

WINGET

OPERATING INSTRUCTIONS & SPARE PARTS LIST

4FL5000 FORKLIFT

(CAPACITY 2270Kg)

**ISSUED JUNE 1977
REVISED MARCH 1980**

REPRINTED OCTOBER 2002

**WINGET LIMITED
PO BOX 41
EDGEFOLD INDUSTRIAL ESTATE
PLODDER LANE
BOLTON
LANCS
BL4 OLS**

TEL: ++ 44 (0) 1204 854650

FAX: ++ 44 (0) 1204 854663

service@winget.co.uk

parts@winget.co.uk

www.winget.co.uk

INTRODUCTION

This Parts & Operators Manual is a re-print of the manual last published in 1980 and contains some amended part numbers.

Note: This manual is applicable to machines with Serial Numbers from and including 4FL5000-503.

Health & Safety legislation and working practices applicable to Forklift Trucks, both 2 and 4 wheel Drive, Rigid Chassis and Articulated Chassis have changed considerably in the years since this manual was last published. We would recommend that only trained operators who are in possession of the relevant certification issued by a recognised Training Authority be allowed to operate this equipment.

Reference is made on a number of pages to 'bolt c/w nut and washer', this no longer the case, fixings such as nuts, bolts, screws and washers should be ordered as individual items. A number of Whitworth and B.S.F fixings are now no longer available, in these cases the nearest metric equivalent size will be supplied.

The contents of this manual although correct at the time of publication, may be subject to alteration by the manufacturers without notice and Winget Limited can accept no responsibility for any errors or omissions contained within the following pages. Nor can we accept any liability whatsoever arising from the use of this manual howsoever caused.

Winget Limited operate a policy of continuous product development. Therefore, some illustrations or text within this publication may differ from your machine.

WINGET LIMITED
PO BOX 41
EDGEFOLD INDUSTRIAL ESTATE
PLODDER LANE
BOLTON
LANCS
BL4 OLS
TEL ++ 44 (0) 1204 854650
FAX ++ 44 (0) 1204 854663
E mail service@winget.co.uk
parts@winget.co.uk
www.winget.co.uk

SPECIFICATION

(For machine fitted with 18 ft. (5.5m) lift duplex mast)

A.	OVERALL HEIGHT (MAST CLOSED AND RAKED BACK)	147"	(3734mm)
B.	OVERALL LENGTH (MINUS FORKS)	158"	(4013mm)
C.	WHEELBASE	84"	(2134mm)
D.	LENGTH FROM FRONT AXLE TO REAR OF FORKS	25½"	(648mm)
E.	LOAD CENTRE	24"	(610mm)
F.	FORK LENGTH	48"	(1219mm)
G.	OVERALL HEIGHT (FORKS LOWERED)	146"	(3708mm)
H.	FORK CENTRES	MAX. 53"	(1346mm)
		MIN. 4"	(102mm)
J.	WHEELTRACK	68"	(1727mm)
K.	OVERALL WIDTH	82"	(2083mm)
	MAXIMUM LOAD AT 2' 0" (609 mm) LOAD CENTRE	5000 lb.	(2270 kg)
	TOTAL LIFT OF FORKS ABOVE GROUND LEVEL	216"	(5486mm)
	MIN. GROUND CLEARANCE	12"	(305 mm)
	TURNING CIRCLE (OUTSIDE DIA.)	342"	(8687mm)
	UNLADEN WEIGHT	11,662 lb	(5294 kg)
	HYDRAULIC RELIEF VALVE PRESSURE	1750 p.s.i.	(123 kg.cm)
	REAR AXLE ARTICULATION	8"	(204 mm)
	LIFTING TIME, LOADED	25 SEC.	43.2 ft/min. 0.219 m/sec.
	LOWERING TIME, LOADED	33 SEC.	32.7 ft/min. 0.166 m/sec.

ROAD SPEED. MAXIMUM IN:

1st	1.93 mph	3.10 kph
2nd	3.04 mph	4.89 kph
3rd	4.86 mph	7.82 kph
4th	7.58 mph	12.19 kph
5th	12.14 mph	19.53 kph

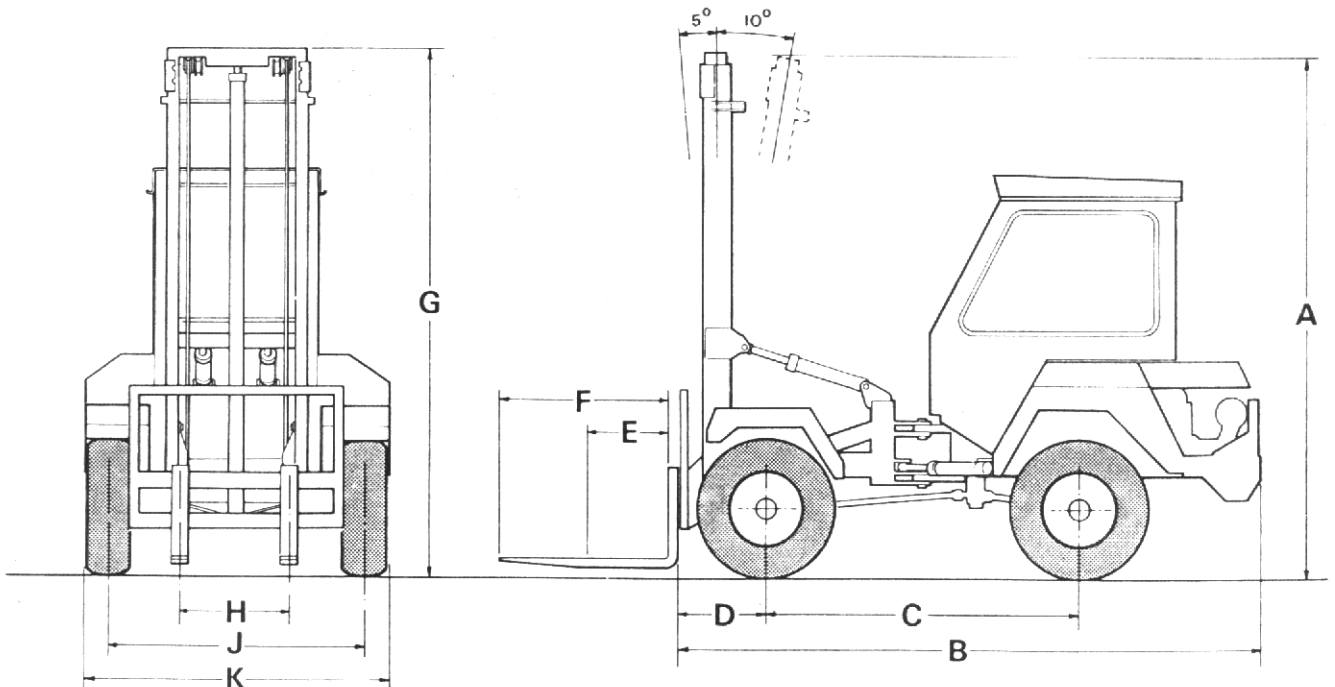
(all speeds similar in reverse)

Capacities

Engine	22 pts. (12.5 litres)	Hydraulic Oil Tank	20 gal. (91. litres)
Gearbox	10 pts. (5.7 litres)	Fuel Tank	20 gal. (91. litres)
Axle.....	16 pts (9.1 litres)	Transfer Case	1¼ pts. (.71 litres)

Load Moment

257500 lb. in (29094 Nm)



tp 219

FIG. I

PREPARATION FOR USE

BEFORE THE 4FL5000 IS PUT INTO SERVICE, ALWAYS CHECK THE FOLLOWING POINTS:—

Engine

Check the oil level on the dipstick topping up if necessary to the full mark.

Gearbox

Check the oil level on the dipstick topping up if necessary to the full mark.

Drive Axles

Remove filler/level plugs on front and rear Axles and check that oil is up to bottom of hole, top up if necessary.

Transfer Case

Remove filler/level plug and check oil is up to bottom of hole, top up if necessary.

Fuel Tank

Fill tank with diesel oil until approximately 1" from the top.

NOTE: Never allow fuel level to fall to below 2" deep in the bottom of the tank.

Hydraulic Tank

Fill the hydraulic tank. Before removing the cap, clean the surrounding area, to prevent the possible entry of foreign matter. DO NOT MIX OILS.

Brake System

Ensure that both brake master cylinder reservoirs are full of brake fluid. Top up if necessary, to within ¼" of the top of the reservoirs. Use only Brake fluid that conforms to B.S. SAE J 1703.

Level Indicator

With machine on level ground check that the level in both limbs of the level indicator are correct.

Battery

Check electrolyte levels. Top up if necessary.

Tyres

Check tyre pressure (55 lb/in²)

Miscellaneous

Check all wheel nuts for tightness

Check all nuts and bolts for tightness. Loose nuts and bolts may lead to damage not covered by the Warranty.

For further information on Lubrication See 'Maintenance' on page (8) and the 'Recommended Lubricant Chart on page (11).

INSTRUMENTS, CONTROLS AND SWITCHES

Ammeter

Indicates battery charge or discharge

Direction Indicator Warning Light (if fitted)

When direction indicators are in use the light in the centre of the switch flashes.

Load Indicator Gauge

The load indicator gauge senses the increase in the lift cylinder pressure due to the load. It has been zeroed with the unladen carriage and forks raised. To obtain an accurate indication of the load, the loaded forks should be raised at least 200 mm (8") then lowered fractionally 10mm (3/8"), before noting the gauge reading.

The maximum permitted load is indicated on the gauge scale.

Fuel Sight Gauge

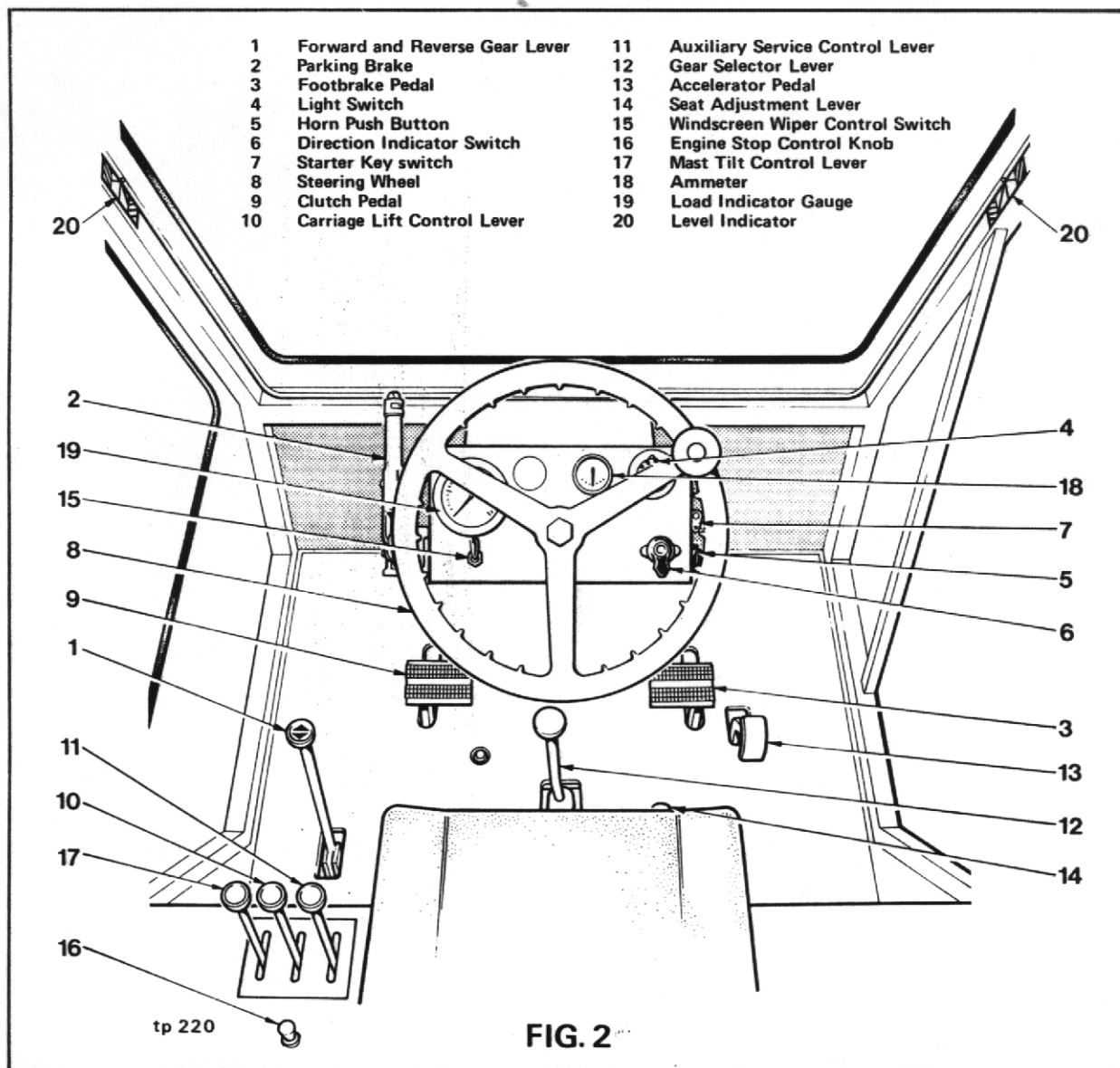
Gauge situated on rear end of Fuel Tank.

Hydraulic Oil Sight Gauge

Gauge situated on rear end of Hydraulic tank.

Level Indicator

The level indicator shows the lateral angle of the ground on which the machine is standing. If the ground angle is steeper than the safe limit indicated on the scale (8° , or 1 in 7) the load should NOT be raised.



OPERATION

Starting

1. Insert the ignition key in the isolating switch and turn clockwise.
2. Turn key further clockwise against spring tension. DO NOT operate starter motor for more than 20 seconds at a time.
3. Where the ambient temperature is 5°F (-15°C) or below, a cold starting aid should be fitted, after consultation with the Engine Manufacturer or Agent.

Stopping

Pull the engine stop control knob, positioned to the left of the operator's seat, until the engine stops.

Gear Shift and Fwd/Rev Range Levers

1. The 4FL5000 is fitted with five gears and a forward/Reverse selector, giving a total of 5 forward and 5 reverse gears.
2. When changing gear in either the forward or the reverse range, the clutch pedal is used in the normal manner.
3. When changing from the fwd. range to the rev. range or vice versa always bring the machine to a stop.
 - a) Bring the machine to a stop using the brake.
 - b) **Depress Clutch pedal.**
 - c) Move the Forward/Reverse lever to the required range.
 - d) Proceed in the new range.

Hydraulic Controls

There are two functions on the standard machine; to raise and lower the fork carriage and to tilt the mast backward and forward.

Each lever is spring biased to the centre (neutral position) and can be moved either side of this position.

Each control lever may be used to vary the speed of the function by operating to allow partial opening of the valve; further control is available by varying the engine speed.

Travelling with Load

The machine should NOT be driven with the load elevated, it should normally be carried with the forks at a height of approximately 400 mm (16") and with the mast tilted fully backwards. If site or load conditions make this operation impossible and the load must be carried higher, the machine should be moved only with extreme caution.

MAINTENANCE

Periodic Maintenance

DAILY (OR EVERY 10 HRS.)

Check engine oil level and fill to full mark on dipstick, if necessary.

Fill fuel tank, or as often as proves necessary to approximately 1" of top. Never allow there to be a depth of less than 2" of fuel in tank.

WEEKLY (OR EVERY 50 HRS.)

Check oil level in the gearbox and fill to full mark on the dipstick if necessary.

Check oil level in the hydraulic tank. Check level only when forks are lowered. Always clean the surrounding area before removing the cap to prevent the possible entry of foreign matter. Fill tank if necessary.

Check brake fluid level in the master cylinder reservoirs and top up if necessary, to within ¼" of the top.

Remove oil level/filler plugs from drive axles and transfer case. Oil levels should be to bottom of holes. Top up if necessary.

Liberally apply grease between the outer and inner frames of the mast assembly.

(For clarification see items A and B in Fig. 6). Use Mobilgrease Special or Shell Alvania 2 with M.O.S. — N.B. This lubrication applies to sliding masts only.

Apply grease to all grease nipples.

Check tyre pressure 55 lb/in²

Check electrolyte levels in the Battery.

Check all wheel nuts and tighten, if necessary.

Lubricate lift chains with aerosol lubricant-Acheson 'HI LOAD forklift chain lubricant' or equivalent.

FREQUENTLY

Check all nuts and bolts and tighten if necessary.

FOR COMPLETE ENGINE MAINTENANCE INSTRUCTIONS REFER TO ENGINE MANUFACTURERS HANDBOOK.

Brake System

The brake system is designed to require the minimum of maintenance, and, providing hydraulic fluid in the reservoirs is not allowed to fall below the recommended level, no defects should normally occur. Fluid loss must be supplemented by topping up the reservoirs with Brake fluid that conforms to B.S. SAE J 1703. If air is present in the system, it will be indicated by sluggish response of the brakes and by spongy action of the brake pedal. This may be due to air being introduced at a loose joint or by the reservoir fluid not being maintained at the correct level. These defects must be remedied immediately and the complete system bled.

To bleed the system proceed as follows:

(See Fig. 3)

1. Check that all connections are tight and both bleed screws are closed.
2. Fill the reservoirs with Brake fluid.
3. Attach bleeder tube (A) to one of the bleed screws (B) and immerse the other end in a small quantity of brake fluid contained in a glass jar (C). Slacken the bleed screw and operate the brake pedal up and down through its full stroke until the fluid pumped into the jar contains no air bubbles. Hold down the pedal and close the bleed screw. Remove bleeder tube and release the pedal.
4. Repeat on the other bleed screw for the other axle.
5. Continue until all air has been bled from the system.
6. Lock both bleed screws and top up the reservoirs to the correct level.
7. Apply normal working load on the brake pedal for two or three minutes and examine the entire system for leaks.

NOTE: During the entire operation it is essential that the reservoir levels are kept topped up to prevent further air from being drawn into the system. Only use new fluid for topping up.

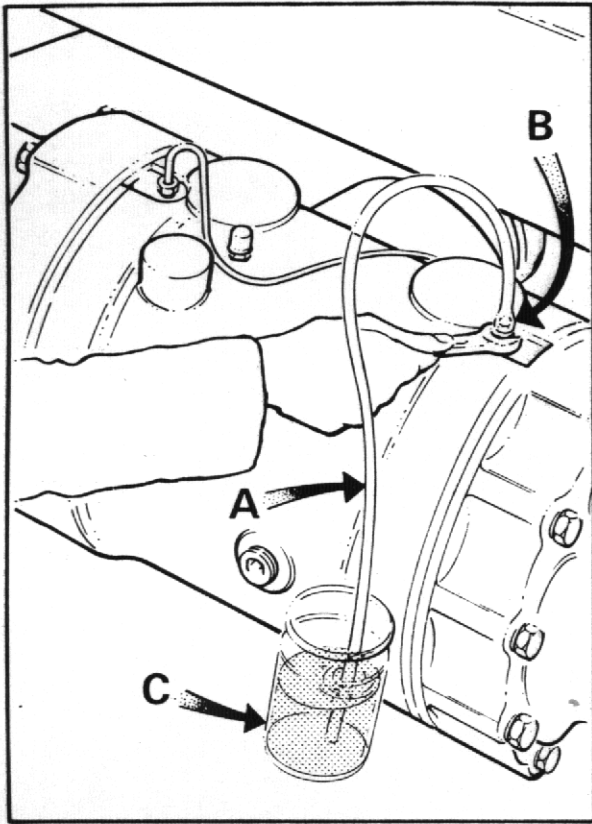


FIG. 3

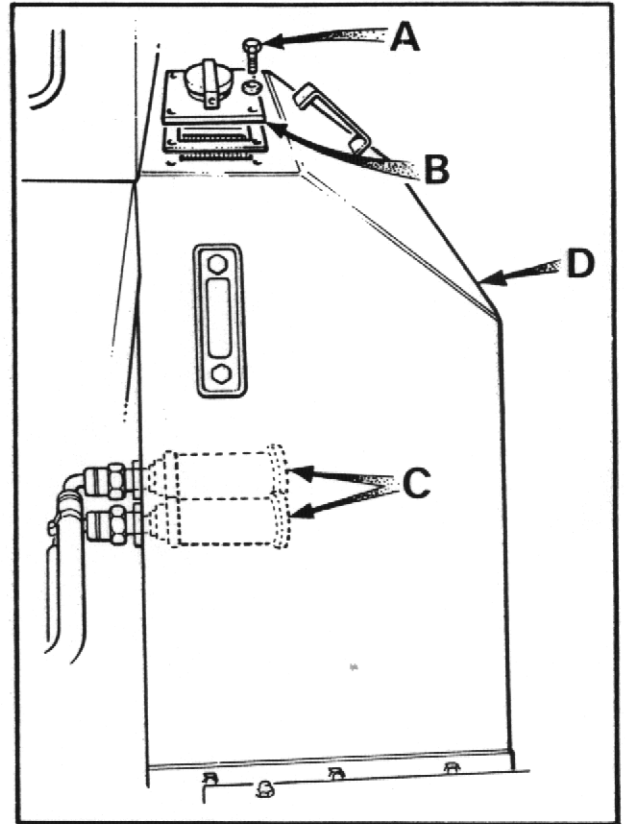


FIG. 4

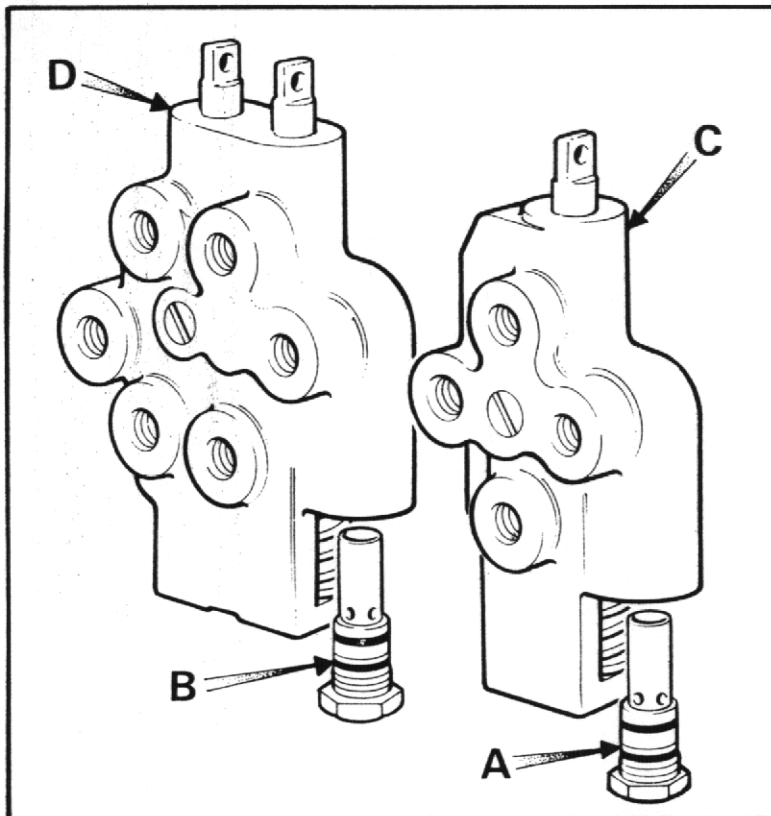


FIG. 5

Main Hydraulic System

The main hydraulic system includes a tandem pump, the output from the two halves of which remain separate. One pump supplies the lift system alone, the other pump supplies the tilt system, the steering system and any other hydraulically operated attachment that might be fitted. If the system fails to operate or does so extremely slowly, carry out the following procedure until the fault is rectified.

1. Check that hydraulic tank is full of oil.
 2. Check that neither hydraulic filter is blocked (See Fig. 4)
 - a) Remove the four setscrews (A) that secure the filler cap assembly (B) and remove assembly.
 - b) Unscrew suction filters (C) from inside tank (D) and wash in white spirit. Dry with moisture-free compressed air.
 - c) Replace suction filters and filler cap assembly.
- NOTE: If either suction filter cannot be thoroughly cleaned, fit a new one.
3. Check that hydraulic pressure is correct in lift system.
 - a) Fit a 3000 lb/in² gauge into the line at the base of the lift cylinder.
 - b) Operate control lever to lift to full height, check that the reading on the pressure gauge is 2000 lb/in²* when lift ram is fully extended and the relief valve (A) Fig. 5 is 'blowing'.
* 2500 lb/in² Triplex mast only
 4. Check that hydraulic pressure is correct in tilt system.
 - a) Fit a 3000 lb/in² gauge into the line at the forward end of either tilt cylinder.
 - b) Operate control lever to tilt mast back and check that pressure reading on gauge is 2000 lb/in² when ram is fully retracted and relief valve (B) Fig. 5 is 'blowing'.

NOTE: If correct pressure is not attained:

5. Remove relief valve cartridge (A) Fig. 5 for lift system or (B) for tilt system (hexagon head) from bottom of control valve (C) or (D) (see fig. 5) and replace with a new one.
6. If, after following this procedure, a fault persists on the forward tilt function only, remove the tilt control valve and fit a new one. (Item 5 Hydraulic Pipes & Fittings, page 46)

If none of these procedures correct the fault, contact your Winget agent. Periodically check the hose between the pump and the tank to ensure it is not deformed. Any deformation in the hose may result in a restricted flow of fluid and damage to the pump.

IMPORTANT:— ON NO ACCOUNT SHOULD THE STEERING VALVE BE DISMANTLED, SHOULD IT REQUIRE ATTENTION REMOVE IT COMPLETE AND RETURN TO THE FACTORY.

Mast Maintenance (For 'Sliding' masts only) (See Fig. 6)

1. PERIODICALLY adjust fork lift chains to keep fork mounting frame level.
2. PERIODICALLY check shims between bottom wear strip (C) and inner frame assembly (B). When wear has occurred fit additional shims (D) as necessary to maintain about 1/16" clearance, at gap (E), when the mast is lowered — check the gap through the full extension of the mast.

NOTE:— With mast fully lowered the bottom wear strip is accessible beneath the machine frame.

3. PERIODICALLY fully raise the inner mast and check the wear strip and block on the channel. at the top of the outer frame (A). If wear has occurred, fit additional shims (F) as necessary behind the wearstrip mounting block assembly (G) to maintain 1/16" clearance at gap (H) when mast is lowered, check gap through full extension of mast.

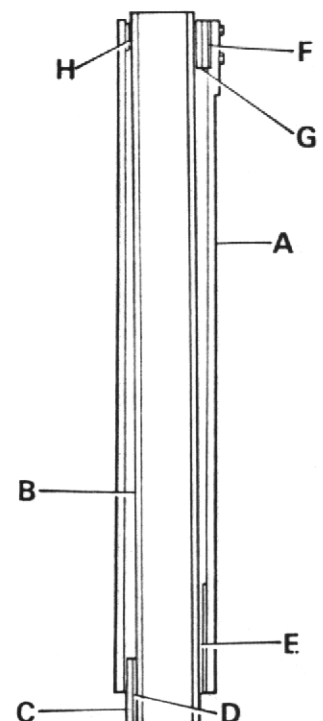


FIG. 6

RECOMMENDED LUBRICATING OILS

COMPANY	ENGINE	DRIVE AXLE	TRANSFER BOX	GEARBOX	WHEEL BEARINGS & OTHER GREASE POINTS	HYDRAULIC SYSTEM
(U.K.) ESSO (Overseas)	ESSOLUBE HDX 20W ESSOLUBE HDX 30 ESSOLUBE HDX 20W ESSOLUBE HDX 10W	TORQUE FLUID 62	GEAR OIL GP 90/140 GEAR OIL GP 140 GEAR OIL GX 85W-140 GEAR OIL GP 80W	ESSOLUBE HDX 30 ESSOLUBE HDX 30	BEACON 2 BEACON 2	NUTO H32 NUTO H68 NUTO H32 NUTO H22
(U.K.) CASTROL (Overseas)	DEUSOL CRI 20 DEUSOL CRI 30 DEUSOL CRI 20 DEUSOL CRI 10		DEUSOL EP 90 DEUSOL GEAR EP 140 DEUSOL GEAR EP 90 DEUSOL GEAR EP 80	DEUSOL CRI 30 DEUSOL CRI 30	CASTROL SPHEEROL APT 2 CASTROL SPHEEROL APT 2	CASTROL HYSPIN AWS 32
(U.K.) SHELL (Overseas)	ROTELLA SX OIL 20/20W ROTELLA SX OIL 30 ROTELLA SX OIL 20/20W ROTELLA SX OIL 10W		SPIRAX 90 EP SPIRAX 140 EP SPIRAX 90 EP SPIRAX 80 EP	ROTELLA SX OIL 30 ROTELLA SX OIL 30	RETINAX A RETINAX A	TELLUS OIL 27
(U.K.) BP (Overseas)	VANELLUS 20 VANELLUS 30 VANELLUS 20 VANELLUS 10W		GEAR OIL SAE 90 EP GEAR OIL SAE 140 EP GEAR OIL SAE 90 EP GEAR OIL SAE 80 EP	VANELLUS 30 VANELLUS 30	ENERGREASE L2 ENERGREASE L2	ENERGOL HLP 65
(U.K.) MOBIL (Overseas)	DELVAC 1220 DELVAC 1230 DELVAC 1220 DELVAC 1210 DELVAC SPECIAL 10W-30		MOBILUBE HD 90 MOBILUBE GX 90 MOBILUBE HD 140 MOBILUBE GX 140 MOBILUBE HD 90 MOBILUBE GX 90 MOBILUBE HD 80 MOBILUBE GX 80	DELVAC 1230 DELVAC 1230	MOBILGREASE MP MOBILGREASE SUPER	DTE 24
(U.K.) WALKERS CENTURY (Overseas)	CENTLUBE HD 20 CENTLUBE HD 30 CENTLUBE HD 20 CENTLUBE HD 10		CENTURY EP 90 CENTURY EP 140 CENTURY EP 90 CENTURY EP 80	CENTLUBE HD 30 CENTLUBE HD 30	REGULUS A2 REGULUS A2	CENTURY PWL A HYD. OIL CENTURY PWL A HYD. OIL

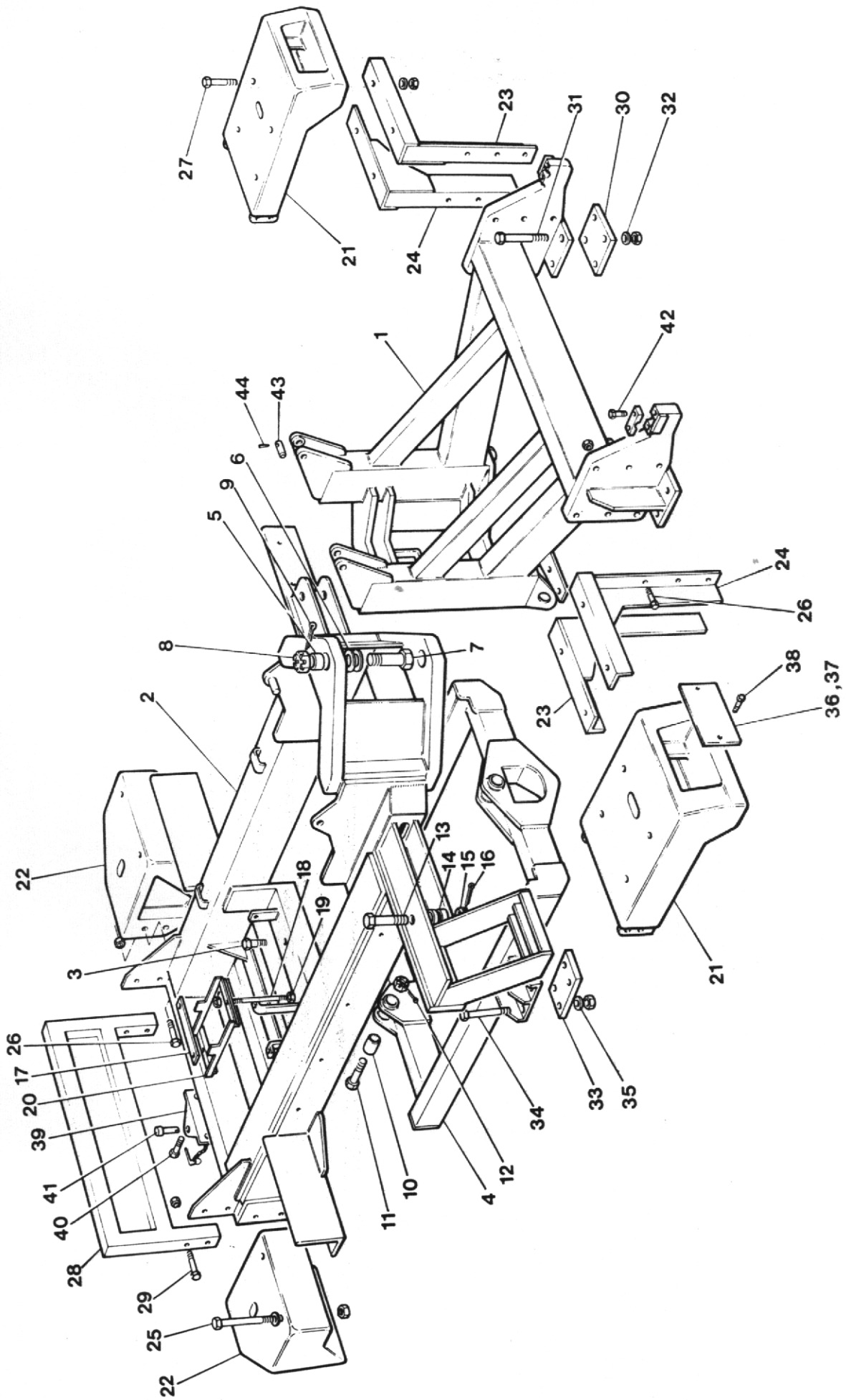
IN THE UNLIKELY EVENT OF THE ABOVE OILS NOT BEING AVAILABLE
EQUIVALENT OILS SUPPLIED BY A REPUTABLE MANUFACTURER MAY BE USED.

FORKLIFT SAFETY

1. This machine should be operated only by drivers who have been suitably trained.
2. Drivers should be aware of the load and stability limitations of the machine.
3. Drivers should be aware of the weight of the loads they are carrying and also of variations in those loads (e.g. wet or dry weight).
4. Drivers should take account of ground conditions which may affect stability.
5. Drivers must ensure that the intended load is in a safe condition to lift, e.g. loose bricks, banded pallets etc.
6. Do not allow anyone to stand or pass under the elevated part of any machine, whether loaded or empty.
7. Do not carry passengers.
8. Always set parking brake when loading or unloading.
9. Maintain specified tyre pressure at all times. Do not alter tyre pressures to suit ground conditions.
10. Be sure of sufficient headroom under overhead installations; lights, pipes, wiring etc.
11. Travel with load or load engaging forks low and where possible, tilted back. Do not Elevate the load except during stacking. If load and/or site conditions make this impossible (e.g. wide load and ground level obstructions) the machine should be moved only with extreme caution.
12. Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without the manufacturer's prior written approval.
13. Front end attachments other than those supplied as original equipment shall only be used with the manufacturer's prior written approval.
14. Never dismount while the machine is in motion.
15. Never start the engine from any position other than sitting in the driving seat.
16. Never drive the machine too close to the edge of any excavation, especially if the ground is loose or wet.
17. Never make any adjustments to the machine while it is in motion.
18. Never run the engine in a closed building or allow the exhaust pipe near to inflammable material.
19. Never fill the fuel tank with the engine running. Exercise caution when the engine is hot.
20. Always keep the floor plates clean.
21. If any part of the lifting chain or its attachments are replaced, the purchaser or user of the vehicle must have the complete lifting device re-certificated by a recognised authority.

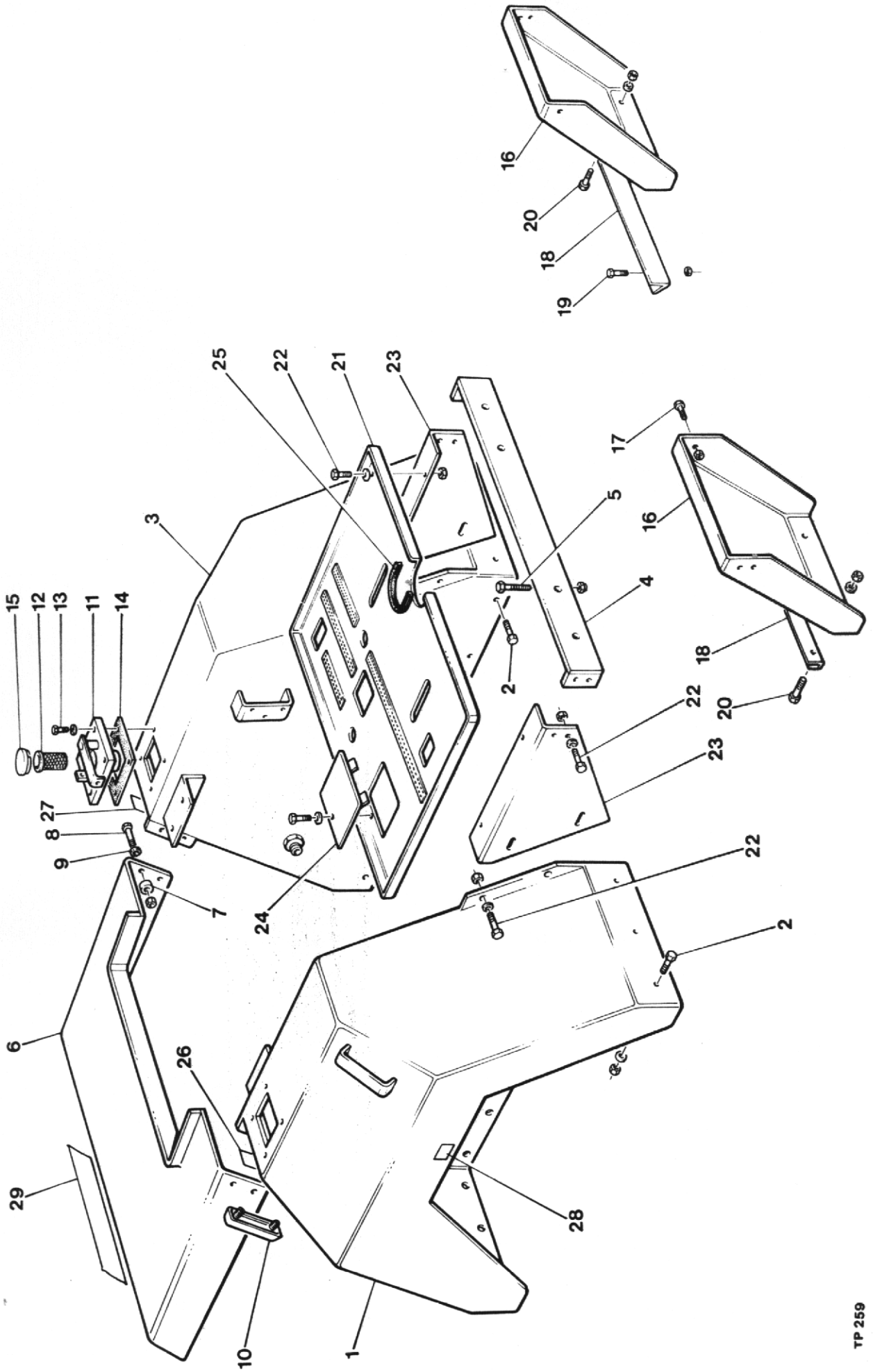
SPARE PARTS SECTION

	Page
CHASSIS	14, 15
MUDWINGS & COVERS	16, 17
CAB & SAFETY FRAME	18, 19
CONSOLE & INSTRUMENTS	20, 21
MAST, CARRIAGE & FORKS	22, 23
CLUTCH.....	24
PROP SHAFTS	25
GEARBOX – CASING	26, 27
GEARBOX – SELECTOR & GEARS	28–31
TRANSFER CASE	32, 33
DRIVE AXLE	34–37
PEDALS & CONTROLS	38, 39
BRAKE PIPES & FITTINGS	40, 41
BRAKE MASTER CYLINDER	42
WHEELS & TYRES	43
HANDBRAKE	44, 45
HYDRAULIC PIPES & FITTINGS	46, 47
HYDRAULIC CONTROL VALVE (DOUBLE SPOOL)	48, 49
HYDRAULIC CONTROL VALVE (SINGLE SPOOL)	50, 51
LIFT RAM	52
TILT RAM	53
STEERING RAM	54
AIR OUTLET DUCT	55
AIR CLEANER & EXHAUST	56
WIRING DIAGRAM	57
ELECTRICS	58, 59
18FT. TRIPLEX MAST	60, 61
21FT. TRIPLEX MAST	62, 63
STANDARD CARRIAGE & FORKS	64, 65



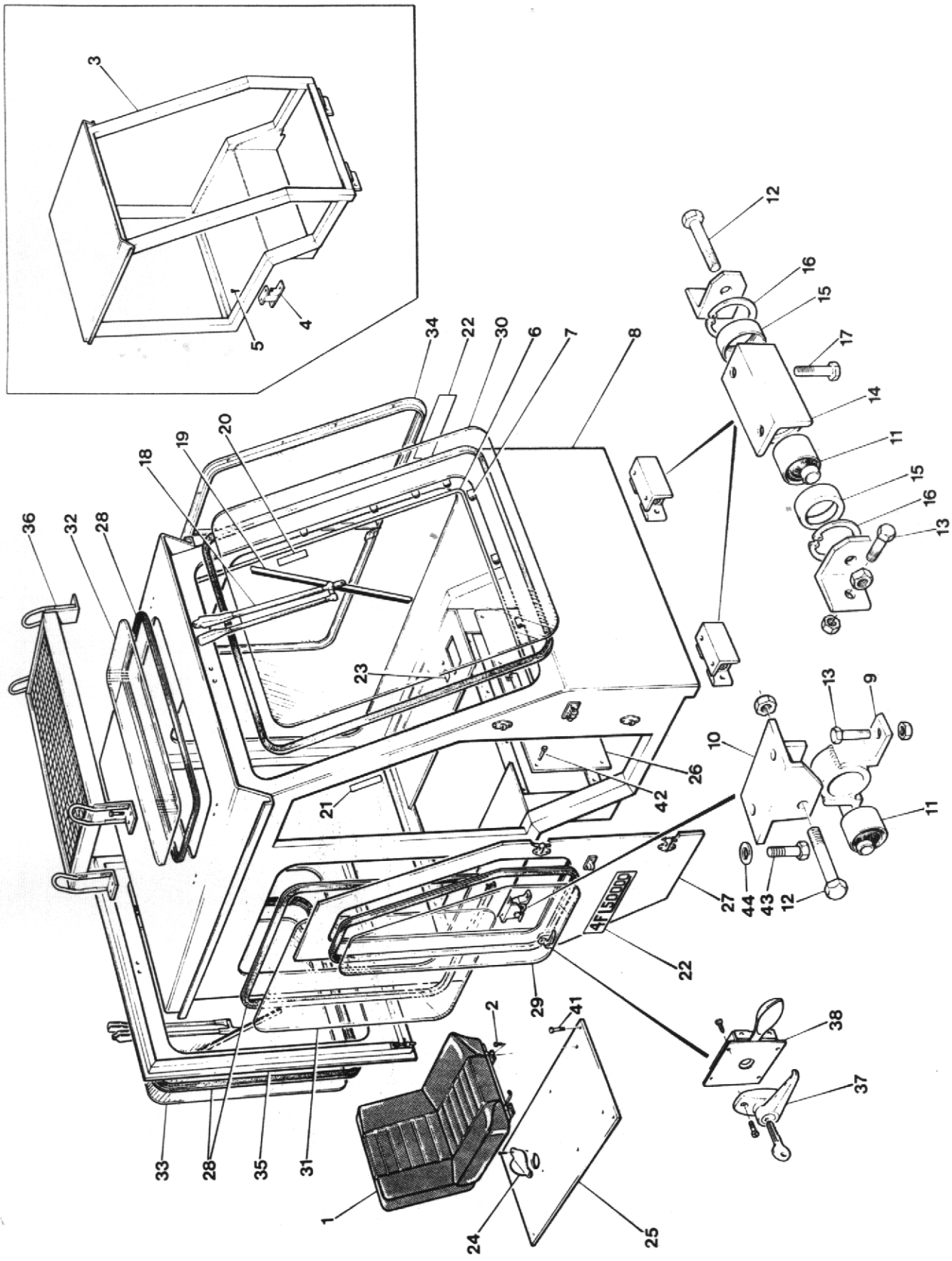
CHASSIS

Item No.	Part No.	Description	Qty.
1	ESE 100	Front chassis	1
2	ESE 102	Rear chassis	1
3		Bolt M16 x 70 mm long and nut	2
4	ESE 101	Articulating frame	1
5	4-60-214	Centre pivot bearing	2
6	ESE 199	Centre pivot spacer	4
7	4-60-103	Centre pivot bolt	2
8	4-60-171	Centre pivot nut	2
9		Split pin 3/16" dia. x 3" long	2
10	MH 5236	'Silent bloc' bush	2
11		Bolt 7/8" UNF x 5" long and nut	2
12		Split pin 3/16" dia. x 2½" long	2
13	4-60-104	Steering ram bolt	4
14	4-60-112	Steering ram bolt spacer	6
15	4-60-172	Steering ram bolt nut	4
16		Split pin 3/16" dia. x 2½" long	4
17	ESE 179-3	Battery locking bar	1
18	ESE 179-4	Tie rod	2
19		Nut M6	8
20	ESE 178	Battery clamp	1
21	ESE 169	Front ballast weight RH. LH.	2
22	ESE 129	Rear ballast weight RH. LH.	2
23	ESE 139	Front ballast weight support	2
24	ESE 221	Front ballast weight support	2
25		Bolt M16 x 150 mm long and nut	4
26		Bolt M12 x 60 mm long and nut	16
27		Bolt M16 x 110 mm long and nut	8
28	ESE 150	Rear Frame	1
29		Bolt M10 x 65 mm long and nut	4
30	ESE 144	Axle clamp plate	2
31		Bolt M20 x 200 mm long and nut	8
32		Washer M20	16
33	ESE 153	Axle clamp plate	2
34		Bolt M20 x 200 mm long and nut	8
35		Washer M20	16
36	ESE 175-2	Front lamp blanking plate (if fitted)	2
37	ESE 175-1	Front lamp mounting plate (if fitted)	2
38		Screw M6 x 20 mm long	4
39	ESE 149	Towing bracket (if fitted)	1
40		Set screw 1" UNF x 2" long and nut (if req'd)	2
41	ESE 222	Towing pin (if req'd)	1
42		Bolt M12 x 85 mm long and nut	4
43	ESE 158	Tilt ram pin	2
44	ESE 212	Tension pin	2



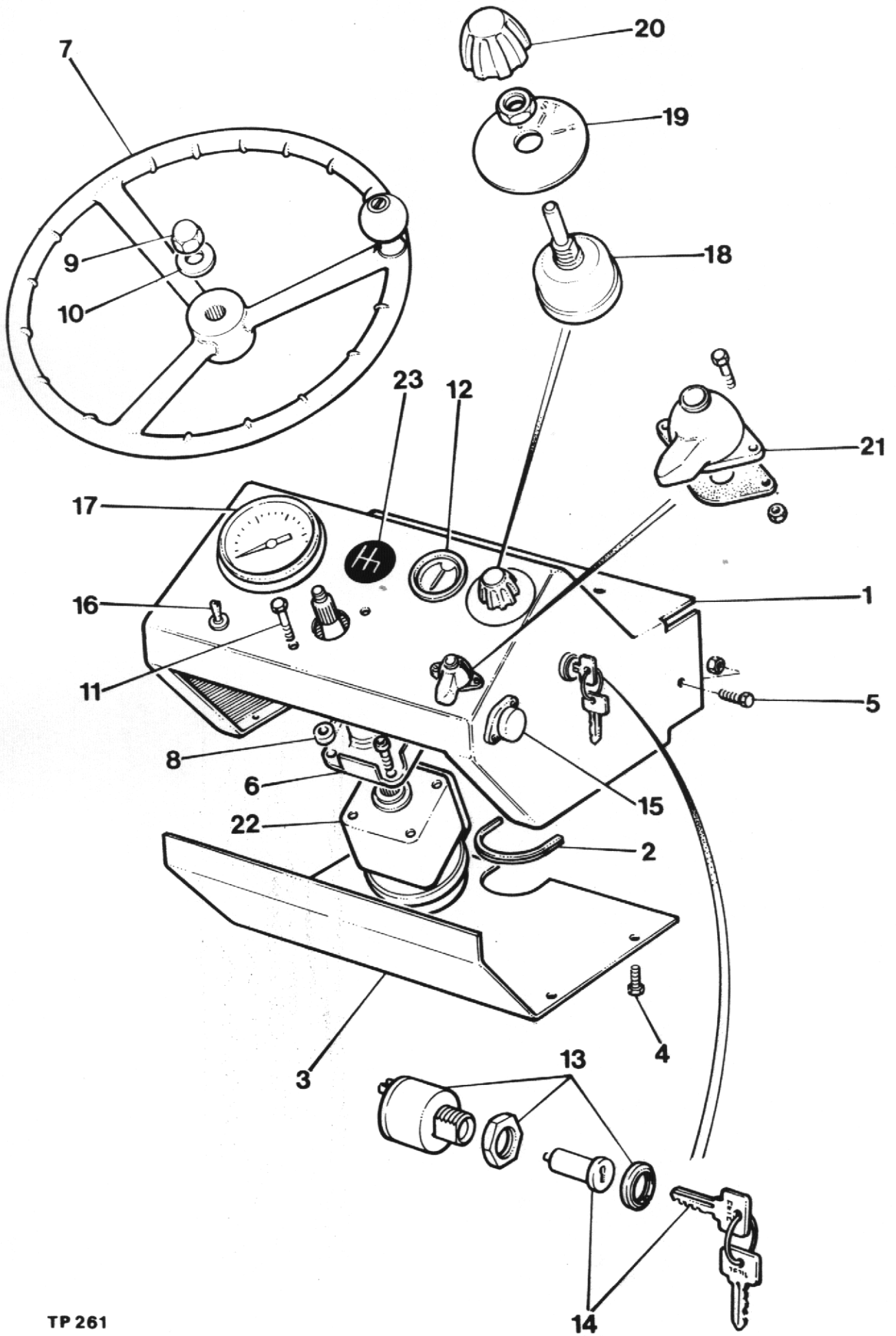
MUDWINGS & COVERS

Item No.	Part No.	Description	Qty.
1	ESE 104	Right hand mudwing and hydraulic tank	1
2		Set screw M10 x 30 mm long and nut	20
3	ESE 103	Left hand mudwing and fuel tank	1
4	ESE 181	Floorplate support angle	1
5		Bolt M12 x 60 mm long and nut	2
6	ESE 107	Engine cover	1
7	4-35-327	Spacer	4
8		Bolt M10 x 35 mm long and nut	4
9		Washer M10	A/R
10	FSE 269	Sight gauges	2
11	4-60-200	Tank filler assembly	2
12	P1263-3	Filter	2
13		Screw 5/16" UNF x 3/4" long	8
14	5ST 18.B	Gasket	2
15	P2792	Tank cap	2
16	ESE 128 RH-LH	Front wings	2
17		Bolt M10 x 35 mm long and nut	6
18	ESE 172 RH-LH	Front mudwing support angle	2
19		Screw M12 x 30 mm long and nut	4
20		Screw M10 x 25 mm long and nut	4
21	ESE 106	Floorplate	1
22		Screw M10 x 20 mm long and nut	12
23	ESE 136 RH-LH	Footplate end support	2
24	ESE 191	Cover plate assembly	1
25	4-35-375	Grommet	1
26	FSE 355	Label – Hydraulic oil	1
27	FSE 356	Label – Diesel fuel	1
28	ESE 237	Label – 55 psi	4
29	FSE 351	Label – Winget	1



CAB & SAFETY FRAME

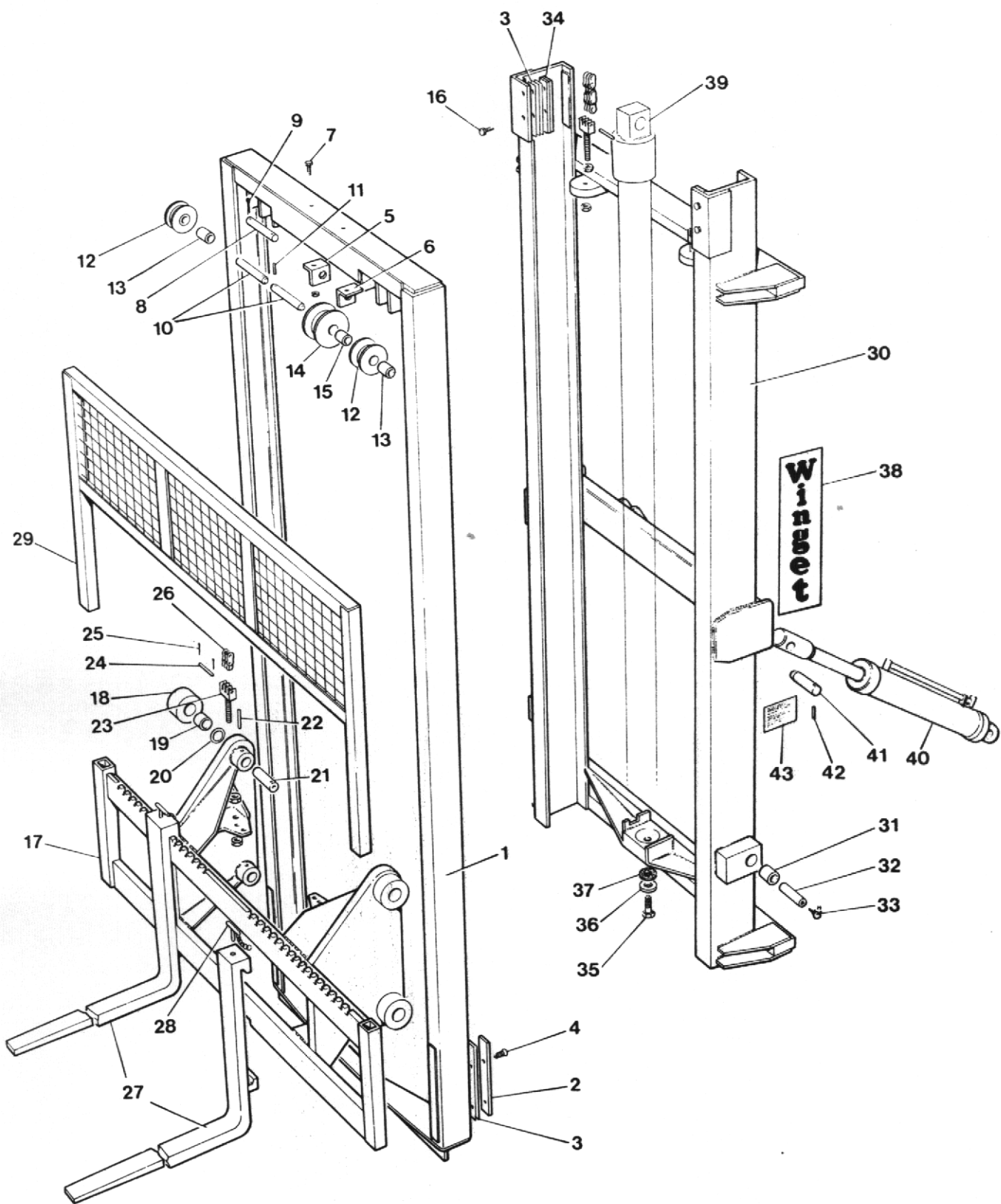
Item No.	Part No.	Description	Qty.
1	FSE 145	Seat	1
2		Screw M10 x 25 mm long	4
3	ESE 168	Safety frame	1
4	ESE 166	Rear mounting pillar	2
5		Screw M10 x 20 mm long and nut	2
6	FSE 450	Level indicator assembly	1
7	FSE 448	Clip 1" sq. (self adhesive)	A/R
8	ESE 125	Cab (optional)	1
9	ESE 165	Rear flexible mounting	2
10	ESE 210	Top bracket assembly	2
11	ESE 164-4	Anti-vibration bush	4
12		Bolt M16 x 90 mm long and nut	4
13		Screw M12 x 25 mm long and locknut	8
14	ESE 164	Pivoted cab mounting	2
15	ESE 164-5	Bush	4
16	1300-54M	Circlip	4
17		Bolt M12 x 70 mm long and nut	4
18	PMG. Thorpe 6596-18" long	Windscreen wiper arms	2
19	PMG. Thorpe 6025-18" long	Windscreen wiper blades	2
20	FSE 369	Label - level indicator L.H.	1
21	FSE 368	Label - level indicator R.H.	1
22	ESE 234	Label - 4FL5000	2
23	ESE 236	Label - Engine stop	1
24	ESE 208	Cover plate	1
25	ESE 115	Seat panel	1
26	ESE 218	Front panel	1
27	ESE 244	Door	1
28	ESE 245	Rubber moulding and filler strip	A/R
29	ESE 246	Glass - Door	1
30	ESE 247	Glass - Windscreen	1
31	ESE 248	Glass - Side R.H.	1
32	ESE 249	Glass - Roof	1
33	ESE 250	Glass - Rear	1
34	ESE 251	Sliding window assembly	1
35	ESE 252	Rear panel	1
36	ESE 253	Stone guard	1
37	FSE 446	Door handle and lock c/w screws	1
38	FSE 447	Door handle inner c/w screws	1
39	56876	Seat slide R.H.	1
40	81988	Seat slide L.H.	1
41		Bolt M8 x 25 mm long	4
42		Bolt M8 x 20 mm long	8
43		Bolt M12 x 30 mm long	4
44		Washer 1/2" flat	4



TP 261

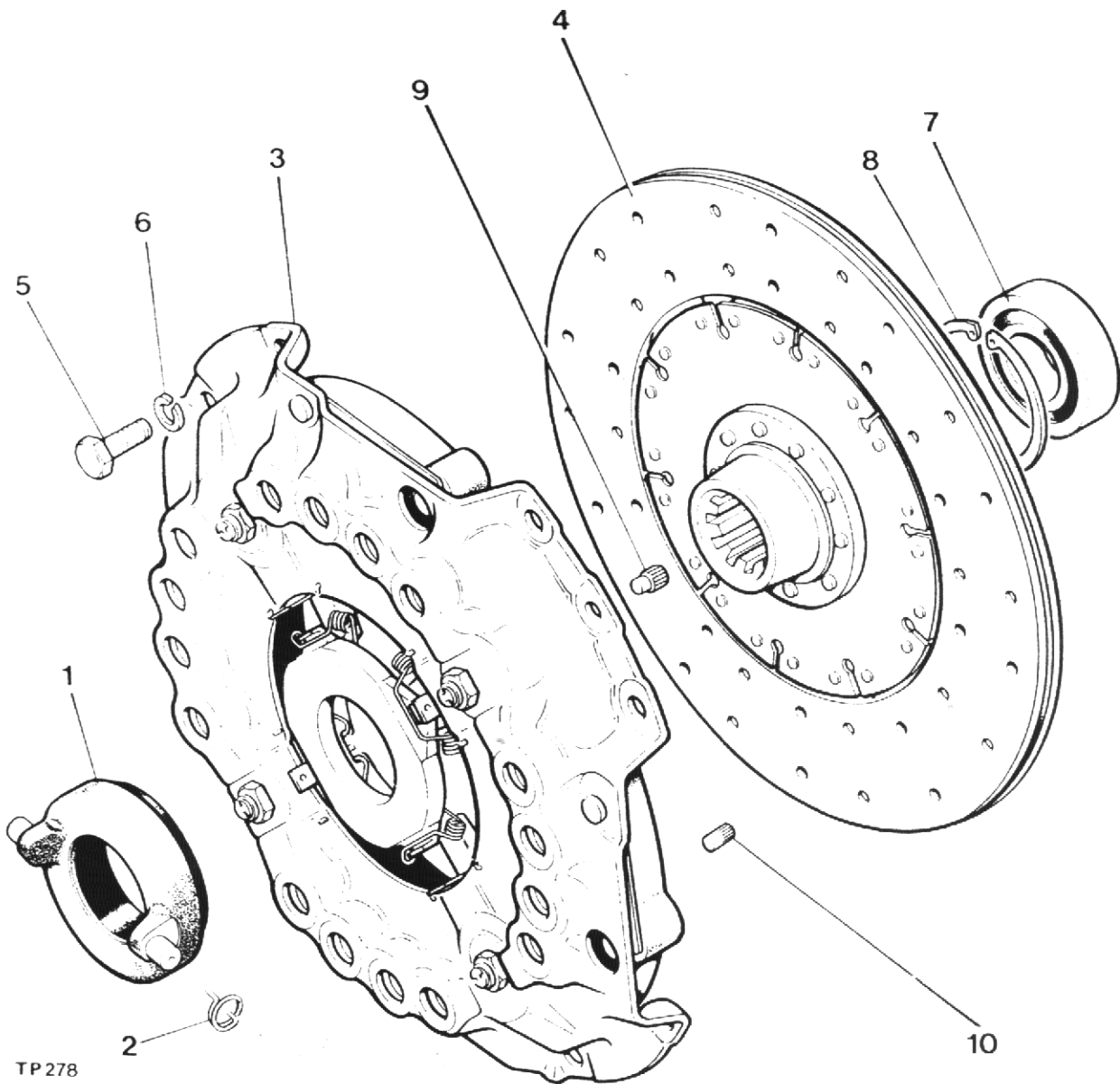
CONSOLE AND INSTRUMENTS

Item No.	Part No.	Description	Qty.
1	ESE 119	Instrument housing	1
2	4-35-375	Grommet	1
3	ESE 142	Bottom panel	1
4		Screw M6 x 15 mm long	4
5		Screw M10 x 25 mm long and nut	4
6	FSE 289	Steering column c/w 2 setscrews	1
7	FSE 279	Steering wheel	1
8	CSE 182	Spacer	2
9	FSE 377	Dome nut	1
10		Washer M18	1
11		Screw 3/8" UNC x 1 1/4" long	2
12		Ammeter	1
13	31973K	Start switch body	1
14	54335169	Keys and barrel	1
15	76205 D	Horn button	1
16	34514	Wiper motor switch	1
17	ESE 216	Hydraulic pressure gauge	1
18	31495	Light switch (optional)	1
19	WT 201	Light switch plate on/off (optional)	1
20	54331311	Light switch knob (optional)	1
21	31190 F	Indicator switch (optional)	1
22	4-60-293	Steering valve	1
23	ESE 238	Label - Gear positions	1



MAST, CARRIAGE & FORKS

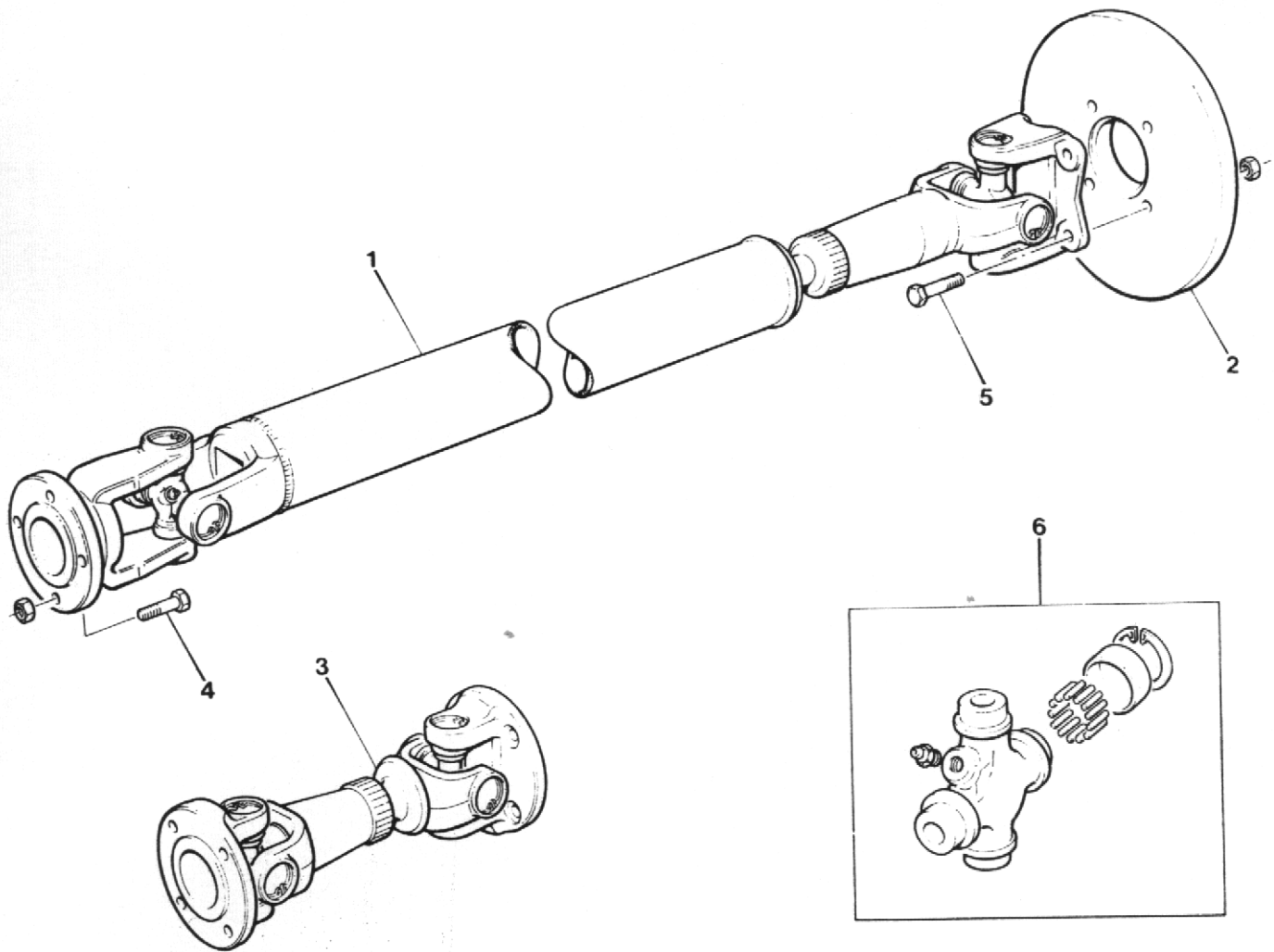
Item No.	Part No.	Description	Qty.
	ESE 159	Complete mast assembly	1
1	FSE 218	Inner mast assembly	1
2	FSE 383	Brass rubbing strip	2
3	FSE 373	Shim 24 SWG	A/R
4		Screw Csk. M8 x 20 mm long	4
5	FSE 404 R.H.	Lift cylinder bracket	1
6	FSE 404 L.H.	Lift cylinder bracket	1
7		Bolt M12 x 40 mm long and locknut	2
8	FSE 261	Lift cylinder pin	1
9		Split pin 3/16" dia. x 2" long	2
10	FSE 185	Pulley pivot pin	2
11	4-35-29A	Tension pin	2
12	FSE 196	Chain pulley	2
13	FSE 348	Chain pulley bush	2
14	FSE 198	Hose pulley (if fitted)	1
15	FSE 349	Hose pulley bush (if fitted)	1
16		Screw M8 x 25 mm long csk.	4
17	ESE 162	Carriage assembly	1
18	FSE 215-5	Roller	4
19	FSE 236	Bush	4
20	FSE 396	Shim	A/R
21	F4-45-214	Pin	4
22	F4-45-216	Tension pin 8 mm dia. x 65 mm long	4
23	FSE 187-2	Tensioner	4
24	FSE 187-3	Pin	4
25	FSE 187-4	Split pin	8
26	FSE 187-1	Chain	2
27	FSE 117	Fork	2
28	E288-15	Peg and chain assembly	2
29	ESE 185	Carriage guard	1
30	ESE 127	Outer mast assembly	1
31	FSE 247	Mast pivot bush	2
32	FSE 204	Mast pivot pin	2
33	T.90	Grease nipple 90°	2
34	FSE 195	Rubbing plate assembly	2
35		Bolt M12 x 25 mm long	1
36	FSE 217-5	Washer	1
37	C180A	Felt washer	2
38	FSE 350	Label - "Winget"	2
39	ESE 240	Mast lift cylinder	1
40	FSE 287	Mast tilt cylinder	2
41	ESE 157	Mast tilt cylinder pin	2
42	ESE 212	Tension pin	2
43		Warning plate	1



TP278

CLUTCH ASSEMBLY

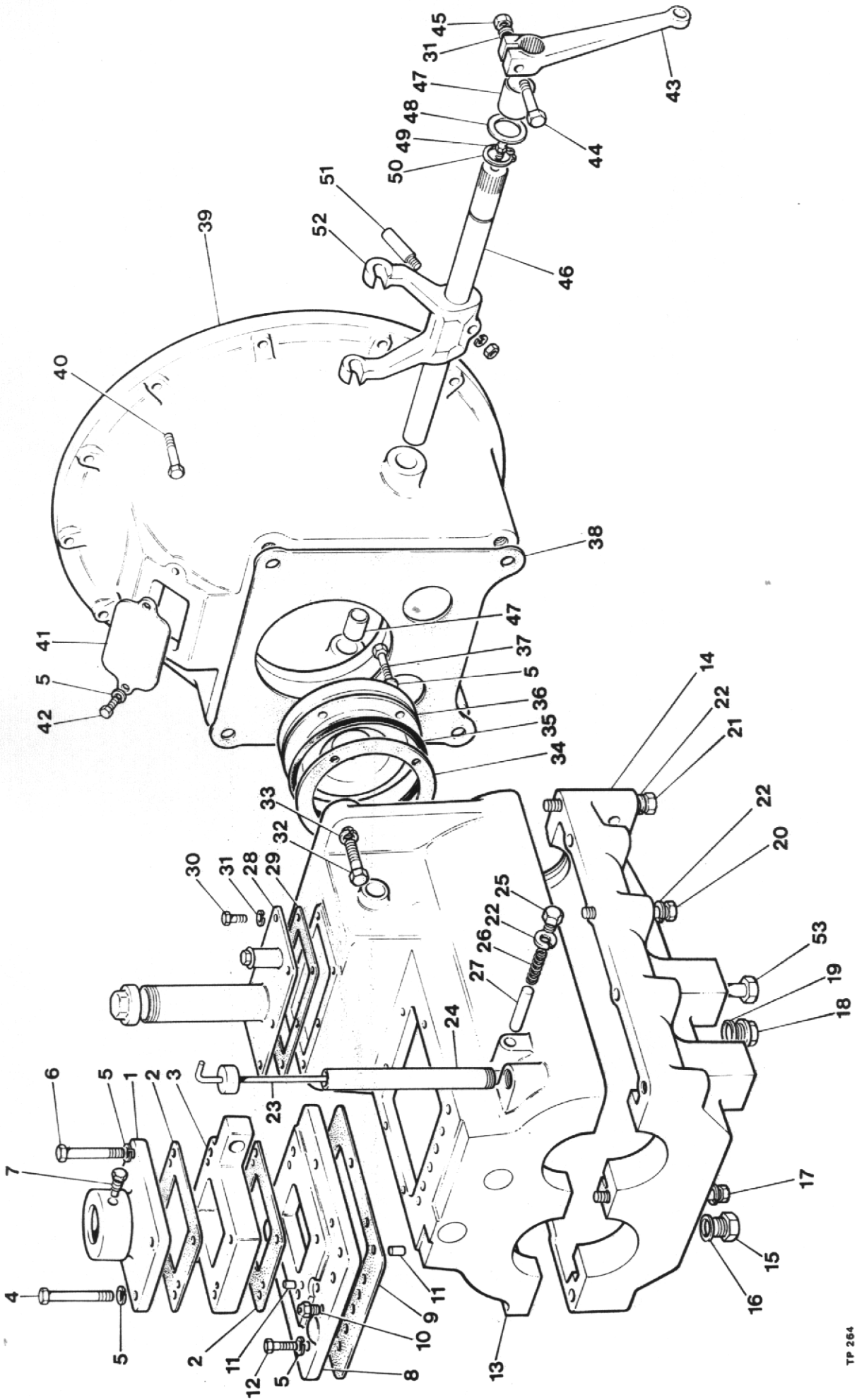
Item No.	Part No.	Description	Qty.
1	10579A02	Clutch Release Bearing	1
2	28S03D	Screw Set	8
3	41S05	Washer Spring	8
4	10597A03	Cover Assembly 12"	1
5	10579A0101	Retainer Spring	2
6	10598A04	Drive Plate 12"	1
7	88S15D	Bearing	1
8	130052MM	Circlip	1
9	EL29122470	Dowel	1
10	EL20125770	Dowel	1
	10948A06	Clutch Kit 12" (comprises of items 1, 4, 5 & 6)	1



TP 263

PROP. SHAFTS

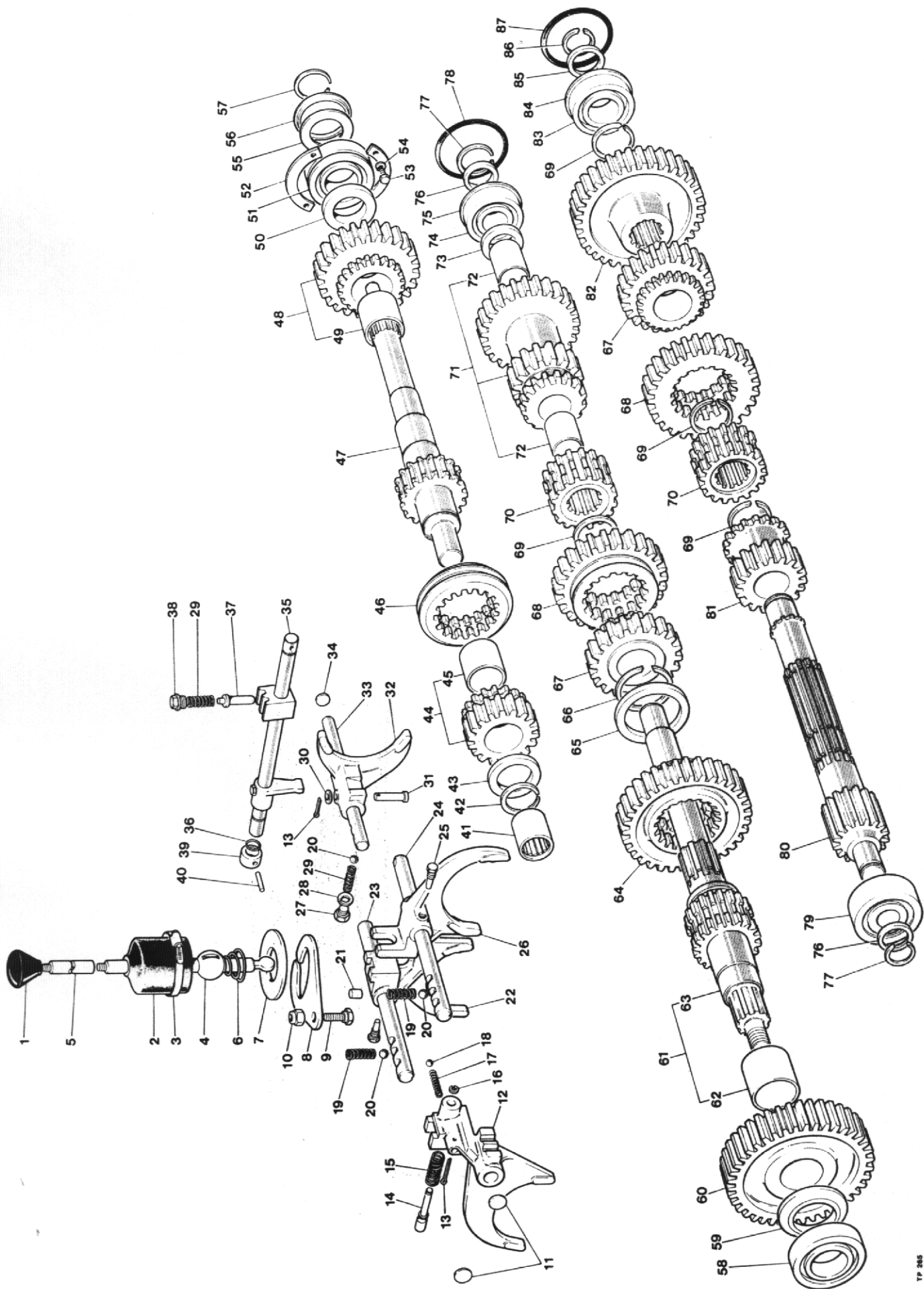
Item No.	Part No.	Description	Qty.
1	ESE 155	Front prop shaft	1
2	ESE 140	Brake disc	1
3	1350 YSA	Rear prop shaft	1
4	ESE 214	Prop shaft bolt 7/16" UNF x 1 1/4" long and nut	12
5	ESE 213	Bolt 7/16" UNF x 1 5/8" long and nut	4
6	K5G B18	Repair kit	A/R



GEARBOX

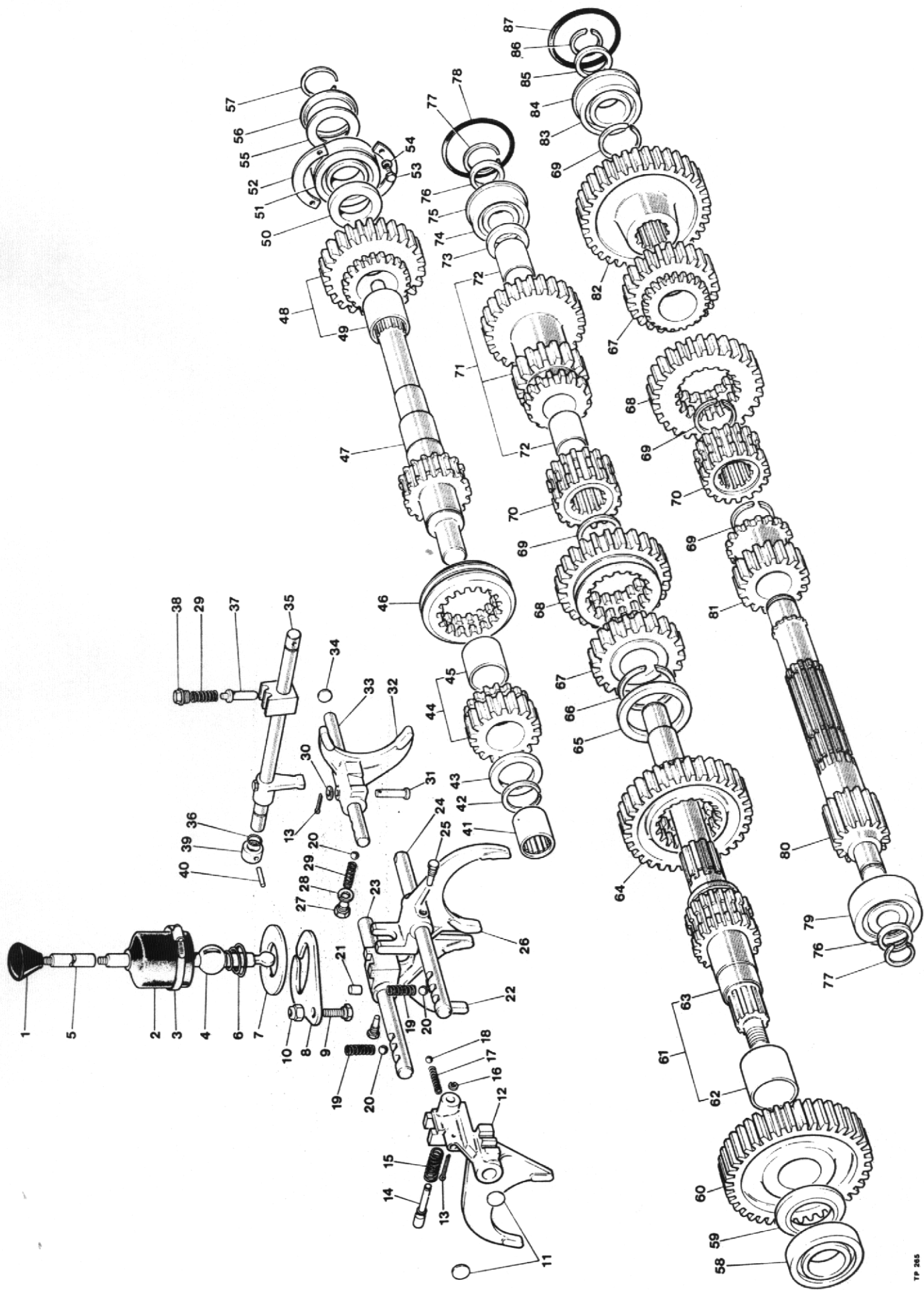
(Casing)

Item No.	Part No.	Description	Qty.
1	5FR 246	Top cover	1
2	5FR 334	Joint	2
3	5FR 347	Packing plate (Winget part no. ESE 145)	1
4	UBF 112	Bolt	2
5	W 113	Washer	16
6	UBF 142	Bolt	2
7	5FR 248	Gear lever pivot bolt	2
8	5FR 157	Intermediate plate	1
9	5FR 333	Top cover joint	1
10	CM 2106	Breather	1
11	CM 2064	Dowel	4
12	USF 52	Bolt	6
13	5FR 11D	Gearcase — top half	1
14	5FR 201D	Gearcase — bottom half	1
15	ESE 197	Drain plug	1
16	CP 1205	Drain plug washer	1
17	UBF 244	Bolt	1
18	CP 1189	Flanged plug	1
19	CP 1068	Washer	1
20	UBF 154	Bolt	8
21	UBF 194	Bolt	2
22	W 125	Washer	11
23	ESE 196	Dipstick	1
24	ESE 200	Dipstick tube	1
25	USF 14	Plug	1
26	CM 2103	Detent spring	1
27	5FR 166	Plunger 1st speed	1
28	5FR 348	Inspection plate	1
29	5FR 155	Gasket	1
30	USF 21	Bolt	6
31	W 112	Washer	7
32	UBF 117	Bolt	4
33	W 129	Washer	4
34	5FR 262	Joint	1
35	006254	'O' Ring	1
36	5FR 332	Input bearing housing	1
37	UBF 72	Bolt	4
38	5FR 156	Gasket	1
39	5FR 281	Bell housing	1
40		Screw 3/8" UNC x 1 1/2" long	12
41	5FR 335	Inspection cover	1
42	USF 12	Bolt	2
43	CM 2090	Clutch operating lever	1
44	UBF 91	Bolt	1
45	UN 501 HTS	Nut	1
46	5FR 284	Clutch cross shaft	1
47	CM 2387	Bush	2
48	CM 2417	Washer	1
49	CP 1069	Grease nipple	2
50	CP 1099	Circlip	1
51	CM 2084	Cotter pin, nut and washer	1
52	CM 2407	Clutch operating fork	1
53		Screw 5/8" UNC x 1 1/2" long	3



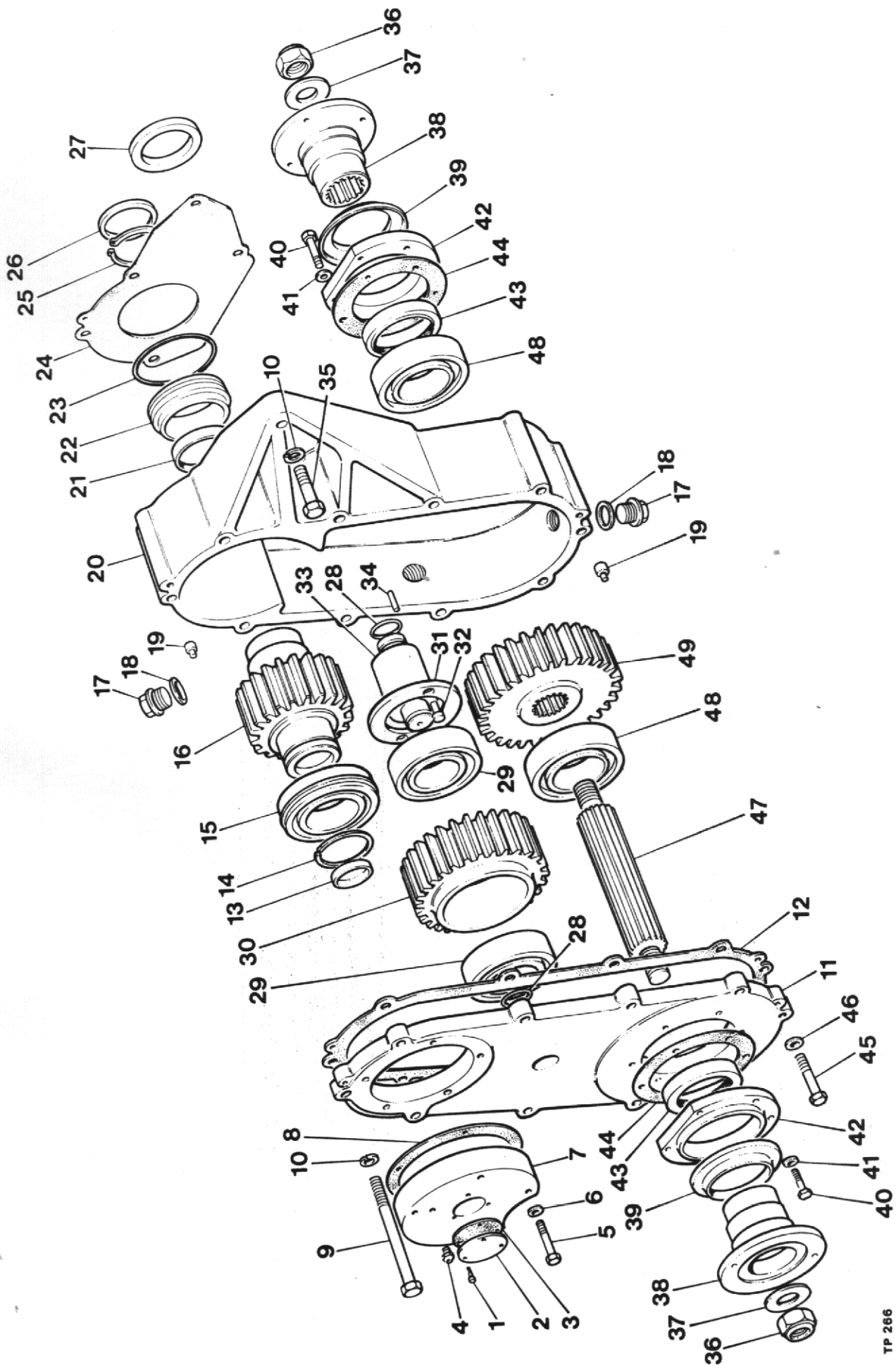
**GEARBOX
Selector & Gears**

Item No.	Part No.	Description	Qty.
1	5FR 84	Gear lever knob	1
2	CM 2197	Gear lever rubber cover	1
3	CM 2198	Clip	1
4	ESE 146	Gear lever	1
5	ESE 147	Gear lever extension	1
6	5FR 249	Spring.	1
7	5FR 247	Spring retaining plate.	1
8	5FR 229	Baulk plate.	1
9	5FR 234	Bolt	1
10	UNS 44	Nut	1
11	CP 1188	Sealing disc	2
12	5FR 237	1st speed fork	1
13	CP 1004	Split pin.	2
14	5FR 236	Lock out plunger	1
15	5FR 145	Spring	1
16	CP 1061	Retaining clip.	1
17	5FR 146	Spring	1
18	CP 1095	Detent ball	1
19	5FR 339	Detent spring.	2
20	CP 1077	Detent ball.	3
21	5FR 194	Packing	1
22	5FR 238	4th and 5th speed fork	1
23	5FR 243	Selector shaft 4th and 5th speeds	1
24	5FR 242	Selector shaft 1st, 2nd and 3rd speeds	1
25	5FR 207	Taper screw	2
26	5FR 86	2nd and 3rd speed fork	1
27	USF 14	Plug	1
28	W 125	Washer	1
29	CM 2103	Detent spring.	2
30	W 101	Washer	1
31	5FR 138	Clevis pin	1
32	5FR 48	Forward/reverse selector fork	1
33	5FR 244	Forward/reverse selector shaft	1
34	CP 1306	Sealing disc	1
35	5FR 329	Forward/reverse shaft	1
36	000753	Retaining clip.	2
37	5FR 196	Plunger	1
38	MT 603	Plug	1
39	5FR 56	Collar.	2
40	CP 1187	Pin	1
41	5FR 62	Roller bearing.	1
42	CP 1183	Retaining clip.	1
43	5FR 252	Thrust Washer	1
44	5FR 254	Gear, including bush 5FR 58	1
45	5FR 58	Bush	1
46	5FR 21	Forward/reverse selector ring with gearlock	1
47	5FR 287	Shaft	1
48	5FR 19	Reverse gear, including 5FR 58	1
49	5FR 58	Bush	1
50	5FR 99	Spacer	1



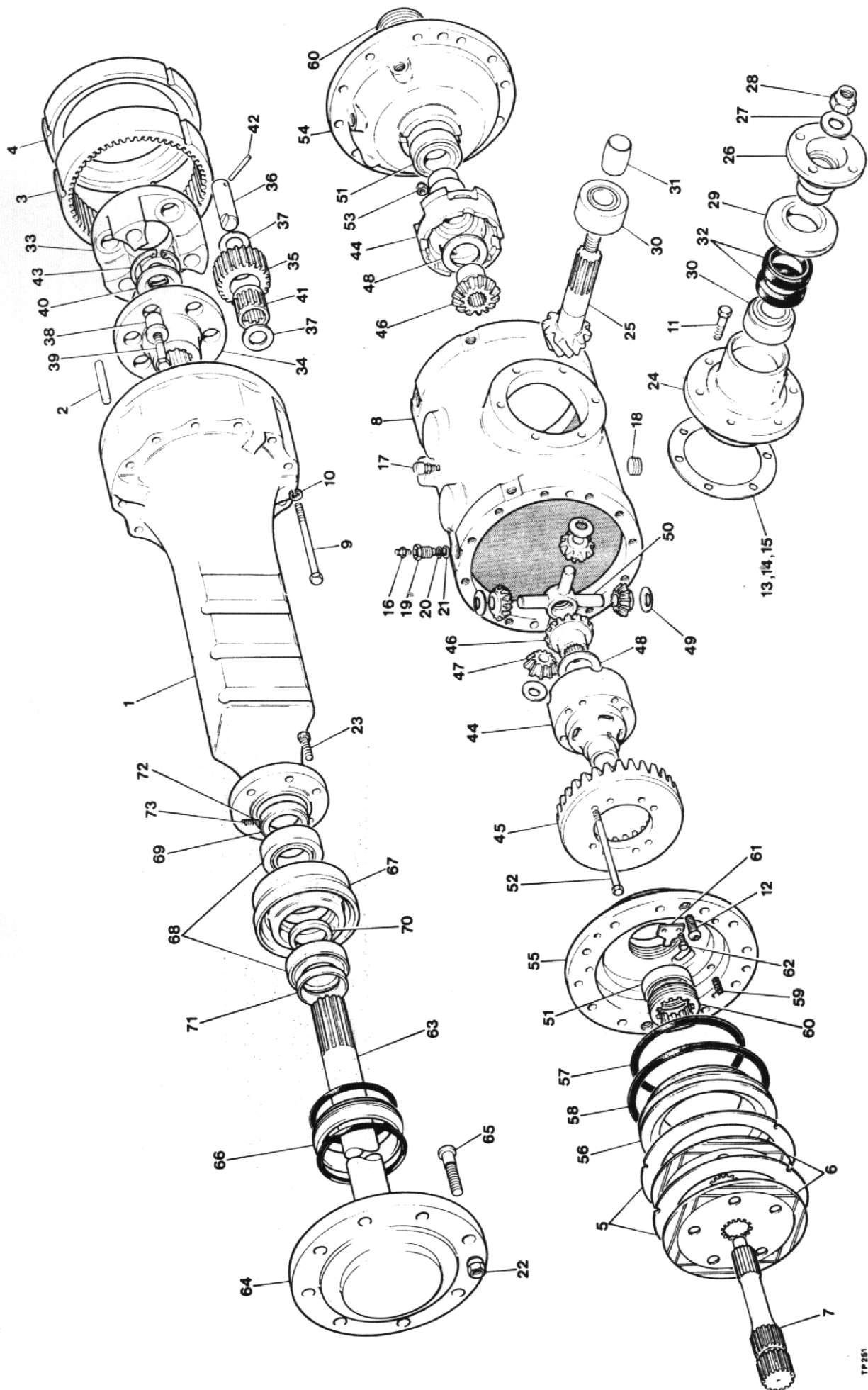
**GEARBOX
Selector & Gears**

Item No.	Part No.	Description	Qty.
51	5FR 97	Bearing	1
52	5FR 147	Bearing retaining clip	2
53	USF 11	Bolt	4
54	W112	Washer	4
55	5FR 331	Seal adaptor	1
56	0400551	Seal	1
57	0270400	Retaining clip	1
58	5FR 64	Bearing	1
59	5FR 90	Thrust washer	1
60	5FR 30	1st speed wheel	1
61	5FR 259	Final drive shaft assembly	1
62	5FR 263	Bush	1
63	5FR 257	Shaft	1
64	5FR 29	Gear	1
65	5FR 162	Lock out washer	1
66	CP 1220	Retaining clip	1
67	5FR 28	3rd speed gear	2
68	5 FR 27	Selector gear with gear lock	2
69	CM 2359	Circlip	4
70	5FR 241	Selector ring locator	2
71	5FR 25	Gear cluster	1
72	5FR 59	Bush	2
73	5FR 43	Thrust washer	1
74	CM 2052	Bearing	1
75	CM2060	Snap ring	1
76	5FR 32	Spacer	2
77	CM 2053	Circlip	2
78	003504	'O' ring	2
79	5FR 139	Bearing	1
80	5FR 92	Idler shaft	1
81	5FR 34	Gear	1
82	5FR 33	Idler shaft gear	1
83	5FR 140	Bearing	1
84	CM 2059	Snap ring	1
85	5FR 45	Washer	1
86	CM 2067	Circlip	1
87	003754	'O' ring	1



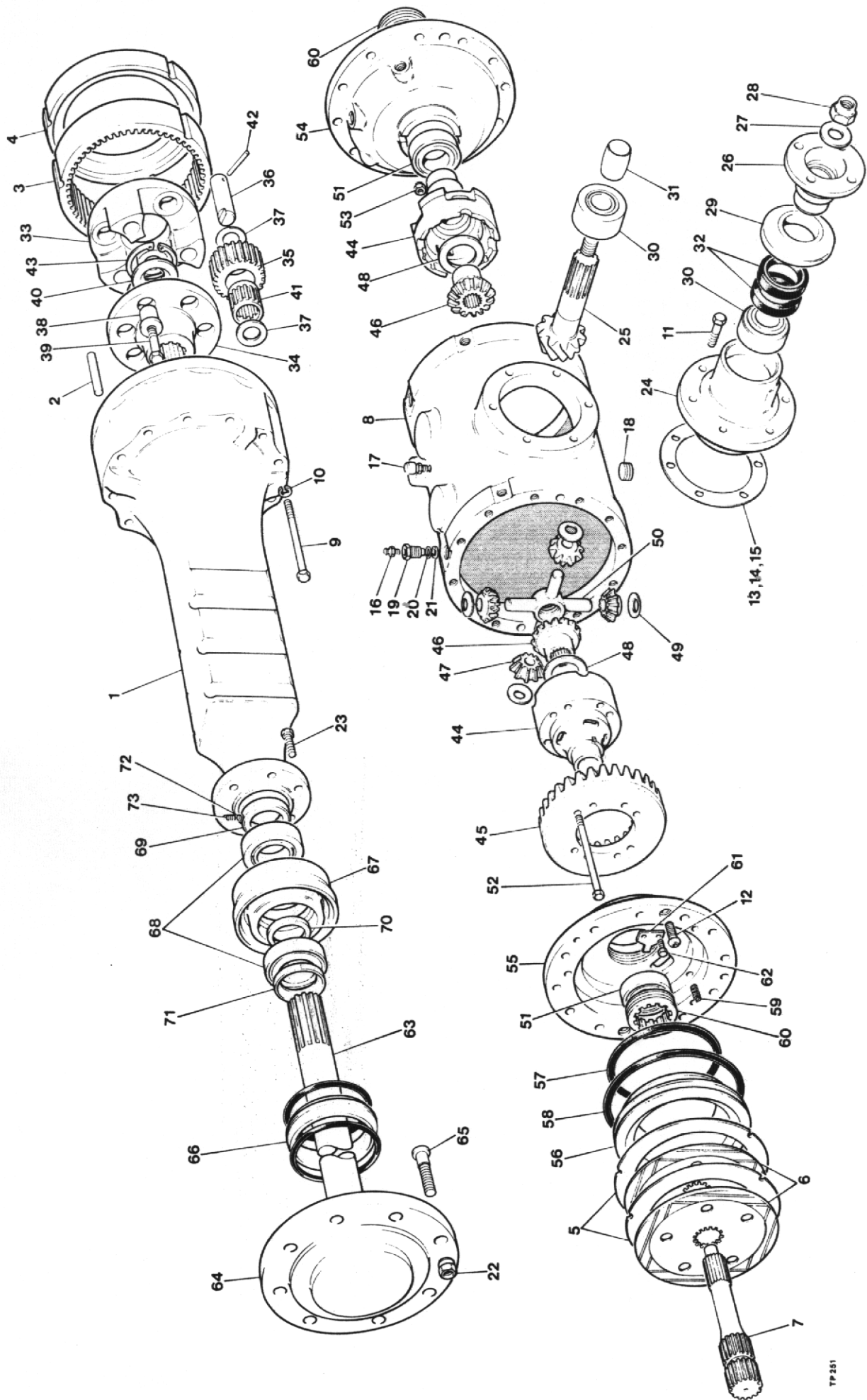
TRANSFER CASE

Item No.	Part No.	Description	Qty.
1	BAC 16	Bolt	3
2	5FR 219	Speed drive blanking cover	1
3	5FR 220	Speed drive blanking cover gasket	1
4	CM 2106	Breather	1
5	UBF 91	Bolt	5
6	CP 1305	Washer	5
7	5FR 209	End cover	1
8	5FR 137	Cover gasket	1
9	UBF 214	Bolt	4
10	W 125	Washer	5
11	5FR 101	Top half case	1
12	5FR 133	Case gasket	1
13	5FR 115	Plug	1
14	CP 1100	Snap ring	1
15	5FR 122	Bearing	1
16	5FR 102	Primary gear	1
17	CP 1189	Flanged plug	2
18	CP 1068	Washer	2
19	CP 1247	Stepped dowel	2
20	5FR 100	Bottom half case	1
21	5FR 66	Seal	1
22	5FR 109	Location ring	1
23	003502	'O' ring	1
24	5FR 226	Gasket	1
25	CP 1203	Circlip	1
26	5FR 117	Spacer	1
27	5FR 225	Spigot ring	1
28	001253	'O' ring	2
29	0535521	Bearing	2
30	5FR 342	Idler gear	1
31	5FR 343	Thrust washer	2
32	023S309H	Headed spiral pin	4
33	5FR 279	Idler shaft	1
34	MT 356	Dowel	1
35	UBF 104	Bolt	1
36	UN 587	Nut	2
37	5FR 44	Washer	2
38	5FR 106	Flange	2
39	5FR 111	Dust shield	2
40	USF 51	Bolt	12
41	CP 1230	Washer	12
42	5FR 108	Oil seal housing	2
43	5FR 136	Oil seal	2
44	5FR 132	Gasket	2
45	UBF 103	Bolt	6
46	W 108	Washer	6
47	5FR 105	Output shaft	1
48	5FR 119	Bearing	2
49	5FR 104	Output gear	1



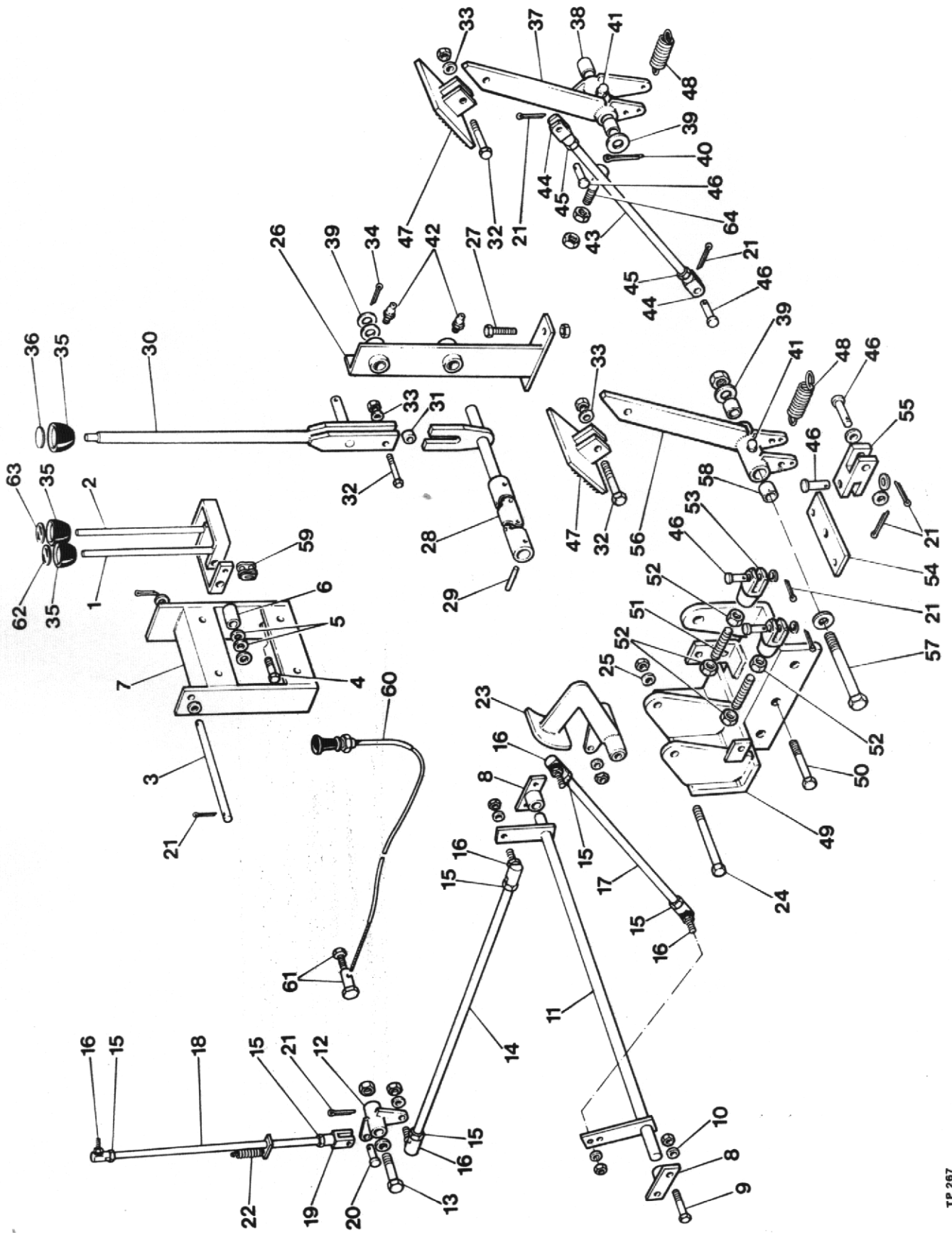
**DRIVE AXLE
400 SERIES**

Item No.	Part No.	Description	Qty.
1	400-0020	Axle Arm	2
2	010-0020	Pin	6
3	420-0070	Annulus	2
4	402-0880	Brake Spacer Plate	2
5	400-0890	Brake Fixed Plate	2
6	400-0750	Oil Immersed Brake Disc	2
7	420-0090	Sun Gear	2
8	402-0011	Main Axle Casing	1
9	004-0060	Bolts — Main Axle Casing	24
10	009-0060	Spring Washers	24
11	012-0060	Hex. Screws	6
12	006-0270	Hex. Socket Button Hd. Screw	4
13	400-2350	Pinion Adjuster Shim	AR
14	400-2290	Pinion Adjuster Shim	AR
15	400-2210	Pinion Adjuster Shim	AR
16	008-0090	Brake Bleed Valve	2
17	008-0070	Relief Valve 1/8 in. BSPT	1
18	008-0020	Hex. Socket BSPT Plug — 3/4 in. BSPT	2
19	400-1070	Brake Pipe Adaptor	4
20	002-0200	'O' Ring	4
21	009-0100	Dowty Washer	4
22	007-0170	Wheel Nuts — M18 x 2mm	16
23	012-0060	Hex. Screw	16
24	400-2300	Input Pinion Cartridge	1
25	400-2000	Spiral Bevel Pinion	1
26	400-2180	Drive Flange	1
27	400-2190	Drive Flange Washer	1
28	400-2200	Drive Flange Nut	1
29	400-0910	Oil Seal Cover	1
30	001-0070	Pinion Bearing	2
31	400-1050	Pinion Bearing Spacer	1
32	002-0070	Pinion Oil Seal	2
33	400-0060	Planet Carrier	1
34	400-0260	Carrier Drive Flange	1
35	420-0080	Planet Gear	3
36	400-0250	Planet Pins	3
37	400-0270	Planet Thrust Washer	6
38	400-0370	Planet Carrier Bush	3
39	012-0120	Planet Carrier Bolt	3
40	400-1320	Axle Shaft Thrust Spacer	1
41	001-0150	Planet Cage Roller	3
42	010-0030	Spring Dowel	3
43	003-0120	Circlip	1



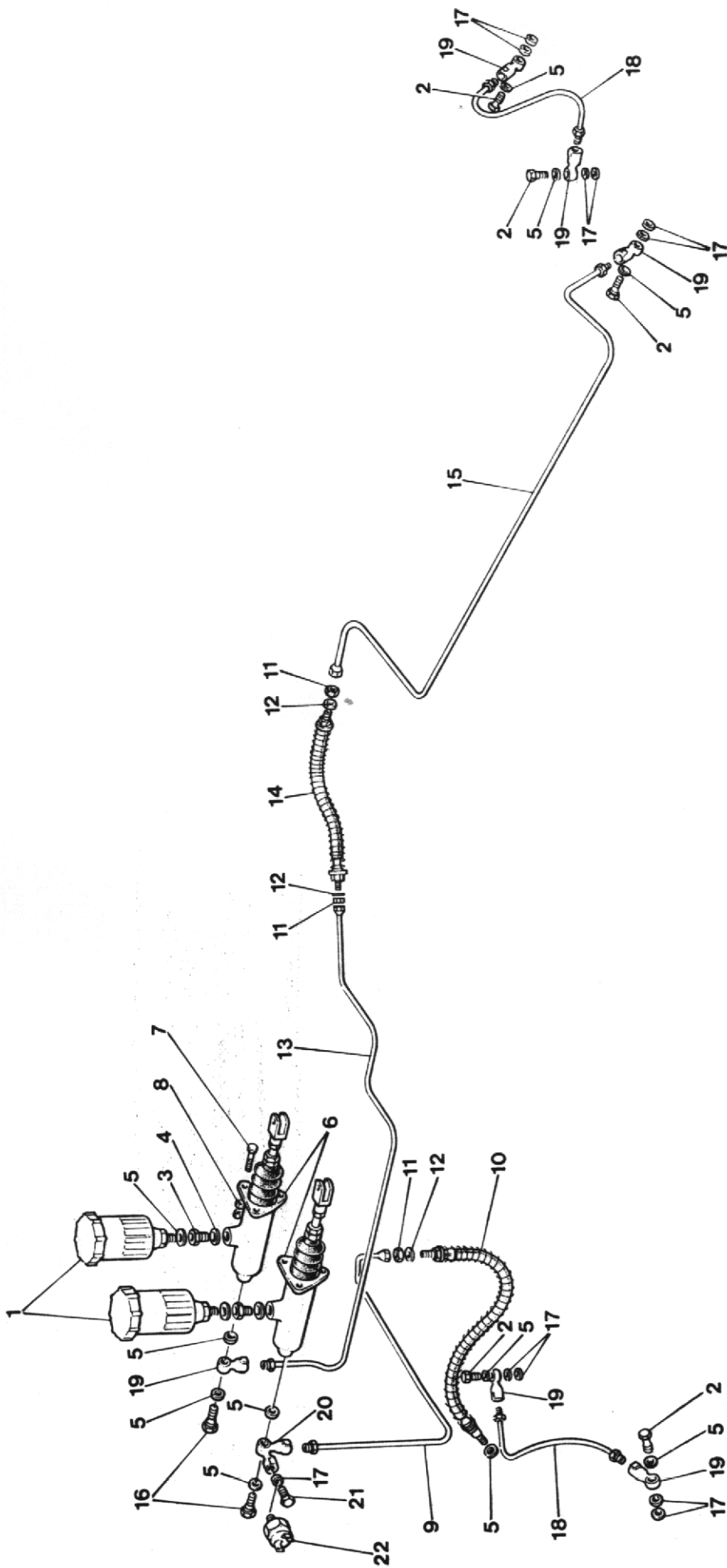
**DRIVE AXLE (Cont'd.)
400 SERIES**

Item No.	Part No.	Description	Qty.
44	401-9520	Diff. Case Process Assembly	1
45	400-2010	Spiral Bevel Wheel	1
46	400-2090	Diff. Wheel	2
47	400-2100	Diff. Pinion	4
48	400-2110	Diff. Wheel Thrust Washer	2
49	400-2120	Diff. Pinion Thrust Washer	4
50	400-2130	Diff. Spider	1
51	001-0080	Diff. Bearing	2
52	004-0080	Bolts	8
53	007-0100	Nyloc Nuts	8
54	402-0761	Brake Cylinder (R.H.)	1
55	402-0771	Brake Cylinder (L.H.)	1
56	400-0780	Brake Pistion	2
57	002-0080	Piston Oil Seal	2
58	002-0090	Piston Oil Seal	2
59	011-0010	Compression Spring	6
60	400-2150	Bearing Adjusting Nut	2
61	400-2160	Bearing Adjusting Nut - Lock Plate	2
62	012-0010	Screw - Lock Plate	4
63	400-0100	Axle Shaft	2
64	400-0790	Wheel Flange	2
65	400-0450	Wheel Stud	16
66	002-0120	Shaft Oil Seal	2
67	400-0140	Oil Seal Housing	2
68	001-0170	Shaft Bearings	4
69	400-0800	Locking Collar	2
70	400-1670	Bearing Cone Spacer	2
71	400-1610	Axle Shaft Distance Piece	2
72	250-1690	Pellet	2
73	012-0230	Grub Screw M6 x 6mm long	2



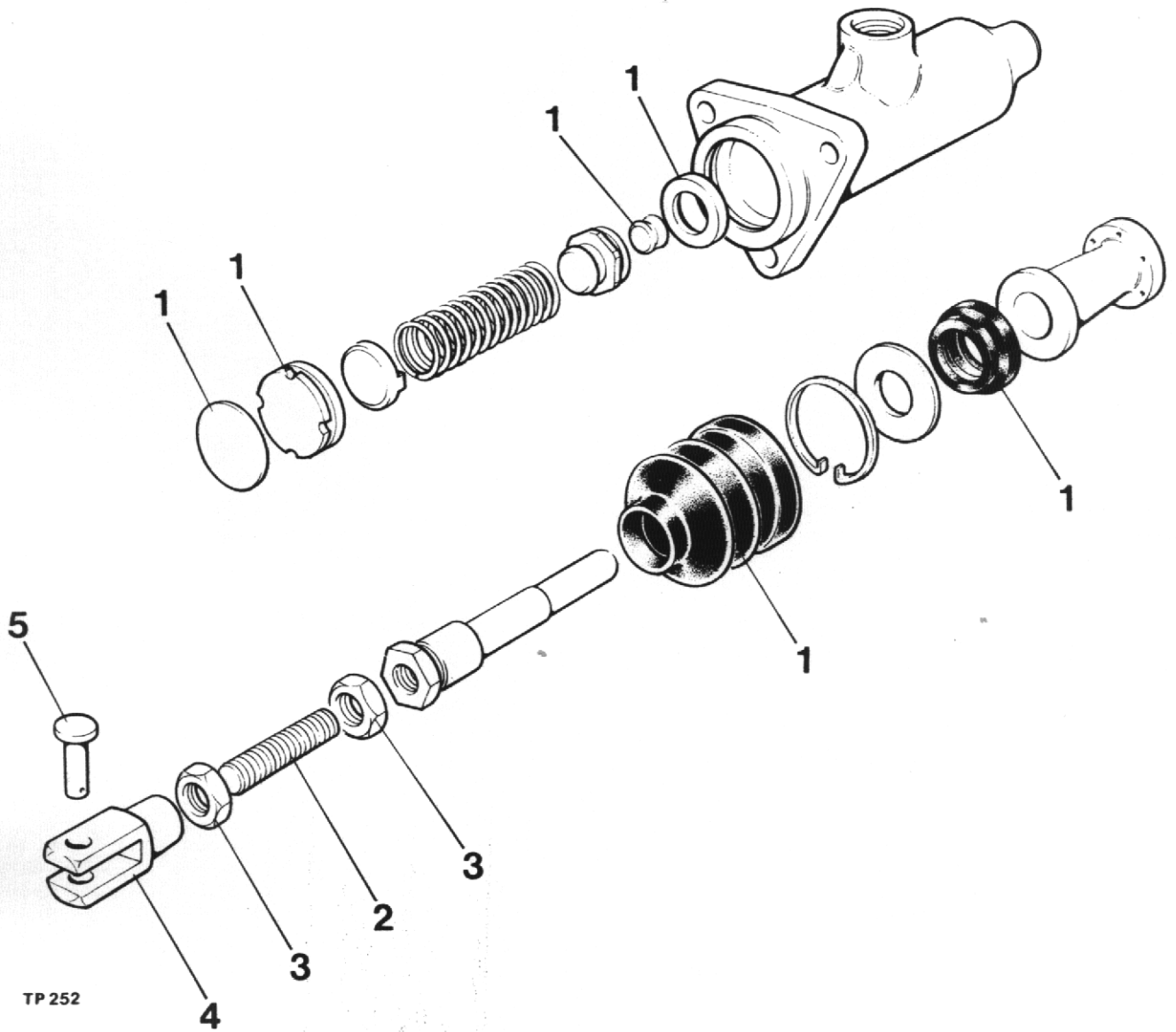
PEDALS & CONTROLS

Item No.	Part No.	Description	Qty.
1	ESE 143	Lift Control Lever	1
2	ESE 180	Tilt Control Lever	1
3	ESE 122	Control Lever Pivot Rod	1
4		Screw M10 x 25mm long and Nut	3
5	ESE 124-1	Spacer	2
6	ESE 124-2	Spacer	1
7	ESE 120	Hydraulic Valve Bracket	1
8	ESE 109	Transfer Shaft Bracket	2
9		Bolt M6 x 20mm long and Nut	4
10		Washer M6	4
11	ESE 108	Accelerator Transfer Shaft	1
12	4-60-164	Accelerator Bell Crank	1
13		Bolt M12 x 80mm long and Nut	1
14	4-60-165	Accelerator Rod 1/4" dia x 28 3/4" long	1
15		Nut 1/4" BSF	6
16	C.160B	Rod Ball End	5
17	ESE 174	Accelerator Link Rod 1/4" dia x 17 5/16" long	1
18	C.240	Accelerator Rod 1/4" dia. x 16 1/4" long	1
19	C.174D	Clevis	1
20	C.174Y	Clevis Pin	1
21		Split Pin 3/32" dia	9
22	C.173D	Spring	1
23	ESE 110	Accelerator Pedal	1
24		Bolt 1/2" UNF x 5" long & Nut	1
25		Washer 1/2" dia.	1
26	ESE 132	Forward/Reverse Lever Mounting Pillar	1
27		Bolt M10 x 25mm long and Nut	2
28	ESE 133	Forward/Reverse Extension Shaft	1
29	ESE 212	Tension Pin	2
30	ESE 134	Forward/Reverse Gear Lever	1
31		Roller 5/8" O.D. x 3/8" I.D. x 1/2" long	1
32		Bolt 3/8" UNF x 1 1/2" long and Nut	3
33		Washer 3/8"	3
34		Split Pin 1/8" dia.	1
35	F4-45-184	Knob	3
36	FSE 235	Label F/R	1
37	ESE 111	Clutch Pedal	1
38	WB 1212	Pedal Bush	2
39		Washer 3/4"	4
40		Split Pin 1/8" dia.	1
41	T.90	Grease Nipple	2
42	T.ST	Grease Nipple	2
43	ESE 131-1	Rod 3/8" dia. x 1' - 7 3/4" long	1
44	C 174A	Clevis	2
45		Nut 3/8" BSF	2
46	C 174X	Clevis Pin	6
47	ESE 151	Pedal Footpad	2
48	C 173B	Return Spring	2
49	ESE 114	Pedal Bracket	1
50		Bolt M10 x 30mm long and Nut	3
51	ESE 189	Connecting Stud	2
52		Nut 7/16" UNF	4
53	ESE 188	Clevis	2
54	CSE 147	Brake Compensator	1
55	CSE 148	Brake Compensator Clevis	1
56	ESE 117	Brake Pedal	1
57		Bolt 3/4" UNF x 5 1/2" long and Nut	1
58	WB 1212	Pedal Bush	2
59	4-60-178	Connecting Link	A/R
60	ESE 194	Engine Stop Cable	1
61	ESE 242	Shouldered Nipple	1
62	FSE 366	Label - Lift	1
63	FSE 365	Label - Tilt	1
64		Bolt M10 x 35mm long and 2 Locknuts	1



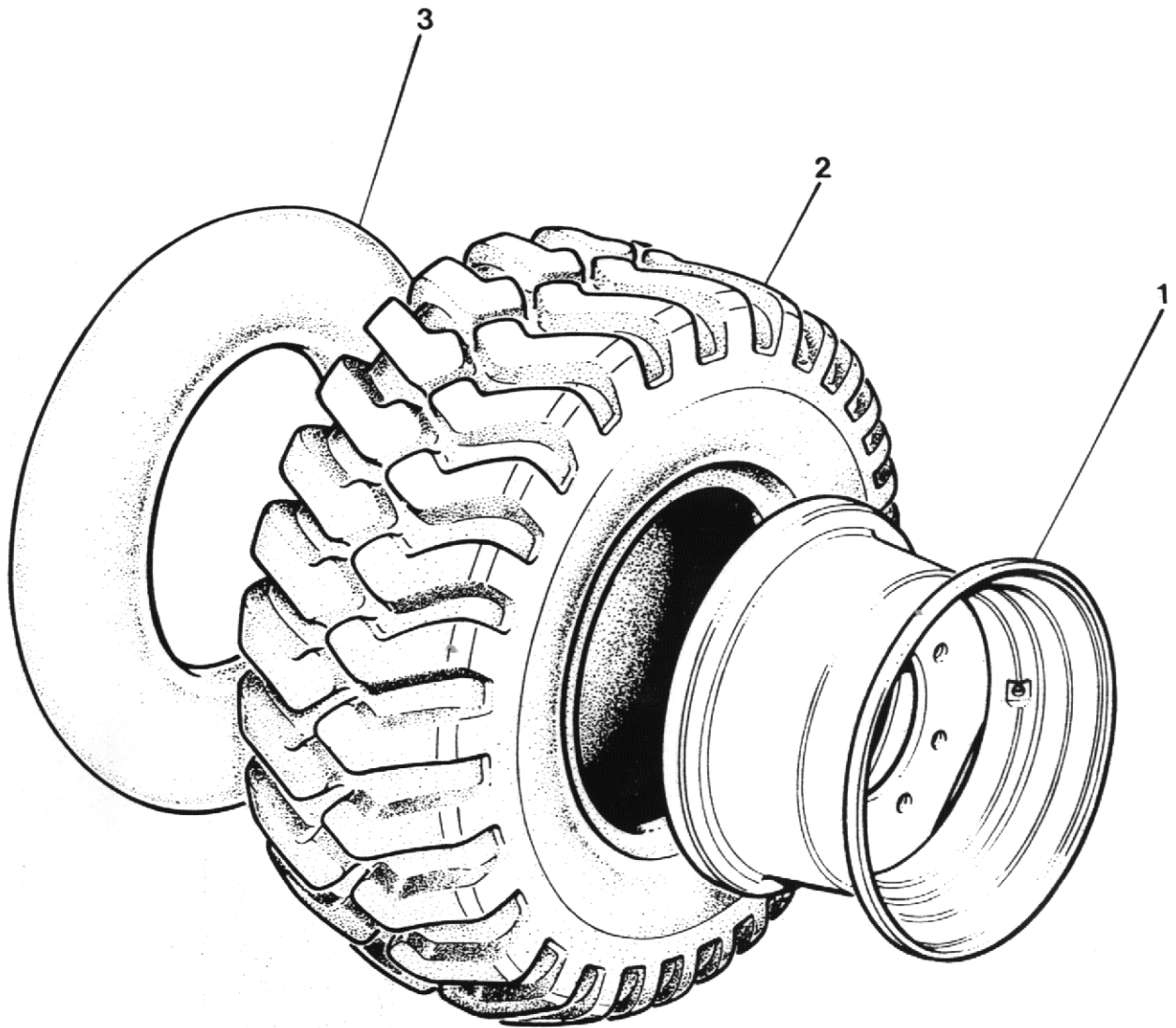
BRAKE PIPES AND CONNECTIONS

Item No.	Part No.	Description	Qty.
1	64047211	Header tank	2
2	376102W	Banjo bolt	5
3	ESE 187	Brake tank adaptor	2
4	KL44532	Copper washer	2
5	378700	Copper washer	11
6	22128	Master cylinder	2
7		Bolt M8 x 30 mm long and nut	6
8		Washer M8	6
9	DM 79-9	Pipe 3/16" dia. x 30 1/4" long	1
10	64047903	Rear flexible pipe 11" long	1
11	64100050	Locknut	3
12	64140087	Shakeproof washer	3
13	DM 79-3	Pipe 3/16" dia. x 38" long	1
14	64046115	Front flexible pipe 9 1/2" long	1
15	DM 79-10	Pipe 3/16" dia. x 56" long	1
16	64473063	Banjo bolt	2
17	378703	Banjo washer	A/R
18	DM 78-16	Bridge pipe 3/16" dia. x 13 1/2" long	2
19	64474287	Banjo	6
20	64474289	Double banjo	1
21		Screw 3/8" UNF x 1/2" long	1
		or	
22	FSE 337	Brake switch (if fitted)	1



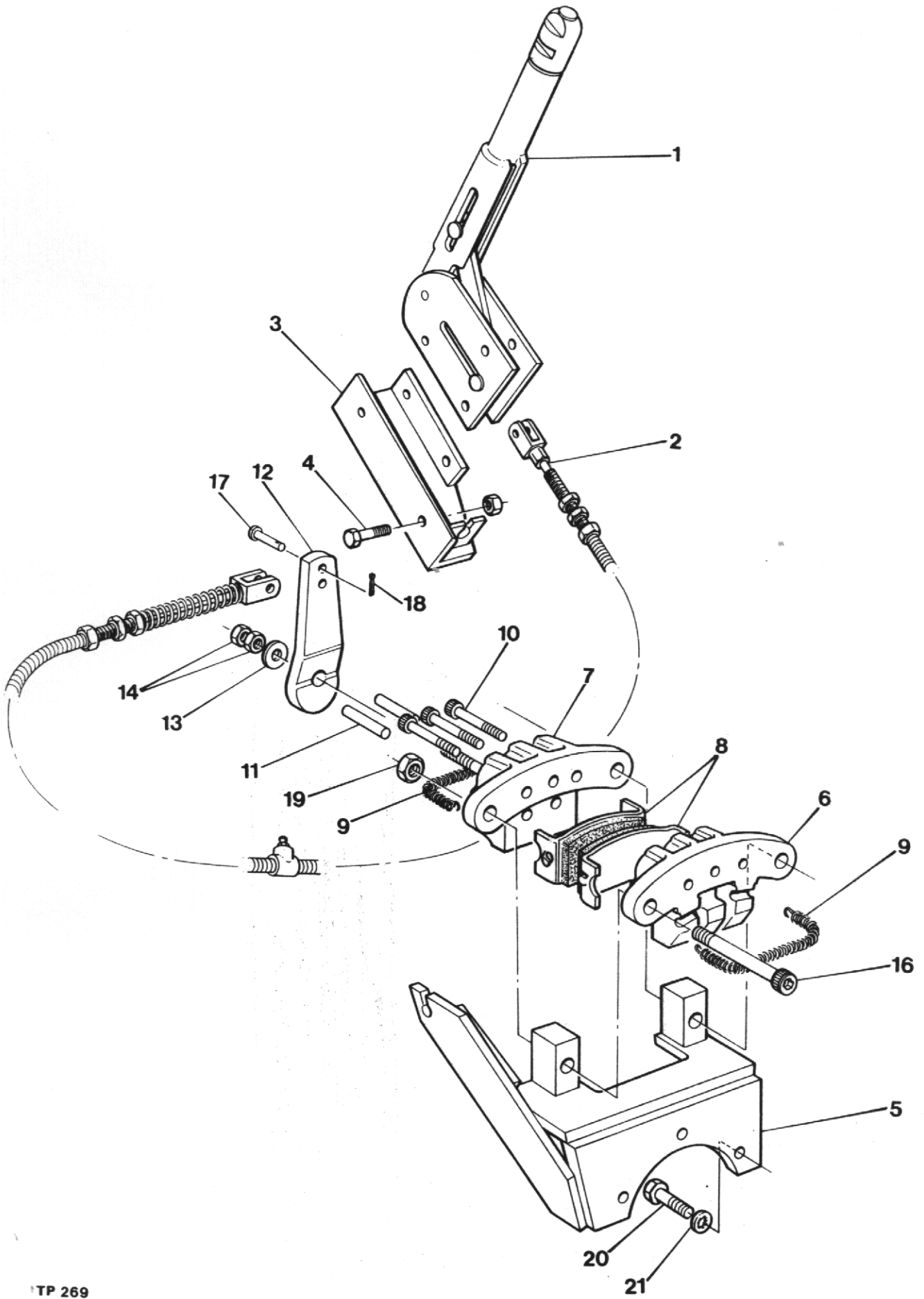
BRAKE MASTER CYLINDER

Item No.	Part No.	Description	Qty.
	22128-3	Master cylinder Assembly (less items 2 to 5 inc.)	2
1	SSB 793	Seal Kit	A/R
2	ESE 189	Threaded Rod	1
3		Nut 7/16" UNF	2
4	4-60-339	Clevis	1
5	FSE 375	Clevis Pin	1



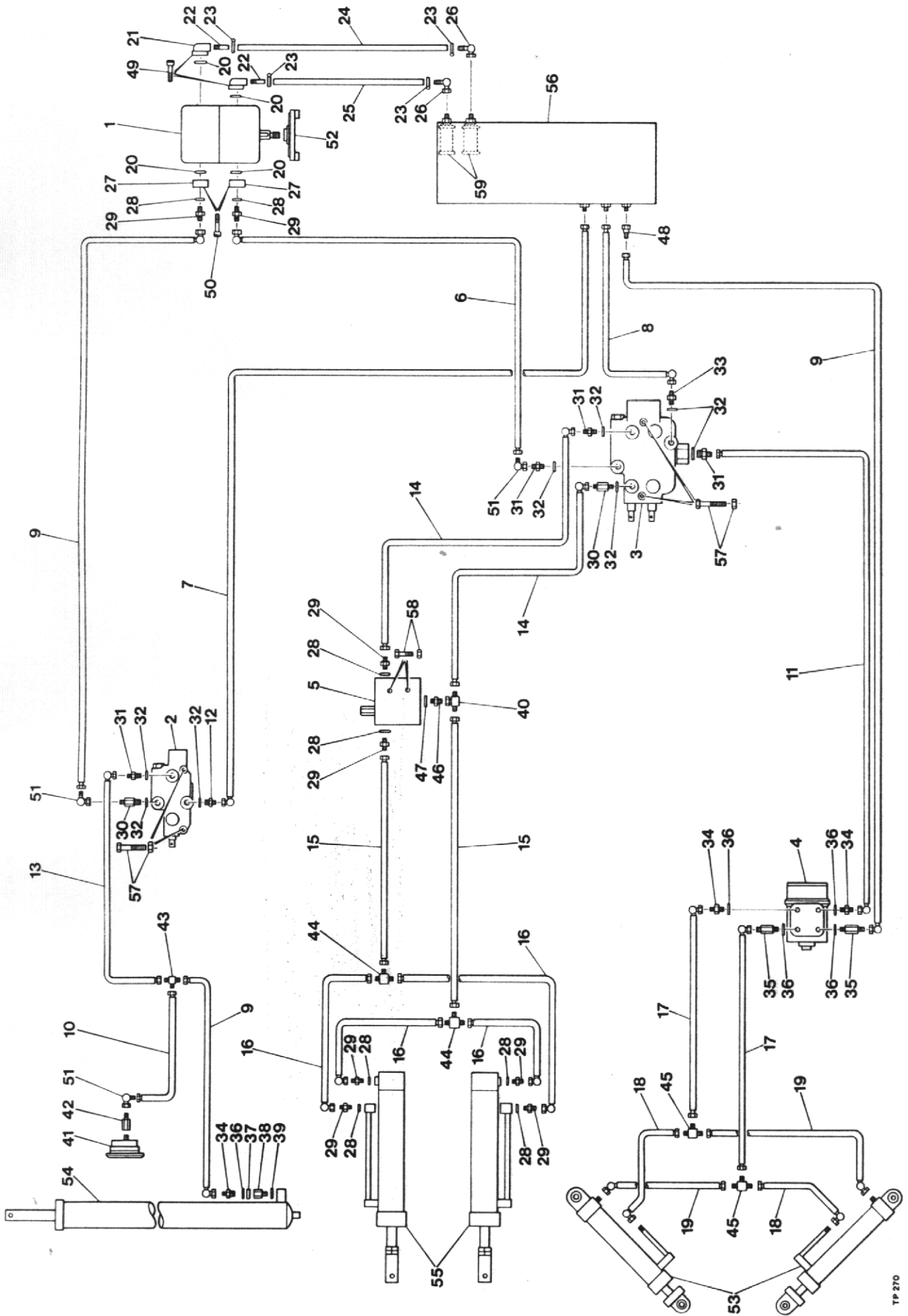
WHEELS AND TYRES

Item No.	Part No.	Description	Qty.
	24S10	Wheel Assembly R/H	2
	24S09	Wheel Assembly L/H	2
1	30181A01	Wheel Rim 11 X 18	4
2	20S12	Tyre 12.5 x 18 10 Ply	4
3	23S05	Tube 12.5 x 18	4



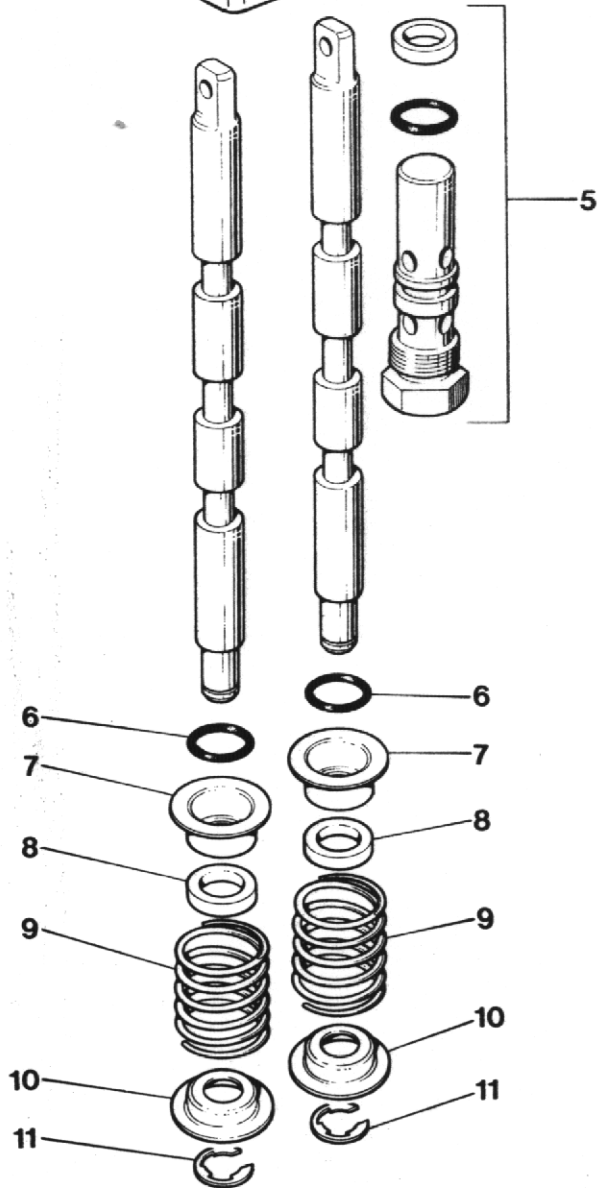
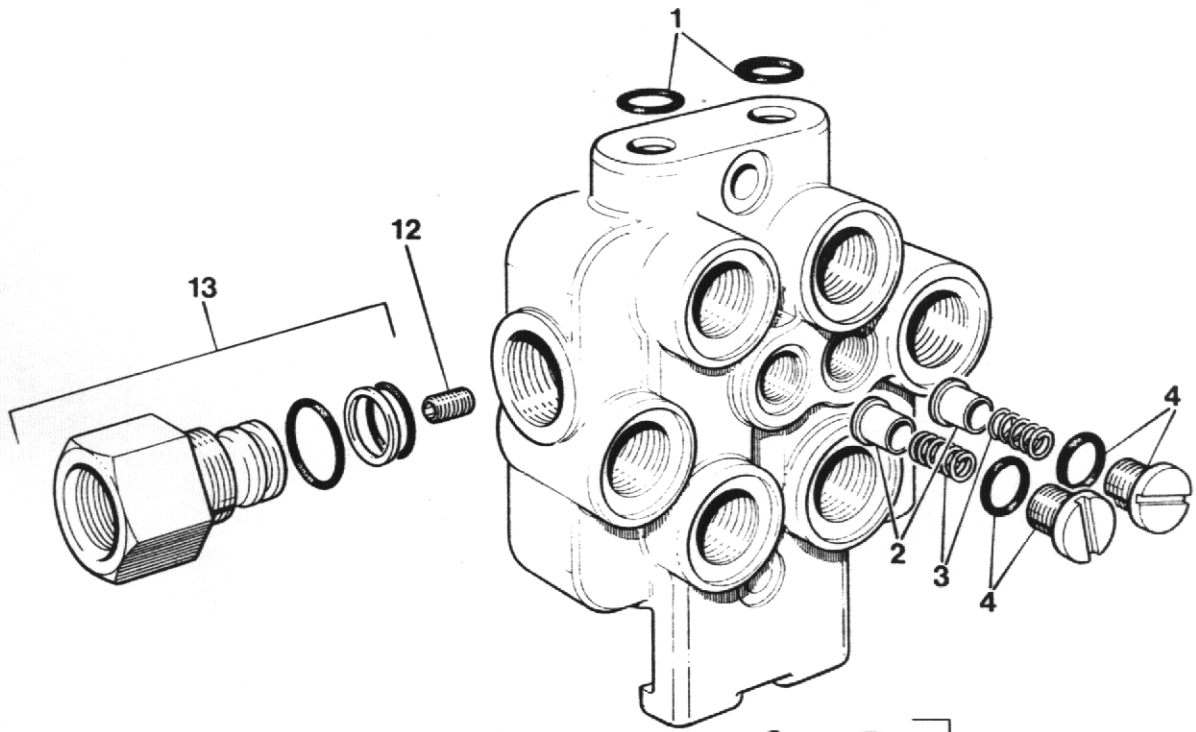
HANDBRAKE

Item No.	Part No.	Description	Qty.
1	715-C-11605	Handbrake	1
2	ESE 116	Cable	1
3	ESE 177	Handbrake bracket	1
4		Screw M8 x 20 mm long and nut	2
5	ESE 141	Brake caliper bracket	1
6	12-02544	Caliper	1
7	99-02564	Caliper	1
8	99-05729	Brake pad	2
9	06-03356	Brake pad retaining spring	2
10	01-03658	Cap screws	3
11	05-05790	Piston	2
12	18-02581	Lever	1
13	03-02772	Washer	1
14	02-03261	Nut	2
15	610 M2	Brake caliper assembly (Items 6-14).....	1
16	ESE 190	Cap screw 1/2" Whit. x 3"long	2
17	C174X	Clevis pin	1
18		Split pin 1/16"	1
19		Nut 1/2" Whit.	2
20		Bolt M12 x 45 mm long	3
21		Shakeproof washer	3



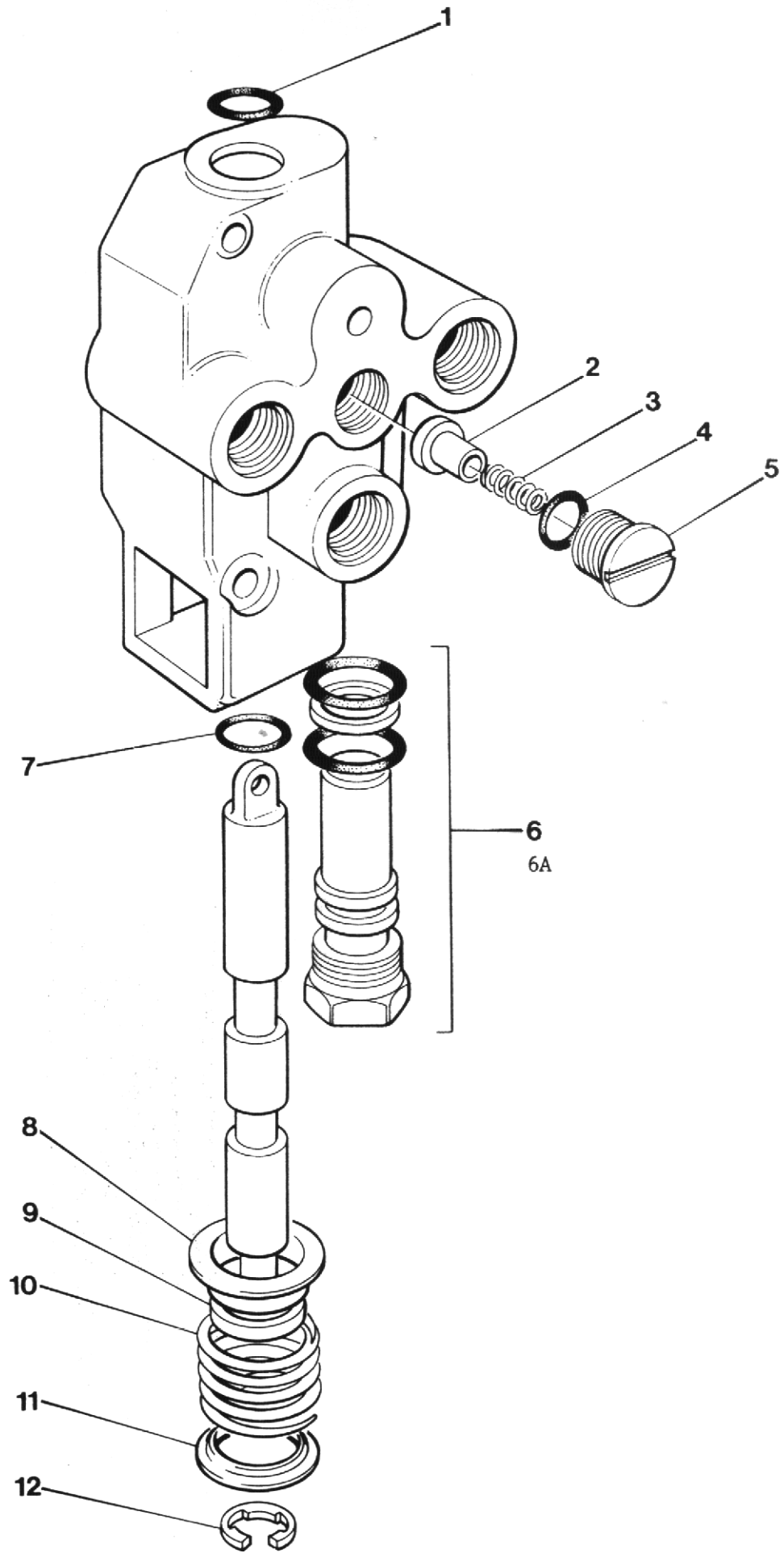
HYDRAULIC PIPES & FITTINGS

Item No.	Part No.	Description	Qty.
1	IP3072-3072-APDFB	Hydraulic pump	1
2	300-023-AAM	Lift valve	1
3	ESE 241	Tilt and auxiliary valve	1
4	4-60-293	Steering valve	1
5	ESE 130-6	Tilt control valve	1
6	T.63E	Hose 3/8" BSP x 73" long ST-90°	1
7	ESE 130-7	Hose 1/2" BSP x 48" long ST-90°	1
8	ESE 130-8	Hose 1/2" BSP x 34 1/4" long ST-90°	1
9	4-60-135	Hose 3/8" BSP x 77" long ST-90°	3
10	4-35-108J	Hose 3/8" BSP x 36" long ST-ST	1
11	CSE 139	Hose 3/8" BSP x 90 1/2" long ST-90°	1
12	2ST 72F	Adaptor 3/8" x 3/4"	1
13	4-35-246	Hose 3/8" BSP x 67" long ST-90°	1
14	4SHL 82	Hose 3/8" BSP x 43" long ST-90°	2
15	4-35-40E	Hose 3/8" BSP x 25" long ST-ST	2
16	3SH 63	Hose 3/8" BSP x 23 1/2" long ST-90°	4
17	4-60-133	Hose 3/8" BSP x 48" long ST-90°	2
18	4-35-108H	Hose 3/8" BSP x 33 1/2" long ST-90°	2
19	4-60-134	Hose 3/8" BSP x 15" long ST-135°	2
20	DH.69.A5	"O" ring	4
21	IPE4	Elbow adaptor	2
22	T.48	Pump inlet adaptor	2
23	T.63M	Hose clip	4
24	ESE 130-24	Hose 3/4" dia. x 3'-9" long	1
25	ESE 130-25	Hose 3/4" dia. x 3'-5" long	1
26	BSE 109	Hose fitting 3/4" BSP 90°	2
27	4-35-261	Flange	2
28	T.14I	Sealing washer	8
29	T.14J	Adaptor 3/8" BSP x 3/8" BSP	8
30	4-60-158	Adaptor 3/8" BSP x 7/8" JIC (long)	2
31	CSE 186	Adaptor 3/8" BSP x 7/8" UNF	4
32	S.9698	"O" ring	8
33	DSE 115	Adaptor 1/2" BSP x 7/8" JIC	1
34	4-35-40K	Adaptor 3/8" BSP x 3/4" UNF	3
35	4-60-115	Adaptor 3/8" BSP x 3/4" UNF (long)	2
36	2ST 72J	'O' ring	5
37	16097-358	Orifice plate	1
38	FSE 121	Adaptor	1
39	T.14H	Sealing washer	1
40	F4-45-99	Tee	1
41	ESE 216	Helicoid pressure gauge	1
42	HG 0037/2	Snubber housing c/w copper washers and S4 snubber	1
42	2ST 72M	Equal tee 3/8" x 3/8" x 3/8"	1
44	ESE 182	Adaptor bracket	1
45	ESE 183	Adaptor bracket	2
46	4-60-189	Adaptor	1
47	ESE 130-47	Sealing washer	1
48	H1007-6-8	Adaptor	1
49		Capscrew 5/16" UNC x 2 1/4" long	4
50		Capscrew 5/16" UNC x 1" long	4
51	2ST 72N	Elbow	3
52	ESE 205	Pump coupling	1
53	TD. 3894	Steering ram (see page 54)	2
54	ESE 240	Lift cylinder	1
55	FSE 287	Tilt cylinder (see page 53)	2
56	ESE 104	Hydraulic tank (see page 17)	1
57		Bolt 5/16" UNF x 2 1/2" long and nut	4
58		Bolt M8 x 40 mm long and nut	2
59	UC 1457	Suction filter	2



TILT CONTROL & AUX. SERVICE VALVE

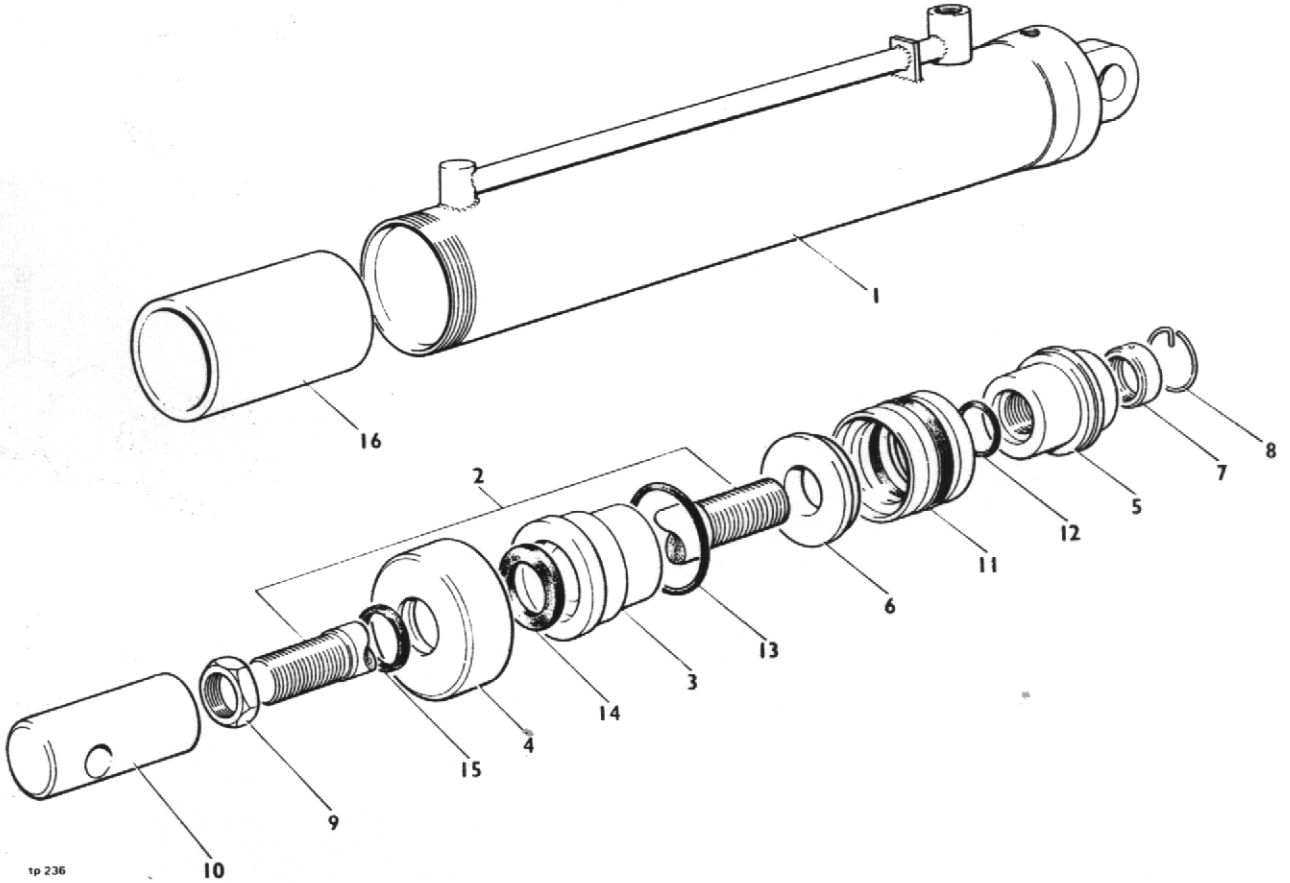
Item No.	Part No.	Description	Qty.
	ESE 241	Hydraulic control valve complete	1
1	100-147-063	'O' Ring 1/8" x 5/8" i.d.....	2
2	30501-12	Plunger, lift check	2
3	30501-13	Spring, lift check	2
4	30501-17	Cap Assy., lift check	2
5	32016-L	Relief Valve Assy. (2000 p.s.i.)	1
6	100-146-012	'O' Ring 3/32" x 5/8" i.d.	2
7	30501-10	Washer, deep	2
8	16048-31	Washer 59/64" o.d.	2
9	30501-39	Spring spool centre	2
10	15546-6	Washer, shallow	2
11	16124-50	Clip ring	2
12	300-024-004	1/16-27 NPTT plug drilled .070D	1
13	30501-74	Pressure beyond plug assy.	1
14	30521-800	Seal kit	A/R



TP 271

LIFT CONTROL VALVE

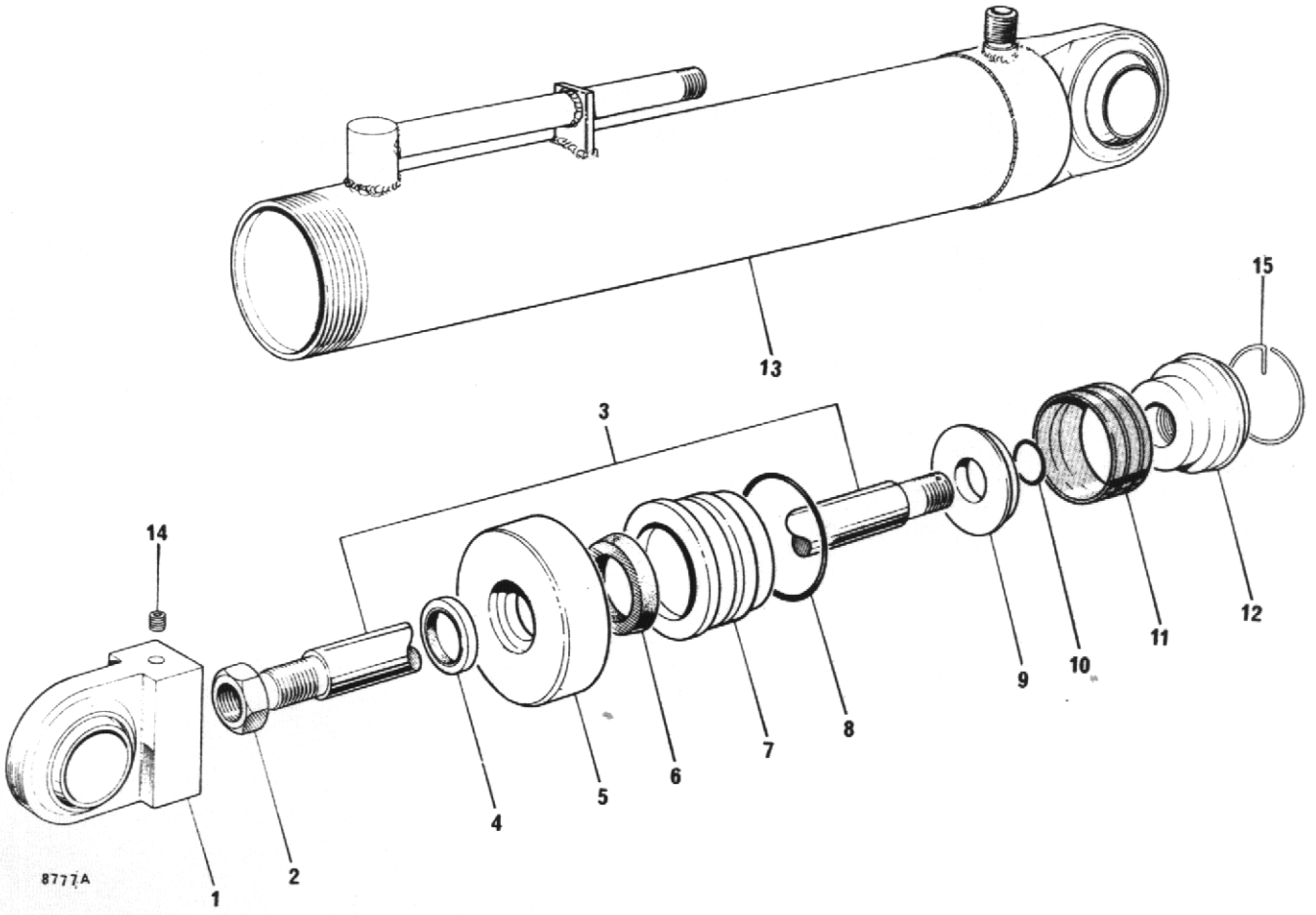
Item No.	Part No.	Description	Qty.
	300-023-AAM	Hydraulic control valve complete	1
1	100-147-063	'O' Ring	1
2	30501-12	Plunger lift check	1
3	30501-13	Spring, lift check	1
4	16003-10	'O' Ring	1
5	30501-11	Plug	1
6	32016-L	Relief valve assy. (2000 p.s.i.)	1
7	100-146-012	'O' Ring	1
8	30501-10	Washer, deep	1
9	16048-31	Washer, spool	1
10	30501-39	Spring, spool centre	1
11	15546-6	Washer, shallow	1
12	16124-50	Clip ring	1
13	30521-800	Seal kit	A/R
6A	300-055-09A	Relief Valve Assy. (2500 p.s.i.) (Used with rollered Triplex Mast only)	1



tp 236

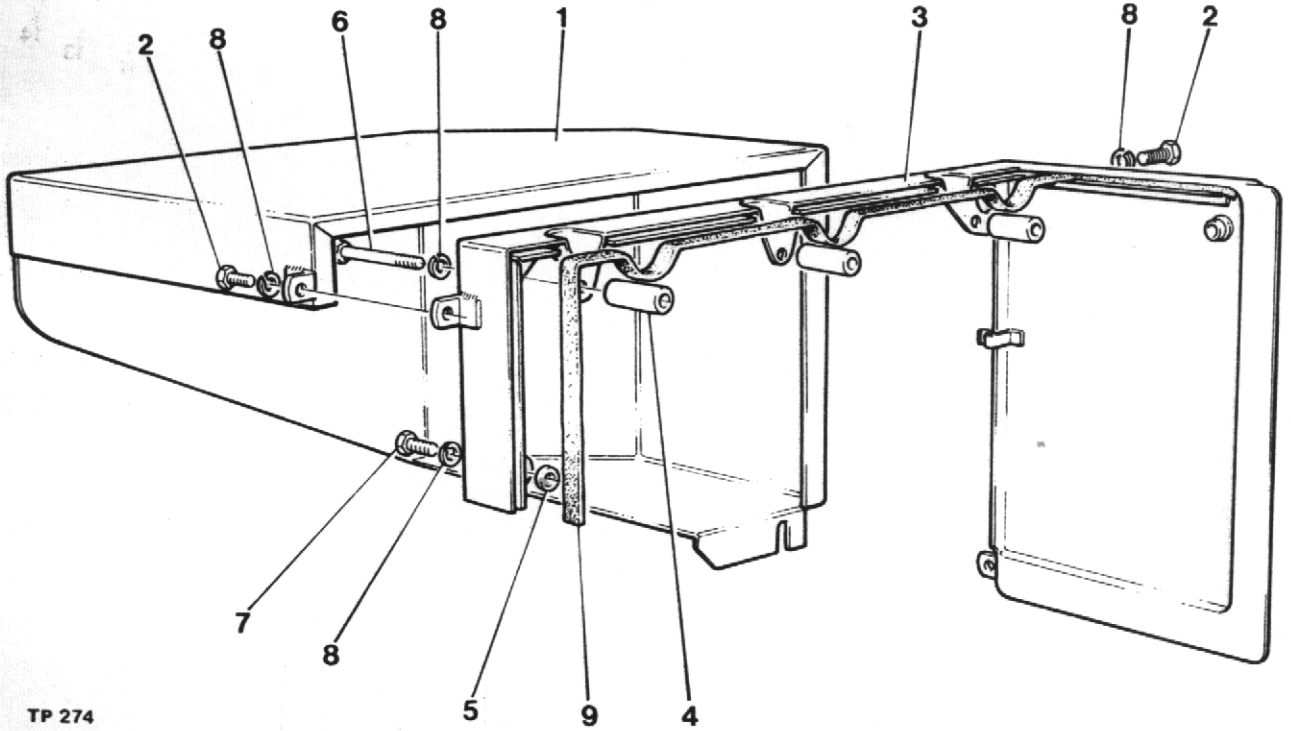
MAST TILT CYLINDER

Item No.	Part No.	Description	Qty.
	TD 8547	Cylinder complete	2
1	TD 8547-1	Cylinder assembly	1
2	TD 9443	Piston rod	1
3	TD 4903	Sleeve	1
4	TD 4902	Tube cap	1
5	TD 6038	Piston head	1
6	TD 6039	Backing washer	1
7	TD 1737	Locknut	1
8	TD 7239	Locking wire	1
9		Locknut 1 1/4" BSF	1
10	TD 9444	Rod end	1
11	R10984 SDW	Piston seal	1
12	BS218	Piston 'O' ring	1
13	BS232	Sleeve 'O' ring	1
14	R5604	Sleeve seal	1
15	PP 58-17	Wiper seal	1
16	FSE 389	Spacer	1
	FSE 477	Seal kit (comprising items 11-15 inclusive)	1



STEERING RAM

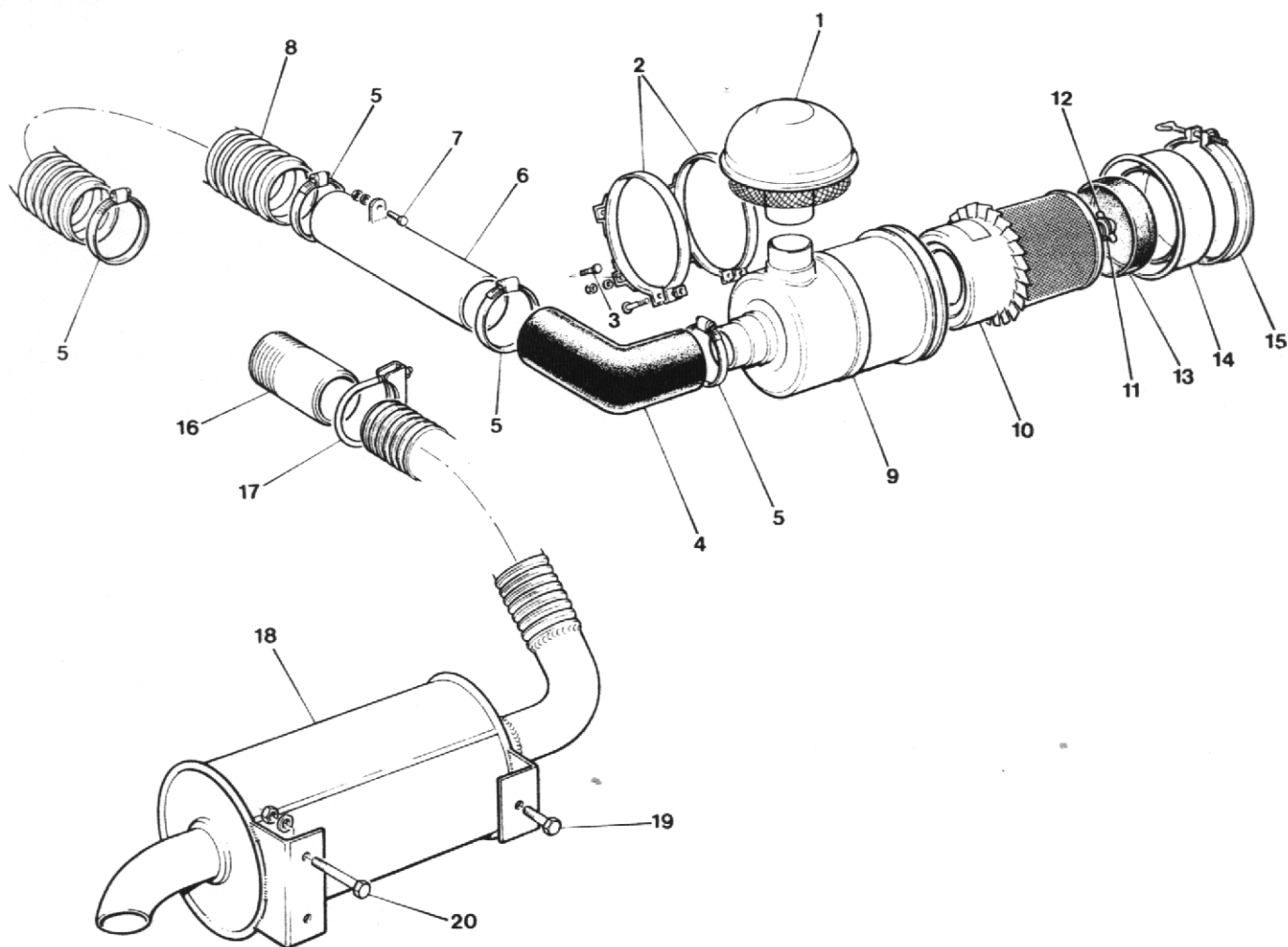
Item No.	Part No.	Description	Qty.
	TD3894	Ram complete (2 per machine)	
1	K1/11	Piston rod fitting	1
2	K1/19	Locknut	1
3	K1/2	Piston rod	1
4	K1/18	Wiper	1
5	K1/4	Tube cap	1
6	K1/17	Sleeve seal	1
7	K1/5	Sleeve	1
8	K1/16	Sleeve 'O' Ring	1
9	K1/15	Backing washer	1
10	K1/13	Piston 'O' Ring	1
11	K1/12	Piston seal	1
12	K1/14	Piston head	1
13	K1/20	Cylinder, bosses & end cap	1
14	K1/21	Grub screw	1
15	K1/22	Spring ring	1
	CSE 189	Seal kit comprising items 4, 6, 8, 10 & 11	1



TP 274

AIR OUTLET DUCT

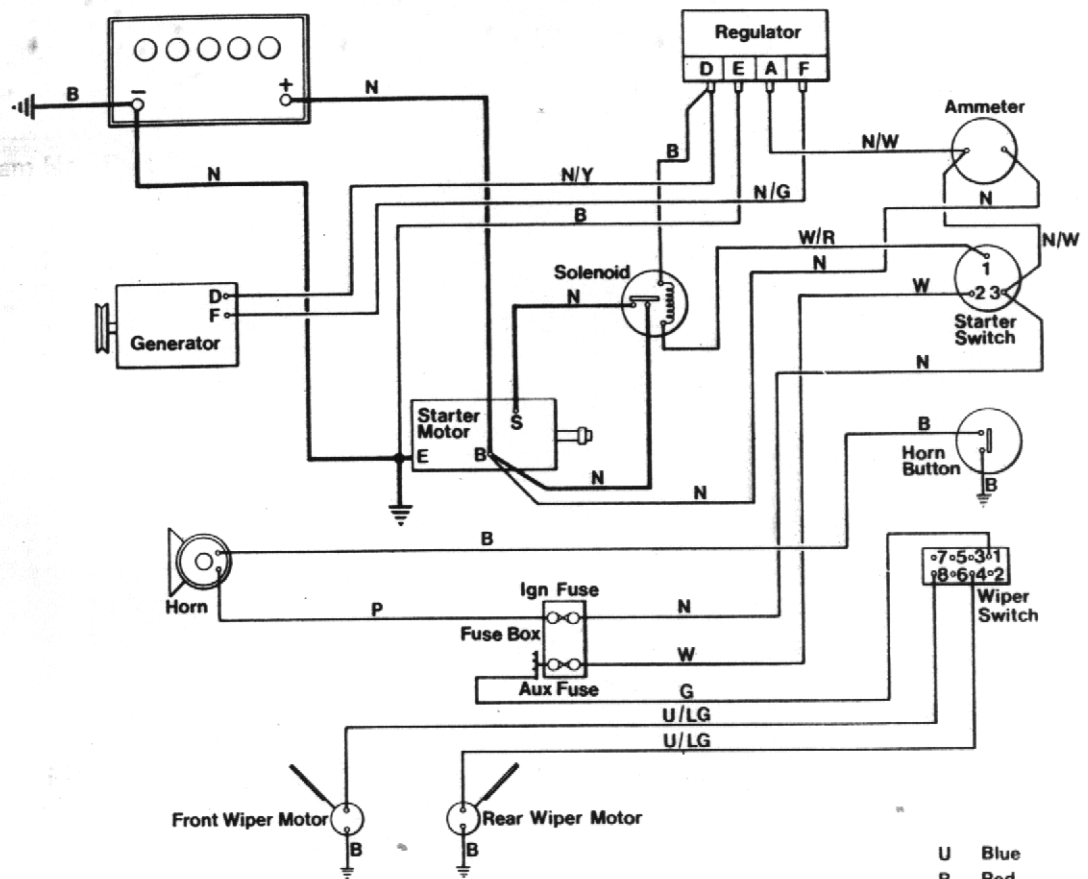
Item No.	Part No.	Description	Qty.
1	ESE 173	Air outlet duct	1
2		Screw 1/4" UNF x 5/8" long	2
3	253E 50670	Flange unit	1
4	35216040	Top distance piece	3
5	29133740	Bottom distance piece	1
6	27000204	Top set bolt	3
7	27000054	Side set bolt	1
8	02700451	Spring washer	6
9	35315690	Felt seal	1



TP 275

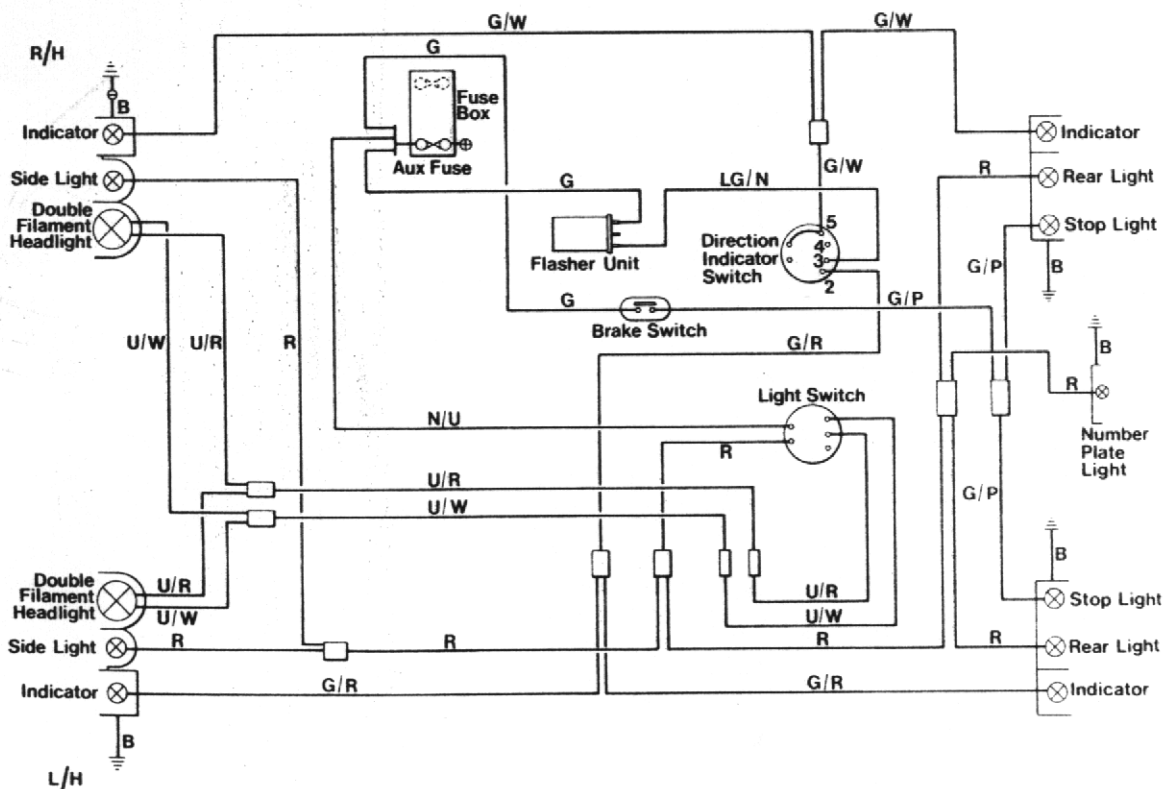
AIR CLEANER & EXHAUST

Item No.	Part No.	Description	Qty.
	4-60-223	Aircleaner (comprising items 9-16)	1
1	DA 124	Stack cap	1
2	DU 440	Mounting clamps	2
3		Screw M6 x 15mm long & nut	4
4	ESE 193	Air cleaner outlet elbow	1
5		Hose clip 3" dia.	4
6	ESE 215	Air inlet connection assembly	1
7		Screw M8 x 15mm long & nut	1
8		Flexible connection 2½" bore x 650mm long	1
9	DU 773	Body assembly	1
10	DU 770	Element assembly	1
11	DU 658	Gasket	1
12	DU 657	Nut	1
13	DU 766	Skirt, baffle	1
14	DU 769	Cup assembly	1
15	DU 420	Clamp assembly	1
16	4-60-296	Adaptor	1
17	SYC 12	Clamp assembly 2 5/8" (67mm)	1
18	ESE 256	Exhaust silencer & pipe assembly	1
19		Bolt M8 x 20mm long & nut	1
20		Bolt M8 x 65mm long & nut	2

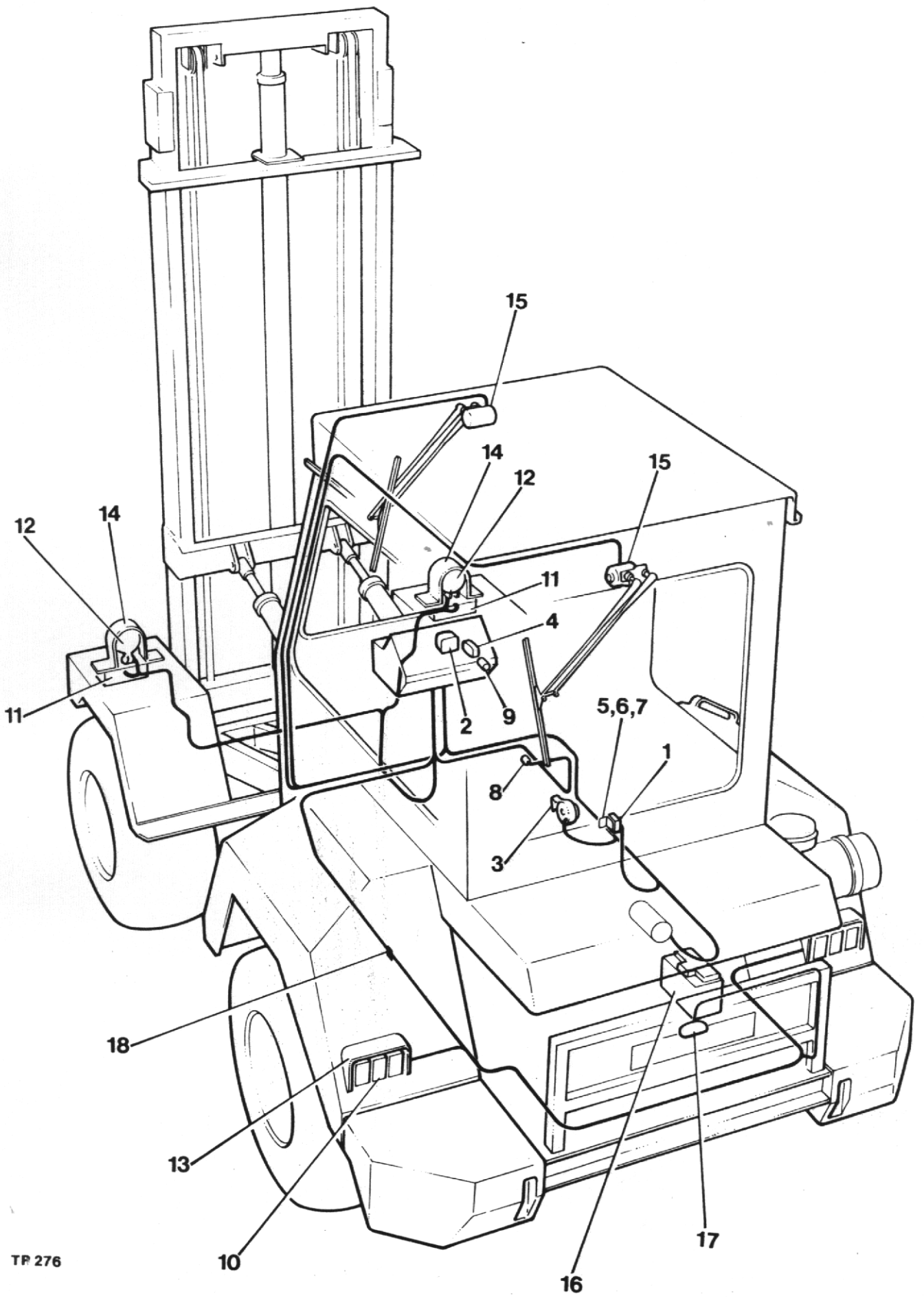


Brown cables connecting Starter Motor & Solenoid to be 65/0,3mm
all other wires to be 28/0,3mm

- U Blue
- R Red
- G Green
- N Brown
- W White
- B Black
- P Purple
- LG Light Green

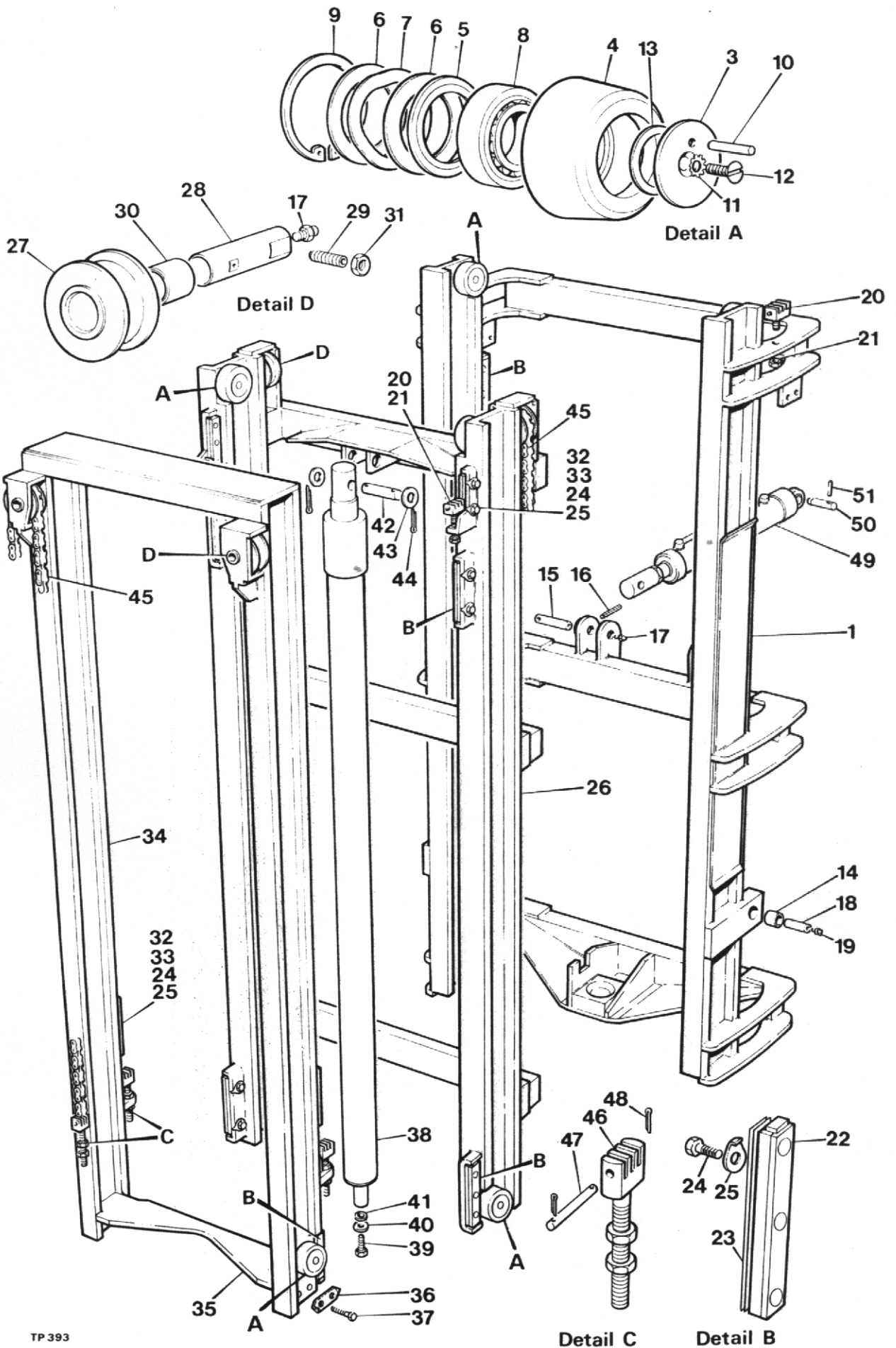


Light Green with Brown wire connecting Flasher Unit to Direction Indicator Switch to be 14/0,3mm
all other wires to be 28/0,3mm



ELECTRICS

Item No.	Part No.	Description	Qty.
1		Starter solenoid	1
2		Regulator	1
3	69219	Horn	1
4	FSE 286	Fuse box 12 volt	1
5	ESE 204	Starter solenoid bracket	1
6		Screw 5/16" BSW x 1½" long	2
7		Screw m5 x 15mm long 8 nut	2
8	FSE 337	Brake switch	1
9	35020	Flasher unit	1
10	FSE 334	Tail & flasher light	2
11	FSE 333	Side & flasher light	2
12	172040	Headlights	2
13	ESE 176	Rear light cowl assembly	2
14	ESE 209	Head light mounting plate assembly	2
15	PMG Thorpe 2068 type SWM	Windscreen wiper motor	2
16	CP 13/11	Battery 12 volt	1
17		Number plate light	1
18	FSE 448	1" sq. self adhesive clip	A/R

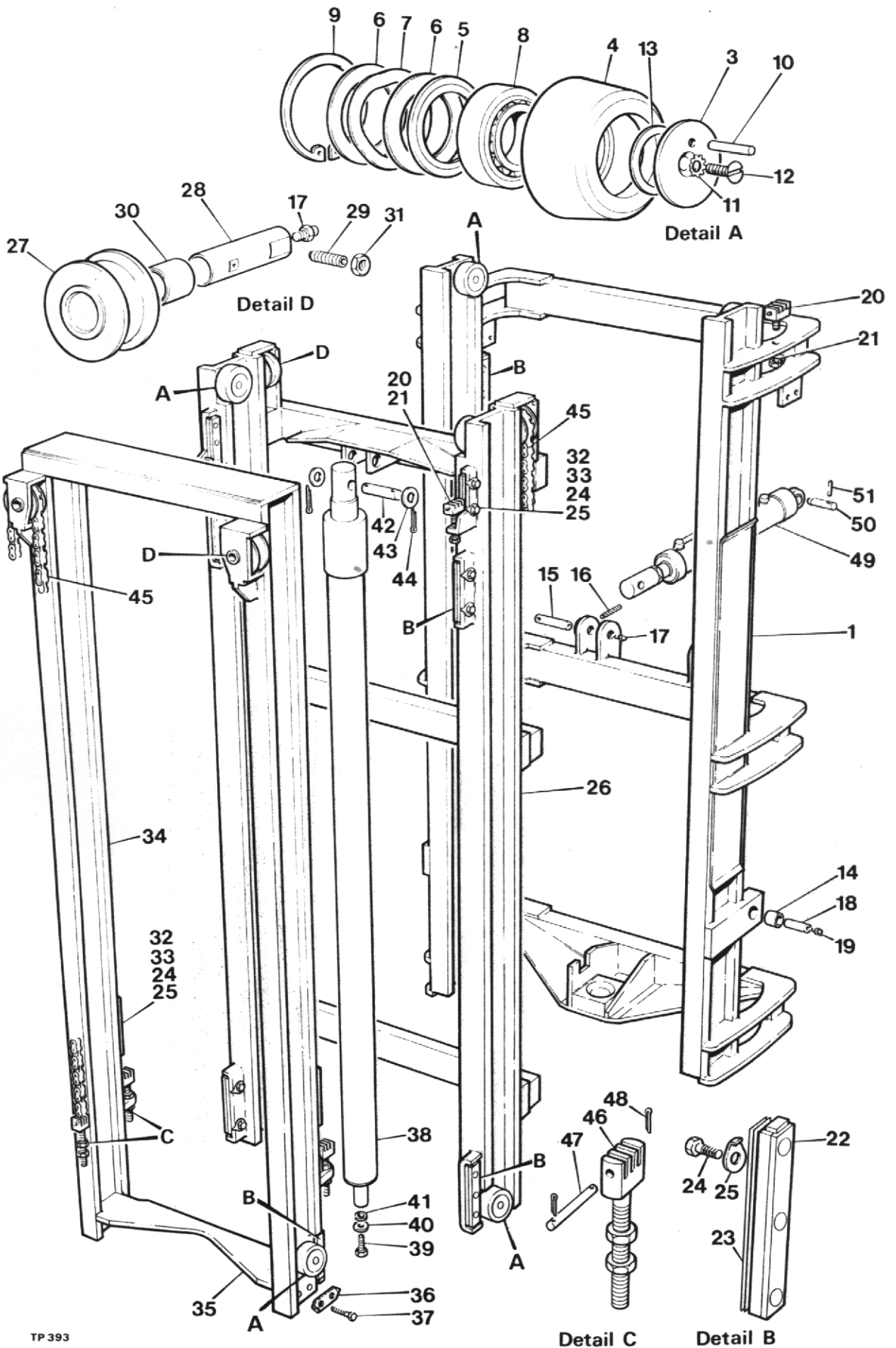


18FT. TRIPLEX MAST

Item No.	Part No.	Description	Qty. per Mast Assy.
	FSE 543	Mast Complete	
1	FSE 534	Outer Mast	1
2	20055.A01	Main Roller Assembly (comprising items 3-13) ..	6
3	10137.A01	End Plate	6
4	10136.A01	Tyre (5 ⁰)	6
5	FSE 393	Spacer	6
6	48S.2	Shim	12
7	FSE 479	Waved Washer	6
8	FSE 433	Roller Bearing	6
9	51S.1	Circlip - Internal	6
10	54S.02A	Locking Pin	6
11	50S.03	Washer Csk. Ext. Shakeproof M8	6
12	53S.03D	Screw Skt. Csk. Hd. M8 x 20mm Long	6
13	48S.1	Shim	6
14	FSE 545	Bush - Pivot	2
15	ESE 157	Pin - Tilt Ram Mast Connector	2
16	54S.07M	Tension Pin	2
17	T/ST	Grease Nipple	6
18	FSE 204	Mast Pivot Pin	2
19	T90	Grease Nipple	2
20	10348.A01	Chain Fixing Block	4
21	76S.6A	Nut Hex. Hd. M16	4
22	20120.A01	Rubbing Strip Assembly	8
23	10526.A01	Shim	16
24	11S.4C	Screw Hex. Hd. M10 x 25mm Long	24
25	CM 2050	Tab Washer	24
26	FSE 535	Intermediate Mast Assembly	1
27	10194.A01	Chain Pulley	4
28	10110.A01	Pulley Pivot Pin	4
29	57S.06K1	Cup Point Setscrew M10 x 35mm Long	4
30	10150.A03	Bush	4
31	56S.04	Half Nut M10	4
32	20121.A01	Rubbing Strip Assembly.....	4
33	10527.A01	Shim	8
34	FSE 536	Inner Mast Assembly	1
35	30157.A01	Crossmember	1
36	10531.A01	Tab Washer	2
37	8S.7J	Bolt Hex. Hd. M20 x 65mm Long	4
38	30118.A01	Displacement Cylinder	1
39	8S.5C	Bolt M12 x 35mm Long	1
40	FSE 217-5	Washer	1
41	C 180A	Felt Washer	1
42	FSE 261	Pin - Lift Ram	1
43	ASE 178	Washer	2
44	44S.5G	Split Pin 3/16" Dia. x 2" Long	2
45	60S.03	Chain	4
46	FSE 187-2	Chain Anchor c/w Half Nuts	4
47	FSE 187-3	Pin	8
48	44S.01M	Split Pin	16
49	30074.A01	Tilt Cylinder	2
50	ESE 158	Pin	2
51	54S.07M	Tension Pin	2

NOTE:- Nut (item 21) must be replaced when Chain Anchor Block (item 20) is replaced.

The Nut to be tightened with the Chain Anchor Block in the correct position, then tack weld 3 faces of the Nut to the mast section.

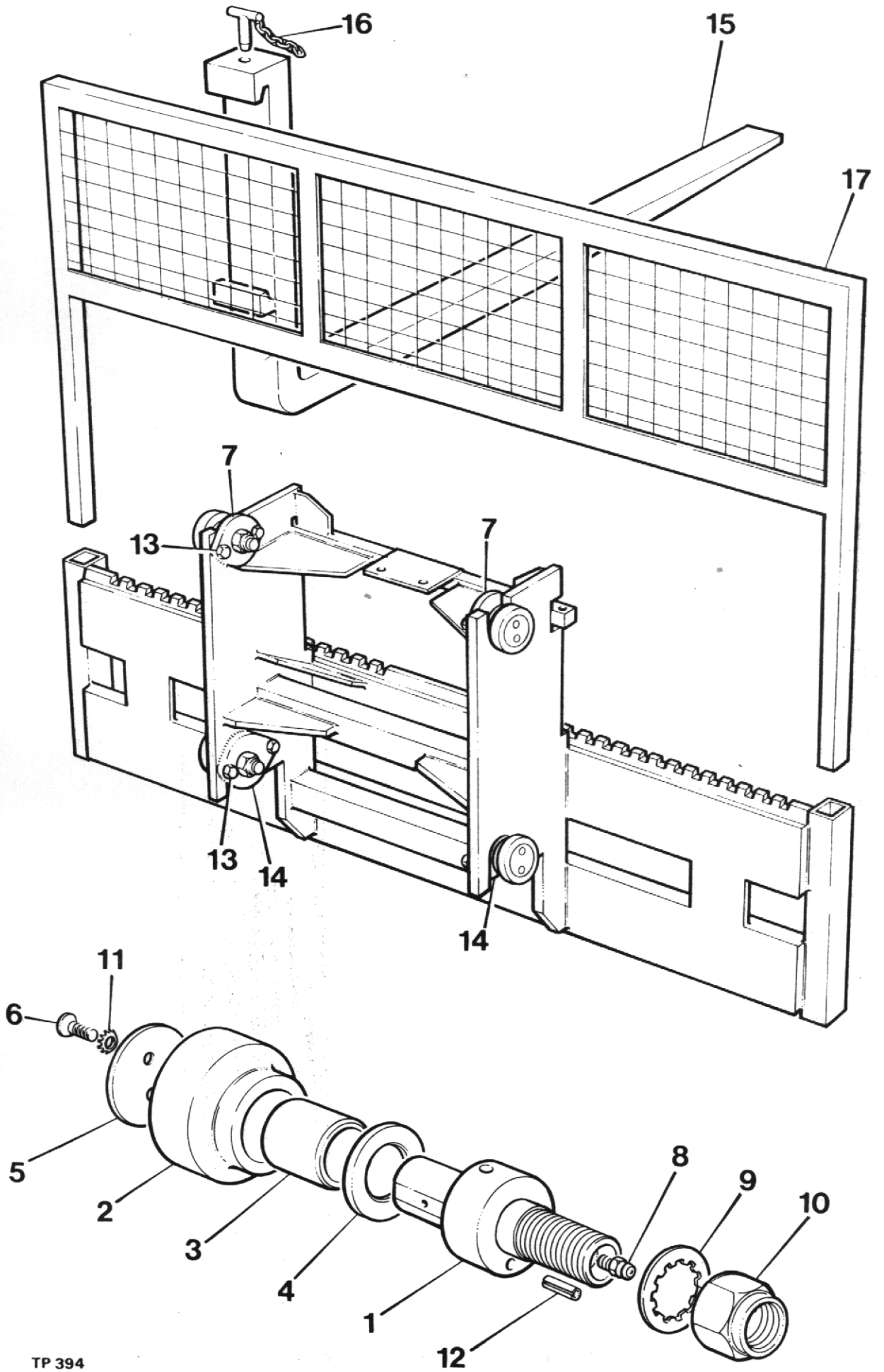


21FT. TRIPLEX MAST

Item No.	Part No.	Description	Qty. per Mast Assy.
	FSE 511	Mast Complete	
1	FSE 512	Outer Mast	1
2	20055.A01	Main Roller Assembly (comprising items 3-13) ...	6
3	10137.A01	End Plate	6
4	10136.A01	Tyre (5°)	6
5	FSE 393	Spacer	6
6	48S.2	Shim	12
7	FSE 479	Waved Washer	6
8	FSE 433	Roller Bearing	6
9	51S.1	Circlip - Internal	6
10	54S.02A	Locking Pin	6
11	50S.03	Washer Csk. Ext. Shakeproof M8	6
12	53S.03D	Screw Skt. Csk. Hd. M8 x 20mm Long	6
13	48S.1	Shim	6
14	FSE 545	Bush - Pivot	2
15	ESE 157	Pin - Tilt Ram Mast Connector	2
16	54S.07M	Tension Pin	2
17	T/ST	Grease Nipple	6
18	FSE 204	Mast Pivot Pin	2
19	T90	Grease Nipple	2
20	10348.A01	Chain Anchor Block	4
21	76S.6A	Nut Hex. Hd. M16	4
22	20120.A01	Rubbing Strip Assembly	8
23	10526.A01	Shim	16
24	11S.4C	Screw Hex. Hd. M10 x 25mm Long	24
25	CM 2050	Tab Washer	24
26	FSE 513	Intermediate Mast Assembly	1
27	10194.A01	Chain Pulley	4
28	10110.A01	Pulley Pivot Pin	4
29	57S.06K1	Cup Point Setscrew	4
30	10150.A03	Bush	4
31	56S.04	Half Nut M10	4
32	20121.A01	Rubbing Strip Assembly	4
33	10527.A01	Shim	8
34	FSE 514	Inner Mast Assembly	1
35	30157.A01	Crossmember	1
36	10531.A01	Tab Washer	2
37	8S.7J	Bolt Hex. Hd. M20 x 65mm Long	4
38	27S.03	Displacement Cylinder	1
39	8S.5C	Bolt M12 x 35mm Long	1
40	FSE 217-5	Washer	1
41	C 180A	Felt Washer	1
42	FSE 261	Pin - Lift Ram	1
43	ASE 178	Washer	2
44	44S.5G	Split Pin 3/16" dia. x 2" Long	2
45	60S.01	Chain	4
46	FSE 187-2	Chain Anchor c/w Half Nuts	4
47	FSE 187-3	Pin	8
48	44S.01M	Split Pin	16
49	25S.03	Tilt Cylinder	2
50	ESE 158	Pin	2
51	54S.07M	Tension Pin	2

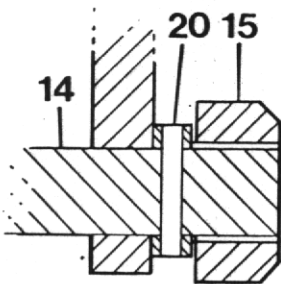
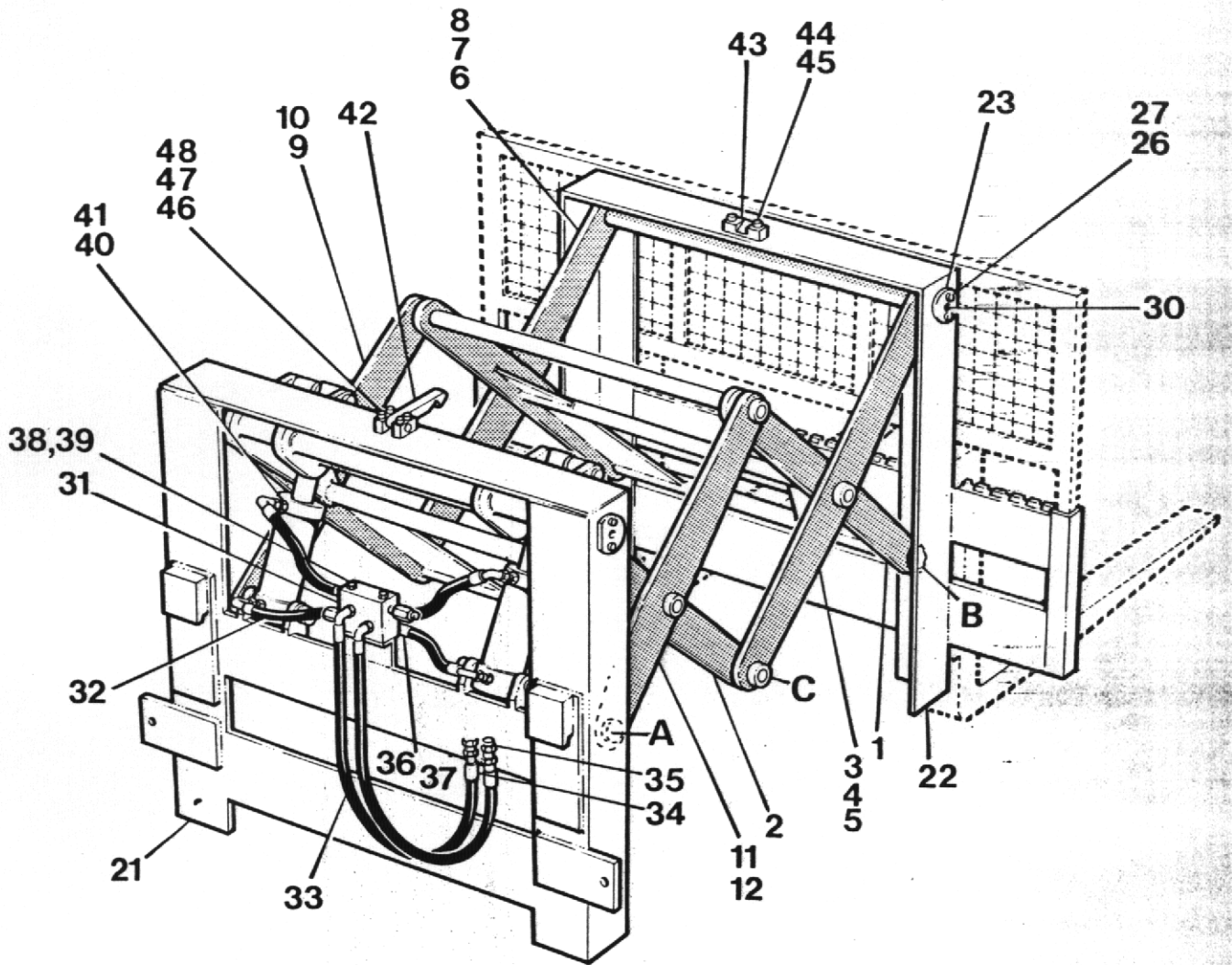
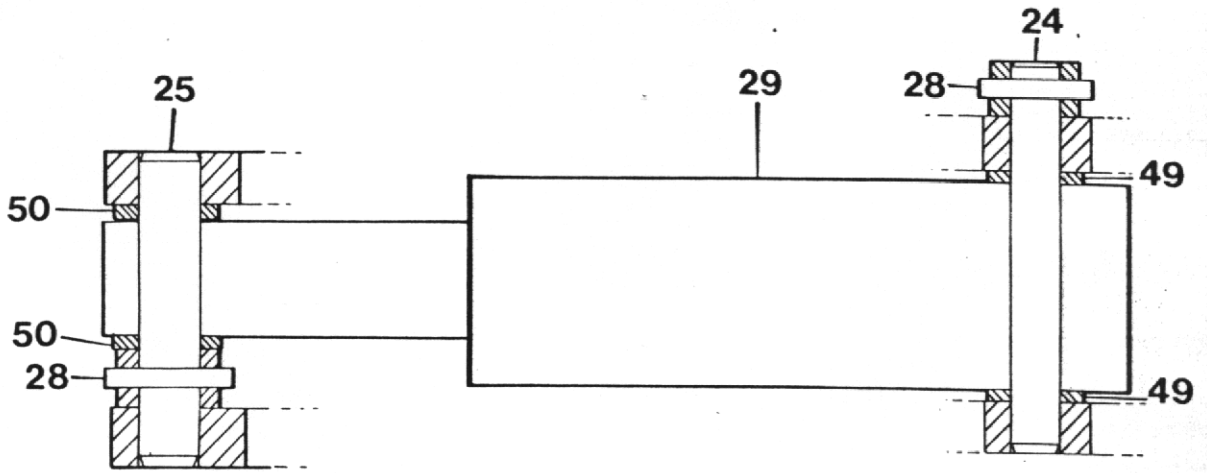
NOTE:- Nut (item 21) must be replaced when Chain Anchor Block (item 20) is replaced.

The Nut to be tightened with the Chain Anchor Block in the correct position, then tack weld 3 faces of the Nut to the mast section.

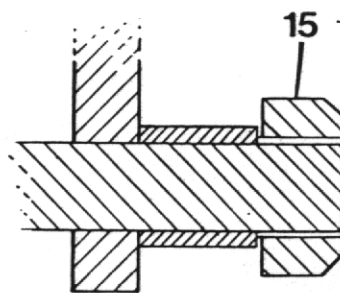


STANDARD CARRIAGE

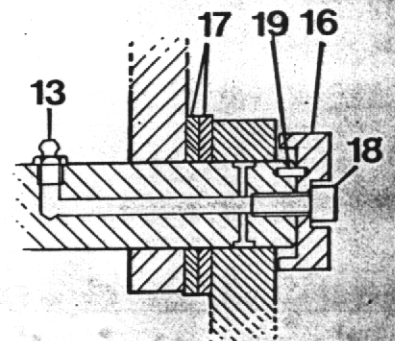
Item No.	Part No.	Description	Qty.
	FSE 515	Carriage Assembly complete (items 1-14)	1
1	10138.A01	Pin	4
2	10139.A01	Roller	4
3	10150.A04	Bush	4
4	10156.A01	Thrust Washer	4
5	FSE 500	End Plate	4
6	53S.02C	Screw Skt. Hd. Csk. M6 x 16mm Long	8
7	10140.A01	Roller Fixing Plate	2
8	T/ST	Grease Nipple	4
9	13S.10	Internal Shakeproof Washer 30mm I.D.	4
10	59S.09	Nut - Nyloc Self Locking M30	4
11	50S.02	External Csk. Shakeproof Washer M6	4
12	54S.07	Tension Pin	4
13	8S.5D	Bolt Hex. Hd. M12 x 40mm Long	8
14	10141.A01	Roller Fixing Plate	2
15	FSE 117	Forks	2
16	E288-15	Peg & Chain Assembly	2
17	ESE 185	Carriage Guard	1



A



B



C

LOAD EXTENDER

Item No.	Part No.	Description	Qty.
	GSE 181	Extender Assembly	
1	GSE 183	Front Inner Frame	1
2	GSE 184	Rear Inner Frame	1
3	GSE 171	Outer Arm R.H.(Front)(Incl. items 4 & 5)	1
4	4-35-29B	Bush	2
5	20-DU-28	Bush	1
6	GSE 172	Outer Arm L.H.(Front)(Incl. items 7 & 8)	1
7	4-35-29B	Bush	2
8	20-DU-28	Bush	1
9	GSE 168	Outer Arm L.H.(Rear)(Incl. item 10)	1
10	4-35-29B	Bush	2
11	GSE 169	Outer Arm R.H.(Rear)(Incl. item 12)	1
12	4-35-29B	Bush	2
13	131S.3	Nipple - Grease	8
14	GSE 180	Cross Bar (Rear Rollers)	1
15	GSE 176	Roller Assy.	4
16	GSE 177	Retaining Collar	8
17	10S.10	Washer	8
18	68S.3D	Cap Screw-Socket Head M10 x 25 Long	8
19	GSE 130-10	Pin - Dowel	8
20	55S.2E	Pin - Tension	2
21	GSE 188	Backplate Assy.	1
22	GSE 189	Frontplate Assy.	1
23	GSE 125	Pin - Pivot	4
24	GSE 127	Pin (Hydraulic Cylinder)	2
25	GSE 128	Pin (Hydraulic Cylinder)	2
26	8S.4M	Bolt - Hex. Hd. M10 x 80 Long	8
27	7S.4	Nut M10	8
28	55S.2E	Pin - Tension	4
29	30074A03	Cylinder - Hydraulic	2
30	131S.3	Nipple - Grease	4
31	GSE 155	Valve	1
32	32S.2A	Hose ST x 90°	4
33	31S.2U	Hose ST x 90°	2
34	C.23543	Snap Coupling Carrier	1
35	C.23554	Snap Coupling Probe	1
36	T14J	Adaptor 3/8" BSP x 3/8" BSP	4
37	100S.3	Seal 3/8" BSP	4
38	8S.4N	Bolt - Hex Hd. M10 x 90 Long	2
39	7S.4	Nut M10	2
40	T63K	Adaptor 1/2" BSP x 3/8" BSP	4
41	100S.4	Seal 1/2" BSP	4
42	GSE.187	Latch	1
43	GSE.151	Catch Block	1
44	8S.4D	Bolt - Hex Hd. M10 x 40 Long	2
45	7S.4	Nut M10	2
46	GSE.152	Latch Pivot Block	2
47	8S.4H	Bolt - Hex Hd. M10 x 60 Long	4
48	7S.4	Nut M10	4
49	10S.8	Washer (1")	A/R
50	10S.9	Washer (1.1/4")	A/R
51	10558.A05	Hyd. Cylinder Seal Kit	

WINGET



NEWAGE 250, 350 & 400 SERIES AXLE SERVICE MANUAL

WINGET LIMITED
PO BOX 41
EDGEFOLD INDUSTRIAL ESTATE
PLODDER LANE
BOLTON
LANCS BL4 OLS
U.K.
Tel:++44(0)1204 854650
Fax:++44(0)1204 854663
E-mail service@winget.co.uk
www.winget.co.uk

LIST OF CONTENTS

SECTION	PAGE NO.
INTRODUCTION	3-4
SECTION THROUGH AXLE	5
PINION CARTRIDGE	6
CROWNWHEEL AND DIFFERENTIAL	7
SETTING UP CROWNWHEEL AND PINION	8
PLANETARY GEARS	9
BRAKES	10
AXLE SHAFT ASSEMBLY	11
STUB AXLE AND WHEEL HUB	12
SPIRAL BEVEL GEAR TOOTH CONTACTS	14
TORQUE SETTINGS	15
BACKLASH SETTINGS	15

Introduction

Winget Limited gratefully acknowledge the assistance given by Newage Transmissions Limited in the preparation of this manual, however neither Winget Limited or Newage Transmissions can be held responsible for any errors or omissions.

The procedures described within this manual should enable experienced service personnel to strip, repair and re-build Newage 250, 350 & 400 series axles fitted to Winget Site Dumpers and Forklifts in a safe and competent manner. The procedures are not intended to be used by personnel who are unfamiliar with the product or mechanically inexperienced.

It is assumed that personnel are aware of the Health and Safety Regulations which should be applied but the following should act as a reminder.

Whenever possible any repairs or service should be carried out in a clean environment. If work must be carried out on site or in the field steps should be taken to ensure that dirt or foreign materials cannot enter the assembly.

Ensure all work tools are in good condition and only use the correct tool for the job in hand.

Always wear safety spectacles when using soft or hard faced hammers, chisels, drifts or when using air tools. Wear safety spectacles when cleaning components or when grinding.

Do not misuse air lines and be aware of the damage compressed air can cause if misused.

Always make sure lifting equipment is in good condition and the Safe Working Load exceeds the weight of the component to be lifted.

Always use suitable supports i.e. axle stands or baulks of timber in conjunction with hydraulic jacks etc. Never rely on hydraulic jacks alone to support a machine.

Be aware of hot surface temperatures and take care when draining hot oils. Always dispose of waste oils in accordance with local and national regulations.

Whenever possible always disconnect the battery or battery isolator when working on the machine to prevent electrical shorts and unauthorised starting.

Refer to the operators handbook for a guide to the correct sequence for assembling components and sub-assemblies.

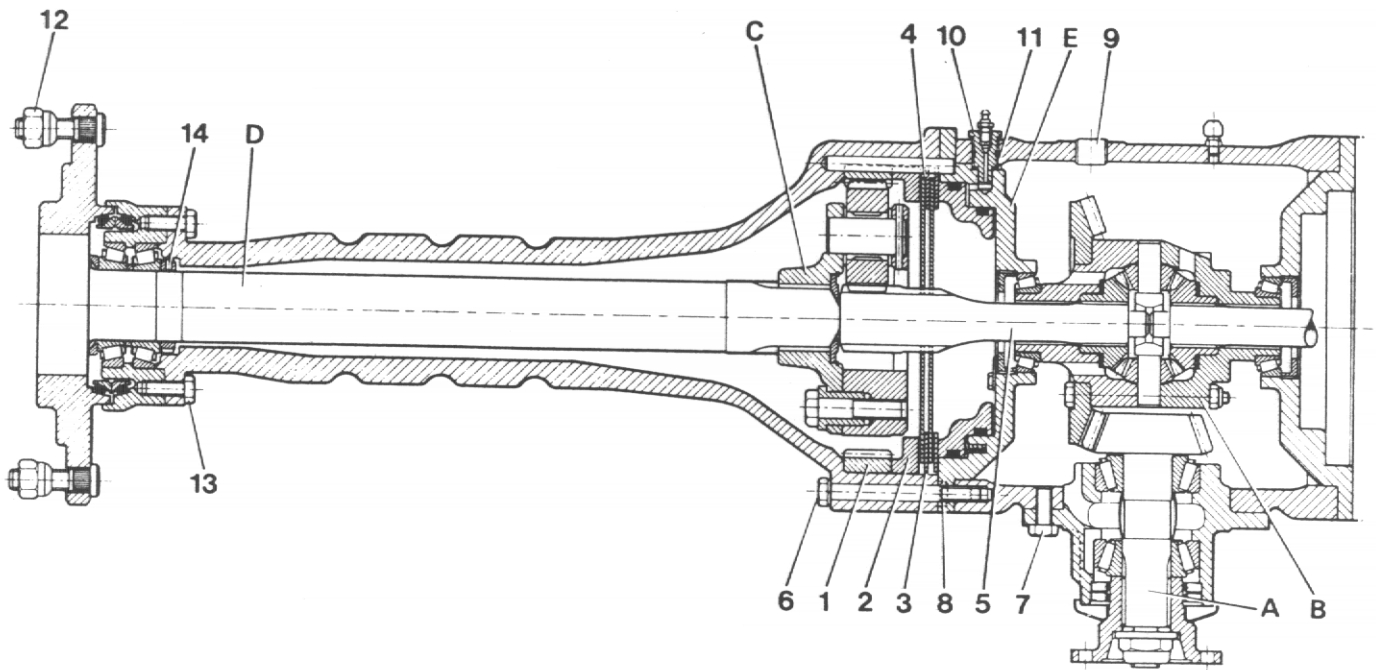
Oils, fuels, silicone sealer etc can cause skin diseases if allowed to contaminate the skin. Always apply barrier creams, wear suitable protective clothing or when contamination is unavoidable clean the area with soap and water as soon as possible. Do not use thinners or other solvents to clean skin.

Health and Safety is a matter of common sense. If common sense is applied correctly the risk of accidents can be reduced.

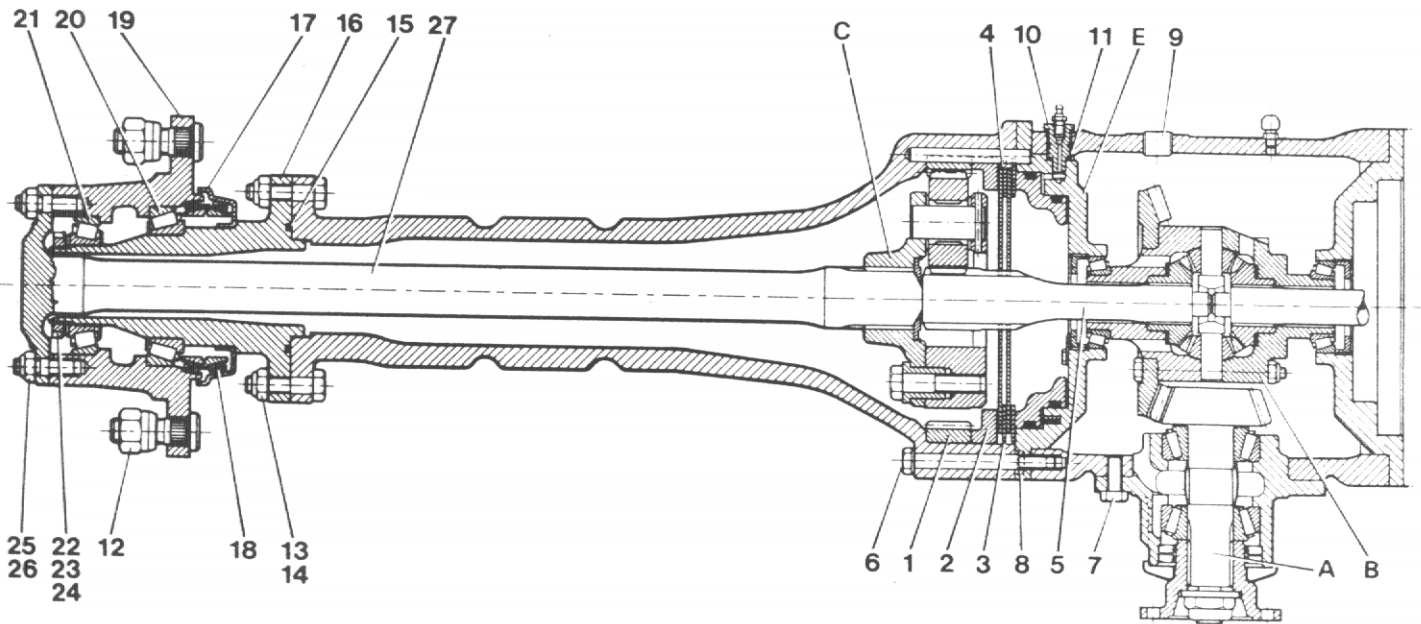
Spares for Newage Axles fitted to Winget Equipment can only be obtained from Winget Limited or one of our authorised distributors and not from Newage Transmissions Limited. Always quote your machines serial number and model together with axle serial number and model when ordering spare parts.

250, 350 & 400 Series axles are designed to operate under arduous conditions and providing they are regularly and correctly maintained they will provide long trouble free service.

Whilst every effort is made to ensure the contents of this manual are accurate Winget Limited and Newage Transmissions reserve the right to alter specification without prior notification and certain sections of this manual may then no longer apply.



TYPICAL AXLE 250 & 400 SERIES



TYPICAL AXLE 350 SERIES

FIG. A

DISMANTLING AND ASSEMBLING AXLE

Pinion Cartridge

(See Fig. A)

1. Remove drain plug (9) and drain axle oil, remove screws (7) and pull out cartridge (A), using easing screws if required.

(See Fig. B)

2. Remove nut (5) in coupling flange, (3) holding flange with special tool (AA). Remove flange and knock out pinion (2).
3. If front bearing is damaged or worn, remove cone and roller assembly by splitting cage and using a bearing puller to remove the cone.
4. If required, bearing cups (7) and oil seals (9) can be drifted out from the pinion cartridge.

To re-assemble with new pinion, bearings, seals etc., the procedure is as follows:—

5. Press bearing cups and oil seals into cartridge.
6. Press front pinion bearing to pinion shaft.
7. Pack gap between seal lips $\frac{3}{4}$ way round with grease.
8. Assemble pinion to cartridge, push on spacer (8) and tail bearing drive flange, washer and nut. (Check drive flange, seal wear surface is free from damage.)

NOTE: If new bearings are fitted, a new collapsible spacer (8) must be fitted.

9. Tighten nut (5) holding coupling flange with special tool, until bearing spacer collapses 21 kpm (150 lb. ft. min.) and continue to tighten until all pinion end float is removed.
10. Turn nut until a drag is felt when turning the coupling flange and check the bearing preload using a piece of string wound round the flange and a spring balance (see Fig. C).

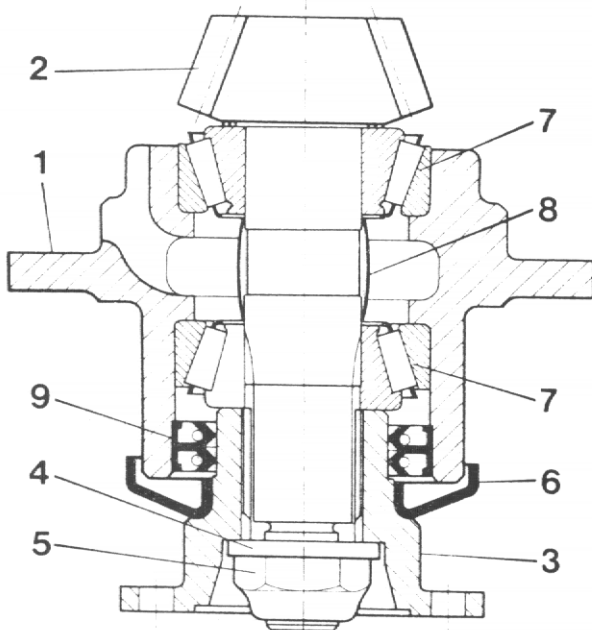


FIG. B

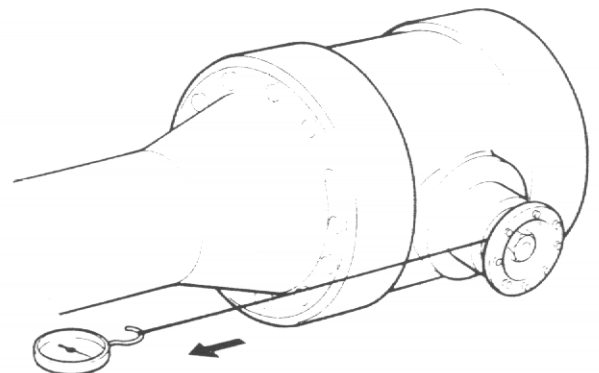


FIG. C

11. Pull the spring balance until the pinion turns smoothly and note the reading (should be 3.5–5.5 kg for new bearings and (1.75–2.75 kg) for old bearings on the 250 Series and 350 Series axles, and 4.5 – 6.5 kg for old bearings on the 400 Series axle.
12. Gradually tighten nut and re-check until correct reading is obtained.

NOTE: Above preload figures should not be exceeded.

13. Assemble pinion cartridge to centre casing, applying sealer between shims, centre case flange and cartridge flange.

NOTE: Ensure cartridge oil slot is in correct position (see Fig. D).

14. Tighten screws holding cartridge to main case.

Crownwheel and Differential (Ref. B)

(See Fig. A)

1. Drain axle oil, remove screws (6) and pull off left hand axle arm assembly.
2. Remove brake feed and bleed adaptors (10).
3. Slacken screws (8) and remove brake cylinder (E) using easing screws if required.
4. Lift out crownwheel and differential assembly (B).
5. Slacken nuts (11) (See Fig. E), remove crownwheel and split differential unit.
6. Thrust washers (5) and (6) should be replaced if they show signs of damage or excessive wear.
7. Check all internal rubbing surfaces of diff. cases (1) for signs of wear.
8. Diff. bearing cone and roller assys. (9) can be pulled or drifted off diff. case halves.

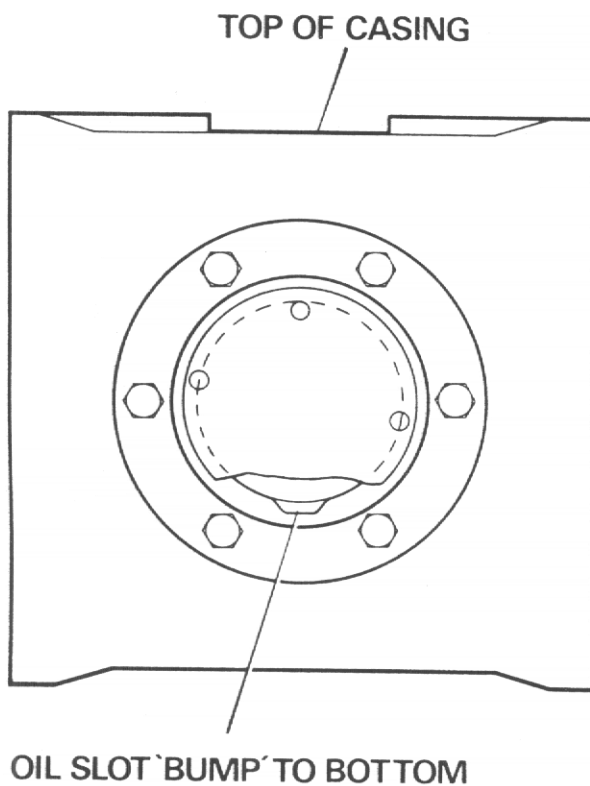


FIG. D

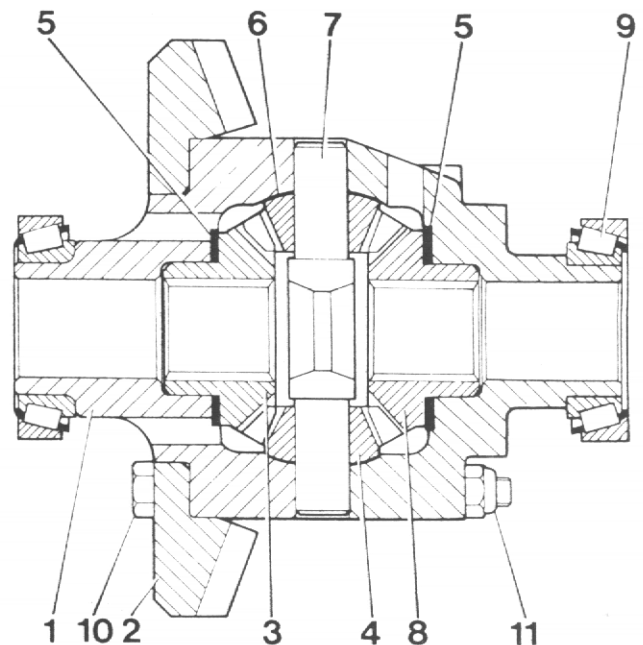


FIG. E

9. Re-assemble differential unit, ensuring that typed marks on diff. halves are aligned.
10. Assemble crownwheel, bolts (10) and torque up nuts (11).
11. Engage a sun gear (7) in a diff. gear and ensure that differential gears turn freely.
12. Press on new diff. bearings if required.
13. If diff. bearings are not replaced, then the diff. can be put back in the centre case and the brake cylinder replaced, without adjusting the bearing nuts (6). (See Fig. F)

14. If the diff. bearings are replaced, then it will be necessary to reset the crownwheel backlash and the bearing preload. (See Crownwheel and Pinion Set Up.)
15. Brake cylinder, centre case and axle arm flange faces should be cleaned, oil sealer scraped off and new sealer applied prior to re-assembly.
16. Replace brake cylinder and axle arm assembly, all screws and bolts being tightened to the correct torque.

Setting up Crownwheel and Pinion

1. Assemble pinion cartridge as described previously.
2. Assemble crownwheel and diff. assembly as described.
3. Assemble and seal one cylinder to main casing using screw (8) (See Fig.A). Push in diff. bearing cup and screw in lock ring (6) (See Fig. F).
4. Stand centre case on cylinder end and lower in diff. assembly, locating the diff. bearing halves together and ensuring that crownwheel and pinion are in mesh.
5. Seal and fit other brake cylinder and assemble bearing cup and lock ring.
6. Tighten lock ring until bearing end float is removed.
7. On pinion cartridge use a depth gauge to measure dimension 'X' from front face of pinion to cartridge flange (see Fig.G).

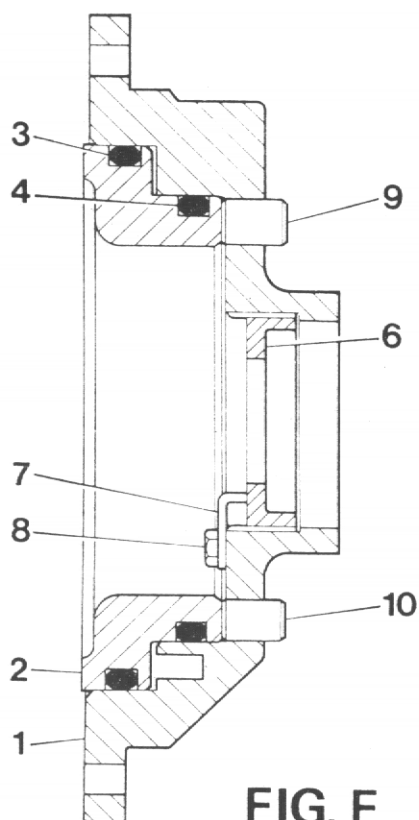


FIG. F

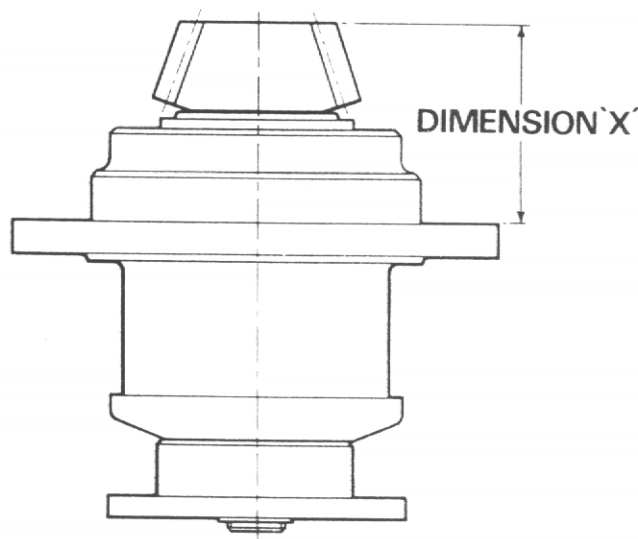


FIG. G

8. On centre case use a depth gauge to measure dimension 'Y' from pinion cartridge flange surface to ground diameter on differential casing (see Fig. H).
9. Read pinion mounting distance (M.D.) from front face of pinion. Pinion head thickness = (see front face of pinion), diff. case ground diameter = 129.50 mm. on the 400 series and 108.76 mm. on the 250 series. and 108.76mm on the 350 Series. Calculate as follows:

$$(M.D. - \text{Head thickness} - \frac{\text{Diff. case dia.}}{2}) = 'A'$$

$('A' - 'B') = Shim thickness to be placed between pinion cartridge flange and centre case flange.$

10. Select shims, place on pinion cartridge and assemble cartridge to centre casing.

NOTE: It is required to know the spring balance reading required to turn pinion in its bearings, as described previously.

11. Adjust diff. bearing lock rings to give correct backlash between crownwheel and pinion.
(See Page 12)

This can be measured by using a dial gauge with its pointer in a coupling flange hole (see Fig. J).

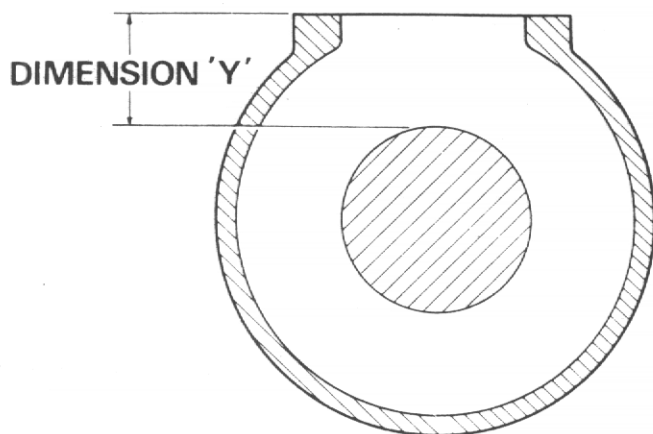


FIG. H

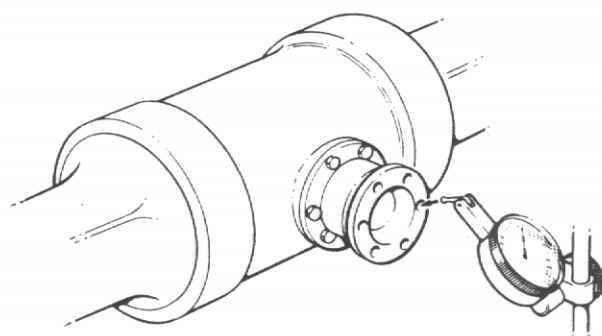


FIG. J

12. Tighten lock rings equally at each end of the differential to preload the bearings. The preload can be checked by turning the pinion coupling flange by means of string and spring balance as previously described. (Check that backlash is maintained.)

13. The additional spring balance load for the diff. bearings is shown.

14. Slacken and remove screws holding pinion cartridge in place and pull out cartridge. Brush on some paint, Engineers Blue etc. to a few crownwheel teeth and replace the pinion cartridge.

15. Turn the coupling flange a few turns in both directions then slacken screws and lift out.

16. Examine the contact on both sides of the crownwheel teeth and check that it is similar to that shown in fig. S and is similar to original factory marking shown on teeth.

17. If marking is satisfactory, replace pinion cartridge with sealer on flange surfaces and torque up screws.

(See Fig. F)

18. Put lock tabs (7) in place in cylinders and tighten screws (8). (Ensure that screws have locking compound applied.)

19. Bend over locking tabs into slots in lock rings (6).

Planetary Gears (Ref. C)

1. Drain axle oil and remove axle arm as explained previously.

(See Fig. A)

2. Lift out sun shaft (5), brake plates (2, 3 & 4) and planetary assembly.

(See Fig. K)

3. Check planet gear (3) end float using feelers. (Should not be greater than 2mm.)

4. Remove lock wire where used, slacken bolts (7) and tap bolt heads to split planetary assembly.

5. Lift off planet gears (3), thrust washers (5) and needle bearings (9).

6. Inspect all parts for wear or damage and replace if required.
 7. If planet pins (4) are worn, remove by drifting out spring pin (10), and push planet pin from hole in planet carrier (1).
- NOTE: On re-assembly, tap in spring pin until flush with outside of planet carrier and peen over edge of hole.
8. To assemble, place gears, washers, bearings etc. on planet pins and locate carrier drive flange (2) on planet pins and push both halves together.
 9. Push dowels (6) home, tighten bolts and fit lock wire if required.
- (See Fig. A)
10. If annulus (1) shows signs of wear, remove using puller (BB) and fit new part. (Ensure that new annulus is fully home in its location bore.)
 11. Check axle shaft (1) (see Figs. L & N), splines for wear or damage and if satisfactory, locate planetary on splines.
 12. Re-assemble sun shaft, brake plates, etc. clean axle arm and brake cylinder flange faces, re-seal and assemble axle arm as previously described.

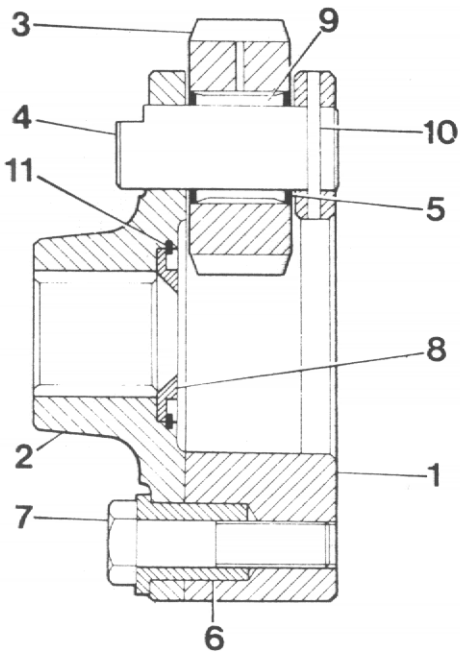


FIG. K

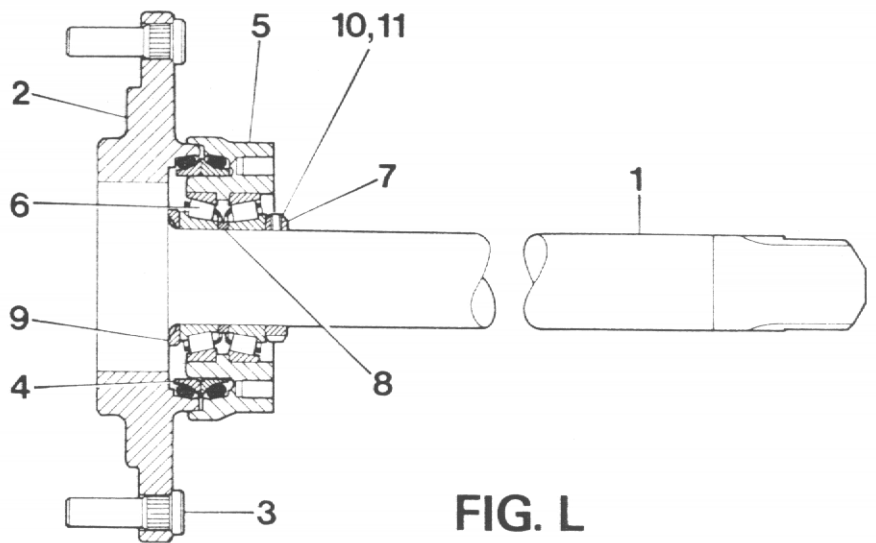


FIG. L

Brakes

1. The dismantling procedure is the same as for the planetary gears.
2. When the sintered plates and the fixed plates are removed from the axle arm, examine both for excess wear. The thickness of the sintered plate should not be less than 4mm. The thickness of the fixed plate should not be less than 2mm.
3. To check the piston/cylinder assembly it is not essential to remove the cylinder from the centre case, but if required, remove brake feed and bleed fittings (10), screws, (8) (see Fig. A) and lift out cylinder from centre case using easing screws if required.

(See Fig. F)

4. Pull the piston (2) from the cylinder and examine the seals (3 & 4) and cylinder walls for signs of damage.

5. When refitting the piston to the cylinder ensure that the 3 springs (5) are in place in their holes in the rear of the cylinder.
6. Clean and seal cylinder and centre case flange surfaces and bolt cylinder in place with screws (8). (See Fig. A)
7. Examine brake plate splines for damage before assembling to sun shaft.

NOTE: When plates are assembled to sun shaft, ensure that holes line up to ensure an oil passage through the plates.

8. Assemble all brake plates and axle arm as previously described.
9. Re-fit, brake bleed and feed adaptors (10) if removed, ensuring that sealing washer (11) is properly located. (See Fig. A)

IMPORTANT NOTE

The axle utilises a hydraulic braking system and 2 different types of hydraulic fluid are used.

1. A conventional synthetic brake fluid system; (fluid to SAE J1703) the fluid is contained in a conventional master cylinder reservoir.
(Note: Piston/cylinder seals 3 & 4 (See Fig. F) will be blue in colour).
2. A mineral brake fluid system; the fluid is contained in the vehicle hydraulic tank.
(Note: Piston/cylinder seals 3 & 4 (See Fig. F) will be black in colour).

For the conventional brake fluid system, the following note applies;

IMPORTANT

It is essential that all cylinder bores, pistons, and seals, are kept clean and free from all lubricating oils. The seals can be lightly coated with brake fluid to SAE J1703 prior to assembly.

For the mineral fluid system, the following note applies;

IMPORTANT

It is essential that all cylinder bores, pistons, and seals are kept clean prior to assembly. They may be coated with one of the MINERAL hydraulic oils listed. They MUST NOT be coated with standard "vegetable" based fluid (SAE J1703).

Axle Shaft Assembly (400 series axle)

(See Fig. A)

1. Slacken and remove screws (13) holding assembly to axle arm.
2. Tap rear of wheel flange to remove shaft assembly from axle arm.

(See Fig. L)

3. Slacken screw (11) in shaft locking ring (7) and unscrew locking ring using special tool (CC).
4. Tap seal housing (5) to remove from axle shaft.
5. Inspect bearings, oil seals and shaft for signs of wear or damage.
6. If a new oil seal is required, it is advisable to fit using the special tool (DD). (See Fig. M)
7. If new shaft bearings are required, they are supplied complete with the shaft spacer and are preset to give the correct running adjustment. Remove the old bearing cups (6) from the oil seal housing and fit new parts. Assemble the oil seal halves to the wheel flange and the oil seal housing.
8. Assemble the bearing/seal housing assembly to the axle shaft and tighten the locking ring behind the bearings.
9. Tighten the screw (11), compressing the nylon insert (10) onto the threaded part of the shaft.
10. Clean the rear surface of the oil seal housing and the axle arm flange surface. Reseal, fit the shaft assembly to the axle arm and tighten screws (13). (See Fig. A)

Axle Shaft Assembly (250 series axle)

(See Fig. A)

1. Slacken and remove screws (13) holding assembly to axle arm.
2. Tap rear of wheel flange to remove shaft assembly from axle arm.

(See Fig. N)

3. Slacken screw (15) in shaft locking ring (7) and unscrew locking ring using special tool CC.
4. Tap seal housing (5) to remove from axle shaft.
5. Inspect bearings, oil seals and shaft for signs of wear or damage.
6. If a new oil seal is required, it is advisable to fit using the special tool DD (see Fig. M).
7. A single unitised taper roller bearing is used and if a new unit is required, then it is necessary to adjust shims (10 to 13) to provide the correct clamping load on the bearing. The procedure is as follows:—
 - a) Remove old bearing from oil seal housing and fit new unit.
 - b) On small end of axle arm, use a vernier depth gauge to measure from the end of the spigot location on the flange (see Fig. P). Let this dimension be 'X'.
 - c) Measure the depth inside the oil seal housing, from the mating face with the axle arm to the end of the bearing outer race. Let this dimension be 'Y'. (See Fig. R)
 - d) The amount of shims to go adjacent to the bearing = ('Y' - 'X') + 0.075 mm (0.003").
 - e) Insert the necessary shims in the oil seal housing.

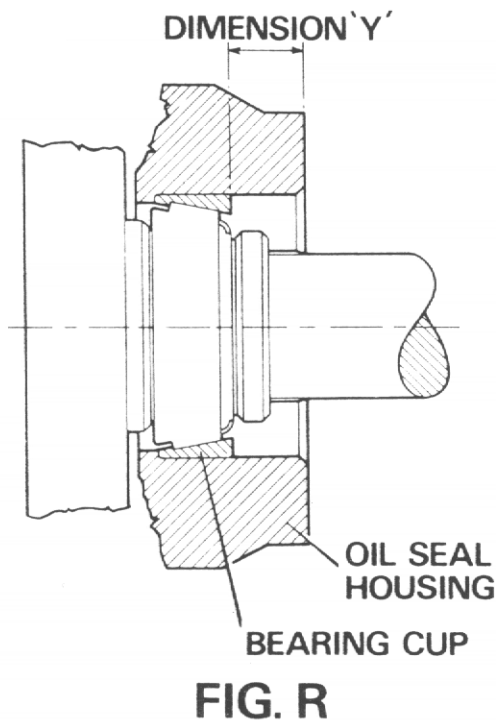
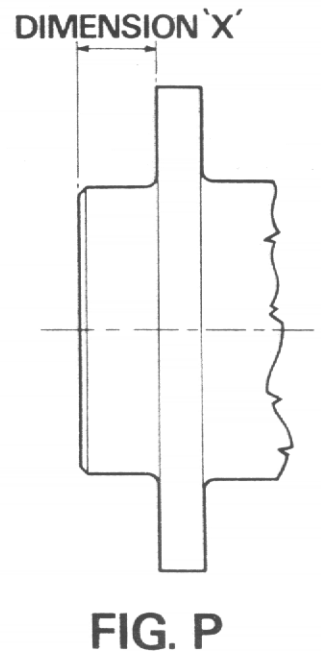
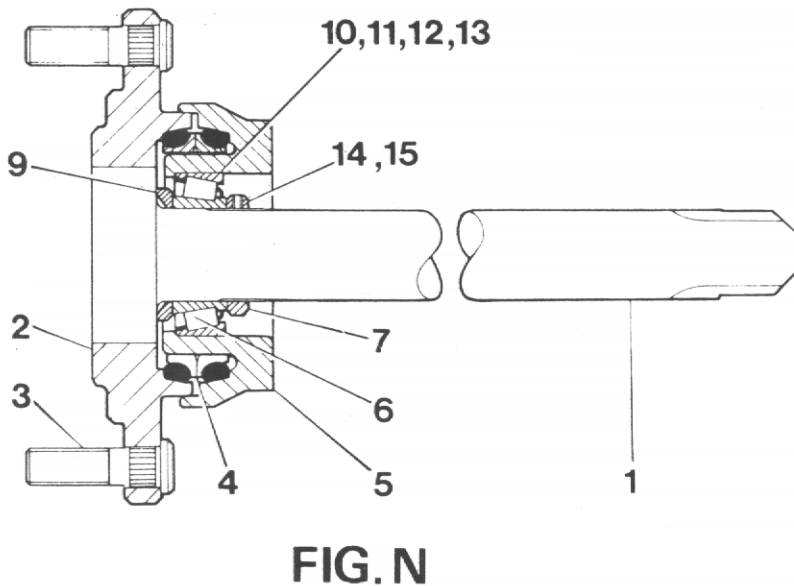
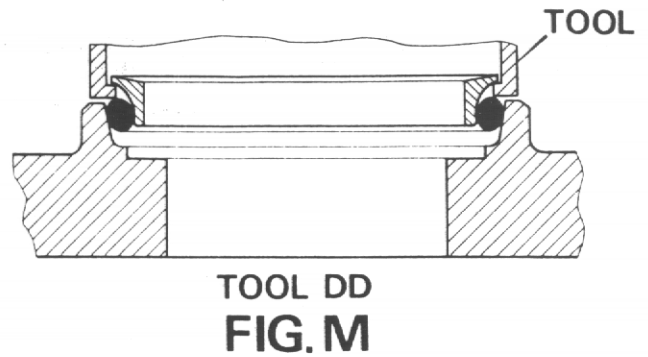
(See Fig. N)

8. Assemble the oil seal housing to the shaft (1) and tighten the locking ring (7).
9. Tighten the screw (15), compressing the nylon insert (14) onto the threaded part of the shaft.
10. Clean the rear surface of the oil seal housing and the axle arm flange surface. Reseal, fit the shaft assembly to the axle arm and tighten screws (13). (See Fig. A)

Stub Axle and Wheel Hub

1. To remove the complete assembly from the axle arm, remove nuts and bolts (13, 14) and pull out straight until the axle shaft disengages on its splines (27).
2. The assembly is the reverse of the above, the axle shaft splines being engaged first. Care should be taken to ensure that the 'O' ring (15) does not fall from its groove in the stub axle.
3. If it is only required to remove the hub (19) from the stub axle, first slacken nuts (26) and remove axle shaft using easing screws if required.
4. Release tab washer (24) slacken lock ring (23) using special tool (EE). Remove the lock ring, tab washer and tongued washer (22).
Note: A new tab washer (24) must be fitted each time the assembly is dismantled.
5. Pull the hub assembly from the stub axle, tapping the rear of the wheel flange with a mallet if required.
6. The hub bearing cone and roller assemblies and cups can now be examined for wear or damage (20, 21). So also can 2 halves of the oil seal (18).
Note: If the rubbing faces of the metal oil seal halves are damaged or scored, then the seal must be replaced.
7. The hub bearing can be drifted out if required.
8. Inspect the bearing journals on the stub axle (16) for signs of wear or damage.
9. To fit new oil seal halves to the hub and oil seal housing (17) the use of special tool (DD) is recommended (See illustration). Coat the rubbing faces of the seal with axle oil prior to assembly.
10. To reassemble the hub, to the stub axle, push the hub, bearings and seal assembly along the stub axle, against the bearing shoulders.
11. Assemble lock ring, tab washer and tongued washer and tighten lock ring to a torque of 14 kpm (100 lbf). Back the nut off an amount equal to the width of 2 tabs on the washer, and bend over a tab into a slot in the lock ring. Ensure that the hub will turn freely on its bearings.
12. Examine the axle shaft splines for damage, clean the flange face of old sealer and also the mating hub face, and then assemble the shaft to the hub.

13. Tighten nuts (26).
14. If the oil seal housing (17) becomes damaged, it is necessary to first remove the wheel hub. The unit can then be drifted from its seating on the stub axle.
15. To fit a new unit, the seating on the stub axle should first be cleaned and new "Loctite" grade 275 applied to the stub axle and seal housing surfaces. The housing can then be pressed or drifted into place.



Surfaces to be Sealed with Liquid Sealant
 Use "Loctite Plastic Gasket" Grade 275
 "Avdelbond" Grade 120/121 OR Similar

1. Pinion cartridge flange to main casing.
2. Brake cylinder flanges to main casing.
3. Axle arm to brake cylinder.
4. Oil seal housing to axle arm flange.
5. Cover plate to top of main casing.

Apply a thin film of sealant to one of the surfaces, having first cleaned the surfaces concerned. Assemble the parts and tighten fasteners.
 Having dismantled an assembly, scrape old sealant off the surfaces, clean and apply fresh solution.

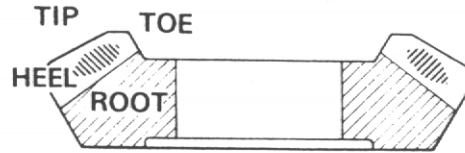
SPIRAL BEVEL GEAR TOOTH CONTACTS

CROWN WHEEL

CONVEX FLANK & CONCAVE FLANK

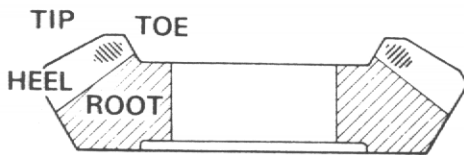
Contact may vary, but generally is approx, in the tooth centre, equispaced between root and tip. The marking may be towards toe on some gears on both flanks, or marking crossed slightly i.e. towards toe on convex flank and heel on concave flank or vice versa.

If, compared to the factory tooth contact, the contact appears as shown below, then corrective action should be taken as follows:



1 CONVEX FLANK

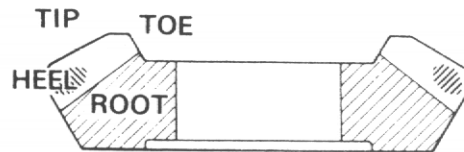
Contact further to toe and tip than factory marking.



CONCAVE FLANK

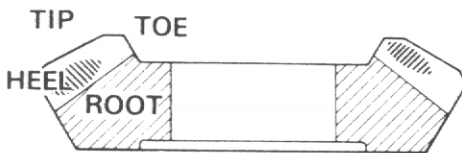
Contact further to heel and tip than factory marking.

ERROR: Pinion too far out of mesh, recheck and decrease shims below pinion cartridge flange.



2 CONVEX FLANK

Contact further to heel and root than factory marking.



CONCAVE FLANK

Contact further to toe and root than factory marking.

ERROR: Pinion too far into mesh, recheck and increase shims below pinion cartridge flange.

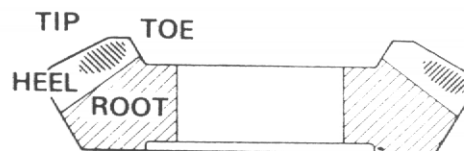


FIG.S

ADDITIONAL LOAD ON SPRING BALANCE FOR DIFFERENTIAL BEARING PRELOAD WHEN CROWN WHEEL & PINION ARE IN MESH.

400 Series.

No. Teeth Pinion	No. Teeth Wheel	Additional Spring Balance Pull (Kg)	
		New Brgs.	Used Brgs.
11	31	2.75-3.25	1.4-1.8
11	29	3.0 -3.4	1.4-1.8
18	33	4.0 -5.0	2.0-2.5

250 and 350 Series

No. Teeth Pinion	No. Teeth Wheel	Bolt Circle Dia. Coupling Flange (mm)	Additional Spring Balance Pull (Kg)	
			New Brgs.	Used Brgs.
11	29	95	3.8-5.2	2.0-2.7
17	29	95	5.9-8.0	3.0-4.1
11	29	80	4.1-5.7	2.0-3.0
17	29	80	6.6-8.8	3.2-4.3

TORQUE SETTINGS FOR ALL FASTENERS (SERIES 250 & 350)

<i>Fastener Ref. No. Fig. A.</i>	<i>Description</i>	<i>Tightening Torque</i>	
		<i>Kpm. (lb. ft.)</i>	
(Diff. Assy.)	M10 Bolt + Nut	5.6	(40)
(Planetary Assy.)	M12 Bolt	10	(72)
(Brake Cyl. Assy.)	M12 Cap Screw	10	(72)
6	Axle Arm—Main Case Bolts	5.6	(40)
7	Pinion Cart.—Main Casing Screws	5.6	(40)
8	Brake Cyl.—Main Case Screws	5.6	(40)
10	Brake Pipe Adaptor—Brake Cyl.	2.7	(20)
12	Wheel Nut (18 mm)	28	(200)
	Wheel Nut ($\frac{7}{8}$ " BSF)	42	(300)
13	Axle Arm—Oil Seal Housing (250 only)	5.6	(40)
14	Axle Shaft Locking Ring (250 only)		(350)

TORQUE SETTINGS FOR ALL FASTENERS (SERIES 400)

<i>Fastener Ref. No. Fig. A.</i>	<i>Description</i>	<i>Tightening Torque</i>	
		<i>Kpm. (lb. ft.)</i>	
(Diff. Assy.)	M10 Bolt + Nut	5.6	(40)
(Planetary Assy.)	M16 Bolt	25	(180)
(Brake Cyl. Assy.)	M12 Cap Screw	10	(72)
6	Axle Arm—Main Case Bolts	10	(72)
7	Pinion Cart.—Main Casing Screws	10	(72)
8	Brake Cyl.—Main Case Screws	10	(72)
10	Brake Pipe Adaptor—Brake Cyl.	2.7	(20)
12	Wheel Nut (18 mm)	28	(200)
	Wheel Nut ($\frac{7}{8}$ " BSF)	42	(300)
13	Axle Arm—Oil Seal Housing	10	(72)
14	Axle Shaft Locking Ring	62	(450)

LIST OF BACKLASH FIGURES FOR DIFFERENT RATIOS ETC.

400 Series	No. Teeth Pinion	Backlash Measured via Hole in Flange
		(mm)
	11	0.31-0.39
	18	0.21-0.26

250 and 350 Series

No. Teeth Pinion	Bolt Circle Dia. on Flange	Backlash Measured via Hole in Flange
		(mm)
11	95	0.27-0.36
17	95	0.17-0.23
11	80	0.22-0.30
17	80	0.14-0.19

DECIMAL, FRACTIONAL AND METRIC EQUIVALENTS

Inches		Milli- metres	Inches		Milli- metres
Fractions	Decimals		Fractions	Decimals	
1/64	0.015625	0.397	33/64	0.515625	13.097
1/32	0.03125	0.794	17/32	0.53125	13.494
3/64	0.046875	1.191	35/64	0.546875	13.891
1/16	0.0625	1.588	9/16	0.5625	14.288
5/64	0.078125	1.984	37/64	0.578125	14.684
3/32	0.09375	2.381	19/32	0.59375	15.081
7/64	0.109375	2.778	39/64	0.609375	15.478
1/8	0.125	3.175	5/8	0.625	15.875
9/64	0.140625	3.572	41/64	0.640625	16.272
5/32	0.15625	3.969	21/32	0.65625	16.669
11/64	0.171875	4.366	43/64	0.671875	17.066
3/16	0.1875	4.763	11/16	0.6875	17.463
13/64	0.203125	5.159	45/64	0.703125	17.859
7/32	0.21875	5.556	23/32	0.71875	18.256
15/64	0.234375	5.953	47/64	0.734375	18.653
1/4	0.250	6.350	3/4	0.750	19.050
17/64	0.265625	6.747	49/64	0.765625	19.447
9/32	0.28125	7.144	25/32	0.78125	19.844
19/64	0.296875	7.541	51/64	0.796875	20.241
5/16	0.3125	7.938	13/16	0.8125	20.638
21/64	0.328125	8.334	53/64	0.828125	21.034
11/32	0.34375	8.731	27/32	0.84375	21.431
23/64	0.359375	9.128	55/64	0.859375	21.828
3/8	0.375	9.525	7/8	0.875	22.225
25/64	0.390625	9.922	57/64	0.890625	22.622
13/32	0.40625	10.319	29/32	0.90625	23.019
27/64	0.421875	10.716	59/64	0.921875	23.416
7/16	0.4375	11.113	15/16	0.9375	23.813
29/64	0.453125	11.509	61/64	0.953125	24.209
15/32	0.46875	11.906	31/32	0.96875	24.606
31/64	0.484375	12.303	63/64	0.984375	25.003
1/2	0.500	12.700	1	1.000	25.400

INCHES INTO MILLIMETRES

Inches	0	1	2	3	4	5	6	7	8	9
0	0	25.40	50.80	76.20	101.60	127.00	152.40	177.80	203.20	228.60
10	254.00	279.40	304.80	330.20	355.60	381.00	406.40	431.80	457.20	482.60
20	508.00	533.40	558.80	584.20	609.60	635.00	660.40	685.80	711.20	736.60
30	762.00	787.40	812.80	838.20	863.60	889.00	914.40	939.80	965.20	990.60
40	1016.00	1041.40	1066.80	1092.20	1117.60	1143.00	1168.40	1193.80	1219.20	1244.60
50	1270.00	1295.40	1320.80	1346.20	1371.60	1397.00	1422.40	1447.80	1473.20	1498.60
60	1524.00	1549.40	1574.80	1600.20	1625.60	1651.00	1678.40	1701.80	1727.20	1752.60
70	1778.00	1803.40	1828.80	1854.20	1879.60	1905.00	1930.40	1955.80	1981.20	2006.60
80	2032.00	2057.40	2082.80	2108.20	2133.60	2159.00	2184.40	2209.80	2235.20	2260.00
90	2286.00	2311.40	2336.80	2362.20	2387.60	2413.00	2438.40	2463.80	2489.20	2514.61

Use in conjunction with above table.

Example: Find equivalent mm. for 84 5/8".

$$84'' = 2133.60 \text{ mm.}$$

$$5/8'' = 15.875 \text{ mm.}$$

$$84 \text{ } 5/8'' = 2149.475 \text{ mm.}$$

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm