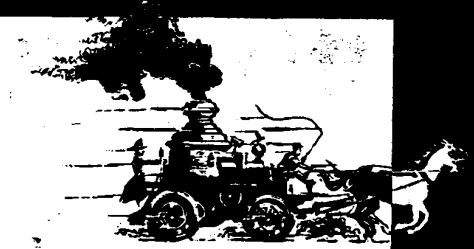
Correction copy

Monsanto

PYDRAUL AC



MONS 072302

fire-resistant lubricant for air compressors

created especially to

PROMOTE SAFETY FROM FLASH FIRES

REDUCE CARBON DEPOSITS

LOWER MAINTENANCE COSTS

MONS 072303

for air compressor systems. . . safer operation at less expense

PYDRAUL* AC

saves maintenance costs

A serious problem facing air compressor operators has been the high maintenance costs of cleaning valve deposits caused by petroleum lubricants. Further difficulties are high exhaust temperatures resulting from mal-function of valves and high cylinder temperatures that cause varnish deposits on cylinder rings and walls.

With years of experience in the synthetic lubricant field behind them, Monsanto researchers sought the answer to this plaguing problem. After testing many types of fluids, they found a fire-resistant lubricant that proved to be ideally suited for air compressors. They called it *Pydraul* AC.

Pydraul AC reduces exhaust valve and air compressor piping deposits to a minimum in all types of air compressors. Fewer carbon deposits on exhaust valves and in interstage equipment means a substantial savings for the operator who must pay the cost of cleaning as well as the cost of down time on the equipment. Lower maintenance cost alone usually justifies the use of *Pydraul* AC in air compressors.

removes explosion threat

There are nearly as many theories as there are men voicing opinions as to why fires and explosions happen in air compressor systems, but one point is generally agreed upon: petroleum oil lubricants are directly involved.

Apparently, oil mist and films gradually accumulate throughout the air system. These break down into combustible gases and carbonaceous residues that can ignite to produce an explosion or receiver fire, *or both.*

Pydraul AC has proven its ability to reduce these hazardous residues to an absolute minimum or *eliminate them completely!* By minimizing residues, *Pydraul* AC effectively reduces the threat of compressor fires and explosions. And *Pydraul* AC is fire-resistant. It provides *safe* operation, protecting not only the equipment, but the lives of workers as well.

MONS 072304

* PYDRAUL MONSANTO TRADEMARK REG U S PAT OFF

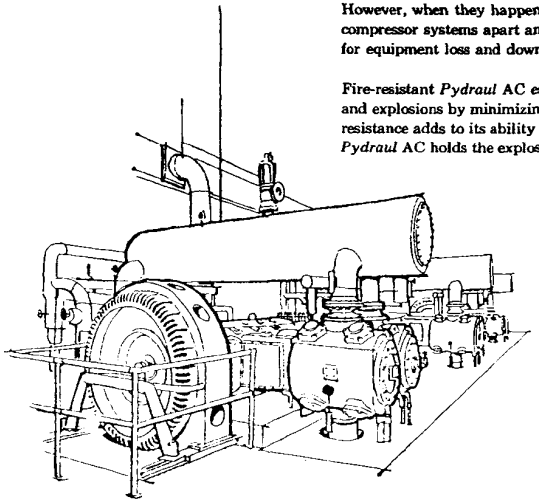
MONS 072305

COMPRESSOR EXPLOSIONS.... UNPREDICTABLE

The history of compressor explosions shows an unfortunate fact—they are entirely unpredictable. They can occur in small compressors operating at 50 psig. and in large installations operating at very high pressures. There is no pattern, no way to predict the safety of a particular compressor operation.

Such explosions and fires are considered infrequent by some people. In fact, an air compressor operator might go along for years without an accident. However, when they happen, these explosions and fires can blow entire compressor systems apart and even rip yard piping out of the ground. The cost for equipment loss and down time from these accidents can be staggering.

Fire-resistant *Pydraul* AC essentially eliminates the *basic cause* for most fires and explosions by minimizing the carbon deposits. Its superior oxidation resistance adds to its ability to reduce explosions: by resisting burning in air, *Pydraul* AC holds the explosion threat to a minimum.



PYDRAUL AC

GIVES YOU SAFETY AND EFFICIENCY, TOO

Compressor operators have kept a close watch on the development of *Pydraul* AC, seeking the answer to one paramount question: "How well does *Pydraul* AC lubricate?" With lubricating qualities proven equivalent to those of the highest grade petroleum oil, *Pydraul* AC has demonstrated its operating efficiency in air compressors of almost every conceivable type.

The statement of a lubricating engineer quoted below typifies its reception as a lubricant. The compressor was a Cooper-Bessemer JM-5 located in a large Midwestern plant.

"Lubricating properties of Pydraul AC have been very satisfactory. Wear measurements on Molypak rings taken approximately five months later indicate 0.003" wear. This is normal and considered very good. No corrosion of cylinder liners, valves and piping has been experienced, and service is very satisfactory."

— Lubricating Engineer

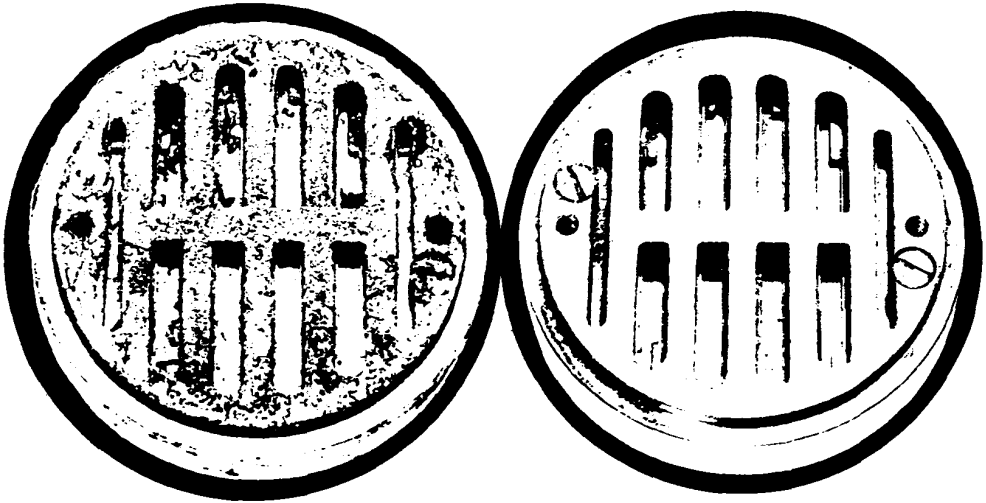
MONS 072306



MONS 072307

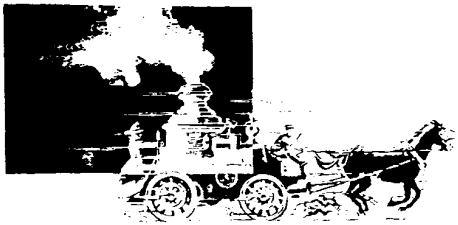
[illegible] OF INDUSTRIAL AIR COMPRESSOR VALVE DEPOSITS FROM TWO LUBRICANTS

Compressor Data: 142 CFM, 6" LP Bore
5" HP Bore, 5" Stroke, 870 RPM, 100 PSI Air



500 HOURS ON PREMIUM PETROLEUM OIL

500 HOURS ON HYDRAULIC



PYDRAUL AC *REDUCES CARBON DEPOSITS*

The photos on the opposite page compare exhaust valve deposits formed during the 500-hour operation on two lubricants: one, a premium grade petroleum oil, and the other, *Pydraul* AC. Deposits formed from the 500-hour operation on petroleum oil were removed before the valve began operating on *Pydraul* AC so the valve was perfectly clean before each operation.

A glance at the photo on the left shows that a considerable amount of carbon formed in the normal 500-hour take-down period for petroleum oil. The photo on the right shows the great improvement when the valve operated 500 hours on *Pydraul* AC. In this particular case, the compressor operator expects to get 7500 to 10,000 hours of service from *Pydraul* AC without shutting down - a 15- to 20-fold increase of operating time without a shut-down. That's a substantial saving of time and money due to *Pydraul* AC.

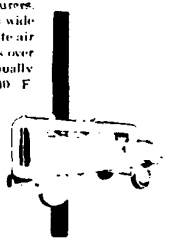
MONS 072308

MONS 072309

PYDRAUL AC *IS CURRENTLY IN USE AS A LUBRICANT IN AIR COMPRESSORS MADE BY THESE MANUFACTURERS*

American Messer Corporation
Bury Compressor Company
Chicago Pneumatic Tool Company
Clark Brothers Company
Cooper-Bessemer Corporation
De Laval Steam Turbine Company
Fuller Company
Gardner-Denver Company
Ingersoll-Rand Company
Joy Manufacturing Company
Norwalk Company, Inc.
Schramm, Inc.
Worthington Corporation

Pydraul AC has been used as an air compressor lubricant for periods up to five years and is now successfully lubricating hundreds of compressors of all types and sizes produced by all of the major compressor manufacturers. Dependable performance is the reason for its wide acceptance. *Pydraul* AC is being used to lubricate air cylinders in a number of compressors at pressures over 4500 psig. Many compressors have operated continually with exhaust air temperatures of 340° F



Extensive field experience has proven that the required lubrication rate with *Pydraul* AC closely approximates that of petroleum oils. When installing new equipment, it is well to start with an increased lubricant feed rate and reduce by successive increments. Inspection of cylinder walls and valves indicates the proper degree of wetting.

On installations converted from petroleum oil to *Pydraul* AC, the same feed rate as for the petroleum fluid should be adequate.

PYDRAUL AC

HAS NORMAL USE RATE

MONS 02310

MONS 072311

CONVERTING TO **PYDRAUL AC** IS EASY

The conversion of air compressor systems from petroleum lubricants to fire- and explosion-resistant *Pydraul AC* is simple, but one procedure is vitally important to insure smooth, efficient operation with *Pydraul AC*. Exhaust valves and interstage equipment should be *thoroughly cleaned before installation*, because *Pydraul AC* will loosen carbonaceous deposits, which may cause unnecessary maintenance down-time and production loss. Once the valves have been thoroughly cleaned of harmful carbon deposits, *Pydraul AC keeps them clean*--lets you run longer between maintenance shutdowns.

standard check for compressors

plastic separator bowls

Not all plastic separator bowls are suitable for *Pydraul* AC service because certain plastics are "crazed" or softened when exposed to it. Though separator bowls can be molded of plastics that are totally resistant, for the present it is safest to use glass, brass or steel bowls. If there is a question as to the resistance of a particular plastic, Monsanto will be happy to advise if the material is suitable.

diaphragm valves

Pydraul AC has a softening effect on the "Neoprene" or Buna N rubber diaphragms that are normally used for petroleum oil service. These rubbers should be replaced with butyl rubber material which is resistant to *Pydraul* AC. Butyl diaphragm sheeting is available from normal sources of supply.

All diaphragms in unloading valves or downstream control valves should be replaced at the time of changeover. Diaphragms in valving downstream from separator systems or drying systems need not be replaced at changeover time, but should be changed on a preventive maintenance schedule as soon as practicable after operation on *Pydraul* AC is begun.

special check for splash-lubricated compressors

crankcase paint

Since the paint used on crankcase interiors of some compressors will in most cases be softened and eventually removed by *Pydraul* AC, the paint should be removed. While the paint particles might pass through the lubricant pump, they could conceivably block the lubricant passages. Therefore, removing this paint is good practice. Standard paint solvents are adequate for removing the paint.

special check for force-feed lubricators

sight-glass fluid

If a separate force-feed lubricator of the type normally filled with water and glycerine is used, one of two changes is necessary: either replace the sight-glass fluid with one heavier than *Pydraul* AC or insert a metal bobber in the sight-glass. *Pydraul* AC is heavier than water or glycerine and will not rise through these standard sight-glass liquids. "Fluorochemical 101," a clear liquid supplied by the Minnesota Mining and Manufacturing Company, has a higher density than *Pydraul* AC and is a completely satisfactory replacement.

metal bobbers

The alternate to using "Fluorochemical 101" is to modify the sight-glass lubricator by inserting a simple metal bobber. The bobber is installed by draining the sight-glass liquid, removing the guide wire and inserting the bobber. Operation of the lubricator is then indicated by movement of the bobber with each stroke of the pump plunger instead of counting the drops as with guide wires. Bobbers are available for either McCord or Manzell lubricators as McCord part number A25849 or Manzell part number 82-1021-B. Modification of the Madison-Kipp lubricator requires replacement of the entire sight-glass with their number C-CV-300 oil feed indicator.

vacuum-sight lubricators

Vacuum-sight lubricators require no modification for *Pydraul* AC usage.

MONS 072312

MONS 072313

PYDRAUL AC *IS SAFE TO USE*

"*Pydraul* AC has an extremely low order of oral toxicity to experimental animals. This, together with experimental data which shows that rats survived a 6-hour exposure to an atmosphere saturated with *Pydraul* AC vapors, attests to its safety for use in air compressor systems.

The material is irritating to the eyes and can cause smarting and burning, but no permanent damage has resulted."

. . . . . *Monsanto Medical Department*

TYPICAL PROPERTIES

Viscosity, (SUS)	
50° F.	15,000
75° F.	1,650
100° F.	410
130° F.	127
210° F.	43
Pour point, ° F.	20
Neutralization number	0.15 maximum
Specific gravity, 60°/60° F.	1.35
Auto-igniting temperature	1,100° F.
Solubility of water in *Pydraul* AC	
75° F.	0.1 per cent
210° F.	0.4 per cent
Solubility of *Pydraul* AC in water	Negligible

For applications requiring significantly different properties, such as intermittent operation of a portable compressor in areas of low ambient temperature, a fluid similar to Pydraul AC can be provided. Contact Monsanto's Functional Fluids Department for details.

Shipping Information

Classification, U.S.A.	Chemicals, NOIBN
Regulations	None
Standard Containers	55-gallon, nonreturnable, black iron drums, 610 lbs. net. 5-gallon drums, 55 lbs. net

MONS 072314

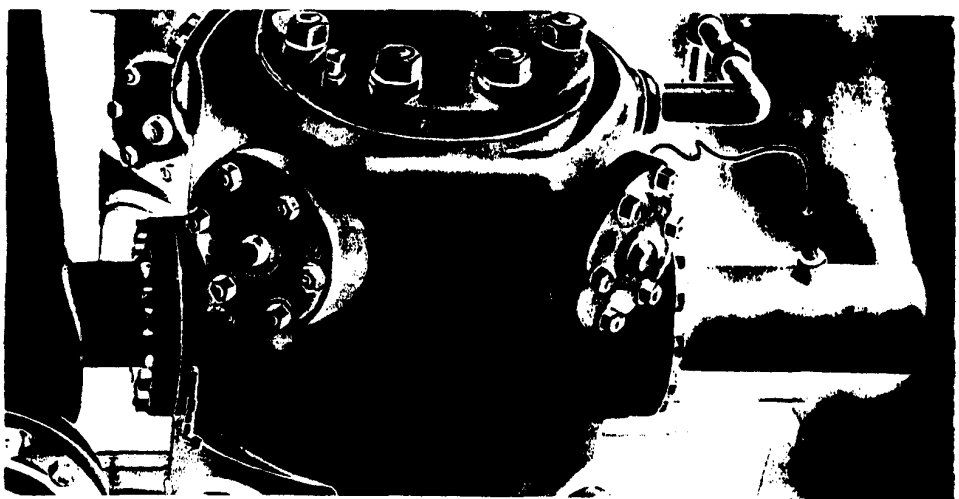
TO ORDER **PYDRAUL AC** CONTACT THE SALES OFFICE NEAREST YOU

For samples or additional information, write Monsanto Chemical Company, Organic Chemicals Division, Functional Fluids Sales, P. O. Box 478, St. Louis 1, Mo.

MONS 072315

AKRON	920 BROWN STREET, AKRON 11, OHIO
ATLANTA	1401 PEACHTREE STREET NE., ATLANTA 5, GA.
BOSTON	EVERETT STATION, BOSTON 49, MASS.
CHICAGO	520 N. MICHIGAN AVENUE, CHICAGO 11, ILL.
CINCINNATI	2330 VICTORY PARKWAY, CINCINNATI 6, OHIO
CLEVELAND	427 HANNA BUILDING, CLEVELAND 15, OHIO
DETROIT	18230 GRAND RIVER AVE., DETROIT 23, MICH.
HOUSTON	904 CITY NATIONAL BANK BLDG., HOUSTON 2, TEXAS
LOS ANGELES	6670 E. FLOTILLA STREET, LOS ANGELES 22, CALIF.
MINNEAPOLIS	FOSHAY TOWER, ROOM 409, MINNEAPOLIS 2, MINN.
NEW YORK	445 PARK AVENUE, NEW YORK 22, N. Y.
SAN FRANCISCO	111 SUTTER STREET, SAN FRANCISCO 4, CALIF.
SEATTLE	911 WESTERN AVENUE, SEATTLE 4, WASH.
WILMINGTON	4335 GOV. PRINTZ BOULEVARD, WILMINGTON 99, DEL.
LONDON	MONSANTO CHEMICALS LTD.
MELBOURNE	MONSANTO CHEMICALS (AUSTRALIA) LTD.
MONTREAL **TORONTO** **VANCOUVER**	MONSANTO (CANADA) LTD.

Representatives in the Principal Cities of the World.



MONS 072316

MONS 0723117



monsanto chemical company st louis missouri