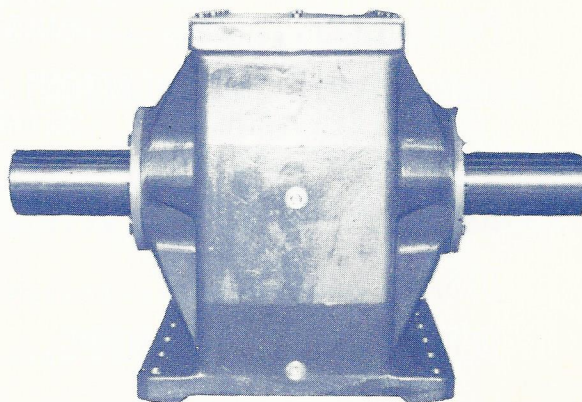
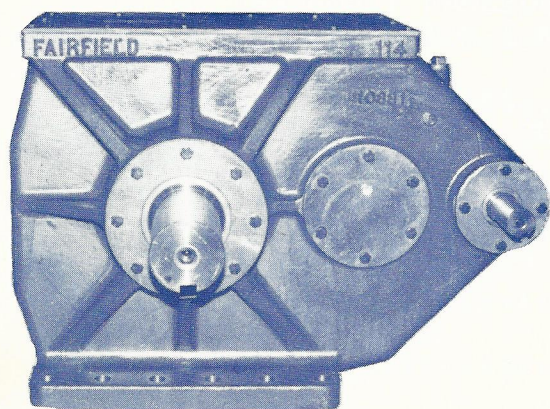


Pump Jack Reducers

114 thru 320



Service Manual
&
Parts List

Fairfield

THE
DRIVE
PEOPLE

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NOTE: FOR INFORMATION NOT COVERED IN THIS MANUAL, CONTACT:

FAIRFIELD MFG. Co., INC.

U.S. 52 SOUTH

LAFAYETTE, INDIANA 47903

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INTRODUCTION


THIS SERVICE MANUAL IS A STEP-BY-STEP GUIDE DESIGNED FOR THE CUSTOMER OR SHOP MECHANIC WHO IS SERVICING OR REPAIRING A PARTICULAR MODEL OF PUMP JACK REDUCER DRIVE. (THE MODEL COVERED BY THIS COPY OF THE MANUAL IS SPECIFIED ON THE MANUAL COVER.)

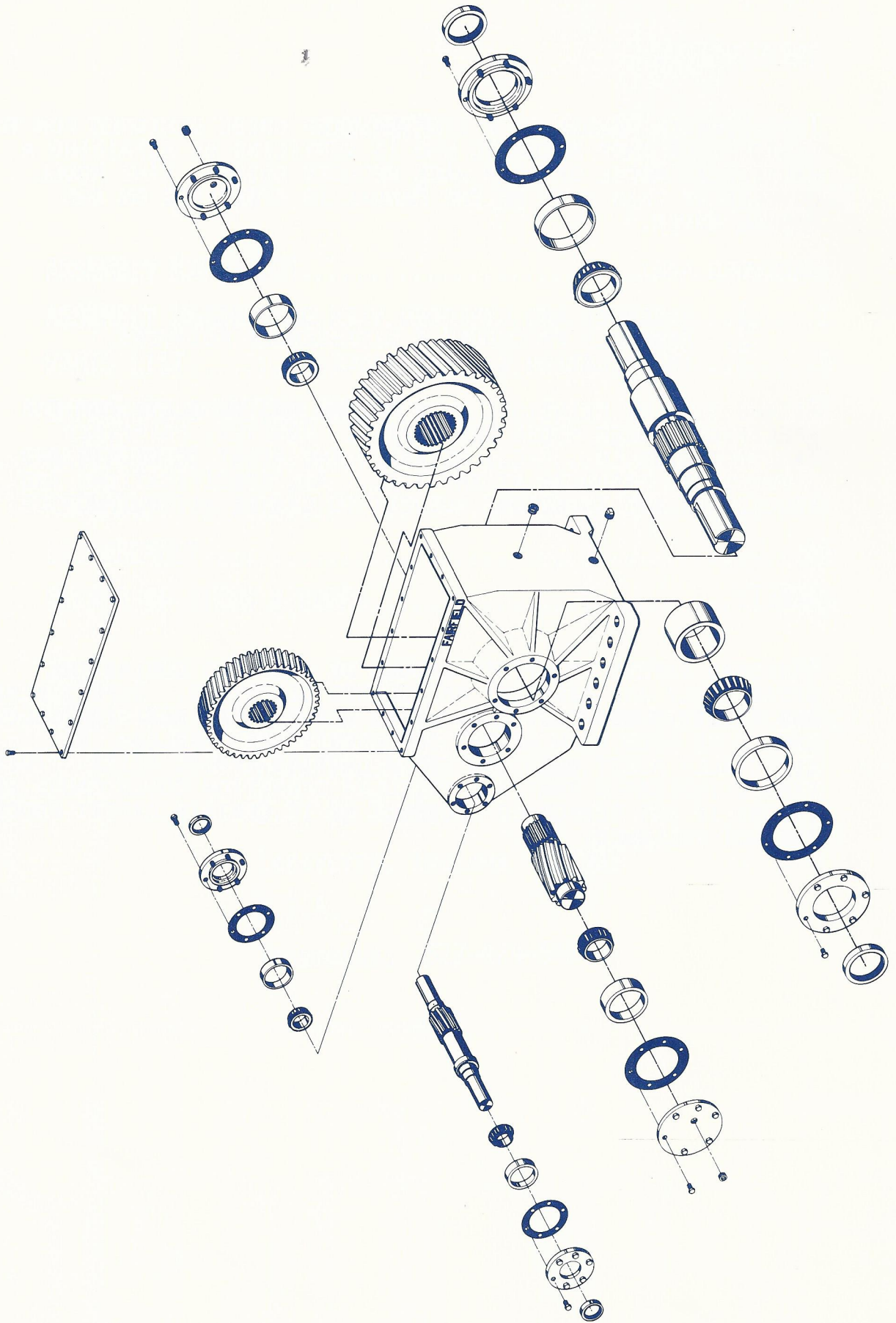
INCLUDED ARE:

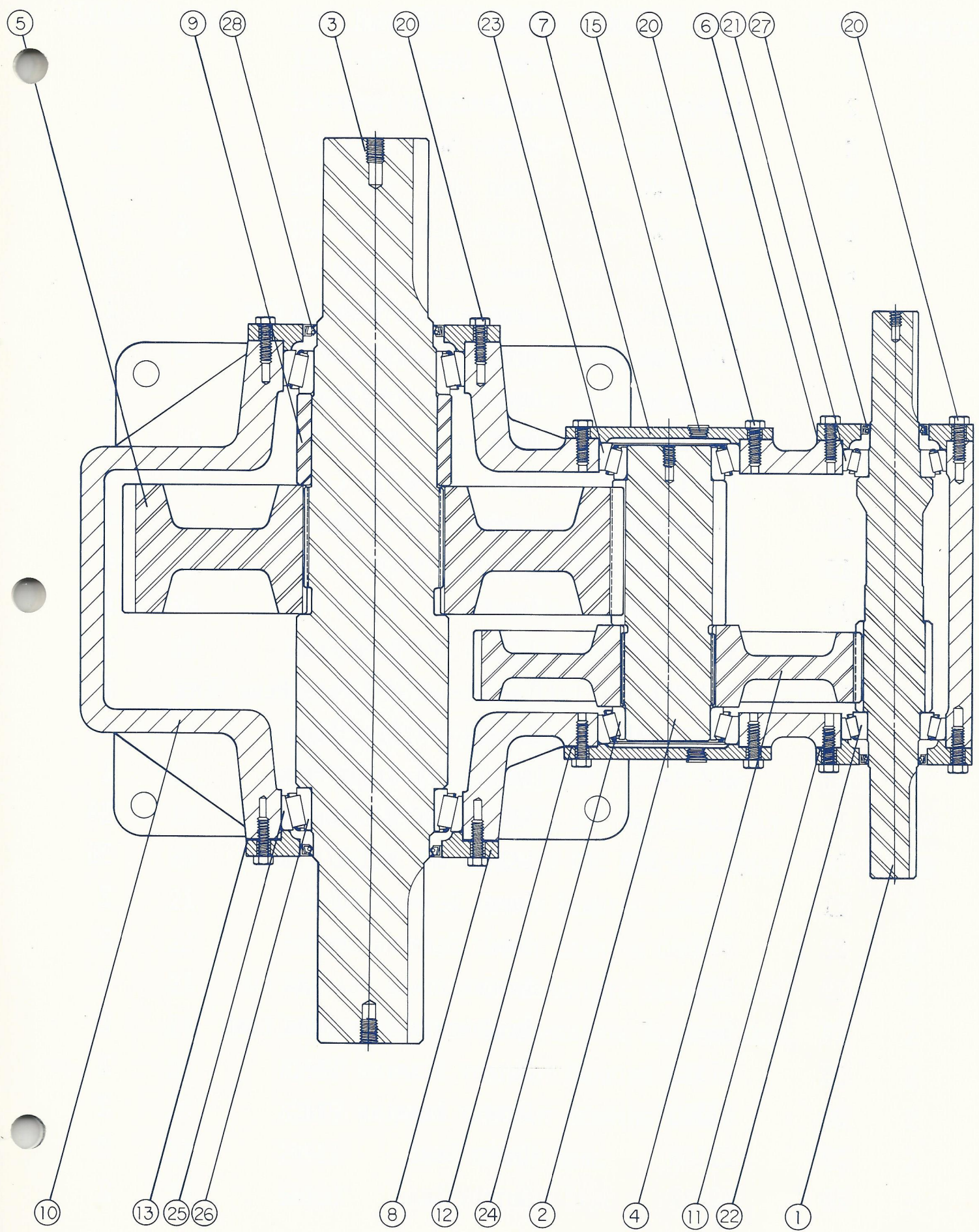
1. ASSEMBLY AND EXPLODED VIEW DRAWINGS.
2. ASSEMBLY PROCEDURE & DISASSEMBLY POINTERS.
3. INSTALLATION & MAINTENANCE.

AT THE TIME OF PRINTING, THIS MANUAL WAS COMPLETE FOR THE SPECIFIC REDUCER MODEL DESIGNATED. HOWEVER, FAIRFIELD MANUFACTURING CO., INC., RESERVES THE RIGHT TO UPDATE AND IMPROVE ITS PRODUCTS AT ANY TIME. ALL SPECIFICATIONS AND PROCEDURES ARE THEREFORE SUBJECT TO CHANGE WITHOUT NOTICE.

SAFETY

STANDARD SAFETY PRACTICES SHOULD BE FOLLOWED DURING THE DISASSEMBLY AND ASSEMBLY PROCEDURES DESCRIBED. SAFETY GLASSES AND SAFETY SHOES SHOULD BE WORN; HEAVY, HEAT RESISTANT GLOVES SHOULD BE USED WHEN HEATED COMPONENTS ARE HANDLED. BE ESPECIALLY ALERT WHEN YOU SEE A CAUTION SYMBOL . THIS SYMBOL INDICATES THAT A PARTICULAR OPERATION COULD CAUSE PERSONAL INJURY IF NOT PERFORMED PROPERLY OR IF CERTAIN SAFETY PROCEDURES ARE NOT FOLLOWED.





FAIRFIELD 114 GEARBOX PARTS LIST

<u>ITEM</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	114-1-1M	INPUT SHAFT	1
2	114-1-2M	INTERMEDIATE SHAFT	1
3	114-1-3M	OUTPUT SHAFT	1
4	114-1-4M	INPUT GEAR	1
5	114-1-5M	OUTPUT GEAR	1
6	114-1-6M	INPUT BEARING CAP	2
7	114-1-7M	INTERMEDIATE BEARING CAP	2
8	114-1-8M	OUTPUT BEARING CAP	2
9	114-1-10M	OUTPUT BEARING SPACER	1
10	114-1-9M	MAIN CASE	1
11	114-1-18M	INPUT SHIMS	4
12	114-1-19M	INTERMEDIATE SHIMS	4
13	114-1-20M	OUTPUT SHIMS	4
14	114-1-11M	TOP COVER	1
15	806-13-19M	1/2-14 NPT PIPE PLUG	2
16	807-P-1	1 - 1 1/2 NPT PIPE PLUG VENT	1
17	805-19-21M	1/2-14 NPT PIPE PLUG	1
18	807-P-2	3/4-14 NPT SIGHT PLUG	1
19	114-1-13M	3/4-16 UNC x 1 LONG	14
20	114-1-12M	1/2-13 UNC x 1-5/8 LONG	36
21	3920	INPUT BEARING CUP	2
22	3979	INPUT BEARING CONE	2
23	592A	INTERMEDIATE BEARING CUP	2
24	598A	INTERMEDIATE BEARING CONE	2
25	67322	OUTPUT BEARING CUP	2
26	67390	OUTPUT BEARING CONE	2
27	21108	INPUT SEAL	2
28	49927	OUTPUT SEAL	2

FAIRFIELD 160 GEARBOX PARTS LIST

<u>ITEM</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	160-1-1M	INPUT SHAFT	1
2	160-1-2M	INTERMEDIATE SHAFT	1
3	160-1-3M	OUTPUT SHAFT	1
4	160-1-4M	INPUT GEAR	1
5	160-1-5M	OUTPUT GEAR	1
6	160-1-6M	INPUT BEARING CAP	2
7	160-1-7M	INTERMEDIATE BEARING CAP	2
8	160-1-8M	OUTPUT BEARING CAP	2
9	160-1-9M	OUTPUT BEARING SPACER	1
10	160-1-10M	MAIN CASE	1
11	160-1-11M	INPUT SHIMS	4
12	160-1-12M	INTERMEDIATE SHIMS	4
13	160-1-13M	OUTPUT SHIMS	4
14	160-1-14M	TOP COVER	1
15	806-13-19M	1/2-14 NPT PIPE PLUG	2
16	807-P-1	1 x 1 1/2 NPT PIPE PLUG VENT	1
17	805-29-21M	1/2-14 NPT PIPE PLUG	1
18	807-P-2	3/4-14 NPT SIGHT PLUG	1
19	805-29-17M	3/8-16 UNC HEX HEAD BOLT	18
20	114-1-12M	1/2-13 UNC HEX HEAD BOLT	40
21	39520	INPUT BEARING CUP	2
22	39590	INPUT BEARING CONE	2
23	772	INTERMEDIATE BEARING CUP	2
24	787	INTERMEDIATE BEARING CONE	2
25	82931	OUTPUT BEARING CUP	2
26	82576	OUTPUT BEARING CONE	2
27	24911	INPUT SEAL	2
28	56160	OUTPUT SEAL	2

FAIRFIELD 228 GEARBOX PARTS LIST

<u>ITEM</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	228-1-1M	INPUT SHAFT	1
2	228-1-2M	INTERMEDIATE SHAFT	1
3	228-1-3M	OUTPUT SHAFT	1
4	228-1-4M	INPUT GEAR	1
5	228-1-5M	OUTPUT GEAR	1
6	228-1-6M	INPUT BEARING CAP	2
7	228-1-7M	INTERMEDIATE BEARING CAP	2
8	228-1-8M	OUTPUT BEARING CAP	2
9	228-1-9M	OUTPUT BEARING SPACER	1
10	228-1-10M	MAIN CASE	1
11	228-1-11M	INPUT SHIMS	4
12	228-1-12M	INTERMEDIATE SHIMS	4
13	228-1-13M	OUTPUT SHIMS	4
14	228-1-14M	TOP COVER	1
15	806-13-19M	1/2-14 NPT PIPE PLUG	2
16	807-P-1	1 x 1 1/2 NPT PIPE PLUG VENT	1
17	805-29-21M	1/2-14 NPT PIPE PLUG	1
18	807-P-2	3/4-14 NPT SIGHT PLUG	1
19	805-29-17M	3/8-16 UNC HEX HEAD BOLT	20
20	114-1-12M	1/2-13 UNC HEX HEAD BOLT	40
21	572	INPUT BEARING CUP	2
22	576	INPUT BEARING CONE	2
23	792	INTERMEDIATE BEARING CUP	2
24	795	INTERMEDIATE BEARING CONE	2
25	HM237510	OUTPUT BEARING CUP	2
26	HM237542	OUTPUT BEARING CONE	2
27	27370	INPUT SEAL	2
28	67533	OUTPUT SEAL	2

FAIRFIELD 320 GEARBOX PARTS LIST

<u>ITEM</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
1	805-29-1M	INPUT SHAFT	1
2	320-29-2M	INTERMEDIATE SHAFT	1
3	320-29-3M	OUTPUT SHAFT	1
4	320-29-4M	INPUT GEAR	1
5	320-29-5M	OUTPUT GEAR	1
6	805-29-23M	INPUT BEARING CAP	2
7	805-29-8M	INTERMEDIATE BEARING CAP	2
8	805-29-24M	OUTPUT BEARING CAP	2
9	805-29-6M	OUTPUT BEARING SPACER	1
10	320-29-10M	MAIN CASE	1
11	805-29-14M	INPUT SHIMS	4
12	805-29-13M	INTERMEDIATE SHIMS	4
13	805-29-12M	OUTPUT SHIMS	4
14	320-29-11M	TOP COVER	1
15	806-13-19M	1/2-14 NPT PIPE PLUG	2
16	807-P-1	1-11-1/2 NPT PIPE PLUG VENT	1
17	805-29-21M	1/2-14 NPT PIPE PLUG	1
18	807-P-2	3/4-14 NPT SIGHT PLUG	1
19	805-29-16M	3/4-10 UNC x 2 HEX HEAD BOLT	24
20	805-29-15M	1/2-13 UNC x 1-1/4 HEX HEAD BOLT	52
21	JM718110	INPUT BEARING CUP	2
22	JM718149	INPUT BEARING CONE	2
23	792	INTERMEDIATE BEARING CUP	2
24	795	INTERMEDIATE BEARING CONE	2
25	H239610	OUTPUT BEARING CUP	2
26	H239649	OUTPUT BEARING CONE	2
27	31148	INPUT SEAL	2
28	70080	OUTPUT SEAL	2

UNPACKING & INSTALLATION

- A. INSPECT UNIT FOR DAMAGE UPON ARRIVAL.
- B. FOR LONG TERM (OVER 30 DAYS) UNIT SHOULD BE GIVEN ADDITIONAL PROTECTION FROM CORROSION. STORE IN A WARM DRY LOCATION AND COAT THE SHAFTS WITH GREASE UP TO AND INCLUDING THE EDGE OF THE SEALS.
- C. INSTALLATION
 - 1. UNIT SHOULD BE BOLTED DOWN TO A CLEAN FLAT SURFACE. TIGHTEN HOLD DOWN BOLTS UNIFORMLY.
 - 2. FILL UNIT TO SIGHT PLUG LEVEL WITH A GOOD GRADE OF OIL. FOR NORMAL OPERATION, USE AN SAE 40 GEAR OIL WITH A VISCOSITY OF 700-1000 SSU AT 100°F. EXTREME PRESSURE OILS SUCH AS EP90 OR EP140 CAN BE USED, BUT ARE NOT AS STABLE AT TEMPERATURES ABOVE 140°F. IF SUBJECTED TO THESE TEMPERATURES MORE FREQUENT OIL CHANGES WOULD BE REQUIRED.
 - 3. OIL SHOULD BE CHANGED AFTER THE FIRST 1000 HOURS AND EVERY YEAR THEREAFTER.

MAINTENANCE

1. CHECK OIL LEVEL ONCE A WEEK. OIL LEVEL SHOULD BE TO MIDDLE OF SIGHT GLASS ON THE OUTPUT END OF THE BOX.
2. CHANGE OIL AFTER FIRST 1000 HOURS AND ONCE A YEAR THEREAFTER. USE AN SAE 40 GEAR OIL OR EP90. DO NOT MIX OIL TYPES.
3. SEAL REPLACEMENT IS REQUIRED IF A LEAK DEVELOPS THAT EXCEEDS ONE CUP PER WEEK. REMOVE SEAL CARRIER AND PUSH OUT SEAL. REPLACE SEAL CARRIER IN THE SAME POSITION WITH THE SAME SHIMS AND TORQUE BOLTS TO 200 FT. LBS. INSTALL NEW SEAL AS SHOWN IN ASSEMBLY SECTION.
4. THE REDUCER SHOULD NOT REQUIRE ANY OTHER NORMAL MAINTENANCE WORK FOR MANY YEARS. IN CASE OF A PROBLEM OR QUESTION, PLEASE CALL YOUR DEALER OR FAIRFIELD MANUFACTURING Co., Inc., CUSTOMER ENGINEERING, LAFAYETTE, INDIANA 47903, PHONE 317-474-3474.

ASSEMBLY

THE FOLLOWING PROCEDURE SHOWS CERTAIN SPECIALIZED TOOLING AND FIXTURES TO LIFT, HOLD OR POSITION PARTS. SUCH TOOLING MAKES THE JOB OF ASSEMBLY MUCH EASIER, HOWEVER, THE JOB CAN BE DONE WITH VERY BASIC HOIST AND HANDLING EQUIPMENT.

IT IS VERY IMPORTANT THAT ALL PARTS BE ABSOLUTELY CLEAN WHEN THEY ARE ASSEMBLED. A LITTLE SAND OR DIRT CAN CAUSE VERY RAPID WEAR OR EVEN FAILURE OF BEARINGS, SEALS, AND GEARS.

PARTS MUST BE HANDLED WITH CARE. THE GEARS ARE "FILE HARD" ON THE SURFACE, BUT ONLY 300 BRINELL IN THE CORE SO EVEN LIGHT BUMPS AGAINST A HARD OBJECT WILL CAUSE A NICK ON THE TOOTH. NICKS AS SMALL AS .001 INCH HIGH WILL CAUSE THE BOX TO BE NOISY AND INCREASE THE STRESS ON THE TEETH. SEE THE SECTION ON REPAIR OF DAMAGED TEETH. IF IT IS NECESSARY TO DRIVE PARTS TOGETHER (OR APART), USE A HARDWOOD BLOCK OR SOFT BRASS PLATE BETWEEN THE HAMMER AND THE PART. DRESS OUT ANY IMPACT DAMAGE BEFORE PROCEEDING.

LOCATE THE BOX ON ITS SIDE AS SHOWN IN FIG. 1 WITH THE BOTTOM INPUT BEARING CUP AND CAP INSTALLED. USE ONE .015 SHIM AS A GASKET UNDER THE CAP.

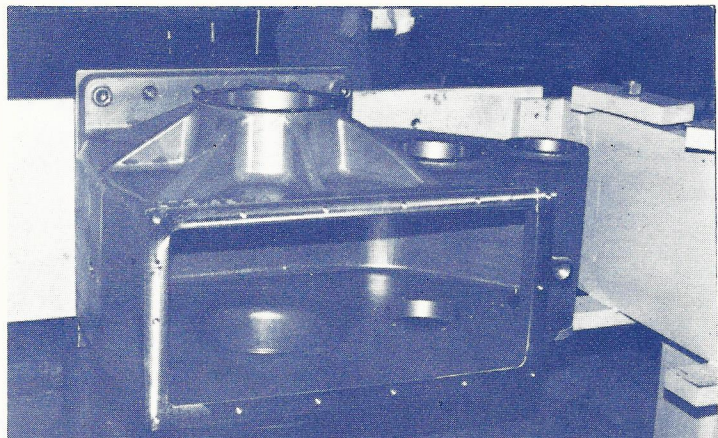


FIG. 1

HEAT INPUT SHAFT BEARING
CONES TO 250°F AND DROP ON
SHAFT AS SHOWN IN FIG. 2.
BEARING MUST BE SEATED
AGAINST ITS SHOULDER.

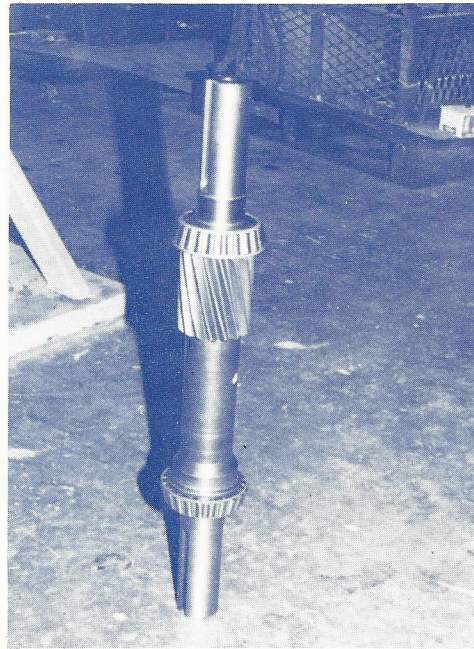


FIG. 2

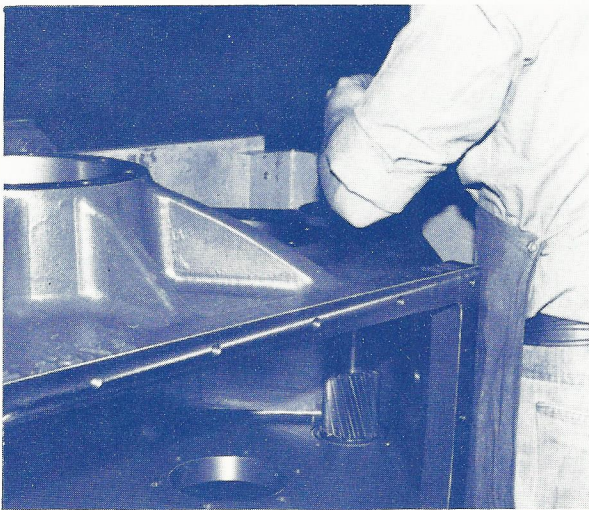


FIG. 3

LOWER THE SHAFT PINION
TOOTH END FIRST INTO THE BOX
AND REST LOWER CONE IN ITS
CUP (FIG. 3).

ASSEMBLE THE TOP CUP
INTO ITS BORE AND USING
.100 TO .120 TOTAL THICK-
NESS OF SHIMS (FIG. 4),
ASSEMBLE CUP AND TORQUE CAP
SCREWS UNIFORMLY TO 200
FOOT POUNDS.

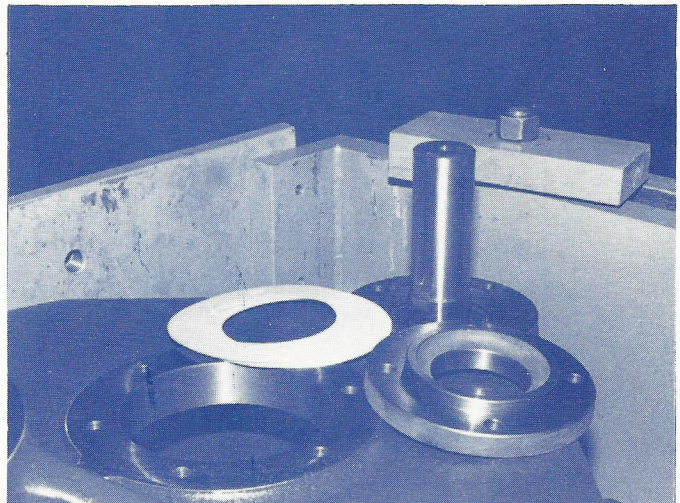


FIG. 4

SLIDE INPUT GEAR INTO THE BOX ON WASHERS OR SPACERS TO HOLD IT ABOUT 1/4 INCH ABOVE THE SURFACE. LOWER THE MIDDLE SHAFT INTO THE GEAR (FIG. 5) AND CAREFULLY START THE SPLINE INTO ITS MATING PART.



FIG. 5

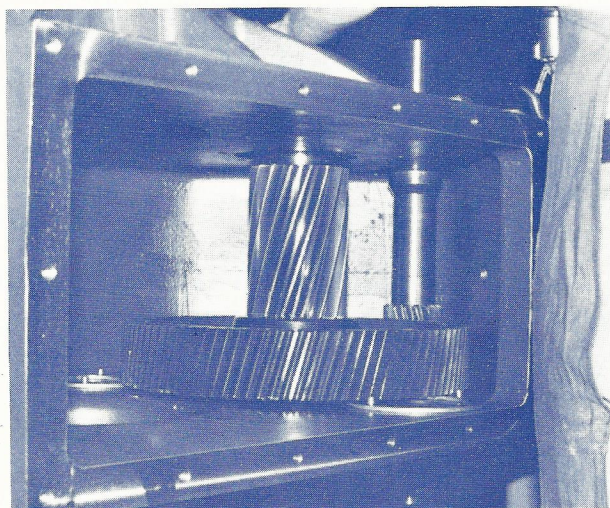


FIG. 6

DRIVE OR PRESS THE SHAFT UNTIL THE OUTPUT PINION SEATS AGAINST THE GEAR (FIG. 6). PROTECT THE END OF THE SHAFT WITH A SOFT BRASS PLATE BEFORE PRESSING OR DRIVING PARTS TOGETHER.

HEAT THE BEARING CONE TO 250°F AND DROP ONTO THE SHAFT (FIG. 7).

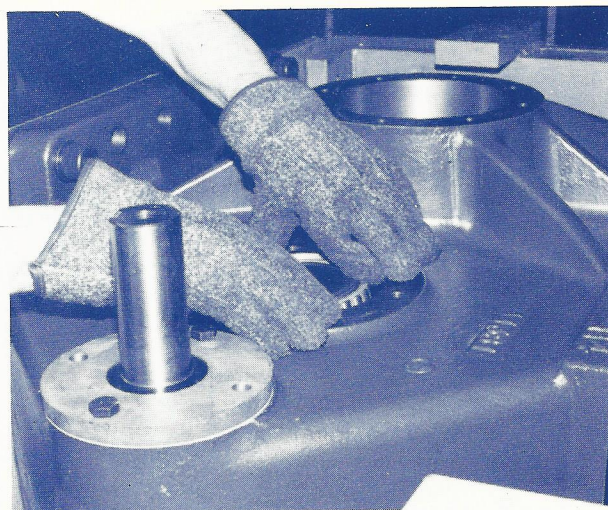


FIG. 7

DRIVE CUP INTO
BORE AND ASSEMBLE
BEARING CUP WITH .100
TO .125 TOTAL SHIMS.
TORQUE CAP SCREWS TO
200 FOOT POUNDS.

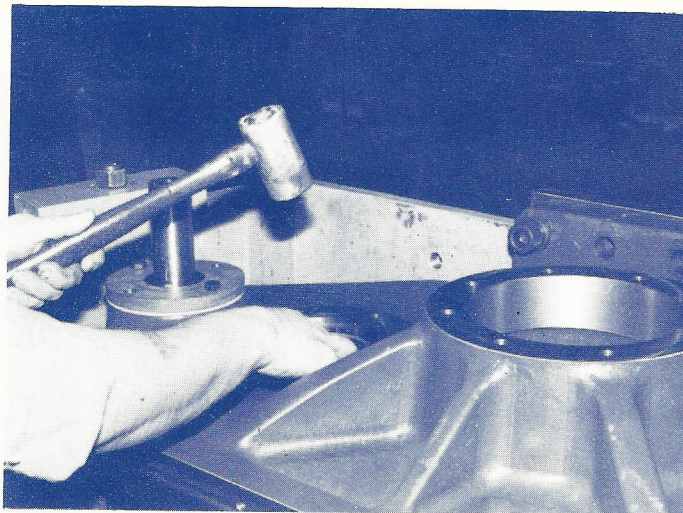


FIG. 8

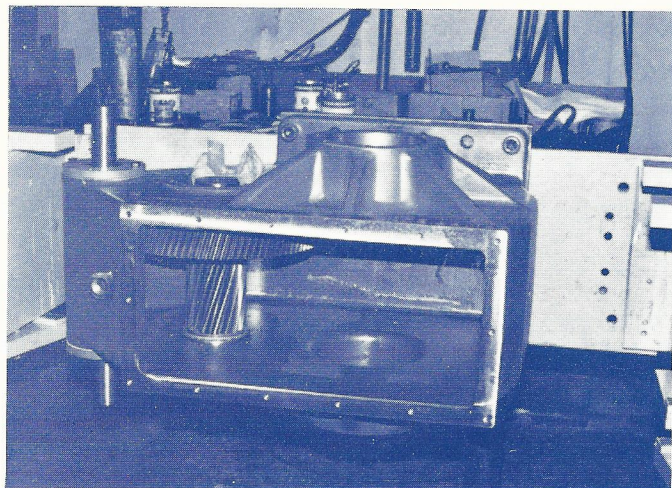


FIG. 9

CAREFULLY ROTATE BOX
TO HAVE THE OTHER SIDE UP.
PROTECT THE BEARING BORE
AND SHAFT WITH A RAG OR
PAD DURING THIS OPERATION.

ASSEMBLE THE CONE,
CUP AND BEARING CAP
USING ONE .015 (PINK)
SHIM ON THE OTHER SIDE
OF THE MIDDLE SHAFT.
REMOVE THE SPACERS THAT
WERE USED UNDER THE MIDDLE
GEAR.



FIG. 10

INSERT THE OUTPUT GEAR
IN THE BOX ON 1/4 INCH
SPACERS AND CAREFULLY SLIDE
INTO MESH WITH ITS PINION.
(FIG. 11)

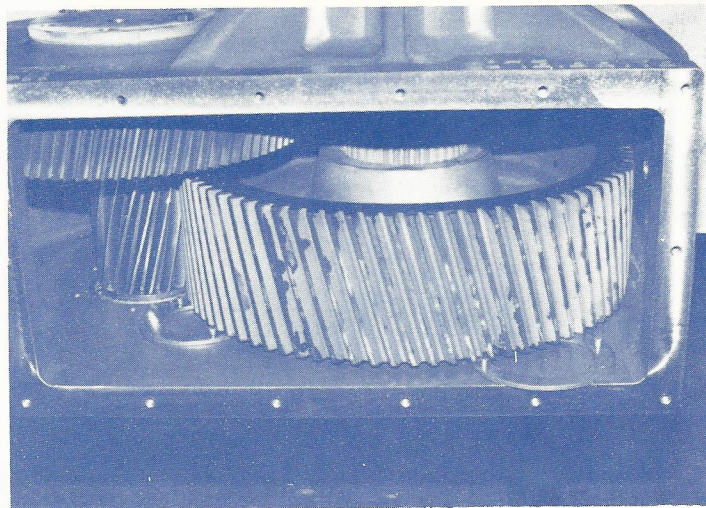


FIG. 11

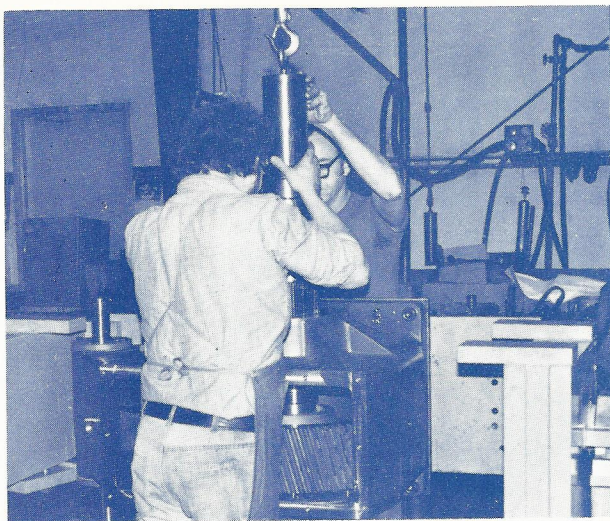


FIG. 12

LOWER THE OUTPUT SHAFT
INTO THE GEAR AND CAREFULLY
START THE SPLINES INTO ENGAGE-
MENT (FIG. 12 & 13).

DRIVE OR PRESS THE SHAFT
UNTIL THE SHOULDER SEATS AGAINST
THE GEAR HUB. PROTECT THE END
OF THE SHAFT WITH A SOFT BRASS
PLATE WHEN PRESSING OR DRIVING
THE PARTS TOGETHER.

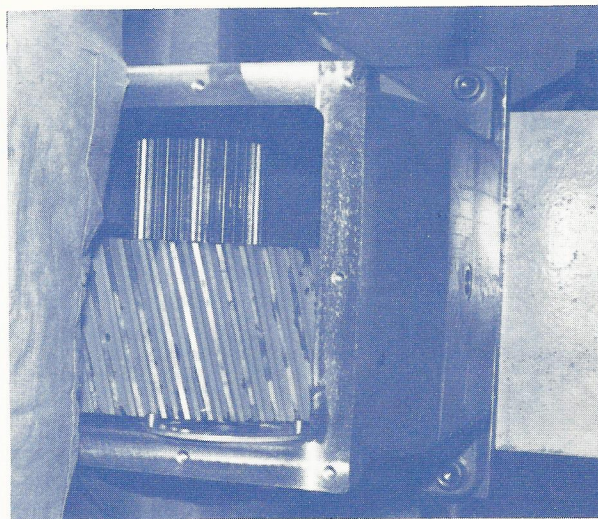


FIG. 13

ASSEMBLE THE CONE,
CUP AND GEAR AS WITH
OTHER SHAFTS. USE ONE
.015 SHIM AS A GASKET.
TORQUE BOLTS TO 200 FOOT
POUNDS.

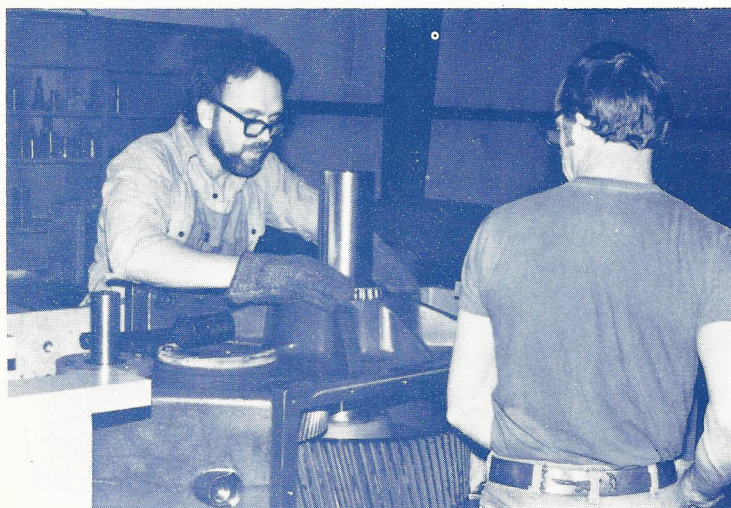


FIG. 14

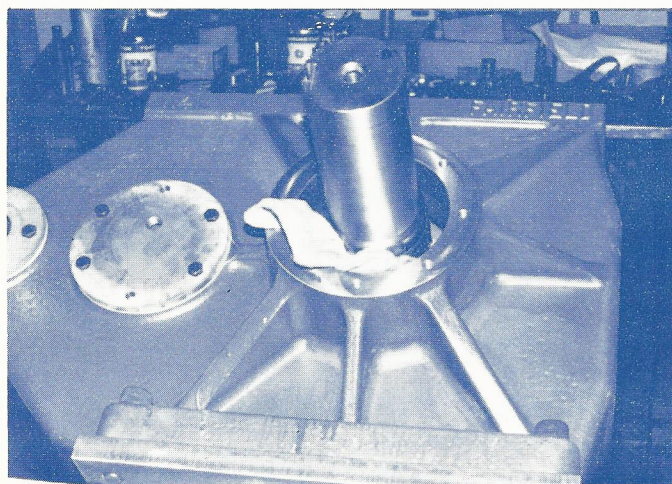


FIG. 15

PROTECT BORE AND SHAFT
WITH RAGS OR PADS AND ROTATE
BOX CAREFULLY TO THE OTHER
SIDE, REMOVE THE SPACERS THAT
WERE UNDER THE OUTPUT GEAR.

ASSEMBLE THE
SPACER AS SHOWN IN
FIG. 16. NEXT
ASSEMBLE THE CONE,
CUP AND BEARING CAP
USING .100 TO .120
SHIMS TOTAL. TORQUE
BOLTS TO 200 FOOT
POUNDS.

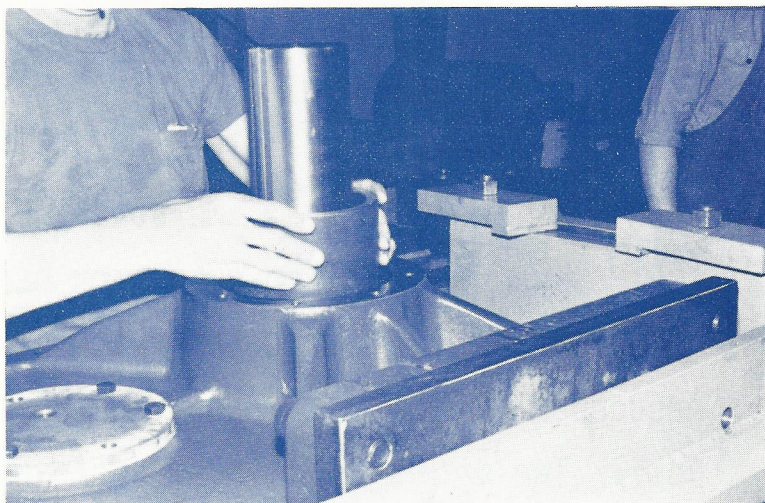


FIG. 16

BEARING ADJUSTMENT IS VERY IMPORTANT FOR PROPER OPERATION. TURN THE BOX WITH THE THICK SHIM (ORIGINALLY .140) SIDE UP. ROTATE IT BACK AND FORTH SO THE OUTPUT GEAR TURNS THROUGH AT LEAST 20°. PLACE A DIAL INDICATOR ON THE TOP END OF THE OUTPUT SHAFT AS SHOWN IN FIG. 17 AND A JACK UNDER THE SHAFT AS SHOWN IN FIG. 18.

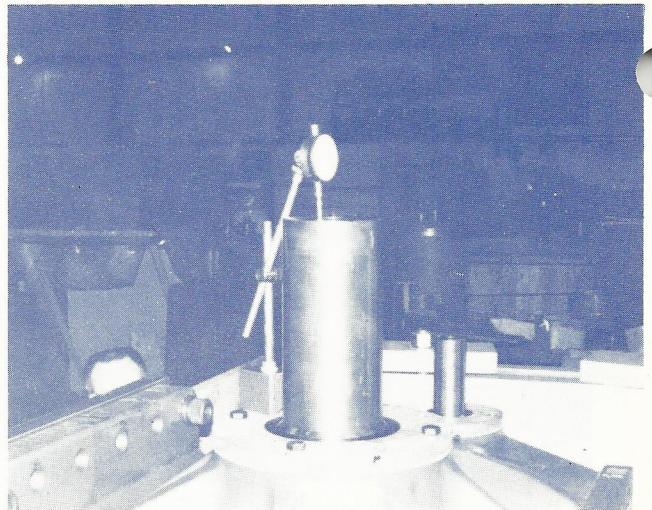


FIG. 17



FIG. 18

ZERO THE INDICATOR AND JACK THE SHAFT UP UNTIL ALL BEARING ENDPLAY IS TAKEN UP. IF NO ENDPLAY IS FOUND, REMOVE COVER AND ADD SHIMS UNTIL ENDPLAY CAN BE MEASURED. REPEAT THIS CHECK 3 TIMES. AVERAGE THE LAST TWO VALUES AND ADD .005 TO THAT AVERAGE ENDPLAY, AND THEN REMOVE THAT MANY SHIMS

FROM THE TOP SHIM PACK. MEASURE THE TOTAL PACK WITH A MICROMETER AND MEASURE THE REDUCED SHIM PACK BEFORE YOU RE-INSTALL IT. DO NOT RELY ON THE COLOR CODED THICKNESS. RE-INSTALL COVER WITH REDUCED SHIM PACK AND TORQUE ALL BOLTS TO 200 FT. LBS. TORQUE. NOTE: THE OUTPUT SHAFT MUST BE ADJUSTED FIRST.

NEXT, ADJUST THE MIDDLE SHAFT. REMOVE THE PIPE PLUGS FROM THE BEARING COVERS TO ALLOW ACCESS TO THE SHAFT (FIGURES 19 & 20).

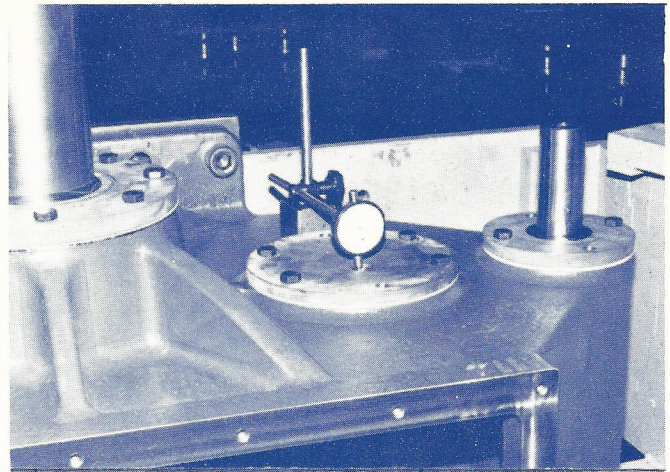


FIG. 19

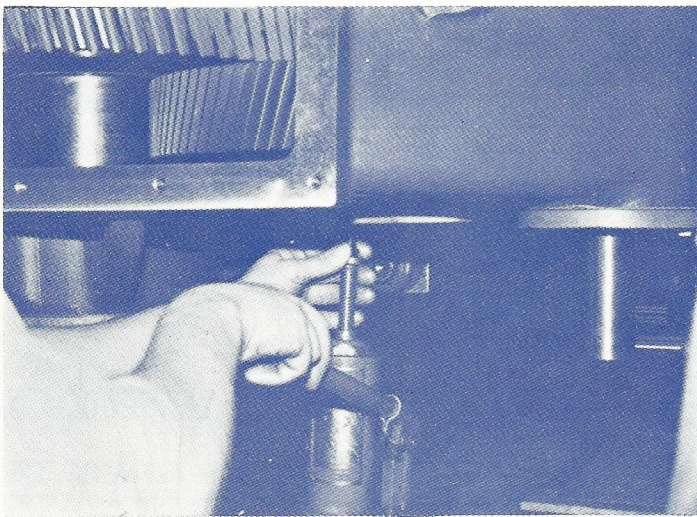


FIG. 20

ADD .002 TO THE AVERAGE ENDPLAY OF THIS SHAFT AND REMOVE THAT TOTAL THICKNESS OF SHIMS AS BEFORE.

FINALLY, ADJUST THE INPUT SHAFT IN THE SAME WAY (FIG. 21), EXCEPT REMOVE SHIMS EXACTLY EQUAL TO THE SHAFT ENDPLAY.

TO INSTALL THE SEALS, GREASE THE SHAFT AND THE SEAL, THEN CAREFULLY TAP THE SEAL INTO ITS BORE WITH THE PART NUMBER SHOWING TOWARD THE OUTSIDE OF THE BOX.



FIG. 21

THE SEAL SHOULD BE FLUSH WITH THE BEARING CAP AND MUST BE SQUARE IN THE BORE. A PIECE OF WOOD MAY BE USED TO DRIVE THE SEAL FLUSH. BE VERY CAREFUL NOT TO DAMAGE OR ROLL THE SEAL LIP DURING INSTALLATION.

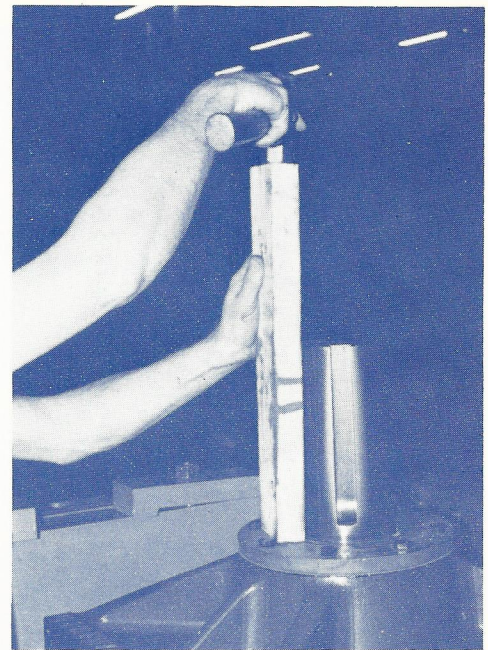


FIG. 22



FIG. 23

THE COVER SHOULD BE SEALED WITH A SINGLE BEAD OF SEALANT APPLIED INSIDE OF THE BOLT HOLES (FIG. 23).

THE BOX SHOULD BE LEAK CHECKED BY INJECTING AIR AT 6 PSI AND THEN HOLDING PRESSURE FOR 5 MINUTES WITH THE SUPPLY REMOVED (FIG. 24).

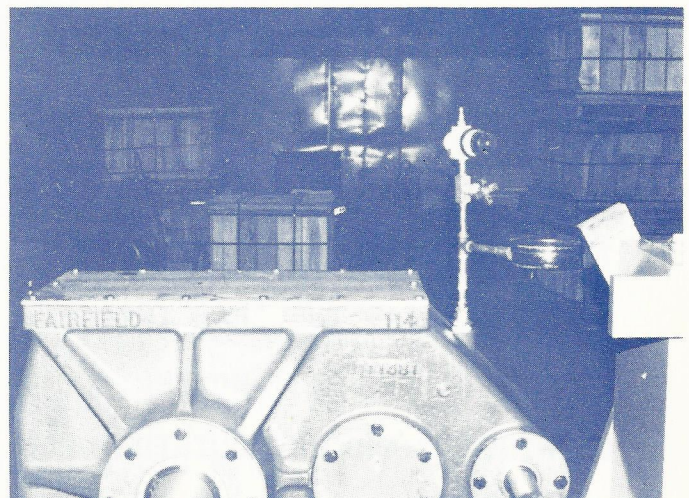
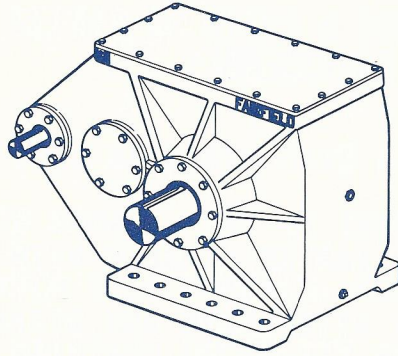


FIG. 24

Fairfield Pump Jack Reducers



Assembly Check List

1. Box Model _____ Box Serial No. _____

2. Output Shaft Bearing Adjustment

_____ Initial Shims - _____ End Play - .005 = _____ Final Shims

Assembler

Inspector

3. Middle Shaft Adjustment

_____ Initial Shims - _____ End Play - .002 = _____ Final Shims

Assembler

Inspector

4. Input Shaft Adjustment

_____ Initial Shims - _____ End Play - .001 = _____ Final Shims

Assembler

Inspector

5. Roll Inspection

Assembler

Inspector

6. Leak Test

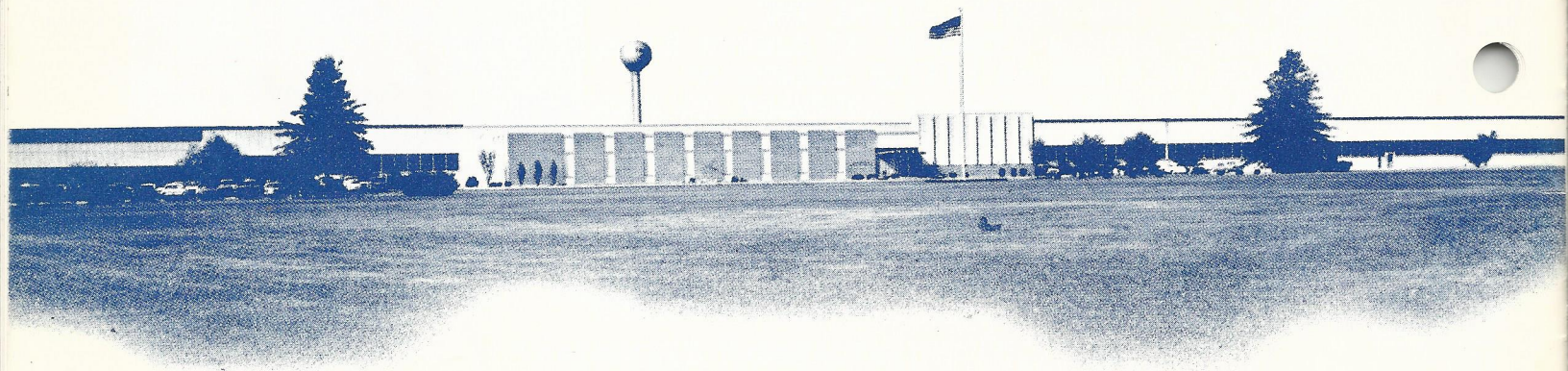
Assembler

Inspector

7. Final Inspection

Inspector

Date



Fairfield Manufacturing Company, Inc.

US 52 South, Lafayette, IN 47903, U.S.A. 317/474-3474 Telex 27-9415
A **Rexnord** Subsidiary

Fairfield

THE
DRIVE
PEOPLE