as soon as possible if it is desired to keep the engine running.

The overload release only disengages the transmission clutch, but it should never be used to stop the tractor for PTO or belt pulley work. The gear range lever should always be put in neutral when the belt pulley or PTO is being used for stationary work.

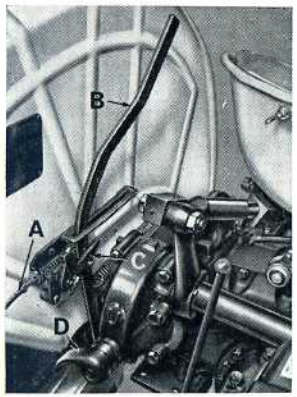


FIGURE 1/23

A. Cable to top link unit
B. Hand lever
C. Latch
D. Lift latch

SECTION 2.
REGULAR MAINTENANCE

Regular routine maintenance is essential. The importance of carrying this out regularly cannot be over emphasised. A properly maintained tractor retains its efficiency longer and remains reliable and ready for use at any time. Failure to carry out the maintenance properly can lead to unnecessary repairs, usually at unexpected and awkward times and in the long run is much more expensive than the cost of the regular attention. Because of its importance, the David Brown maintenance procedure has been made very simple. To this end the requirements have been divided into a daily inspection and greasing, plus 5 tasks A, B, C, D, and E to be carried out at set periods. The frequency of these tasks is shown in the table opposite and it is only necessary to keep an eye on the hour meter. The recommended times are for normal temperate conditions and in areas of dry dust or wet mud, the daily greasing and inspection of the air cleaner, should be carried out twice a day or more often if dictated by experience. The other tasks should also be carried out at correspondingly shorter intervals.

It is strongly recommended that the tasks be carried out at the end of the day on which the hour meter reaches the stipulated time. The oils will then be warm and will drain away easily.

NOTE. Attention to cleanliness is very important. All grease points must be cleaned before applying the grease gun. Sump plugs and filler caps must be wiped clean before removing and any containers used for filling the engine, gearboxes or fuel tank must be kept perfectly clean. The smallest grain of dust in the fuel system can cause faults with loss of power and early replacement. It is recommended that servicing be carried out under cover wherever possible.

TABLE OF SERVICE TASKS

In addition to the Daily Inspection and greasing, carry out the tasks marked X at the times shown.

Note. Recommended times are for normal conditions. In very wet and muddy conditions — grease more often. In dry dusty conditions (*i.e.* stationary work or hot climates) — clean the air filter, oil and fuel filters and carry out oil changes more frequently.

Hour Meter Reading	Task A	Task B	Task C	Task D	Task E
60	X	†			† (1 to 4)
125	X	X			
185	X				
250	X	X	X		
315	X				
375	X	X			
440	X				
500	X	X	X	X	
560	X				
625	X	X			
685	X				
750	X	X	X		
815	X				
875	X	X			
940	X				
1000	X	X	X	X	X

† New and Reconditioned Tractor only.

DAILY INSPECTION

1. **Inspection** — Check for oil, water and fuel leaks.

2. **Engine Oil** — Top up the engine sump if below the safe limit.

3. **Fuel** — Top up the fuel tank to within 1½ in. (4 cm) of the top. This ensures a good supply and reduces condensation in the tank. Visually check the fuel water trap for excessive dirt or water. Clean if necessary.

4. **Pre-Cleaner** — In dry and dusty conditions the paper element in the pre-filter should be cleaned every 8 hours by tapping gently on its side.
In damp and less dusty conditions the pre-filter element will not require such frequent attention but experience will guide you to the correct periods of cleaning.
A blocked filter will give rise to rich mixture, low power and sooty exhaust. This should not be allowed to occur.

4a. **Air Cleaner** — Where a paper element pre-cleaner is not fitted, check the oil in the air cleaner oil cup as item 1 in Task A, page 42.

5. **Greasing** — In dusty or wet and muddy conditions apply lubricant to the following points (see Fig. 2/2). Clean the grease points (fittings) before applying the gun.

SAE 140 OIL
- King Pins.
- Front Axle Trunnions (2 points).

GREASE
- Front Hubs.*
- Steering Box Cross-shaft (3 points).
- Rear Hubs.*

6. **Wheel Nuts** — Early in the tractor life it is essential that the wheel nuts are checked for tightness each day. Once the concial seats have bedded in this will no longer be necessary.

* Continue until **grease** exudes from inside of hub. This is not a sign that the hub seal is faulty.

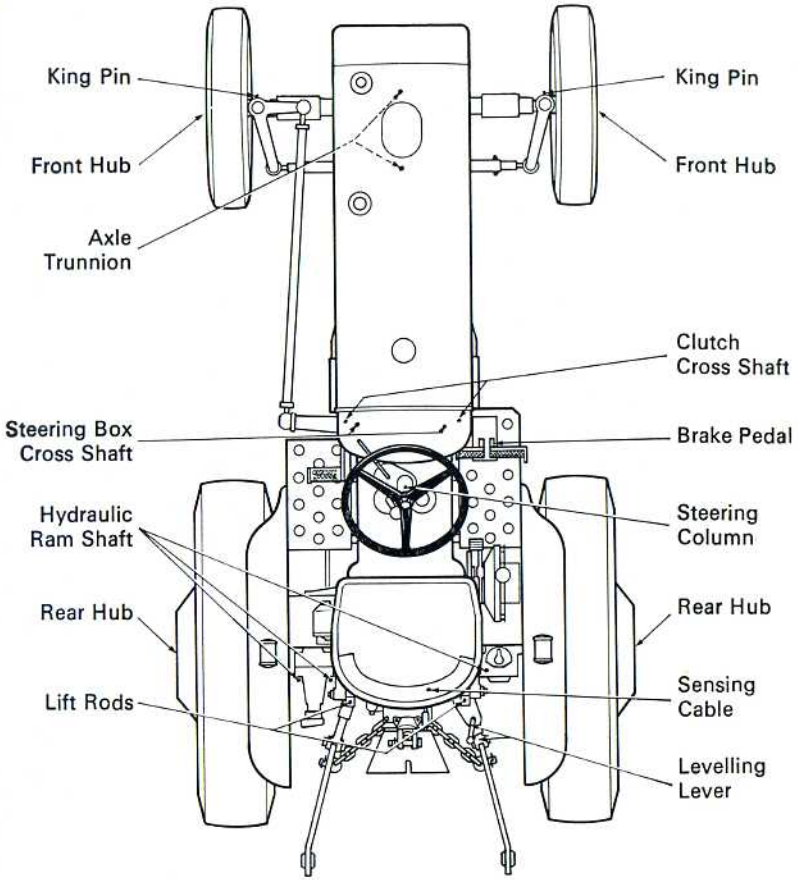


FIGURE 2/2. GREASING CHART

In addition to the above points, the water pump and distributor should be greased with **High melting point grease** every **500 hours only**

SERVICE TASK A

Every 60 hours under normal conditions — **more often if necessary.**

1. **Air Cleaner** — Check the condition of the oil in the air cleaner oil cup after releasing the 3 toggle clips. The oil should be clean and up to the level of the bead. If the pre-filter becomes damaged, the oil will dirty quickly and should be discarded and refilled with new engine oil. Occasionally detach the wire mesh element with its sealing rings and clean in gasoline, drain and replace. It is essential that all joints are air tight to prevent dust being drawn in. If the rubber sealing ring on the oil bath becomes damaged, a new one must be fitted.

2. **Gearbox Oil** — Top-up the gearbox oil to within the safe marks on the dip stick if necessary.

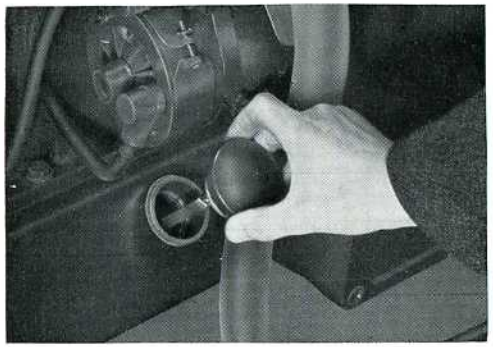


FIGURE 2/3. ENGINE OIL FILLER

3. **Greasing** — Apply lubricant after cleaning the grease points (fittings).

SAE 140 OIL
- King Pins.
- Front Axle Trunnions (2 points).

GREASE
- Front Hubs.
- Steering Box Cross-shaft (3 points).
- Steering Column top bearing.
- Clutch Cross-shaft (2 points)*.
- Rear Hubs.
- Brake Pedal (1 point).
- Sensing Unit Cable.
- Hydraulic Lift Ramshaft (2 points).
- Lift Rod and levelling lever (5 points).

** Take care not to overgrease. Apply only 2 shots of the grease gun.*

4. **Controls** — Lubricate the controls and pivots with new engine oil. In dry, dusty conditions these points are best left unlubricated.

5. **Brakes** — Check that the brakes pull evenly when the two pedals are locked together. Also readjust as given on page 68 if there is more than 2in. (5 cm) of travel before commencement of operation.

6. **Clutch** — Check free-play and reset to 1 to 1½ in. (2·5 to 3·8 cm) if necessary.

7. **Water** — Top up the radiator, if necessary, to within 1 in. (2·5 cm) of the neck to allow for expansion. Release the cap slowly as the system is pressurised.

8. **Battery** — Fill up the battery with distilled water as instructed on the lid. Dry off any spilled water. The battery will require more frequent attention in hot, dry conditions.

9. **Tyres** — Inflate tyres to correct pressures.
Front tyres—all conditions 25 lb/in² (1·76 kg/cm²).

Rear tyres { field work 12 lb/in² (0·84 kg/cm²).
road work 14 lb/in² (0·98 kg/cm²).

SERVICE TASK B

Every 125 hours under normal conditions — **more often if necessary.**

1. **Engine Oil Change** — Drain the engine sump whilst hot. Refill to within the safe marks on the dipstick with new oil.

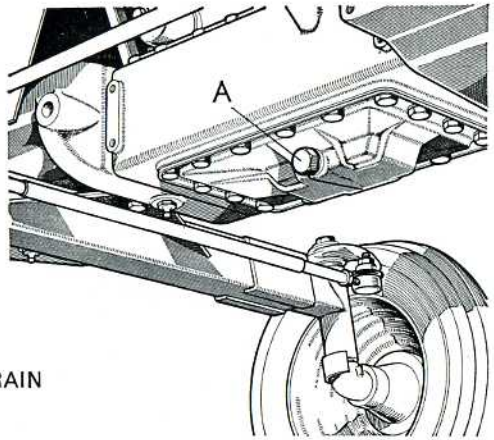


FIGURE 2/4.
ENGINE SUMP DRAIN
A. Oil drain plug

2. **Final Drive Oil Check** — Top up the final drive reduction units to the plug with new oil if necessary. Check that the hole in the vent plug is clear.
3. **Distributor** — Clean the surfaces of the contact points and re-set the gap to 0·020 in. (0·50 mm). Smear a small amount of high melting point grease to the cam and one or two drops of oil through the oil hole.
4. **Fuel Water Trap** — Clean out the fuel water trap and sediment bowl.

SERVICE TASK C

Every 250 hours under normal conditions — **more often if necessary.**

1. **Oil Filter Renewal** — While the engine oil is being drained, remove the oil filter and fit a new element.
2. **Sparking Plugs** — Remove, clean and re-set the sparking plug gaps to 0·025 in. (0·63 mm). Take care not to bend the centre electrode.

SERVICE TASK D

Every 500 hours under normal conditions — **more often if necessary.**

1. **Gearbox Filter** — Drain the gearbox and transmission housing into a **clean** container. Cover the container and allow the oil to stand while completing the servicing operations. Remove the full flow filter housing, clean out with fuel oil and a stiff brush, making sure that the wire screen is also clean and free of bits. Fit a new paper element filter and re-assemble. Refill with the original oil except for the last gallon which should be discarded with any sediment. Top up with new oil. Cleanliness is most essential as the transmission oil is used in the Selectamatic hydraulic system.

   NOTE: It may be necessary to fit a new element assembly before 500 hours. The filter warning lamp will indicate this, see page 6.

   Clean the nylon filter in the by-pass valve plunger situated in the hydraulic control valve assembly.

2. **Sparking Plugs** — Remove the sparking plugs and fit new ones. Set the gap to 0·025 in. (0·63 mm) before fitting.
3. **Valve Clearance** — Check and reset the valve clearances.
4. **Fan Belt** — Check the tension by deflecting midway between the pulleys. Adjust this, if necessary, to be $\frac{1}{2}$ in. (12·7 mm) deflection.
5. **Distributor** — Fit a **new set of distributor points** if necessary and set the gap to 0·020 in (0·50 mm).
6. **Inspection** — Check over the tightness of external nuts, etc.

7. **Water Pump** — Apply high melting point grease sparingly to the water pump grease point (fitting).

8. **Dynamo** — Apply one or two drops of thin oil to the lubricating pad at the end of the dynamo. Replace the rubber plug.

9. **Air Filter** — Where a paper element pre-filter is fitted, fit a new paper element.

SERVICE TASK E

Every 1000 hours under normal conditions — **more often if necessary.**

1. **Engine Oil Pump** — Clean the oil pump wire mesh.

2. **Gearbox** — When hot, drain the oil from the two plugs, (main frame and rear axle). Replenish through the gearbox cover with new oil.

3. **Final Drives** — When hot, drain the oil from the final drive reduction housing and refill to the plug with new oil.

4. **Belt Pulley** — Where fitted, drain off the oil and refill to the level of the plug with the same grade of oil as used for the Gearbox and Hydraulic System.

5. **Inspection** — Check the front hub, front axle and steering for wear and adjustment.

6. **Brakes and Clutch** — Check the adjustment of the brakes and clutch.

FUEL, GREASE AND ANTI-FREEZE

FUEL

Regular grade gasoline having an Octane rating of not less than 90 (Research Method) should be used. It should be clean and free from water.

Warning — Remember that gasoline is a highly inflammable liquid and should be stored and handled with care. Whilst re-fuelling switch off the engine and do not smoke or use naked lights.

GREASING POINTS

A good quality multi-purpose grease should be applied to all grease fittings (except the water pump and the distributor ram which requires a high melting point grease applied sparingly every 500 hours). To avoid keeping various types of grease, a high melting point grease may be used for all fittings except those that require oil.

ANTI-FREEZE

Good quality anti-freeze should be used diluted with clean pure water to the manufacturer's recommendation for the temperature encountered.

The anti-corrosion products in the anti-freeze, have a limited life and the mixture should not be kept in the system for longer than two years. The system should be flushed before filling with new solution.

APPROVED LUBRICANTS—BRITISH ISLES

APPLICATION	GRADE Recommended	Alternative	AMOCO	B.P.	CASTROL	ESSO	MOBIL	SHELL
Engine & Air Cleaner	Multi-purpose Oil	SAE 20/20W	Super VITAMATIC Motor Oil SAE 20W-30	Tractor Oil Universal	Agricastrol Multi-use	Esso Tractorlube (Universal)	Mobiland Universal	Tractor Oil Universal
Transmission & Hydraulic System, Belt Pulley	Multi-purpose Oil	SAE 80	VITAMATIC Motor Oil SAE 20W-30	Tractor Oil Universal	Agricastrol Multi-use	Esso Tractorlube (Universal)	Mobiland Universal	Tractor Oil Universal
Final Drive Reductions King Pins, Front Trunnion & Steering Box	SAE 140		AMOCO Gear Lubricant SAE 140	Tractor Gear 140	Agricastrol Gear Oil Medium	Esso Gear Oil GP 90/140	Mobiland Gear 140 Tractor Oil	Tractor Gear 140
Power Assisted Steering	SAE 10		AMERICAN Industrial Oil 15	Energol HL65	Hyspin 70	Esso Automatic Transmission Fluid or Nuto H44	Mobilfluid 200	Tellus 27
Alternative Grade Oils	SAE 20/20W		AMERICAN HD-M Motor Oil SAE 20-20W	Vanellus SAE 20	Castrol CRI 20 or Agricastrol 20	Essolube HD20	Mobiloil Arctic or Delvac Oil 1120	Rotella S 20/20W
	SAE 80		AMOCO Gear Lubricant SAE 80	Tractor Oil 30	Castrol CRI 30 or Agricastrol 30	Essolube HD30	Mobilube C80 or Mobiloil A or Delvac Oil 1130	Tractor Oil 30

APPROVED LUBRICANTS—OVERSEAS

Application	A.P.I. Classn.	Air Temp.	GRADE Recomm.	Alternative	AMOCO	B.P.	CASTROL	ESSO	MOBIL	SHELL
Engine and Air Cleaner	DG, MS, DM	Below —7°C (20°F)	Multi-purpose 10W/30	SAE 10W	AMERICAN HD-M Motor Oil 10W/30	Tractor Oil Universal	Agricastrol Multi-use 10W/30	Esso Tractorlube Universal 10W/30	Mobiloil Special 10W/30	Rotella M Multigrade 10W/30
	DG, MS, DM	—7°C to 32°C (20°F to 90°F)	Multi-purpose 20W/30 or 20W/40	SAE 20W	AMERICAN HD-M Motor Oil 20W/30 or 20W/40	Tractor Oil Universal	Agricastrol Multi-use 20W/30 or 20W/40	Esso Tractorlube Universal 20W/30	Mobiloil Special 20W/40	Rotella M Multigrade 20W/40
	DG, MS, DM	Above 32°C (90°F)	Multi-purpose 20W/30 or 20W/40	SAE 30						
Transmission and Hydraulic System and Belt Pulley		Below —7°C (20°F)	Multi-purpose 20W/30 or 20W/40	SAE 80	AMERICAN HD-M Motor Oil 20W/30 or 20W/40	Tractor Oil Universal	Agricastrol Multi-use 20W/30 or 20W/40	Esso Tractorlube Universal 20W/30	Mobiloil Special 20W/40	Rotella M Multigrade 20W/40
		—7°C to 32°C (20°F to 90°F)								
		Above 32°C (90°F)	Multi-purpose 20W/30 or 20W/40	SAE 90						
Power-Assisted Steering		All temps.	SAE 10	—	AMERICAN Industrial Oil 15	Energol HL65	Hyspin 70	Esso Automatic Transmis-sion Fluid	Mobilfluid ATF 200	Tellus 27

ENGINE OIL—Under normal operating conditions the engine oils should be marked with viscosity grade and API classification as shown in the above table. Oils marked with service classification DM are recommended when one or more of the following conditions is present:— abnormally high operating temps., intermittent operation at low temps. or fuel contains more than 1% sulphur.

AIR CLEANER—Where possible a straight mineral oil should be used as an alternative to engine oil to avoid frothing

APPROVED LUBRICANTS — OVERSEAS *(continued)*

APPLICATION	Air Temp.	GRADE Recomm.	GRADE Alternative	AMOCO	B.P.	CASTROL	ESSO	MOBIL	SHELL
Final Drive Reductions, King Pin and Front Trunnion (Pivot) and Steering Box	Below —7°C (20°F)	SAE 90	—	AMOCO Gear Lubricant SAE 140	Gear Oil SAE 90	Castrol ST or Agricastrol Gear Oil Light	Esso Gear Oil GP 90/140	Mobilube C90	Dentax 90
	—7°C to 32°C (20°F to 90°F)	SAE 140	—	AMOCO Gear Lubricant SAE 140	Gear Oil SAE 140	Castrol D or Agricastrol Gear Oil Medium	Esso Gear Oil GP 90/140	Mobilube C140	Dentax 140
	Above 32°C (90°F)								
Details of Alternative Grade Oils		SAE 10W		AMERICAN HD-M Motor Oil SAE 10W	Vanellus SAE 10W	Castrol CRI10 or Agricastrol HD10	Essolube HD10W	Mobiloil 10W or Delvac Oil 1110	Rotella S 10W
		SAE 20W		AMERICAN HD-M Motor Oil SAE 20/20W	Vanellus SAE 20W	Castrol CRI20 or Agricastrol HD20	Essolube HD20	Mobiloil Arctic or Delvac Oil 1120	Rotella S 20/20W
		SAE 30		AMERICAN HD-M Motor Oil SAE 30	Vanellus SAE 30	Castrol CRI30 or Agricastrol HD30	Essolube HD30	Mobiloil A or Delvac Oil 1130	Rotella S 30
		SAE 80		AMOCO Gear Lubricant SAE 80	Gear Oil SAE 80	Castrol ST 80 or CR30 or Agricastrol Medium	Essolube 20 HD30	Mobilube C80 or Mobiloil A or Delvac Oil 1130	Dentax 80
		SAE 90		AMOCO Gear Lubricant SAE 90	Gear Oil SAE 90	Castrol ST or Agricastrol Gear Oil Light	Esso Gear Oil GP 90/140	Mobilube C90	Dentax 90

SECTION 3. SERVICE INFORMATION

The following pages give sufficient information to enable the operator to carry out the routine servicing and adjustments required to maintain the high efficiency of the tractor.

Before removing any caps, plugs or covers, all surrounding dirt must be cleaned off. Dust or dirt must not be allowed to enter any part of the tractor at any time.

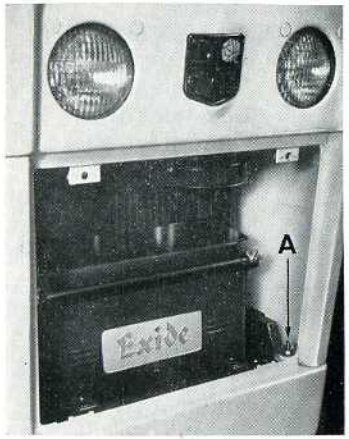
SUB-INDEX

HOOD REMOVAL

Remove the front grille by releasing the Dzus fasteners with a coin or screwdriver and lifting out, forwards and upwards. Disconnect the wires to the headlamps by pulling apart the connectors under the left-hand side of the hood. If an upswept exhaust is fitted, this should be removed by pulling upwards. Remove the air pre-filter and extension pipe. The clip is under the bonnet and has a thumb nut which can be slackened by reaching up inside the front through the grille opening.

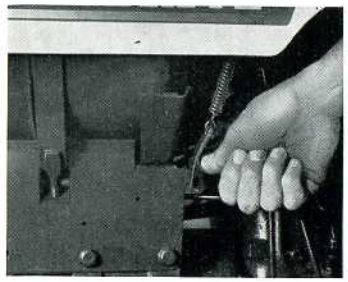
Remove the thumb screws and washers inside the front of the hood at the bottom and release the two spring clips at the rear which hold down the top to the fuel tank. Hood removal will be easier if the fuel tank cap is removed. Lift the hood clear of the fuel tank filler, pull forward and lift clear.

GRILLE REMOVAL



R.H. THUMB SCREW 'A'

HEADLAMP CONNECTOR



BONNET CLIP

ENGINE

AIR CLEANER

A 3-stage filter system is used to provide the best possible protection to the engine. The first stage is a pre-filter with a removable paper element. The second and third stages consist of the oil bath and the detachable wire mesh.

In servicing the cleaner, the aim is to prevent more than $\frac{1}{4}$ in. (6 mm) of dirt accumulating in the oil bath and to prevent the detachable wire mesh becoming choked with oily dust. If the dust collected by the cleaner is not removed frequently, it will reach the stage where it will be carried over into the engine. This will cause premature wear and excessive oil consumption.

In dry and dusty conditions, cleaning and refilling may be required several times a day. In clean and in damp conditions the cleaner will remain efficient for several weeks. Inspect frequently to begin with and clean when there is $\frac{1}{4}$ in. (6 mm) of solid sediment, the oil is very dirty or the detachable wire mesh is thick with oily dust. Let experience then guide future inspection periods. Don't forget to inspect more frequently if conditions become worse.

It is important to clean the wire mesh with petrol (gasoline) and to clean the inlet passages at the same time as cleaning and renewing the oil bath.

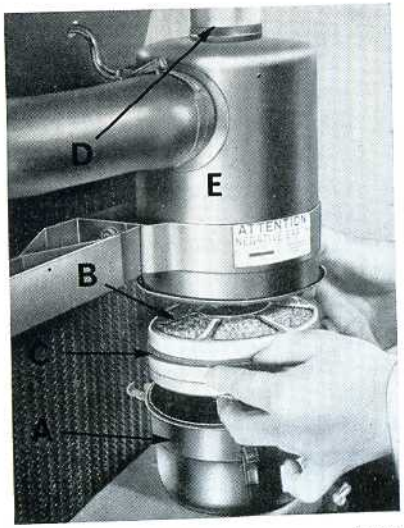


FIGURE 3/1.
AIR CLEANER

A. Oil pan
B. Wire mesh
C. Rubber seals
D. Inlet pipe
E. Cleaner Body

The paper element pre-filter should be cleaned with a brush or by tapping the element gently on its side so that the dust falls off it. Care should be taken not to damage the paper. If it becomes perforated or if it is damp, a new element must be fitted.

COOLING SYSTEM

Ensure that at all times the hose connections are tight and the system free from leaks.

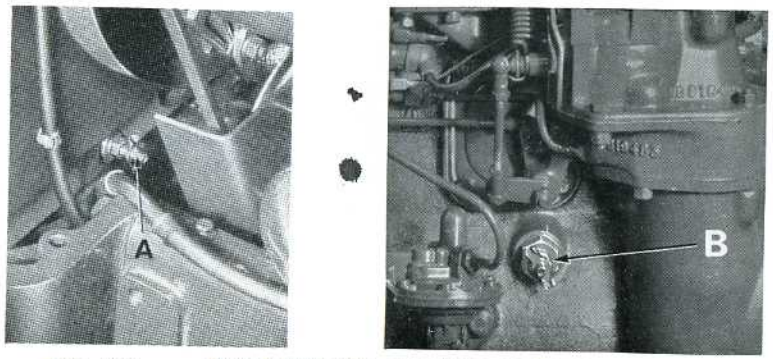


FIG. 3/2. DRAINING THE COOLING SYSTEM

A. Radiator Drain Tap *B. Cylinder Block Drain Tap*

Precautions in freezing weather

If the tractor is to stand for any length of time the radiator **and** cylinder block must be drained (two points) unless anti-freeze is used. The radiator cap **must** be removed to ensure complete drainage.

The use of anti-freeze is strongly recommended in climates where freezing occurs. The strength should be such as to withstand the lowest temperature likely to be encountered. The correct ratio to achieve this will be recommended by the manufacturer.

A good quality anti-freeze should be used and only mixed with pure water. Fresh rain water is ideal as some forms of tap water are unsuitable. The solution should be mixed *before* filling the system. Ensure that the system is free from corrosion by flushing thoroughly. Ensure that there are no leaks as these are made worse by anti-freeze. Anti-freeze should not be retained in the system for more than 2 years.

To prevent rust from forming during the summer a corrosion inhibited summer coolant should be used. The inhibitor in this, as also in anti-freeze, becomes exhausted after a few months of use and must be discarded after use.

FAN BELT ADJUSTMENT

Refer to Fig. 3/3. The fan, dynamo (generator) and water pump drive belt should never be run taut. The correct adjustment allows $\frac{1}{2}$ in. (12·7 mm) of deflection on the drive side of the dynamo (generator) pulley. If incorrect, slacken the bolts A, and the rear mounting bolt, and pivot the dynamo about the lower bolts to give the correct tension. Retighten all the bolts after adjustment has been made.

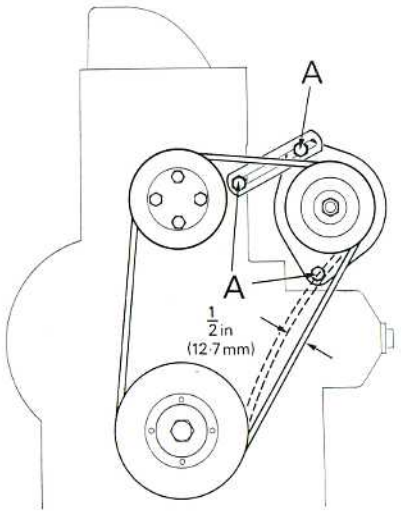


FIGURE 3/3.
FAN BELT DRIVE ADJUSTMENT

A. Securing bolts

SEDIMENT BOWL

It is advisable to clean the sediment bowl and filter before venting the fuel system to prevent carry over due to the high speed of fuel flow. Wash the bowl and filter in petrol (gasoline), and replace. Refer to Fig. 3/4. Do not clean with a cloth because of the risk of including lint. Renew the gasket if the old one is damaged.

If contaminated fuel has been inadvertently allowed into the tank, or excessive condensation has taken place, the fuel should be drained from the plug under the fuel tank.

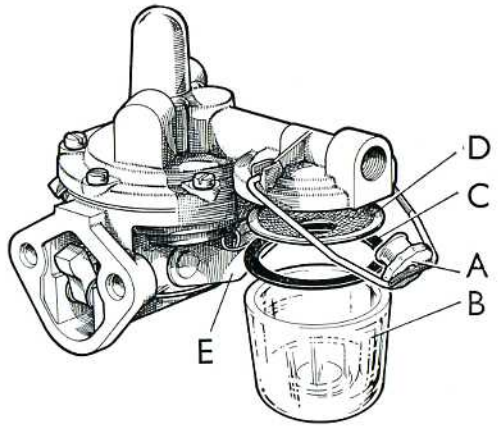


FIGURE 3/4.
SEDIMENT BOWL

A. Bowl securing screw
B. Sediment bowl
C. Sealing ring
D. Filter
E. Fuel pump priming lever

CONTROL LINKAGE

The control linkage is set at the factory and should not be disturbed without good reason.
It is essential before attempting to adjust the carburetter and governor that the control linkage is free to move and is correctly adjusted.
Slacken off the stops on the hand throttle quadrant control on the steering column and move them to ends of quadrant.
Disconnect the short connecting rod (bell crank to cam-plate) on the side of the governor housing and the long control rod on the side of the engine.
Lubricate all ball and cup joints and also all pivot points with good quality grease.
Check the length of the short connecting rod, this should be $2\frac{3}{8}$ in. (60 mm) long between the internal shoulders of the ball and cup joints ignoring the locknuts. **It is most important that this dimension be maintained at $2\frac{3}{8}$ in. as shown in Fig. 3/5A.**

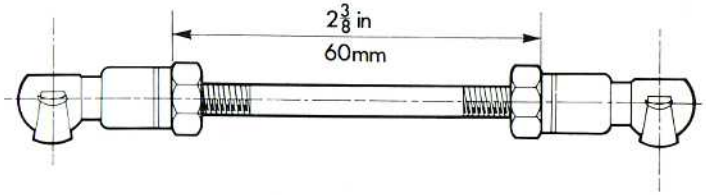


FIGURE 3/5A.

Reconnect the short connecting rod and offer up the long connecting rod ball cup to the ball pin on the bell crank lever **without moving** the bell crank. Should the throttle lever

foul on the previously moved stops on the quadrant before the long connecting rod ball cup can be engaged on the ball crank lever ball pin, it will be necessary to adjust the length of this control rod so that the hand throttle lever does not foul against the quadrant stops.
Move the idling stop on the hand throttle quadrant until it abuts the hand throttle lever and secure in place.
Start the engine and gradually move the hand throttle lever whilst carefully watching the tractormeter/engine speed indicator until 2,350 rev/min light load speed is obtained.
Move the maximum speed stop on the hand throttle quadrant until it abuts the hand throttle lever and secure. Adjust the cam stop grub screw until it abuts against the cam quadrant and tighten the locknut.
The hand throttle control linkage will then be correctly adjusted to the optimum setting for smooth operation throughout its range of movement.

GOVERNOR

The governor is a mechanical type driven from the distributor shaft. It is set at the factory and should not be disturbed.

If it is suspected that the governor is not working correctly, ensure that the fault is not due to a mechanical defect or stiffness in the control linkage. Control rod joints and linkage pivots should be clean and operate freely.

Adjusting the governor, refer to Fig. 3/6.

1. Set the hand throttle lever on the steering column to the fully closed position.
2. Fit a 2BA setscrew to the throttle at B, and adjust to give an engine speed of 1400 rev/min.

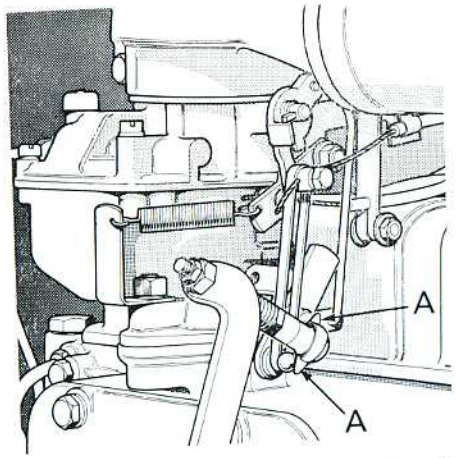


FIGURE 3/5B.
GOVERNOR SETTING

Remove control rod from throttle by lifting tags "A" and attach rubber band as shown to hold throttle closed.

3. Disconnect the control rod A at the carburetter throttle taking care not to overspeed the engine. A rubber band should be attached to the throttle to hold it in the slow run position, as shown in Fig. 3/5.

4. Slacken the locknut and unscrew the governor adjusting screw C until it is clear of the push rod underneath it. Carefully screw the button in until it just makes contact with the push rod. From this point screw in the button 1 to 1½ turns and lock temporarily.

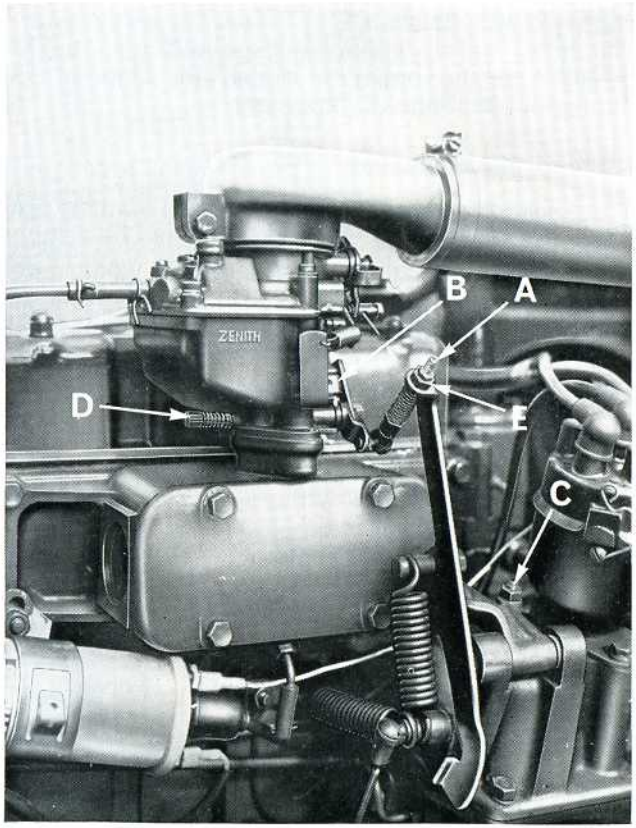


FIGURE 3/6. GOVERNOR ADJUSTMENT

A. Control Rod
B. Slow running screw
C. Governor adjusting screw
D. Mixture control screw
E. Adjustment nuts

5. Reset the 2 BA setscrew B to give an engine speed of 500 rev/min.

6. Screw the mixture control D right in (clockwise) and then unscrew slowly until maximum idling speed is obtained. Re-adjust the 2 BA setscrew B to give 500 rev/min. Next screw the mixture control D clockwise until the speed just begins to drop, then unscrew a ½ turn.

7. Reconnect the control rod A to the carburetter throttle and cut the rubber band free. Remove the 2 BA setscrew. Adjust the length of the rod A by the nut and locknut E, to give an idling speed of 500 rev/min. Lock the rod length in this position.

ENGINE LUBRICATING OIL

Always drain the sump while the engine is still hot with the tractor on level ground. Allow about 5 minutes before replacing the sump plug so that oil can drain down the walls. Refill to the safe marks on the dipstick using the recommended oil, see page 47. If the oil filter element has been changed, motor the engine on the starter to fill the oil filter housing. It may be found necessary to add a little extra oil to compensate for this after filling the sump.

It is important not to allow any dirt to enter the engine. Always clean the filler caps before removing them and also the surrounding surface of the housing. Clean the drain plug before replacing. Keep oil containers clean and wipe the tops and necks before pouring the oil; it is advisable to pour oil through a funnel with a fine mesh strainer, and do it under cover. The oil recommended for engines contains additives to reduce sludge and carbon formation within the engine. After renewing the oil it may be noticed to discolour rapidly. This does not affect the lubricating qualities and is only due to the absorbent nature of the oil.

OIL FILTER ELEMENT

Remove by unscrewing the bolt A in the end of the unit, Fig. 3/7. Remove and discard the dirty element and wash the cover in diesel oil using a small brush. A cloth should not be used as any lint will foul the seat of the by-pass valve in the base of the cover.

Fit the new element and ensure that the rubber sealing ring in the cylinder block is satisfactory before refitting the unit. It is recommended that the securing bolt be tightened to 10 lb ft torque (1·4 kg m). Motor the engine to refill the filter with oil and top up the sump if necessary. Restart the engine and check the cover for leakage.

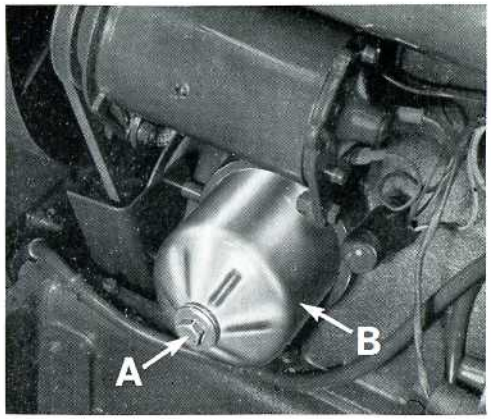


FIGURE 3/7. ENGINE OIL FILTER
A. Securing bolt *B. Filter housing*

OIL PUMP WIRE FILTER

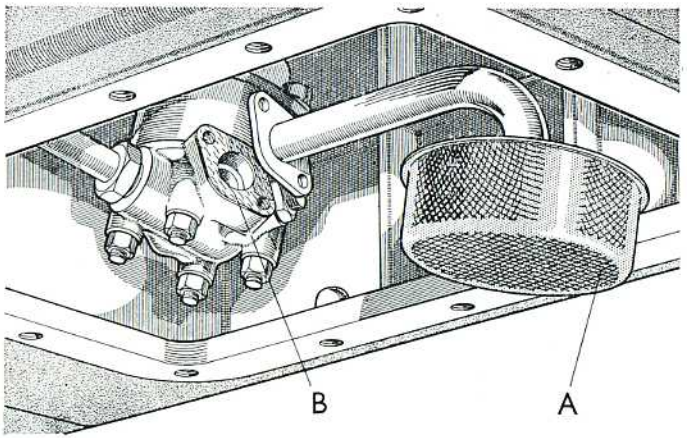


FIGURE 3/8. REMOVING THE ENGINE OIL PUMP FILTER
A. Filter assembly *B. Gasket*

The filter surrounding the oil pump inlet is readily accessible after removing the sump cover. Drain the oil from the engine and remove the sump cover. Remove the set screws from the flange connection of the pipe from the gauze to the oil pump as shown in Fig. 3/8. Clean the strainer by washing in paraffin. A small brush may be used to disturb any sludge or dirt but never use a cloth. Refit the screen, sump cover, and plug. New gaskets should be used. Refill with the correct oil.

VALVE CLEARANCE

The valve clearance should be set cold to 0·010 in. (0·25 mm) inlet, 0·007 in. (0·18 mm) exhaust and is measured between the tip of the rocker arm and top of the valve stem with a feeler gauge as shown at C, Fig. 3/9. Remove the bonnet (hood) and rocker cover. Adjustment is made by slackening the locknut B and adjusting the screw A in or out until the correct clearance is obtained. When tightening the locknut, hold the adjustment screw to avoid it turning.

The relative positions of the valves are as follows.

No. 1 Cylinder (Front)		No. 2 Cylinder (Centre)		No. 3 Cylinder (Rear)	
Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet

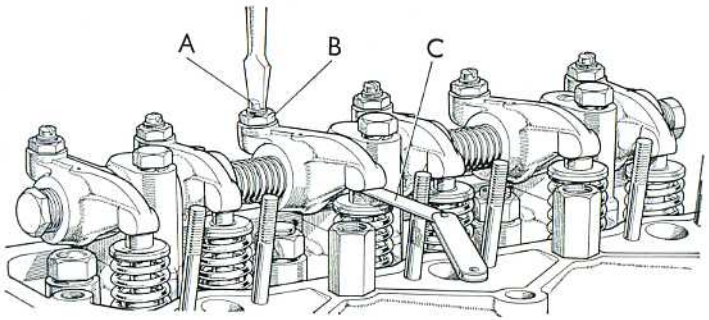


FIGURE 3/9. SETTING THE VALVE CLEARANCE
A. Adjusting screw *B. Locknut* *C. Feeler gauge*

It is important to set the clearance with the tappet on the base of the cam. This is achieved by proceeding as below.

Turn the engine forward slowly and observe which exhaust valve is closing (*i.e.* spring expanding to its full length) and continue until the inlet valve of the same cylinder just commences to open (spring begins to compress). When the inlet and exhaust valves are just open by the same amount, stop turning. It is permissible to turn the engine backwards and forwards to find the correct point. This position is known as having the valves "rocking". Proceed to set the valve clearances of the corresponding valves as shown in the table below. Then turn the engine forward until the next set of valves are "rocking" and repeat the above procedure. Repeat again to complete the job.

Valves Rocking	Set Valves	
No. 1	No. 2 Inlet	No. 3 Exhaust
No. 2	No. 3 Inlet	No. 1 Exhaust
No. 3	No. 1 Inlet	No. 2 Exhaust

CYLINDER HEAD TIGHTENING

The sequence of tightening the cylinder head is shown in Fig. 3/10. If a torque wrench is available this should be set to 90 lb ft (12·5 kg m). The valve clearances should be checked after tightening the head.

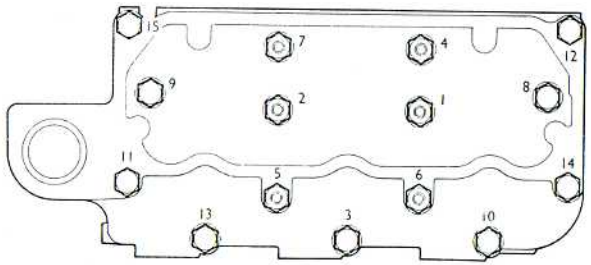


FIGURE 3/10. CYLINDER HEAD TIGHTENING SEQUENCE

CHASSIS

LUBRICATION

Oil should be used in the grease gun for the king pins and front axle trunnions. A good quality grease should be used for the remaining points excepting the water pump and distributor cam which require a **high melting point type. In order to reduce the number of grease guns required, a high melting point grease may be used for all points except those requiring oil.** The positions of the grease points are shown on the chart, Fig. 2/2, page 41.

The periods of lubrication given should be used as a guide only. The various points, especially the front and rear hubs, rely in part upon the pressure of grease for their protection against ingress of water and mud under adverse conditions. When conditions are extreme, lubrication should be carried out daily. Make sure that all dirt is wiped off the grease points before applying the grease gun. The water pump on the engine is packed with grease during manufacture and sealed, therefore greasing should not be carried out more frequently than every 500 hours.

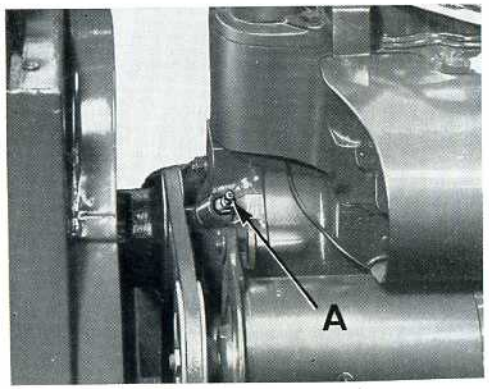


FIGURE 3/11.
WATER PUMP
A. Greaser

FRONT AXLE

Refer to Figs. 3/12 to 3/14 for the location of the grease points. These should be carefully cleaned before application of the grease gun. Jack up the front of the tractor and check the steering king pins and axle trunnion (pivot) bearings. If wear is apparent, through neglecting to grease regularly, your David Brown dealer should be consulted.

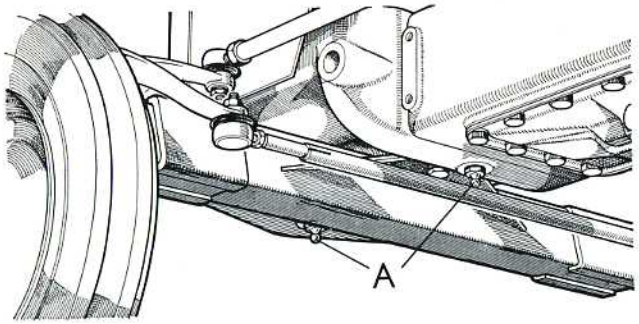


FIGURE 3/12. FRONT PIVOT GREASING
A. Grease fittings

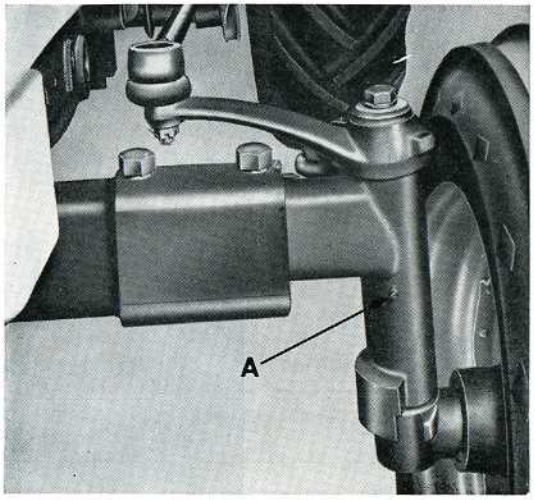


FIGURE 3/13.
FRONT AXLE
A. Oil fitting

FRONT HUB

Clean the grease point before applying the grease gun. Lubricate until grease is seen at the inner end of the hub. Grease at this point does **not** indicate a faulty hub seal. Besides lubricating, frequent greasing has the added advantage of forcing out any water or dirt which may have found its way in.

If the hub bearings require adjustment, remove the hub caps and take the split pins out of the castellated nuts. The nuts should be screwed up until all play is just removed. Fit the

split pin at the nearest castellation either tighter or slacker. Notice that there are two split pin holes in the shaft so it should not be necessary to move the nut more than $\frac{1}{16}$th of a turn. Caution: this adjustment must be carried out with the wheel jacked clear of the ground.

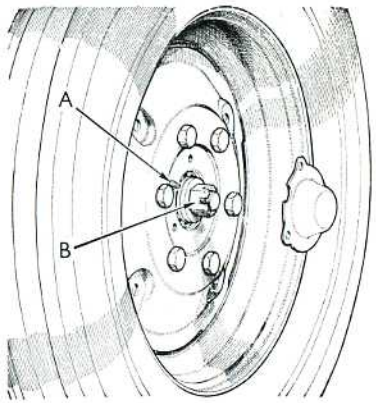


FIGURE 3/14. FRONT HUB
A. Front hub greaser (fitting)
B. Hub bearing adjustment nut

TRANSMISSION AND HYDRAULIC SYSTEM

The transmission oil is used in the Selectamatic hydraulic system, the valve unit of which operates at pressures up to 2000 lb/in² (140 kg/cm²). It is essential that no dirt or grit is allowed to contaminate the oil. Clean round the plug holes before removing and use only scrupulously clean funnels and containers.

The full flow filter should be changed at the first 50 hour service and subsequently at least every 500 hours, whether or not the yellow warning lamp indicates that it is blocked. If the warning lamp remains lit at 1800 rev/min after the oil has been allowed to warm up for 30 minutes, the filter element must be renewed even though it may not have completed 500 hours' service.

On no account must any attempt be made to clean the paper element; a new replacement must be used. The edges of the element are exposed and easily split when dry. A damaged element is useless. Examine for damage and handle with care when fitting.

To replace the full flow filter element, it is necessary to drain from plug C, Fig. 3/15. To completely drain the rear axle case, when renewing the oil, plug D must also be removed.

Where a filter element change only is being carried out, drain into a clean container, keep covered while standing and refill with all except the last gallon which should be discarded with any sediment. Top up with new oil.

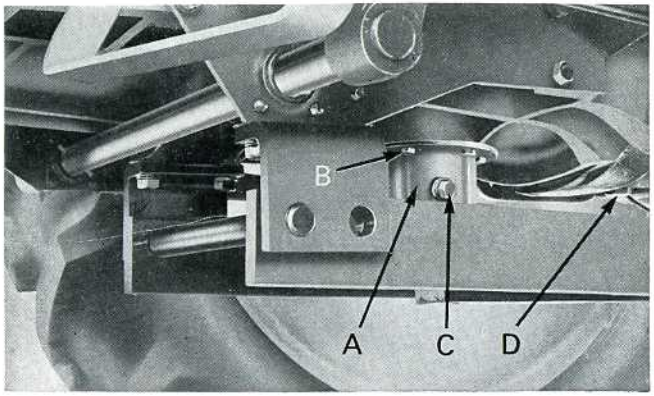


FIGURE 3/15. HYDRAULIC FILTER HOUSING

A. Hydraulic filter housing
B. Retaining bolts
C. Transmission drain plug
D. Rear axle drain plug

Unscrew the retaining bolts B, Fig. 3/15 and remove housing A to gain access to the filter element.

The Nylon Filter in the by-pass valve plunger situated in the hydraulic control valve assembly should be cleaned every 500 hours. Remove the dump valve or cover plate. Unscrew the right-hand of the two $\frac{5}{8}$ UNF domed plugs and withdraw the spring and plunger. Take care of the washer under the plug head. Unscrew the plug within the plunger and lift out the restrictor and filter. Clean the filter with a jet of air and re-assemble. Ask your dealer to show you the operation.

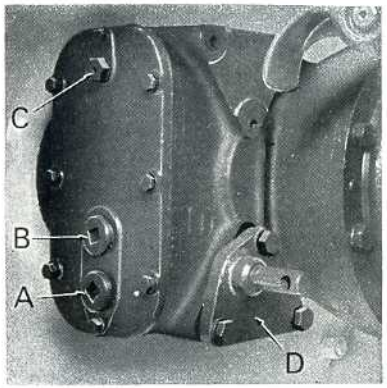


FIGURE 3/16.
FINAL REDUCTION UNITS

A. Drain plug
B. Filling plug
C. Vent plug
D. Bracket for stabiliser

The final reductions have separate lubrication. The drain plug is denoted by A and the filler plug by B in Fig. 3/16. Refill to the level of the filler plug with the correct oil. Ensure that the vent plug C is not blocked with dirt.

EXTERNAL HYDRAULIC EQUIPMENT

When oil is taken from the 3-way take-off valve to supply external motors and so on, requiring a continuous supply, a return flow must be connected to the internal lubrication pipe system. Returning to the gearbox cover would result in starvation of the gearbox and PTO.

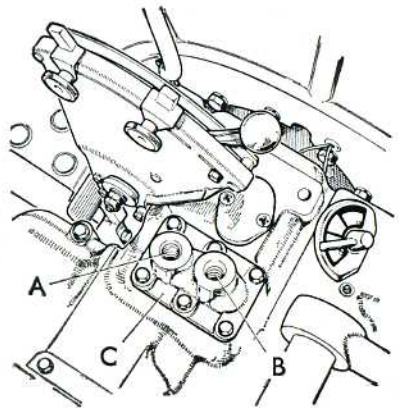


FIGURE 3/17.
EXTERNAL HYDRAULIC CONNECTION

A. Return connection
B. Supply connection
C. Housing

The return connection should be made to point A, Fig. 3/17, or to the plug A, Fig. 3/18 at the left-hand side of the seat on top of the rear axle case. The connecting point is threaded $\frac{7}{8}$ UNF.

Oil returned to this point lubricates the gearbox and PTO which otherwise would be starved when the hydraulic hand lever is in the lift position.

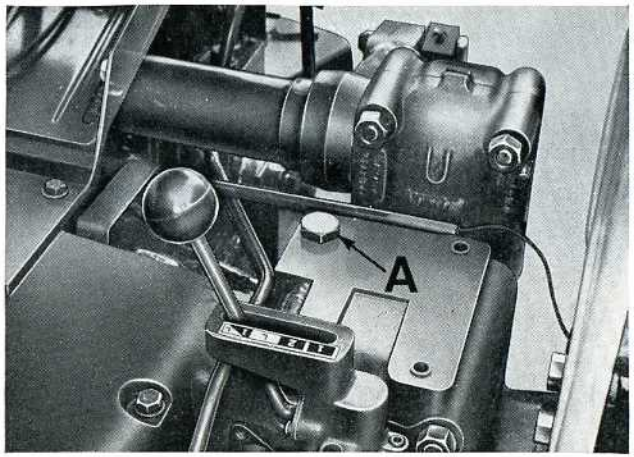


FIGURE 3/18. HYDRAULIC RETURN POINT

A. Return connection point

BRAKES

The independent foot brakes must be adjusted as the brake linings wear. They should be adjusted with the pedals interlocked using the locking bar B so that when used together on the highway there is no tendency to swerve. Frequent use of one of the brakes for steering assistance will cause that brake to wear more quickly and to become out of adjustment one with the other. This should be corrected as soon as it becomes evident. Make regular checks weekly and also before pulling a trailer.

Jack up both rear wheels and with the pedals interlocked press them approximately $1\frac{1}{2}$ in. (4 cm). Pull up the hand brake just sufficient to "hold" the brakes in this position.

At the front end of the brake rods, just under each foot plate, release the locknuts A, Fig. 3/19 and screw each adjusting screw one way or the other until both wheels are equally stiff to turn by hand. Retighten the locknuts and release the hand brake. Ensure that the wheels are free to turn and the brakes not binding. A grease fitting is provided as shown at D, Fig. 3/19.

When the limit of adjustment has been reached it is an indication that the brakes require relining.

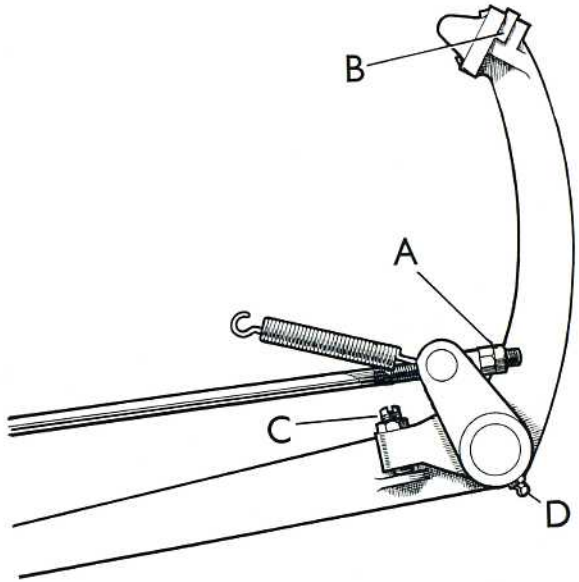


FIGURE 3/19. BRAKE ADJUSTMENT

A. Locknut
B. Locking bar
C. Locking bar adjuster
D. Greaser

CLUTCH

Check the free-play frequently, say once a week or more frequently when using a front loader. The play must never be allowed to fall below $\frac{1}{2}$ in. (12 mm). Adjust if necessary referring to Fig. 3/20.

(a) When an overload release is fitted, slacken back the lock nut on the rod to the hand lever to give $\frac{1}{4}$ in. (6 mm) clearance.

(b) Adjust bolt A, to give 1 in. to 1½ in. (2·5 to 3·8 cm) free movement of the clutch pedal.

(c) Reset the adjustment on the rod to the hand clutch to give $\frac{1}{16}$ in. (1·5 mm) clearance.

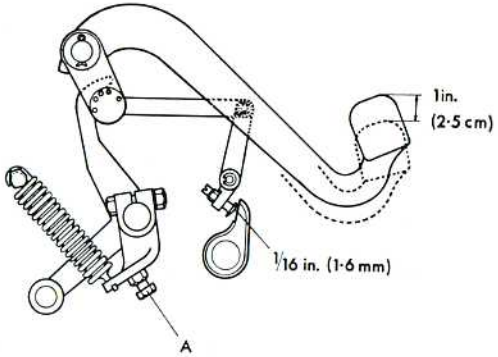


FIGURE 3/20.
CLUTCH
ADJUSTMENT

If it is found with the 2-stage clutch (Livedrive) that the PTO/Belt Pulley cannot be completely disengaged with the pedal fully depressed, new transmission clutch facings will be required. If not excessively worn a new period of life may be obtained by adjustment to the three adjustable pegs in the clutch. Adjustment to these should only be carried out by a competent service engineer and your David Brown dealer should be consulted.

CLUTCH STOP

When the clutch pedal is depressed an associated linkage operates a band brake on a drum mounted on the clutch drive shaft bringing the revolving gears to a stop in under 2 seconds allowing a new gear to be selected. With the clutch pedal fully upwards there should be $\frac{1}{16}$ in. (1·6 mm) clearance between the adjusting nut and operating lever as shown in Fig. 3/20.

POWER TAKE-OFF

The oil in the PTO unit is automatically maintained from the gearbox and does not need attention.

Note. The PTO gear lever should be in neutral when not in use. Before attempting to engage, push the clutch pedal fully down to disengage the drive to the PTO.

BELT PULLEY

For high power outputs the high PTO ratio must be used giving 1000 rev/min. This gives a British Standard belt speed of 3140 ft/min (957 m/min) at an engine speed of 2000 rev/min. This provides maximum belt horsepower with minimum torsional loading. Although a belt speed of 1695 ft/min (520 m/min) may be used with the PTO speed of 540 rev/min in low ratio, this is not recommended for long periods of continuous operation because the torsional loading is twice that in high ratio.

Lubrication

The pulley should be filled with the same grade of oil as used in the transmission gearbox to the level of the plug A.

Mounting instructions

The belt pulley may be mounted on either side according to the direction of rotation required.

Unless the unit is supplied on the tractor, it will be necessary on the first mounting to replace the four cover bolts, which are symmetrically disposed round the PTO shaft, with the special studs B, Fig. 3/21. Replace the studs one at a time.

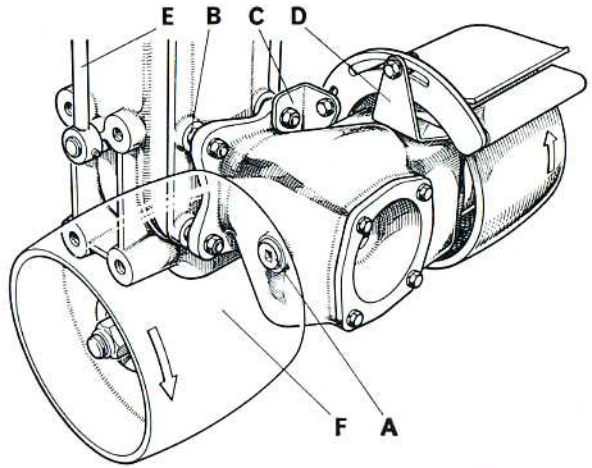


FIGURE 3/21. BELT PULLEY UNIT

A. Filler plug
B. Special stud
C. Pulley guard mounting bracket
D. Guard Bracket
E. Speed change lever
F. Alternative pulley position

Note that the end of the stud with the longest plain portion is screwed into the PTO housing. Once fitted, these studs should be left in position and when it is desired to fit the belt pulley unit, slide it onto the PTO shaft in the position required and secure with four nuts and spring washers. The bracket for the belt pulley guard fits on the two studs on the side adjacent to the pulley before the washers and nuts are attached. The other support bracket fits on the studs securing the pulley support bearing and necessitates the removal of the pulley rim from its flange.

Note. The PTO gear lever should be in neutral when not in use. Fully depress the clutch before attempting to engage.

ELECTRICAL

DISTRIBUTOR

Smear a small amount of high melting point grease on the distributor cam A and place a few drops of thin oil through the hole B marked 'OIL'.

Turn the engine slowly until the plastic follower on the points is on the peak of the cam. This opens the points to their maximum. The gap at E should then be 0·020 in (0·51 mm) when tested with a feeler gauge. To alter the setting, slacken screw C and with a screwdriver blade inserted in the slots D, the fixed point can be moved by turning the driver one way or the other to set the clearance. Tighten screw C and check the setting.

The points can be removed for cleaning when screw C is taken out. Remove all pit marks with a carborundum stone and re-set the clearance after replacing. New points will be required when the hardened tips are worn low.

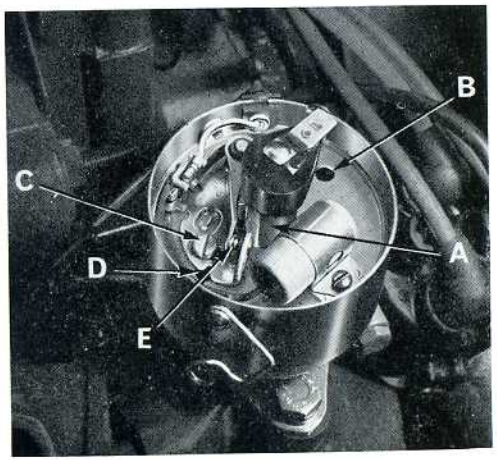


FIGURE 3/22 DISTRIBUTOR

A. Cam
B. Oil hole
C. Fixed point screw
D. Screw driver slot
E. Points

DYNAMO (GENERATOR)

Apply a few drops of lubricating oil to the pad through the hole in the centre of the end cover after removing the rubber plug. Refit the plug afterwards.

After about 2 years' use the dynamo (generator) brushes should be checked for wear and replaced if necessary. The interior of the dynamo (generator) should be thoroughly cleaned of dust and the bearings re-lubricated This work is best carried out by your David Brown Dealer or Lucas Agent.

If for any reason the dynamo has to be renewed, ensure that the correct one for a negative earth system is used.

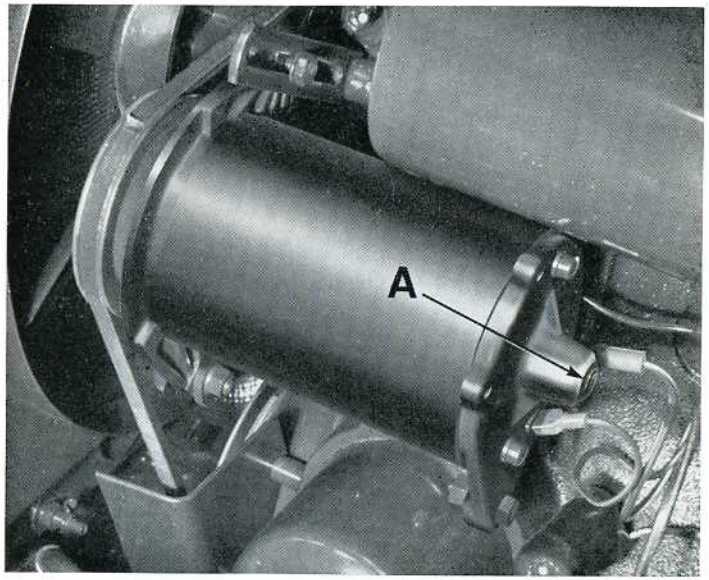


FIGURE 3/23. DYNAMO (GENERATOR) LUBRICATION
A. Oil hole
(replace rubber plug)

FUSE

A standard $1\frac{1}{4}$ in. (3 cm) cartridge fuse of 25 amp. rating is fitted in a white plastic bayonet type holder situated in the wiring under the instrument panel. The fuse should not be replaced until the cause of blowing has been traced and the fault corrected.

STARTER

This is a 12 volt inertia type with a solenoid relay switch mounted on top of it. Maintenance consists of periodical lubrication only. Do not attempt to renew or adjust the brushes or relay mechanism. Failure of the starter motor to operate may be due to the discharged condition of the battery. Check that the fan belt is correctly adjusted and sufficient running is done to re-charge the battery. Although there may be sufficient current for the lights it may not be able to give the very heavy discharge required by the starter The reasons for failure may be slackness of battery or starter terminals or faulty relay mechanism. Check the clutch-operated safety switch. If the starter fails to operate do not keep trying or damage may result to starter or battery; consult an authorised agent.

WIRING

Most connections are made with spade connectors which pull apart for disconnection of the part concerned. All wires are colour coded for easy identification as shown in the wiring diagram.

Maintenance consists only of visual checking for loose or dirty terminals and frayed, burnt or broken wires. A frayed or broken wire if touching the frame will run down the battery rapidly.

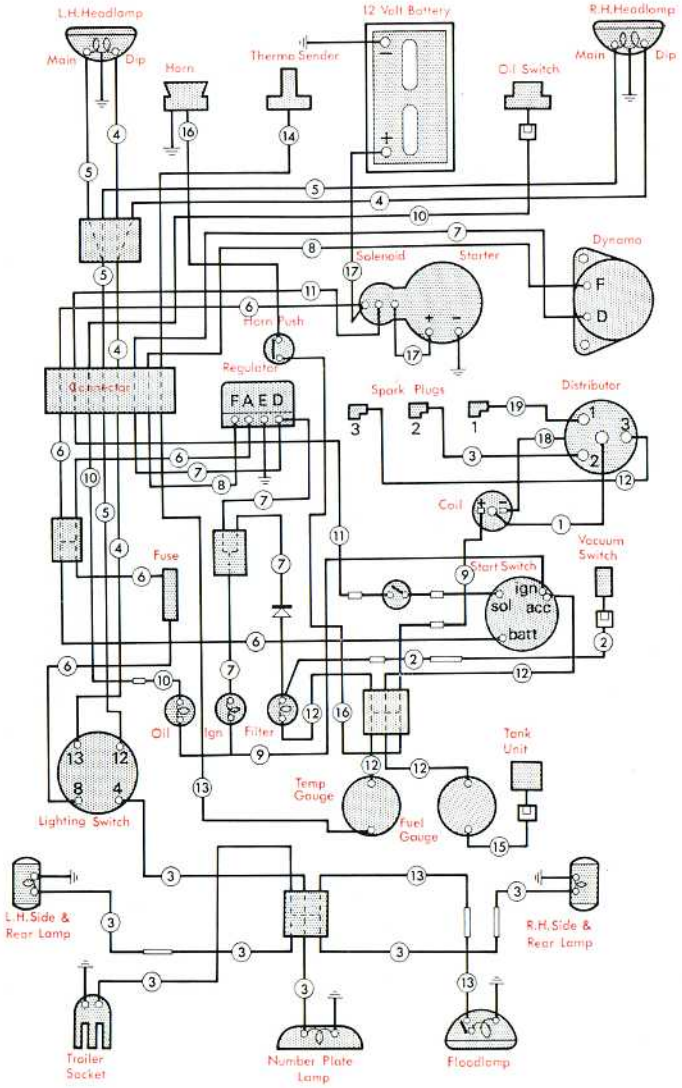


FIGURE 3/24. WIRING DIAGRAM

WIRING COLOUR CODE

1. Black
2. Black/Light Green
3. Red
4. Blue/Red
5. Blue/White
6. Brown
7. Brown/Yellow
8. Brown/Green
9. White
10. White/Brown
11. White/Red
12. Green
13. Green/Brown
14. Green/Blue
15. Green/Black
16. Purple/Black
17. Heavy Duty Cable
18. White/Black
19. Yellow

SECTION 4.
SPECIFICATION AND DATA

GASOLINE ENGINE

Type 355101 (Livedrive)

The engine is a compact and robust power unit applying the cross flow head technique for economy coupled with high performance. The three throw crankshaft is supported in 4 main bearings ensuring rugged dependability and is fully balanced giving very smooth running.

Displacement—3 cylinders	164·4 in³ (2695 cm³)
Bore	$3\frac{15}{16}$ in (100 mm)
Stroke	$4\frac{1}{2}$ in (114·3 mm)
Rated speed	1800 rev/min
Maximum full load speed	2200 rev/min
Maximum no load speed	2350 rev/min
Gross maximum power ..	50 b.h.p. at 2200 rev/min
Compression Ratio ..	7·5 : 1
Firing order	1, 2, 3

Valve clearances — SET COLD

—inlet	0·010 in (0·25 mm)
—exhaust	0·007 in (0·18 mm)

Cooling system — The thermostat is set to commence opening at 82°C (180°F) and to be fully open at 94°C (200°F). It controls the flow of coolant through the cylinder head from the water pump. Circulation through the block is by thermo-syphon. A 16 in. (40·6 cm) diameter 7-blade fan is fitted to the water pump drive pulley. The radiator coolant is pressurised by means of a relief valve fitted in the radiator cap.

Fuel System — A diaphragm type lift pump, operated by push rod from the camshaft, has a water trap built in.

Coil — A.C. oil filled.

Distributor

A.C. Point gap — 0·020 in (0·51 mm)
Auto Advance — 20 degrees
Static timing — 8 degrees B.T.D.C.

Sparking Plugs

A.C. type 44 XLS
Gap 0·025 in. (0·63 mm)

Carburetter

Zenith type — 34IVN
Choke — 26 mm
Main jet — 87
Compensating jet —127
Slow running jet — 45

Lubrication System — A gear type pump, driven from the camshaft on the same axis as the distributor, incorporates a main relief valve set to commence opening at 40 lb/in^2 (2·8 kg/cm^2). Filtration is by means of a paper element full flow filter with a low pressure valve to by-pass oil if the element is allowed to become blocked. The overhead valve gear is supplied by intermittent restricted feed from the rear camshaft bearing.

Air Intake — The air intake is through a 2-stage 6 in. (15·2 cm) diameter oil bath air cleaner plus a paper element pre-filter. An extension inlet pipe may be fitted as an alternative for very dusty conditions.

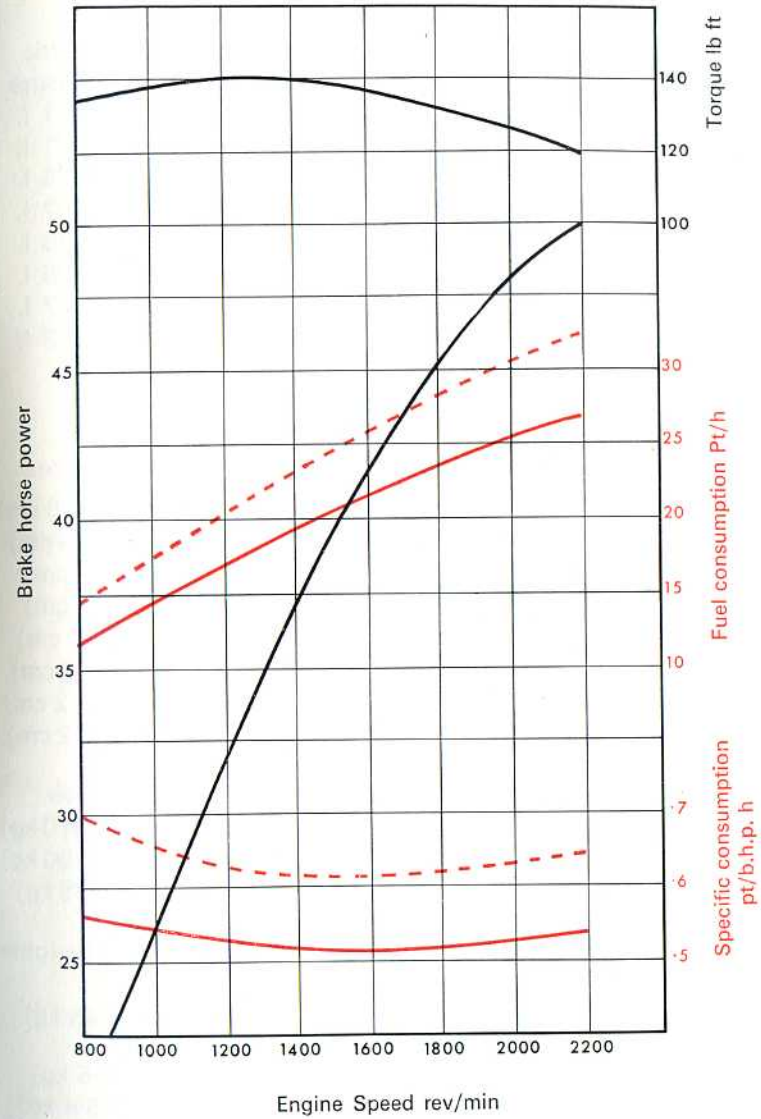


FIGURE 4/1. TYPICAL ENGINE PERFORMANCE CURVES

– – – – – U.S. rating

CHASSIS

CAPACITIES (Approximate initial fill)

	Imperial Measure	U.S. Measure	Metric Measure
Cooling system	2 gal	19 pt	9·1 l.
Air Cleaning oil bath ..	1¼ pt	1½ pt	0·71 l.
Engine lubricating oil ..	11 pt	6½ qt	6·25 l.
Transmission oil	5 gal	6 gal	22·7 l.
Final drive oil (each) ..	4 pt	4¾ pt	2·3 l.
Steering oil	2⅛ pt	2½ pt	1·25 l.
Belt Pulley	1¼ pt	1½ pt	0·7 l.
Fuel Tank	11½ gal	13¾ gal	52·3 l.

DIMENSIONS — on 600-16 front, 14·9/13-28 rear tyres

Overall length	121½ in. (308 cm)
Height over exhaust pipe	84⅝ in. (215 cm)
Height — bonnet top	54 in. (137 cm)
Overall width — minimum	64 in. (163 cm)
Bonnet width	21 in. (53·3 cm)
Wheelbase	79¾ in. (203 cm)
Ground clearance under front axle ..	19¾ in. (50·2 cm)
Ground clearance under drawbar frame	14¼ in. (36·2 cm)

Weight — with oil, fuel, etc.—	Livedrive
—total	3985 lb (1810 kg)
—rear axle	2530 lb (1150 kg)
—front axle	1455 lb (660 kg)

Water ballast in the rear wheels adds the following weights per wheel.

14·9/13-28 tyre	540 lb (245 kg)
Front wheel weights (each) ..	85 lb (38·5 kg)
Rear wheel weights (each)	100 lb (45·4 kg)

Turning radius on 52 in. (132 cm) track:

—without brakes	138 in. (350 cm)
—with brakes	124 in. (314·5 cm)

PERFORMANCE

Maximum PTO horsepower ..	46
Maximum drawbar horsepower ..	40
Maximum drawbar pull on tarmac with ballast	6000 lb (2720 kg)

POWER LIFT

Maximum load at the end of the links 1800 lb (816 kg).

The hydraulic pump is of the balanced gear type and is mounted in the rear axle case. The pump is still driven when the transmission is de-clutched. Pump delivery is 5 gal/min (6 U.S. gal/min) (22·3 litres/min) at 1800 rev/min engine at a maximum pressure of 2000 lb/in² (140 kg/cm²).

CLUTCH

Livedrive — A double dry plate clutch.

Transmission clutch — 10 in. (2·54 cm) dia., surface area 82 in² (530 cm²).

PTO clutch — 10 in. (25·4 cm) dia., surface area 94 in² (606 cm²).

PERMANENT DRAWBAR

The drawbar has a normal trailer position or may be fully extended for PTO work.

Clevis height from ground — 16¾ in. (42·5 cm).

Maximum downward load at clevis
Trailer position — 2200 lb (1000 kg).
Fully extended — 1200 lb (540 kg).

SWINGING DRAWBAR — optional

This has 2 positions either side of centre with 4 positions of height. The towing position can be normal or extended for PTO work.

Clevis height from ground — 9 in. (22·9 cm), 11 in. (27·9 cm), 13 in. (33 cm) and 15 in. (38·1 cm).

Lateral adjustment — 6 in. (15·2 cm) each side of centre.

Maximum downward load at clevis
Trailer position — 3000 lb (1360 kg).
Fully extended — 2500 lb (1133 kg).

PICK-UP HITCH — optional

This unit is easily fitted when the drawbar is removed. Slotted lift rods allow the hook to be stowed and the linkage to be used independently.

TWO-SPEED PTO (Power take off) and BELT PULLEY

British Standard 6 spline shaft — $1\frac{3}{8}$ in. (34·9 mm) diameter. Clockwise rotation viewed from rear. Offset from centre line of the tractor $\frac{3}{8}$ in. (9·5 mm) to the left-hand side. Belt Pulley $5\frac{1}{8}$ in. (13 cm) wide, $8\frac{1}{2}$ in. (21·6 cm) diameter, may be fitted to left or right. Rotation is clockwise viewed from the open end.

PTO Ratio	Engine Speed rev/min	PTO Speed rev/min	Belt Pulley		
			rev/ min	ft/ min	metres/ min
Low	1800	532	751	1670	509
High	1100	550	776	1727	526
High	2000	1000	1412	3140*	957

* British Standard belt speed

Speed Ratio

Engine to PTO — Low 3·383 : 1
— high 2 : 1
PTO to Belt Pulley — 1 : 1·412
Height of shaft from ground : $25\frac{1}{4}$ in. (64·1 cm)

SEATING

The seat is an upholstered tip-up pan seat with a foam rubber cushion and an adjustable backrest. The seat support gives fore and aft adjustment with simultaneous height variation giving optimum seating position for varying leg lengths. Adjustment is easily carried out while seated.

A de-luxe suspension seat using rubber in torsion, is available as an optional fitment. Adjustment is provided to suit the weight of the operator and should be altered to bring the two support arms horizontal when the operator's weight is on the seat.

STEERING

Recirculating ball and nut type, with a $17\frac{1}{4}$ in. (43·5 cm) diameter wheel.

TRACK ADJUSTMENT

Front — Adjustable by means of telescopic extensions from 52 in. to 72 in. (132 cm to 183 cm) in 4 in. (10 cm) steps. Crop clearance is $19\frac{3}{4}$ in. (50·2 cm) on 6·00-16 front tyres.

Rear—Adjustment is from 52 in. to 80 in. (132 cm to 203 cm) in 4 in. (10 cm) steps by means of the dished wheel centres and off-set wheel rim lugs.

An alternative rim giving power adjusted variable track is also available.

UNIVERSAL LINKAGE

British Standard (B.S. 1841) three-point linkage enables Category 1 (narrow) or Category 2 (wide) implements to be fitted.

	Category 1	Category 2
Nominal diameter of lower pins	$\frac{7}{8}$ in. (2·22 cm)	$1\frac{1}{8}$ in. (2·86 cm)
Nominal diameter of top pin	$\frac{3}{4}$ in. (1·90 cm)	1 in. (2·54 cm)
Recommended length of implement cross shaft (distance between shoulders of pins)	$26\frac{7}{8}$ in. (68 cm)	$32\frac{7}{16}$ in. (82·5 cm)
Recommended height between upper and lower hitch points	22 to 25 in. (53·4 to 63·5 cm)	22 to 25 in. (53·4 to 63·5 cm)

WHEEL EQUIPMENT

Front .. .. .. 6·00-16 (4-ply or 6 ply)
7·50-16 (6 ply)

Rear .. .. .. 14·9/13-28 (6 ply)

TRAVEL SPEEDS WITH 11/49 RATIO FINAL DRIVES— ON 14·9/13-28 REAR TYRES (Rolling radius 24·7 in)

GEAR LEVER POSITIONS	ENGINE SPEED										OVERALL GEAR RATIO
	700 rev/min		1100 rev/min		1800 rev/min		2000 rev/min		2200 rev/min		
	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	
SL1	0·30	0·48	0·47	0·76	0·77	1·24	0·86	1·38	0·94	1·51	345·2
SL2	0·49	0·79	0·78	1·26	1·27	2·04	1·41	2·27	1·55	2·49	208·1
SH1	0·67	1·08	1·04	1·67	1·71	2·75	1·90	3·06	2·09	3·36	154·4
NL1	0·76	1·22	1·19	1·91	1·95	3·14	2·17	3·49	2·38	3·83	135·4
SL3	0·90	1·45	1·42	2·28	2·32	3·73	2·58	4·15	2·84	4·57	113·9
SH2	1·10	1·77	1·74	2·80	2·84	4·57	3·16	5·08	3·47	5·58	93·0
NL2	1·26	2·03	1·98	3·19	3·24	5·21	3·60	5·79	3·96	6·37	81·6
NH1	1·70	2·74	2·67	4·30	4·37	7·03	4·86	7·82	5·34	8·59	60·5
SH3	2·02	3·25	3·18	5·12	5·20	8·37	5·78	9·30	6·36	10·2	50·9
NL3	2·30	3·70	3·62	5·82	5·92	9·53	6·58	10·6	7·24	11·6	44·7
NH2	2·82	4·54	4·43	7·13	7·25	11·7	8·06	13·0	8·86	14·3	36·5
NH3	5·17	8·32	8·12	13·1	13·3	21·4	14·8	23·8	16·3	26·2	19·9
SLR	0·49	0·79	0·77	1·24	1·26	2·03	1·40	2·25	1·54	2·48	209·6
SHR	1·10	1·77	1·72	2·77	2·82	4·54	3·13	5·04	3·45	5·55	93·7
NLR	1·25	2·01	1·97	3·17	3·22	5·18	3·58	5·76	3·94	6·34	82·2
NHR	2·80	4·51	4·40	7·08	7·20	11·6	8·00	12·9	8·80	14·2	36·7

NOTE — Six-speed tractors only have the "N" range of speeds.
Maximum speed at light running i.e. NH3 at 2350 rev/min — 17·4 mile/h (28·0 km/h).

ACCESSORIES

The following units may be ordered through your David Brown Dealer in the usual way. Ask for details and prices.

Unit No.	Part No.	Description
U825	911809	Air cleaner extension
U413	907602	Belt pulley unit
U414	907847	Belt pulley guard
U730	911471	Catch unit for power lift lever
U1205	92264	Downswept exhaust, silencer and shield
U765	911727	Drawbar-linkage (stabilisers should be used)
U786	911699	Drawbar-universal (use with support frame U787)
U787	911698	Drawbar-support frame only
U1196	922323	Foot throttle control
U1010	918295	Horn and push button
U1181	922284	Linkage stabilisers
U1051	918356	Overload release (top link unit)
U1056	918357	Oil return plate—external services
U1045	918349	Operating lever—clutch (for use with U1051)
U815	911768	Pick-up hitch (use with support frame U787)
U1080	918381	Power-assisted steering
U378	906988	Power take-off guard
U1013	918299	Rear number plate light (standard seat)
U1014	918300	Rear number plate light (de-luxe seat)
U1204	92263	Seat—de-luxe suspension
U1077	918389	Slotted lift rods
U1119	922794	Tool kit
U1005	918290	Thermometer—electric
U729	86167	Wheel weights—rear (14·9/13—28 tyres)
U436	907954	Wheel weights—front
U731	911599	Weights—chassis ballast
U844	918957	Valve—external hydraulics (single-live)
U845	918938	Valve—external hydraulics (twin-live)
U1054	918360	Valve—3-way selector, less pipe and coupling
U1053	918359	Valve—3-way selector with pipe and Exactor coupling
U1121	918522	Valve—3-way selector with pipe and Quick Release coupling
U939	918195	Valve—Dump (quick drop)
U1122	918520	Universal Coupling—Quick Release to Exactor
U1123	918521	Universal Coupling—Quick Release to Dowty

GLOSSARY OF ABBREVIATIONS

Abbreviations used in this publication are based on the recommendations of British Standard 1991 : 1954. Note that the abbreviation remains the same for both singular and plural.

Minute (time)	min
Revolutions per minute ..	rev/min
Inch	in
Feet	ft
Feet per minute	ft/min
Cubic inch	in^3
Square inch	in^2
Pounds per square inch ..	lb/in^2
Atmosphere (pressure) ..	atm
Centimetre	cm
Millimetre	mm
Brake horsepower	b.h.p.
Kilogramme..	kg
Gramme	g
Pint..	pt
Quart	qt
Gallon	gal
Litre	l
Hour	h
Miles per hour	mile/h
Degree Centigrade	°C
Degree Fahrenheit	°F
Power take-off	PTO
Weight transfer (Traction Control Unit—*a David Brown patent*) ..	TCU

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DAVID BROWN PRODUCTS

Ask your dealer for details of any of the following:

Mid-mounted Hydraulic Mower

Front-mounted Super Loader

Front-mounted Loader

Mouldboard Plough

Reversible Plough

Match Plough

Disc Plough

David Brown policy is one of continuous development and improvement and therefore the specification details may have been altered since this book went to press.
Moreover, as the David Brown tractor is offered in a variety of forms to cover a large number of markets and applications, this handbook may contain details of items not applicable to the particular tractor for which it has been supplied.

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