FIAT
Trattori

115-90
130-90 Turbo
140-90 Turbo
160-90 Turbo
180-90 Turbo

WORKSHOP MANUAL

06910088

SERVIZI TECNICI DI ASSISTENZA

Reprinted

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WORKSHOP MANUAL

QUICK REFERENCE INDEX

SERVIZI TECNICI DI ASSISTENZA

FOREWORD

- *The manual is divided into separately numbered sections.*
- ***Two-digit sections whose second digit is zero** contain:*
  – tractor specification (00);
  – tractor sub-assembly specification and data (10-Engine; 20-Power Train; 30-Front Axle-Steering; 40-Front Wheel Drive; 50-Hydraulic Lift Unit; 60-Electrical System; 90-Service Tools).
- ***Two-digit sections whose second digit is from one to nine** deal with overhaul of the sub-assemblies whose data are listed in the sections described above. The first digit is the same as that of the corresponding data section (e.g. 20 - Power Train, is associated with 22 - Clutch; 23 - Transmission and Splitter; 24 - Creeper, Mechanical Reverser, etc...).*
- *A contents list is provided to facilitate retrieval of desired information.*
- *The print number of the manual and the date of issue is shown at the bottom of each page.*
- *Revised sheets will carry the same print number followed by a two-digit number (e.g. first revision 603.54.252.01; second revision 603.54.252.02; etc.) and date of issue. Revised sheets will be accompanied by the updated contents sheet.*
- *All information herein is correct at the time of printing but is subject to alteration without prior notice. In case of discrepancies contact the nearest dealer, distributor of branch.*

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CONTENTS

GENERAL: Contents

SHIMS

When adjusting, measure each shim with micrometer gauge and add the values obtained. Do not rely on overall shim thickness or the nominal value indicated for each shim.

ROTARY SHAFT SEALS

To fit rotary shaft seals proceed as follows:
— prior to fitting, soak the seals for at least half an hour in the fluid to be retained;
— carefully clean the shaft and ensure that the contact surface is free from damage;
— turn the end of the sealing lip towards the fluid. If of the thrower lip type, turn the grooves so that during shaft rotation the fluid tends to be thrown back;
— smear the sealing lip with a very thin coat of lubricant (oil is better than grease) and pack the space between sealing lip and dust shield with grease (applicable to double-lip seals);
— fit the seals into their housing using a flat-ended tool or ram. Under no circumstances should a mallet or hammer be used for installation;
— avoid entry of the seal into the recess in a tilted position. Exert a firm and uniform pressure squarely on it and ensure that the seal is pressed fully home;
— to prevent sealing lip damage during fitting, use some sort of protection before sliding over the shaft.

O-RINGS

Lubricate each ring prior to fitting and, on reassembly, slide over the part but do not twist, otherwise leakage will result.

SEALING COMPOUNDS

On the mating surfaces indicated with X, apply one of the following sealing compounds: RTV SILMATE, RHODORSHIL CAF 1 or LOCTITE PLASTIC GASKET.
Before applying the sealing compound, prepare the surfaces as follows:
— remove any deposits using a wire brush;
— thoroughly degrease using solvent, kerosene or hot water/soda solution.

BEARINGS

To install bearings:
— preheat to 80°C ÷ 90°C and slide over shaft;
— cool before pressing outer races home.

ROLL PINS

When fitting straight roll pins ensure that the split faces toward the direction of work stressing the pin.
Coil roll pins can be installed in any position.

SPARE PARTS

Use exclusively **FIAT spare parts,** bearing the trade mark indicated below.

FIATAGRI

Parts

15138

These are the only spares that ensure the quality, durability and safety of original parts as they are the same as those fitted in production.
Only **FIAT spare parts** can offer this guarantee.
When ordering spare parts please state:
— tractor model (marketing code) and frame number;
— engine type and number;
— part number (given on "Microfiches" or Spare Parts Catalogue).

SERVICE TOOLS

The service tools indicated in this manual are:
— designed specifically for tractors of the FIAT range;
— essential for reliable repair work;
— manufactured and tested to offer efficient and durable service.
Mechanics are also reminded that being equipped means:
— operating in optimum working conditions;
— obtaining the best results;
— saving time and energy;
— working in more safety.

NOTICE

Wear limits recommended for some parts are not binding, being given for guidance only. "Front", "rear", "right" and "left" references are with operator facing direction of forward travel.

GENERAL: Safety precautions

WARNING

This symbol is your safety alert sign.
It means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

AVOID ACCIDENTS

Most accidents occuring in the workshop are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason MOST ACCIDENTS CAN BE PREVENTED by recognizing the real cause and doing something about it before the accident occurs.
Regardless of the care used in the design and production of any type of equipment, there are many conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.
A careful operator is the best insurance against an accident. The complete observance of one simple rule would prevent many thousand serious injuries each year.

That rule is:
ATTENTION: Never attempt to clean, oil or adjust a machine while it is in motion.

SAFETY PRECAUTIONS

GENERAL

- Study the Operator's Manual before starting, operating, maintaining, fuelling or servicing machine.
- Do not wear rings, wrist watches, jewelry or loose or hanging apparel, such as ties, torn clothing, scarves, unbuttoned or unzipped jackets that can catch on moving parts. Wear proper safety equipment as authorized for the job. Examples: Hard hats, safety shoes, heavy gloves, ear protectors, safety glasses or goggles.
- Machine should not be serviced with anyone in the operator's seat unless they are qualified to operate the machine and are assisting in the service.
- Never attempt to operate the machine or its tools from any other position that seated in the operator's seat.
- Never lubricate, service or adjust a machine with the engine running, except as called for in the Operator's Manuals.
- Shut off engine and check that hydraulic oil is no longer under pressure before removing caps and covers.
- Carry out all servicing operations with maximum care and attention.
- Shop or field service platforms and ladders used to maintain or service machinery should be constructed and maintained according to local or national requirements.
- Never check or fill fuel tanks, storage batteries or use starter fluid while smoking or near open flames, due to the presence of flammable fluid.
- Brakes are inoperative when manually released for servicing. Provision must be made to maintain control of the machine by blocking or other means.
- Ensure that the fuel gun is in contact with the filler when refuelling. To reduce the chance of a static electricity sparking maintain contact until after fuel flow is cut off.
- Use only designated towing or pulling attachment points. Use care in making attachment. Be sure pins and locks as provided are secure before pulling. Stay clear of drawbars, cables or chains under load.
- To move a disabled machine, use a trailer or low body truck if available.
- Load and unload on level ground affording full support to the trailer wheels.
- Use only grounded auxiliary power source for heaters, chargers, pumps and similar equipment to reduce the hazards of electrical shock.

- Lift and handle all heavy parts with a lifting device of proper capacity.
- Watch out for people in the vicinity.
- Never place gasoline or diesel fuel in an open pan.
- Never use gasoline or solvent or other flammable fluid to clean parts. Use authorized commercial, non-flammable non-toxic solvents.
- When cleaning parts with compressed air use safety glasses with side shields or goggles.
- Limit the pressure to 2.1 bar (30 psi) according to local or national requirements.
- Do not run engine in a closed building without adequate ventilation.
- Do not smoke or permit any open flame or spark near when refuelling or handling highly flammable materials.
- Do not use an open flame as a light source to look for leaks or for inspection anywhere on the tractor.
- Move carefully when under, in or near machine or implements. Wear required protective equipment, such as hard hat, safety glasses, safety shoes, ear protectors.
- When making equipment checks that require engine running, an operator should be in the opertor's seat at all times with the mechanic in sight.
- For field service, move machine to level ground if possible and block machine. If work is absolutely necessary on a gradient, block machine and its attachments securely. Move the machine to level ground as soon as possible.
- Guard against kinking chains or cables. Do not lift or pull through a kinked chain or cable. Always wear heavy gloves when handling chain or cable.
- Be sure cables are anchored and the anchor point is strong enough to handle the expected load. Keep exposed personnel clear of anchor point and cable or chain.
- Keep maintenance area CLEAN and DRY. Remove water or oil puddles immediately.
- Do not pile oily, greasy rags — they are a fire hazard. Store in a closed metal container. Before starting machine or moving attachment check and adjust and lock operator's seat. Be sure all personnel in the area are clear before staring or moving machine and any of its attachments.
- Do not carry loose objects in pockets that might fall unnoticed into open compartments.
- Wear proper protective equipment such as safety goggles or safety glasses with side shields, hard hat, safety shoes, heavy gloves where metal or other particles are apt to fly or fall.
- Wear welders's protective equipment such as dark safety glasses, helmets, protective clothing, gloves and safety shoes when welding. Dark safety glasses must be worn by anyone standing by when welding is in progress. DO NOT LOOK AT ARC WITHOUT PROPER EYE PROTECTION.
- Wire rope develops steel slivers. Use authorized protective equipment such as heavy gloves and safety glasses when handling.
- Handle all parts with extreme care. Keep hands and fingers from between parts. Wear authorized protective equipment such as safety glasses, heavy gloves, safety shoes.

START UP

- Do not run the engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.
- Do not place head, body, limbs, feet, fingers or hands near a rotating fan or belts. Be especially alert around a pusher fan.

ENGINE

- Turn radiator cap slowly to relieve pressure before removing. Add coolant only with engine stopped or idling if hot.
- Do not run engine when refuelling and use care if engine is hot due to the increased possibility of fire if fuel is spilled.
- Never attempt to check or adjust fan belts when engine is running. Do not adjust engine fuel pump when the machine is in motion.
- Never lubricate a machine with the engine running.
- Avoid running engine with open unprotected air inlets. If such running is unavoidable for service reasons, place protective screen over all inlet openings before servicing engine.

GENERAL:
Safety precautions

ELECTRICAL

- BATTERY GAS IS HIGHLY INFLAMMABLE. Leave battery box open to improve ventilation when charging batteries. Never check charge by placing metal objects across the posts. Keep sparks or open flame away from batteries. Do not smoke near battery to guard against the possibility of accidental explosion.
- Check for fuel or battery electrolyte leaks before starting service or maintenance work. Eliminate leaks before proceeding.
- Do not charge batteries in a closed area. Provide proper ventilation to guard against an accidental explosion from an accumulation of explosive gases given off in the charging process.
- Disconnect batteries before working on electrical system, or starting repair work of any kind.

HYDRAULICS

- Fluid escaping under pressure from a very small hole can almost be invisible and can have sufficient force to penetrate the skin. Use a piece of carboard or wook to search for suspected pressure leaks. DO NOT USE HANDS. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.
- When making pressure checks use the correct gauge for expected pressure.

WHEELS AND TYRES

- Be sure tyres are properly inflated to the manufacturer's specified pressure. Inspect for damage periodically.
- Stand to one side when changing inflation of tyres.
- Check tyres only when the machine is empty and tyres are cool to avoid overinflation. Do not use reworked wheel parts. Improper welding, heating or brazing weakens them and can cause failure.
- Never cut or weld on the rim of an inflated tyre.
- When servicing tyres block the machine in front and back of all wheels. After jacking up, place blocking under machine to protect from falling according to local or national requirements.
- Deflate tyres before removing objects from the tread.
- Never inflate tyres with flammable gases. Explosion and personal injury could result.

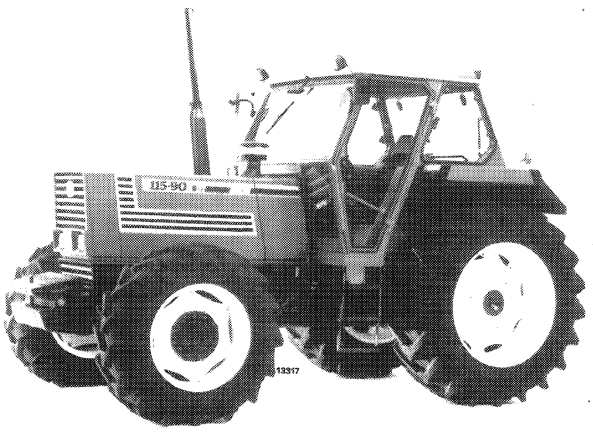
ATTACHMENTS

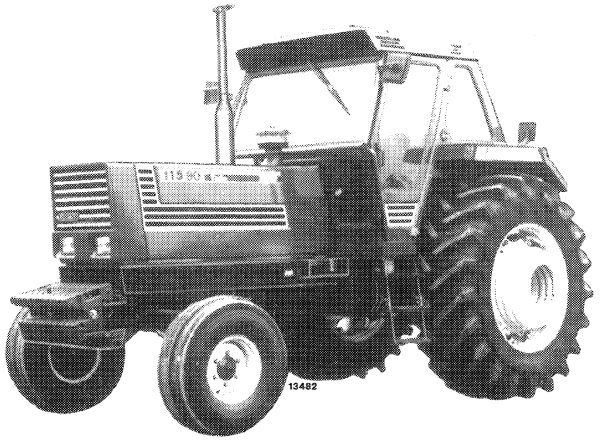
- Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.
- Handle all parts with extreme care. Keep hands and fingers from between parts. Wear authorized protective equipment such as safety glasses, heavy gloves, safety shoes.
- Guard against kinking chains or cables. Always wear heavy gloves when handling chain or cable.

IDENTIFICATION DATA

	115-90 115-90 DT	130-90 Turbo 130-90 Turbo DT	140-90 Turbo 140-90 Turbo DT	160-90 Turbo 160-90 Turbo DT	180-90 Turbo 180-90 Turbo DT
Marketing code:					
— 2-wheel drive					
— 4-wheel drive					
Engineering code:					
— 12-speed, 2-wheel drive	658.300.000	658.400.000	659.200.000	660.300.000	660.400.000
— 16-speed, 2-wheel drive with reverser (overlapped ratios)	658.300.000 var. 720.110	658.400.000 var. 720.110	659.200.000 var. 720.110	660.300.000 var. 720.110	660.400.000 var. 720.110
— 16-speed, 2-wheel drive with reverser (sequence ratios)	658.300.000 var. 720.110 + var. 720.292	658.400.000 var. 720.110 + var. 720.292	659.200.000 var. 720.110 + var. 720.292	660.300.000 var. 720.110 + var. 720.292	660.400.000 var. 720.110 + var. 720.292
— 24-speed, 2-wheel drive	658.300.000 var. 720.111	658.400.000 var. 720.111	659.200.000 var. 720.111	660.300.000 var. 720.111	660.400.000 var. 720.111
— 12-speed, 4-wheel drive	658.327.000	658.427.000	659.227.000	660.327.000	660.427.000
— 16-speed, 4-wheel drive with reverser (overlapped ratios)	658.327.000 var. 720.110	658.427.000 var. 720.110	659.227.000 var. 720.110	660.327.000 var. 720.110	660.427.000 var. 720.110
— 16-speed, 4-wheel drive with reverser (sequence ratios)	658.327.000 var. 720.110 + var. 720.292	658.427.000 var. 720.110 + var. 720.292	659.227.000 var. 720.110 + var. 720.292	660.327.000 var. 720.110 + var. 720.292	660.427.000 var. 720.110 + var. 720.292
— 24-speed, 4-wheel drive	658.327.000 var. 720.111	658.427.000 var. 720.111	659.227.000 var. 720.111	660.327.000 var. 720.111	660.427.000 var. 720.111
— 16-speed, power shift, 2-(4-) wheel drive with reverser	—	—	—	660.300.000 (660.327.000) var. 720.283 + var. 720.290 + var. 720.110	660.400.000 (660.427.000) var. 720.283 + var. 720.290 + var. 720.110
— 24-speed, power shift, 2-(4-) wheel drive	—	—	—	660.300.000 (660.327.000) var. 720.283 + var. 720.290 + var. 720.117	660.400.000 (660.427.000) var. 720.283 + var. 720.290 + var. 720.117

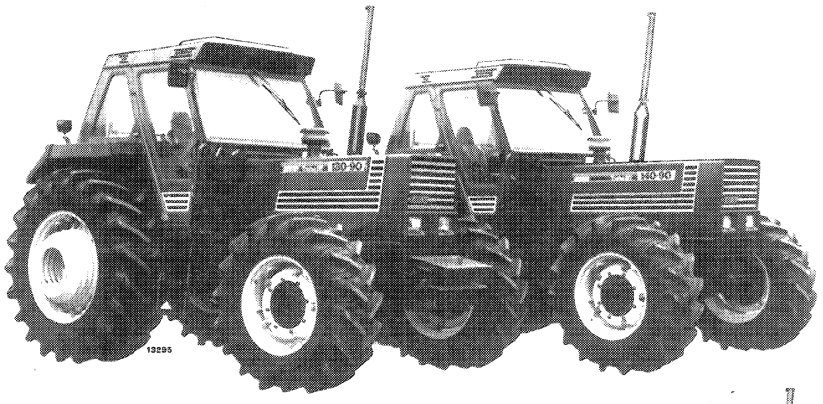
Note - Synchromesh splitter is available on all manual transmissions as variant 720.290.
Synchromesh splitter is standard equipment on power shift transmissions.



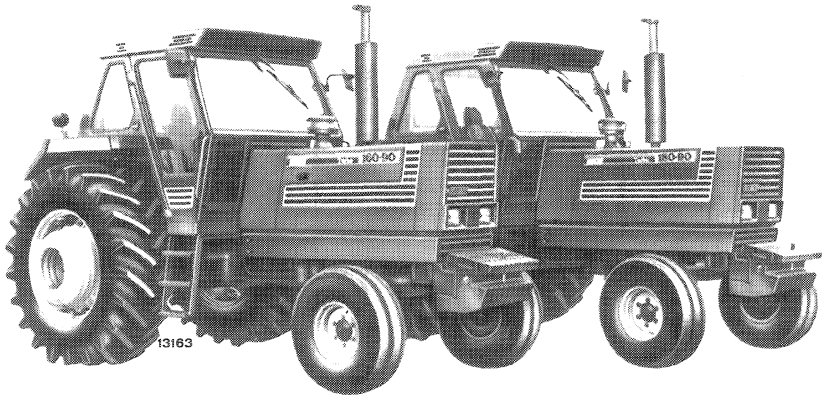


SPECIFICATION

	115-90 115-90 DT	130-90 Turbo 130-90 Turbo DT	140-90 Turbo 140-90 Turbo DT	160-90 Turbo 160-90 Turbo DT	180-90 Turbo 180-90 Turbo DT
Engine type (all versions)	FIAT Nat. aspirated 8065.05.000 (FIAT pump)	FIAT turbo- charged 8065.25.010 (FIAT pump)	FIAT turbo- charged 8065.25.000 (FIAT pump)	FIAT turbo- charged 8365.25.503 (FIAT pump)	FIAT turbo- charged 8365.25.502 (BOSCH pump)
WEIGHTS					
Operating weight (including lift, implement attachment, ballast weight support, tow hook and ROPS cab:					
— 2-wheel drive	4580 kg 10,099 lb	5210 kg 11,488 lb	5810 kg 12,811 lb	6190 kg 13,649 lb	6330 kg 13,958 lb
— 4-wheel drive	5010 kg 11,047 lb	5590 kg 12,326 lb	6350 kg 14,399 lb	6760 kg 14,906 lb	6890 kg 15,192 lb
ENGINE					
Type	Diesel 4-stroke, Nat. aspirated	Diesel 4-stroke, turbocharged	Diesel 4-stroke, turbocharged	Diesel 4-stroke, turbocharged	Diesel 4-stroke, turbocharged
Injection	direct				
No. of cylinders	6				
Cylinder sleeves	dry, press fit			wet	
Bore × stroke	104 × 115 mm (4.094 × 4.527 in)			115 × 130 mm (4.527 × 5.118 in)	
Displacement	5861 cm^3			8102 cm^3	
Compression ratio	17 to 1	16.5 to 1	16.5 to 1	15.5 to 1	15.5 to 1
Max. horsepower DGM/DIN, metric	84.6 kW (115 HP)	95.7 kW (130 HP)	103 kW (140 HP)	117.7 kW (160 HP)	132.4 kW (180 HP)
Max. output speed	2500 rpm			2200 rpm	



	115-90 115-90 DT	130-90 Turbo 130-90 Turbo DT	140-90 Turbo 140-90 Turbo DT	160-90 Turbo 160-90 Turbo DT	180-90 Turbo 180-90 Turbo DT
Max. torque speed		1500 rpm		1400 rpm	
Main bearings			7		
Oil pan			cast iron		
VALVE GEAR					
			OH valves, push rod operated		
Inlet — opens B.T.D.C.		3°		8°	
Inlet — closes A.B.D.C.		23°		60°	
Exhaust — opens B.B.D.C.		48°30′		60°	
Exhaust — closes A.T.D.C.		6°		8°	
Valve clearance — for timing check		.45 mm (.018 in)		.41 mm (.016 in)	
Normal — Inlet		.25 mm (.010 in)		.30 mm (.012 in)	
Normal — Exhaust		.35 mm (.014 in)		.50 mm (.020 in)	
FEED					
Air cleaner		dry, double cartridge, restriction indicator with centrifugal precleaner on hood			
Fuel filters		two, in parallel, disposable paper cartridge (water separator integral with both filters) and bowl filter with mesh element on pump suction		two, in line, disposable paper cartridge (one paper, the other cloth) and bowl filter with mesh element on feed pump suction	



SPECIFICATION

	115-90 115-90 DT	130-90 Turbo 130-90 Turbo DT	140-90 Turbo 140-90 Turbo DT	160-90 Turbo 160-90 Turbo DT	180-90 Turbo 180-90 Turbo DT
Feed pump	incorporated in injection pump				
Injection pump	in-line, integral governor (and aneroid on models 140-90 Turbo and 180-90 Turbo)				
— type — W ALTECNA	PES 6A 80D 410 RF 312-4791120	PES 6A 90D 410 RF 313-4791389	PES 6A 90D 410 RF 313-4791388	PES 6A 90D 410 RF 309-4776891	—
— type — BOSCH	—	—	—	—	PES 6MW 100-4754679
Integral all-speed governor	centrifugal				
Fixed advance, at spill cut-off B.T.D.C.	25° ± 1°	25° ± 1°	25° ± 1°	22°30′ ± 30′	15° ± 30′
Injection pump lubrication	engine oil				
Injection nozzles	see page 10, section 10				
Nozzle opening pressure	230 to 238 bar (235 to 243 kg/cm²) 3,336 to 3,452 PSI			200 to 208 bar (204 to 212 kg/cm²) 2,901 to 3,017 PSI	
Firing order	1-5-3-6-2-4				
TURBOCHARGER					
Exhaust gas driven	—	see page 9, section 10			
Turbine and compressor shaft lubrication and cooling	—	engine oil			
LUBRICATION	Force-feed, gear pump				
Pump drive	engine crankshaft				
Oil filters	gauze element on pump suction side and two disposable cartridges on delivery side	gauze element on pump suction side and two full-flow disposable cartridges on delivery side		gauze element on pump suction side and disposable cartridges on delivery side	
Pressure relief valve	on pump body			on filter body	
Oil pressure at governed speed	2,9 to 3,9 bar (3 to 4 kg/cm²) 42 to 56 psi	3,9 to 4,9 bar (4 to 5 kg/cm²) 56 to 71 psi		4,7 to 5,1 bar (4,8 to 5,2 kg/cm²) 68 to 74 psi	
Oil cooler	oil-to-water				
COOLING SYSTEM	water, centrifugal pump				
Radiator	four row vertical tubes		five row vertical tubes		
Expansion tank	traslucent plastic				
Fan, installed on water pump pulley	suction, steel				
Temperature control	wax thermostat				
TRACTOR METER	dashboard-mounted				
— drive	camshaft gear		camshaft drive gear		
— hourmeter activation speed	1800 rpm				
— meter to engine ratio	1 to 2				

POWER TRAIN

Clutch (115-90)

Type ..... LUK or VALEO 12″
Construction ..... twin, dry single plate
Controls:
— transmission ..... hydraulic, pedal
— P.T.O. ..... mechanical, hand lever
Plate material:
— transmission ..... cerametallic compound
— P.T.O. ..... organic compound.

Master clutch (130-90 Turbo and 140-90 Turbo)

Type ..... VALEO or LUK 14″
Construction ..... dry single plate
Material ..... cerametallic compound
Control ..... hydraulic, pedal.

Master clutch (160-90 Turbo and 180-90 Turbo)

Type ..... LUK 12″ + 12″
Construction ..... twin, dry single plate
Material ..... cerametallic compound
Control ..... hydraulic, pedal.

P.T.O. clutch (130-90 Turbo, 140-90 Turbo, 160-90 Turbo and 180-90 Turbo)

Type ..... multidisc, oil bath
Location ..... rear transmission housing
Control ..... hydraulic.

Standard shift transmission

Type ..... constant mesh, full-synchromesh
Gear ..... helical

Splitter pinion drive, with 3 forward and 1 reverse range (12 and 24 speed tractors) or 4 forward and 4 reverse ranges (reverser version tractors. Synchromesh optional).

Transmission lubrication force-feed through power steering pump.

Oil cooling (160-90 Turbo and 180-90 Turbo only) oil-to-water heat exchanger (same as engine cooling circuit).
Creeper version:
Creeper type ..... planetary
Forward ..... 24 speeds
Reverse ..... 8 speeds
Mechanical reverser version:
Forward ..... 16 speeds
Reverse ..... 16 speeds
Transmission and splitter controls ... separate levers below steering wheel.
Crawler or reverser control ... handle on left of operator's seat.

Power shift transmission (optional for 160-90 Turbo and 180-90 Turbo)

Type .....constant mesh, helical gear.

Shift clutches
four pressurized multiple plate wet disc.

Splitter
pinion drive, synchromesh, with 3 forward and one reverse range (24-speed tractors) or 4 forward and 4 reverse ranges (reverser version tractors).

Transmission and splitter controls
separate levers below steering wheel.

Creeper and mechanical reverser versions of power shift transmission tractors are identical with those of standard shift tractors.
Bevel drive ..... standard
Differential:
Type ..... 4 pinion
Differential lock:
— 115-90 mechanical, pedal operated
— 115-90 H, 130-90 Turbo, 140-90 Turbo, 160-90 Turbo and 180-90 Turbo hydraulic, with multiple disc oil bath hydraulic clutch supplied by P.T.O. clutch pump.
Lock operation through independent pedal, release through brake pedals.

Final drives
Type ..... planetary, 3 planets.

BRAKES

Service

Oil-bath, disc, inboard, hydrostatic, divided circuit, separate pedals.

Parking and emergency

Twin oil-bath discs, fully independent, acting on bevel pinion shaft, hand lever operated.

STEERING

Type ..... hydrostatic power steering
Circuit ..... independent
Steerage joints ..... sealed for life
Turning radius (no brakes):

	mm	ft.	in.
— 115-90, 130-90 Turbo and 140-90 Turbo	4600	15	1
— 115-90 DT, 130-90 Turbo DT and 140-90 Turbo DT, front wheel drive in	6600	21	8
— 160-90 Turbo and 180-90 Turbo	5100	16	9
— 160-90 Turbo DT and 180-90 Turbo DT	7300	23	11½

FRONT AXLE (115-90, 130-90 Turbo, 140-90 Turbo, 160-90 Turbo e 180-90 Turbo)

Type ..... inverted U, telescopic, center pivoting
Track adjustment ..... sliding axle ends
Track widths ..... 6 off

FRONT WHEEL DRIVE (115-90 DT, 130-90 Turbo DT, 140-90 Turbo DT, 160-90 Turbo DT and 180-90 Turbo DT)

Type ..... full floating, center pivoting
Shaft (no U-joints) and articulations .....
..... on tractor centerline
Final drives ..... planetary

Hydraulic differential lock

Standard for 115-90 DTH, 130-90 Turbo DT, 140-90 Turbo DT, 160-90 Turbo DT and 180-90 Turbo DT .
Type ..... oil bath hydraulic clutch
Control ..... rear differential lock pedal
Supply ..... rear differential lock pump.
NO-SPIN differential ..... standard for 115-90 DT.

Track widths:

— spiral adjustment ..... 5 off

REAR WHEELS

Track widths:

— disc/rim/hub repositioning ..... 8 off
— spiral adjustment ..... 7 off

POWER TAKE-OFF

Type ..... fully independent
540 - 1000 rpm ..... 115-90, 130-90 Turbo, 140-90 Turbo e 160-90 Turbo
1000 rpm ..... 180-90 Turbo.

Shaft
- 540 rpm
  - 1⅜" - 6 spline
  - 1¾" - 6 spline
- 1000 rpm
  - 1⅜" - 21 spline
  - 1¾" - 20 spline

Control:

— single, dry plate mechanical clutch (115-90);
— multiplate, oil bath, hydraulic clutch (115-90 H, 130-90 Turbo, 140-90 Turbo, 160-90 Turbo and 180-90 Turbo).

Speed selection (540 or 1000 rpm) automatic upon changing splined ends (115-90, 130-90 Turbo, 140-90 Turbo and 160-90 Turbo).

Engine speed with P.T.O. at standard speeds:

— 115-90, 130-90 Turbo and 140-90 Turbo:
  - 540 rpm ..... 2260 rpm
  - 1000 rpm ..... 2460 rpm

— 160-90 Turbo:
  - 540 rpm ..... 1950 rpm
  - 1000 rpm ..... 2075 rpm

— 180-90 Turbo
  - 1000 rpm ..... 2075 rpm

Rotation (tractor viewed from rear): clockwise.

LIFT

Type ..... hydraulic, draught, position and draft/position control.
Draft control ..... lower links (sensing bar)
Control from operator's seat ..... two independent levers
Control from ground ..... outer lever
Variospeed sensitivity control ..... 4 position knob to right of operator
Response control ..... knob beneath operator's seat
LIFT-O-MATIC ..... automatic lift arm raising and lowering without altering set working depth
Main cylinder ..... single-acting
Auxiliary outer cylinder linked to lift arms .....
..... one (optional for 115-90, 130-90 Turbo and 140-90 Turbo) or two (optional for 130-90 Turbo and 140-90 Turbo and standard for 160-90 Turbo and 180-90 Turbo).
Pump ..... gear, engine valve gear driven
Hydraulic fluid ..... real transmission oil.
Design lifting capacity and max. lift travel .....
..... see section 50, pages 3 and 4
Three point linkage ..... category 2 or 3
Lower links ..... quick connect or telescoping
Sway restrictors ..... check links or check blocks.

Remote control valves

Number ..... one (standard)
Type ..... single and double-acting, convertible
Lift circuit pressure relief valve ..... integral
Optional 2 or 3 remote control valves type:

— single and double-acting, convertible;
— single and double-acting, convertible with automatic hydraulic kick-off;
— double-acting with float position and automatic hydraulic kick-off.

Tractor brake pedal controlled hydraulic trailer brake remote control valve ..... optional.

TOWING ATTACHMENTS

Rear:

— swinging drawbar;

— drilled crossmember;

— Rockinger jaw hook;

— trailer tow hook;

— tow hook, adjustable for height.

Front:

— fixed pull hook.

BALLASTING

Front axle

Four plates of 48 kg (106 lb.) each located inside front axle support. Total weight: 192 kg (430 lb.).
Moreover:

— 115-90, 130-90 Turbo and 140-90 Turbo, 10 cast iron plates with handles, 40 kg (88 lb.) each, and 130 kg (287 lb.) support. Total weight: 530 kg (1169 lb.).

— 160-90 Turbo and 180-90 Turbo, 10 or 20 cast iron plates with handles, 40 kg (88 lb.) each, and 130 kg (287 lb.) or 255 kg (562 lb.) support. Total weight: 530 kg (1169 lb.) or 1055 kg (2326 lb.).

Rear wheels

— **Cast iron discs** (spiral adjustment rim), 300 kg (661 lb.) each. Total weight: 600 kg (1323 lb.). Optional 2, 4 or 6 cast iron rings.
Total weight: 730 kg (1610 lb.), 860 kg (1896 lb.) or 990 kg (2183 lb.).

— **Pressed discs** 2, 4 or 6 wheel disc mounted cast iron rings, 65 kg (143 lb.) each. Total weight: 130 kg (287 lb.), 260 kg (573 lb.) or 390 kg (860 lb.).

BODY

Platform and operator's seat

Platform fully suspended, mounted on 6 rubber buffers. Integral structure including footboards, fenders and dashboard. Compact, rigid, vibration-free. Provision for ROP frame or cab installation.
Fuel tank located behind operator's seat, boxed between fenders. Two auxiliary fuel tanks, standard on 160-90 Turbo and 180-90 Turbo and optional on 115-90, 130-90 Turbo and 140-90 Turbo, located below platform and laterally on rear transmission.

Operator's seat de luxe, padded with flip-up arm rests. Parallelogram suspension, hydraulic dampers, manual adjustment for height and ride.
Steering wheel height and Rake adjustable.

Dashboard

Multi-function instrument panel plus control board.

Hood

Fully enclosed, in 6 sections:

— LH panels ..... access to oil filters, dipstick

— RH panels ..... access to fuel filters, feed pump, injection pump, power steering fluid reservoir, lift filters

Cab

Visibility ..... all round

Accessibility ..... on both sides

Rear window ..... adjustable

Side windows ..... open for ventilation

Sunblind ..... curtain

Safety hatch ..... in cab roof

Heating and ventilation ..... 3-speed fan

Air conditioner ..... optional

Protection ..... fully insulated against dust, cold, heat, etc.

Windshield washer and wiper ..... standard

Accessories ..... courtesy light and provision for stereo radio/tape player.

ELECTRICAL SYSTEM

Voltage ..... 12 V

Alternator ..... 65 A, with integral electronic voltage regulator

Starter ..... MARELLI MT 68 LB or BOSCH JD 12

Battery location ..... in front of radiator

Capacity:

— 115-90, 130-90 Turbo e 140-90 Turbo..... 132 Ah

— 160-90 Turbo e 180-90 Turbo ..... 176 Ah

Lighting

Headlamps ..... twin, high and asymmetric low beam (45/40 W bulb)

Front lamps

— parking ..... 5 W white;

— turn signal ..... 21 W orange;

Tail lamps

— parking ..... 5 W, red;
— turn signal ..... 21 W, orange;
— stop ..... 21 W, red;
— license plate ..... LH rear parking bulb;
— reflex reflectors ..... red.

Instruments and accessories

Instrument panel ..... multi-function (see section 60, page 8)
Control board ..... (see section 60, page 7)
Floodlight ..... 35 W
Rear power point ..... DIN, 7-pole
Dash power point ..... Single-pole
Horn ..... push
Cold starting ..... thermostarter or start-pilot
Cigar lighter ..... dash-mounted
Fuses ..... up to 12 (see Section 60, page 7)
Hazard warning lights ..... tractor and trailers.

115-90 H and 115-90 DTH TRACTORS

These extra heavy duty models differ from 115-90 and 115-90 DT tractors in the following respects:

— 2-wheel drive versions: 14″ transmission clutch, multiple disc oil bath P.T.O. clutch with release brake in transmission housing, hydraulic differential lock and pump with flow divider valve supplying both P.T.O. clutch and differential lock ..... **658.300.000 var. 720.326**

— 4-wheel drive version: as for 2-wheel drive versions, plus hydraulic front differential lock ..... **658.327.000 var. 720.326**

Note - Unless otherwise indicated, overhaul procedures described herein for **115-90** and **115-90 DT** tractors also apply to **115-90 H** and **115-90 DTH** tractors.

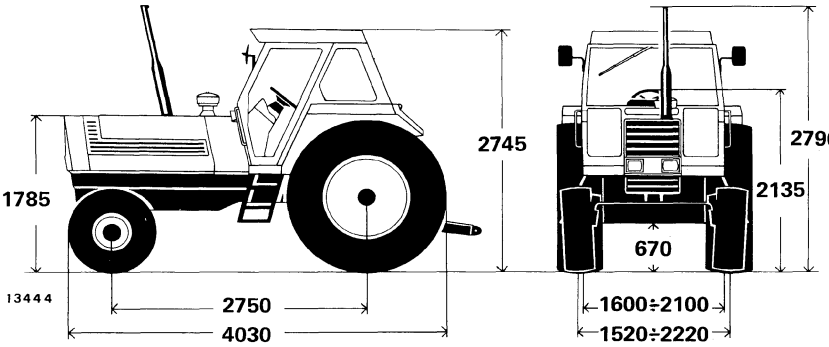
TYRE SIZES

	115-90	130-90 Turbo	140-90 Turbo	160-90 Turbo	180-90 Turbo
Front	9.00-16 10.00-16 11.00-16	9.00-16 10.00-16 11.00-16	9.00-16 10.00-16 11.00-16	11.00-16	11.00-16
Rear	16.9/14-38 18.4/15-38 23.1/18-34	18.4/15-38 23.1/18-34	18.4/15-38 20.8/38 23.1/18-34	18.4/15-38 20.8/38 23.1/18-34	20.8/38

	115-90 DT	130-90 Turbo DT	140-90 Turbo DT	160-90 Turbo DT	180-90 Turbo DT
Front	13.6/12-28 (2) 14.9/13-28 (1) (3)	14.9/13-28 (1) (2)	14.9/13-28 (3) (4) 16.9/14-28 (1) 18.4 R 70-28 (2)	14.9/13-28 (1) (2) 16.9/14-28 (3) 18.4 R 70-28 (4)	16.9/14-28 (1) 18.4 R 70-28 (2)
Rear	18.4/15-38 (1) 16.9/14-38 (2) 23.1/18-34 (3)	18.4/15-38 (1) 23.1/18-34 (2)	20.8/38 (1) (2) 18.4/15-38 (3) 23.1/18-34 (4)	18.4/15-38 (1) 23.1/18-34 (2) 20.8/38 (3) (4)	20.8/38 (1) (2)

(1) (2) (3) (4) Tyre matching references.

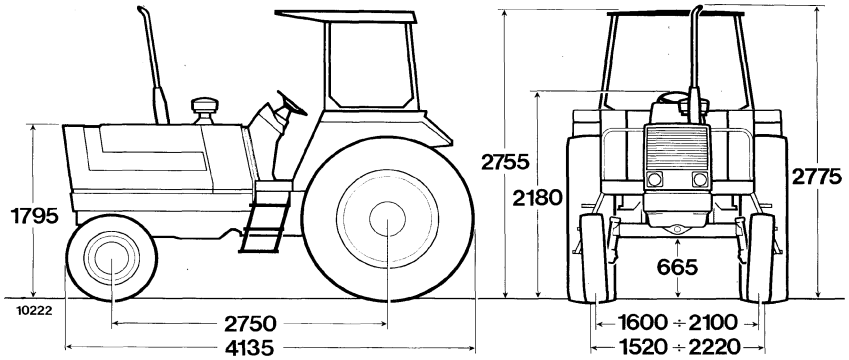
MAIN DIMENSIONS (in mm)



115-90

(9.00-16 front and 16.9/14-38 rear tyres).

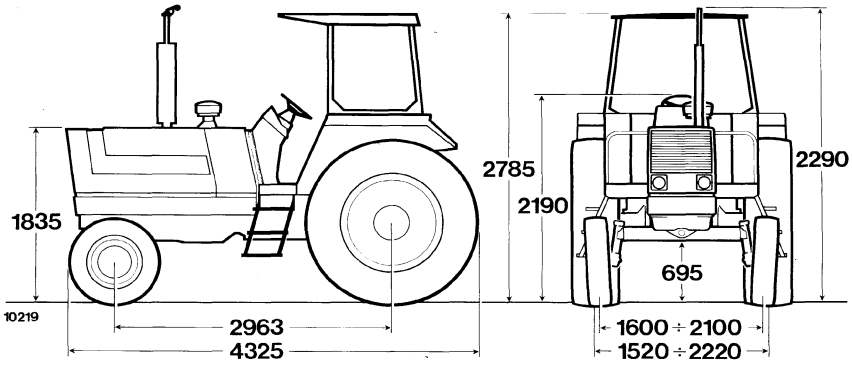
* 2745 with ROPS frame



130-90 Turbo and 140-90 Turbo

(9.00-16 front and 18.4/15-38 rear tyres).

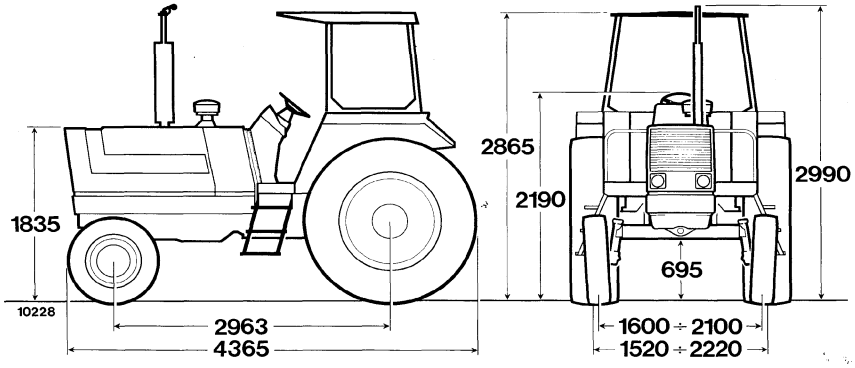
* 2840 with CAB



160-90 Turbo

(with 11.00-16 front and 18.4/15-38 rear tyres).

* 2850 with CAB



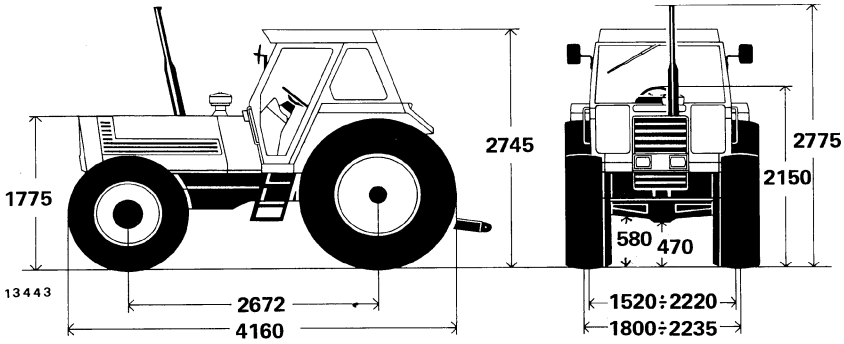
180-90 Turbo

(with 11.00-16 front and 20.8/38 rear tyres).

* 2930 with CAB

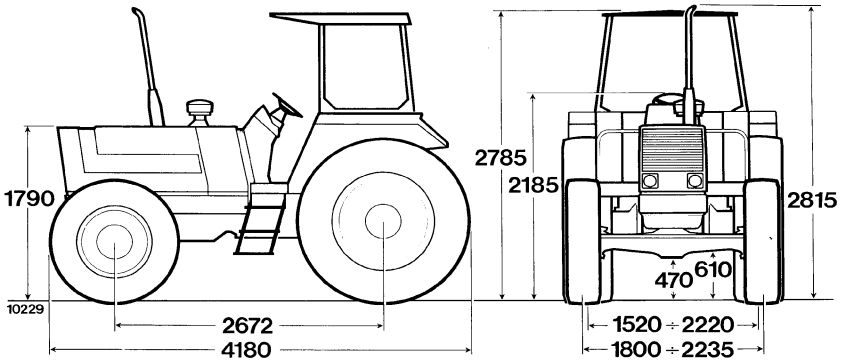
SPECIFICATION

MAIN DIMENSIONS (in mm)



115-90 DT

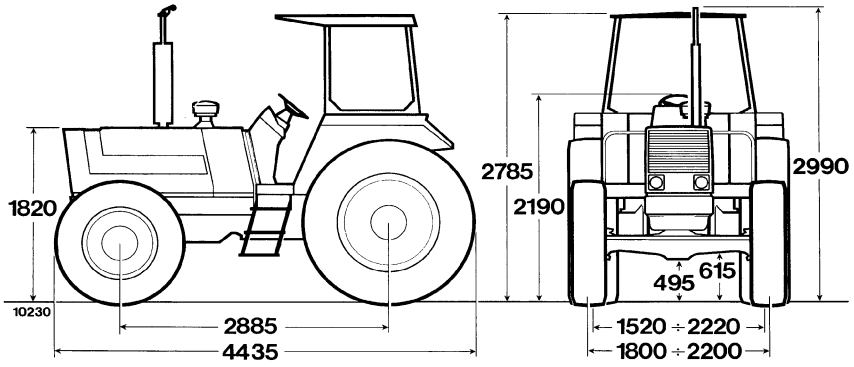
(with 13.6/12-28 front and 16.9/14-38 rear tyres).



130-90 Turbo DT and 140-90 Turbo DT

(with 14.9/13-28 front and 18.4/15-38 rear tyres).

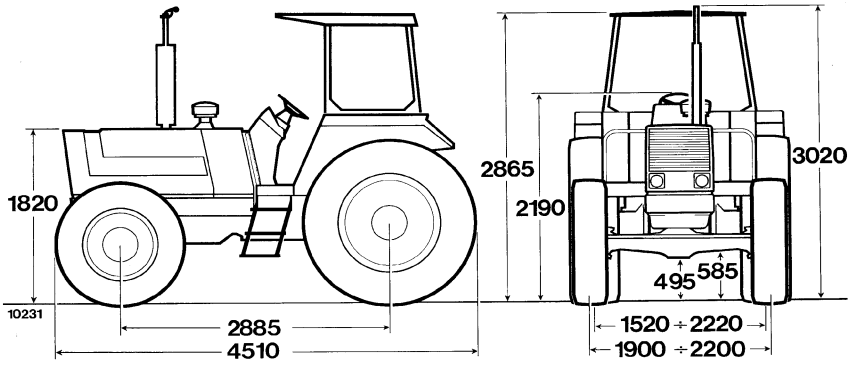
* 2840 with CAB



160-90 Turbo DT

(with 14.9/13-28 front and 18.4/15-38 rear tyres).

* 2850 with CAB



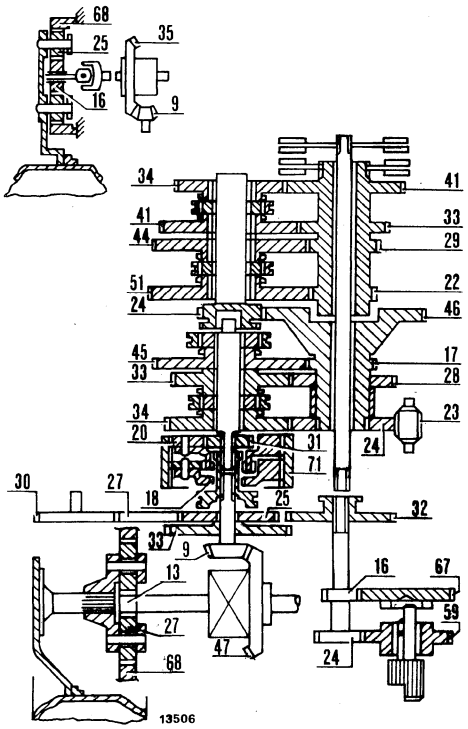
180-90 Turbo DT

(with 16.9/14-28 front and 28.8/38 rear tyres).

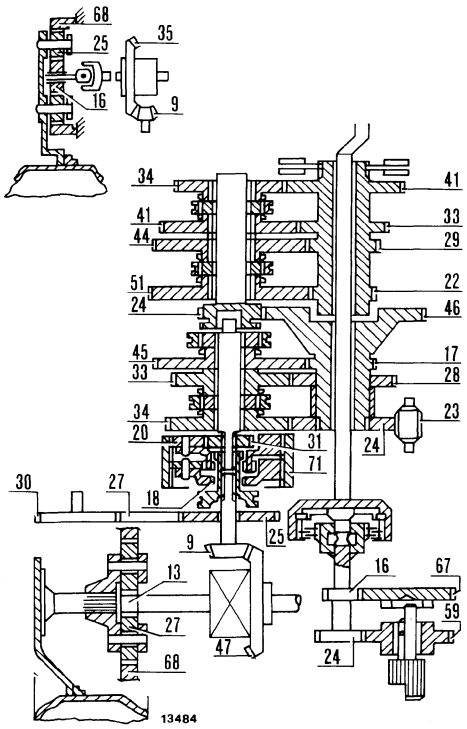
* 2930 with CAB

POWER TRAIN SCHEMATICS

115-90 (12-24 speed)



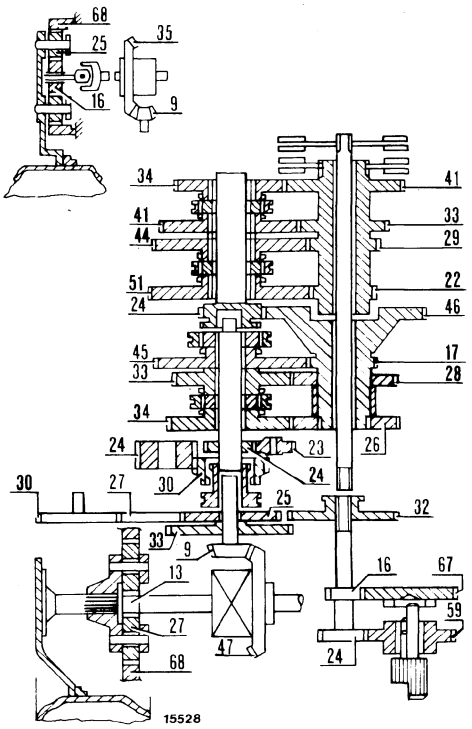
130-90 Turbo and 140-90 Turbo (12-24 speed)



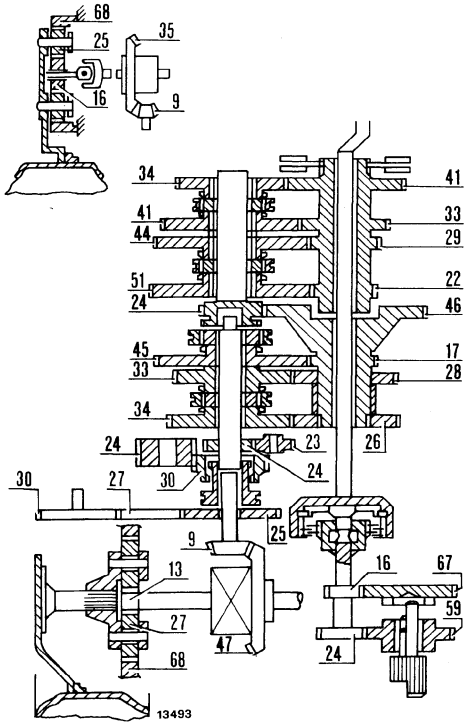
GEAR	Tractor speeds at maximum engine speed and with rear tyres:																			
	115-90						130-90 Turbo 140-90 Turbo				140-90 Turbo		160-90 Turbo						180-90 Turbo	
	18.4/15-38		23.1/18-34		16.9/14-38		18.4/15-38		23.1/18-34		20.8/38		18.4/15-38		23.1/18-34		20.8/38		20.8/38	
	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1 Low splitter	0.2	0.12	0.2	0.12	0.2	0.12	0.2	0.12	0.2	0.12	0.2	0.12	0.2	0.12	0.2	0.12	0.2	0.12	0.2	0.12
2 »	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19
3 »	0.35	0.22	0.35	0.22	0.34	0.21	0.35	0.22	0.36	0.22	0.4	0.25	0.35	0.22	0.36	0.22	0.4	0.25	0.4	0.25
4 »	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31	0.6	0.37	0.6	0.37
1 Nor. splitter	0.4	0.25	0.4	0.25	0.4	0.25	0.4	0.25	0.4	0.25	0.4	0.25	0.4	0.25	0.4	0.25	0.4	0.25	0.4	0.25
2 »	0.6	0.37	0.7	0.43	0.6	0.37	0.6	0.37	0.6	0.37	0.7	0.43	0.7	0.43	0.7	0.43	0.7	0.43	0.7	0.43
3 »	0.8	0.50	0.8	0.50	0.8	0.50	0.8	0.50	0.8	0.50	0.8	0.50	0.8	0.50	0.8	0.50	0.8	0.50	0.8	0.50
4 »	1.2	0.74	1.2	0.74	1.1	0.68	1.2	0.74	1.2	0.74	1.2	0.74	1.2	0.74	1.2	0.74	1.3	0.81	1.3	0.81
1 High splitter	1.0	0.62	1.0	0.62	0.9	0.56	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62
2 »	1.5	0.93	1.5	0.93	1.4	0.87	1.5	0.93	1.5	0.93	1.5	0.93	1.5	0.93	1.5	0.93	1.5	0.93	1.5	0.93
3 »	1.8	1.12	1.8	1.12	1.7	0.06	1.8	1.12	1.8	1.12	1.9	1.18	1.8	1.12	1.8	1.12	1.9	1.18	1.9	1.18
4 »	2.7	1.68	2.7	1.68	2.6	1.61	2.7	1.68	2.7	1.68	2.8	1.72	2.7	1.68	2.7	1.68	2.8	1.74	2.8	1.74
1 Low	2.0	1.24	2.1	1.30	2.0	1.24	2.0	1.24	2.1	1.30	2.1	1.30	2.1	1.30	2.1	1.30	2.2	1.37	2.2	1.37
2 »	3.1	1.93	3.2	1.90	3.0	1.86	3.1	1.93	3.2	1.99	3.3	2.05	3.1	1.93	3.2	1.99	3.3	2.05	3.3	2.05
3 »	3.8	2.36	3.8	2.36	3.7	2.30	3.8	2.36	3.9	2.42	4.0	2.48	3.8	2.36	3.9	2.42	4.0	2.48	4.0	2.48
4 »	5.7	3.54	5.8	3.60	5.5	3.41	5.7	3.54	5.8	3.60	6.0	3.73	5.8	3.60	5.8	3.60	6.0	3.73	6.0	3.73
1 Normal	4.6	2.86	4.6	2.86	4.4	2.73	4.6	2.86	4.6	2.86	4.8	2.92	4.6	2.86	4.7	2.92	4.9	3.04	4.9	3.04
2 »	7.0	4.35	7.1	4.41	6.8	4.22	7.0	4.35	7.1	4.41	7.4	4.60	7.1	4.41	7.2	4.47	7.4	4.60	7.4	4.60
3 »	8.6	5.34	8.7	5.41	8.3	5.16	8.6	5.34	8.7	5.41	9.0	5.59	8.6	5.34	8.7	5.41	9.1	5.65	9.1	5.65
4 »	12.8	7.95	13.0	8.08	12.4	7.70	12.8	7.95	13.0	8.08	13.5	8.39	12.9	8.02	13.1	8.14	13.6	8.45	13.6	8.45
1 High	10.4	6.46	10.5	6.52	10.0	6.21	10.4	6.46	10.5	6.52	10.9	6.77	10.5	6.52	10.6	6.59	11.0	6.83	11.0	6.83
2 »	15.8	9.82	16.0	9.94	15.3	9.51	15.8	9.82	16.0	9.94	16.6	10.31	16.0	9.94	16.2	10.07	16.8	10.44	16.8	10.44
3 »	19.3	11.99	19.6	12.18	18.6	11.56	19.3	11.99	19.6	12.18	20.3	12.61	19.5	12.12	19.8	12.30	20.5	12.74	20.5	12.74
4 »	29.0	18.02	29.3	18.21	27.9	17.34	29.0	18.02	29.3	18.21	30.4	18.89	29.2	18.14	29.6	18.39	30.7	19.08	30.7	19.08
1 Rev. splitter	0.3	0.19	0.3	0.19	0.3	0.19	0.3	0.19	0.4	0.25	0.4	0.25	0.3	0.19	0.4	0.25	0.4	0.25	0.4	0.25
2 »	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31	0.5	0.31	0.6	0.37	0.5	0.31	0.5	0.31	0.6	0.37	0.6	0.37
3 »	0.7	0.43	0.7	0.43	0.6	0.37	0.7	0.43	0.7	0.43	0.7	0.43	0.7	0.43	0.7	0.43	0.7	0.43	0.7	0.43
4 »	1.0	0.62	1.0	0.62	0.9	0.56	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62	1.0	0.62
1 Reverse	3.8	2.36	3.9	2.42	3.7	2.30	3.8	2.36	3.9	2.42	4.0	2.48	3.8	2.36	3.9	2.42	4.0	0.25	4.0	0.25
2 »	5.8	3.60	5.9	3.67	5.6	3.48	5.8	3.60	5.9	3.67	6.1	3.79	5.9	3.67	5.9	3.67	6.2	3.85	6.2	3.85
3 »	7.1	4.41	7.2	4.47	6.9	4.29	7.1	4.41	7.2	4.47	7.5	4.66	7.2	4.47	7.3	4.54	7.5	4.66	7.5	4.66
4 »	10.7	6.65	10.8	6.71	10.3	6.40	10.7	6.65	10.8	6.71	11.2	6.96	10.8	6.71	10.9	6.77	11.3	7.02	11.3	7.02

POWER TRAIN SCHEMATICS

115-90 with reverser-overlapping ratios



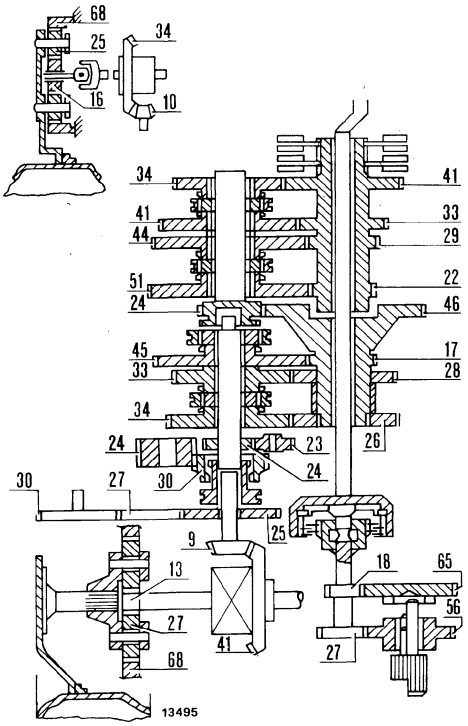
130-90 Turbo and 140-90 Turbo with reverser-overlapping ratios



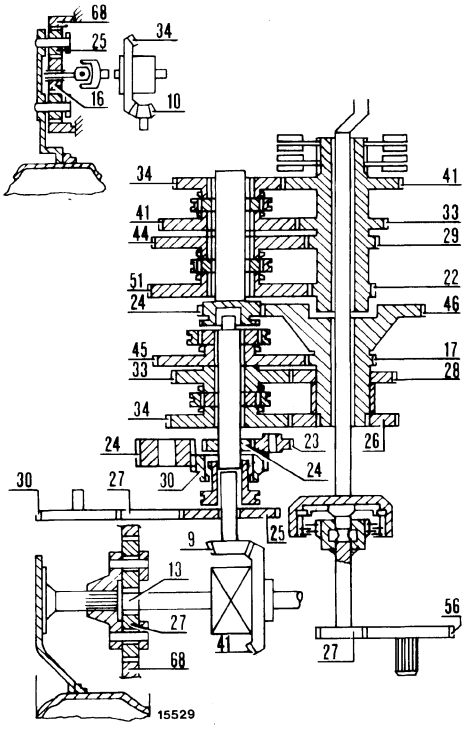
Tractor speeds at maximum engine speed and with rear tyres:																								
GEAR	FORWARD (overlapping ratios)												REVERSE (overlapping ratios)											
	115-90						130-90 Turbo 140-90 Turbo				140-90 Turbo		115-90						130-90 Turbo 140-90 Turbo				140-90 Turbo	
	18.4/15-38		23.1/18-34		16.9/14-38		18.4/15-38		23.1/18-34		20.8/38		18.4/15-38		23.1/18-34		16.9/14-38		18.4/15-38		23.1/18-34		20.8/38	
	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1 Low	2.0	1.24	2.1	1.30	2.0	1.24	2.0	1.24	2.1	1.30	2.1	1.30	1.6	0.99	1.7	1.06	1.6	0.99	1.6	0.99	1.7	1.06	1.7	1.06
2 »	3.1	1.93	3.2	1.99	3.0	1.86	3.1	1.93	3.2	1.99	3.3	2.05	2.5	1.55	2.5	1.55	2.4	1.49	2.5	1.55	2.5	1.55	2.6	1.61
3 »	3.8	2.36	3.8	2.36	3.7	2.30	3.8	2.36	3.9	2.42	4.0	2.48	3.0	1.86	3.1	1.93	2.9	1.80	3.0	1.86	3.1	1.93	3.2	1.99
4 »	5.7	3.54	5.8	3.60	5.5	3.42	5.7	3.54	5.8	3.60	6.0	3.73	4.6	2.86	4.6	2.86	4.4	2.73	4.6	2.86	4.6	2.86	4.8	2.98
1 Low normal	4.1	2.55	4.2	2.61	4.0	2.48	4.1	2.55	4.2	2.61	4.3	2.67	3.3	2.05	3.3	2.05	3.2	1.99	3.3	2.05	3.3	2.05	3.5	2.17
2 »	6.3	3.91	6.4	3.98	6.1	3.79	6.3	3.91	6.4	3.98	6.6	4.10	5.0	3.11	5.1	3.17	4.9	3.04	5.0	3.11	5.1	3.17	5.3	3.29
3 »	7.7	4.78	7.8	4.85	7.4	4.60	7.7	4.78	7.8	4.85	8.1	5.03	6.2	3.85	6.2	3.85	5.9	3.67	6.2	3.85	6.2	3.85	6.5	4.04
4 »	11.6	7.21	11.7	7.27	11.1	6.90	11.5	7.15	11.7	7.27	12.1	7.42	9.2	5.72	9.3	5.78	8.9	5.53	9.2	5.72	9.3	5.78	9.7	6.03
1 High normal	4.6	2.86	4.6	2.86	4.4	2.73	4.6	2.86	4.6	2.86	4.8	2.98	3.7	2.30	3.7	2.30	3.5	2.17	3.7	2.30	3.7	2.30	3.8	2.36
2 »	7.0	4.35	7.1	4.41	6.8	4.22	7.0	4.35	7.1	4.41	7.4	4.60	5.6	3.48	5.7	3.54	5.4	3.35	5.6	3.48	5.7	3.54	5.9	3.67
3 »	8.6	5.34	8.7	5.41	8.3	5.16	8.6	5.34	8.7	5.41	9.0	5.59	6.8	4.22	6.9	4.29	6.6	4.10	6.8	4.22	6.9	4.29	7.2	4.47
4 »	12.8	7.95	13.0	8.08	12.4	7.70	12.8	7.95	13.0	8.08	13.5	8.39	10.3	6.40	10.4	6.46	9.9	6.15	10.3	6.40	10.4	6.46	10.8	6.71
1 High	10.4	6.46	10.5	6.52	10.0	6.21	10.4	6.46	10.5	6.52	10.9	6.77	8.3	5.16	8.4	5.22	8.0	4.97	8.3	5.16	8.4	5.22	8.7	5.41
2 »	15.8	9.82	16.0	9.94	15.3	9.51	15.8	9.82	16.3	10.13	16.6	10.31	12.7	7.89	12.8	7.95	12.1	7.52	12.7	7.89	12.8	7.95	13.3	8.26
3 »	19.3	11.99	19.6	12.18	18.6	11.56	19.3	11.99	19.6	12.18	20.3	12.61	15.5	9.63	15.7	9.75	14.9	9.26	15.5	9.63	15.7	9.75	16.3	10.13
4 »	29.0	18.02	29.3	18.21	27.9	17.34	29.0	18.02	29.3	18.21	30.4	18.89	23.2	14.42	23.5	14.60	22.4	13.92	23.2	14.42	23.5	14.60	24.4	15.16

POWER TRAIN SCHEMATICS

160-90 Turbo with reverser-overlapping ratios



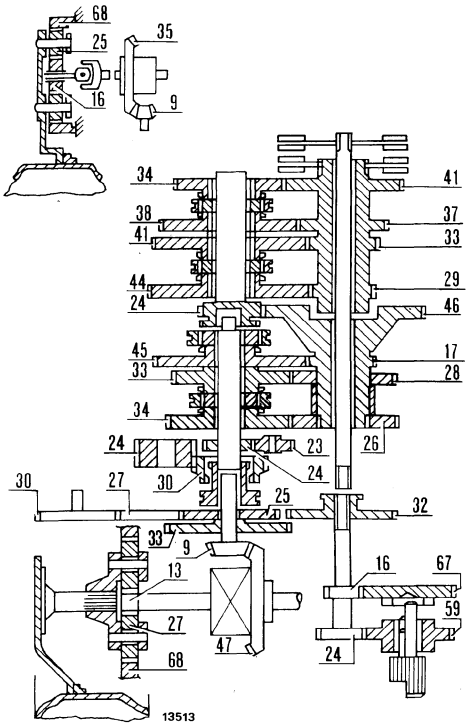
180-90 Turbo with reverser-overlapping ratios



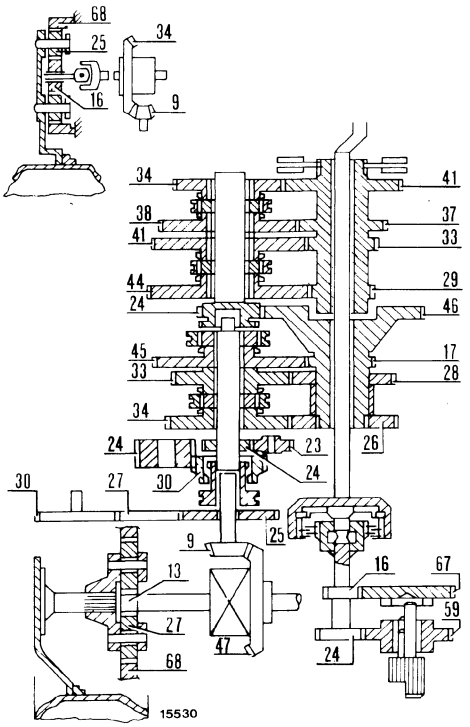
GEAR	Tractor speeds at maximum engine speed and with rear tyres:															
	FORWARD (overlapping ratios)								REVERSE (overlapping ratios)							
	160-90 Turbo						180-90 Turbo		160-90 Turbo						180-90 Turbo	
	18.4/15-38		23.1/18-34		20.8/38		20.8/38		18.4/15-38		23.1/18-34		20.8/38		20.8/38	
	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1 Low	2.1	1.30	2.1	1.30	2.2	1.37	2.2	1.37	1.6	0.99	1.7	1.06	1.7	1.06	1.7	1.06
2 »	3.1	1.93	3.2	1.99	3.3	2.05	3.3	2.05	2.5	1.55	2.5	1.55	2.6	1.61	2.6	1.61
3 »	3.8	2.36	3.9	2.42	4.0	2.48	4.0	2.48	3.1	1.93	3.1	1.93	3.2	1.99	3.2	1.99
4 »	5.8	3.60	5.8	3.60	6.1	3.79	6.1	3.79	4.6	2.86	4.7	2.92	4.8	2.98	4.8	2.98
1 Low normal	4.2	2.61	4.2	2.61	4.4	2.73	4.4	2.73	3.3	2.05	3.4	2.11	3.5	2.17	3.5	2.17
2 »	6.4	3.98	6.4	3.98	6.7	4.16	6.7	4.16	5.1	3.17	5.2	3.23	5.4	3.35	5.4	3.35
3 »	7.8	4.85	7.9	4.91	8.2	5.09	8.2	5.09	6.2	3.85	6.3	3.91	6.5	4.04	6.5	4.04
4 »	11.7	7.27	11.8	7.33	12.3	7.64	12.3	7.64	9.3	5.78	9.4	5.84	9.8	6.09	9.8	6.09
1 High normal	4.6	2.86	4.7	2.92	4.9	3.04	4.9	3.04	3.7	2.30	3.7	2.30	3.9	2.42	3.9	2.42
2 »	7.1	4.41	7.2	4.47	7.4	4.60	7.4	4.60	5.6	3.48	5.7	3.54	5.9	3.67	5.9	3.67
3 »	8.6	5.34	8.7	5.41	9.1	5.65	9.1	5.65	6.9	4.29	7.0	4.35	7.3	4.54	7.3	4.54
4 »	12.9	8.02	13.1	8.14	13.6	8.45	13.6	8.45	10.3	6.40	10.5	6.52	10.9	6.77	10.9	6.77
1 High	10.5	6.52	10.6	6.59	11.0	6.83	11.0	6.83	8.4	5.22	8.5	5.28	8.8	5.47	8.8	5.47
2 »	16.0	9.94	16.2	10.07	16.8	10.44	16.8	10.44	12.8	7.95	12.9	8.02	13.4	8.33	13.4	8.33
3 »	19.5	12.12	19.8	12.30	20.5	12.74	20.5	12.74	15.6	9.69	15.8	9.82	16.4	10.19	16.4	10.19
4 »	29.2	18.14	29.6	18.39	30.7	19.08	30.7	19.08	23.4	14.54	23.7	14.73	24.6	15.29	24.6	15.29

POWER TRAIN SCHEMATICS

115-90 with reverser-sequence ratios



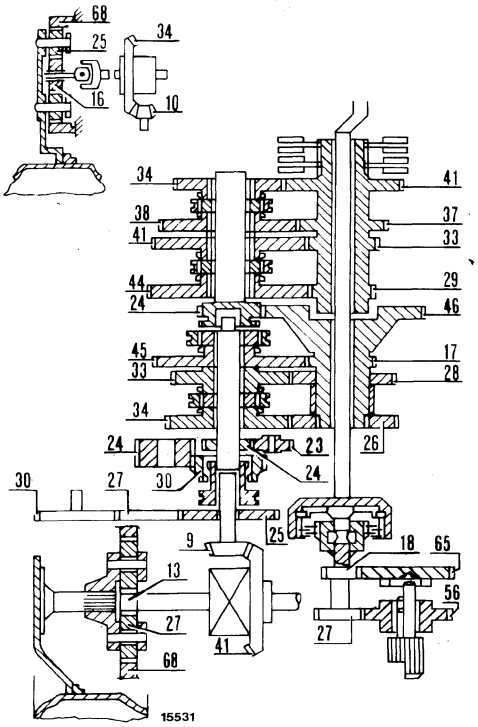
130-90 Turbo and 140-90 Turbo with reverser-sequence ratios



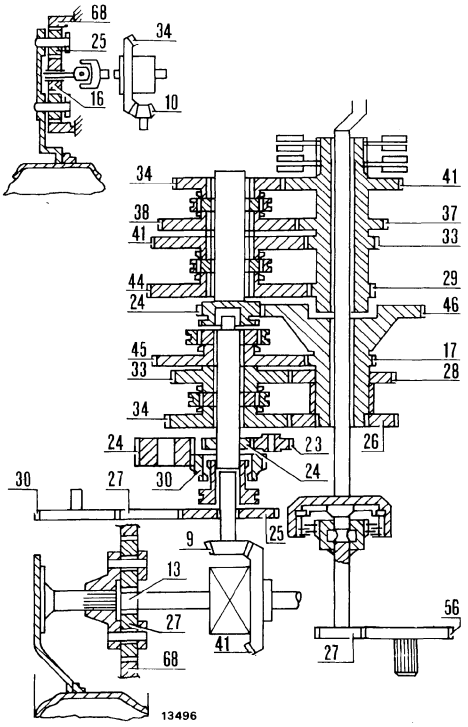
Tractor speeds at maximum engine speed and with rear tyres:																								
GEAR	FORWARD (sequence ratios)												REVERSE (sequence ratios)											
	115-90						130-90 Turbo 140-90 Turbo				140-90 Turbo		115-90						130-90 Turbo 140-90 Turbo				140-90 Turbo	
	18.4/15-38		23.1/18-34		16.9/14-38		18.4/15-38		23.1/18-34		20.8/38		18.4/15-38		23.1/18-34		16.9/14-38		18.4/15-38		23.1/18-34		20.8/38	
	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1 Low	3.1	1.93	3.2	1.99	3.0	1.86	3.1	1.93	3.2	1.99	3.3	2.05	2.5	1.55	2.5	1.55	2.4	1.49	2.5	1.55	2.5	1.55	2.6	1.61
2 »	3.8	2.36	3.8	2.36	3.7	2.30	3.8	2.36	3.8	2.36	4.0	2.48	3.0	1.86	3.1	1.93	2.9	1.80	3.0	1.86	3.1	1.93	3.2	1.99
3 »	4.6	2.86	4.7	2.92	4.4	2.73	4.6	2.73	4.7	2.92	4.8	2.98	3.7	2.30	3.7	2.30	3.6	2.24	3.7	2.30	3.7	2.30	3.9	2.42
4 »	5.7	3.54	5.8	3.60	5.5	3.42	5.7	3.54	5.8	3.60	6.0	3.73	4.6	2.86	4.6	2.86	4.4	2.73	4.6	2.86	4.6	2.86	4.8	2.98
1 Low normal	6.3	3.91	6.4	3.98	6.1	3.79	6.3	3.91	6.4	3.98	6.6	4.10	5.0	3.11	5.1	3.17	4.9	3.04	5.0	3.11	5.1	3.11	5.3	3.29
2 »	7.7	4.78	7.8	4.85	7.4	4.60	7.7	4.78	7.8	4.85	8.1	5.03	6.2	3.85	6.2	3.85	6.0	3.73	6.2	3.85	6.2	3.85	6.5	4.04
3 »	9.3	5.78	9.4	5.84	9.0	5.59	8.5	5.28	9.5	5.90	9.8	6.09	7.5	4.66	7.6	4.72	7.2	4.47	7.5	4.66	7.6	4.72	7.8	4.85
4 »	11.6	7.21	11.7	7.27	11.2	6.96	11.6	7.21	11.7	7.27	12.2	7.58	9.3	5.78	9.4	5.84	8.9	5.53	9.3	5.78	9.0	5.59	9.7	6.03
1 High normal	7.0	4.35	7.1	4.41	6.8	4.22	7.0	4.35	7.1	4.41	7.4	4.60	5.6	3.48	5.7	3.54	5.4	3.35	5.6	3.48	5.7	3.54	5.9	3.67
2 »	8.6	5.34	8.7	5.41	8.3	5.16	8.6	5.34	8.7	5.41	9.0	5.59	6.8	4.22	6.9	4.29	6.6	4.10	6.8	4.22	6.9	4.29	7.2	4.47
3 »	10.4	6.46	10.5	6.52	10.0	6.21	10.4	6.46	10.5	6.52	10.9	6.77	8.3	5.16	8.4	5.22	8.0	4.97	8.3	5.16	8.4	5.22	8.7	5.41
4 »	12.8	7.95	13.0	8.08	12.4	7.70	12.8	7.95	13.0	8.08	13.5	8.39	10.3	6.40	10.4	6.46	9.9	6.15	10.3	6.40	10.4	6.46	10.8	6.71
1 High	15.8	9.82	16.0	9.94	15.3	5.91	15.8	9.82	16.0	9.94	16.6	10.31	12.7	7.89	12.8	7.95	12.2	7.58	12.7	7.89	12.8	7.95	13.3	8.26
2 »	19.3	11.99	19.6	12.18	18.6	11.56	19.3	11.99	19.6	12.18	20.3	12.61	15.5	9.63	15.7	9.75	14.9	9.26	15.5	9.63	15.7	9.75	16.3	10.13
3 »	23.4	14.54	23.7	14.73	22.6	14.04	23.4	14.54	23.7	14.73	24.6	15.29	18.7	11.62	18.9	11.74	18.0	11.18	18.7	11.62	18.9	11.74	19.7	12.24
4 »	29.0	18.02	29.3	18.21	27.9	10.77	29.0	18.02	29.3	18.21	30.5	18.95	23.2	14.42	23.5	14.60	22.4	13.92	23.2	14.42	23.5	14.60	24.3	15.10

POWER TRAIN SCHEMATICS

160-90 Turbo with reverser-sequence ratios



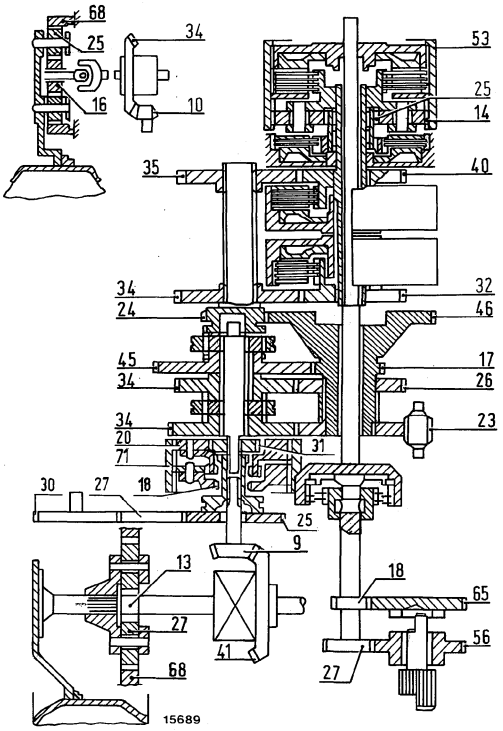
180-90 Turbo with reverser-sequence ratios



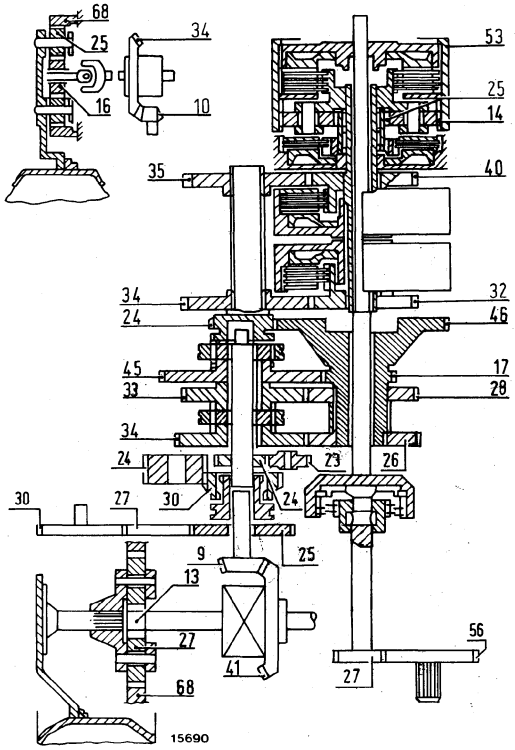
Tractor speeds at maximum engine speed and with rear tyres:																
GEAR	FORWARD (sequence ratios)								REVERSE (sequence ratios)							
	160-90 Turbo						180-90 Turbo		160-90 Turbo						180-90 Turbo	
	18.4/15-38		23.1/18-34		20.8/38		20.8/38		18.4/15-38		23.1/18-34		20.8/38		20.8/38	
	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1 Low	3.1	1.93	3.2	1.98	3.3	2.05	3.3	2.05	2.5	1.55	2.5	1.55	2.6	1.61	2.6	1.61
2 »	3.8	2.36	3.9	2.42	4.0	2.48	4.0	2.48	3.1	1.93	3.1	1.93	3.2	1.98	3.2	1.98
3 »	4.6	2.86	4.7	2.92	4.9	3.04	4.9	3.04	3.7	2.30	3.8	2.36	3.9	2.42	3.9	2.42
4 »	5.8	3.60	5.8	3.60	6.1	3.79	6.1	3.79	4.6	2.86	4.7	2.92	4.8	2.98	4.8	2.98
1 Low normal	6.4	3.98	6.4	3.98	6.7	4.16	6.7	4.16	5.1	3.17	5.2	3.23	5.4	3.35	5.4	3.35
2 »	7.8	4.85	7.9	4.91	8.2	5.09	8.2	5.09	6.2	3.85	6.3	3.91	6.5	4.04	6.5	4.04
3 »	9.4	5.84	9.5	5.90	9.9	6.15	9.9	6.15	7.5	4.66	7.6	4.72	7.9	4.91	7.9	4.91
4 »	11.7	7.27	11.8	7.33	12.3	7.64	12.3	7.64	9.3	5.78	9.4	5.84	9.8	6.09	9.8	6.09
1 High normal	7.1	4.41	7.2	4.47	7.4	4.60	7.4	4.60	5.7	3.54	5.7	3.54	5.9	3.67	5.9	3.67
2 »	8.6	5.34	8.7	5.41	9.1	5.65	9.1	5.65	6.9	4.29	7.0	4.35	7.3	4.54	7.3	4.54
3 »	10.5	6.52	10.6	6.59	11.0	6.83	11.0	6.83	8.4	5.22	8.5	5.28	8.8	5.47	8.8	5.47
4 »	13.0	8.08	13.1	8.14	13.6	8.45	13.6	8.45	10.4	6.46	10.5	6.52	10.9	6.77	10.9	6.77
1 High	16.0	9.94	16.2	10.07	16.8	10.44	16.8	10.44	12.5	7.78	12.6	7.83	13.1	8.14	13.1	8.14
2 »	19.5	12.12	19.8	12.30	20.5	12.74	20.5	12.74	15.6	9.69	15.8	9.82	16.4	10.19	16.4	10.19
3 »	23.6	14.67	23.9	14.85	24.8	15.41	24.8	15.41	18.9	11.74	19.1	11.87	19.8	12.30	19.8	12.30
4 »	29.2	18.14	29.6	18.39	30.7	19.08	30.7	19.08	23.4	14.54	23.7	14.73	24.6	15.29	24.6	15.29

POWER TRAIN SCHEMATICS

160-90 Turbo with POWER-SHIFT transmission (24 speed)



180-90 Turbo with POWER-SHIFT transmission and reverser



Tractor speeds at max. engine speed w/rear tyres:						
GEAR	160-90 Turbo				160-90 Turbo 180-90 Turbo	
	18.4/15-38		23.1/18-34		20.8/38	
	KPH	MPH	KPH	MPH	KPH	MPH
1 Low splitter	0.3	0.17	0.3	0.17	0.3	0.17
2 »	0.3	0.17	0.3	0.17	0.4	0.25
3 »	0.4	0.25	0.4	0.25	0.4	0.25
4 »	0.5	0.31	0.5	0.31	0.5	0.31
1 Normal splitter	0.6	0.37	0.6	0.37	0.6	0.37
2 »	0.7	0.43	0.7	0.43	0.7	0.43
3 »	0.8	0.50	0.8	0.50	0.9	0.56
4 »	1.0	0.62	1.0	0.62	1.1	0.68
1 High splitter	1.4	0.87	1.4	0.87	1.5	0.93
2 »	1.7	1.06	1.8	1.06	1.8	1.12
3 »	2.1	1.30	2.1	1.30	2.2	1.37
4 »	2.5	1.55	2.6	1.61	2.7	1.68
1 Low	3.0	1.86	3.1	1.93	3.2	1.98
2 »	3.7	2.30	3.7	2.30	3.9	2.42
3 »	4.5	2.77	4.5	2.77	4.7	2.92
4 »	5.4	3.35	5.5	3.42	5.7	3.54
1 Normal	6.2	3.85	6.2	3.85	6.5	4.04
2 »	7.5	4.66	7.6	4.72	7.9	4.91
3 »	9.1	5.65	9.2	5.72	9.6	5.96
4 »	11.0	6.83	11.1	6.90	11.6	7.21
1 High	15.5	9.63	15.6	9.69	16.3	10.13
2 »	18.8	11.68	19.0	11.81	19.8	12.30
3 »	22.8	14.17	23.0	14.29	24.0	14.21
4 »	27.7	17.21	27.9	17.34	29.1	18.08
1 Reverser splitter	0.5	0.31	0.5	0.31	0.5	0.31
2 »	0.6	0.37	0.6	0.37	0.7	0.43
3 »	0.8	0.50	0.8	0.50	0.8	0.50
4 »	0.9	0.56	0.9	0.56	1.0	0.62
1 Reverser	5.7	3.54	5.8	3.60	6.0	3.73
2 »	6.9	4.29	7.0	4.35	7.3	4.54
3 »	8.4	5.22	8.5	5.28	8.8	5.47
4 »	10.2	6.34	10.3	6.40	10.7	6.65

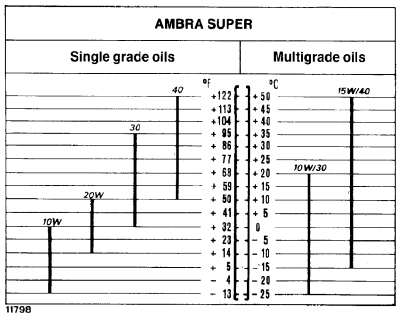
Tractor speeds at maximum engine speed with rear tyres:												
GEAR	FORWARD						REVERSE					
	160-90 Turbo				160-90 Turbo 180-90 Turbo		160-90 Turbo				160-90 Turbo 180-90 Turbo	
	18.4/15-38		23.1/18-34		20.8/38		18.4/15-38		23.1/18-34		20.8/38	
	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH	KPH	MPH
1 Low	3.0	1.86	3.1	1.93	3.2	1.98	2.4	1.49	2.5	1.55	2.6	1.61
2 »	3.7	2.30	3.7	2.30	3.9	2.42	3.0	1.86	3.0	1.86	3.1	1.93
3 »	4.5	2.77	4.5	2.77	4.7	2.92	3.6	2.24	3.6	2.24	3.8	2.36
4 »	5.4	3.35	5.5	3.42	5.7	3.54	4.4	2.73	4.4	2.73	4.6	2.86
1 Low normal	6.2	3.85	6.2	3.85	6.5	4.04	4.9	3.04	5.0	3.11	5.2	3.23
2 »	7.5	4.66	7.6	4.72	7.9	4.91	6.0	3.73	6.0	3.73	6.3	3.91
3 »	9.1	5.65	9.2	5.72	9.6	5.96	7.3	4.54	7.3	4.54	7.6	4.72
4 »	11.0	6.83	11.1	6.90	11.6	7.21	8.8	5.47	8.9	5.53	9.3	5.78
1 High normal	6.8	4.22	6.9	4.29	7.2	4.47	5.5	3.42	5.5	3.42	5.8	3.60
2 »	8.3	5.16	8.4	5.22	8.8	5.47	6.6	4.10	6.7	4.16	7.0	4.35
3 »	10.1	6.28	10.2	6.34	10.6	6.59	8.1	5.03	8.1	5.03	8.5	5.28
4 »	12.2	7.58	12.4	7.70	12.9	8.02	9.8	6.09	9.9	6.15	10.3	6.40
1 High	15.5	9.63	15.6	9.69	16.3	10.13	12.4	7.70	12.5	7.77	13.0	8.08
2 »	18.8	11.68	19.0	11.80	19.8	12.30	15.0	9.32	15.2	9.44	15.8	9.82
3 »	22.8	14.17	23.0	14.29	24.0	14.91	18.2	11.31	18.4	11.43	19.2	11.93
4 »	27.7	17.21	27.9	17.34	29.1	18.08	26.5	16.47	26.7	16.59	27.9	17.34

CAPACITIES

DESCRIPTION	LUBRICANTS																
	FIAT RECOMMENDED PRODUCT	115-90			130-90 Turbo			140-90 Turbo			160-90 Turbo			180-90 Turbo			INTERNATIONAL DESIGNATION
		litres	pints	kg	litres	pints	kg	litres	pints	kg	litres	pints	kg	litres	pints	kg	
Sump and filter oil	**Oliofiat AMBRA SUPER**	15.2	26¾	13.7	15.2	26¾	13.7	15.2	26¾	13.7	18.3	32¼	16.5	18.3	32¼	16.5	Diesel engine oil to MIL-L-2104D and API CD service
Sump oil		13,3	23½	12	13.3	23½	12	13.3	21¼	12	16.6	29¼	15	16.6	29¼	15	
Sensing bar support oil	**Oliofiat TUTELA MULTI F**	1.2	2	1.1	1.2	2	1.1	1.2	2.1	1.1	1.2	2	1.1	1.2	2	1.1	Transmission, drive train, oil-bath brakes and lift oil to Massey Ferguson MF1135 and Ford M2C 86A
Transmission oil (standard shift)		18.3	32¼	16.5	18.3	32¼	16.5	18.3	32.2	16.5	21.1	37	19	21.1	37	19	
Live front axle oil:																	
— axle casing		10.8	19	9.7	10.8	19	9.7	10.8	19	9.7	10.8	19	9.7	10.8	19	9.7	
— final drives (each)		2.1	3¾	1.9	2.1	3¾	1.9	2.1	3.7	1.9	2.1	3¾	1.9	2.1	3¾	1.9	
Rear transmission (bevel drive, final drives, brakes) and lift oil:																	
— 2-wheel drive		54.2(2)	95½	48.8(2)	56.5	99½	50.8	56.5	99½	50.8	56.5	99½	50.8	57.6	101½	51.8	
— 4-wheel drive		55.5(3)	97¾	50 (3)	58.9	103¾	53	58.9	103¾	53	59.5	104¾	53.5	60.6	106¾	54.5	
POWER-SHIFT Transmission oil	**Oliofiat TUTELA GI/M**	—	—	—	—	—	—	—	—	—	27.8	48	25	27.8	48	25	Red, high viscosity oil, class "A.T.F. - Type A - Suffix A"
Brake fluid	**Oliofiat AMBRA SUPER 10 W**	0.48	¾	0.45	0.48	¾	0.45	0.48	¾	0.45	0.48	¾	0.45	0.48	¾	0.45	MIL-L-2104D and API CD - SAE 10W oil
Clutch fluid		0.37	¾	0.35	0.37	¾	0.35	0.37	¾	0.35	0.37	¾	0.35	0.37	¾	0.35	
Front hub grease	**Oliofiat TUTELA G9**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Lithium-calcium grease to NLGI2
Lubricator grease		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Coolant (incl. expansion tank):																	
— without cab	Water and **FIAT "PARAFLU 11"**	17	30	—	17	30	—	17	30	—	27	47½	—	27	47½	—	
— with cab		19	33½	—	19	33½	—	19	33½	—	28.5	50¼	—	28.5	50¼	—	
Windshield washer fluid	Water and **FIAT "DP1"** (1)	2	3½	—	2	3½	—	2	3½	—	2	3⅓	—	2	3½	—	
Fuel (diesel oil):																	
— Main tank	Diesel oil	180	317	—	180	317	—	180	317	—	180	317	—	180	317	—	
— Auxiliary tank		100	176	—	100	176	—	100	176	—	100	176	—	100	176	—	

(1) Detergent fluid effective down to −10°C in 50-50 mixture. For temperatures below −10°C use DP1 without water.
(2) For rear hydraulic differential lock increase normal capacity by .5 kg (.55 dm³ or 1 Pint).
(3) For front and rear hydraulic differential lock increase normal capacity by 1.5 kg (1.7 dm³ or 2½ Pint).

SAE VISCOSITY OF OIL IN RELATION TO OUTDOOR TEMPERATURE



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