

# **WINGET**

## **OPERATING INSTRUCTIONS & SPARE PARTS LIST**

### **FOUR/40E DIESEL DUMPER (CAPACITY 40 CWT)**

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**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 1975 and contains some amended part numbers.

Health & Safety legislation and working practices applicable to Site Dumpers, both 2 and 4 wheel Drive, Rigid Chassis and Articulated Chassis have changed considerably in the years since this manual was last published and immediately following this Introduction are notes on the Safe Use of Site Dumpers. These notes supersede and replace all previous 'Dumper Safety' notes issued with Winget FOUR/40E Four Wheel Drive Dumpers

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.

### **NOTE**

**Dumpers with standard earth skips will be C.D.P. (Central Driving Position) from Serial Number 4/40E 659**

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LANCS  
BL4 OLS  
TEL ++ 44 (0) 1204 854650  
FAX ++ 44 (0) 1204 854663  
E mail [service@winget.co.uk](mailto:service@winget.co.uk)  
[parts@winget.co.uk](mailto:parts@winget.co.uk)  
[www.winget.co.uk](http://www.winget.co.uk)**

# DUMPER SAFETY

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**Safety is the responsibility of all persons working with this machine. Think "safety" at all times. Read and remember the contents of this handbook.**

## MACHINE MODIFICATIONS

**WARNING** Any modifications to the machine will affect its working parameters and safety factors. Refer to the Manufacturers before fitting any non-standard equipment or parts.



The Manufacturers accept no responsibility for any modifications made after the machine has left the factory, unless previously agreed by the Manufacturers in writing; the Manufacturers will accept no liability for damage to property, personnel or the machine if failure is brought about due to such modifications, or fitment of spurious parts.

## TRAINING

**WARNING** Only trained operators should use this machine.



Operators should hold an appropriate full motor vehicle driving licence and undergo both a safety awareness course and a driver training course for Site dumpers run by the C.ITB or equivalent body leading to the award of a CTA.

It is strongly recommended that operators read the H.S.E. publication "Safe Working with Small Dumpers" which is available from government bookshops (HMSO) or from other bookshops quoting the following number ISBN 011 8836935. Another useful publication is British Standard number BS 6264, "Procedure for Operator Training For Earth Moving Machinery" available from the British Standard Institution.

## OPERATION

**WARNING** NEVER use the machine for purposes other than those for which it was designed. This machine was designed to carry loads such as soil, clay, sand, wet concrete, stone or other similar materials. It was not designed to carry loads which may move around in the skip uncontrollably, nor to carry any loads or materials which overhang the skip in any way. If in any doubt as to the suitability of this machine for a particular task, contact your nearest Distributor or the Manufacturer for advice.



ALWAYS be aware of local and national regulations governing the use of the machine.

NEVER commence work with the machine until the "Daily (or every ten hours)" service checks have been made. (See Service Section for details)

ALWAYS check wheel nut tightness daily.

NEVER carry passengers.

Where seat belt restraints are fitted as part of Rops/Fops Protection they must be worn. Ensure that the seat and seat belt are securely fixed to the machine. Check that the seat belt is in good condition, free from cuts and frayed edges.

ALWAYS remain in the driving seat whenever the engine is running. Never attempt to operate any controls unless seated.

ALWAYS apply the parking brake before leaving the driver's seat.



## DUMPER SAFETY

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*NEVER* dismount with the engine running, and never leave the machine unattended with the key in the starter switch.

When Battery Isolators are fitted they must be activated only when the engine is turned off except in cases of emergency.

Activating a Battery Isolator when the engine is running can result in damage to the electrical components and circuits.

*NEVER* fill the fuel or hydraulic tanks with the engine running.

*ALWAYS* drive only on surfaces that are known to be stable.

*ALWAYS* keep the floor plates and walkways clean.

*NEVER* drive the machine close to the edge of any excavation. Always use effective wheel stops to prevent the machine running close to the edge. Make sure that the stops are in proportion to the size of the wheels and are set sufficiently far enough back from the edge of any excavation to prevent the weight of the load causing a collapse.

*NEVER* adjust the tyre pressures in an attempt to improve traction on soft ground or obtain a softer ride on hard ground. Incorrectly adjusted tyres can affect the steering and handling characteristics.

*NEVER* attempt to free a machine which is 'bogged down' by pushing with the bucket of a backhoe loader, tracked excavator or other similar machine.

*NEVER* make unnecessary "crash stops" when travelling at speed, especially in forward direction.

*NEVER* work under an unpropped skip. *If the dumper was supplied with a special Skip Support always ensure that it is used.*

*Some articulating dumpers are manufactured with an articulation lock. If your machine has this feature proceed as follows:*

*ALWAYS* fit the articulation lock when working within the articulation point crush zone.

*NEVER* attempt to lift the machine unless the articulation lock is engaged.

## SKIPS AND LOADING

**WARNING** *NEVER* exceed the rated payload. The weights of all loads above skip water level must be checked.



*NEVER* remain on the machine when loading the skip with excavators or loaders. Stop the engine, apply the parking brake, dismount, and stand well clear.

*ALWAYS* ensure that the load is evenly distributed in the skip.

*NEVER* carry loads or heap materials in such a manner as to affect the forward vision.

*ALWAYS* take extra care when tipping non free running loads.

*NEVER* use the skip in a tipped position to bulldoze heaped materials level or to backfill material into excavations.

# DUMPER SAFETY

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## TOWING

**WARNING** NEVER attempt to start the engine of a dumper by towing or pushing.



Dumpers are not designed as towing vehicles, but loads (including weight of trailer) not exceeding the rated payload of the dumper may be towed on dry level ground in first gear, providing the dumper skip is loaded with half the rated payload to ensure tyre adhesion when braking.

ALWAYS use a purpose made towing pin.

NEVER tow loads up, down or across gradients.

## GRADIENTS

**WARNING** NEVER operate *Four Wheel Drive articulated steer dumpers* on any gradients which exceed 25% (1 in 4), or across gradients which exceed 16% (1 in 6).



NEVER operate *Two Wheel Drive rigid chassis dumpers* on any gradients which exceed 10% (1 in 10), or across gradients which exceed 10% (1 in 10).

ALWAYS remember that slippery or loose surface conditions can adversely affect safe machine operation, including braking, particularly on gradients.

ALWAYS choose routes that avoid steep, slippery or loose gradients.

NEVER coast down gradients. Always negotiate gradients in first gear.

ALWAYS drive forwards up gradients when loaded.

ALWAYS reverse down gradients when loaded.

ALWAYS keep the load facing uphill.

NEVER park on a gradient. If this is unavoidable, ALWAYS chock the wheels.

NEVER attempt to turn on a gradient.

NEVER tow up, down or across a gradient.

NEVER operate high discharge or rotating skips on gradients.

## HYDRAULICS

**WARNING** ALWAYS "Dump" residual pressure from the system before leaving the machine or before carrying out any maintenance or adjustments.



If maintenance work requires the skip to be in the raised position, then it must be raised and supported before dumping the pressure.

Dump pressure by switching off the engine, then moving the hydraulic control lever several times in each direction.

NEVER leave the machine unattended with pressure in the system.

ALWAYS purge hydraulic rams before commencing work. With the engine running operate the hydraulic control to fully extend and retract the rams.

ALWAYS practise the greatest cleanliness in maintaining hydraulic components.

# DUMPER SAFETY

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## SERVICING

**WARNING** ALWAYS report any defect at once, before an accident or consequential damage can occur.



ALWAYS conform to service schedules except where:

- 1 Warning lights or warning indicators call for immediate attention.
- 2 Adverse conditions necessitate more frequent servicing.

ALWAYS wear correctly fitting protective clothing. Loose or baggy clothing can be extremely dangerous when working on running engines or machinery.

ALWAYS, where possible, work on or close to engines or machinery only when they are stopped. If this is not practical, remember to keep tools, test equipment and all parts of your body well away from the moving parts.

ALWAYS dump pressure from the hydraulic system before carrying out any kind of maintenance or adjustment. (*see Hydraulics Warnings*).

ALWAYS avoid contact with exhaust pipes, exhaust manifolds and silencers when the engine is running; these can be very hot.

ALWAYS work out of doors, or in a well-ventilated area.

NEVER run an engine in an enclosed space. Exhaust fumes in enclosed areas can kill.

ALWAYS disconnect battery cables and remove battery before using an external charger, carrying out welding repairs or to prevent unauthorised usage when unattended or during a repair.

NEVER allow unqualified personnel to attempt to repair, remove or replace any part of the machine, or anyone to remove large or heavy components without adequate lifting tackle.

NEVER attempt to modify or repair Rops Frames or Fops Canopies by welding, drilling or any other means. Attempts to do so will invalidate Rops/Fops Certification.

ALWAYS obtain advice before mixing oils; some are incompatible. If in doubt drain and refill.

NEVER allow oils and fuels to come into regular contact with skin. This can lead to serious skin diseases including, medical evidence suggests, skin cancer. ALWAYS wear protective gloves when handling oils and fuels whether topping up, draining or refilling. ALWAYS wash hands if oils or fuels come into contact with the skin.

Many liquids used in this machine are harmful if taken internally or splashed into the eyes. In the event of accidentally swallowing oils, fuels, anti-freeze, battery acid etc, DO NOT encourage vomiting, seek qualified medical assistance immediately.

ALWAYS dispose of waste oils and fuels into waste oil storage tanks. If storage tanks are not available consult your distributor or local authority for addresses of local designated disposal points. It is illegal to dispose of waste oil into drains or water courses or to bury it.

## DUMPER SAFETY

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Equipment which includes friction materials will sometimes contain asbestos. When removing friction material dust from components, such as when servicing brakes or clutches, do not blow out with an airline; it could be harmful to inhale the dust. Remove the dust with a vacuum cleaner or wipe clean with a damp rag. Waste should be placed in a sealed container, marked, and disposed of in accordance with local or national regulations.

The accumulated dust found in clutch housings may contain lead/antimony. No food should be eaten at a work place contaminated by this dust. Hands must be washed before eating. Do not blow out dust with an airline.

*ALWAYS* ensure that the starting handle is clean and in good condition. Keep the engine starting dog, and the part of the starting handle that mates with it, lightly lubricated (*Refer to the Engine Handbook*).

*NEVER* work under an unpropped skip. *If the dumper was supplied with a special Skip Support always ensure that it is used.*

*Some articulating dumpers are manufactured with an articulation lock. If your machine has this feature, ALWAYS fit the articulation lock when servicing or working on the machine.*

## PREPARATION FOR USE

BEFORE THE FOUR/40E DUMPER IS PUT INTO SERVICE ALWAYS CHECK THE FOLLOWING POINTS:—

(See Fig.1)

1. **Engine**  
Check the oil level on the dipstick (A), topping up if necessary to the full mark. See also 'Recommended Lubricating Oils',
2. **Gearbox**  
Check the oil level on the dipstick (B), topping up if necessary to the full mark. See also 'Recommended Lubricating Oils',
3. **Drive Axles and Transfer Case**  
Remove level plugs (C) from drive axles and filler/level plug (D) from transfer case and check that oil is up to bottom of level holes. Top up if necessary through filler plug (E) or filler/level plug (D) if necessary. See also 'Recommended Lubricating Oils',
4. **Fuel Tank**  
Fill tank (F) with diesel oil until approximately 1" from the top.

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

5. **Hydraulic Tank**  
Fill the hydraulic tank (G). Before removing the cap, clean the surrounding area, to prevent the possible entry of foreign matter. DO NOT MIX OILS. See 'Recommended Lubricating Oils',
6. **Brake System**  
Ensure that the brake master cylinder reservoir (H) is full of brake fluid. Top up if necessary to within 1/4" of the top of the reservoir. Use only Girling Crimson Brake Fluid.
7. **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 Dumper Warranty.

N.B. For further Lubrication information see Fig.6 and corresponding text



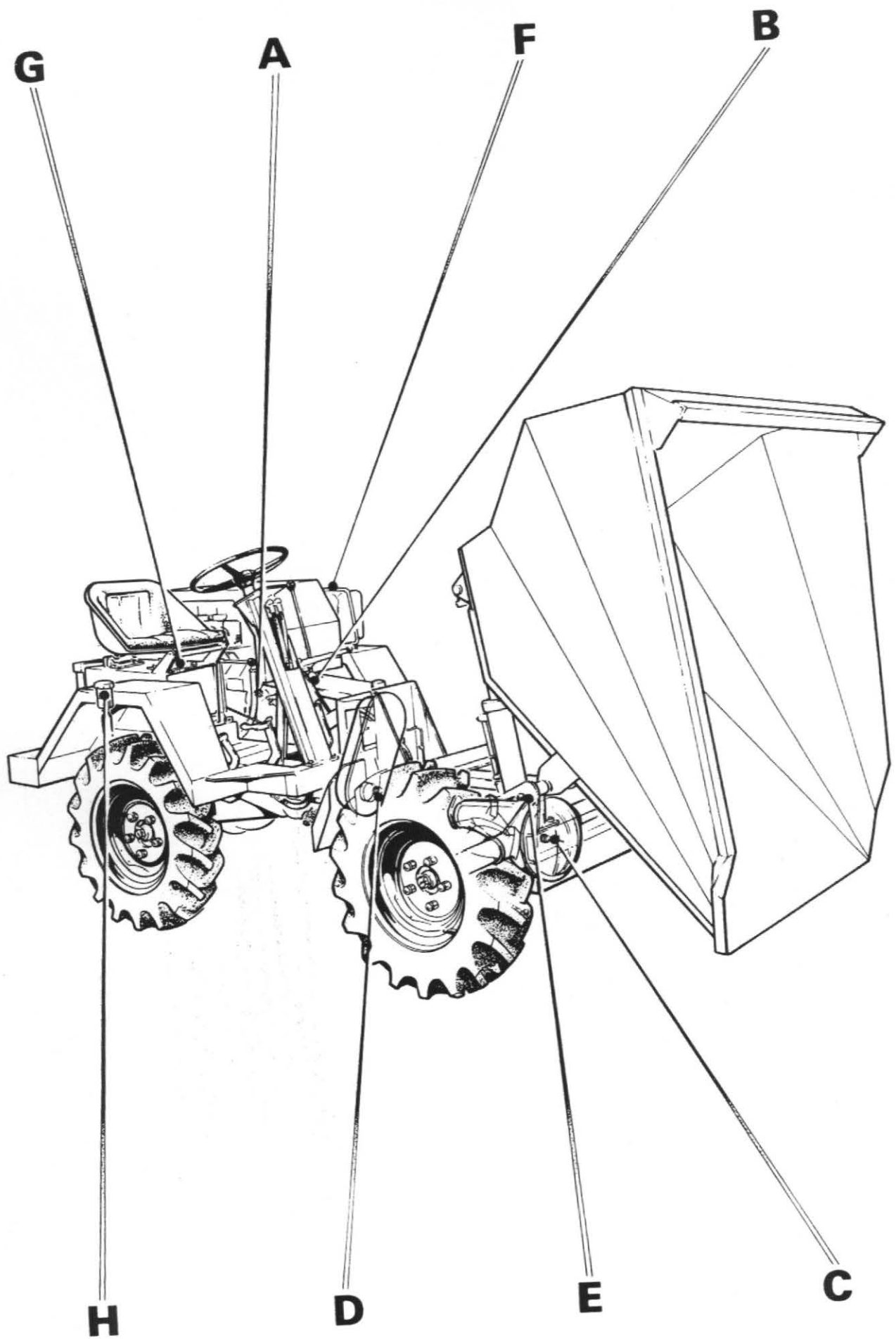


FIG. 1

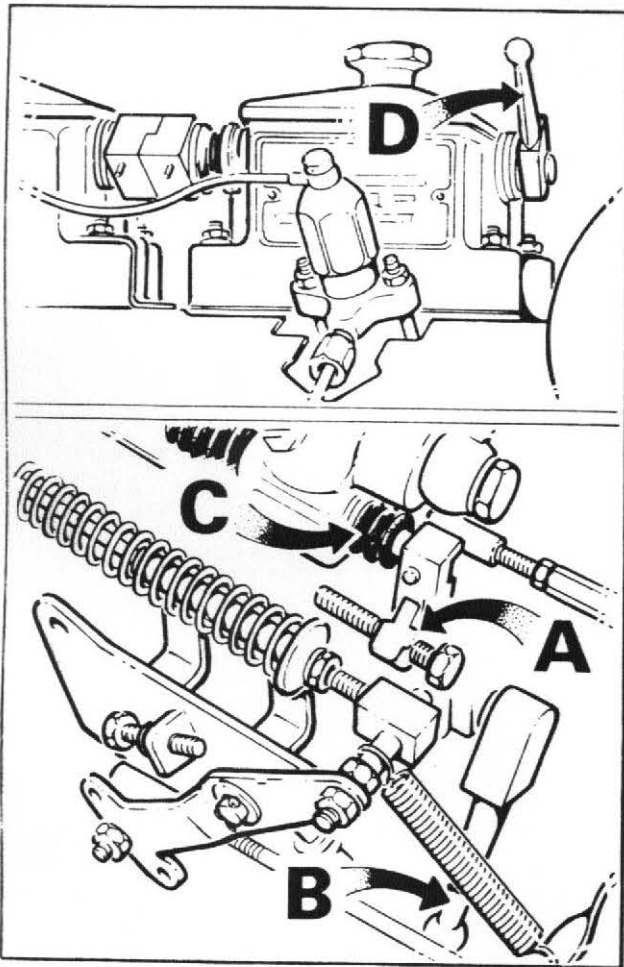


FIG. 2

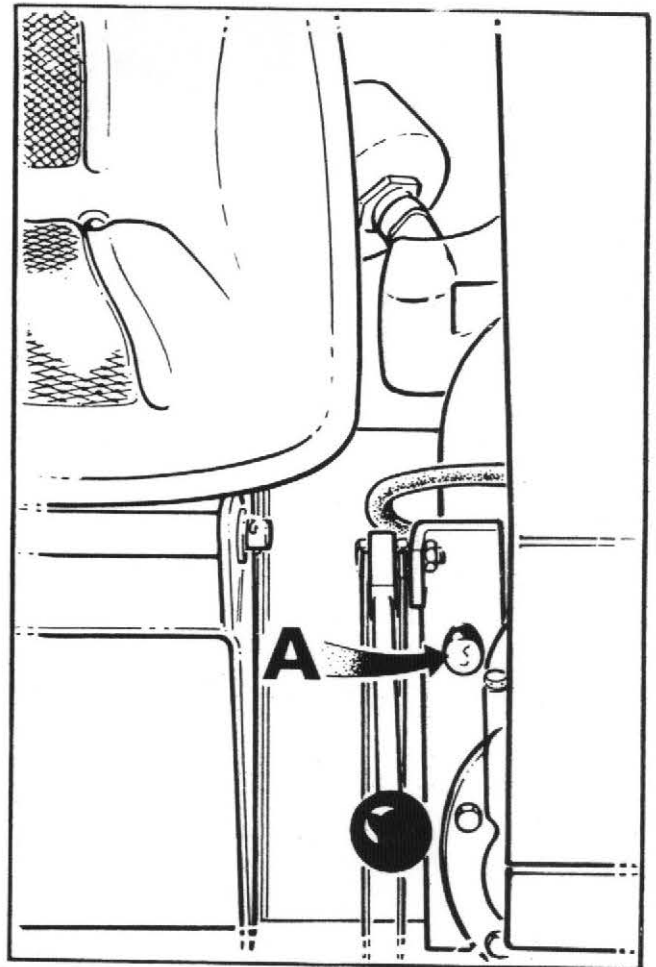


FIG. 3

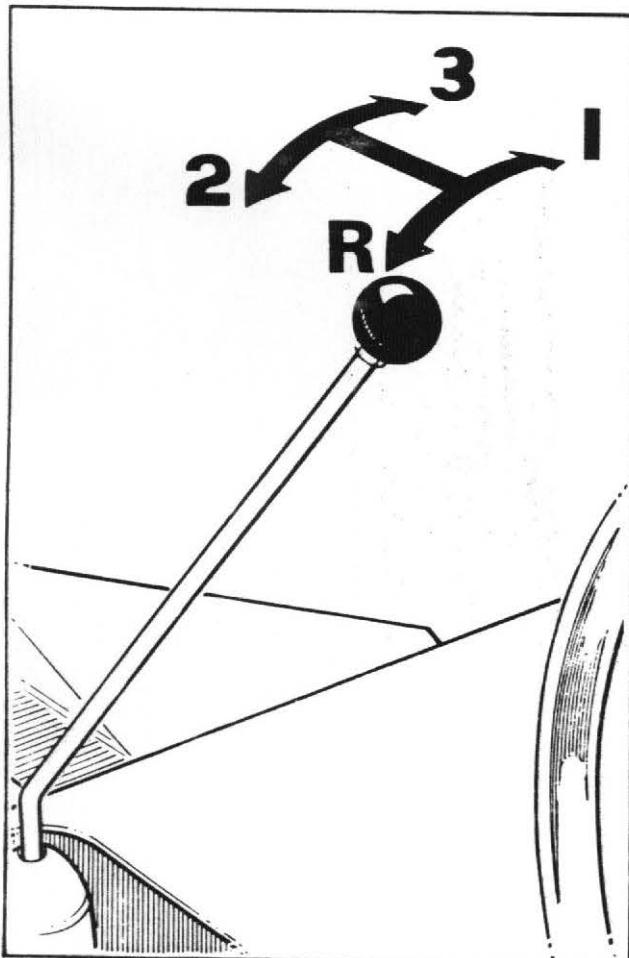


FIG. 4

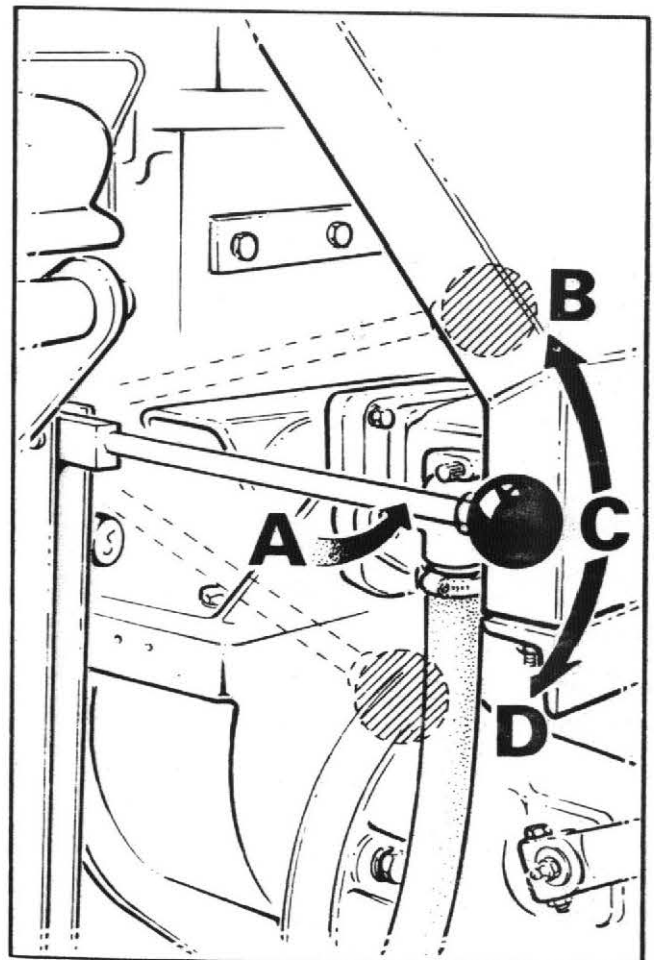


FIG. 5

## OPERATION

### Starting

(See Fig.2 )

1. Lift red-painted overload stop (A) situated on the fuel pump rack above and to the rear of the priming lever (B) and move fuel pump rack (C) into fully-open position.
2. Operate priming lever (B) six times.

NOTE: This is unnecessary if engine is already warm.

3. Lift decompression lever (D), positioned on top of engine and turn engine as fast as possible using starting handle. When engine is turning at a good speed, knock down decompression lever and engine should fire.
4. If engine does not fire, lift decompression lever and slowly crank engine a few times before attempting to start again. Where ambient temperature is 5<sup>0</sup>F (–15<sup>0</sup>C) or below, a cold start aid should be fitted.

### Stopping

(See Fig.3)

Pull out stop control knob (A) and hold in its fully forward position until engine stops. Release stop control knob when engine has ceased to turn.

IMPORTANT:

1. DO NOT stop engine by means of decompression lever, as this will lead to damaged valve seats and cylinder head joint.
2. DO NOT stop engine by closing fuel tap or by allowing fuel tank to run dry, this will allow air into fuel lines and necessitate bleeding and priming system.

### Gear Shift Lever

(See Fig. 4)

The Four/40E Dumper is fitted with three forward (1), (2), (3), and one reverse (R) gear. When changing gear, the clutch pedal is used in the normal manner.

### Skip Control Lever

(See Fig. 5)

1. Control lever (A) has three positions DUMP (B), HOLD (C), and RETURN (D).
2. Pull lever UP to DUMP (B) to deposit load.
3. Push lever DOWN to RETURN (D) to return skip to carrying position.

NOTE: If lever is released when in DUMP or RETURN position, it will automatically return to HOLD (C) position and motion of skip will cease. In this way, speed at which load is deposited can be finely controlled.

## GENERAL MAINTENANCE

### Periodic Maintenance

1. DAILY check engine oil level and fill to full mark on dipstick, if necessary.
2. DAILY 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.
3. WEEKLY check oil level in gearbox and fill to full mark on dipstick, if necessary.
4. WEEKLY remove oil level plugs from drive axles and transfer case. Oil level should be to bottom of holes. Top up, if necessary through filler/level plugs on drive axles or through filler/level plug in transfer case.
5. WEEKLY check oil level in hydraulic tank. Always clean the surrounding area before removing cap to prevent possible entry of foreign matter. Fill tank, if necessary, to within 1" of top.
6. WEEKLY check brake fluid level in master cylinder reservoir and top up if necessary, to within 1/4" of top.
7. WEEKLY apply grease to all grease nipples.
8. WEEKLY check all wheel nuts and tighten, if necessary.
9. WEEKLY check tyre pressures 32 lb/sq.in.
10. OCCASIONALLY check all nuts and bolts, and tighten if necessary.

### Lubrication (See Fig. 6)

| Period | Key | Description                               | Lubrication     | No. of Points |
|--------|-----|---|-----------------|---------------|
| Daily  | 1   | Engine                                    | Engine Oil      | 1             |
|        | 2   | Fuel Tank                                 | Diesel Fuel     | 1             |
| Weekly | 3   | Gearbox                                   | Gearbox Oil     | 1             |
|        | 4   | Drive Axles                               | Axle Oil        | 2             |
|        | 5   | Hydraulic Tank                            | Hydraulic Fluid | 1             |
|        | 6   | Brake Master Cylinder Reservoir           | Brake Fluid     | 1             |
|        | 7   | Footbrake Pedal                           | Grease Gun      | 1             |
|        | 8   | Footbrake Master Cylinder Actuating Lever | Grease Gun      | 1             |
|        | 9   | Footbrake Compensator Lever               | Grease Gun      | 2             |
|        | 10  | Clutch Pedal                              | Grease Gun      | 1             |
|        | 11  | Clutch Cross Shaft                        | Grease Gun      | 2             |
|        | 12  | Skip Pivot                                | Grease Gun      | 2             |
|        | 13  | Handbrake Cable                           | Grease Gun      | 1             |
|        | 14  | Chassis Centre Pivot                      | Grease Gun      | 2             |
|        | 15  | Front Prop. Shaft U.J.                    | Grease Gun      | 1             |
|        | 16  | Transfer Case                             | Axle Oil        | 1             |
|        | 17  | Drive Axle Hub Bearings                   | Grease Gun      | 4             |

N.B. FOR RECOMMENDED LUBRICATING OILS SEE CHART

### Oil Capacities

|                        |                     |                      |                      |
|------------------------|---------------------|----------------------|----------------------|
| Transfer Box . . . . . | 1 pt. (.6 litres)   | Drive Axle . . . . . | 8 pts. (4.57 litres) |
| Gear Box . . . . .     | 1½ pts.(.86 litres) | Engine . . . . .     | 12 pts. (6.8 litres) |

- NOTES: 1. Rear Axle articulation points consist of bearings that require no lubrication.  
 2. For full details of the lubrication and maintenance of the engine refer to Manufacturers Manual.

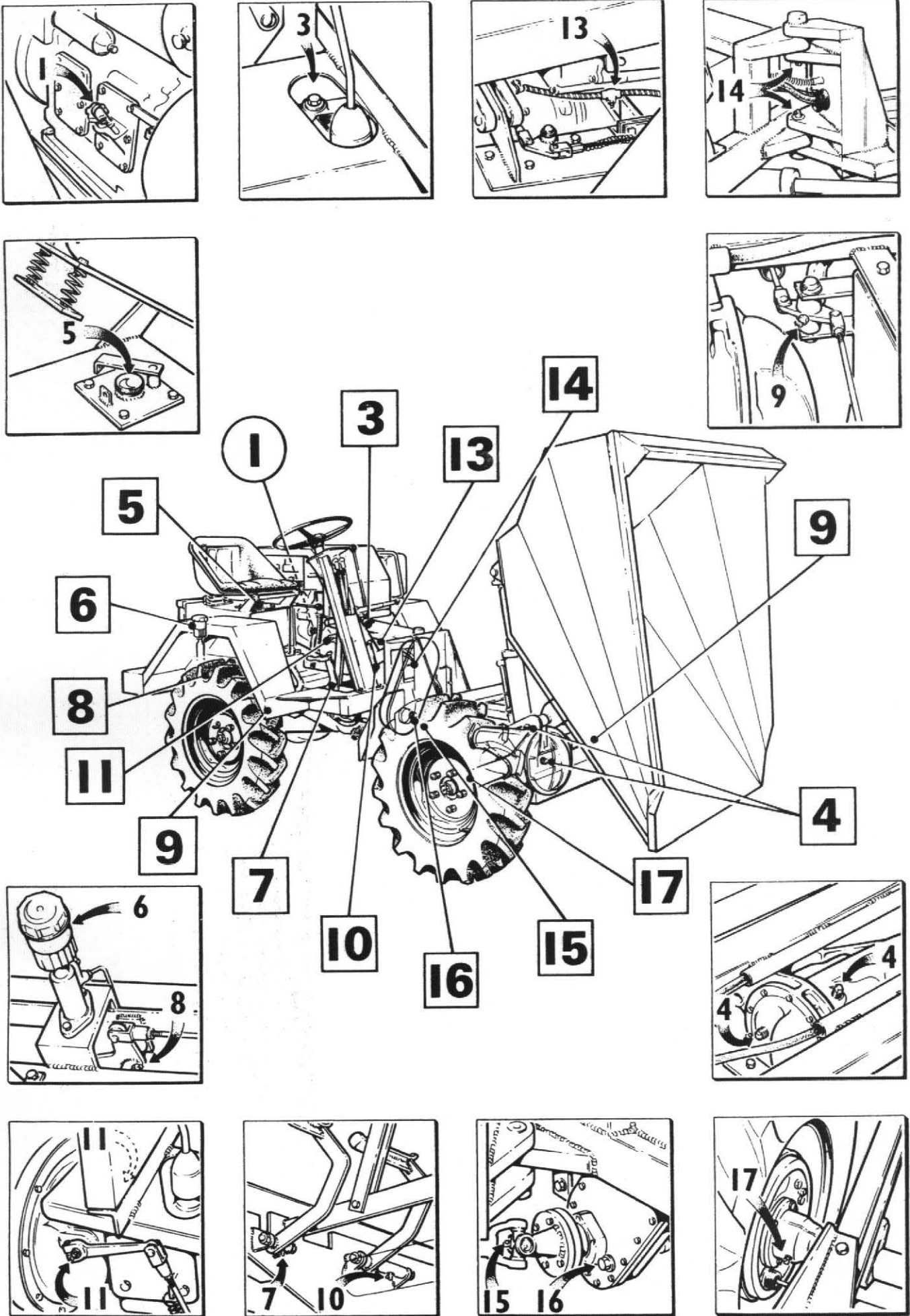


FIG. 6

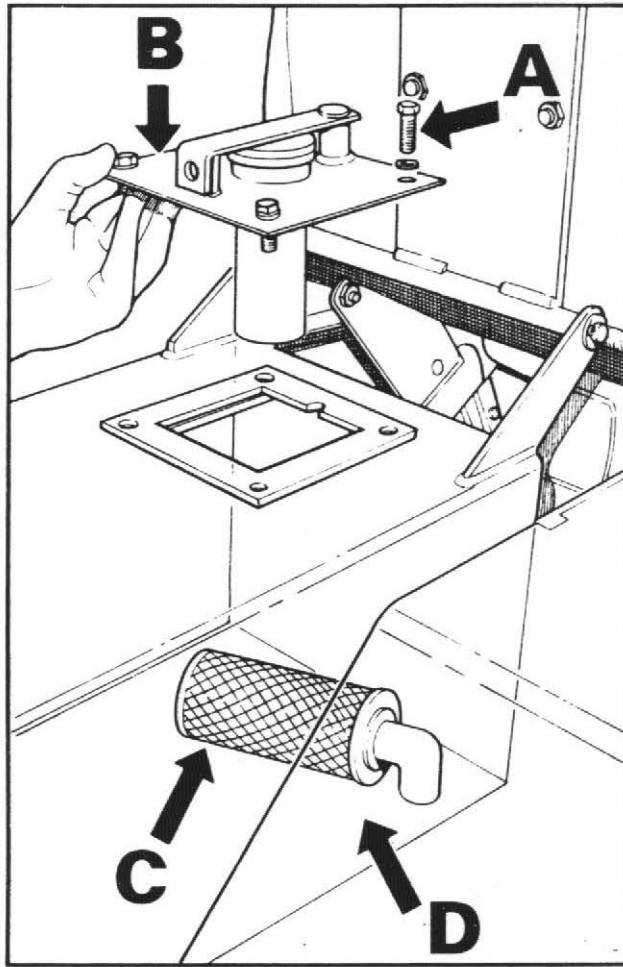


FIG. 7

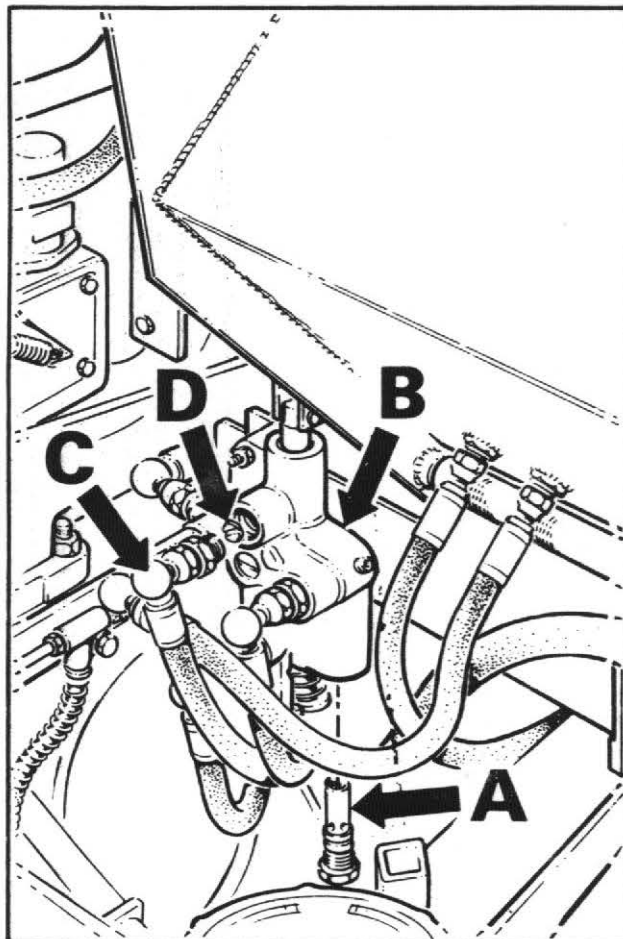


FIG. 8

### **Main Hydraulic System**

The main hydraulic system controls the dumping and return of the skip and also provides the power for the dumper steering. 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 hydraulic filter is not blocked (See Fig.7).
  - a) Remove the four setscrews (A) that secure the filler cap assembly (B) and remove assembly.
  - b) Unscrew suction filter (C) from inside tank (D) and wash in white spirit. Dry with moisture-free compressed air.
  - c) Replace suction filter and filler cap assembly.

**NOTE:** If suction filter cannot be thoroughly cleaned, fit a new one.

3. Check that hydraulic pressure is correct.
  - a) Fit a 2000 lb/sq.in. gauge into the hydraulic system at the base of the skip ram.
  - b) Operate control lever to dump skip and check that pressure reading on gauge is 1750 lb/sq.in. when ram is fully extended and relief valve is 'blowing'.

**NOTE:** If correct pressure is not attained –

4. Remove relief valve cartridge (A) (hexagon head) from the bottom of the Control Valve (B) (See Fig.8) and replace with a new one
5. Remove hose adaptor (C) from control valve (See Fig.8), remove hexagonal orifice plate (D) and wash in white spirit. Dry using moisture-free compressed air. DO NOT poke wire etc., into the orifice. Re-fit plate and hose adaptor with slot of orifice plate facing outwards.

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.**

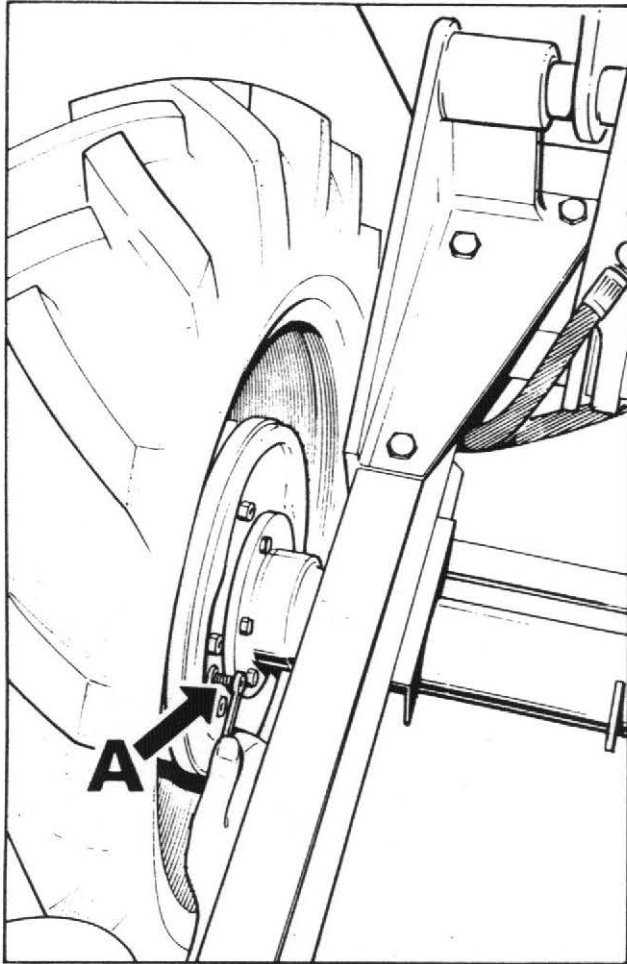


FIG. 9

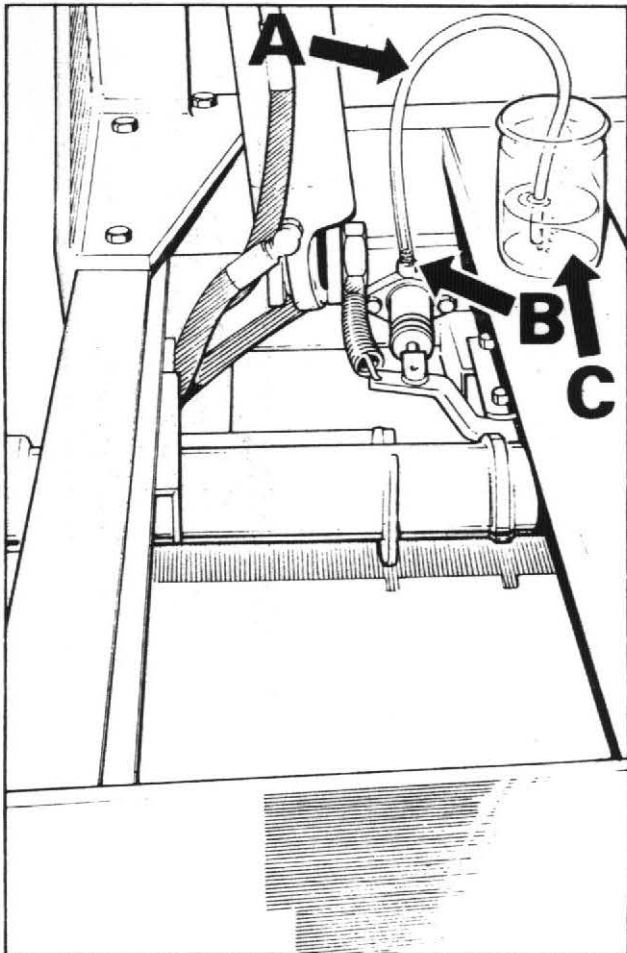


FIG. 10



### **Brake Adjustment**

The brake adjusting screw is located on the rear of the brake back plate (See Fig.9)

- a) Screw the adjuster (A) clockwise until the brakes are fully on.
- b) Then slacken the screw anti-clockwise until the brake shoes are just clear of the drum. This will cause the shoes to be centralised on the drum and ensure the whole brake lining area is used.

### **Brake System**

The brake system is designed to require the minimum amount of maintenance, and, providing the hydraulic fluid in the reservoir is not allowed to fall below the recommended level, no defects should normally occur. Fluid loss must be supplemented by topping up the reservoir with Girling Crimson brake fluid. No other fluid may be used. If air is present in the system it will be indicated by sluggish response of the brakes and spongy action of the brake pedal. This may be due to air being introduced at a loose joint or by the reservoir fluid level being allowed to fall very low. These defects must be remedied immediately and the complete system bled.

To bleed the system proceed as follows:—

1. Check all connections are tight and the bleed screws on the slave cylinders are closed.
2. Fill reservoir with Girling Crimson brake fluid.
3. Attach bleeder tube (A) (See Fig.10) to the bleed screw (B) on the front slave cylinder, immerse the other end of the tube in a small quantity of brake fluid contained in a glass jar (C). Slacken bleed screw and operate brake pedal up and down to its full stroke until fluid pumped into the jar contains no air bubbles. Hold pedal down and close bleed screw. Remove bleeder tube and release pedal.
4. Lock the bleed screw and top up the reservoir to the correct level.
5. Repeat the procedure for the rear slave cylinder.
6. Apply normal working load on brake pedal for two or three minutes and examine system for leaks.

**NOTE:** DURING THE OPERATION IT IS ESSENTIAL THAT THE RESERVOIR LEVEL IS KEPT TOPPED UP TO PREVENT FURTHER AIR BEING DRAWN INTO THE SYSTEM. ONLY USE NEW FLUID FOR TOPPING UP.

## SPECIFICATION FOR MACHINE WITH HYDRAULIC FORWARD TIP SKIP

### Key to Fig.11

|    |                                   |             |            |
|----|-----------------------------------|-------------|------------|
| A. | Overall length                    | 10ft 11 in. | (332cms.)  |
| B. | Overall width                     | 5 ft 5 in   | (165 cms.) |
| C. | Overall height                    | 5 ft 0 in   | (152 cms.) |
| D. | Overall height when tipped        | 6 ft 0 in   | (183 cms.) |
| E. | Wheelbase                         | 5ft 7¼ in.  | (170 cms.) |
| F. | Skip loading height               | 4 ft 0 in   | (122 cms.) |
| G. | Skip ground clearance when tipped | 6½ in       | ( 17 cms.) |
| H. | Skip discharge                    | 1ft 5½ in.  | ( 44 cms.) |
| J. | Reach from tyres                  | 2ft 9½ in.  | ( 85 cms.) |
| K. | Wheeltrack                        | 4 ft 7 in   | (140 cms.) |
| L. | Prow width                        | 3 ft 0 in   | ( 91 cms.) |
| M. | Ground clearance                  | 9½ in       | ( 24 cms.) |

### Skip Capacity

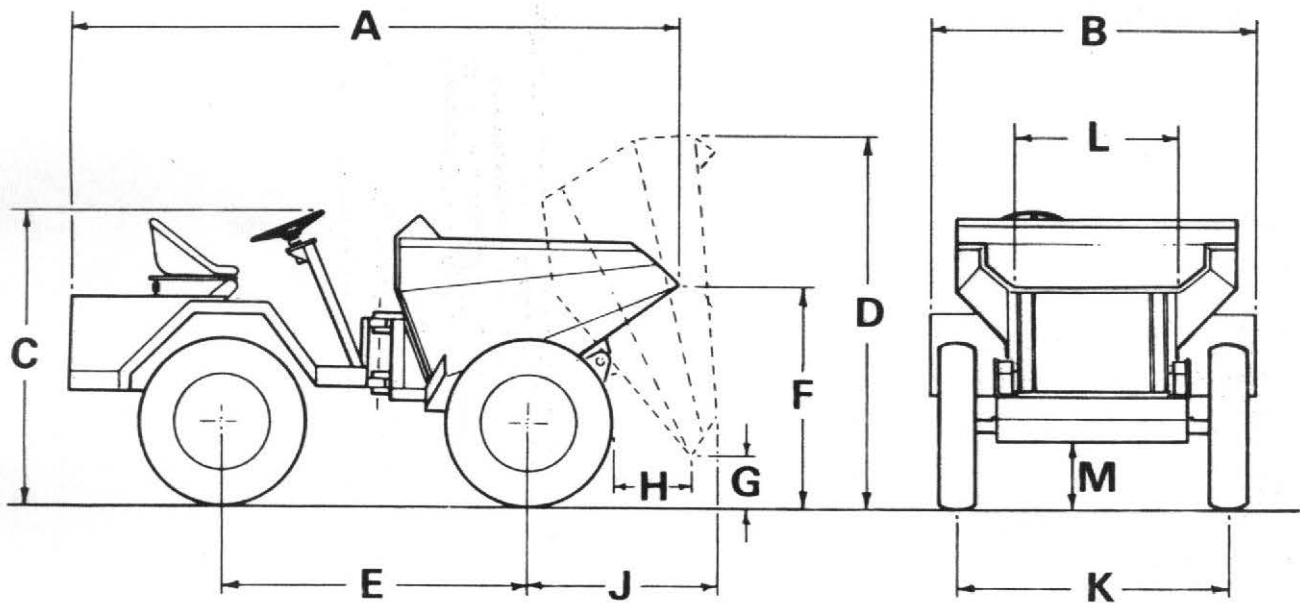
|              |            |                        |
|--------------|------------|------------------------|
| Water level  | 28 cu. ft  | (.80 m <sup>3</sup> )  |
| Struck level | 35 cu. ft. | (.99 m <sup>3</sup> )  |
| Heaped level | 42 cu. ft. | (1.19 m <sup>3</sup> ) |
| Max. Payload | 40 cwt.    | (2032 kgs)             |

### Road speeds at 2000 r.p.m.

|      | mph | kph |
|------|-----|-----|
| 1st  | 3   | 4½  |
| 2nd  | 6½  | 10½ |
| 3rd  | 12¼ | 19½ |
| Rev. | 3¾  | 5   |

### Miscellaneous

|                                |               |                           |
|--------------------------------|---------------|---------------------------|
| Turning circle                 | 23 ft-6in     | (716 cms.)                |
| Unladen weight                 | 31 cwt.       | (1574 kgs)                |
| Hydraulic relief valve setting | 1750 lb/sq in | (123 kg/cm <sup>2</sup> ) |
| Hydraulic tank capacity        | 5 galls       | (22.7 litres)             |
| Rear axle articulation         | 11 in         | (28 cms.)                 |



**FIG. 11**

## SPECIFICATION FOR MACHINE WITH HIGH DISCHARGE SKIP

### Key to Fig.12

|    |                                   |              |              |
|----|-----------------------------------|--------------|--------------|
| A. | Overall length                    | 10ft 10 in.  | (330 cms.)   |
| B. | Overall width                     | 5 ft 5 in    | ( 165 cms. ) |
| C. | Overall height                    | 6ft 3 in.    | (191 cms.)   |
| D. | Overall height when tipped        | 10ft 6 in.   | (320 cms.)   |
| E. | Wheelbase                         | 5 ft. 7¼ in. | (170 cms.)   |
| F. | Skip loading height               | 5ft 8 in.    | (173 cms.)   |
| G. | Skip ground clearance when tipped | 5ft 2 in.    | (158 cms.)   |
| H. | Skip discharge                    | 1ft 10 in.   | ( 56 cms.)   |
| J. | Reach from tyres                  | 3ft 2 in.    | ( 97 cms.)   |
| K. | Wheeltrack                        | 4 ft 7 in    | ( 140 cms. ) |
| L. | Prow width                        | 2 ft 2 in    | ( 66 cms. )  |
| M. | Ground clearance                  | 9½ in        | ( 24 cms. )  |

### Skip Capacity

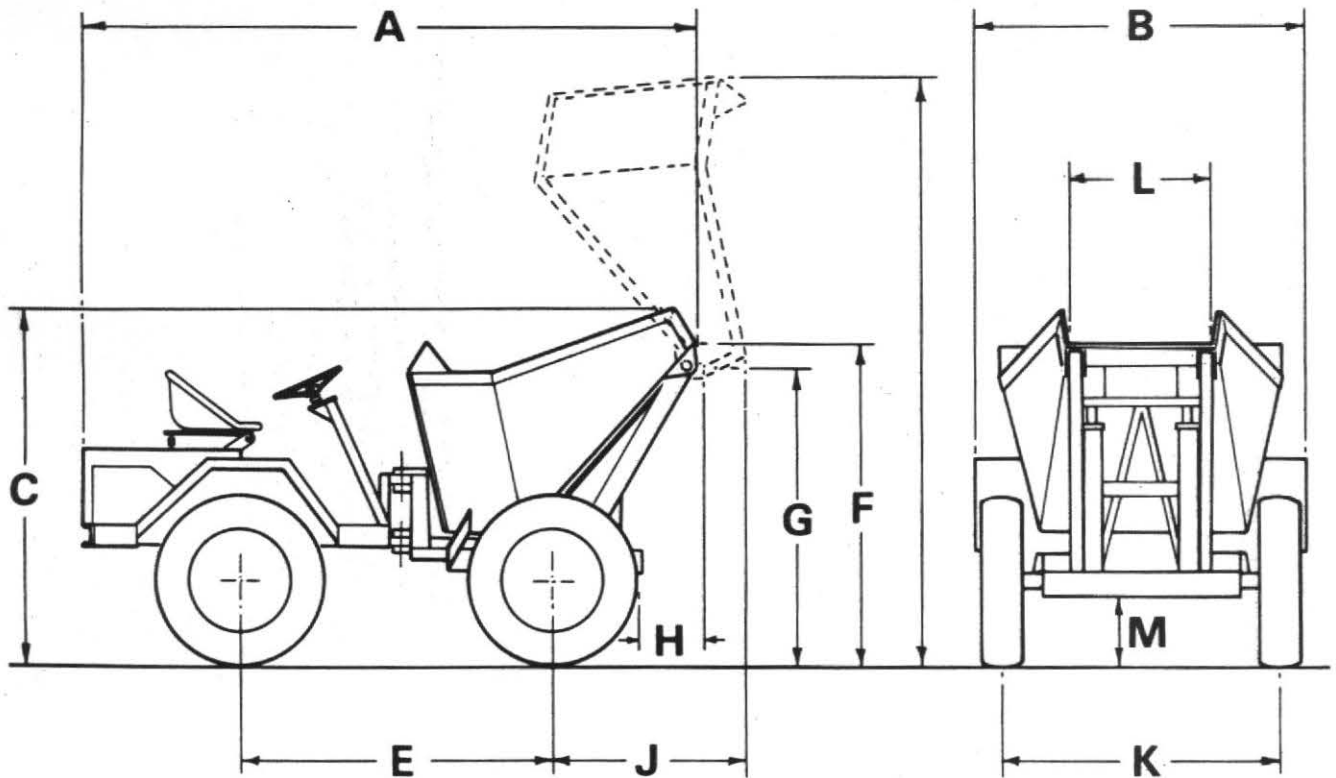
|              |          |
|--------------|----------|
| Water level  | 34 cu ft |
| Struck level | —        |
| Heaped level | —        |
| Max. Payload | 40 cwt   |

### Road speeds at 2000 r.p.m.

|      | mph | kph |
|------|-----|-----|
| 1st  | 3   | 4½  |
| 2nd  | 6½  | 10½ |
| 3rd  | 12¼ | 19½ |
| Rev. | 3¼  | 5   |

### Miscellaneous

|                                |               |                            |
|--------------------------------|---------------|----------------------------|
| Turning circle                 | 23 ft 6 in    | (716 cms.)                 |
| Unladen weight                 | 32 cwt.       | (1625 kgs)                 |
| Hydraulic relief valve setting | 1750 lb/sq in | (123 kgs/cm <sup>2</sup> ) |
| Hydraulic tank capacity        | 5 galls       | (22.7 litres)              |
| Rear axle articulation         | 11 in         | (28 cms)                   |



**FIG. 12**

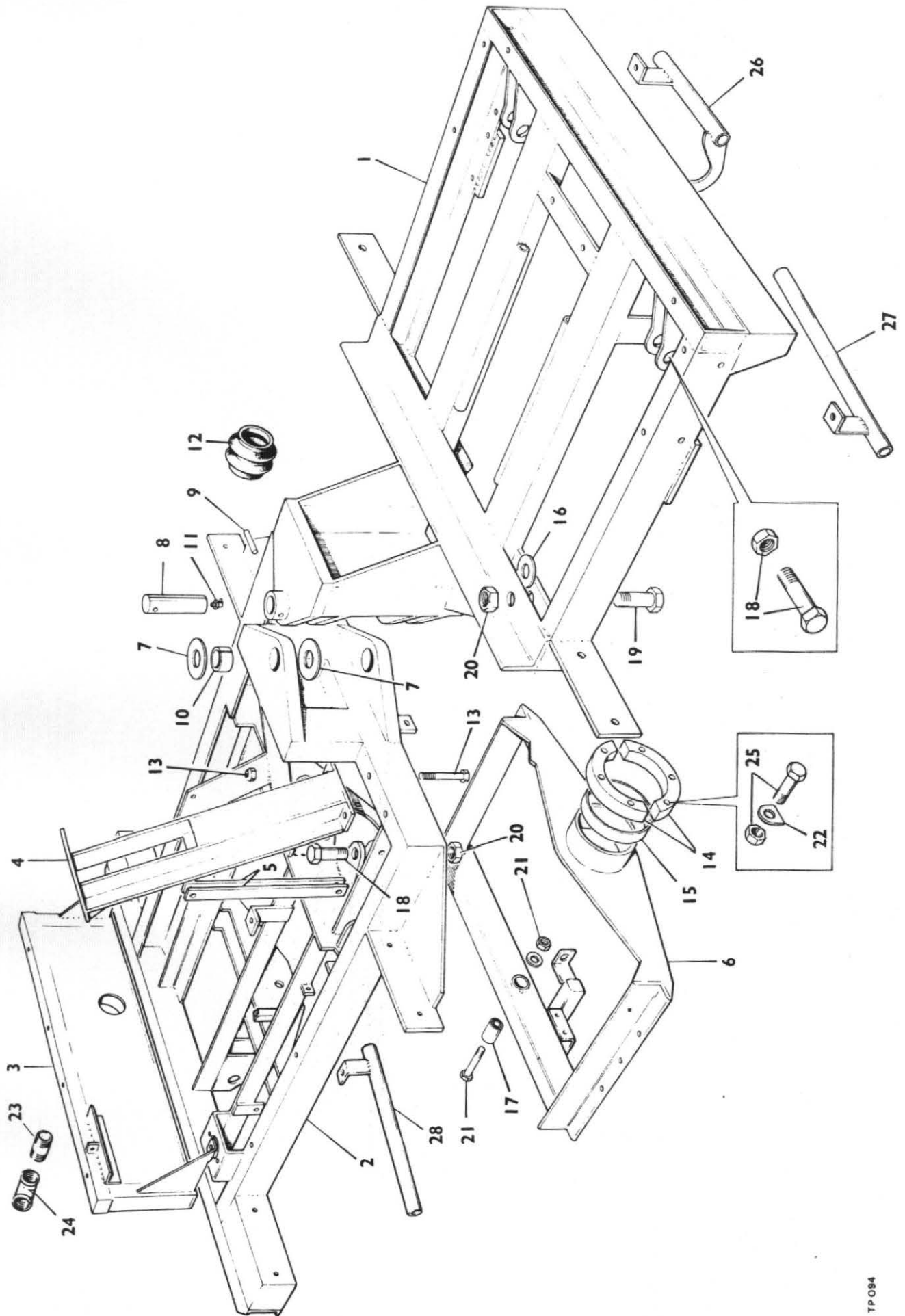
**RECOMMENDED LUBRICATING OILS**

| Company  |                  | Engine<br>Petter                             | Transfer Box &<br>Drive Axle | Gearbox           | Wheel Bearings<br>& Other<br>Grease Points | Hydraulic System         |
|--|------------------|--|------------------------------|-------------------|--|--------------------------|
| (U.K.)<br><b>ESSO</b>  | Summer           | Estor HD 20                                  | Esso Gear Oil<br>GP 90/140   | Estor HD 30       | Beacon 2                                   | Nuto H 44                |
|  | Winter           |  |                              |                   |  |                          |
|  | Above 90°F       | Essolube HD 30                               | Esso Gear Oil GP 90/140      | Essolube HD 30    | Beacon 2                                   |                          |
|  | 32-90°F          | Essolube HD 20                               | Esso Gear Oil GP 90/140      |                   |  |                          |
| (Overseas)   | Below 32°F       | Essolube HD 10W                              | Esso Gear Oil GP 80          |                   |  |                          |
| (U.K.)<br><b>CASTROL</b>   | Summer           | Deusol CRI 20                                | Deusol Gear EP 90            | Deusol CRI 30     | Castrol<br>Spheerol APT 2                  | Castrol<br>Hyspin AWS 32 |
|  | Winter           |  |                              |                   |  |                          |
|  | Above 90°F       | Deusol CRI 30                                | Deusol Gear EP 140           | Deusol CRI 30     | Castrol<br>Spheerol APT 2                  |                          |
|  | 32-90°F          | Deusol CRI 20                                | Deusol Gear EP 90            |                   |  |                          |
| (Overseas)   | Below 32°F       | Deusol CRI 10                                | Deusol Gear EP 80            |                   |  |                          |
| (U.K.)<br><b>SHELL</b>   | Summer           | Rotella S Oil 20/20W                         | Spirax 90 EP                 | Rotella S Oil 30  | Retinax A                                  | Tellus Oil 27            |
|  | Winter           |  |                              |                   |  |                          |
|  | Above 90°F       | Rotella S Oil 30                             | Spirax 140 EP                | Rotella S Oil 30  | Retinax A                                  |                          |
|  | 32-90°F          | Rotella S Oil 20/20W                         | Spirax 90 EP                 |                   |  |                          |
| (Overseas)   | Below 32°F       | Rotella S Oil 10W                            | Spirax 80 EP                 |                   |  |                          |
| (U.K.)<br><b>BP</b>  | Summer           | Energol DD 20W                               | BP Gear Oil SAE 90EP         | Energol DD 30     | Energrease L2                              | Energol HL 65            |
|  | Winter           |  |                              |                   |  |                          |
|  | Above 90°F       | Energol DD 30                                | BP Gear Oil SAE 140 EP       | Energol DD 30     | Energrease L2                              |                          |
|  | 32-90°F          | Energol DD 20W                               | BP Gear Oil SAE 90 EP        |                   |  |                          |
| (Overseas)   | Below 32°F       | Energol DD 10W                               | BP Gear Oil SAE 80 EP        |                   |  |                          |
| (U.K.)<br><b>MOBIL</b>   | Summer           | Mobil Delvac Special or<br>Mobil Delvac 1120 | Mobilube GX 90               | Mobil Delvac 1130 | Mobilgrease MP                             | Mobil DTE Oil<br>Light   |
|  | Winter           |  |                              |                   |  |                          |
|  | Above 90°F       | Mobil Delvac 1130                            | Mobilube GX 140              | Mobil Delvac 1130 | Mobilgrease MP                             |                          |
|  | 32-90°F          | Mobil Delvac 1120                            | Mobilube GX 90               |                   |  |                          |
| (Overseas)   | Below 32°F       | Mobil Delvac 1110                            | Mobilube GX 80               |                   |  |                          |
|  | All Temperatures | Mobil Delvac Special                         |                              |                   |  |                          |
| <p><b>IN THE UNLIKELY EVENT OF THE ABOVE OILS NOT BEING AVAILABLE<br/>EQUIVALENT OILS SUPPLIED BY A REPUTABLE MANUFACTURER MAY BE USED</b></p> |                  |  |                              |                   |  |                          |

# SPARE PARTS SECTION

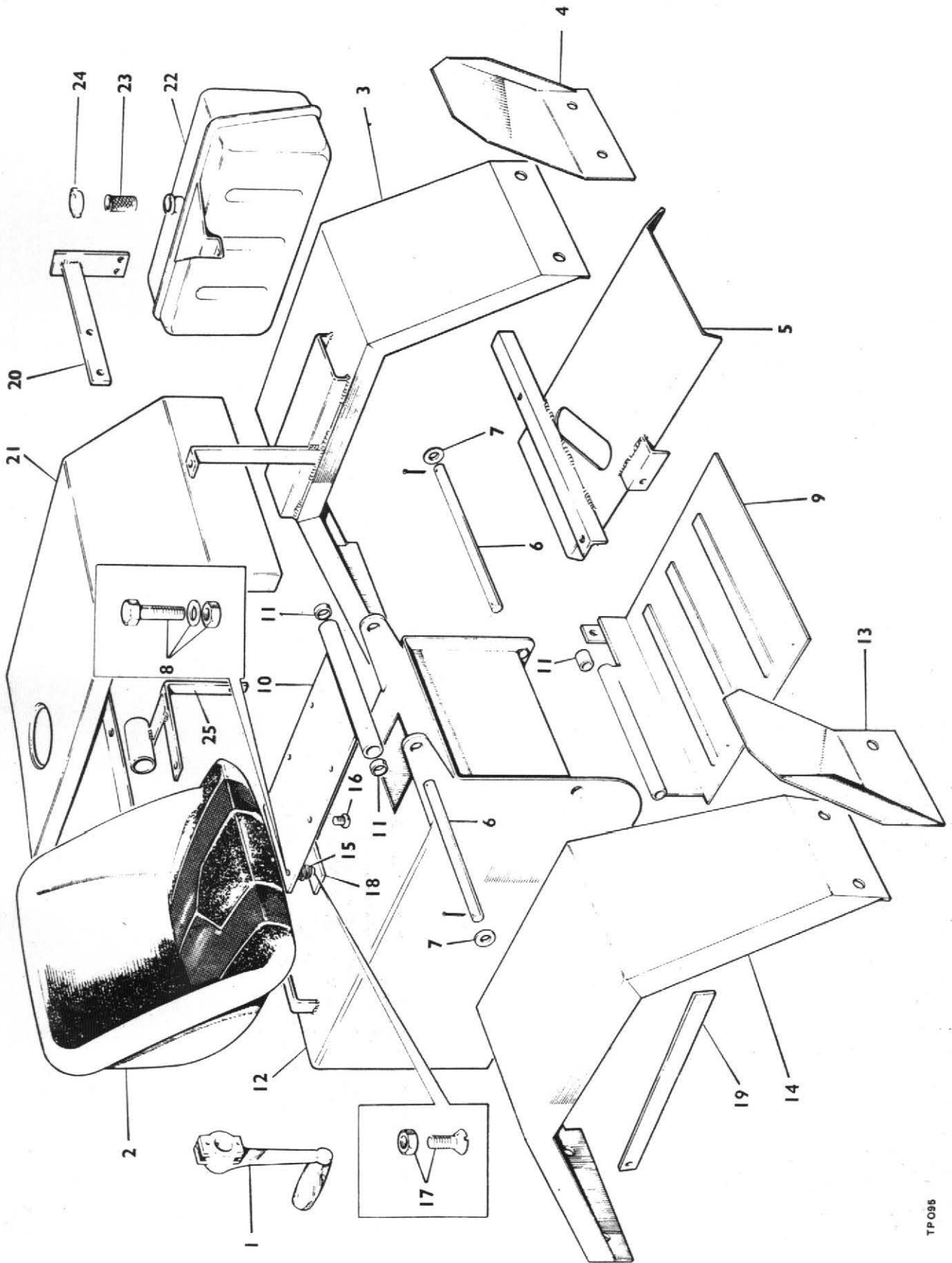
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## CHASSIS

| Item No. | Part No.   | Description  | Qty. |
|----------|------------|--|------|
| 1        | BSE 133    | Front chassis Fwd.Hyd. Tip . . . . .                 | 1    |
| 2        | BSE 132    | Rear chassis (Petter) . . . . .                      | 1    |
|          | BSE 118    | Rear chassis (Lister) . . . . .                      | 1    |
| 3        | BSE 110    | Rear frame (Petter). . . . .                         | 1    |
|          | BSE 119    | Rear frame (Lister). . . . .                         | 1    |
| 4        | 4-35-248   | Steering Column . . . . .                            | 1    |
| 5        | 4-35-333   | Steering Column Brace . . . . .                      | 2    |
| 6        | BSE 101    | Articulating Axle Carrier . . . . .                  | 1    |
| 7        | 4-35-29C   | Thrustwasher—Centre Pivot . . . . .                  | 4    |
| 8        | 4-35-29    | Centre Pivot Pin . . . . .                           | 2    |
| 9        | 4-35-29A   | Tension Pin 5/16in Dia x 2¼ in Long . . . . .        | 2    |
| 10       | 4-35-29B   | Centre Pivot Pin Bush . . . . .                      | 2    |
| 11       | T 90       | Grease Nipple . . . . .                              | 2    |
| 12       | ASE 139    | Convolutd Hose . . . . .                             | 1    |
| 13       |            | Bolt ½" BSF x 5" long & locknut . . . . .            | 2    |
| 14       | 4-35-27    | Axle Bearing Carrier . . . . .                       | 1    |
| 15       | 4-35-26    | Axle Carrier Bearing . . . . .                       | 1    |
| 16       | F4-45-50   | Spacer . . . . .                                     | 1    |
| 17       | E 2245     | Pivot Bush . . . . .                                 | 1    |
| 18       | 4-35-110 A | Bolt—Steering Ram & skip ram (See page 22) . . . . . | 5    |
| 19       | F4-45-57   | Bolt—Steering Ram . . . . .                          | 1    |
| 20       | 4-35-110B  | Nut . . . . .  | 2    |
| 21       |            | Nut & Bolt 7/8 in BSF x 4 in long . . . . .          | 1    |
| 22       | 4-35-145   | Axle Bearing Carrier Tab Washer . . . . .            | 4    |
| 23       | 4-35-28B   | Pipe 1½ in B.S.P. . . . .                            | 1    |
| 24       | ASE 135    | Elbow 1½ in B.S.P. F & F x 45° . . . . .             | 1    |
| 25       |            | Bolt ½ in BSF x 2¼ in Long & Nut . . . . .           | 6    |
| 26       | ASE 134 LH | Front LH & Rear R.H. Brake Rod Guard . . . . .       | 2    |
| 27       | ASE 134 RH | Front RH Brake Rod Guard . . . . .                   | 1    |
| 28       | BSE 105    | Rear LH Brake Rod Guard . . . . .                    | 1    |



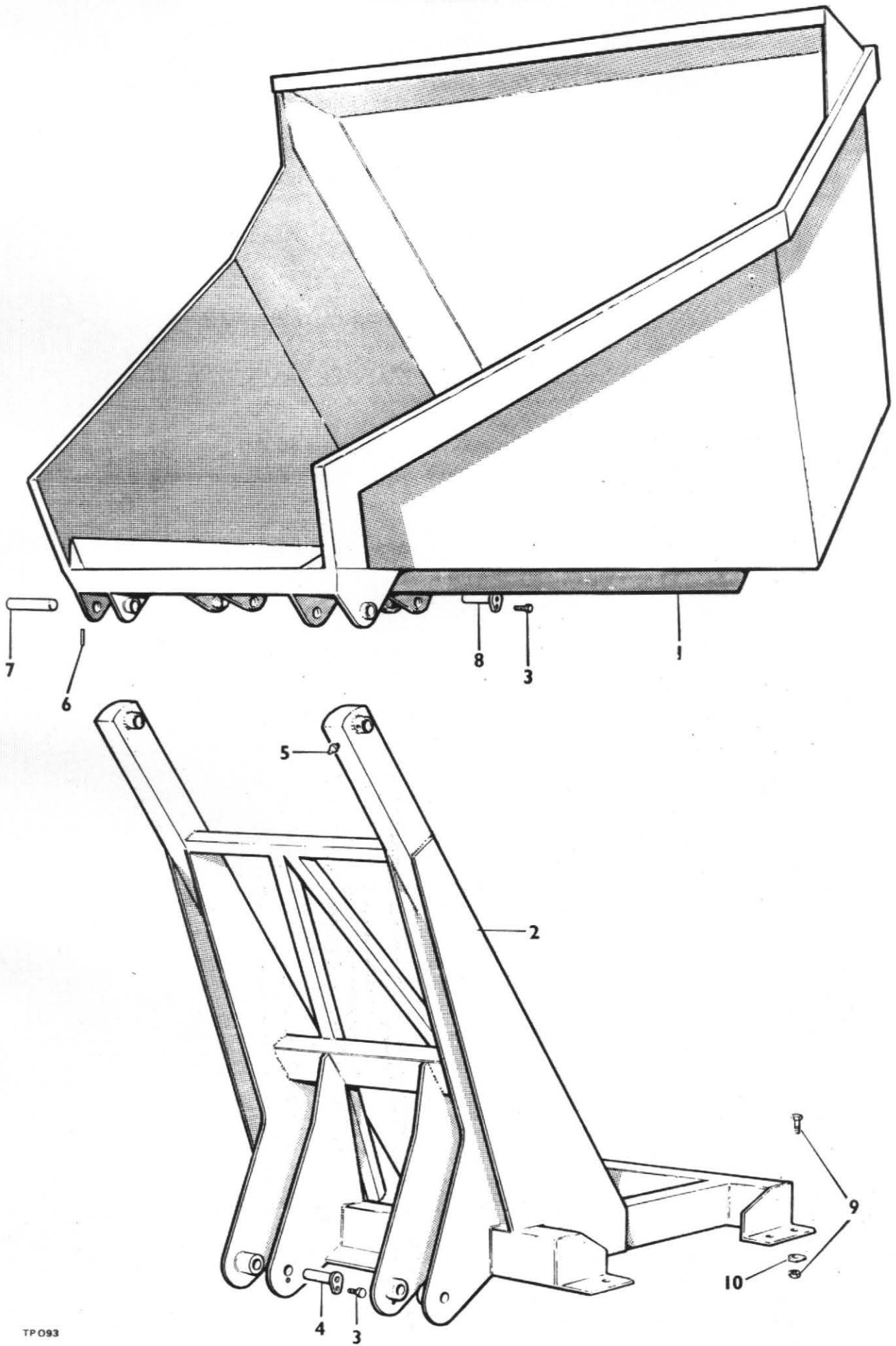
TP095



## MUDWINGS & COVERS

| Item No. | Part No.    | Description   | Qty. |
|----------|-------------|---|------|
| 1        | C 188       | Starting Handle . . . . .                               | 1    |
| 2        | 4-35-301    | Seat . . . . .  | 1    |
| 3        | BSE 111     | Mudwing LH . . . . .                                    | 1    |
| 4        | 2ST 78      | Mudflap LH . . . . .                                    | 1    |
| 5        | BSE 121     | Gearbox Cover . . . . .                                 | 1    |
| 6        | 4-35-307    | Rod-Seat & Tank . . . . .                               | 2    |
| 7        |             | Flat Washer ½in Dia . . . . .                           | 4    |
| 8        |             | Nut & Bolt 3/8in B.S.F. x 1 in Long & Washer . . . . .  | 2    |
| 9        | ASE 116     | Footplate (Petter) . . . . .                            | 1    |
|          | BSE 124     | Footplate (Lister) . . . . .                            | 1    |
| 10       | 4-35-296-12 | Seat Frame . . . . .                                    | 1    |
| 11       | WB0808      | Bush . . . . .  | 4    |
| 12       | BSE 108     | Hydraulic Tank (See pages 46, 47) . . . . .             | 1    |
| 13       | 2ST 77      | Mudflap RH . . . . .                                    | 1    |
| 14       | ASE 114     | Mudwing RH . . . . .                                    | 1    |
| 15       | 5ST 99      | Spring . . . . .  | 2    |
| 16       |             | Seat Bolts 8 MM x 20 MM Long . . . . .                  | 4    |
| 17       |             | Spring Bolts CSK. Bolt 3/8 in BSF x 1 in Long . . . . . | 2    |
| 18       | ASE 131     | Seat Spring Plate . . . . .                             | 1    |
| 19       | BSE 103     | Hydraulic Tank Support . . . . .                        | 1    |
| 20       | BSE 104     | Fuel Filter Support Bracket . . . . .                   | 1    |
| 21       | BSE 130     | Engine cover (Petter) . . . . .                         | 1    |
|          | BSE 120     | Engine cover (Lister) . . . . .                         | 1    |
| * 22     | BAE 7E      | Fuel Tank . . . . .                                     | 1    |
| * 23     | JE13        | Strainer . . . . .                                      | 1    |
| * 24     | CE12        | Cap . . . . .   | 1    |
| 25       | 4-35-241    | Air cleaner Adaptor . . . . .                           | 1    |

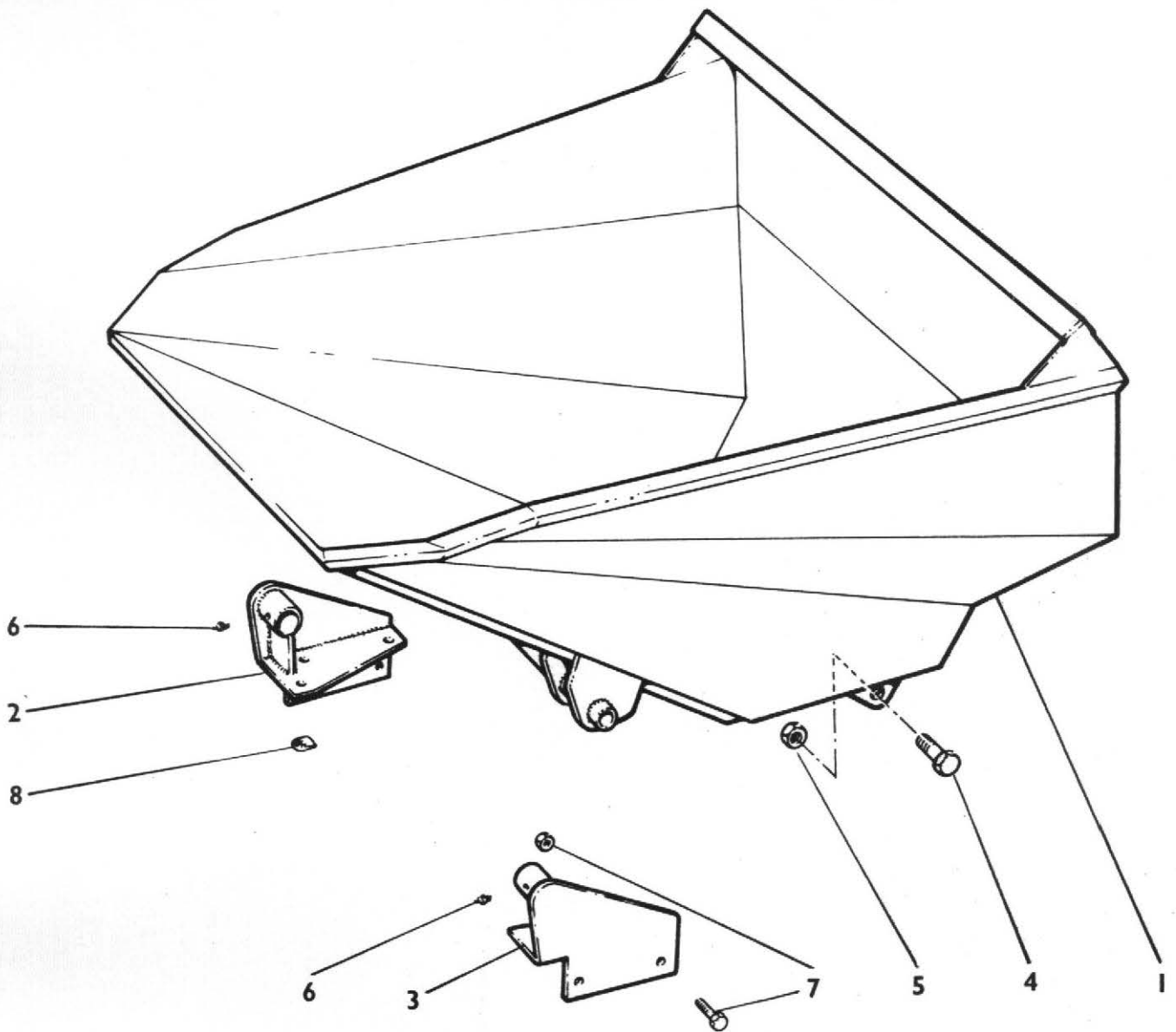
Items 22, 23, and 24. obtainable from Petter agents only.



TP 093

### HIGH DISCHARGE SKIP & FRAME

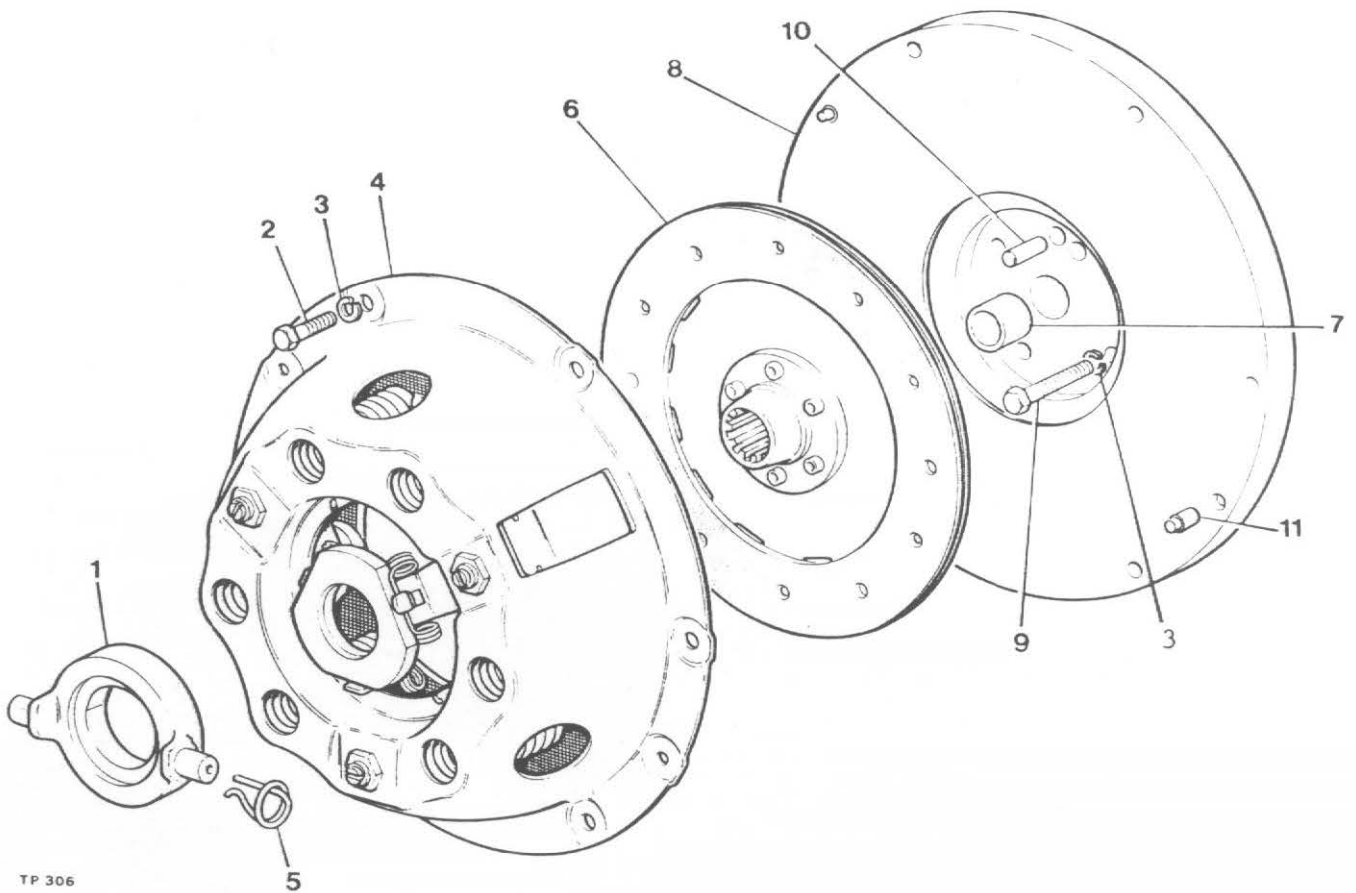
| Item No. | Part No. | Description                                     | Qty. |
|----------|----------|---|------|
| 1        | 4-35-210 | Skip . . . . .                                  | 1    |
| 2        | BSE 146  | Frame . . . . .                                 | 1    |
| 3        |          | Bolt 5/16" UNF x 3/4" long . . . . .            | 4    |
| 4        | 4-35-226 | Lower Ram Pin . . . . .                         | 2    |
| 5        | 5ST 100  | Grease Nipple . . . . .                         | 2    |
| 6        | 4-35-29A | Tension Pin 5/16" dia. x 2 1/4" long . . . . .  | 2    |
| 7        | 5ST 84   | Skip Pivot Pin . . . . .                        | 2    |
| 8        | 4-35-178 | Ram Pin . . . . .                               | 2    |
| 9        |          | Bolt 1/2 in BSF x 1 1/2 in long & nut . . . . . | 6    |
| 10       |          | Taper washer 1/2 in dia . . . . .               | 6    |



### HYDRAULIC TIP SKIP

| Item No. | Part No.  | Description                                | Qty. |
|----------|-----------|--|------|
| 1        | BSE 113   | Skip . . . . .                             | 1    |
| 2        | ASE 108   | Skip Mounting bracket R.H. . . . .         | 1    |
| 3        | ASE 107   | Skip Mounting bracket L.H. . . . .         | 1    |
| 4        | 4-35-110A | Bolt . . . . .                             | 4    |
| 5        | 4-35-110B | Nut . . . . .                              | 4    |
| 6        | 5ST 100   | Grease Nipple . . . . .                    | 2    |
| 7        |           | Bolt ½ in BSF x 1½ in Long & Nut . . . . . | 10   |
| 8        |           | Taper washer . . . . .                     | 6    |

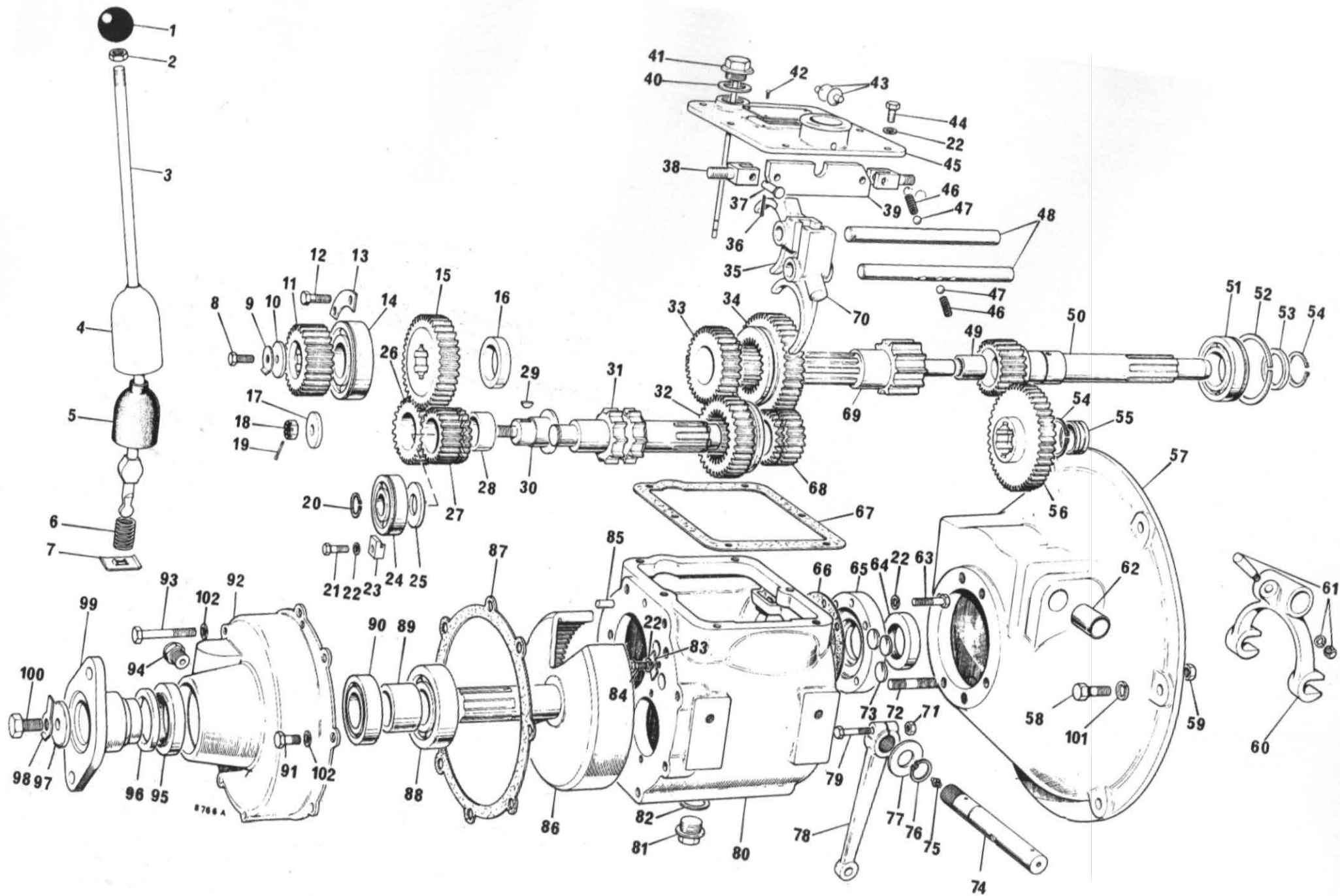
## FLYWHEEL AND CLUTCH ASSEMBLY



TP 306

| Item No. | Part No.   | Description  | Qty. |
|----------|------------|--|------|
| 1        | 10579A01   | Clutch Release Bearing                               | 1    |
| 2        | 28S02D     | Screw Set  | 6    |
| 3        | 41S04      | Washer Spring  | 10   |
| 4        | 10597A01   | Cover Assembly                                       | 1    |
| 5        | 10579A101  | Retainer Spring                                      | 2    |
| 6        | 10598A02   | Drive Plate  | 1    |
| 7        | 10580A0101 | Bush   | 1    |
| 8        | 10580A02   | Flywheel Assembly<br>(comprises of items 7, 8, & 11) | 1    |
| 9        | 1S02C      | Bolt, Petter PH Engine<br>(drill for locking wire)   | 4    |
| 9A       | 6S02B      | Bolt, Lister Engine<br>(drill for locking wire)      | 4    |
| 10       | C321       | Dowel  | 1    |
| 11       | 10580A0102 | Dowel  | 2    |
|          | 10948A02   | Clutch Kit<br>(comprises of items 1, 4, 5 & 6)       | 1    |

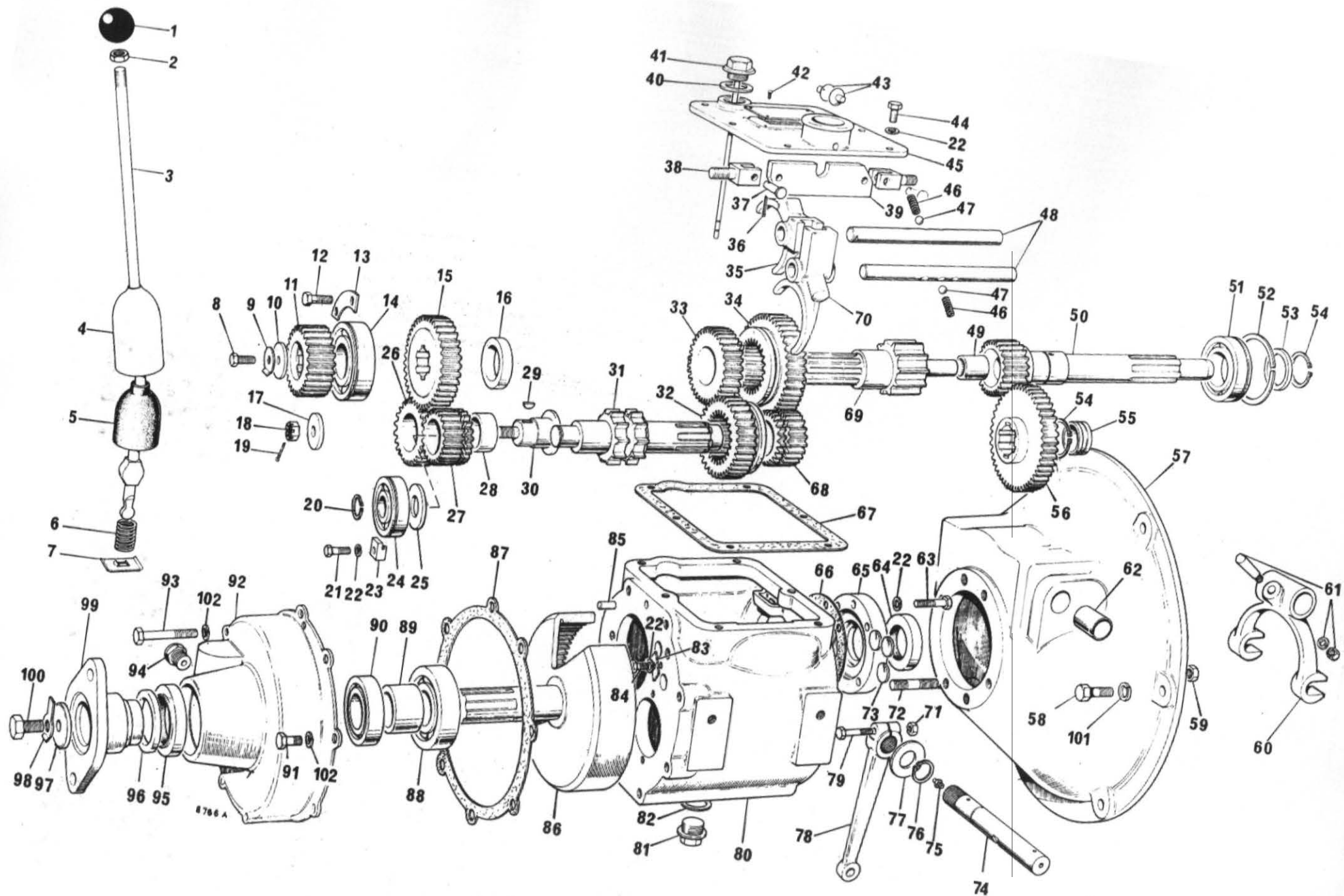
It is recommended that instead of drilling the head of the bolts (item 9) for locking wire that one of each of tabwashers part no's 10531A02 and 10531A03 are used to prevent the bolts working loose.



## GEARBOX 40M-42-583 INV.-676 (PETTER)

## GEARBOX 40M-43-583 INV.-676 (LISTER)

| Item No. | Part No. | Description                            | Qty. |
|----------|----------|--|------|
| 1        | 40M/133  | Knob, Gear Lever . . . . .             | 1    |
| 2        | UN 512   | Locknut, Gear Lever . . . . .          | 1    |
| 3        | 40M/676  | Gear Lever . . . . .                   | 1    |
| 4        | 40M/377  | Cap, Gear Lever . . . . .              | 1    |
| 5        | 40M/129  | Cover, Gear Lever . . . . .            | 1    |
| 6        | 40M/367  | Spring, Gear Lever . . . . .           | 1    |
| 7        | 40M/245  | Retaining Plate, Gear Lever . . . . .  | 1    |
| 8        | USF 53   | Screw, Mainshaft . . . . .             | 1    |
| 9        | 40M/179  | Lockwasher - Tab . . . . .             | 1    |
| 10       | 40M/178  | Washer, Reduction Pinion . . . . .     | 1    |
| 11       | 40M125   | Reduction Pinion (Petter) . . . . .    | 1    |
|          | 40M123   | Reduction Pinion (Lister) . . . . .    | 1    |
| 12       | USF 11   | Screw, Bearing Retainer . . . . .      | 2    |
| 13       | 40M/378  | Bearing Retainer, Small . . . . .      | 1    |
| 14       | CM/2052  | Bearing, Mainshaft Rear . . . . .      | 1    |
| 15       | 40M/110  | Output Gear . . . . .                  | 1    |
| 16       | 40M/128  | Spacer, Output Gear . . . . .          | 1    |
| 17       | 40M/155  | Washer, Reverse Pinion Shaft . . . . . | 1    |
| 18       | UN 507   | Nut, Reverse Spindle . . . . .         | 1    |
| 19       | CP/1004  | Split Pin . . . . .                    | 1    |
| 20       | 40M/148  | Circlip . . . . .                      | 1    |
| 21       | USF/31   | Screw . . . . .                        | 2    |
| 22       | W104     | Spring Washer . . . . .                | 16   |
| 23       | 40M/299  | Clip, Layshaft Bearing . . . . .       | 2    |
| 24       | 40M/146  | Layshaft bearing . . . . .             | 2    |
| 25       | 40M/130  | Bearing Spacer . . . . .               | 1    |
| 26       | 40M/111  | Reverse Pinion . . . . .               | 1    |
| 27       | 40M/114  | Reverse Speed Gear . . . . .           | 2    |
| 28       | 40M/161  | Bush, Reverse Pinion . . . . .         | 1    |
| 29       | 40M/222  | Key, Reverse Pinion Shaft . . . . .    | 1    |
| 30       | 40M/119  | Shaft, Reverse Pinion . . . . .        | 1    |
| 31       | 40M/118  | Layshaft . . . . .                     | 1    |
| 32       | 40M/116  | 2nd Speed Sliding Gear . . . . .       | 1    |
| 33       | 40M/113  | Second Speed Gear . . . . .            | 1    |
| 34       | 40M/115  | 1st Speed Gear . . . . .               | 1    |
| 35       | 40M/502  | Selector Fork, 2nd & 3rd . . . . .     | 1    |
| 36       | 40M/244  | Split Pin, Interlock . . . . .         | 2    |
| 37       | 40M/232  | Clevis Pin, Interlock . . . . .        | 2    |
| 38       | 40M/231  | Stud, Interlock . . . . .              | 2    |
| 39       | 40M/505  | Interlock Plate . . . . .              | 1    |
| 40       | CP/1068  | Seal, Dipstick . . . . .               | 1    |
| 41       | 40M/153  | Dipstick . . . . .                     | 1    |
| 42       | CP/1003  | Drive Screw . . . . .                  | 4    |
| 43       | 40M/254  | Pad, Gear Lever . . . . .              | 2    |
| 44       | USF 21   | Screw, Top Cover . . . . .             | 6    |
| 45       | 40M/220  | Top Cover . . . . .                    | 1    |
| 46       | CM/2103  | Detent Spring . . . . .                | 2    |
| 47       | CM/1077  | Detent Ball . . . . .                  | 2    |
| 48       | 40M/135  | Selector Shaft . . . . .               | 2    |
| 49       | 40M/513  | Bearing, Primary Shaft . . . . .       | 1    |
| 50       | 40M/117  | Primary Shaft . . . . .                | 1    |
| 51       | 40M/143  | Input Bearing . . . . .                | 1    |
| 52       | 40M/252  | Snap Ring . . . . .                    | 1    |
| 53       | 40M/174  | Bearing Spacer . . . . .               | 1    |
| 54       | CM/2053  | Circlip . . . . .                      | 2    |
| 55       | 40M/162  | Bush, Layshaft . . . . .               | 1    |
| 56       | 40M/360  | 1st Reduction Gear . . . . .           | 1    |
| 57       | 40M/392  | Clutch Housing . . . . .               | 1    |

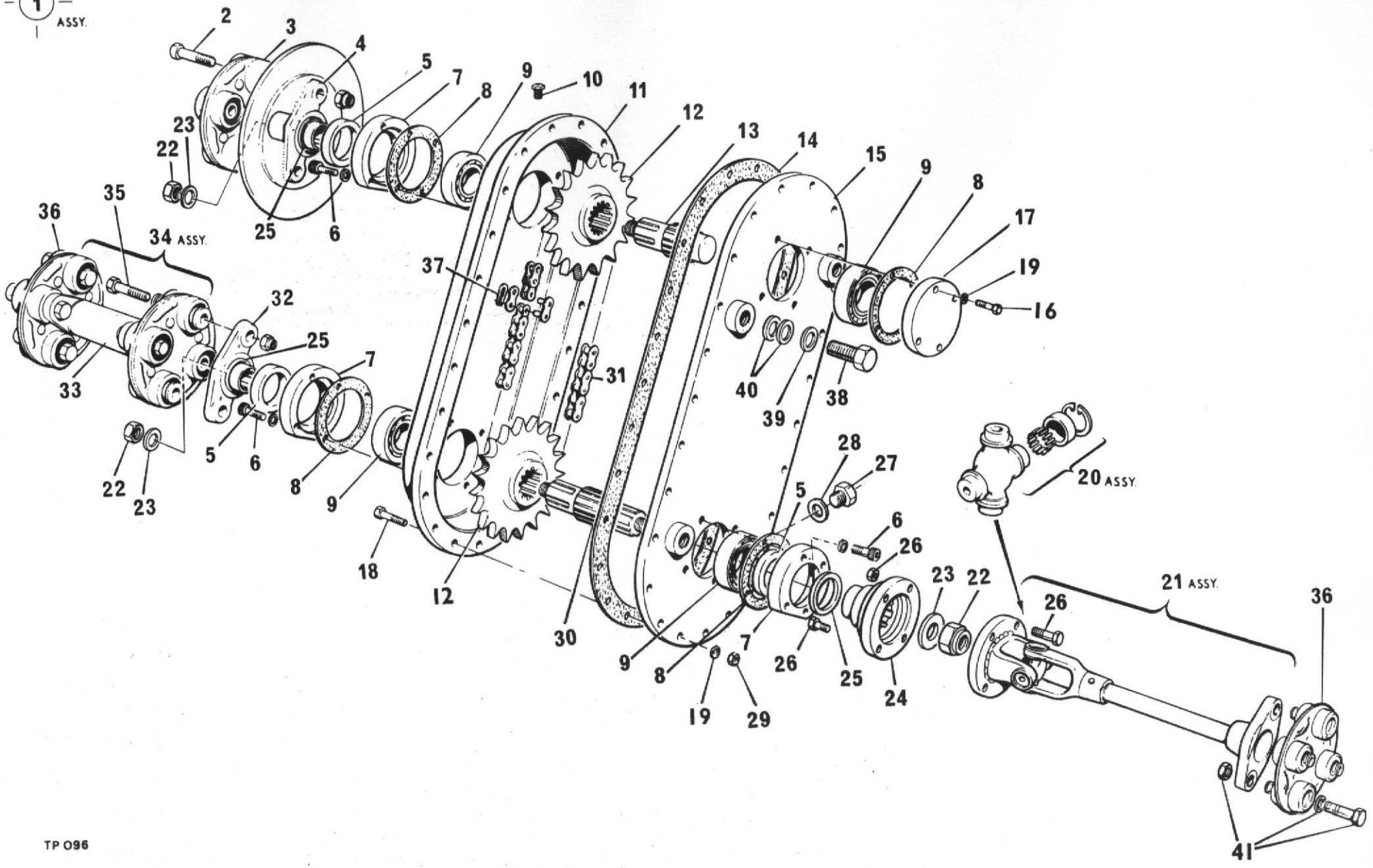




GEARBOX 40M-42-583 INV.-676 (Continued)

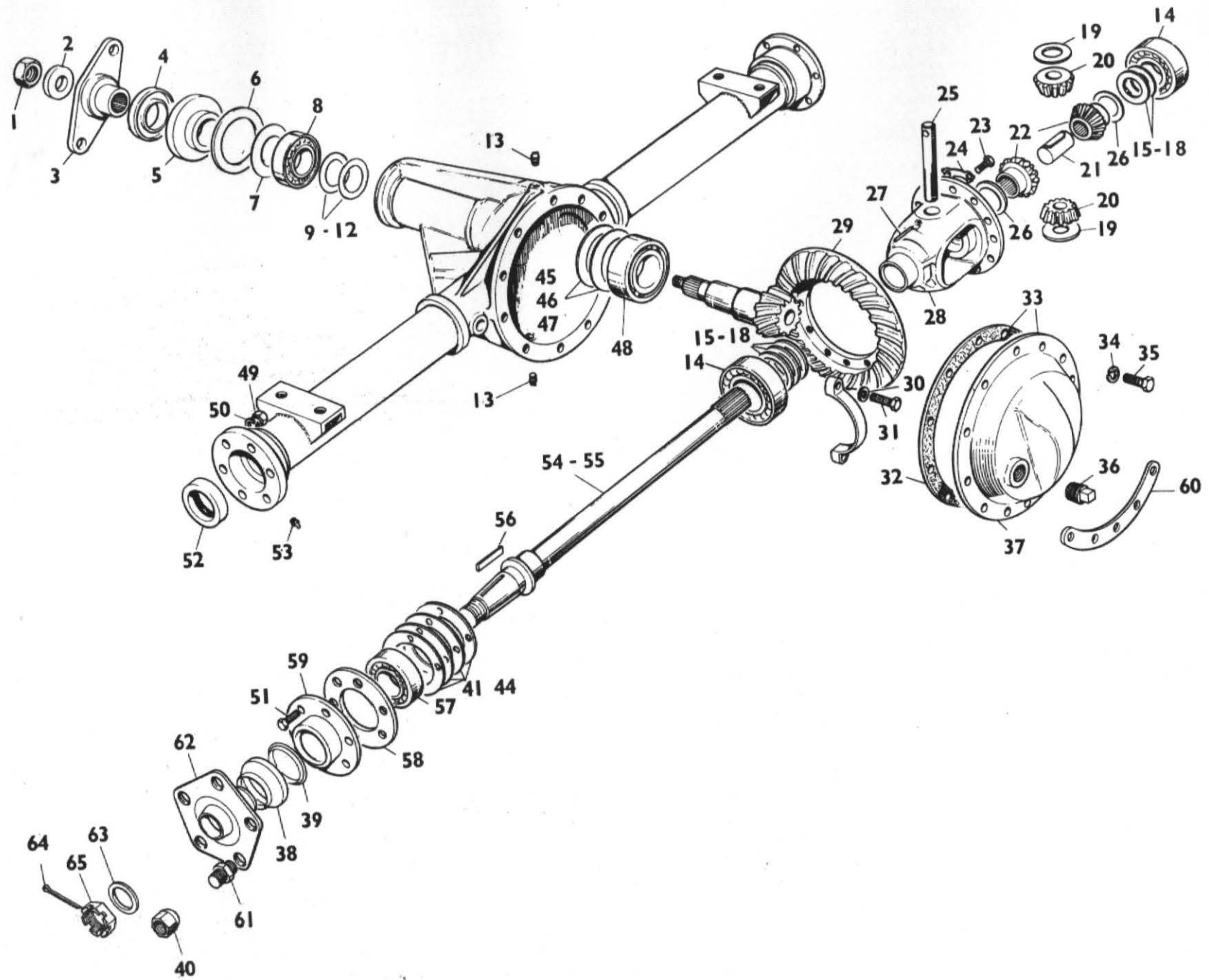
| Item No. | Part No.    | Description                                       | Qty. |
|----------|-------------|---|------|
| 58       |             | Bolt Clutch Housing 3/8" BSF x 1" Long - Petter . | 6    |
| 59       | UNL 106     | Nut . . . . .                                     | 6    |
| 60       | CM/2083     | Clutch Release Fork . . . . .                     | 1    |
| 61       | CM/2084 S/A | Cotter, Nut and Washer S/A . . . . .              | 1    |
| 62       | CM/2179     | Bush, Cross Shaft . . . . .                       | 2    |
| 63       | UBF 71      | Bolt, Front Cover . . . . .                       | 4    |
| 64       | 40M/150     | Oil Seal, Input . . . . .                         | 1    |
| 65       | 40M/126     | Front Cover . . . . .                             | 1    |
| 66       | 40M/172     | Joint, Front Cover . . . . .                      | 1    |
| 67       | 40M/169     | Joint, Top Cover . . . . .                        | 1    |
| 68       | 40M/114     | Reverse Speed Gear . . . . .                      | 2    |
| 69       | 40M/515     | Mainshaft . . . . .                               | 1    |
| 70       | 40M/501     | Selector Fork, 1st. and Reverse . . . . .         | 1    |
| 71       | UN501       | Nut, Clutch Lever . . . . .                       | 1    |
| 72       | 40M/177     | Stud, Clutch Housing . . . . .                    | 6    |
| 73       | CM/2113     | Sealing Disc, Selector Shaft . . . . .            | 3    |
| 74       | 40M/394     | Clutch Cross Shaft . . . . .                      | 1    |
| 75       | CP/1069     | Grease Nipple . . . . .                           | 2    |
| 76       | CP/1006     | Circlip . . . . .                                 | 1    |
| 77       | 40M/398     | Washer, Cross Shaft . . . . .                     | 1    |
| 78       | CM/2090     | Clutch Release Lever . . . . .                    | 1    |
| 79       | UBF 91      | Bolt, clutch lever . . . . .                      | 1    |
| 80       | 40M/101/M   | Casing . . . . .                                  | 1    |
| 81       | CP/1002     | Drain Plug . . . . .                              | 1    |
| 82       | CP/1068     | Seal, Drain Plug . . . . .                        | 1    |
| 83       | 40M/136     | Selector Locking Strip . . . . .                  | 1    |
| 84       | USF 21      | Setscrew . . . . .                                | 2    |
| 85       | 40M/656     | Dowel . . . . .                                   | 2    |
| 86       | 40M/120     | Internal Gear . . . . .                           | 1    |
| 87       | 40M/654     | Joint, Reduction Housing . . . . .                | 1    |
| 88       | CM/2068     | Bearing, Internal Gear Front . . . . .            | 1    |
| 89       | 40M/138     | Spacer . . . . .                                  | 1    |
| 90       | 40M/149     | Bearing, Internal Gear Rear . . . . .             | 1    |
| 91       | USF 32      | Hex. Head Screw . . . . .                         | 5    |
| 92       | 40M/655     | Reduction Housing . . . . .                       | 1    |
| 93       | UBF/142     | Hex. Head Bolt . . . . .                          | 3    |
| 94       | CM/2106     | Breather . . . . .                                | 1    |
| 95       | 40M/167     | Oil Seal, Rear . . . . .                          | 1    |
| 96       | CM/2537     | Dust Shield . . . . .                             | 1    |
| 97       | CM/2123     | Washer, Coupling . . . . .                        | 1    |
| 98       | CM/2050     | Lock Washer . . . . .                             | 1    |
| 99       | 40M/583     | Coupling . . . . .                                | 1    |
| 100      | USF 55      | Screw, Coupling . . . . .                         | 1    |
| 101      |             | Spring Washer 3/8" . . . . .                      | 6    |
| 102      |             | Spring Washer 5/16" . . . . .                     | 8    |

1  
ASSY.



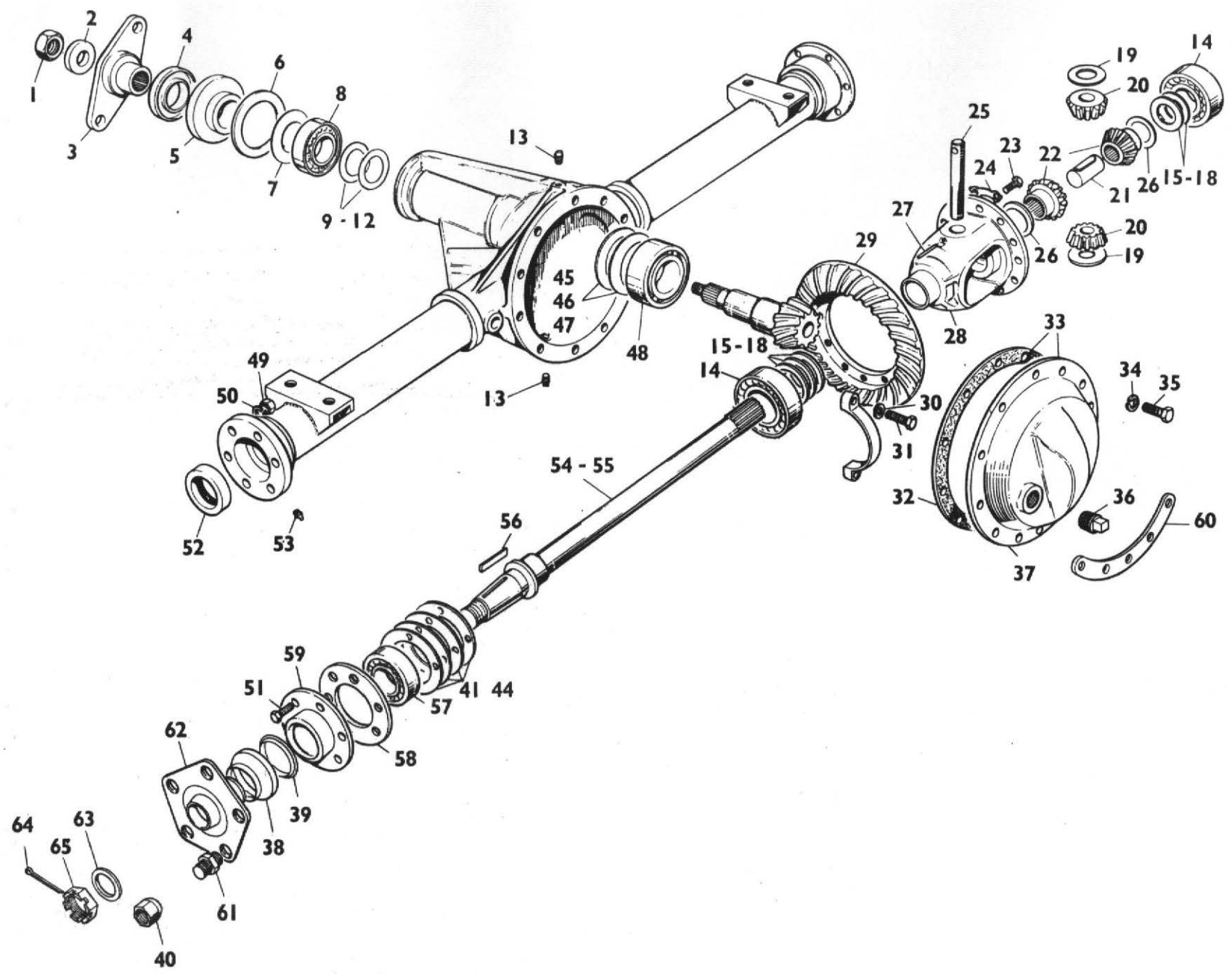
## TRANSFER BOX AND PROP SHAFTS

| Item No. | Part No.   | Description  | Qty  |
|----------|------------|--|------|
| 1        | ASE 142    | Transfer Box Complete Including Item 4 . . . . .                     | 1    |
| 2        | 10203A     | Coupling Bolt, Washer and Nut . . . . .                              | 4    |
| 3        | 10203      | Coupling C/W Bolts and Nuts . . . . .                                | 1    |
| 4        | 4-35-400   | Brake Disc . . . . .   | 1    |
| 5        | 40M 167    | Oil Seal . . . . .   | 3    |
| 6        | UFC 416    | Cap Screw . . . . .  | 12   |
| 7        | 4-35-102   | Oil Seal Housing . . . . .   | 3    |
| 8        | CM.2073    | Gasket . . . . .   | 4    |
| 9        | CM.2068    | Bearing . . . . .  | 4    |
| 10       | CM.2106    | Breather . . . . .   | 1    |
| 11       | 4-35-96    | Main Case . . . . .  | 1    |
| 12       | 4-35-17    | Chain Wheel 19 Tooth . . . . .                                       | 2    |
| 13       | 4-60-252   | Input Shaft . . . . .  | 1    |
| 14       | 4-35-20    | Joint . . . . .  | 1    |
| 15       | 4-35-97    | Main Cover . . . . .   | 1    |
| 16       | UBF 51     | End Cover Screws . . . . .   | 4    |
| 17       | CM 2528    | Cover . . . . .  | 1    |
| 18       | UBF 71     | Housing Screw . . . . .  | 24   |
| 19       |            | Spring Washer 1/4 " dia . . . . .                                    | 28   |
| 20       | 03-501-346 | Repair Kit   |      |
| 21       | BSE 134    | Prop Shaft . . . . .   | 1    |
| 22       |            | 3/4" UNF Self Locking Nut . . . . .                                  | 2    |
| 23       |            | 3/4" Dia. Thick Washer . . . . .                                     | 3    |
| 24       | 40M/589    | Companion Flange . . . . .   | 1    |
| 25       | CM 2537    | Dust Shield . . . . .  | 3    |
| 26       |            | Prop Shaft Nut and Bolt 1 1/4" x 7/16" BSF . . . . .                 | 8    |
| 27       | CP.1002    | Drain Plug . . . . .   | 1    |
| 28       | CP.1068    | Fibre Washer . . . . .   | 1    |
| 29       | UN.501     | Nut . . . . .  | 24   |
| 30       | 4-60-253   | Output Shaft . . . . .   | 1    |
| 31       | 4-35-18    | Drive Chain . . . . .  | 1    |
| 32       | 40M/580    | Companion Flange . . . . .   | 1    |
| 33       | L307       | Prop Shaft . . . . .   | 1    |
| 34       | 76491      | Prop Shaft Assembly Complete . . . . .                               | 2    |
| 35       | 2407A      | Coupling Bolt, Washer and Nut . . . . .                              | 10   |
| 36       | 2407       | Coupling C/W Bolts and Nuts . . . . .                                | 3    |
| 37       | 4-35-18A   | Connecting Link (Chain) . . . . .                                    | 1    |
| 38       |            | Setscrew 1/2" BSF x 1 1/4" Long (Drilled for Wire Locking) . . . . . | 3    |
| 39       |            | Washer 1/2" . . . . .  | 3    |
| 40       |            | Spacing Washers . . . . .  | A.R. |
| 41       | 2408A      | Coupling bolt, washer & nut . . . . .                                | 2    |



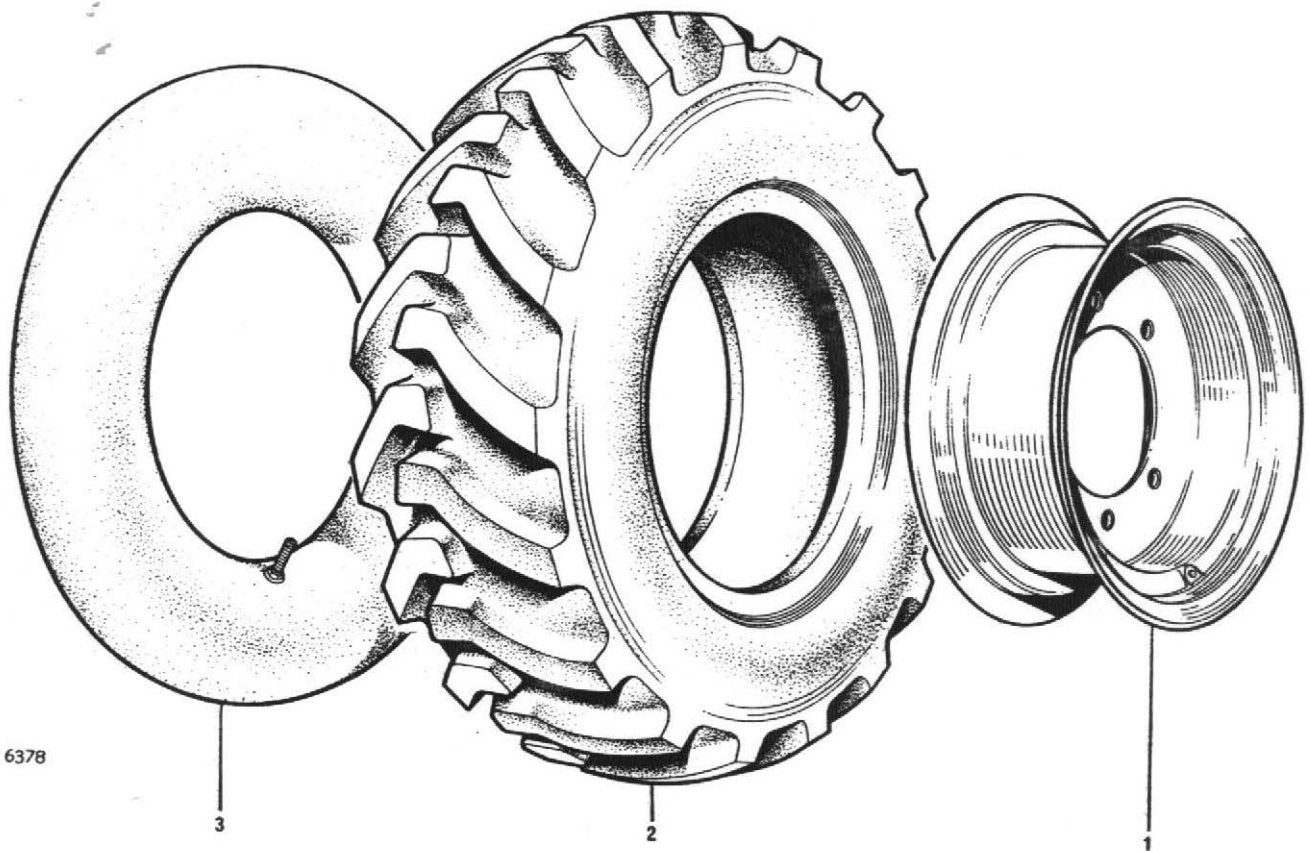
## DRIVE AXLE

| Item No. | Part No.    | Description   | Qty. |
|----------|-------------|---|------|
|          | 5HA-001-274 | Drive Axle Complete with drum brakes (2 per m/c)    |      |
| 1        | 12 LN-NF9   | Pinion Nut . . . . .                                | 1    |
| 2        | 12W-24      | Pinion Nut Washer . . . . .                         | 1    |
| 3        | 3HA-083-1   | Companion Flange Assembly . . . . .                 | 1    |
| 4        | 2HA-021     | Companion Flange Dust Shield . . . . .              | 1    |
| 5        | 2HA-019     | Pinion Oil Seal . . . . .                           | 1    |
| 6        | 2HA-020     | Pinion Oil Seal Gasket . . . . .                    | 1    |
| 7        | 2HA-036     | Pinion Oil Slinger . . . . .                        | 1    |
| 8        | 5HA-022     | Pinion Bearing, Outer . . . . .                     | 1    |
| 9        | 5HA-039     | Pinion Bearing Adjusting Shim Outer .003" . . . . . | 2    |
| 10       | 5HA-040     | Pinion Bearing Adjusting Shim Outer .005" . . . . . | 2    |
| 11       | 5HA-041     | Pinion Bearing Adjusting Shim Outer .010" . . . . . | 2    |
| 12       | 5HA-042     | Pinion Bearing Adjusting Shim Outer .030" . . . . . | 1    |
| 13       | HA-059      | Filler and Drain Plug (each) . . . . .              | 1    |
| 14       | 5HA-024/1   | Differential Bearing . . . . .                      | 2    |
| 15       | 5HA-046     | Differential Bearing Shim .003" . . . . .           | 2    |
| 16       | 5HA-047     | Differential Bearing Shim .005" . . . . .           | 2    |
| 17       | 5HA-048     | Differential Bearing Shim .010" . . . . .           | 2    |
| 18       | 5HA-049     | Differential Bearing Shim .030" . . . . .           | 1    |
| 19       | 5HA-037     | Differential Pinion Mate Thrustwasher . . . . .     | 2    |
| 20       | 5HA-008-1   | Differential Pinion Mate . . . . .                  | 2    |
| 21       | 5HA-033-3   | Axle Shaft Spacer . . . . .                         | 1    |
| 22       | 5HA-007-2   | Differential Side Gear . . . . .                    | 2    |
| 23       | 5HA-075-2   | Drive Gear Screw . . . . .                          | 12   |
| 24       | 5HA-074-1   | Drive Gear Tabwasher . . . . .                      | 6    |
| 25       | 5HA-012     | Differential Pinion Mate Shaft . . . . .            | 1    |
| 26       | 5HA-038     | Differential Side Gear Thrustwasher . . . . .       | 2    |
| 27       | 5HA-013     | Differential Pinion Mate Shaft Lock Pin . . . . .   | 1    |
| 28       | 5HA-006     | Differential Case . . . . .                         | 1    |
| 29       | 5HA-105 15  | Drive Gear and Pinion Assembly Complete . . . . .   | 1    |
| 30       | 8 LW-115    | Differential Bearing Cap Washer - Spring . . . . .  | 4    |
| 31       | 8 B-NC 36   | Differential Bearing Cap Bolt . . . . .             | 4    |
| 32       | 5HA-026     | Gear Carrier Cover Gasket . . . . .                 | 1    |
| 33       | 5HA-064-1   | Gear Carrier Cover Assembly . . . . .               | 1    |
| 34       | 6LW-105     | Cover Screw Washer - Spring . . . . .               | 10   |
| 35       | 6B-NC10     | Cover Screw . . . . .                               | 10   |
| 36       | HA-059      | Level Plug . . . . .                                | 1    |
| 37       | 5HA-010     | Gear Carrier Cover . . . . .                        | 1    |
| 38       | 5HA-030-4   | Shroud . . . . .                                    | 2    |
| 39       | 5HA-032-14  | Seal . . . . .                                      | 2    |
| 40       | C 177       | Wheel Nut . . . . .                                 | 10   |
| 41       | 5HA-050-3   | Axle Shaft Bearing Shim .003" . . . . .             | 2    |
| 42       | 5HA-051-3   | Axle Shaft Bearing Shim .005" . . . . .             | 2    |
| 43       | 5HA-052-3   | Axle Shaft Bearing Shim .010" . . . . .             | 2    |
| 44       | 5HA-053-3   | Axle Shaft Bearing Shim .030" . . . . .             | 2    |
| 45       | 5HA-043     | Pinion Adjusting Shim, Inner .003" . . . . .        | 2    |
| 46       | 5HA-044     | Pinion Adjusting Shim, Inner .005" . . . . .        | 2    |
| 47       | 5HA-045     | Pinion Adjusting Shim, Inner .010" . . . . .        | 2    |
| 48       | 5HA-023     | Pinion Bearing Inner . . . . .                      | 1    |
| 49       | 6N-NF5      | Bearing Retainer Nut . . . . .                      | 12   |
| 50       | 6W-12       | Washer - Spring . . . . .                           | 2    |
| 51       | 6B-NF 18/B  | Bearing retainer bolt . . . . .                     | 12   |
| 52       | 5HA-027     | Axle Shaft Oil Seal . . . . .                       | 2    |
| 53       | 5HA-056     | Axle Shaft Bearing Grease Nipple . . . . .          | 2    |
| 54       | 5HA-005-51  | Axle Shaft RH . . . . .                             | 1    |
| 55       | 5HA-005-51  | Axle Shaft LH . . . . .                             | 1    |



DRIVE AXLE (Continued)

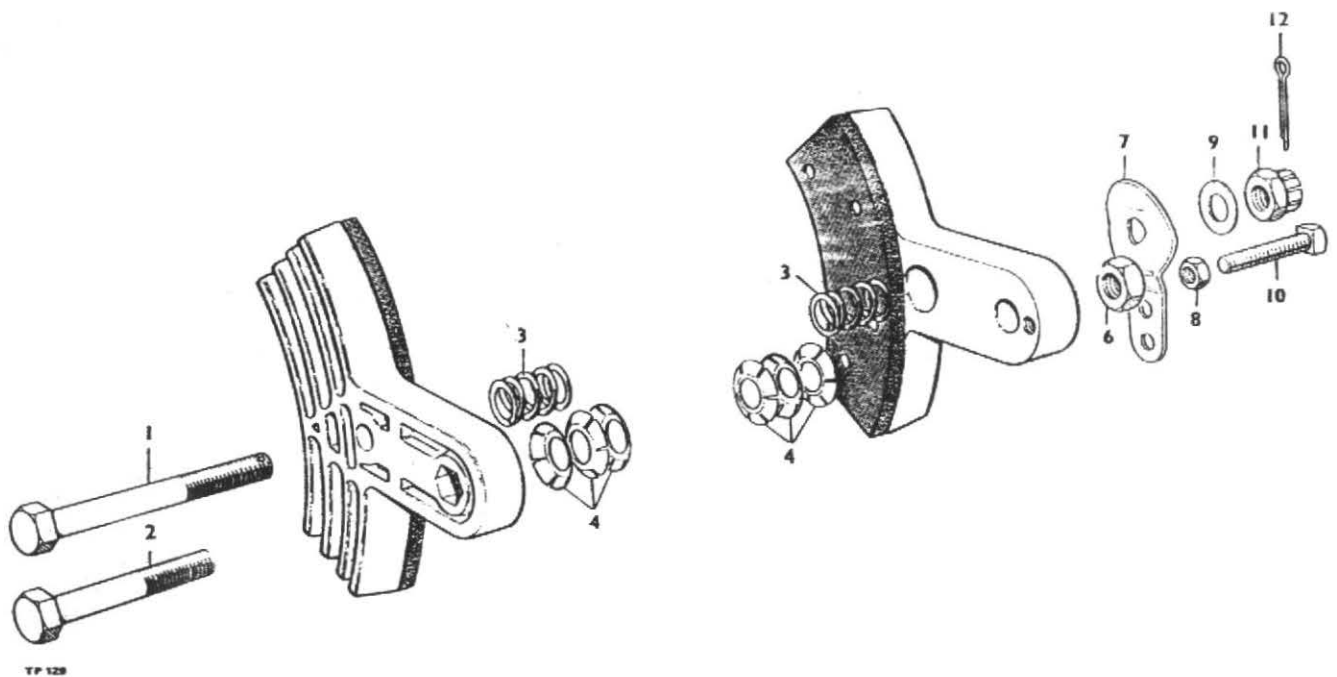
| Item No. | Part No.    | Description                           | Qty. |
|----------|-------------|---------------------------------------|------|
| 56       | 5HA-029     | Axle Shaft Key . . . . .              | 2    |
| 57       | 5HA-025     | Axle Shaft Bearing . . . . .          | 2    |
| 58       | 5HA-035-5   | Axle shaft bearing retainer . . . . . | 2    |
| 59       | 5HA-057-1   | Hub oil seal assembly . . . . .       | 2    |
| 60       | 4-35-235    | Differential cover support . . . . .  | 1    |
| 61       | 5HA-055-6   | Wheel stud . . . . .                  | 10   |
| 62       | 5HA-028-37  | Wheel hub complete . . . . .          | 2    |
| 63       | 18W-32      | Axle shaft washer . . . . .           | 2    |
| 64       | 12SP-18     | Axle shaft cotter . . . . .           | 2    |
| 65       | 18-SN-NF-12 | Axle shaft Nut . . . . .              | 2    |



### WHEELS AND TYRES

| Item No. | Part No. | Description          | Qty. |
|----------|----------|----------------------|------|
| 1        | 24S04    | R/H Wheel Assembly   | 2    |
|          | 24S03    | L/H Wheel Assembly   | 2    |
| 2        | 30192A01 | Wheel rim 5.50 x 16  | 4    |
|          | 20S08    | Tyre 7.50 x 16-6 ply | 4    |
| 3        | 23S03    | Tube 7.50 x 16       | 4    |

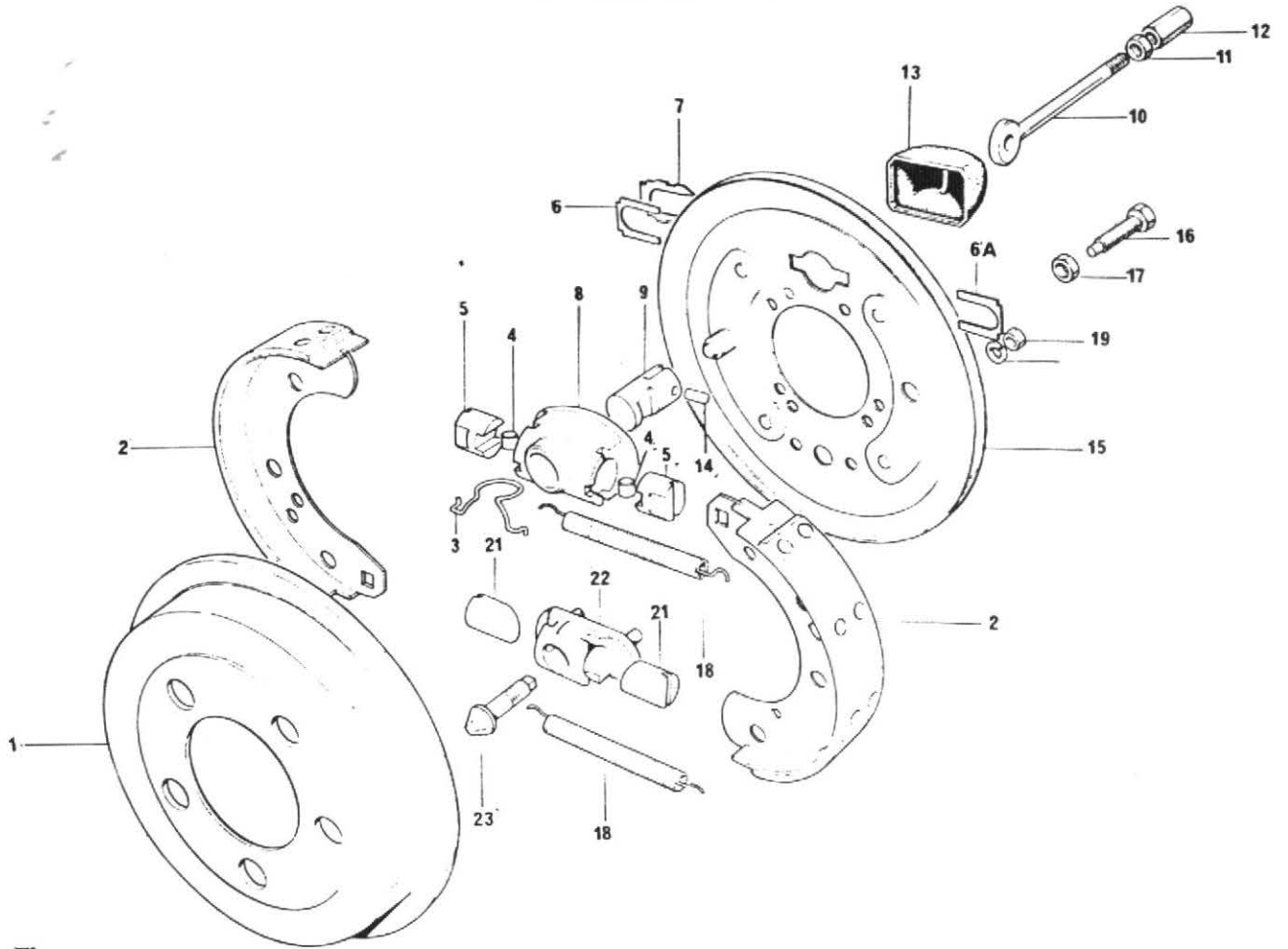




## CALIPER, parking brake

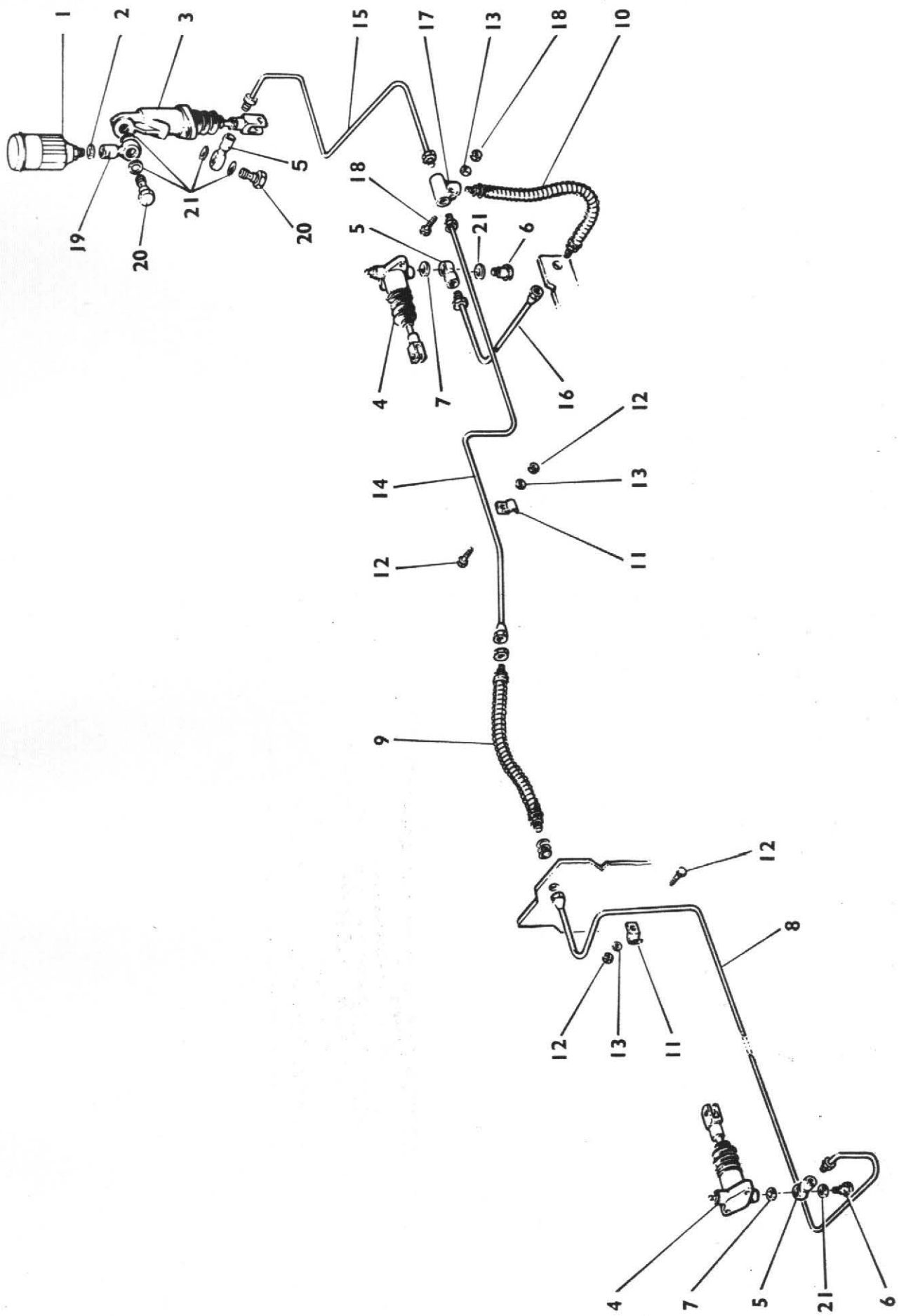
| Item | Part no    | Description                 | Qty |
|------|------------|-----------------------------|-----|
| 1A   | 10578A01   | CALIPER, one pair, assembly | 1   |
| 1    | 28S02T     | SCREW                       | 1   |
| 2    | 28S02P     | SCREW                       | 1   |
| 3    | 10578A0101 | SPRING, centring            | 2   |
| 4    | 10578A0102 | WASHER, tension             | 6   |
| 6    | 9S02       | NUT                         | 1   |
| 7    | 10578A0104 | CAM                         | 1   |
| 8    | 230S01     | NUT, locking                | 1   |
| 9    | 10578A0105 | WASHER                      | 1   |
| 10   | 66S01H     | SCREW, set                  | 1   |
| 11   | 227S02     | NUT, castle                 | 1   |
| 12   | 44S01C     | PIN, cotter                 | 1   |
| 13   | 1072A4     | PAD c/w rivets              | 2   |

## DRUM BRAKE ASSEMBLY



7818

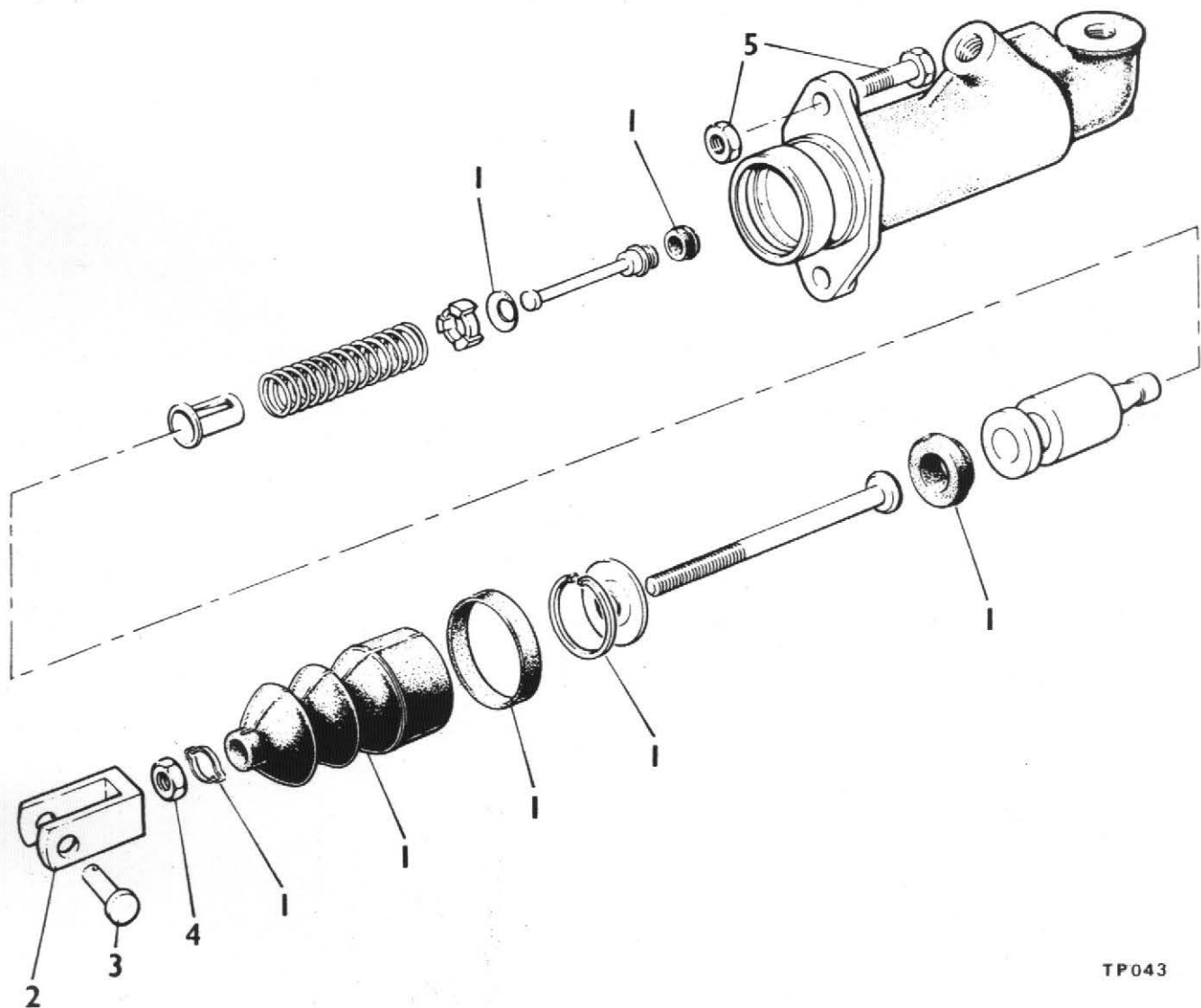
| Item | Part No.    | Description  | Qty. |
|------|-------------|--|------|
| 1    | 30088.A0128 | Brake Drum   | 1    |
| 2    | 20298.A0101 | Lined Shoe   | 2    |
| 3    | 20298.A0102 | Spring   | 1    |
| 4    | 20298.A0103 | Roller   | 2    |
| 5    | 20298.A0104 | Tappet Expander                                      | 2    |
| 6    | 20298.A0105 | Plate  | 1    |
| 6A   | 20298.A0106 | Plate  | 1    |
| 7    | 20298.A0107 | Locking Plate  | 1    |
| 8    | 20298.A0108 | Expander Housing                                     | 1    |
| 9    | 20298.A0109 | Plunger  | 1    |
| 10   | 20298.A0110 | Drawlink   | 1    |
| 11   | 20298.A0111 | Locknut  | 1    |
| 12   | 20298.A0112 | Barrel Nut   | 1    |
| 13   | 20298.A0113 | Dust Cover   | 1    |
| 14   | 20298.A0114 | Pin  | 1    |
| 15   | 20298.A0115 | Brake Back Plate                                     | 1    |
| 16   | 1S.02C      | Setscrew 5/16" BSF                                   | 2    |
| 17   | 1S.03       | Nut 5/16" BSF  | 2    |
| 18   | 20298.A0116 | Spring   | 2    |
| 19   | 20298.A0117 | Nut  | 2    |
| 20   | 20298.A0118 | Washer   | 2    |
| 21   | 20298.A0119 | Tappet Adjuster                                      | 2    |
| 22   | 20298.A0120 | Adjuster Housing                                     | 1    |
| 23   | 20298.A0121 | Wedge  | 2    |
| 24   | 20298.A0122 | Service Kit (Adjuster) (N.I.)                        | A/R  |
| 25   | 20298.A0123 | Adjuster Assy. (Compr: 19-25)                        | A/R  |
| 26   | 20298.A0124 | Expr. Assy. (Compr: items<br>3,4,5,8,9,10,11,12,& 14 | A/R  |



FWD.

**BRAKE PIPES & CONNECTIONS**

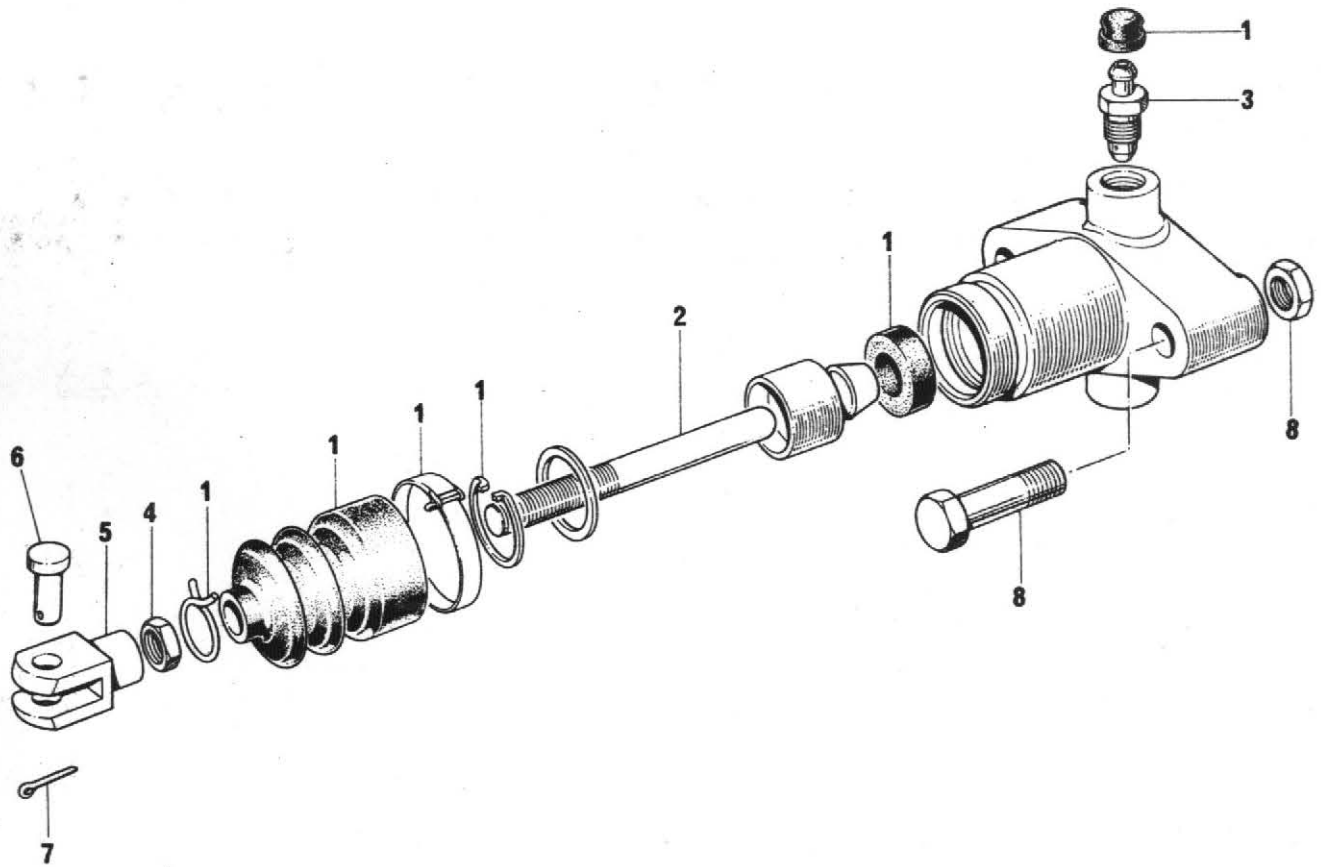
| Item No. | Part No. | Description  | Qty. |
|----------|----------|--|------|
| 1        | 64046158 | Header Tank . . . . .                                    | 1    |
| 2        | 4-35-378 | Copper Washer 3/4" OD. x 7/16" ID. x 1/8" thick. . . . . | 1    |
| 3        | 64066004 | Master Cylinder (See Page 40) . . . . .                  | 1    |
| 4        | ASE 149  | Slave Cylinder (See Page 41) . . . . .                   | 2    |
| 5        | 64474287 | Banjo . . . . .  | 3    |
| 6        | 376102 W | Banjo Bolt . . . . .                                     | 2    |
| 7        | 378703   | Washer . . . . .   | 2    |
| 8        | DM 79-5  | Pipe . . . . .   | 1    |
| 9        | 64047903 | Flex Pipe 11" . . . . .                                  | 1    |
| 10       | 64046115 | Flex Pipe 9" . . . . .                                   | 1    |
| 11       | 4S 133   | P Clip . . . . .   | 3    |
| 12       |          | Bolt 1/4" BSF x 1" Long & Nut . . . . .                  | 3    |
| 13       |          | Shakeproof Washer 1/4" . . . . .                         | 4    |
| 14       | DM 79-4  | Brake Pipe . . . . .                                     | 1    |
| 15       | DM 78-9  | Brake Pipe . . . . .                                     | 1    |
| 16       | DM 79-6  | Brake Pipe . . . . .                                     | 1    |
| 17       | 64474341 | Tee Piece . . . . .                                      | 1    |
| 18       |          | Bolt 1/4" BSF x 1 1/2" Long & Nut . . . . .              | 1    |
| 19       | 64474291 | Banjo . . . . .  | 1    |
| 20       | 64473063 | Banjo bolt . . . . .                                     | 2    |
| 21       | 378700   | Washer . . . . .   | 4    |



TP043

### BRAKE MASTER CYLINDER

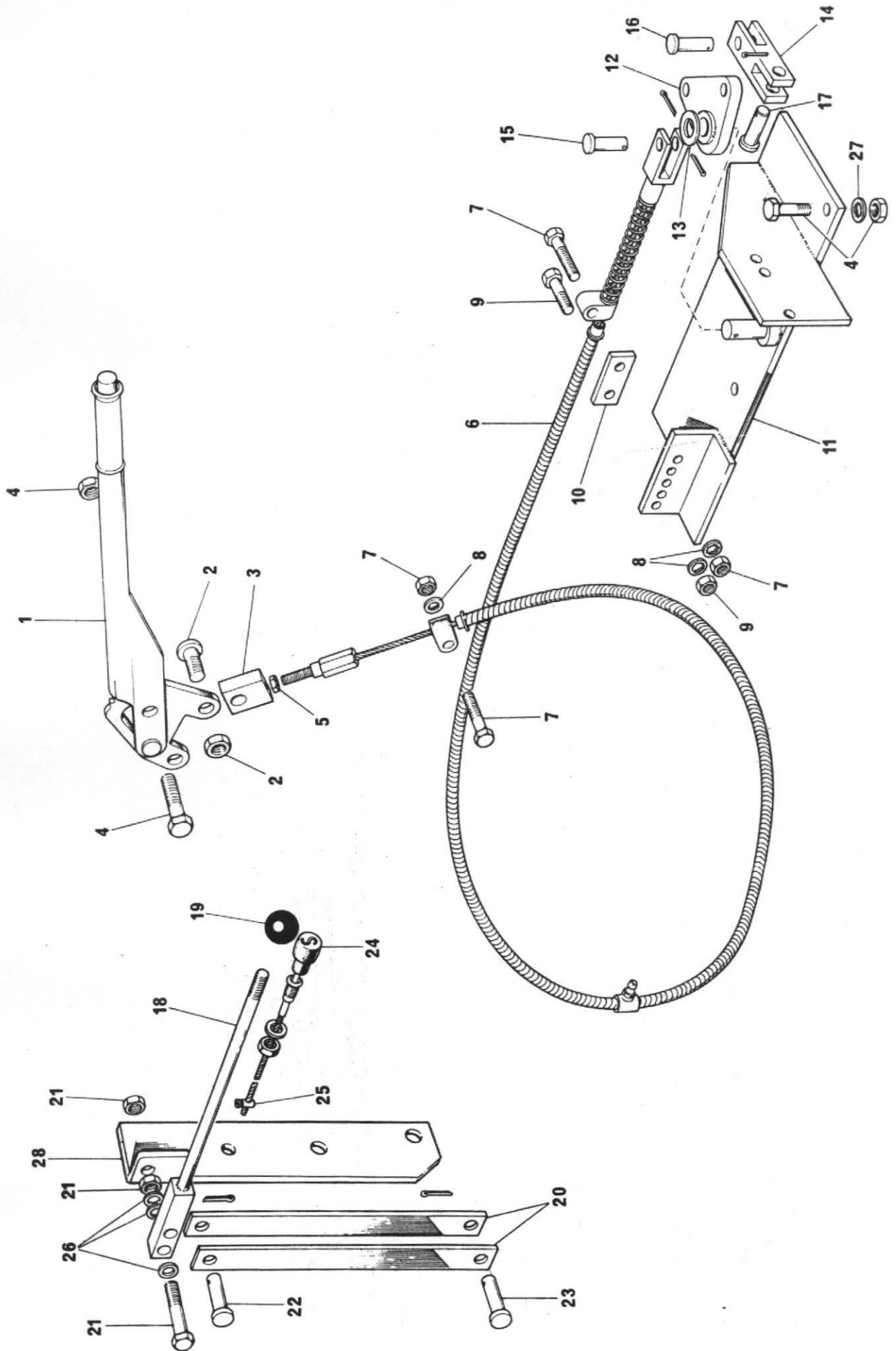
| Item No. | Part No. | Description                                 | Qty. |
|----------|----------|---|------|
|          | 64066004 | Master Cylinder Complete . . . . .          | 1    |
| 1        | SP.2636  | Service Kit . . . . .                       | A/R  |
| 2        | 64671286 | Clevis . . . . .                            | 1    |
| 3        | C174Y    | Clevis Pin . . . . .                        | 1    |
| 4        | 64100052 | Locknut . . . . .                           | 1    |
| 5        |          | Bolt 3/8" BSF x 1 1/2" Long & Nut . . . . . | 2    |



10043

### BRAKE SLAVE CYLINDER ASSEMBLY

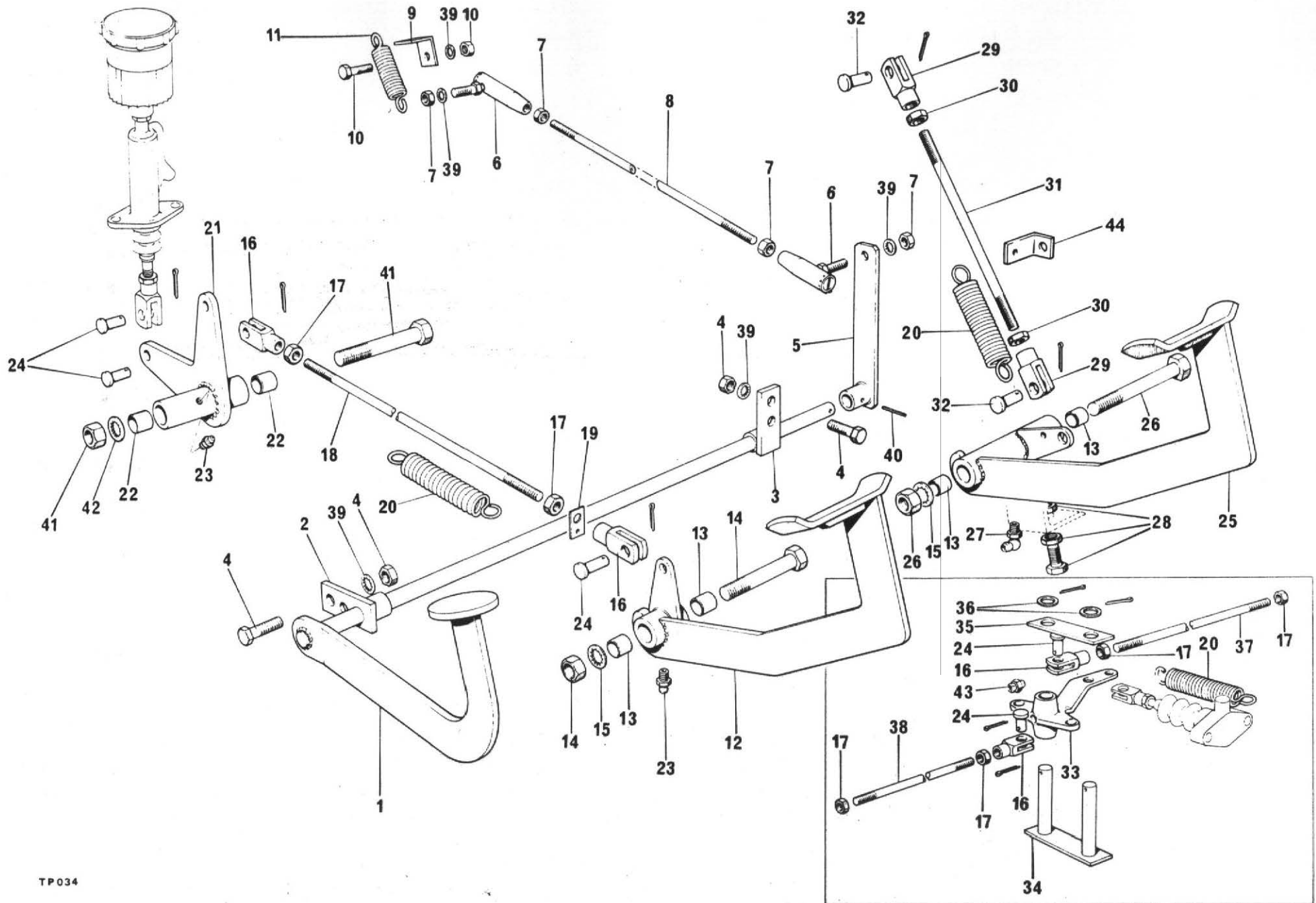
| Item No. | Part No. | Description                                    | Qty. |
|----------|----------|--|------|
|          | ASE 149  | Slave Cylinder Complete . . . . .              | 1    |
| 1        | SP 2694  | Repair Kit . . . . .                           | 1    |
| 2        | ASE 117  | Push Rod . . . . .                             | 1    |
| 3        | 64470444 | Bleed Nipple . . . . .                         | 1    |
| 4        |          | Nut 3/8" BSF . . . . .                         | 1    |
| 5        | C 174A   | Clevis . . . . .                               | 1    |
| 6        | C 174X   | Clevis Pin . . . . .                           | 1    |
| 7        |          | Split Pin 3/32" Dia. . . . .                   | 1    |
| 8        |          | Bolt 5/16" BSF x 1 3/4" Long and Nut . . . . . | 2    |



## HANDBRAKE, VALVE CONTROL LEVER & ENGINE STOP CONTROL

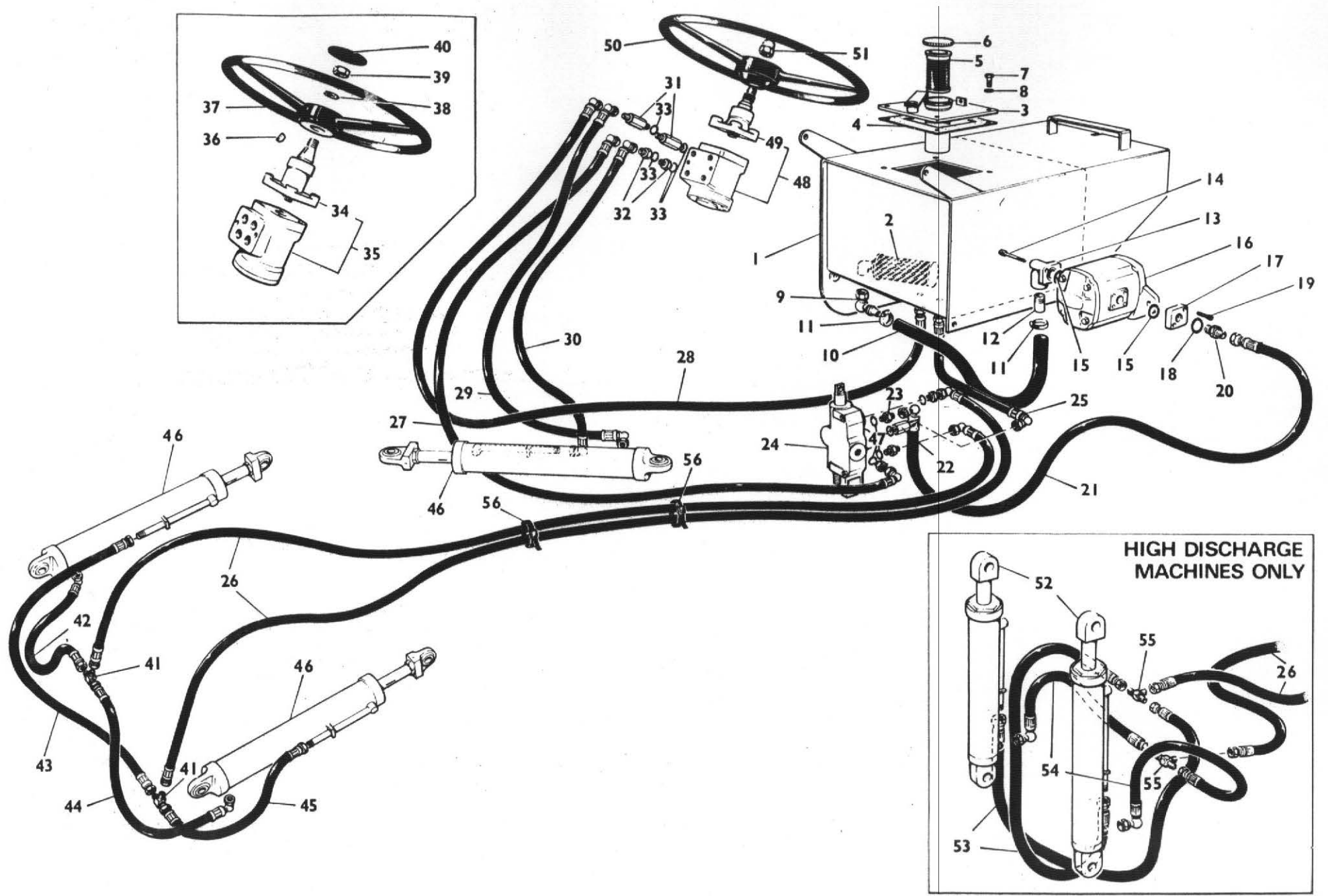
| Item No. | Part No. | Description   | Qty |
|----------|----------|---|-----|
| 1        | 303      | Handbrake Lever . . . . .                             | 1   |
| 2        |          | Mushroom Head Bolt 3/8" BSF x 1" Long & Nut . . . . . | 2   |
| 3        | L309     | Block . . . . .                                       | 1   |
| 4        |          | Bolt 3/8" BSF x 1 1/2" Long & Nut . . . . .           | 4   |
| 5        |          | Nut 3/8" BSF . . . . .                                | 1   |
| 6        | 4-35-111 | Handbrake Cable . . . . .                             | 1   |
| 7        |          | Bolt 5/16" BSF x 1 3/4" Long & Nut . . . . .          | 2   |
| 8        |          | Shakeproof Washer 5/16" DIA . . . . .                 | 3   |
| 9        |          | Bolt 5/16" BSF x 1" Long & Nut . . . . .              | 1   |
| 10       | 4-35-349 | Disc Brake Adjusting Plate . . . . .                  | 1   |
| 11       | 4-35-350 | Transmission Brake Mounting Bracket . . . . .         | 1   |
| 12       | 4-35-256 | Bell Crank . . . . .                                  | 1   |
| 13       |          | Flat Washer 1/2" Dia . . . . .                        | 1   |
| 14       | 4-35-253 | Double Clevis . . . . .                               | 1   |
| 15       | C-174X   | Clevis Pin . . . . .                                  | 1   |
| 16       | C-174Y   | Clevis Pin . . . . .                                  | 1   |
| 17       | 4-35-264 | Clevis Pin . . . . .                                  | 1   |
| 18       | 4-35-276 | Control Valve Lever . . . . .                         | 1   |
| 19       | 2ST88    | Knob . . . . .  | 1   |
| 20       | 4-35-277 | Connecting Link . . . . .                             | 2   |
| 21       |          | Bolt 3/8" BSF x 1 3/4" Long & 2 Nuts . . . . .        | 1   |
| 22       | C-174XL  | Pin . . . . .   | 1   |
| 23       | 2ST89    | Pin . . . . .   | 1   |
| 24       | 4-35-82  | Engine Stop Control Cable Assy. . . . .               | 1   |
| 25       | 4-35-196 | Solderless Nipple . . . . .                           | 1   |
| 26       |          | Flat Washer 3/8" Dia . . . . .                        | 3   |
| 27       |          | Shakeproof Washer 3/8" Dia . . . . .                  | 3   |
| 28       | BSE 102  | Valve Control Bracket (Petter) . . . . .              | 1   |
|          | BSE 122  | Valve control bracket (Lister) . . . . .              | 1   |





PEDALS AND CONTROLS

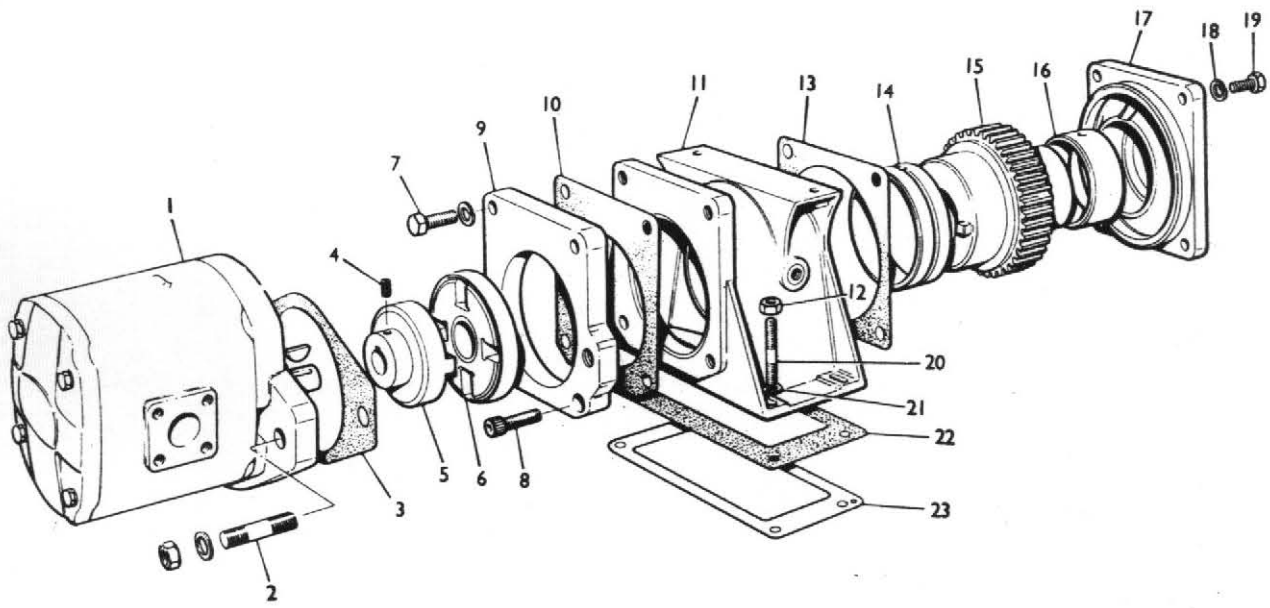
| Item No. | Part No. | Description  | Qty. |
|----------|----------|--|------|
| 1        | 4-35-322 | Accelerator Pedal & Shaft . . . . .                        | 1    |
| 2        | 4-35-151 | Accelerator Mounting Bracket . . . . .                     | 1    |
| 3        | ASE 125  | Accelerator Mounting Bracket . . . . .                     | 1    |
| 4        |          | Bolt 1/4" BSF x 1" Long & Nut . . . . .                    | 4    |
| 5        | F 522    | Accelerator Lever . . . . .                                | 1    |
| 6        | C160B    | Accelerator Rod Ball Eng . . . . .                         | 2    |
| 7        |          | Nut 1/4" BSF . . . . .                                     | 4    |
| 8        | BSE 107  | Accelerator Rod 1/4" BSF x 21 1/4" long (Petter) . . . . . | 1    |
|          | BSE 123  | Accelerator Rod 1/4" BSF x 30 1/4" long (Lister) . . . . . | 1    |
| 9        | C163     | Spring Attachment Bracket . . . . .                        | 1    |
| 10       |          | Bolt 1/4" BSF x 5/8" Long & Nut . . . . .                  | 1    |
| 11       | C173D    | Spring . . . . .   | 1    |
| 12       | 4-35-125 | Brake Pedal . . . . .                                      | 1    |
| 13       | WB 1010  | Bush . . . . .   | 4    |
| 14       |          | Bolt 5/8" BSF x 3 1/2" Long & Nut . . . . .                | 1    |
| 15       |          | Shakeproof Washer 5/8" . . . . .                           | 2    |
| 16       | C174C    | Clevis . . . . .   | 6    |
| 17       |          | Nut 1/4" UNF . . . . .                                     | 10   |
| 18       | 2ST 107  | Footbrake Rod 1/4" UNF x 27" Long . . . . .                | 1    |
| 19       | CT-160-1 | Spring Attachment Bracket . . . . .                        | 1    |
| 20       | C173B    | Spring . . . . .   | 4    |
| 21       | ASE 118  | Bell Crank Lever . . . . .                                 | 1    |
| 22       | WB0808   | Bush . . . . .   | 2    |
| 23       | T/ST     | Grease Nipple . . . . .                                    | 2    |
| 24       | C174Y    | Clevis Pin . . . . .                                       | 7    |
| 25       | 4-35-367 | Clutch Pedal . . . . .                                     | 1    |
| 26       |          | Bolt 5/8" BSF x 8 1/2" Long . . . . .                      | 1    |
| 27       | T90      | Grease Nipple . . . . .                                    | 1    |
| 28       |          | Clutch Stop Bolt 3/8" BSF x 1 1/2" Long & 2 Nuts . . . . . | 1    |
| 29       | C174A    | Clevis . . . . .   | 2    |
| 30       |          | Nut 3/8" BSF . . . . .                                     | 2    |
| 31       | T21C     | Clutch Rod 3/8" BSF x 9" Long . . . . .                    | 1    |
| 32       | C174X    | Clevis Pin . . . . .                                       | 2    |
| 33       | C272     | Compensator Arm . . . . .                                  | 2    |
| 34       | C271     | Link Assembly . . . . .                                    | 2    |
| 35       | C189A    | Link . . . . .   | 2    |
| 36       |          | Washer 1/2" Dia . . . . .                                  | 4    |
| 37       | T20B     | Brake Rod 1/4" UNF x 12" Long . . . . .                    | 2    |
| 38       | C218-2   | Brake Rod 1/4" UNF x 28" Long . . . . .                    | 2    |
| 39       |          | Shakeproof Washer 1/4" . . . . .                           | 7    |
| 40       | C129A    | Tension Pin . . . . .                                      | 1    |
| 41       |          | Bolt 1/2" BSF x 4 1/2" Long & Nut . . . . .                | 1    |
| 42       |          | Shakeproof Washer 1/2" . . . . .                           | 1    |
| 43       | 5ST 100  | Grease nipple . . . . .                                    | 2    |
| 44       | BSE 131  | Clutch Return spring bracket . . . . .                     | 1    |



**HIGH DISCHARGE  
MACHINES ONLY**

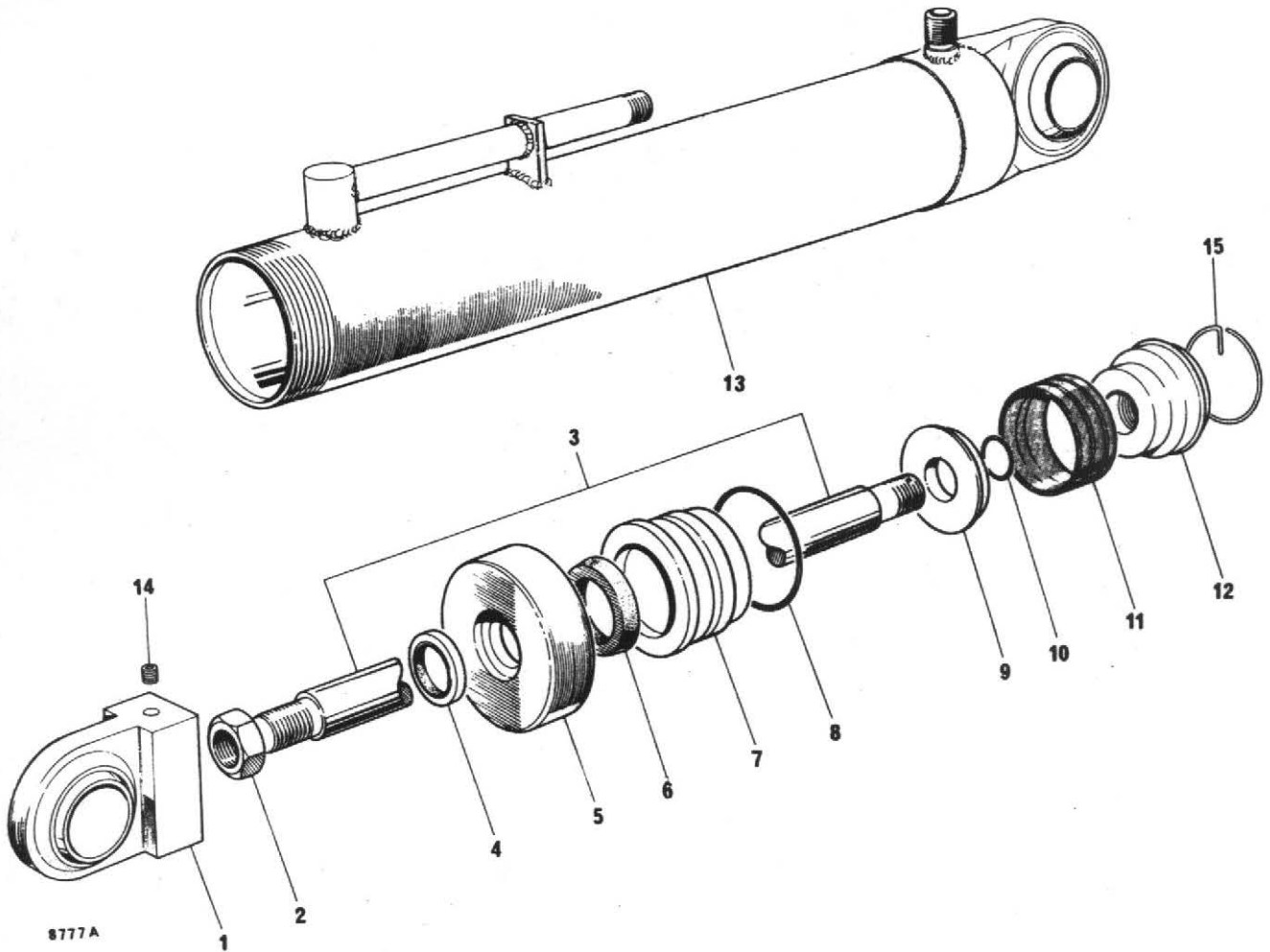
## HYDRAULIC PIPES & FITTINGS

| Item No. | Part No.     | Description   | Qty.              |
|----------|--------------|---|-------------------|
| 1        | BSE 108      | Hydraulic Tank (See Page 18, 19)  | 1                 |
| 2        | UC 1457      | Suction Filter  | 1                 |
| 3        | 4-35-187     | Cover Plate Assembly  | 1                 |
| 4        | T 18 B       | Gasket  | 1                 |
| 5        | P 1145       | Strainer  | 1                 |
| 6        | P 2578-2     | Cap   | 1                 |
| 7        |              | Bolt 5/16" UNF x 3/4" Long & Nut  | 4                 |
| 8        |              | Shakeproof Washer 5/16"   | 4                 |
| 9        | BSE 109      | 90° Hose Fitting 3/4" BSP   | 1                 |
| 10       | 4-35-312     | Hose 3/4" cotton braid x 36" long (Petter)                                    | 1                 |
|          | BSE 126      | Hose 3/4" cotton braid x 34" long (Lister)                                    | 1                 |
| 11       | T 63 M       | Hose Clip   | 2                 |
| 12       | T 48         | Pump Inlet Adaptor  | 1                 |
| 13       | IPE 4        | Pump Elbow  | 1-Petter 2-Lister |
| 14       |              | Cap Screw 5/16" UNF x 2 1/4" Long   | 2-Petter 4-Lister |
| 15       | DH 69 A5     | 'O' Ring  | 2                 |
| 16       | IP3072-CPSFB | Pump (Petter) see page 48   | 1                 |
|          | IP3044-ATDFB | Pump (Lister)   | 1                 |
| 17       | 4-35-261     | Adaptor (Petter only)   | 1                 |
| 18       | T141         | Seal 3/8" BSP (Petter)  | 1                 |
|          | T14H         | Seal 1/2" BSP (Lister)  | 1                 |
| 19       |              | Cap Screw 5/16" UNF x 1" Long (Petter Only)                                   | 2                 |
| 20       | T14J         | Adaptor 3/8" BSP x 3/8" BSP (Petter)  | 1                 |
|          | T63K         | Adaptor 1/2" BSP x 3/8" BSP (Lister)  | 1                 |
| 21       | 4-60-133     | Hose 3/8" x 48" ST-90 (Petter)  | 1                 |
|          | 4-35-108H    | Hose 3/8" x 33 1/2" ST-90 (Lister)  | 1                 |
| 22       | 4-60-158     | Adaptor 3/8" BSP x 7/8" JIC (Long)  | 1                 |
| 23       | 4-60-159     | Adaptor 3/8" BSP x 7/8" JIC (Std)   | 4                 |
| 24       | 300-024-GAA  | Control Valve (See Pages 50, 51)  | 1                 |
| 25       | 2ST 72 C     | Hose 3/8" x 13 1/4" ST-90   | 1                 |
| 26       | 4SH 54       | Hose 3/8" x 99" ST-90   | 2                 |
| 27       | 4-35-293     | Hose 3/8" x 60" 90-90 (Petter)  | 1                 |
|          | 4-35-246     | Hose 3/8" x 67" ST-90 (Lister)  | 1                 |
| 28       | 4-60-137     | Hose 3/8" x 61" ST-90   | 1                 |
| 29       | 4-35-245     | Hose 3/8" x 43" 90-90   | 1                 |
| 30       | 4-35-244     | Hose 3/8" x 36" 90-90   | 1                 |
| 31       | 4-60-115     | Adaptor 3/8" BSP x 3/4 UNF (Long)   | 2                 |
| 32       | 4-35-40K     | Adaptor 3/8" BSP x 3/4 UNF  | 2                 |
| 33       | 2ST 72J      | 'O' Ring 3/4"   | 4                 |
| 34       | SCA 315      | Steering Valve Column (Taper/Key type)  | 1                 |
| 35       | UE 160       | Steering Valve Complete (Taper/Key type)                                      | 1                 |
| 36       |              | Woodruff Key No.11  | 1                 |
| 37       | 153          | Steering Wheel (Taper/Key type)   | 1                 |
| 38       |              | Washer 3/4"   | 1                 |
| 39       | 4-60-247     | Steering Wheel Nut 3/4" UNF   | 1                 |
| 40       | 153 A        | Steering Wheel Cap  | 1                 |
| 41       | 2ST 72M      | Tee Piece   | 2                 |
| 42       | 4-35-365     | Hose 3/8" x 20" ST-90   | 1                 |
| 43       | 3SHD 65      | Hose 3/8" x 31 1/2" ST-ST   | 1                 |
| 44       | 2ST 72 D     | Hose 3/8" x 34 1/4 ST-90  | 1                 |
| 45       | 4-35-40E     | Hose 3/8" x 25" ST-ST   | 1                 |
| 46       | TD 3894      | Hydraulic Ram (See Page 49)   | 3                 |
| 47       | S 9698       | 'O' Ring 7/8"   | 5                 |
| 48       | OSP 160 SMMT | Steering Valve Complete (taper/spline type)                                   | 1                 |
| 49       | D-15-2099    | Steering Valve column (taper/spline type)                                     | 1                 |
| 50       | 347K         | Steering wheel (taper/spline type)  | 1                 |
| 51       | C304         | Steering wheel domed nut 5/8" UNF   | 1                 |
| 52       | BE3          | Hydraulic Ram (See Page 52)   | 2                 |
| 53       | 4-35-108J    | Hose 3/8" x 36" ST-ST   | 2                 |
| 54       | 4-35-365     | Hose 3/8" x 20" ST-90   | 2                 |
| 55       | 2ST72M       | Tee piece   | 2                 |
| 56       |              | Hose clip (45-61 mm)  | 2                 |
|          | 2ST 72N      | Elbow 3/8" BSP (Control Valve to Steering Supply and Tank Return) Lister only | 2                 |



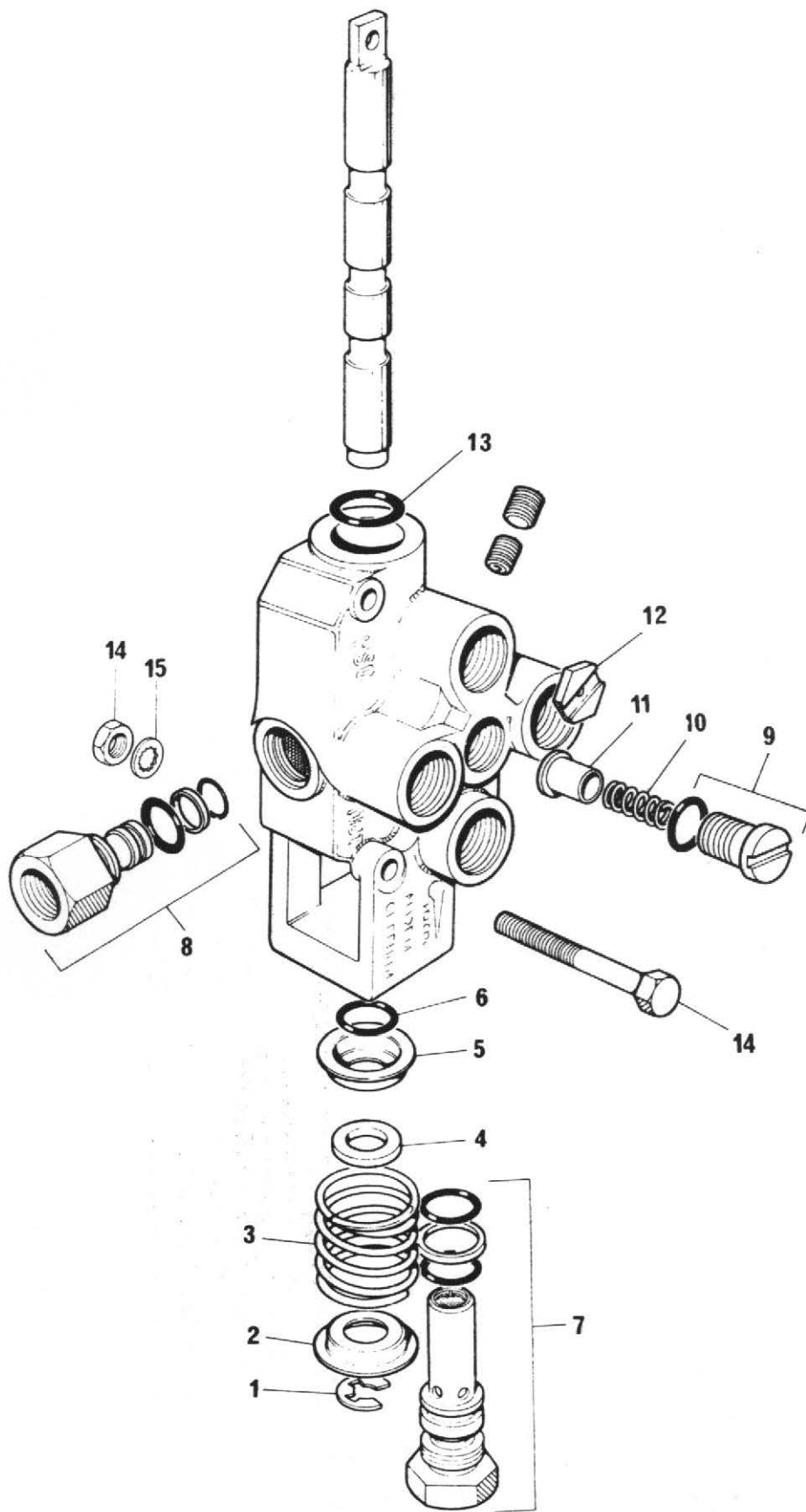
**HYDRAULIC PUMP & DRIVE (PETTER ONLY)**

| Item No. | Part No.    | Description                                  | Qty. |
|----------|-------------|--|------|
| 1        | IP3072CPSFB | Pump complete . . . . .                      | 1    |
| 2        |             | Stud, washer & nut . . . . .                 | 2    |
| 3        | 334932      | Joint . . . . .                              | 1    |
| 4        | 724202      | Socket Screw 1/4" BSF x 5/16" Long . . . . . | 1    |
| 5        | 334931      | Coupling (Pump Half) . . . . .               | 1    |
| 6        | 266185      | Coupling Assy . . . . .                      | 1    |
| 7        | 725049      | Bolt 3/8" BSF x 1" Long . . . . .            | 2    |
| 8        | 724056      | Cap Screw 3/8" BSF x 3/4" Long . . . . .     | 2    |
| 9        | 292709      | Spigot Plate . . . . .                       | 1    |
| 10       | 266159      | Joint . . . . .                              | 1    |
| 11       | 2-197597    | Pump Housing . . . . .                       | 1    |
| 12       | 726003      | Nut 3/8" BSF . . . . .                       | 4    |
| 13       | 264702      | Joint . . . . .                              | 1    |
| 14       | 2-264704    | Bearing . . . . .                            | 1    |
| 15       | 334968      | Gearwheel . . . . .                          | 1    |
| 16       | 2-202485    | Bearing . . . . .                            | 1    |
| 17       | 264701      | Cover - Pump Housing . . . . .               | 1    |
| 18       | 786029      | Spring Washer - 5/16" . . . . .              | 4    |
| 19       | 722024      | Bolt 5/16" BSF x 5/8" Long . . . . .         | 4    |
| 20       | 760061      | Stud 3/8" BSF x 1 3/8" Long . . . . .        | 4    |
| 21       | 786030      | Spring Washer - 3/8" . . . . .               | 4    |
| 22       | 264700      | Joint . . . . .                              | 1    |
| 23       | 264706      | Shim . . . . .                               | A.R. |



### HYDRAULIC RAM

| Item No. | Part No. | Description  | Qty. |
|----------|----------|--|------|
|          | TD3894   | Ram Complete (3 Per Machine — 1 on high discharge 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    |

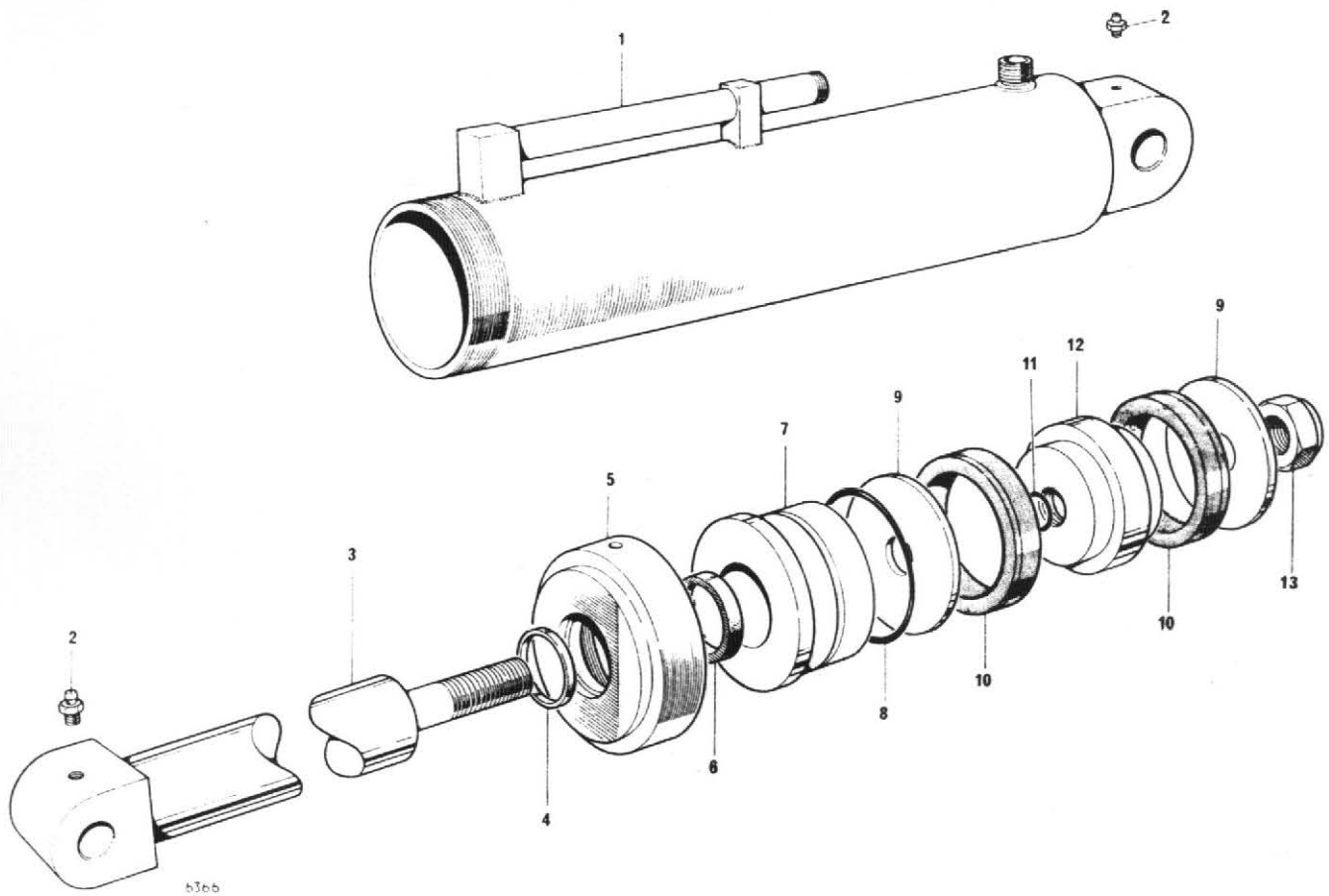


7791A

### HYDRAULIC CONTROL VALVE

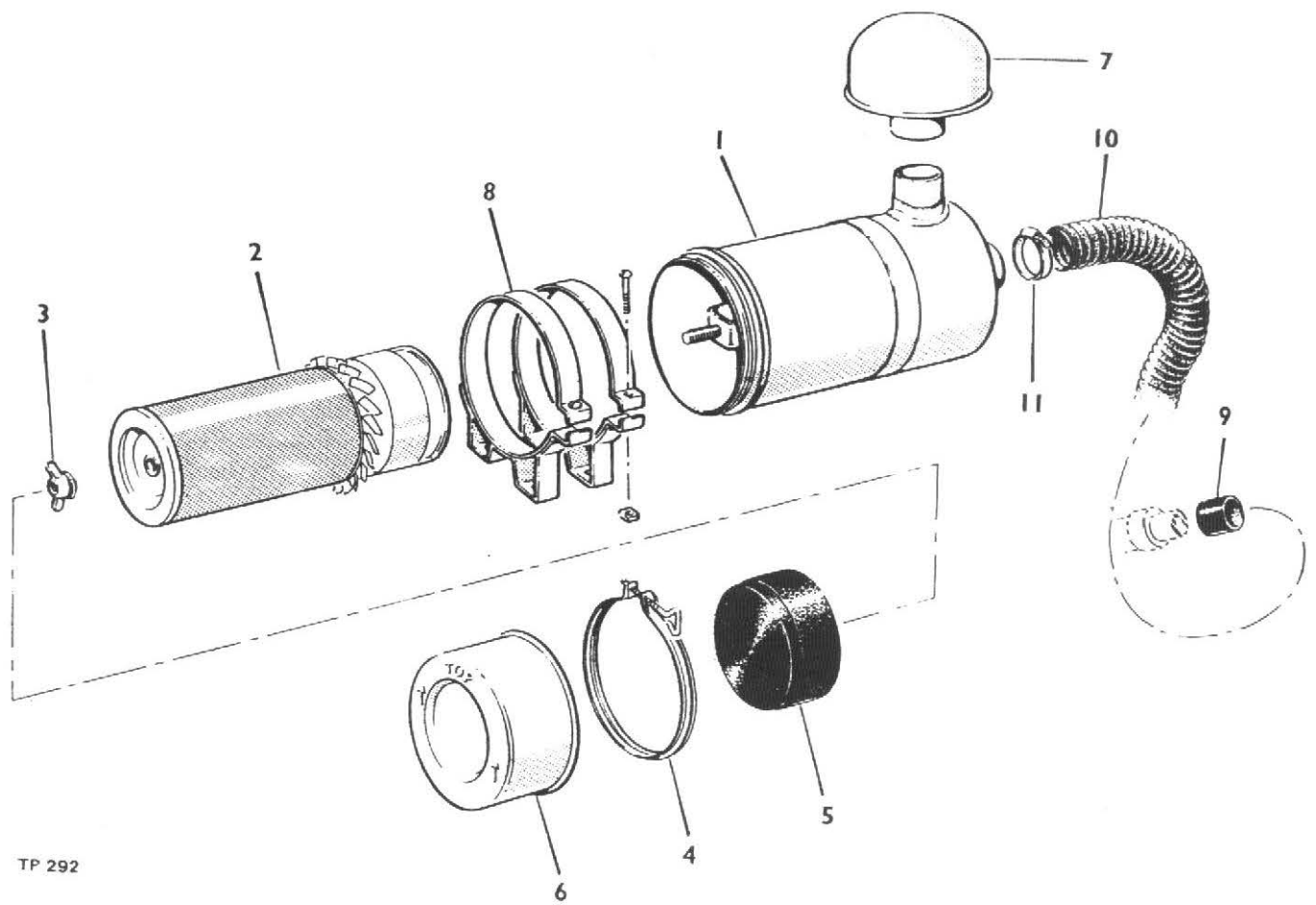
| Item No. | Part No.    | Description                                | Qty. |
|----------|-------------|--|------|
|          | 300-024-GAA | Control Valve Assembly (1 Per M/c) .....   | -    |
| 1        | 16124-50    | Clip Ring (1/2" Shaft) .....               | 1    |
| 2        | 15546-6     | Shallow Washer .....                       | 1    |
| 3        | 30501-39    | Spool Spring .....                         | 1    |
| 4        | 16048-31    | Washer Spacer .....                        | 1    |
| 5        | 30501-10    | Deep Washer .....                          | 1    |
| 6        | 16003-12    | 'O' Ring 3/32" x 5/8" I/D .....            | 1    |
| 7        | 300-055-J9A | Relief Valve Assembly .....                | 1    |
| 8        | 30501-15    | Pressure Beyond Plug Assembly .....        | 1    |
| 9        | 30501-17    | Lift Check Plug Assembly .....             | 1    |
| 10       | 30501-13    | Lift Check Spring .....                    | 1    |
| 11       | 30501-12    | Lift Check Plunger .....                   | 1    |
| 12       | 16097-451   | Orifice Plate .....                        | 1    |
| 13       | 16004-63    | 'O' Ring .....                             | 1    |
| 14       |             | Bolt 5/16" UNF x 2 1/2" long and Nut ..... | 2    |
| 15       |             | Shakeproof Washer .....                    | 2    |





### HIGH DISCHARGE HYDRAULIC RAM

| Item No. | Part No. | Description  | Qty. |
|----------|----------|--|------|
|          | BE-3     | Ram Assembly Complete<br>(Two per high discharge m/c's only) |      |
| 1        | BE3-21   | Ram Body . . . . .   | 1    |
| 2        | BE3-20   | Grease Nipple . . . . .                                      | 2    |
| 3        | BE3-22   | Piston Rod Assembly . . . . .                                | 1    |
| 4        | BE3-15   | Wiper . . . . .  | 1    |
| 5        | BE3-6    | Tube Cap . . . . .   | 1    |
| 6        | BE3-16   | Sleeve Seal . . . . .  | 1    |
| 7        | BE3-7    | Sleeve . . . . .   | 1    |
| 8        | BE3-13   | Sleeve 'O' Ring . . . . .                                    | 1    |
| 9        | BE3-10   | Backing Washer . . . . .                                     | 2    |
| 10       | BE3-14   | Piston Seal . . . . .  | 2    |
| 11       | BE3-12   | Piston 'O' Ring . . . . .                                    | 1    |
| 12       | BE3-9    | Piston Head . . . . .  | 1    |
| 13       | BE3-11   | Lock Nut . . . . .   | 1    |



TP 292

### AIR CLEANER

| Item No. | Part No.   | Description                                  | Qty. |
|----------|------------|--|------|
| 1        | 10532A02   | Air Cleaner Assembly                         | 1    |
| 2        | 10532A0101 | Element                                      | 1    |
| 3        | V600487    | Nut & Gasket Kit                             | 1    |
| 4        | 220229002  | Clamp Body                                   | 1    |
| 5        | 220229003  | Skirt, baffle                                | 1    |
| 6        | 220229004  | Cup  | 1    |
| 7        | 10534A02   | Stack Cap                                    | 1    |
| 8        | 10533A02   | Bracket                                      | 2    |
| 9        | 10320A06   | Sleeve Adapter                               | 1    |
| 10       |            | Hose Flexible 2" Bore x 20" Long<br>(Petter) | 1    |
|          |            | Hose Flexible 2" Bore x 27" Long<br>(Lister) | 1    |
| 11       | 97S12      | Hose Clip                                    | 2    |

## DECIMAL, FRACTIONAL AND METRIC EQUIVALENTS

| Inches    |          | Milli-<br>metres | Inches    |          | Milli-<br>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 | 1676.40 | 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 | 2260.60 |
| 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 mm.

5/8" = 15.875 mm.

84 5/8" = 2149.475 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**