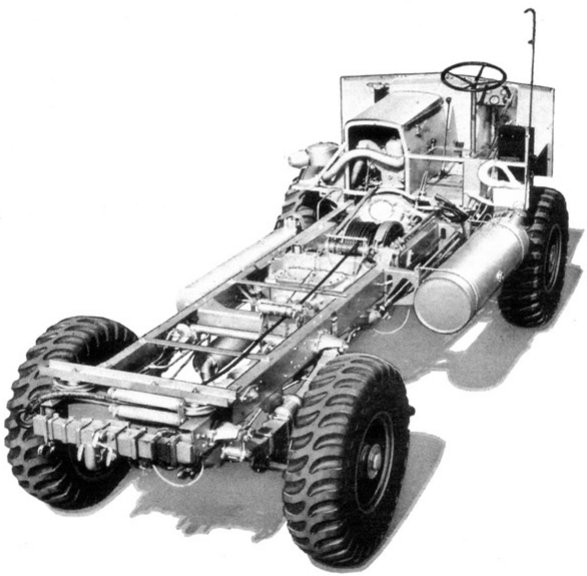
AEC SOUTHALL

MATADOR

4-WHEEL DRIVE TRACTOR

(UNITED KINGDOM)

A PROVED MODEL WITH MANY SPECIALIZED APPLICATIONS



- *7·7 Litre Direct-Injection Oil Engine*
- *Main and Auxiliary Gearboxes Giving Eight Forward Speeds*
- *Double Reduction Bevel-Driven Front and Rear Axles*
- *Air Pressure Brakes On All Wheels*
- *Front and Rear Towing Gear*

A.C.V. SALES LIMITED

AN A.C.V. COMPANY

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ACV SALES

FOREWORD

One of the most outstanding vehicles of the second World War in which it served on every fighting front and earned a widespread and unqualified reputation for sound performance and sturdy reliability, the A.E.C. " Matador " 4-wheel drive tractor is now proving a valuable machine for specialised peace-time haulage.

Ample power from the A.E.C. 7·7 litre 6-cylinder 95 b.h.p. oil engine, which can be transmitted as required through either two or four wheels, makes the " Matador " particularly suitable for operation in rough country conditions and the provision of a power-driven winch renders it readily adaptable for heavy forestry work. Since it may also be supplied to conform to the standard width of 7 ft. 6 ins. (2286 mm.), the " Matador " may likewise be used as a break-down vehicle and for a variety of other purposes on normal roads. Its eminently practical design, robust construction and consistent dependability having been conspicuously proved for over a decade, the " Matador " takes a rightful lead among vehicles built for the difficult, the unusual and the roughest forms of haulage. Like all the A.C.V. range, it is backed up by service facilities of the highest standard.

Used by A.C.V. Sales Ltd., at all its Service Depots, the 4-wheel drive " Matador," fitted with a manually operated crane and incorporating a workshop at the rear of the cab, is a highly useful breakdown vehicle.

ABRIDGED VEHICLE DATA AND INDEX

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CHASSIS TYPE—0853 2

OIL ENGINE—A.E.C. 7·7 litre 6-cylinder, direct injection. Nominal dimensions 105 mm. (4·13 in.) bore × 146 mm. (5·74 in.) stroke .. 4
Power developed: 95 b.h.p. at 1,800 r.p.m.
R.A.C. rating 41 h.p.

RADIATOR—"Still" high efficiency tubes. Radiator mounted on rubber cored trunnions. Cowled to increase efficiency 4

CLUTCH—A.E.C. single dry plate. Diameter of plate 15⅜ in. (400 mm.), area of friction surfaces 320 sq. in. (2,061 sq. cm.) 4

GEARBOX (Main)—A.E.C. 4 forward speeds and reverse. Ratios: 1st speed, 4·38 to 1; 2nd speed, 2·69 to 1; 3rd speed, 1·59 to 1; Top speed 1 to 1; Reverse, 5·14 to 1 4
Remote mechanical control selector mechanism mounted on the left-hand side of the driver.

GEARBOX (Auxiliary)—High and low ratios. Four-wheel drive for cross-country; rear wheel drive for main roads.

High auxiliary gearbox ratio 1 to 1 ..
Low auxiliary gearbox ratio 2·31 to 1.. } 5 & 6

BRAKES—Foot: air-operated brakes to all wheels. **Hand:** mechanical to rear wheels only. Brake drums are secured to the outside of the hubs. Total area of the linings is 500 sq. in. (3,220 sq. cm.) 6

PROPELLER SHAFTS—Tubular and Solid type. Tubular type are fitted with Hardy Spicer needle roller bearing universal joints from auxiliary gearbox to front and rear axles. Solid type are fitted with A.E.C. couplings for the inter-gearbox and winch drives 6

AXLES—Front and rear: double reduction bevel and double helical, fully floating, with Bendix "Tracta" constant velocity joints on front axle 6
Ratios 7·9 to 1 (both axles).

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STEERING—Marles roller and cam type. Ratio 4¼ turns of the steering wheel from lock to lock 7

SUSPENSION—Semi-elliptic leaf springs .. 7

WHEELS AND TYRES—14·00—20 "cross country" single front and rear or 9·00-24 12 ply rating single front, twin rear for normal road work 7

FUEL SUPPLY—40 Imperial gallon (182 litre) capacity tank 7

FRAME—Alloy steel channels; crossmembers riveted and bolted 7

TOWING GEAR—A laminated spring draw bar is fitted at both ends of the chassis 7

ELECTRICAL EQUIPMENT—5 lamp equipment on 12-volt insulated return circuit. Compensated voltage control system. 24-volt, 480-watt, 5⅜ in. (140 mm.) diameter dynamo of C.A.V. or Simms manufacture, and 24-volt starter motor. 150 ampere hour lead acid batteries of Exide or Oldham make 7

WINCH—A winch is driven through a special dog clutch by a driving shaft incorporated in the auxiliary gearbox. A hand operated band type brake of 7 tons (7,112 Kg.) capacity is fitted 8

CHASSIS DIMENSIONS 8

OVERALL FINAL DRIVE RATIOS—Front and rear axle ratios of 7·9 to 1 :—

GEAR.	*High Auxiliary*	*Low Auxiliary.*
1st	34·6 : 1	80·0 : 1
2nd	21·25 : 1	49·2 : 1
3rd	12·56 : 1	29·1 : 1
4th	7 9 : 1	18·25 : 1
Reverse	40·6 : 1	93·8 : 1

SPECIFICATION

ENGINE

A.E.C. 7·7 litre, 6-cylinder, direct injection, 105 mm. (4·13 in.) bore × 146 mm. (5·74 in.) stroke.

Output : 95 b.h.p. at 1,800 r.p.m., maximum torque 330 lb. ft. (45·6 Kg.M.) at 1,000 r.p.m.

The cylinder block is a one piece casting fitted with renewable dry liners. The crankshaft which is exceptionally stiff, is carried in seven main bearings.

Lubrication under pressure to the main bearings and connecting rod big-ends is by gear type pump. The pump is protected by a gauze strainer in the rear well of the sump, and delivers oil to the main bearings and the connecting rod big-ends via a relief valve. Gudgeon pins and fan bearings are lubricated by oil splash. The valve gear and timing chain tensioner are lubricated by means of a low pressure oil feed.

The water pump is of the centrifugal type and a uniform temperature is maintained by a thermostat in the water outlet pipe.

The fuel injection equipment is of C.A.V. or Simms manufacture. A maximum and minimum speed governor is fitted.

The fuel-lift pump is of the diaphragm type, delivering fuel at constant pressure.

A large oil bath type air cleaner is provided to remove abrasive matter that would otherwise be sucked into the combustion chambers.

RADIATOR

The cooling system employs a " Still " tube type radiator and a centrifugal type water pump ; automatic thermostatic temperature control is provided.

A six-blade fan mounted on the engine and driven by the timing chain draws air through the radiator which is cowled to increase its efficiency. Special precautions have been taken in the design of the radiator to reduce the loss of water due to surging.

CLUTCH

Power from the engine is transmitted to the driven plate through a detachable rubbing plate bolted to the flywheel ; the actuating pressure being supplied by 15 coil springs mounted in the cover plate. The friction linings on a single driven plate have a total area of 320 sq. in. (2,061 sq. cm.).

The large ball bearing which takes the thrust from the clutch fork, is lubricated through a flexible pipe connected to a nipple on the chassis frame.

A clutch brake is fitted and the whole assembly is enclosed in a well ventilated bell-housing forming part of the engine crankcase and gearbox.

GEARBOX—MAIN

The gearbox is unit mounted with the engine, to which it is bolted, and the assembly is supported by a pressed steel banjo member bolted to the chassis frame.

Four forward speeds and one reverse speed are provided; direct and third being engaged by means of dog clutches. The gears which are mounted on short stiff shafts running on ball and roller bearings, are located by spring loaded plungers housed in the selector casing and engaging in "V" shaped slots cut in the selector shafts; a circular interlock prevents more than one gear being engaged at a time. The selector mechanism is carried in a detachable cover, which can be removed from the gearbox as a complete unit. The change speed lever is on the left of the driver. A reverse gear guard is provided.

The ratios are :—

1st speed, 4·38 to 1; 2nd speed, 2·69 to 1; 3rd speed, 1·59 to 1; 4th speed, 1 to 1; Reverse, 5·14 to 1.

GEARBOX—AUXILIARY

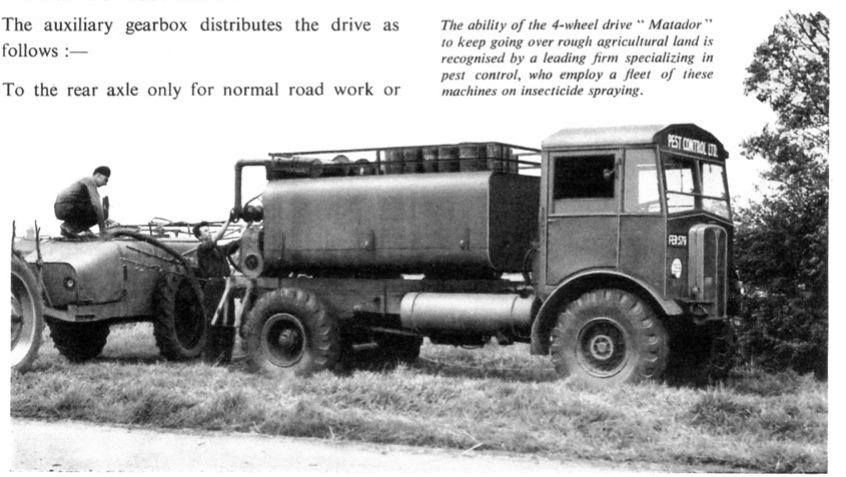
The auxiliary gearbox distributes the drive as follows :—

To the rear axle only for normal road work or the front and rear axles for "cross-country" conditions. It also provides a further reduction if necessary, for use under severe operating conditions when in four-wheel drive and for driving a winch.

The main and countershaft gears are locked in the fully meshed and neutral positions by spring loaded plungers which engage in "V" shaped slots cut in the selector shafts. The winch gear is located by a similar plunger mounted in the gearbox casing.

Two change speed levers, for operating the auxiliary gearbox are at the driver's right-hand and indicator plates adjacent thereto indicate the movements of each lever. An interlock on the gear change lever ensures that the low ratio cannot be engaged with rear wheel drive only.

The ability of the 4-wheel drive "Matador" to keep going over rough agricultural land is recognised by a leading firm specializing in pest control, who employ a fleet of these machines on insecticide spraying.



The combined gearbox ratios are as follows :—

Gear	High Ratio	Low Ratio
	Rear or 4-wheel drive	4-wheel drive only
1st	4·38 to 1	10·12 to 1
2nd	2·69 to 1	6·22 to 1
3rd	1·59 to 1	3·67 to 1
4th	1 to 1	2·31 to 1
Reverse	5·14 to 1	11·9 to 1

BRAKES

The air pressure foot braking system operates on all four wheels, each wheel having an individual air cylinder. Compressed air is drawn from the combined air reservoir through the brake control valve, mounted on the chassis frame. The reservoir is supplied by a compressor mounted on and driven from the main gearbox, and draws filtered air through the engine air cleaner.

The system which may be of either Westinghouse or Clayton Dewandre manufacture, operates the brake shoes which have linings of 500 sq. in. (3,220 sq. cm.) total area in brake drums of 17 in. (431 mm.) diameter.

Compressed air brake lines and a Warner electric brake coupling socket are also provided for trailers employing these systems.

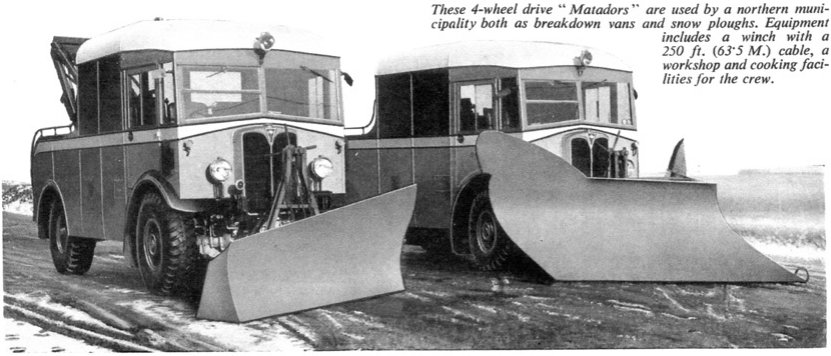
The hand brake is of the conventional pawl and ratchet type, and operates on the rear wheels through brake ribbons and mechanical linkage.

PROPELLER SHAFTS

A short solid shaft with A.E.C. couplings at each end transmits the engine torque to the auxiliary gearbox ; thence by shafts of tubular construction, with Hardy Spicer needle roller bearing universal couplings, to the front and rear axles. A.E.C. couplings are provided for the winch drive.

FRONT AXLE

The front axle is of the driving and steering type employing a double reduction gear unit. The drive is transmitted through fully floating driving shafts and Bendix " Tracta " constant velocity universal joints.



These 4-wheel drive " Matadors " are used by a northern municipality both as breakdown vans and snow ploughs. Equipment includes a winch with a 250 ft. (63·5 M.) cable, a workshop and cooking facilities for the crew.

REAR AXLE

The rear axle provides a final reduction of 7·9 to 1 by means of a double reduction gear unit. Fully floating alloy steel axle shafts transmit the drive to the road wheels while a one-piece alloy

steel axle casing houses the final drive, and acts as a load carrying member. The hubs are mounted on large diameter roller bearings and are fitted with dual oil seals.

STEERING

The steering is of the " Marles " cam and roller type. Ratio 4¼ turns of the steering wheel (approximately) lock to lock.

SUSPENSION

Normal suspension is employed consisting of four semi-elliptic leaf springs clamped to the axles by the usual " U " bolts, and anchored at the ends to the spring brackets by shackles and pins.

WHEELS AND TYRES

14·00—20 low pressure " cross-country " tyres are fitted to wheels of the divided disc type.

For heavy transport of logs under the most arduous conditions, the 4-wheel drive " Matador " is unrivalled. This machine, working with a timber trailer, operates on the roads and in the forests of the Gold Coast.

9·00—24 single front and twin rear tyres may be fitted as an alternative for normal road use.

FUEL SUPPLY

A fuel tank of 40 gallons (182 litres) [34 gallons (155 litres) in main tank and 6 gallons (27 litres) in reserve tank] is provided on the right-hand side of the chassis.

FRAME

A ¼ in. (6·3 mm.) thick alloy steel channel frame, 8 in. (203·2 mm.) in depth, with 3 in. (76·2 mm.) wide flanges.

TOWING GEAR

A laminated spring draw bar gear is fitted at both ends of the vehicle for towing purposes.

ELECTRICAL EQUIPMENT

The chassis is equipped with lighting, starting and auxiliary units of C.A.V. or Simms manufacture ; the batteries are of Exide or Oldham make.

The wiring system is of the balanced 3-wire method employing an insulated return. A 24-volt, lead acid, 150 amp. hour battery (four 6-volt units) is used in conjunction with a 24-volt dynamo and starter ; the 12-volt lighting and

other circuits are distributed on each side of the 3-wire system so that under average operating conditions the load on each half of the battery is approximately equal.

The dynamo is a 480-watt, 5½ in. (140 mm.) machine with compensated voltage control employing a separate control panel. The control unit which is mounted on the right-hand side of the cab, houses all the switches, fuses, dynamo control, etc.

WINCH

The winch, which is mounted upon trunnion brackets amidships of the chassis, is driven by a special driving shaft incorporated in the auxiliary gearbox.

The drive to the drum is through a dog clutch which, when disengaged, allows the drum to run free, thus permitting the cable to be paid out by hand.

A hand-operated band type brake of 7 tons (7,112 Kg.) capacity is fitted. A cable 250 feet (63·5 M.) in length, spliced at both ends to form eyelets, can be used for forward and rearward pulls. Mean cable speed at 1,000 r.p.m. engine speed is : 1st speed, 54 ft. per min. 2nd speed, 88 ft. per min. The forward pull is achieved by using a guide wheel on the left-hand rear corner of the chassis frame, and forwards alongside the chassis to " fairlead " rollers at the front.

A safety device is incorporated in the cable rollers which stops the engine when the pull on the cable approaches danger point.

Lifting bollards are incorporated in the hub cap of each road wheel.

CHASSIS DIMENSIONS

Wheelbase . .	. . 12 ft.—7½ in. (3,848 mm.).
Width . .	. . 7 ft.—8 in. (2,340 mm.).
Length . .	. . 20 ft.—9⅜ in. (6,334 mm.).
Track—Front	. . 6 ft.—3⅛ in. (1,908 mm.).
Rear	. . 5 ft.—10¾ in. (1,798 mm.).

Chassis Weight (approximate)—

5 tons 14 cwt. 2 qts. (5,816 Kg.) (Ready for the road and including spare wheel).

5 tons 6 cwt. 2 qts. (5,410 Kg.) (For licencing).

Gross load—11 tons (11,176 Kg.).

NOTE. This vehicle can be supplied to conform to the standard width of 7 ft. 6 in. (2,286 mm.).

A.E.C. products are sold subject to the A.C.V. Group's current Conditions of Business.

GUARANTEE. Comprehensive guarantees are given with all A.C.V. Group products, full particulars of which are stated in their current Conditions of Business.

A.E.C's policy of extensive research resulting in continuous improvement in design, makes it necessary for the Company to reserve the right to alter the information in this publication without notice.

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