
















780
Selectamatic
Operators Manual

TP646

Reprinted

CASE III

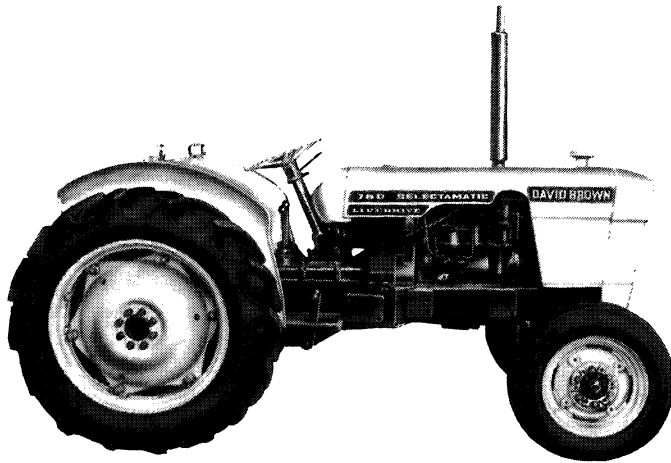
SAFETY POINTS

-  **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** start the engine without putting the gear lever in neutral.
-  **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 narrow front wheel settings when power-assisted steering is fitted.

DAVID BROWN

780 Selectamatic Livedrive

INSTRUCTION BOOK



780/1 — Livedrive

With 3-cylinder Diesel Engine

DAVID BROWN TRACTORS LIMITED
MELTHAM, HUDDERSFIELD, ENGLAND, HD7 3AR

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INTRODUCTION

The 780 Selectamatic 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 is given on page 88.

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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

After 50 hours, change the engine oil and filter element. Change the transmission oil and hydraulic filter element. The transmission gearbox should be flushed and the wire mesh screen cleaned. Clean the small Nylon filter situated in the hydraulic by-pass valve assembly. Change the oil in the final drive reduction housings. Check the valve clearances and tightness of cylinder head and main external nuts and bolts especially rear wheel nuts.

Note — The transmission gearbox is filled at the factory with special oil having inhibitors to prevent corrosion and assist initial bedding in. This oil **must** be discarded after 50 hours and the gearbox refilled with new oil of the type recommended on pages 48 to 51.

SECTION 1. OPERATION

STARTING THE DIESEL ENGINE

1. With fuel in the tank and the tap turned on, 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.  Depress the clutch pedal fully. In certain markets an isolating switch is fitted so that the starter cannot be energised until the clutch is pushed down.
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 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 in the 'stop' position.

CONTROLS

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

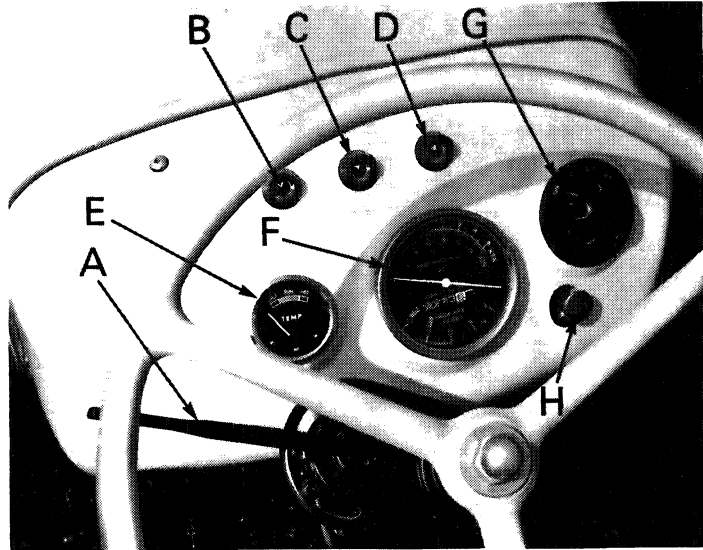


FIGURE 1/1. INSTRUMENTS AND CONTROLS

- | | |
|---------------------------------------|------------------------|
| A. Throttle lever | E. Water temperature |
| B. Charge warning light (Red) | F. Tractormeter |
| C. Filter warning light (Yellow) | G. Light switch |
| D. Oil pressure warning light (Green) | H. Engine stop control |

NO CHARGE WARNING LIGHT

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

TRANSMISSION FILTER WARNING LAMP

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

It is also arranged to light when the isolating switch is turned on and the driver should check that the bulb 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.

ENGINE 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.

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 tractorometer. This speed should be used for most purposes to conserve fuel and engine life. It also gives a PTO speed of 532 rev/min.

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

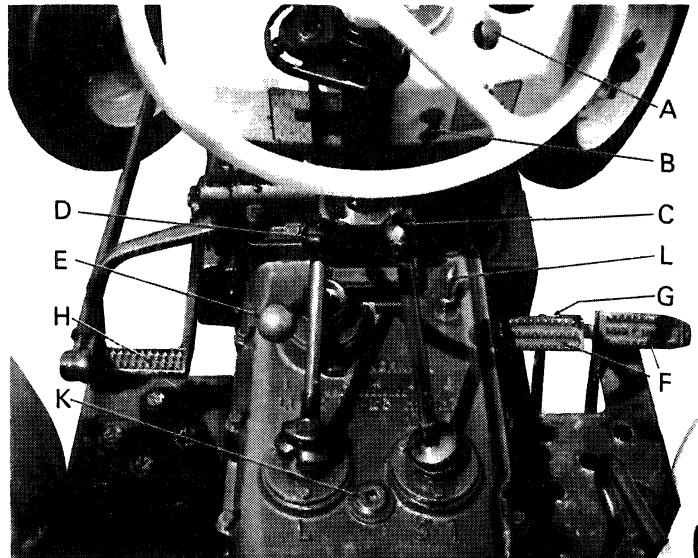


FIGURE 1/2. CONTROLS

- | | |
|--|------------------------------------|
| A. <i>Engine stop control</i> | F. <i>Brake pedals</i> |
| B. <i>Isolating Starter switch key</i> | G. <i>Locking bar</i> |
| C. <i>Gear (shift) lever</i> | H. <i>Clutch pedal</i> |
| D. <i>H/L range lever</i> | K. <i>Transmission filler plug</i> |
| E. <i>S/N (creep) lever</i> | L. <i>Transmission dipstick</i> |

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 G, 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.

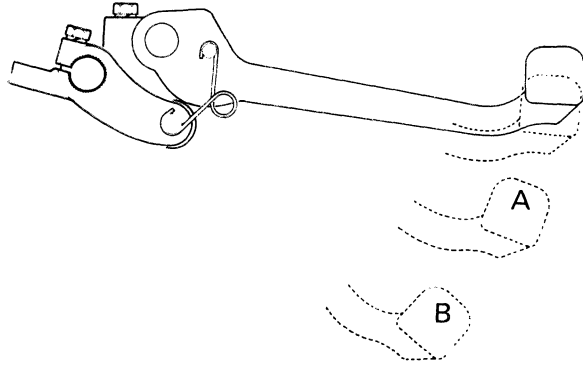


FIGURE 1/3. LIVEDRIVE CLUTCH

A. *Transmission disengaged*

B. *Transmission and PTO disengaged*

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. This setting should also be used for transmitting high horsepowers on PTO work.

2-SPEED TRANSMISSION GEAR BOX

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

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

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

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

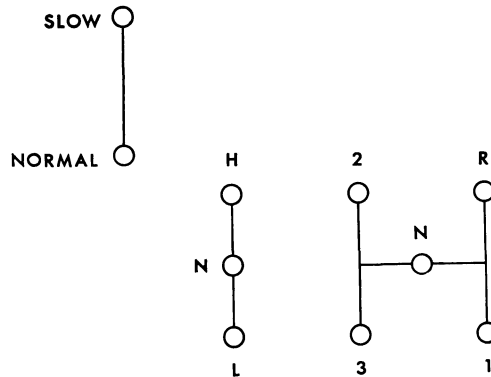


FIGURE 1/4. POSITIONS OF GEAR (SHIFT) LEVERS

6-SPEED TRANSMISSION GEARBOX

Twelve-speed tractors have three shift levers. The H/L range and main levers are as shown in Fig. 1/4 with a third lever on the left. The extra lever has two positions: normal (marked "N") and slow (marked "S"). In the normal rearward position "N", the speeds obtainable are the same as the 6-speed gearbox. In the forward position "S", an additional slower range of speeds is available.

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

The first three speeds in the shaded section use indirect drive to give slow speeds for planting, transplanting, hedging, PTO and similar operations. Gear ratios 5, 6 and 9, in the red part of the chart, 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.

TRAVEL SPEEDS

ENGINE SPEED 1800 rev/min

PTO SPEED 540 rev/min

Gear		Lever Positions	Travel Speed	
6-speed	12-speed		Mile/h	Km/h
1	1	SL1	0.76	1.23
	2	SL2	1.27	2.05
	3	SH1	1.72	2.76
	4	NL1	1.96	3.15
	5	SL3	2.32	3.74
	6	SH2	2.85	4.57
2	7	NL2	3.24	5.20
3	8	NH1	4.36	7.03
4	9	SH3	5.20	8.36
	10	NL3	5.92	9.49
5	11	NH2	7.25	11.7
6	12	NH3	13.3	21.4
1R 2R	1R	SLR	1.26	2.03
	2R	SHR	2.82	4.54
	3R	NLR	3.22	5.17
	4R	NHR	7.20	11.6

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** — Satisfactory reliability is ensured by a full-flow suction filter 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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