CLEANACRES MACHINERY

AIRTEC

INSTRUCTION AND PARTS MANUAL FOR THE FOLLOWING MODELS:

185H18ECA
185H20ECA
185H24ECA

2500H18ECA
2500H20ECA
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INTRODUCTION TO THE AIRTEC SPRAYER.

THE CLEANACRES AIRTEC SPRAYER HAS BEEN DESIGNED TO ALLOW LOW VOLUME APPLICATION WHEN APPLYING CHEMICALS, WHILE AT THE SAME TIME DRAMATICALLY REDUCING SPRAY DRIFT AND BLOCKAGES. HOWEVER A FEW BLOCKED NOZZLES MAY BE EXPERIENCED IN THE FIRST WEEK OF OPERATION, THIS IS DUE TO ENGINEERING SWARTH WITHIN THE SYSTEM THAT IS VERY DIFFICULT TO REMOVE UNTIL CHEMICAL HAS BEEN USED IN THE SPRAYER.

WITH THE KNOWLEDGE AND ADVICE OF YOUR AGRONOMIST, WE ARE CONFIDENT THAT GREAT BENEFITS WILL COME FROM THE CORRECT OPERATION OF THIS SPRAYER.

GENERAL LAYOUT

LIQUID IS DRAWN FROM THE TANK, THROUGH A SUCTION FILTER, TO THE DIAPHRAGM PUMP. ON THE PRESSURE SIDE OF THE PUMP THE LIQUID IS PUMPED THROUGH A FLUSHING PRESSURE FILTER AND INTO THE LIQUID DISTRIBUTION MANIFOLD, ON WHICH ARE MOUNTED THE INDIVIDUAL BOOM SECTION BALL VALVES.

WHEN THE SPRAYLINE CONTROLS ARE IN THE 'ON' POSITION, THE LIQUID IS PASSED THROUGH THE OPEN BALL VALVES TO THE SPRAYLINES, ON WHICH ARE MOUNTED THE AIRTEC NOZZLE ASSEMBLIES. THE SPRAYLINES ARE FITTED WITH A CONSTANT RECIRCULATING SYSTEM(C.R.S). THIS IS A RETURN TO TANK PIPE FITTED ON THE OUTER END OF THE SPRAYLINES THAT ALLOWS AGITATION TO TAKE PLACE WITHIN THE SPRAYLINES, AS WELL AS IN THE TANK. THE C.R.S. ENSURES THAT WHEN LOW VOLUME IS BEING USED, POWDERS DO NOT SETTLE OUT IN THE SPRAYLINE, THUS BECOMING A POTENTIAL BLOCKAGE PROBLEM. ALL LIQUID FROM THE CRS IS RETURNED

TO THE SPRAYER TANK TO PROVIDE ADDITIONAL AGITATION. WHEN THE SPRAYLINE CONTROLS ARE IN THE 'OFF' POSITION THE LIQUID PASSES THROUGH THE OPPOSITE SIDE OF THE BALL VALVES, THROUGH THROTTLE VALVES AND BACK INTO THE TANK TO PROVIDE FURTHER AGITATION. THE THROTTLE VALVES ENSURE THAT WHEN INDIVIDUAL SECTIONS ARE TURNED OFF THE LIQUID PRESSURE IN THE REMAINING SECTIONS STAYS CONSTANT.

THE AIR SYSTEM ON THE SPRAYER USES A HIGH VOLUME, LIQUID COOLED, ROTARY COMPRESSOR TO SUPPLY AIRFLOW TO THE BOOM SECTIONS. AIR IS FED FROM THE COMPRESSOR INTO THE AIR DISTRIBUTION MANIFOLD. FROM HERE THE AIR PASSES THROUGH ELECTRIC SOLENOIDS TO THE INDIVIDUAL BOOM SECTIONS. AIR IS FED TO THE AIRTEC NOZZLE THROUGH A SEPARATE SET OF PIPELINES, THE AIR AND THE LIQUID IS THEN MIXED IN THE NOZZLE TO PROVIDE THE AIR INCLUDED DROPLET FORMATION.

LIQUID PRESSURE IS CONTROLLED BY THE USE OF A MOTORIZED ELECTRIC BALL VALVE, AND AIR PRESSURE BY A MOTORIZED BUTTERFLY VALVE.

APPLICATION RATES CAN BE ALTERED BY CHANGING THE TRACTOR'S FORWARD SPEED AND/OR USING THE IN-CAB CONTROLS TO VARY AIR AND LIQUID PRESSURE. SPRAY QUALITY CAN BE ALTERED BY CHANGING THE RATIO BETWEEN THE LIQUID AND AIR PRESSURE.

SAFETY PRECAUTIONS.

ALWAYS PROP THE BOOM BEFORE WORKING UNDERNEATH IT IN CASE OF MECHANICAL OR HYDRAULIC FAILURE.

ALWAYS 1. CHOCK THE WHEELS TO PREVENT IT MOVING, TURNING THE ENGINE OFF AND DISENGAGING THE PTO BEFORE WORKING BETWEEN THE TRACTOR AND THE SPRAYER.

2. FOR THREE POINT LINKAGE MOUNTED MACHINES THE SPRAYER SHOULD BE PROPPED TO PREVENT IT DROPPING ON THE HYDRAULIC LINKAGE. FOR TRAILED MACHINES THE TRAILED WHEELS SHOULD ALSO BE CHOCKED.

ALWAYS FIRMLY SECURE THE BOOMS BEFORE TRAVELLING.

NEVER ALLOW CHILDREN TO PLAY NEAR THE SPRAYER.

ALWAYS WEAR PROTECTIVE CLOTHING, AS SPECIFIED ON THE CHEMICAL CONTAINER LABEL, WHEN HANDLING CHEMICALS. CALCULATE AND CAREFULLY MEASURE IN THE AMOUNT OF CHEMICAL REQUIRED.

NEVER ADD CHEMICALS TO AN EMPTY SPRAY TANK, ALWAYS TO A HALF FULL TANK, THEN FILL UP AND AGITATE GENTLY TO MIX. RINSE CHEMICAL CONTAINERS INTO THE TANK AND DISPOSE OF THEM SAFELY.

ALWAYS WASH DOWN ANY SPILLS AND STORE UNUSED CONTAINERS SAFELY.

DO NOT STORE PROTECTIVE CLOTHING IN THE TRACTOR CAB, ALWAYS PLACE IT IN THE LOCKER PROVIDED.

ALWAYS WASH HANDS BEFORE SMOKING, EATING, OR DRINKING.

GUIDE TO EFFECTIVE CROP SPRAYING.

FOR EFFECTIVE CROP SPRAYING WITH MODERN EXPENSIVE AGROCHEMICALS IT IS VERY IMPORTANT TO SPRAY ACCURATELY.

SPRAYING OBJECTIVES:

ALWAYS AIM TO SPRAY THE RECOMMENDED CHEMICAL RATE SAFELY AND EFFECTIVELY BY ENSURING THAT THE CORRECT VOLUME OF CHEMICAL REACHES THE INTENDED TARGET AND THAT AS LITTLE AS POSSIBLE DRIFTS OR RUNS OFF AND CONSEQUENTLY FAILS TO REACH THE TARGET.

AIM TO CARRY OUT THE OPERATION QUICKLY AND COST EFFECTIVELY BY USING THE LOWEST SPRAY VOLUME COMPATABLE WITH CHEMICAL AND CONDITIONS AND A FORWARD SPEED WITHOUT EXCESSIVE BOOM BOUNCE, DRIFT OR INEFFICIENT APPLICATION.

THERE ARE FOUR KEY ASPECTS TO ACCURATE, TROUBLE FREE SPRAYING:

- PREPARATION
- AIRTEC SETTING SELECTION
- CALIBRATION
- GOOD FIELD WORK

THE NEXT SECTION OF THIS SPRAYER MANUAL GIVES FURTHER INFORMATION ON EACH OF THESE AREAS.

FITTING THE SPRAYER TO THE TRACTOR.

THIS MANUAL COVERS THREE TYPES OF SPRAYER IN THE CLEANACRES AIRTEC RANGE. PLEASE REFER TO THE THE APPROPRIATE SECTION RELATING TO YOUR PARTICULAR SPRAYER.

1. THREE POINT LINKAGE MOUNTED MACHINES

⚠ **WARNING** ALWAYS PROP THE SPRAYER AND CHOCK THE TRACTOR WHEELS, AND STOP THE TRACTOR ENGINE BEFORE WORKING BETWEEN TRACTOR AND SPRAYER. FIT THE SPRAYER TO THE TRACTORS THREE POINT LINKEAGE AS FOLLOWS:- CONNECT LEFT HAND THEN RIGHT HAND LINKEAGE, AND THEN TOP LINK WHILST SPRAYER IS STILL ON THE PARKING LEGS. CONNECT P.T.O. AND ELECTRICS. RAISE THE SPRAYER AND REMOVE OR STOW THE PARKING LEGS.
LOWER LINK CHAINS OR STABILIZERS SHOULD BE FITTED TO IMPROVE THE SPRAYER'S HANDLING UNDER ROUGH CONDITIONS.

2. TRAILED SPRAYERS.

THESE MACHINES ARE DESIGNED TO BE TOWED ON THE TRACTOR'S PICK UP HITCH. IF THE SPRAYER IS TO BE TOWED USING A CLEVIS DRAWBAR THEN A SPECIAL REDUCING BUSH MUST BE INSERTED INTO THE DRAWBAR HOLE ON THE SPRAYER TO REDUCE THE SIZE OF THIS HOLE DOWN TO THE SIZE OF THE DRAW PIN. IF THIS REDUCING BUSH IS NOT USED THEN SERIOUS DAMAGE TO THE SPRAYER OR TRACTOR COULD RESULT.

TO ATTACH THE SPRAYER TO THE TRACTOR THE DRAWBAR JACK SHOULD BE SET TO A SUITABLE HEIGHT FOR THE TRACTOR HITCH. THE SPRAYER SHOULD THEN BE HITCHED TO THE TRACTOR IN THE CONVENTIONAL WAY. ONCE THE SPRAYER IS HITCHED TO THE TRACTOR THE JACK SHOULD BE WOUND FULLY UP AND TRANSFERRED TO ITS TRANSPORT POSITION.

⚠ **WARNING** WHEN TOWING THE SPRAYER WITH A DRAW PIN, ALWAYS ENSURE THAT A LYNCH PIN IS INSERTED THROUGH THE HOLE IN THE BOTTOM OF THE PIN TO PREVENT THE PIN FROM JUMPING OUT.

IN ORDER TO KEEP THE SPRAYER LEVEL FORE AND AFT, IT MAY BE NECESSARY TO ADJUST THE HEIGHT OF THE WHEELS. BEFORE CARRYING OUT THIS OPERATION ALWAYS ENSURE THAT THE SPRAYER IS ON FIRM, LEVEL GROUND AND THAT THE WHEELS ARE CHOCKED. JACKING UP ONE SIDE OF THE SPRAYER AT A TIME, REMOVE THE WHEEL HEIGHT ADJUSTMENT PIN AND ADJUST THE WHEEL HEIGHT TO SUIT REQUIREMENTS. RE-INSERT THE PIN AND REPLACE THE SAFETY LYNCH PIN. REPEAT THIS PROCESS ON THE OTHER SIDE OF THE SPRAYER.

3. MB TRAC MOUNTED MACHINES.

THESE ARE SUPPLIED WITH THEIR OWN, CUSTOM MADE SUB-FRAME, WHICH BOLTS DIRECTLY ONTO THE MB.TRAC CHASSIS.

ONCE FITTED, THE SUB-FRAME CAN BE LEFT ON, AS IT DOES NOT INTERFERE WITH ANY OF THE TRACTOR FUNCTIONS.

TO MOUNT THE SKID UNIT SPRAYER ONTO THE SUB-FRAME, IT IS NECESSARY TO RAISE THE SPRAYER UP ON ITS DEMOUNT LEGS UNTIL THERE IS AT LEAST ONE INCH OF CLEARANCE BETWEEN THE BOTTOM TANK FITTINGS OF THE SPRAYER AND THE TRACTOR REAR MUD-GUARDS. AFTER ENSURING THAT NO CABLES OR PIPES CAN BE TRAPPED, REVERSE THE TRACTOR UNDER THE SPRAYER SO THAT THE BOTTOM RUNNERS OF THE SPRAYER ARE IN LINE WITH THE BEARERS OF THE SUB-FRAME.

JUST BEFORE THE FRONT LOCATING HOOKS ON THE SPRAYER REACH THE FRONT CROSS MEMBER ON THE SUB-FRAME, LOWER THE SPRAYER ON THE DEMOUNT LEGS SO THAT THE FRONT OF THE RUNNERS ON THE SPRAYER ARE JUST RESTING ON THE SUB-FRAME, AND THE BACK OF THE RUNNERS ARE

JUST CLEAR OF THE SUB-FRAME. CONTINUE REVERSING UNDER THE MACHINE UNTIL THE FRONT LOCATING HOOKS ARE FIRMLY LOCATED UNDER THE FRONT CROSS-MEMBER. NOW LOWER THE WHOLE SPRAYER ONTO THE SUB-FRAME AND INSERT THE REAR RETAINING PINS.

THE DEMOUNT LEGS CAN NOW BE REMOVED AND STORED IN A SAFE PLACE UNTIL THEY ARE NEXT NEEDED.

CONNECTION TO TRACTOR OF HYDRAULIC SERVICES

CONNECT THE HYDRAULIC PIPES FROM THE SPRAYERS HYDRAULIC VALVES TO THE TRACTORS HYDRAULIC SERVICES AS FOLLOWS:

RED - PRESSURE FROM TRACTOR SPOOL.

GREEN - RETURN THROUGH OPEN LINE RETURN TO OIL TANK.

⚠ **CAUTION:** IF THE HYDRAULIC PIPES ARE INCORRECTLY FITTED, DAMAGE MAY OCCUR.

THE MINIMUM TRACTOR SPOOL REQUIREMENT IS ONE SINGLE ACTING, HOWEVER, IF A FRONT TANK,FITTED WITH A HYDRAULICALLY DRIVEN CENTRIFUGAL PUMP IS TO BE USED, THEN TWO SINGLE ACTING VALVES WITH AN UNRESTRICTED RETURN TO TANK FOR THE FRONT TANK RETURN PIPE WILL BE REQUIRED.

FRONT TANK HYDRAULIC PIPES WILL BE COLOUR CODED IN THE SAME MANNER AS THE SPRAYER.

CONNECTION TO TRACTOR OF ELECTRICAL SERVICES.

THE ELECTRICAL PLUGS AND SOCKETS ARE COLOUR CODED TO ENSURE THE CORRECT PLUG GOES INTO THE CORRECT SOCKET. BEFORE CONNECTING ENSURE ALL ELECTRICAL SERVICES ARE SWITCHED OFF.

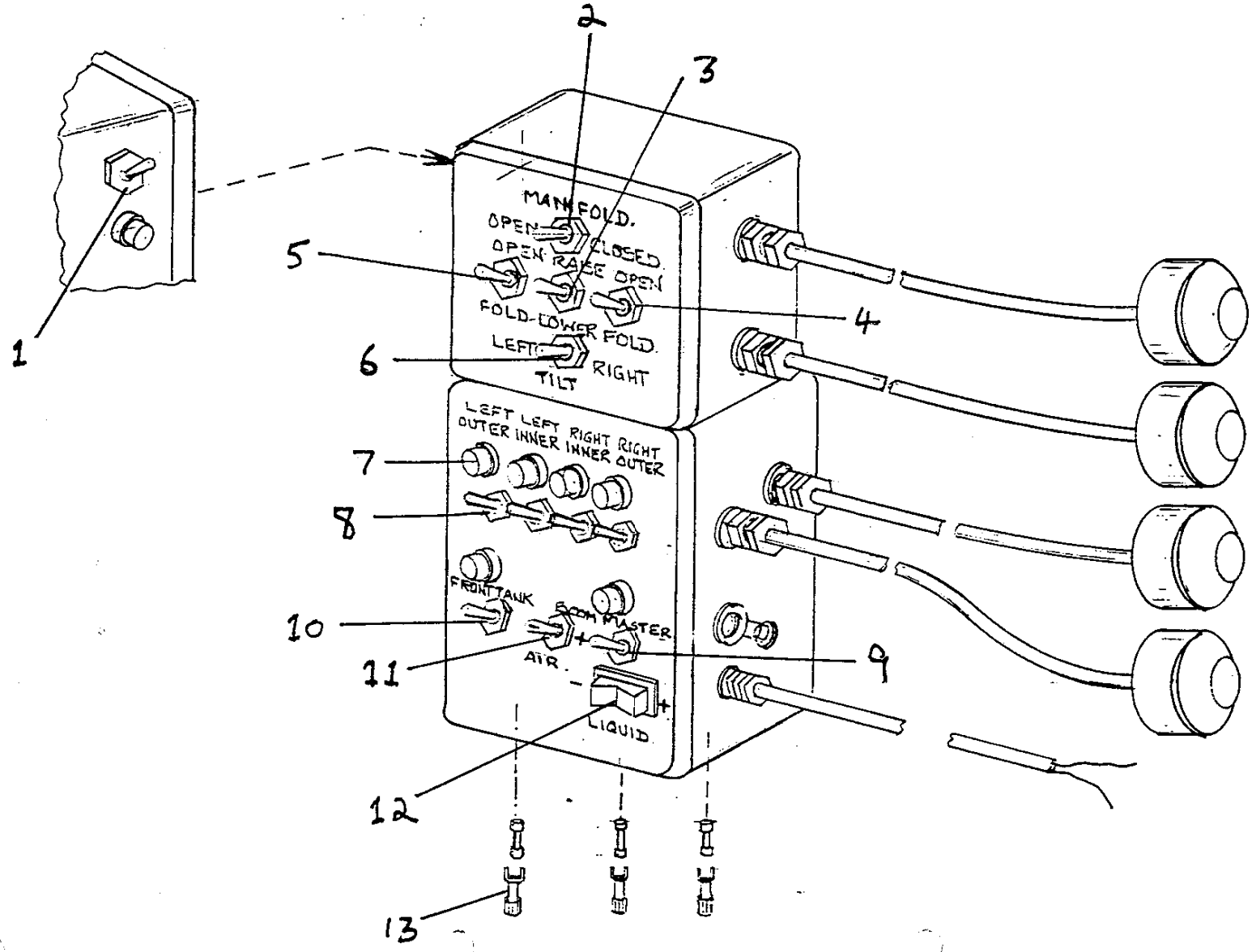
SPRAYER CONTROL BOX.

CLEANACRES AIRTEC SPRAYERS ARE ALL FITTED WITH IN-CAB CONTROLS FOR OPERATION OF BOOM SECTION CONTROL, PRESSURE ADJUSTMENT AND BOOM HYDRAULIC FUNCTIONS FOR YOUR SAFETY AND COMFORT. THE FOLLOWING STEPS SHOULD BE FOLLOWED WHEN INSTALLING CONTROLS IN THE CAB:

A. MOUNT THE CONTROL BOX WITHIN EASY REACH AND VISION FROM THE TRACTOR SEAT, IDEALLY TO THE RIGHT OF THE STEERING WHEEL. ENSURE THAT THE ELECTRIC CABLES HAVE AN UNRESTRICTED RUN THROUGH THE REAR OF THE CAB, PREFERABLY THROUGH THE FLOOR OF THE CAB TO ALLOW THE WINDOWS TO SHUT WHEN SPRAYING. THE PLATE CARRYING THE FOUR SEVEN-PIN SOCKETS SHOULD BE MOUNTED ON THE OUTSIDE OF THE CAB IN A POSITION WHERE IT WILL NOT FOUL ANY OF THE TRACTORS EXTERNAL SERVICES. THE FOUR PLUGS FROM THE SPRAYER SHOULD THEN BE CONNECTED UP TO THE SOCKETS, WITH SUFFICIENT LENGTH OF CABLE TO ALLOW FOR RAISING AND LOWERING OR TURNING THE SPRAYER.

B. TAKE AN ELECTRICAL SUPPLY TO THE CONTROL BOX FROM THE TRACTOR'S FUSE BOX OR DIRECTLY FROM THE BATTERY. MAKE SURE THAT THE SUPPLY CABLE IS ROUTED SO THAT IT WILL NOT BECOME PINCHED AT ANY TIME OR GET CAUGHT UP IN ANY MOVING PARTS.

CONTROL BOX FIGURE 1



HYDRAULIC CONTROLS

1. HYDRAULIC ON/OFF.
2. MAINFOLD SWITCH.
3. RAISE/LOWER SWITCH.
4. RIGHT HAND FLIP OVER.
5. LEFT HAND FLIP OVER.
6. BOOM TILT.

SPRAYER CONTROLS

7. SECTION WARNING LIGHTS.
8. INDIVIDUAL SECTION CONTROLS.
9. BOOM MASTER CONTROL.
10. FRONT TANK CONTROL.
11. AIR PRESSURE CONTROL.
12. LIQUID PRESSURE CONTROL.
13. FUSE HOLDERS.

1. HYDRAULIC ON/OFF: THIS SWITCH MUST BE ON BEFORE ANY OF THE ELECTRO-HYDRAULIC SERVICES ON THE SPRAYER WILL WORK.

2. MAINFOLD SWITCH: THIS SWITCH CONTROLS THE FOLDING AND UNFOLDING OF THE MAIN BOOM SECTIONS.

3. RAISE/LOWER SWITCH: THIS SWITCH CONTROLS THE RAISING AND LOWERING OF THE BOOMS ON THE SPRAYER.

4. RIGHT HAND FLIP OVER: THIS SWITCH CONTROLS THE FOLDING AND UNFOLDING OF THE RIGHT HAND OUTER SECTION OF THE BOOM.

5. LEFT HAND FLIPOVER: THIS SWITCH CONTROLS THE FOLDING AND UNFOLDING OF THE LEFT HAND OUTER SECTION OF THE BOOM.

6. BOOM TILT: THIS SWITCH CONTROLS THE BOOM TILT, WHICH ALLOWS THE BOOM TO REMAIN PARALLEL TO THE GROUND, EVEN WHEN WORKING ON SLOPING GROUND.

7. SECTION WARNING LIGHTS: THESE WARNING LIGHTS ARE ON WHEN THE APPROPRIATE SECTION IS SPRAYING.

8. INDIVIDUAL SECTION CONTROLS: THESE ARE USED FOR OPERATING IN SHORT WORK TO ISOLATE INDIVIDUAL BOOM SECTIONS. THE SWITCHES CONTROL BOTH THE AIR AND LIQUID LINES.

9. BOOM MASTER CONTROL: THIS SWITCH SHUTS AND OPENS ALL FOUR BOOM SECTIONS WHEN TURNING AT THE HEADLANDS ETC.. SPRAYLINES ARE ON WHEN THE RED LIGHT IS GLOWING. THIS SWITCH ALSO SHUTS OFF THE AIR SUPPLY TO THE AIR LINES.

10. FRONT TANK SWITCH: THIS IS USED TO TRANSFER LIQUID FROM THE FRONT TO THE REAR TANK (WHERE APPLICABLE). WHEN THE GREEN LIGHT IS GLOWING, LIQUID IS BEING TRANSFERRED. WHEN THE GREEN LIGHT IS OFF THE LIQUID IS AGITATING AND NOT BEING TRANSFERRED.

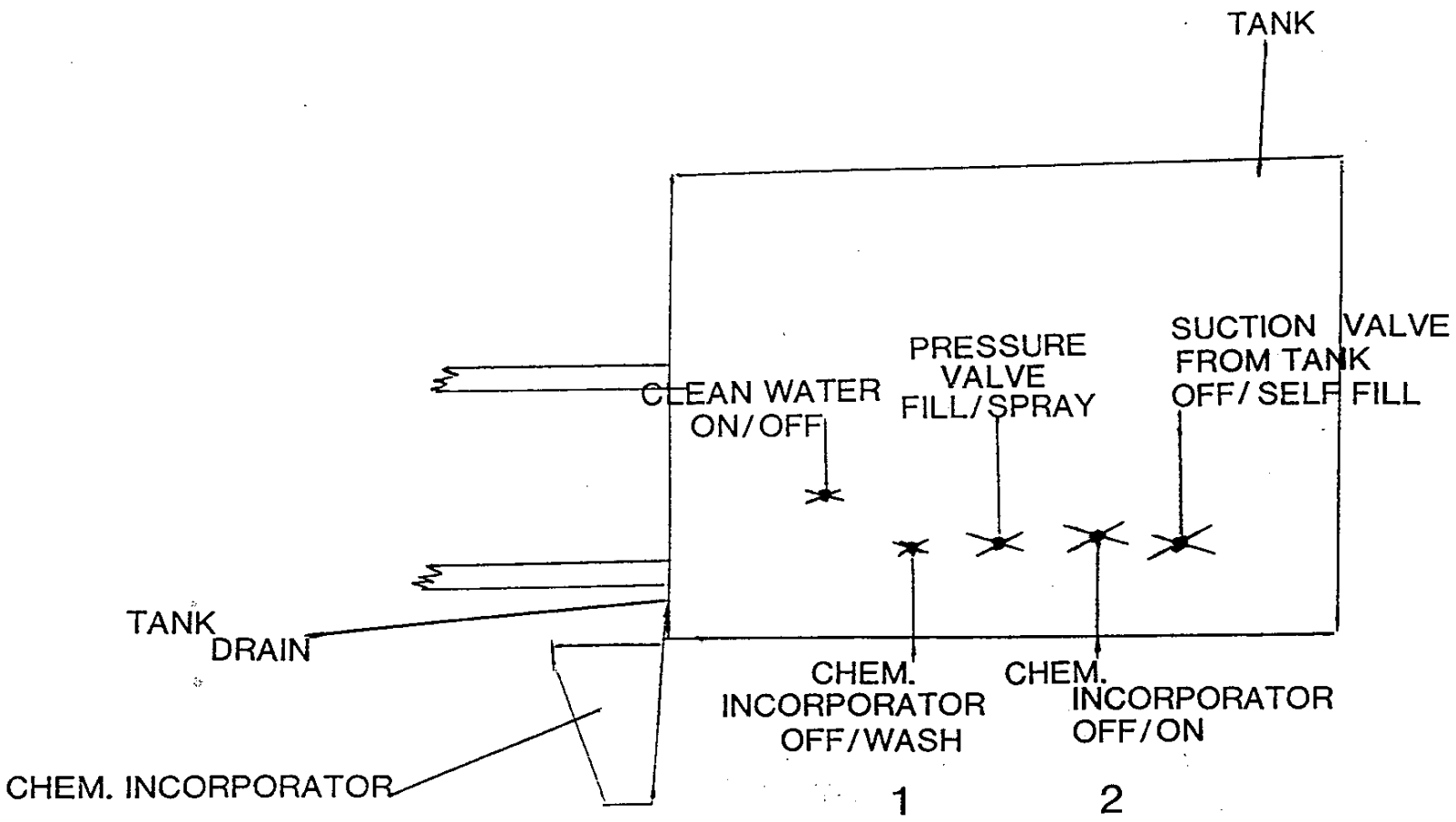
11. & 12. AIR & LIQUID PRESSURE CONTROLS: THESE INCREASE OR DECREASE THE AIR AND LIQUID PRESSURE, PUSH THE SWITCH TO THE RIGHT AND PRESSURE WILL INCREASE, TO THE LEFT AND IT WILL DECREASE. THESE SWITCHES OPERATE BUTTERFLY VALVES ON THE AIR AND LIQUID MANIFOLDS. BECAUSE THE VALVES CAN OPERATE THROUGH 360 DEGREES THEY CAN GO OVER CENTRE, SO THAT THE PRESSURE WILL DROP WHEN IT SHOULD BE RISING AND VICE VERSA. SHOULD THIS HAPPEN, SIMPLY PUSH THE SWITCH IN THE DIRECTION REQUIRED, THE PRESSURE WILL INITIALLY MOVE IN THE WRONG DIRECTION, THE VALVE WILL THEN GO BACK OVER CENTRE AND THE PRESSURE WILL THEN MOVE IN THE RIGHT DIRECTION.

PRESSURE GAUGES.

⚠ **IMPORTANT:** AT THE START OF EACH DAY'S SPRAYING, PARTIALLY FILL THE SPRAY TANK WITH WATER, SET THE MACHINE TO SPRAY AND OPEN THE TAP ON THE BOTTOM OF THE LIQUID PRESSURE GAUGE. WAIT FOR ALL OF THE AIR TO BE EXPELLED (WATER WILL FLOW UNDER PRESSURE FROM THE DRAIN PIPE) AND THEN CLOSE THE TAP. THIS WILL ENSURE NO AIR IS TRAPPED AND THAT THE CORRECT LIQUID PRESSURE READING IS GIVEN. THIS TAP MUST ALSO BE OPENED WHEN FLUSHING OUT TO PREVENT RESIDUE BUILD UP.

FIGURE 2

VALVE LAYOUT (MB TRAC)



FILLING PROCEDURE.

REFER TO FIGURE 2.

THE AIRTEC SPRAYER IS FITTED WITH A SPRAYER SELF-FILL AND A CHEMICAL INDUCTION BOWL. THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED WHEN FILLING THE SPRAYER.

A. DISENGAGE P.T.O.

B. USING A CLEAN WATER SOURCE, CONNECT THE SELF FILL HOSE TO THE MALE CAMLOCK COUPLING ON THE SUCTION VALVE, CHECKING FIRST THAT A RUBBER SEAL IS FITTED IN THE FEMALE CAMLOCK COUPLING ON THE END OF THE SELF-FILL HOSE. ROTATE THE SUCTION VALVE TO THE 'SELF FILL' POSITION.

C. SET THE PRESSURE VALVE TO THE FILL POSITION AND IMMERSE THE FILTER END OF THE SELF FILL HOSE INTO THE WATER SOURCE.

D. CHECK THAT THE SPRAYER CONTROLS ON THE CONTROL BOX ARE SWITCHED OFF AND ENGAGE THE P.T.O. GRADUALLY INCREASE THE P.T.O. SPEED TO 540 R.P.M. ⚠ **CAUTION** DO NOT ENGAGE PTO IMMEDIATELY AT FULL SPEED, OTHERWISE EXPENSIVE DAMAGE MAY OCCUR TO THE PUMP AND COUPLINGS.
THE SPRAYER WILL NOW BE SELF FILLING.

E. ALLOW THE SPRAYER TO FILL TO HALF ITS CAPACITY, OR HALF OF THE AMOUNT OF WATER REQUIRED. TURN THE SUCTION VALVE TO THE "FROM TANK" POSITION.

USE OF CHEMICAL INDUCTION BOWL.

NOTE: IF SPRAYER REQUIRES CALIBRATING THIS MUST BE DONE FIRST USING CLEAN WATER (REFER TO PAGE 23).

⚠ WARNING: BEFORE HANDLING ANY PESTICIDE CONTAINER, ENSURE THAT THE CORRECT PROTECTIVE CLOTHING IS WORN, AS SPECIFIED ON THE CHEMICAL CONTAINER LABEL.

IT IS RECOMMENDED THAT YOU FAMILIARIZE YOURSELF WITH THE SYSTEM USING WATER BEFORE USING CHEMICAL.

THE CHEMICAL INDUCTION BOWL IS FITTED TO THE SUCTION SIDE OF THE SELF FILLING SYSTEM. CHEMICAL IS DRAWN FROM THE INDUCTION BOWL AND IS MIXED WITH WATER DRAWN FROM THE TANK BEFORE PASSING THROUGH THE PUMP. THIS PREVENTS NEAT CHEMICAL FROM COMING INTO CONTACT WITH THE PUMP DIAPHRAGMS.

IT IS POSSIBLE TO INDUCT CHEMICAL BOTH WHEN THE SPRAYER IS SELF FILLING WITH WATER, AND WHEN THE CONTENTS OF THE TANK ARE BEING AGITATED. CARE SHOULD BE TAKEN TO ENSURE THAT THERE IS ENOUGH SPACE REMAINING IN THE TANK TO ACCEPT THE CHEMICAL.

REFER TO FIGURE 2.

1. THIS VALVE CONTROLS THE FLOW OF WATER TO THE INDUCTION BOWL RINSING JETS.

2. THIS VALVE CONTROLS THE FLOW OF CHEMICAL OUT OF THE INDUCTION BOWL.

WITH THE VALVES 1 & 2 BOTH CLOSED, POUR THE REQUIRED AMOUNT OF CHEMICAL INTO THE CHEMICAL INDUCTION BOWL. OPEN VALVE 2 SO THAT THE CHEMICAL IS TRANSFERRED TO THE TANK. IT IS IMPORTANT TO CLOSE VALVE 2 AS SOON AS THE INDUCTION BOWL IS EMPTY. IF IT IS LEFT OPEN, 'AIR WILL BE DRAWN INTO THE SYSTEM, CAUSING FOAMING IN THE TANK.

NOTE: OPERATORS MAY FIND THAT THERE IS INSUFFICIENT SUCTION TO EMPTY THE INDUCTION BOWL. IF THIS IS THE CASE THEN PARTIALLY CLOSE THE SUCTION VALVE **NEVER** CLOSE THIS VALVE FULLY, AS DAMAGE TO THE PUMP MAY OCCUR.

WHEN ALL OF THE LIQUID HAS BEEN ADDED THE BOWL CAN BE RINSED OUT BY TURNING ON VALVE 1 SO THAT WATER IS DELIVERED TO THE BOWL RINSING JETS.

HAVING FINISHED ADDING THE CHEMICAL, TURN OFF VALVE 1. AND THEN TURN OFF VALVE 2 WHEN THE INDUCTION BOWL IS EMPTY. FINALLY TURN THE SUCTION VALVE TO "SELF FILL" AND CONTINUE TO FILL THE TANK UNTIL THE DESIRED AMOUNT OF WATER IS IN THE TANK.

⚠ **IMPORTANT:** THE SIGHT GAUGES WILL NOT BE ACCURATE UNLESS THE SPRAYER IS PARKED ON PERFECTLY LEVEL GROUND. FOR GREATER ACCURACY CLEANACRES MACHINERY OFFER A HIGH OUTPUT FLOW METER FOR INSTALLATION IN THE SUCTION PIPE.

POWDER FORMULATIONS

THE INDUCTION BOWL MAY BE USED AS A CONTAINER TO CREAM POWDERS AS FOLLOWS:-

TURN VALVE 2 OFF AND OPEN VALVE 1 TO ADD WATER TO THE INDUCTION BOWL. CLOSE VALVE 1 WHEN THERE IS SUFFICIENT WATER IN THE INDUCTION BOWL TO MIX THE POWDERS. AFTER MIXING OPEN VALVE 2 TO EMPTY THE INDUCTION BOWL - REPEAT AS NECESSARY.

ALTERNATIVE METHOD FOR POWDERS.

PART FILL THE INDUCTION BOWL WITH WATER. NEXT PARTLY OPEN VALVE 2 SO THAT THE WATER LEVEL IN THE INDUCTION BOWL REMAINS CONSTANT I.E. THE RINSING JETS ARE ADDING WATER AS FAST AS IT IS BEING REMOVED. POWDERS MAY NOW BE ADDED DIRECTLY TO THE BOWL. MOST CHEMICALS WILL BE MIXED WITH THE WATER AS THEY ARE SUCKED INTO THE SPRAYER TANK. A PERIOD OF AGITATION IN THE MAIN TANK AS THE REST OF THE WATER IS BEING ADDED WILL COMPLETE THE MIXING PROCESS. ALWAYS READ THE LABEL BEFORE ADDING POWDER TO THE TANK, AS SOME PRODUCTS SHOULD NOT BE PRE-CREAMED, AND SHOULD BE ADDED DIRECT INTO THE SPRAYER TANK.

OPERATING TIPS.

1. IF IT IS NECESSARY TO STOP THE PUMP WHILE USING THE CHEMICAL INDUCTION BOWL ENSURE VALVE 2 IS CLOSED FIRST. THIS PREVENTS WATER RUNNING BACK INTO THE INDUCTION BOWL FROM THE TANK.

2. IF CHEMICAL IS PRONE TO FOAM USE THE CHEMICAL BOWL AT THE MINIMUM P.T.O. SPEED POSSIBLE.

BOOM UNFOLDING AND FOLDING.

ELECTRO HYDRAULIC CONTROLS ARE USED ON ALL OF THE BOOM FUNCTIONS. THIS MEANS THAT ALL BOOM FUNCTIONS CAN BE CONTROLLED FROM THE CAB USING THE CONTROL BOX AND ONE SPOOL VALVE. IN ORDER TO UNFOLD THE BOOMS, FOLLOW THE FOLLOWING PROCEDURE REFERRING TO FIGURE 1.

⚠ **WARNING** ENSURE THAT SPRAYER IS WELL AWAY FROM OVERHEAD POWER CABLES.

A. TURN ON THE HYDRAULIC ON/OFF SWITCH (NUMBER 1) ON THE CONTROL BOX.

B. PLACE THE APPROPRIATE SPOOL VALVE IN THE CONSTANT FLOW POSITION.

C. USING THE RAISE/LOWER SWITCH (NUMBER 3) RAISE THE BOOMS OUT OF THE BOOM RESTS UNTIL THE BOOMS ARE IN THE FULLY RAISED POSITION.

D. USING THE MANIFOLD SWITCH (NUMBER 2) OPEN OUT THE BOOMS UNTIL BOTH SIDES ARE IN THE FULLY UNFOLDED POSITION.

E. USING THE OUTER SECTION, FLIP OVER SWITCHES (NUMBERS 4 + 5) FIRST UNFOLD ONE OUTER SECTION AND THEN THE OTHER. ALWAYS ENSURE THAT BOTH OUTER SECTIONS ARE FULLY UNFOLDED.

THE TWO OUTER SECTIONS CAN BE UNFOLDED SIMULTANEOUSLY BY OPERATING BOTH SWITCHES AT THE SAME TIME.

⚠ **WARNING** ALWAYS BEWARE OF OVERHEAD POWER CABLES AND NEVER UNFOLD OR FOLD THE SPRAYER BOOMS WHEN PARKED BENEATH THESE CABLES.

F. LEVEL THE BOOM PARALLEL TO THE GROUND, USING THE BOOM TILT SWITCH NUMBER 6.

G. LOWER THE BOOMS TO THE REQUIRED WORKING HEIGHT. (SEE JET CHART). IF THE WORKING HEIGHT IS SUCH THAT THE BOOMS ARE AT THE BOTTOM OF THEIR TRAVEL IT IS REQUIRED TO RAISE THEM 50mm., SO THAT THE BOOM SUSPENSION HAS ROOM TO WORK.

H. FOLDING THE BOOMS IS THE REVERSE OF THE ABOVE PROCEDURE.

NOTE: MB-TRAC MOUNTED MACHINES.
ON THESE MACHINES IT IS NECESSARY TO PARTIALLY OPEN THE BOOMS IN ORDER TO GAIN ACCESS TO AND FROM THE CAB AS FOLLOWS:-

FOLD THE BOOMS IN THE USUAL WAY, BUT DO NOT LOWER FULLY INTO THE BOOM RESTS WHICH RUN ALONGSIDE THE SPRAY TANK. WHEN THE BOOMS ARE JUST CLEAR OF THE RESTS, UNFOLD THE BOOMS SLIGHTLY. THE RIGHT HAND BOOM WILL BE PREVENTED FROM OPENING BY THE BOOM STOP ON THAT SIDE OF THE MACHINE. THE LEFT HAND BOOM SHOULD BE OPENED SUFFICIENTLY TO ALLOW THE CAB DOOR TO OPEN, BUT THE BOOM MUST STILL BE ABLE TO REST ON THE REAR BOOM SUPPORT TO ALLOW THE BOOMS WEIGHT TO BE CARRIED ON THE RESTS.

⚠ **CAUTION.** NEVER TRAVEL WITH THE BOOMS IN A PARTIALLY FOLDED POSITION, ALWAYS ENSURE THAT THE BOOMS ARE PARKED SECURELY IN THE RESTS.

OPERATION OF TILT FOR BOOM INCLINATION.

THE BOOM ON THE CLEANACRES AIRTEC SPRAYER, PIVOTS ON A SINGLE, CENTRAL BEARING. THE BOOM IS PROVIDED WITH A FLOAT FACILITY BY MEANS OF SPRINGS AND SHOCK ABSORBERS. UNDER NORMAL CONDITIONS THESE WILL ACCOUNT FOR UNDULATIONS IN TERRAIN. IF HOWEVER, THE FIELD IS DRILLED ALONG THE SIDE OF A BANK, IT MAY BE NECESSARY TO INCLINE THE BOOM TO THE LEFT OR RIGHT TO FOLLOW THE CONTOUR OF THE GROUND.

TO INCLINE THE BOOM TO THE LEFT, THE BOOM TILT SWITCH (NO. 6) SHOULD BE MOVED TO THE LEFT AND VICE-VERSA FOR THE RIGHT.

WHEN RETURNING TO LEVEL GROUND, RETURN THE BOOM TO THE FLOAT POSITION.

⚠ **IMPORTANT:** ALWAYS ENSURE THAT THE BOOMS ARE LEVEL BEFORE FOLDING. IF THIS IS NOT DONE, DAMAGE TO THE BOOMS MAY RESULT.

GENERAL GUIDELINES FOR THE SELECTION OF SPRAY QUALITY

⚠ **CAUTION:** THE FOLLOWING GUIDELINES ARE DESIGNED TO HELP OPERATORS SELECT AIRTEC SETTINGS. HOWEVER, REFERENCE SHOULD BE MADE TO YOUR AGRONOMIST FOR GUIDANCE ON TANK MIX COMPATABILITY, SPRAY QUALITY SELECTION AND VOLUME REQUIREMENTS.

SOIL APPLIED HERBICIDES

FOR OVERALL APPLICATION TO BARE SOIL, THE TARGET IS CLEAR AND THE SPRAY QUALITY SETTING IS NOT HIGHLY CRITICAL, PROVIDED THE CHEMICAL IS DEPOSITED ON THE GROUND EVENLY WITHOUT TOO MUCH GAP BETWEEN SPRAY DROPS, AT THE REQUIRED DOSE, AND WITH MINIMUM DRIFT.

FOLIAR APPLIED PRODUCTS

APPLICATIONS TO PLANT FOLIAGE ARE MORE COMPLEX. THE TARGET FOR FOLIAGE HERBICIDES IS THE WEED AND NOT THE CROP, WHEREAS FUNGICIDES, INSECTICIDES, AND CROP GROWTH REGULATORS ARE AIMED AT THE CROP. IN MANY INSTANCES A TANK MIX OF THE ABOVE PRODUCTS REQUIRES AN APPLICATION SYSTEM TO COMPROMISE BETWEEN THE REQUIREMENTS FOR DIFFERENT DROPLET SIZES.

WITH CONVENTIONAL SPRAYERS, HERBICIDES, SYSTEMIC FUNGICIDES, INSECTICIDES, AND GROWTH REGULATORS ARE GENERALLY APPLIED AT A PRESSURE OF 3 BARS (45 PSI) THROUGH FAN NOZZLES, AT VOLUMES OF 100-200 L/ha (10-20 G.P.A.).
AT THESE PRESSURES AND VOLUMES, THERE IS A TENDENCY TOWARDS PRODUCING A WIDE RANGE OF DROP SIZES FROM 1 - 600um IN DIAMETER WITHIN WHICH ARE A VERY LARGE NUMBER OF SMALL DROPS OF LESS THAN 100um WHICH ARE LIABLE TO DRIFT OVER LONG DISTANCES. ALTHOUGH THE TOTAL AMOUNT OF ACTIVE INGREDIENT FALLING OUTSIDE THE TARGET AREA MAY BE VERY SMALL, THE ENVIRONMENTAL EFFECTS

COULD BE UNDESIRABLE. THE VERY LARGE DROP FRACTION (350um upwards) IS ALSO UNDESIREABLE DUE TO RUN OFF FROM FOLIAGE LEADING TO A RELATIVELY SMALL PROPORTION OF THE SPRAY DROPS BEING RETAINED BY THE FOLIAGE. MANUFACTURERS APPLICATION RATES TEND TO ALLOW FOR A RELATIVELY HIGH PROPORTION OF WASTE TO COPE WITH THE INEFFICIENCY OF THE HYDRAULIC NOZZLE.

AIRTEC SPRAYERS EMIT A SIGNIFICANTLY SMALLER FRACTION OF LARGE DROPLETS, AND THOSE WHICH IT DOES ARE AIR INCLUDED AND CONSEQUENTLY RETAIN ON THE TARGET, WHICH LEADS TO LESS WASTAGE AND A COMMENSURATE REDUCTION OF THE AMOUNT OF WATER REQUIRED TO TREAT A UNIT AREA. IN ADDITION THE FINE DROPLETS (1 - 100 um) ARE ENTRAINED IN THE CURTAIN OF AIR EMITTED FROM THE NOZZLE AND ARE CONSEQUENTLY CARRIED INTO THE CROP CANOPY RATHER THAN DRIFTING OUTSIDE THE TARGET AREA.

ALL THE REQUIRED SPRAY QUALITY CATEGORIES CAN BE ACHIEVED WITH THE AIRTEC, NOT BY CHANGING NOZZLES AS WITH CONVENTIONAL SPRAYERS, BUT MERELY BY ALTERING THE COMBINATION OF AIR AND WATER PRESSURES. ONE CAN ALSO CHANGE SPRAY QUALITY CATEGORY IN THE MIDDLE OF AN APPLICATION WITHOUT ALTERING THE APPLICATION RATE - PARTICULARLY USEFUL IF SPRAYING IS NOT TO BE INTERRUPTED DUE AN INCREASE IN WIND SPEED.

SPRAY QUALITY GUIDE.

IF A CHEMICAL IS APPLIED AT THE CORRECT APPLICATION RATE, AT THE CORRECT TIME, AND WITH THE CORRECT SPRAY QUALITY FOR THE TARGET, YOU WILL GET THE BEST POSSIBLE RESULTS FROM YOUR CHEMICALS WITH MINIMUM RISK OF DRIFT.

THE BRITISH CROP PROTECTION COUNCIL HAS DIVIDED SPRAY QUALITIES INTO FIVE CATEGORIES. VERY FINE, FINE, MEDIUM, COARSE, VERY COARSE. THE VERY FINE AND VERY COARSE CATEGORIES ARE NOT COMMONLY USED.

YOUR CHEMICAL LABEL RECOMMENDATIONS MAY WELL REFER TO A PREFERRED SPRAY QUALITY TO GIVE BEST EFFECTIVENESS AND SAFETY, SO YOU SHOULD SELECT A SETTING TO GIVE THIS QUALITY. IF NO SPRAY QUALITY IS RECOMMENDED BY THE CHEMICAL MANUFACTURER, USE A MEDIUM SPRAY QUALITY. THE SPRAY QUALITY FOR EACH SETTING IS INDICATED IN THE JET CHART (APPENDIX 1), AND WITH THE AIRTEC YOU SHOULD HAVE NO PROBLEM IN SELECTING A SUITABLE SETTING.

SPRAY QUALITY	USED FOR	LEAF RETENTION	DRIFT RISK
FINE	GOOD COVER, e.g. SOME FUNGICIDES AND INSECTICIDES	GOOD	MEDIUM/HIGH. **WARNING:** DO NOT USE FOR VERY TOXIC PRODUCTS OR WHERE DRIFT MAY CAUSE PROBLEMS.
MEDIUM	MOST PRODUCTS. GENERAL HERBICIDES	GOOD	MEDIUM
COARSE	SOIL-APPLIED HERBICIDES	POOR	LOW

CALIBRATION PROCEDURE.

ONCE YOU HAVE SELECTED AND FITTED THE CORRECT NOZZLE AND DECIDED ON THE **AIRTEC** SETTING, IT IS THEN NECESSARY TO CALIBRATE YOUR SPRAYER.

1. **READ LABEL** ON THE CHEMICAL PACK (OR ACCOMPANYING LEAFLET) FOR RECOMMENDED SPRAY QUALITY, AND APPLICATION RATE. THE LABEL WILL ALSO ADVISE YOU ON THE SAFETY EQUIPMENT THAT YOU ARE OBLIGED TO WEAR.

2. CARRY OUT A TRIAL RUN TO ESTABLISH A FORWARD SPEED WHICH GIVES AN ACCEPTABLE LEVEL OF BOOM STABILITY AND A GEAR WHICH GIVES A PTO SPEED OF 540 RPM.

3. CARRY OUT SPEED CHECK OVER 100 METRES, USING GEAR AND P.T.O. RPM AS ABOVE. TAKE THE TIME IN SECONDS, TO COVER THE DISTANCE.

ESTABLISH THE FORWARD SPEED FROM THE FORMULA:

360 ÷ TIME (IN SECONDS) = SPEED (IN KILOMETERS PER HOUR)

4. SELECT REQUIRED AIRTEC SETTING BY REFERRING TO THE JET CHART FOR THE RESTRICTORS FITTED (APPENDIX 1). ESTABLISH THE DESIRED AIR AND LIQUID PRESSURE TO GIVE THE CORRECT APPLICATION RATE AT THE DESIRED FORWARD SPEED AND SPRAY QUALITY.

MAKE A NOTE OF THE REQUIRED PRESSURES AND NOZZLE OUTPUT. ALSO NOTE THE OTHER SETTINGS THAT GIVE DIFFERENT SPRAY QUALITIES WITHIN THE SAME APPLICATION RATE SHOULD YOU NEED TO ALTER THE SETTINGS TO ALLOW FOR A CHANGE IN THE WEATHER CONDITIONS.

5. TURN BOOM SECTIONS ON AND SET PRESSURES.

6. **CHECK NOZZLE** SPRAY PATTERNS AND ALIGNMENT VISUALLY. REPLACE ANY ROGUE NOZZLES.

7. **RE-CHECK PRESSURES**

8. COMPARE THE OUTPUT OF INDIVIDUAL NOZZLES BY USE OF THE CALIBRATION BEAKER PROVIDED. CHECK AT LEAST ONE NOZZLE ON EACH BOOM SECTION AND COMPARE THE OUTPUT OVER ONE MINUTE. RE-ADJUST LIQUID PRESSURE IF NECESSARY TO ACHIEVE DESIRED OUTPUT. **NOTE:** LIQUID PRESSURE WILL ONLY NEED ALTERING BY A SMALL AMOUNT TO ACHIEVE A RELATIVELY LARGE DIFFERENCE IN FLOW.

9. IF THE OUTPUT DIFFERS BY A LARGE AMOUNT, RE-CHECK CALIBRATION AND CALCULATIONS AND CHANGE SETTINGS IF NECESSARY.

10. SET BOOM HEIGHT.

THE MINIMUM NOZZLE HEIGHT ABOVE TARGET IS 50cm.

MISCELLANEOUS CONVERSION FACTORS

ONE GALLON PER ACRE = 11.23 LITRES PER HECTARE.

ONE MILE = 5,280 FEET = 1610 METRES = 1.61 KILOMETRES.

ONE GALLON = 4.55 LITRES.

ONE POUND PER SQUARE INCH (PSI) = 0.070 BARS = 6.895 KILOPASCAL.

ONE BAR = 14.5 PSI.

FILTRATION SYSTEM.

PRESSURE FILTRATION

CLEANACRES SPRAYERS ARE ALL FITTED WITH A MAIN IN-LINE SELF-FLUSHING PRESSURE FILTER. THE FILTER IS MOUNTED JUST BEFORE THE PRESSURE MANIFOLD. THE SELF-FLUSHING FILTER OBVIATES THE NEED TO REMOVE THE FILTER ELEMENT FOR DAILY CLEANING.

FILTERING MODE: VALVE CLOSED. DIRT IS DEPOSITED INSIDE THE SCREEN.

FLUSHING MODE: VALVE OPEN. FLUSH DIRT THROUGH OPEN VALVE.

SUCTION FILTRATION

FILTRATION ON THE SUCTION SIDE OF THE SPRAYER IS PROVIDED BY THE MEANS OF A FILTER THAT ENSURES ALL LIQUID IS FILTERED WHEN SPRAYING OR FILLING. THE FILTER IS LOCATED BETWEEN THE SUCTION VALVE AND THE PUMP.

WASH OUT THE FILTER BY UNSCREWING, (WHEN TANK IS EMPTY), THE FILTER BOWL AND REMOVING THE FILTER ELEMENT. WHEN RE-ASSEMBLING SMEAR WATER PUMP GREASE ON THE SEAL TO PREVENT PINCHING AND LEAKS.

AS WITH THE PRESSURE FILTER THERE ARE A RANGE OF COLOUR CODED ELEMENTS: 20 MESH, COARSE (BLACK). 30 MESH, COARSE (WHITE) AND 50 MESH, MEDIUM (BLUE). THE 30 MESH FILTER IS FITTED AS STANDARD.

⚠ **CAUTION:** WHEN RE-ASSEMBLING FILTERS IT IS IMPORTANT NOT TO OVERTIGHTEN AS THIS WILL CRUSH THE 'O'RINGS AND CAUSE LEAKING OR AIR TO BE DRAWN INTO THE SYSTEM. AIR LEAKING THROUGH THE SUCTION FILTER IS A COMMON FAULT WHICH CAN STOP THE SPRAYER FUNCTIONING CORRECTLY.

USE OF CONSTANT RECIRCULATING SYSTEM. (CRS).

THE LIQUID LINES ON THE BOOM ARE FITTED WITH A CONSTANT RECIRCULATING SYSTEM. THIS ENSURES THAT WHEN LOW VOLUMES ARE BEING USED, POWDERED FORMULATION WILL NOT START TO SETTLE OUT IN THE LINE.

THE SPRAYLINE IS FED FROM THE END NEAREST TO THE SPRAYTANK. AT THE OTHER END OF THE SPRAYLINE THERE IS A RETURN PIPE ROUTED BACK DOWN THE BOOM AND BACK TO THE TANK. INSIDE THE TANK THERE ARE DROP PIPES WHICH RETURN THE EXCESS LIQUID NOT SPRAYED THROUGH THE LINE.

FLUSHING SPRAYER THROUGH WITH FRESH WATER

WHEN SPRAY TANK IS EMPTY.

THE SPRAYER SHOULD ALWAYS BE FLUSHED THROUGH EVERY DAY BEFORE A CHANGE OF CHEMICALS. THIS IS CRITICAL TO AVOID DAMAGE TO RUBBER COMPONENTS SUCH AS PUMP DIAPHRAGMS.

PLEASE CARRY OUT THE FOLLOWING PROCEDURE:

1. TURN OFF THE P.T.O.

2. TURN THE SUCTION VALVE (FIGURE 2) TO 'SELF FILL' AND CONNECT THE SELF FILL HOSE. PLACE THE FILTER END OF THE SELF FILL HOSE IN A CLEAN WATER SOURCE.

3. SET THE PRESSURE VALVE TO 'SPRAY' (FIGURE 2) AND ENGAGE THE P.T.O. WITH ALL OF THE BOOM SECTIONS IN THE "ON" POSITION. FLUSH WATER THROUGH THE BOOM FOR APPROXIMATELY FIVE MINUTES.

4. TURN OFF THE P.T.O. AND TURN THE C.R.S. TAPS TO DUMP.
THEN REPEAT THE PROCESS AS IN 3 AND WHILST CARRYING THIS OUT TURN ON THE FLUSHING FILTER, THE COMPRESSOR, AND PRESSURE GAUGE DRAIN VALVES INDIVIDUALLY FOR 10 SECONDS EACH.

5. IF IT IS LIKELY TO FREEZE EITHER ADD ANTIFREEZE THROUGH THE CHEMICAL INDUCTION BOWL, OR PARK THE SPRAYER IN A SUITABLY INSULATED BARN (SEE FROST PROTECTION PAGE 37).

6. THOROUGHLY WASH DOWN THE EXTERIOR OF THE SPRAYER, USING A SUITABLE DETERGENT.

7. OPEN ALL DRAIN TAPS AS LISTED BELOW:-

COMPRESSOR

TANK

SIGHT GAUGE

FLUSHING FILTER

PRESSURE GAUGE.

8. CLEAN THE SUCTION FILTER AND REPLACE.

⚠ CAUTION. ENSURE THAT WASHING OUT OF THE SPRAYER IS CARRIED OUT WHERE SPRAY RESIDUE WILL CAUSE NO HARM TO LIVESTOCK OR THE ENVIRONMENT IN ACCORDANCE WITH THE GUIDELINES SET OUT IN THE FOOD AND ENVIRONMENT PROTECTION ACT, 1985.

FLUSHING OUT THE SPRAYLINES AND PLUMBING

WHEN CHEMICAL IN TANK.

AS DAILY FLUSHING OUT IS CRITICAL, IT MAY BE NECESSARY TO FLUSH OUT THE BOOMS AND PLUMBING WITH FRESH WATER, WHILST THERE IS STILL CHEMICAL IN THE SPRAY TANK.

PARK THE SPRAYER ON FIRM, LEVEL GROUND, WITH THE BOOMS UNFOLDED. SET THE PRESSURE VALVE TO 'SPRAY', CONNECT A FRESH WATER SUPPLY TO THE 'SELF FILL'. DISCONNECT THE LIQUID PRESSURE REGULATING PIPE FROM THE TOP OF THE TANK AND ALLOW WATER FROM THIS PIPE TO FLOW ONTO THE GROUND. TURN THE COMPRESSOR RETURN TAP TO THE DRAIN POSITION SO THAT WATER FROM THE COMPRESSOR AGAIN DRAINS ONTO THE GROUND. TURN THE CRS RETURN TAPS TO DRAIN AND TURN ON ALL OF THE BOOM SECTIONS.

⚠ **CAUTION** NEVER SHUT OFF A BOOM SECTION WHEN FLUSHING SPRAYER THROUGH AS ABOVE.

ENGAGE THE P.T.O. AND ALLOW FRESH WATER TO PASS THROUGH THE SPRAY LINES, FOR ABOUT 5 MINUTES, TO ENSURE THAT ALL CHEMICAL IS THROUGHLY RINSED OUT.

OPEN THE FOLLOWING DRAIN TAPS: COMPRESSOR, FLUSHING FILTER, AND PRESSURE GAUGE.

THE CHEMICAL IN THE TANK WILL NOT HAVE BEEN DILUTED AND CAN BE LEFT OVERNIGHT.

⚠ **IMPORTANT:** IF CHEMICAL HAS BEEN LEFT IN THE TANK OVERNIGHT OR FOR A SIMILAR TIME PERIOD, THEN ALWAYS ALLOW A PERIOD OF AGITATION BEFORE SPRAYING. OBSERVE CHEMICAL MANUFACTURERS STORAGE RECOMMENDATIONS AS SOME PRODUCTS GO SOLID IF LEFT STANDING.

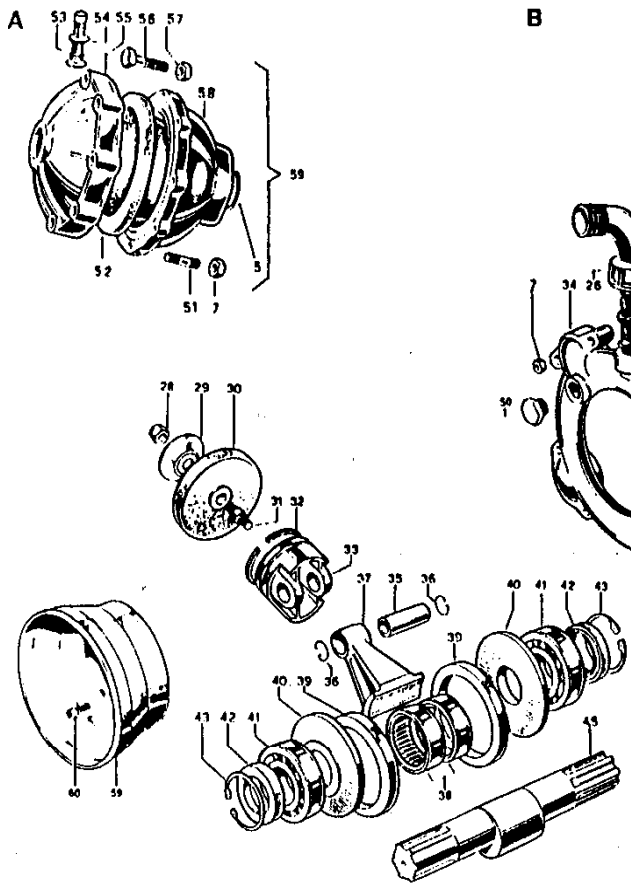
Your Cleanacres Sprayer may be fitted with a CL 90 Air Cooled, Oil Lubricated Compressor. It is very important that you use the correct oil. Using the incorrect oil may cause the compressor to over heat and partially seize.

The following compressors may be fitted:

MDC 72 or 124 Liquid Cooled	: Shell Corena H150 or equivalent
CL 90 Air Cooled	: 15/40 Turbo Diesel Engine Oil
KP 85A Kompressor	: Shell Talpa or equivalent
Hammond E 150 or E 50	: No oil lubrication

If you are unsure please do not hesitate to contact us.

AR150bp

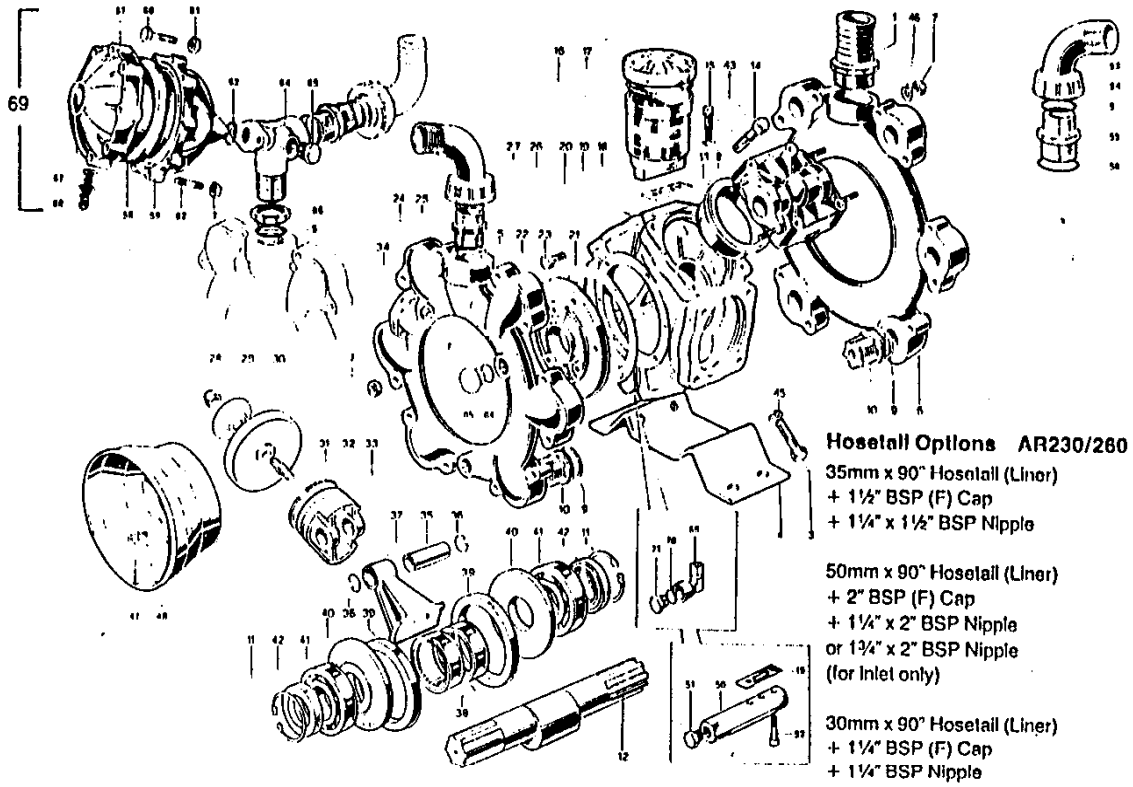


★ = Items in Winter Overhaul Kit – 47KIT150

	Ref.	Description	Qty	Part No.
B	1	50mm 90° Hosetail	1	47760020
	2	Hosetail Nut	1	47760040
	3	'O' Ring	1	47620210
	4	Hexagon Nipple	1	47760030
	5	'O' Ring	2	47250310
	6	Inlet Manifold	1	47760220
	7	Nut 8MA	16	47380240
	8	Cylinder Head	4	47750100
★	9	'O' Ring	8	47680070
★	10	Valve	8	47759050
	11	Bolt 12MA x 70	4	47750070
	12	⅜" BSP Plug	1	47030171
	13	Piston Sleeve	4	47750110
	14	Bolt 12MA x 65	12	47750060
	15	Screw	2	47680350
	16	'O' Ring	1	47580230
	17	Oil Reservoir Cap	1	47750050
	18	Oil Reservoir	1	47750030
	19	Gasket	1	47750040
	20	Body	1	47760010
	21	Body Gasket	1	47680250
	22	Body Plate	1	47680020
	23	Bolt 10MA x 25	6	47160670
	24	Hexagon Nipple	1	47540530
	25	'O' Ring	1	47250310
	26	Hosetail Nut	1	47540540
	27	35mm 90° Hosetail	1	47392130
	28	Diaph. Retaining Nut	4	47550131
	29	Diaph. Retaining Plate	4	47580090
★	30	Diaphragm	4	47550085
	31	Stud	4	47550270

Hosetail Options AR150	Part No.
30mm x 90° Hosetail (Liner)	47580040
1¼" BSP (F) Cap	47580060
1¼" BSP Nipple	47580030
50mm 90° Hosetail (Liner)	47760020
+ 2" BSP (F) Cap	47760040
+ 1¼" x 2" BSP Nipple	47760030
35mm x 90° Hosetail (Liner)	47392130
+ 1½" BSP (F) Cap	47540540
+ 1¼" x 1½" BSP Nipple	47540530

	Ref.	Description	Qty	Part No.
	32	Piston Ring	4	47500260
	33	Piston	4	47750120
	34	Outlet Manifold	1	47760070
	35	Piston Spindle 48 x 8	4	47160700
	36	Circlip 18mm	8	47160691
	37	Con Rod (price each)	1	47760140
	38	Needle Bearing	2	47750090
	39	Spacer Ring	2	47750130
	40	Spacer	2	47540040
	41	Bearing	2	47230350
	42	Seal	2	47230380
	43	Circlip 62mm	2	47200390
	44	Pump Base	2	47760200
	45	Shaft	1	47750170
	47	Washer	2	47380241
	48	Washer	4	47250141
	49	Washer	16	47390311
	50	Bung	2	47330170
	59	P.T.O. Guard	1	47540660
	60	Screw 8M8 x 15	3	47180431
A	5	'O' Ring	1	47390290
	7	Nut 8MA	2	47380240
	51	Stud 8MA x 40	2	47390670
	52	Diaphragm	1	47550190
	53	'O' Ring	1	47650542
	54	Air Valve	1	47180020
	55	Upper Air Chamber	1	47620230
	56	Screw 8MA x 45	8	47380250
	57	Nut 8MA	8	47390270
	58	Lower Air Chamber	1	47680180
	59	Air Receiver Assy	1	37ARARA1



Hosetail Options AR230/260	Part No.
35mm x 90° Hosetail (Liner)	47392130
+ 1½" BSP (F) Cap	47540540
+ 1¼" x 1½" BSP Nipple	47540530
50mm x 90° Hosetail (Liner)	47760020
+ 2" BSP (F) Cap	47760040
+ 1¼" x 2" BSP Nipple	47760030
or 1¾" x 2" BSP Nipple (for Inlet only)	47750330
30mm x 90° Hosetail (Liner)	47580040
+ 1¼" BSP (F) Cap	47580060
+ 1¼" BSP Nipple	47580030

★ = Items in Winter Overhaul Kit — 40KIT230 / 40KIT260

	Ref.	Description	Qty	Part No.
	1	50mm Hosetail	1	47750160
	1	60mm Hosetail	1	47750150
	2	'O' Ring	1	47030281
	3	Bolt 12MA x 70	4	47750070
	4	Pump Base	1	47750200
	5	'O' Ring	1	47620210
	6	Inlet Manifold	1	47750220
	7	Nut 8MA	24	47380240
	8	Cylinder Head	6	47750100
★	9	'O' Ring	12	47680070
★	10	Valve	12	47759050
	11	Circlip 62mm	2	47200390
	12	Shaft (AR230BP)	1	47750170
	12	Shaft (AR260BP)	1	47750171
	13	Piston Sleeve (AR230BP)	6	47750111
	13	Piston Sleeve (AR260BP)	6	47750112
	14	Bolt 12MA x 65	20	47750060
	15	Bolt 8MA x 35	2	47680350
	16	'O' Ring	1	47580230
	17	Cap (AR180)	1	47750051
	17	Oil Reservoir Cap	1	47750050
	18	Oil Reservoir	1	47750030
	19	Gasket	1	47750040
	20	Body	1	47750010
	21	Body Gasket	1	47680250
	22	Body Plate	1	47680020
	23	Bolt 10MA x 25	6	47160670
	24	Hexagon Nipple	1	47540530
	25	'O' Ring	1	47250310
	26	Hosetail Nut	1	47540540
	27	35mm 90° Hosetail	1	47392130
	28	Diaph. Retaining Nut	6	47550131
	29	Diaph. Retaining Plate	6	47580090
★	30	Diaphragm	6	47550085
	31	Stud	6	47550270
	32	Piston Ring	6	47500260

Ref.	Description	Qty	Part No.
33	Piston	6	47750120
34	Outlet Manifold	1	47750420
35	Piston Spindle 48 x 18	6	47160700
36	Circlip 18mm	12	47160691
37	Con Rod	6	47750140
38	Needle Bearing	2	47750090
39	Spacer Ring	2	47750130
40	Spacer	2	47540040
41	Bearing	2	47230350
42	Seal	2	47230380
43	Nut 8MA	2	47380241
45	Washer	4	47250141
46	Washer	24	47390311
47	Screw	3	47180430
48	PTO Guard	1	47540660
50	Oil Outlet	1	47750230
51	Bung	1	47030171
52	Screw	2	47540290
53	Hosetail	1	47760020
54	Hosetail Nut	1	47760040
55	Nipple	1	47750330
56	'O' Ring	1	47030281
57	Upper Air Chamber	1	47620230
58	Diaphragm	1	47550190
59	Lower Air Chamber	1	47680180
60	Screw Bolt 8MA 45	8	47380250
61	Nut 8MA H65	8	47390270
62	Stud	2	47390670
63	'O' Ring	1	47390290
64	Elbow	1	47760300
65	Bung	2	47330170
66	Nut	1	47760310
67	'O' Ring	1	47650540
68	Air Valve	1	47180020
69	Air Receiver Assy	1	37ARARA1

CLEANACRES MACHINERY SERVICE BULLETIN.

6TH JUNE 1990

NO: 101

REF: NEOPRENE BLOCKS FITTED TO E.C.A. SPRAYERS

These are located at the centre of the back frame and cushion the yaw on the booms.

The blocks will wear, and therefore should be inspected on a weekly basis. If they show signs of wear, or damage, they should be replaced immediately. The blocks are available from your local dealer or Cleanacres Machinery.

When fitting new blocks, they should not be greased as this will cause them to distort and will seriously reduce their service life.

Expensive damage can occur to the fold rams and the centre section if the sprayer is used with worn or damage neoprene blocks. Whilst checking blocks, ensure that all nuts and bolts in the block housing assembly are tight, and that the ram ends are properly secured.

Damage to the sprayer resulting from worn blocks will not be covered under warranty.

Alistair Hett
Service Manager

PRE AND POST SPRAYING CHECKS

PERIOD	ITEM/AREA	CHECK
DAILY PRE-SPRAYING: ⚠WARNING: dis-engage P.T.O. and switch off tractor engine.	LIQUID SUCTION FILTER	Clean And Replace.
	COMPRESSOR AIR FILTER	Check not clogged with dust, replace if necessary. ⚠CAUTION: When conditions are dusty it can become clogged and damage to the compressor could result.
	COMPRESSOR OIL RESERVOIR.	Check level. Only use specified oil. examine pipe to compressor for air locks or damage. Check for any water contamination.
	PUMP OIL	Check level. only use specified oil.
	P.T.O. SHAFT	Grease universal joints and guard.
	TANK/PLUMBING	Ensure that absolutely no resedue has been left over from the last spray application.
DAILY PRE-SPRAYING: CHECKS WITH Sprayer running with water in tank.	COMPRESSOR	Check the required No. of oil drops per minute. ⚠CAUTION: Switch off immediately if not obtained. Check water is circulating in compressor by opening compressor drain tap.
	PUMP	Check oil is not overflowing from cap. ⚠CAUTION: switch off immediately if this is occuring.

LIQUID FERTILIZER.

ALL CLEANACRES AIRTEC SPRAYERS ARE SUITABLE FOR APPLYING LIQUID FERTILIZER SOLUTION IF A SECOND FERTILIZER LINE IS FITTED. THE AIRTEC NOZZLE IS NOT SUITABLE FOR THE APPLICATION OF LIQUID FERTLIZER. IT IS IMPORTANT TO REALIZE THAT FERTILIZER SOLUTION IN THIS CASE IS CONSIDERED ONLY AS NITROGEN, AS EITHER A COMPOUND OR STRAIGHT, IN A FULLY AQUEOUS SOLUTION. FERTILIZER OF THE SUSPENSION TYPE CANNOT BE APPLIED USING STANDARD CLEANACRES SPRAYERS.

TO AVOID PLANT SCORCH, THE USE OF DRIBBLE BARS IS RECOMMENDED AS THESE PRODUCE VERY LARGE DROPLETS WHICH ROLL OFF THE PLANT LEAVES.

CHANGING TO SECOND SPRAYLINE.

1. ENSURE THAT THE SPRAYER HAS BEEN THROUGHLY FLUSHED OUT.

2. AT THE TANK END OF EACH SPRAYLINE WILL BE FOUND MALE CAMLOCK FITTINGS. DISCONNECT THE LIQUID FEED LINE FROM THE AIRTEC SPRAY LINE AND CONNECT THE FEED LINE TO THE LIQUID FERTILIZER LINE.

3. FIT BLANKING CAPS TO THE AIRTEC SPRAYLINE TO PREVENT ACCESS BY FOREIGN MATTER.

4. THE SECOND LINE IS NOT FITTED WITH CRS AS IT IS USED FOR HIGH VOLUME SPRAYING SUCH AS LIQUID FERTILIZER. THE SPRAYER IS NOW READY TO SPRAY THROUGH THE SECOND LINE.

NOTE: THE AIR SYSTEM WILL HAVE NO EFFECT ON THE SECOND LINE AND THE SPRAYER WILL BE OPERATING AS A CONVENTIONAL SPRAYER.
FOR CALIBRATION REFER TO THE LIQUID FERTILIZER CALIBRATION CHART.

PERIOD	ITEM/AREA	CHECK
DAILY PRE-SPRAYING CHECKS CONTINUED.	C.R.S.	Check restrictors for blockages.
	AGITATION	visually check for flow.
	BOOM SOLENOIDS	Check for operation:
	NOZZLES	Check for alignment & pattern, and that nozzle is correct for desired application rate.
	GENERAL	Walk around machine to observe any leaks or chafing hoses.
	COMPRESSOR PRESSURE RELIEF VALVE	Should be blowing off when solenoids are switched off.
	PRESSURE ADJUSTMENT	Check full range of both liquid and air pressures is available.
	BOOM HEIGHT	Adjust to 50cm above desired target or top of crop whichever is taller, if using skids adjust to suit.
	CALIBRATE	Always carry this out using clean water.

YOU ARE NOW READY TO ADD THE CHEMICAL.

PERIOD	ITEM / AREA	CHECK
DURING SPRAYING	PRESSURE SETTINGS	Ensure they remain correct & constant. Re-adjust if necessary.

PERIOD	ITEM/AREA	⚠ CAUTION: CHECK
		Flickering of the liquid pressure guage will indicate a pump problem or an empty tank. Stop immediately.
DURING SPRAYING	NOZZLE BLOCKAGES	Be aware that a nozzle may only partially block showing a smoky stream of droplets.
	FORWARD SPEED & P.T.O. R.P.M.	Keep both as constant as possible.
	PRESSURES	Keep a constant watch for any changes in either liquid or air pressures and re-adjust as necessary
	BOOM SHUT OFF RESPONDING SLOWLY	Will be due either to faulty solenoid or more likely the C.R.S. restrictor being blocked.
	HEIGHT/ANGLE OF BOOM	Boom must be parallel to ground and at correct height. Use boom controls to adjust.
	TANK CONTENTS	Do not start another pass if you do not have enough in the tank to complete that pass.
	WEATHER CONDITIONS	If wind increases and yet there is an overriding urgency to finish the job, select a coarser droplet pressure setting for the same application rate. ⚠ CAUTION: Consult your agronomist if in doubt about spray quality range

PERIOD	ITEM/AREA	CHECK
AFTER SPRAYING	SURPLUS CHEMICAL IN THE TANK.	Either pump into a storage tank or if small amount dispose of safely in accordance with Codes of Practice.
	FLUSHING OUT	Flush out and wash down. ⚠ CAUTION: if flushing out is not done on a daily basis, damage may occur to the pump and plumbing.
	FROST PROTECTION	Anti-freeze or store in a frost free building.
WEEKLY or or more frequently if large acreage being covered	BOOM BREAKBACK	Check full breakback is unrestricted.
	ALL GREASE POINTS	Grease.
	GEARBOX OIL	Check level.
MONTHLY	NOZZLE WEAR	Calibrate and check flood tips for wear. Also check visual pattern and alignment.
	ELECTRICAL CONNECTIONS	Clean and spray with a water dispersing oil.
	PLUMBING	Check for any signs of hoses chafing.
	AIR CONNECTIONS	Check for leaks and spray with water dispersing oil.
SEASONALLY	FLOOD TIPS	Remove and throughly clean.
	COMPRESSOR	Flush out oil reservoir and replace oil.
	GEARBOX	Change oil.

ROUTINE MAINTENANCE

GUIDELINES FOR REPLACEMENT COMPONENTS ARE AS FOLLOWS:-

COMPONENT	PERIOD
COMPRESSOR AIR FILTER	CHECK FREQUENTLY PARTICULARILY IN DUSTY CONDITIONS - REPLACE MONTHLY
PUMP DIAPHRAGMS D.C.V. RUBBERS C.R.S. RETURNS RESTRICTORS PRESSURE SET DIAPHRAGM & GASKETS POLO MINT WASHERS FILTER O-RINGS	ANNUALLY OR EVERY 5,000 HECTARES WHICHEVER IS SOONER.
SOLENOID DIAGHRAMS PUMP VALVES	BI-ANNUALLY OR EVERY 10,000 HECTARES, WHICHEVER IS SOONER.
FLOODTIPS	WHEN THEY SHOW SIGNS OF WEAR. THIS IS CAUSED BY POOR QUALITY WATER OR THE ABRASIVENESS OF THE CHEMICALS. A SIMPLE CHECK IS TO RUB THE END OF A MATCH STICK ALONG THE FLOOD TIP FACE AND IF YOU FEEL A DIMPLE THEY NEED REPLACING.
RESTRICTORS	WHEN THE FLOW RATE VARIES BY MORE THAN 5% FROM CHART.

⚠ CAUTION: COMPONENTS, PARTICULARILY THOSE MADE OF RUBBER, WILL LAST LONGER IF THE SPRAYER IS FLUSHED OUT AFTER USE EVERY DAY.

BOOM MAINTENANCE AND SETTING.

THE CLEANACRES BOOM REQUIRES VERY LITTLE ADJUSTMENT. THE FOLLOWING INSTRUCTIONS WILL GIVE MANY YEARS OF TROUBLE FREE SERVICE.

1. GREASE ALL NIPPLES ON THE BOOMS ONCE EVERY WEEK.

2. BEFORE DELIVERY THE BOOM TILT IS SET SO THAT THE BOOMS ARE LEVEL WHEN THE TILT RAM IS IN ITS HALF WAY POSITION AS THE LIFE OF THE MACHINE PROGRESSES IT MAY BE NECESSARY TO ADJUST THE TENSION ON THE BALANCING SPRINGS IN ORDER TO KEEP THE BOOMS LEVEL.

THIS OPERATION SHOULD ONLY BE CARRIED OUT WITH THE SPRAYER STANDING ON LEVEL GROUND WITH THE BOOMS FULLY UNFOLDED. SET THE TILT RAM TO ITS HALF WAY POSITION AND THEN ADJUST THE SPRING TENSIONING BOLTS TO SET THE BOOM LEVEL. ALWAYS TIGHTEN THE LOCK NUTS AFTER ADJUSTING THE SRING TENSION.

3. THE CLEANACRES BOOMS ARE FITTED WITH A BREAKBACK SECTION AT THE END OF EACH BOOM. THESE SECTIONS SHOULD ALWAYS BE FREE TO MOVE, AND THE SPRING TENSION SHOULD BE SUCH THAT THE BREAKBACK SECTION RETURNS FIRMLY BACK TO ITS REST POSITION AFTER BREAKBACK, BUT IS STILL FREE TO BREAKBACK.

NOTE: THE BREAKBACK SYSTEM IS DESIGNED TO PREVENT DAMAGE TO THE BOOM IN THE EVENT OF ACCIDENTALLY CATCHING THE BOOM IN A HEDGE OR ON OTHER OBJECTS. IT IS NOT DESIGNED TO BE PURPOSEFULLY DRIVEN INTO TREES OR TELEGRAPH POLES WHIILST SPRAYING.

FROST PROTECTION PRECAUTION

FROST DAMAGE TO SPRAYERS CAN BE VERY COSTLY AND TIME CONSUMING. IF THE FOLLOWING POINTS ARE OBSERVED THEN DAMAGE WILL BE PREVENTED.

1. DRAIN TANK.

2. OPEN ALL SPRAYLINE CONTROL VALVES AND SOLENOIDS, TURN THE CRS TAPS TO DRAIN AND DISCONNECT THE SPRAYLINE FEEDS.

3. REMOVE SUCTION FILTER BOWL AND OPEN VALVE ON PRESSURE FILTER.

4. DISCONNECT PUMP FEED AND SUCTION LINES AND DRAIN.

5. DRAIN COMPRESSOR.

6. DRAIN SIGHT GUAGE.

⚠ **IMPORTANT**

7. ALWAYS FLUSH THROUGH WITH ANTIFREEZE OR STORE IN FROST FREE BARN.

FAULT FINDING

WHILST FILLING.

Fault	Possible Cause	Remedial Action
Water not self filling or filling slowly.	Lift from water source too long. (over 3.7m)	Reduce lift.
	Chemical Induction Bowl valve left open.	Close valve.
	Pressure valve not set to self fill	Set to self fill.
	Blocked filter on self-fill hose.	Clean.
	Blocked suction filter.	Clean.
	Air leak on self fill hose.	Tighten connections check camlock seals. repair hole in pipe or replace pipe.
	Suction filter drawing in air. Faulty or worn pump.	Tighten, Check seals Replace diaphragnms and/or valve.
	Air lock in pump.	Prime pump.
Chemical incorporator not working or working slowly.	Suction valve fully open.	Partially close valve. ⚠CAUTION Neverfully close as pump may be damaged.

FAULTS WHILE SPRAYING

Faults	Possible Cause	Remedial Action
No spray Pressure.	Electrics not connected.	Connect up and switch on.
	No water in tank.	Check sight guage and fill if necessary.
	Pressure valve set to Self fill.	Set to spray.
	Chemical induction bowl valve left open.	Close valve.
	Blocked suction filter.	Clean.
	Air leak around suction filter	Check filter bowl is seating correctly on sealing ring.
	Air leak at suction valve.	Tighten. Check seals.
	Air leak on suction pipe.	Check joints for leaks and tighten if necessary.
	Blocked pressure filter.	Check and clean. Change to coarser mesh if frequent blockages.
	Faulty or worn pump.	Replace diaphragms and/or valves.
	Blocked breather hole in tank lid.	Clear obstruction.
	Blockage in suction pipe.	If machine will self fill with water, blockage is in suction pipe from tank.

Fault	Possible Cause	Remedial Action
Cannot attain required nozzle output	Worn or wrong jets.	Fit new or correct jets.
	Application rate or pressure excessive for pump.	Contact dealer.
Spray pressure not constant.	Faulty diaphragm in pump. (diaphragm pumps only)	Replace diaphragm.
spray pressure too high.	Faulty pressure regulation valve.	Contact Dealer.
Sudden Pressure Loss.	No liquid in tank.	Check Sight Gauge.
	Liquid pipe burst.	Check for leaks.
	Blocked breather hole in tank.	Clear Obstruction.
Cannot Stop Spraying.	Electrical fault on master ON/OFF spray switch or valves	Stop PTO, Effect repair if possible.
Nozzle Drip When Spray Switched Off.	Worn or faulty diaphragm check valves on nozzle body.	Replace.
Spray Pattern Incorrect.	Incorrect boom height for jets selected.	Check height.
	Spray fans not offset by 5°.	Adjust nozzles.

Fault	Possible Cause	Remedial Action
Frequent Blocked Jets.	Damaged or incorrectly fitted pressure filter.	Replace.
	Machine not flushed out after use:	Flush system throughly using approved detergent.
	Pressure filter too coarse	Select finer pressure filter mesh
	Chemical damage to rubber hose	Complete overhaul required - contact Dealer.
Frequent Blocked Filters.	Dirty water.	Find different water source.
	If pressure filter then suction filter inoperative.	Check and replace.
	Filter mesh too fine.	Fit coarser mesh.

FAULTS ON ELECTRICS

No Electric Control at all.	Electrics not connected.	Connect up.
	Blown line fuse.	Check and replace.
	Sprayer plugged into trailer lights socket on tractor.	Connect up with spray control unit socket.

FAULTS ON BOOM OPERATION

Fault	Possible Cause	Remedial Action.
Booms will not raise.	Hydraulic pipe not connected.	Connect with tipping pipe outlet.
	Restrictor valve on hydraulic pipes not open.	Adjust.
	Hydraulic connections not fully inserted.	Check and fully tighten.
Boom will not open.	Booms on rests.	Lift clear.
	Hydraulic feed pipe trapped.	Check.
Booms open too quickly.	Restrictors not set correctly.	Adjust.
	Tractor hydraulics excessive for sprayer system without adaptor, e.g. Ford 7600	Reduce engine speed or contact dealer for diverter valve to be fitted.
Booms will Not Close.	Hydraulic pipe trapped.	Check.
	Restrictor on hydraulics closed.	Check and open.
	Booms not raised sufficiently.	Raise to maximum height.
Boom will not maintain height.	Hydraulic leak.	Check unions and tighten if necessary.
	Spool valve faulty.	Contact dealer.

Fault	Possible Cause.	Remedial Action
	Damaged accumulator.	Contact dealer.
	Leaking tractorhydraulics.	Fit pilot operated check valve.
	Worn or damaged centre springs.	Adjust spring tension or replace.
	Pivot springs too slack.	Tighten.
Too much boom movement.	Worn or damaged pivot.	Replace.
Boom sag.	Badly adjusted stay bars.	Adjust.

FAULT ON DRAINING

Tank will not drain.	Blocked breather hole in tank lid.	Remove lid and clear hole.
	Blocked sump drain.	Check and clear.

FAULTS ON AIR SYSTEM.

Cannot obtain air pressure.	Air filter blocked.	Change filter.
	Air pressure guage disconnected.	Reconnect pipe.
	PTO not at 540.	Set PTO speed.
	Pressure relief valve not screwed in enough.	Screw down valve. and adjust to blow off at 28 psi.

Fault	PossibleCause.	Remedial Action
	Air solenoids not opening or faulty.	Check electrical conncections & solenoids.
	Coupling damaged between gear box and compressor.	Fit new coupling.
	Compressordamaged.	Contact Dealer.
	No liquid in tank.	Fill tank.
	Pressure guage faulty.	Change guage.
	Electrics not connected.	
Compressor over heating.	Liquid pipes from and to Compressor blocked.	Unblock feed & return lines.
	Compressor not flushed out properly.	Flush through with clean water.
	P.T.O. Speed too fast.	Adjust to 540 r.p.m.
	Filter blocked.	Replace.
Air pressure too high.	P.T.O. running too fast.	Adjust to 540 r.p.m.
	Relief valve too tight.	Adjust relief valve to blow off at 28 psi.
	Faulty butterfly valve.	Replace valve.

////////////////////// LEGAL REQUIREMENTS //////////////////////

HEALTH AND SAFETY AT WORK ACT 1974 IMPOSES GENERAL DUTIES ON EMPLOYERS TO ENSURE,SO FAR AS IS REASONABLY PRACTICABLE, THE SAFETY AND ABSENCE OF RISKS TO HEALTH IN THE USE, HANDLING, STORAGE AND TRANSPORT OF SUBSTANCES SUCH AS PESTICIDES.

ALSO THE SELF EMPLOYED AND EMPLOYEES MUST TAKE REASONABLE CARE FOR THE HEALTH AND SAFETY OF THEMSELVES AND EMPLOYEES MUST CO-OPERATE WITH OTHERS CONCERNING ANY DUTY OR REQUIREMENT.

THE POISONOUS SUBSTANCES IN AGRICULTURE REGULATIONS 1984 REQUIRE AN EMPLOYER TO PROVIDE EMPLOYEES WITH PRESCRIBED PROTECTIVE CLOTHING AND NOT TO ALLOW THEM TO PERFORM A SCHEDULED OPERATION UNLESS IT IS WORN.

ALSO EMPLOYERS MUST PROVIDE ACCOMMODATION FOR PROTECTIVE CLOTHING AND EMPLOYEES PERSONAL CLOTHING TOGETHER WITH SUITABLE WATER FOR DRINKING, PERSONAL WASHING, AND WASHING PROTECTIVE CLOTHING PLUS FACILITIES FOR CLEANING SPRAYER EQUIPMENT. SIMILARLY, SELF EMPLOYED PERSONS MUST PROVIDE THEMSELVES WITH PROTECTIVE CLOTHING AND ACCOMMODATION FOR IT. ALL OPERATORS MUST WEAR THE APPROPRIATE PROTECTIVE CLOTHING FOR THE WORK BEING DONE.

REGULATIONS MADE UNDER THE FOOD AND ENVIRONMENT PROTECTION ACT 1985 MUST ALSO BE COMPLIED WITH.

IT IS MOST IMPORTANT THAT THE CORRECT PROTECTIVE CLOTHING IS WORN AT ALL TIMES WHEN HANDLING PESTICIDE. CLEANACRES MACHINERY STOCK A FULL RANGE OF PROTECTIVE CLOTHING, IF YOU THINK YOU ARE NOT PROPERLY EQUIPPED IN THIS RESPECT PLEASE CONTACT US FOR ADVICE.

SERVICE INSTRUCTIONS FOR MODEL MDC 72 AND 124 ROTARY WATERCOOLED COMPRESSOR.

CHECKS BEFORE USE

BEFORE RUNNING THE FIRST TIME AFTER INSTALLATION OR MAINTENANCE MAKE THE FOLLOWING CHECKS:-

FILL OIL BOTTLE WITH SHELL CORENA H 150 OIL OR EQUIVALENT.

WHEN STARTING UP CHECK DAILY THE TWO OIL DRIP INDICATORS MOUNTED ON THE PUMP END OF THE COMPRESSOR.

THE MINIMUM FLOW RATES FOR EACH INDICATOR ARE:-

MDC 72 .....4 DROPS PER MINUTE

MDC124 .....6 DROPS PER MINUTE

IF ADJUSTMENT OF THE OIL PUMP IS NECESSARY REFER TO INSTRUCTION SHEET IC067.

OPERATING INSTRUCTIONS

REGULARLY INSPECT FILTER FITTED TO THE INTAKE PIPELINE. FAILURE TO CARRY OUT THIS MAINTENANCE WILL RESULT IN LOSS OF PERFORMANCE AND OVERHEATING.

CHECK THE BLADES FOR WEAR EVERY 2000 RUNNING HOURS AND RENEW IF THE RUBBING TIPS HAVE WORN REDUCING THE DEPTH TO 1 5/16" - REFER TO CLEANACRES MACHINERY TO HAVE THIS CHECK CARRIED OUT.

! CAUTION: THE COMPRESSOR DEPENDS UPON THE SPRAY LIQUID FOR COOLING THE CYLINDER AND MUST NOT BE RUN WITHOUT LIQUID IN THE SPRAY TANK, OTHERWISE THE COMPRESSOR WILL OVERHEAT AND SEIZURE WILL OCCUR.

IT IS ESSENTIAL THAT THE WATER JACKET IS DRAINED OF ALL LIQUID DURING FROSTY WEATHER.

THE FOLLOWING INSPECTIONS MUST BE CARRIED OUT BY A CLEANACRES MACHINERY APPOINTED ENGINEER.

To inspect and change sliding blades

Remove oil pipes from drive end. Undo 3 screws (27) and take off end cap (3) and outer bearing shim (19). Remove lock nut (16) and tap washer (17). Undo 6 nuts (25) and lightly tap off coverplate (2) complete with outer race of roller bearing (13) and bearing shims (19). At this stage measure and note the thickness of the special gasket (22) fitted between the coverplate and cylinder.

The blades can now be inspected. When renewing the sliding blades make sure that they slide freely in their slots and if necessary remove any high spots with emery cloth. The two grooves in one side of the blades must be in the leading face when positioned in the rotor slot.

To change bearings and shaft seals

Proceed as above for changing blades. The shaft seals (15) can be removed from the end cap (3) and inspected. The outer race of the roller bearing (13) may be tapped from the coverplate, this releases the inner bearing shim (19). To remove the inner race from the shaft, first remove the spacing ring (7) by carefully cracking in half with a sharp chisel. This will now permit the inner race to be pulled off the shaft using a two-leg pulley drawer. Before fitting the replacement spacing ring, first accurately measure the width of the old ring and grind the replacement to the same width to give correct clearances on assembly.

To dismantle the rear end, first remove oil pipes and bracket with oil drip indicators, and take off oil pump (21) and slip out the coupling (8). Undo three screws (28) and take off end cap (4) and outer bearing shim (19). Undo 6 nuts (25) and remove the rear coverplate (2) complete with rotor and shaft assembly (5) from the cylinder (1). Again note the thickness of the gasket fitted at this end. Hold this assembly firmly in a vice, gripping on the rotor diameter with protection on the vice jaws.

TAKE OFF CIRCLIP (18) TAKING CARE NOT TO DAMAGE OR LOSE ANY SHIM THAT MAY BE FITTED BETWEEN THE CIRCLIP AND BEARING, AND USING A PULLEY DRAWER PULL THE COVERPLATE (2) AND BALL BEARING (14) FROM THE SHAFT. THIS RELEASES THE INNER BEARING SHIM (19). THE BALL BEARING (14) CAN BE TAPPED OUT FORM THE COVERPLATE. REFER TO INSTRUCTION SHEET IC 067 FOR MAINTENANCE OF THE BEKA LUBRICATION PUMP.

TO RE-ASSEMBLE

IT IS ESSENTIAL THAT ALL PARTS ARE PERFECTLY CLEAN BEFORE RE-ASSEMBLY. WHEN REPLACING THE OIL SEALS (15) ENSURE THAT THE TENSION SPRING SIDE FACES THE BEARING FOR BOTH SEALS.

LIGHTLY SMEAR THE SHAFT WITH GREASE TO ASSIST ASSEMBLY. RE-BUILD WITH GASKETS HAVING EXACTLY THE SAME THICKNESS AS THE ORIGINALS.

THE CORRECT ASSEMBLY CLEARANCES ARE:-

A) BETWEEN COVERPLATE AND ROTOR - REAR END		.003/.004"
B) BETWEEN COVERPLATE AND ROTOR - DRIVE END	MDC 72	.013/.015"
	MDC124	.020/.022"
C) BETWEEN ROTOR AND CYLINDER BORE		.005/.006"

FAILURE TO FOLLOW THE ABOVE INSTRUCTIONS CAN CAUSE LOSS OF PERFORMANCE OR SEIZURE.

WHEN ORDERING SPARE PARTS ALWAYS QUOTE THE MACHINE CHASSIS NO.

6d

MAINTENANCE OF COMPRESSOR OIL RESERVOIR.

REFILL THE OIL TANK REGULARLY TO ENSURE THAT THE LEVEL IS NOT ALLOWED TO FALL TO THE POINT WHERE AIR CAN BE DRAWN INTO THE OIL PUMP. USE ONLY CLEAN NEW OIL OF THE GRADE RECOMMENDED IN THE INSTRUCTIONS FOR THE MACHINE.

AT LEAST EVERY YEAR, OR IF THE MACHINE HAS BEEN OUT OF USE FOR A LONG PERIOD, OR IF THE OIL BOTTLE HAS BECOME CONTAMINATED, THE PUMP MUST BE THOROUGHLY FLUSHED WITH PARAFFIN TO CLEAR ANY OIL RESIDUES WHICH MAY HAVE SOLIDIFIED IN THE CONTROL DUCTS. TO CARRY OUT THIS OPERATION WE RECOMMEND THE FOLLOWING PROCEDURE.

1) STOP MACHINE AND DISCONNECT OIL FEED PIPE FROM TANK.

2) REMOVE OIL TANK FROM CRADEL, DRAIN OIL, WASH OUT WITH PARAFFIN AGAIN ENSURING THAT ALL RESIDUES ARE REMOVED, AND REPLACE. RECONNECT FEED PIPE TO PUMP.

3) FILL TANK WITH SUFFICIENT PETROL/KEROSINE TO COVER OIL FILTER ELEMENT. LOOSEN FEED PIPE CONNECTION AT PUMP END UNTIL ALL AIR HAS BEEN DISPELLED. RETIGHTEN PIPE CONNECTION.

4) START MACHINE UNDER NO LOAD CONDITIONS AND RUN UNTIL PARAFFIN BEGINS TO FLOW FROM OIL PUMP DISCHARGE POINTS. THIS OPERATION WILL TAKE APPROXIMATELY 15 MINUTES AND PROVIDING THAT THE MACHINE IS NOT ON LOAD NO DAMAGE WILL OCCUR.

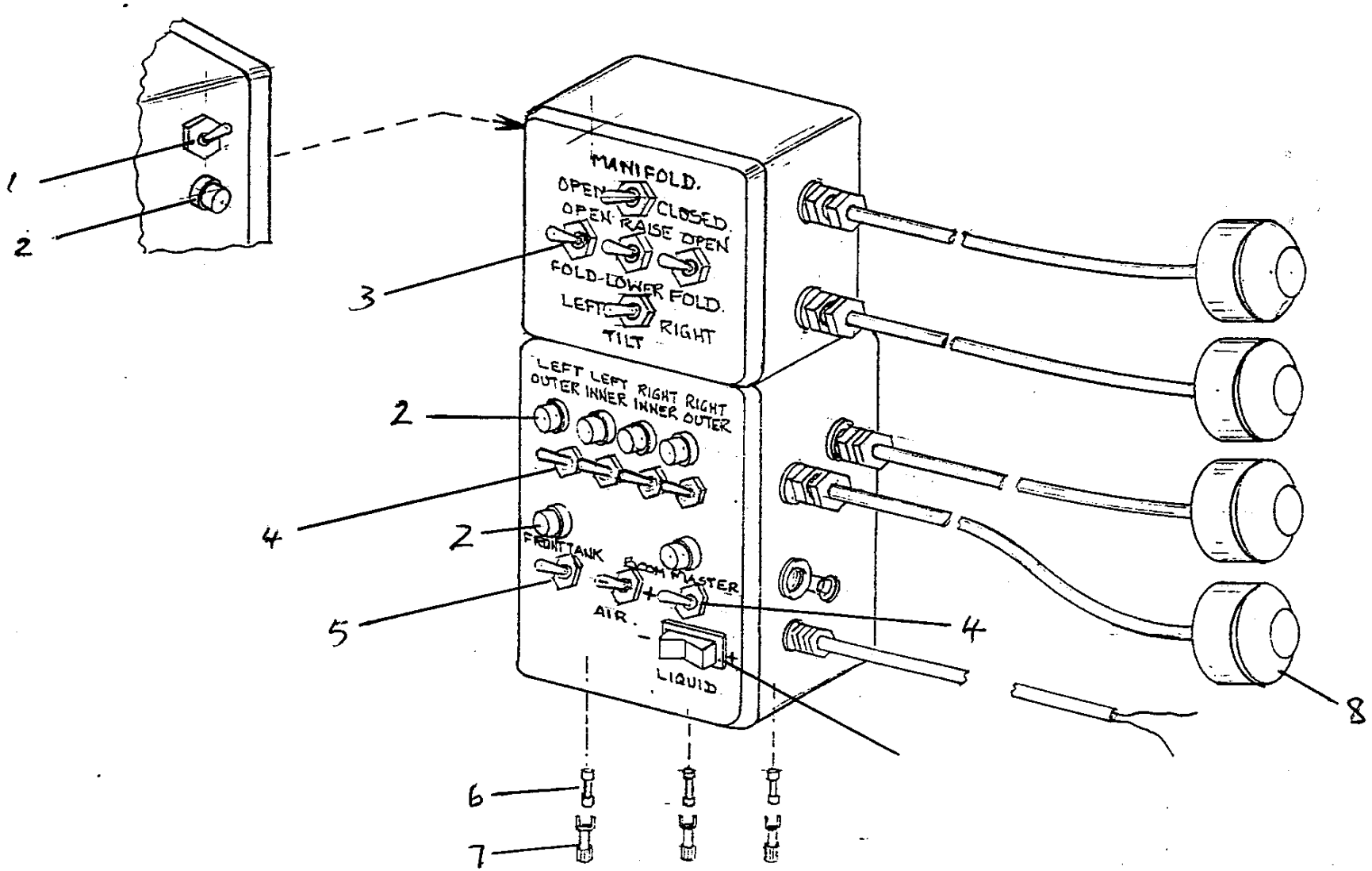
5) STOP MACHINE, DRAIN OIL TANK AND FILL WITH RECOMMENDED GRADE OF OIL. ENSURE THAT OIL PUMP FEED PIPE IS PRIMED, AND THAT THERE ARE NO AIR LOCKS.

AIRTEC 2. (PLASTIC NOZZLE) CALIBRATION CHART 35 RESTRICTOR

Pressure Settings		Spray Quality	Flow Rate Mls/Min Per Nozzle	Application Rates									
				Ltrs per HA. at KPH				Flow Rate F.ozs Per Min	Galls per acre at MPH				
Air PSI	Liquid PSI			8	10	12	14		4	5	6	7	8
10 15 20	15 20 25	Fine Very Fine Very Fine	332	50	40	33.2	28.5	11.6	5.5	4.4	3.7	3.1	2.75
10 15 20	17 23 28	Medium Fine Very Fine	386	58	46	39	33	13.5	6.4	5.1	4.3	3.6	3.2
10 15 20	19 24 29	Medium Medium Fine	420	63	50	42	36	14.7	7.0	5.6	4.6	4.0	3.5
10 15 20	22 26 32	Medium Medium Fine	465	70	56	46.5	40	16.3	7.7	6.2	5.1	4.4	3.8
10 15 20	24 28 34	Medium Medium Fine	500	75	60	50	43	17.5	8.3	6.6	5.5	4.7	4.1
10 15 20	25 30 36	Medium Medium Fine	525	79	63	52.5	45	18.4	8.7	7.0	5.8	5.0	4.3
10 15 20	28 33 39	Coarse Medium Medium	580	87	70	58	50	20.3	9.6	7.7	6.4	5.5	4.8
10 15 20	31 36 40	Coarse Medium Medium	615	92	74	61.5	53	21.6	10.2	8.1	6.8	5.8	5.1
15 20 25	41 46 51	Coarse Coarse Medium	680	102	82	68	58.3	24.0	11.3	9.0	7.5	6.4	5.6
15 20 25	47 51 56	Coarse Coarse Medium	740	111	89	74	63.5	26.0	12.3	9.8	8.2	7.0	6.1
15 20 25	50 56.5 60	Coarse Coarse Medium	790	119	95	79	68	28.0	13.1	10.5	8.7	7.5	6.5

AGH. JULY 1991

CONTROL BOX

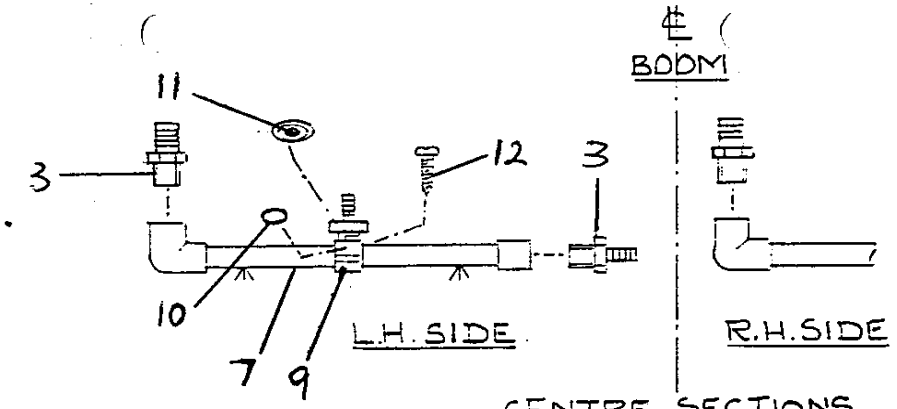

1
2
3
MANIFOLD.
OPEN
CLOSED
OPEN RAISE OPEN
FOLD-LOWER FOLD
LEFT
RIGHT
TILT
LEFT LEFT RIGHT RIGHT
OUTER INNER INNER OUTER
2
4
2
FRONT TANK
BOOM MASTER
+
AIR
-
5
4
LIQUID
8
6
7

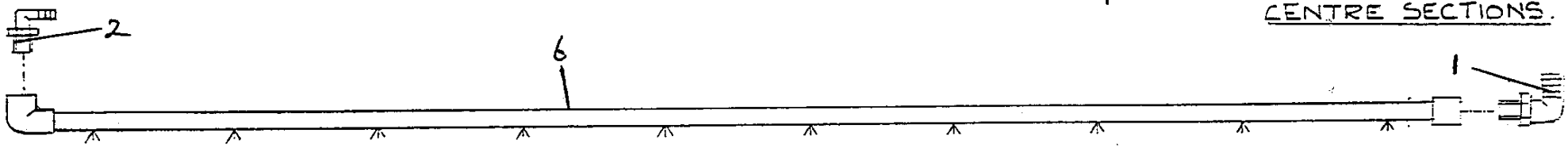
CONTROL BOX.

ITEM	QUANITITY	PART NUMBER	DESCRIPTION
1	1	ECA110-01	SWITCH
2	7	ECA110-02	LIGHT
3	5	ECA110-03	SWITCH
4	5	ECA110-04	SWITCH
5	1	ECA110-05	SWITCH
6	3	ECA110-06	FUSE
7	3	ECA110-07	FUSE HOLDER
8	4	ECA110-08	PLUG/SOCKET

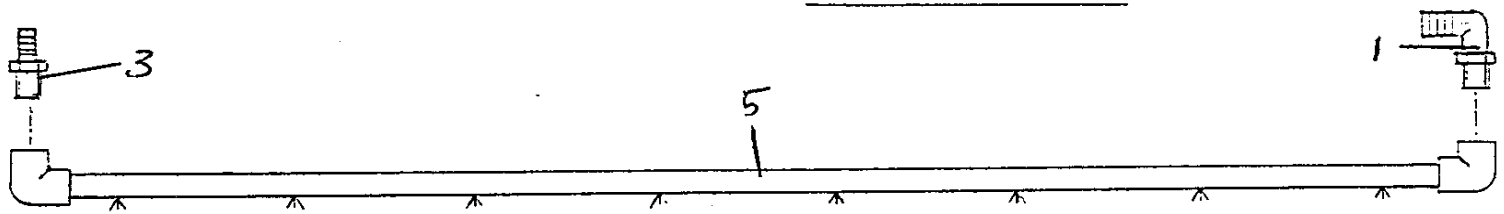
LIQUID LINE and FITINGS

(4 SECTION)

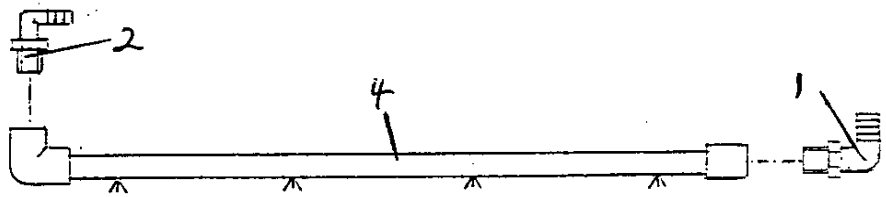




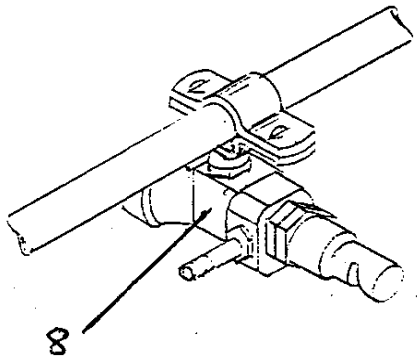
INNER SECTION



OUTER SECTION



BREAK BACK SECTION

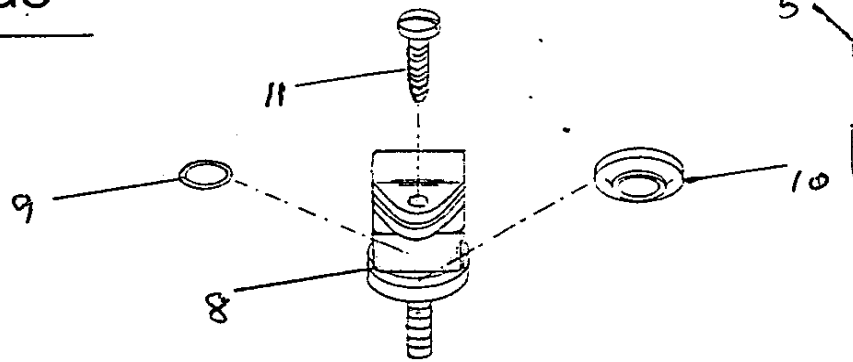


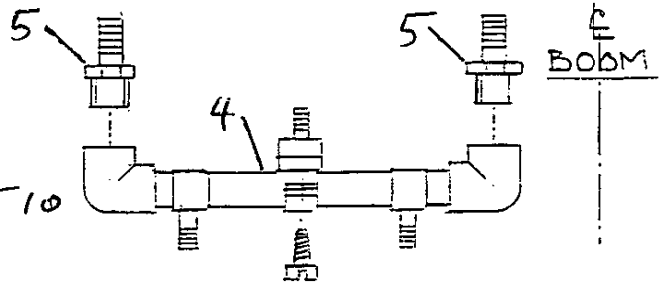
LIQUID LINE & FITTINGS
(4 SECTION)

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	6	DPEL1234	1/2" 3/4" ELBOW
2	4	DPEL1214	1/2" 1/4" ELBOW
3	6	DPA1234	1/2" 3/4" HOSETAIL
4	2	ECA104-01	BREAK BACK SPRAYLINE (SPECIFY BOOM WIDTH)
5	2	ECA104-02	OUTER SECTION SPRAYLINE (SPECIFY BOOM WIDTH)
6	2	ECA104-03	INNER SECTION SPRAYLINE
7	2	ECA104-04	CENTRE SECTION SPRAYLINE
8	48	ME11	AIRTEC NOZZLE (SPECIFY BOOM WIDTH)
9	48	ECA104-05	BAND CLAMP/HOSETAIL
10	48	LU15AQ2706	SEAL
11	48	LU14-Q1819	SEAL
12	48	LU15AQ2707	SCREW

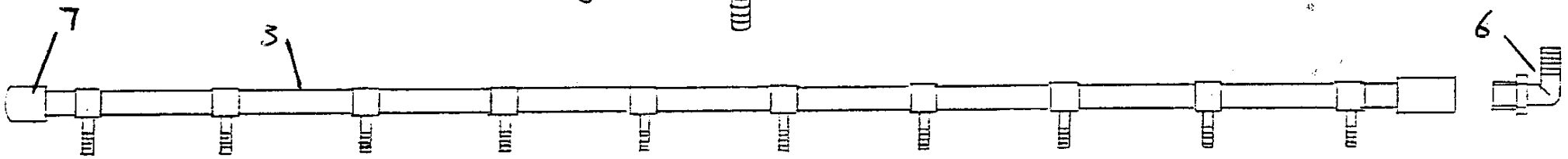
AIR LINE and FITTINGS

(4 SECTION)





CENTRE SECTION



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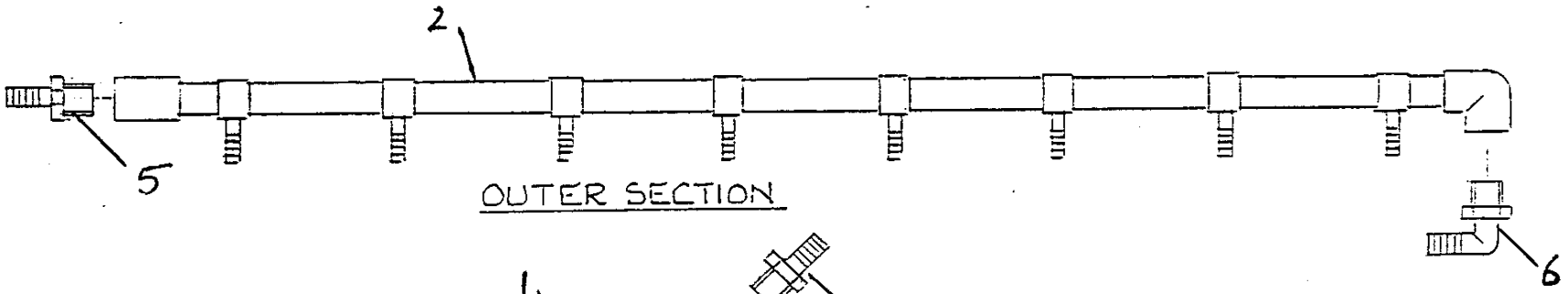
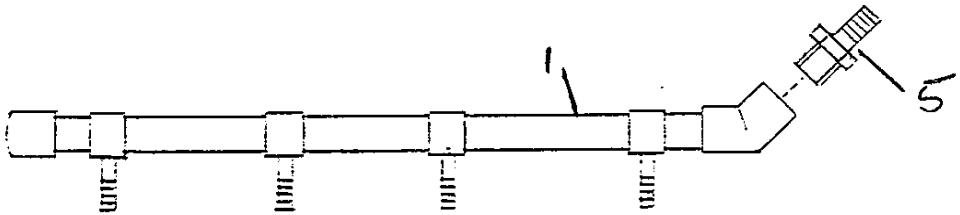


OUTER SECTION

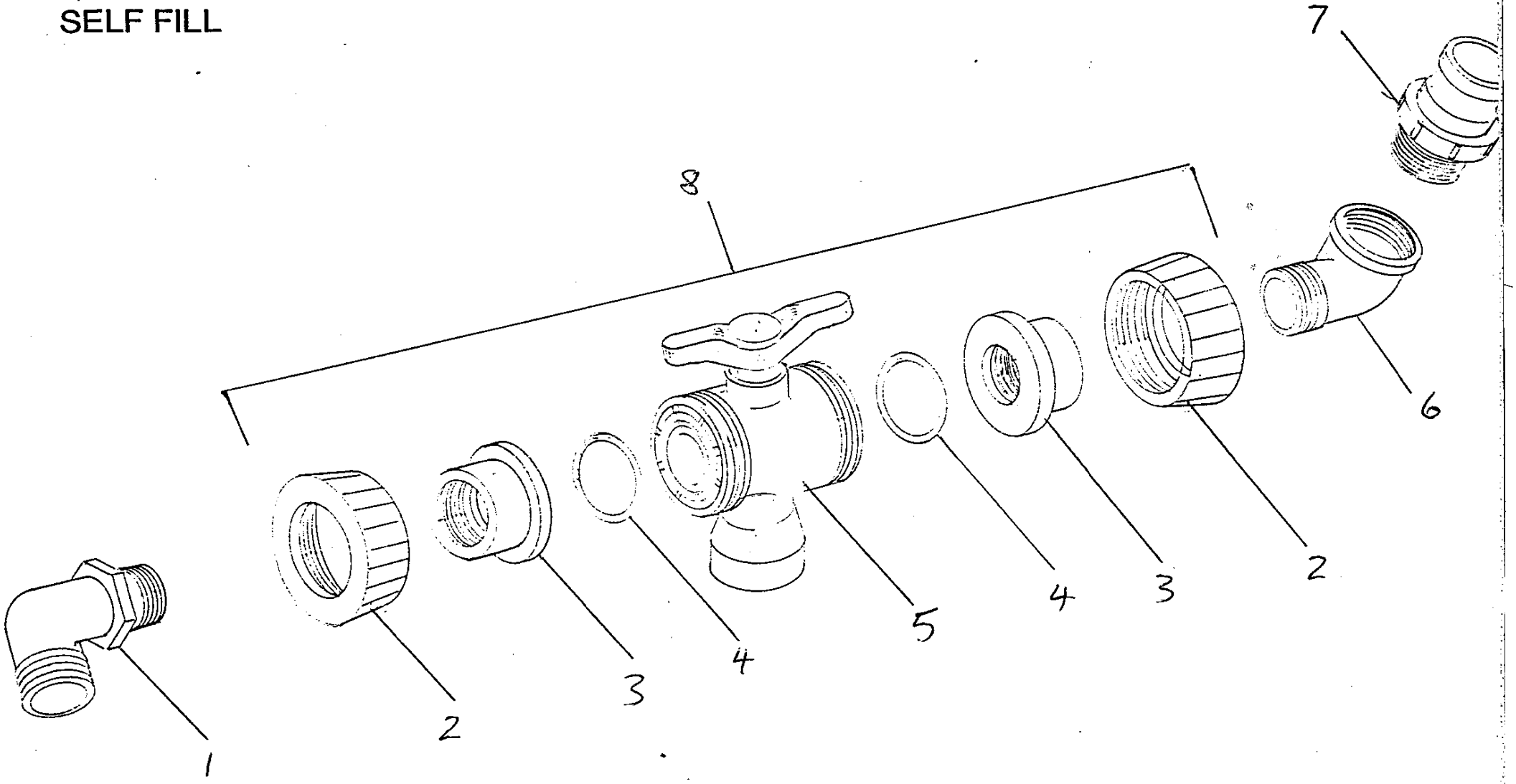


BREAK BACK SECTION

AIR LINE & FITTINGS
(4 SECTION)

ITEM	QUANTITY	PART NUMBER	DESCRIPTION	
1	2	ECA105-01	BREAK BACK AIRLINE	(SPECIFY BOOM WIDTH)
2	2	ECA105-02	OUTER SECTION AIRLINE	(SPECIFY BOOM WIDTH)
3	2	ECA105-03	INNER SECTION AIRLINE	
4	2	ECA105-04	CENTRE SECTION AIRLINE	
5	8	DPA1034	1" $\frac{3}{4}$" HOSETAIL	
6	4	DPEL1034	1" $\frac{3}{4}$" ELBOW	
7	4	DPEL1034	END CAP	
8	48	ECA105-05	BAND CLAMP/HOSETAIL	
9	48	LU15AQ2706	SEAL	
10	48	LU14Q1819	SEAL	
11	48	LU15AQ2707	SCREW	
PVC REPAIR KIT		ECA105-08		

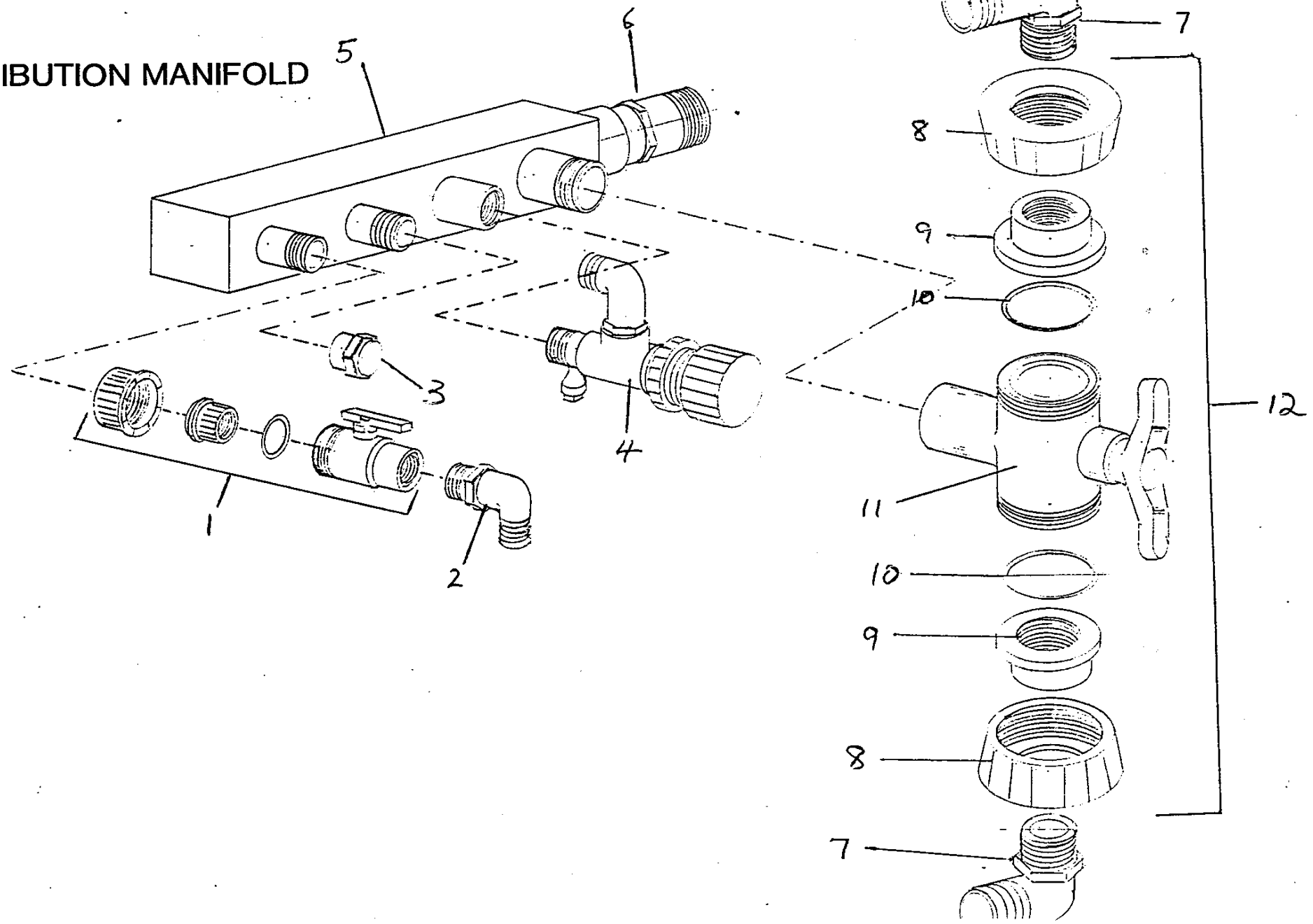
SELF FILL



SELF FILL

ITEM	QUANITITY	PART NUMBER	DESCRIPTION
1	1	DPEL200	2" ELBOW
2	2	LU58000032	BODY NUT
3	2	LU58000036	SOCKET
4	2	LU58000064	O-RING
5	1	ECA109-01	VALVE BODY
6	1	TFM08-200	45 DEGREE ELBOW
7	1	DP9912-200F	CAMLOCK
8	1	LU56003005	2" 3 WAY VALVE

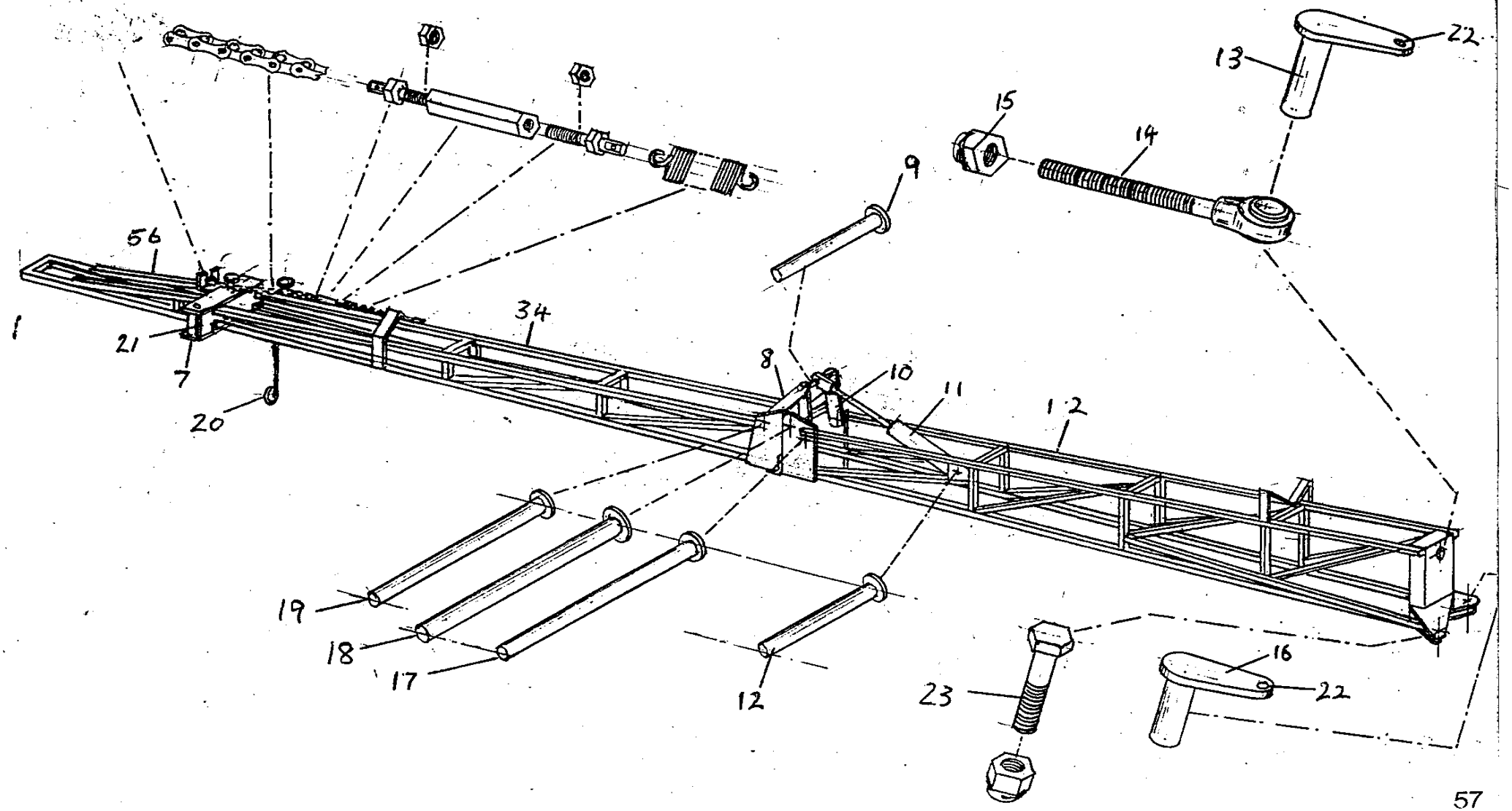
DISTRIBUTION MANIFOLD



DISTRIBUTION MANIFOLD

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	LU55BD0300	1/2" VALVE
2	1	DPEL1212	1/2" ELBOW
3	1	DPF1200	1/2" CAP
4	1	CT23120	3/4" P.R. VALVE
5	1	SP030	MANIFOLD
6	1	DPA114/DPA114112	HOSETAIL (SPECIFY PUMP)
7	2	DPEL112/DPEL112114	ELBOW (SPECIFY PUMP)
8	2	LU58000031	BODY NUT
9	2	LU58000035	SOCKET
10	2	LU58000062	O-RING
11	1	ECA108-01	VALVE BODY
12	1	LU56003004	$1\frac{1}{2}$" 3-WAY VALVE

BOOM (Steel work) and FITTINGS

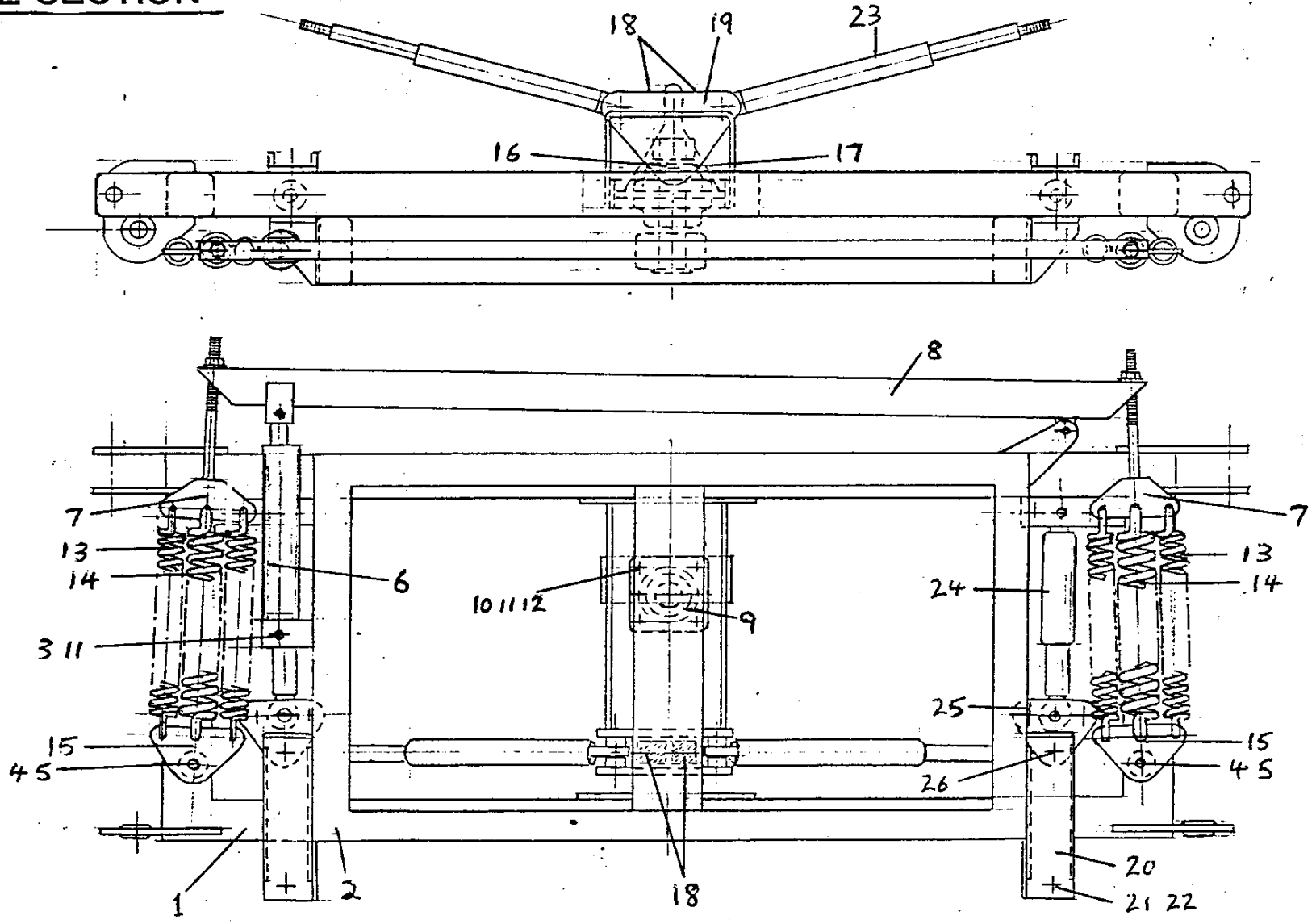


18, 20, 24 METRE FLIP OVER BOOM STEEL WORK

ITEM	QUANTITY	PART NUMBER	DESCRIPTION	
	1	ECA103-01	CENTRE FRAME WORK	
1	1	ECA103-02	INNER SECTION LEFT HAND	
2	1	ECA103-03	INNER SECTION RIGHT HAND	
3	1	ECA103-04	OUTER SECTION LEFT HAND	(SPECIFY BOOM WIDTH)
4	1	ECA103-05	OUTER SECTION RIGHT HAND	(SPECIFY BOOM WIDTH)
5	1	ECA103-06	BREAKBACK SECTION LEFT HAND	(SPECIFY BOOM WIDTH)
6	1	ECA103-07	BREAKBACK SECTION RIGHT HAND	(SPECIFY BOOM WIDTH)
7	2	ECA103-08	BREAKBACK PIN	
8	2	ECA103-09	FOLDING LINK - OUTER BOOM	
9	2	ECA103-10	HINGE PIN - FLIPOVER LINKS	
10	2	ECA103-11	FOLDING LINK - INNER BOOM	
11	2	ECA103-12	RAM	
12	2	ECA103-13	RAM PIN	
13	2	ECA103-14	TOP PIN-CENTRE TO INNER BOOM	
14	2	ECA103-15	ADJUSTABLE TOP LINK	
15	6	ECA103-16	1.1/8" UNC NUTS + 1" DIA. FLAT WASHER	
16	2	ECA103-17	BOTTOM PIN - CENTRE TO INNER BOOM	
17	2	ECA103-18	PIN-FLIPOVER LINK TO INNER BOOM	
18	2	ECA103-19	HINGE PIN - INNER TO OUTER BOOM	

20	2	ECA103-21	TINE SPRING
21	14	ECA103-22	GREASE NIPPLE
22	4	ECA103-23	M8 BOLT X 25 LONG + M8 NUT
23	2	ECA103-24	RAM BOLT M20X100 + M20 NUT

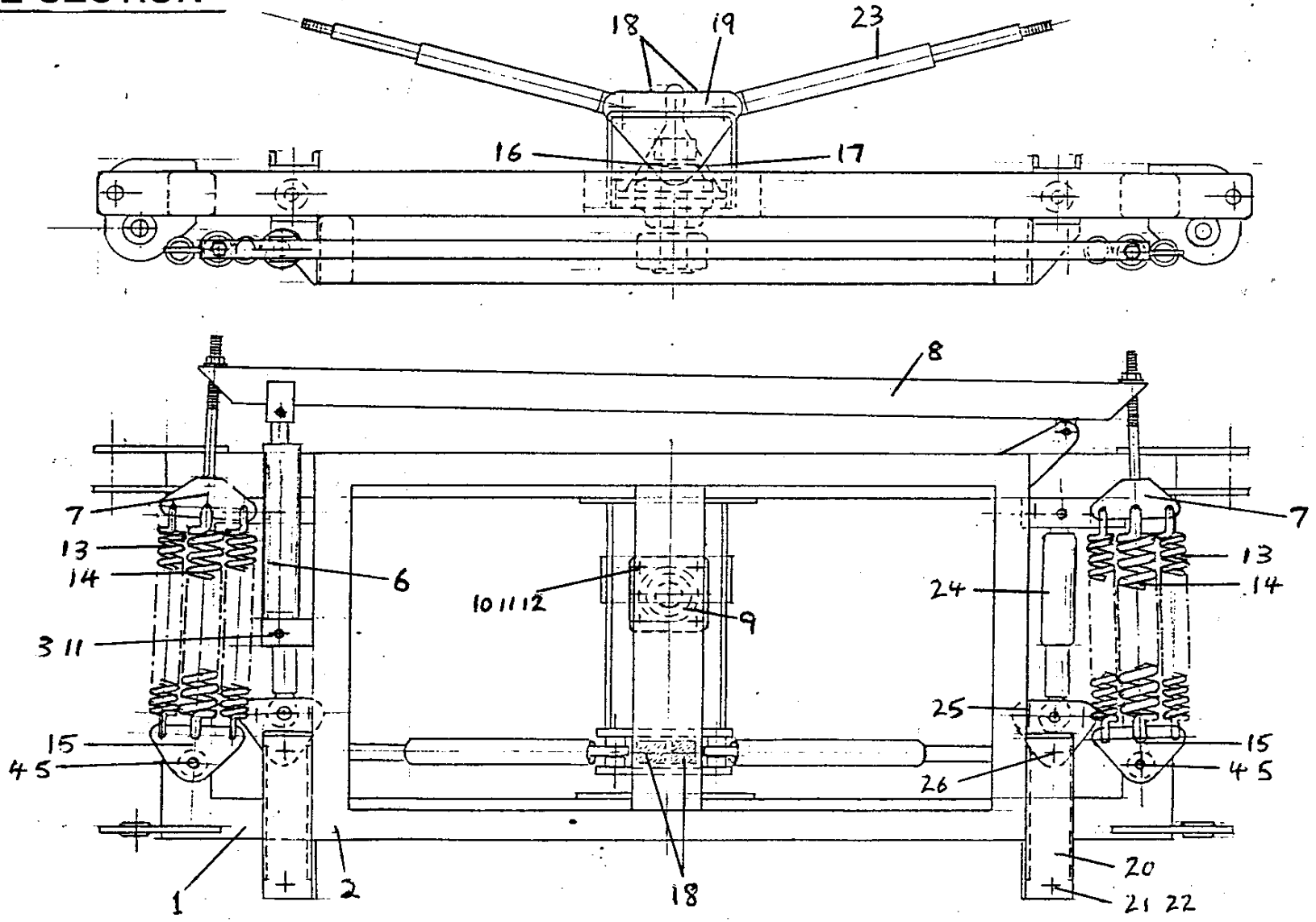
BACK FRAME and CENTRE SECTION



18, 20, 24 METRE FLIP OVER BOOM, BACK FRAME, AND CENTRE SECTION

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	ECA102-01	BACKFRAME
2	1	ECA102-02	CENTRE SECTION
3	1	ECA102-03	M16 X 110 HEX HD BOLT
4	AS REQ	ECA102-04	"R" PIN
5	2	ECA102-05	20 DIA. FLAT WASHER
6	1	ECA102-06	TILT RAM
7	2	ECA102-07	SPRING TENSIONER
8	1	ECA102-08	SPRING ROCKING LEVER
9	2	ECA102-09	FLANGE BEARING UNIT 40 BORE
10	2	ECA102-10	M16 X 80 HEX HD BOLT
11	3	ECA102-11	M16 NYLOC NUT
12	8	ECA102-12	16 DIA. WASHER
13	4	ECA102-13	SPRING
14	2	ECA102-14	SPRING
15	2	ECA102-15	SPRING ANCHOR PLATE
16	1	ECA102-16	CENTRE PIVOT COLLAR
17	1	ECA102-17	M10 X 90 HEX HD BOLT + M10 NUT
18	2	ECA102-18	URETHANE BLOCK
19	1	ECA102-19	ANTI-YAW RAM MOUNTING BRACKET

BACK FRAME and CENTRE SECTION

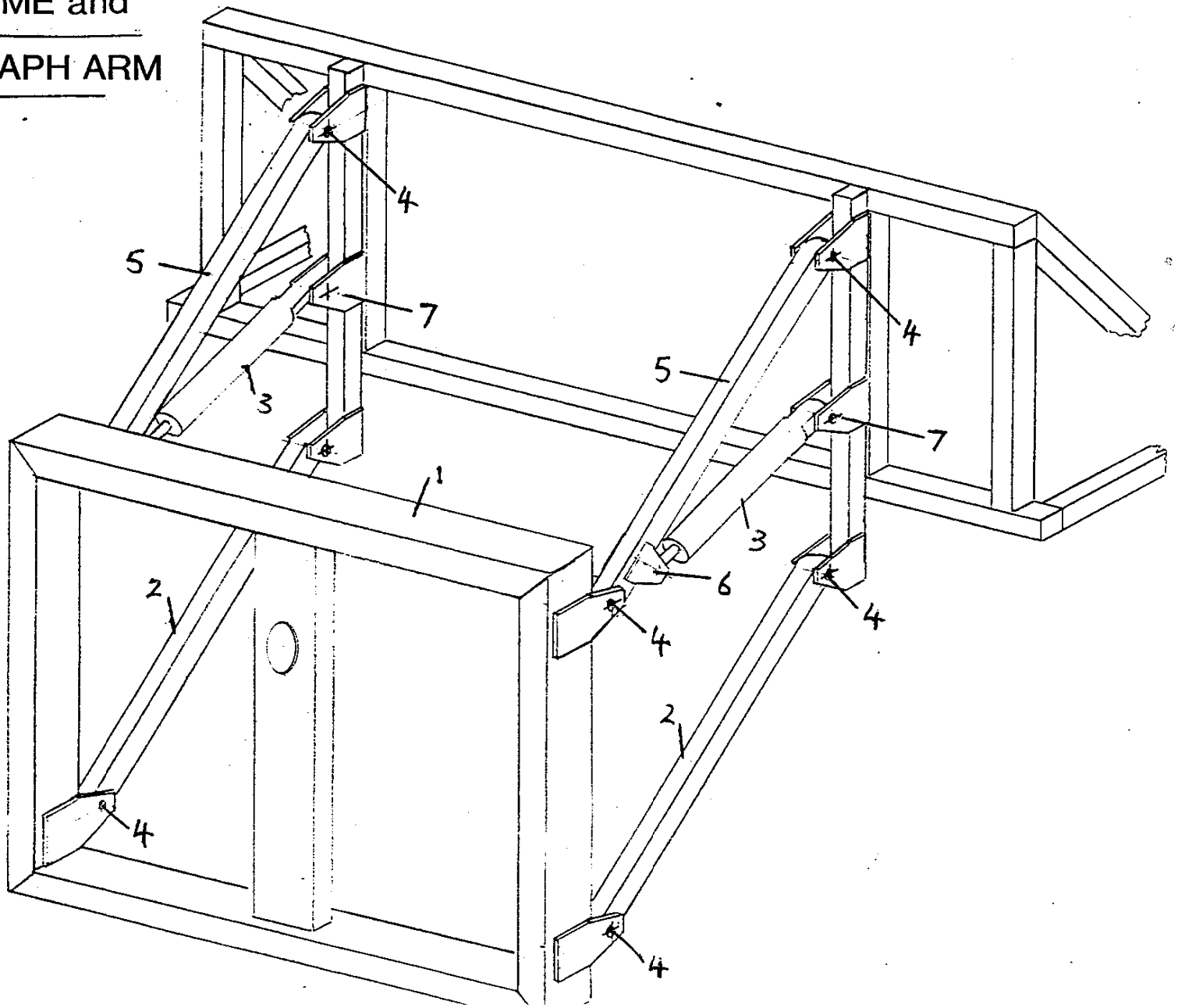


18, 20, 24 METRE FLIP OVER BOOM, BACK FRAME, AND CENTRE SECTION

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	ECA102-01	BACKFRAME
2	1	ECA102-02	CENTRE SECTION
3	1	ECA102-03	M16 X 110 HEX HD BOLT
4	AS REQ	ECA102-04	"R" PIN
5	2	ECA102-05	20 DIA. FLAT WASHER
6	1	ECA102-06	TILT RAM
7	2	ECA102-07	SPRING TENSIONER
8	1	ECA102-08	SPRING ROCKING LEVER
9	2	ECA102-09	FLANGE BEARING UNIT 40 BORE
10	2	ECA102-10	M16 X 80 HEX HD BOLT
11	3	ECA102-11	M16 NYLOC NUT
12	8	ECA102-12	16 DIA. WASHER
13	4	ECA102-13	SPRING
14	2	ECA102-14	SPRING
15	2	ECA102-15	SPRING ANCHOR PLATE
16	1	ECA102-16	CENTRE PIVOT COLLAR
17	1	ECA102-17	M10 X 90 HEX HD BOLT + M10 NUT
18	2	ECA102-18	URETHANE BLOCK
19	1	ECA102-19	ANTI-YAW RAM MOUNTING BRACKET

21	4	ECA102-21	M20 X 125 HEX HD BOLT
22	7	ECA102-22	M20 NYLOC NUT
23	2	ECA102-23	RAM FOLDING
24	2	ECA102-24	SHCOK ABSORBER
25	2	ECA102-25	CARRIER FOR SHOCK ABSORBER
26	2	ECA102-26	M20 X 125 HEX HD BOLT

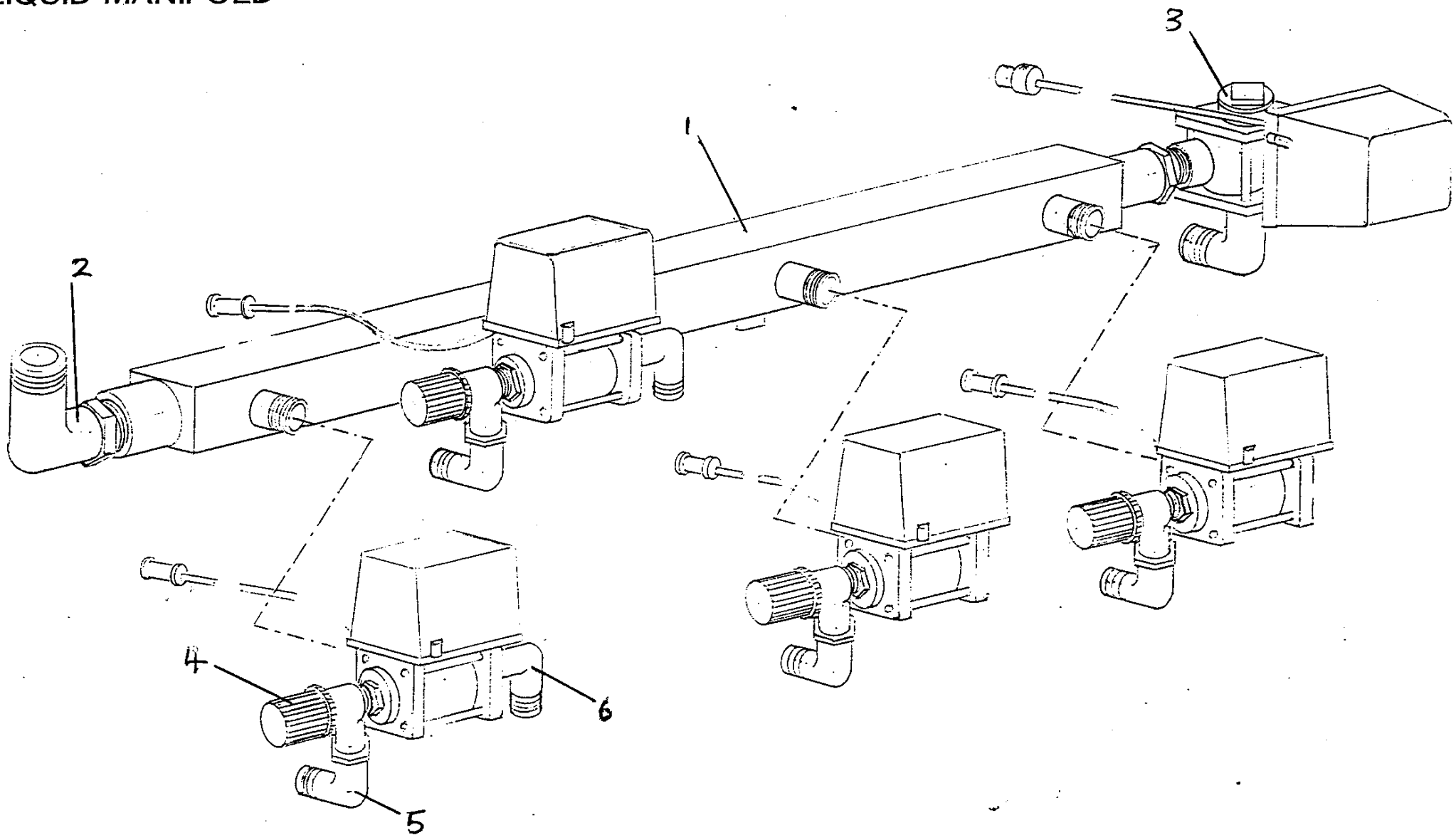
BACKFRAME and PANTOGRAPH ARM



BACKFRAME AND PANTOGRAPH ARM

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	ECA101-01	BACK FRAME
2	1	ECA101-02	PANTOGRAPH ARMS LOWER
3	2	ECA101-03	RAM
4	8	ECA101-04	PANTOGRAPH TABBED BOLTS M20 X 120 + M20 NUT
5	1	ECA101-05	PANTOGRAPH ARMS UPPER
6	2	ECA101-06	M16 X 100 + M20 NUT + WASHER
7	2	ECA101-07	M16 X 110 + M20 NUT + WASHER

LIQUID MANIFOLD



AIR BAND CLAMP

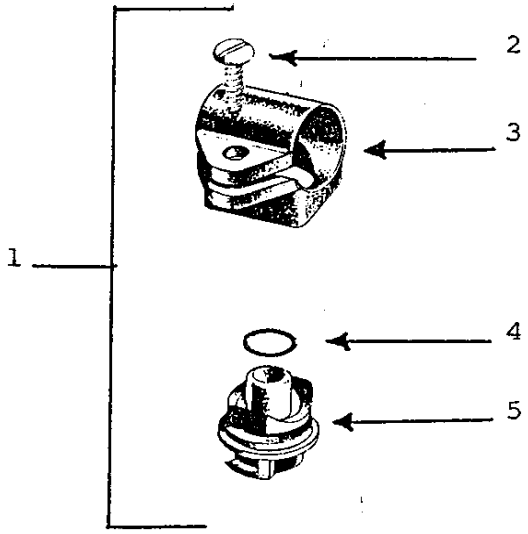
1 BCC 1

2 N215 AQ2707

3 N215 AQ2703

4 N215 AQ2706

5 N215 AQ2704



AIRTEC NOZZLE
PLASTIC

1 NAP 1

2 NAP 03

3 NAT 0002T

4 NAP 0235

5 NAP 05

6 NAT 0006

7 NAT Q1821

8 NAP 04

9 N214 Q1819

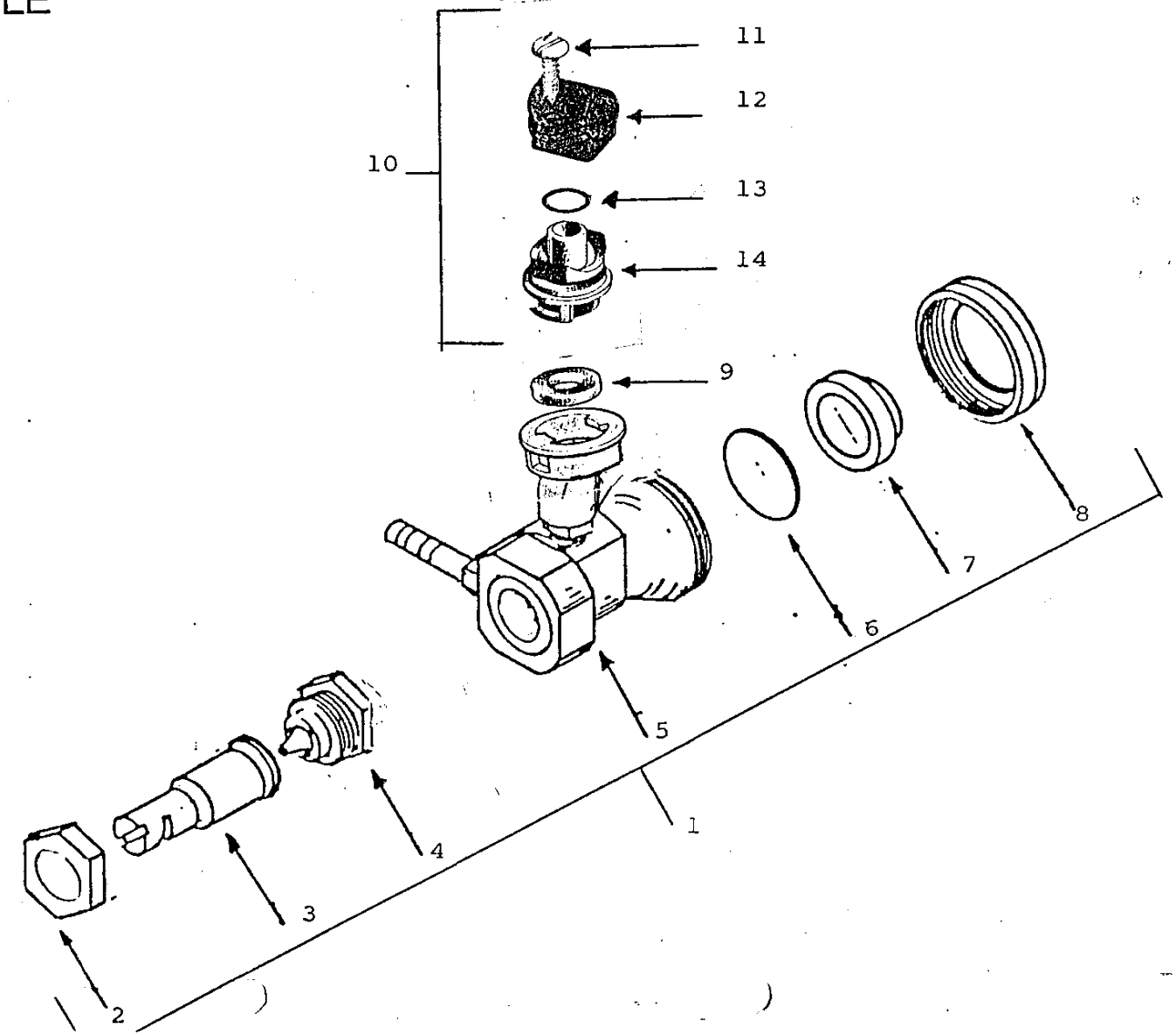
10 BCC 2

11 N2066356

12 N215 AQ2701

13 N215 AQ2706

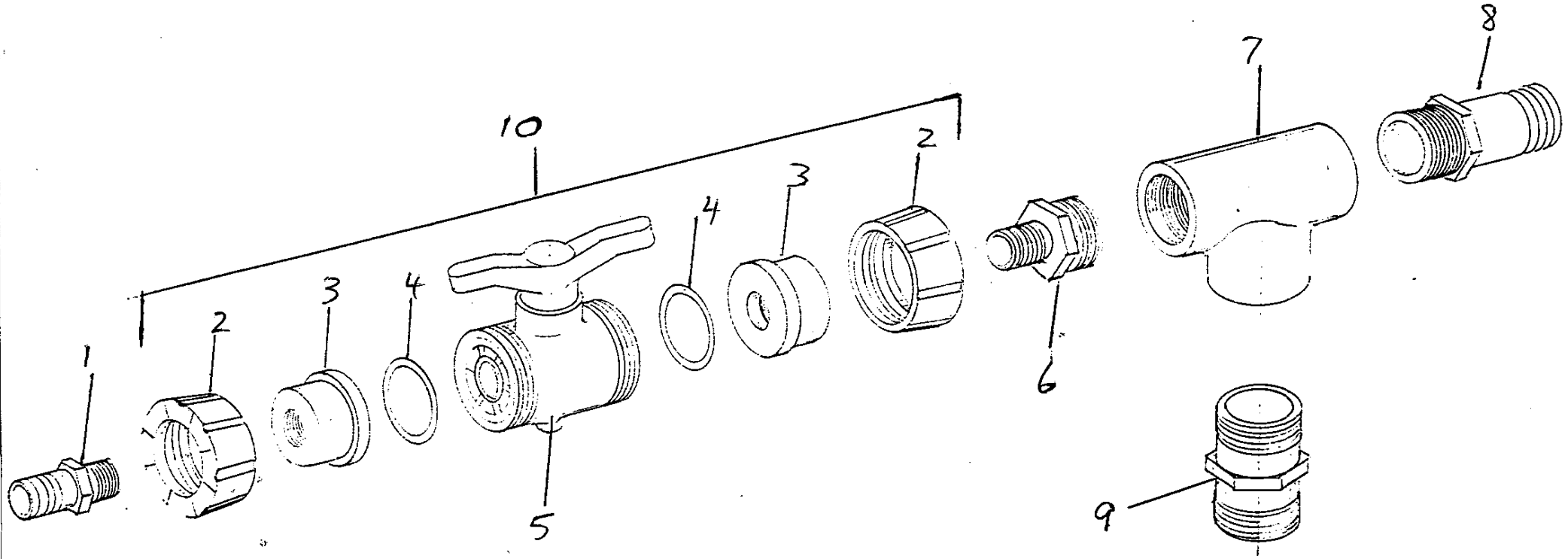
14 N215 AQ2704



LIQUID MANIFOLD

ITEM	QUANTITY	PART NUMBER	DESCRIPTION	
1	1	ECAS107-01	MANIFOLD	
2	1	DPEL112/DPEL112114	ELBOW	(SPECIFY PUMP)
3	1	CT344-1-2	1" 2-WAY VALVE	
4	4	CT23520	1/2" THROTTLE VALVE	
5	4	DPEL1234	1/2" 3/4" ELBOW	
6	4	DPEL3434	3/4" ELBOW	

INCORPORATOR CONTROL ASSEMBLY



INCORPORATOR CONTROL ASSEMBLY

ITEM	QUANTITY	PART NUMBER	DESCRIPTION
1	1	DPEL114	1" ELBOW
2	2	LU58000030	1" BODY NUT
3	2	LU58000034	1" SOCKET
4	2	LU58000060	1" O-RING
5	1	ECA106-01	1" VALVE BODY
6	1	ECA106-102	REDUCING BUSH
7	1	DPTT200	2" TEE
8	1	DPA200	2" HOSETAIL
9	1	DPM200	2" SOCKET
10	1	LU56100303	1" VALVE

USEFUL CONTACTS

MARK CURTOYS	SALES	OFFICE	(0451) 60721
		CAR	0860 414039
		HOME	(0285) 651644

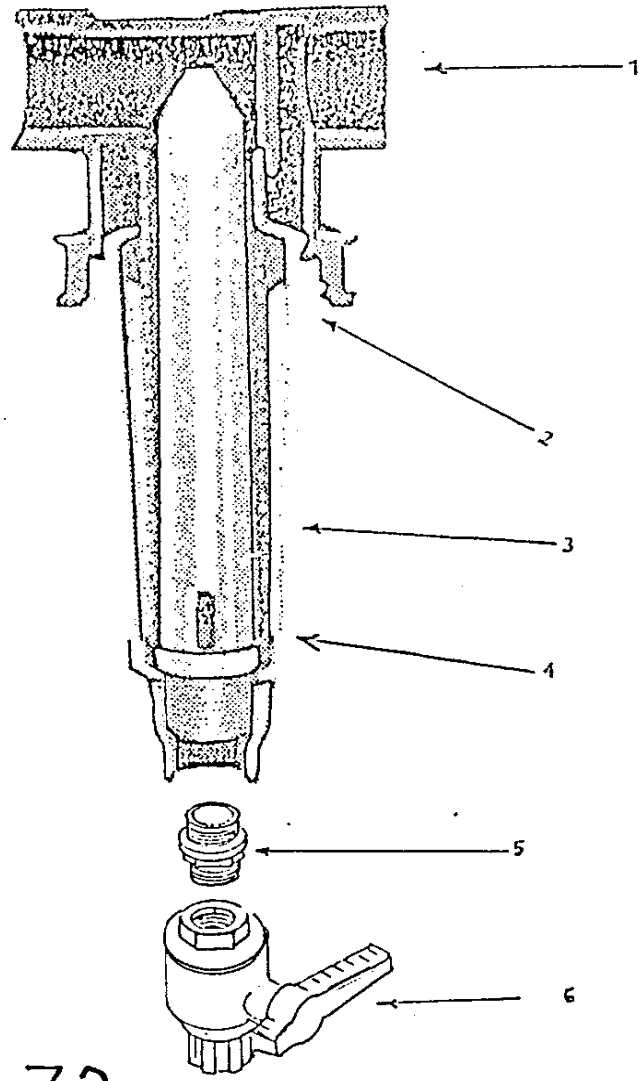
****

CLIVE CHRISTIAN	TECHNICAL		(090 855) 222
		CAR	0860 638942

****

ALISTAIR HEIT	SERVICE	OFFICE	(0451) 60721
		CAR	0860 637495
		HOME	(0451) 30117

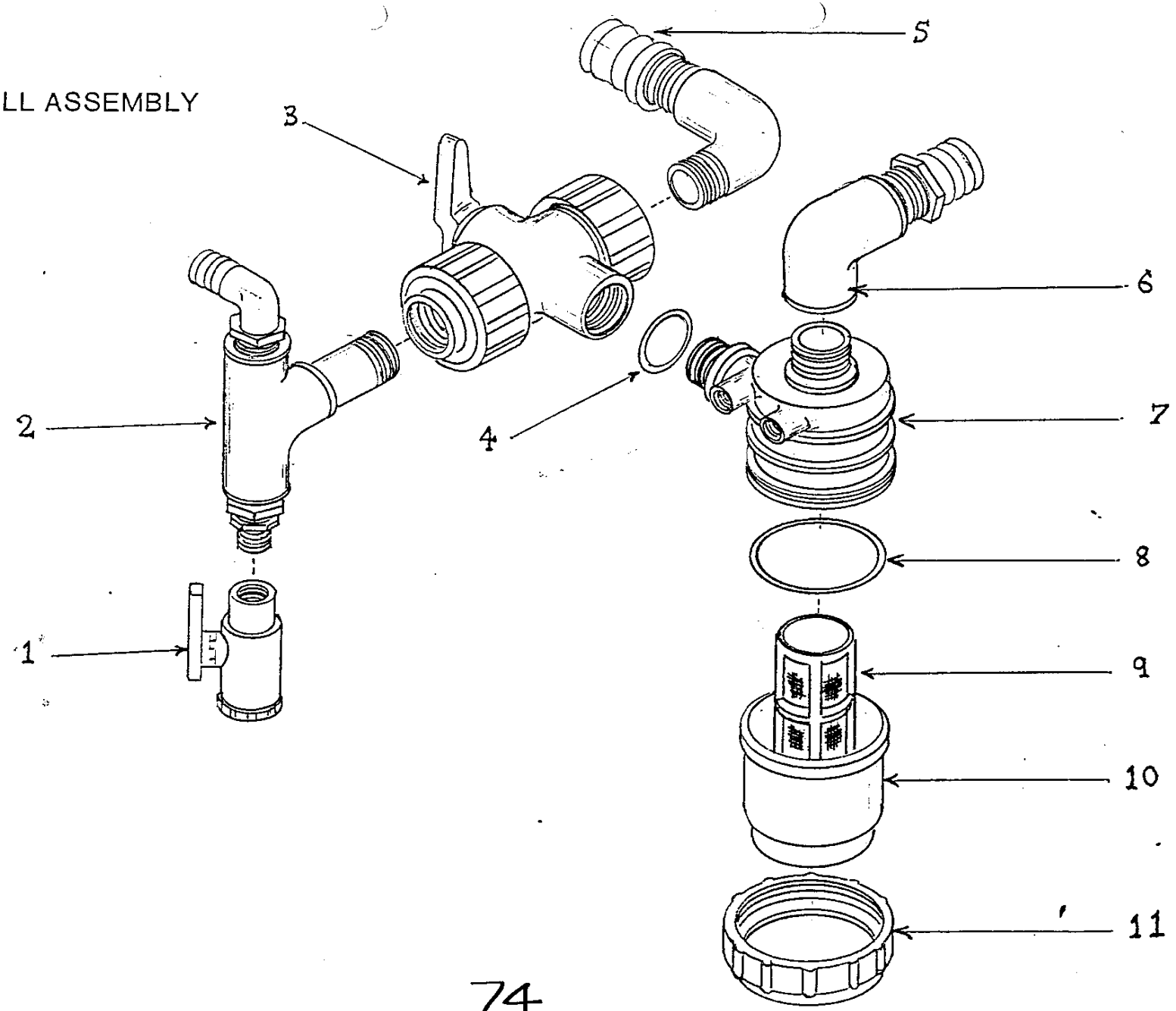
FLUSHING FILTER



FLUSHING FILTER

REF.NO.	PART NO.	DESCRIPTIOPN
1	0082	FILTER BODY
2	0083	O RING
3	0084	FILTER GAUZE
4	0085	HOUSING
5	0086	NIPPLE
6	0087	TAP

SELF FILL ASSEMBLY



SELF FILL ASSEMBLY

REF.NO.	PART NO.	DESCRIPTION
1	0087	TAP
2	0088	TEE ASSY.
3	0089	3 WAY TAP
4	0090	O RING
5	0091	CAMLOCK ASSY.
6	0092	ELBOW ASSY.
7	0093	FILTER BODY
8	0094	O RING
9	0095	FILTER GAUZE
10	0096	HOUSING
11	0097	RING

SERVICE INSTRUCTIONS FOR MODEL CL 90
ROTARY BLOWERS AND VACUUM PUMPS

INSTALLATION

The machine should be sited in a cool, clean, well ventilated position. If these conditions are not available the intake must be piped from a more suitable location. Ample room should be left for inspection.
If the machine is not required for immediate use the inlet and outlet must be kept covered otherwise entry of foreign matter through the ports could cause serious damage.
On vacuum pumps the connecting pipework on the intake side must be thoroughly cleaned to remove internal rust and scale. Use PTFE tape for making joints since surplus from jointing compounds will damage the blades if drawn into the machine. This also applies to the outlet joint, and pipework on the inlet of blowers.

CHECKS BEFORE USE

Before running the machine for the first time after installation or maintenance, make the following checks :-
Fill the lubricator with **SHELL RIMULA X 15W/40 OR EQUIVALENT**
Check that the machine is free by turning the shaft through a few revolutions.
Check that the direction of rotation is anti-clockwise when viewed from the drive shaft.
The pump speed must not normally exceed **1800** rpm.

OPERATING INSTRUCTIONS

Regularly inspect any filters fitted to the pipeline. Failure to carry out this maintenance will result in loss of performance and overheating.
Check blades for wear every 5000 running hours and renew it the rubbing tips have worn so as to reduce the depth to 2".

TO INSPECT AND CHANGE THE BLADES

For inspection of blades firstly remove the eyebolt (37) exposing a hole leading to the cylinder bore. Insert a measuring rod, rotate the shaft by hand so that the cone end is resting on the rotor diameter, scribe a mark on the rod at the level of the machine face. Turn the rotor until the point of the rod drops into the slot and rests on the blades tip, scribe a second mark, measure the difference between the marks. The blades must be changed if this dimension is greater than 1/8" (3mm). Replace the eyebolt.
To change the blades dismantle rear end by undoing two screws (24) and removing the oil pump (14) and oil pipes (35 & 36) and unscrew the lubricator extension (10). Remove fancowl by undoing three set screws (29), the fan can be released by removing the screws (25). After removing six set screws (22) the coverplate (3) can be withdrawn with endcap (5) and outer race of roller bearing (16). **AT THIS STAGE MEASURE AND NOTE THE THICKNESS OF THE GASKETS FITTED BETWEEN THE CYLINDER AND COVERPLATE.** The blades can now be changed. When renewing blades make sure they slide freely in their slots and if necessary remove any high spots with emery cloth. Slightly smear all surfaces of the blades with oil before re-assembly.

TO CHANGE BEARINGS AND SHAFT SEAL

Proceed as above for changing blades, and then using a two-leg pulley drawer remove the inner race of the roller bearing from the shaft. The seal sleeve can now be removed.
To dismantle the drive end undo six coverplate screws (22) and withdraw coverplate and rotor/shaft assembly. **AGAIN NOTE THE THICKNESS OF THE GASKETS AT THIS END.** Take off drive endcap (4) and carefully note the position of the belleville washers (27) and shim (26), remove the circlip (39) and bearing retaining washer (9). Using a two leg pulley drawer remove the ball bearings (15), noting the position of the bearings before their removal. When both seal sleeves (6) are removed care must be taken not to interchange them as this will affect the clearances.

TO RE-ASSEMBLE

It is essential that all parts are perfectly clean before re-assembly. Ensure that the oilways in the coverplates are clear.
Lightly smear the shaft with grease to assist assembly.
Re-build with gaskets having exactly the same thickness as the originals.
The correct clearances are :-

Between rotor and rear end coverplate :	.009"/.010"	(.23mm/.25mm)
Between rotor and drive end coverplate :	.004"/.005"	(.10mm/.13mm)
Between rotor and cylinder bore :	.004"/.005"	(.10mm/.13mm)

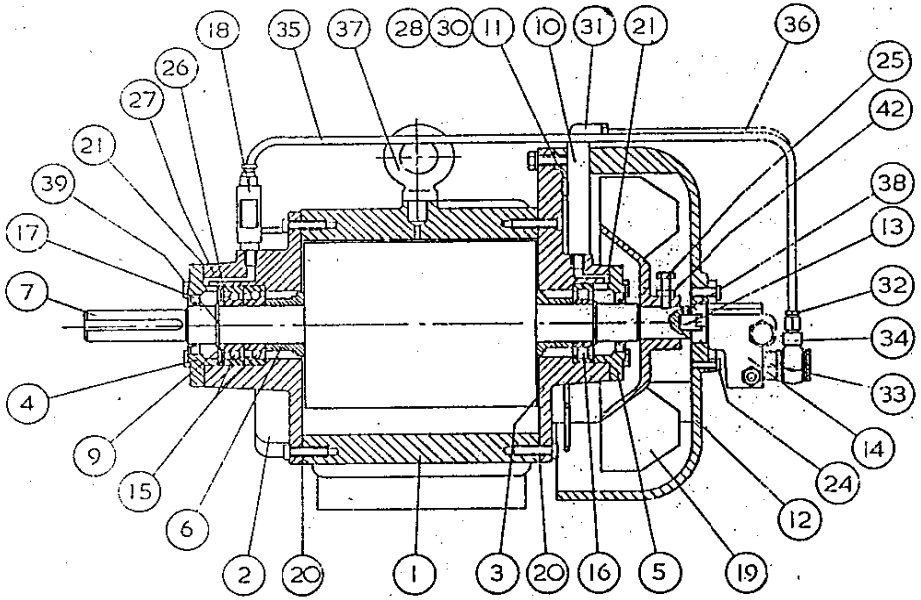
Failure to follow the above instructions can cause seizure or loss of performance.

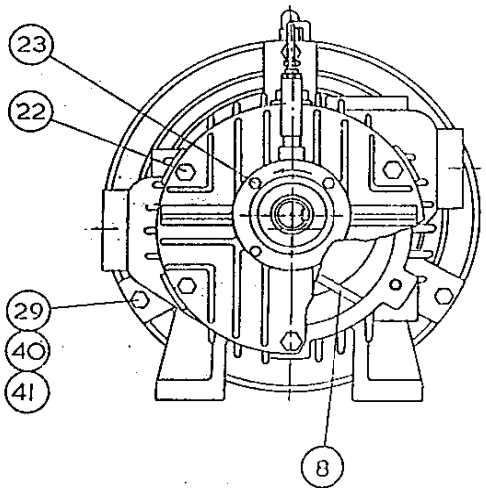
WHEN ORDERING SPARE PARTS ALWAYS QUOTE THE MACHINE SERIAL NUMBER. C178

The Utile Engineering Co. Ltd.
Irthlingborough, Northants, England.
Tel:(0933) 650216 Fax:(0933) 652738

December 1991

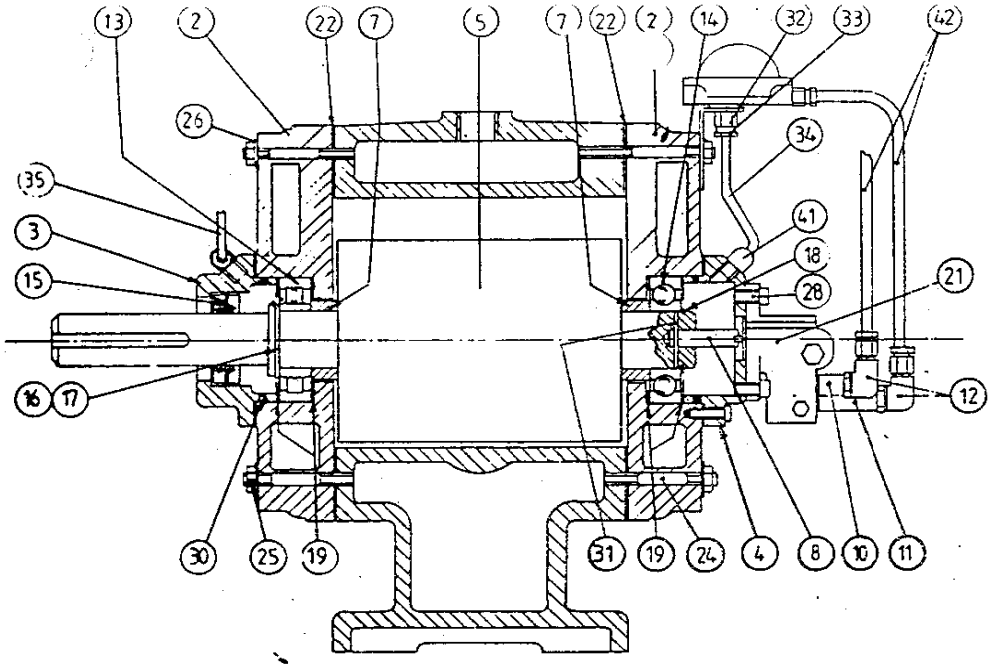
IC 102

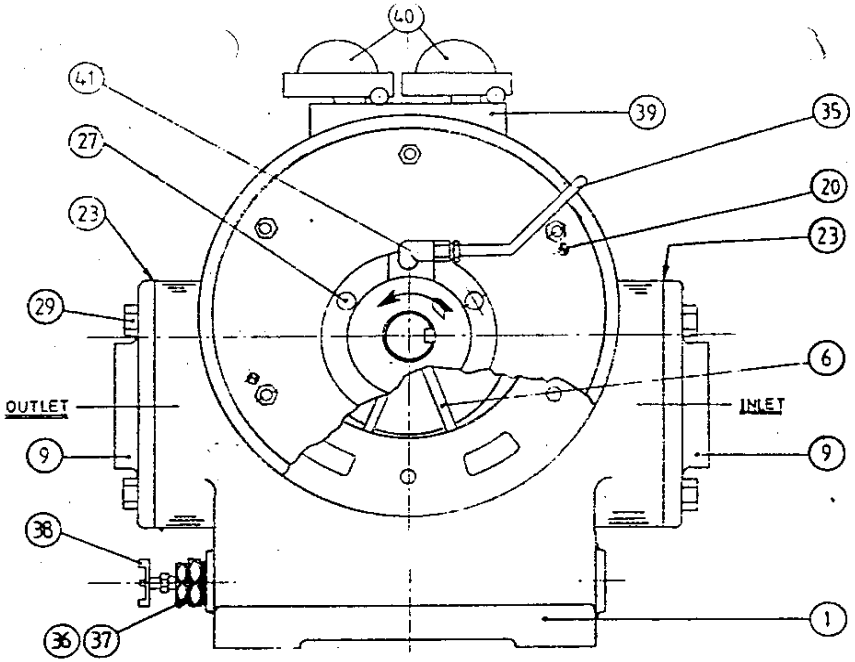




ITEM	DESCRIPTION	PART NO.	NO. OFF
1	CYLINDER	S 8484	1
2	COVERPLATE - DRIVE END	S 8482	1
3	COVERPLATE - REAR END	S 8489	1
4	END CAP - DRIVE END	S 8491/2	1
5	END CAP - REAR END	S 8491/1	1
6	SEAL SLEEVE	S 8490	2
7	ROTOR AND SHAFT ASSEMBLY	S 10025	1
8	BLADE	S 8140/2	6
9	BEARING RETAINING WASHER	S 8190	1
10	LUBRICATOR EXTENSION	S 10000	1
11	GUARD	S 8496	1
12	FANCOWL	S 8487	1
13	PUMP DRIVE EXTENSION	S 8854	1
14	BEKA OIL PUMP	T 1014	1
15	ANGULAR CONTACT BEARING	H 1026	2
16	ROLLER BEARING	H 1036	1
17	SHAFT SEAL	F 1073	2
18	OIL DRIP INDICATOR	S 9193	1
19	FAN	S 8165/1	1
20	GASKET - COVERPLATE	K 1119	2
21	GASKET - END CAP	K 1120	2

ITEM	DESCRIPTION	PART NO.	NO. OFF
22	HEX HEAD SCREW	G 1083	12
23	HEX HEAD SCREW	G 1068	8
24	SOCKET HEAD CAP SCREW	G 1121	2
25	HEX HEAD SCREW	G 1094	1
26	SHIM	K 1123	1
27	BELLVILLE WASHER	B 1127	2
28	PLAIN WASHER	U 1025	3
29	SET SCREW	G 1083	3
30	HEX HEAD SCREW	G 1075	3
31	ELBOW	R 1061	1
32	TUBING NUT	R 1040	3
33	STEM ADAPTOR	S 8912/1	2
34	NON-RETURN VALVE	S 8956	2
35	OIL DELIVERY PIPE - DRIVE END	X 1111	1
36	OIL DELIVERY PIPE - REAR END	X 1112	1
37	EYE BOLT	A 1013	1
38	GRUB SCREW	G 1032	1
39	CIRCLIP	B 1012	1
40	PLAIN WASHER	U 1026	3
41	NUT	B 1060	3
42	NUT	B 1049	1





Item	Description	Part No.		No. Off	Item	Description	Part No.		No. Off
		MDC72	MDC124				MDC72	MDC124	
1	CYLINDER	S1743/1	S1743/2	1	22	GASKET (COVERPLATE)	S1757	S1757	2
2	COVERPLATE	S1841	S1841	2	23	GASKET (FLANGE)	S1697	S1697	2
3	END CAP – DRIVE END	S1839	S1839	1	24	STUD	S1822	S1822	12
4	END CAP – PUMP END	S1840	S1840	1	25	NUT	B1044	B1044	12
5	ROTOR & SHAFT ASSEMBLY	S1735/1	S1735/2	1	26	WASHER	U1027	U1027	12
6	BLADE	S1568/1	S1568/2	8	27	SOCKET CAP HEAD SCREW	G1116	G1116	6
7	SPACING RING	S1516/5	S1516/5	2	28	SOCKET HEAD CAP SCREW	G1121	G1121	2
8	COUPLING	S1787	S1787	1	29	HEX. HEAD SCREW	G1086	G1086	8
9	FLANGE	M1053	M1053	2	30	'O' RING	F1120	F1120	2
10	SHORT STEM ADAPTOR	S8912/1	S8912/1	1	31	PIN	E1022	E1022	1
11	LONG STEM ADAPTOR	S8912/2	S8912/2	1	32	ADAPTOR	R1055	R1055	2
12	NON RETURN VALVE	S8917/1	S8917/1	2	33	TUBING NUT	R1040	R1040	8
13	ROLLER BEARING	H1031/H	H1031/H	1	34	OIL DELIVERY PIPE – PUMP END	X1082	X1082	1
14	BALL BEARING	H1003/H	H1003/H	1	35	OIL DELIVERY PIPE – DRIVE END	X1084	X1083	1
15	SHAFT SEAL	F1151	F1151	2	36	HEX. REDUCING BUSH	M1197	M1197	1
16	LOCK NUT	B1052	B1052	1	37	HEX. REDUCING BUSH	M1198	M1198	1
17	TAB WASHER	B1004	B1004	1	38	DRAIN TAP	M1064	M1064	1
18	CIRCLIP	B1013	B1013	1	39	BRACKET	S1825	S1825	1
19	BEARING SHIM	K1084	K1084	4	40	OIL DRIP INDICATORS	S1063	S1063	2
20	DOWEL	E1012	E1012	4	41	ELBOW	R1061	R1061	2
21	BEKA OIL PUMP	T1014	T1014	1	42	OIL FEED PIPE	X1085	X1085	2

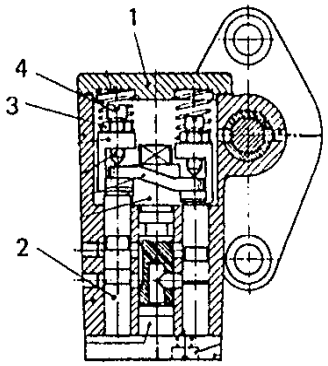
OIL PUMP ADJUSTMENT

The oil pump is adjusted to the correct flow rate when despatched from our works. If it is found necessary to alter the oil feed, proceed as follows:–

Remove the cover (1) to expose the 2 pistons (2).

Slacken off the locknuts (3) and adjust the feed as required.

To increase the flow, turn the adjusting screws (4) clockwise or anti-clockwise to decrease.



THE UTILE ENGINEERING CO. LTD.

IRTHLINGBOROUGH
NORTHANTS, ENGLAND.
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IC 067

Operating Instructions for BEKA Lubrication Pump

MAINTENANCE

Refill the oil tank regularly to ensure that the level is not allowed to fall to the point where air can be drawn into the pump. Use only clean new oil of the grade recommended in the instructions for the machine.

At least every year, or if the machine has been out of use for a long period, the pump must be thoroughly flushed with petrol/kerosene to clear any oil residues which may have solidified in the control ducts. To carry out this operation we recommend the following procedure.

1) Stop machine and disconnect oil feed pipe from tank.

2) Remove oil tank from cradle, drain oil, wash out with petrol/kerosine, drain again ensuring that all residues are removed, and replace. Reconnect feed pipe to pump.

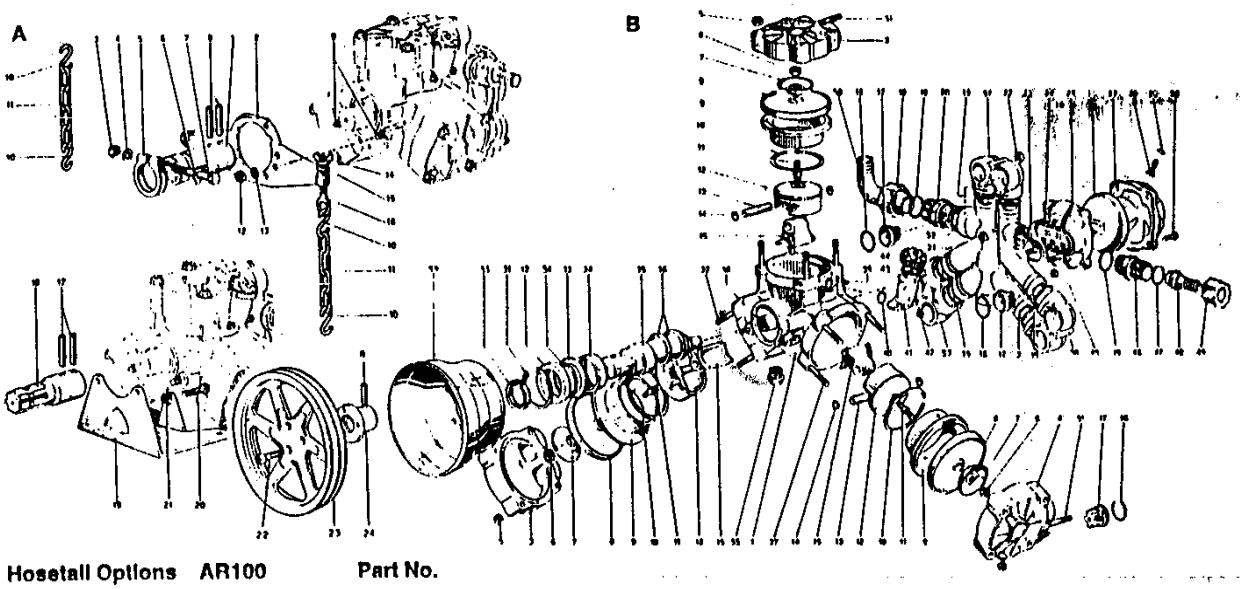
3) Fill tank with sufficient petrol/kerosine to cover oil filter element. Loosen feed pipe connection at pump end until all air has been dispelled. Retighten pipe connection.

4) Start machine under no load conditions and run until petrol/kerosine begins to flow from oil pump discharge points. This operation will take approximately 15 minutes and providing that the machine is not on load no damage will occur.

5) Stop machine, drain oil tank and fill with recommended grade of oil. Ensure that oil pump feed pipe is primed. Reconnect delivery pipes and start up.

NOTE. The small amount of cleaning fluid left in the system will not damage the pump providing that it is run under no load conditions until the delivery pipelines have been cleared.

continued overleaf



Hosetail Options AR100		Part No.
Inlet	30mm x 90° Hosetail (Liner)	47580040
	+ 1¼" BSP (F) Cap	47580060
	+ 1¼" BSP Nipple	47580030
Outlet	1" x 90° Hosetail (Liner)	47550370
OR	¾" x 90° Hosetail (Liner)	47550380
	+ 1" BSP (F) Cap	47550242
	+ 1" BSP Nipple	47550340

	Ref.	Description	Qty	Part No.
A	1	Q.R. Coupling Body	1	47550250
	2	Torque Plate	1	47380271
	3	Nut 12MA	1	47320130
	4	Lock Washer	1	47320131
	5	Clamp	1	47500160
	6	Washer	1	47500171
	7	Bolt 12MA x 75	1	47320170
	8	Pin	2	47550290
	9	Stud 10MA x 34	2	47580020
	10	S Link	4	47650340
	11	Torque Chain	2	47320640
	12	Nut 10MA	2	47180150
	13	Spring Washer	2	47200231
	14	Wing Nut	1	47320610
	15	Washer	1	47320620
	16	Eye Bolt	1	47320630
	17	Pin	2	47550290
	18	Shaft Extension	1	47550260
	19	Pump Base	1	47580080
	20	Bolt 10MA x 30	1	47540300
	21	Nut 10MA x H10	1	47580190
	22	Screw	3	47620470
	23	Pulley 280 2A	1	47620280
	24	Pulley Bush	1	47550510
	25	Splined Shaft	1	47550173
B	1	Body	1	47580010
	2	Manifold	1	47580150
	3	Cylinder Head	2	47550101
	4	Cylinder Head	1	47550102
	5	Nut 10MA	12	47180150
	6	Diaph. Retaining Nut	3	47550131
	7	Retaining Plate	3	47580090
★	8	Diaphragm	3	47550085
	9	Piston Sleeve	3	47580110
	10	Piston Ring	3	47500260
	11	Stud	3	47550270
	12	Piston	3	47580120
	13	Piston Spindle	3	47380300

★ = Items in Winter Overhaul Kit			47KIT100
	14	Circlip	6 47380080
	15	Con Rod	3 47580140
★	16	'O' Ring	6 47320230
★	17	Valve	6 47550050
	18	1¼" BSP Hosetail Nut	1 47580080
	19	'O' Ring	2 47390291
	20	Hexagonal Nipple	1 47580030
	21	Nut 8MA H6.5	3 47390270
	22	Nut 10MA	3 47180150
	23	Gasket	1 47580050
	24	Stud 10MA x 33	3 47280030
	25	Air Receiver Base	1 47580180
	26	Air Diaphragm	1 47550190
	27	Air Receiver Head	1 47550230
	28	Air Valve	1 47550300
	29	'O' Ring	1 47650542
	30	Bolt 8MA x 30	4 47580290
	31	Circlip 62mm	1 47200391
	32	Seal Seat	1 47550470
	33	Washer	1 47550070
	34	Needle Bearing	1 47550060
	35	Shaft	1 47550170
	36	Spacer Ring	2 47580130
	37	Stud 10MA x 65	12 47550200
	38	Needle Bearing	1 47550310
	39	Stud 6MA x 34	2 47550330
	40	'O' Ring	1 47180101
	41	Oil Reservoir	1 47550030
	42	Nut 6MA H6	2 47390440
	43	'O' Ring	1 47550040
	44	Oil Reservoir Cap	1 47550050
	45	Nut 8MA	4 47380240
	46	Hexagon Nipple	1 47550340
	47	'O' Ring	1 47550350
	48	25mm 90° Hosetail	1 47550370
	49	1" BSP Hosetail Nut	1 47550242
	50	30mm 90° Hosetail	1 47580040
	51	Stud 10MA x 72	3 47550020
	52	'O' Ring	1 47250310
	53	Seal, Oil	1 47550491
	54	Seal	1 47550480
	55	⅜" BSP Plug	1 47030171
	57	Manifold Elbow (Right)	2 47580071
	58	Manifold Elbow (Left)	1 47580072
	59	P.T.O. Guard	1 47540660
	60	Washer	1 47550331