GALION MANUFACTURING COMPANY, Galion, Ohio 44833, U.S.A.
a Jeffrey Galion Inc. Company

This section is a complete Revision of Lubrication Specifications. Please Examine Carefully.

LUBRICATION SPECIFICATIONS

Lubricants used in Galion graders, rollers and cranes should be represented by the supplier as meeting the minimum quality requirements as listed in this section.

The Galion Manufacturing Company does not recommend any specific brand of lubricant. Brand names given are listed only as a guide to enable the user to more readily select the recommended lubricant or its equivalent.

INDEX

GRADERS

MODEL	SERIAL NO. FROM – TO	TEMPERATURE RANGE	TABLE
Transfer Case, Transmission Final Drive			
101, 102, 103, 116, 201, 202, 203, 303, 401, 402, 450	All	Above 32° F.	A or D
104, 118	To – 01588	Below 32° F.	B or E
160 (Clark)	To – 01092		
503	01001 – 05100		
503A	05100 – 06112	To 100° F.	B or E
503L	06112 & Up	Above 100° F.	A or D
104, 118	01588 – 07245		
160 (Dana)	01092 – 02018	Above 32° F.	E
160A (Dana)	02018 – 02055	Below 32° F.	F
118A, 104H-A, 104A	07245 – 07600	Above 32° F.	A or D
		Below 32° F.	B or E
Transfer Case, Transmission			
118B, 104H-B, 104B	07600 – 10750	Above 32° F.	A or D
160B	02155 – 02714	Below 32° F.	B or E
104C	10750 – 11214		
118C	10750 & Up	All	G
160C	02714 & Up		
Torque Converter Powershift Transmission			
T-400A	01001 & Up		
T-500	01001 – 02601		
T-500A	02601 & Up		
T-500L	03286 & Up	All	G
T-600	01001 – 01501		
T-600B	01501 & Up		
T-700	01001 – 01081		
Transmission			
160L	02101 & Up	All	G
Independent Rear Axle*			
160B	02155 – 02714		
118B, 104H-B, 104B	07601 – 10750		
104C	10750 – 11214	All ----------	J
160C	02706 & Up	or	
160L	02101 & Up	–20° F. to 60° F. ---------	K*
118C	10750 & Up	20° F. to 120° F. ---------	L*
T-400A	01001 & Up	Above 100° F. ----------	M*
T-500A	02601 & Up	0° F. to –65° F. ---------	N*
T-500L	03286 & Up		
T-600B	01501 & Up		
Integral Final Drive			
T-500	01001 – 02601		
T-600	01001 – 01501	All	A or D
T-700	01001 – 01081		
Tandem Drive – Gear Type			
All Models		Above 0°	A or D
		Below 0°	B or E
Tandem Drive – Chain Type*			
All Models – Except 503A, 503L			B or G*
503A	05101 – 06112	All	B or E
503L	06112 & Up		

GRADERS (Cont'd)

MODEL	SERIAL NO. FROM – TO	TEMPERATURE RANGE	TABLE
Circle Reverse Gear Case *(2nd Section)**			
503A	05101 – 05879	Above 32° F.	A
160B	02155 – 02714	Below 32° F.	B
118B	07601 – 10750		
104H-B	07619 – 10693		
104B	07601 – 10750		
160L	02101 – 02729		
T-400A	01001 – 01163		
T-500A	02601 – 04198		
T-500L	03286 – 04198		
T-600B	01501 – 01906		
503A *	05879 – 06112	Above 32° F.	U or L*
503L	06112 & Up	Below 32° F.	B or K*
104C	10750 – 11214		
160C	02706 & Up		
118C	10750 & Up		
160L	02729 & Up		
T-400A	01163 & Up		
T-500A	04198 & UP		
T-500L	04198 & Up		
T-600B	01906 & Up		
Drawbar Side Shift Gear Case *			
All Models – Except T-400A, 503A, 503L		All	P or U*
Independent Steering System			
All Models		All	G
Hydraulic System *			
503A	05101 – 06112	Above –20° F.	G*
503L	06112 & Up	Below –20° F.	I
160B	02155 – 02714		
160C	02706 & Up		
160L	02101 & Up		
104H-B	07619 – 10693		
104B	07601 – 10750		
104C	10750 & Up		
118B	07601 – 10750		
118C	10750 & Up		
T-400A	01001 & Up		
T-500A	02601 & Up		
T-500L	03286 & Up		
T-600B	01501 & Up		
Front Wheel Bearings			
All Models		All	Q
Pressure Gun Fittings			
All Models		All	Q
Clutch Throwout Bearings			
303, 303A			
503	01001 – 06123	All	V
Oil Clutch System			
All Models		All	G
Service Foot Brake System			
All Models		All	W

ROLLERS

MODEL	SERIAL NO. FROM – TO	TEMPERATURE RANGE	TABLE
Transmission – R-O-Static R-O-S Tandem R-O-S 3–Wheel V-O-S Vibratory	All	Above –20° F. Below –20° F.	G I
Transmission – Mechanical R-O-M Tandem R-O-M 3–Wheel PTR	All	Above 0° F. Below 0° F.	A B
V-O-S Vibratory *	All	Above 0° F. Below 0° F.	A or L* B or K*
Torque Converter R-O-M Tandem (Except 3–5 & 4–6 Ton) R-O-M 3–5 & 4–6 Ton Tandem R-O-M 3–Wheel R-O-M PTR	All	All	G
Final Drive – Enclosed Gears* R-O-M Tandem R-O-S Tandem R-O-S 3–Wheel V-O-S Vibratory	All	Above 0° F. Below 0° F.	A or L* B or K*
Final Drive – Open Gears R-O-M 3–Wheel R-O-M Tandem R-O-S Tandem	All	All	S
Differential PTR	All	Above 0° F. Below 0° F.	A B
R-O-S 3–Wheel * V-O-S Vibratory *	All	Above 0° F. Below 0° F.	A or L* B or K*
Chain Drive PTR	All	Above 0° F. Below 0° F.	A B
Power Steering Hydraulic System – Tiller Steering R-O-M Tandem R-O-S Tandem R-O-M 3–Wheel	All	Above –20° F. Below –20° F.	G I
Power Steering Hydraulic System – Wheel Steering PTR R-O-S 3–Wheel R-O-M Tandem R-O-S Tandem	All	Above –20° F. Below –20° F.	G I
Steering Gear * PTR	All	All	O or K*
Transport Wheel Bearings R-O-M 3–5 & 4–6 Tandem R-O-S 3–5 & 4–6 Tandem	All	All	Q
Pressure Gun Fittings All	All	All	Q
Service (Foot) Brakes PTR V-O-S Vibratory	All	All	W

CRANES

MODEL	SERIAL NO. FROM – TO	TEMPERATURE RANGE	TABLE
Transmission – Mechanical *			
		Above 0° F.	A or D
		Below 0° F.	B or E
80, 90, 100, 110, 125	All		or
		–20° F. to 60° F.	K*
		20° F. to 120°F.	L*
		Above 100° F.	M*
		–65° F. to 0° F.	N*
Transmission & Torque Converter – Power Shift			
90A, 100A, 110A, 125A, 150A	All	Above –20° F.	G
		Below –20° F.	I
Torque Converter			
80, 90, 100, 110, 125	All	Above –20° F.	G
		Below –20° F.	I
Planetary Drive Axles *			
All Models – Except 80	All	All	J
		or	
80	01001 – 04001	–20° F. to 60° F.	K*
		20° F. to 120° F.	L*
		Above 100° F.	M*
		–65° F. to 0° F.	N*
80	04001 & Up	–20° F. to 60° F.	K
		20° F. to 120° F.	L
		Above 100° F.	M
		–65° F. to 0° F.	N
Steering Gear *			
		All	O
			or
All Models – Except 80	All	Above 32° F.	L*
80	01001 – 04001	Below 32° F.	K*
Swing Drive Final Mesh			
All Models	All	All	T
Winch *			
		All	D
			or
All Mobile Models	All	Above 32° F.	L*
125P, 150P, 150T	All	Below 32° F.	K*
Swing Drive Gear Case *			
		All	D
			or
All Mobile Models	All	Above 32° F.	L*
125P, 150P, 150T	All	Below 32° F.	K*
Pressure Gun Fittings			
All	All	All	Q
Service Brake System			
All Mobile Models	All	All	W
Hydraulic System *			
All Models	All	Above –20° F.	G or H
		Below –20° F.	I

TABLE A

TRANSMISSION & GEAR LUBRICANT SPECIFICATIONS*

SAE Specification: 90
Type: Straight Mineral Gear Lube

Straight mineral gear oils of the SAE viscosity recommended above which measure up to the quality standards of a reputable refiner of petroleum products are preferable and should meet these requirements.

Viscosity S.S.U. @ 210°F.--	85-95
Flash point °F, minimum ---	350
Channel point °F ----------	0
Rust protection ----------	Yes
Foam inhibited ----------	Yes

TABLE B

TRANSMISSION & GEAR LUBRICANT SPECIFICATIONS*

SAE Specifications: 80
Type: Straight Mineral Gear Lube

Straight mineral gear oils of the SAE viscosity recommended above which measure up to the quality standards of a reputable refiner of petroleum products are preferable and should meet these requirements.

Viscosity S.S.U. @ 210°F --	55.65
Flash point °F, minimum ---	325
Channel point °F ----------	30
Rust protection ----------	Yes
Foam inhibited ----------	Yes

TABLE C

TRANSMISSION & GEAR LUBRICANT SPECIFICATIONS*

SAE Specification: 140
Type: Straight Mineral Gear Lube

Straight mineral gear oils of the SAE viscosity recommended above which measure up to the quality standards of a reputable refiner of petroleum products are preferable and should meet these requirements.

Viscosity S.S.U. @ 210°F --	120-160
Flash point °F, minimum ----	375
Channel point °F ----------	20
Rust Protection ----------	Yes
Foam inhibited ----------	Yes

* DO NOT USE EXTREME PRESSURE LUBRICANTS--E.P. lubricants were compounded primarily for use in rear axles where unit gear tooth loads are very high and the rubbing action between the gear teeth is severe.

These oils contain added chemical compounds which, under certain conditions of operation, are designed to unite with the metal of the gear teeth and protect the rubbing surfaces. Extreme gear tooth loads have been designed "out" of Galion transmissions and the use of E.P. oils is unnecessary. In fact, most of these lubricants have certain undesirable characteristics for transmission use.

Sulphur and graphite are widely used as E.P. additives. Under certain conditions of operation, the sulphur in company with normal condensation of water will form corrosive sulfuric acid. Graphite, even in its purest form, must be classified as an abrasive material and will tend to increase wear when used in transmissions. In addition, the chemical instability of such lubricants may result in heavy soap and oxide deposits inside the unit, clogging the oil passages.

The object in draining the transmission oil periodically is to eliminate possible bearing surface abrasion and attendant wear. Minute particles of metal (the product of normal wear in service) are deposited in and circulate with the transmission oil. The oil changes chemically due to its repeated heating and cooling and also the terrific churning it undergoes in the presence of air. It is desirable to drain out this used oil at least every 1000 hours of service--more frequently when operating in a dusty or dirty environment. Do this only when the transmission is thoroughly warm.

After draining, flushing is desirable. Replace the drain plug and fill the transmission to the proper level with a light flushing oil. Drive the transmission for a short period at fast idle in such a manner that the gears in the transmission are rotating without load. This washes out the old oil clinging to the interior of the gear case, covers, and shifter rails.

Be sure to drain out all of the flushing oil before attempting to refill with new oil.

TABLE D

HEAVY DUTY ENGINE OIL

SAE 50 HD Engine Oil
Type: Meeting Military Specification MIL-L-2104C or API Engine Service CC

TABLE E

HEAVY DUTY ENGINE OIL

SAE 30 HD Engine Oil
Type: Meeting Military Specification MIL-L-2104C or API Engine Service CC

TABLE F

HEAVY DUTY ENGINE OIL

SAE 10W Engine Oil
Type: Meeting Military Specification MIL-L-2104C or API Engine Service CC

TABLE G

TORQUE CONVERTER and AUTOMATIC TRANSMISSION FLUID

Types: AQ-ATF, Type A, Suffix A
Dexron

These two products are interchangeable. They are completely compatible and can be used as makeup or refill oil in any proportion.

Typical Properties (Dexron)		Test
Gravity °API	28.2	D287
Viscosity SUS @ 100°F	185.0	D445,2161
@ 210°F	50.85	D445,2161
Viscosity Index	172	D2270
Pour Point, °F	-45	D97
Flash Point, of	375	D92
Color	Red	---

TABLE H

HYDRAULIC OIL

The Galion hydraulic cranes are factory filled with this hydraulic oil. This oil may be topped with Dexron or AQ-ATF Type A, Suffix A, but it is not advised to top Dexron or Type A, Suffix A with this oil.

Type: Military Specification MIL-L-17672A, Grade 2110Th

Properties

Saybolt universal viscosity @ 210°F:
43 seconds, min. ----- ASTM-D-2161
Saybolt universal viscosity @ 100°F
145-155 seconds ------ ASTM-D-2161
Viscosity Index:
90 minutes ---------- ASTM-D-2270
Pour Point (ASTM)
-30° maximum --------- ASTM-D-97-47
Neutralization number (ASTM)
.10 or less ---------- ASTM-D-974-51T
Copper strip test (corrosion)
3 hours @ 212°F:
negative ----------
Rust test (ASTM) time distilled water:
No rust---------- ASTM-D-665A
Oxidation test (ASTM) time to neutralization #2.0:
1500 hours, min. ----- ASTM-D-943-47T
Foam test (ASTM) sequence 1,2,3 mi. foam after 10 minutes standing:
none ---------- ASTM-D-892-46T

Most major oil companies have hydraulic oils meeting these specifications. Some example brands are:

Rando Oil HD A	Texaco, Inc.
Tellus 27	Shell Company
Duro Oil 160	Sinclair Refining Co.
Nuto 43 or Nuto H44	Humble Oil & Refining Co.
Sunvis 2110th	Sun Oil Co.
Citgo Pacemaker 15 or Citgo Pacemaker T-15	Cities Service Oil Co.
D.T.E. 13	Mobil Oil Co.
Super Hydraulic Oil 15	Continental Oil Co.
Magnus Oil 150	Phillips Petroleum Co.

TABLE I

HYDRAULIC OIL, LOW TEMPERATURE

For operation at ambient temperatures below -20°F and at no time exceeding above 20°F use an oil meeting these specifications.

Military Specifications MIL-H-5606A
Amendment 1,5.17/61

Viscosity, centistokes @ 210°F	5.0
Viscosity, centistokes @ 100°F	14
Viscosity, centistokes @ -40°F	500
Viscosity, centistokes @ -65°F	3000
Pour point	-75°F
Flash point	200°F
Acid or base No.	.20

Examples of brand names meeting these specifications.

Texaco 662 Aircraft Hydraulic Oil	Texaco, Inc.
Eldoran 5606	Standard Oil, Ohio
Aeroshell Fluid 4	Shell Oil Co.
Univis J-43	Humble Oil & Refining Co.
Mobil Aero HFA	Mobil Oil Co.
Rando Oil HD A	Texaco, Inc.
Tellus 27	Shell Company
Duro S-150LP or Duro AW S-150	Atlantic Richfield
Nuto 43 or Nuto H44	Humble Oil & Refining Co.
Sunvis 2110th	Sun Oil Company
Citgo Pacemaker 15 or Citgo Pacemaker T-15	Cities Service Oil Co.
D.T.E. 13	Mobil Oil Company
Super Hydraulic Oil 15	Continental Oil Co.
Magnus Oil 150	Phillips Petroleum Co.

TABLE J

SAE 90 EXTREME PRESSURE (SCL) GEAR LUBRICANT

This specification covers a lubricant which may be used in gear cases to lubricate gears and pinions. *CAUTION: DO NOT USE this lubricant at points not specifically recommended in this lubrication section. DO NOT mix with any other extreme pressure lubricant that is not SCL.*

It shall be a well refined mineral oil, properly compounded with sulphur-chlorine-lead (SCL) type extreme pressure additives. It shall be free of fillers or abrasives such as fuller's earth, talc, graphite, cork,etc. It shall be stable, non-abrasive and non-corrosive to the materials used in the case gear mechanism whether or not in the presence of small percentages of water.

Physical and Chemical Properties

Viscosity S.U.S. @ 210°F	85.95
A.P.I. Gravity	14.4-15.9 degrees
Pour Point	-10°F max.
Flash Point	350°F min.
Fire Point	400°F min.
Channel Point	0°F min.
Sulphur (added)	1.20% min.
Sulphur (total)	3.00% min.
Chlorine	1.20% min.
Lead as Lead Oxide (P60)	2.00% min.
Moisture	.20% max.
Load carrying capacity (Timken Test	70 lbs. lever load min.
Abrasion Test (33 lbs., 6 hours)	20 milligrams loss, max.
SAE Test 750 RPM	350 pounds min.

TABLE K

MULTI PURPOSE GEAR LUBRICANT

SAE Specification: 80

Type: Extreme pressure gear oil (not SCL)
Military Specification
MIL-L-2105B
API Classification GL-5

It shall be an extreme pressure gear oil with sulphur-phosphorus extreme pressure additives. *DO NOT* substitute straight mineral gear oils or oils with SCL additives. SAE 80 should be used in the sustained ambient temperatures of -20°F to 60°F.

Typical Properties

Viscosity @ 210°F	
Kinematic, centistokes	8.8-11.6
(Saybolt universal seconds)	55-65
Viscosity @ 0°F	
(Kinematic, centistokes, maximum	10,850
Channel point °F minimum	-30°F
Flash Point °F, minimum	325
Moisure Corrosion	Pass
Rust test	Pass
Copper corrosion test exposed 3 hours @ 250°F	Pass

TABLE L

MULTI PURPOSE GEAR LUBRICANT

SAE Specification: 90

Type: Extreme pressure gear oil (not SCL)
Military Specification:
MIL-L-2105B
API Classification: GL-5

It shall be an extreme pressure gear oil with sulphur-phosphorus extreme pressure additives. *DO NOT* substitute straight mineral gear oils or oils with SCL additives. SAE 90 should be used in the sustained ambient temperatures of 20°F to 120°F.

Typical Properties

Viscosity @ 210°F	
Kinematic, centistokes	16.8-19.2
(Saybolt universal seconds)	85-95
Viscosity @ 0°F	
Kinematic, centistokes, maximum	65,200
Channel point °F, minimum	0°
Flash Point °F, minimum	350
Moisure Corrosion Test	Pass
Rust Test	Pass
Copper corrosion test exposed 3 hours @ 250°F	Pass

TABLE M

MULTI PURPOSE GEAR LUBRICANT

SAE Specification: 140

Type: Extreme pressure gear oil
(Not SCL)
Military Specification:
MIL-L-2105B
API Classification: GL-5

It shall be an extreme pressure gear oil with sulphur-phosphorus extreme pressure additives. *DO NOT* substitute straight mineral gear oils or oils with SCL additives. SAE 140 should be used in the sustained ambient temperatures above 100°F.

Typical Properties

Viscosity @ 210°F	
Kinematic, centistokes	25.7-34.3
Saybolt universal seconds	120-160
Viscosity Index Minimum	75
Channel Point °F Minimum	20
Flash Point °F, Minimum	375
Moisture Corrosion Test	Pass
Rust Test	Pass
Copper Corrosion Test exposed 3 hours @ 250°F	Pass

TABLE N

MULTI PURPOSE GEAR LUBRICANT

Type: Extreme pressure gear oil
(Not SCL)
Military Specification:
MIL-L-10324A

It shall be an extreme pressure gear oil with sulphur-phosphorus extreme pressure additives. *DO NOT* substitute straight mineral gear oils or oils with SCL additives. This oil should be used for sustained ambient temperatures of 0°F to -65°F.

Typical Properties

Viscosity @ 210°F	
S.U.S.	36
Viscosity @ -65°F	
Kinematic, centistokes, max.	30,000
Channel Point °F	-65
Flash Point °F	250
Moisture Corrosion	Pass
Rust test	Pass
Copper Corrosion test exposed 1 hour @ 250°F	Pass

TABLE O

STEERING GEAR LUBRICANT

MEETING THE FOLLOWING SPECIFICATIONS:

NLGI	0
Soap Base	Calcium or Lithuim
Penetration @ 77°F	355-385
Drop Point	295°F
Texture	Tacky
Water	Trace
Oil Viscosity: 100°F	600 SUS
210°F	60 SUS

Most major oil companies have a product meeting these specifications. Some example brands are:

Citgo H-O	Cities Service Oil Co.
Factran EP-O	Standard Oil Co.(Ohio)
Alvania EPRO	Shell Oil Co.
Lidok EP-O	Humble Oil & Refining Co.
Sun Prestige 740 EP	Sun Oil Co.
Multifak EPO	Texaco,Inc.
Mobilux EPO	Mobil Oil Co.
EP Conolith Grease No. O	Continental Oil Co.
Philube L-O MPG	Phillips Petroleum Co.

TABLE P

SEMI-FLUID GEAR LUBRICANT

MEETING THE FOLLOWING SPECIFICATIONS:

NLGI Consistency	0
Thickner	Lithium 12 Hydroxy
Thickner %	7
Unworked penetration	355
Worked, 60 strokes	355
Worked, 100,000 strokes	363
Rust, prevention, ASTM D-1743	1
Rust, Prevention, ASTM D-1743-with 5% water added	1
Timken EP OK Load, lbs.	70
Timken Film Durability test, 8 hours, scar width mm.	1.1
Oxidation Stability, ASTM D-942 500 hrs, PSI Drop	3.5
Dropping Point	370
Mineral Oil Viscosity @ 100°F, SUS	510
Viscosity Index	93

TABLE Q

MULTI-PURPOSE LITHIUM BASE GREASE

Lithium base grease is recommended to fill the needs of a general purpose lubricant. Even though this grease is of greater cost, its additional properties and characteristics thoroughly compensate for the added expense. The supplier should meet the following specifications:

Penetration (D-217)	
unworked	275
worked 60 strokes	270
worked 10,000 strokes	less than 5% raise
Dropping point (D-566)	380°F, min.
Water resistance	excellent
ASTM oxidation (D-942)	negative
Texture	buttery & smooth
Soap Base	lithium
Base oil, pour	-10
viscosity @ 210°F	78
viscosity index	95
oxidation inhibited	yes
Coordinating Research Council test, wheel bearing	passes
wheel bearing overpacked	passes

Grease meeting above specifications:

Factran 2 ---------- Sohio
Mobilgrease 77 ---------- Mobil Oil Co.
Marfak All-Purpose ------ Texaco, Inc.
Alvania EP2 ---------- Shell Oil Co.
Maralube 526 -------- Marathon Oil Co.
Enco Multi-purpose Grease or
Lidok 2 -- Humble Oil & Refining Co.
Sunfleet Multi-duty Grease-Sun Oil Co.
Citgo Premium Lithium 2
Cities Service Oil Co.
Super-Sta Grease No. 2
Continental Oil Co.
Philube IB & RB Grease
Phillips Petroleum Co.

TABLE R

CIRCLE & CIRCLE SHOE LUBRICANT

The following products, or their equal, are recommended for lubricating motor grader circle, circle shoes and circle pinion wear surfaces.

Lubriplate Mo-Lith #2-Fisk Bros.Refining Co.
Molub Alloy #2 --- Imperial Oil & Grease Co.
Molytex #2 ---------- Texaco, Inc.
Beacon Q2 -------- Humble Oil & Refining Co.
D. G. Lubricant #1399 ----- Marathon Oil Co.
Sunaplex 872 EP ---------- Sun Oil Co.
Citgo Premium Moly Lithium 2
Cities Service Oil Co.
Mobil Grease Special --------- Mobil Oil Co.
Lithall MDS ---------- Shell Oil Co.
Barium Outside Gear Compound
Phillips Petroleum Co.
Super Lube M ---------- Continental Oil Co.

TABLE S

OPEN GEAR LUBRICANT

The following products, or their equal, are recommended for lubricating roller open gear final drive.

OPEN GEAR LUBRICANT

COMPOUND	FLUID	SUPPLIER
Texaco Crater Compound #5	Texaco Crater Compound #5X Fluid, Texclad	Texaco, Inc.
Surett N1550	Surett Fluid 50	Humble Oil & Refining Co.
Sunep Compound 1250 Special	-----	Sun Oil Co.
Citgo Open Gear Compound #5	Citgo Open Gear Compound #5A	Cities Service Oil Co.
Mobiltac SS	Mobiltac E	Mobil Oil Co.
Cardium Compound EPC	Cardium EP Fluid G	Shell Oil Co.
Coglube No. 9	Spray-N-Stay	Continental Oil Co.

TABLE T

SPECIAL PURPOSE OPEN GEAR LUBRICANT

This specification covers a lubricant for use in certain gear drives and is not to be used for general chassis or anti-friction bearing lubrication.

It shall be made from well refined heavy base oils thickened with soda soap and other bodying agents and special extreme pressure additives. This lubricant is to be a fluid product and shall not contain lead soap or sulphur-chlorine additives..

It shall be represented by the supplier as meeting the following specifications.

Penetration:
  unworked ---------- 340
  worked 60 strokes ---------- 330
  worked 5000 strokes ---------- 330
Dropping Point 0°F ---------- 370+
Water resistance ---------- excellent
Rust protection ---------- excellent
Adhesiveness ---------- excellent
Timken OK load-lbs.---------- 35+
Corrosion ---------- None
Color ---------- Black
Saponified Content
  Type ---------- Soda-Lead
  Percent ---------- 15
Base Oil
  Viscosity SUS @ 210°F ---------- 200

Most major oil companies have a product meeting these specifications. Some example brands are:

Gearep G-1 ---- Standard Oil Co. (Ohio)
Marfak HD EP 1 ---------- Texaco, Inc.
Cardium EPB ---------- Shell Oil Co.
Norva EP 375 or
Pen-O-Led EP 350
Humble Oil & Refining Co.
Sun Gear Compound C or
Sunaplex 781 ---------- Sun Oil Co.
Barium Outside Gear

TABLE U
WORM GEAR COMPOUND

This lubricant has long been available as a compound steam cylinder oil. It contains fatty materials such as tallow, lard or degras, and a pour depressant.

If the ambient temperature is consistently below +32°F, drain and refill with SAE 80 straight mineral gear lube or SAE 30 Heavy Duty engine oil (MIL-L-2104C or API Engine Service CC).

TYPICAL PROPERTIES

Viscosity, S.U.S. @ 100°F ----3000-4000
Viscosity, S.U.S. @ 210°F ----- 125-175
Pour Point ------------------- 30°-35°F
Saponification No. ------------- 11-14
Rust Test (ASTM-D-665A)--------- Passed

Most major oil companies have a product meeting these specifications. Some examples are:

Texaco 650T Cylinder Oil - Texaco, Inc.
Marathon 598 Worm Gear Compound ---------- Marathon Oil Co.
Sohio Facto-Cyl 650 Standard Oil Co. (Ohio)
Occident Cylinder Oil or Sunoco Gear Oil 7-C ------ Sun Oil Co.
Citgo Cylinger Oil 140-5 Cities Service Oil Co.
Cylesstic TK 180 Humble Oil & Refining Co.
Mobil Cylinder Oil 600-W -Mobil Oil Co.
Valvata J-78 ---------- Shell Oil Co.
Hector 3000 ---- Phillips Petroleum Co.

TABLE V

HIGH TEMPERATURE LUBRICANT THROW OUT BEARING GREASE

This grease contains unusually high quality sodium soap and is recommended for all types of anti-friction bearings where extended lubrication intervals are necessary.

This grease exhibits a high dropping point to 500°F. and excellent oxidation resistance as shown by 200 + hours in the Bomb Oxidation Test. Mechanical stability, an important property of ball and roller bearing grease, is clearly shown by the small 5 point change in penetration of these greases from an unworked to a worked state.

This type grease is the choice of bearing manufacturers for use in sealed bearings and is especially effective in clutch throw-out ball bearing application requiring a low torque lubricant. Its body permits prompt channeling allowing the bearings to be free running yet perfectly lubricated with a thin film of grease.

TYPICAL PROPERTIES

Penetration
  unworked ---------- 200
  worked 60 strokes ---------- 205
N.L.G.I. Consistency ---------- 4
Dropping Point °F ---------- 500
Color ---------- Brown
Soap Base ---------- Sodium
Base Oil
  Viscosity SUS @ 100°F. ---------- 510
Bomb oxidation @ 210°F
  Hours to 5 psi. Pressure Drop ------- 510

Some Examples Are:

Fiberon AC-------- Standard Oil Co. (Ohio)
Andok C --------- Humble Oil & Refining Co.
Thermatex EP2 ---------- Texaco, Inc.
Mobiltemp 1 ---------- Mobil Oil Co.

TABLE W
HYDRAULIC BRAKE FLUID

At the time of assembly, Galion hydraulic brakes are filled with:

Wagner Lockheed Brake Fluid 21B

This brake fluid is suitable for use at all ambients to -60°F.

Use a fluid that meets the following specifications:

SAE	U.S. government specs.
70R-3	VV-H-910 (H58)

Procedures for making changes of new Lubrication Specifications on Galion Graders, Rollers and Cranes.

The new lubrication specifications are located on Pages 1-4 of this section and are indicated by an asterisk (*). When the existing quantities of the previously utilized lubricants has depleted, it is recommended that the new specifications be used. When changing to the new specifications, the following procedure should be practiced:

It is imperative the new specification lubricants not be mixed with the old specifications in any manner.

1. After the unit has been operated sufficiently to bring the lubricant to normal operating temperature, remove drain plug and completely drain lubricant.

2. After draining, flushing is desirable. Clean and replace drain plug and clean fill plug area. Fill the unit to the correct level with a light flushing oil *(See machine operator's manual for correct oil levels.)* Operate the unit for a short period of time (5-10 minutes) under extremely light or no load condition. Drain *ALL* of the flushing oil from the unit while it is warm. Clean and replace drain plug.

3. To refill, clean the area around the fill plug and fill the unit to the correct level with the new specification lubricant. DO NOT OVERFILL as an excessive amount will serve no useful purpose.

4. Use same level checks and drain intervals outlined in the operator's manual for the new lubricants.

Note: If there is any doubt whether the unit has been filled with the old or new lubricant, the unit should be drained and flushed. Mixing of the lubricants could cause damage and cannot be tolerated.

The following serial numbers indicate factory fill with new speiciciation:

TANDEM CASES

118C	11721 & Up
T-400A	01414 & Up
T-500A	05239 & Up
160L, 160C	02961 & Up
T-600B	02043 & Up

SIDE SHIFT CASES

T-500A	05125 & Up

CIRCLE REVERSE CASE

T-500A ---------- 05125 & Up
118C ---------- 11673 & Up
T-600B ---------- 02034 & Up
T-400A ---------- 01399 & Up

GRADER AXLES

T-600B ---------- 02034
T-500A, L ---------- 05125
T-400A ---------- 01399
118C, 160C ---------- 11673
160L ---------- 02943

CRANE AXLES

90, 100, 110, 125 --- 4815 & Up
90A, 100A, 110A,
125A, 150A -------- 4815 & Up
80 ---------- 4001 & Up