

















DAVID BROWN

1200 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 isolating/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.
-  **Don't** use the 52 in. (132 cm) front track width when a loader or power assisted steering is fitted.

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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.

Periods of idling should be avoided as the rate of carbon formation is fairly high at low temperatures.

FIFTY-HOUR SERVICE

It is essential that the 50-hour service detailed below is carried out at this time either by your David Brown Agent or, where this is not practicable, by the user's mechanic or service engineer.

After 50 hours, change the engine oil and filter element, drain and flush the transmission gearbox and final drive reduction housings. Fit a new full-flow filter element. Clean the Nylon filter in the by-pass valve plunger situated in the hydraulic control valve assembly. Refill with new oil. Check the valve clearances and tightness of cylinder head and main external nuts and bolts.

SECTION 1. OPERATION

STARTING THE DIESEL ENGINE

1. With fuel in the tank, pull the fuel cut-off rearward to the running position, and drop into the retaining slot.
2. Open the throttle (towards the driver).
3. Press in the cold starting button. (This will remain in provided the throttle is open and will be thrown out automatically when the engine starts.)



4. **Put the gear (shift) lever in neutral** (the right-hand lever).
5. Depress the clutch pedal **fully**. An isolating switch is fitted so that the starter cannot be energised until the clutch pedal is pushed down.
6. Switch on and check that both charge and oil warning lights glow. (If not, investigate for a fault.) Then operate the starter switch (turn the key to the right against the spring).

Release the starter switch immediately the engine runs and close the throttle to give about 1000 rev/min to warm up. Check that the charge and oil warning lights go out.

STARTING IN COLD WEATHER

In difficult conditions dip the felt, attached to the plastic plug in the inlet manifold, in ether or a starting fluid. Replace and start immediately. Keep the engine turning by the starter until the engine runs unaided. Short attempts will be of no avail. However, if it fails to run, release the starter switch after 25 seconds and wait 20 seconds before trying again, otherwise the battery will be overheated and damaged. Adequate running time should be allowed to enable the dynamo to replace the heavy discharge. Use only the correct grade of engine oil.

STOPPING THE ENGINE

Reduce engine speed, lift the fuel cut-off and allow it to move forward to the stop position. Switch off and remove the key.

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 isolating key is removed and the fuel cut-off is in the 'stop' position.

CONTROLS

The engine and tractor controls are shown in Fig. 1/1 to 1/3.

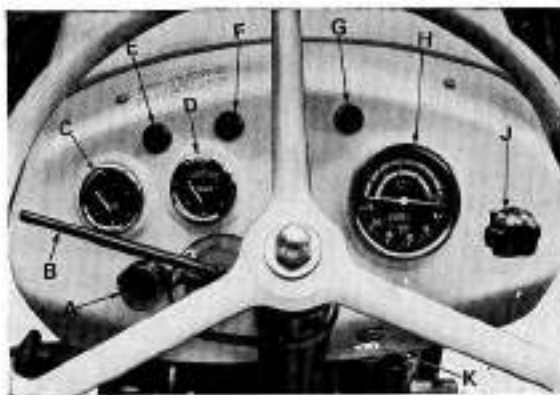


FIGURE 1/1. INSTRUMENT PANEL

- | | |
|----------------------------------|---------------------------------------|
| A. Horn button | F. Oil pressure warning light (Green) |
| B. Throttle lever | G. Charge warning light (Red) |
| C. Fuel gauge | H. Engine speed indicator |
| D. Water temperature | J. Light switch |
| E. Filter warning light (Yellow) | K. Ignition/starter switch |

HYDRAULIC 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 is intact 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.

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.

THROTTLE CONTROL LEVER

When fully rearwards the diesel 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 in low gear.

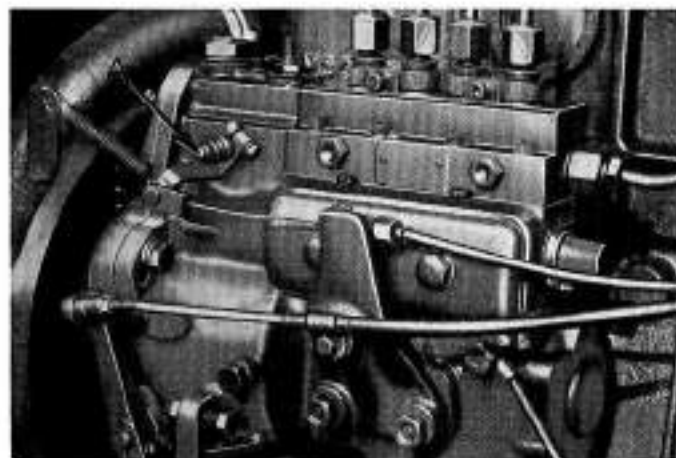


FIGURE 1/2. FUEL INJECTION PUMP

A. Cold starting button

STARTING BUTTON

When starting from cold, the button A, Fig. 1/2 should be pressed in, making sure that the throttle is open wide enough to ensure that it stays in. When the engine runs up to speed

the button will automatically eject ready for future use. It is not necessary to use this button when re-starting unless the engine has had time to cool off completely.

FUSE HOLDER

Situated on the control panel on early tractors and later fitted in the wiring near the regulator under the right-hand side of the instrument panel. The two halves should be pressed together and twisted to release. A 25 amp glass cartridge fuse is fitted.

LIGHT SWITCH

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

<i>Single filament</i>	<i>Double filament</i>
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 positions

EXHAUST BRAKE (Optional fitting)

When stopping with a heavily loaded trailer or controlling the speed on a steep descent, the exhaust brake should be used to provide additional retardation from the engine. To obtain maximum effect and prevent excessive internal pressures in the engine, the throttle must be closed **before** pressing the exhaust brake pedal.

TRANSMISSION CLUTCH

Pushing the clutch pedal down interrupts the drive to the gearbox without affecting the drive to the power take-off (PTO).

The pedal should always be pushed down past the point at which the transmission is freed. "Easing" of the clutch to reduce forward speed, when baling, etc., to allow the implement to clear a heavy patch, is detrimental to clutch life.

When moving off with a loaded trailer, engine speed should be kept as low as possible. Full engagement of the clutch should be obtained as quickly as is possible without stalling, then, the throttle opened. The clutch should not be operated at full engine speed or excessive wear will result.

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 F, Fig. 1/3 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.

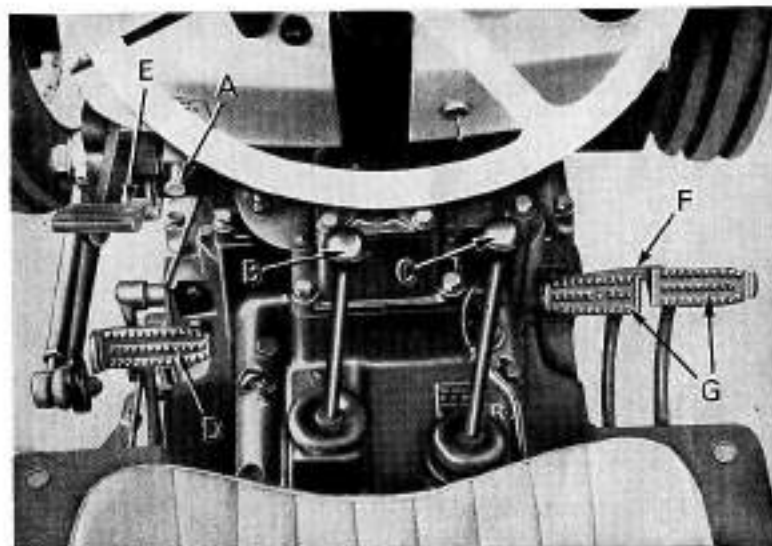


FIGURE 1/3. CONTROLS

- | | |
|------------------------|------------------------|
| A. Engine stop control | E. Exhaust brake pedal |
| B. H/L range lever | F. Locking bar |
| C. Gear lever | G. Brake pedals |
| D. Clutch pedal | |

PTO CLUTCH

Drive to the power take-off shaft at the back of the tractor is controlled by the hand lever on the left of the operator. When fully forward, the clutch is engaged and the PTO will be driven independently of the drive to the tractor rear wheels. To disengage the PTO at the ends of rows, to change PTO speed, or for other short term uses, the lever should be pulled rearwards into the latched position.

! The PTO hand clutch lever must not be retained for long periods in the latched position. Instead, the PTO speed change lever should be placed in neutral and the hand lever released to re-engage the clutch.



FIGURE 1/4.
PTO CLUTCH
A. PTO clutch
release lever

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 gear (shift) lever has 3 forward and 1 reverse speed. The secondary transmission gearbox, controlled by the left-hand gear (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 has a neutral position which should be used whenever the tractor is stationary with the engine running for any period of time, i.e. on 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

The main transmission gearbox is controlled by the right-hand (shift) lever and has 3 forward and 1 reverse speeds. The secondary transmission gearbox, controlled by the left-hand (shift) lever, has two ratios—high and low (H and L) with a slow or creep ratio associated with each (HS or LS). This gives a total of 12 forward and 4 reverse ratios.

The movements of the gear (shift) levers are given in the sketch below. The combination of the two lever positions to give a progressive sequence of speeds is as follows:

1	2	3	4	5	6	7	8	9	10	11	12	R1	R2	R3	R4
LS,1	LS,2	HS,1	L,1	LS,3	HS,2	L,2	H,1	HS,3	L,3	H,2	H,3	LS,R	HS,R	LR	HR

A full range of travel speeds on various tyres are given in the tables on pages 94-99.

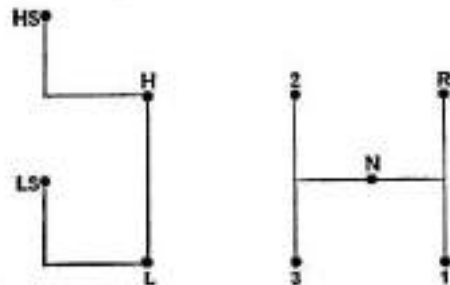


FIGURE 1/5. POSITIONS OF GEAR (SHIFT) LEVERS (12-SPEED)

The three lowest ratios in the gearbox, 1 (LS.1), 2 (LS.2) and 3 (HS.1) use indirect drive to give slow speeds for planting, transplanting, hedging, PTO and similar operations.

Gear ratios 5 (LS.3), 6 (HS.2) and 9 (HS.3) are driven from the same gear train and provide ratios for light traction or PTO work.

The above ratios are suitable for all normal types of work. However, for work involving continuous heavy traction, gears 4, 7, 8, 10, 11 and 12 are the most suitable since these are direct drive ratios.

PTO DRIVEN IMPLEMENTS

When using implements which require power to be transmitted via a telescopic drive shaft from the PTO the following points should be observed.

1. Ensure that the mounting does not involve angles of the drive shaft which exceed the angular ability of the universal joints (usually 20°).
2. Where high shock loading is to be expected, a slip clutch, correctly adjusted, should be incorporated in the drive.
3. Thrust loadings should be kept to a minimum by (a) ensuring that the telescopic drive does not bottom and (b) keeping the torque loading as low as possible.

Where high horse powers are required to be transmitted, use the 1000 rev/min standard speed instead of 540 rev/min (with appropriate adjustment of the drive gear ratio of the implement). This will reduce the torque to about half and permit easier sliding of the shaft.

Keep the shaft well lubricated and where 540 rev/min must be used, a roller type or splined shaft should be used in preference to a square shaft.

DE-LUXE SEAT

The upholstered pan-type seat and back rest has an adjustable, torsion suspension fitted with a hydraulic damper. The adjustment should be set initially by tightening or slackening handle A, Fig. 1/6 so that, when the driver is seated, the arms B are approximately horizontal.

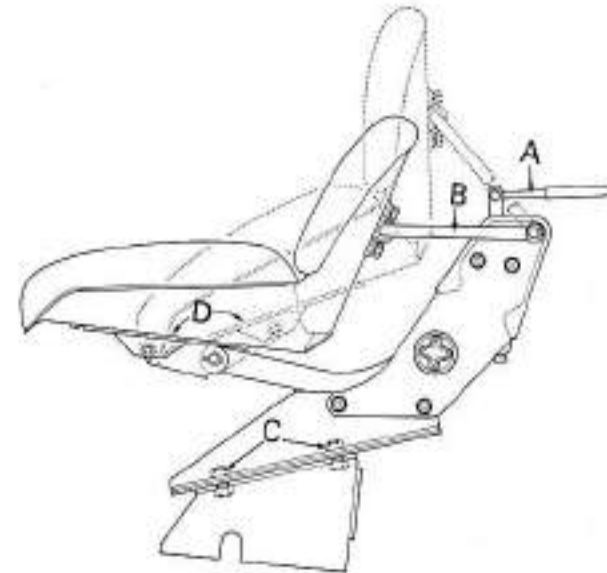


FIGURE 1/6. DE-LUXE SEAT

- A. Adjusting handle B. Arms
C. Fore and aft securing nuts

For road work a softer ride may be achieved, if desired, by unscrewing the adjustment. On rough ground the adjustment may be tightened to prevent bottoming against the rubber stop.

Seat arms are available for bolting to the seat pan.

The seat may be adjusted for leg length by slackening bolts C and sliding up or down as required.

If the tractor is parked in the open during rain, the whole seat should be lifted and the front pivoted rearwards as shown at D, Fig. 1/6. It then assumes a front down attitude so that water will run off it.

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 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.

Note: A variable sensing unit with 4-positions to cater for a very wide range of implements, from heavy draught to extra light draught, is available as an optional unit.

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.

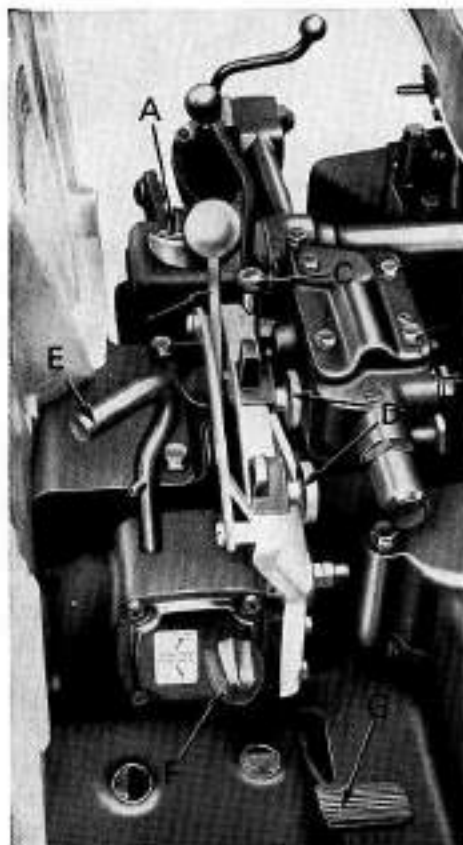


FIGURE 1/7.
CONTROLS

- A. Dial pointer
- B. Hand lever
- C. Dump valve
- D. Finger guides
- E. Parking brake
- F. Lowering adjustment
- G. Differential lock

3-WAY VALVE

The 3-way valve is an optional fitment mounted on the left-hand front of the rear axle case. It enables external single acting light duty auxiliary units such as loaders, tipping trailers etc. to be controlled from the tractor Selectomatic Hand Lever. It has a quick selection 4-position lever. Two external supply points are available.

Lubrication of the gearbox and PTO is supplied by overflow oil from the hydraulic pump. When using external

equipment which uses a large 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 using the return oil point on the distribution or combining block on top of the rear axle at the right-hand side of the seat.

For full details, see the section on External Hydraulic Services, page 26 onwards.

CATCH UNIT

When external equipment is being used via the 3-way valve 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. 1/8.

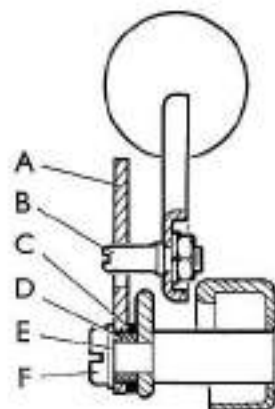


FIGURE 1/8.
CATCH UNIT

- 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 is a useful safety measure when working on an implement in the raised position. It is not necessary for transporting implements over short distances but should be used when making a long journey on the highway.

Care should be taken to avoid impact loads by driving carefully and slowly over rough ground.

DUMP VALVE (Optional fitting)

When external equipment with a low back pressure, such as certain types of trailer, are operated on the Selectamatic system via a 3-way valve, a much quicker rate of lowering may be obtained by operation of the dump valve; see page 42. It is situated on the rear axle case as shown at C, Fig. 1/7.

TRAILED IMPLEMENTS

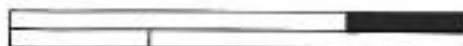
The operation of the hydraulic systems on the following pages refer to tractor mounted implements or to external hydraulically operated equipment.

Where trailed implements are being used, the selector dial should be set to 'Height' or 'Depth' control and the links raised and secured on the lift latch. The hand lever may then be left in any position (except 'Select') without loading the hydraulic pump.

OPERATION OF SERVICE 1

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

SETTINGS



Red band — Select

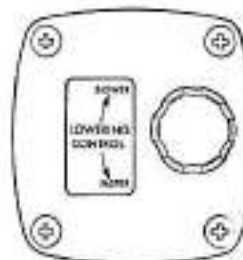


1. Pull the hand lever fully rearwards in the red band to "select" and while holding there against the spring, turn the selector dial pointer to "TCU".

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.

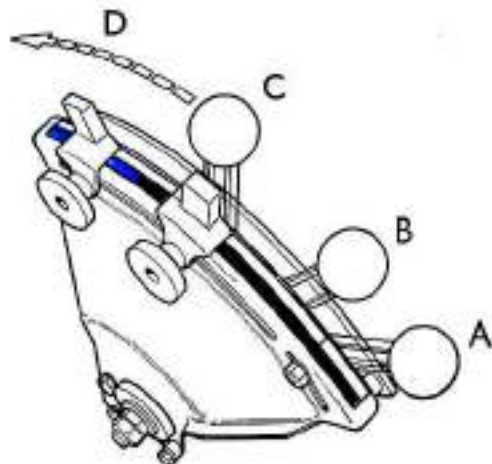


4. Set the first finger guide to the lower position.*
5. Set the second finger guide approximately 1 inch in front of the first guide.

* 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 can be pressed down quickest 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 1/9.

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

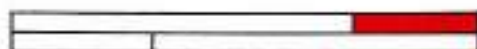
Because of the different forces acting on the plough when using TCU a slight re-adjustment to the settings may be required.

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.



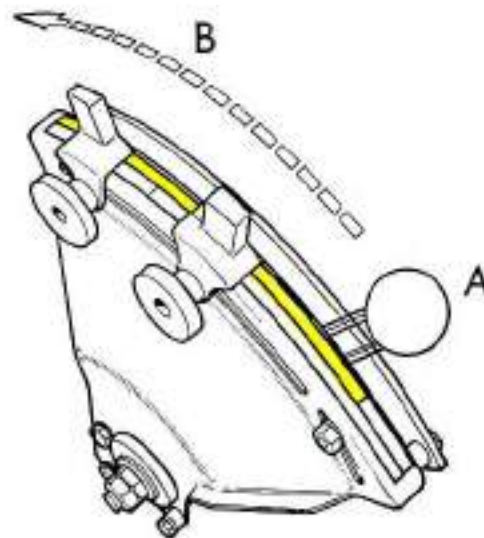
3. Set the lowering adjustment temporarily to mid-position and adjust later by trial to give the required rate of lowering for the work in hand.



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 33.



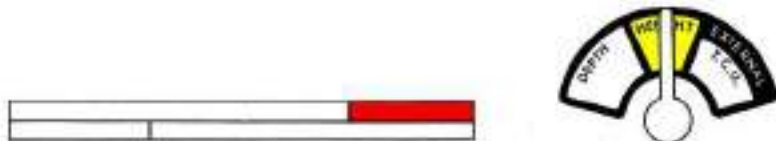
Yellow band — Range of depth

FIGURE 1/10.
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



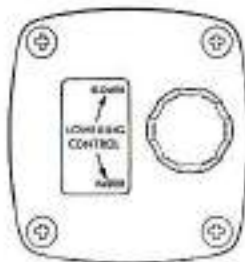
Red band — Select

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.



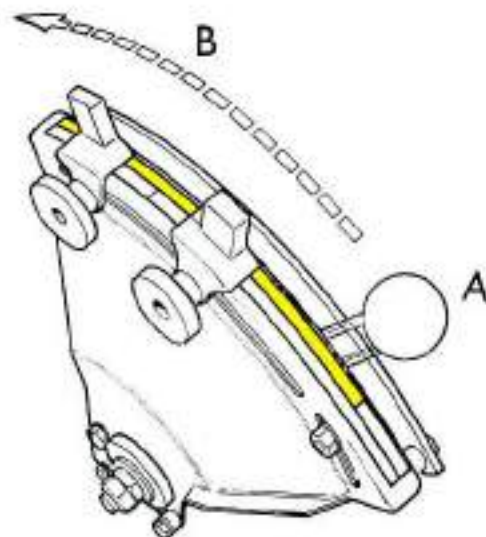
3. Set the lowering adjustment temporarily to mid-position and adjust later by trial to give the required rate of lowering for the work in hand.



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 1/11.
HAND LEVER POSITIONS WITH DIAL POINTER AT HEIGHT
A. Lift position B. Range of height

EXTERNAL HYDRAULIC SERVICE

DESCRIPTION

The basic specification of the 1200 Tractor allows for the provision of various alternative external hydraulic systems. The internal hydraulic system is supplied with hydraulic oil from a pump mounted at the front of the tractor and driven by an extension on the engine crankshaft. The oil is delivered to a distributor block on top of the rear axle case at the right-hand of the operator. From this point it is directed to the Selectamatic control system and thence to the internal hydraulic ram cylinder via the connection on the front of the rear axle casing at the left of the operator.

Oil for external hydraulic equipment may be obtained in any or all of the following ways, according to which of the following equipment is fitted to the tractor.

1. **Three-way Valve** — This unit may be fitted on the rear axle casing at the connection to the ram cylinder. A hand lever on the unit is used to direct oil to either of two external connections at the front of the valve or to the internal ram cylinder, as desired. A fourth position allows oil to be directed to one external connection and the internal ram cylinder at the same time.
2. **Live, double acting, control valves** — Either one or two control valves may be mounted above the distributor block. Each has its own independent operating handle and is also independent of the 3-way valve. Two connection points are provided on each valve and oil can be supplied under pressure in either direction or locked in the system to hold the implement. The handles can be latched in either of the pressure positions but are self cancelling when the pressure exceeds 2000 lb/sq. in. i.e. when the implement reaches the end of its stroke.

The alternatives, with a few of the possible combinations, are shown in Figs. 1/12 to 1/14. None, one or two live control valves may be fitted with or without the 3-way valve.

REFERENCES USED IN FIGS. 1/12 to 1/14

- A. Oil supply from pump
- B. Oil from Selectamatic System to and from internal cylinder or 3-way valve
- C. Selectamatic hand lever
- D. Distributor block
- E. 3-way valve lever
- F. External supply No. 1
- G. External supply No. 2
- H. Oil return
- K. First live, double-acting, control valve
- L. Second live, double-acting, control valve

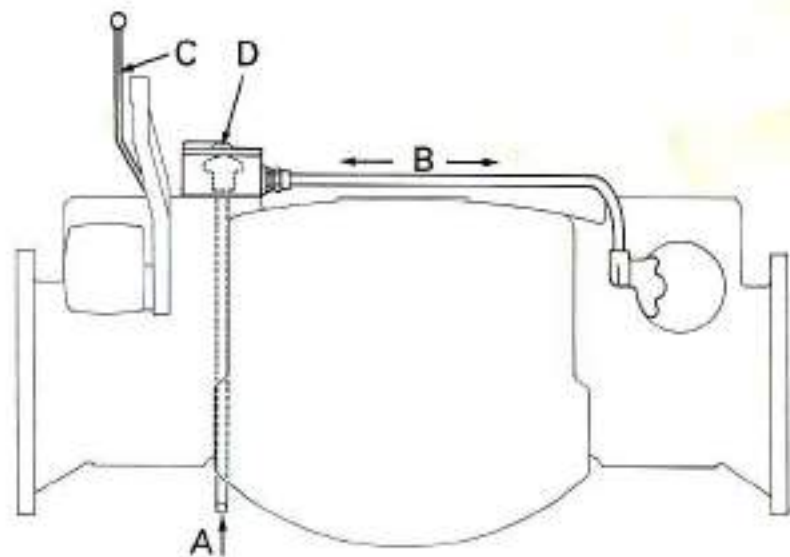


FIGURE 1/12. BASIC HYDRAULIC SYSTEM

Single hydraulic pump supplying the Selectamatic system i.e. internal cylinder. No external service added.

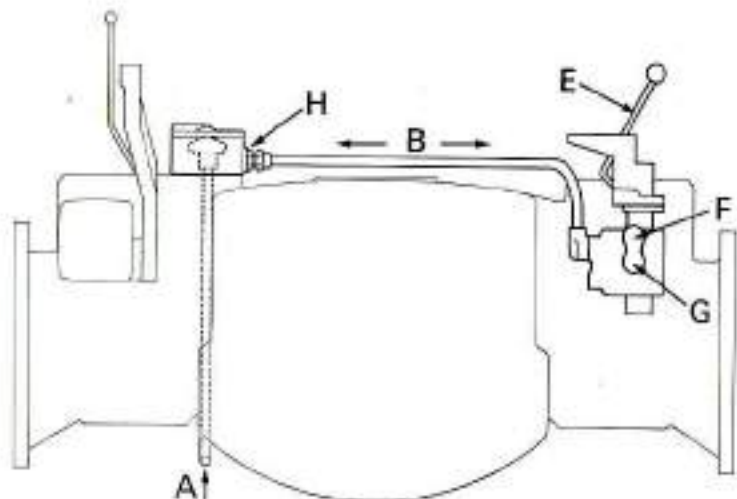


FIGURE 1/13. 3-WAY VALVE

3-way valve provides 2 external supplies F and G. Return oil (i.e. from mower) should be taken to H.

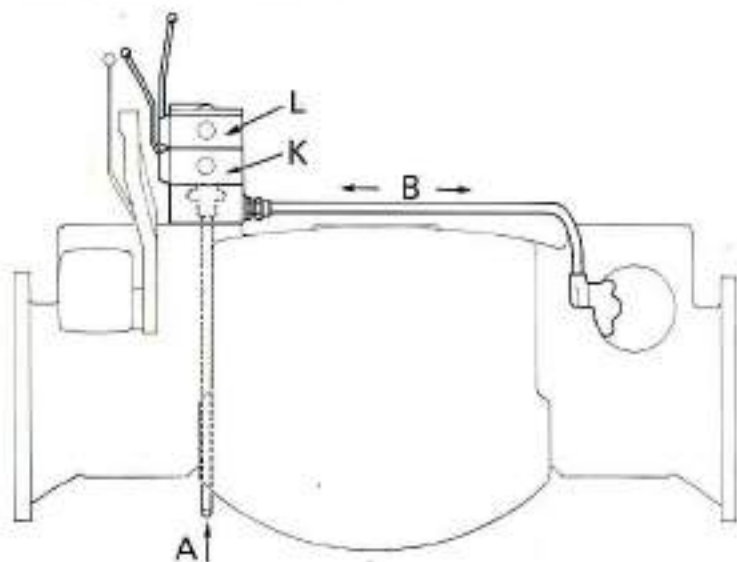


FIGURE 1/14. LIVE, DOUBLE-ACTING, CONTROL VALVES

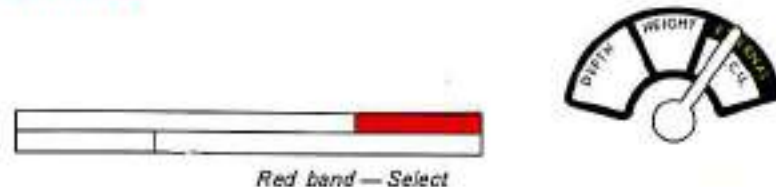
One or two independent live valves may be added for use with double acting external equipment. Supply and return connections are on the left-hand side of each valve unit. The 3-position control handle is self cancelling on pressure build up.

OPERATION OF SERVICE 4

External Equipment operated by the selectomatic hydraulic system

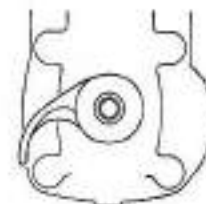
(This service covers external equipment connected to points F or G of the 3-way valve. See Fig. 1/13.)

SETTINGS



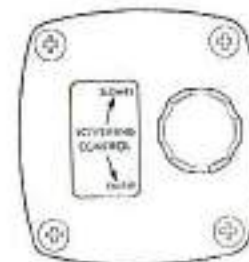
1. Pull the hand lever fully rearwards in the red band to "select" and while holding it against the spring, turn the selector dial pointer to "EXTERNAL".

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 31.

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.

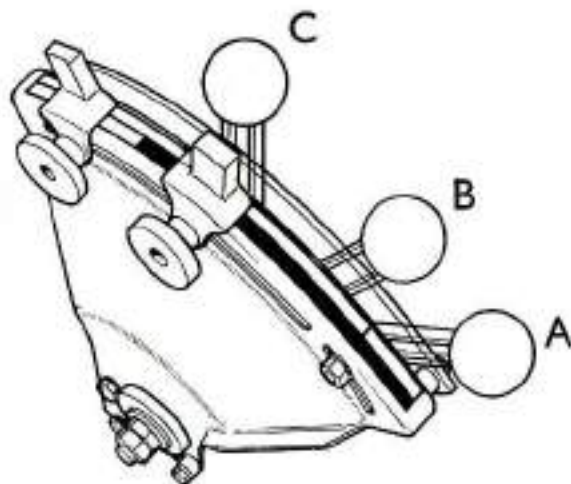
* See footnote on page 19.

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 17).



Black band — Lift, hold, lower

FIGURE 1/15.

HAND LEVER POSITIONS WITH DIAL POINTER AT EXTERNAL

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

3-WAY VALVE Connections

The two external connections are available on the front of the unit and are supplied sealed with $\frac{3}{8}$ UNC plugs. The

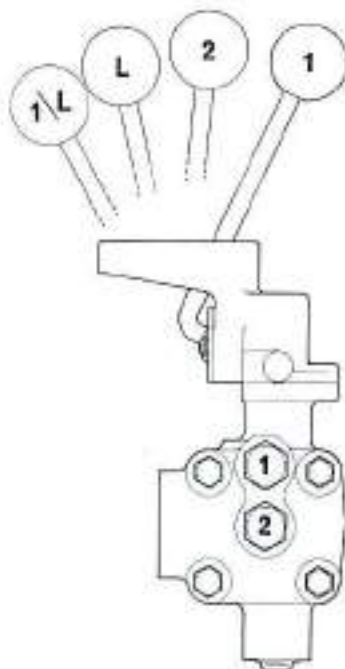


FIGURE 1/16.

3-WAY VALVE

1. Output connection 1
2. Output connection 2

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 the connection 'E' Fig. 1/17 on the distributor block in order that the gearbox and PTO should be properly lubricated.

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 42.

OPERATION OF LIVE EXTERNAL EQUIPMENT

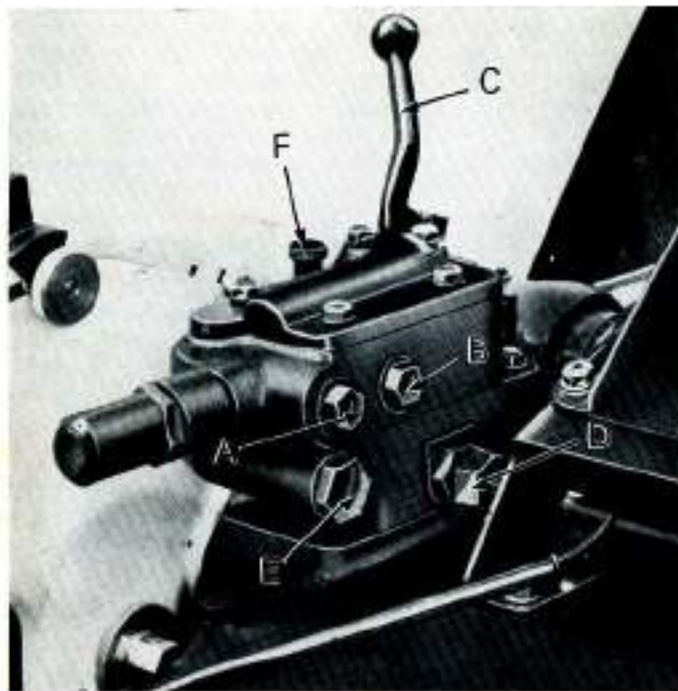


FIGURE 1/17. LIVE, DOUBLE-ACTING, CONTROL VALVE MOUNTED ON THE DISTRIBUTOR BLOCK

- A. Output to this connection when lever C is rearward
- B. Output to this connection when lever C is forward
- C. Operating lever
- D. Output to internal ram and 3-way valve
- E. Return from continuously operated equipment connected to 3-way valve to be taken to this point
- F. Dump valve

Connections to the double-acting control valve are shown at A and B in Fig. 1/17. When the control lever is pulled rearwards, oil is fed to connection A and returned to the sump via connection B. When the control lever is pushed forward 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.

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.



FIGURE 1/18.
DIFFERENTIAL LOCK
A. Pedal

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.

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

The 52 in (132 cm) front track should not be used with power assisted steering or damage may occur. Wider settings should be used with a loader for stability.

TRACK SETTINGS FOR PLOUGHING

For ploughing up to 14 in (35.6 cm) furrows the rear track should be set to 56 in (142 cm) and the front track to 52 in (132 cm). For 16 in (40.6 cm) furrows, set the rear wheels to 60 in (152.5 cm) and the front to 56 in (142 cm). This brings the insides of the front and rear tyres into 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. 1/19 for 12.4/11-36 and 12.4/11-38 tyres. It will be noticed that two different positions of rim and centre give a track width of 68 in (173 cm).

Wheels with 18.4/15-30 tyres have an integral rim and centre giving a fixed wheel track of 72 in (183 cm).

Power adjusted wheels supporting 13.6/12-38 tyres give settings of 68 to 88 in in 4 in steps (173 to 223 cm in 10 cm steps).

 **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.

FRONT TRACK ADJUSTMENT

The axle extension is secured by two bolts A, Fig. 1/20. 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 B 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 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.

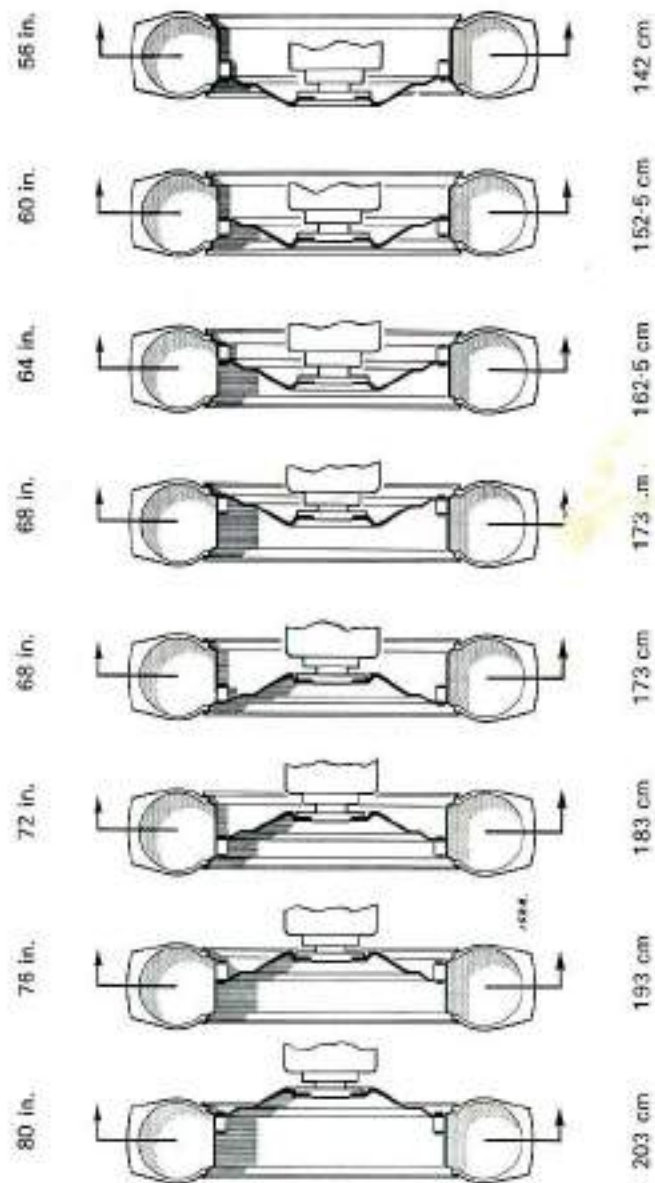


FIGURE 1/19. REAR WHEEL POSITIONS OF RIMS AND CENTRES
FOR TRACTORS FROM SERIAL No. 703005.

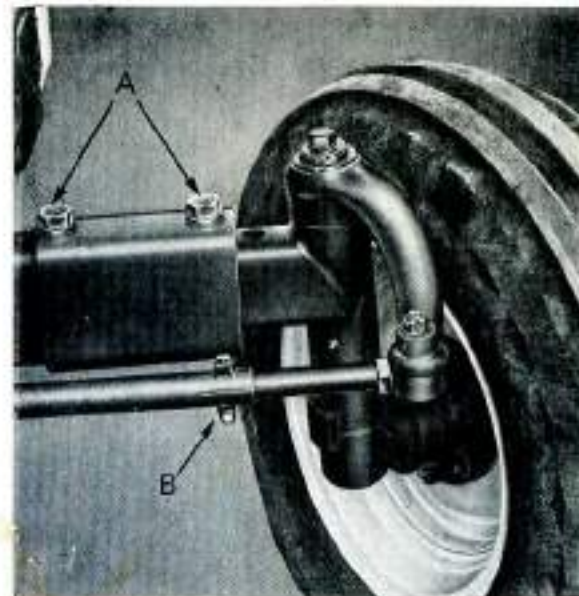


FIGURE 1/20.
FRONT AXLE TRACK ADJUSTMENT

A. Axle securing bolts B. Track rod securing bolt

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 there is only a small volume of air in the tyre and pressure should be checked each day before work commences.

Front tyres—general-purpose work—30 lb/in²
(2.15 kg/cm²)
—with loader, 600-19 (6-ply) tyres—45 lb/in²
(3.16 kg/cm²)
—with loader, 750-16 (6-ply) tyres—36 lb/in²
(2.53 kg/cm²)

Rear tyres —road work—20 lb/in² (1.45 kg/cm²)
—field work—12 lb/in² (0.84 kg/cm²)

LINKAGE SETTINGS

The linkages are designed for implements with category II cross shafts. When bolting the lower links to the hitch brackets ensure that the attachment hole B, Fig. 1/21 for the stabiliser bar is to the rear. The bolts should be inserted through the hitch brackets from the inside and the head securely seated against the lug which prevents it from turning whilst tightening the nut.

The drawbar frame **must** be in its uppermost position when using linkage mounted implements otherwise the check chains will prevent full lift being obtained. Three holes are provided in the check chain link bar. The bolt must be used through the hole marked 1200, the other two are only for use with the 990 tractor.

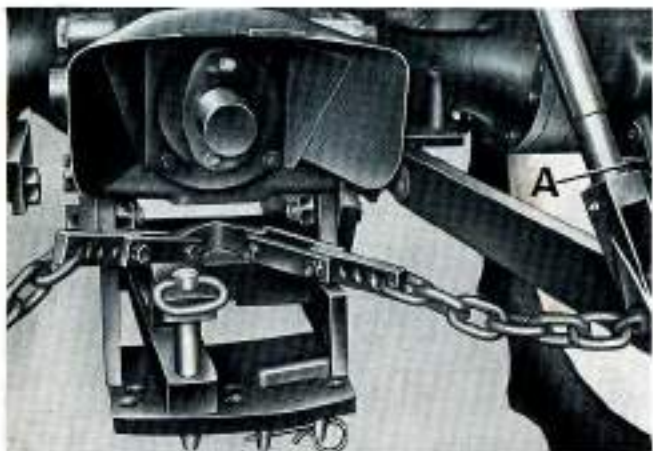


FIGURE 1/21. CHECK CHAINS AND DRAWBAR (STOWED)

A. Mounting pad for linkage stabiliser bracket

When side movement must be avoided, a stabiliser bar may be fitted between point A shown in Fig. 1/21 and the rear-most hole in the lower link. The links are still free to lift up and down. See note on page 39 for adjustment.

LIFT RODS

For ploughing the lift rod and levelling lever should be set initially to 20 in (50.8 cm) measured between the pivot centres.

N.B. The lift rod must not be extended to more than 23 in (58.4 cm) between pivot centres, otherwise there will be excessive strain on the remaining thread. Similarly the levelling lever must not be extended beyond $23\frac{7}{8}$ in (59.2 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.

SLOTTED LIFT RODS

Where rough or undulating ground is being cultivated, slotted lift rods are available. These replace the lower half of the lift rods and give the alternative of a fixed connection to the lower links or a slotted connection which allows 3 in (7.6 cm) of vertical free movement.

STABILISER BARS

When linkage stabiliser bars are fitted, the final adjustment should be made by **increasing** their length to remove free play from the lower link hitch points and to place the bars in **compression**.

UNIVERSAL DRAWBAR

FULLY EXTENDED POSITION

Attachment is similar to the trailer position described on page 40 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 1/22. DRAWBAR IN EXTENDED POSITION

A. Drawbar frame secured in upper position

WING POSITION

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

The rear of the drawbar is held by an inverted 'U' shaped bracket A, Fig. 1/23 and secured by pin B. The bracket can be fitted in several positions, centrally or to either side.

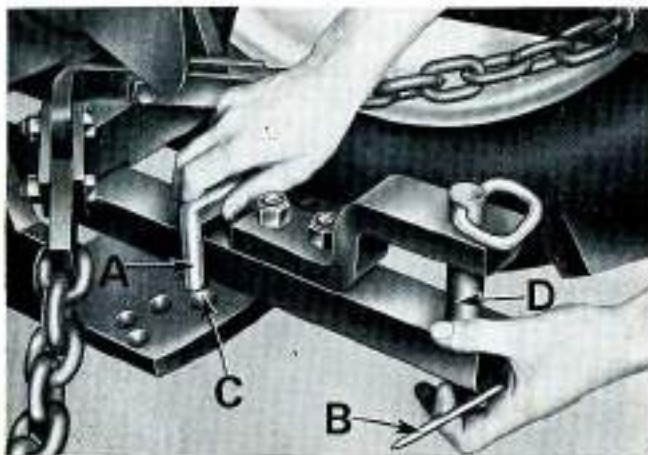


FIGURE 1/23. DRAWBAR IN TRAILER TOWING POSITION

- A. Securing bracket
- B. Pin
- C. Drawpin secures drawbar through this hole in stowed position
- D. Drawpin

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.

HEIGHT ADJUSTMENT

The clevis can be adjusted for height. The rear of the drawbar frame can be bolted at two different positions and, with the drawbar in the extended position, it may be

fitted either way up giving heights of 12 $\frac{5}{8}$ in (32.1 cm), 14 $\frac{1}{2}$ in (37.5 cm), 16 $\frac{5}{8}$ in (42.2 cm) and 18 $\frac{1}{2}$ in (47.6 cm), on 13.6/12 - 38 tyres.

Note. The drawbar frame must be in the top position when using linkage mounted implements otherwise the check chains will prevent full lift being obtained.

PICK-UP HITCH

A pick-up hitch may be fitted to the drawbar frame after removing the drawbar.

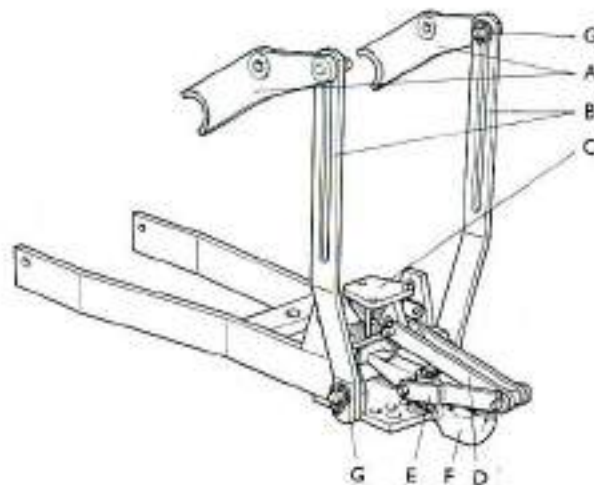


FIGURE 1/24. PICK-UP HITCH

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

FITTING INSTRUCTIONS

Bolt the towing hook firmly to the centre of the drawbar frame. Bolt the jaw plate bracket C to the underside of the PTO housing. 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 4 $\frac{1}{2}$ 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.

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 bracket A, Fig. 1/23 and secured by pin B. The bracket can be fitted in several positions, centrally or to either side.

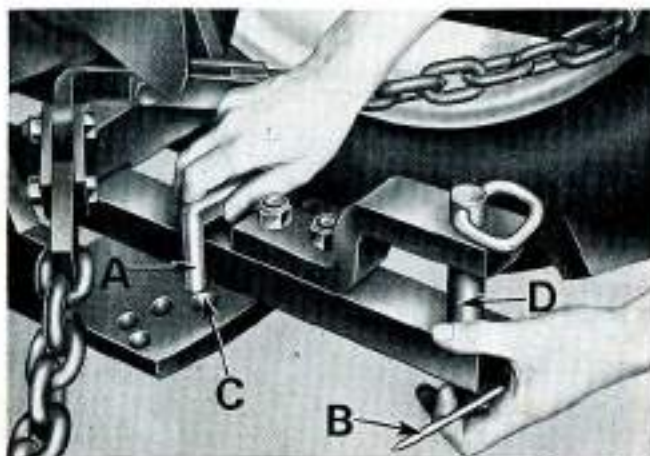


FIGURE 1/23. DRAWBAR IN TRAILER TOWING POSITION

- A. Securing bracket
- B. Pin
- C. Drawpin secures drawbar through this hole in stowed position
- D. Drawpin

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.

HEIGHT ADJUSTMENT

The clevis can be adjusted for height. The rear of the drawbar frame can be bolted at two different positions and, with the drawbar in the extended position, it may be

fitted either way up giving heights of 12 $\frac{3}{8}$ in (32.1 cm), 14 $\frac{1}{2}$ in (37.5 cm), 16 $\frac{3}{8}$ in (42.2 cm) and 18 $\frac{1}{2}$ in (47.6 cm), on 13.6/12 - 38 tyres.

Note. The drawbar frame must be in the top position when using linkage mounted implements otherwise the check chains will prevent full lift being obtained.

PICK-UP HITCH

A pick-up hitch may be fitted to the drawbar frame after removing the drawbar.

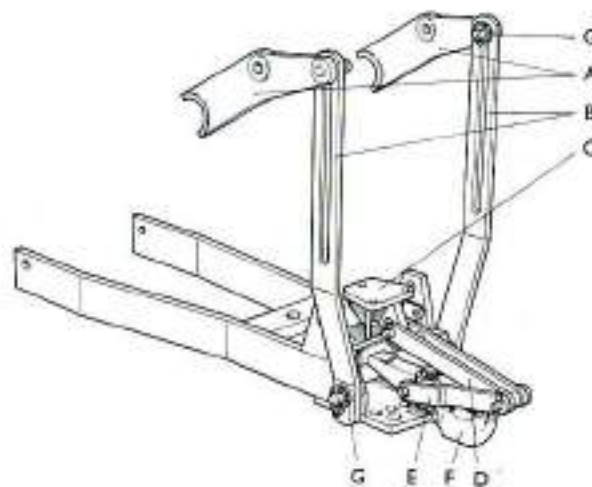


FIGURE 1/24. PICK-UP HITCH

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

FITTING INSTRUCTIONS

Bolt the towing hook firmly to the centre of the drawbar frame. Bolt the jaw plate bracket C to the underside of the PTO housing. 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 4 $\frac{1}{2}$ 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.

Fit a $\frac{3}{8}$ in (2.2 cm) washer between the lift rod and securing linch pin at the top and bottom ends as shown at G, Fig. 1/24.

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. The dump valve should be used to give a quick lowering of the jaw (see below).

DUMP VALVE (Optional fitting)

The dump valve allows a much quicker rate of lowering of external ram operated equipment used with the selectomatic system via a 3-way valve. 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 position of the hydraulic control lever (F, Fig. 1/17 on page 32).

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.

ADJUSTABLE SENSING UNIT (Optional fitting)

Owing to the wide variation in such factors as soil condition, depth of work and weight distribution of the implement, the forces operating (via the tractor top link) on the hydraulic sensing unit can vary very considerably and in extreme cases these forces may be outside the operating limits of the standard sensing unit spring.

Where the forces exerted on the sensing unit are either insufficient to actuate the spring or are such that they completely compress the spring the hydraulic depth control will be inoperative. The adjustable sensing unit provides a means by which the forces exerted on the spring during work may be increased or decreased, to suit prevailing conditions or equipment, by introducing an adjustable relay lever between the top link and the sensing unit spring.

Set the top link and link plate to one of the following four arrangements depending upon the size of implement in use. Once assembled, operation of the hydraulic system is as described previously for the standard sensing unit.

Heavy Draught

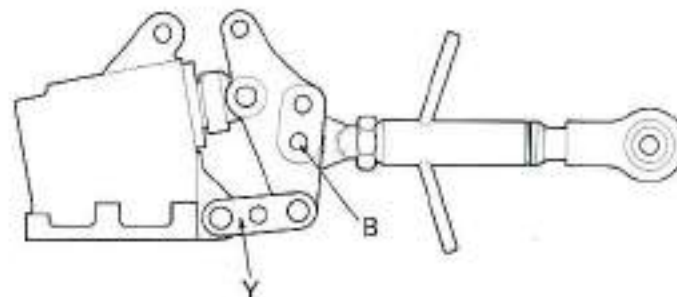


FIGURE 1/25.

Top link connected to lower hole 'B' in relay lever.

Link plate fitted to lower position 'Y'.

Suitable for the heaviest draught implements with top link forces up to 5830 lb (2640 kg) in compression and 3500 lb (1588 kg) in tension.

In this range would come the heavy chisel ploughs, subsoilers and heavy multi-furrow mouldboard and disc ploughs.

Medium-heavy Draught

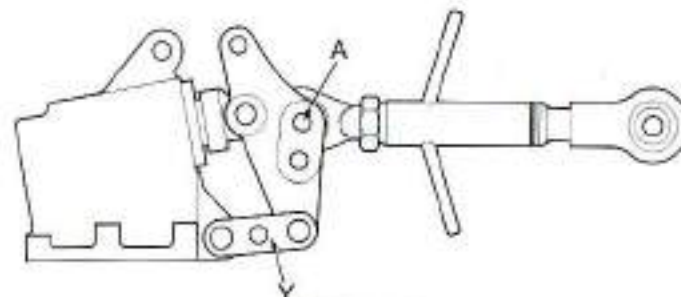


FIGURE 1/26.

Top link connected to position 'A' in relay lever.

Link plate fitted to lower position 'Y'.

Suitable position for medium to heavy draught implements with top link forces up to 3880 lb (1760 kg) in compression and 2330 lb (1057 kg) in tension. Implements in this range would include multi-furrow ploughs and cultivators etc.

Normal Draught

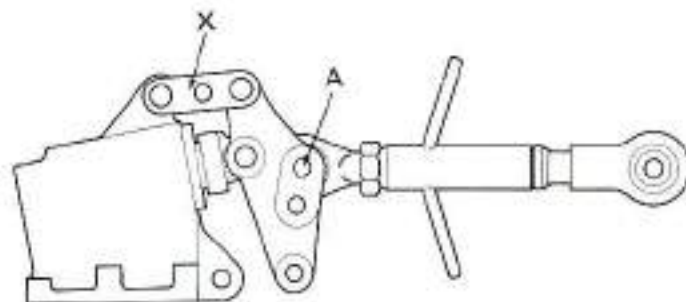


FIGURE 1/27.

Top link connected to position 'A' in relay lever.

Link plate fitted to upper position 'X'

Suitable for light draught ploughs and medium cultivators with top link forces up to 2150 lb (975 kg) in compression and 1290 lb (585 kg) in tension.

Extra Light Draught

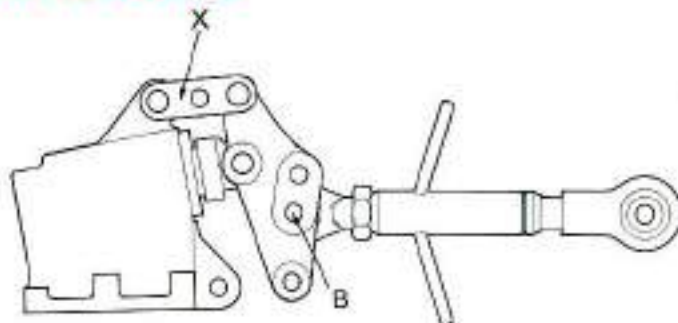


FIGURE 1/28

Top link connected to lower position 'B' in relay lever.

Link plate fitted to upper position 'X'.

Suitable for light draught ploughs and medium cultivators with top link forces up to 1575 lb (715 kg) in compression and 954 lb (429 kg) in tension.

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 overleaf 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 task 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 3)
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

- Inspection** — Check for oil, water and fuel leaks.
- Engine Oil** — Top up the engine sump if below the safe limit.
- Fuel** — Top up the fuel tank to within 1 ½ 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.
- Air Cleaner** — In dusty conditions, clean as follows every 8 hours or as found necessary by experience (see page 58).

Empty and clean the oil bath bowl (cup) and refill to the bead with clean engine oil. Detach the wire mesh element and clean in petrol (gasoline) or kerosene (fuel oil). If necessary clean the pre-filter and centre tube of the oil bath filter. Refit the wire mesh element with its sealing rings and secure the oil bath firmly with the 3 toggle clips.



FIGURE 2/1.
AIR CLEANER

If a paper element pre-filter is fitted, this must be cleaned and replaced.

- 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.*
Rear Hubs.*

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

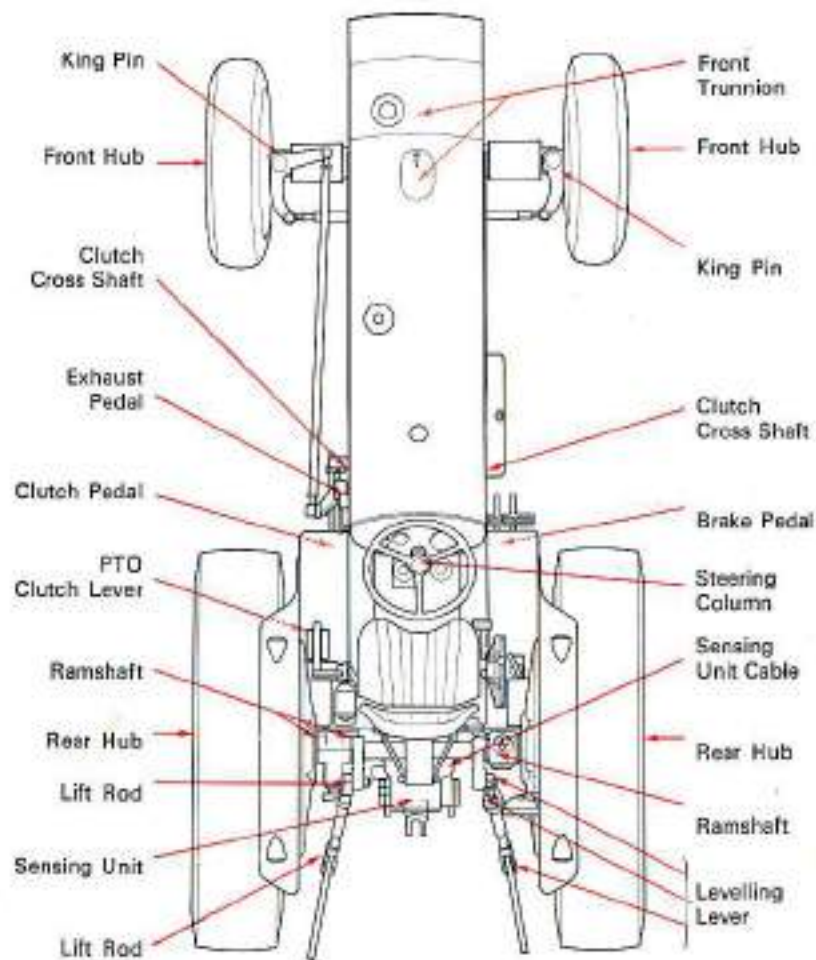


FIGURE 2/2. GREASING CHART

In addition to the above points, the greaser on the hand brake housing should be injected with oneshot of SAE 140 oil every 500 hours only.

SERVICE TASK A

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

1. **Air Cleaner** — See page 80 — Empty and clean the oil bath bowl (cup) and refill to the bead with new clean engine oil. Detach the wire mesh element and clean in petrol (gasoline) or kerosene (fuel oil). If necessary clean the pre-filter and centre tube of the oil bath filter. (Refit the wire mesh element with its sealing rings and secure the oil bath firmly with the 3 toggle clips.)

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.

If a paper element pre-filter is fitted, this must be cleaned and refitted.

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 (early tractors)
A. Filler cap and dip stick

NOTE — On later tractors the engine oil filler is on the left-hand side of the timing case and the dip stick on the left-hand side of the main frame.

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

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

GREASE

Front Hubs.
Steering Column top bearing.
Rear Hubs.
Clutch Pedal (1 point).
Brake Pedal (1 point).
PTO Clutch Lever.
Sensing Unit.
Sensing Unit Cable.
Hydraulic Lift Ramshaft (3 points).
Lift Rod and levelling lever (5 points).

- Controls** — Lubricate the controls and pivots with new engine oil. In dry, dusty conditions these points are best left unlubricated.
- Brakes** — Check that the brakes pull evenly when the two pedals are locked together. Also readjust as given on page 62 if there is more than 2 in (5 cm) of travel before commencement of operation.
- Transmission Clutch** — Check the free-play at the foot pedal and reset if necessary to $\frac{3}{8}$ - $\frac{1}{2}$ in (2.2-2.4 cm).
- PTO Clutch** — Check the free-play at the top of the hand lever and reset if necessary to $1\frac{1}{2}$ - $2\frac{1}{8}$ in (4.8-5.4 cm).
- 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.
- Battery** — Top up the battery with distilled water. Dry off the top of the battery. The battery will require more frequent attention in hot, dry conditions.
- Tyres** — Inflate tyres to correct pressures, see page 37.
- Wheels** — Tighten the wheel securing nuts each day for the first 50 hours when new or after the nuts have been disturbed. Tighten until no further movement can be detected indicating that they have fully bedded into the conical seats.
- Fuel Water Trap** — Check and if necessary clean out the fuel water trap and sediment bowl. Bleed at the inlet to the first filter to remove air.

SERVICE TASK B

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

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

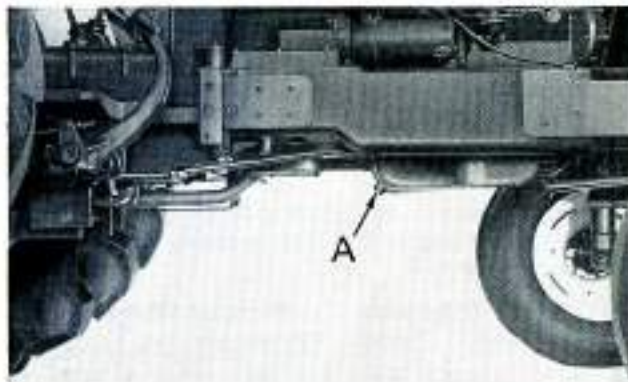


FIGURE 2/4. ENGINE SUMP DRAIN

A. Oil drain plug

- 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.
- Fuel Injection Pump** — The oil in the governor housing should be checked for level and if necessary topped up until it begins to drain from the level plug. See page 71.

SERVICE TASK C

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

- Oil Filter Renewal** — While the engine oil is being drained, remove the oil filter and fit a new element.

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.

Top up with new oil. Cleanliness is most essential as the Selectamatic system is operated by the transmission oil.

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

2. **Steering Box** — Check the level of oil and fill to the level of the plug if necessary.
3. **Fuel Injection Pump** — The oil in the governor housing and cambox should be drained off and new engine lubricating oil poured in through the filler plug until it begins to drain from the level plug. See page 71.
4. **Clutch Cross-shaft** — Apply grease with the gun to the fittings either side of the main frame as shown in Fig. 2/2. Do not over lubricate.
5. **Injectors** — Remove the injectors for cleaning by a David Brown agent. Cleaning at this period is essential otherwise reconditioning will be necessary before the normal time of 1500 to 2000 hours use.
6. **Valve Clearance** — Check and reset the valve clearances.
7. **Fan Belt** — Check the tension by deflecting midway between the pulleys. Adjust this, if necessary, to be $\frac{1}{2}$ in (1.3 cm) as shown in fig. 3/10 on page 66.

8. **Fuel Filter** — Renew the first fuel filter element and vent the system.
9. **Inspection** — Check over the tightness of external nuts, etc.
10. **Water Pump** — Apply high melting point grease sparingly to the water pump grease point (fitting).
11. **Dynamo** — Apply one or two drops of thin oil to the lubricating pad at the end of the dynamo. Replace the rubber plug.
12. **Hand Brake** — Inject one shot only of SAE 140 oil into the greaser on the hand brake housing to lubricate the pawl.

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). Clean the filter and replenish 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. **Fuel Filter** — Renew the second fuel filter element at least once a year.
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 clutches.



FIGURE 2/5.

- A. Transmission oil dipstick
- B. Transmission oil filler
- C. Steering box filler

FUEL, GREASE AND ANTI-FREEZE SPECIFICATIONS

DIESEL FUEL—BRITISH ISLES

Farm diesel fuel of high quality is recommended for use in David Brown Engines. Fuels with not more than 0.5% by weight sulphur should be used when available. A high sulphur content fuel requires an engine lubricating oil with high detergent characteristics to prevent carbon build-up in the nozzles and combustion chambers, and to neutralise the acid created by sulphur.

DIESEL FUEL—OVERSEAS

For temperatures above 0°C (32°F) use No. 2D fuel (ASTMD 975) with a minimum cetane rating of 45.

For temperatures below 0°C (32°F) use No. 1D fuel (ASTMD 975) with a minimum cetane rating of 50.

Note — For low temperature operation a fuel with a pour point 6°C (10°F) below lowest starting temperature should be specified, fuels with not more than 0.5% by weight sulphur should be used when available. A high sulphur content fuel requires an engine lubricating oil with high detergent characteristics to prevent carbon build-up in the nozzles and combustion chambers and to neutralise the acid created by sulphur.

GREASE

A good quality multi-purpose grease should be applied to all grease fittings (except water pump which requires a high melting point grease applied very sparingly every 500 hours). A high melting point grease may be used for all fittings except those which require oil.

ANTI-FREEZE

Use only a brand formulated for use in diesel engines to British Standard 3151:1959 type B, or its equivalent. This specifies an ethylene glycol type anti-freeze with sodium benzoate or sodium nitrite inhibitors. Topping-up should be carried out with the same type of anti-freeze in the appropriate strength. It is not recommended that any anti-freeze should be retained longer than 2 years.

APPROVED LUBRICANTS — BRITISH ISLES

APPLICATION	GRADE		AMOCO	B.P.	CASTROL	ESSO	MOBIL	SHELL
	Recommended	Alternative						
Engine, Air Cleaner & Injection Pump	Multi-purpose Oil	SAE 20/20W	SUPER VITAMATIC Motor Oil SAE 20W-30	Tractor Oil Universal	Agricaseol Multi-use	Eso Tractorube (Universal)	Mobiland Universal	Tractor Oil Universal
	20W/30 or 20W/40							
Transmission & Hydraulic System, Belt Pulley	Multi-purpose Oil	SAE 80	VITAMATIC Motor Oil SAE 20W-30	Tractor Oil Universal	Agricaseol Multi-use	Eso Tractorube (Universal)	Mobiland Universal	Tractor Oil Universal
	20W/30 or 20W/40							
Final Drive Reductions King Pins & Front Transmission and Steering Box	SAE 140		AMOCO Gear Lubricant SAE 140	Tractor Gear 140	Agricaseol Gear Oil Medium	Eso Gear Oil GP 90/140	Mobiland Gear 140 Tractor Oil	Tractor Gear 140
Power Assisted Steering and Hydrostatic Steering	SAE 10		AMERICAN Industrial Oil 15	Engrol HL55	Agricaseol ATF or Hyseol AWS 32	Eso Automatic Transmission Fluid or Numa H44	Mobilfluid 200	Tellus 27
Alternative Grade Oils	SAE 20/20W		AMERICAN HD-M Motor Oil SAE 20-30W	BP Vanellus SAE 20	Castrol CR120 or Agricaseol 20	Essolube HD20	Mobillic Acetic or Dravac Oil 1120	Robella S 20/20W
	SAE 80		AMOCO Gear Lubricant SAE 80	Tractor Oil 80	Castrol CR130 or Agricaseol 30	Essolube HD 30	Mobilube C80 or Mobillic A or Duovac Oil 1130	Tractor Oil 30

APPROVED LUBRICANTS — OVERSEAS

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Appli- cation	A.P.I. Classn.	Air Temp.	GRADE		AMOCO	B.P.	CASTROL	ESSO	MOBIL	SHELL
			Recomm.	Alternative						
Engine, Air Cleaner and Injection Pump	DG, MS, DM	Below -7°C (20°F)	Multi- purpose SAE 10W/30	SAE 10W	AMERICAN HD-M Motor Oil 10W/30	Tractor Oil Universal	Agri-castrol Multi-use 10W/30	Eso Tractorlubs Universal 10W/30	Mobilol Special 10W/30	Rotella M Multigrade 10W/30
			Multi- purpose SAE 20W/30 or 20W/40	SAE 20W	AMERICAN HD-M Motor Oil 20W/30 or 20W/40	Tractor Oil Universal	Agri-castrol Multi-use 20W/30	Eso Tractorlubs Universal 20W/30	Mobilol Special 20W/40	Rotella M Multigrade 20W/40
			Multi- purpose SAE 20W/30 or 20W/40	SAE 30	AMERICAN HD-M Motor Oil 20W/30 or 20W/40	Tractor Oil Universal	Agri-castrol Multi-use 20W/30	Eso Tractorlubs Universal 20W/30	Mobilol Special 20W/40	Rotella M Multigrade 20W/40
Transmission and Hydraulic System, Belt Pulley	DG, MS, DM	Below -7°C (20°F)	Multi- purpose SAE 20W/30 or 20W/40	SAE 80	AMERICAN HD-M Motor Oil 20W/30 or 20W/40	Tractor Oil Universal	Agri-castrol Multi-use 20W/30	Eso Tractorlubs Universal 20W/30	Mobilol Special 20W/40	Rotella M Multigrade 20W/40
			Multi- purpose SAE 20W/30 or 20W/40	SAE 90	AMERICAN HD-M Motor Oil 20W/30 or 20W/40	Tractor Oil Universal	Agri-castrol Multi-use 20W/30	Eso Tractorlubs Universal 20W/30	Mobilol Special 20W/40	Rotella M Multigrade 20W/40
			Multi- purpose SAE 20W/30 or 20W/40	SAE 90	AMERICAN HD-M Motor Oil 20W/30 or 20W/40	Tractor Oil Universal	Agri-castrol Multi-use 20W/30	Eso Tractorlubs Universal 20W/30	Mobilol Special 20W/40	Rotella M Multigrade 20W/40
Power-Assisted Steering and Hydrostatic Steering	All temp.	All temp.	SAE 10	—	AMERICAN Industrial Oil 15	Energol HL68	Hydrol AMS 32 or Castrol TD	Eso Automatic Transmission Fluid or Nuto H54	Mobilol ATF 200	Tellus 27
			SAE 10	—	AMERICAN Industrial Oil 15	Energol HL68	Hydrol AMS 32 or Castrol TD	Eso Automatic Transmission Fluid or Nuto H54	Mobilol 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 (SM) 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% sulfur. In climates where the day temperature often exceeds 22°C (70°F) an SAE 30 straight mineral oil may be used in the Air Cleaner to prevent frosting and "pull-over" into the engine. Do not overfill the bowl.

APPLICATION	Air Temp.	GRADE		AMOCO	B.P.	CASTROL	ESSO	MOBIL	SHELL
		Recomm.	Alternative						
Final Drive Reductions, King Pin and Front Trunnion (Pivot) and Steering Box	Below -7°C (20°F)	SAE 80	—	AMOCO Gear Lubricant SAE 80	Gear Oil SAE 90	Castrol ST or Agri-castrol Gear Oil Light	Eso Gear Oil GP 80/140	Mobilube C80	Dentox 80
		SAE 140	—	AMOCO Gear Lubricant SAE 140	Gear Oil SAE 140	Castrol D or Agri-castrol Gear Oil Medium	Eso Gear Oil GP 90/140	Mobilube C140	Dentax 140
		SAE 10W	—	AMERICAN HD-M Motor Oil SAE 10W	BP Vanellus SAE 10W	Castrol CR110 or Agri-castrol 10	Esso-lube HD 10W	Mobilol 10W or Delvac Oil 1110	Rotella S 10W
Details of Alternative Grade Oils	Above 32°C (90°F)	SAE 20W	—	AMERICAN HD-M Motor Oil SAE 20-20W	BP Vanellus SAE 20W	Castrol CR120 or Agri-castrol 20	Esso-lube HD 20	Mobilol Agri-cast or Delvac Oil 1120	Rotella S 20/20W
		SAE 30	—	AMERICAN HD-M Motor Oil SAE 30	BP Vanellus SAE 30	Castrol CR130 or Agri-castrol 30	Esso-lube HD 30	Mobilol A or Delvac Oil 1130	Rotella S 30
		SAE 80	—	AMOCO Gear Lubricant SAE 80	Gear Oil SAE 80	Castrol ST 80 or CR130 or Agri-castrol 30	Esso-lube HD 30 or CR130 or Agri-castrol 30	Mobilube C80 or Mobilol A or Delvac Oil 1130	Dentax 80
		SAE 90	—	AMOCO Gear Lubricant SAE 90	Gear Oil SAE 90	Castrol ST or Agri-castrol Gear Oil Light	Eso Gear Oil GP 90/140	Mobilube C90	Dentax 90

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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.

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. Remove the cap slowly as the system is pressurised.

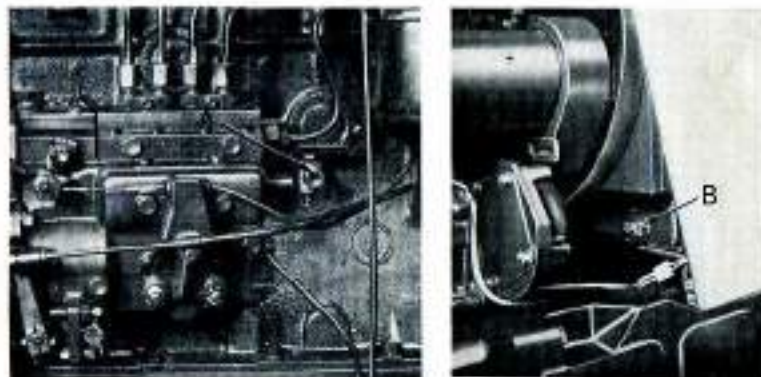


FIGURE 3/1. RADIATOR AND CYLINDER BLOCK DRAINS

A. Cylinder block drain

B. Radiator drain

ANTI-FREEZE SOLUTION

If anti-freeze solution is used in diesel engines there is the possibility of severe corrosion of the cylinder block taking place, with subsequent blockage of the radiator, etc., unless the following precautions are taken. (1) Use only a brand having a manufacturer's guarantee that it has been formulated to BS.3151 Type B for use in diesel engines. (2) Ensure that the system is free from corrosion by flushing the system with a reliable flushing compound. (3) Use only pure water for making the mixture, *i.e.*, fresh rain water, some forms of tap

water are unsuitable. (4) When topping-up, use a mixture of anti-freeze and water. (5) Ensure that the system is free from leaks at hose joints, etc. (6) If cylinder head gasket blowing is suspected, attend to the leakage at once, and refill with a brand new anti-freeze mixture. It is recommended that the system be drained and refilled with a new mixture once a year. Even with the so called "permanent" varieties it is not recommended that they be retained for more than two years.

AIR CLEANER

A 3-stage filter system is used to provide the best possible protection to the engine. The first stage is a centrifugal pre-filter. A pre-filter with a removable paper element can be fitted as an alternative. 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.



FIGURE 3/2.
AIR CLEANER

- A. Oil pan
- B. Wire mesh
- C. Rubber seals
- D. Pre-cleaner location
- E. Cleaner body

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 the oil is very dirty, there is $\frac{1}{4}$ in (6 mm) of solid sediment, 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. Use a straight mineral oil to prevent foaming and carry over of oil (and dirt).

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

Where a paper element pre-filter is fitted, the element 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.

BATTERY

To gain access for inspection and topping up, remove the radiator grille, lift the catch A, fig. 3/3 and pull the battery fully forward complete with its mounting tray as shown in the illustration. The tray is captive and will not fall out.

Prise off both Autofil covers and if the level of the acid is below the bottoms of the filling tubes, pour pure water into each trough until all tubes are filled. Replace covers immediately.

Note — Covers must be in place when changing.

In hot weather or climates, the electrolyte should be checked



FIGURE 3/3.
BATTERY

- A. Catch
- B. Air Cleaner
- C. Hydraulic Pump

frequently. Use only distilled water or soft clean rain water for filling. The top of the battery should be dried off and cleaned. Smear a little petroleum jelly on each terminal.

BONNET (HOOD) AND GRILLE REMOVAL

The grille is removed by turning the two fasteners at the top counter-clockwise half a turn and pulling the top forward as shown in Fig. 3/4. Access is gained to the battery, air cleaner and the hydraulic pump.



FIGURE 3/4.
GRILLE REMOVAL

The bonnet (hood) top may be removed as follows, refer to Fig. 3/5.

1. Remove the exhaust silencer (muffler) by lifting upwards.
2. Unhitch the finger hooks A by pressing down and forwards.
3. Using the small square end of the tool C provided, turn the catch B on each side of the bonnet to disconnect it from the top section. The hood may then be lifted off.

To gain access to the radiator filler it is not necessary to remove the bonnet top as a small hatch cover is fitted. Turn the knob counter-clockwise and hinge forward.

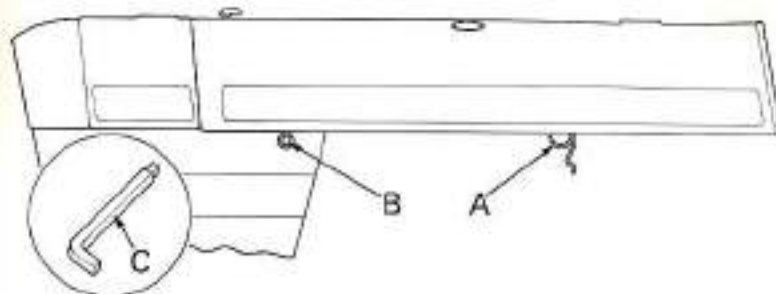


FIGURE 3/5. HOOD TOP REMOVAL

A. Finger hook B. Catch C. Tool

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. 3/6 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

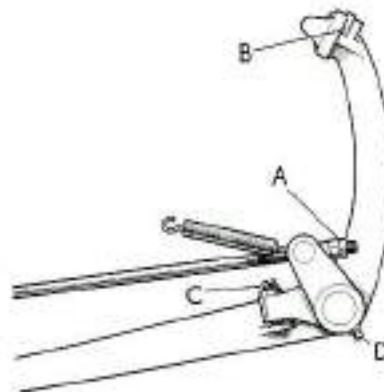


FIGURE 3/6.
BRAKE ADJUSTMENT

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

hand brake. Ensure that the wheels are free to turn and the brakes not binding.

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

A grease fitting is provided as shown at D, Fig. 3/7.

TRANSMISSION CLUTCH

Check the free-play frequently, say once a week when used on work involving frequent use of the clutch as when using a front loader. The play must never be allowed to fall below $\frac{3}{8}$ in (19 mm). Slacken the locknut and adjust nut A, Fig. 3/7 to give $\frac{3}{8}$ - $\frac{1}{2}$ in (2.2-2.4 cm) free-play. Re-lock when correct.

PTO CLUTCH

Free-play should be adjusted when necessary by means of nut B, Fig. 3/7 to give $1\frac{3}{8}$ - $2\frac{1}{4}$ in (4.8-5.4 cm) movement at the top of the hand lever when in the forward (engaged) position. Re-lock when correct.

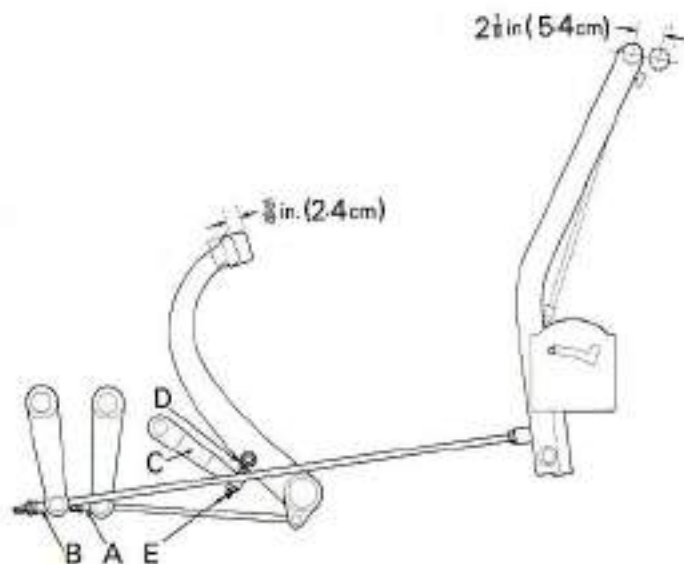


FIGURE 3/7. CLUTCH ADJUSTMENT

- | | |
|-------------------------------|------------------------------|
| A. Transmission adjusting nut | D. Clearance |
| B. PTO adjusting nut | E. Clutch stop adjusting nut |
| C. Clutch stop lever | |

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 plates to a stop in under 2 seconds allowing a new gear ratio to be selected.

Press down lever C, Fig. 3/7, by hand. Then press down the foot pedal just far enough to take up the free-play. Set the adjusting screw E to give $\frac{1}{8}$ in (1.6 mm) between it and the actuating pin at D. Tighten the locknut.

COOLING SYSTEM

Anti-freeze to BS.3151 type B should be used 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 and is usually 5:1 in the U.K. Except for the inclusion of anti-freeze or corrosion inhibitor, only clean soft water should be used in the cooling system.

When anti-freeze is used in diesel engines it is essential to remove corrosion deposits before introducing it. To do this a proprietary flushing solution may be used or alternatively the system filled with a 4% solution in water of citric or tartaric acid. Run the engine for 20 minutes, drain and thoroughly flush with clean water.

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

CYLINDER HEAD TIGHTENING

The sequence of tightening the cylinder head is shown in Fig. 3/8. If a torque wrench is available this should be set to 90 lb ft (12.5 m kg). The valve clearances should be checked after tightening the head.

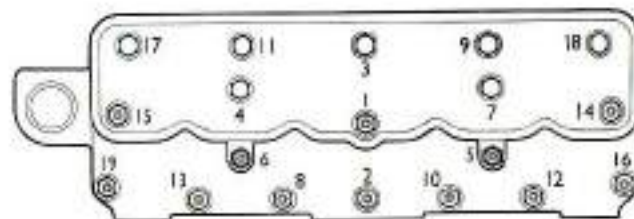


FIGURE 3/8. CYLINDER HEAD TIGHTENING SEQUENCE

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 3/9.
DYNAMO (GENERATOR)
LUBRICATION

A. Oil hole
(replace rubber plug)

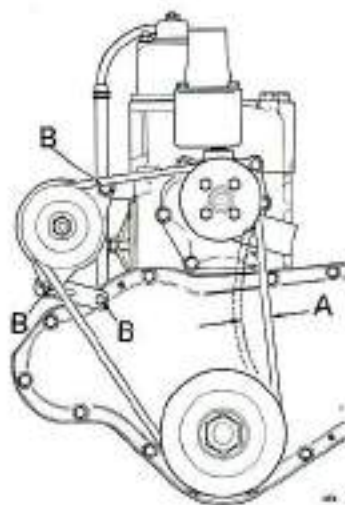


FIGURE 3/10.
FAN BELT DRIVE
ADJUSTMENT

A. Deflection $\frac{1}{2}$ in (1.3 cm.)
B. Securing bolts

FAN BELT

Refer to Fig. 3/10. The fan, dynamo (generator) and water pump drive belt should never be run taut. The correct adjustment allows $\frac{1}{2}$ in (1.3 cm) of deflection on the drive side of the dynamo (generator) pulley. If incorrect, slacken the bolts B, 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 3/11.
FRONT TRUNNION
(PIVOT) GREASING

A. Lubrication points

FRONT AXLE

Refer to Figs. 3/11 to 3/12 for the location of the lubrication points. These should be carefully cleaned before application of SAE 140 oil. Jack up the front of the tractor and check the steering king pins and axle trunnion (pivot) bearings. If wear is apparent, your David Brown dealer should be consulted. Neglecting to lubricate regularly will lead to premature wear at these points.

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. Turn the wheel whilst tightening the nut and check that there is not excessive friction. 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 $\frac{1}{8}$ th of a turn. Caution: this adjustment must be carried out with the wheel jacked clear of the ground.



FIGURE 3/12. FRONT AXLE
A. King pin lubrication point



FIGURE 3/13. FRONT HUB
A. Front hub greaser (fitting)

FUEL

The fuel pump and injection equipment are machined with extremely small clearances. Only sufficient room is allowed for a film of fuel to provide a lubricant. The smallest particle of dirt will cause scoring of the surface, rapid wear, and reduced efficiency. The injector needles may stick, causing erratic or poor engine power and permanent damage to the injector if not serviced immediately.

It is important that only clean fuel be put in the tank, therefore refuelling should be carried out under cover where possible. Correct storage of the fuel will help to make sure it is not contaminated and consideration should be given to the following points.

1. The size of the tank should be ample to cover expected requirements but not so large that draining and refilling periods are infrequent.
2. The tank should be high enough to allow gravity feeding direct into the tractor tank and should be under cover or at least protected from extremes of temperature by surrounding walls.
3. The tank should slope towards the rear with a drain tap at the lowest point.
4. The draw-off tap should be at the front, at least 3 in (7.6 cm) above the drain tap.
5. The draw-off should be through a filter with provision for cleaning or changing the element.
6. There should be a vent at the top adequately protected by a fine wire mesh.
7. The filling pipe should be within reasonable access of a bulk delivery tanker and kept scrupulously clean.
8. Sludge and water should be drained from the drain tap every month.

Note — Galvanised material should **not** be allowed to come into contact with diesel fuel or the fuel will be contaminated by the zinc.

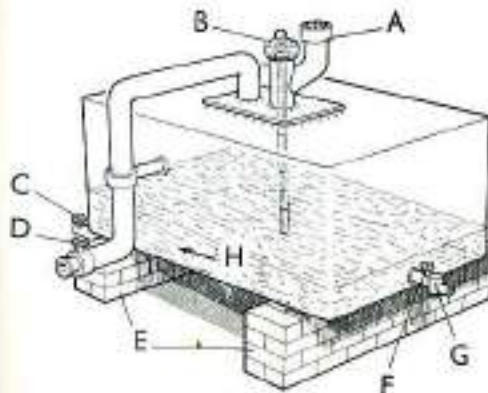


FIGURE 3/14.
FUEL STORAGE

- A. Vent pipe
- B. Dipstick
- C. Drain valve
- D. Fill pipe valve
- E. Cradle
- F. Draw-off valve
- G. Filter
- H. Fall

FUEL FILTER ELEMENT

The David Brown diesel tractor has two paper element fuel filters in series. The first filter should be removed at regular intervals but the second filter will only require occasional replacement. The precise life will be governed by the condition of the fuel used. Fuel supplied from a tank, such as described above, being clean and free from water, should give a life of at least 500 hours for the first filter and approximately two years for the second. With barrel storage and the attendant contamination, life of the first filter will be reduced to perhaps only 100 hours and the second filter about 500-1,000 hours especially where water is present as this causes the paper to swell and fail to pass fuel.

To change the element proceed as follows, refer to Fig. 3/15.

1. Clean the outside of the filter.
2. Unscrew the bolt C supporting the body with the other hand.
3. Discard the used element and flush the base until clean.

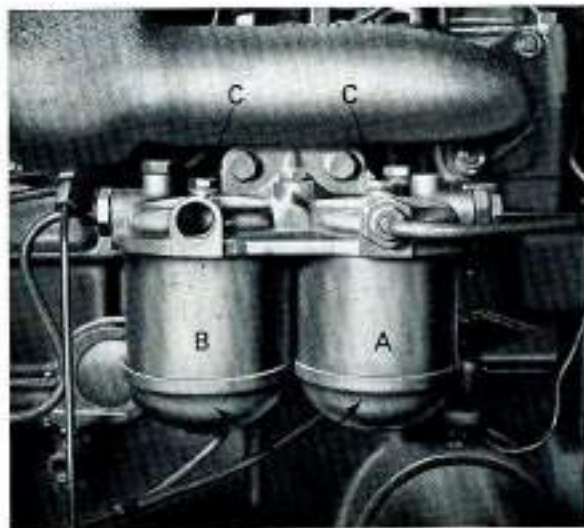


FIGURE 3/15. RENEWING THE FUEL FILTER

- | | |
|------------------|-------------------|
| A. First filter | C. Securing bolts |
| B. Second filter | D. Bases |

4. Fit a new sealing washer under bolt C. Fit the new element, taking care to seat it on the rubber sealing rings in the cover and base.
5. Clean out the sediment bowl on the fuel pump before priming the system. See instructions under VENTING THE FUEL SYSTEM.

FUSE

A standard 1½ in. (3 cm) cartridge fuse of 25 amp. rating is fitted in the white plastic bayonet type holder suspended in the wiring near the regulator under the instrument panel. The fuse should not be replaced until the cause of blowing has been traced and the fault corrected.

INJECTION PUMP

A Simms Minimec fuel injection pump is fitted to the engine timing case and driven via an idler gear from the front of the crankshaft. The governor is a mechanical type mounted internally on the injection pump camshaft at the front of the pump.

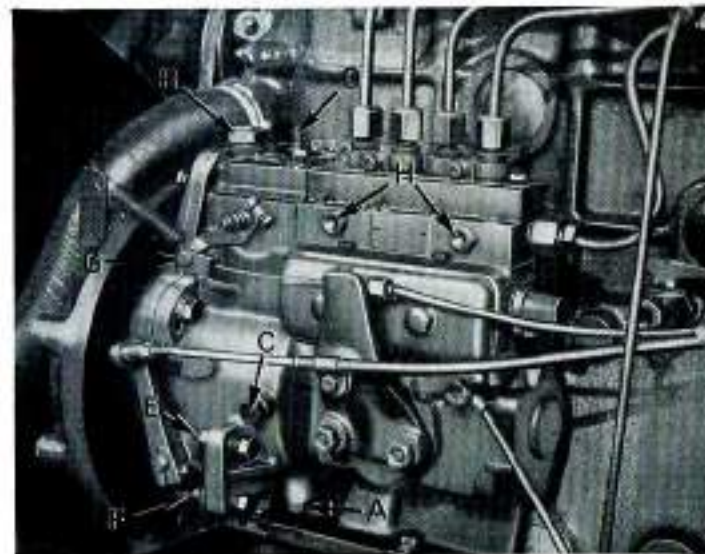


FIGURE 3/16. FUEL INJECTION PUMP

- | | |
|----------------------|-----------------------|
| A. Drain plug | E. Maximum speed stop |
| B. Filler plug | F. Idling speed stop |
| C. Level plug | G. Fuel cut-off |
| D. Maximum fuel stop | H. Vent plugs |

The cold starting button, when pressed in, allows the control rod to move past the normal stop and thus inject an excess amount of fuel if the throttle is open. As soon as the engine starts and runs up to speed, the button re-sets to its normal position.

The oil in the cambox should be replenished every 500 hours. Drain the old oil from the plug A, Fig. 3/16 and refill with new engine oil through the plug B until it begins to drain from the level plug C.

The maximum fuel stop screw D and the maximum speed stop E are set at the factory and must not be disturbed.

INJECTORS

The injectors are a high precision piece of equipment, and upon their condition and treatment depends the engine's performance. They should be treated carefully and protected against dirt. To remove them from the engine, for servicing by an approved dealer or Simms agent, proceed as follows:

1. Thoroughly clean off all external dirt before attempting to carry out any work on the fuel system.
2. Disconnect the leak-off pipe from its connections at each end.
3. Undo the unions on the top of each injector. Remove the pipe and store away from dirt.
4. Disconnect the high pressure pipes at the unions.
5. Slacken the injector holding down nuts — each side of an injector should be slackened in stages to prevent distortion of the injector.
6. Withdraw the injectors carefully, use a bar under the lugs of the injector if stuck in position by carbon. Blank off the inlet union to prevent ingress of dirt, and fit a protection sleeve to the nozzle tip to prevent damage to the fine spray holes.
7. Clean out the inside of the injector port in the head and remove the old copper washer. Plug with clean material to prevent dirt entering the engine until the injectors are replaced.

When replacing the injectors fit the new copper washer and tighten each side down evenly, each nut a part turn alternately. Do not overtighten but make sure that they are firmly seated to seal against engine combustion pressure. Reconnect all pipes in the reverse order to their removal. It is suggested that tightening of the high pressure lines is left till last. Turn on the fuel and turn the engine until fuel appears at each union. This will eject air and dirt. Tighten the unions but not overtight, start up the engine and check for fuel leaks.

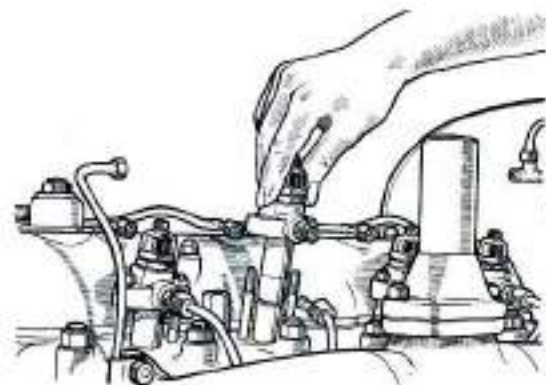


FIGURE 3/17
INJECTOR
REMOVAL

LUBRICATION Grease Fittings

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 which requires 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



FIGURE 3/18.
WATER PUMP
A. Greaser

requiring oil. The positions of the greese points are shown on the chart, Fig. 2/2, page 48.

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 3/19.

- A. Transmission clutch pedal greaser
- B. PTO clutch lever greaser
- C. Starter isolating switch-clutch operated

Engine oil

Always drain the oil 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 55. 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 when filling the sump (oil pan).

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 diesel 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.

STEERING BOX

It should not be necessary to renew the oil in the steering box except at major overhauls. Make an occasional check of the level and when necessary top up to replace any leakage which may have occurred.

Should it be necessary to remove the steering column, some oil should be drained from plug A, Fig. 3/20 to bring the level below the joint face.



FIGURE 3/20.

- A. Steering box drain plug
- B. Transmission oil dip stick

OIL FILTER ELEMENT

Remove by unscrewing the bolt B in the bottom of the unit, Fig. 3/21. Remove and discard the dirty element and wash the cover A 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 together with a new rubber sealing ring in the cylinder block. It is recommended that the securing bolt be tightened to 10 lb ft torque (1.4 m kg). Motor the

engine to refill the filter with oil and top up the sump (oil pan) if necessary. Restart the engine and check the cover for leakage.



FIGURE 3/21.
ENGINE OIL
FILTER
A. Filter body
B. Securing bolt

OIL PUMP WIRE FILTER

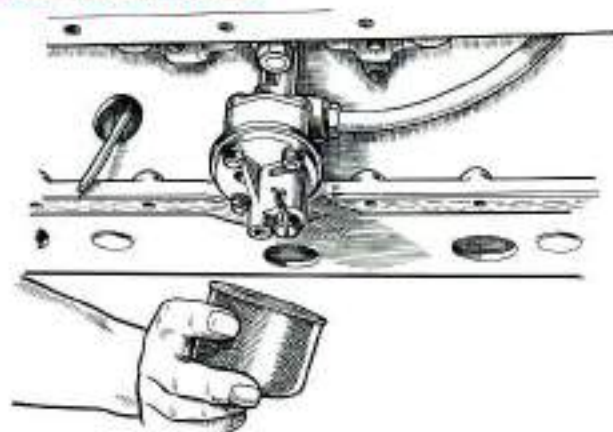


FIGURE 3/22. REMOVING THE ENGINE OIL PUMP FILTER

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 screw from the centre of the oil strainer base as shown in Fig. 3/22. 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 wire mesh, sump cover (oil pan), and plug. A new gasket should be used. Refill with the correct oil.

POWER TAKE-OFF AND BELT PULLEY

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

The belt pulley unit is designed to give a British Standard belt speed of 3140 ft/min (957 m/min) at a PTO speed of 1000 rev/min, *i.e.* in high PTO ratio. This gives maximum belt horsepower with minimum torsional loading. Although a belt speed of 1695 ft/min (520 m/min) may be used with a 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.

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

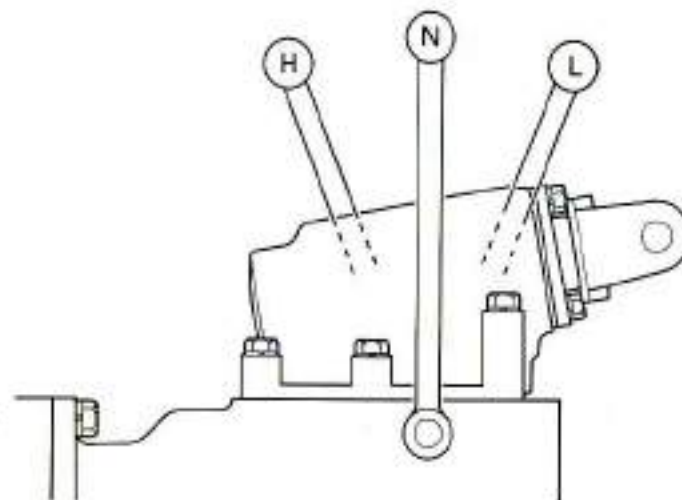


FIGURE 3/23. POWER TAKE-OFF

H. High gear ratio N. Neutral L. Low gear ratio

filled, with the same grade of oil as used in the transmission gearbox, to the level of the plug.

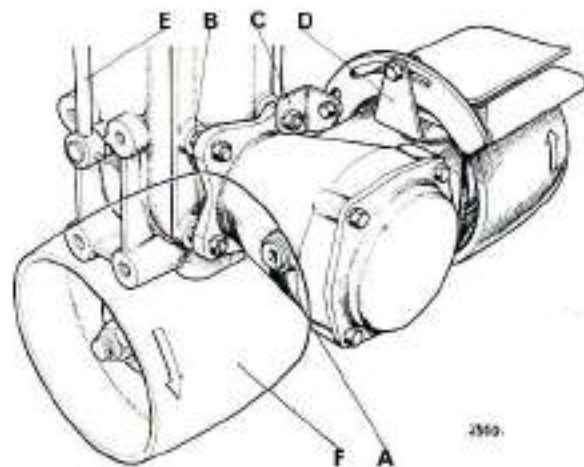


FIGURE 3/23A. BELT PULLEY UNIT

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

Mounting Instructions—Unless the belt pulley 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 supplied. Replace the studs one at a time. 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. Before attempting to engage, pull the clutch release lever fully rearwards to disengage.

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. 3/24. Do not clean with a cloth because of the risk of including lint. Renew the gasket if the old one is damaged.

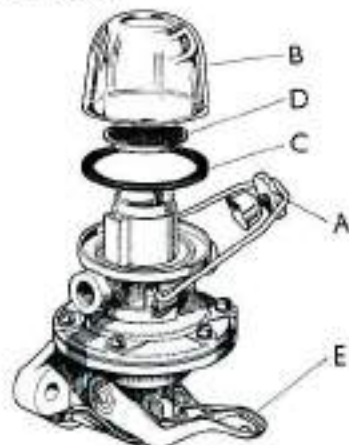


FIGURE 3/24. SEDIMENT BOWL

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

Loosen the connection to the first filter and bleed until free of air. 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.

STARTER

This is a 12 volt axial type incorporating a solenoid relay switch. 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 recharge 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. If the starter fails to operate do not keep trying or damage may result to starter or battery; consult an authorised agent.

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 B, Fig. 3/25. To completely drain the rear axle case, when renewing the oil, plug A must also be removed.

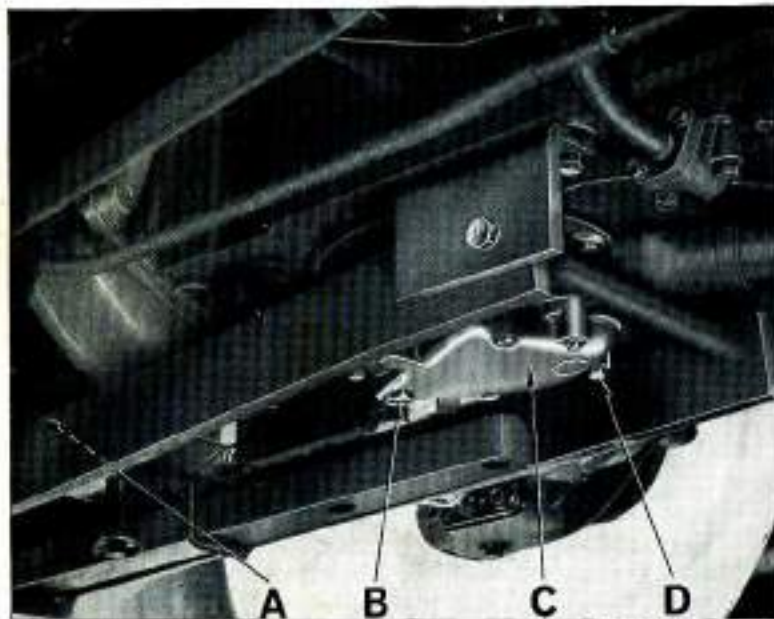


FIGURE 3/25. DRAINING THE TRANSMISSION

- A. Rear axle drain plug
- B. Gearbox drain plug
- C. Cover plate and magnet
- D. Retaining bolts

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.

Unscrew the retaining bolts D, Fig. 3/25 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 $\frac{3}{8}$ 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.

NOTE

When transmission oil is drained off, air will be admitted to the hydraulic system which may cause an air lock with subsequent starvation of the hydraulic lift pump.

To avoid this after changing the transmission oil, run the engine at *minimum idling speed* for a period of 30 seconds with the hydraulic control lever in the *Lower* position. If after this period there is no response at the linkage when the control lever is placed in the lift position, the control lever should be returned to the lower position and the pressure pipe adjacent to the relief valve should be slackened to bleed the air from the pipe. (This is done with the engine still running at idling speed). After a further 30 seconds, operate the lever again and ensure the hydraulic system is working satisfactorily.

The engine should not be operated above idling speed until the hydraulic system is free of air.

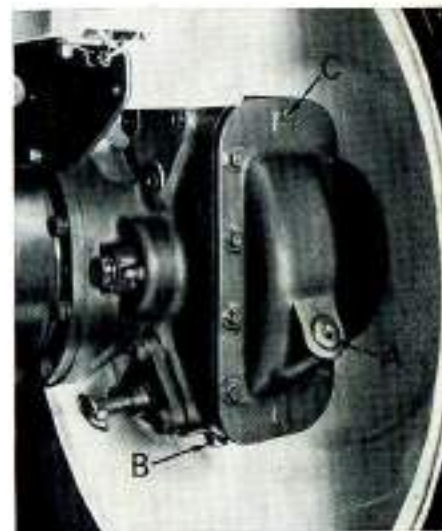


FIGURE 3/26.
FINAL REDUCTION
UNITS

- A. Filling plug
- B. Drain plug
- C. Vent plug

Final Reductions

The final reductions have separate lubrication. The drain plug is denoted by B and the filler plug by A in Fig. 3/26. Refill to the level of the filler plug with the correct oil. Ensure that the vent plug C is not blocked with dirt.

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. 3/27. 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 adjustment is best carried out when the injectors have

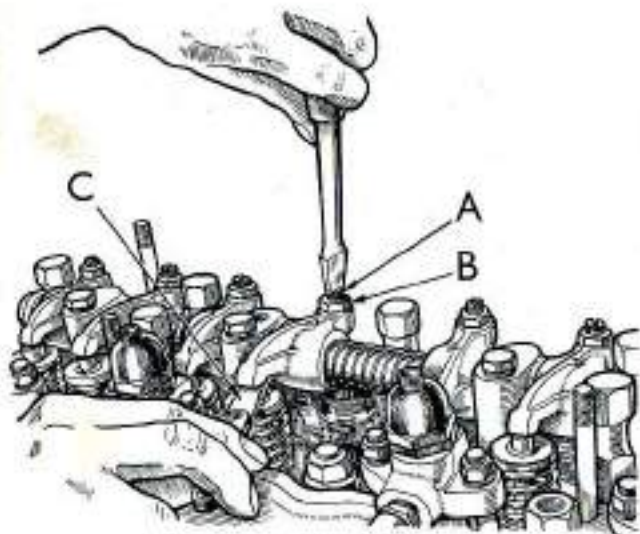


FIGURE 3/27. SETTING THE VALVE CLEARANCE

A. Adjusting screw B. Locknut C. Feeler gauge

been removed for servicing. The engine may then be turned by the fan belt.

If it is desired to turn the engine with the injectors *in situ* it will be necessary to use a special box spanner on the crankshaft pulley nut. This may be purchased from your dealer.

To facilitate the positioning of the cam correctly, proceed in the following order, noticing that the valves concerned are always equally positioned from the back and the front of the engine:

- Adjust No. 1 valve with No. 8 valve fully open.
- Adjust No. 6 valve with No. 3 valve fully open.
- Adjust No. 4 valve with No. 5 valve fully open.
- Adjust No. 2 valve with No. 7 valve fully open.
- Adjust No. 8 valve with No. 1 valve fully open.
- Adjust No. 3 valve with No. 6 valve fully open.
- Adjust No. 5 valve with No. 4 valve fully open.
- Adjust No. 7 valve with No. 2 valve fully open.

VENTING FUEL SYSTEM

It is essential that any air trapped in the system be cleared. If difficulty in starting is experienced, or if any of the fuel

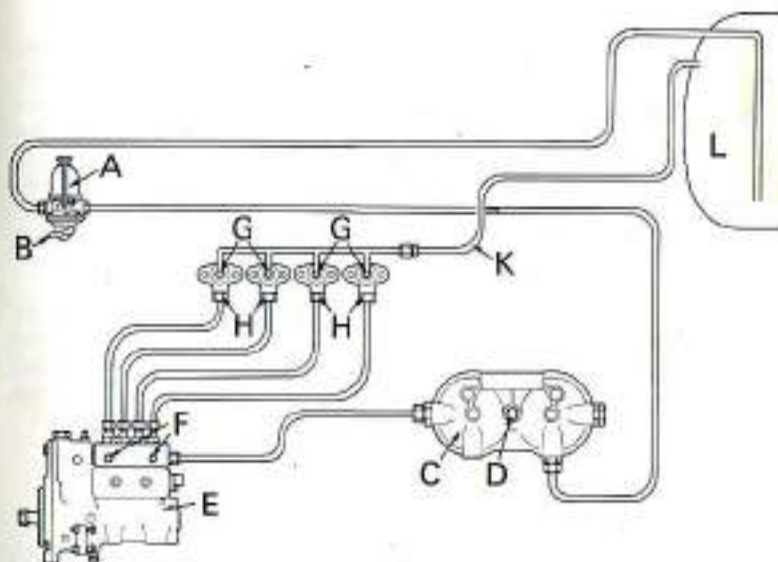


FIGURE 3/28. DIAGRAM OF FUEL SYSTEM

- | | |
|--------------------------------|------------------|
| A. Lift pump and sediment bowl | F. Vent plugs |
| B. Hand priming lever | G. Injectors |
| C. Fuel filters | H. Connections |
| D. Vent plug | K. Leak-off pipe |
| E. Injection pump | L. Fuel tank |

system has been disturbed, vent the system in the following way.

1. Fill the tank with a minimum of 2 gallons (9 litres) of fuel.
2. Check the glass bowl and all fuel joints for leaks.
3. Refer to Fig. 3/28. Clean the outside of the filters and vent points.
4. Slacken the outlet pipe at its connection to the fuel lift pump A and operate the hand priming lever B, until the glass bowl is full of fuel and no more air bubbles pass through. Tighten the connection and dry off the spilt fuel.
5. Slacken the vent plug D on top of the fuel filter housing C and prime until air free fuel issues from the vent. Tighten the plug.
6. Slacken the two vent plugs F on the gallery of the injection pump E. Prime until air free fuel appears and then tighten the plugs.
7. Slacken the high pressure delivery pipes to the injectors G at the injector ends of H. Put the tractor in neutral, push the fuel cut off into the run position, press the foot clutch and operate the starter motor. Keep the engine turning with the throttle wide open until air free fuel is ejected. Tighten the connectors H and dry off all spilt fuel.
8. Start the engine and run for a few minutes observing for fuel leaks.

If the engine has run out of fuel it will be necessary to carry out the full venting operation. If a fuel filter only has been changed, operation four may be omitted. When changing injectors only, it is normally only necessary to carry out operations 7 and 8.

WIRING

Most connections are made with snap 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.

WIRING COLOUR CODE

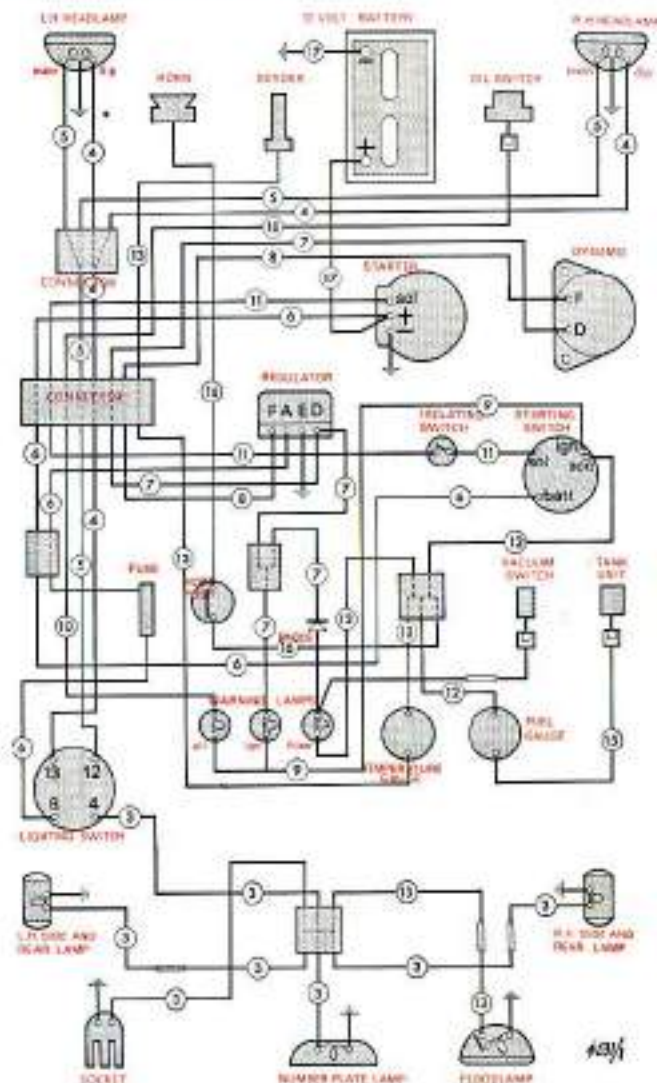


FIGURE 3/29. Wiring Diagram

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

SECTION 4. SPECIFICATION AND DATA

DIESEL ENGINE

Type AD4/55

The engine is a compact and robust power unit applying the cross flow head technique for economy coupled with high performance.

Displacement—4 cylinders	219.3 in (3594 cm ³)
Bore	3.939 in (100.05 mm)
Stroke	4½ in (114.3 mm)
Rated speed	1800 rev/min
Maximum full load speed ..	2300 rev/min
Maximum no load speed ..	2450 rev/min
Gross maximum power ..	72 b.h.p. at 2300 rev/min
Compression Ratio ..	17 : 1
Firing order	1, 2, 4, 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 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 equipment — The Simms 'Minimec' type injection pump of advanced design incorporates a mechanical governor and is driven via an idler gear from the front of the camshaft. A manually set excess fuel device for cold starting is automatically put out of action when the engine runs. For

exceptionally cold weather an ether pad is incorporated in the inlet manifold.

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

Spill timing is set to a dimple on the flywheel by means of a peg through the left-hand side of flywheel housing.

The injectors spray fuel direct into the cylinders through four holes. A combustion chamber is machined in the top of the piston. The pressure setting of the injectors is 175 atmospheres (180 kg/cm²).

Filtration is by means of 2 paper-element units in series.

Lubrication System — A gear type pump, driven from the camshaft, incorporates a main relief valve set to commence opening at 40 lb/in (2.8 kg/cm). Filtration is by means of a paper element full-flow filter with a low pressure valve to bypass 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 7 in (18.5 cm) diameter oil bath air cleaner plus a centrifugal type pre-filter. A paper-element pre-filter or an extension inlet pipe may be fitted as alternatives for very dusty conditions.

CHASSIS

CAPACITIES (Approximate initial fill)

	Imperial Measure	U.S. Measure	Metric Measure
Cooling system	3 gal	3½ gal	13.6 l
Air Cleaner oil bath ..	1½ pt	1½ pt	0.85 l
Engine lubricating oil ..	13 pt	15½ pt	7.4 l
Transmission oil	9 gal	10½ gal	41.0 l
Final drive oil (each) ..	4 pt	4¾ pt	2.3 l
Steering oil	5 pt	6 pt	2.8 l
Injection pump oil	½ pt	¾ pt	0.43 l
Fuel Tank	18 gal	21½ gal	81.7 l

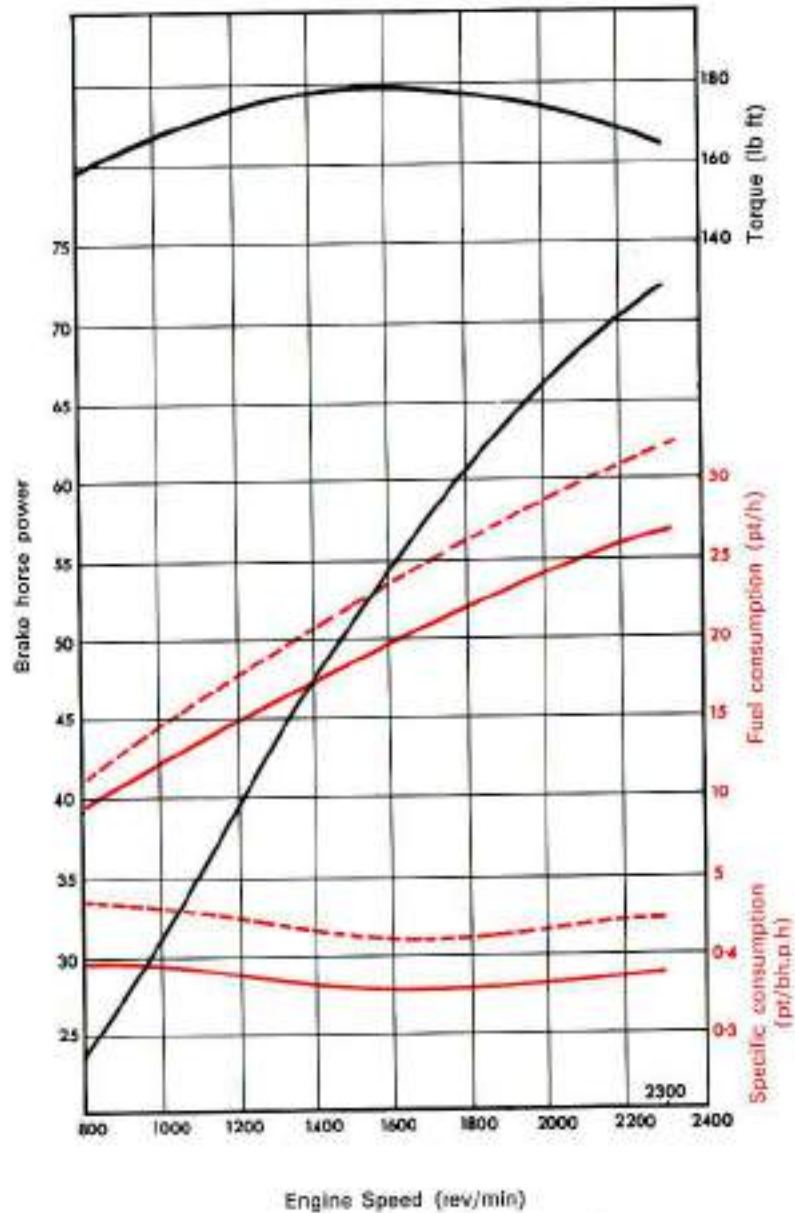


FIGURE 4/1. TYPICAL ENGINE PERFORMANCE CURVES
 ----- U.S. rating

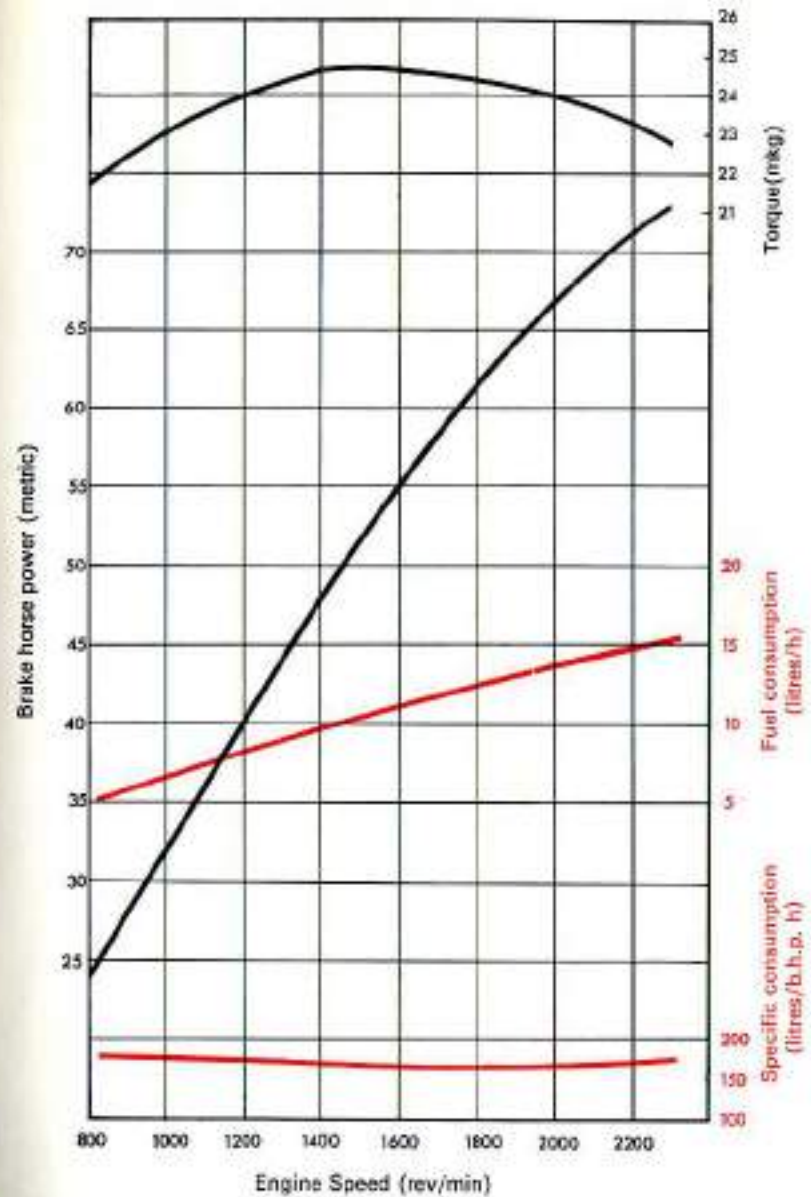


FIGURE 4/2. TYPICAL ENGINE PERFORMANCE
 (Metric Measurements)

DIMENSIONS — on 7-50-16 front, 13-6/12-38 rear tyres

Overall length	143 in (363 cm)
Height over exhaust pipe	90 in (229 cm)
Height — bonnet top	64 $\frac{3}{8}$ in (164 cm)
Overall width — minimum	69 $\frac{1}{2}$ in (176.5 cm)
Bonnet width	21 in (53.3 cm)
Wheelbase	88 $\frac{1}{2}$ in (225 cm)
Ground clearance under front axle ..	21 $\frac{3}{8}$ in (54.3 cm)
Ground clearance under drawbar frame	16 $\frac{1}{2}$ in (42.0 cm)
Weight — with oil, fuel, etc.—	
—total	5800 lb (2630 kg)
—rear axle	3500 lb (1585 kg)
—front axle	2300 lb (1045 kg)
Maximum recommended ballast weight	7900 lb (3583 kg)
Turning radius on 52 in (132 cm) track:	
—without brakes	155 in (394 cm)
—with brakes	138 in (351 cm)

PERFORMANCE

PTO horsepower at 2300 rev/min engine	64.6*
PTO horsepower (540 rev/min) at 1828 rev/min engine	56.2*
PTO horsepower (1000 rev/min) at 2000 rev/min engine	60.8*
Maximum drawbar horsepower (3rd gear)	56.7*
Drawbar horsepower at 1800 rev/min engine	48
Maximum drawbar pull on tarmac with ballast	8700 lb (3946 kg)

*N.I.A.E. Test Report No. 588/OECD

POWER LIFT

A hydraulically balanced gear pump is mounted in front of the radiator and is driven from an extension on the engine crankshaft. Filtration of the hydraulic oil, which is contained in the transmission housing, is by means of a full flow paper-element filter.

Maximum working pressure —	2000 lb/in ² (140 kg/cm ²)
Relief valve setting —	2500 lb/in ² (176 kg/cm ²)

Delivery at 2000 rev/min engine—5 gal/min (22.7 litre/min)
Rated maximum working load at link ends—2200 lb (998 kg).

BRAKES

Rear wheel drum brakes on the spur pinion shafts are foot operated independently or together. A hand parking brake is fitted.

Drums — 8 $\frac{1}{2}$ in (22 cm) diameter.
2 $\frac{1}{2}$ in (6.4 cm) wide to tractor No. 703004
3 $\frac{1}{2}$ in (8.9 cm) wide from tractor No. 703005.

A pedal operated exhaust brake is also available.

CLUTCH

A double dry plate clutch is fitted having separate operation of each plate, one of which is for the transmission and the other for the PTO drive.

Transmission — 11 in (27.9 cm) diameter, surface area 114 in² (735 cm²).
— lining material F30C.

Power take-off — 11 in (27.9 cm) diameter, surface area 114 in² (735 cm²).
— lining material F30C.

DRAWBAR

This has 6 in (15.2 cm) swing either side of centre with 4 positions of height. The towing position can be normal or extended for PTO work.

Clevis height from ground — 12 $\frac{3}{8}$ in (32.1 cm), 14 $\frac{1}{2}$ in (37.5 cm), 16 $\frac{3}{8}$ in (42.2 cm) and 18 $\frac{3}{8}$ in (47.6 cm).

Lateral adjustment — 6 in (15.2 cm) each side of centre.

Maximum vertical 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 to the drawbar frame. 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 $5\frac{1}{2}$ 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: 29 in (73.7 cm)

SEATING

The de-luxe upholstered pan-type seat and back rest has an adjustable torsion suspension fitted with a hydraulic damper. In some markets seat arms are available for bolting to the seat pan.

Fore and aft adjustment $3\frac{1}{2}$ in (8.2 cm).

STEERING

Recirculating ball and nut type, with a $17\frac{1}{2}$ in (43.8 cm) diameter wheel.
A separate oil bath is provided.

TRACK ADJUSTMENT (Standard wheels)

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 $21\frac{3}{8}$ in (54.3 cm) on 7.50-16 front tyres.

Rear — Adjustment is from 56 in to 80 in (142 cm to 203 cm) in 4 in (10 cm) steps by means of the dished wheel centres and off-set wheel rim lugs.

UNIVERSAL LINKAGE

Three-point linkage enables Category 2 (wide) implements to be fitted.

	Category 2
Nominal diameter of lower pins	$1\frac{1}{8}$ in (2.86 cm)
Nominal diameter of top pin	1 in (2.54 cm)
Recommended length of implement cross shaft (distance between shoulders of pins)	$32\frac{7}{8}$ in (82.5 cm)
Recommended height between upper and lower hitch points	22 to 25 in (53.4 to 63.5 cm)

WHEEL EQUIPMENT

Front tyres — 7.50-16 (6-ply),
Rear tyres — 13.6/12-38 (6-ply).

Front tyres — 6.00-19 (6-ply),
Rear tyres — 13.6/12-36 (6-ply).

12.4/11-36 (6-ply).

12.4/11-38 (6-ply).

18.4/15-30 (8-ply).

TRAVEL SPEEDS on 18.4/15-38, 12.4/11-38 or 13.6/12-36 TYRES (Rolling radius 27.7 in.)
with 9:50 Ratio Reductions

GEAR	GEAR LEVER POSITIONS	ENGINE SPEED											
		700 rev/min		1100 rev/min		1800 rev/min		2000 rev/min		2300 rev/min			
		mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h		
1	LS.1	0.29	0.47	0.46	0.74	0.76	1.21	0.84	1.34	0.66	1.06		
2	LS.2	0.40	0.78	0.76	1.23	1.25	2.03	1.36	2.23	1.59	2.56		
3	HS.1	0.60	0.97	0.86	1.62	1.55	2.49	1.72	2.77	1.98	3.19		
4	L.1	0.74	1.19	1.17	1.88	1.81	3.07	2.12	3.41	2.44	3.83		
5	LS.3	0.83	1.34	1.31	2.11	2.14	3.45	2.38	3.83	2.74	4.41		
6	HS.2	1.00	1.61	1.57	2.63	2.67	4.14	2.86	4.60	3.28	5.29		
7	L.2	1.23	1.96	1.94	3.11	3.17	5.10	3.52	5.66	4.05	6.31		
8	H.1	1.63	2.46	2.41	3.87	3.94	6.32	4.37	7.04	5.03	8.10		
9	HS.3	1.72	2.77	2.70	4.38	4.42	7.11	4.91	7.80	5.65	9.09		
10	L.3	2.12	3.41	3.33	5.36	5.44	8.76	6.06	9.73	6.86	11.2		
11	H.2	2.54	4.09	3.99	6.42	6.53	10.6	7.26	11.7	8.36	13.4		
12	H.3	4.36	7.02	6.86	11.0	11.2	18.1	12.8	20.1	14.3	23.1		
R1	LS.R	0.48	0.77	0.76	1.22	1.24	1.88	1.38	2.21	1.68	2.65		
R2	HS.R	0.69	1.40	1.36	2.61	2.66	4.11	2.84	4.67	3.26	5.26		
R3	L.R	1.22	1.87	1.82	3.08	3.14	5.06	3.49	5.62	4.02	6.47		
R4	H.R	2.92	4.06	3.96	6.36	6.49	10.4	7.21	11.4	8.28	13.3		

Maximum speed at light running i.e. H.3 at 2450 rev/min—15.2 mile/h (24.6 km/h).

TRAVEL SPEEDS on 13.6/12-38 and 16.9/14-34 TYRES (Rolling radius 28.5 in.)
with 9:50 Ratio Reductions

GEAR	GEAR LEVER POSITIONS	ENGINE SPEED											
		700 rev/min		1100 rev/min		1800 rev/min		2000 rev/min		2300 rev/min			
		mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h		
1	LS.1	0.30	0.48	0.47	0.76	0.77	1.24	0.86	1.38	0.89	1.49		
2	LS.2	0.60	0.80	0.78	1.26	1.28	2.06	1.42	2.29	1.64	2.63		
3	HS.1	0.62	1.00	0.97	1.57	1.59	2.56	1.77	2.85	2.03	3.27		
4	L.1	0.76	1.23	1.20	1.93	1.96	3.16	2.18	3.61	2.61	4.03		
5	LS.3	0.86	1.38	1.35	2.16	2.20	3.54	2.44	3.83	2.81	4.52		
6	HS.2	1.03	1.65	1.61	2.60	2.64	4.25	2.93	4.72	3.37	5.43		
7	L.2	1.26	2.04	1.99	3.20	3.25	5.23	3.61	5.82	4.16	6.59		
8	H.1	1.67	2.63	2.47	3.98	4.04	6.51	4.49	7.23	5.17	8.31		
9	HS.3	1.77	2.84	2.77	4.46	4.54	7.30	5.04	8.12	5.80	9.33		
10	L.3	2.17	3.50	3.42	5.50	5.59	9.00	6.21	10.0	7.14	11.4		
11	H.2	2.61	4.20	4.10	6.60	6.71	10.8	7.45	12.0	8.67	13.8		
12	H.3	4.48	7.21	7.04	11.3	11.5	18.5	12.8	20.4	14.7	23.7		
R1	LS.R	0.49	0.80	0.78	1.26	1.27	2.05	1.41	2.27	1.62	2.61		
R2	HS.R	1.02	1.64	1.60	2.68	2.62	4.22	2.91	4.68	3.36	5.39		
R3	L.R	1.26	2.02	1.87	3.18	3.23	5.20	3.59	5.77	4.13	6.64		
R4	H.R	2.69	4.17	4.07	6.55	6.66	10.7	7.40	11.9	8.61	13.7		

Maximum speed at light running i.e. H.3 at 2450 rev/min—15.7 mile/h (25.2 km/h).

**TRAVEL SPEEDS on 12-4/11-36 TYRES (Rolling radius 26-6 in.)
with 9/50 Ratio Reductions**

GEAR	GEAR LEVER POSITIONS	ENGINE SPEED									
		700 rev/min		1100 rev/min		1800 rev/min		2000 rev/min		2300 rev/min	
		mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h
1	LS.1	0.28	0.45	0.44	0.71	0.73	1.17	0.81	1.30	0.93	1.49
2	LS.2	0.47	0.75	0.74	1.19	1.20	1.94	1.34	2.15	1.54	2.48
3	HS.1	0.58	0.94	0.91	1.47	1.50	2.41	1.66	2.68	1.91	3.08
4	L.1	0.72	1.15	1.13	1.81	1.84	2.97	2.05	3.30	2.36	3.79
5	LS.3	0.90	1.30	1.27	2.04	2.07	3.33	2.30	3.70	2.64	4.26
6	HS.2	0.97	1.55	1.52	2.44	2.48	4.00	2.79	4.44	3.17	5.11
7	L.2	1.19	1.81	1.87	3.01	3.05	4.92	3.40	5.47	3.91	6.29
8	HL.1	1.48	2.38	2.32	3.74	3.80	6.12	4.22	6.80	4.86	7.42
9	HS.3	1.66	2.67	2.61	4.20	4.27	6.87	4.74	7.63	5.45	8.78
10	L.3	2.04	3.29	3.21	5.17	5.28	8.45	5.84	9.40	6.72	10.6
11	H.2	2.45	3.96	3.86	6.20	6.31	10.2	7.01	11.3	8.06	13.0
12	H.3	4.22	6.75	6.62	10.7	10.8	17.4	12.0	19.4	13.9	22.2
R1	LS.R	0.47	0.75	0.73	1.18	1.20	1.92	1.33	2.14	1.53	2.46
R2	HS.R	0.96	1.54	1.51	2.43	2.47	3.87	2.74	4.41	3.15	5.07
R3	LR	1.18	1.90	1.86	2.99	3.04	4.89	3.37	5.43	3.88	6.24
R4	HR	2.44	3.82	3.83	6.16	6.26	10.1	6.96	11.2	8.00	12.9

Maximum speed at light running i.e. H.3 at 2450 rev/min—14.8 mile/h (23.7 km/h).

**TRAVEL SPEEDS on 18-4/15-30 or 12-4/11-36 or 13-6/12-36 TYRES (Rolling radius 27.75 in.)
with 11/49 Ratio Reductions**

GEAR	GEAR LEVER POSITIONS	ENGINE SPEED									
		700 rev/min		1100 rev/min		1800 rev/min		2000 rev/min		2300 rev/min	
		mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h
1	LS.1	0.36	0.59	0.57	0.92	0.94	1.51	1.05	1.67	1.20	1.93
2	LS.2	0.60	0.97	0.95	1.53	1.56	2.51	1.72	2.78	1.86	3.19
3	HS.1	0.76	1.21	1.19	1.90	1.93	3.11	2.15	3.46	2.47	3.99
4	L.1	0.92	1.48	1.40	2.35	2.38	3.83	2.64	4.25	3.04	4.90
5	LS.3	1.04	1.67	1.63	2.63	2.67	4.30	2.97	4.78	3.42	5.60
6	HS.2	1.25	2.01	1.96	3.15	3.21	5.16	3.57	5.74	4.10	6.60
7	L.2	1.53	2.47	2.42	3.88	3.95	6.38	4.39	7.08	5.05	8.12
8	HL.1	1.91	3.07	3.01	4.83	4.91	7.90	5.45	8.78	6.27	10.1
9	HS.3	2.15	3.46	3.37	5.43	5.51	8.87	6.12	9.85	7.05	11.3
10	L.3	2.64	4.25	4.15	6.67	6.79	10.9	7.55	12.1	8.68	14.0
11	H.2	3.17	5.10	4.98	8.01	8.14	13.1	9.06	14.6	10.4	16.7
12	H.3	5.44	8.75	8.56	13.7	14.0	22.6	15.6	25.1	17.8	28.8
R1	LS.R	0.60	0.96	0.95	1.52	1.55	2.48	1.72	2.76	1.97	3.18
R2	HS.R	1.23	2.00	1.95	3.13	3.18	5.13	3.54	5.70	4.07	6.55
R3	LR	1.52	2.46	2.40	3.85	3.92	6.31	4.35	7.01	5.01	8.07
R4	HR	3.14	5.06	4.94	7.96	8.09	13.0	8.95	14.5	10.3	16.6

Maximum speed at light running, i.e. H.3 at 2450 rev/min — 19.1 mile/h (30.7 km/h).

**TRAVEL SPEEDS on 13-6/12-38 and 16-5/14-34 TYRES (Rolling radius 265 in.)
with 11/45 Ratio Reductions**

Gear	GEAR LEVER POSITIONS	ENGINE SPEED											
		700 rev/min		1100 rev/min		1800 rev/min		2000 rev/min		2300 rev/min			
		mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h		
1	L51	0.57	0.80	0.69	0.95	0.98	1.55	1.07	1.72	1.24	1.88		
2	L52	0.62	1.00	0.87	1.37	1.60	2.07	1.77	2.80	2.05	3.28		
3	H51	0.77	1.25	1.21	1.96	1.98	3.19	2.21	3.56	2.53	4.08		
4	L1	0.86	1.53	1.50	2.41	2.45	3.84	2.72	4.38	3.13	5.03		
5	L53	1.07	1.72	1.68	2.69	2.74	4.42	3.04	4.80	3.51	5.64		
6	H52	1.29	2.06	2.01	3.24	3.29	5.30	3.66	5.69	4.20	6.77		
7	L2	1.57	2.54	2.48	3.99	4.05	6.52	4.50	7.26	5.19	8.34		
8	H1	1.86	3.18	3.08	4.86	5.04	8.12	5.60	9.02	6.46	10.4		
9	H53	2.21	3.54	3.48	5.66	5.66	9.11	6.29	10.1	7.23	11.6		
10	L3	2.71	4.37	4.27	6.86	6.97	11.2	7.75	12.5	8.81	14.3		
11	H2	3.26	5.24	5.11	8.23	8.37	13.5	9.29	15.0	10.7	17.2		
12	H3	5.59	9.00	8.78	14.1	14.3	23.1	16.0	25.7	18.3	29.6		
R1	LSR	0.61	1.00	0.97	1.56	1.58	2.55	1.78	2.83	2.02	3.26		
R2	HSR	1.27	2.05	2.00	3.22	3.27	5.26	3.63	5.65	4.18	6.72		
R3	LR	1.57	2.52	2.47	3.97	4.03	6.49	4.48	7.20	5.15	8.28		
R4	HR	3.23	5.20	5.06	8.17	8.31	13.4	9.23	14.8	10.6	17.1		

Maximum speed at light running, i.e. H3 at 2450 rev/min — 19.6 mile/h (31.5 km/h).

**TRAVEL SPEEDS on 12.4/11-38 TYRES (Rolling radius 268 in.)
WITH 11/45 Ratio Reductions**

Gear	GEAR LEVER POSITIONS	ENGINE SPEED											
		700 rev/min		1100 rev/min		1800 rev/min		2000 rev/min		2300 rev/min			
		mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h	mile/h	km/h		
1	L51	0.26	0.46	0.46	0.89	0.91	1.48	1.01	1.62	1.16	1.86		
2	L52	0.39	0.64	0.62	1.47	1.50	2.42	1.67	2.68	1.92	3.10		
3	H51	0.72	1.17	1.13	1.83	1.87	3.01	2.07	3.34	2.38	3.84		
4	L1	0.90	1.43	1.41	2.26	2.30	3.70	2.66	4.12	2.94	4.73		
5	L53	1.00	1.62	1.58	2.64	2.58	4.15	2.87	4.52	3.29	5.31		
6	H52	1.21	1.92	1.80	3.04	3.09	4.99	3.44	5.54	3.95	6.37		
7	L2	1.48	2.38	2.33	3.75	3.82	6.14	4.24	6.52	4.88	7.85		
8	H1	1.85	2.97	2.89	4.66	4.74	7.63	5.28	8.48	6.08	9.76		
9	H53	2.07	3.33	3.26	5.24	5.33	8.57	5.91	9.52	6.80	11.0		
10	L3	2.54	4.10	4.00	6.45	6.56	10.6	7.28	11.7	8.38	13.5		
11	H2	3.06	4.93	4.81	7.73	7.87	12.7	8.74	14.1	10.1	16.2		
12	H3	5.26	8.46	8.26	13.3	13.5	21.7	15.0	24.2	17.3	27.8		
R1	LSR	0.59	0.94	0.91	1.47	1.50	2.40	1.66	2.67	1.91	3.07		
R2	HSR	1.20	1.92	1.88	3.03	3.08	4.85	3.42	5.50	3.93	6.32		
R3	LR	1.47	2.37	2.32	3.73	3.79	6.10	4.20	6.77	4.64	7.76		
R4	HR	3.04	4.89	4.78	7.68	7.81	12.6	8.70	14.0	9.97	16.1		

Maximum speed at light running, i.e. H3 at 2450 rev/min — 18.4 mile/h (29.6 km/h).

ACCESSORIES

The following units are stocked by Parts Department of David Brown Tractors (Sales) Limited and may be ordered through your Dealer in the usual way. Ask for full details and prices.

Unit No.	Part No.	Description
U950	918180	Arm rests for seat
U844	918189	Battery - heavy duty
U1260	925754	Belt pulley unit - heavy duty
U414	907847	Belt pulley guard
U730	911471	Catch unit for power lift lever
U923	918190	Downswept exhaust
U1322	925871	Exhaust Brake - standard
U1323	925873	Exhaust brake - hydrostatic steering
U1020	918312	Horn and push button
U947	918178	Linkage stabiliser
U1171	922217	Pick-up hitch
U965	918210	Power assisted steering
U378	908988	Power take-off guard
U1146	918567	Radiator blind - standard
U1327	925877	Radiator blind - hydrostatic steering
U1035	918322	Rear Number Plate Lamp
U1190	922311	Support Ram
U1120	918341	Slotted Adjusting Nut—Linkage
U1005	918290	Thermometer - electric
U1119	918595	Toolkit
U184	21180	Wheel weights - rear (4 x 90 lb.)
U427	907796	Wheel weights - front (19 in. wheel)
U475	909326	Wheel weights - front (16 in. wheel)
U731	911599	Weights - chassis ballast
U948	918183	Valve - external hydraulics (single-live)
U949	918184	Valve - external hydraulics (double-live)
U958	918197	Valve - 3-way selector (internal-external)
U1057	918358	Valve - 3-way selector with pipe, and quick-release coupling
U1116	918505	Valve - 3-way selector with pipe, fittings and Exactor coupling
—	962222	Valve - 3-way selector with pipe and fittings
U939	918195	Valve - Dump (quick drop)
U1122	918520	Universal Coupling - 'quick-release' to Exactor Coupling
U1123	918521	Universal Coupling - 'quick-release' to Dowty coupling
—	961758	Valve - 3-way hydraulic less Exactor coupling

GLOSSARY OF ABBREVIATIONS

Abbreviations used in this publication are based on the recommendations of British Standard 1991 : 1967. Note that the abbreviation remains the same for both singular and plural.

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

NOTES

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