	~~PYDRAUL 60~~	~~PYDRAUL 150 B~~	~~PYDRAUL F 9A~~	~~PYDRAUL 625 A~~
FIRE RESISTANCE TESTS				
Factory Mutual Spray Test. Test fluid sprayed at 1000 psi through orifice, passing through flame of propane torch.	Pass	Pass	Pass	Pass
Factory Mutual Channel Iron Test. Test fluid sprayed at 1000 psi through orifice, onto hot channel iron at 1300°F.	Pass	Pass	Pass	Pass
Hot Manifold Test (Federal Test Method Std. 791). Test fluid dripped on at 1300°F.	Intermittent flashing and burning. Does not burn after leaving tube.	Intermittent flashing and burning. Little burning in pan below.	Does not flash or burn.	Does not flash or burn.
Factory Mutual Approval FM	Yes	Yes	Yes	Yes

Fire-resistance Advantages of Pydraul

Pydraul fluids protect hydraulic equipment and personnel with permanent fire protection. Pydraul fluids contain no water to evaporate and leave a flammable residue. During their millions of hours of machine use, Pydraul fluids have been accidentally sprayed over molten metal, through electrical arcs, into flames and sparks - without causing fire. Pydraul fluids have never caused or contributed to a hydraulic fire in any type of equipment. They pass all of the important ignition tests for fire-resistance.

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0107597

TOWOLDMON0022499

PYDRAUL FLUID	BUTYL	EPR	VITON	TEFLON	SILICONE	BUNA N	NEOPRENE	NATURAL RUBBER
60	R	R	U	S	S	U	U	U
F-9-A	R	R	R	R	R	U	U	U
150-A	R	R	R	R	R	U	U	U
625-A	R	R	R	R	R	U	U	U

NEW COPY (H)
SET SAME FACES
SAME FORMAT
AS OLD BOOK

SAME WEIGHT Rubs.

39R

See Style

10/26

8/93

0107598

For technical information phone your Monsanto representative or the nearest Monsanto sales office (listed on this page)

To place and order for Pydraul products from Monsanto Dial toll free 800-325-3850

[ ]

10 PT News Gothic
18 PICAS
Flush L&R

BILL KERR
ADVERTISING DESIGN
P.O. No. 71-187

0107599

TOWOLDMON0022501

In a more severe Vickers hydraulic pump test (V-105-C pump), the Pydraul fluids performed as well as commercial antiwear oils and proved far superior to premium R & O oil (rust and oxidation inhibited).

12 PT N/GOTHIC
30 PICAS

PYDRAUL 150-A
PYDRAUL F-9-A
PYDRAUL 625-A

8 PT NEWS GOTHIC BOLD
HELVETICA MED
WITH CUTTING SPACE.

Premium R & O Oil

Antiwear Oil
Pydraul 625-A
Pydraul F-9-A
Pydraul 150-A

NEWS GOTHIC BOLD.
8 PT HELVETICA MED
WITH CUTTING SPACE.

PYDRAUL 135-A
PYDRAUL 230-A
PYDRAUL 312-A
PYDRAUL 540-B

Antiwear Oil
Pydraul 540-B
Pydraul 135-A
Pydraul 312-A

BILL KERR
ADVERTISING DESIGN
P. O. NO. 11-186

0107600

TOWOLDMON0022502

PYDRAUL 625-A
PYDRAUL A-200-B
PYDRAUL F-9-A
PYDRAUL 150-A
PYDRAUL 60

8PT N/GOTHIC ~~HELVETICA~~ BOLD ~~[illegible]~~ WITH CUTTING SPACE.

PYDRAUL 540-B
PYDRAUL 312-A
PYDRAUL 230-A
PYDRAUL 135-A

Premium R & O Oil

~~Monsanto Company / Organic Division, Specialty Products / 800 North Lindbergh Blvd. /~~
~~St. Louis, Missouri~~
~~[illegible]~~

Monsanto Company / Organic Division, Specialty Products / 800 North Lindbergh Blvd. / St. Louis, Missou
63166

~~PZ-0474~~

10PT NEWS/GOTHIC ~~HELVETICA~~ ~~lite~~ One line

PZ-0471-IGI-LRA LITHO IN U.S.A.

6PT ~~HELVETICA~~ NEWS GOTHIC ~~lite~~

0107601

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2/69

0107602

2-2852-0469- LITHO IN U.S.A.

TOWOLDMON0022504

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Ballard Estate
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Chiyoda-ku
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Mitsubishi Monsanto Chemical Co.
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Chiyoda-ku
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4000 Dusseldorf 1

Representatives in principal cities of the world

4-69

OVER

TOWOLDMON0022505

SELECTOR 2

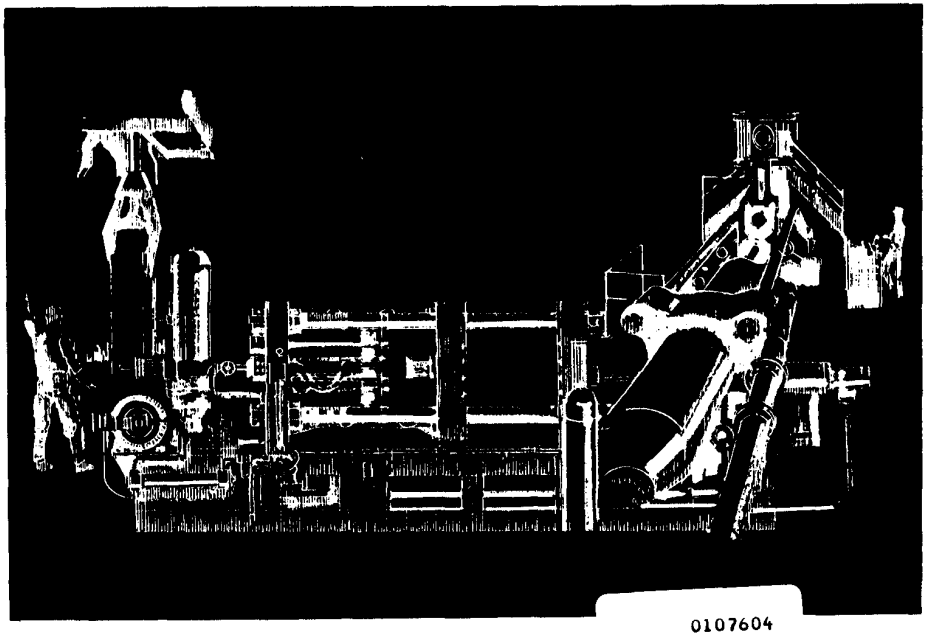
PYDRAUL®

Fire-Resistant Hydraulic Fluid

A guide to selecting the correct low-cost synthetic base Pydraul fluid for an hydraulic system. These fluids provide antiwear oil performance . . . plus safety . . . at the price of water glycols.

O/FF-11

Monsanto



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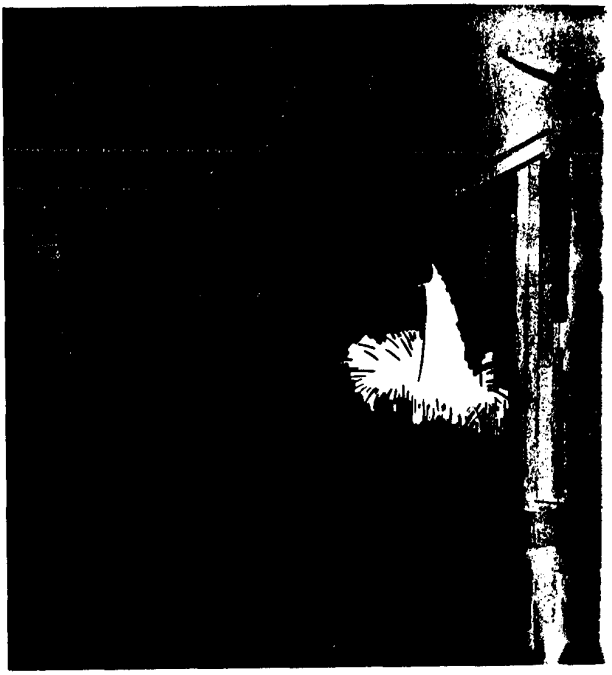

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TOWOLDMON0022507

PYDRAUL fluids

Development

Fire protection for industrial hydraulic operations began with Pydraul in 1951. Pydraul fluids have since provided industry with millions of machine hours of safe operation. Pydraul fluid has never caused a fire—not even when sprayed from broken high pressure hydraulic lines onto white-hot surfaces.

New ways are continuously being explored to improve the excellent performance records of Pydraul fluids. From the first Pydraul fluid, (Pydraul F-9) the family has grown to a dozen-plus specially tailored, fire-resistant safety fluids. Each answers a major but specific hydraulic fluid need for industrial use. In addition to guarding against fire, each Pydraul fluid lubricates as well as premium grade oil. Pydraul fluids have answered the need of virtually every industrial hydraulic operation, indoors and out—from the sub-zero, outdoor hydraulic lift operations for refineries and blast furnaces to the low-viscosity fluid demands of high-speed, precision machine tools.

Performance

Pydraul fluids offer a wide range of viscosities from which to select the proper range specified by the hydraulic equipment manufacturer. Whichever Pydraul fluid selected, each provides safety, premium lubricity, ease of maintenance, and freedom from corrosive action and foam. These Pydraul fluids have positive viscosity index values, and are shear stable . . . they will not undergo a mechanical change in viscosity.

INTRODUCTION OF LOW COST SERIES OF PYDRAUL SAFETY FLUIDS

Pydraul 312 was the first of Monsanto's new series of low cost high performance fire-resistant hydraulic fluids. Introduced to the market in 1965, the chemistry of Pydraul 312 was the latest innovation in synthetic safety hydraulic fluids. Pydraul 312 is now augmented with four other viscosity grade fluids which combine proved high performance with low cost.

Besides providing safe hydraulic operations, these Pydraul fluids offer lubrication equal to or even better than premium grade oils; freedom from corrosive action and foam; ease of maintenance; permanence—they don't "wear out".

These new lower cost Pydraul fluids are unique formulations of synthetic fluids blended with selected high viscosity low volatility petroleum fractions. The results are a series of fire-resistant hydraulic fluids which match or excel existing hydraulic fluids—including synthetics, premium grade petroleum oils, and water base fluids—but which sell in the price range of water-glycol fluids.

REDUCED FIRE INSURANCE RATES

Pydraul eliminates fire hazards from hydraulic operations, reduces fire threats to surrounding structure and equipment. Insurance premiums for plants using Pydraul are often lower than premiums for operations using petroleum oil.

SAFETY PROVED AND TESTED

Used in a wide variety of hazardous hydraulic applications since 1965, numerous line breaks have exposed these fluids to severe ignition sources: Results—no propagation of fire, no injuries. All fluids in this series (except Pydraul 90) have been tested by Underwriters' Laboratories and are listed as satisfactory for hazardous hydraulic operations.

LONGER PUMP LIFE

Machines which operate on water-based fluids frequently require pump repair or replacement as often as every two or three months. Machines which use Pydraul hydraulic fluids can operate on the same pump for several years. Pydraul hydraulic fluids give the same long pump life as the finest grade petroleum oil.

NO CORROSION PROBLEMS

Any metal hydraulic system component in contact with Pydraul will not rust. Pydraul hydraulic fluids do not lose anti-rust properties even after extended use.

MAXIMUM EQUIPMENT RESPONSE

Pydraul never produces excessive froth or foam during normal operations to interfere with hydraulic equipment response. Because Pydraul hydraulic fluids lubricate as well as premium petroleum oils, Pydraul permits equipment to operate at optimum response capability.

INSPECTION AND REPLACEMENT DOWN-TIME ARE VIRTUALLY ELIMINATED

Pydraul hydraulic fluids are designed to be permanent—they do not wear out. Normal "make-up" requirements are usually all that is needed for new Pydraul. Pydraul eliminates "drain and change" periods; it does not have to be inspected in your system from month to month—or replaced from year to year.

TOWOLDMON0022508

PYDRAUL® Selector Two

	PYDRAUL 90	PYDRAUL 135
PHYSICAL PROPERTIES Appearance	Blue-green Liquid	Blue-Green Liquid
Spec. Gravity 25°/25°C.	1.194 to 1.210	1.186 to 1.199
Neutralization No. (acidity) (mg KOH/gm) max.	0.50	0.40
Moisture (max.)	0.12%	0.10%
VISCOSITY Centistokes @ 100°F. 210°F. Saybolts as @ 100°F. measured: 210°F. "Absolute Saybolts" @ 100°F. (SSU x Density) 210°F.	17.4 to 19.0 cs 3.2 to 3.8 cs 90.3 SSU 37.9 SSU 109 SSU 45.6 SSU	27.5 to 30.5 cs 4.3 to 4.7 cs 140 SSU 41 SSU 167 SSU 48.8 SSU
Pour Point	−25°F.	−12°F.
Compressibility x 10^{-6} sq. in./lb.	2.74	2.69
Bulk Temperature Max. (fluid thermal stability)	200°F.	200°F.
Coefficient of Thermal Expansion per °F.	0.00048	0.00038
Specific Heat BTU/lb./°F. @ 77°F.	0.31	0.33
Thermal Conductivity BTU/hr./ft./°F.	0.067	0.067
Vapor Pressure mm Hg @ 200°F.	26.9	20.0
Bulk Modulus (Room Temp. 1000-6000 psi)	365,000	372,000
Rust Test ASTM D-665	No Rust—Pass	No Rust—Pass
Foam Test ASTM-892 (Sequence I, II, III)	Pass	Pass
Solubility in Water	Negligible	Negligible
Weight per gallon, lbs. @ 60°F. approx.	10.10	9.92
FIRE RESISTANCE TEST		
High Pressure Spray Test (AMS-3150C and Federal Test Method Std. 791) Test fluid sprayed at 1000 psi through orifice, passing through flame of oxyacetylene torch, 6000°F.	Intermittent flashing, but self-extinguishing.	Intermittent flashing, but self-extinguishing.
Low Pressure Spray Test (AMS-3150C). Test fluid sprayed at low pressure over ignited, oil-soaked rag to determine degree of increase in flame intensity.	Slight increase in flame intensity.	Slight increase in flame intensity.
Hot Manifold Test (Federal Test Method Std. 791). *Test fluid dripped on* tube at 1300°F.	Intermittent flashing, but does not propagate to pan below.	Intermittent flashing, but does not propagate to pan below.
Molten Metal Ignition Test. Test fluid exposed to the surface of aluminum alloy at 1200°F., to test for spontaneous ignition.	Does not ignite spontaneously. Flashes intermittently with ignition source.	Does not ignite spontaneously. Flashes intermittently with ignition source.
Fire-resistance Advantages of Pydraul Pydraul fluids protect hydraulic equipment and personnel with *permanent* fire protection. Pydraul fluids contain no water to evaporate and leave a flammable residue. During their many millions of machine hours of use, Pydraul fluids have been accidentally sprayed over molten metal, through electrical arcs, into flames and sparks—without causing fire. They pass all of the important ignition tests for fire-resistance.	Pydraul 90 developed as the low temperature, low viscosity member of the synthetic base Pydraul family of fluids. Minus 25°F. pour point means adequate pumpability as low as 10F°.	Pydraul 135 has found wide application in mobile equipment, steel and aluminum mill hydraulic systems requiring a lower viscosity fluid with high thermal stability. *Pydraul* 135 will provide excellent lubricity to vital system components at continuous temperatures up to 180°F. with no thermal degradation of the fluid. Pydraul 135 has proved successful in steam turbine hydraulic control systems. The gas turbine industry also has applications for Pydraul 135 to replace currently used synthetic fluids as the bearing and compressor lubricant in these vital units. Listed by Underwriters' Laboratories as satisfactory for hazardous hydraulic applications.

0107607

TOWOLDMON0022509

PYDRAUL 230	PYDRAUL 312	PYDRAUL 540
Blue-Green Liquid	Blue-Green Liquid	Blue-Green Liquid
1.150 to 1.180	1.104 to 1.120	1.160 to 1.200
0.30	0.30	0.40
0.10%	0.10%	0.08%
47 to 53 cs 5.3 to 5.9 cs 232 SSU 44.6 SSU 269 SSU 51.7 SSU	60 to 71 cs 6.9 to 8.1 cs 304 SSU 50.8 SSU 338 SSU 56.5 SSU	111 to 118 cs 8.2 to 8.9 cs 533 SSU 54.2 SSU 629 SSU 64.0 SSU
0°F.	−10°F.	0°F.
2.66	2.74	3.08
200°F.	200°F.	200°F.
0.00043	0.00036	0.00041
0.37	0.36	0.35
0.068	0.069	0.069
0.158	0.108	0.085
376,000	365,000	325,000
No Rust—Pass	No Rust—Pass	No Rust—Pass
Pass	Pass	Pass
Negligible	Negligible	Negligible
9.70	9.26	10.0
Intermittent flashing, but self-extinguishing.	Intermittent flashing, but self-extinguishing.	Intermittent flashing, but self-extinguishing.
Slight increase in flame intensity.	Slight increase in flame intensity.	Slight increase in flame intensity.
Intermittent flashing, but does not propagate to pan below.	Intermittent flashing, but does not propagate to pan below.	Intermittent flashing but does not propagate to pan below.
Does not ignite spontaneously. Flashes intermittently with ignition source.	Does not ignite spontaneously. Flashes intermittently with ignition source.	Does not ignite spontaneously. Flashes intermittently with ignition source.
Pydraul 230 was developed to provide a fluid with a 200 plus SSU viscosity for the many industrial hydraulic systems which specify a fluid in the 150 to 250 SSU range. Listed by Underwriters' Laboratories as satisfactory for hazardous hydraulic applications.	Pydraul 312 was the first of the low cost synthetic base Pydraul fluids. The unique formulation which combines these time proved safety qualities of synthetic base stocks with the excellent lubricity of high viscosity, low volatility petroleum fractions has proved a real break-through in fire-resistant hydraulic fluid technology. Pydraul 312 provides higher viscosity in the medium viscosity range. Its lower density makes it acceptable in a wide range of safety fluid applications. Listed by Underwriters' Laboratories as satisfactory for hazardous hydraulic applications.	Pydraul 540 was formulated initially for a large aluminum extrusion press. Eighteen months of satisfactory performance in this unit has proved it an excellent safety fluid and lubricant. Pydraul 540 is recommended for large forging and extrusion presses. Listed by Underwriters' Laboratories as satisfactory for hazardous hydraulic applications.

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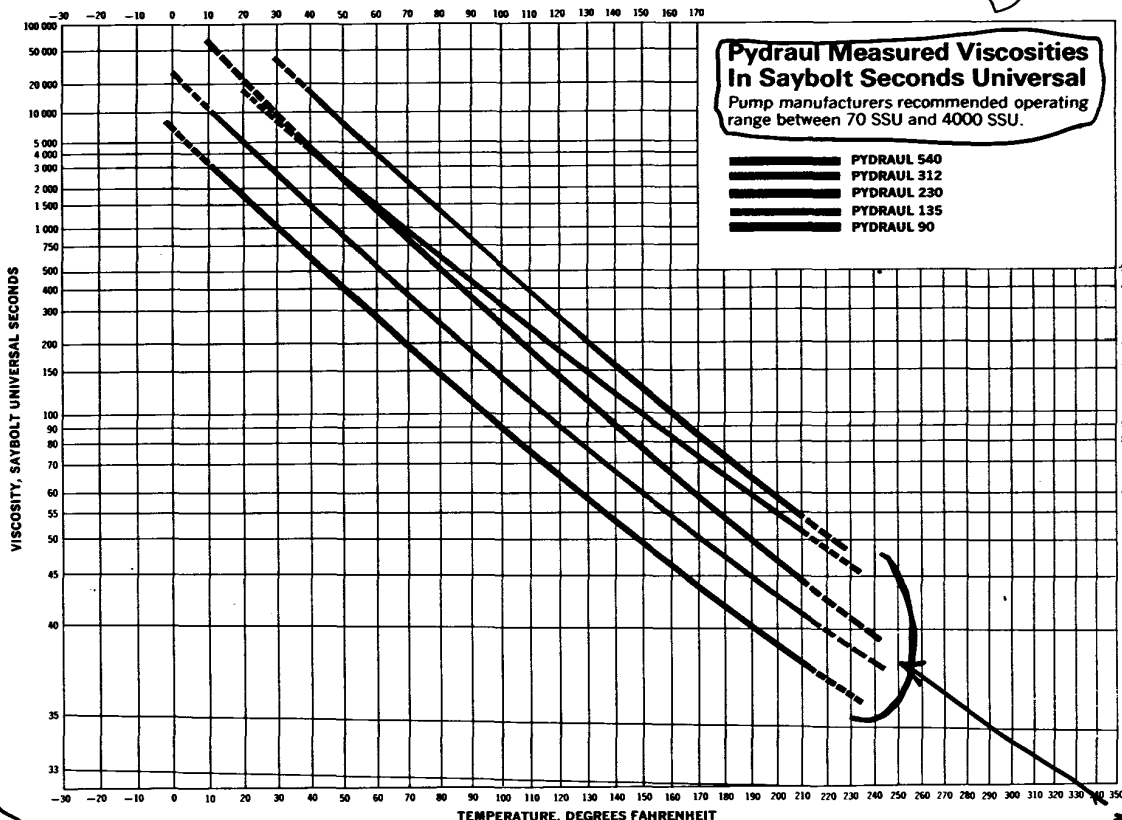
TOWOLDMON0022510



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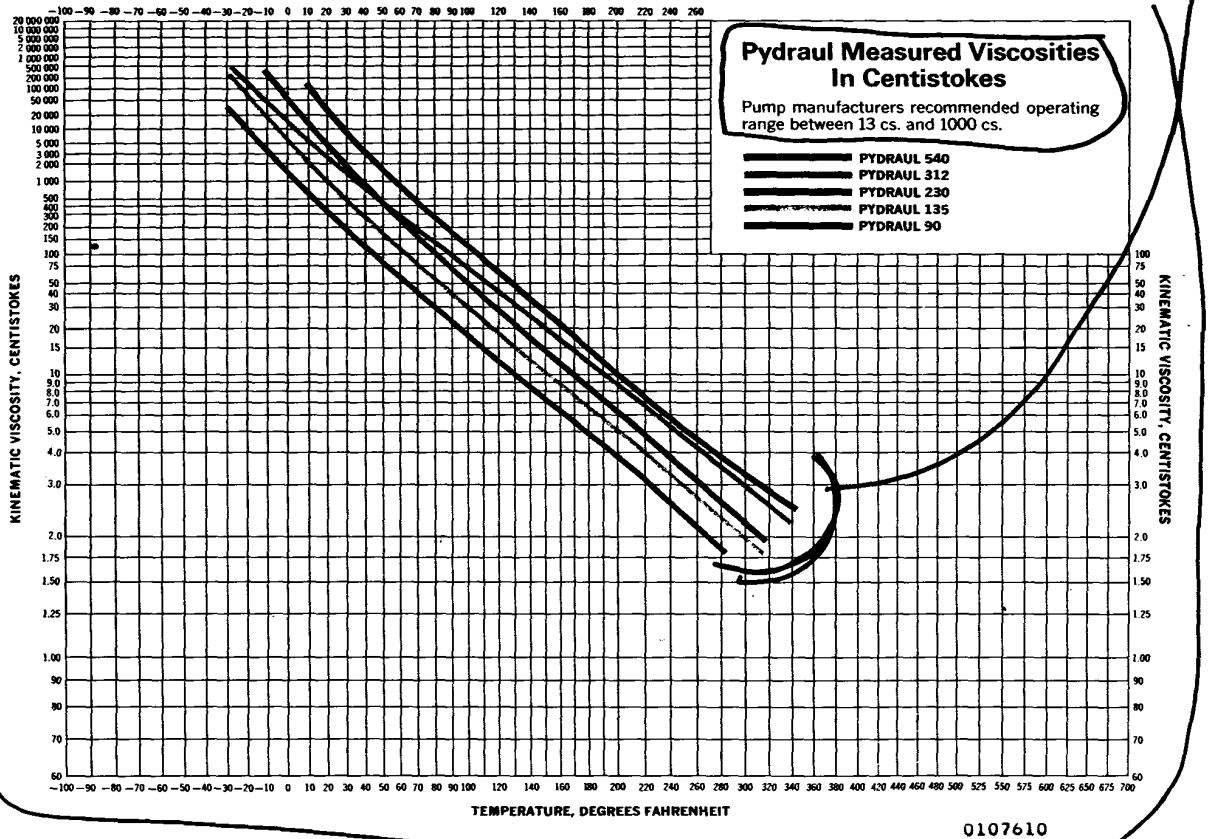
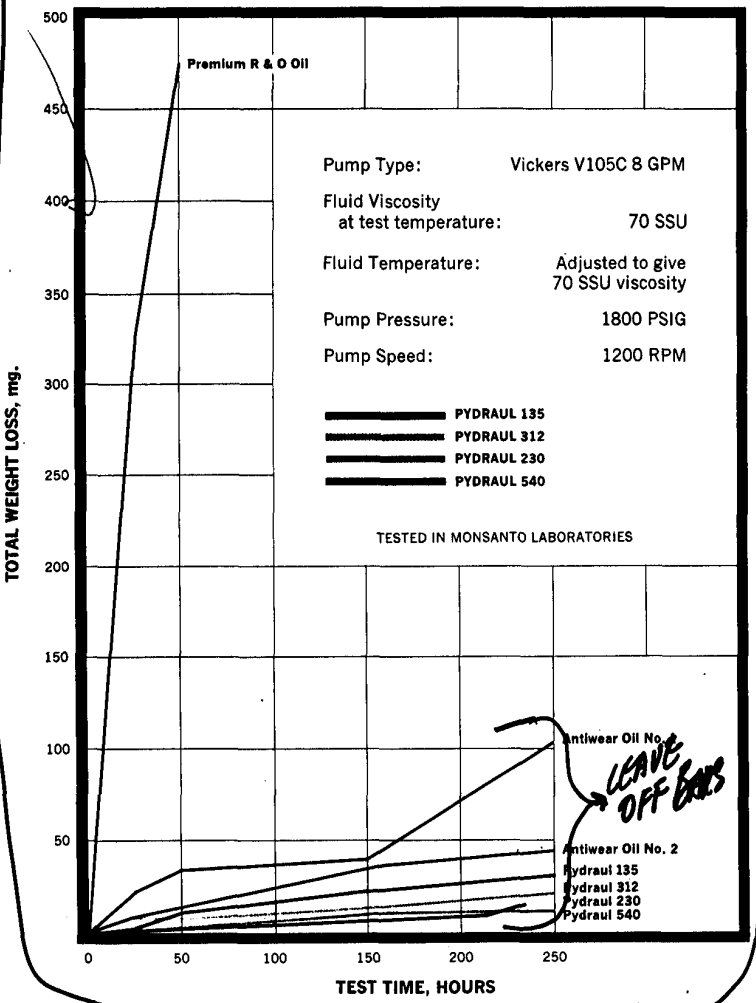


TOWOLDMON0022512

In a more severe Vickers hydraulic pump test (V-105-C pump), the low-cost Pydraul fluids performed as well as commercial antiwear oils and proved far superior to premium R & O oil (rust and oxidation inhibited).



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TOWOLDMON0022513

Pydraul Lubrication Properties

Pydraul fluids lubricate as well as premium petroleum oil. Because of this premium lubricity, Pydraul fluids give the same long pump life as premium petroleum oil. Equipment responds at its optimum capability. And Pydraul fluids are designed to be permanent—they never evaporate or wear out.

	PYDRAUL 90	PYRADUL 135	PYDRAUL 230	PYDRAUL 312	PYDRAUL 540
Timken Load (Passing)	65 lbs.	50 lbs.	55 lbs.	55 lbs.	55 lbs.
Shell Four-Ball Wear (167°F. 1hr., 630 rpm, mm scar) Steel on Steel					
10 kg.	0.24	0.24	0.23	0.25	0.23
40 kg.	0.45	0.43	0.49	0.44	0.44
Steel on Bronze					
10 kg.	0.55	0.48	0.47	0.87	0.43
Pump Test—Vickers (V-105-E, 140°F. 1000 hrs.)					
Ring, grams (loss or gain)	−6.8120	−0.0220	−0.0121	−0.0013	−0.0039
Vanes, grams (loss or gain)	−0.0696	−0.0020	−0.0036	−0.0021	−0.0010

Mixing Compatibility

PYDRAUL WITH OTHER HYDRAULIC FLUIDS

PYDRAUL*		FYRQUEL®		HOUGHTO-SAFE®	
90		90		1010	
135		150		1115	
230		220		1055	
312		300		1120	
540		550		1130	

*Under certain conditions, Pydraul fluids may be satisfactorily added to systems containing these competitive fluids without interrupting operations. Please consult your Monsanto fluids representative for complete information and the correct procedure.

Fyrquel® is a registered trademark of Stauffer Chemical Company.
Houghto-Safe® is a registered trademark of E. F. Houghton Co.

PYDRAUL WITH OTHER PYDRAUL HYDRAULIC FLUIDS

	312	135	230	540	90	F-9	A-200	150	280	625	60
312	—	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
135	YES	—	YES	YES	YES	YES	YES	YES	YES	YES	YES
230	YES	YES	—	YES	YES	YES	YES	YES	YES	YES	YES
540	YES	YES	YES	—	YES	YES	YES	YES	YES	YES	YES
90	YES	YES	YES	YES	—	YES	YES	YES	YES	YES	YES
F-9	YES	YES	YES	YES	YES	—	YES	YES	YES	YES	NO
A-200	YES	YES	YES	YES	YES	YES	—	YES	YES	YES	YES
150	YES	YES	YES	YES	YES	YES	YES	—	YES	YES	NO
280	YES	YES	YES	YES	YES	YES	YES	YES	—	YES	YES
625	YES	YES	YES	YES	YES	YES	YES	YES	YES	—	YES
60	YES	YES	YES	YES	YES	NO	YES	NO	YES	YES	—

WATER-GLYCOL and **WATER-OIL EMULSION** Fluids—Pydraul hydraulic fluids are not compatible with these fluids.

0107612

TOWOLDMON0022514

Converting to PYDRAUL is Easy

Regardless of the type hydraulic fluid being used, converting a system to low-cost Pydraul fluids is easy. Virtually every type of equipment which uses fire-resistant hydraulic fluid has been converted to Pydraul fluids. Most equipment manufacturers are experienced in Pydraul fluid conversions and should be consulted.

If changing seals is necessary, equipment manufacturers can recommend what seals to change, and many carry a supply of correct seals. Laboratory tests and operational experience show Viton*, Teflon*, and silicone the preferred elastomers for compatible seals. For moderate temperatures (below 140°F) butyl seals, hose, etc. are usually acceptable. Nylon and Teflon are satisfactory for higher temperatures.

To replace other fluids which are compatible with Pydraul and where compatible seals are in the system, it is only necessary to add Pydraul as make-up fluid. It is not necessary to drain or clean. When converting from petroleum oils, non-compatible synthetic fluids, water-glycol fluids, or water-in-oil emulsions, the following steps are recommended. These conform to USA Standard B93.5—1966. For best seal performance, make your future seal selection according to recommendations on page 9 in this booklet.

Please ask the Monsanto fluids specialist for recommendations and assistance, or telephone our technical specialists in St. Louis directly (314) 694-2500.

Change-Over Procedures

CHANGING FROM PETROLEUM OIL

1. Completely drain and clean the system. Small amounts of oil will not interfere with the performance of Pydraul, but resistance to fire is reduced by the amount of oil left in the system.
2. Drain and blow out pipelines. Manually clean valves and reservoirs.
3. Open or remove and drain valves. Replace gaskets, packings, and seals with those compatible with Pydraul. It is particularly important to change dynamic seals. Static seals do not necessarily have to be changed if they are not leaking. Non-compatible static seals will have to be replaced when the part is disassembled for maintenance.
4. Remove pumps, accumulators, and cylinders, if necessary, for draining. Replace packings, seals, gaskets, and bladders with those compatible with Pydraul.
5. Check component functions before the system is closed and fluid is added.
6. If your system cannot be completely drained, you may have to flush it with a small amount of Pydraul.

CHANGING FROM WATER-GLYCOL OR WATER-IN-OIL EMULSION

1. Drain and clean system thoroughly. Remove all traces of water. Empty all lines and low points or dead pockets in components.
2. Clean with steam or warm water. Follow by blowing with dry air.
3. Check sealing materials, hoses, and accumulator bags. Replace if necessary with compatible materials.
4. Install a minimum charge of Pydraul and operate the system from 16 to 24 hours. During this period, inspect the reservoir. If water or other contaminants float to the top, skim them off.
5. Drain the flushing charge immediately after shut-down while the fluid is warm. Drain all isolated points or parts which do not drain back to the reservoir. If water is apparent in fluid clinging to walls, wipe down all accessible parts.

CHANGING FROM PHOSPHATE ESTERS (OTHER THAN PYDRAUL)

1. Drain the system completely.
2. Cleaning is unnecessary.
3. Generally, seal changes are unnecessary at the time of conversion, but installation of compatible seals is recommended during routine maintenance.

*Registered trademark of E. I. Du Pont de Nemours & Co., Inc.

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Seals and Packings Information

Materials compatible with Pydraul hydraulic fluid are necessary for dynamic or moving seals. For static seals they are preferred, but not essential. The following table indicates materials recommended, depending on the Pydraul fluid selected.

PYDRAUL FLUID	BUTYL*	EPR	VITON	FLUOREL	TEFLON	SILICONE	BUNA-N	NEOPRENE	NATURAL RUBBER
90	M	M	R	R	R	R	U	U	U
135	M	M	R	R	R	R	U	U	U
230	M	M	R	R	R	R	U	U	U
312	M	M	R	R	R	R	U	U	U
540	M	M	R	R	R	R	U	U	U

R—RECOMMENDED M—MARGINAL U—UNSATISFACTORY

*Although generally classified as marginal with these Pydraul fluids, butyl and EPR (ethylene propylene rubber) have proved satisfactory in equipment operating under certain conditions of temperature, fluid cleanliness, maintenance, etc. For best service under general all-around operating conditions, elastomers of Viton, Fluorel, Teflon, and silicone are recommended.

This list of component manufacturers is a guide to obtaining seals compatible with Pydraul fluids. Please contact your equipment manufacturer or seal supplier for their most current recommendations.

Acushnet Process Company
776 Belleville Avenue
New Bedford, Massachusetts 02745

Anchor Packing Company
401 North Broad Street
Philadelphia, Pennsylvania 19108

Bearings, Inc.
3634 Euclid Avenue
Cleveland, Ohio 44115

A. W. Chesterton Company
Everett
Massachusetts 02149

Chicago Rawhide Manufacturing Company
1311 Elston Avenue
Chicago, Illinois 60622

C. E. Conover & Company, Inc.
333 Passaic Avenue
Fairfield, New Jersey 07006

Crane Packing Company
6400 Dakton Street
Morton Grove, Illinois 60053

Garlock Packing Company
Palmyra
New York 14522

Goshen Rubber Company, Inc.
P. O. Box 416
Goshen, Indiana 46526

Greene, Tweed & Company
North Wales
Pennsylvania 19454

Hercules Packing Corporation
3061 Walden Road
Alden, New York 14004

International Packing Corporation
Bristol
New Hampshire 03104

Johns-Manville
22 East 40th Street
New York, New York 10016

C. W. Marsh Company
36 Hudson Street
Muskegon, Michigan 49441

Minnesota Rubber Company
3630 Wooddale Avenue
Minneapolis, Minnesota 55416

Parker Seal Company
10567 Jefferson Boulevard
Culver City, California 90230

Plastic & Rubber Engineering, Inc.
756 East Florence Avenue
Los Angeles, California 90001

Plastic & Rubber Products Company
2100 Hyde Park Boulevard
Los Angeles, California 90047

Precision Rubber Products Corporation
Hartmann Drive
Lebanon, Tennessee 37087

Raybestos-Manhattan, Inc.
Packing Division
Passaic, New Jersey

Reliable Rubber Products
Eddyington
Pennsylvania 19020

Rockwell Mechanical Packing Company, Inc.
1634 Long Beach Avenue
Los Angeles, California 90021

W. S. Shamban Company
11617 West Jefferson Boulevard
Culver City, California 90230

Vellumoid Company
Rockdale Street and Beaman Avenue
Worchester, Massachusetts 01606

The James Walker Packing Company, Inc.
P. O. Box 75
Chicago Heights, Illinois 60411

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Filters and Hoses

FILTERS/Most standard oil filters are satisfactory. You can use active earth or clay types. Filter manufacturers include:

Briggs Filtration Division
Bowser Corporation
Cookeville, Tennessee

Capital Engineering Company
5839 S. Ashland Avenue
Chicago, Illinois

Commercial Filters Corporation
(Honan-Crane)
Lebanon, Indiana

Cuno Engineering Corporation
Sub. of American Machine
& Foundry
4627 S. Vine Street
Meriden, Connecticut

Dollinger Corporation
20 Centre Park
Rochester 3, New York

Fulflo Specialties Company, Inc.
410 Fancy Avenue
Blanchester, Ohio

Hilliard Corporation
98 W. Fourth Street
Elmira, New York

Marvel Engineering Company
7227 North Hamlin Avenue
Chicago 45, Illinois

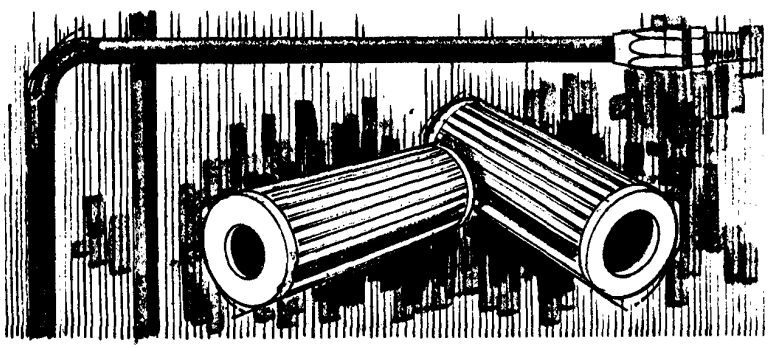
Pall Corporation
32 Sea Cliff Avenue
Glen Cove, L. I., New York

Purolator Products
1000 New Brunswick Avenue
Rahway, New Jersey

Rosaen Filter Corporation
1776 E. Nine Mile Road
Hazel Park, Michigan

Schroeder Bros. Corporation
101 Nichol Avenue
McKees Rocks, Pennsylvania

Serfilco Division
Service Filtration Corporation
7408 North Milwaukee
Niles, Illinois 60648



HOSES/Although both neoprene and buna elastomers swell somewhat in Pydraul, hose of these materials have given satisfactory service when made of a reinforced braid construction. Butyl, nylon or Viton are preferred when new hoses are installed. Suppliers include:

Anaconda Metal Hose Division
Anaconda American Brass Co.
Waterbury, Connecticut 06720

Anchor Coupling Company
3600 N. Fourth Street
Libertyville, Illinois

Eastman Mfg. Company
(See Imperial-Eastman Corp.)
Department T. R.
6300 West Howard Street
Chicago 48, Illinois

Electric Hose & Rubber Co.
1201 Duro Street
Wilmington, Delaware

Gates Rubber Company
999 South Broadway
Denver, Colorado 80217

Imperial Eastman Corp.
6300 W. Howard Street
Chicago, Illinois

Lewis Products
Hohenwald, Tennessee 38462

Samuel Moore Co.
Mantua, Ohio

Resistoflex Corp.
Roseland, New Jersey

Stratoflex, Inc.
222 Roberts Cutoff Rd.
Fort Worth, Texas

Weatherhead Corp.
302 E. 131st Street
Cleveland, Ohio 44108

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Other Components

SWIVEL COUPLINGS

Systems for Pydraul fluids often contain swivel couplings. Some suppliers are:

Chiksan Division
FMC Corporation
332 N. Brea Boulevard
Brea, California

PIPE JOINT SEALERS

. . . can be bought from:

American Sealants Company
(See Loctite Corporation)
115 N. Mountain Road
Hartford 11, Connecticut

Crane Packing Company
6410 Oakton Street
Morton Grove, Illinois

Dow Corning Corporation
Midland, Michigan

Friesland Plastics Company
Friesland, Wisconsin

General Electric Company
Insulating Materials Department
1 Campbell Road
Schenectady 6, New York

Permatex Company
Department T. R.
Flagler Court Building
West Palm Beach, Florida

W. S. Shamban & Company
11617 W. Jefferson Boulevard
Culver City, California

Shell Chemical Company
110 W. 51st Street
New York, New York

ACCUMULATORS

. . . many hydraulic systems for Pydraul contain an accumulator which uses a bladder to separate the fluid from air or nitrogen pressure. For these, a rubber compatible with the fluid is necessary. Suppliers include:

Greer Hydraulics, Inc.
5930 W. Jefferson Boulevard
Los Angeles, California

PAINTS

. . . resistant to Pydraul are supplied by:

Amercoat Corporation
Department T
Brea, California

Andrew Brown Paint Company
5413 S. District Boulevard
Los Angeles, California

Carboline Company
32-R Hanley Industrial Court
St. Louis, Missouri

Carrol Products
148 Marine Street
Farmingdale, New York

Finch Paint & Chemical Company
Torrence, California

W. P. Fuller & Company
1645 W. Valencia Drive
Fullerton, California

The Glidden Company
900 Union Commerce Building
Cleveland, Ohio

Interchemical Corporation
Finishes Division
1255-T Broad Street
Clifton, New Jersey

Lowe Brothers Company
Third & Madison Streets
Dayton, Ohio

Magna Coatings & Chemical Corporation
1785 N. Eastern Avenue
Los Angeles, California

Nycote Laboratories
15002 Delano Street
Van Nuys, California

Pittsburgh Plate Glass Company
One Gateway Center
Pittsburgh 22, Pennsylvania

Rinshed-Mason Company
5935 Milford
Detroit, Michigan

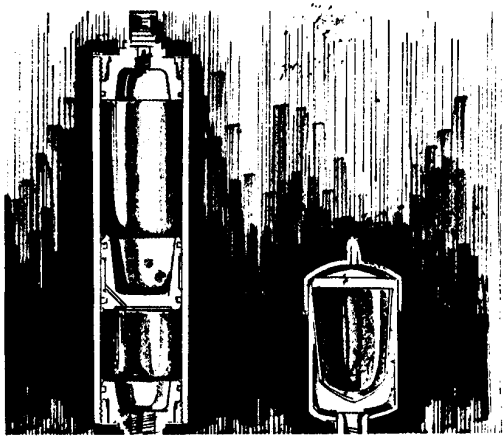
Royalty Paint & Varnish Company
Pasadena, California

Saran Protective Coatings Company
2415 Burdette at Reed
Ferndale, Michigan

Sherwin-Williams Company
101 Prospect Avenue, N. W.
Cleveland, Ohio

Titanine, Inc.
Seagrave Corporation
Elmwood & Morris Avenues
Union, New Jersey

U. S. Paint, Lacquer & Chemical Company
2101 Singleton
St. Louis, Missouri



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Reclaiming PYDRAUL Fluids

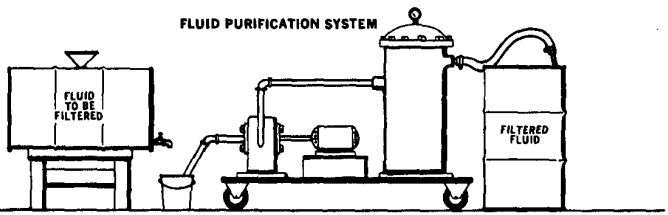
Pydraul hydraulic fluid lost from leaks and spills can be reclaimed because it is exceptionally stable and resistant to water and other contaminates. If fluid losses are appreciable—fluid recovery can result in considerable savings. Simply placing a container beneath leaks until they can be repaired will save some fluid. Where drip pans have been used beneath hydraulic machinery, more than half of the total Pydraul leakage has been reclaimed.

This dollar-saving recovery appears especially advantageous because it isn't practical to reclaim either water glycol or water-oil emulsions except to filter out large dirt particles. Reclaiming Pydraul fluid helps make it the most economical fire-resistant fluid available.

Reclaiming Pydraul consists of two steps: removing water, and filtering dirt or other solid particles.

WATER REMOVAL... Water does not mix with Pydraul and will, therefore, form a layer on top. A drum reserved for contaminated fluid with a side and end bung, placed horizontally on a cradle about two feet off the floor, is a simple and effective settling chamber. Salvaged fluid can be added through a large funnel in the top opening and Pydraul periodically drained off through the lower opening.

FLUID PURIFICATION SYSTEM

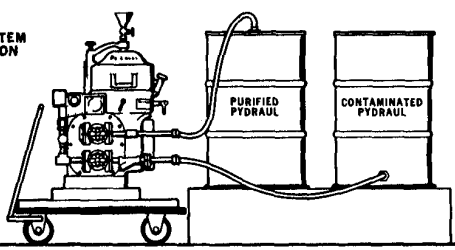


For a more elaborate system, permanently installed settling tanks, or a commercial installation can be used.

A second method is centrifuging. Suitable units are made by DeLaval and Sharples Co. Centrifuges operate swiftly . . . will separate water from large volumes of fluid in a short time.

FINAL FILTRATION . . . A number of filtration units are available complete with filter pump and motor. Other systems use filter media such as cotton linters, felt or metal screens. Attapulgus clay and Fuller's earth may be used to help keep the fluid clean, reduce moisture and lower neutralization number. Diatomaceous earth filtration is recommended for solid particles removal only. Paper and fiber type filters are recommended for water and particle removal but are ineffective for lowering neutralization number (acidity) values.

CENTRIFUGE SYSTEM FOR PURIFICATION



Filters in the 3 to 5 micron range are recommended for Pydraul filtration and reclamation. Such filter media will not affect the basic Pydraul formulation.

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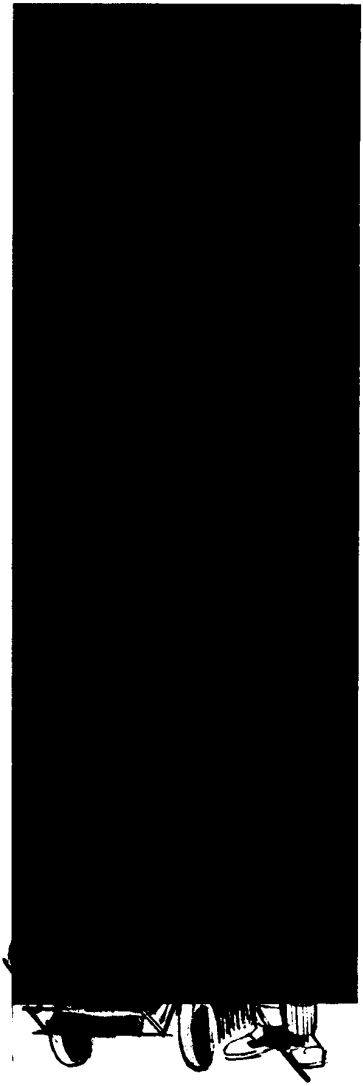
Handling

Animal toxicity studies and human experience indicate that the Pydraul hydraulic fluids may be used safely if a few reasonable precautions are taken. Repeated or prolonged skin contact should be avoided not only to prevent absorption of the material and possible systemic effect but, also, because the fluids are excellent solvents for the oils normally present in the skin. Thus, drying and irritation could occur.

When splashed or sprayed into the eyes, Pydraul causes painful smarting. There is no evidence, however, of any permanent eye injury. In the event of accidental contact with the eyes, the eyes should be flushed with copious amounts of water for 15 minutes and the workman referred to a physician; physicians have used 1% Pontocaine solution and ophthalmic cortisone acetate solution to relieve irritation.

When Pydraul is kept at room temperature, it does not constitute a vapor inhalation hazard except in a confined, unventilated space. Respiratory protection or mechanical exhaust ventilation should be provided if there is repeated and prolonged contact of the fluid with heated surfaces with resulting volatilization or possible decomposition of the fluid. Where a ruptured oil hydraulic line near a white-hot surface means a fire, a ruptured hydraulic line containing Pydraul causes a vapor with an unpleasant odor that can help you locate the trouble. For short periods, such as turning off equipment following the rupture of a hydraulic line or other mechanical failure, no protection is necessary.



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Additional District Offices
are maintained by:

Agricultural Division

ALLENTOWN, PENNSYLVANIA 18104
Park Professional Building
2200 Hamilton Street
Tel. (215) 437-5471

DES MOINES, IOWA 50310
312 Merle Hay Tower
Tel. (515) 276-8503

FREMONT, NEBRASKA 68025
150 South Main Street
Tel. (402) 727-1230

INDIANAPOLIS, INDIANA 46205
Suite 218, 4000 Meadows Drive Building
Tel. (317) 547-9148

LULING, LOUISIANA 70070
P. O. Box 174
Tel. (504) 784-6263

MANKATO, MINNESOTA 56001
111 Madison East
Tel. (507) 387-3406

MEMPHIS, TENNESSEE 38104
303 Union Plaza Bldg.
Tel. (901) 278-7811

MUSCATINE, IOWA 52761
P. O. Box 473
Tel. (319) 263-1331

Hydrocarbons & Polymers Division-Lion Oil

EL DORADO, ARKANSAS 71730
Lion Oil Building
Tel. (501) 863-3111

JACKSON, MISSISSIPPI 39209
P. O. Box 10937, Westland Station
Tel. (601) 352-3648

N. LITTLE ROCK, ARKANSAS 72119
410 West 8th Street, P. O. Box 5821
Tel. (501) 376-2437

MEMPHIS, TENNESSEE 38113
1023 Riverside Drive, P. O. Box 13248
Tel. (901) 948-4451

Organic Division (Rubber Instruments)

AKRON, OHIO 44311
920 Brown Street, P. O. Box 2307
Tel. (216) 434-1962

Plastic Products & Resins Division

KENILWORTH, NEW JERSEY 07033
North Seventh St. & Monroe Ave.
Tel. (201) 276-2900

Textiles Division

ATLANTA, GEORGIA 30303
Atlanta Merchandise Mart
240 Peachtree St., N. W.
Tel. (404) 577-2260

CHARLOTTE, NORTH CAROLINA 28210
6230 Fairview Road, Suite 400
Tel. (704) 364-0110

GREENVILLE, SOUTH CAROLINA 29606
McAlister Plaza
P. O. Box 5564, Station B
Tel. (803) 239-9171

NEW YORK, NEW YORK 10001
350 Fifth Ave.
Tel. (212) 556-5100

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Monsanto

Monsanto Company / Functional Fluids / 800 North Lindbergh Blvd. / St. Louis, Missouri 63166

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(PYDRAUL SELECTOR 1 and 2)
Page 1

(After section on "Development" put in the following section:)

Reformulation

The Pydraul fluids in this Selector were reformulated in 1970 to remove polychlorinated biphenyls (PCB's). They are now designated with the letter "A" following the product name and provide equal or superior performance when compared to the original Pydraul fluids.

Because some PCB's have been considered to be persistent in the environment, Monsanto chose to remove these components from Pydraul. We took this action voluntarily in an effort to demonstrate our environmental awareness.

Reformulation of the Pydraul fluids provided us with the opportunity to make a number of product improvements, particularly in the areas of lubricity, pump performance and thermal stability. These improvements give you the benefit of the latest Monsanto technology in fire resistant hydraulic fluids.

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