DYNACAST INSTRUCTION MANUAL
FOR
MODEL A-1 AND MODEL A-2 AUTOMATIC DIE CASTING MACHINE

This manual is intended to aid the operator in becoming thoroughly acquainted with this equipment in order that it may achieve maximum performance. It should be read before any attempts are made to operate the machine; particular attention should be paid to the safety precautions.

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Gries Division

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1970 Edition

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DYNACAST MODEL A-1 AND MODEL A-2

The Dynacast Model A-1 and Model A-2 high speed automatic zinc die casting machines represent a major advance in the field of precision miniature casting. High production rates from single cavity tooling and the precision inherent in the machines, have combined to make this process a "must" in numerous industries. The single cavity principle insures that all parts are exactly alike – an important consideration where automatic assembly equipment is used.

Costly secondary operations can often be eliminated. A four-slide principle with an optional fifth slide make simple the production of a large variety of parts which are difficult or impossible on conventional equipment. Flash-free castings and small gates eliminate the need for trimming.

Sensitive interlocks and micrometric adjustments on the dies and cores combine to insure flash-free castings and operating safety.

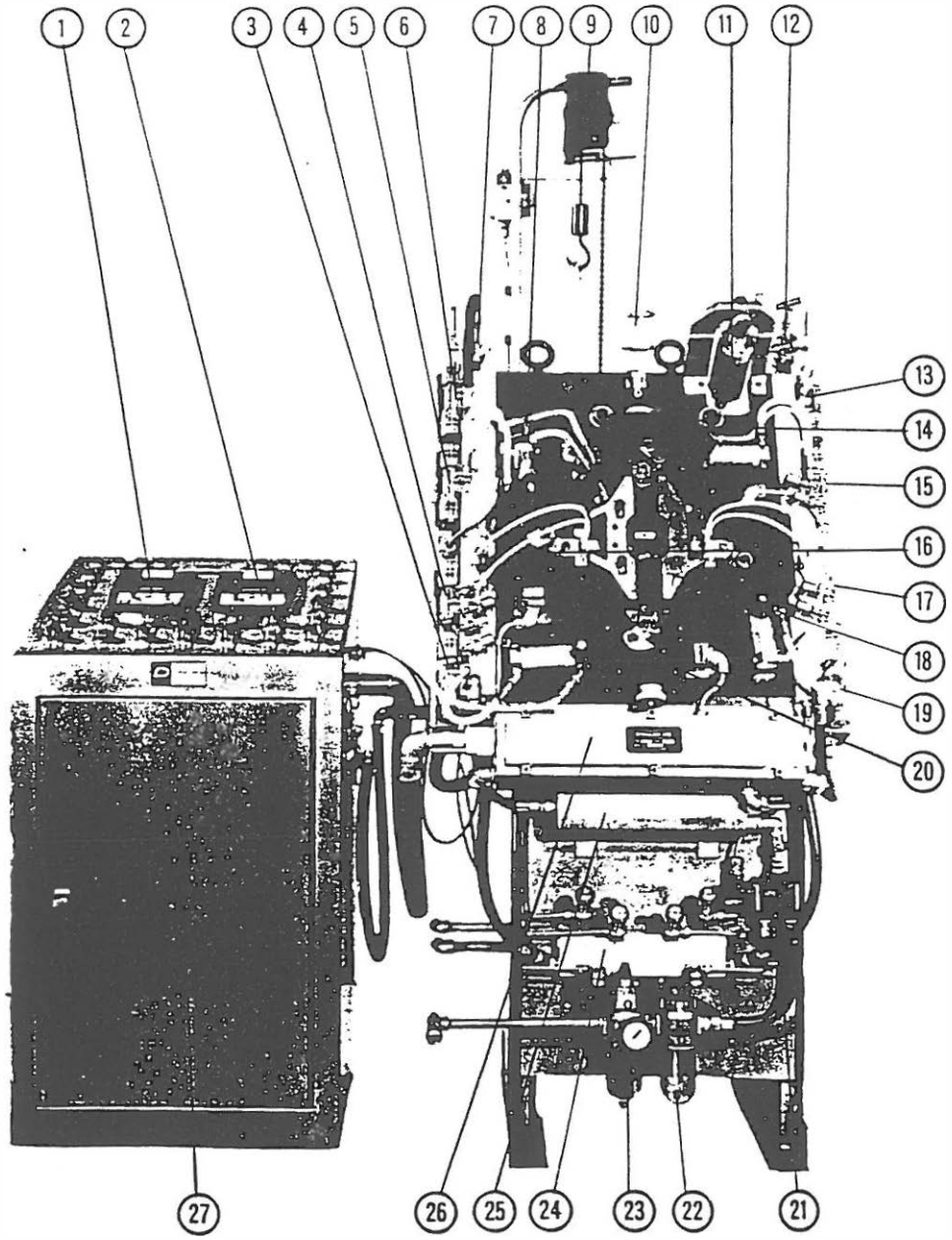
DISREGARD

GENERAL CHARACTERISTICS

	MODEL A-1	MODEL A-2
Injection Force	Max. 1177 lbs. at 100 P.S.I.	Max. 1177 lbs. at 100 P.S.I.
Injection Pressure	2200 P.S.I. (155 kg/cm^2)	1961 P.S.I. (138 kg/cm^2)
Dry Cycle Rate	100 cycles per minute	75 cycles per minute
Standard Die Area	1½ x 1½ (38mm x 38mm)	1½ x 1½ (38mm x 38mm)
Optional Die Areas	Up to 2-1/8" x 3" (54mm x 76mm)	Up to 2-1/8" x 3" (54mm x 76mm)
Max. Recommended Casting Weight	1 oz. (28gr.)	1¾ oz. (49gr.)
Die Lubrication Units	1 spray type, 1 drip type	1 spray type, 1 drip type
Pot Capacity	Max. 150 lbs. (max. 68.0 kg.)	Max. 150 lbs. (max. 68.0 kg.)

INSTALLATION DATA

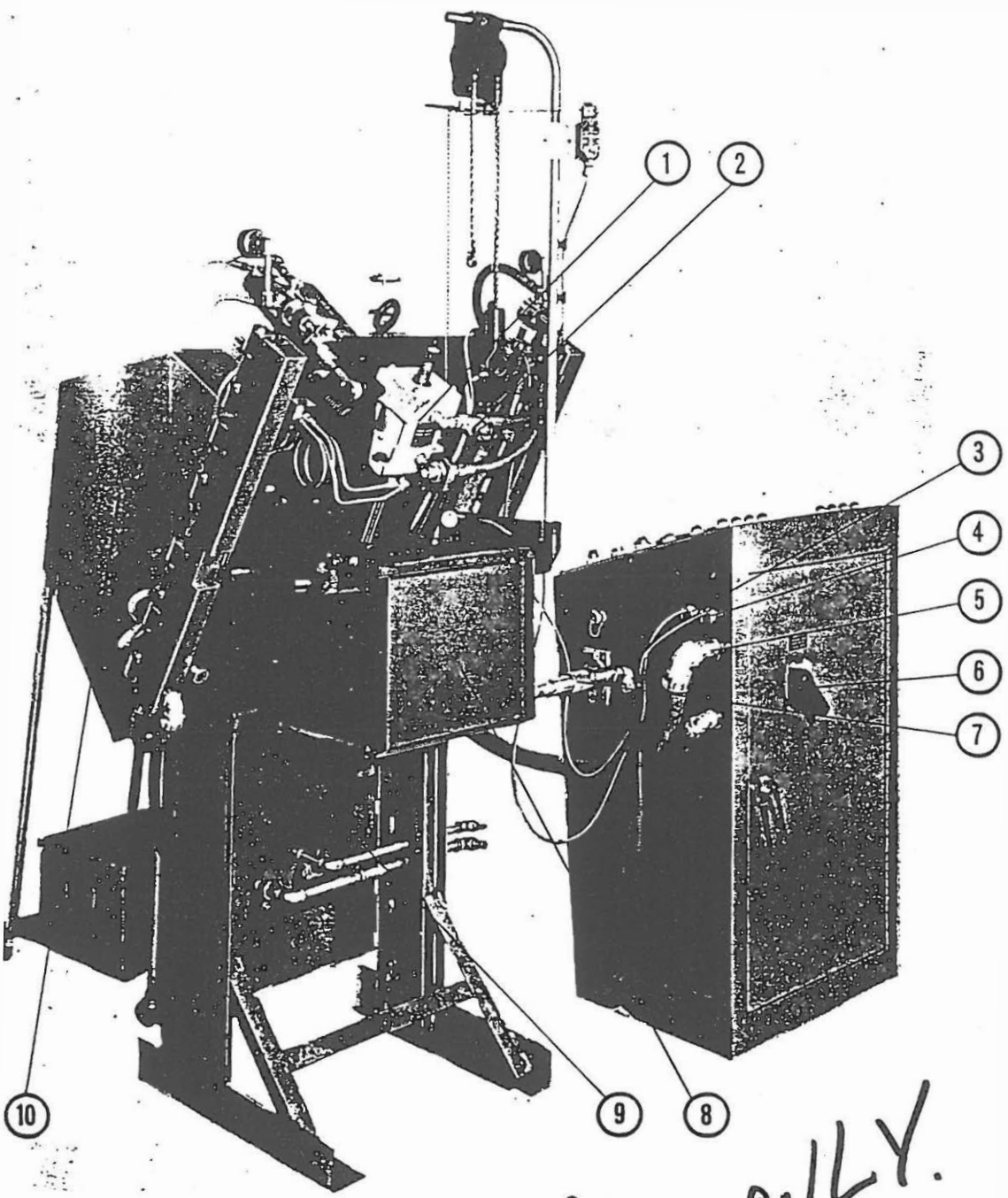
	MODEL A-1	MODEL A-2
Electrical Requirements	240 volts, 3 phase, 50 or 60 cycles	240 volts, 3 phase, 50 or 60 cycles
Maximum Draw	9KW	9KW
Water Consumption	3.5 gal/min. (15.9 l/min.) at 50 P.S.I.	3.5 gal/min. (15.9 l/min.) at 50 P.S.I.
Air consumption	Max. 21 C.F.M. (0.6 m^3/min.)	Max. 39 C.F.M. (1.10 m^3/min.)
Floor Space Required	72" x 72" (183 cm. x 183 cm.)	72" x 72" (183 cm. x 183 cm.)



OTHER CONTROL PANEL OPTION EXIST.

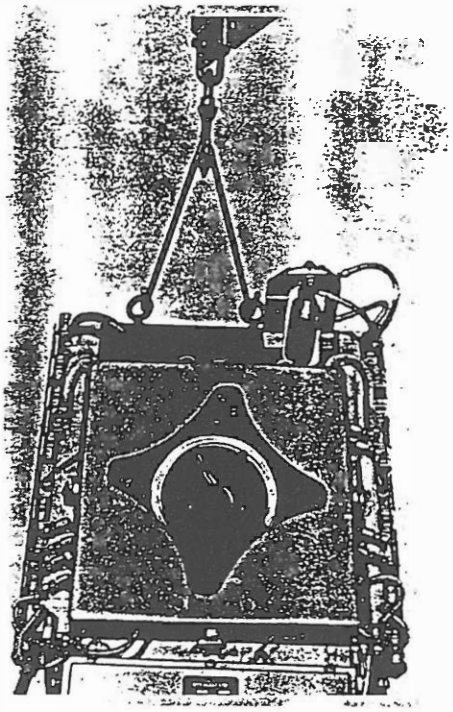
VALVES TO BE MAC OR NUMATIC TYPE

~~1. Nozzle temperature control instrument~~ ✓
~~2. Pot temperature control instrument~~ ✓
✓ ~~3. Bottom core valve~~
✓ 4. Air blast valve
✓ ~~5. Left hand die valve~~
✓ ~~6. Injection valve~~
7. Injection pressure regulator
✓ 8. Air blast
~~9. Automatic injection dial~~
10. Drip unit
11. Gooseneck motion cylinder
12. Gooseneck motion cylinder pressure regulator
~~13. Gooseneck motion cylinder valve~~
14. Top core mounting block
15. Top core valve
16. Die mounting blocks
17. Lube unit valve
18. Die
19. Right hand die valve
20. Bottom core mounting block
21. Air supply solenoid valve
22. Constant density air lubricator
23. Pressure regulator
24. Water manifold
25. Pressure tank
26. Junction box
27. Electrical control console



FOR REF. ONLY.

1. Injection cylinder
2. Flow control valve
3. Pot thermocouple
4. Nozzle thermocouple
5. Cable assembly – machine
6. Main Switch
7. Cable assembly – pot
8. Pot
9. Muffler
10. Casting receiver



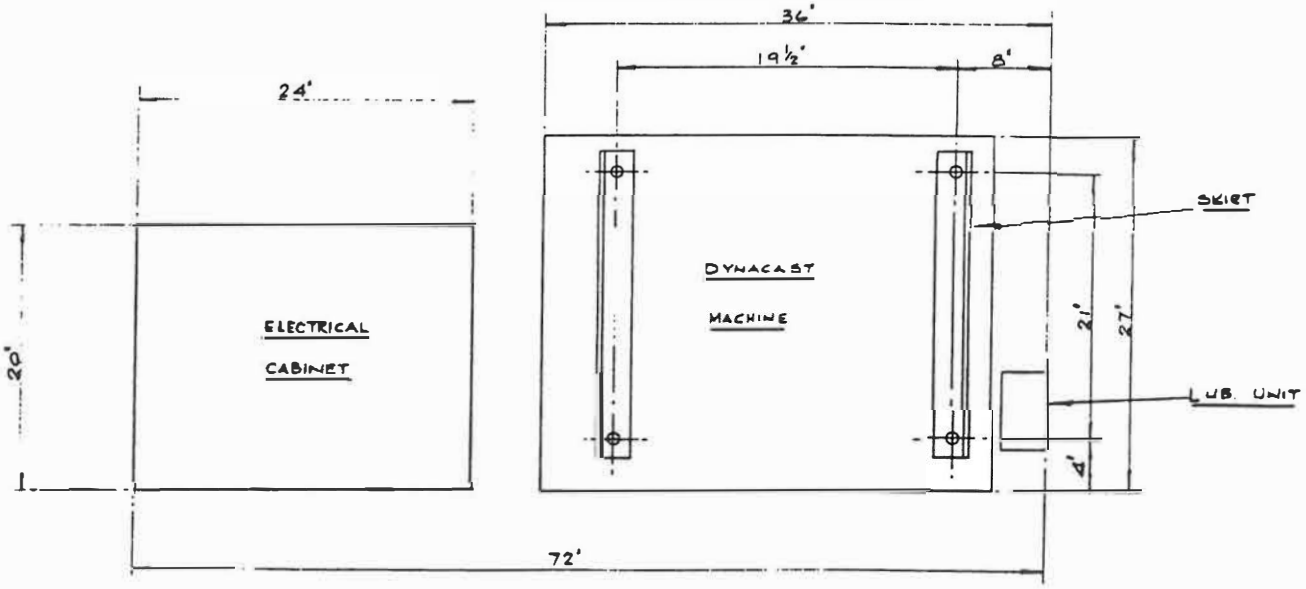
INSTALLATION OF THE MACHINE

LIFTING:
The machine should only be lifted by the eye-bolts provided for this purpose.

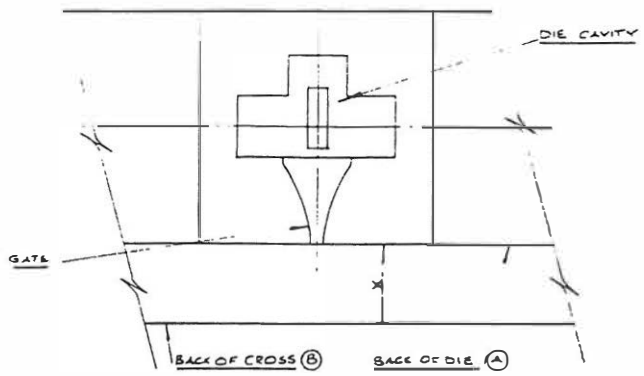
When lifting, care should be taken, as the machine will swing forward. One man, standing behind it, can hold the machine upright.

Machine weight 1,092 lbs.
Electrical console 230 lbs.

FLOOR SPACE:
It is recommended that an allowance of 2 ft. be provided behind the machine in order that the door at the back of the cabinet may open freely.



Although anchor bolts are not normally required, the machine base is provided with four 9/16'' holes which can be used to fasten it to the floor.

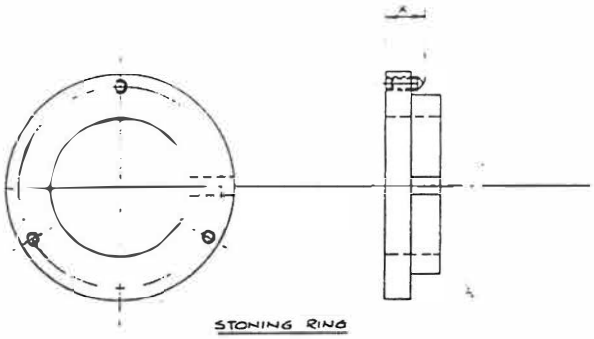


STONING OF NOZZLE

Whenever a new nozzle is installed, dies are changed or back of dies has been ground, nozzle must be stoned flat and parallel with back of dies. To effect a perfectly flat seal, use the following procedure:

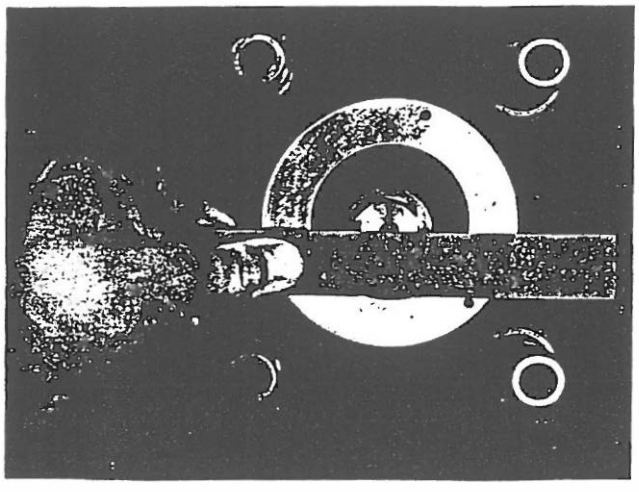
1. Freeze nozzle and put in safety fork.

2. Measure distance X between back of die (A) and back of cross (B) with depth micrometer.



3. Set 3 screws on ring (supplied in machine tool kit) according to distance X.

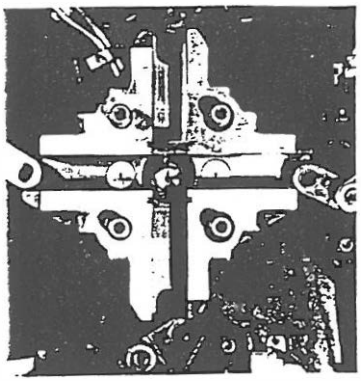
4. Remove air blast tube. Place ring, with thickness set equal to X, on main plate of machine, around the nozzle. Insure that the 3 set screws are against the main plate.



5. Place lapping stone against ring and bring nozzle in contact with stone. One man, standing behind machine, pulls on arm of gooseneck to move nozzle forward, against stone.

6. Stone nozzle until evenly flat surface has been achieved. (Excessive stoning reduces nozzle life.)

NOTE:
Periodically, check ground surface of stoning ring for wear. If any, regrind face of ring.



SETTING UP DIES AND CORES FOR FLASH-FREE OPERATION

Refer to: Stoning the nozzle on page 9.
Adjusting the nozzle position on page 11.
Toggle adjustments on page 21.

Crosshead fits over four pins. Right side pins have larger diameter for correct and accurate location of cross-head.

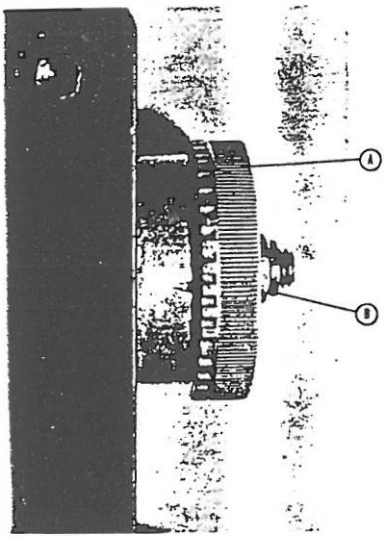
Put in pressure pads and springs.

Clean thoroughly to remove foreign matter on shanks and cross.

Put in die and core shanks. They should run freely in crosshead; clearance should be .0007/.0009".

Put on cover plates and tighten screws.

Insert link pins. Clamp retaining ring with special washer.

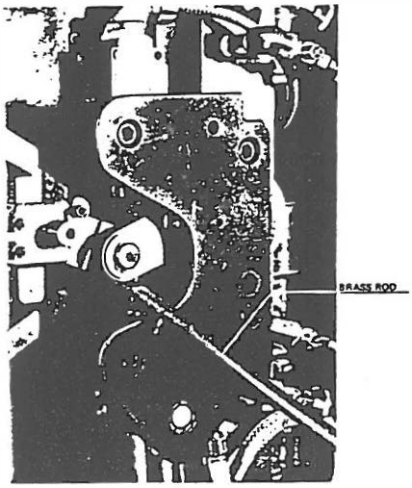


Loosen (4) nuts (B).

Lower top core to down position by hand. Bring right hand die to touch core by using micrometer adjustment knob (A). Toggles should be straight.

Bring left hand die against right hand die by using micrometer adjustment knob.

The centering of the nozzle has to be checked, as gate location may vary with each die. If the nozzle is found to be more than 1/16" out of position, it should be centered and then stoned again before running the machine.



Lift top core and tighten both dies identically (approximately 2 graduations each knob). Top core should still move in by its own weight. If it does not, the dies do not meet exactly in the center and have to be re-adjusted, as above. Each graduation on the knob represents .0022" linear movement of the die shank. To close dies, use brass rod as indicated in picture. Critical point can easily be overcome in this manner. Toggles should "snap" into locked position with moderate pressure.

After dies are adjusted, connect link pins to the cores. With toggle assembly in straight position, lower top core to desired height by turning the adjustment knob. Repeat procedure with bottom core until it meets top core. Locking pressure on cores is usually very low and varies with their size and shape.

Tighten nuts (B).

Check straightness of toggles visually.

OZZLE POSITION

ven to the following instru
ion of the dies.

ine with gate hole. To mal
ft-hand die and move goos
the nozzle touches the di
ozzle has to be moved.

screws (A) clockwise.

rn screws (A) countercloc

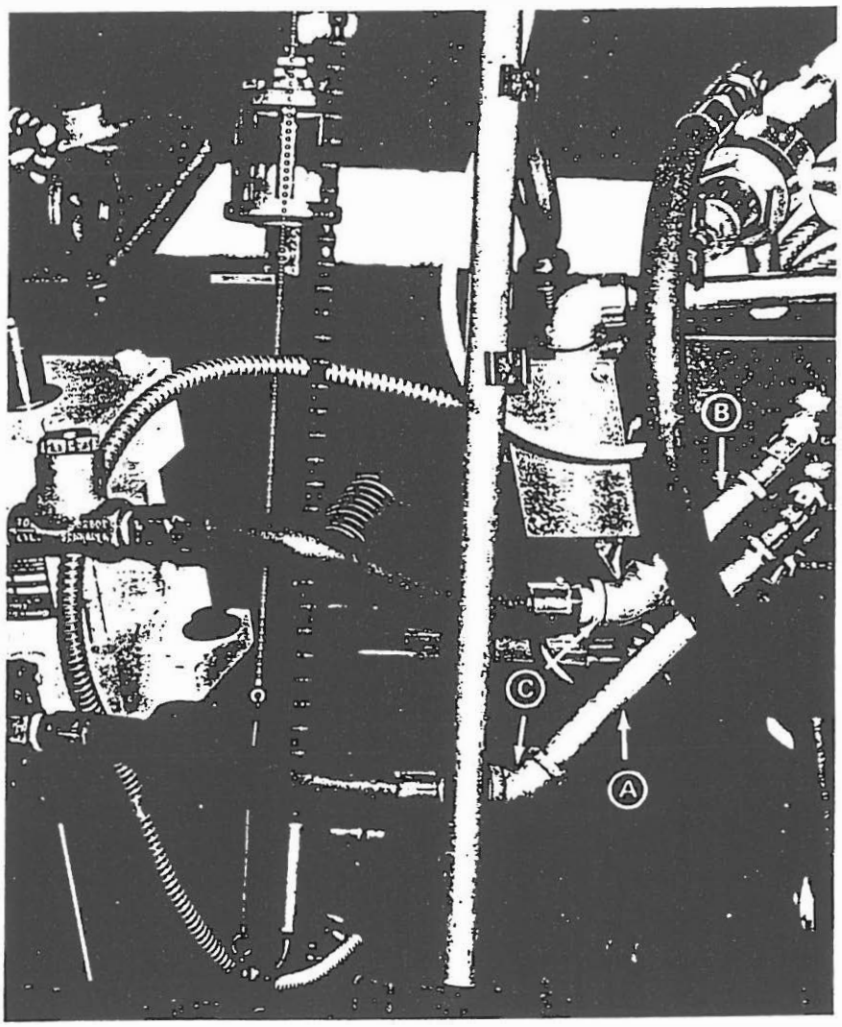
DYNACAST INFORMATION LETTER

INJECTION CYLINDER, AIR CONNECTION:

To prevent accidents when the manual/automatic switch is turned "ON" and the injection cylinder is not installed, we recommend the following changes which will deflect the airblast up rather than into the pot. This alteration will also simplify the connection of the injection cylinder to the air supply.

The following material is required to incorporate change into your equipment: –

A shorter set of air hoses are available from Dyna Montreal, upon request. This change is effective f March 1970 on every future Model A-1 and A-2.



A) One (1) 3/8 NPT x7" long Nipple.

B) One (1) 3/8 NPT x 3-1/2" long Nipple

C) Two (2) 45 – 3/8 NPT Elbow

TO INSTALL PLUNGER

1. Turn nozzle heater control to 900°F and allow nozz to warm up.

2. Open dies and cores.

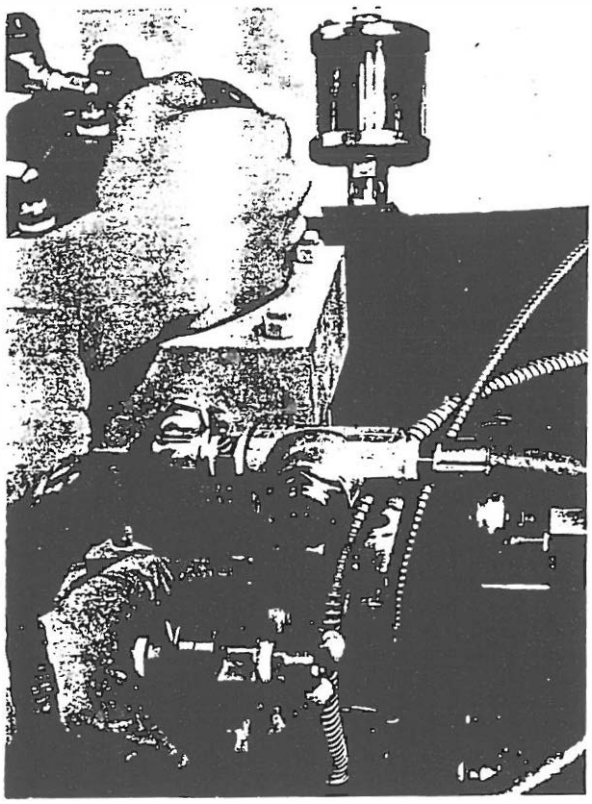
3. Install tube in casting receiver to guide zinc shooti from nozzle.

4. Place casting receiver in front of machine.

5. Skim zinc in pot, particularly in area where plung will be inserted.

6. Place plunger in molten zinc and let it warm up f approximately one minute.

7. Insert plunger in sleeve.



NOTE:
Zinc will shoot from nozzle. Receiver and tube must b in place. No one should stand in front of machine.

8. Tighten two 1/2" hex. hd. screws.

9. Connect air hoses.

10. Remove tube.

11. Clean dies of zinc particles using brass tools and rag o wooden stick. Machine is ready to start.

12. The machine must be started as fast as possible afte the installation of a new plunger assembly to prevent i from seizing in the sleeve. This procedure applies unti 50,000 castings have been produced with a new sleeve plunger assembly, or with a new machine.

13. After a few castings have been produced, tighter special washer (8) and nut (A) (See page 19).

14. To remove plunger assembly loosen nut (A) and specia washer (8), then reverse above procedure. Check safety rules

While hot, wipe off plunger with a clean rag to remove all molten zinc.

WHEN TO REMOVE THE PLUNGER ASSEMBLY

Every evening, before 50,000 castings have been made either with a new machine or with a new sleeve-plunger combination.
For any stoppage exceeding 24 hours.
To change gooseneck.

STARTING MACHINE (Manually)

1. Dies and core switches must be "OPEN", injection switch must be "OFF".
2. Turn manual/automatic switch on manual.
3. Close dies and cores in proper sequence.
4. Bring nozzle against die (*always* after dies are closed).
5. Press 2 red injection buttons simultaneously.
6. Retract nozzle (*always* before dies are opened).
7. Open dies and cores in proper sequence.
8. While opening last slide, activate airblast to eject casting.

Correct position of nozzle will be indicated by gate of casting: an even border proves a perfect setting. See page 18.

NOTE:

Dies open simultaneously on standard setting. A selector switch is provided if dies have to open independently; in such a case, die switch operates left hand die only. An extra switch is provided for the right hand die (This applies with the function selector switch on Pos: 5-6-7-8-12).

STARTING MACHINE
(Automatic Operation)

1. Set nozzle heater controller to 880°F.
2. Place casting receiver in front of machine.
3. Set 2 lube switches, one on control cabinet and the other one inside, to receive desired spray action. (Follow instructions on inside of cabinet door).
4. Turn manual/automatic switch to automatic.
5. Set dial for speed at approximately 15-20%.

NOTE:

Setting of speed control is indicated in % of theoretical maximum speed. Maximum speed is, depending on voltage available, 110-130 C.P.M.

6. Open water valves on dies and cores; also open valves on water manifold.
7. Press "Start" button
8. Dry cycle machine until lube unit starts to spray.
9. Position lubricant spray in desired location.
10. Stop machine.
11. Injection switch "ON" (It is not necessary to pre-heat dies).
12. Press "Start" and "Stop" buttons in succession. Machine will complete one cycle. (This procedure prevents dies from closing on a casting which may not be ejected).
13. Repeat and check ejection of casting. If necessar adjust air blast.
14. Start production.
15. After a few shots, tighten special washer (B) and nu (A) of plunger assembly. See page 19 (Guarantees optimu alignment).
16. Increase speed gradually depending on casting. Appea ance of casting and nozzle will indicate whether the speed too high or too low. In both cases, the water cooling can b adjusted accordingly to reach maximum efficiency.

Blisters, flash or a hole in the gate usually indicate dies a too hot (Machine running too fast for water cooling).

Porosity, cold marks or excessive shrinkage usually i dicates that dies are too cold. (Machine running too slowl or too much water flowing in dies).

17. Produce several pieces to check castings for finish an fill.
18. Correct positioning of nozzle will be indicated by gat of casting. An even border proves a perfect setting. Se page 18.

STOPPING MACHINE

1. Press "Stop" button (machine completes cycle).
2. Turn injection switch off.
3. Turn manual/automatic switch off.
4. Turn nozzle heater to zero if stoppage exceeds 30 minutes.

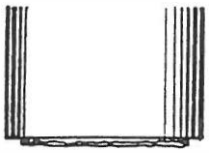
RE-STARTING

When machine stops because of an object lodged between the dies, switch off injection, remove object, turn on injection switch, press re-set button, then start button.

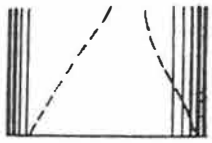
MACHINE SHUT-OFF

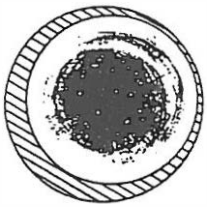
1. Remove plunger, if necessary (see page 16).
2. Turn nozzle heater to zero.
3. Shut off water to dies and cores.
4. Maintain water circulation in main plate and gooseneck.

GATES

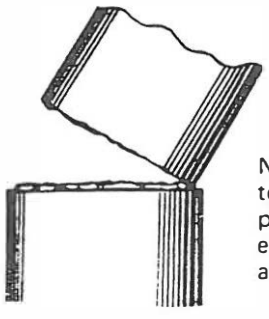


Perfect centered nozzle – Even border all around.

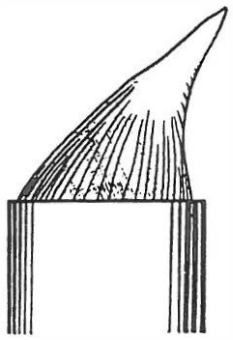




Nozzle off center Hole in gate indicates too hot Result: Flash.

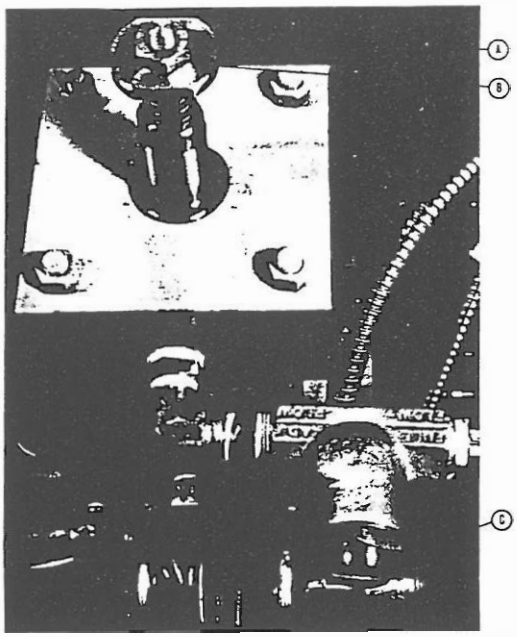


Nozzle slightly too cold. Excess piece can cause ejecting problem and flash.

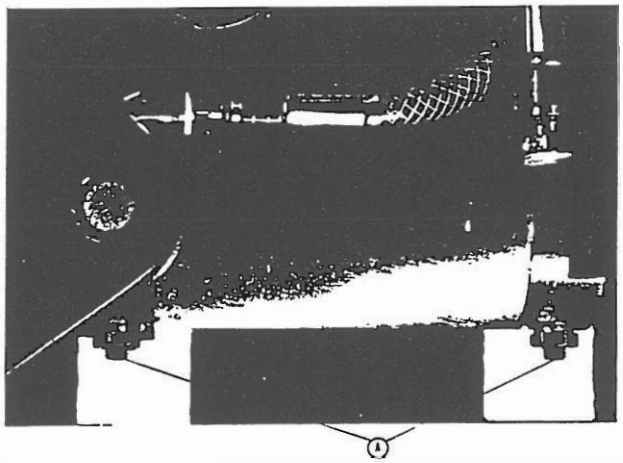


Gooseneck retracts too slowly. Nozzle slightly too hot. Flash will occur.

ADJUSTMENTS



Special washer (B) and nut (A) have to be tightened a few shots. Cushion on injection cylinder is adjusted flow control valve (C). Returning piston should nc against anvil. (Danger of dripping nozzle caused by b ing piston).

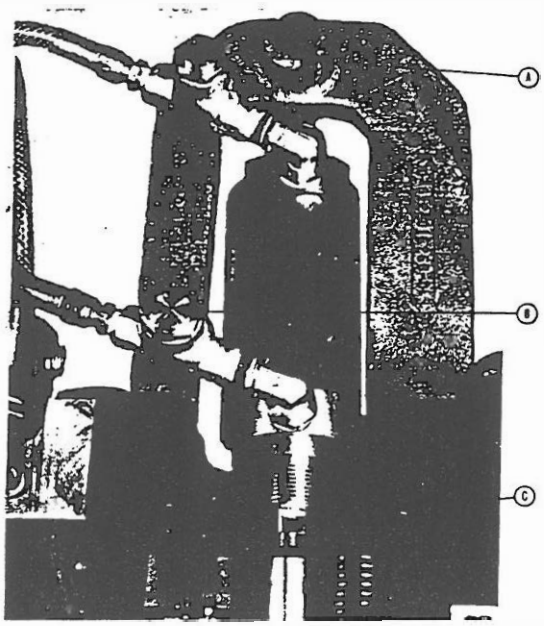


Each standard cylinder on dies and cores has 2 set sc (A) to adjust cushion. (Piston should not bang ag either anvil).

Excessive cushion action will result in machine stopp since the limit switch will be activated too late.

To increase cushion-action, turn set screw (A) clockv To decrease cushion-action, turn set screw (A) cou clockwise.

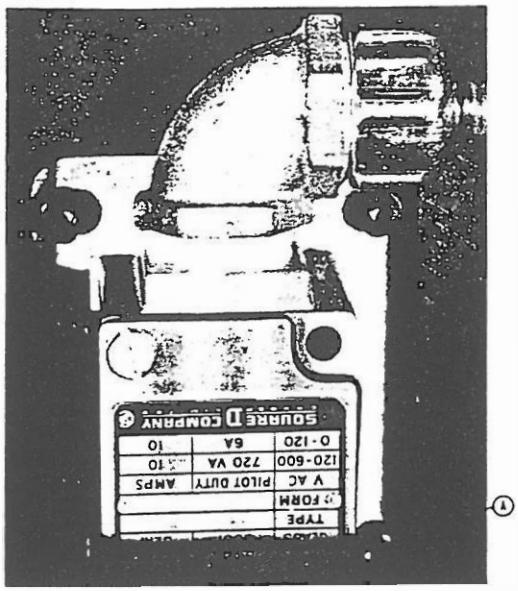
Special cylinders have a built-in cushion, therefore adjustments are required.



Stroke should be 1/8" to 3/16" between nozzle and die is adjusted with piston rod (C).

The impact force of the nozzle on the dies is adjusted flow control valve (B).

The velocity of the returning gooseneck is controlled valve (A).



ADJUSTING LIMIT SWITCH

The adjustment of the limit switches is a fairly coarse Distance between the critical point and a straight lin toggle is over 1/16".

See page 21 for critical point.

To adjust limit switch for flash-free operation of mach the following steps should be taken.

1. Check alignment of toggles by hand. Toggle should perfectly straight when piston is at end of stroke.

2. Check positioning of limit switches. They should actuated when toggle is .050" to .060" from straight position.

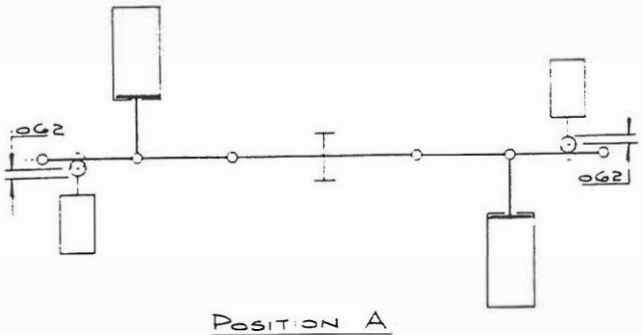
3. To check setting, a shim .004" thick, put between dies, should prevent toggle from reaching critical po This, of course, can only be checked while the machin running. Before testing, make sure nozzle is frozen.

4. To set limit switch, loosen 3 socket head screws (

NOTE:

All machines supplied by Dynacast Ltd. have b thoroughly tested. It is therefore unnecessary to adj the limit switch location or the toggle travel un damage has occurred in transit.

ADJUSTING THE TOGGLES

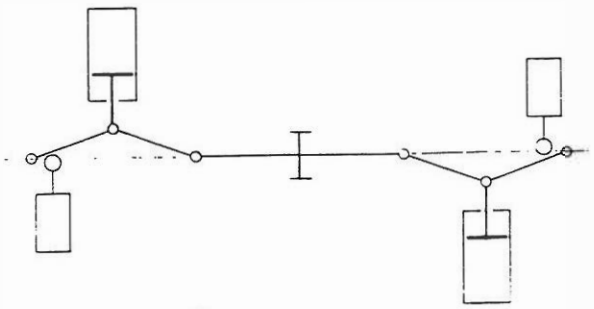


POSITION A

Die mechanism is designed to stop machine whenever flash occurs between the dies and/or cores. To achieve sensitivity, certain adjustments must be made when a n die is installed. These adjustments are made with mic meter adjusting knobs at ends of toggles.

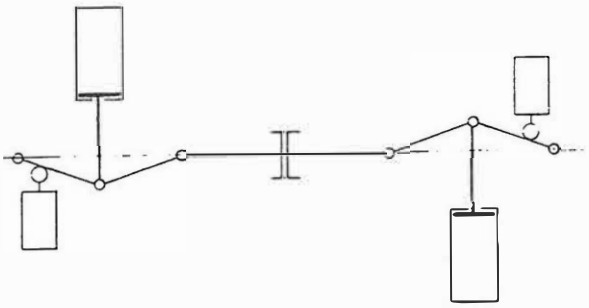
A brief analysis of the toggle action follows:

Position A – Dies completely closed with die pressure fu on.



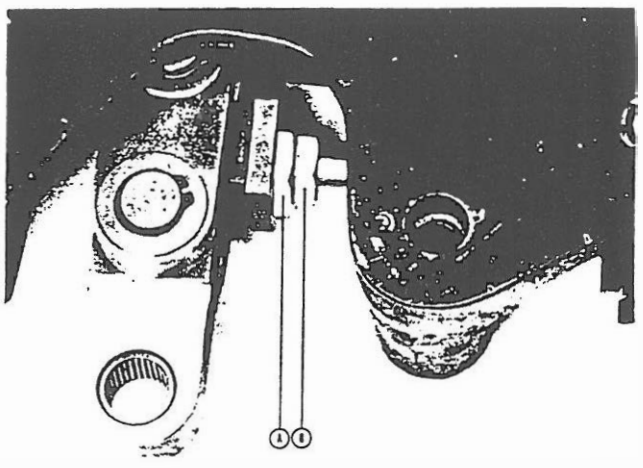
POSITION B

Position B – Dies touching but no pressure on them. T equilibrium point between forces applied by toggles a resistance of dies to close is referred to as the "Criti Point". Toggles will not reach this point if dies are set t close together with adjusting knobs. If toggles reach t point, they will snap closed completely.



POSITION C

Position C – Toggles should not travel farther than straig line as shown in Position A or the dies will open up sligh and cause flash.



To adjust toggles, loosen nut (A) and turn rod (B) unti they are in straight line position.

Machine Dry Cycling: If locking pressure between dies i adjusted as explained in B, a shim of .004" between th dies will sufficiently increase pressure to prevent toggle from reaching critical point. In this case, limit switches wil not be actuated and machine will stop immediately.

NOTE:

All adjustments must be made while link pins are in serted into die shanks and cross is clamped to mair plate, and in accordance with instructions on Page 20.

Pre-travel on limit switch	3/64
Differential travel	1/64
over travel	13/64

TIPS FOR EFFICIENT OPERATION

Costly repairs and down-time can be minimized by care at the die set-up. Every effort must be made to avoid damage to the dies and cores.

Brass tools should be used to prevent damages to the dies.

Cores must move freely in dies when latter are closed with pressure.

Core height must be adjusted carefully. With some dies, it is possible to break die inserts with cores which travel too far.

Delicate cores may be damaged during set-up.

Sequence of operation has to be chosen carefully. Usually, dies close before cores.

Air blast location is important to insure steady running. For heavy or thin parts, two tubes may be necessary.

To facilitate stripping, draft on cores should be as great as possible.

Lubrication should be directed to the area most likely to hang in the dies or cores.

If a large core tends to hang when starting the machine, closing off the water to dies and cores plus increasing starting speed may help. Make sure to turn speed back to normal and also open water, or else flash will occur.

IMPROVING FILL AND FINISH

The correct procedure to achieve good finish on castings varies greatly from die to die.

The following general rules apply:

Water to dies and cores should be turned low in order to allow dies to heat up.

Air vents are usually not necessary but may help in some instance to achieve better fill and finish.

For better finish, overflows may be added.

Lubricant should be used as sparingly as possible and should have a low evaporating point.

It is often necessary to reach a compromise between casting appearance and maximum production rate. The operator should experiment with new dies to arrive at the optimum operating conditions.

Cavity must be draw-polished to eliminate zinc dragging or build-up.

PERIODIC MAINTENANCE

DAILY (or each shift):

Oil dies and cores twice.

Oil toggles once.

Check oil level in air lubricator (maintain drip rate at 3-4 drops per minute at 60 CPM).

Check level of die lubricant.

Wipe main plate clean.

Skim zinc bath (oxidized zinc film has to be removed specially where the plunger is inserted. It is imperative that no dirt is pushed into sleeve. Oxidized zinc tends to crystallize in ball or sleeve seat.

Clean zinc passage through nozzle with a .080" spiral blade.

WEEKLY:

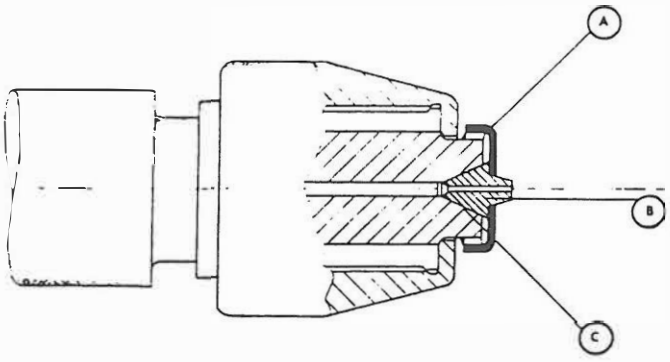
Check air filter in pressure regulator.

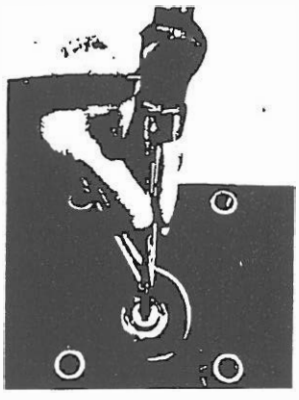
Grease gooseneck pivot shaft.

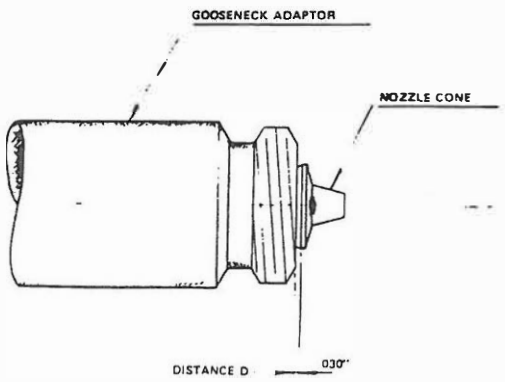
AS REQUIRED:

Clean air lube unit (see literature).

For oil and grease specifications, see page 35.







CHANGING OF NOZZLE

Refer to safety rules before changing nozzle.

1. Turn nozzle heater control to 900°F and allow no to warm up.

2. Unscrew nozzle clamp (A) from gooseneck with socket wrench.

3. Remove nozzle (B) by hitting it with a brass rod f different sides.

4. Clean nozzle seat (C) thoroughly, first with woo stick then with clean rag. Heat will facilitate removal zinc.

5. Turn off nozzle heater.

6. If same nozzle is re-used, it should be thoroug cleaned with muriatic acid. If new nozzle is used, inspec insure that conical seating surface is clean. If conical sea gooseneck shows marks, lap with nozzle.

7. Place nozzle in conical seat.

8. Check distance (D). If less than .030", file adapter required.

9. Tighten nozzle clamp with 17-20 ft/lbs torque. (H nozzle before tightening.)

10. Make a free shot to clean out injection passage.
Refer to: Safety devices on page 7.

NOTE:
Any leakage around nozzle is usually due to poor seat of the nozzle, not insufficient clamp pressure.

INSTALLATION OF HEATER BAND

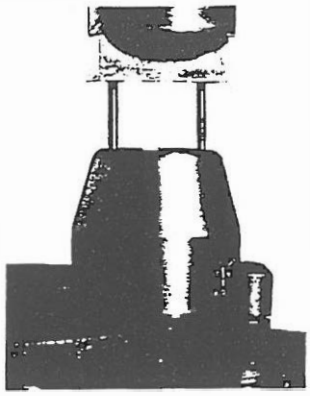


FIG. 1

Remove used band heater. Push it out as indicated in fig. 1.

Check inside of slot on heater shield (Part No. A-207) for sharp edges. Radius with file, if necessary.

Blend the inner end of chamfer at entrance of shield.

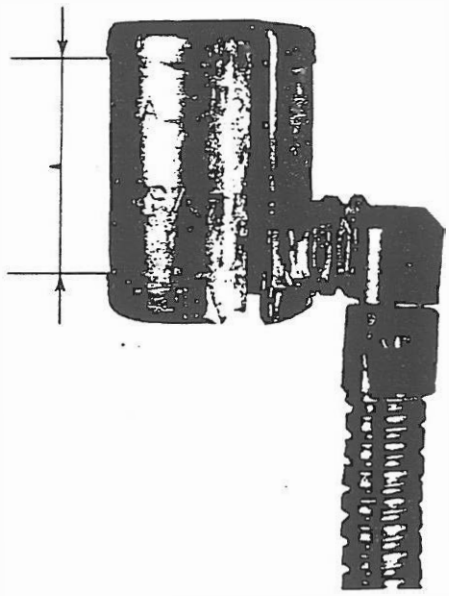


FIG. 2

If not provided, bend a .020" steel shim, 3" long, around a piece of round bar to the diameter required. Fit snugly to outside of part No. B-227 inside dimension "A".

All sharp edges on shim must be removed.

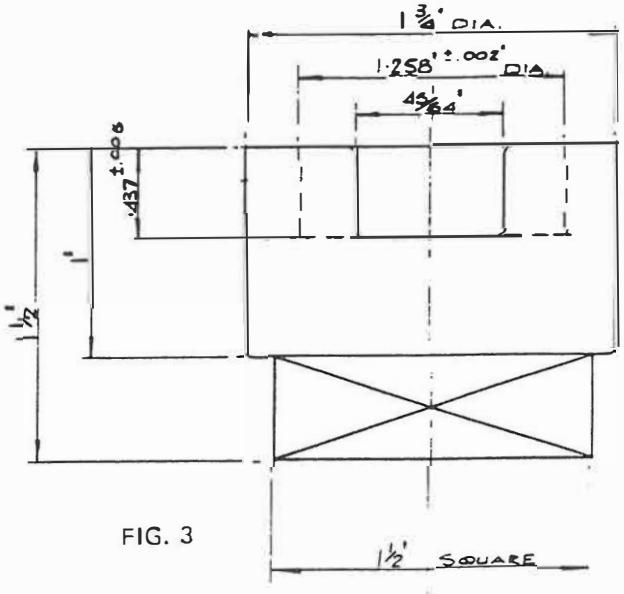
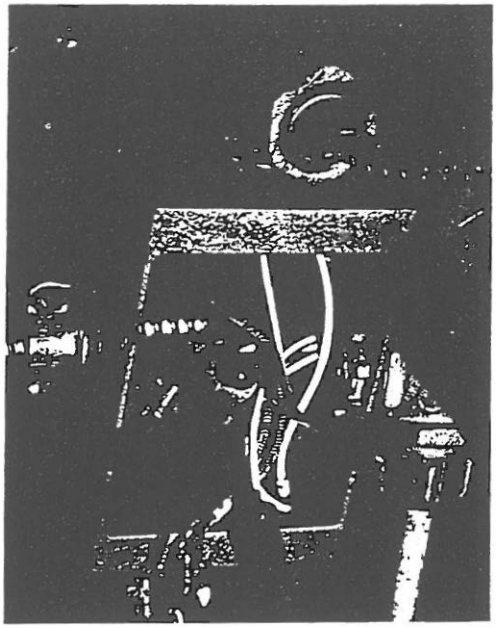


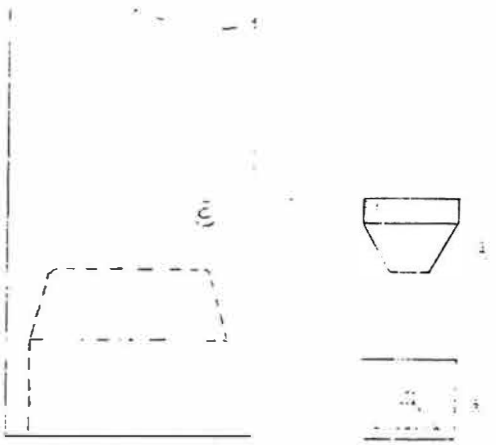
FIG. 3

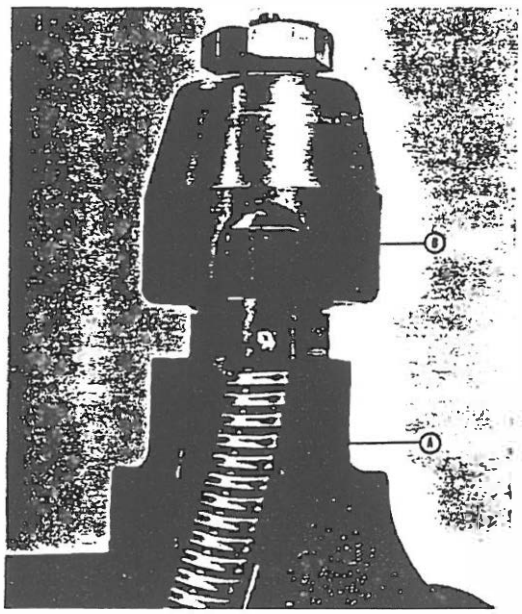
The fixture in fig. 3 is very simply made and is a great asset in assembling Parts No. A-207 and No. B-227 with shim. It stops shim from creeping over the lip on the heater band.

It may be necessary to file a little off the gap on heater band, in order that heater can be inserted in fixture. File only side nearest elbow (C).

NOTE:
It is important that no air gaps remain between heater and nozzle adapter. Air pockets cause hot spots which contribute to early failure of the heater.







NOZZLE HEATER CHANGE

Gooseneck does not have to be removed for changin nozzle heater.

1. Remove nozzle clamp. Heat with torch, if neces care should be taken to prevent breakage of thread.

2. Turn nozzle heater control to zero. It is *very impor* that absolutely no power goes through heater to a shorting the instrument or blowing a fuse.

3. Disconnect wires No. 4 and No. 6 in junction box.

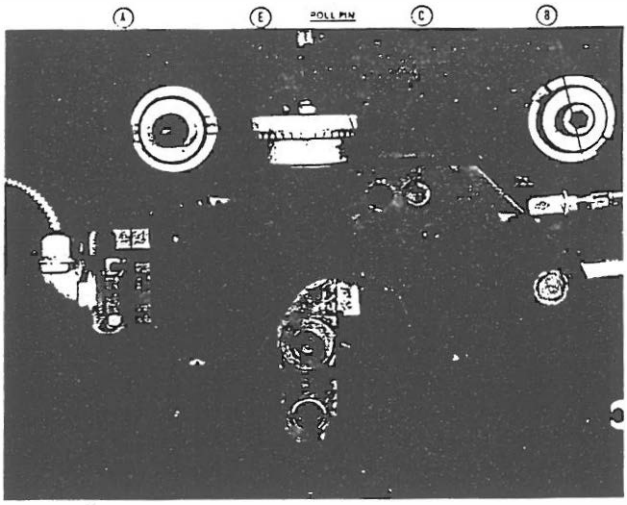
4. Disconnect flexible conduit from gooseneck.

5. Pull heater shield and heater band using a wheel pu To protect nozzle or seat in gooseneck, use brass ir (A) or (B).

6. Install heater band (see page 24).

7. Replace nozzle heater assembly, using aluminum ro

When assembling nozzle heater, insure that wire fitting heater (B) points toward cut-out (A) of gooseneck.



DISMANTLING AND ASSEMBLING TOGGLE MECHANISM

Remove airblast tubes.

Remove limit switch (A).

Disconnect hoses (B).

Remove 4 screws (C); roll pin holds block.

Loosen lock nut (D).

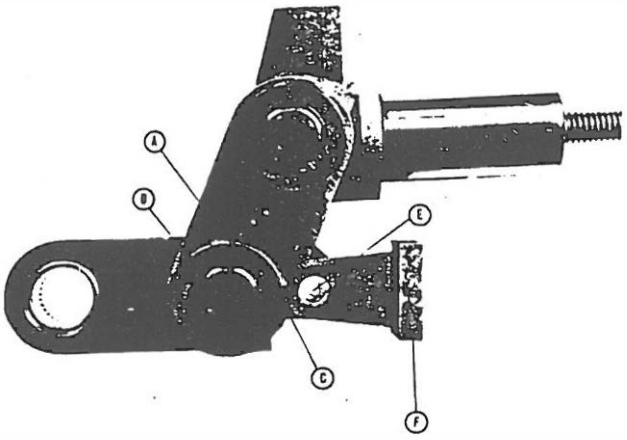
Remove nut (E).

Unscrew threaded sleeve.

Remove toggle assembly and cylinder.

Unscrew piston rod from toggle assembly.

To assemble, reverse above procedure, making sure all p
move freely. Roll pin has to be put in before screws (C)
tightened.



REPLACE BEARINGS ON TOGGLE ASSEMB

Bearings have to be replaced when play in the to
assembly becomes more than .004". Also check pins
wear.

Remove retaining ring (A).

Pull out pins (B).

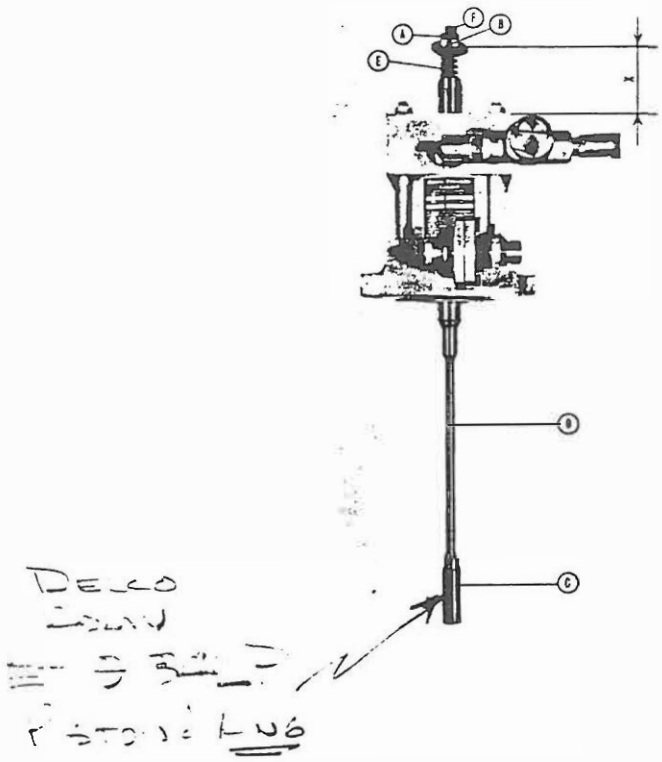
Replace bearing. Keep needle bearings dust-free; this
increase the bearing life considerably.

When re-assembling, make sure flat (C) of lever is fac
opposite direction of (D).

Roll pin (E) is loose on yoke (F) and tight in lever (C).

NOTE:

When replacing roll pins, outer edges alongside the s
have to be ground in order to make the roll pin round
is impossible to assemble an oval roll pin with the yo



CHANGING OF PLUNGER

Remove cylinder-plunger assembly from gooseneck.

Unscrew nut (A) and shoulder washer (B). Remove er plunger rod assembly.

Unscrew plunger (C) from rod (D) using clamp provide tool kit (it may be necessary to heat plunger to loos Tighten new plunger with 12 ft/lb of torque. Ch assembly for concentricity.

Re-assemble plunger rod assembly in injection cylinder. spring (E), shoulder washer (B) and tighten nut (A), lea 6-7 threads showing below shoulder washer. Distanc between cylinder and shoulder washer should be 1/4" la than when fully assembled. This will prevent exce compression of spring (E) and facilitate alignment plunger (C) in sleeve. Rod (F) has considerable clearanc cylinder.

Install plunger.

Insert safety fork between end of cylinder and washer Tighten nut (A) against washer (B) until washer is sec against safety fork.

See page 16 for "breaking-in" of plunger.

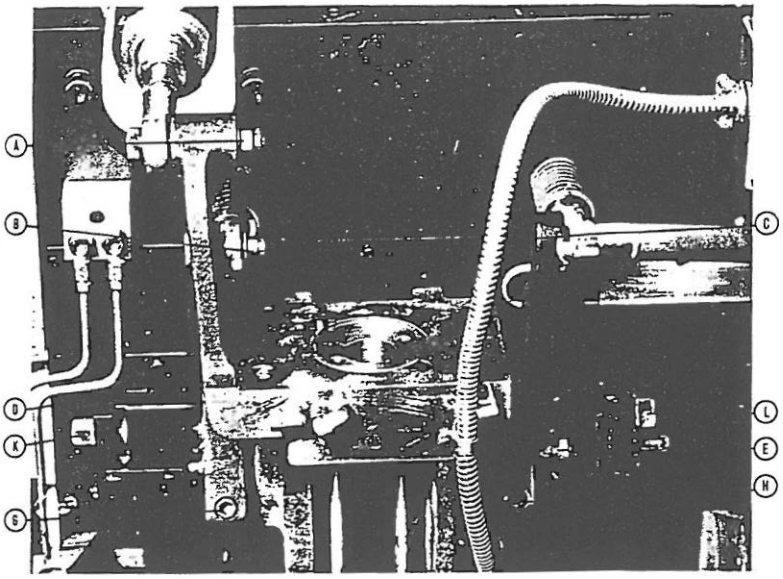


FIG. 1

CHANGING THE GOOSENECK

Remove die.

Close "water-in" valve to gooseneck.

Remove plunger assembly.

Remove copper tubes.

Disconnect plug for nozzle sensor. Make jumper for female plug, otherwise power to the pot heater elements will be cut off as "Over-Temperature" device will be activated. Any conducting wire will be sufficient as a jumper. It is only important that the circuit is closed. There is no danger of blowing a fuse or receiving a shock.

Remove screws (A), (B) and (C).

Loosen screws (D) and (E).

Insert fork (F).

Use bar (I) to prevent gooseneck from falling into pot.

Loosen screws (G) and (H).

Loosen cone screws (K) and (L) as required (always supporting gooseneck as shown in Fig. 2). Hold adjusting arms and rock them until gooseneck comes loose.

To mount gooseneck, install fork and insert bar for support as in Fig. 2. Push gooseneck towards back plate and tighten cone screws (K) and (L) so that they extend equally at both ends. Move gooseneck to approximate center. Tighten screws (G) and (H) so that gooseneck can no longer be moved horizontally. Check springs to ensure that they are of equal length before connecting adjusting arms.

Make all remaining connections and necessary adjustments in reverse of above procedure.

NOTE:
Cone screws (K) and (L) have to be tight to assure flash-free running.

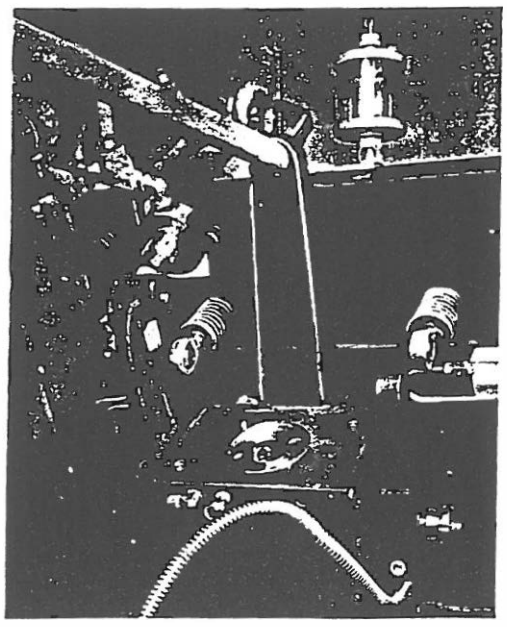
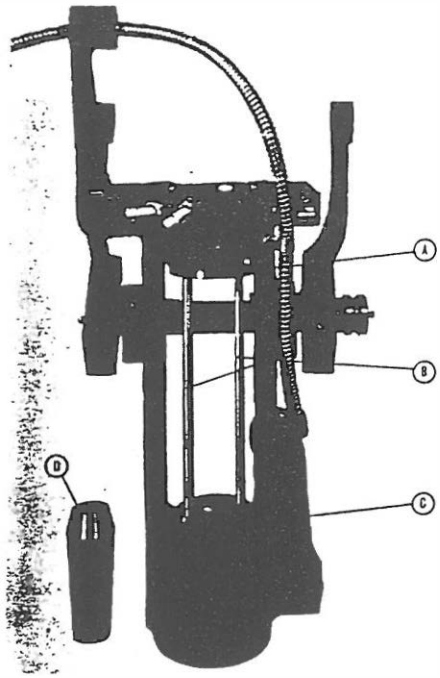
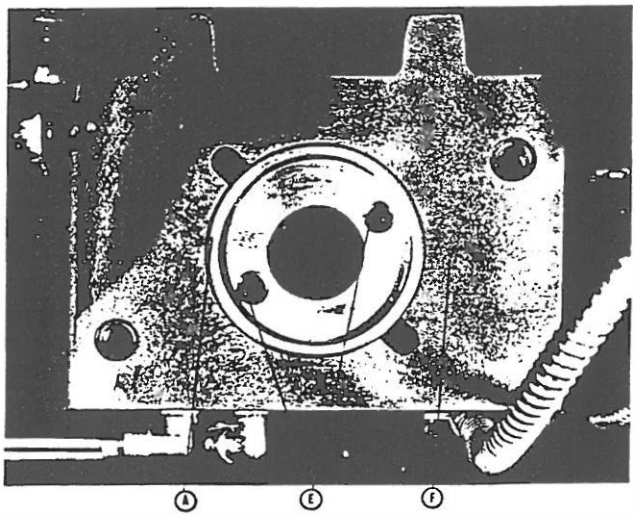


FIG. 2





CHANGE OF SLEEVE

1. Remove plunger assembly.

2. Remove gooseneck.

3. Remove rod holder (A), holding rods (B) and sleeve (C).

4. Turn gooseneck upside down, and place on hydr press. Push out tapered sleeve with arbor 1" DIA.

NOTE:
This should be done as quickly as possible, v gooseneck is still hot.

5. Remove all traces of zinc from sleeve seat and hou Use muriatic acid for tapered sleeve. Lap seat in goose with compound until sleeve fits properly. Wash out sleeve with kerosene. Check with Hi Spot Blue.

6. Replace sleeve. Align slot (D) in sleeve with corresp ing hole in internal wall of seat. This hole connects sl with nozzle. Fasten tapered sleeve with a light blow. brass hammer.

7. Replace sleeve ring (C), rods (B) and holder (A). Hc (A) has to be flush with surface (F). Check play of rods and screws (E) to allow for .005" expansion. Adjus necessary.

8. Re-install gooseneck.

9. After gooseneck has reached working temperat check that rods (B) have no play. Install plunger assem

Observe safety rules.

NOTE:
Be careful when using muriatic acid. Make sure to w off acid, before putting sleeve back.

TESTING GOOSENECK

After changing sleeve or plunger, or when getting porous castings, test gooseneck. To find out whether sleeve or ball is leaking, or whether plunger does not fit properly.

Turn manual/automatic switch on manual.

Close dies and cores in proper sequence.

Bring nozzle against dies (always after dies are closed).

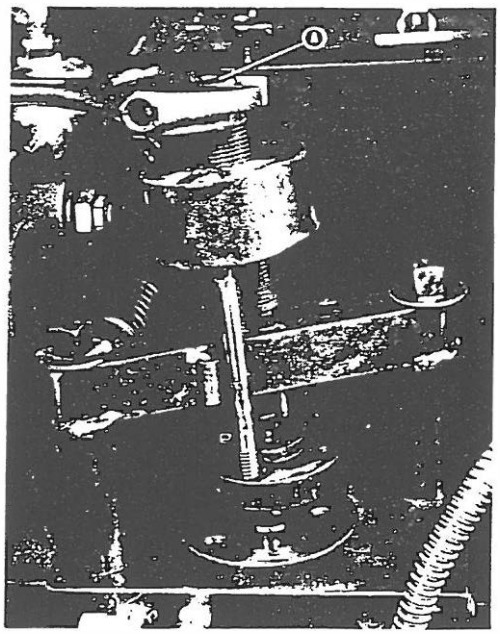
Press 2 red injection buttons simultaneously.

Release buttons.

Press buttons again and observe downward motion plunger. If it is very slow (6 seconds or more), the assemb is correct.

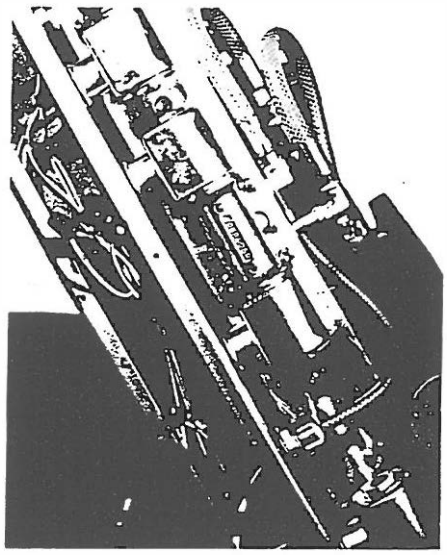
A fast downward motion indicates that either the plunger worn, ball is not seating properly or a leak exists betwe sleeve and gooseneck. If zinc is shooting up betwe plunger and sleeve, ripples may be seen on pot surface.

To free ball remove plunger and tap top of ball with a 1/ DIA. rod on each side of retaining pin in sleeve.



HOW TO REMOVE SEIZED PLUNGER

1. Fabricate a tool as shown in illustration.
2. Unscrew locknut.
3. Unscrew special washer. See page 27.
4. Remove spring.
5. Remove injection cylinder.
6. Unscrew upper rod.
7. Install tool.
8. Turn screw (A) until plunger is loose.
9. Clean zinc from plunger.



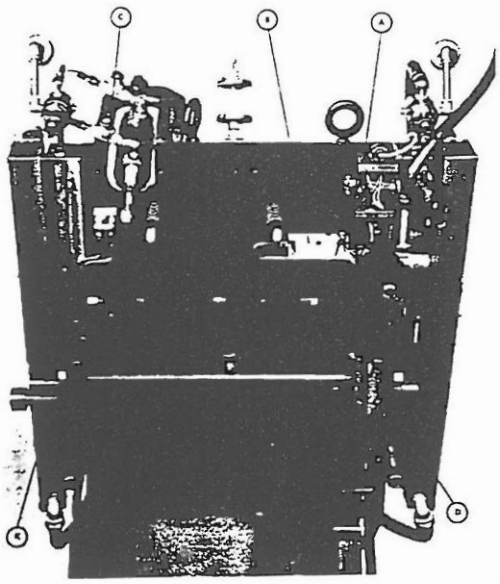
CHANGING SOLENOID VALVE

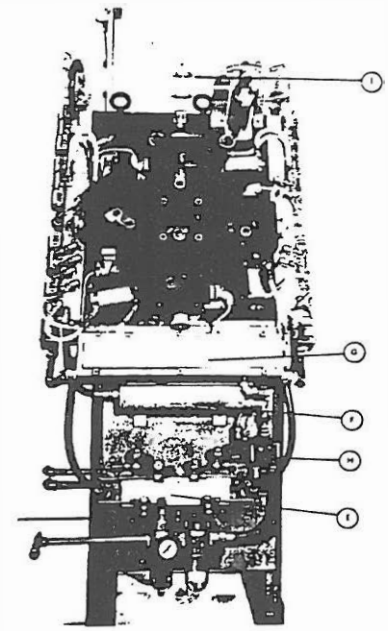
1. Turn switch off.
2. Open junction box.
3. Disconnect wires from valve.
4. Unscrew 1/2" NPT chase nipple.
5. Unscrew 4 socket head cap screws.
6. Remove solenoid valve.

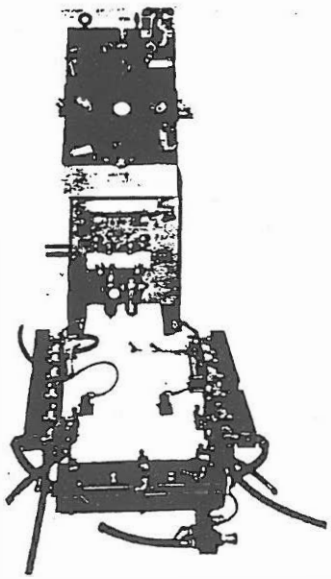
Care should be taken to prevent loss or damage to O-ring and plate in valve.

TO REMOVE POT

Remove left hand side of skirt and back door.
Support pot with fork lifter.
Turn main switch off.
Disconnect electrical cable to pot.
Remove pot sensor.
Unscrew three 1" - 8NC cap screws.
Lower pot to free it from gooseneck (pot should move down freely); let rest until zinc solidifies.
If gooseneck is frozen in pot, remove gooseneck and pot, then lift out gooseneck with solidified zinc.

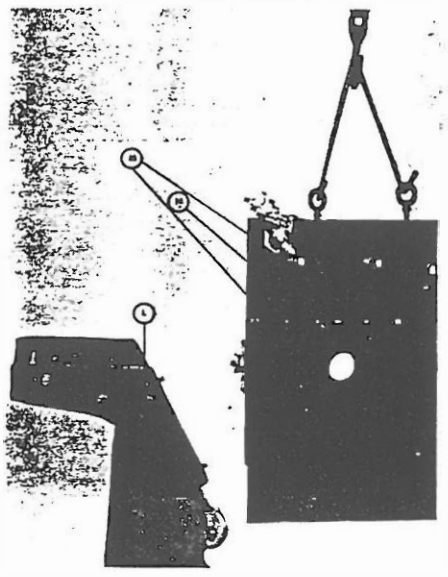






REMOVAL OF WATER JACKET

Remove plunger assembly.
Disconnect and remove electrical cabinet.
Remove skirt and guard.
Remove pot.
Open junction box (A).
Remove gooseneck.
Disconnect thermostat wires No. 7 and 8.
Remove limit switch from automatic ingot feeder.
Remove automatic ingot feeder.
Remove junction box (A) (Two 10-32 x 3/8" Lg. soc
head cap screws).
Disconnect copper tubing to thermostat (1/4" - O.D.).
Remove thermostat (B).
Loosen aluminum block (C).
Remove airblast copper tubes (D) (3/8" - O.D.).
Disconnect all hoses to cylinder including goosene
motion cylinder (Compoflex 1/2" - O.D.).
Disconnect "water-in" copper tube on left-hand and rig
hand manifold (1/4" - O.D.).
Disconnect "water-out" red rubber hoses on water ma
fold (E) (1/2" - I.D.).
Disconnect "air-in" red rubber hoses on pressure tank
(1/2" - I.D.).
Remove 3 screws to junction box (G) (10-32 x 1/2"
socket head cap screws).
Disconnect brass union to main valve (H) (3/8" NPT).
Have 2 men assist in taking the manifolds off.
Remove 3 stainless steel screws (1/4"-20 x 2-3/4" Lg.) fro
each manifold being very careful that the manifold doesn
drop.
Remove complete unit.
Remove drip unit (I).
Lift mainplate on eyebolts.
Loosen tie rod nut (K) (1/2" - 13).
Remove 4 socket head screws (L) (1/2" - 13 x 2" Lg.).
Place mainplate on face, supporting with wood blocks
clear gooseneck motion cylinder bracket.
Remove 2 gooseneck adjusting blocks (M) and 1 cent
block (N).
Remove 26 (1/4"-20) socket head cap screws from wat
jacket.
Remove waterjacket (1/4" boiler plate).
Replace rubber seals every time the water jacket is r
moved.
To assemble reverse above precedure.



TROUBLE SHOOTING

(Refer also to Electrical Diagrams)

NO INJECTION:

Nozzle:
- Temperature setting too low (nozzle freezes)
- Temperature setting too high (when nozzle hits die, zinc drop gets into gate and solidifies instantly)
- Heater burned out

Dies:
- Too cold (nozzle freezes before injection takes place)
- Not closed

Cores:
- Not closed

Gooseneck:
- "ON" time too long (if nozzle moves against the cold die too early before injection, it will freeze)
- Seat on tapered sleeve leaking
- Channel plugged (zinc crystallized behind nozzle)

Injection:
- Too late
- Valve broken

Plunger:
- Seized
- Worn

Sleeve:
- Ball does not seal
- Assembled with slot on wrong side

Air Blast:
- Blows against nozzle causing freezing
- Timing incorrect (activated too early)

No air in cylinder
Pot frozen
Pressure regulator closed
Zinc level too low (causing freezing of nozzle)
Lube sprays on nozzle (causing freezing)
Injection switch "OFF"
Limit switch No. 5 MCS not operating

NOTE:
In most cases, when the machine fails to run, the problems are mechanical. Check all adjustments on the machine before checking the electrical control cabinet. Special attention should be given to the adjustment of the limit switches, cushions on cylinders and pressure on dies and cores.

MACHINE DOES NOT START:

- No air
- Cam not in 0 position
- Not re-set
- Fuse burned out
- No power
- Faulty starter button
- (Overheating system doesn't stop machine. It only cuts off the power to the heating elements and resets automatically after temperature has dropped back to normal)

FLASHING NOZZLE:

Nozzle:
- Too hot
- Seat leaking
- Does not fit properly over gate (see page 18)
- Chipped
- Not stoned properly
- Nozzle clamp loose

Gooseneck:
- Does not close firmly enough
- No cushion action when moving back
- "ON" time too short
- Valve not working properly
- Assembly not tight

Injection:
- Too early

Dies:
- Not enough closing pressure
- Too hot
- Water leaking
- Chipped at nozzle seat

Cover plates:
- Loose
- Worn

Plunger:
- Bounces

Air Blast Tube:
- Between gooseneck and die

Pressure Pads:
- Missing or springs not operating

Plug Connector:
- For nozzle sensor oxidized (nozzle gets too hot)

PISTON RODS BREAKING:

- No cushion on cylinder
- Poor adjustment of toggles

MACHINE STOPS:

- Too much pressure on dies
- Too much cushion on cylinders
- Badly adjusted limit switch
- Part between dies or cores
- Incorrect connection of wires to limit switch

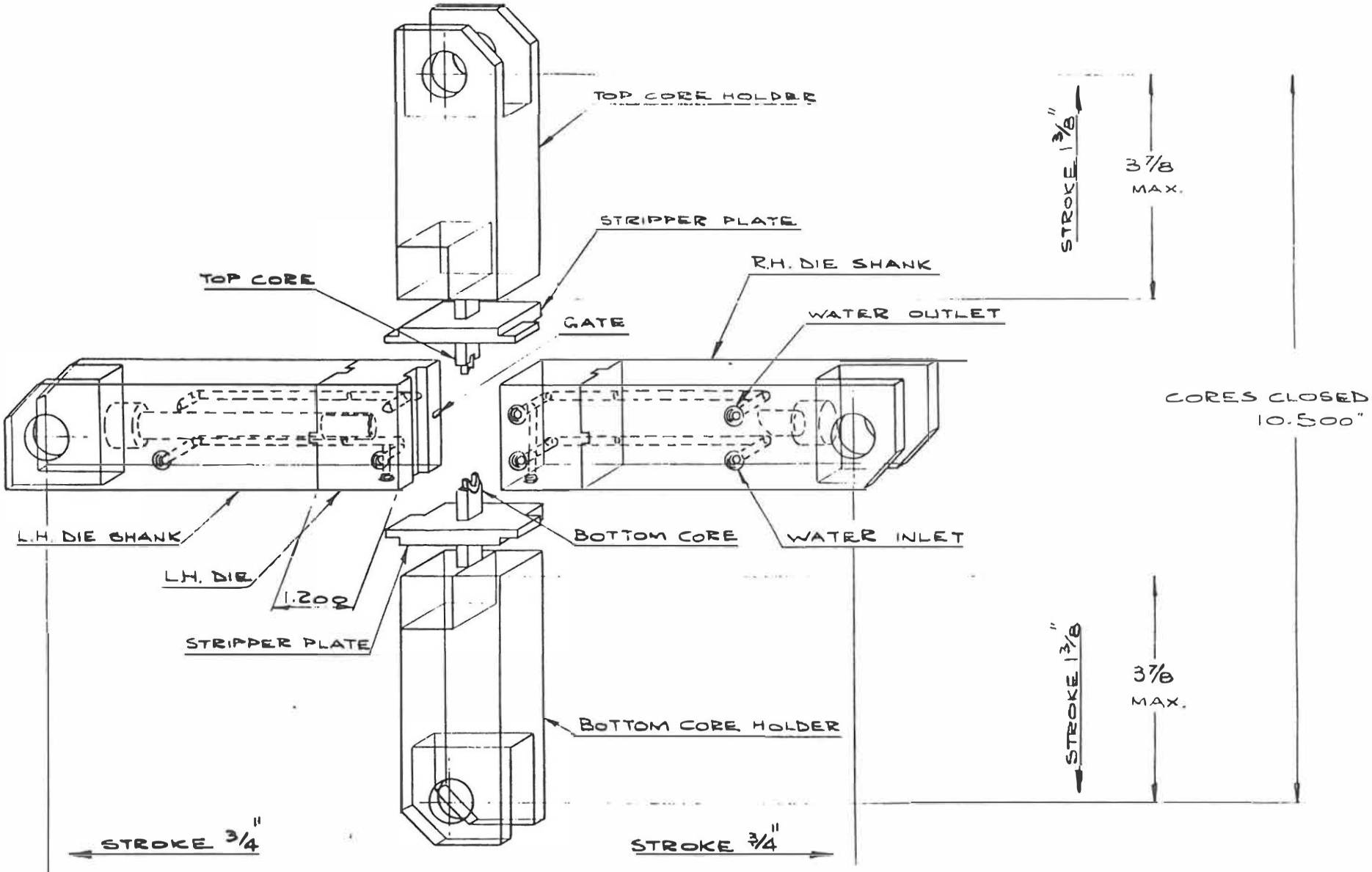
BREAKING CORES:

- Link pins and bearings on toggle assembly worn out
- Little or no draft on cores and pins
- Wrong sequence
- Misalignment

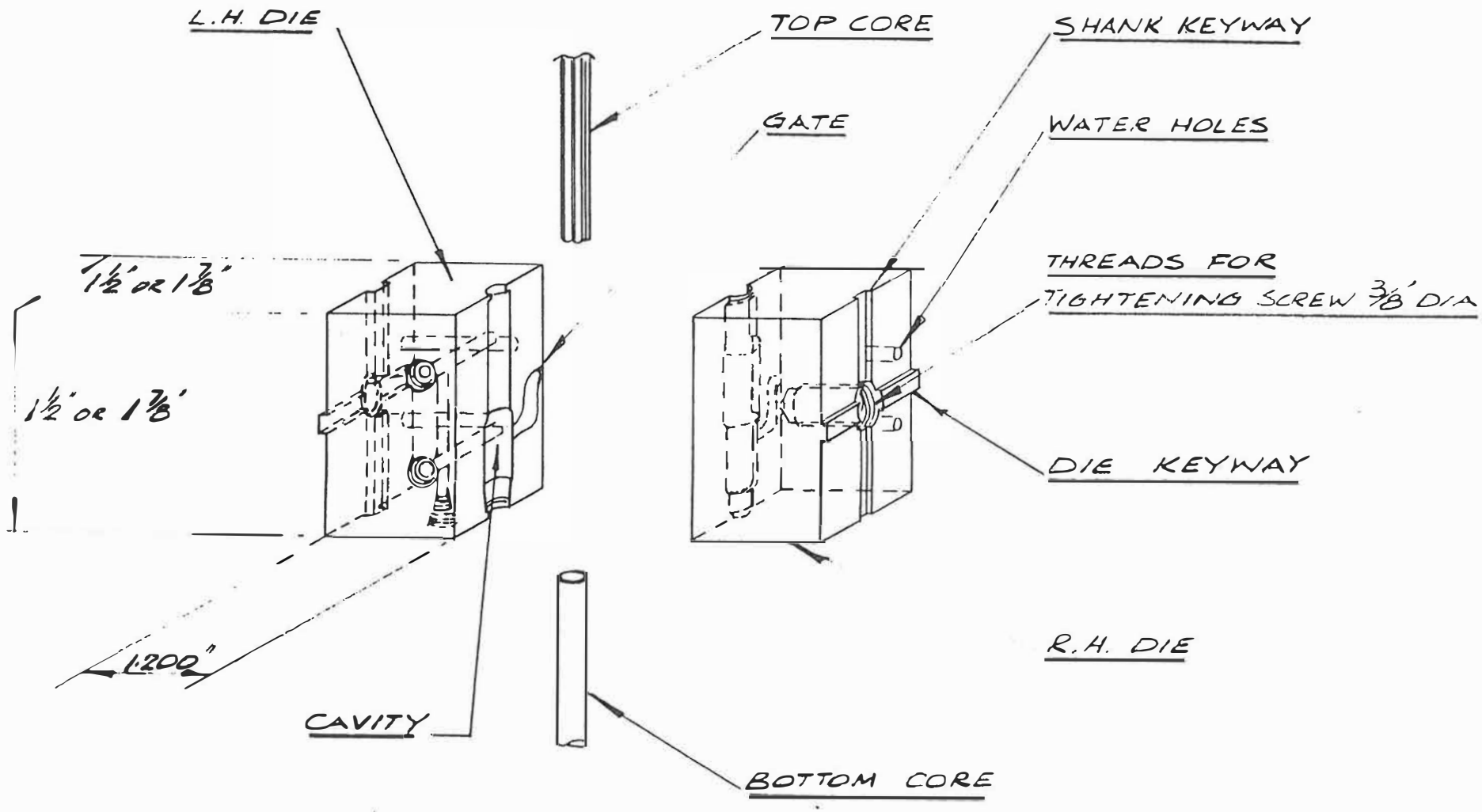
BANGING OF NOZZLE:

- Not enough cushion on cylinder

DIE AND CORE SHANK ASSEMBLY



DIE AND CORE ASSEMBLY



MISCELLANEOUS

MATERIAL FOR:

Die Shanks	SAE 01
Die Cavity Blocks	SAE T1
Cross	Meehanite
Cover Plates	Meehanite
Gooseneck	Meehanite
Mounting Block	Meehanite
Pot	Meehanite
Tapered Sleeve	SAE H-13
Ball	H.S.S. or Carbide
Plunger	SAE T1
Main Plate	SAE 1020
Adjusting Pin Holder	Atlas Super Impacto
Links	Atlas Super Impacto
Link Pins	Atlas Roll Steel
Manifold	Al. 24 ST 4

DIE LUBRICANTS:
Any core and die lubricant available can be used with spray unit. Choice of lubricant depends on application and has to be selected by user.

Use kerosene as solvent.

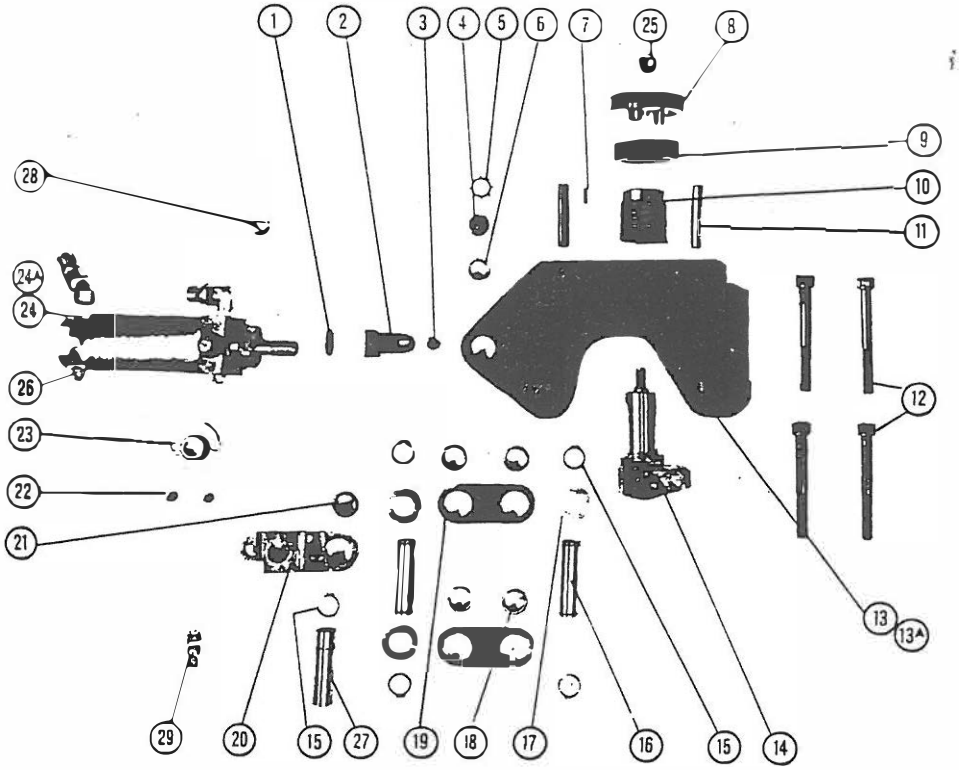
Silicone-base lubricants are good agents. However, they are not recommended for parts which are to be electro-plated.

AIR LUBRICATION:
Parafinic Oil. Viscosity – 110 ssu @ 100°F.

PIVOT SHAFT LUBRICATION:
Darina Grease No. 2. 71502 (Shell) or equivalent.

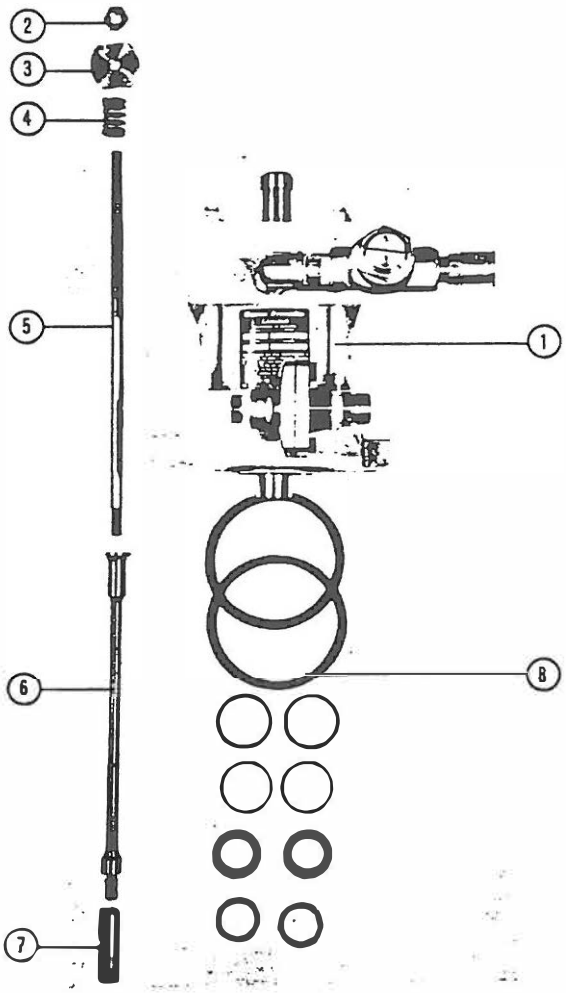
DIE & CORE SHANK LUBRICATION:
Good quality machine oil.

MOUNTING BLOCK ASSEMBLY MODEL A-1



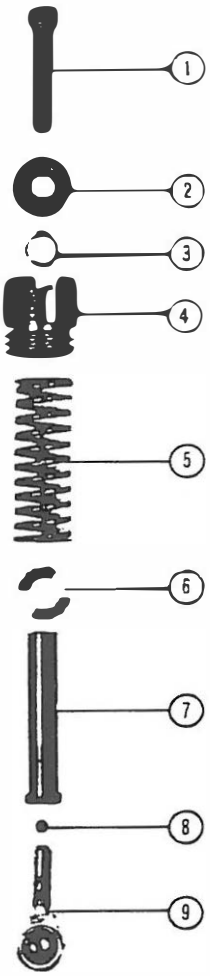
ITEM NO.	PART NO.	QUANTITY	DESCRIPTION
1	A-184	4	Jam nut
2	A-177	4	Yoke machining
3	8-176	4	Yoke pin
4	A-180	4	Disc
5	2369	4	Plug retainer 3/4" DIA.
6	A-181	4	Bushing
7	2363	4	Selector lock spring 1/8" DIA.
8	8-164	4	Knob machining
9	A-165	4	Spacer
10	A-166	4	Threaded sleeve
11	2370	8	Selector lock spring pin 3/8" DIA. x 2" Lg.
12	2367	16	Socket head cap screw 3/8" - 16 NC x 3-1/4" Lg.
13	D-162	2	Mounting block (Dies)
14	C-167	4	Adjusting pin holder
15	2368	24	Retaining ring 5/8" DIA.
16	A-169	8	Link pin
17	A-174	16	Special washer
18	A-168	16	Needle bearing
19	8-173	8	Connecting link machining
20	8-175	4	Lever machining
21	8-178	4	Needle bearing
22	2519	8	Button head cap screw 10 - 32 x 3/8" Lg.
23	A-183	4	Special bushing
24	8-259	2	Die toggle cylinder 1-1/2" DIA. x 1-5/8" stroke
25	2364	4	Flex lock nut 3/8" - 16 NC
26	A-266	8	Set screw cushion regulator
27	A-170	4	Connecting pin
28	A-171	4	Shoulder washer
29	A-425	8	Short nipple 5/16" - 18 NC
13a	D-187	2	Mounting block (Cores)
24a	8-270	2	Core toggle cylinder 1-1/2" DIA. x 2-1/8" stroke

PLUNGER ASSEMBLY



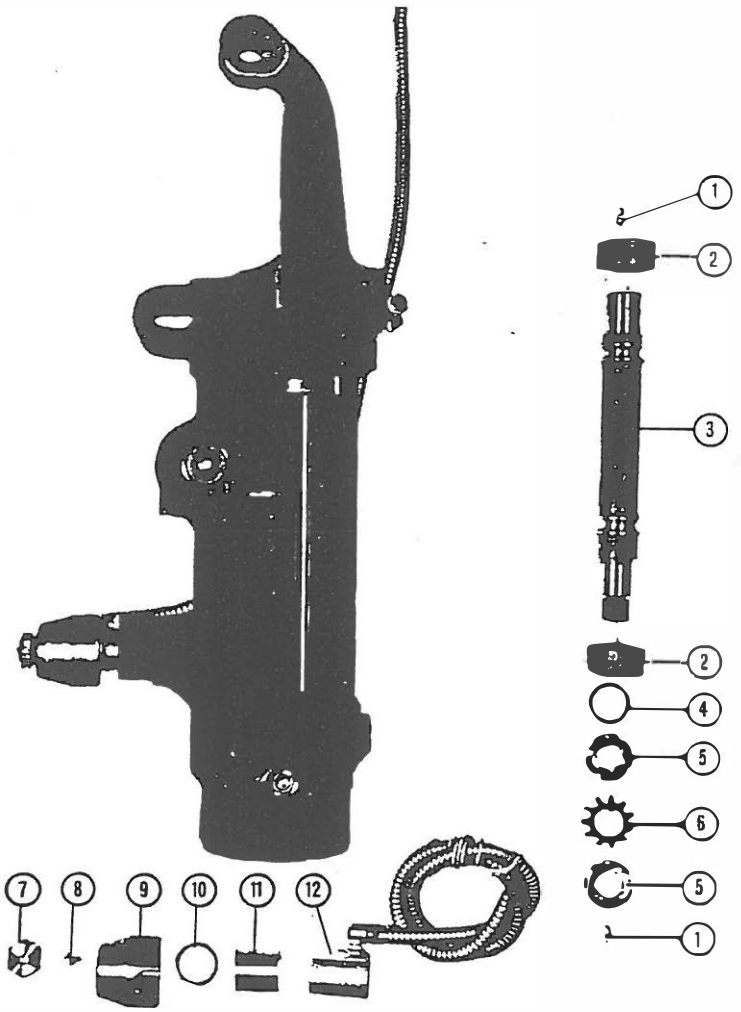
ITEM NO.	PART NO.	QUANTITY	DESCRIPTION
1	C-220	1	Injection cylinder
2	2385	1	Hex jam nut 3/8" - 16 NC
3	A-216	1	Special washer
4	A-217	1	Spring (Danly)
5	B-215	1	Upper rod
6	B-214	1	Push rod
7	~~A-218~~	~~1~~	~~Plunger~~
8	A-648	1	Set O-Rings (for piston rod and piston seal)

GOOSENECK ADJUSTMENT SPRING ASSEMBLY



ITEM NO.	PART NO.	QUANTITY	DESCRIPTION
1	A-237	2	Special screw
2	A-238	2	Special washer
3	2362	2	Retaining ring 3/4" DIA.
4	A-243	2	Base
5	A-251	2	Spring
6	A-242	2	Washer
7	A-239	2	Threaded sleeve
8	2354	2	Pipe plug 1/16" - 27 NPT
9	A-236	2	Male rod end

PIVOT SHAFT & NOZZLE HEATER ASSEMBLY

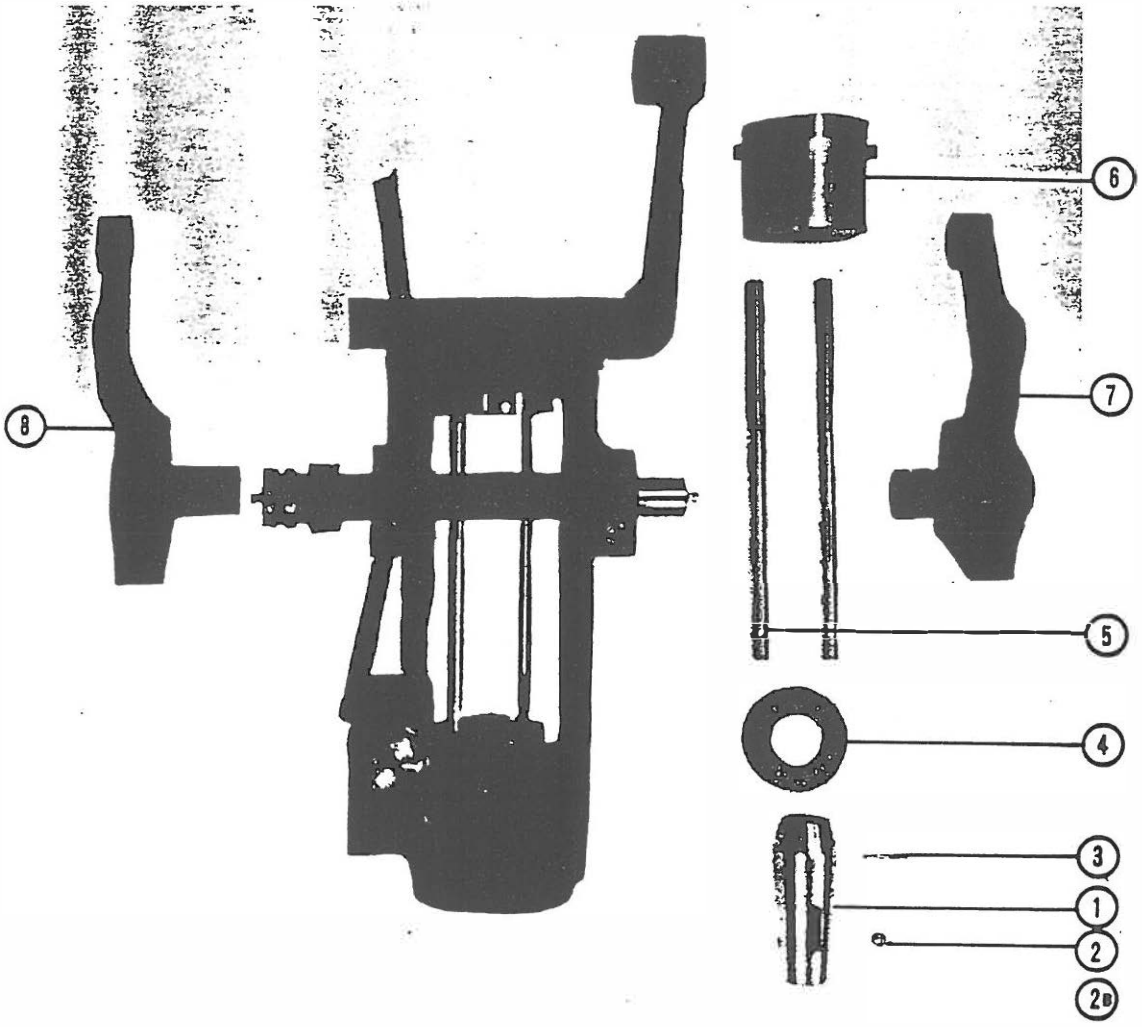


ITEM NO.	PART NO.	QUANTITY	DESCRIPTION
1	2338	2	Grease nipple 1/4" - 28 NF
2	B-223	2	Ball bushing
3	B-221	1	Pivot shaft
4	A-222	1	Spacer sleeve
5	2387	2	Lock nut SAE N-04
6	2388	1	Lock washer SAE W-04
7	~~A-208~~	~~1~~ 1	Nozzle clamp — DET. 10 OF ET-
8	~~A-209~~	~~1~~ 1	Nozzle cone (50°) — DET. 11 OF ET-
9	~~A-207~~	1	~~Heater shield~~
10	~~A-619~~	1	~~Ring for nozzle heater~~
11	~~A-651~~	1	~~Shim~~
12	~~B-223~~	1	Nozzle heater — P/N M11805 & M11806
Optional			
8	A-209-1		.100 Dia. hole
	A-209-2		.120 Dia. hole
7	A-208-1		To be used with A-209-1 & A-209-2

ITEM Qty 11 REPLACE BY M23A02

Lead wi

GOOSENECK ASSEMBLY



	ITEM NO.	PART NO.	QUANTITY	DESCRIPTION
		DET. 1, 2 OF EF9842-P		1" I.D.
	1	~~A-608~~	1	Tapered sleeve ~~1/4" I.D.~~
MODEL A-1	2	~~A-211~~	1	~~Ball (high speed steel)~~
	3	~~A-210~~ M21102	1	Ball (carbide)
~~MODEL A-2~~	1	~~A-606-2~~	1	~~Tapered sleeve 7/8" I.D.~~
	2	2515	1	~~Ball~~
	3	A-212	1	Pin
	4	A-607	1	Sleeve ring
	5	B-213	2	Holding rod
MODEL A-1 & A-2	6	B-219	1	Rod holder
	7	C-240	1	Adjusting arm right
	8	C-241	1	Adjusting arm left