

COMPACT
TURF CONDITIONER
TC/11

Edition No: 7106-1-95

CE

EC DECLARATION OF CONFORMITY
conforming to EEC Directive 98/37/EC

We,

of TWOSE OF TIVERTON LIMITED, 6 Chinon Court, Lower Moor Way, Tiverton Business Park, Tiverton, Devon, EX16 6SS.

declare that under our sole responsibility that the product (type)

This machine is one of a group suitable for mowing/topping pasture/vegetation

Serial No. & Date:

Manufactured by the above Company/*

.....

(*insert business name and full address if not stated above)

complies with the required provisions of the Directive 98/37/EC and conforms with European Norm. BS EN 292

Part 1: 1991 Safety of Machinery - Terminology, Methodology

Part 2: 1991 Safety of Machinery - Technical Specifications

and other national standards associated with its design and construction as listed in the Technical File.

Signed *Adrian Longstaff*

on behalf of TWOSE OF TIVERTON LIMITED Responsible Person

Status DIRECTOR OF ENGINEERING

Date 13 February 2001

**THIS MANUAL IS TO BE HANDED TO THE CUSTOMER BEFORE
THE MACHINE IS TO BE USED FOR THE FIRST TIME**



**TWOSE OF TIVERTON LIMITED
6 CHINON COURT
LOWER MOOR WAY
TIVERTON BUSINESS PARK
TIVERTON
DEVON
EX16 6SS**

**TEL: (01884) 253691
FAX: (01884) 255189**

All dimensions and capacities mentioned in this book are approximate. In pursuance of the Companies policy of constant development, the right is reserved to depart, without notice, from any detail illustrated or specified in this book, without incurring the obligation to provide such modifications on machines previously delivered.

No responsibility will be accepted by Twose of Tiverton Limited for any injury, damage or loss arising from the improper use or lack of maintenance of any machinery supplied by them or from any failure of the user to comply with all instructions published by Tractor or Loader manufacturers, particularly with regard to maximum load capacities, tyre pressures and stability, or with instructions and regulations pertaining to Tractor Cabs.

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GENERAL SPECIFICATION AND CAPACITIES

Three point linkage mounted suitable for Compact Tractors.

Fitted with three tines spaced at 230mm centres.

Maximum depth of operation is 200mm (Depending on ground conditions).

Hydraulically driven free vibrator - maximum speed 1500 rpm at 20 Litres/Minute.

P.T.O mounted pump to drive vibrator.

Vibrating beam mounted on compound rubber blocks.

Oil tank capacity - 11 Litres - 2.5 Gallons - Excelube Ultra 46
(or equivalent)

Hydraulic Working Pressure - 2200 p.s.i - 155 Bar.

P.T.O Gearbox - 0.15 litres (1/4 pts) - Excelgear EP 90 Oil.
(or equivalent)

Three point linkage mounting suitable for Compact Tractors.

Total Weight of Machine 140 Kg (308 lb)

Minimum Tractor requirement 12 kW (16 HP)

Airbourne Noise emmissions

The equivalent A - weighted sound pressure level at the workstation (tractor seat) does not exceed 70 dB(A). This value was achieved at work using a Dawe 1405C Sound Meter (BS 3489) on a 24 HP Iseki tractor complete with cab.

NOTE:- Dimensions are approximate and are for guidance only.

GENERAL INFORMATION

NOTE:- The provision of this information is a requirement of the Health & Safety at Work Act 1974.

NOTE:- This handbook has been designed to help the operator and service/mechanic to use and understand the machine fully, safely and efficiently, bearing in mind the Health & Safety requirements and the new CE requirements which come into force from January 1st 1995.

NOTE:- The handbook/manual will be supplied in a waterproof plastic outer cover to prevent damage from rain, condensation etc. The cover of the handbook will include its own part number, which includes information as to machine type and issue date of manual in question.

DANGER

NOTE:- It is very important that the handbook/manual has been read thoroughly - throughout, and is completely understood before attempting to attach or use machine in any way.

CAUTION: When ordering spares, please state clearly:-

- (a) Machine type and model No.
- (b) Part No. of component.
- (c) Description of component.
- (d) Quantity required.
- (e) Full address to which spares are to be sent.
- (f) Method of delivery required.

CAUTION:- Always insist on genuine and correct spare parts.

NOTE:- Further copies of this handbook/manual can be obtained from:-

TWOSE OF TIVERTON LIMITED
6 CHINON COURT
LOWER MOOR WAY
TIVERTON BUSINESS PARK
TIVERTON
DEVON
EX16 6SS

TEL: 01884 253691
FAX: 01884 255189

SAFETY NOTES AND WARNINGS

Throughout the handbook the following sub headings are used to draw attention to various points of importance.



DANGER
WARNING

This is to draw attention to very important instructions which MUST be followed precisely to avoid injury or death.

CAUTION

This is used to draw attention to instructions which MUST be followed to avoid damage to operator, machine, process or the environment.

NOTE:-

This is used to highlight points used for supplementary information.

ABOUT THIS MACHINE

This is a Compact Turf Conditioner, suitable for mounting on all modern compact tractors from 12 kW upwards.

It is intended to be attached to the tractor by means of the "three-point-linkage" couple-up system. The machine has Coulter discs, a vibrating unit, three blades and pressure roller which, together condition the land.

The purpose for its production and its sole intention is to condition such areas as golf greens and lawns etc.

AT NO TIME must this machine be used for anything other than, or to do any job - other than that for which it has been designed (see note above).

HEALTH AND SAFETY



DANGER
WARNING

Never attempt to assemble, couple up, or operate machinery until you understand fully the functions, controls and safety precautions required, as shown in the operators manual.



DANGER
WARNING

Always follow tractor safety operations and instructions VERY carefully.

NEVER TAKE RISKS



DANGER
WARNING

NEVER LEAVE TRACTOR SEAT WHILST ENGINE - OR MACHINE IS RUNNING

CAUTION.

Be aware of warning stickers and instruction stickers on machine as care must be taken and instructions obeyed.

CAUTION

Contact your dealer should you need advice, assistance, or if you do not understand the manual or machine. "NEVER ASSUME" - if not sure - ASK.

CAUTION

Machine MUST NOT be altered or modified in any way - without permission - No liability will be accepted in respect of a machine that has been modified without manufacturers permission.



DANGER
WARNING

Never drive machinery at speeds that could cause danger to other persons or properties, or in a manner that may cause accidents.



DANGER
WARNING

Never attempt to Service/adjust or work on any machinery in an unsupported state.

For Example:- Any three point linkage mounted machinery
Front Loaders
Digger Booms
Hedgetrimmer booms etc. etc.

Always ensure that machinery is safely supported and propped in position.



DANGER
WARNING

Always ensure that the wheels of any wheeled implement/machinery are 'chocked' firmly and implement will not move, before attempting

CAUTION

Always "SWITCH-OFF" tractor engine before attempting to carry out adjustment or service repairs and inspections, on machinery.



DANGER
WARNING

Always be aware of your surroundings - and operate machinery accordingly. Beware of confined-tight areas, low height restrictions, buildings and overhangs etc. Also drive and operate bearing in mind weather conditions such as sun, rain, ice, snow, wind etc. [Make allowances in all situations].

CAUTION

Never carry "passengers" on machinery or on tractor. Ensure bystanders/onlookers are kept well away from operational area of apparatus.

CAUTION

'PARKING UP' MACHINE

When machine is being removed from tractor linkage and being 'parked up' it is essential that a good firm base and level site be found.

Always chock and prop machine to ensure a good firm position to leave parked. Ensure that stand legs of machine are correctly locked into position.

CAUTION

Never allow children to play on, or around, parked machinery.

CAUTION

Never wear loose fitting or ragged clothing which could get caught in machinery or controls.

CAUTION

Always dispose of discarded or worn out parts thoughtfully - by disposing of them in an approved and specified legal scrap site, bin or skip.

CAUTION

Worn out and spent waste oil, grease and other obnoxious substances must always be disposed of in suitable and legally approved dumping containers suitable for the waste in question.

NOTES

AMENDMENT

DATE

DETAILS

GENERAL INSTRUCTIONS

DANGER
WARNING

1. Before attaching any machine to a tractor or loader make sure that implement is still standing firmly on good solid - level site as it will be, providing unit was previously parked correctly.
-Check that any wheels are 'chocked' correctly and that supports/props are in position where necessary to prevent booms etc. dropping.
2. Before and during the manoeuvring of the tractor or vehicle in order to attach machinery/implements, - make sure that No other persons are in the vicinity.
Keep other persons well clear and make known your intentions, all the while keeping a sharp lookout whilst reversing and aligning machines for coupling up.
3. Always secure tractor into selected position by ensuring that brakes are applied correctly in order to prevent vehicle moving off on its own to cause injury and damage.
4. Make sure that the lift arms and top link ball ends of the tractor are properly fitted to the machine/implement by using correct adaptor sleeves where necessary, and that retaining pins of the correct type are used on all three point linkage points. Secure pins with relevant pin and ring assembly.
5. If the machine is of the drawbar type - check that the hitch on the tractor is in good condition and that the hitch pin used is of the correct size and type, and is properly secured when fitted.
6. Should it become necessary to make any adjustments or service on machine while raised on the tractor linkage, or raised on a front end loader - trestles or suitable supports MUST be positioned to support machine to prevent accidental dropping of lift arms, loader arms or mechanical failure.
[MACHINE MUST ALWAYS BE PROPPED AND CHOCKED]
7. Never attempt to work on, adjust or service repair machinery of any kind whilst it is still running or working. Always stop the machine and STOP THE TRACTOR ENGINE - before any service/repairs begin.
(SWITCH OFF TRACTOR ENGINE BEFORE LEAVING TRACTOR SEAT)

8. In transit always use transport stays or locking devices where provided.
If, as in the case of some longer machines, the unit is transported lengthways - make sure that the front of the tractor is suitably ballasted to maintain stability.
A method of achieving this would be to add suitable weights to a correctly specified and fitted front weight frame.
9. Always use machines in a sensible and reasonable manner and do not attempt to use them in work for which they are not intended. Avoid overloading and abusing them as this can cause damage to machine and tractor and can be very dangerous.
10. When unhitching/detaching a machine from a tractor three point linkage or from a front end loader ensure that any stands or legs are securely positioned and that the machine is parked where it will not be a safety hazard or cause annoyance to others.
Make sure that chose 'parking site' is a firm and level site.
11. Carry out regular periodic maintenance. - Always with safety in mind.
12. Ensure regular maintenance procedures are maintained for the lifetime of the machine.
13. HEALTH AND SAFETY RULES AND REGULATIONS MUST BE ADHERED TO IN ALL AGRICULTURAL RESPECTS.

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TWOSE TURF CONDITIONER FOR COMPACT TRACTORS

FITTING AND OPERATING INSTRUCTIONS

INTRODUCTION

As the owner of a Twose Turf Conditioner you will find many uses for the machine throughout the year.

The principal purpose of the machine is to break up the layer of compaction, which can exist at different depths below the turf, with the least possible disturbance to the playing surface. This is a well proven method of modern turf aeration and has been used in the U.S.A and Europe for several years.

The shattering of the soil below the surface to form a tilth aids root development, assists drainage, allows deeper penetration of moisture, oxygen, fertilisers etc. helps de-composition of thatch, and generally improves the condition of the turf.

The machine is also useful for improving the drainage of wet areas, such as in the goal mouths and centres of football pitches during the playing season, and can help to keep the soil structures open by assisting the working in of sand and top dressing.

When overseeding, a run through with the machine will open tiny cracks in the soil to assist young roots to become quickly established.

The machine is of a simple and strong construction, requires little maintenance, and is designed specifically for use with compact tractors fitted with three point linkage, P.T.O and 4 wheel drive.

It is necessary that the tractor should also have weighted axles.

FITTING THE MACHINE TO THE TRACTOR

The Conditioner will be delivered in an assembled condition and filled with oil, but the following instructions have been compiled to cover the possibility that it may have been dismantled.

With the Conditioner standing on firm and level ground, the tractor should be reversed to the machine and the tractor's lower lift arms aligned with the lower lift pins. It should be noted that a range of alternative attachment positions is provided for the Lower Lift Pins, which should be positioned so that the lift arms of the tractor are angled upwards from the tractor when the Conditioner is attached.

A Stabiliser Bar should be fitted, or the check chains adjusted to prevent any side-sway of the machine.

A suitable, Adjustable Top Link should be fitted, usually in the corresponding hole to that in which the lower links were fitted.

With the P.T.O Shaft Drive disengaged, the tractor engine switched off, and the ignition key removed, fit the P.T.O Pump Gearbox Assembly to the P.T.O Shaft of the tractor, by sliding back the outside sleeve of the retainer and sliding the unit onto the P.T.O Shaft, ensuring that the retaining balls engage in the groove on the P.T.O Shaft.

The torque limiting Chain provided must then be fitted between the Pump and the Tractor. It will be appreciated that the chain is intended to prevent the pump rotating on the P.T.O Shaft, and the chain must be fitted and adjusted so that this is done. The usual method is to secure the Chain around the Top Link using the 'D' Shackle provided so that the Pump Gearbox is retained in the horizontal position.

The pump should be positioned so that the Hydraulic Pipes will not be kinked or twisted, and the best position will normally be with the pump horizontal, with the pressure supply pipe at the top. Refer to Hydraulic Connections.

Continue as in Putting the Machine to work.

OPERATING NOTES

1. Two types of Blade are available. One fitted with a Bullet which is supplied as standard. The other, which can be supplied as an extra, is a plain slitting Blade. This Blade is most useful for use in dry weather, when the ground is hard and baked, and will allow moisture to penetrate to the grass roots more easily.
2. It is not recommended to cross previous work with the machine until the original slits have healed, unless the area can be taken out of use for several weeks. This is because the edges of the crossed slits could be turned up and hitched out if play is allowed on the surface.
3. Do not use the machine when there is a heavy frost, as the wheels of the tractor can damage the turf, and frost will penetrate into the slits causing lift which will disturb the surface level.

See General Maintenance Notes.

PUTTING THE MACHINE INTO WORK

Start the tractor and engage the P.T.O drive, slowly release the P.T.O clutch pedal to drive the hydraulic pump unit. P.T.O speed should be in the range 400-600 rpm. and the tractor should be driven in 4 wheel drive low gear range.

Lower the Conditioner into work slowly, and whilst driving forward.

IMPORTANT NOTES

1. It is important that the vibrator mechanism should not be run for long periods when the Conditioner is not in work.
2. When deciding upon the depth of work it should be remembered that it is NOT ESSENTIAL FOR THE BLADES TO BE SET AT THEIR FULL DEPTH for the Conditioner to do it's work successfully. Very often the heaviest compaction is only a few inches below the surface of the turf and it is at this level that the bullets will do most good.
3. When possible, use a compaction test probe to locate the areas and depth of compaction and adjust the Conditioner accordingly.

Setting the Conditioner to work deep can have the following effects:-

More Power is required to operate.
A slower forward speed will be necessary.
More likelihood of surface damage due to wheel spin.
Less shattering at the compaction layer and the possibility of damage by lifting stones to the surface from the base hardcore.

4. When the operating depth has been determined, it will be necessary to adjust the cutting depth of the coulter discs. This should be to approximately 1 1/2" (38mm) below the surface of the ground when in work.

PUTTING THE MACHINE TO WORK CONTINUED

NOTE:

If when in work, wheel spin or excessive tearing of the turf surface by the rear wheels occurs, adjust the depth of the blades slightly until the machine moves forward easily.

In hard ground conditions or when requiring to work at maximum depths, it may be necessary to add weight to the machine. A bar is fitted across the machine behind the top linkage point which will carry tractor weights which are of a similar design to those available from TWOSE.

The purpose of the rollers is to firm the edges of the slits made by the blades, so as to leave as even a surface as possible and, together with the disc coulters, govern depth of operation.

Continue as in Operating Notes.

HYDRAULIC CONNECTIONS

NOTE:

The following instructions should be used in conjunction with the diagram at the rear of these fitting instructions.

1. Connect the larger diameter (Suction) hose 700mm long between the filter and the port on the underside of the tank (connection 7 to 8) using the jubilee clips provided.
2. Connect the pressure hose 550mm long between the P.T.O pump and the junction block. (Connections 1 to 2).
3. Connect the hose 550mm long between the teepeece and the port on the vibrator motor nearest to the tank (Connections 5 to 6).
4. Connect the hose 550mm long between the junction block and the remaining port of the vibrator motor (Connection 3 to 4).

GENERAL MAINTENANCE

DAILY

Before commencing work, all bolts, setbolts and nuts should be checked for tightness, especially the blade attachment bolts, and main pivot bolts which locate the Vibrating Beam.

The Blades should be checked for sharpness and wear, and also straightness. Worn or damaged blades should be replaced and blunted blades re-sharpened.

Grease daily covering all grease nipples and using a good quality grease.

Check the Hydraulic Oil level, topping up if necessary using Castrol Hydraulic Oil.

DO NOT use a different type or grade of oil for topping up, unless you have first checked with your supplier that there can be no adverse effect from doing so.

WEEKLY

Check the oil level in the P.T.O Gearbox pump and top up if necessary using Spirak EP 90 oil.

Check the Conditioner for oil leaks and cure if necessary.

250 HOURS

Repalce the Oil Filter by unscrewing the cannister and replacing with a new unit.

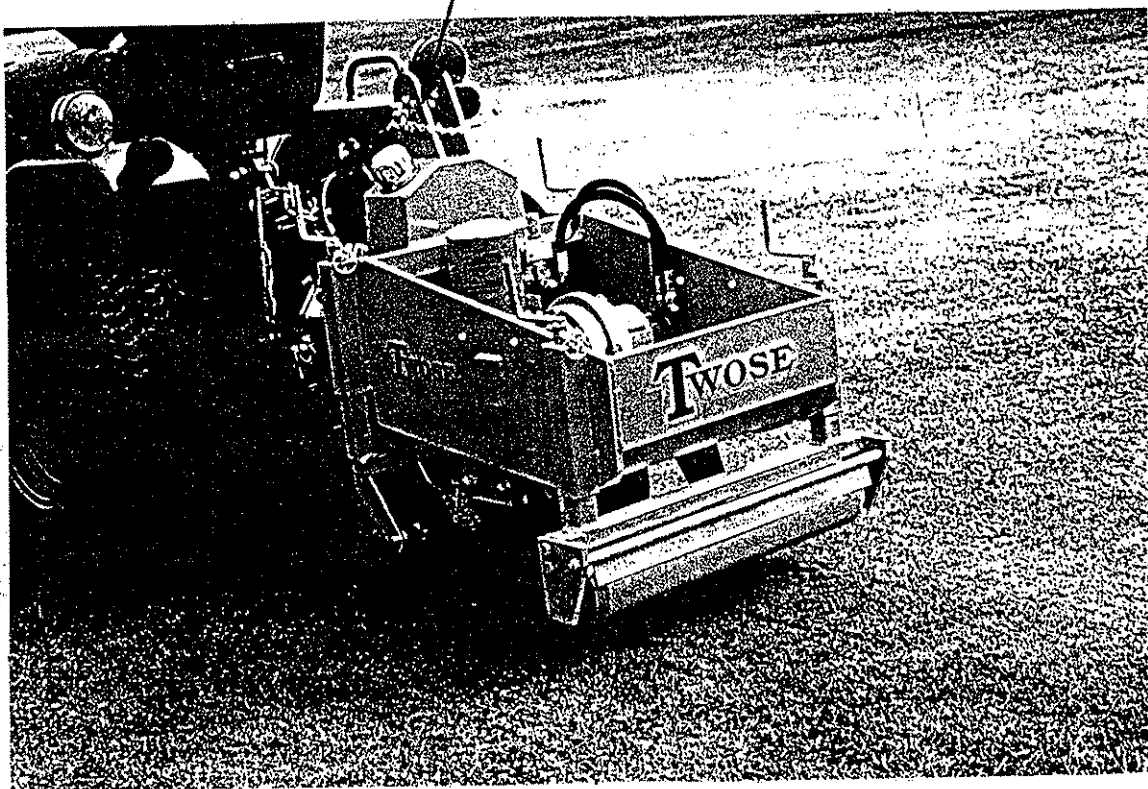
500 HOURS

Change the P.T.O pump gearbox oil using Excelgear EP 90 oil.

HANDLING AND TRANSPORTATION OF MACHINERY

The picture highlighted below indicates safe lifting points for the machinery.

LIFT POINT (TOP LINK)



The unladen weight of this machinery is given in the specification sheet of this book.

A form of lifting gear is required in order to move or handle this machinery safely. The lifting gear can be attached using a chain, rope or strap of sufficient strength, to the positions shown above.

Once the machinery has been moved, ensure that it comes to rest in a safe position. Supports or stay bars may be necessary to ensure stability of the machinery. Make sure the supports/stay bars are used whenever the machinery is transported.

PARTS LIST

Always order Twose genuine spares for your machine. They are correctly designed to give the best operational results.

When ordering spare parts, please specify:-

Type and Serial Number of machine

Part number, description and quantity of spares required.

Always make sure that you have ordered a sufficient quantity to complete the job.

Always make sure that you have ordered the correct parts. In some instances (eg Hydraulic Rams) parts or assemblies are, in the course of time, modified due to introduction of new materials, or improved design.

Always state by what means you wish the goods to be sent. In the absence of specific instructions consignments will be sent by post or railways goods service, if it is not possible to deliver by our own transport.

Always State the number of our Invoice or Sales Slip, and the reason for return should it become necessary to return any items for exchange or credit.

Remember that we operate a Service Department for Hydraulic Equipment which means that we can normally supply, by return, complete serviced and tested replacements.

WARRANTY AND SPARE PARTS

all enquiries regarding these machines and orders for spare parts must be addressed to:-

TWOSE OF TIVERTON LIMITED

6 Chinon Court

Lower Moor Way

Tiverton Business Park

Tiverton

DEVON

EX16 6SS

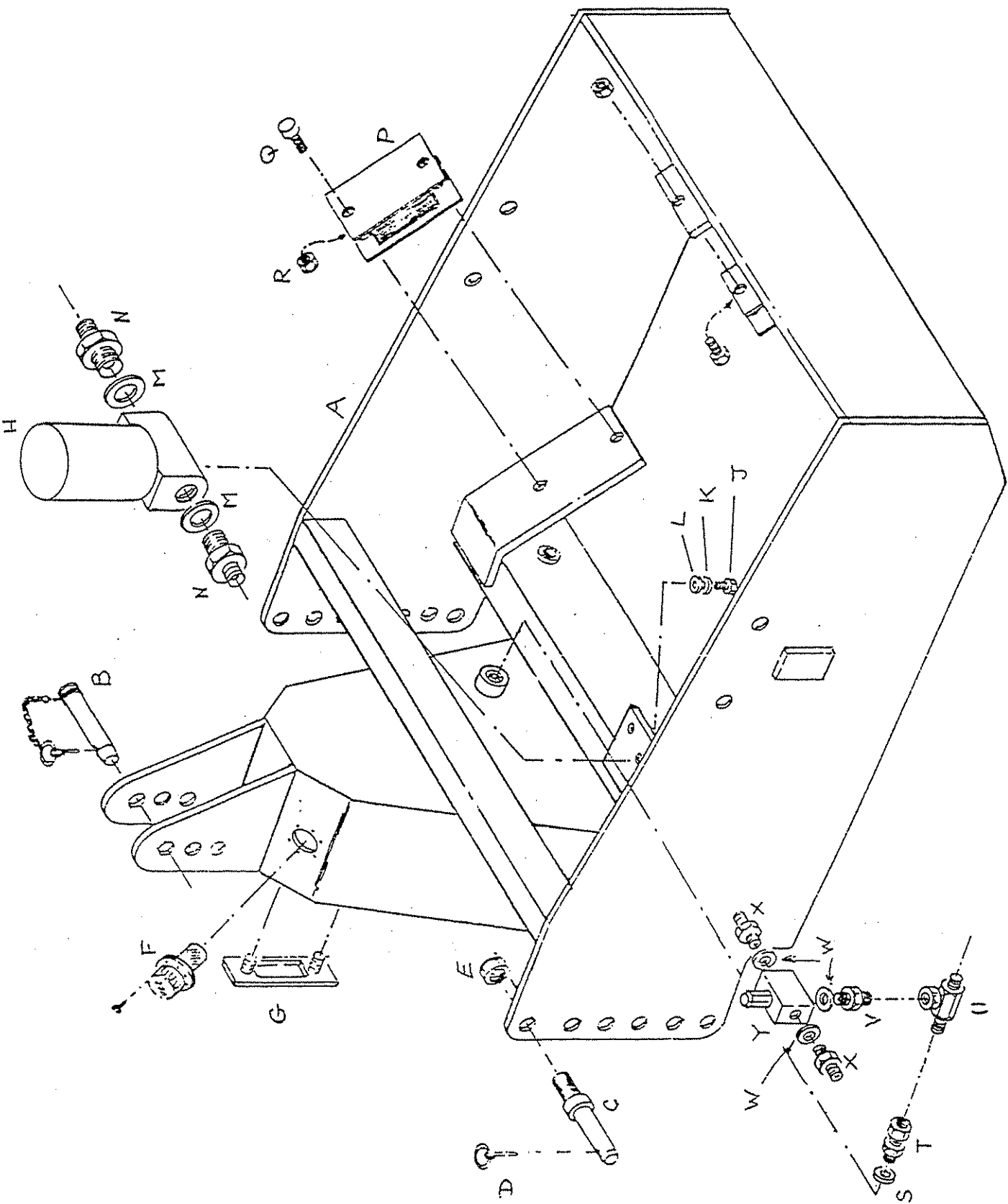
TELEPHONE (01884) 253691

FAX (01884) 255189

MAIN FRAME -
UP TO 1987

Figure 1.

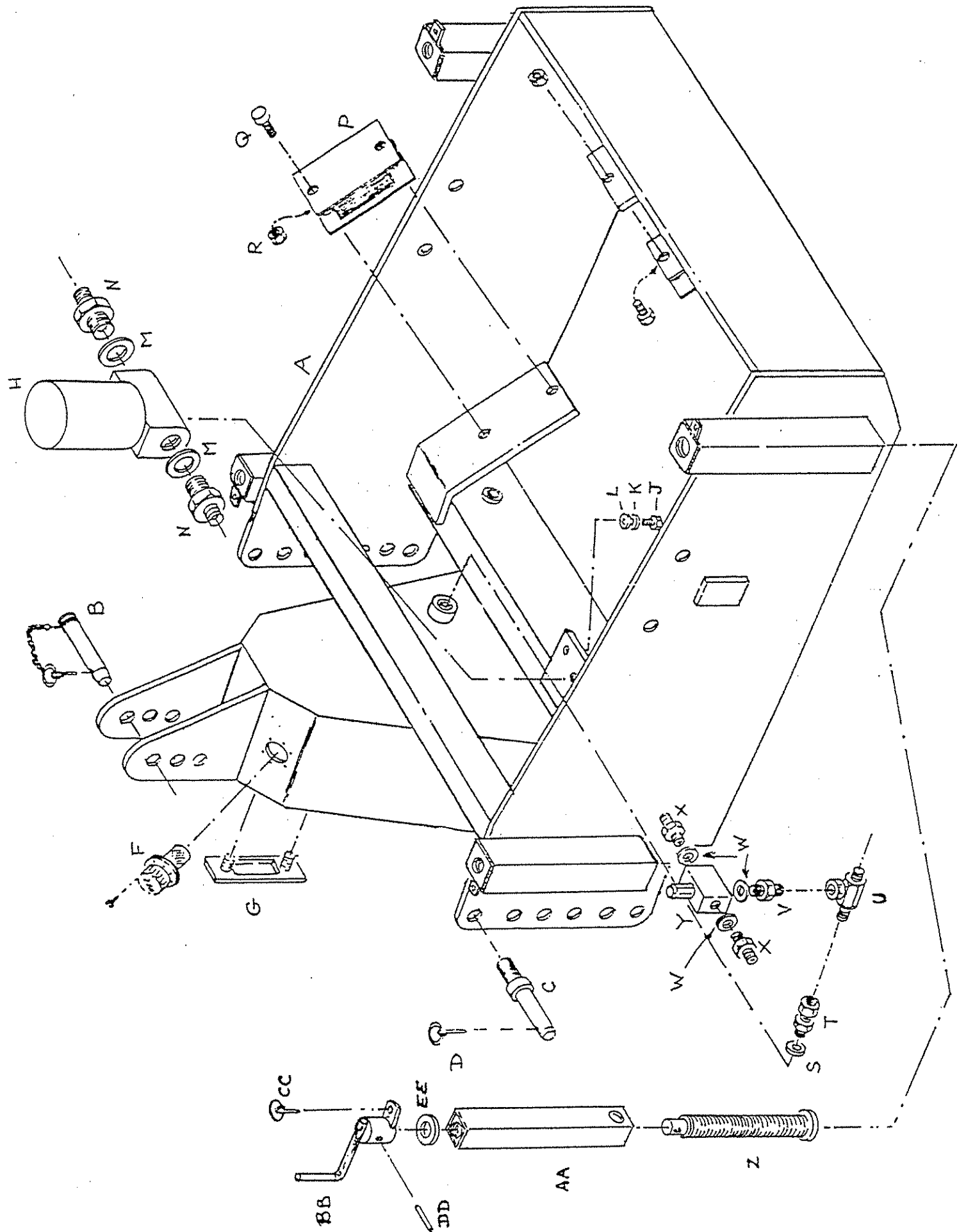
<u>REF</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A	1550037	Main Frame	1
B	1657	Pin, Chain, Linch Pin and Ring (For 1550037)	1
C	630022	Lift Pin (For 1550037)	2
D	0832	Linch Pin and Ring (for 630022)	2
E	2749	Stiffnut (630022 to 1550037)	2
F	3125	Oil Filler Cap (to 1550037)	1
G	3127	Oil Level Gauge	1
H	5341	Oil Filter	1
J	2987	Setscrew (5341 to 1550037)	2
K	3001	Spring Washer (5341 to 1550037)	2
L	3111	Flat Washer (5341 to 1550037)	2
M	3155	Seal (For 5341)	2
N	5342	Adaptor (For 5341)	2
P	4358	Metalastic Mounting	4
Q	2710	Setscrew (4358 to 1550037)	16
R	4421	Stiffnut (4358) to 1550037)	16
S	0909	Seal	1
T	4927	Loose Nut Adaptor	1
U	4933	Loose Nut Tee Piece M/M/Fm	1
V	0914	Adaptor	1
W	0670	Seal	3
X	0665	Adaptor	2
Y	4135	Relief Valve (2200 P.S.I)	1



MAIN FRAME -
1988 ONWARDS

Figure 2.

<u>REF</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A	1550037	Main Frame	1
B	1657	Pin, Chain, Linch Pin and Ring (For 1550037)	1
C	630022	Lift Pin (For 1550037)	2
D	0832	Linch Pin and Ring (for 630022)	2
E	2749	Stiffnut (630022 to 1550037)	2
F	3125	Oil Filler Cap (to 1550037)	1
G	3127	Oil Level Gauge	1
H	5341	Oil Filter	1
J	2987	Setscrew (5341 to 1550037)	2
K	3001	Spring Washer (5341 to 1550037)	2
L	3111	Flat Washer (5341 to 1550037)	2
M	3155	Seal (For 5341)	2
N	5342	Adaptor (For 5341)	2
P	4358	Metalastic Mounting	4
Q	2710	Setscrew (4358 to 1550037)	16
R	4421	Stiffnut (4358) to 1550037)	16
S	0909	Seal	1
T	4927	Loose Nut Adaptor	1
U	4933	Loose Nut Tee Piece M/M/Fm	1
V	0914	Adaptor	1
W	0670	Seal	3
X	0665	Adaptor	2
Y	4135	Relief Valve (2200 P.S.I)	1
Z	1550064	Elevation Screw	4
AA	1550062	Screw Jack Leg	4
BB	1550065	Handle	4
CC	1498	Linch Pin and Ring (1550065 to 1550037)	4
DD	2243	Groverlock Pin(1550065 to 1550064)	4
EE	2716	Washer M12 Flat (to 1550064)	4



TINE MOUNTING FRAME

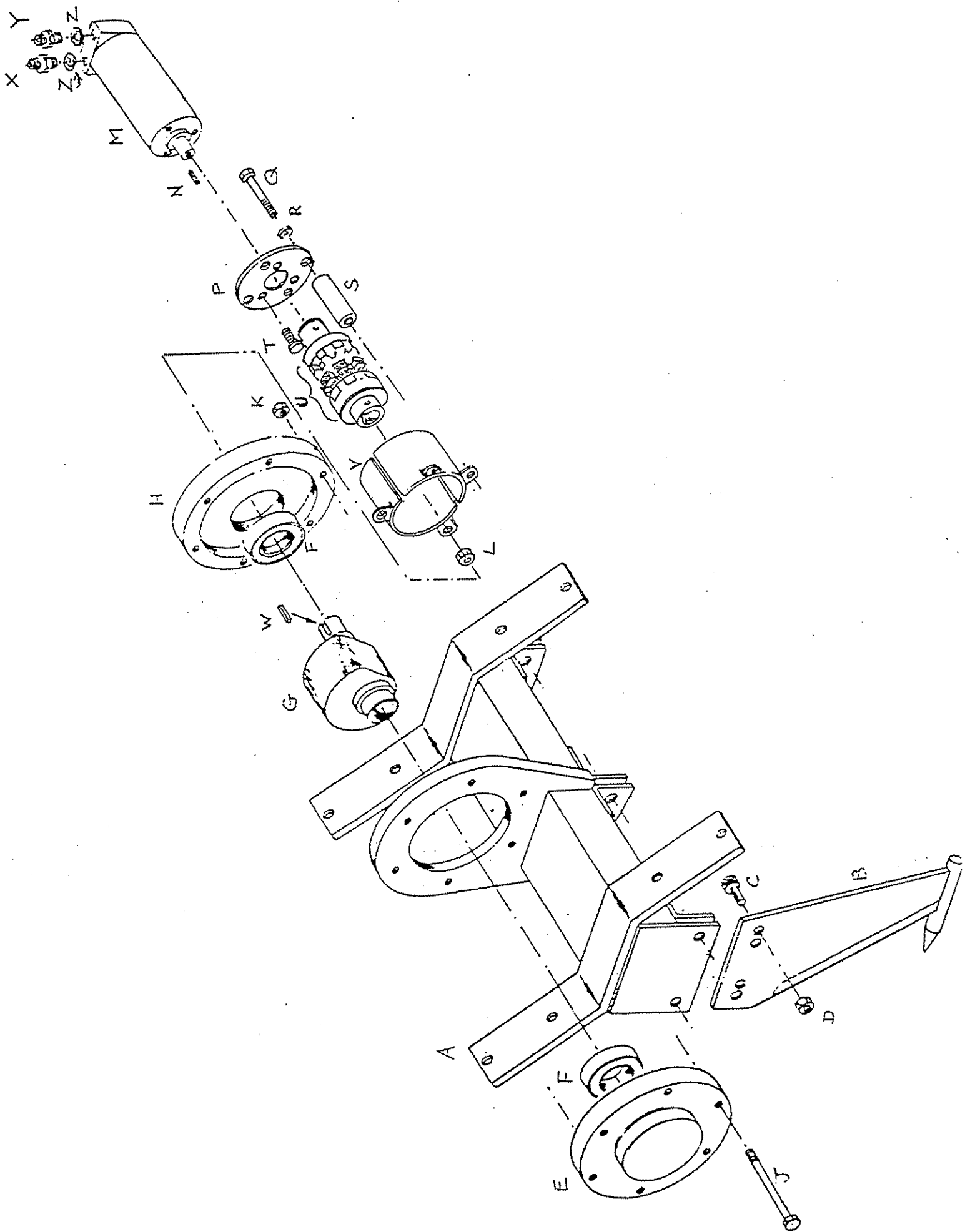
Figure 3.

<u>REF</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A	1550011	Mounting Frame	1
B	240021	Blade c/w Bullet	3

Alternatively

*	240022	Blade less Bullet	3
C	3536	Setscrew	6
D	3082	Socket Caphead (240021 to 1550011)	6
E	1360051	Stiffnut Nyloc (for 3536)	6
F	1360051	Aluminium Casting (for 1550011)	1
F	7009	Bearing (for 1360051 and 1360052)	2
G	1550056	Excentric Weight (for 1360051 and 1360052)	1
H	1360052	Aluminium Casting	1
J	2888	Bolt (1360051, 1360052, 1360053 and 1550011)	6
K	3182	Stiffnut (for 2888)	6
L	2766	Fullnut	4
M	4311	Motor	1
N	4417	Key (1360058 to 4311)	1
P	1360056	Mounting Plate (for 4311)	1
Q	5383	Bolt	4
R	3001	Spring Washer	4
S	1550058	Spacer for Motor Plate	4
T	4416	Countersunk Screw (1360058 to 4311)	3
U	1550059	Drive Coupling	1
V	1550057	Coupling Drive Cover	2
W	3538	Key (1360053 to 1550059)	1
X	0914	Adaptor (to 4311)	1
Y	0665	Adaptor (to 4311)	1
Z	0670	Seal (to 4311)	2

* Denotes parts not illustrated



COULTER FRAME -
UP TO 1987

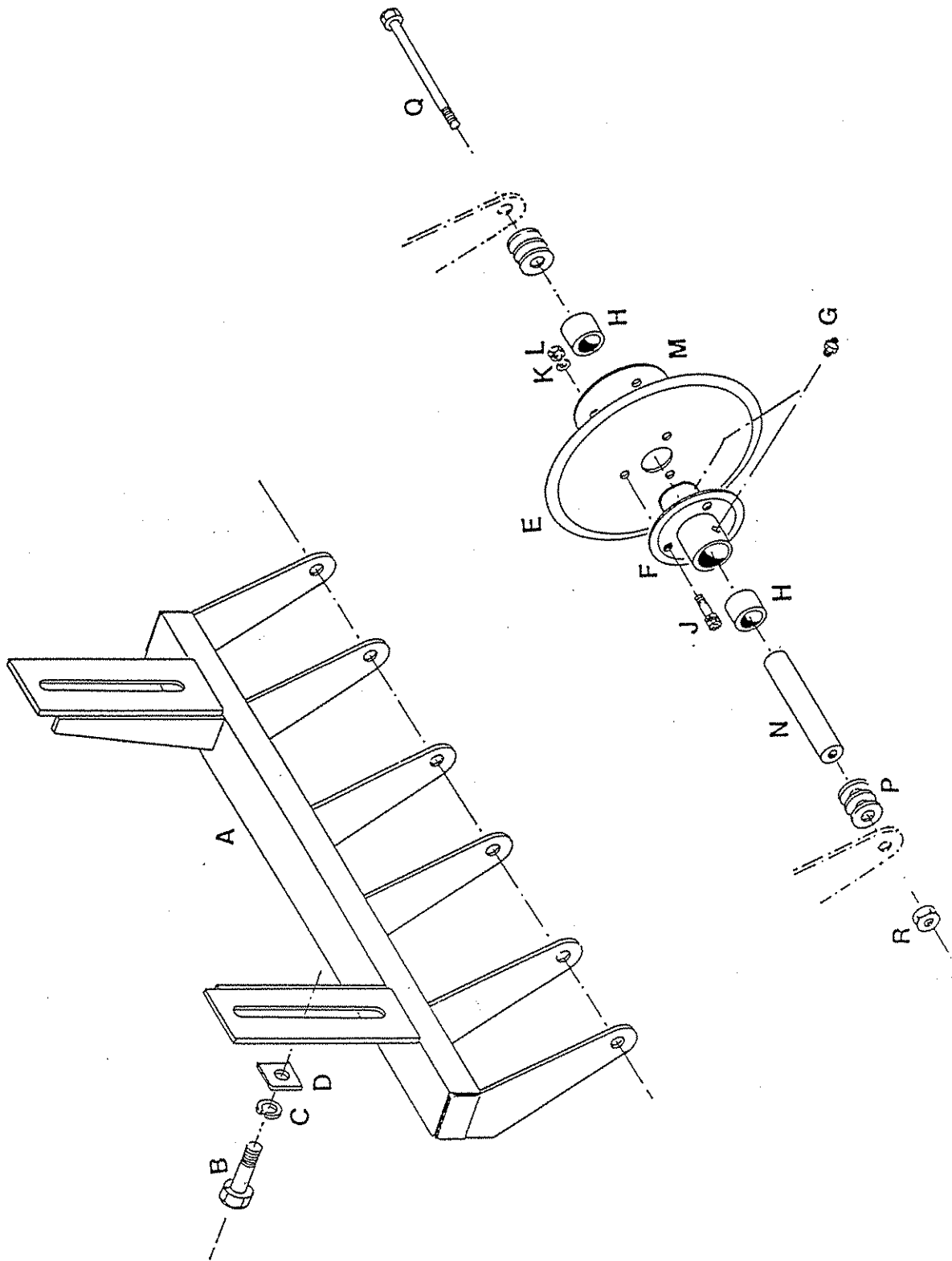
Figure 4.

<u>REF</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A	1550022	Main Frame	1
B	2747	Setscrew	2
C	2730	Spring Washer (for 2747)	2
D	410002	Special Washer (for 2747)	2
E	240108	Coulter Disc	2
F	240107	Bush Housing (for 240108)	3
G	2923	Grease Nipple (For 240107)	6
H	1008	Bush (For 240107)	6
J	3494	Socket Cap Screw (240107 and 240138 to 240108)	9
K	2731	Spring Washer (for 3494)	9
L	2718	Fullnut (for 3494)	9
M	240138	Locking Ring (for 240108)	3
N	240129	Spacer	2
P	1561	Washer	24
Q	2997	Bolt (Coulter Assembly to 1550022)	2
R	2720	Stiffnut (for 2997)	2

NOTE: The following items are used on the central Coulter Disc Assembly only.

*	1550025	Spacer (for 240107)	1
*	2950	Setscrew (1550025 to 1550022)	2
*	2729	Spring Washer (for 2950)	2
*	2716	Washer (for 2950)	2

* Denotes parts not illustrated.



COULTER FRAME -
1988 ONWARDS

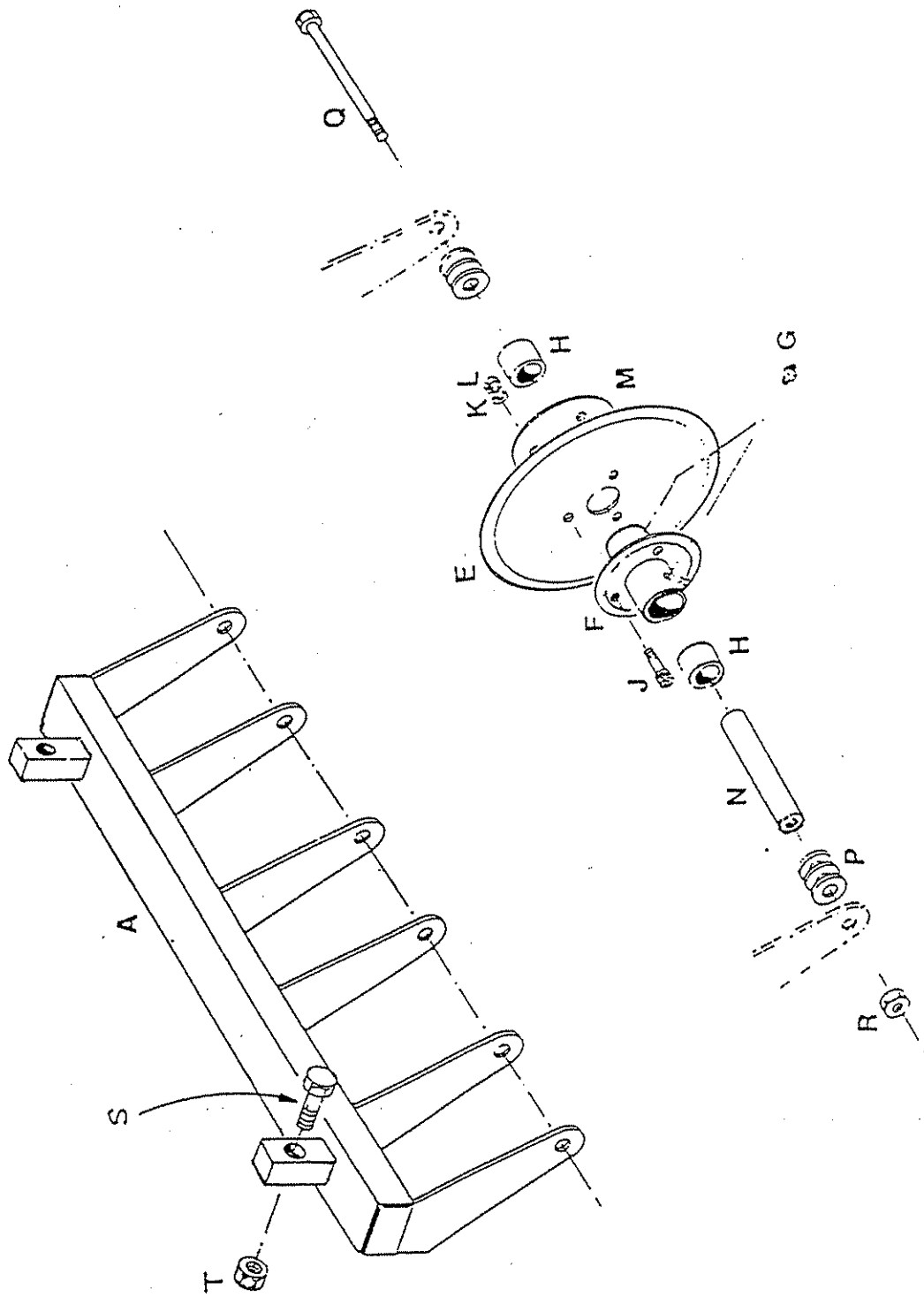
Figure 5.

<u>REF</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A	1550067	Main Frame	1
E	240108	Coulter Disc	3
F	240107	Bush Housing (for 240108)	3
G	2923	Grease Nipple (For 240107)	6
H	1008	Bush (For 240107)	6
J	3494	Socket Cap Screw (240107 and 240138 to 240108)	9
K	2731	Spring Washer (for 3494)	9
L	2718	Fullnut (for 3494)	9
M	240138	Locking Ring (for 240108)	3
N	240129	Spacer	2
P	1561	Washer	24
Q	2997	Bolt (Coulter Assembly to 1550022)	2
R	2720	Stiffnut (for 2997)	2
S	2902	Bolt (to 1550067)	2
T	3747	Stiffnut (to 2902)	2

NOTE: The following items are used on the central Coulter Disc Assembly only.

*	1550025	Spacer (for 240107)	1
*	2950	Setscrew (1550025 to 1550022)	2
*	2729	Spring Washer (for 2950)	2
*	2716	Washer (for 2950)	2

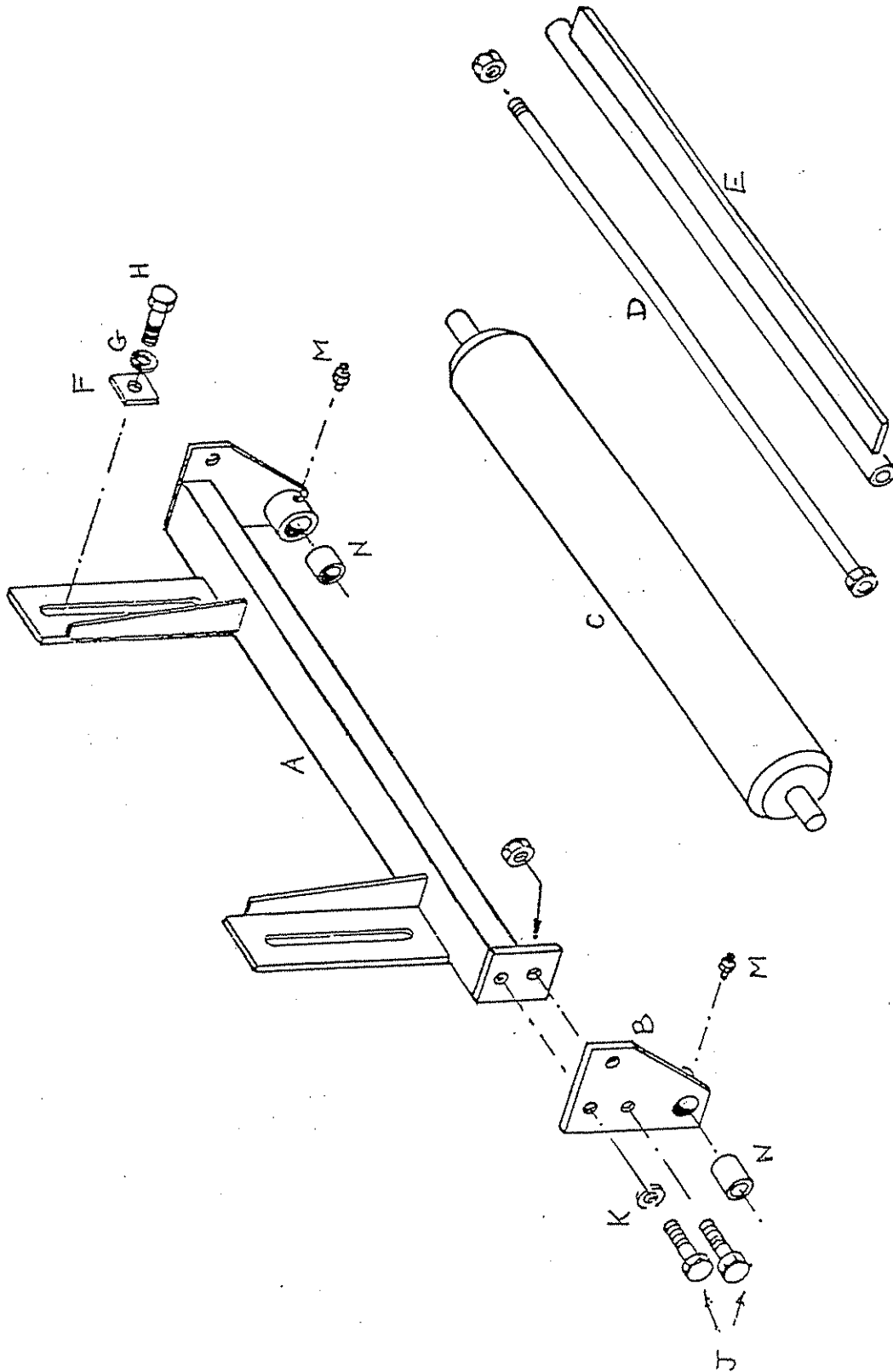
* Denotes parts not illustrated.



ROLLER FRAME -
UP TO 1987

Figure 6.

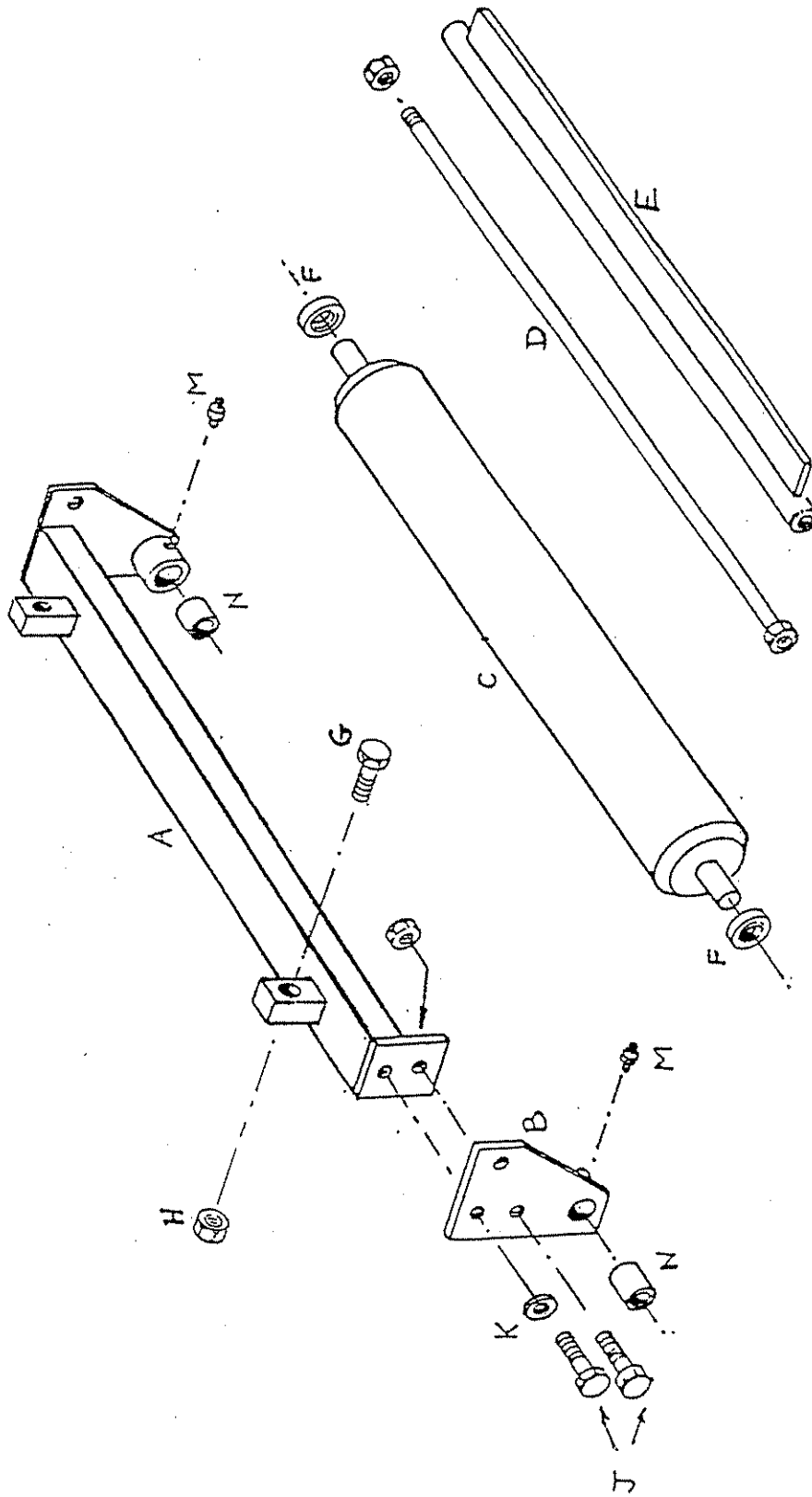
<u>REF</u>	<u>PART NO</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A	1550027	Roller Bracket	1
B	1550043	Roller Locating Bracket	1
C	1550044	Roller	1
D	1550047	Pivot Rod for Scraper	1
E	1550045	Scraper	1
F	410002	Special Washer (for 2747)	2
G	2730	Spring Washer (for 2747)	2
H	2747	Setscrew (for 1550027 to Main Frame)	2
H	2748	Setscrew (for 1550043)	2
K	2729	Spring Washer (for 2748)	1
L	2720	Stiffnut (for 2748)	1
M	2923A	Grease Nipple (for 1550027)	2
N	2427	Brass Bush (for 1550027)	2



ROLLER FRAME -
1988 ONWARDS

Figure 7.

<u>REF</u>	<u>PART NO</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A	1550066	Roller Bracket	1
B	1550043	Roller Locating Bracket	1
C	1440124	Roller	1
D	1550047	Pivot Rod for Scraper	1
E	1550045	Scraper	1
F	1440126	Spacer (for 1440124)	2
G	2902	Bolt (for 1550066)	2
H	3747	Stiffnut (for 2902)	2
J	2748	Setscrew (for 1550043)	2
K	2729	Spring Washer (for 2748)	1
L	2720	Stiffnut (for 2748)	1
M	2923A	Grease Nipple (for 1550066)	2
N	2427	Brass Bush (for 1550066)	2



PUMP AND GEARBOX
ASSEMBLY

Figure 8.

<u>REF</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
*	3905	Pump and Gearbox Assembly complete	1
comprising:-			
*	3973	Pump only	1
*	2326	Bolt (3973 to 3960)	2
*	0872	Spring Washer (for 2326)	2
*	2084	Fullnut (for 2326)	2
*	3960	Gearbox Complete	1
comprising:-			
A	3961	Housing - output side	1
B	3224	'O' Ring (for 3961)	1
C	3270	Filler Plug (for 3961)	1
D	3269	Fibre Washer (for 3270)	1
E	3962	Bearing (for 3963)	2
F	3963	Pinion - 21T (for 3962)	1
*	3964	Core Plug (for 3963)	1
G	3965	Gear - 73T (for 3966)	1
H	3966	Input Shaft (for 3961 and 3970)	1
J	3967	Bearing (for 3966)	2
K	3281	Steel Ball (For 3966)	3
L	3968	Oil Seal (for 3966)	1
M	3273	Core Plug (for 3966)	1
N	3970	Housing - Input Side	1
P	3279	Circlip (for 3966)	1
Q	3280	Spring (for 3282)	1
R	3282	Ball Retainer (for 3966)	1
*	3969	Gasket (for 3961 and 3970)	1
S	3971	Bolt (3961 to 3970)	7
T	1127	Spring Washer (for 3971)	7
U	3972	Fullnut (for 3971)	7
*	3075	Reaction Chain	1
*	3074	'D' shackle c/w pin and clip (for 3075)	2
*	0877	Adaptor (for 3905)	1
*	3397	Adaptor (for 3905)	1
*	310753	P.T.O Pump Guard	1
*	4031	Bolt (for 310753)	1
*	2718	Fullnut (for 4031)	1
*	2715	Washer Bright Flat (for 310753)	3

* Denotes parts not illustrated

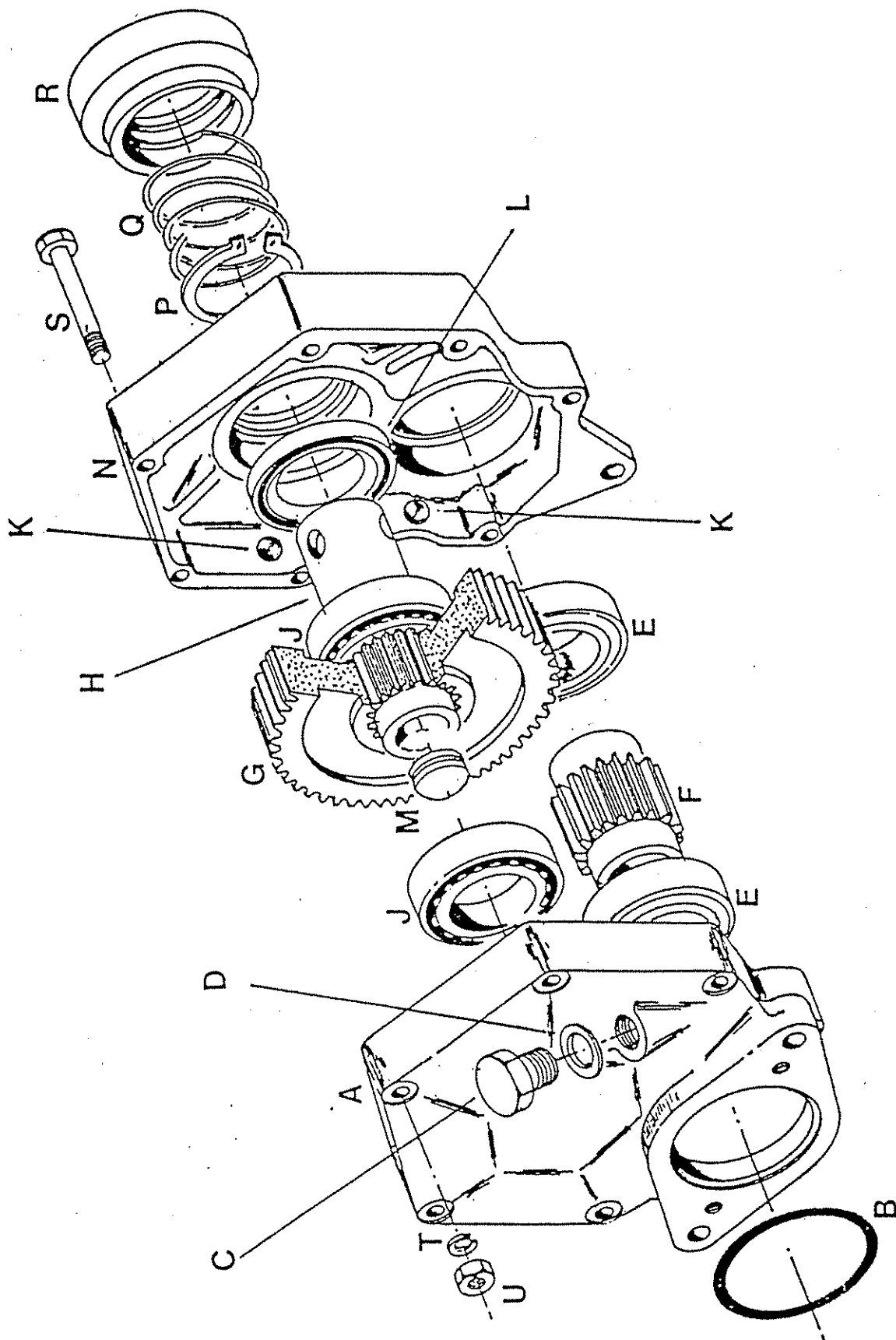


Figure 8.

PUMP AND GEARBOX
ASSEMBLY

Figure 9.

<u>REF</u>	<u>PART NO</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	7071	Pump Unit	1
2		Caphead Setscrew (Supplied with Pump)	4
3		Spring Washer (Supplied with Pump)	4
4	7086	Elbow (complete with bolts, washers and 'O' Ring)	1
5	0670	Dowty Seal	1
6	0665	Adaptor	1
7	7073	Elbow (Complete with bolts washers, and 'O' Ring)	1
8	0934	Dowty Seal	1
9	0935	Adaptor	1
10	7072	Pump Coupling (BF2)	1
11	7070	Gearbox	1
12	155.069	Stay Bracket	1
13	5570	Caphead Setscrew	3
14	2728	Spring Washer	3
15	3219	Flat Washer	3
* *	3074 3075	'D' Shackle c/w Pin and Clip Chain	1 1

* Denotes items not illustrated

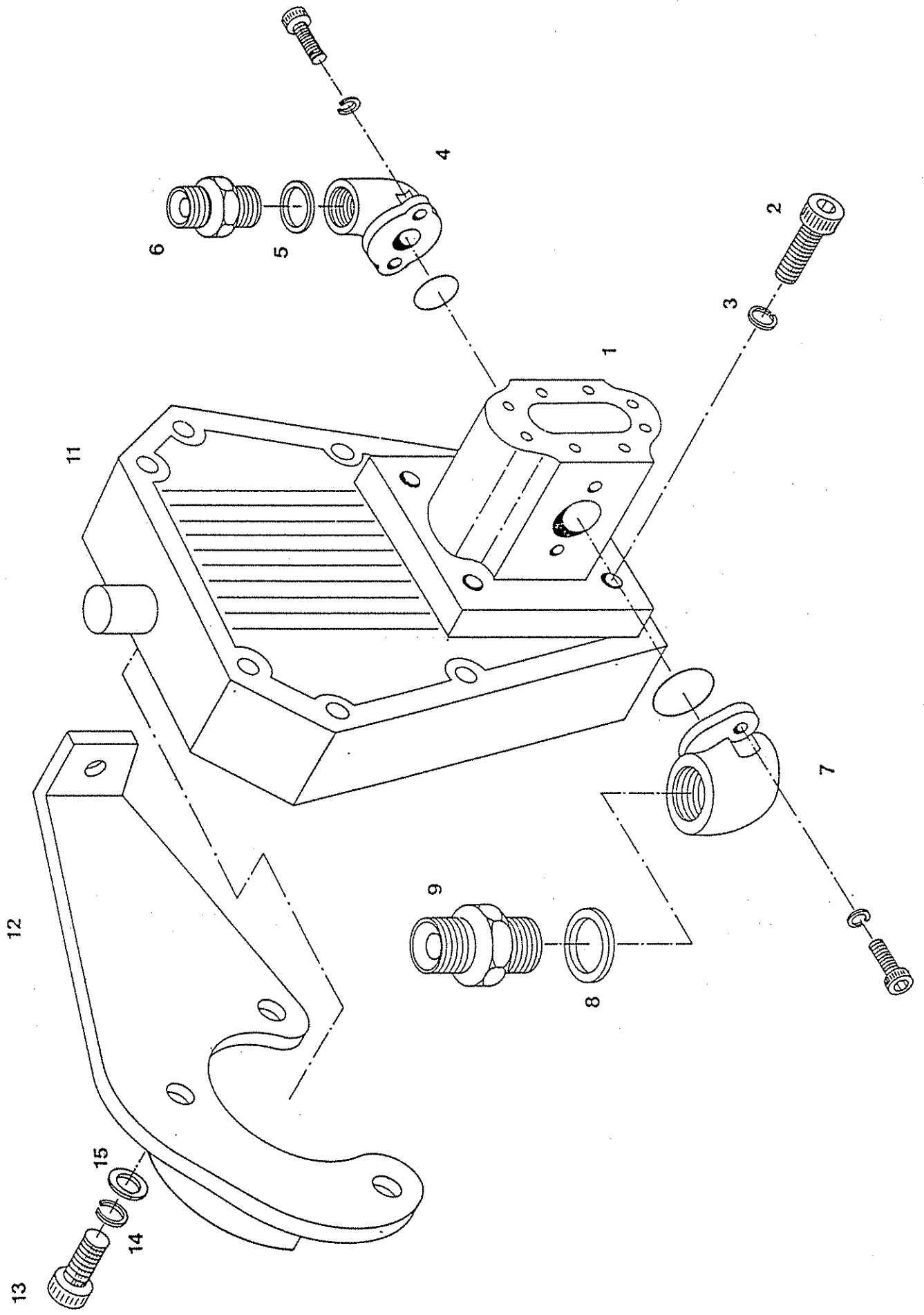


Figure 9.

HYDRAULIC HOSES

Figure 10.

<u>CONNECTION</u>	<u>PART NO</u>	<u>DESCRIPTION</u>	<u>HOSE LENGTHS</u>	<u>CONNECTING POSITION</u>
A - B	1550055	Hydraulic Hose	0.530m	Tank to Filter
C - D	1550051	Hydraulic Hose	0.880m	Pump to Relief Valve
E - F	1550052	Hydraulic Hose	0.380m	Motor to Relief
G - H	1550053	Hydraulic Hose	0.415m	Motor to Tee of Relief
J - K	1550054	Hydraulic Hose	0.780m	Filter to Pump

FROM JUNE 1990 ONWARDS

C - D	040241	Hydraulic Hose	0.880m	Pump to Relief Valve
J - K	040242	Hydraulic Hose	0.780m	Filter to Pump

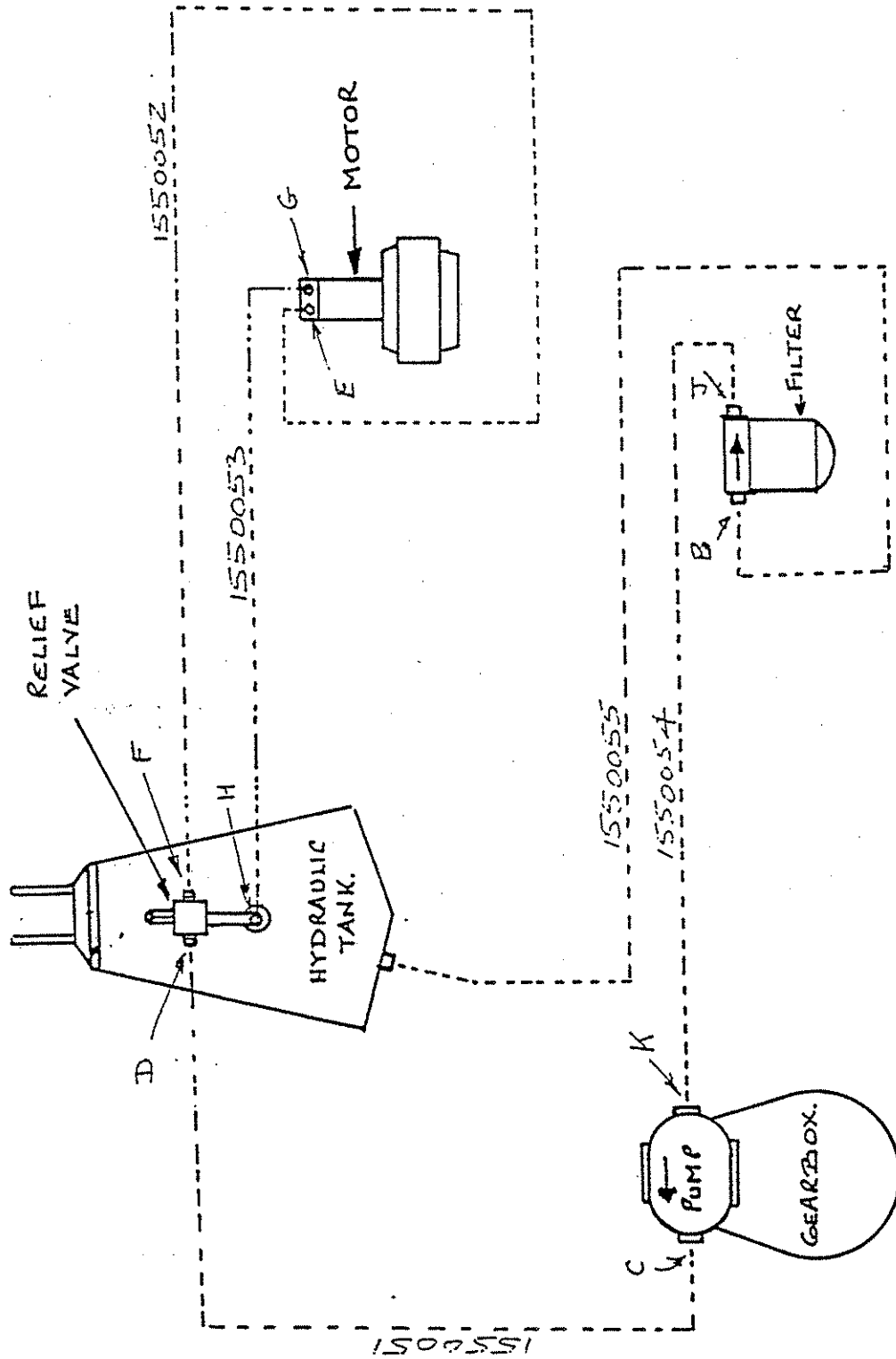


Figure 11.