

THE QUEEN'S AWARD
TO INDUSTRY 1986

DAVID BROWN

770 SELECTAMATIC

**Instruction
book**

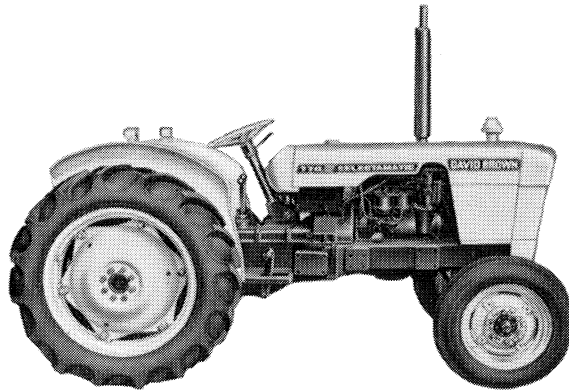
SAFETY POINTS

- 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.

DAVID BROWN

770 Selectamatic and 770 Selectamatic Livedrive

INSTRUCTION BOOK



770 A — Livedrive

770 B — Non-Livedrive

With 3-cylinder Diesel Engine

DAVID BROWN TRACTORS LIMITED
MELTHAM · HUDDERSFIELD · ENGLAND

Publication No. TP617

INTRODUCTION

The 770 Selectomatic tractor with 3-cylinder diesel engine incorporates the latest refinements of technical design and is the culmination of many years of development and rigorous field testing. In fact, it is a tractor which does a wide range of farming jobs well, reliably and efficiently.

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

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

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

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

Note: A list of abbreviations used in this book are given on page 78.

First Edition December 1964

Fourth Edition March 1967

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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 1600 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 and clean the magnetic filter. Refill with new oil. Check the valve clearances and tightness of cylinder head and main external nuts and bolts.

Note—The transmission gearbox is filled at the factory with special oil having inhibitors to prevent corrosion and assist initial bedding in. This oil **must** be discarded after 50 hours and the gearbox refilled with new oil of the type recommended on pages 41 to 43. At the same time it is essential that the transmission by-pass filter element is changed to a new element No. 914441. This is a different grade from that fitted to a new tractor. The original element must therefore be discarded after 50 hours.

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 wide (towards the driver).
3. **Put the gear (shift) lever in neutral** (the right-hand lever).
4. Disengage the clutch.
5. Switch on and 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 oil warning light goes out.

STARTING IN COLD WEATHER

The wing nut on the side of the Injection Pump should be screwed in **before** trying to start the engine. As soon as the engine is running, the screw must be unscrewed otherwise erratic running with black exhaust will occur. In conditions when starting is difficult the use of ether or a proprietary starting fluid is recommended. This should be used on the felt attached to the plastic plug in the top of the manifold. Replace and start immediately. When starting is difficult, short presses on the starter will be of no avail. The engine should be kept turning by the starter until the engine runs unaided. 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.

Use of the starter places a heavy drain on the battery and adequate running time should be allowed to enable the dynamo to replace the charge. Use of the correct grade of oil in the engine, and pressing the clutch whilst starting, will help to reduce the load on the starter.

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 applying 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 in the 'stop' position.

CONTROLS

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

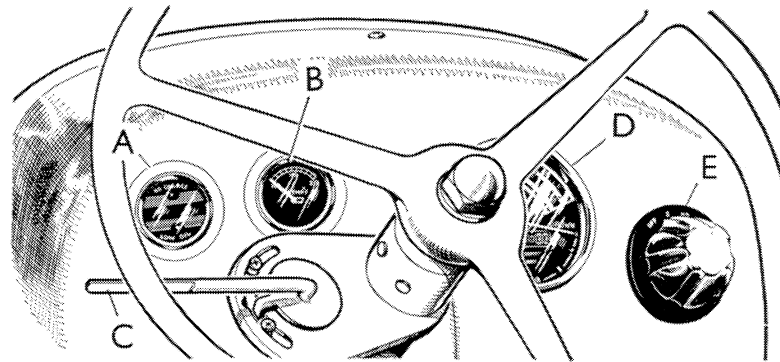


FIGURE 1/1. INSTRUMENTS AND CONTROLS

- | | |
|----------------------------------|-----------------|
| A. Oil and charge warning lights | D. Tractormeter |
| B. Water temperature | E. Light switch |
| C. Throttle lever | |

OIL WARNING LIGHT

The amber 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 1600 rev/min and may be set by observing the tractorometer. This speed should be used for most purposes to conserve fuel and engine life. It also gives a PTO speed of 540 rev/min.

LIGHT SWITCH

This has 4 or 5 positions depending upon whether or not the head lamps are fitted with a dipped or low beam filament. The positions are as follows starting at the left-hand or

counterclockwise position. (1) All lights out. (2) Side and tail (and rear licence plate) lights. (3) Side and tail plus head lamps on dipped or low beam. (3a) Side and tail plus head lamps on high beam. (4) Head lights only. The rear flood lamp is energised when the switch is in position 3 or 4 but it incorporates its own switch allowing it to be extinguished when not required. Position 4 is designed for use in the field and conserves the battery. It must not be used on the highway. Position 3 or 3a is recommended for this purpose.

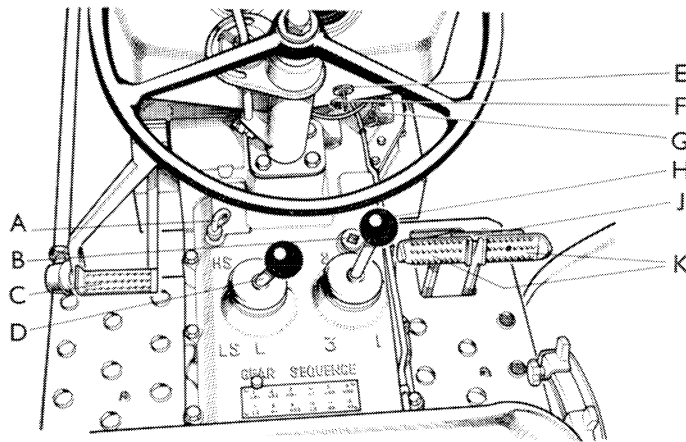


FIGURE 1/2. CONTROLS

- | | |
|-----------------------------|---------------------------|
| A. Transmission dipstick | F. Fuse holder |
| B. Transmission filler plug | G. Radiator blind control |
| C. Clutch pedal | H. Gear lever |
| D. H/L range lever | J. Locking bar |
| E. Starter switch key | K. Brake Pedals |

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 J, Fig. 1/2 should be used on the highway. However, the balance of the braking system should be checked each week or whenever the tractor is taken on the road after working extensively where one brake is used much more than the other for turning at headlands, etc. If this precaution is not taken, an unexpected and dangerous swerve may occur.

LIVEDRIVE CLUTCH

There are two main stages of pedal movement. Stage 1—Complete disengagement of the transmission clutch is denoted by an increase in pedal pressure at point A, Fig. 1/3. In practice the pedal should always be pressed to this point. "Easing" of the clutch to reduce forward speed, when baling etc., to allow the implement to clear a heavy patch, is detrimental to the life of the clutch plates. When moving off with a loaded trailer on road haulage, engine speed should be kept as low as possible. Full engagement of the clutch should be obtained as quickly as possible, **then**, the throttle opened. **The clutch should not be operated at full engine speed or excessive wear will result.**

Stage 2—Fully depressing the clutch pedal also disengages the PTO (B. Fig. 1/3.) If the PTO clutch is not used frequently, the pedal should be fully operated once a week and the PTO "freed" to prevent binding of the plates.

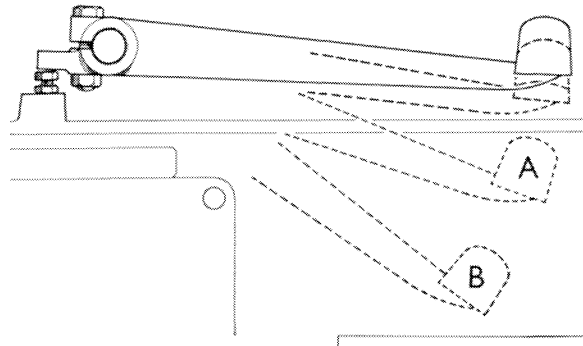


FIGURE 1/3. LIVEDRIVE CLUTCH

- A. *Transmission disengaged*
- B. *Transmission and PTO disengaged*

TRACTORMETER

The lower half of the scale shows the speed of the engine. A yellow band shows the useful working range from 1200 rev/min to 2000 rev/min. A white line indicates the rated engine speed of 1600 rev/min which corresponds to a PTO speed of 540 rev/min. Another white line indicates the maximum power speed of 2000 rev/min which also gives a belt surface speed of 3100 ft/min (944 metres/min).

The upper half of the scale shows the road speed in the top gear ratio—H.3. For speeds in the lower ratios it is necessary to observe the position of the needle on the lower scale in the yellow sector. Transpose this mentally to the yellow band on the indicator label above the dash panel which

corresponds to the selected gear. The forward speed will then be found on the bottom scale in miles/hour and on the upper scale in kilometres/hour.

The centre panel gives the total number of hours which the engine has run based on an average running speed. This figure should be used as a basis for regular servicing of the tractor.

TRANSMISSION GEARBOX

The main transmission gearbox controlled by the right-hand (shift) lever has 3 forward and 1 reverse speed. The secondary transmission gearbox, controlled by the left-hand (shift) lever has two ratios—high and low (H and L) 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 and the combination of positions for the gear sequences is shown in the table on page 10 together with the tractor speeds at 1600 rev/min engine which corresponds to a PTO speed of 540 rev/min.

The right-hand gear (shift) lever has a neutral position in the centre, mid-way between gears. The lever should be placed in this position before attempting to start the engine. The left-hand (shift) lever does not have a neutral position.

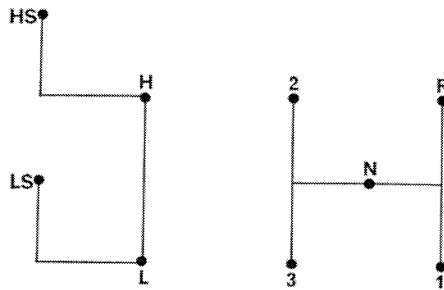


FIGURE 1/4. POSITIONS OF GEAR (SHIFT) LEVERS

The first 3 gear ratios give slow speeds for planting, transplanting, hedging and similar operations. Gear ratios 5, 6 and 9 also use the indirect slow drive and provide ratios fairly close to the direct drive gears and are suitable for light traction and PTO work. The nearest direct drive gears (left-hand lever in H or L) should be used for continuous heavy traction.

The gearbox is of the sliding gear type and changing ratios whilst the tractor is in motion must be undertaken only by an experienced driver.

TRAVEL SPEEDS

ENGINE SPEED 1600 rev/min

PTO SPEED 540 rev/min

Gear	Lever Positions	11.2/10-28 Tyres		12.4/11-28 Tyres	
		Mile/h	km/h	Mile/h	km/h
1	LS.1	0.7	1.1	0.7	1.2
2	LS.2	1.2	1.9	1.2	1.9
3	HS.1	1.6	2.5	1.6	2.6
4	L.1	1.7	2.8	1.8	2.9
5	LS.3	2.1	3.4	2.2	3.5
6	HS.2	2.6	4.1	2.7	4.3
7	L.2	2.9	4.7	3.0	4.8
8	H.1	3.9	6.3	4.0	6.5
9	HS.3	4.7	7.6	4.9	7.9
10	L.3	5.3	8.5	5.5	8.8
11	H.2	6.5	10.4	6.7	10.8
12	H.3	11.8	19.0	12.3	19.8
1R	LS.R	1.1	1.8	1.2	1.9
2R	HS.R	2.6	4.1	2.6	4.3
3R	L.R	2.9	4.6	3.0	4.8
4R	H.R	6.4	10.3	6.7	10.7

For a full list of Travel Speeds see the Data section at the end of this Book.

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 by-pass oil filter has been included in the hydraulic oil system. This will remove particles of dirt which could interfere with the working of high pressure hydraulic valves.
5. **Ease of service**—The control valve has been designed as a single separate unit which can be fully bench tested before fitting to the tractor. There are a minimum number of connections and three simple adjustments to be made after fitting to the tractor, only one of which need be made with the engine running.
6. **Variable rate of drop**—The rate of drop can be adjusted by the user to suit the type of work. When set by a small handwheel, the rate is fixed at the chosen speed and is constant regardless of load.

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