

ONE WORD THAT MAKES PUMPING UNITS EVEN BETTER...



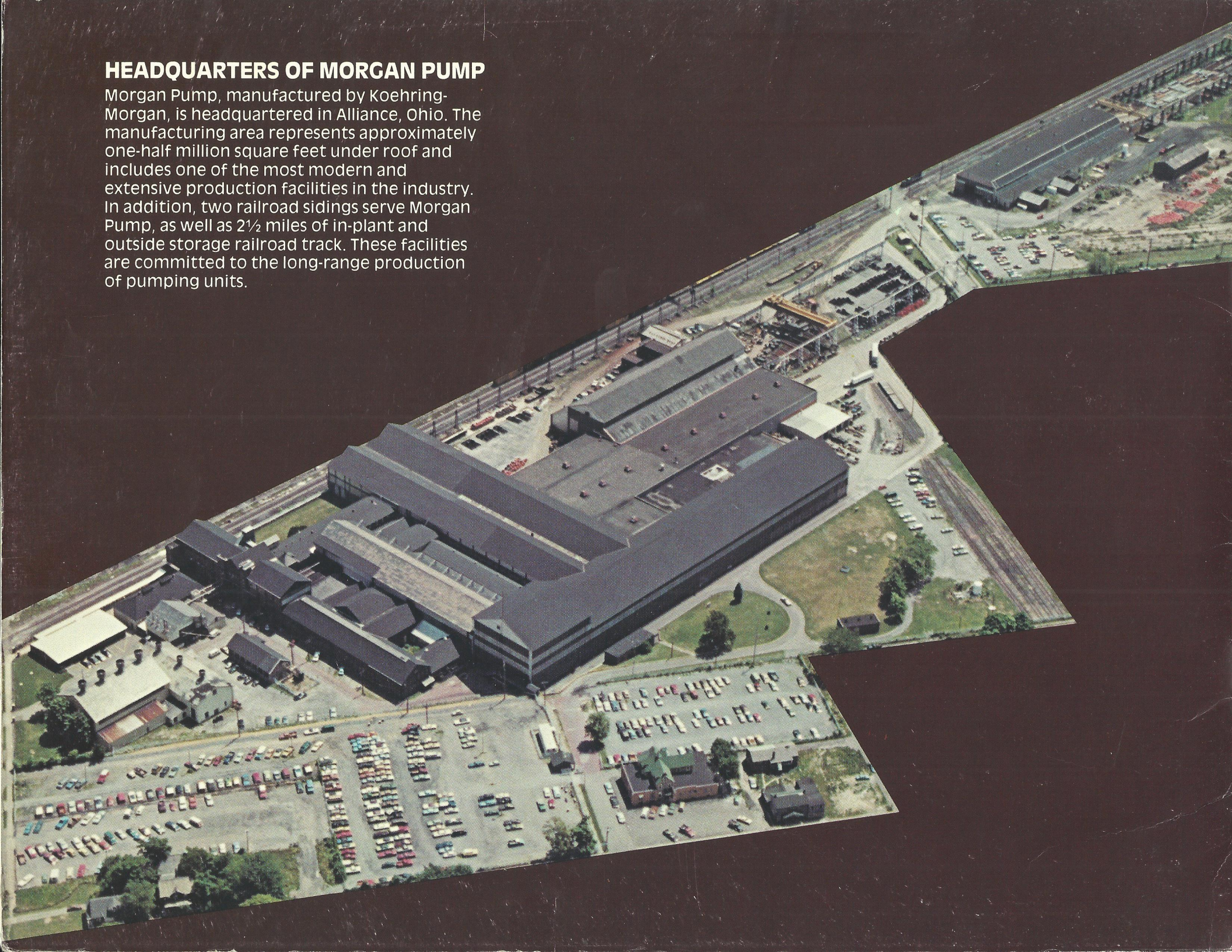
# MORGAN<sup>®</sup>

**MORGAN PUMP** *Manufactured by:*

 **KOEHRING  
MORGAN**  
**AMCA  
INTERNATIONAL**  
A Unit of AMCA INTERNATIONAL CORPORATION

## HEADQUARTERS OF MORGAN PUMP

Morgan Pump, manufactured by Koehring-Morgan, is headquartered in Alliance, Ohio. The manufacturing area represents approximately one-half million square feet under roof and includes one of the most modern and extensive production facilities in the industry. In addition, two railroad sidings serve Morgan Pump, as well as 2½ miles of in-plant and outside storage railroad track. These facilities are committed to the long-range production of pumping units.



## **MORGAN<sup>®</sup> PUMP**

### **BUILT FOR YOU IN THE GREAT MORGAN ENGINEERING TRADITION . . .**

A perfect combination — MORGAN pumping units now built for you in the great MORGAN Engineering tradition. With over 110 years experience, MORGAN Engineering has committed its enormous plant facilities, engineering, sophisticated equipment, manufacturing skills, and financial strength to produce, warrant, and service the finest pumping units in the oil patch. An enormous capital investment, initially involving tens-of-millions of dollars, gives evidence of MORGAN'S total commitment to the oil and petrochemical industries.

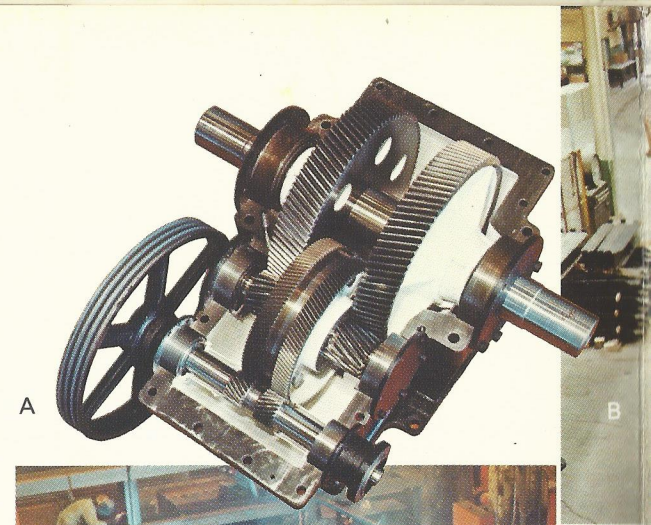
The same dedication that has made the MORGAN name a standard of excellence in equipment for primary metal production, heavy transportation, ship building, power plants, and foundries has been applied to the manufacturing of MORGAN pumping units.

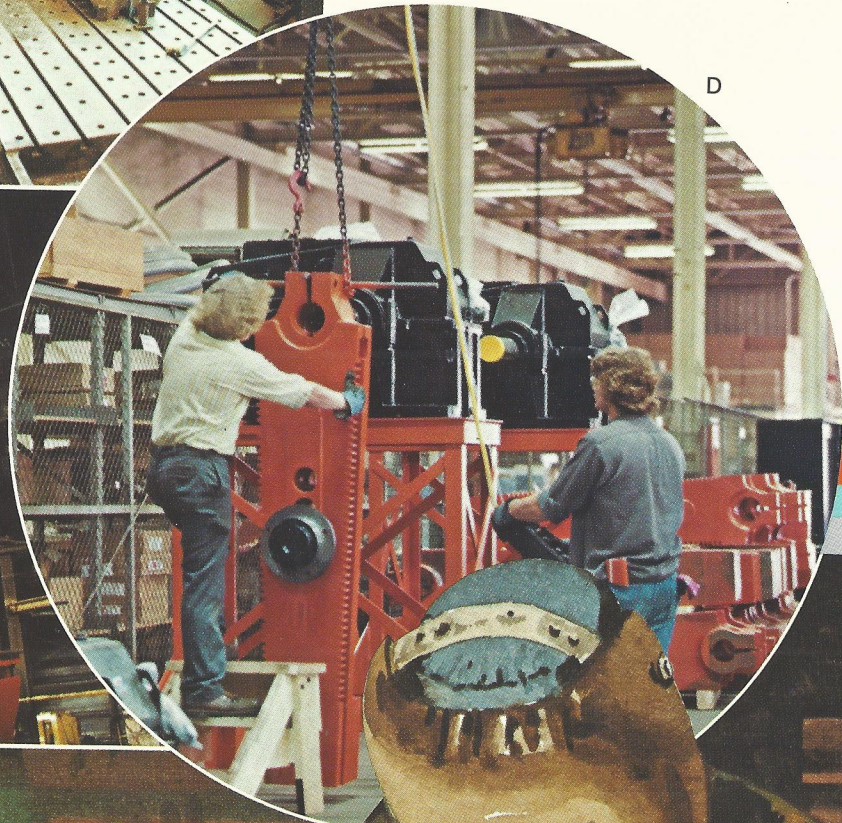
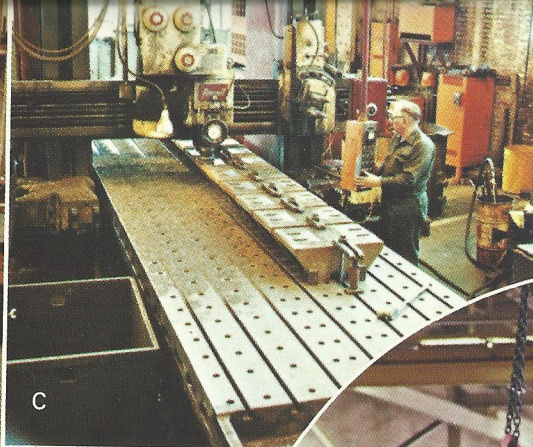


## MANUFACTURING FACILITIES AND PEOPLE . . . GEARED TO PRODUCE THE FINEST PUMPING UNITS IN THE OIL PATCH

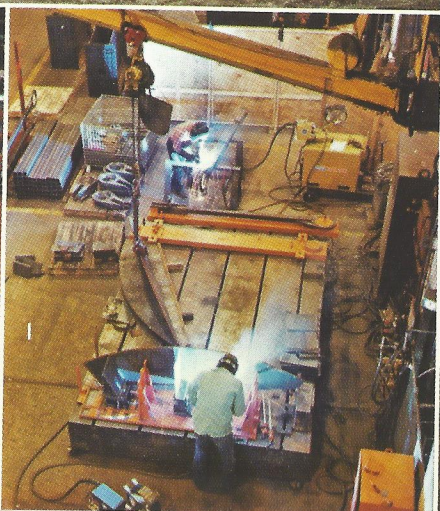
When affiliates MORGAN Engineering and Dominion Bridge of Canada joined forces, one of the most comprehensive lines of pumping units was established to supply North America and the international oil industry with a superior line of performance-proven pumping units. Dominion Bridge, founded in 1882, has a long and distinguished record of service to the oil industry of Canada through the supply of pumping units, pressure vessels, pipe fabrication, and field construction services. Through this union, MORGAN has entered the American market with expertise from Dominion Bridge, and adds its own reputation for manufacturing and engineering excellence. No where in the world will you find a comparable amount of experience and skill in working with heavy parts and machinery. Our commitment to unequalled craftsmanship is recognized throughout the world.

MORGAN Pump represents a total dedication throughout the '80's to utilize our vast manufacturing capacities and unique engineering excellence for the production of the finest pumping units in the oil patch.





- A. MORGAN double reduction — double helical gearbox.
- B. Unit in final assembly.
- C. Bearing housings being milled.
- D. Assembly operation: crank arm and gearbox.
- E. 160 wide base in fabrication.
- F. 160-200-74 on test.
- G. 160-200-74 during life test.
- H. Bearing housings being assembled.
- I. Horsehead and pitman arms being fabricated.



# MORGAN PUMP . . . WORKHORSE OF THE OIL PATCH

Keeping pace, as well as setting the pace, with changing industrial technology is just one reason why MORGAN is recognized as a leader and innovator in engineering and manufacturing know-how.

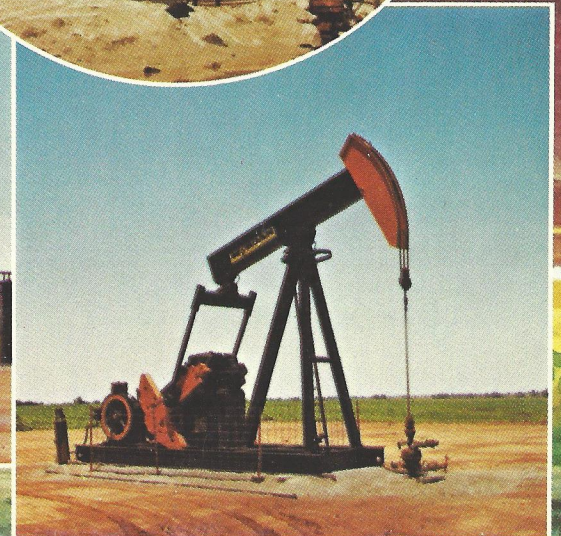
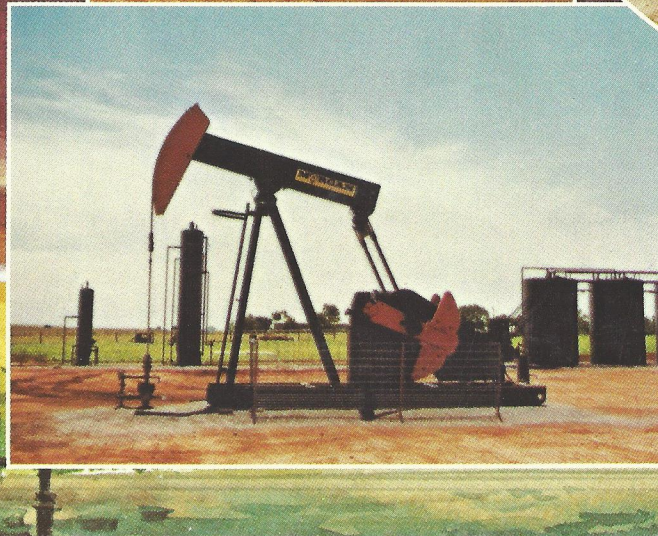
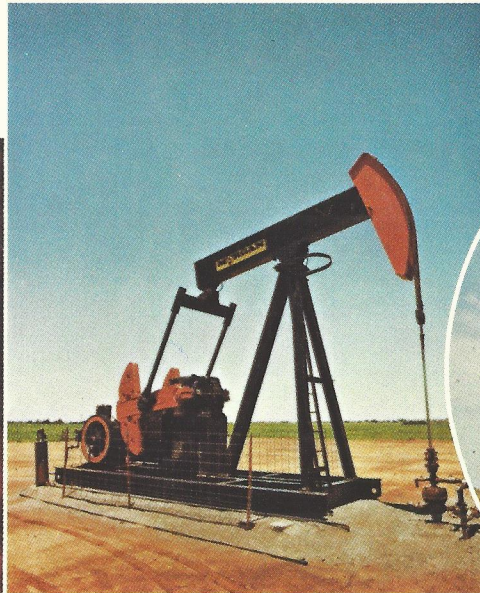
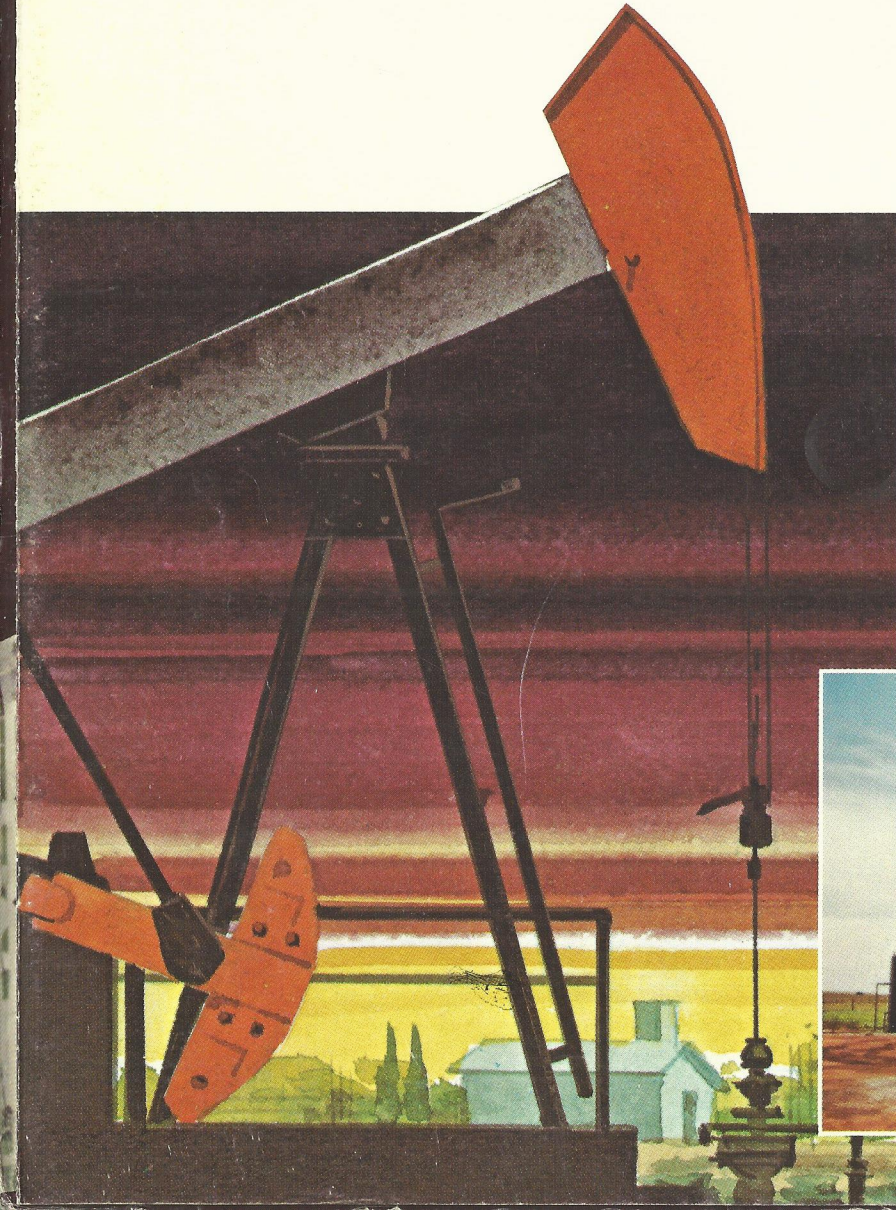
MORGAN Pump exemplifies this tradition. Our pumping units feature MORGAN designed gear boxes with double helical design, anti-friction bearings for increased drive efficiency, forge-steel shafting for

strength and long wear, and a self contained lubrication system using gear wipers. The equalizer beam is supported at the tail end of the walking beam through self-aligning spherical roller bearings. MORGAN tail bearings will

align themselves while in motion to equalize loads.

A MORGAN Pump engineering team will work with your staff to custom design a pumping unit that will meet your specific lifting needs.

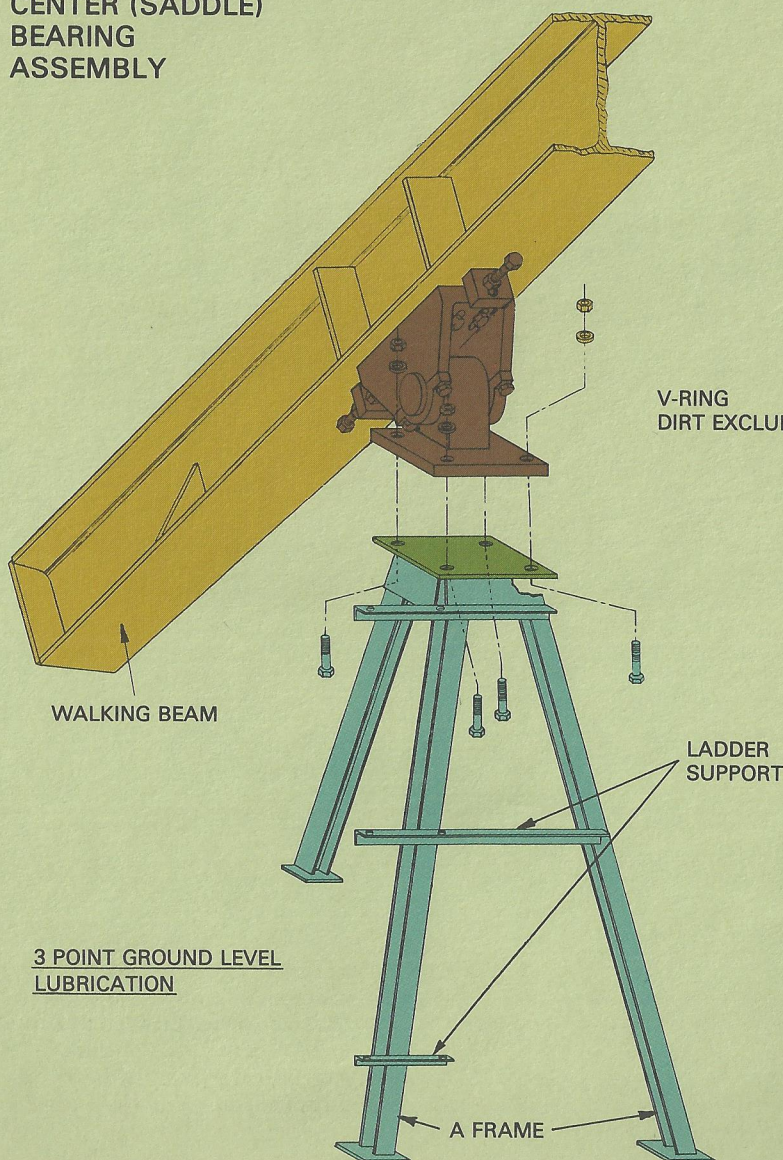
Discover MORGAN Pump . . . workhorse of the oil patch.



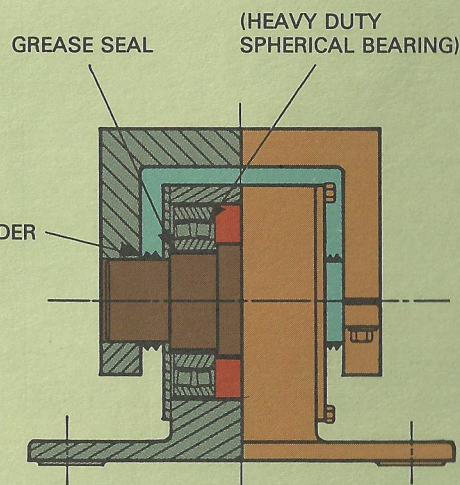
# OVER 110 YEARS OF ENGINEERING & MANUFACTURING KNOW-HOW

For over 110 years, MORGAN has been called upon to build the largest and most exacting equipment in industrial history. Throughout the world, we have been known as the "giant builder" for the steel industry . . .

## CENTER (SADDLE) BEARING ASSEMBLY



## ASSEMBLY CENTER BEARING



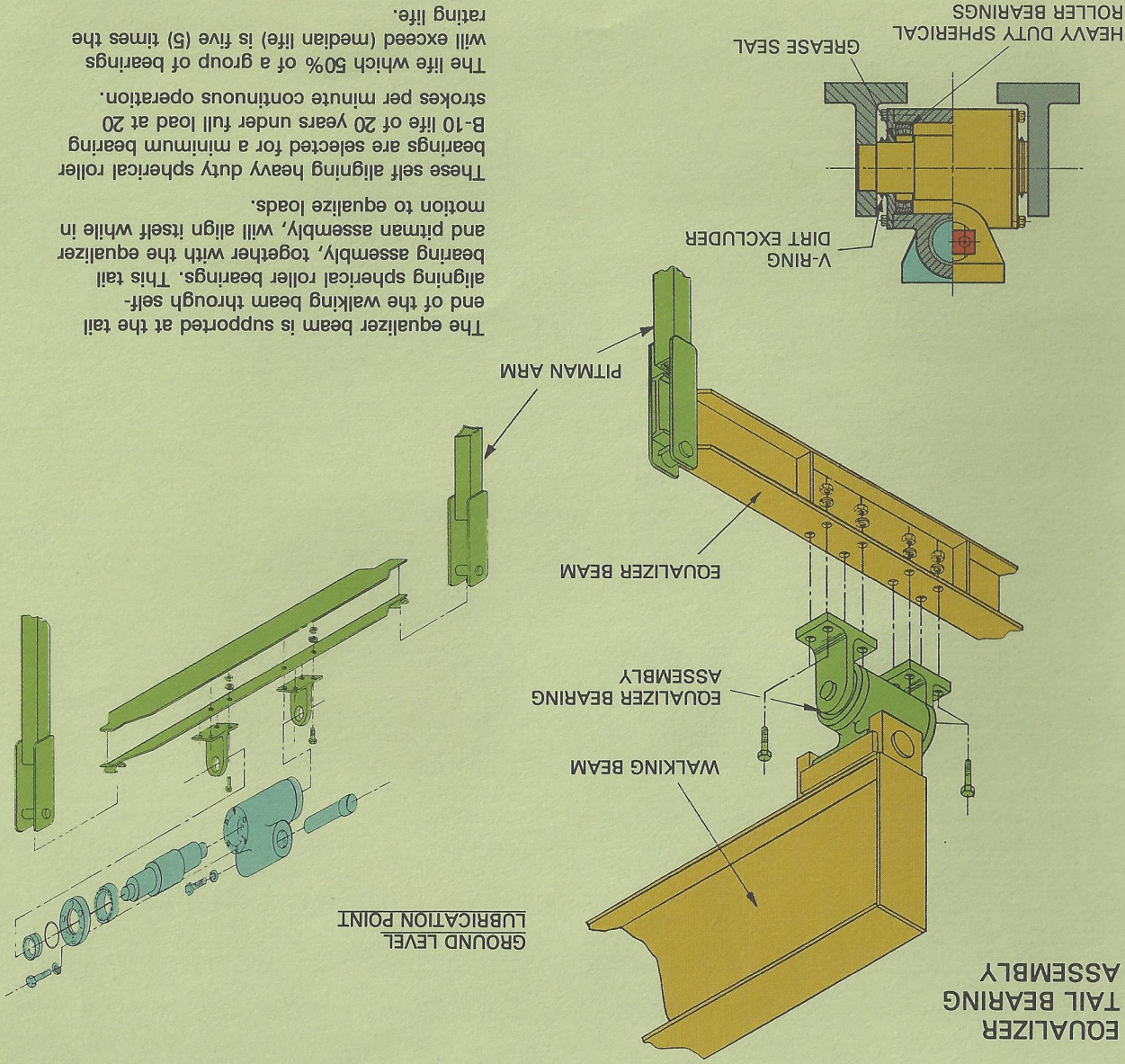
The walking beam is attached to the A frame through a center bearing using two (2) heavy duty spherical bearings spread apart for stability.

The bearings are selected for a minimum bearing B-10 life of 20 years under full load at 20 strokes per minute continuous operation.

The life which 50% of a group of bearings will exceed (median life) is five (5) times the rating life.

# A NATURAL EXTENSION OF MORGAN'S EXPERTISE IN WORKING WITH HEAVY EQUIPMENT FOR OVER 110 YEARS

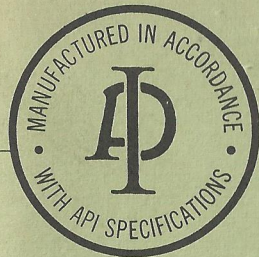
We believe MORGAN'S long experience in engineering and manufacturing big, heavy parts and products to incredibly close tolerances provides us with the know how to produce superior pumping units. It is a natural extension.



The equalizer beam is supported at the tail end of the walking beam through self-aligning spherical roller bearings. This tail bearing assembly, together with the equalizer and pitman assembly, will align itself while in motion to equalize loads.

These self aligning heavy duty spherical roller bearings are selected for a minimum bearing B-10 life of 20 years under full load at 20 strokes per minute continuous operation. The life which 50% of a group of bearings will exceed (median life) is five (5) times the rating life.



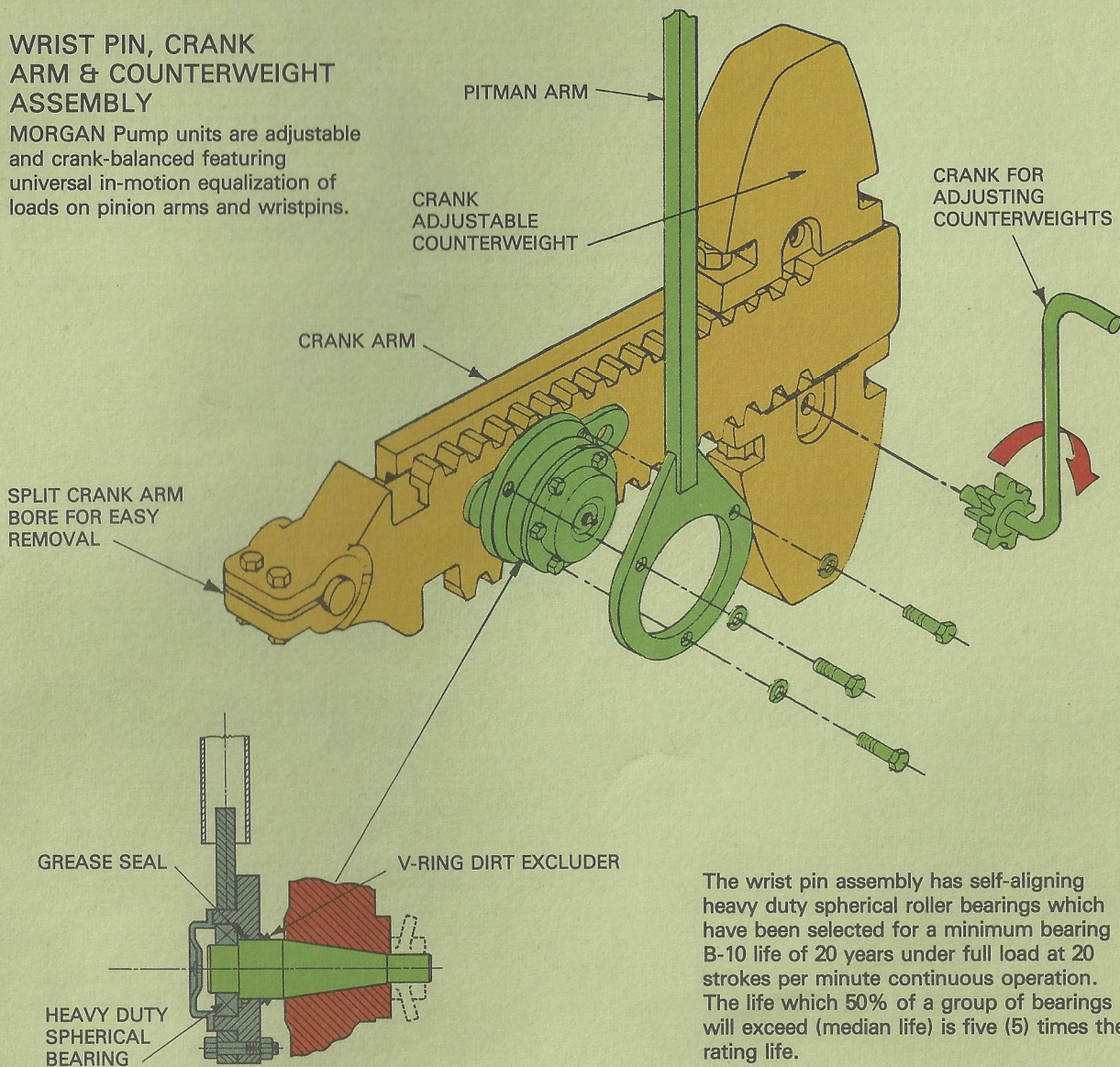


## NO OTHER PUMPING UNIT MEASURES UP

MORGAN'S quality assurance programs, engineering expertise, and manufacturing capabilities meet the rigorous and stringent demands of nuclear utility applications. Accordingly, all MORGAN pumping units meet the specifications of API.

### WRIST PIN, CRANK ARM & COUNTERWEIGHT ASSEMBLY

MORGAN Pump units are adjustable and crank-balanced featuring universal in-motion equalization of loads on pinion arms and wristpins.



The wrist pin assembly has self-aligning heavy duty spherical roller bearings which have been selected for a minimum bearing B-10 life of 20 years under full load at 20 strokes per minute continuous operation. The life which 50% of a group of bearings will exceed (median life) is five (5) times the rating life.

# SCHEMATIC OF MORGAN GEARBOX

## HARDNESS AND HORSEPOWER RATINGS SELECTED FROM THE API STANDARDS

The first and second shafts are mounted in spherical roller anti-friction bearings mounted to allow the gearing to "train" in line behind the output gears.

The output shaft is held rigidly in place by tapered roller bearings which are installed with a slight pre-load to prevent shaft oscillations or movement and reduce the bearing noise level.

All shaft openings are sealed with dual lip seals.

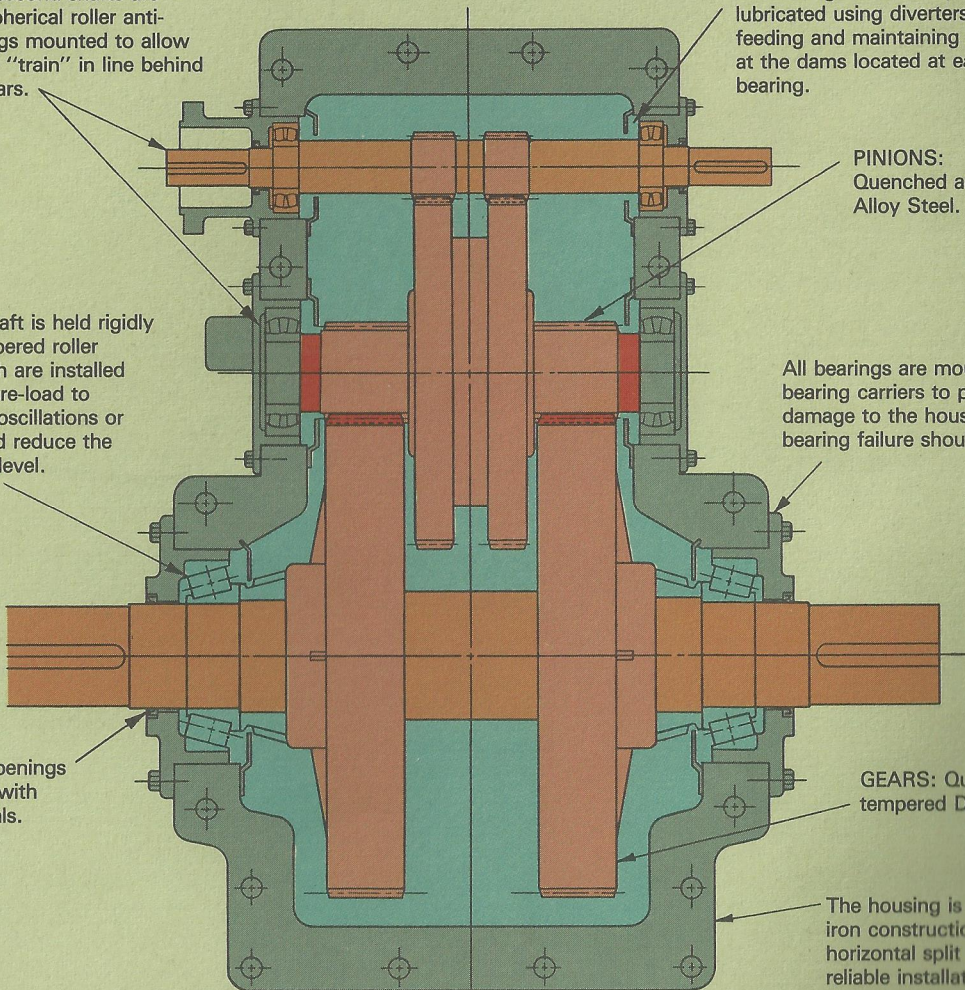
All bearings to be oil splash lubricated using diverters for feeding and maintaining oil level at the dams located at each bearing.

PINIONS:  
Quenched and tempered  
Alloy Steel.

All bearings are mounted in bearing carriers to prevent damage to the housing if a bearing failure should ever occur.

GEARS: Quenched and  
tempered Ductile Iron.

The housing is of heavy cast iron construction with a horizontal split for easy and reliable installation of gears.



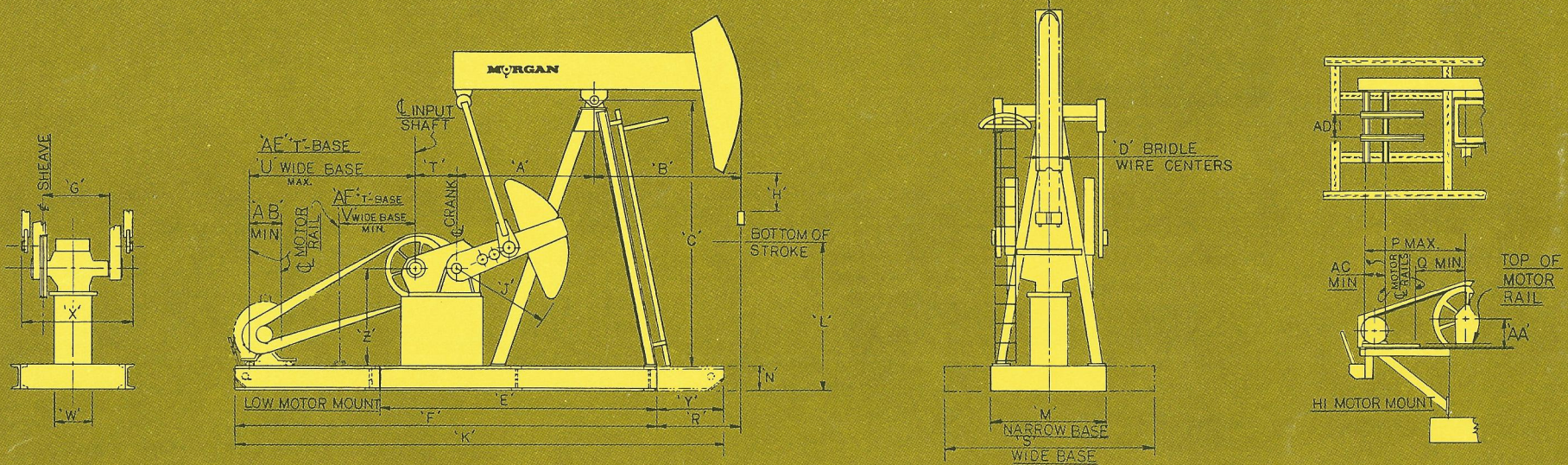
Double helical gear design allows for the use of modern gear hobbing machines for generated gearing which gives the quality level of a helical gear and eliminates the thrust loads as do the herringbone gears. Not only does the double helical design combine the best features of the other two designs, but additionally creates a balanced load on the gear box shafting and bearings.

DOUBLE REDUCTION GEAR BOX  
WITH GEAR RATIOS AS FOLLOWS:

#114	29.7:1	#456	29.78:1
#160	30.3:1	#640	30.0:1 (approx.)
#228	29.8:1	#912	30.0:1 (approx.)
#320	29.2:1		

# DIMENSIONS OF MORGAN PUMPING UNITS

(See dimension chart in back flap)



## HOW TO ORDER MORGAN PUMPING UNITS (CONVENTIONAL)

### PUMPING UNIT SIZING

Fill in the space with your well conditions. Then mail or call the card information to MORGAN. We'll send you a computer predictive program like the one at right, showing loads and torques for the MORGAN PUMP. (Conventional Unit.)

Remember that this information is just a guideline based on experience in pumping unit selection and is intended for comparison purposes under identical well conditions.

MORGAN welcomes all comments or questions about our Pumping Unit. Write or call MORGAN PUMP 3000 Center, 3015 E. Skelly Dr., Tulsa, Oklahoma 74105 (918) 744-8206.

#### WELL CONDITIONS:

Fluid Level \_\_\_\_\_ Pump Setting Depth \_\_\_\_\_ inches

Rod String Size Or API Rod No. \_\_\_\_\_ inches

Tubing Size \_\_\_\_\_  anchored  unanchored

Pump Plunger Diameter \_\_\_\_\_ inches Type Prime Mover  Int. Comb.  Elec.

Total Fluid Production \_\_\_\_\_ Specific Gravity of Fluid \_\_\_\_\_  
(If Known)

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PHONE ( ) \_\_\_\_\_

PUMPING UNIT LOADING  
DATE 07/17/81

ENTER H = FLUID LEVEL (FEET)  
L = PUMP DEPTH (FEET)  
N = PUMPING SPEED (SPM)  
S = LENGTH OF STROKE (INCHES)  
D = PLUNGER DIAMETER (INCHES)  
G = SPECIFIC GRAVITY OF FLUID  
?

4800 4800 14 74 1.5 .9  
IS TUBING ANCHORED ENTER 1 FOR YES 2 FOR NO  
?

1  
IS ROD NUMBER OR ROD SIZE TO BE ENTERED ?  
ENTER 1 IF ROD NUMBER IS TO BE ENTERED OR 2 IF ROD SIZE  
?

1  
ENTER ROD NUMBER  
?

75  
WR = 1.664  
ER = 0.00000935  
FC = 1.189  
\*\*\*  
ET = 0.0  
WRFSKR = 0.429  
FD = 3304.799  
1/KR = 0.004488  
SKR = 16488.418  
N/NO = 0.274  
FD/SKR = 0.200  
N/NO' = 0.231  
SF/S = 0.91  
F1/SKR = 0.396  
F2/SKR = 0.171  
2T/S2KR = 0.316  
F3/SKR = 0.249  
TA = 1.027

PD = PUMP DISPLACEMENT BARRELS PER DAY	247.23
PPRL = PEAK POLISHED ROD LOAD	13603.74 LBS
MPLR = MINIMUM POLISHED ROD LOAD	4253.66 LBS
PT = PEAK CRANK TORQUE	198095.81 LB INCHES
PRHP = POLISHED ROD HORSEPOWER	10.76
CBE = COUNTERWEIGHT REQUIRED	9242.64 LBS
0.0 0.0 0.0 33.3 33.3 33.3 0.0	
WR = 1.664	
ER = 0.00000935	
***	

EXAMPLE OF COMPUTER DATA  
PER A.P.I. RP11L



## HOW TO READ SPECIFICATIONS

**228 - 246 - 86**

Peak Torque Rating In Thousands Of Inch Pounds	Polished Rod Load Rating In Hundreds Of Pounds	Stroke Length In Inches
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## INSTRUCTIONS FOR ORDERING SPARE PARTS

WHEN ORDERING SPARE PARTS, THE DESIGNATION AND SERIAL NUMBER OF THE UNIT MUST BE GIVEN. This information is necessary in addition to the description of the part, part number, etc. By supplying all the information available our personnel will have a cross check on the particular part wanted and errors in typing, etc. can be eliminated.

## MORGAN PUMP'S FIELD SERVICE ORGANIZATION

- Major Field Service Groups strategically located throughout the oil patch for fast response.
- Large, experienced in-house Field Service Engineering Organization to support our Field Service Group.
- Stocking Program for all components and assemblies for use as service repair or replacement parts.
- Standardization of components between units to simplify the stocking and servicing of parts.

## COMPUTERIZATION FOR STOCKING PARTS AND ASSISTANCE IN SIZING YOUR UNIT

In support of our Field Service Organization, MORGAN PUMP has a computer system which can pinpoint the unit serial number, size, location, parts used in manufacture, parts stocked for service usage, warranty date and service history. This system allows our service organization to locate a unit and react quickly to any service requests.

Also available from MORGAN PUMP is a computer system to assist in the sizing of the unit and the counter balance required.

## MORGAN PUMPING UNIT SIZES

- |               |               |
|---------------|---------------|
| • 114-143- 64 | • 320-213-120 |
| • 114-173- 64 | • 320-256-120 |
| • 114-143- 74 | • 320-256-144 |
| • 114-119- 86 | • 456-256-120 |
| • 160-174- 64 | • 456-305-120 |
| • 160-143- 74 | • 456-365-120 |
| • 160-173- 74 | • 456-256-144 |
| • 160-200- 74 | • 456-305-144 |
| • 160-173- 86 | • 456-305-168 |
| • 228-173- 74 | • 640-305-120 |
| • 228-200- 74 | • 640-256-144 |
| • 228-213- 86 | • 640-305-144 |
| • 228-246- 86 | • 640-365-144 |
| • 228-173-100 | • 640-305-168 |
| • 228-213-120 | • 640-305-192 |
| • 320-213- 86 | • 912-427-144 |
| • 320-256-100 | • 912-305-168 |
| • 320-305-100 | • 912-365-168 |

## SPECIFICATIONS

- Low or high prime
- "T" or wide base
- Gas or electric motor mounts
- 3 Pt. ground lube
- Rails
- Belt guards
- Gear boxes have double helical design, anti-friction bearings for increased drive efficiency, forge-steel shafting for strength and long wear, and a self contained lubrication system using gear wipers
- Wide range of effective counter balance ratings available using MORGAN supplied main and auxiliary counter weights
- Bearing carriers
- Anti-friction bearings throughout
- Interchangeable parts through standardization
- Special units available upon request
- Wrenches available
- All units shipped with oil in gear box

## SERVICE, DISTRIBUTION, AND SALES . . . WHEREVER YOU ARE, WE ARE

From Michigan to Mississippi, North Dakota to Texas, Ohio to California, you'll find MORGAN Pump service centers, distribution points, and sales offices. *Wherever there's an oil patch, there's MORGAN Pump.* We take pride in the most comprehensive service and distribution back-up in the industry. For over 110 years, service after the sale has been as important to MORGAN as the sale itself.



# MORGAN<sup>®</sup> PUMP

Manufactured by:

947 East Broadway, Alliance, OH 44601, U.S.A.  
Phone (216) 823-6130 Telex: 98-3456  
Cable: "MORGAN" Alliance



**KOEHRING  
MORGAN**

**AMCA  
INTERNATIONAL**

A Unit of AMCA INTERNATIONAL CORPORATION

## DISTRIBUTED BY:

MORGAN PUMP  
P.O. BOX 7581  
3000 Center  
3015 E. Skelly Drive  
Tulsa, Oklahoma 74105  
(918) 744-8206

918-272-1126

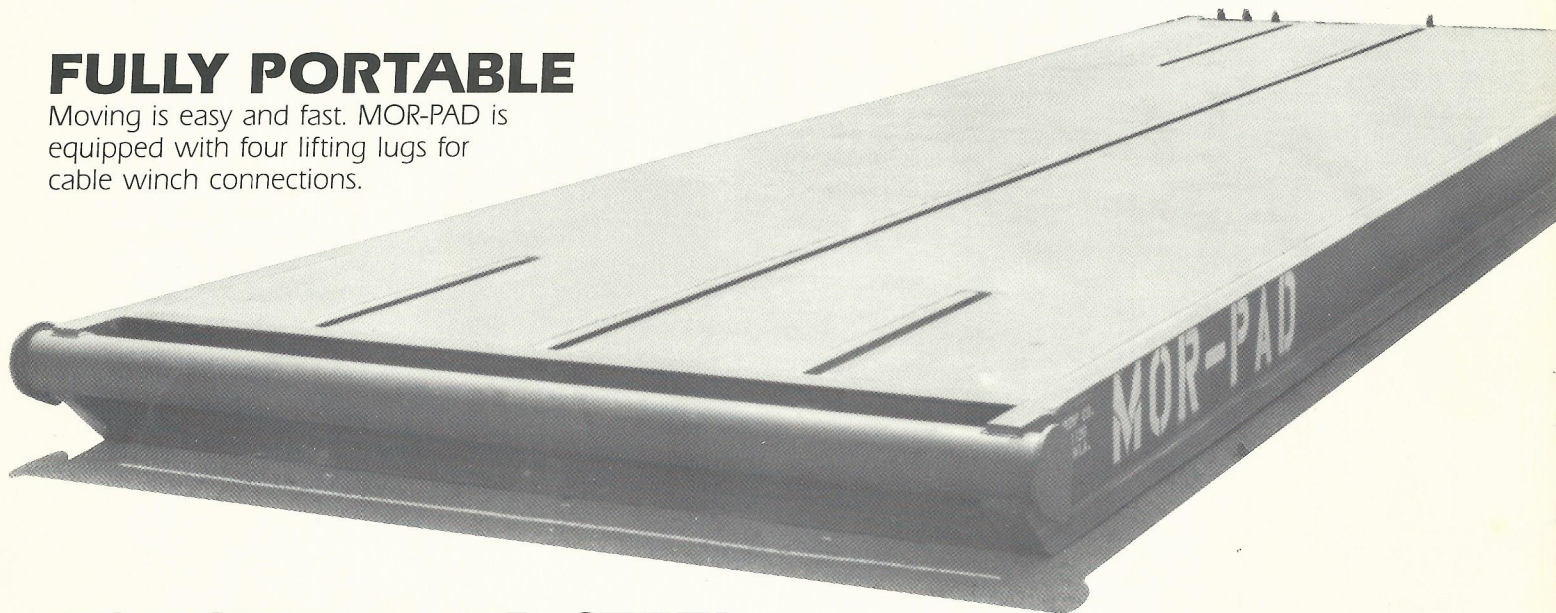
Darlene Brazier  
fax 918-272-7414

# MOR-PAD

## PUMPING UNIT BASES

### FULLY PORTABLE

Moving is easy and fast. MOR-PAD is equipped with four lifting lugs for cable winch connections.



### CONCRETE AND STEEL

Pad is made of steel reinforced concrete and surrounded by a steel channel frame for greater strength and long life. Concrete is fully cured a minimum of 28 days and has a compressive strength of up to 4,000 PSI.

### INCREASES LIFE OF PUMPING UNIT

MOR-PAD provides a solid foundation for structural base. It also insures the proper installation and placement of the tie-downs. This reduces the stress

in the pumping unit base by as much as 90%, as compared to a wider base. MOR-PAD also separates the prime mover vibrations from the unit structure.

### FEATURES:

#### EASY/FAST INSTALLATION

Winch on and off oil field truck using lifting lugs to preprepared level surface of chat or sand.

#### CHANNELED GROOVES

Built-in grooves allow tie-down of pump at center in front and back. Extra groove is for motor tie-down.

#### BUILT-IN VOLUME POT

A built-in pot handles the regulation of natural gas or propane for any gas engine.

#### UNIVERSAL APPLICATION

MOR-PAD will accommodate any wide base or tee-base pump, with a variety of sizes and load capacities. Tie-downs are included with all pads.

### FULL ONE YEAR WARRANTY

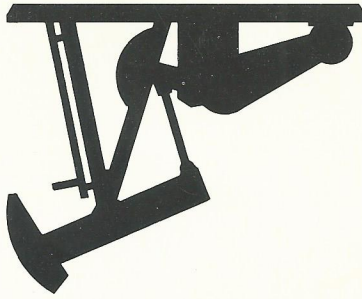
GET MOR-PAD FOR LESS MONEY

For complete information contact:

## MORGAN PUMP

PO. Box 1229 Tulsa, OK 74101  
(918) 272-1126 or outside Oklahoma call (800) 322-PUMP

**WORKHORSE OF THE OIL PATCH**



**MORGAN**

**WITH**

**GET THE UP**

*Quality*

## **MANUFACTURING**

Tulsa, Oklahoma  
5199 N. Mingo Rd., 74117  
(918) 272-1126

## **SALES & SERVICE**

- Tulsa, OK
- Enid, OK
- Denver, CO
- Dallas, TX
- Houston, TX
- Midland/Odessa, TX

## **WORKHORSE FIELD SERVICE**

- Field Service personnel strategically located throughout the oil patch.
- In-house Field Service Engineering Organization to support Field Service Group.
- Stocking program for all components and assemblies.
- Standardization of components among units, greatly simplifying stocking and servicing of parts.

**MORGAN**  
**PUMPING UNITS**

P.O. Box 1229  
Tulsa, Oklahoma 74101  
(918) 272-1126  
Outside Oklahoma (800) 322-7867



# WE DELIVER

## QUALITY

Every Morgan pumping unit contains the uniquely designed Morgan gearbox, the strongest in the industry. This "Ultimate Gearbox" has a split, double-helical design allowing for balanced loads on shafts and bearings. It features a patented positive lubrication system.

Other important features of Morgan pumping units are self-aligning spherical roller bearings on the wrist, center, and equalizer assemblies, forged alloy steel shafting for high strength, gear reducer operates bi-directionally with equal efficiency, plus others which also meet or exceed A.P.I. standards.

Morgan pumping units deliver the highest quality at competitive prices in all sizes.

For the name of your nearest representative, call 800-322-7867 or contact:

MORGAN PUMP COMPANY  
P.O. Box 1229  
Tulsa, OK 74101

"GET IT UP WITH MORGAN"

# MORGAN PUMPING UNITS