To prevent your machine from **trembling or moving** from its set position, place a **rubber mat**, 1/ 2" thick and slightly bigger than its base underneath it.

ATTN: INSTALLER

WHEN STARTING THE ELECTRICAL MOTOR CHECK AND STOP IMMEDIATELY IF ROTATION IS NOT CONSISTENT WITH THE ON THE GREASE TANK/RESERVOIR. IF ROTATION IS CONTRARY TO THE ARROW, JUST UNDO SCREW ON TOP OF THE SQUARE CABLE CONNECTION BOX/SOCKET AND ROTATE IT AS SHOWN ON THE ILLUSTRATION JC2LUBE.

NOTE:
FOR SHIPPING PURPOSES THE JAW CRUSHER IS NOT MOUNTED ON THE STAND (if supplied with your order).

If the dust collecting hopper was ordered, it should be installed between the bottom of the machine and stand, in the back, with the three (3) screws in the sides already in place. Remove the screws, insert them in the eyes of the hopper, and tighten.

ONE YEAR LIMITED WARRANTY

This Jaw Crusher is warranted against defective materials or workmanship for one year from date of original purchase. This warranty is void if the product has been damaged by accident, unreasonable use, neglect, improper service, by not following the instructions in this owner's manual, or other causes not arising out of defect in material or workmanship.

ATTENTION PURCHASER

ANY ALTERATIONS, RE-WIRING OR MODIFICATIONS TO BE DONE ON THIS

MACHINE WHILE UNDER WARRANTY, MUST BE AUTHORIZED BY THE

MANUFACTURER OTHERWISE ALL WARRANTIES BECOME VOID.

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T.M. TERMINATOR JAW CRUSHER

MODEL #JCT#1AL

The lubrication system is set to grease the correct amount every 60 minutes irrespective of whether the machine is continuously operated or if it is stopped and started many times. Check regularly to refill it when the grease reservoir is at a very low level.

As grease, we recommend Lubriplate 1200-2 or any equivalent of the following heavy duty, non-corrosive extreme pressure, water resistant greases possibly containing molybdenum disulphides (N.L.G.I. No.2)

Esso - Unirex EP2
Shell - Darina XLEP2
Chevron - Ultiplex grease EP2

NEVER, NEVER, NEVER SET JAWS TOUCHING EACH OTHER!

THIS MACHINE IS NOT SUITABLE FOR WET GRINDING. IT WILL CREATE SEIZING OF MATING PARTS AND POSSIBLE FAILURE OF BEARINGS AND OTHER PARTS.

The transparent purge lines will not show grease exiting from the machine simultaneously. That is, because there are different size cavities within the machine that will allow the grease to accumulate for a long time before eventually it is forced to come out.

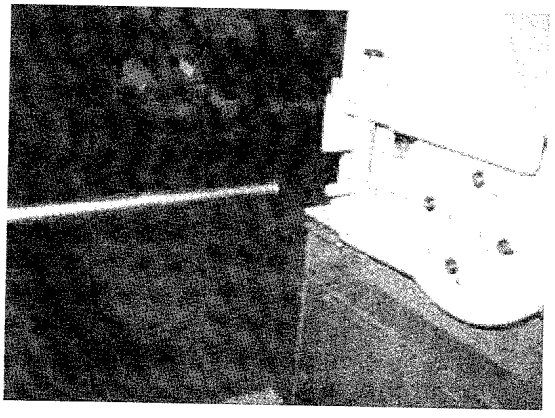
The air deflector plate (JCT144G) with time might become obstructed with grease and rocks accumulation. It is advisable to detach the *duct from fan cover to rear duct* (JCT006A) and through the opening remove all the air flow obstructing material.

Should the clamp JCT095J, with time show slippage from the set position, that might be caused by grease that has percolated where it grips. By spraying paint thinner or similar solvent that dilutes the grease and blowing it away, this can be easily corrected. In the worse cases the clamp needs to be removed and cleaned along with the *cover of the bottom shaft* (JCT087A).

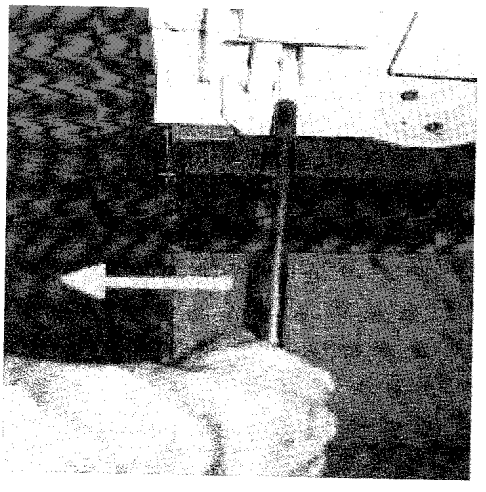
Also, when setting the opening with the moving jaw it is essential to have the moving jaw bottom edge, below the one of the stationary jaw. If the moving jaw bottom edge is set above the stationary bottom edge , under heavy crushing conditions, the jaws will have the tendency to open up.

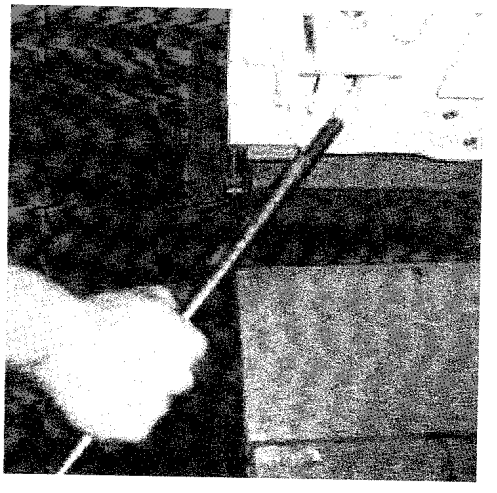
INSTRUCTIONS FOR RELEASING CLAMP

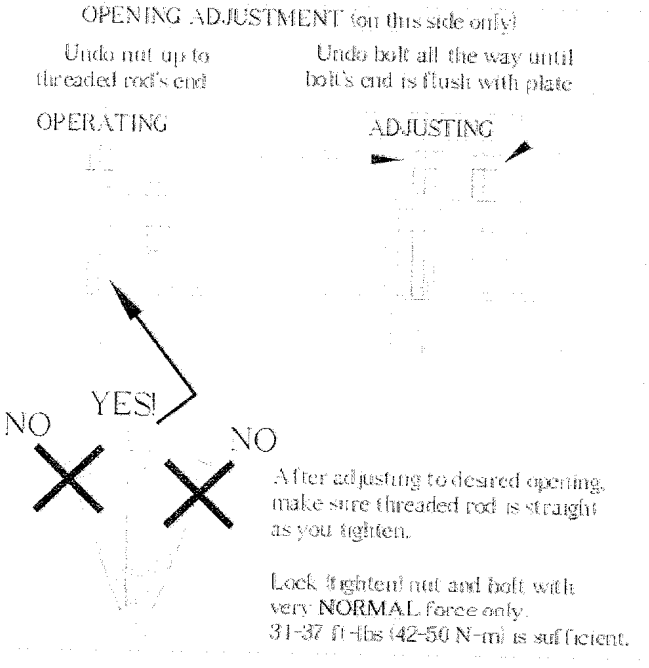
Use the side of the adjustment bar (JCT133) that has a hole.



Insert it on the lever (JCT095Y) and rotate it to release the clamp (JCT095J). Adjust the opening to the desired amount. Release lever and tighten the nut and bolt.







PARTS DESCRIPTION - TERMINATOR JAW CRUSHER

(Quantities in brackets indicated quantity required per machine. When ordering please specify quantity required as all parts are priced each.)

JCT003	Motor Guard
JCT006	Flywheel/Fan Guard
JCT006A	Duct from fan cover to rear duct
JCT007	Retaining bolts for flywheel locking plate (2 pcs.)
JCT008	Locking bolt for flywheel
JCT009	Locking plate for flywheel
JCT010	Retaining plate for flywheel
JCT011	Flywheel
JCT011A	Screw to hold fan blade (10 pcs)
JCT011B	Fan blade (10 pcs)
JCT011C	Nut to hold fan blade (10 pcs)
JCT012	Retaining bolts for flywheel locking plate (2 pcs.)
JCT013	Locking bolt for flywheel
JCT014	Locking plate for flywheel
JCT015	Retaining plate for flywheel
JCT016	Drive pulley
JCT017	Key for drive pulley
JCT018	Lock nut for excentric shaft
JCT019	Lock washer for excentric shaft
JCT020	Key for flywheel
JCT021	Lock nut for excentric shaft
JCT022	Lock washer for excentric shaft
JCT023	Retaining screws for flange cover plate (4 pcs.)
JCT025	Felt for cover plate
JCT026	Ring for flange cover plate
JCT027	Bearing for main frame flange (hub)
JCT028	Felt for main frame flange (hub)
JCT030	Flange mounting bolts (4 pcs.)
JCT031	Lock washer for flange mounting bolts (4 pcs.)
JCT032	Flange for main frame excentric shaft
JCT033B	Spacing ring (Must be mounted with same flange where it was removed and with chamfer toward centre of shaft as shown) Flange is stamped either A or B.
JCT034	Retaining screws for flange cover plate (4 pcs.)
JCT036	Felt for cover plate
JCT037	Ring for flange cover plate
JCT038	Bearing for main frame flange (hub)
JCT039	Felt for main frame flange
JCT041	Flange mounting bolts (4 pcs)
JCT042	Lock washer for flange mounting bolts (4 pcs.)
JCT043	Flange for main frame excentric shaft (stamped either A or B)
JCT044A	Spacing ring (Must be mounted with same flange where it was removed and with chamfer toward centre of shaft as shown) Flange is stamped either A or B.
JCT045	Bolts for pusher cover plate (6 pcs)
JCT046	Felt for pusher cover plate
JCT047	Pusher cover plate
JCT048	Pusher cover plate spacing ring
JCT049	Pusher bearing
JCT049A	Pusher auxiliary bearing
JCT049C	Bearing large spacer
JCT049D	Bearing small spacer
JCT050	Bolts for pusher cover plate (6 pcs)
JCT051	Felt for pusher cover plate
JCT052	Pusher cover plate
JCT053	Pusher cover plate spacing ring
JCT054	Pusher bearing
JCT054A	Bearing small spacer
JCT055	Excentric shaft
JCT057	Pusher (must be sold with JCT059)
JCT057A	Barbed purge fitting (3 pcs.)
JCT057B	Clamp for purge line hose
JCT057C	Purge line hose
JCT058	Bolts for Pusher retaining cover (8 pcs)
JCT059	Pusher retaining covers (must be sold with JCT057) (2 pcs)
JCT062	Moving jaw top shaft
JCT062A	Outer bearing (2 pcs)
JCT062B	Middle bearing (2 pcs)

JCT062C	Inner bearing (2 pcs)
JCT062D	Ring for bottom shaft (2 pcs)
JCT062E	Ring (grooves) for bottom shaft (2 pcs)
JCT063	Block (bearing housing) cover (2 pcs)
JCT063A	Seal (2 pcs)
JCT063B	Seal (Wiper) (2 pcs)
JCT063C	O-Ring (2 pcs)
JCT063D	Block cover bolt (16 pcs)
JCT064A	Clamp for purge line hose
JCT064B	Purge line hose
JCT065	Moving jaw
JCT065A	Moving jaw cover (2 pcs)
JCT065B	Moving jaw cover screws (8 pcs total)
JCT065C	Seal (2 pcs)
JCT065D	Seal (Wiper) (2 pcs)
JCT065R	Purge line hose
JCT065T	Clamp for purge line hose
JCT065U	Rubber curtain retainer screws (2 pcs)
JCT065V	Rubber curtain retainer
JCT065W	Rubber curtain
JCT066A	Holding bolts of moving jaw (2 pcs)
JCT067A	Lockwasher for holding bolts of moving jaws (2 pcs)
JCT069A	Clamp for moving jaw
JCT077	Bottom shaft of moving jaw (pivoting shaft)
JCT077A	Bottom shaft offset sleeve side A
JCT077B	Bottom shaft offset sleeve side B
JCT079	Key for bottom shaft of moving jaw (2 pcs)
JCT080	Housing for offset sleeve side A
JCT081A	Cover for bottom shaft side A
JCT082	Screws to hold cover (4 pcs)
JCT086	Housing for offset sleeve side B
JCT087A	Cover for bottom shaft side B
JCT088A	Screws to hold cover for bottom shaft side B (4 pcs)
JCT095A	Pivot bar for adjusting mechanism
JCT095B	Bolt and nut
JCT095C	Threaded rod
JCT095D	Washer for adjusting rod
JCT095E	Nut for adjusting rod
JCT095F	Screw
JCT095G	Bolt
JCT095H	Lockwasher
JCT095J	Adjustment holding clamp
JCT095K	Dowel pin for guide block (2 pcs)
JCT095L	Screws to hold guide blocks (4 pcs)
JCT095M	Guide block (2 pcs)
JCT095N	Clamp pivoting/sliding bar
JCT095P	Hexagon capscrew to hold support plate (5 pcs)
JCT095R	Flathead capscrew to hold support plate
JCT095T	Support plate
JCT095U	Dowel Pin
JCT095V	Guard for adjustment holding clamp
JCT095W	Screws to hold guard (2 pcs)
JCT095X	Flat disc (washer)
JCT095Y	Clamp releaser
JCT105	Moving Jaw (serrated or smooth) Alloy 2
JCT106	Stationary Jaw (serrated or smooth) Alloy 2
JCT107	Clamp for stationary jaw
JCT108	Lockwashers for holding bolts stationary jaw (2 pcs)
JCT109	Flat washers for holding bolts (2 pcs)
JCT110	Holding bolts for stationary jaw (2 pcs)
JCT111	Side wearing plate (left)
JCT112	Side wearing plate (right)
JCT113	Side wearing plate holding screws (2 pcs)
JCT114	Side wearing plate flat washers (2 pcs)
JCT115	Cotter pins (2 pcs)
JCT116	Motor plate shaft
JCT117	Motor plate
JCT118	Motor plate tensioner
JCT119	Retaining bolt for motor plate tensioner to main frame
JCT120	Nut and washer for bolt retaining motor plate tensioner to main frame
JCT121	Bottom nut motor plate tensioner
JCT122	Bottom angular retaining spacer
JCT122A	Upper angular retaining spacer

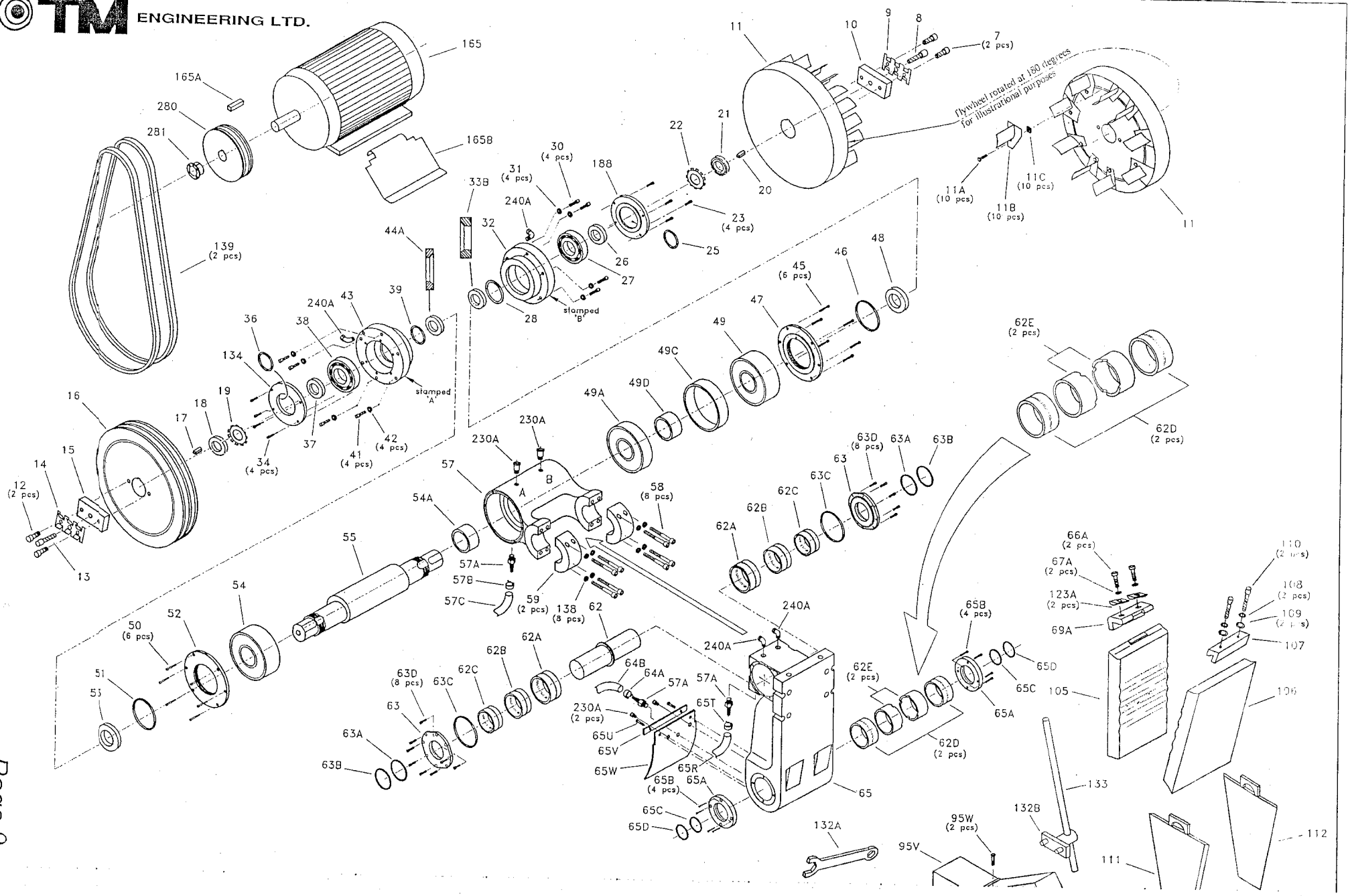
JCT123A	Top angular retaining spacer (2 pcs.)
JCT124	Top nut of motor plate tensioner
JCT125	Hopper
JCT126	Hopper main frame side clamp
JCT127	Hopper cover clamp
JCT130	Drawer
JCT131	Stand
JCT132A	Adjustment wrench
JCT132B	Adjustment key
JCT134	Cover for bearing flange of main frame eccentric shaft
JCT138	Screws for pusher cover (8 pcs)
JCT139	Belts (specify 50 or 60 hertz) (2 pcs)
JCT143	Front part of JCT frame
JCT143A	Bar with rubber and hardware
JCT144	Back part of JCT frame
JCT144B	Washer for autolube mounting frame (2 pcs)
JCT144C	Screw for autolube mounting frame (2 pcs)
JCT144D	Auto lube mounting frame
JCT144E	Screws and washers to hold duct (4 pcs)
JCT144F	Duct inlet
JCT144G	Air deflector plate (Vent)
JCT144H	Screws to hold air deflector plate (4 pcs)
JCT145	Left side of JCT frame
JCT145E	Motor mounting plate's yoke
JCT145F	Motor mounting plate's yoke screw
JCT145G	Motor mounting plate's yoke hardware
JCT145J	Support plate hardware (2 pcs)
JCT145K	Support plate
JCT146	Right side of JCT frame
JCT146A	Insert for right side of frame
JCT146B	Screws for insert (2 pcs)
JCT146C	Dowel pins for insert (2 pcs)
JCT146D	Screws to hold strip (8 pcs)
JCT146E	Strip for holding side wearing plate (2pcs)
JC148A	Seals (2 pcs)
JCT151	Nuts for hopper bolts (4 pcs)
JCT152	Hopper bolts (2 pcs)
JCT153	Hinge brackets for hopper (4 pcs)
JCT154	Lockwashers for hopper brackets (8 pcs)
JCT155	Bolt for hopper hinge brackets (8 pcs)
JCT156	Screws for hopper cover clamp (4 pcs)
JCT157	Screws for hopper main frame side clamp (3 pcs)
JCT158	Frame/Leg bolts (20 pcs)
JCT159	Lockwashers for frame/leg bolts (20 pcs)
JCT160	Frame legs (4 pcs) . If ordering please specify front right (F.R.) front left (F.L), rear right (R.R.), rear left (R.L.)
JCT161	Dowel pins for frame (8 pcs)
JCT162	Cross bars (2 pcs)
JCT165	Motor
JCT165A	Motor shaft key
JCT165B	Rock shield
JCT188	Cover for bearing flange of main frame eccentric shaft
JCT238	Protective rubber rings for grease line (2 pcs)
JCT280	Pulley (specify 50 or 60 hertz)
JCT281	Bushing (specify 50 or 60 hertz)

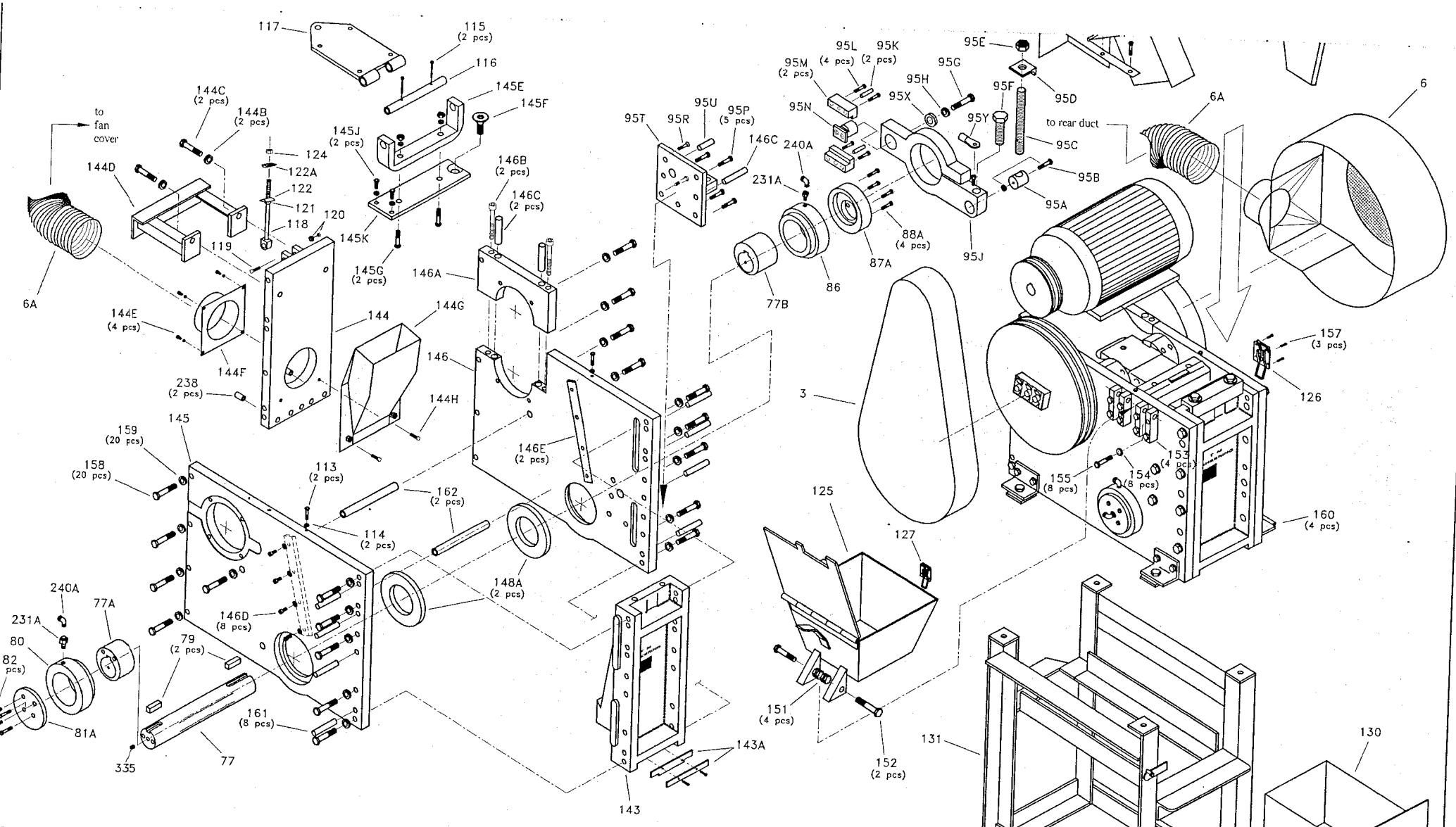
PARTS DESCRIPTION - AUTOLUBRICATION SYSTEM

(Quantities in brackets indicated quantity required per machine. When ordering please specify quantity required as all parts are priced each.)

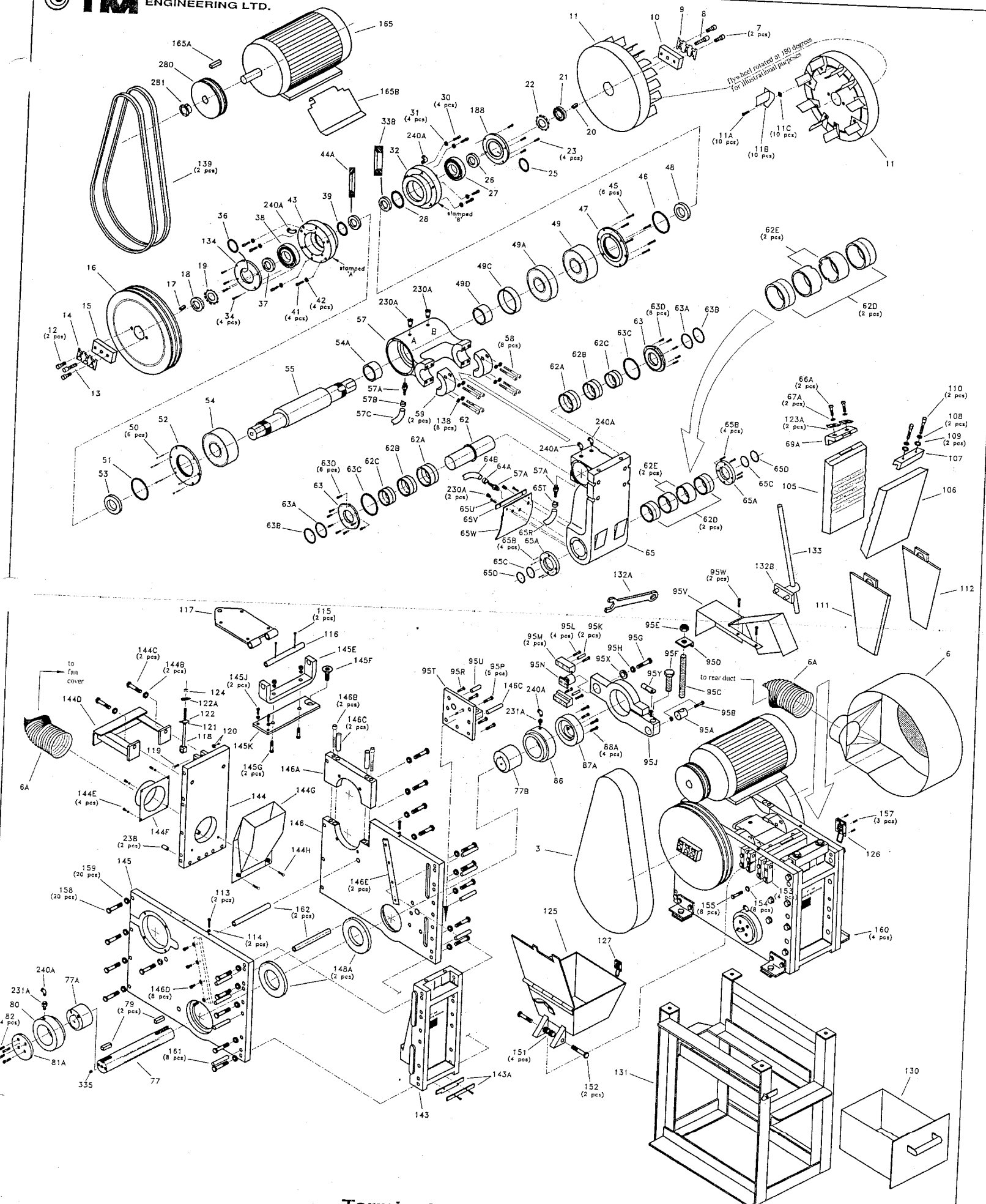
JCT057A	Barbed purge fitting (3 pcs.)
JCT057B	Clamp for purge line hose
JCT064A	Clamp for purge line hose
JCT064B	Purge line hose
JCT065R	Purge line hose
JCT065T	Clamp for purge line hose
JCT230A	Straight grease fitting (8 pcs.)
JCT230B	Fitting for main grease line
JCT231A	Check valve (3 pcs.)
JCT233	Bolts to fit manifold to Jaw Crusher (2 pcs.)
JCT234	Fitting for main grease line to manifold
JCT235	Fitting for main grease line to manifold
JCT237	Lock washer for screw to hold manifold to Jaw Crusher (2 pcs.)
JCT239A	Electric motor
JCT240A	90 degree grease fitting (12 pcs.)
JCT258	Grease unit main frame
JCT260	Solenoid block
JCT264	Straight adaptor for pipe
JCT265A	Control panel box
JCT266	Grease line from one point lubrication to manifold
JCT267	1/4" pipe adaptor
JCT271A	Pump speed reducer
JCT272	Grease container
JCT273A	Grease pump primer nipple
JCT275	Grease container cover
JCT276A	Pressure check valve
JCT279	Tube Compression Ring
JCT282	Double Cone Compression Ring
JCT285A	Timer control board for Autolube
JCT288	1/ 2" Non-metallic clamp for cable
JCT289	3/ 4" Non-metallic clamp for cable (2 pcs)
JCT292	Transformer for autolube
JCT295	Grease Manifold
JCT315	Grease Line
JCT316	Grease Line
JCT317	Grease Line
JCT318	Grease Line
JCT319	Grease Line
JCT320	Grease Line
JCT321	Grease Line
JCT322	Grease Line
JCT323	Grease Line
JCT324	Grease Line
JCT335	Plug for grease hole
JCT350	Grease pump bleeder screw

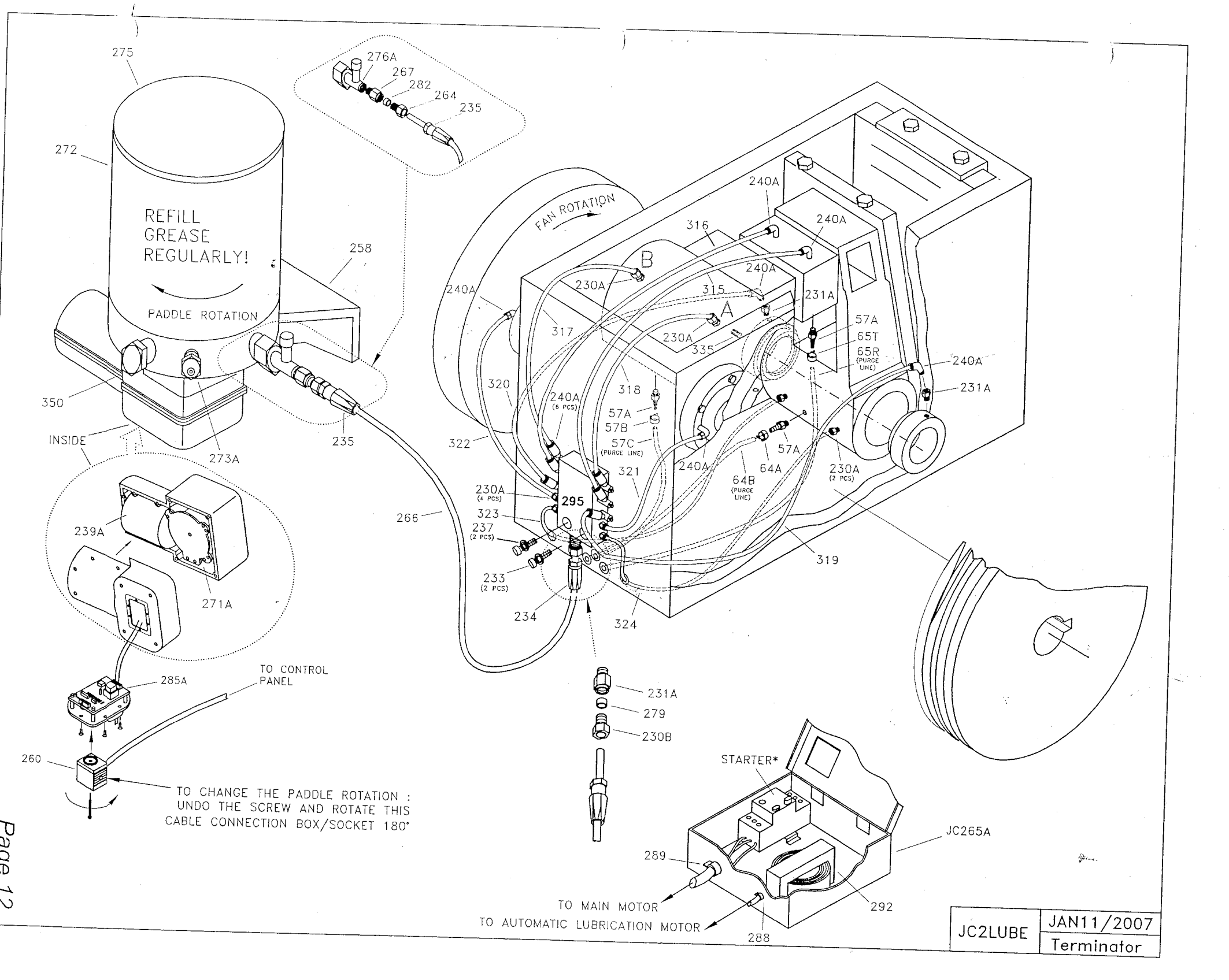
TM ENGINEERING LTD.





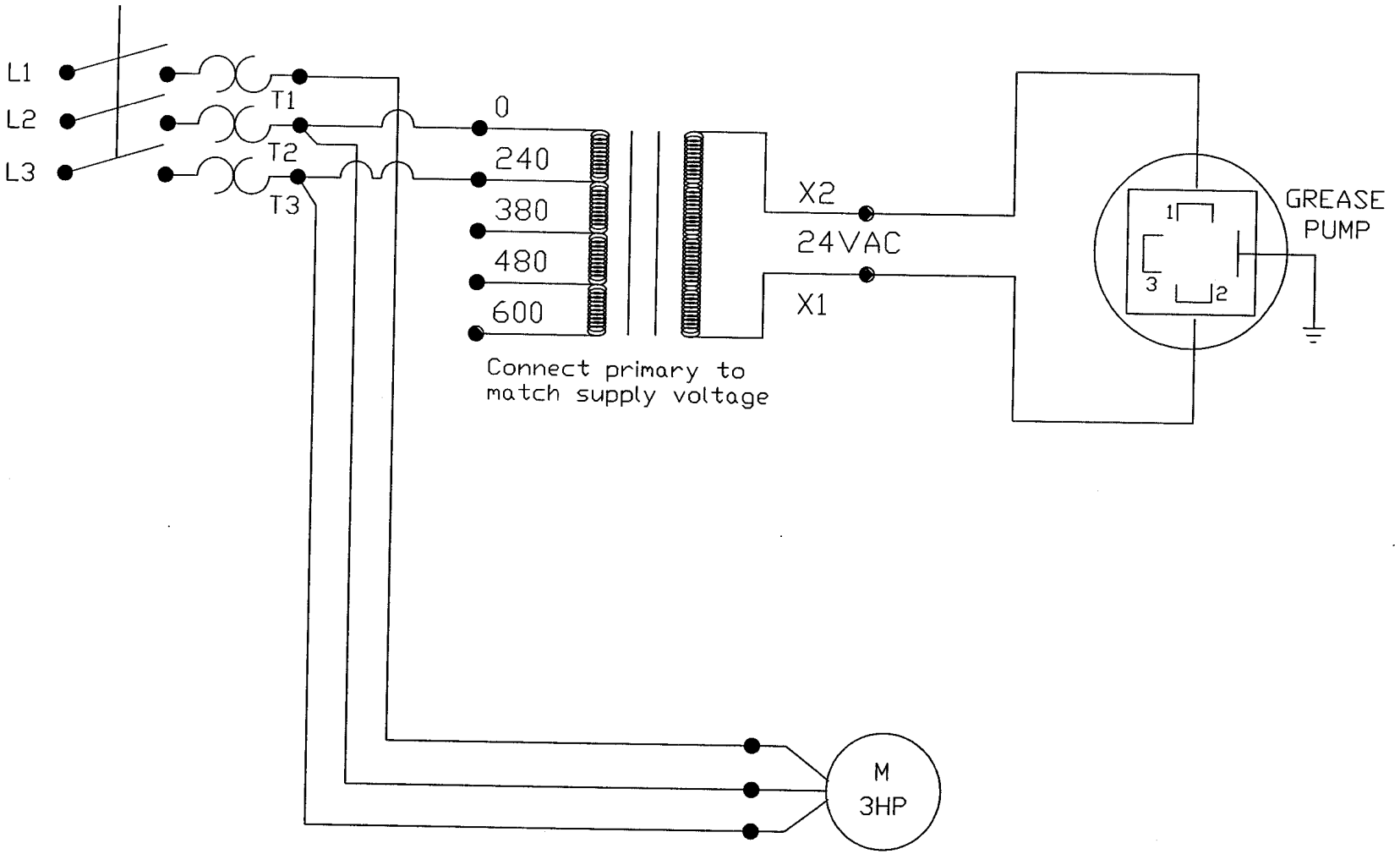
Terminator Jaw Crusher


Flywheel rotated at 180 degrees for illustrational purposes
to fan cover
to rear duct
stamped "A"
stamped "B"

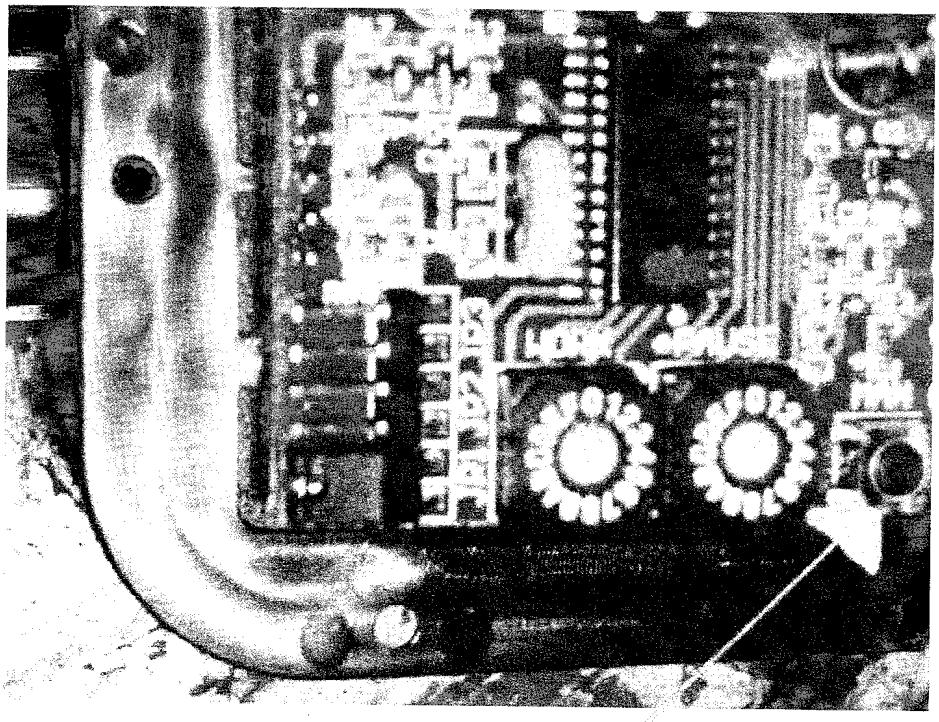


JC2LUBE	JAN11/2007
	Terminator

TM AUTO LUBE 208/240/380/480/600VOLT 3PHASE/SINGLE PHASE 50/60HERTZ



FOR TESTING PURPOSES GREASE PUMP CAN BE OPERATED MANUALLY WITH PUSH BUTTON ON TIMER CONTROL BOARD. SEE ATTACHED PICTURE.



For troubleshooting or for manual pump operation, press the 'MAN' button indicated by the arrow

Terminator Disassembling/Assembling

To remove the motor (JCT165):

1) Remove motor guard (JCT003).
2) Release tensioned belts by undoing nuts on motor plate tensioner (JCT118).
3) Remove belts (JCT139).
4) Remove motor (JCT165) by undoing bolts holding it to motor plate (JCT117).

Removing flywheel (JCT011) (same procedure for drive pulley (JCT016)):

1) Remove flywheel guard (JCT006).
2) Open up locking plate lips (JCT009) for all bolts (JCT007 & JCT008).
3) Remove bolt (JCT008), loosen up bolts (JCT007) enough to allow insertion of a small plate and a 1/2" NC nut between the retaining plate of flywheel and the flywheel itself. Use a 1/2" bolt screwed in the nut through the hole in the retaining plate (JCT010) to force out the flywheel from the main excentric shaft (JCT055).

Disconnecting the pusher (JCT057) from the moving jaw (JCT065):

1) Remove grinding jaws (JCT105/106).
2) The moving jaw (JCT065) has the appropriate holes in the face for one to insert a 1/2" socket wrench to start undoing bolts (JCT058). Afterwards, a bondus socket wrench in combination with a ratchet one will speed up the process considerably (see Picture #1).

Moving jaw (JCT065) removal:

1) To remove moving jaw from the machine, remove cover (JCT081) by undoing screws (JCT082) with a normal socket wrench and pipe (see picture #1).
2) Fasten a bar across offset sleeve (JCT077A) by using the threaded holes in the face (see Note 1). The bar will have two threaded holes 1/2" NC in line with the ones used, clearing the hub's diameter. Now one can thread two bolts through the bar against the JC frame and pull out the hub. Make sure also to remove the pivoting shaft key (JCT079). By loosening the adjustment clamp one can now slide out the bottom shaft from the machine and remove the moving jaw.
3) To pull out bottom shaft (JCT077) from cover (JCT087), first remove the four bolts (JCT088) from it. Then screw in two through the cover on the shaft's face with at least 1/2" thread into the shaft and clearance of 1/2" between cover and screw's head. Make sure that screws are protruding from cover's surface at least the same amount. Set shaft vertically with cover up supported at the lower edge. If a press is available press down on the screw's head that had previously been mounted on the shaft's end. Otherwise, by using the same set up and a flat plate set onto the screw's head, hammer them down thereby freeing the cover from the shaft.
4) Now using a similar method one can press out the shaft from the offset sleeve.

Disassembling the moving jaw (JCT065):

1) All bearings, top and bottom, are precision pressed in line into the moving jaw. The same procedure will be used to press them out.
2) To replace old ones with new ones, proceed by pressing the top ones into the seats, one on each side and at the bottom two from each side.

Removing the pusher (JCT057):

1) Prying out the frame's insert (JCT146A) will greatly facilitate the pusher removal. Therefore, first remove flange A (JCT043) and then undo bolts (JCT031) from flange B (JCT032). (See Note 1.) The insert will come out by:
   1) Removing JCT145A.
   2) Insert two round bars (1/2" diameter by 1-3/4" long) into threaded holes 15-16 (see Picture #3)
   3) Screw in 3/4" long thread bolts. (For this purpose, custom made bolts are available from the factory without the need of 1/2" X 1-3/4" bars. Also read Note 1.) This will pry out the insert. Now the pusher can slide out from JC frame.

Pusher (JCT057) disassembling:

1) Set the excentric shaft (JCT055) vertically and supports under cover side A. The shaft can be pressed out all the way since it has no shoulders. Remove covers. Press out first bearing on side A. Rotate pusher. Use a bar slightly smaller than the big diameter of the center's bearing inner ring and press out side B bearing. Central bearing will be removed by pressing onto the bearing roller.
2) Flange A (JCT043) and B (JCT032) are conventional bearing housings: If bearing replacement is necessary press them out, replace and re-pack with grease. At the reassembling stage, two important things to keep in mind:
   1) Reassemble pusher and press onto it excentric shaft (JCT055) and also flange B (JCT032). Slide assemblies into JC frame. Fasten flange B to frame with two 3/8" NC bolts. This allows one to mount flange A on the opposite side in an easy manner, particularly when one has two longer 3/8" NC bolts that will drive the flange into the frame's seat. (See Note #1).
   2) The moving jaw must be re-assembled (if bearing replacement was needed) before being re-assembled into the JC. Being a relatively heavy piece some auxiliary lifting device might be necessary to lower it within the frame. All machines purchased and delivered before May 31, 2004 had been equipped with a sealing system made of parts JCT148, 149, & 150. After that date, a new improved seal (JCT148A) has been installed and it is <u>fully interchangeable</u> with all previous machines and is available for replacement. When replacing seals, first slide them onto covers (JCT065A) and then proceed in lowering the moving jaw within the JC frame until it has the lower bearing's hole in line with housing's holes (JCT080 & 086). The bottom shaft pre-assembled with parts JCT079,

077B, 087, & 088 will be slid through the bearings and secured tightly with clamp (JC095J). Now, one can insert key (JCT079) onto the bottom shaft on the opposite side and by using a plastic mallet, hammer into place offset sleeve (JCT077A). Please note that in order to have the bottom shaft staying in place rigidly when assembling this offset sleeve it is sufficient to tighten the adjustment clamp on the opposite side.

Pusher installation and positioning:

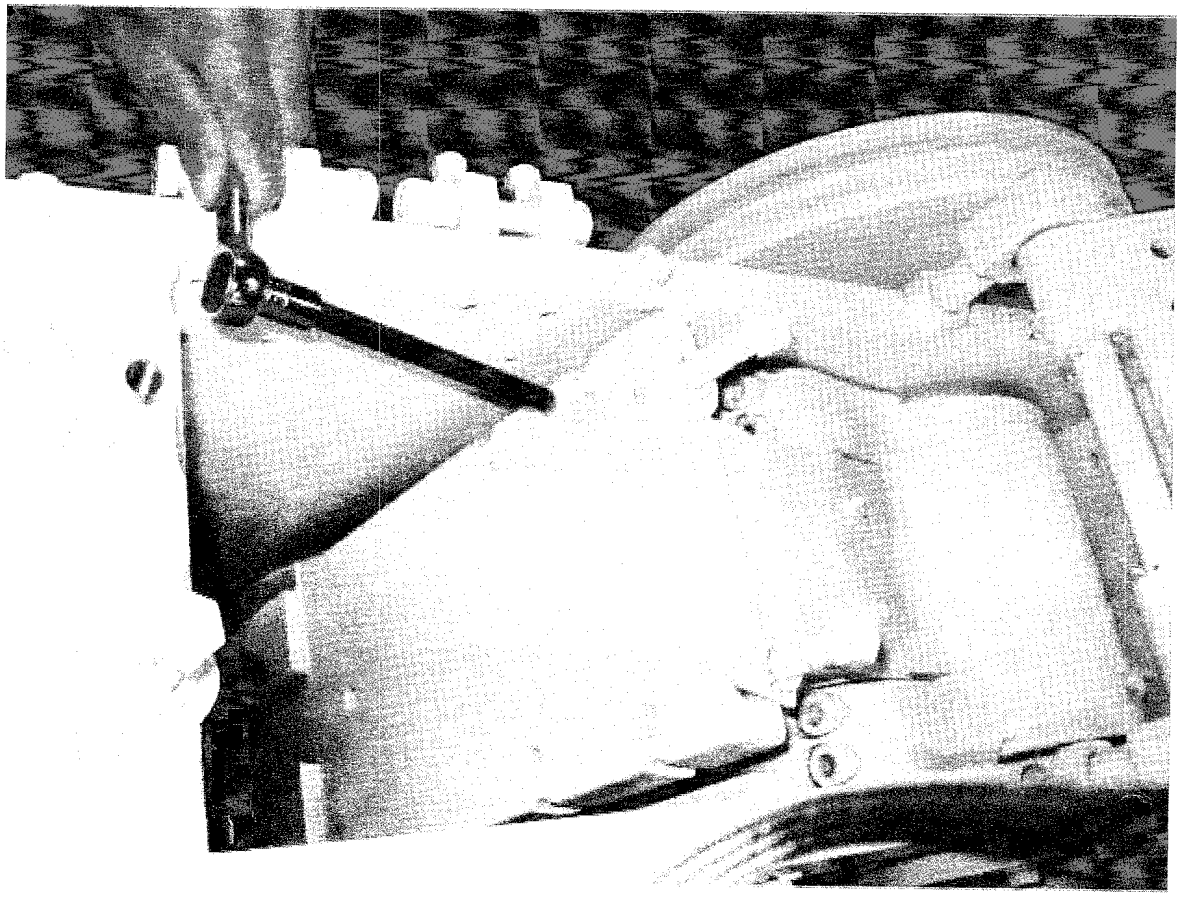
1) With everything bolted in place, that is, insert (JCT146A) and flanges (JCT032 & JCT043) it is very important to tighten first locknut (JCT018) on side A and then the locknut (JCT019) on side B. In both processes, it is advisable to screw on old 1/2" NC hexagon head bolt, preferably with same heavy duty washers, in between at the opposite end of the excentric shaft and hammer onto it while tightening the locknuts. One will notice the shaft's lateral displacement until it will no longer happen and therefore the shaft will be correctly positioned.

Note 1

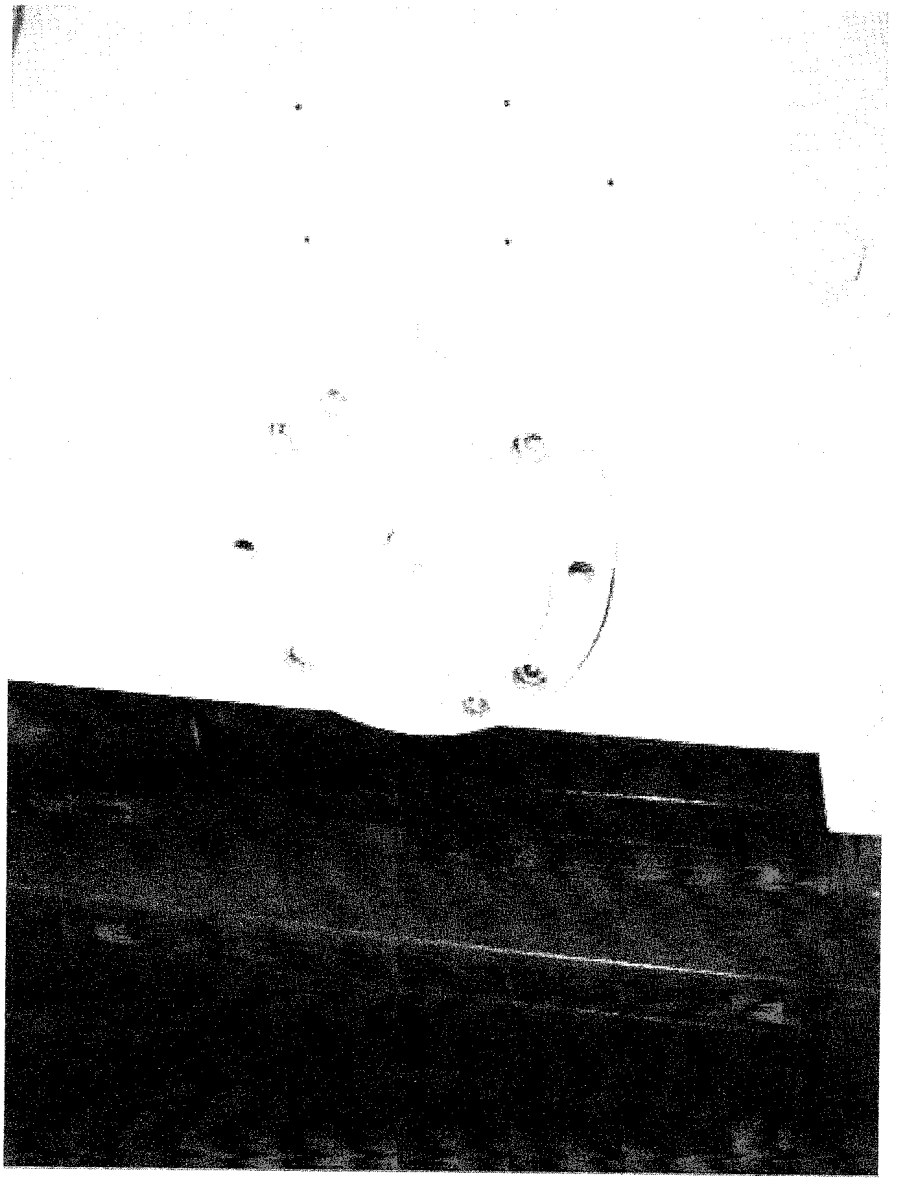
Two customized accessory kits are available that will facilitate enormously the disassembling/assembling of this machine.

Kit One:
- Extractor/offset hub puller
- Moving jaw lifting bridge
- Insert extractor screws (2 pcs.)
- 3/8" Ball point socket wrench
- 3/8" hexagon socket drive

Kit Two: All items in Kit One plus:
- Disk to remove spherical roller bearings in pusher
- Disk to press in pusher's bearings
- Disk to press in & out moving jaw bottom bearings
- Riser to support moving jaw to press in or out bottom shaft bearings
- Disk to remove bearings (bushings) in top of moving jaw
- Bar to press in & out rings for bottom shaft
- Disk to press bearings into flanges A & B
- Disk to press bearings (bushings) in top of moving jaw in their seat

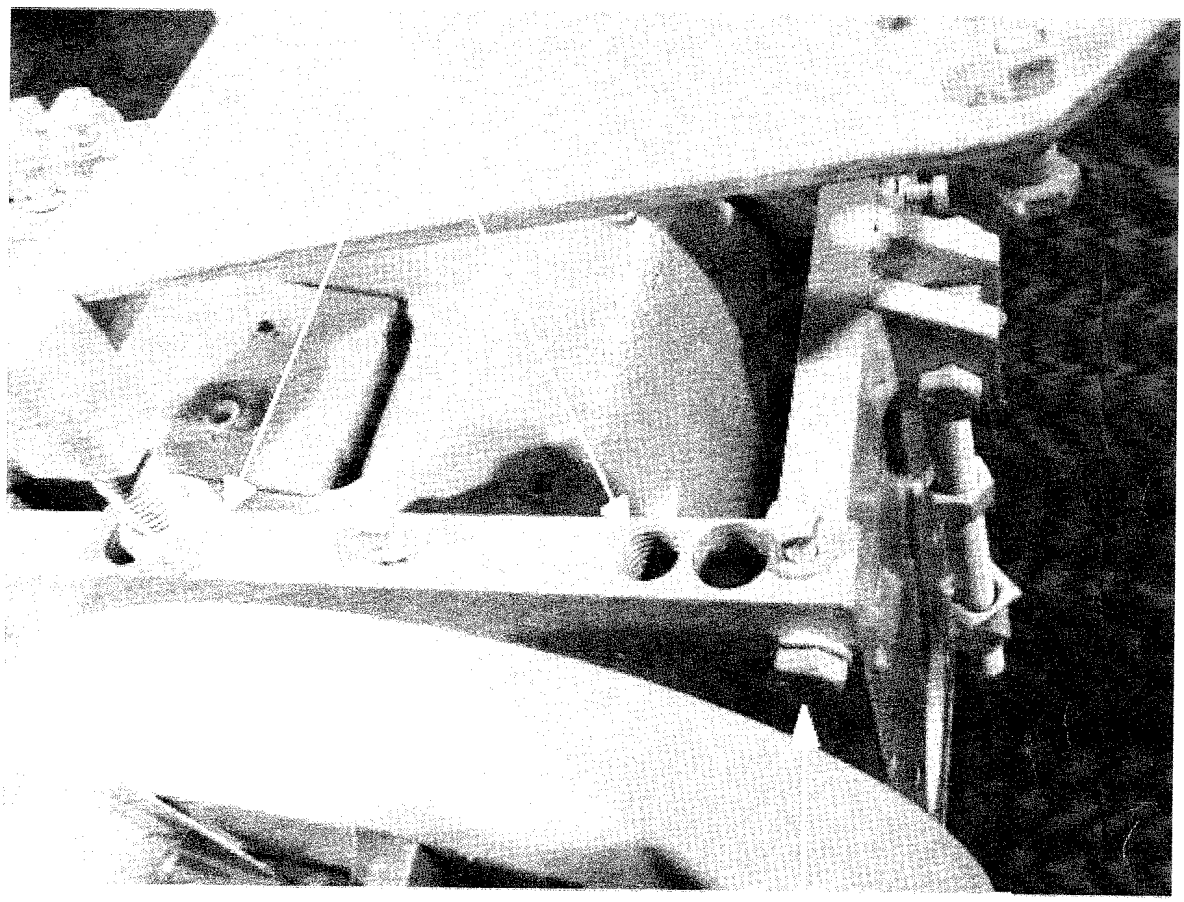


Picture #1



Picture #2

Insert bars 1/2dia x 1 3/8 and screw in 3/4NC long thread thread bolts. It will pry out the insert. Read Note 1.



Remove this bolt

Picture #3

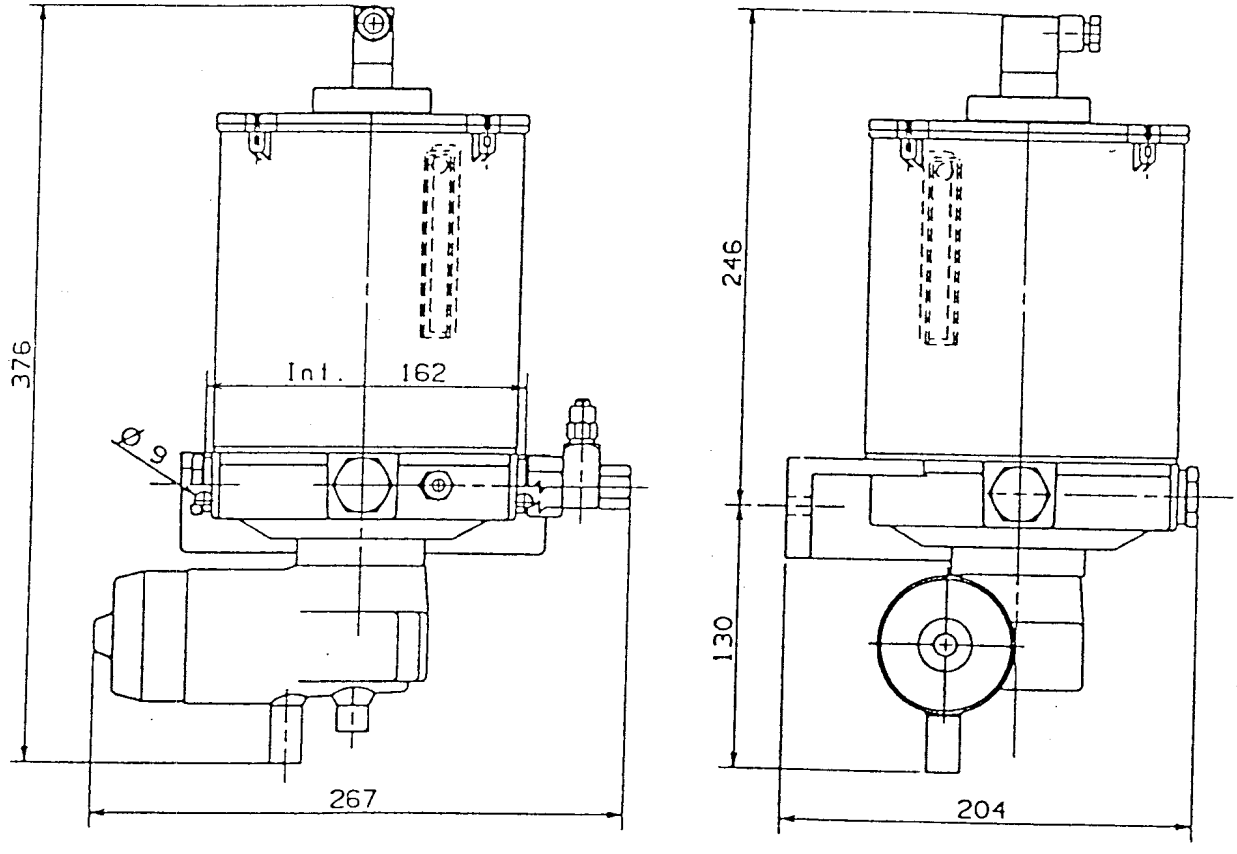
AUTOLUBRICATION SYSTEM MAINTENANCE AND TROUBLESHOOTING INFORMATION

AUTOLUBRICATION SYSTEM MAINTENANCE
AND
TROUBLESHOOTING INFORMATION

Pump Features:

Number of Devices Involved in the Pumping Process:	From 1 to 3
Discharge/Cycle with Adjustable Pumping Element:	0.01 - 0.16 cc
RPM:	15
Motor:	24 V dc - 30 W - 1.5 A
Low Level Switch Ratings:	0.5A - 250V - IP54
Reservoir Capacity:	2 kg
Maximum Working Pressure:	250 BAR (3630 PSI)
Recommended Lubricants:	Grease Max. NLGI - 2
Temperature:	From -20°C to +80°C
Discharge Outlet:	1/4"

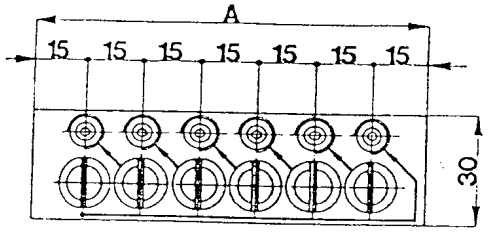
Overall Dimensions (in millimetres):

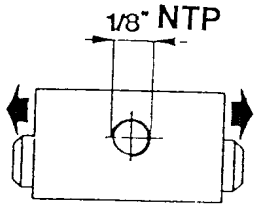


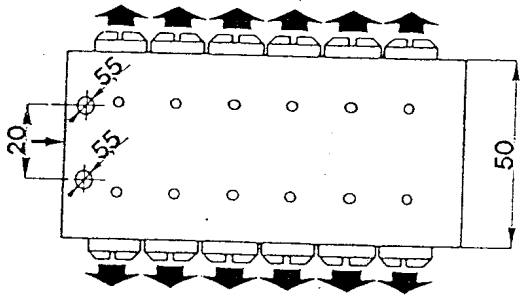
Single Line Progressive Dividers DPM Features:

Discharge/Stroke:	0.10cc - 0.15cc - 0.20cc
Operating Pressure:	From 15 bar to 250 bar
Operating Temperature:	From -20°C to +80°C
Body Distributor:	Galvanized Steel
Number of Cycles/Minute:	Maximum 250
Inlet:	1/8"
Outlet:	M10x1
Mounting Screws:	M5x40
Lubricants:	Grease Max. NLGI - 2
Control Elements:	Visual and Electric for Cycle and Overpressure indication
Main Lines:	Tube O.D. 10-8-6
Secondary Lines:	Tube O.D. 6-4

Overall Dimensions (in millimetres):







Single Line Progressive Dividers Flow Diagram:

Operating Sequence

1. Pressure supply through internal passages moves piston "A" left while holding pistons "B" and "C" fixed. A measured quantity of grease discharges from Outlet 4.
2. Piston "A" reaches end of stroke. It opens internal passages directing pressure supply to right end of piston "B". Grease discharges from Outlet 1.
3. Piston "B" reaches end of stroke. It opens internal passages directing pressure supply to right end of piston "C". Grease discharges from Outlet 2.
4. Piston "C" reaches end of stroke. It opens internal passages directing pressure supply to left and end of piston "A" which returns on its initial position as grease discharges from Outlet 3.

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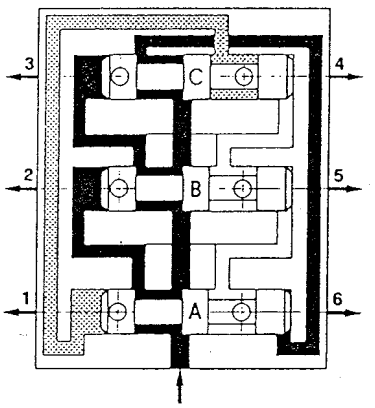

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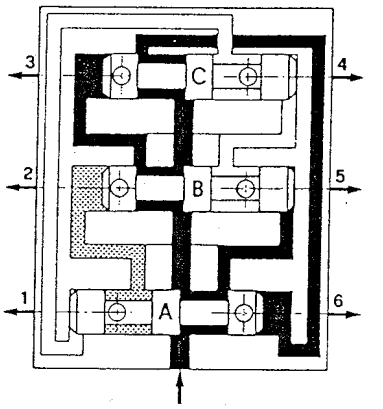

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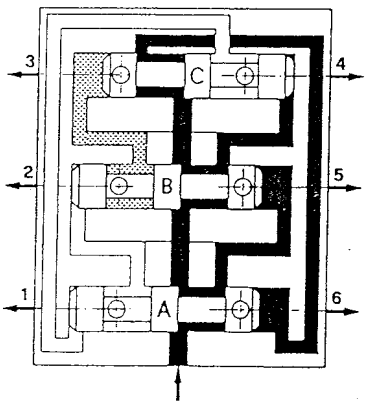

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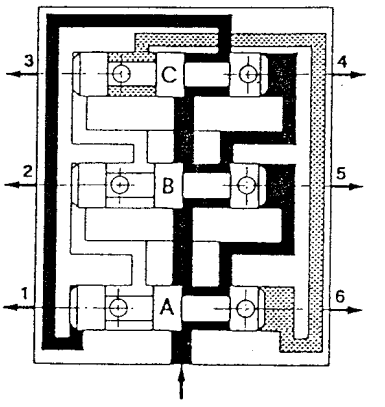
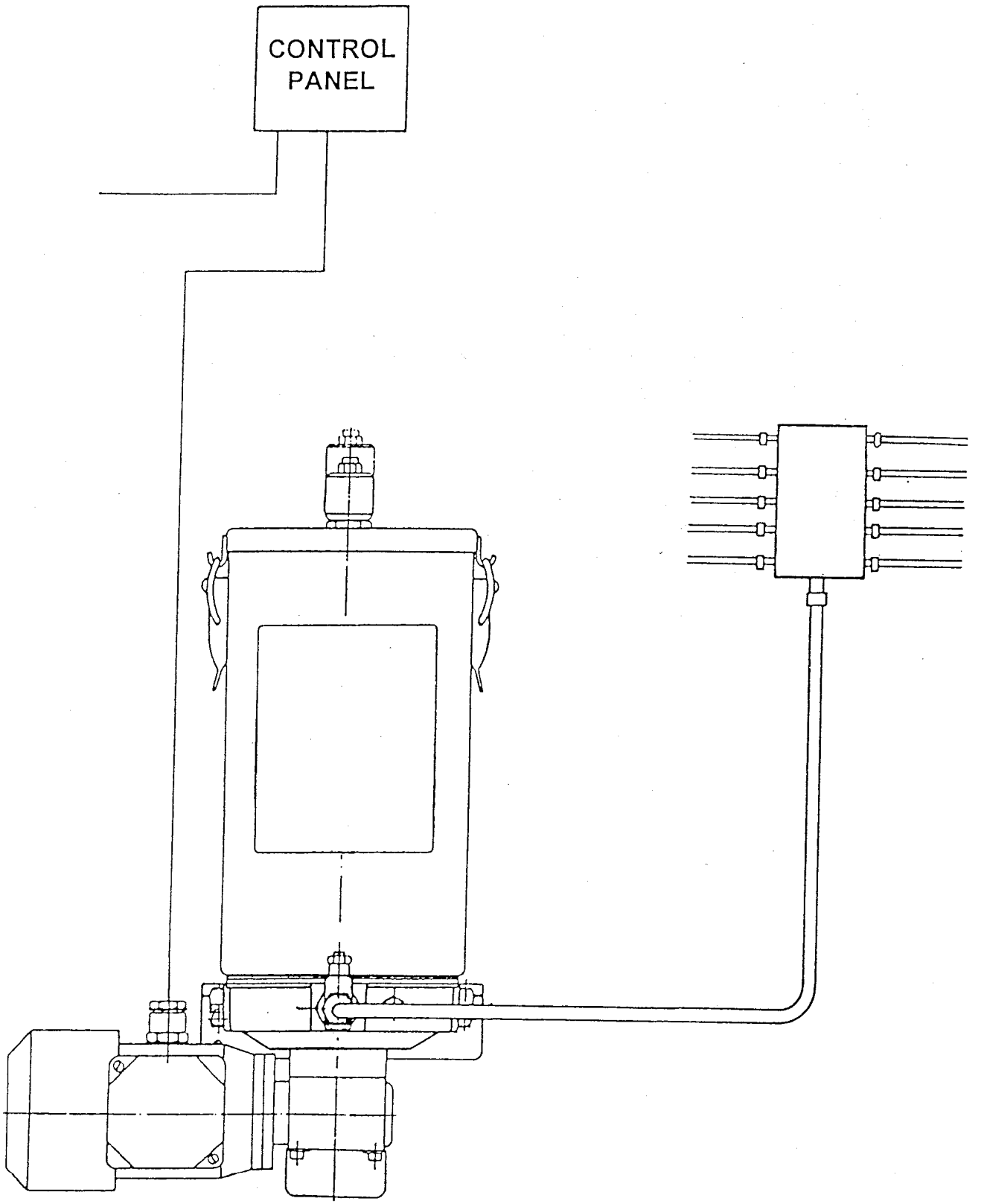


Black - Pressure supply acting
Dots - Grease being dispensed to bearing
White - Static, no pressure

Layout of Centralized Lubrication System with Single Block Progressive DPM Series



Starting Up the System

1. Fill the grease lines with clean grease. An air driven pump works well for filling long grease lines. Fill the discharge line from the valve manifold to the bearings and also lubricate the bearings with a hand grease gun if possible.

2. Fill the reservoir with clean grease.

3. Loosen the grease lines at all valve manifold inlet outlets as well as at bearing injection points.

4. Before starting the motor, check the following:
   - ♦ Timer setting.
   - ♦ System power requirements - voltage, phase, AC or DC, etc. For electrical systems and air supply for air operated systems (enough filtered and lubricated air must be available to operate the system).
   - ♦ Electrical connections to timer, cycle indicator switch, pressure indicator switch, etc.

5. Start up the system pump and progressively purge all parts of the system of air. Tighten the inlet fitting at the primary valve manifold. When the pump to the primary valve manifold line is free of air, repeat the operation at the bearing injection points.

6. After the system has run for a while, check all connections for leaks.

7. Observe normal system operating pressure, check if there is any excessive pressure peaks or dips which may indicate a tight bearing or valve manifold being distorted in mounting, or a loose or disconnected fitting.

How to Prevent Problems:

1. Keep reservoir filled. A pump operating with an empty reservoir may force air into the system causing difficulty in building pressure or preventing the pump from priming.

2. Use clean grease because foreign matter may clog pump filler screen. Keep filler screen and filler connection assembly clean.

3. Inspect entire system regularly including all grease lines. Replace if damaged. Connections should be tight and a small amount of grease should be at the edge of each bearing.

How to Locate and Correct Problems:

1. If there is air in the reservoir it is likely because the pump fails to build pressure. Correct this by cleaning out reservoir, adding a small amount of oil (this helps prime and purge system of air), and filling it with clean grease. To ensure that the system is free of air, cycle it several times and then open the lines at the valve manifold inlet outlets to bleed out the air.

Note:
Remember that a fully pressurized grease system capable of operating properly is conditional to having removed all air and filled it with grease!

2. Locate blocked points as follows:

A. Open the pressure line at the inlet outlet to the manifold to check for blockage of the line to this point with pump operating. Grease should flow without the pressure opening the pressure check valve and releasing grease.

B. Disconnect lines in an alternative sequence at the manifold. Grease should eject from each of the discharge outlets. If any of the outlets does not let out grease, the manifold is not functioning.

C. If the manifold is O.K., reconnect the grease lines and check at the bearing connections that grease reaches them. With a manual grease gun and a grease nipple one can check each passage at the bearing grease outlets that there is no blockage causing the grease not to flow. If all checks out O.K., reconnect all lines and start the autolube system.

If the Autolube System Operates but does not pump grease:

	Cause	Solution/Repair
1.	Plugged bearing	Ascertain which bearing is plugged and remove obstruction
2.	Crushed or plugged line	Replace
3.	Blocked manifold	Clean or replace
4.	Manifold assembled improperly	Check schematic diagram
5.	Improper cross-porting	Check schematic diagram for proper cross-porting
6.	Grease too heavy	Change grease
7.	Faulty check in valve	Clean or replace
8.	System supply and discharge lines too small or too long	Check schematic diagram
9.	Pump stroking too fast	Check pump's power supply and pump
10.	Manifold discharge outlet is plugged	Never plug an outlet inadvertently connected to a bearing Remove plug

Pump Operates but Unable to Build Pressure or Operate System:

	Cause	Solution/Repair
1.	Not enough grease	Add grease to reservoir
2.	Air in pump or grease lines	Bleed air at pump and at manifold
3.	Grease line from reservoir not properly sized to satisfy pump	Remove and replace
4.	Clogged reservoir screen or strainer	Clean or replace
5.	Faulty or dirty pump	Clean or replace
6.	Hydraulic pump worn out or malfunctioning	Check out and replace what necessary
7.	Grease too heavy to prime pump	Change to lighter grease
8.	Broken or leaky lines or fittings	Tighten or replace

Other Possible Problems:

SYMPTOM	POSSIBLE FAULT	REMEDY
The pump does not deliver grease	♦ Lack of grease	♦ Fill reservoir
	♦ Check if valve, lines or manifold are dirty	♦ Remove and clean
	♦ Pumping elements are worn	♦ Replace
The pump does not deliver grease at the required pressure and rate	♦ Faulty or damaged valves	♦ Replace
	♦ Valves incorrectly set (calibrated)	♦ Plug desired line and connect it with pressure gauge to check for pressure and for grease delivery
	♦ Relief valve is dirty	♦ Remove and clean
	♦ Pumping elements are worn	♦ Replace what necessary
Pump does not operate	♦ Check electrical power supply	♦ Trace fault and correct
	♦ Faulty timer	♦ Check and replace if faulty
	♦ Faulty electrical system	♦ Repair and/or replace faulty parts