



McLaughlin
BORING SYSTEMS

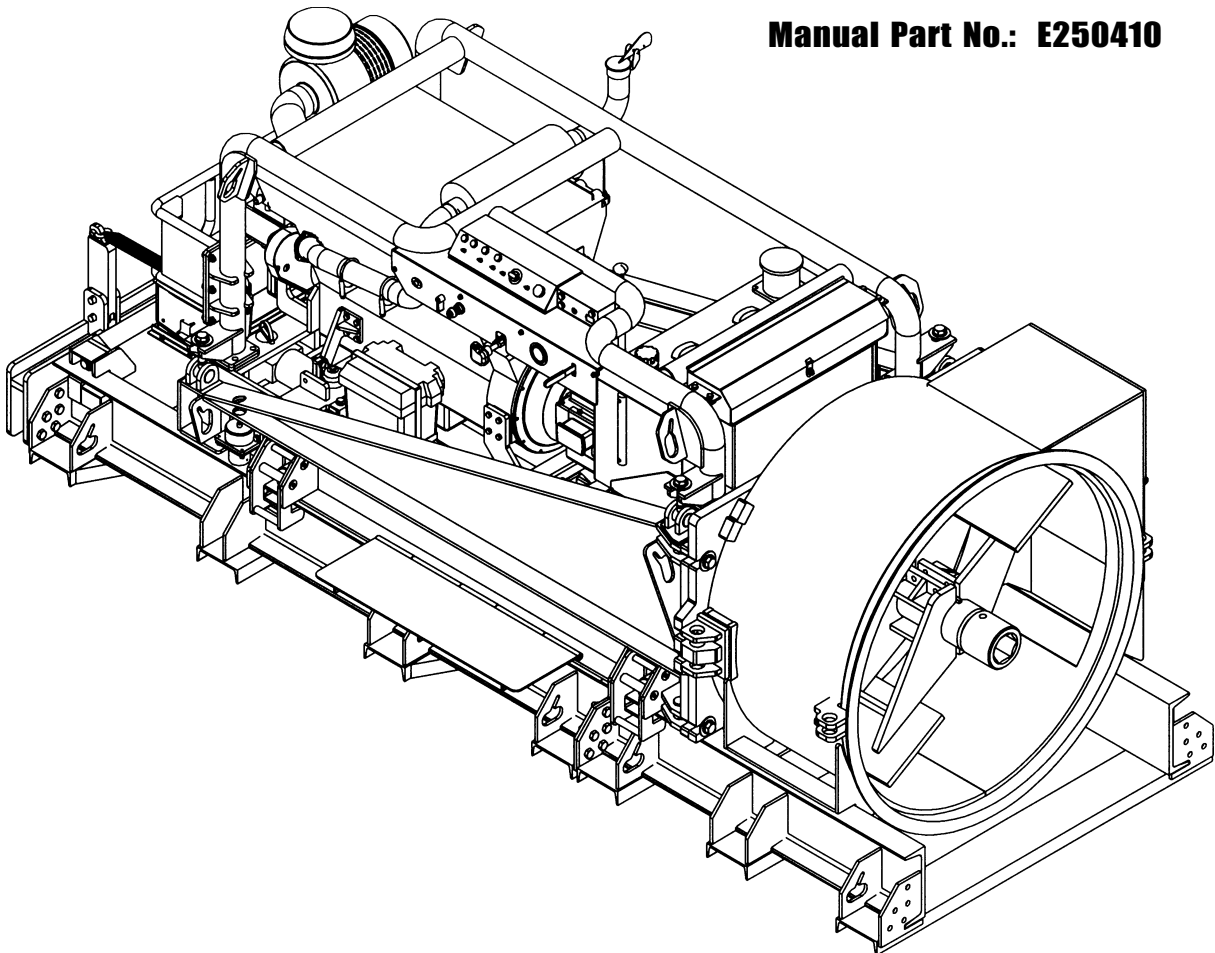
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COMPONENTS AND REPAIR MANUAL

**MODEL McL-54/60
EARTH BORING MACHINE
PART NO. 4810000**

**Machine Serial No.:
54/60 06060608 - Present**

Manual Part No.: E250410



Machine Serial # _____

Purchased &
Serviced Thru: _____

Purchase Date: _____

WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **Wash hands after handling.**

WARNING: The engine exhaust from this product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

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MACHINE SPECIFICATIONS

MCL 54/60

SPECIFICATIONS OF MCL-54/60

EARTH BORING MACHINE

Boring Range:	ENGLISH	METRIC
Cased Bore	16"-54"	41 cm-138 cm

Engine: Air cooled, in-line 6 cylinder diesel, turbo charged
12 VDC electric system
162 hp ISO max. (121 kW) @ 2,500 RPM
139 hp continuous (104 kW) @ 2,500 RPM

Transmission: 5 forward speeds, 1 reverse

Clutch: Hydraulic clutch with Operator Presence Control Switch

Final Drive: Planetary reduction, 4" hex chuck (10 cm)

Auger Torque: 170,000 ft/lbs. peak(230,000 Nm) in 1st gear

Forward Thrust: 950,000 lbs. (4228 kN) max @ 5,000 psi
(345 bar) with infinitely adjustable thrust speed

Dog Plate: Hydraulically activated with dog pin indicators and fast feed

Hydraulic Parameters: 5,000 psi (345 bar) max. system,
pressure comp. pump with load sense, 48 gpm (182) lpm
@ 2,500 RPM, hydraulic tank capacity 58 gallons (219 L),
oil level sight gauge, temp. and cleanout ports.

Hydraulic Filtration:

1. Suction strainer - 100 mesh
2. In-take return filter - 12 micron replaceable element
3. 10 micron spin-on return filter

Fuel Tank: 15 gallon (57 L) capacity with sight gauge

Dimensions

Machine: 74" (188 cm) wide x 12'6" (3.8 m) long x 64" (163 cm) high

Jacking Station: 9,750 lbs. (4,422 kg)

Carriage: 4,200 lbs. (1,905 kg)

Casing Pusher: 1,300 lbs. (590 kg)

Track: 66" (168 cm) wide x 9' (274 cm) long x 14.5" (37 cm) high - 1,500 lbs.(680 kg)

5' Track Extension: 800 lbs. (365 kg)

Machine Centerline: 32.5" (83 cm)

Push Plate: 440 lbs. (200 kg)

McLaughlin Group, Inc. reserves the right to make changes at any time without notice or obligation.

SYSTEM OPERATION SPECIFICATIONS

McL 54/60

Engine

1. Speed Idle: 1050-1150 Max.: 2400-2500
2. Oil SAE 5W-30 or refer to Engine Manual
3. Fuel Commercially available diesel fuel with less than 0.5% sulphur content. Refer to Engine Manual.
4. Fuel Tank Capacity ~ 15 Gallons (56 l.)

Gearbox

Capacity 80-90 wt. gear oil with EP additives

~ 2 Gallons (8 l.)

Transmission

Capacity Synthetic 50 wt. transmission fluid

1.5 Gallons (5.9 l.)

Hydraulic System

- 1 Hydraulic Pump Pressure Compensated w/ Load Sense
Compensator Setting: ~ 5000 psi
Stand-by Setting: ~ 250-300 psi
2. Hydraulic Control Valve Main Thrust System Electric-proportional w/ Manual operation
Relief Valve Setting: ~ 5100 + psi
3. Hydraulic Track Brake (Secondary System) Setting: ~ 800 psi
4. Hydraulic Dog Pins (Secondary System) Setting: ~ 800 psi
5. Hydraulic Clutch (Secondary System) Setting: 225 psi
6. Hydraulic Fluid: 76 Unax AW #46 or equivalent

ISO grade 46, hydraulic fluid with anti-wear additives. Contains additives that provide oxidation resistance, rust and corrosion protection, foaming resistance and have water separating characteristics. Consult McLaughlin Group, Inc. for recommendations on cold weather operation.
7. Hydraulic Tank Capacity ~ 60 Gallons (225 l.)

Electrical System

1. Battery 12V DC w/ 700 CCA Max.
2. Hydraulic Control Valve Main Thrust System 12V DC w/ Valve Driver Card and Potentiometer
.6 Amps to shift valve, 1.8 Amps to shift fully
3. Preheat System 12 V DC w/ manual delay
4. Fuses 12V DC, Inline and panel, SFE and ATO styles
5. Cartridge Valves 12V DC at 1-3 Amps

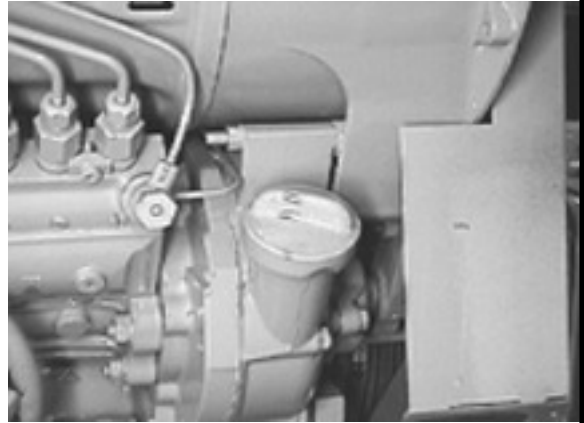
*Specifications subject to change without notice or obligations.

FILTERS AND FILL POINTS

Mcl 54/60

1. Engine Oil Fill - Use only manufacturer's approved oils (Reference section 5.1 Engine Operation).

1



2. Dip Stick - Check daily with engine warm. Fill as needed to the upper dash mark on the

2



3. Oil Filter - Use only manufacturer approved engine filter. Reference section 5.1 Engine Operations for specifications and maintenance.

3, 4



4. Fuel Filter - Use only manufacturer's approved replacement filters. (Reference section 5.1 Engine Operation for maintenance schedule).

5. Fuel Level - Fill as needed with branded grades of diesel fuel with a sulfur content below 0.5% (Reference section 5.1co Engine Operation for approved fuel specifications).

5



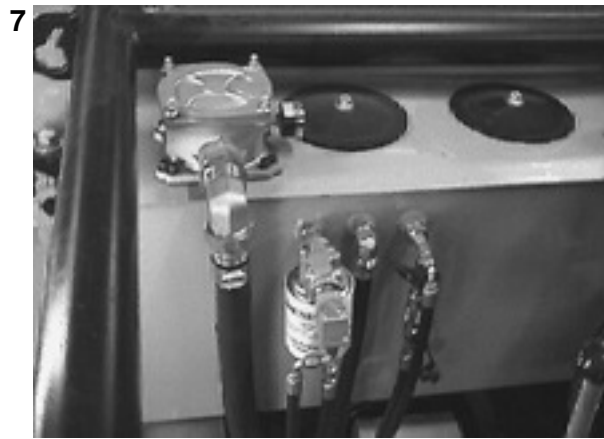
FILTERS AND FILL POINTS

McL 54/60

6. Hydraulic Oil Level - Fill to 1 1/2" below top of tank (with cylinders retracted). Change oil after first 1000 hours of use, then annually.



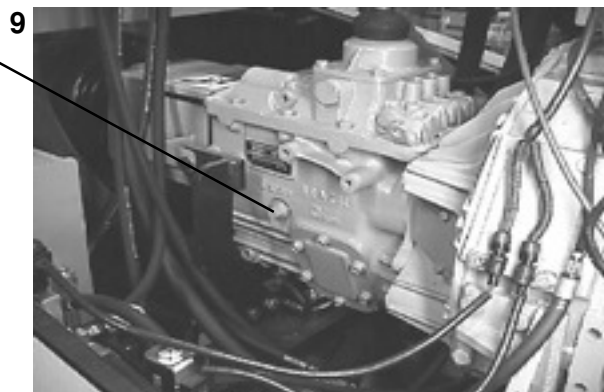
7. Hydraulic Oil Filter - Replace all filters with every engine oil change or if required by filter indicator, whichever comes first. Clean or replace in-tank suction strainer annually when oil is changed.



8. Gearbox Oil Fill - Fill to check point. Change after first 50 hours of use, then every 1000 hours or annually.

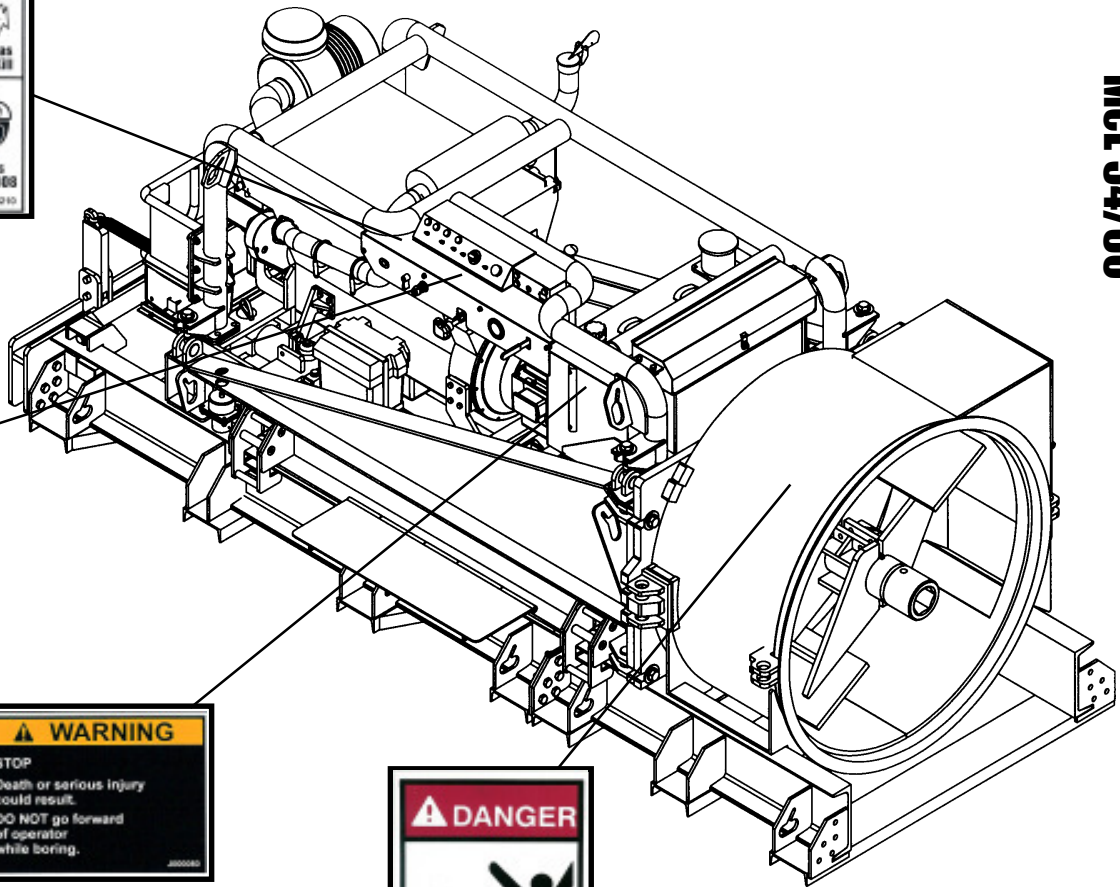


9. Transmission Oil Fill - Fill to check point with #50 synthetic transmission fluid. Change after first 50 hours of use, then every 1000 hours or annually.



10. Engine Air Cleaner - Check air cleaner element condition using the filter indicator. Clean or replace element when indicator is in the "red zone." Clean or replace when required by the filter indicator or annually, which ever comes first. Reference pages 5.1.23 & 5.1.24 of the Engine Operation section for more information.

DECAL PLACEMENT MCL 54/60



J000210 - WARNING
LOCATE UTILITIES



J000020 - WARNING
AVOID DEATH



DECAL APPLICATION:
REMOVE OIL AND DIRT FROM SURFACE.
MAKE SURE SURFACE IS SMOOTH.



J000080 - WARNING
DO NOT GO FORWARD



J000100 - DANGER
ENTANGLEMENT HAZARD



J800030 - INSTRUCTION
OPERATOR'S MANUAL
PLACE ON MANUAL BOX

DECAL PLACEMENT MCL 54/60



J000120 - DANGER
ROTATING BLADES



J000200 - DANGER
MACHINE PARTS



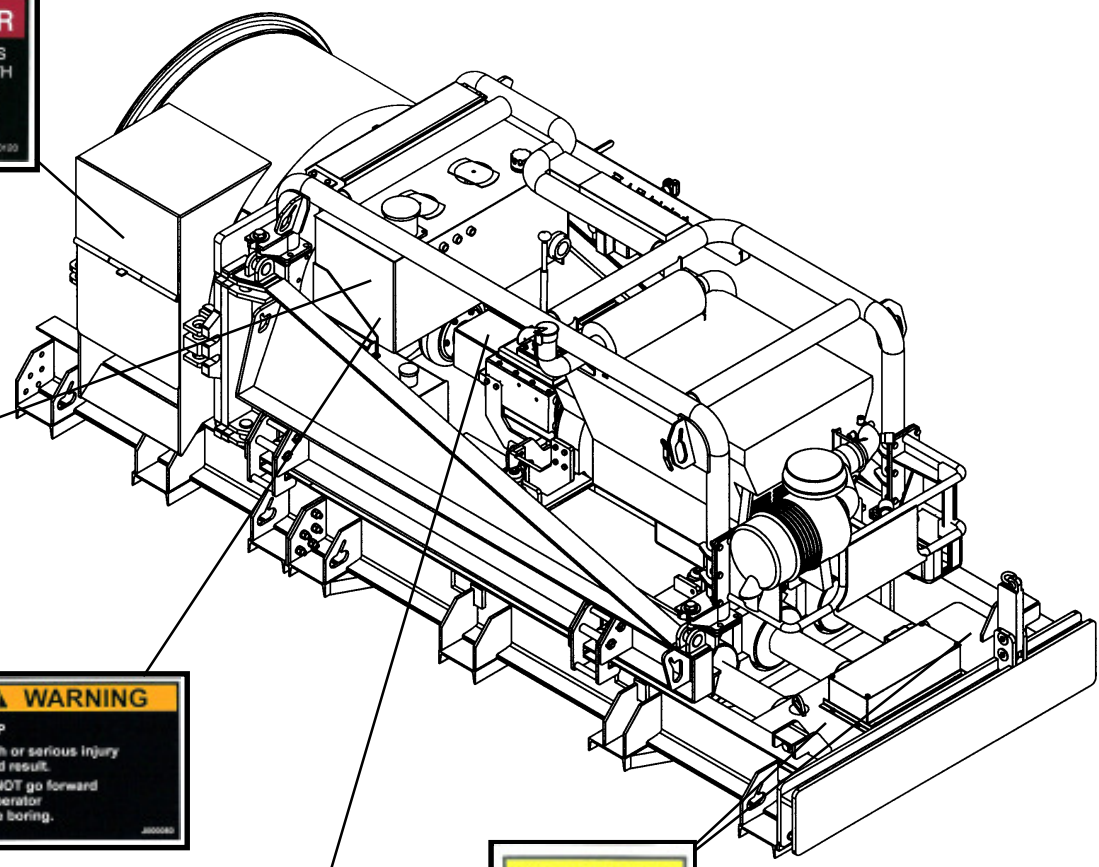
J000080 - WARNING
DO NOT GO FORWARD



J802000 - WARNING
ROTATING SHAFT



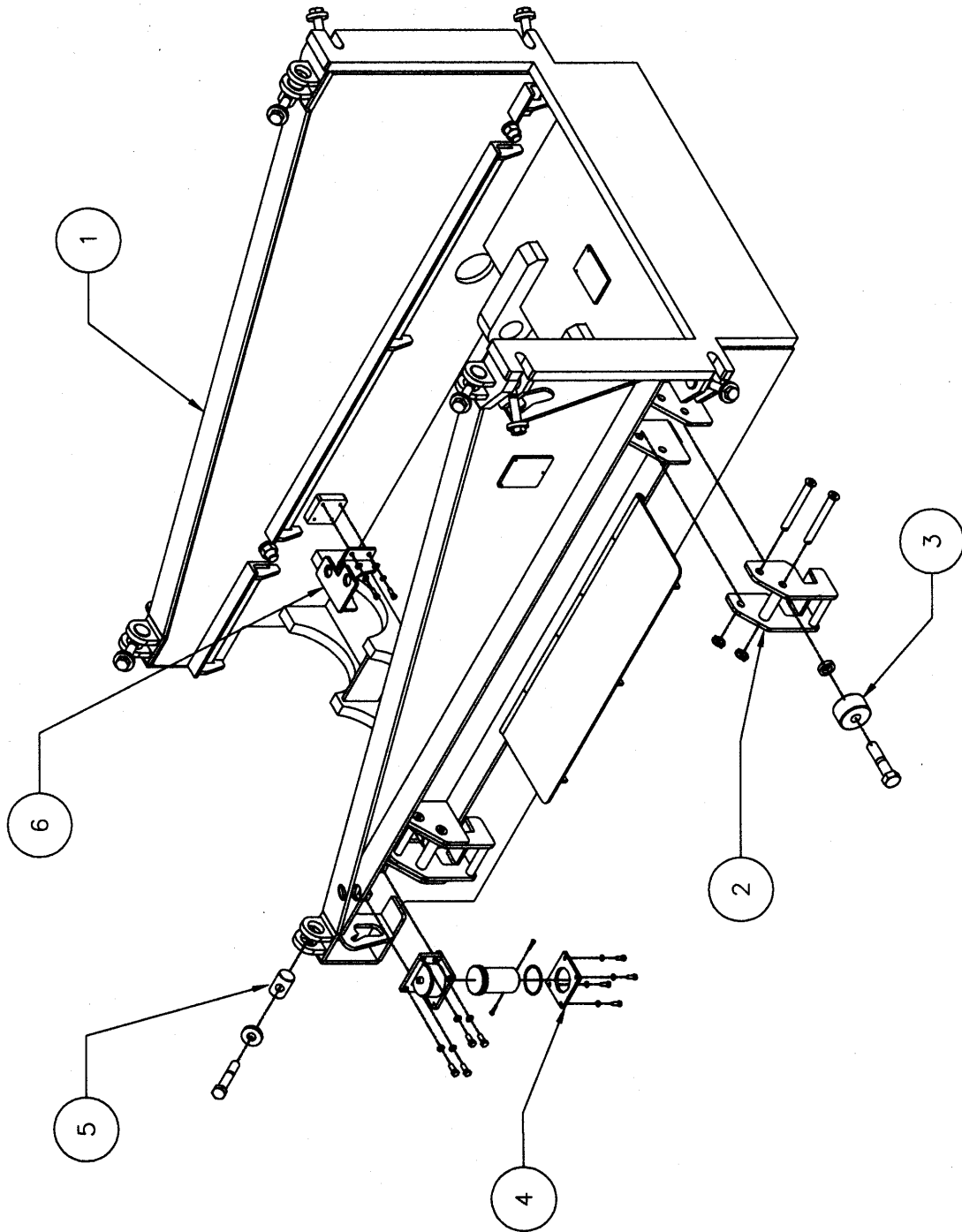
J000160 - CAUTION
PINCH POINT
2 REQUIRED



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JACKING STATION ASSEMBLY

McL 54/60



JACKING STATION ASSEMBLY

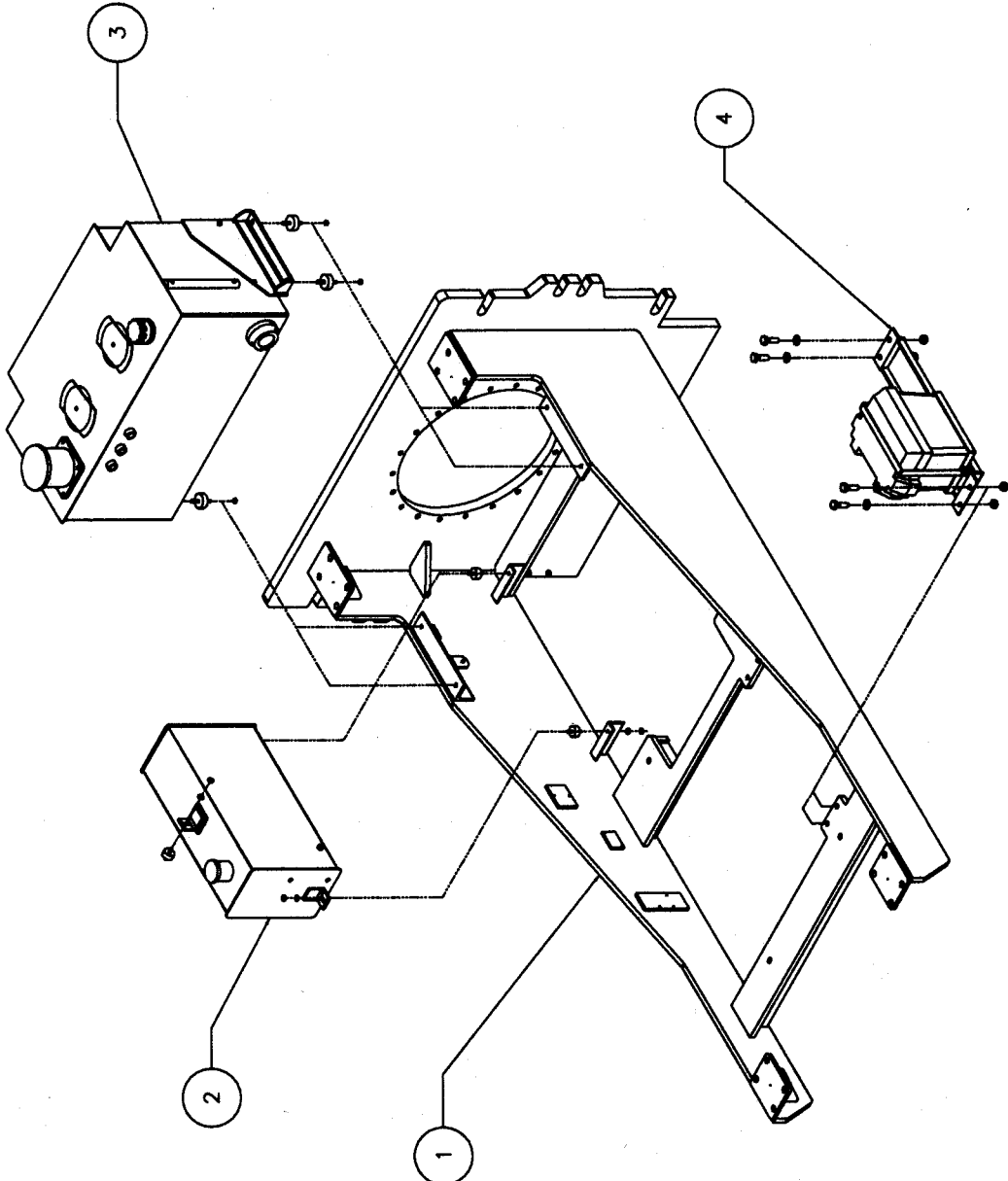
McL 54/60

ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	4810101	Jacking Station
2	4	4810130	Hold Down
	8	4800147	Hold Down Pin
	8	U340065	.25" Linch Pin
	4	W000100	Cam Roller
3	4	4800178	Cam Roller Spacer
	4	U001581	Screw, HC 1.25-7 X 5.50
	4	U210071	Nut, Lock NY 1.25-7
	4	4801110	Track Brake Assembly
4	1	4801111	Track Brake Cylinder
	1	4801113	Mounting Block
	4	U210100	Washer, Lock .500
	4	U000820	Screw, HC .500-13 X 1.25
	1	4801112	Piston
	2	U000080	Screw, HC .250-20 X 1.25
	1	W200215	O-Ring #236
	1	4801114	Stop Plate
	4	U210060	Washer, Lock .375
	4	U000420	Screw, HC .375-16 X 1.00
	5	4	4800149
4		4810129	Anchor Pin
8		4810134	1/2' Heavy Duty Washer
8		U001583**	Screw, HC 1-8 X 6.50 G8
1		4810135	Quick Disconnect Mount
6	4	U000440	Screw, HC .375-16 X 1.25 G8
	4	U200600	Washer, Flat .375
	4	U210060	Washer, Lock .375

** - Use exact grade specified - DO NOT change from original equipment.

CARRIAGE ASSEMBLY

McL 54/60



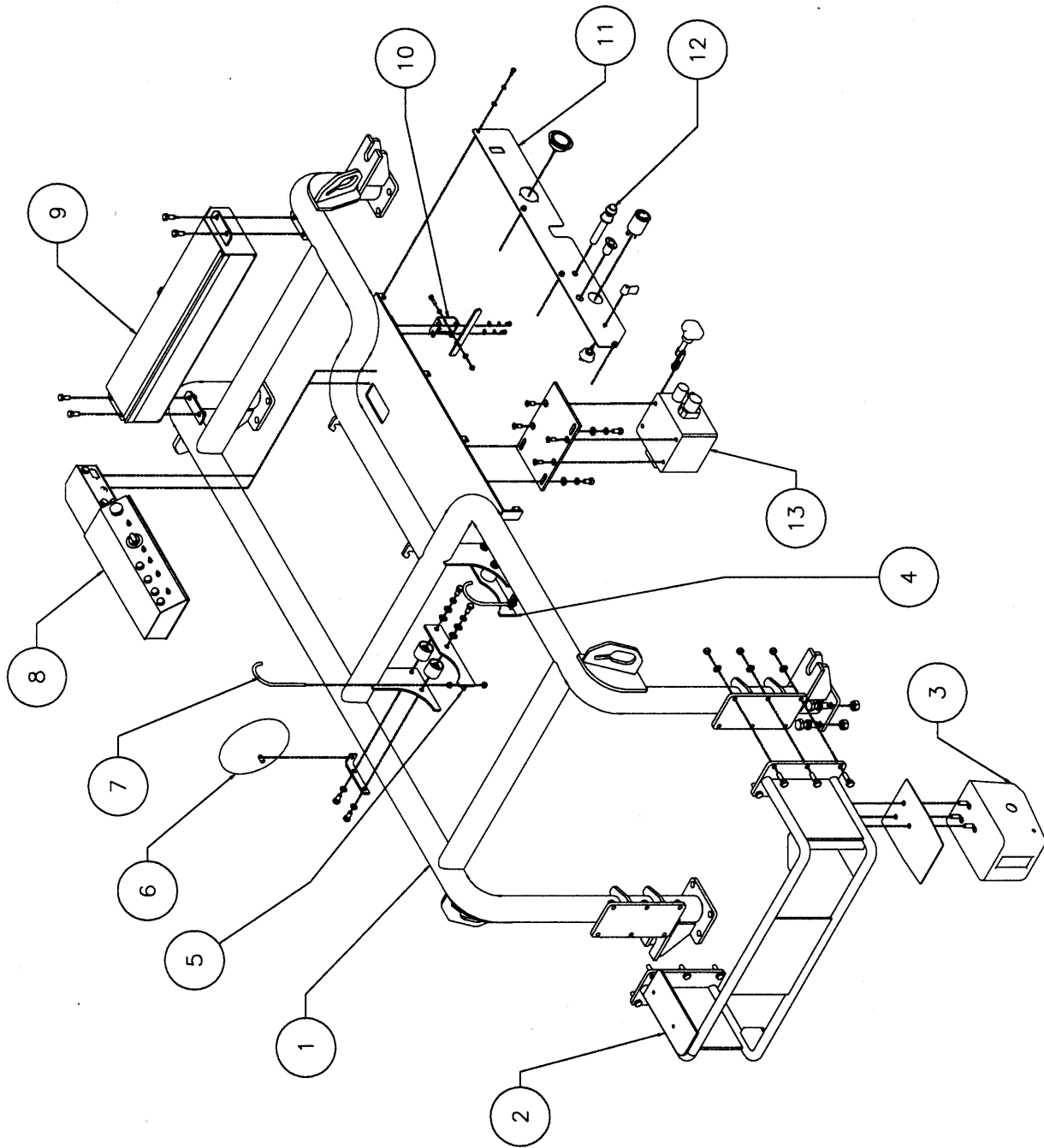
CARRIAGE ASSEMBLY

Mcl 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4810201	Carriage
2	1	4810261	Fuel Tank
	3	4800277	Fuel Tank Mount
	5	U160010	Nut, Jam .375-16
	5	U200060	Washer, Flat .375
3	1	4810700	Hydraulic Tank
	4	4800762	Hydraulic Tank Mount
	8	U120200	Nut, Whiz Lock .375-16
4	1	4810270	Battery Bracket
	4	U001200	Screw, HC .625-11 X 2.00
	4	U100180	Nut, Hex .625-11
	4	U200140	Washer, Flat .625
	1	4810277	Battery Hold Down
	2	U000180	Screw, HC .312-18 X .75
	2	U210040	Washer, Lock .312
	2	U200060	Washer, Flat .375
	1	X400030	Battery Enclosure
	1	X400020	Battery Automotive

ROLL BAR ASSEMBLY

McL 54/60



ROLL BAR ASSEMBLY

Mcl 54/60

ITEM#	QTY.	NUMBER	DESCRIPTION	ITEM#	QTY.	NUMBER	DESCRIPTION
1	1	4810230	Roll Cage	10	1	4801300	Drag Brake Handle Assembly
	16	U001420	Screw, HC .750-10 X 2.50		1	4801301	Drag Brake Handle Bracket
	16	U210160	Washer, Lock .750		2	U200040	Washer, Flat .312
	16	U100200	Nut, Hex .750-10		2	U210040	Washer, Lock .312
2	1	4810232	Pump Roll Cage		2	U000160	Screw, HC .312-18 X .500
	12	U000860	Screw, HC .500-13 X 1.75		1	4801333	Lever
	12	U200100	Washer, Flat .500		1	2050057	Lever Grip
	12	U100120	Nut, Hex .500-13		1	U000220	Screw, HC .312-18 X 1.25
3	1	4800847	Winch		1	U210040	Washer, Lock .312
	1	480084703	Freewheel-Engage Dial		1	U200040	Washer, Flat .312
	1	4810256	Winch Seal Plate		1	U210041	Nut, NyLock .312-18
	3	U000840	Screw, HC .500-13 X 1.50	11	1	4810255	Console Cover Plate
	3	U210100	Washer, Lock .500		4	U000040	Screw, HC .250-20 X .750
	3	U100120	Nut, Hex .500-13		4	U200020	Washer, Flat .250
4	1	4800298	Left Side Muffler Bracket		4	U210020	Washer, Lock .250
	2	4800290	Muffler Isolator		1	4800784	Thrust Pressure Gauge, 5000 psi
	4	U000817	Screw, HC .500-13 X 1.00		1	T720012	Clutch Pressure Gauge, 600 psi
		G8			1	4800829	Power Outlet
	6	U200100	Washer, Flat .500		1	X000400	Tachometer, Operator Switch
	4	U210100	Washer, Lock .500		1	480084702	Winch Operating Switch Knob
5	1	4800297	Right Side Muffler Bracket		1	480024701	Winch Operating Switch
	2	4800290	Muffler Isolator		1	3600116	Throttle Control
	4	U000817	Screw, HC .500-13 X 1.00	12	1	3600115	Throttle Cable
		G8			1	3600131	Throttle Cable Bulkhead Adapter
	6	U200100	Washer, Flat .500		1	4800778	Control Valve
	4	U210100	Washer, Lock .500	13	1	U030110	Screw, SFH .43714 X 1.25
6	1	4800299	Mirror		4	4810710	Valve Handle
	1	4800288	Mirror Bracket		1	3610211	Valve Adapter Plate
7	2	4800295	Muffler Hook		3	U000817	Screw, HC .500-13 X 1.00 G8
	4	U120200	Nut, Whiz, Lock		3	U210100	Washer, Lock .500
8	1	4801215	Operator Console		3	U200100	Washer, Flat .50
	4	U000040	Screw, HC .250-20 X .750				
	4	U210020	Washer, Lock .250				
	4	U200020	Washer, Flat .250				
9	1	4800280	Toolbox				
	4	U000820	Screw, HC .500-13 X 1.25				
	4	U210100	Washer, .500				
	4	U100120	Nut, Hex .500-1				

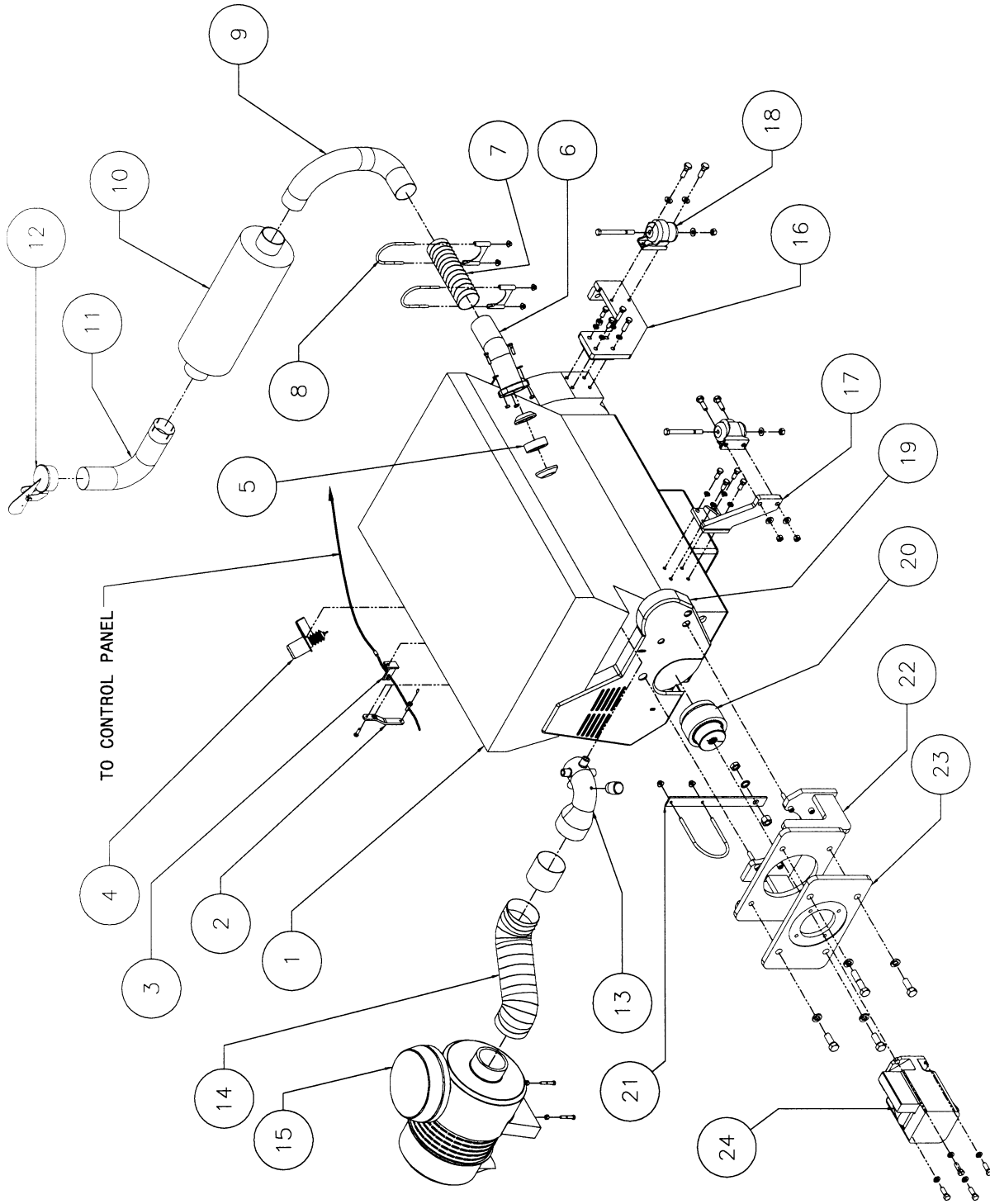
Optional Equipment (Available upon request)

1	1	4810281	Vandal Shield, Control Panel
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POWERTRAIN ASSEMBLY

McL 54/60

HYDRAULIC PUMP DETAIL



POWERTRAIN ASSEMBLY

McL 54/60

HYDRAULIC PUMP

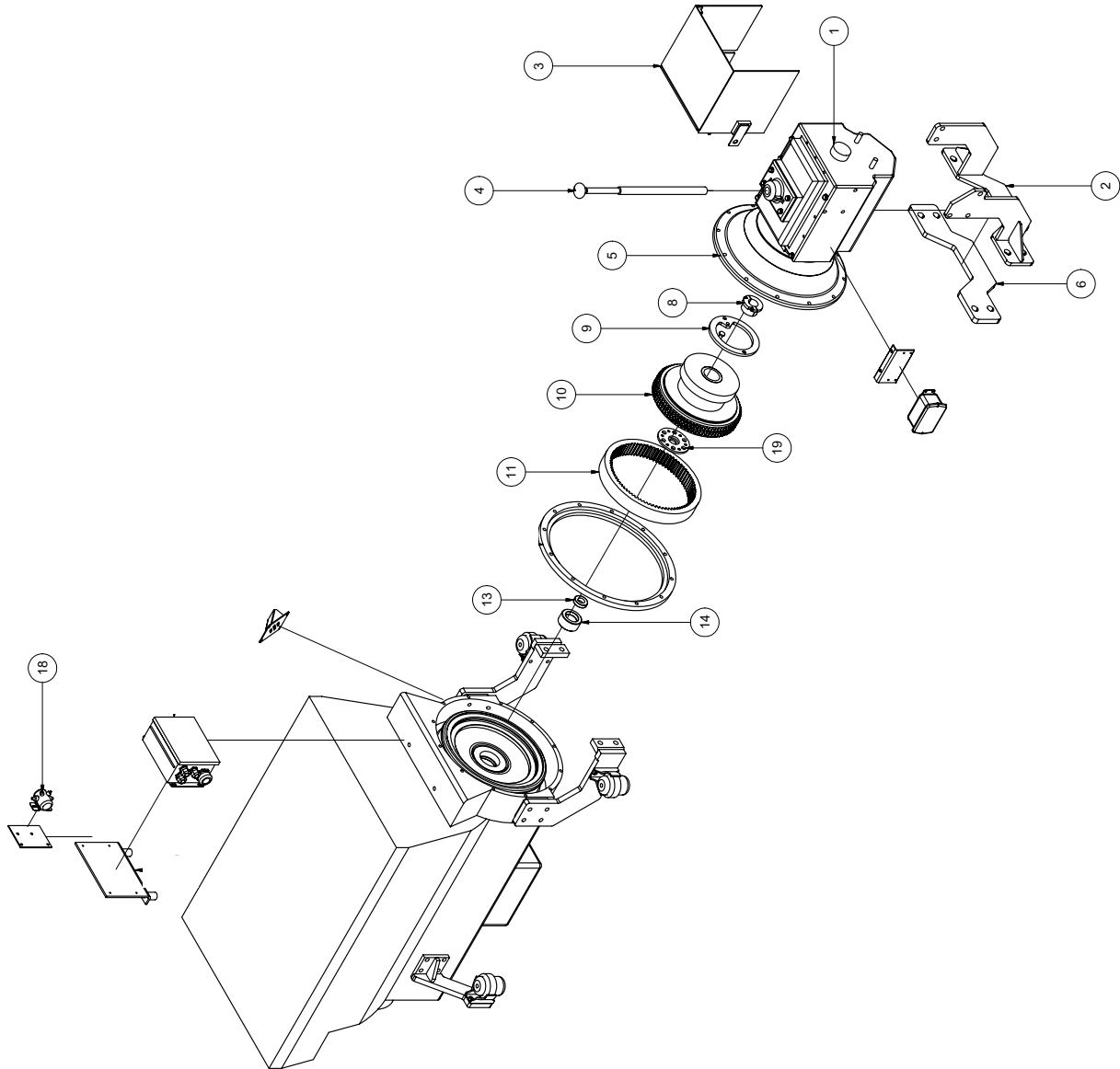
DETAIL

ITEM	QTY	NUMBER	DESCRIPTION	ITEM	QTY	NUMBER	DESCRIPTION
1	1	4812000	ENGINE (DEUTZ)	19	1	4800351	PULLEY GUARD ASSEMBLY
2	1	4800324	THROTTLE CABLE ARM	-	-	480035101	HEX SPACER
	1	U001590	SCREW HC 8MM X 1.25 X 15MM	-	-	480035102	TUBE SPACER
	1	4801108	CABLE LOCK	-	-	480035103	SUPPORT BRACKET
	1	U024010	SCREW SET .250-20 X 0.50	-	-	480035104	HALTER BRACKET
3	1	4800328	BRACKET CABLE BULKHEAD	-	-	480035105	BELT GUARD
	1	3600131	BULKHEAD ADAPTER KIT	-	-	480035106	WASHER
	1	3600115	THROTTLE CABLE	-	-	480035107	SCREW HC 8MM X 20
4	1	4800365	SHUT DOWN SOLENOID	-	-	480035108	SCREW HC 8MM X 200
5	1	4800379	EXHAUST SEAL RINGS	20	1	4800360	HYDRAULIC PUMP COUPLING
6	1	4800364	EXHAUST MANIFOLD ELBOW	21	1	4800361	SUPPORT BAR FOR INTAKE HOSE
	3	U000802	SCREW HC .438-14 X 2.25	1	1	U160020	NUT JAM .750-10
	3	U210080	WASHER LOCK .438	1	1	U220040	WASHER STAR .750
	3	U100100	NUT HEX .438-14	1	1	4800380	U-CLAMP
7	1	4800384	EXHAUST FLEXIBLE HOSE	2	2	U120200	NUT WHIZ LOCK .375-16
8	2	4800341	BRACKET MUFFLER EXHAUST	22	1	4800701	HYDRAULIC PUMP BRACKET
	2	U120205	NUT WHIZ LOCK .312-18	4	4	U010340	SCREW HSH 14MM X 110MM
9	1	4800368	EXHAUST MUFFLER SIDE	4	4	U210230	WASHER LOCK 14MM
10	1	4800381	MUFFLER	4	4	U200310	WASHER FLAT 14MM
11	1	4810308	MUFFLER EXHAUST ELBOW	23	1	4800702	HYDRAULIC PUMP MOUNTING PLATE
12	1	4800378	RAINCAP	1	1	U001485	SCREW HC .750-10 X 3.50
13	1	4800382	AIR FILTER ELBOW	3	3	U001420	SCREW HC .750-10 X 2.50
	1	4200041	AIR FILTER INDICATOR	4	4	U210160	WASHER LOCK .750
14	1	4800383	AIR FILTER FLEXIBLE HOSE	24	1	4800769	HYDRAULIC PUMP
	1	4800369	AIR FILTER ADAPTER	4	4	U210100	WASHER LOCK .500
15	1	4800338	AIR FILTER COMPLETE	4	4	U000900	SCREW HC .500-13 X 2.50
	-	480033801	AIR FILTER OUTER ELEMENT				
	-	480033802	AIR FILTER INNER ELEMENT				
	-	480033803	AIR FILTER HOUSING DUST EJECTOR				
	-	480033804	AIR FILTER HOUSING RAIN CAP				
16	1	4810310	RIGHT SIDE FRONT ENGINE MOUNT				
	1	4810311	LEFT SIDE FRONT ENGINE MOUNT				
	8	U001642	SCREW HC 12MM X 1.75 X 30MM				
	8	U210223	WASHER LOCK 12MM				
	8	U200305	WASHER FLAT 12MM				
17	1	4800207	RIGHT SIDE REAR ENGINE MOUNT				
	1	4800211	LEFT SIDE REAR ENGINE MOUNT				
	8	U001642	SCREW HC 12MM X 1.75 X 30MM				
	8	U210223	WASHER LOCK 12MM				
	8	U200305	WASHER FLAT 12MM				
18	4	4800352	ENGINE ISOLATOR				
	4	U001020	SCREW HC .500-13 X 5.50				
	8	U000806	SCREW HC .500-13 X 0.75				
	12	U200100	WASHER FLAT .500				
	12	U120120	NUT LOCK .500				

POWERTRAIN ASSEMBLY

MCL 54/60

TRANSMISSION DETAIL



POWERTRAIN ASSEMBLY

McL 54/60

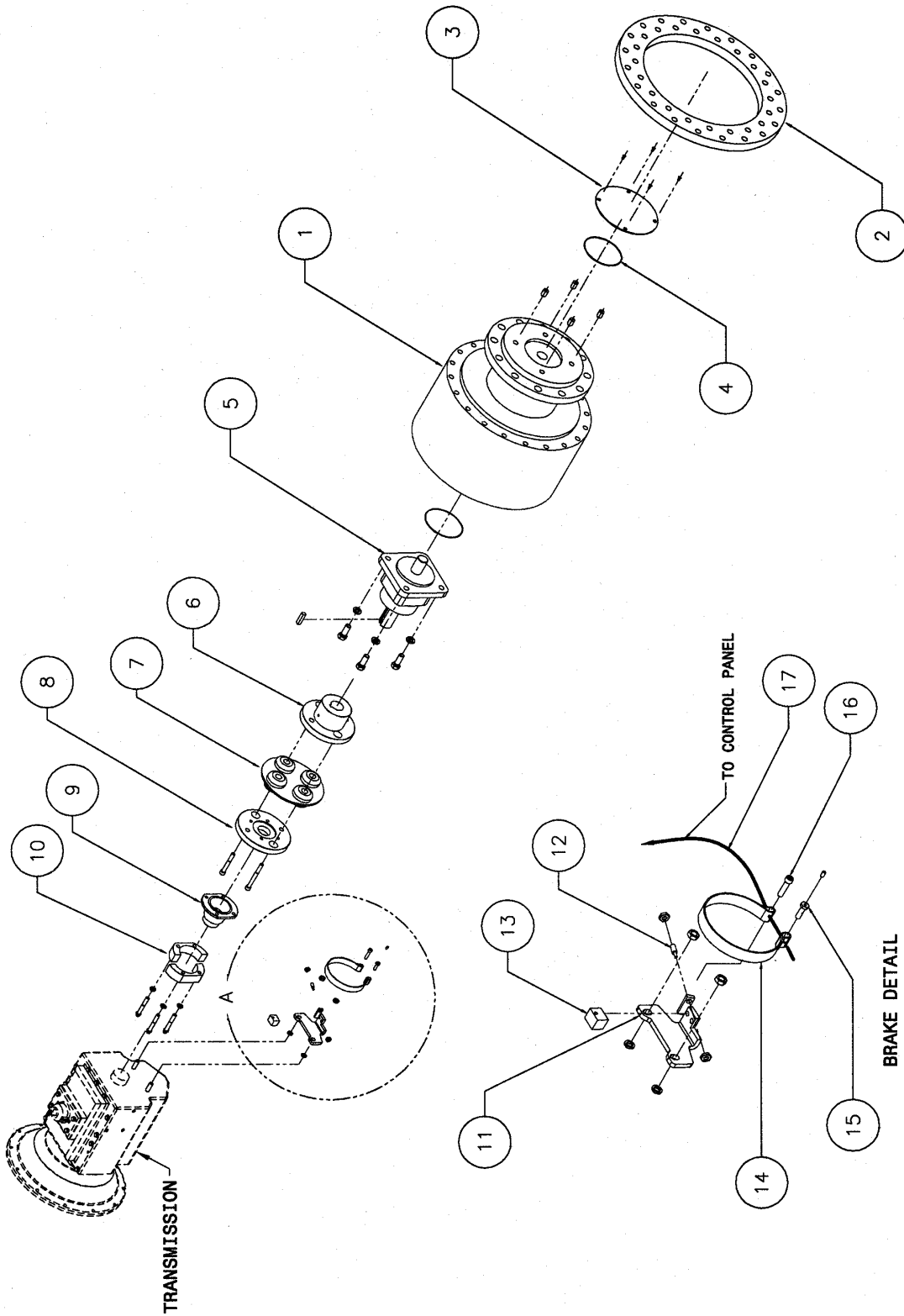
TRANSMISSION DETAIL

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4800346	Transmission
2	1	4810312	Transmission Support Weldment
	4	U001360	Screw, HC .750-10 X 1.50
	4	U210160	Washer, Lock .750
	5	U001642	Screw, HC 12mm X 1.75 X 30mm
	5	U210223	Washer, Lock 12mm
3	1	4810346	Coupling Guard
	3	U000440	Screw, HC .375-16 X 1.25
	3	U200600	Washer, Flat .375
4	1	480034601	Transmission Shaft Rod
	1	480034602	Transmission Shaft Knob
5	1	4800369	Bell Housing
	2	4800355	Bell Housing Side Cover (Not Shown)
	12	U001620	Screw, HC 10mm X 1.50 X 25mm
	12	U210220	Washer, Lock 10mm
6	1	4810322	Eng/Trans Support Spacer
8	1	4810385	Clutch Sleeve
9	1	4810379	Ant-Rotation Bracket
10	1	4810399	Hydraulic Clutch - Model 211
11	1	4810398	Clutch Drive Shell
13	1	4800387	Bearing
14	1	4810384	Bearing Carrier
18	1	X000047	V-Belt Solenoid
	1	4801309	Bracket, V-Belt Solenoid
	2	U000040	Screw, HC .250-20 X .750
	2	U200020	Washer, Flat .25
19	1	4810389	Clutch Capture Spacer
	6	U030050	Screw, SFH .3125-18 x .750

POWERTRAIN ASSEMBLY

Mcl 54/60

GEARBOX DETAIL



POWERTRAIN ASSEMBLY

MCL 54/60

GEARBOX DETAIL

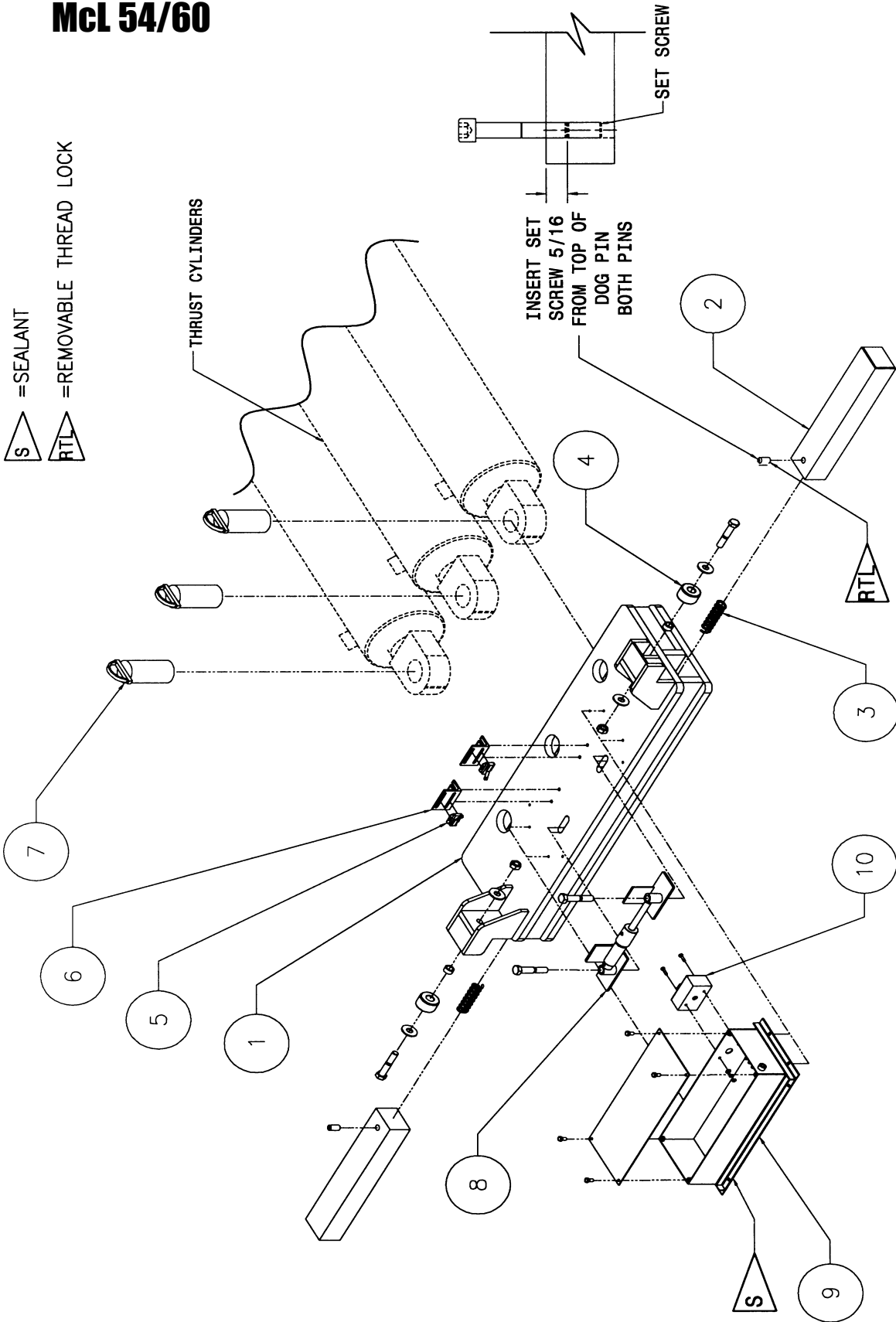
ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4800302	Gearbox
	4	4800307	Gearbox Seal Plate Threaded Insert
2	1	4800103	Gearbox Adapter Ring
	40	U001440	Screw, HC .750-10 x 2.00 (Not Shown)
	40	U210160	Washer, Lock .750 (Not Shown)
3	1	4800306	Gearbox Seal Plate
	4	U030010	Screw, SFH .250-20 X .563
4	2	W200195	O-Ring
5	1	4800348	Shaft, Input Adapter
	4	U001380	Screw, HC .750-10 X 2.00
	4	U210160	Washer, Lock .750
	1	U420041	Key
6	1	4810334	Coupling Round Flange
	2	U240030	Screw, Set .375-16 x 1.50
7	1	4810331	Center Member
8	1	4810332	Coupling Adapter Plate
	2	U010250	Screw, HSH .500-13 X 3.75
	2	U010261	Screw, HSH .500-13 X 4.75
	2	U100140	Nut, Hex .500-13
9	1	4810333	Companion Flange
10	1	4800395	Drag Brake Disk
	4	U210110	Washer, H-C .500
	4	U070030	Screw, CB, 12Pt. .500-13 X 3.25
11	1	4810338	Drag Brake Mount
	2	U200100	Washer, Flat .500
	2	U120015	Nut, Nyloc.500-20
12	2	3600131	Bulkhead Adapter Kit Contains: 1 Field Hub 2 Nut, Jam
13	1	4810336	Drag Brake Mounting Block
14	1	4801306	Brake Band
15	1	4801303	Brake Band Cable Lock
		U024010	Screw, Set .250-20 X .500 KN Cup
16	1	U022155	Screw, Shoulder .375 x 1.00
17	1	3600115	Throttle Cable

Optional Equipment (Available upon request)

1	1	4810360	Vandal Shield, Powertrain
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DOG PLATE ASSEMBLY

MCL 54/60



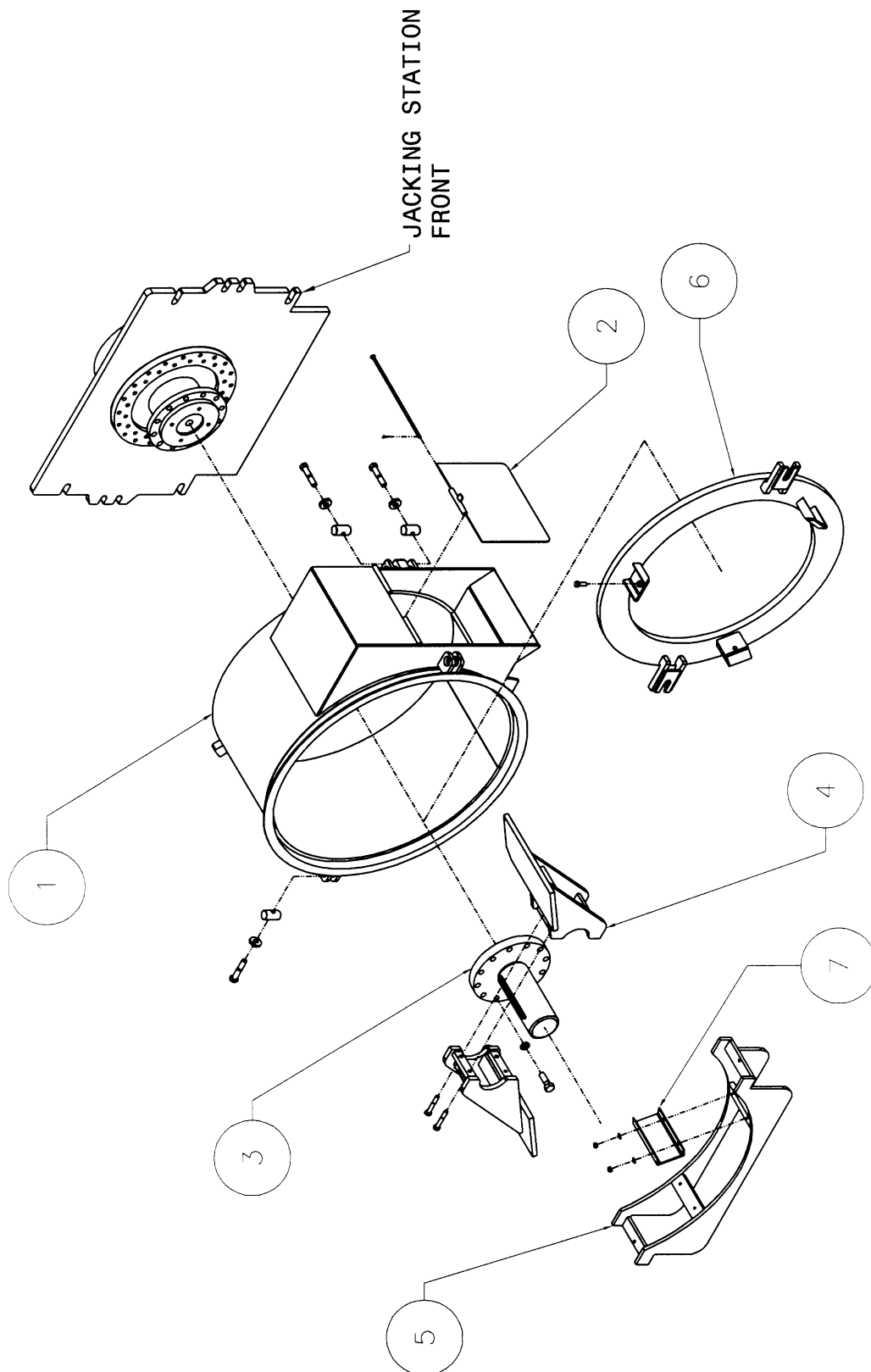
DOG PLATE ASSEMBLY

MCL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4800435	Dog Plate
2	2	4800410	Dog Pin
3	2	U600060	Dog Pin Compression Spring
4	2	W000070	Dog Plate Roller
	2	4800418	Roller Spacer
	2	U001505	Screw, HC .750-10 X 4.00
	4	U200160	Washer, Flat, Large .750
	2	U100200	Nut, HC .750-10
5	2	4800808	Dog Plate Switch
6	2	4800437	Switch Mount
	4	U000060	Screw, HC .250-20X1.00
	4	U100020	Nut, Hex .250-20
	4	U200020	Washer, Flat .250
7	3	4800430	Cylinder Pin
8	1	4801710	Dog Pin Cylinder
	2	U001505	Screw, HC .750-10 X 4.00
9	1	4810401	Cylinder Cover Box
	1	4800425	Top Cover
	8	U000400	Screw, HC .375-16 X .750
	8	U210060	Washer, Lock .375
	4	U000400	Screw, HC .375-16 X .750
	4	U200060	Washer, Flat .375
10	1	4800412	Outlet Box
	1	4800413	Outlet Cover
	1	4800414	Outlet Grommet
	2	U000060	Screw, HC .250-20 X 1.00
	2	U210020	Washer, Lock .250
	2	U200020	Washer, Flat .250
	2	U120100	Nut, Lock .250-20

54 CASING PUSHER/SPOIL EJECTOR

McL 54/60



54 CASING PUSHER/SPOIL EJECTOR

McL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4810501	54" Casing Pusher, Complete
	4	4810129	Anchor Pins
	4	4810134	Tie Down
	4	U001570	Screw, HC 1-8 X 5.00 G5
2	1	4800514	Spoil Door
	1	4800550	Hinge Rod
	1	U320015	Pin, Cotter .125 X 1.00
3	1	4800515	4" Hex Chuck
	12	U001584	Screw, HC 1.125-12 X 3.50
	12	U210210	Washer, Lock 1.125
4	1	4800526	54" Paddle Assembly
5	1	4800520	Saddle

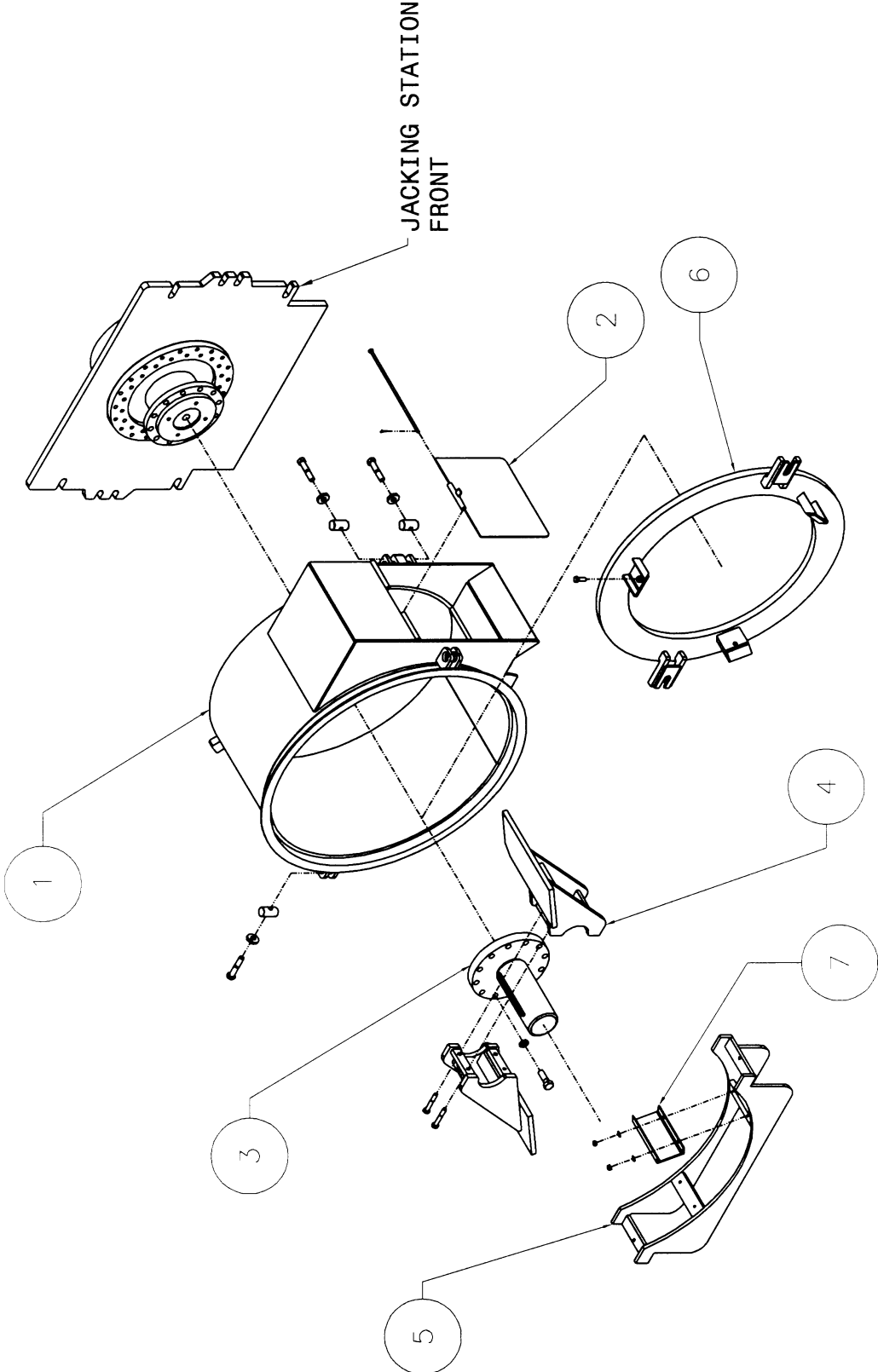
Optional Equipment

(Available upon request)

6	A800180	Adapter Kit, 18"
	A800200	Adapter Kit, 20"
	A800240	Adapter Kit, 24"
	A800300	Adapter Kit, 30"
	A800360	Adapter Kit, 36"
	A800420	Adapter Kit, 42"
	A800480	Adapter Kit, 48"
	U020120	Screw, SQ .750-10 x 3.50 (3 Req'd)
7	A80020S	Shoe, 20" Adapter
	A80024S	Shoe, 24" Adapter
	A80030S	Shoe, 30" Adapter
	A80036S	Shoe, 36" Adapter
	A80042S	Shoe, 42" Adapter
	A80048S	Shoe, 48" Adapter
	U000880	Screw, HC .500-13 X 2.00 (4 Req'd)
	U210100	Washer, Lock .500 (4 Req'd)
U100120	Nut, Hex .500-13 (4 Req'd)	

48 CASING PUSHER/SPOIL EJECTOR

McL 54/60



48 CASING PUSHER/SPOIL EJECTOR

McL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4810521	48" Casing Pusher, Complete
	4	4810129	Anchor Pins
	4	4810134	Tie Down
	4	U001570	Screw, HC 1-8 X 5.00 G5
2	1	4800514	Spoil Door
	1	4800550	Hinge Rod
	1	U320015	Pin, Cotter .125 X 1.00
3	1	4800515	4" Hex Chuck
	12	U001584	Screw, HC 1.125-12 X 3.50
	12	U210210	Washer, Lock 1.125
4	1	4800526	54" Paddle Assembly
	1	4800520	Saddle

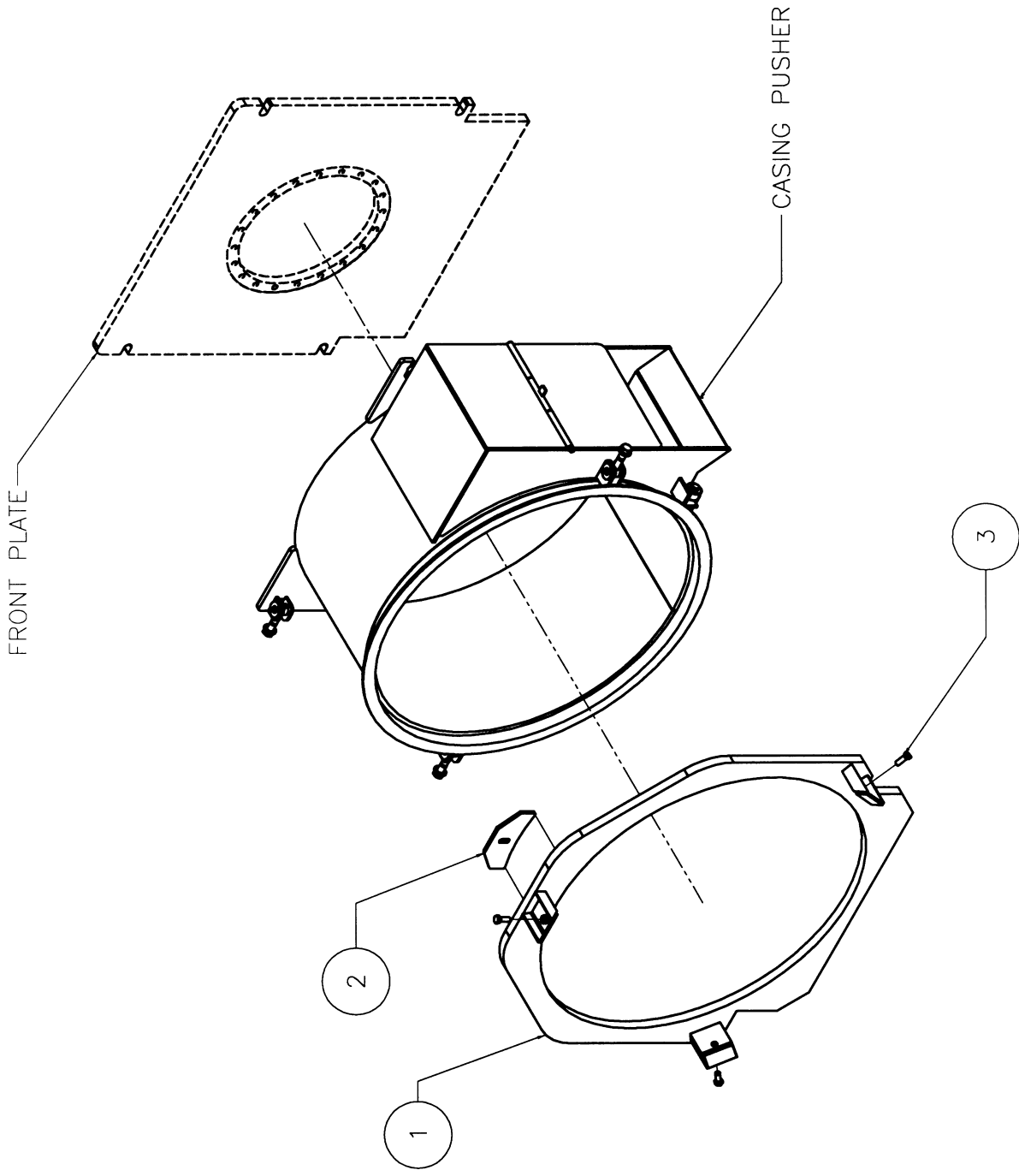
Optional Equipment

(Available upon request)

6	A700180	Adapter Kit, 18"
	A700200	Adapter Kit, 20"
	A700240	Adapter Kit, 24"
	A700300	Adapter Kit, 30"
	A700360	Adapter Kit, 36"
	A470020	Adapter Kit, 42"
7	U020120	Screw, SQ .750-10 x 3.50 (3 Req'd)
	A70020S	Shoe, 20" Adapter
	A70024S	Shoe, 24" Adapter
	A70030S	Shoe, 30" Adapter
	A70036S	Shoe, 36" Adapter
	A70042S	Shoe, 42" Adapter
	U000880	Screw, HC .500-13 X 2.00 (4 Req'd)
	U210100	Washer, Lock .500 (4 Req'd)
	U100120	Nut, Hex .500-13 (4 Req'd)

60 ADAPTER

McL 54/60



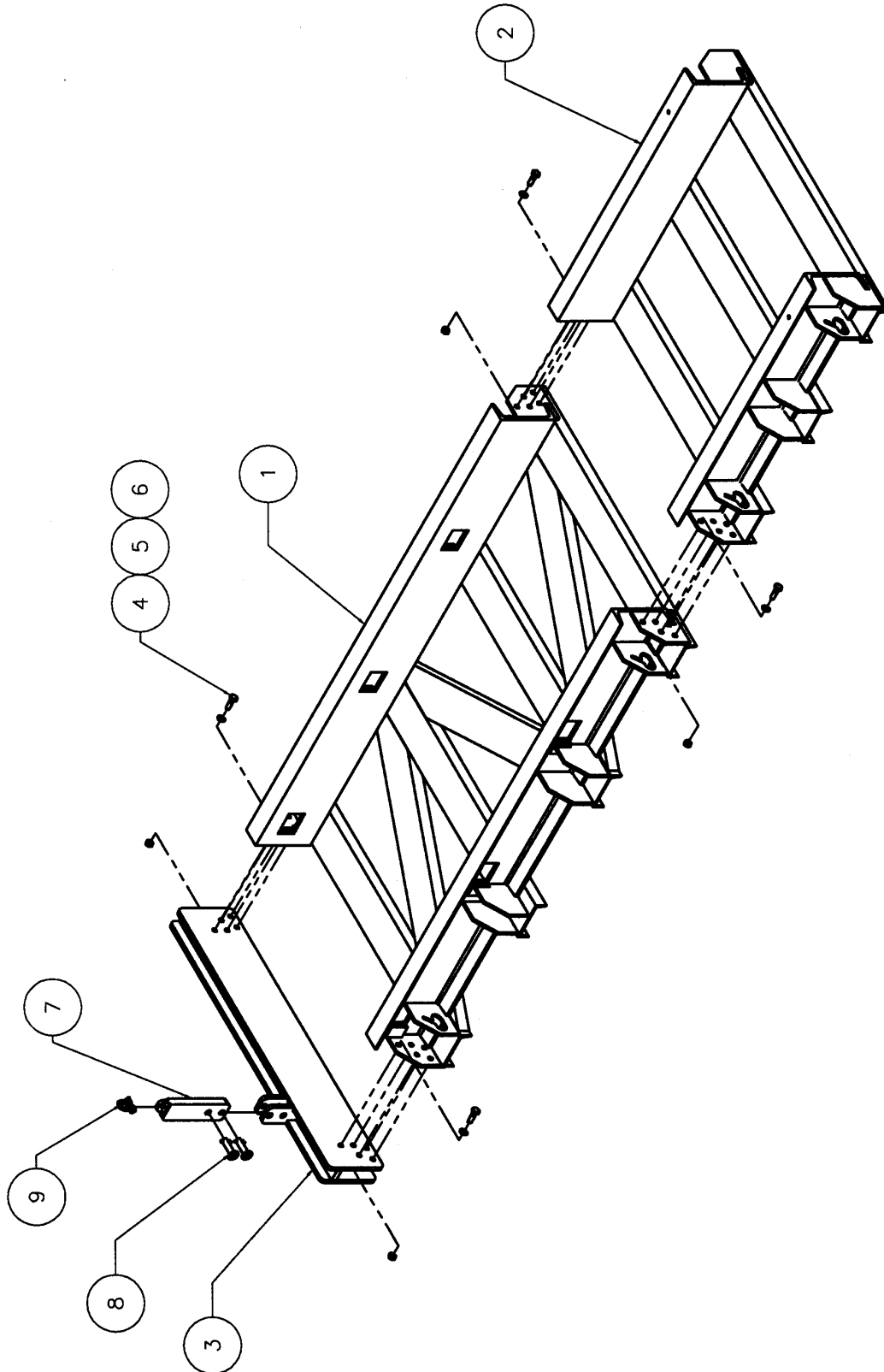
60" ADAPTER

McL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4800555	60" Adapter
2	1	4800557	Bracket, Back Support
3	3	U020120	Screw, SQ .75-10 X 2.00

MASTER TRACK ASSEMBLY

MCL 54/60



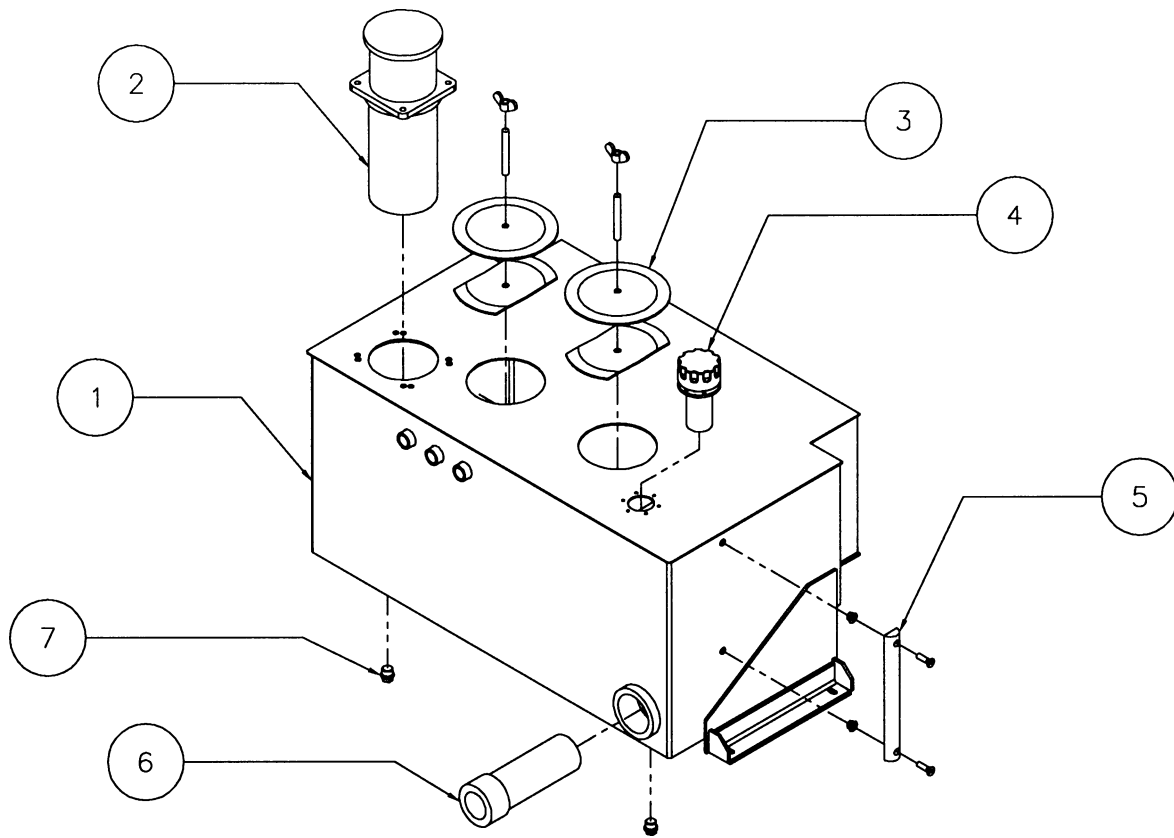
MASTER TRACK ASSEMBLY

MCL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	3	4800632	Track
2	1	4800631	Extension Track
3	1	4800620	Push Plate
4	40	U001420	Screw, HC .75-10 X 2.50
5	40	U210160	Washer, Lock .750
6	40	U100200	Nut, Hex .750-10
7	1	4800645	Anchor Bar
8	2	4800648	Anchor Bar Pin
	2	U320020	Pin, Cotter .125 X 1.50
9	1	4800650	Anchor Bar Shackle

HYDRAULIC TANK ASSEMBLY

MCL 54/60



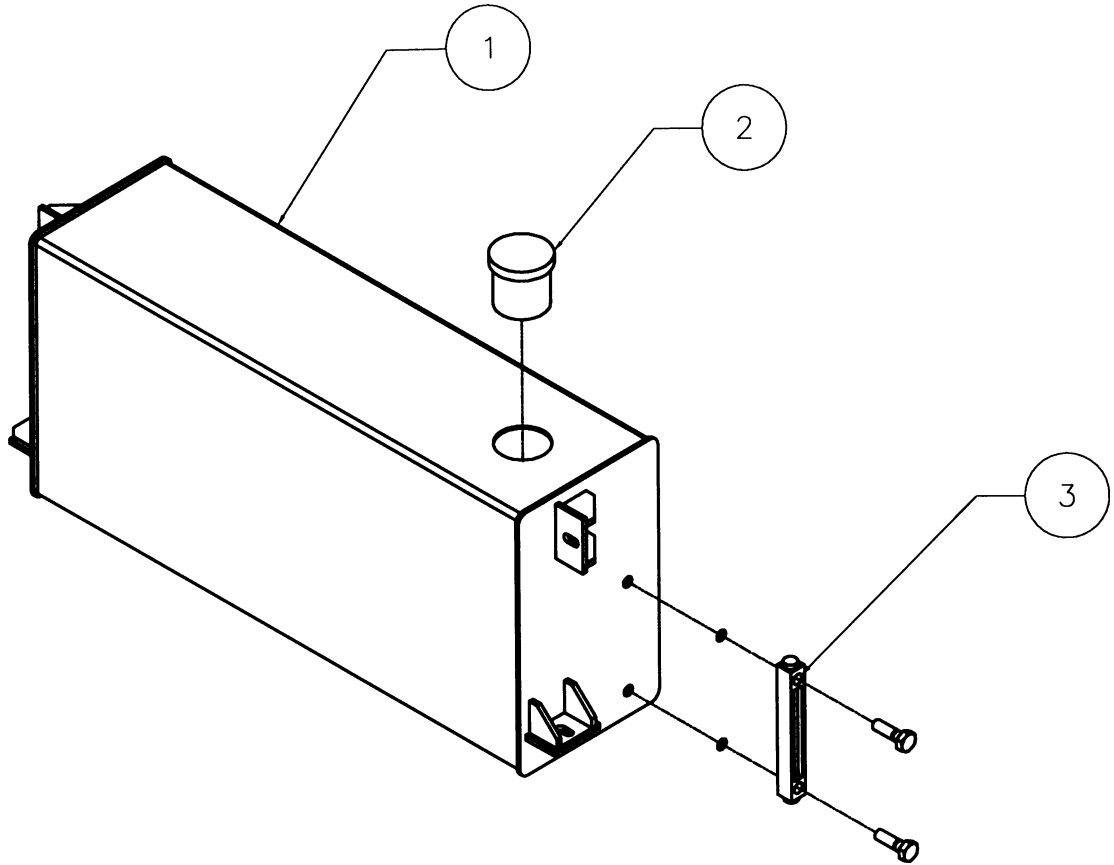
HYDRAULIC TANK ASSEMBLY

MCL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4810701	Hydraulic Tank
2	1	4800723	Return Filter Assembly
	1	4801708	(Filter Element Only)
3	2	4800758	Clean-Out Cover Kit
4	1	4800759	Fill Assembly Kit
5	1	T720060	Sight Gauge Kit
6	1	4800761	Suction Strainer
7	2	T405060	Drain Plug

FUEL TANK ASSEMBLY

MCL 54/60



FUEL TANK ASSEMBLY

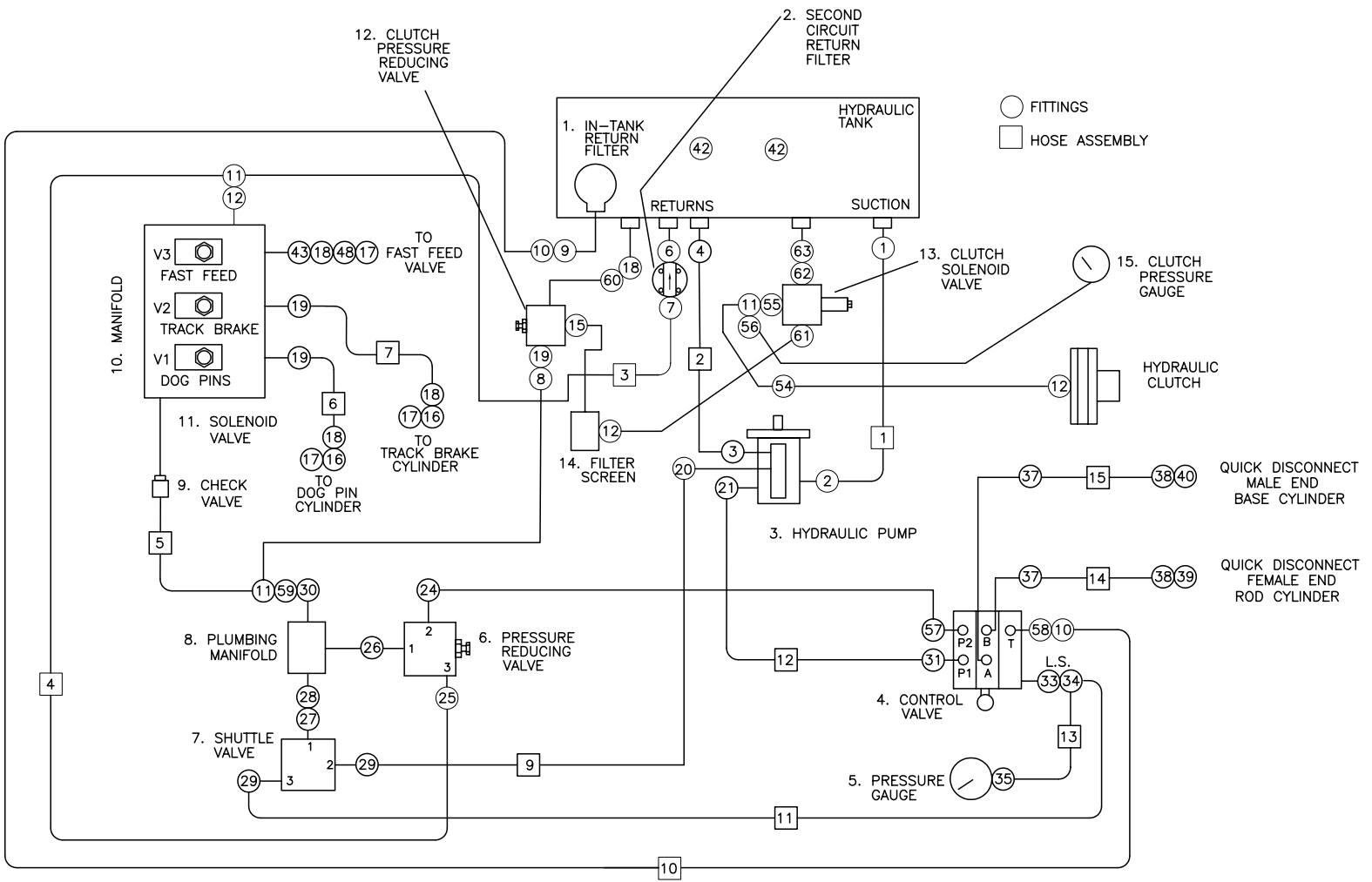
MCL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	4810261	Fuel Tank
2	1	4800278	Lockable Fuel Cap Kit
3	1	8010006	Sight Gauge, 6" Kit

HYDRAULIC SYSTEM

MCL 54/60

GARRIAGE



4.1.1

See page 4.1.2 for fittings and components callout

HYDRAULIC SYSTEM

MCL 54/60

CARRIAGE

4.1.2

	FITTING DESCRIPTION	PART NO.
1	ELBOW, 45 32MP-32MJ	T401565
2	KIT #32 SPLIT FLANGE COMPLETE	T410450
3	ELBOW, 90 10MB-12MJ	T401581
4	ELBOW, 90 12MP-12MJ	T401180
5	UNION, 12MP-6MJ	T400085
6	UNION, 12MP-12MP	T400800
7	UNION, 12MP-6MJ	T400085
8	ELBOW, 90 6FJ-6MJ	T401228
9	UNION, 24MB-24MJ	T400580
10	ELBOW, 90 24FJ-24MJ	T401730
11	TEE, 6FJ-6MJ-6MJ	T402153
12	ELBOW, 90 6MB-6MJ	T401250
13	-	
14	-	
15	UNION, 6MB-6MB	T400038
16	QUICK DISC., FEMALE 6FP	T412009
17	DUST CAP, QUICK DISC., 6FP	T412010
18	UNION, 6MP-6MJ	T400028
19	UNION, 6MB-6MJ	T400037
20	UNION, 4MB-4MJ	T400570
21	ADAPTER, SPLIT FLANGE 16FB	4800767
22	UNION, 8MB-8MJ	T400140
23	UNION, 16MB-16MF	T400545
24	ELBOW, 90 6MB-8MJ	T401260
25	ELBOW, 90 6MB-6MJ	T401250
26	UNION, 6MB-6MB	T400038
27	UNION, 8MB-10MJ	T400400
28	UNION, 10FJ-6MJ	T403130
29	UNION, 8MB-4MJ	T400134
30	ELBOW, 90 10MB-8MJ	T401300
31	UNION, 16MB-16MF	T400545
32	-	
33	UNION, 4MB-4MJ	T400570
34	TEE, 4FJ-4MJ-4MJ	T402010
35	UNION, 4FP-4MJ	T400110
36	-	
37	UNION, 16MB-16MF	T400545
38	UNION, 16MF-16MP	T400546
39	QUICK DISC., MALE 16FP	4800775
40	QUICK DISC., FEMALE 16FP	4800776
41	-	
42	PLUG, 8MP	T405062
43	O-RING #6 SAE	W200015
44	-	
45	ELBOW, 90 6FJ-6MJ	T401228
46	UNION, 6FJ-6FP	T400083
47	UNION, 6MP-6MP	T400803
48	QUICK DISC., MALE 6FP	T412008
49	UNION, 12MP-8FP	T403065

	FITTING DESCRIPTION	PART NO.
50	UNION, 8MP-6FP	T404010
51	UNION, 6MP-6MB	T400027
52	UNION, 8FJ-6MB	T400710
53	TEE, 6MB-6MJ-6MJ	T402148
54	BULKHEAD, 6MJ-6MJ	T400391
55	UNION, 10MB-6MJ	T400035
56	UNION, 6FJ-4MJ	T400039
57	UNION, 6MJ-5MB	T400033
58	UNION, 24MJ-16MB	T400290
59	UNION, 8FJ-6MJ	T400705
60	UNION, 6MB-6FJ	T400036
61	ELBOW, 90 10MB-6MJ	T401290
62	UNION, 10MB-8MJ	T400160
63	UNION, 8FJ-6MP	T400142

	HYDRAULIC COMPONENTS	PART NO.
1	IN-TANK RETURN FILTER	4800723
2	SECOND CIRCUIT RETURN FILTER	T700080
3	HYDRAULIC PUMP	4800769
4	CONTROL VALVE	4800778
5	PRESSURE GAUGE	4800784
6	PRESSURE REDUCING VALVE	-
	BODY	4800765
	CARTIDGE	4801720
7	SHUTTLE VALVE	-
	BODY	4801700
	CARTIDGE	4801703
8	PLUMBING MANIFOLD	2400367
9	CHECK VALVE	4800785
10	MANIFOLD, SECOND CIRCUIT	4810713
11	SOLENOID VALVE (V1, V2 & V3)	-
	CARTIDGE	4801701
	COIL	4801702
12	CLUTCH PRESSURE REDUCING VALVE ASSEMBLY	4810712
13	CLUTCH SOLENOID VALVE	-
	CARTIDGE	3600345
	BODY	3600346
	COIL	3600347
14	FILTER SCREEN ASSEMBLY	-
	FILTER SCREEN CARTIDGE	2400368
	FILTER SCREEN BODY	2400367
15	CLUTCH PRESSURE GAUGE (0-600 PSI)	T720012

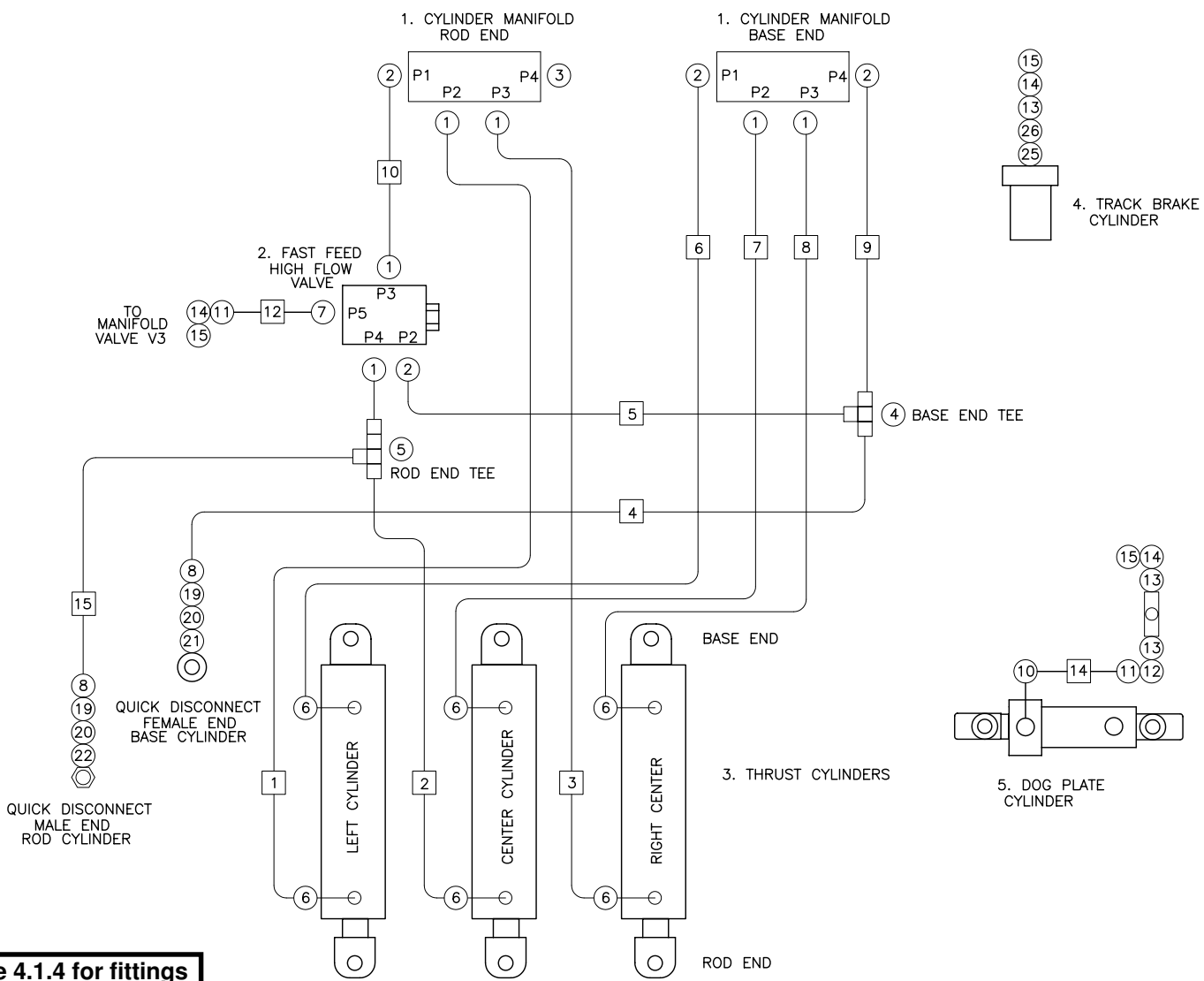
	HOSE ROUTING	PART NO.
1	HYD. TANK — PUMP (INLET)	TH48120
2	CASE DRAIN — HYD. TANK	TH48121
3	MANIFOLD DRAIN — HYD. TANK 2ND FILTER	TH48122
4	PRV #3 — MANIFOLD TEE DRAIN	TH48123
5	PLUMBING MANIFOLD — CHECK VALVE MANIFOLD	TH48124
6	MANIFOLD, V1 — DOG PLATE CYLINDER	TH48125
7	MANIFOLD, V2 — TRACK BRAKE CYLINDER	TH48126
8	PUMP (OUTLET) — PRV #2	TH48127
9	PUMP #X — SHUTTLE VALVE #2	TH48128
10	CONTROL VALVE #T — HYD. TANK MAIN FILTER	TH48129
11	SHUTTLE VALVE #3 — CONTROL VALVE L.S. TEE	TH48130
12	PUMP (OUTLET) — CONTROL VALVE #P1	TH48131
13	CONTROL VALVE L.S. TEE — PRESSURE GAUGE	TH48132
14	CONTROL VALVE #B — FITTING BULKHEAD ROD END	TH48133
15	CONTROL VALVE #A — FITTING BULKHEAD BASE END	TH48134

HYDRAULIC SYSTEM

MGL 54/60

JACKING

STATION



See page 4.1.4 for fittings and components callout

HYDRAULIC SYSTEM MGL 54/60

JACKING STATION

	HYDRAULIC COMPONENTS	PART NO.
1	CYLINDER MANIFOLD (QTY 2)	4800731
2	FAST FEED VALVE	-
	FAST FEED CARTIDGE	4800779
	FAST FEED BODY	4800780
3	THRUST CYLINDER (QTY 3)	4800729
4	TRACK BRAKE CYLINDER	4810750
5	DOG PLATE CYLINDER	4801710

	FITTING DESCRIPTION	PART NO.
1	UNION 16MB-16MF	T400545
2	ELBOW 90 16MB-16MF	T401635
3	PLUG 16MB	T405120
4	TEE 16MF-16MF-16MF	T402225
5	TEE 16FF-16MF-16MF	T402228
6	ELBOW 90 20MB-16MF	T401710
7	ELBOW 90 6MB-6MJ	T401250
8	BULKHEAD 90 16MF-16MF	T400395
9	UNION 16MP-16MF	T400546
10	SWIVEL 90 4MP-6MJ	T401700
11	UNION 6MJ-6MP	T400028
12	ELBOW, 90 6FP-6MP	T401065
13	UNION 6MP-6MP	T400803
14	QUICK DISC, MALE 6FP	T412008
15	CAP QUICK DISC	T412010
16	UNION 4MP-4MJ	T400020
17	UNION 4FP-6MP	T400023
18	UNION 4FP-4FJ	T400081
19	UNION 16FF-16MJ	T400812
20	UNION 16FJ-16MP	T400815
21	QUICK DISC FEMALE 16FP	4800776
22	QUICK DISC MALE 16FP	4800775
23	QUICK DISC FEMALE 6FP	T412009
24	VENTED CAP 4MP	T400801
25	UNION 16MP-8FP	T403060
26	UNION 8MP-6FP	T400024

#	HOSE ROUTING	PART NO.
1	LEFT CYLINDER, ROD END -- ROD MANIFOLD P2	TH48101
2	CENTER CYLINDER, ROD END -- TEE, ROD END	TH48102
3	RIGHT CYLINDER, ROD END -- ROD MANIFOLD P3	TH48103
4	CYLINDER BASE TEE -- QUICK DISC FEMALE	TH48104
5	CYLINDER BASE TEE -- HIGH FLOW VALVE P2	TH48105
6	LEFT CYLINDER, BASE END -- BASE MANIFOLD P1	TH48106
7	CENTER CYLINDER, BASE END -- BASE MANIFOLD P2	TH48107
8	RIGHT CYLINDER, BASE END -- BASE MANIFOLD P3	TH48108
9	CYLINDER BASE TEE -- BASE MANIFOLD P4	TH48109
10	ROD MANIFOLD P1 -- HIGH FLOW VALVE P3	TH48110
11	HIGH FLOW VALVE P1 -- HYD TANK (JACKING STATION)	TH48111
12	HIGH FLOW VALVE P5 -- MANIFOLD V3 (JACKING STATION)	TH48112
13	-	-
14	DOG PLATE CYLINDER -- HOUSING COUPLING	TH48114

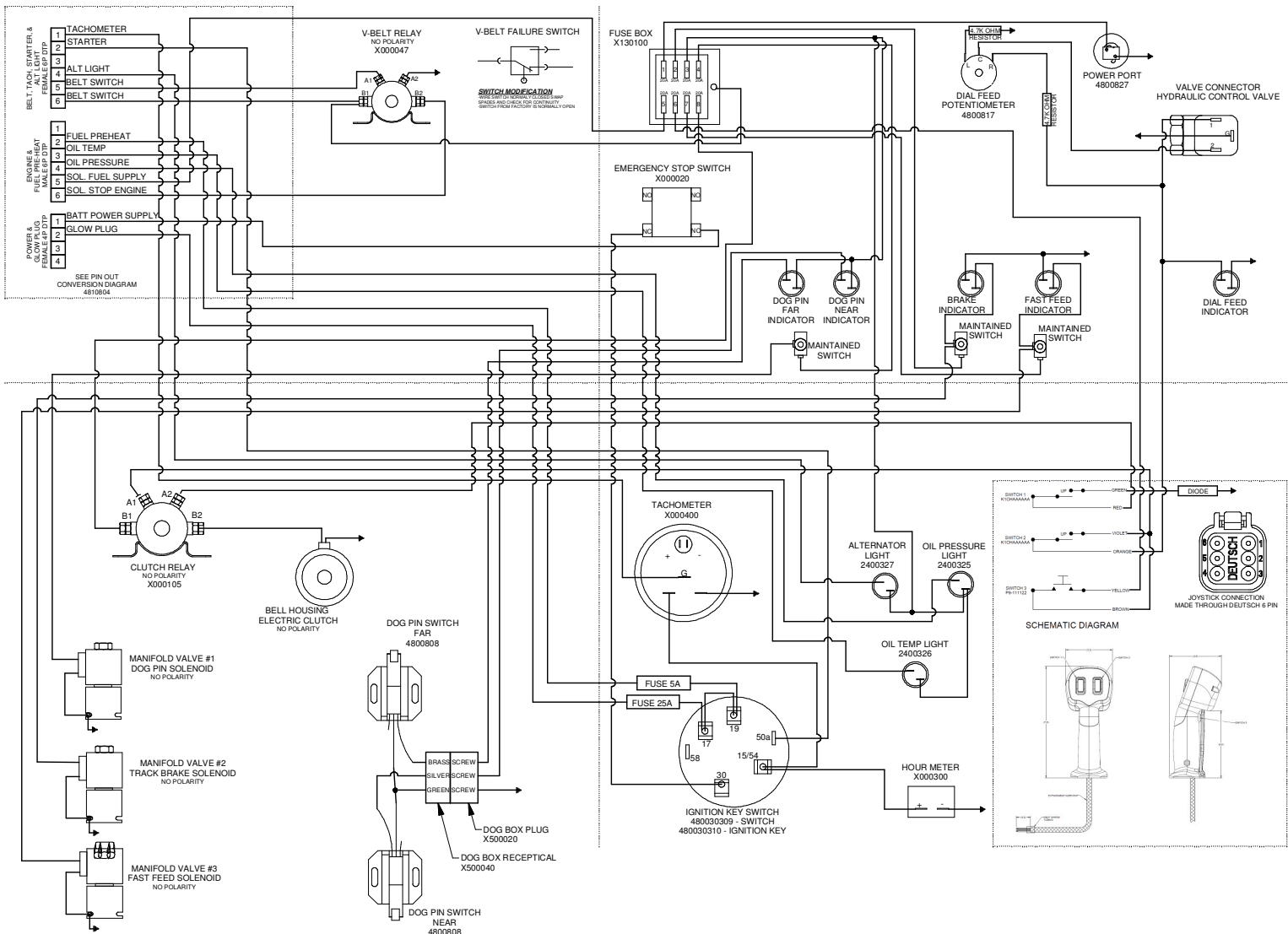
**NOTE: For replacement Hose Assemblies,
please include hose length and end fittings.**

ELECTRICAL SYSTEM

MCL 54/60

WIRING DIAGRAM

ENGINE DETAIL



4.2.1

5.1 ENGINE DETAILS

McL 54/60

DETAIL	PAGE
ENGINE DESCRIPTION	5.1.1
MODEL DESIGNATION	5.1.2-5.1.3
ENGINE PARTS	5.1.4-5.1.5
LUBE OIL CIRCUIT	5.1.6
FUEL SYSTEM SCHEMATIC	5.1.7
ENGINE COOLING	5.1.8
COMMISSIONING	5.1.9-5.1.10
STARTING	5.1.11
MONITORING SYSTEMS	5.1.12
STOPPING	5.1.13
OPERATING CONDITIONS	5.1.14
LUBE OIL	5.1.15
OPERATING MEDIA	5.1.16
MAINTENANCE SCHEDULE	5.1.17-5.1.18
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FUEL SYSTEM	5.1.21
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COMBUSTION AIR FILTER	5.1.23-5.1.24
BELT DRIVES	5.1.25-5.1.26
ADJUSTMENTS	5.1.27
ACCESSORIES/BATTERY	5.1.28-5.1.29
ENGINE CLEANING	5.1.30
ADDITIONAL MAINTENANCE	5.1.31
DIAGNOSIS CHART	5.1.32
ENGINE PRESERVATION	5.1.33
ENGINE SPECIFICATIONS AND SETTINGS	5.1.34-5.1.35
TORQUE WRENCH SETTINGS/TOOLS	5.1.36
ORDERING SPARE PARTS	5.1.37

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NOTES

McL 54/60

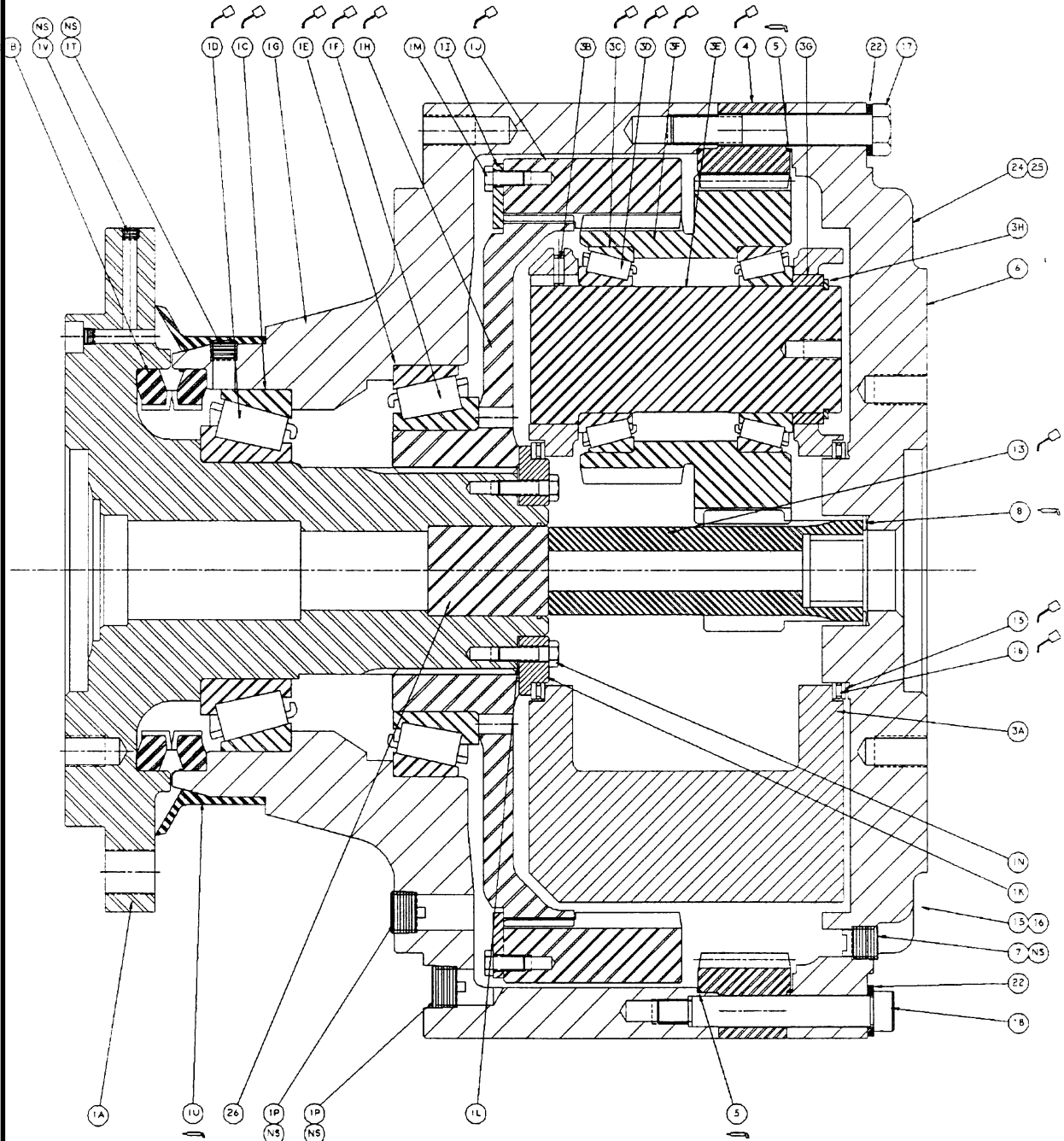
5.2 -5.8 MACHINE COMPONENTS

MCL 54/60

DETAIL	PAGE
GEARBOX	5.2.1-5.2.3
TRANSMISSION PARTS	5.3.1-5.3.14
HYDRAULIC PUMP COUPLING	5.4.1
HYDRAULIC CLUTCH	5.5.1
HYDRAULIC THRUST CYLINDER	5.6.1
HYDRAULIC DOG PLATE CYLINDER	5.7.1
HYDRAULIC VALVE	5.8.1

GEARBOX COMPONENTS

MCL 54/60



GEARBOX COMPONENTS

McL 54/60

MODEL# _____

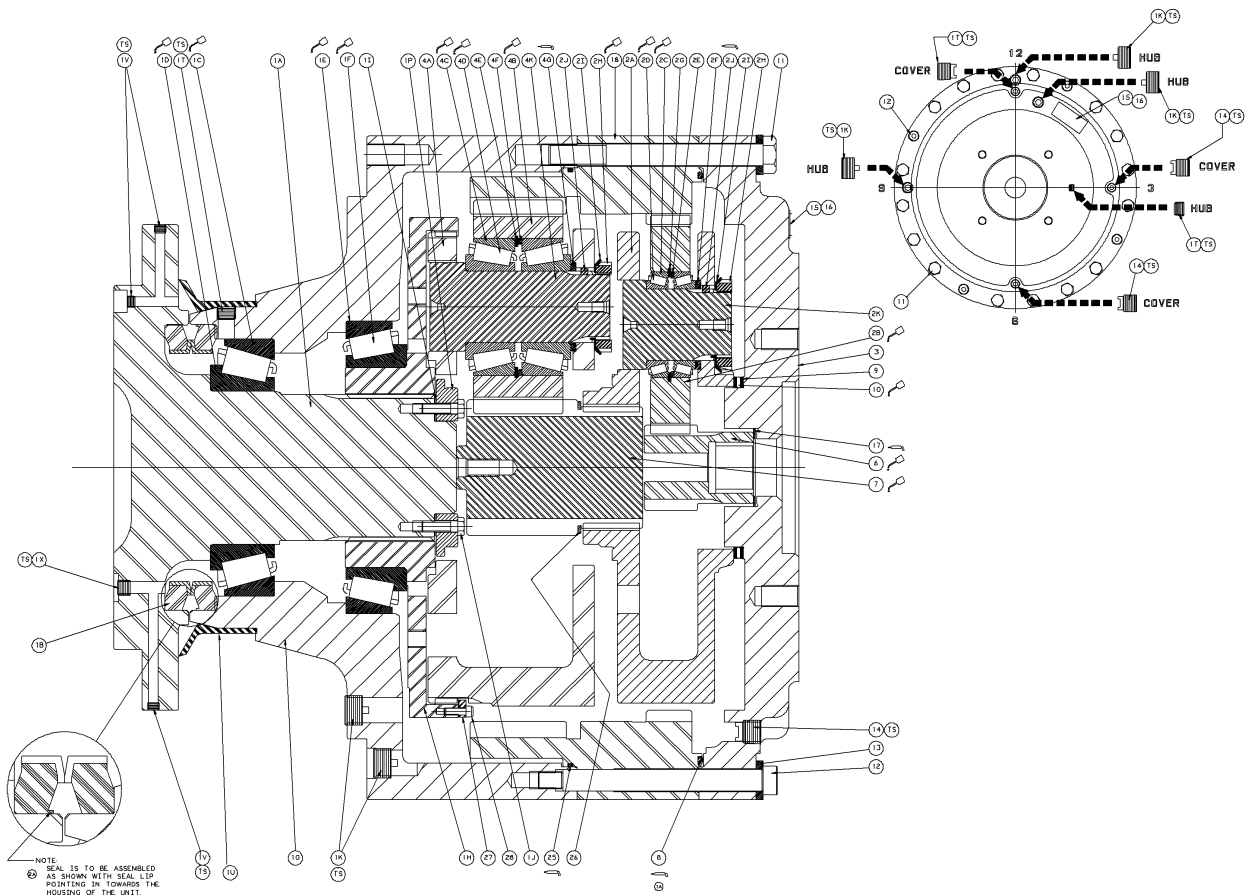
SERIAL # _____

ITEM #	QTY.	NUMBER	DESCRIPTION
1A	1	480030201	Spindle
1K	1	480030202	Carrier, Bearing
1I	4	480030203	Plate, Rectangular
1G	1	480030204	Housing
1C	1	480030205	Bearing, Tapered
1D	1	480030206	Bearing, Tapered
1E	1	480030207	Bearing, Tapered
1F	1	480030208	Bearing, Tapered
1B	1	480030209	Seal, Face
1L	1	480030210	Shim, Steel
1N	8	480030211	Bolt, Hex-Special
5	2	480030212	O-Ring
24	1	480030213	Plate, ID
1M	8	480030214	Bolt, Hex-UNC
17	16	480030215	Bolt, Hex-UNC
18	4	480030216	Bolt, Shoulder
1U	1	480030217	Seal, Boot
3C	6	480030218	Bearing, Cup
3B	3	480030219	Pin, Roll
3E	3	480030220	Shaft, Planet
3A	1	480030221	Carrier
3F	1	480030222	Gear, Cluster Set
1J	1	480030223	Gear, Internal
1H	1	480030224	Coupling, Internal
4	1	480030225	Gear, Ring
3G	3	480030226	Spacer, Thrust
3D	6	480030227	Bearing, Tapered
3H	3	480030228	Ret, Ring-Extension
16	2	480030229	Bearing, Thrust
15	4	480030230	Washer, Thrust
26	1	480030231	Spacer, Input
13	1	480030232	Gear, Sun
25	2	480030233	Screw, Drive
1V	2	480030234	Pipe Plug, STD-NPT
1T	1	480030235	Pipe Plug, STD-NPT
7	2	480030236	Pipe Plug, MAGN-NP
1P	3	480030237	Pipe Plug, MAGN-NP
22	20	480030238	Washer, Lock
6	1	480030239	Plug, Cardboard
8	1	480030240	Washer, Thrust
6	1	480030241	Cover, Input

Note: McLaughlin Manufacturing Co. is not authorized to service Gearboxes. Consult McLaughlin Manufacturing Co. for repair manual or the name of an authorized service dealer near you.

GEARBOX COMPONENTS

McL 54/60



Note: McLaughlin Manufacturing Co. is not authorized to service Gearboxes. Consult McLaughlin Manufacturing Co. for repair manual or the name of an authorized service dealer near you.

GEARBOX COMPONENTS

McL 54/60

MODEL# S50B

SERIAL # _____

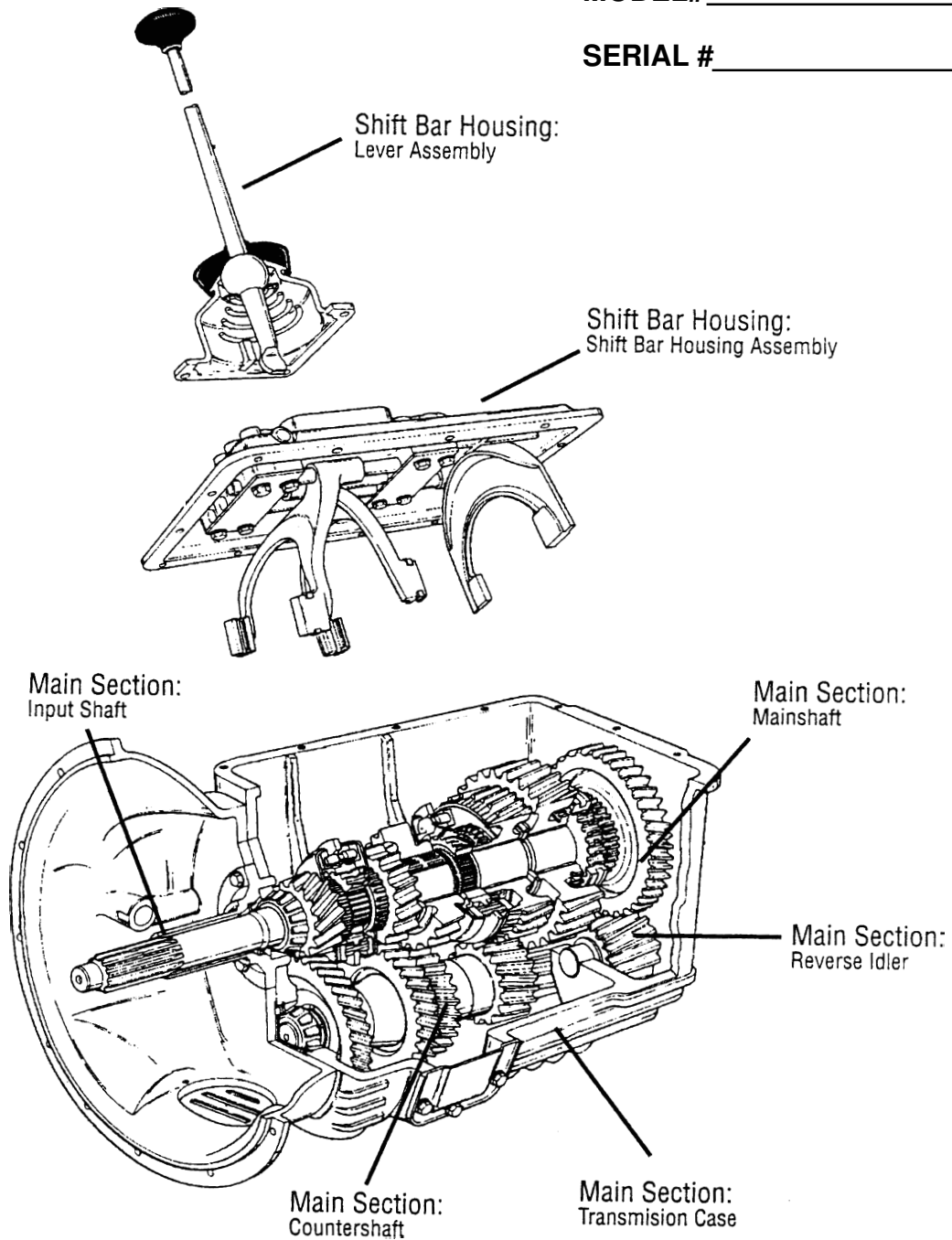
ITEM #	QTY.	NUMBER	DESCRIPTION
2J	6	480134001	PIN, LOCK (.250, .250)
10	1	480134002	BRG, THRUST (FA26786)
9	2	480134003	WASHER, THR*INDIA* (5.580,.1025)
17	1	480134004	WASHER, THRUST (2.007,.0615)
1A	1	480134005	SPINDLE
1P	1	480134006	CARRIER, BEARING
3	1	480134007	COVER, INPUT
1G	1	480134008	HOUSING
1C	1	480134009	(892-NTN) BRG, TAPERED-CUP
1D	1	480134010	(896-NTN) BRG, TAPERED-CONE
1E	1	480134011	(M236810-NTN) BRG, TAPERED-CUP
1F	1	480134012	(M236849-NTN) BRG, TAPERED-CONE
1B	1	480134013	SEAL, FACE (MG7112,10.000)
1U	1	480134014	SEAL, BOOT
1I	1	480134015	SHIM, STEEL (3.265, 4.125)
1J	8	480134016	BOLT, HEX-SPCL (.375-16, 1.25GR8)
25	1	480134017	O-RING (SPECIAL, 20.026,.139)
6	1	480134018	GEAR, SUN
7	1	480134019	GEAR, SUN
2K	3	480134020	SHAFT, PLANET *INDIA*
2A	1	480134021	CARRIER
2C	6	480134022	(L610510) BRG, TAPERED-CUP
2D	6	480134023	(L610549) BRG, TAPERED-CONE
2E	3	480134024	WASHER, THRUST (3.250,.0975)IND
4K	3	480134025	SHAFT, PLANET *INDIA*
4A	1	480134026	CARRIER
4C	6	480134027	(5535) BRG, TAPERED-CUP
4D	6	480134028	(5584) BRG, TAPERED-CONE
4F	3	480134029	WASHER, THRUST*INDIA (4.375,.141)
2F4G	6	480134030	WASHER, THRUST *INDIA*
2B	3	480134031	GEAR, PLANET
4B	3	480134032	GEAR, PLANET *INDIA*
1H	1	480134033	COUPLING, INTERNAL
27	3	480134034	PLATE, RETAINER *INDIA*
18	1	480134035	GEAR, RING
15	1	480134036	PLATE, ID *INDIA*
26	1	480134037	RET,RING-EXT (4.250, EN425)
4E	3	480134038	RET,RING-INT (4.724, N5000475)
2G	3	480134039	RET,RING-INT (3.740, N5000375)
11	16	480134040	BOLT, HEX-UNC (.750-10, 7.50GR8)
12	4	480134041	BOLT, SHDR (.625-11, 7.00GR8)
16	2	480134042	SCREW, DRIVE (#2,.188)
28	6	480134043	BOLT, SKT-UNC (.250-20,.750GR8)
8	1	480134044	O-RING (-389, 19.955,.210)
1X	1	480134045	PIPE PLUG, STD-NPTF (.250-18)
1T	1	480134046	PIPE PLUG, STD-NPTF (.375-18)
14	3	480134047	PIPE PLUG, MAGN-NPTF (.500-14)
1K	3	480134048	PIPE PLUG, MAGN-NPTF (.750-14)
1V	3	480134049	PIPE PLUG, STD-PTF (.125-27)
13	20	480134050	WASHER, LOCK (.750,.241,H.D.)
2I	6	480134051	WASHER, LOCK-TANGED (2.412,.062)
2H	6	480134052	NUT, BRG (2.360-18, N-12)

TRANSMISSION COMPONENTS

MCL 54/60

MODEL# _____

SERIAL # _____



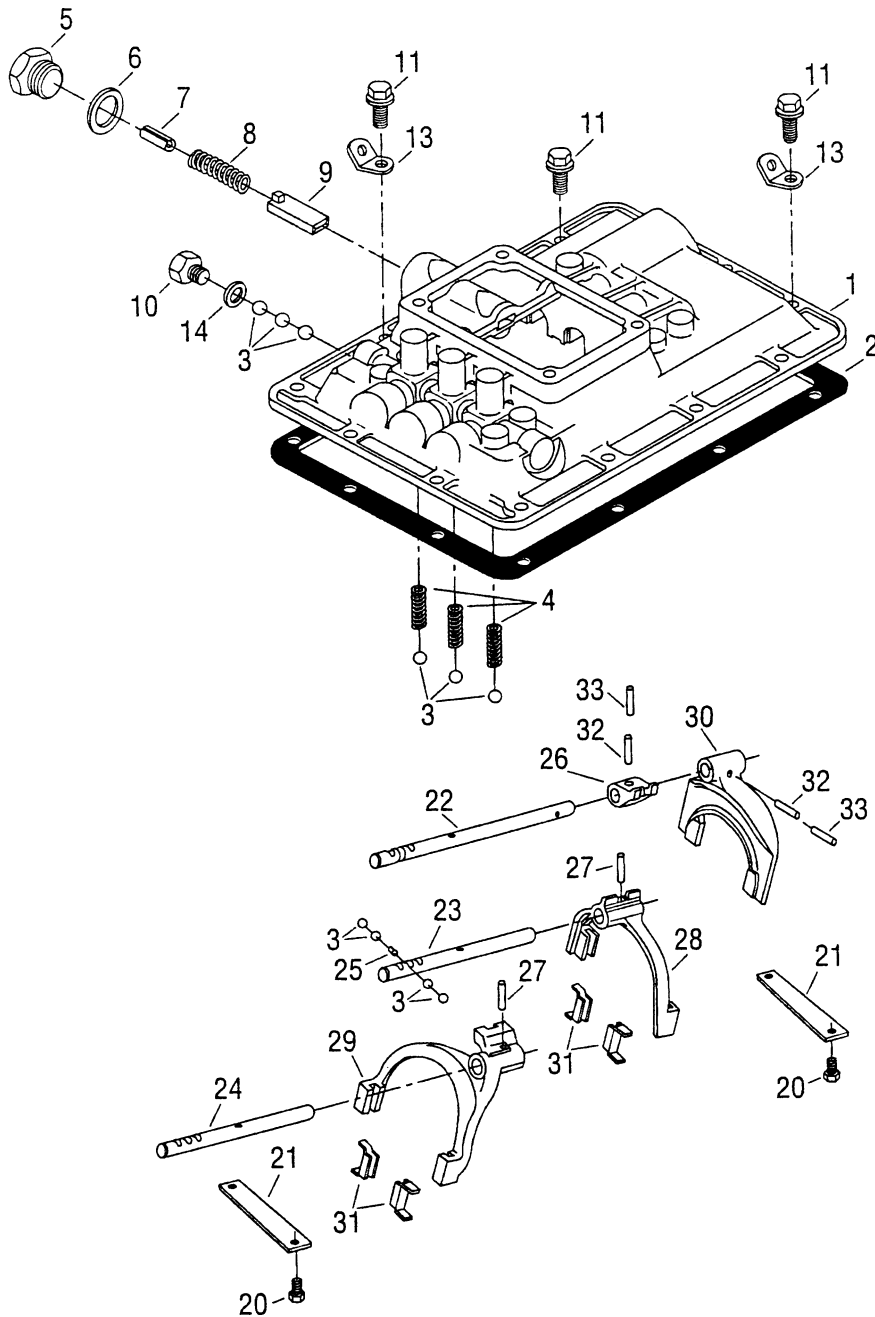
Note: McLaughlin Manufacturing Co. is not authorized to service transmissions. Consult an authorized dealer of the transmission manufacturer for parts and /or service. Transmission model and serial number is required for part orders.

Contact McLaughlin Manufacturing Co. for a distributor near you.

TRANSMISSION DETAIL

MCL 54/60

SHIFT BAR HOUSING



TRANSMISSION DETAIL

McL 54/60

Shift Bar Housing

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
1	239834	Shift Bar Hsg		1	Housing Only	
2	240038	Gasket		1		K-2143/S-7077
3	10J14	Steel Ball		10	7/16"	
4	201045	Spring		3		
5	235621	Plug 1"		1		
6	235622	Gasket		1		K-2143
7	240496	Spacer		1		
8	233794	Spring		1		
9	23576	Plunger		1		
10	235052	Plug		1		
11	239611	Capscrew		13	3/8"-16X7/8"	
13	238370	Bracket		2		
14	15900	Gasket		1		K-2143/S-7077
20	233043	Capscrew		4	3/8"-16X1"	
21	4301277	Shift Bar Retainer		2		
22	4301541	Yoke Bar 1st/Rev		1		
23	4301540	Yoke Bar 2nd/3rd		1		
24	4301539	Yoke Bar 4th/5th		1		
25	201044	Pin		1		
26	4300402	Shift Block 1st/Rev		1		
27	14J1818	Pin		2		
28	A-6146	Yoke Assy 2nd/3rd	4301595	1		
29	A-6145	Yoke Assy 4th/5th	4301593	1		
30	4300401	Shift Yoke 1st/Rev		1		
31	227675	Bushing		4		K-2144
32	1JM6028	Pin		2		
33	1JM3528	Pin		2		
999	S-7077	Shift Bar Housing Assy	239834	1	Complete	

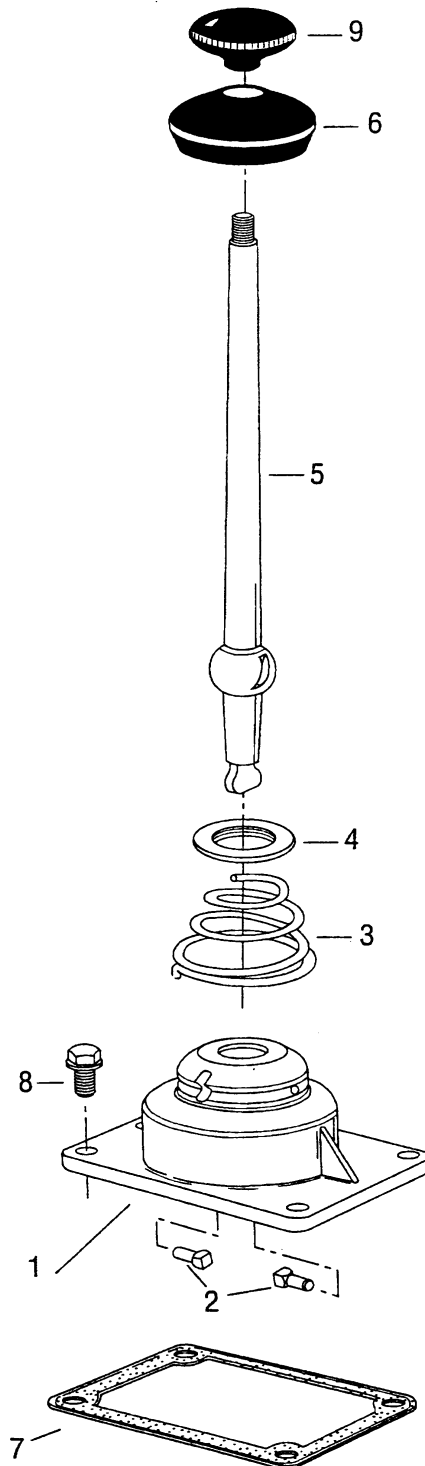
Kits and Assemblies

K-2143 Gasket Kit
 K-2144 Small Parts Kit
 S-7077 Shift Bar Housing Assy

TRANSMISSION DETAIL

MCL 54/60

LEVER ASSEMBLY



TRANSMISSION DETAIL

MCL 54/60

Lever Assembly

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
1	233080	Shift Lever Hsg		1	High	S-1643
2	201054	Pin		2	For High & Med. Hsg	S-1643/S-7079
2	23180	Pin		2	For Low Hsg	S-7045
3	4300690	Spring		1		S-1643/S-7045/S-7079
4	23181	Washer		1		S-1643/S-7045/S-7079
5	228648	Shift Lever		1	Use With 233080	S-1643
					Straight Lever - "Bend To Suit"	
5	241076	Shift Lever		1	Use With 241075	S-7079
					Straight Lever - "Bend To Suit"	
5	4302823	Shift Lever		1	Use With A-6448	S-7045
					Straight Lever - "Bend To Suit"	
6	202484	Dust Cover		1		S-1643/S-7045/S-7079
7	4301958	Gasket		1		K-2143/S-7045/S-7077
8	X-8C-604	Capscrew		4	3/8"-16X1-1/4"	
9	201401	Knob		1		

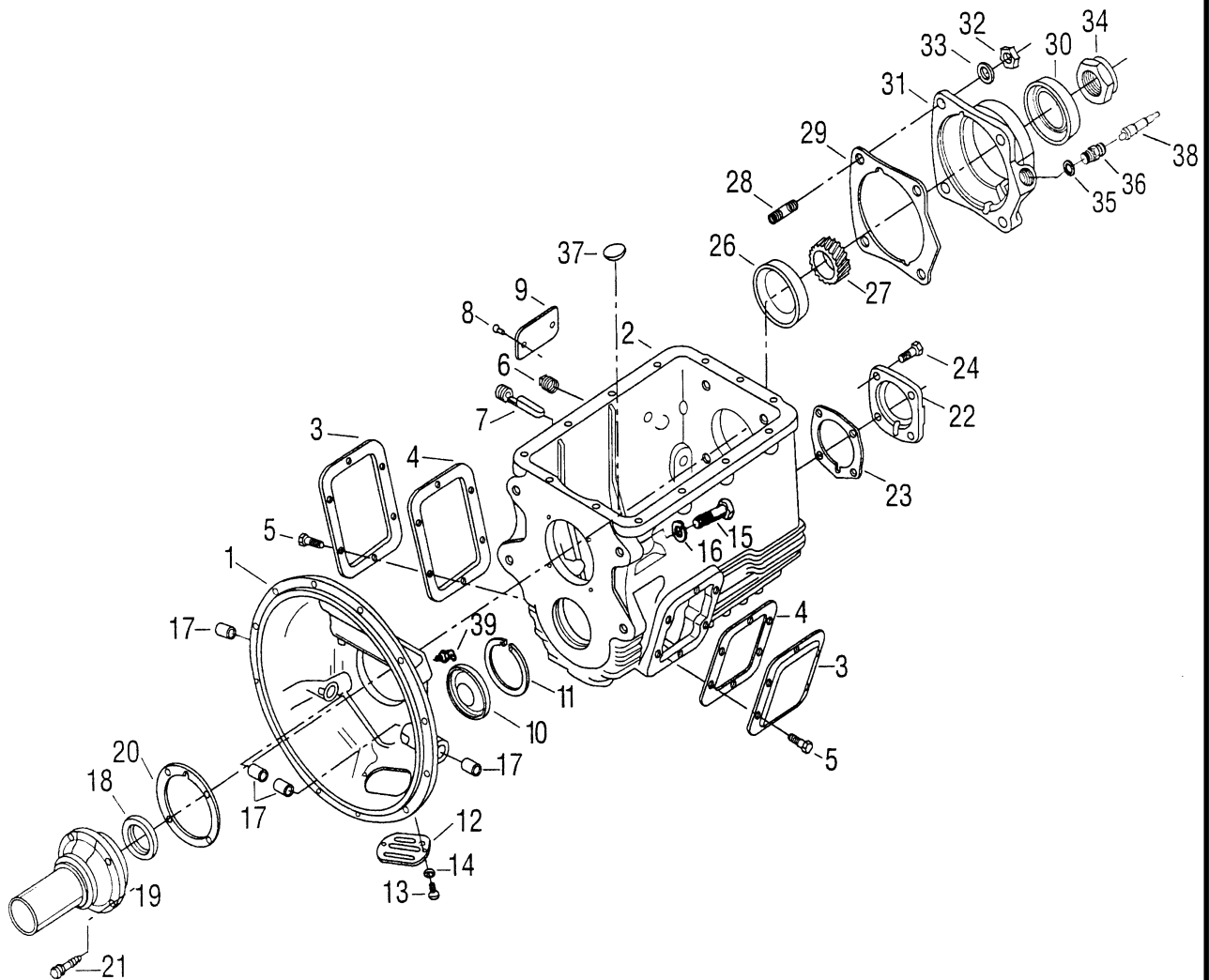
Kits and Assemblies

K-2143	Gasket Kit
S-1643	Shift Lever Assy-High
S-7045	Shift Lever Assy-Low
S-7077	Shift Bar Housing Assy
S-7079	Shift Lever Assy-Medium

TRANSMISSION DETAIL

McL 54/60

TRANSMISSION CASE



TRANSMISSION DETAIL

Mcl 54/60

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
1	A-5634	Clutch Hsg Assy	23726	1	#2 Pull-Aluminum w/11H15 Fittings	
1	A-5771	Clutch Hsg Assy	23726	1	#2 Pull-Aluminum	
1	A-5205	Clutch Hsg Assy	21646	1	#2 Push-Aluminum	
1	A-5751	Clutch Hsg Assy	4300418	1	#2 Push-Aluminum	
1	3316239	Clutch Hsg Assy		1	#2 Push-Aluminum (Fork)	
1	A-5630	Clutch Hsg Assy	23722/229297	1	#2 Push-Iron	
1	A-5629	Clutch Hsg Assy	23721	1	#3 Push-Iron	
2	S-1874	Case Assy	4300878	1		
2	S-1875	Case Assy	4301099	1		
2	S-1923	Case Assy	4301032	1		
2	S-1924	Case Assy	4301033	1		
3	201398	PTO Cover		2		
4	201400	Gasket		2		K-2143
5	239613	Capscrew		12	3/8"-16X5/8"	
6	X-12-1206	Pipe Plug		1	3/4"	S-1874/S-1875/S-1923/S-1924
7	X-12-1207	Pipe Plug		1	3/4" Magnetic	S-1874/S-1875/S-1923/S-1924
8	207873	Screw		2		
9	22300	Name Plate		1		
10	239783	Plug		1		K-2144
11	240040	Snap Ring		1		K-2144
12	23380	Cover		1		
13	1C408	Capscrew		2	1/4"-20	
14	4E04	Lockwasher		2	1/4"	
15	1C936	Capscrew		4	9/16"-12	
16	4E09	Lockwasher		4	9/16"	
17	12815	Bushing		4		
17	8677	Bushing		2	Use w/A-5205 Clutch Hsg Assy	
18	4300121	Oil Seal		1		K-2129/K-7029
18	4300204	Oil Seal		1	Shaft 1.89	
18	4300798	Oil Seal		1	Shaft 1.62	K-2120/K-7029
19	22129	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
19	23147	Front Brg Cover-Pull	3315538	1	Use 4300121 Oil Seal	
19	237743	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
19	238104	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
19	238870	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
19	239821	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
19	3315497	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
19	3315552	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
19	4300354	Front Brg Cover-Push		1	Use 4300204 Or 4300798 Oil Seal	
19	4300355	Front Brg Cover-Push		1	Use 4300204 Oil Seal	
19	4300882	Front Brg Cover-Push		1	Use 4300798 Oil Seal	
20	240321	Gasket		1		K-2143
21	239614	Screw		4	3/8"-16X3/4"	
22	4300261	C/S Rear Brg Cover		1		

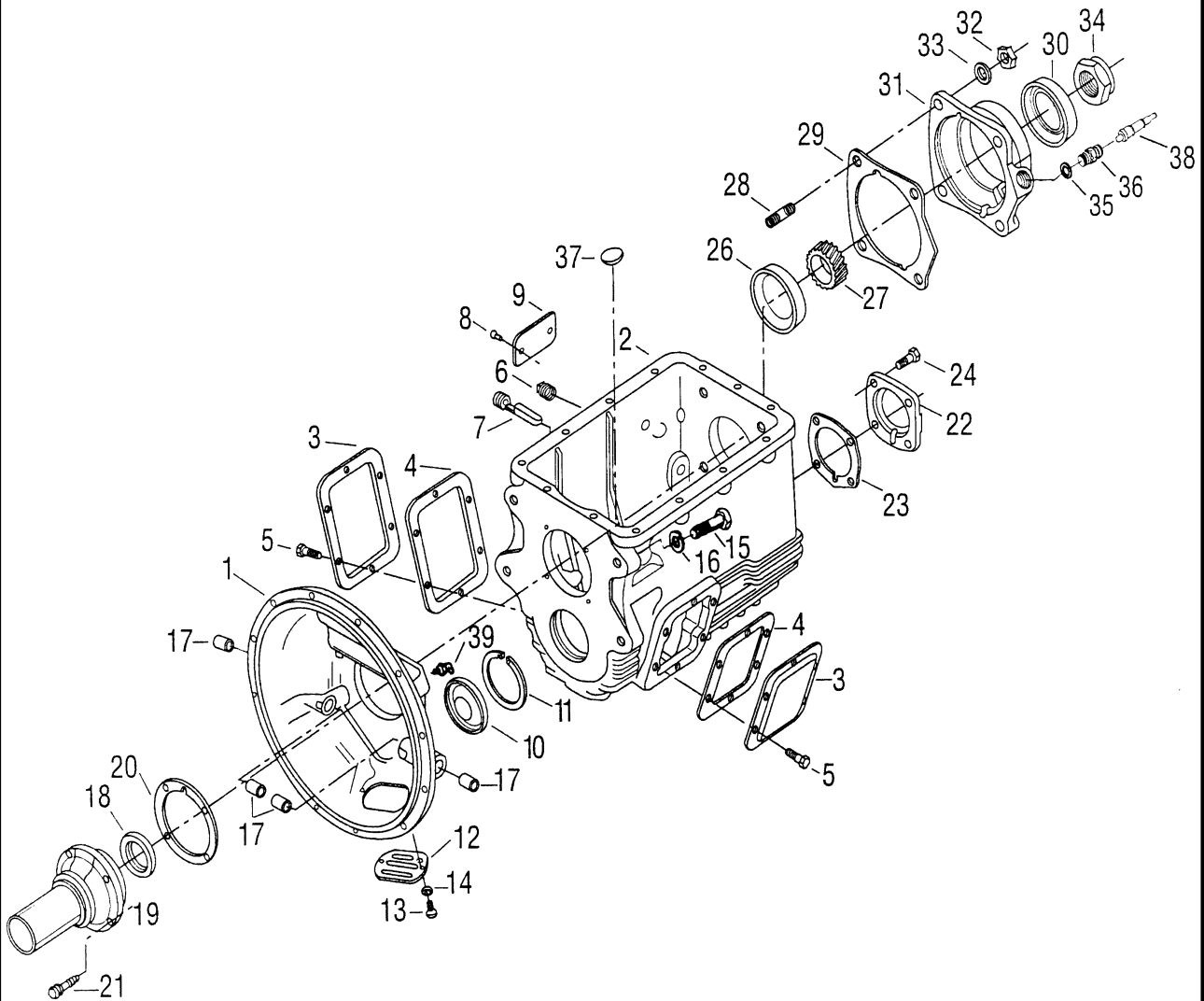
Kits and Assemblies

K-2120	Basic Rebuild Kit	S-1874	Case Assy
K-2129	Basic Rebuild Kit	S-1875	Case Assy
K-2143	Gasket Kit	S-1923	Case Assy
K-2144	Small Parts Kit	S-1924	Case Assy
K-7029	Rebuilder Kit		

TRANSMISSION DETAIL

MCL 54/60

TRANSMISSION CASE



TRANSMISSION DETAIL

Mcl 54/60

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
23	240017	Shim .004		1	Quantity As Required	K-2116
23	240018	Shim .007		1	Quantity As Required	K-2116
23	240019	Shim .010		1	Quantity As Required	K-2116
23	240020	Shim .020		1	Quantity As Required	K-2116
23	4300980	Shim .040		1		
24	X-8-688	Capscrew		4	3/8"-16X1"	
26	654166	Bearing Cup		1		K-2120/K-2129/K-7029
27	21555	Speedo Rotor		1		
27	3314356	Speedo Drive Gear		1		
27	3314448	Speedo Drive Gear		1		
27	86301	Speedo Drive Gear		1		
28	239433	Stud		4	1/2"-20X2-5/16"	S-1874/S-1875/S-1923/S-1924
29	240329	Shim .004		1	Quantity As Required	K-2116
29	240330	Shim .007		1	Quantity As Required	K-2116
29	240331	Shim .010		1	Quantity As Required	K-2116
29	240332	Shim .020		1	Quantity As Required	K-2116
29	4300981	Shim .040		1		
30	208385	Oil Seal		1		
30	4300203	Oil Seal		1		K-2120/K-7029
31	K-7038	Rear Brg Cover Kit	4302614	1	Use 4300203 Oil Seal Note: Push-In Type Speedo Sensor	
31	K-7039	Rear Brg Cover Kit	4302615	1	Use 4300203 Oil Seal Note: Push-In Type Speedo Sensor	
31	S-7030	Rear Brg Cover Assy	4300845/4302037	1	Use 4300203 Oil Seal Note: Sensor Seal Required	
31	S-7031	Rear Brg Cover Assy	4301677/4302039	1	Use 4300203 Oil Seal Note: Sensor Seal Required	
31	4300846	Rear Brg Cover		1	Use 4300203 Oil Seal	
31	4300849	Rear Brg Cover		1	Use 4300203 Oil Seal	
31	4300877	Rear Brg Cover		1	Use 4300203 Oil Seal	
31	4300970	Rear Brg Cover		1	Use 208385 Oil Seal	
31	4300972	Rear Brg Cover		1	Use 4300203 Oil Seal	
31	4301053	Rear Brg Cover		1	Use 4300203 Oil Seal	
32	86D08	Nut		4	1/2"-20	
33	239436	Washer		4	1/2"	
34	21937	Nut		1	1/4"-18	
35	4301954	Seal		1		S-7030/S-7031
36	86016	Sleeve		1		
37	14373	Magnet		1		S-1923/S-1924
38	3313714	Speedo Driven Gear		1		
38	3314433	Speedo Driven Gear		1		
38	3314449	Speedo Driven Gear		1		
38	3314545	Speedo Driven Gear		1		
38	3315575	Speedo Driven Gear		1		
38	5501502	Speedo Driven Gear		1		
38	5501503	Speedo Driven Gear		1		
39	11H15	Fitting-45 Degree		2		
39	12H15	Fitting-90 Degree		2		

Kits and Assemblies

K-2116 Shim Kit
 K-2120 Basic Rebuild Kit
 K-2129 Basic Rebuild Kit
 K-2143 Gasket Kit
 K-7029 Rebuilder Kit

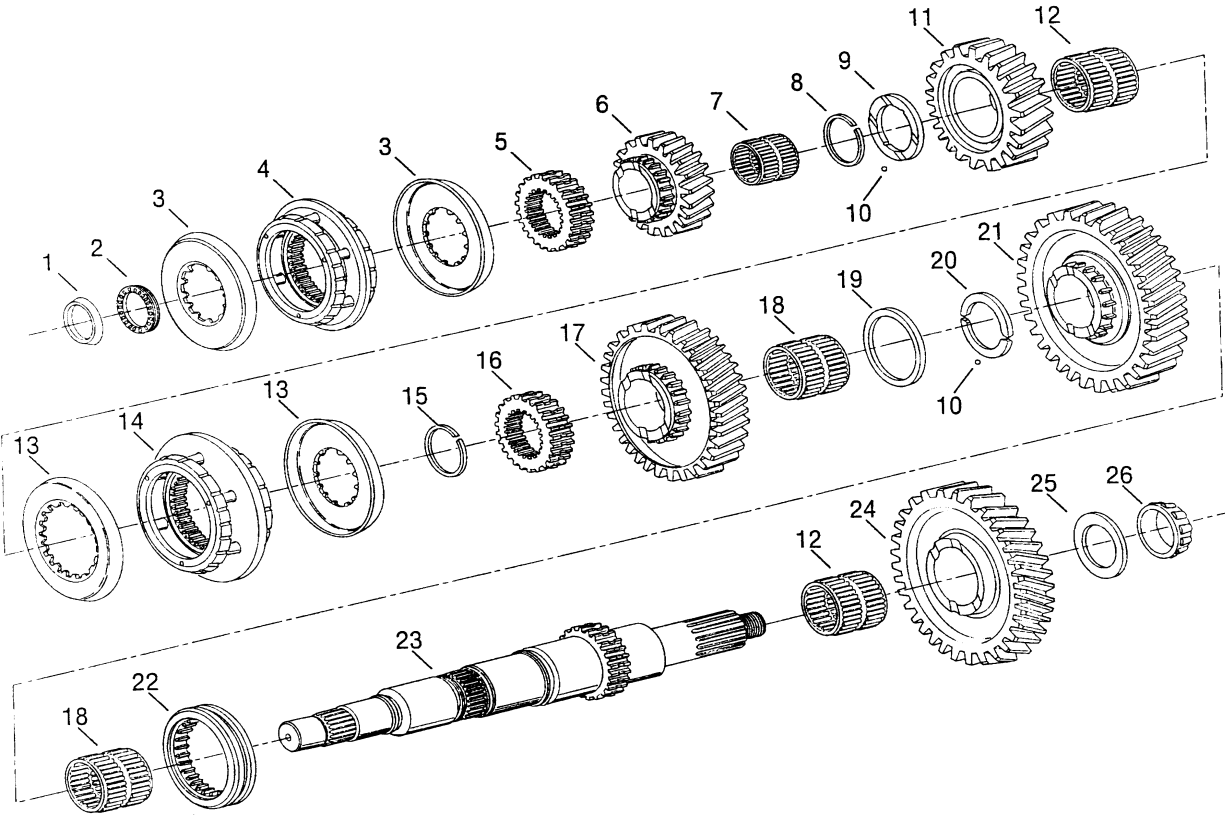
S-1874 Case Assy
 S-1875 Case Assy
 S-1923 Case Assy
 S-1924 Case Assy
 S-7030 Rear Brg Cover Assy
 S-7031 Rear Brg Cover Assy

TRANSMISSION DETAIL

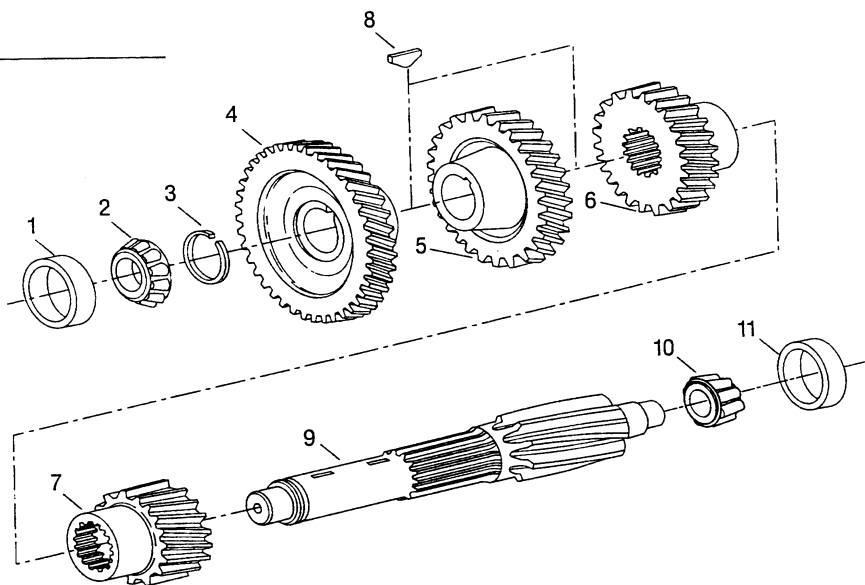
MCL 54/60

TRANSMISSION CASE

Mainshaft Assy



Countershaft Assy



TRANSMISSION DETAIL

McL 54/60

Mainshaft Assy

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
1	235383	Bearing Race		1		K-2120/K-2129/K-7029
2	235382	Bearing		1		K-2120/K-2129/K-7029
3	4301565	Synchronizer Cup		2		K-7005
4	A-6144	Synchronizer Assy 4/5		1		K-7005
5	4301534	Clutch Hub 4/5		1		
6	4301527	4th Gear-Mainshaft		1		
7	239651	Bearing		1		K-2120/K-2129/K-7029
8	224069	Snap Ring		1		
9	23127	Washer		1		
10	10J06	Steel Ball		2	3/16"	K-2144
11	4301528	3rd Gear-Mainshaft		1		
12	239818	Bearing		2		K-2120/K-2129/K-7029
13	4301467	Synchronizer Cup		2		K-7004
14	A-6137	Synchronizer Assy 2/3		1		K-7004
15	240037	Snap Ring		1		K-2144
16	4301533	Clutch Hub 2/3		1		
17	4301529	2nd Gear-Mainshaft		1		
18	239653	Bearing		2		K-2120/K-2129/K-7029
19	235379	Retainer		1		K-2144
20	235378	Split Washer		2		K-2144
21	4301530	1st Gear-Mainshaft		1		
22	4301566	Sliding Clutch		1		
23	4301532	Mainshaft		1		
24	4301531	Reverse Gear-Mainshaft		1		
25	240026	Washer		1		K-2144
26	654137	Bearing Cone		1		K-2120/K-2129/K-7029

Countershaft Assy

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
1	672070	Bearing Cup		1		K-2120/K-2129/K-7029
2	675246	Bearing Cone		1		K-2120/K-2129/K-7029
3	240767	Snap Ring		1		K-2144
4	241012	Drive Gear-Cntrshft		1		
5	4301535	4th Gear-Cntrshft		1		
6	4301536	3rd Gear-Cntrshft		1		
7	241017	2nd Gear-Cntrshft		1		
8	230292	Key		2		K-2144
9	4301537	Countershaft		1		
10	666554	Bearing Cone		1		K-2120/K-2129/K-7029
11	730362	Bearing Cup		1		K-2120/K-2129/K-7029

Kits and Assemblies

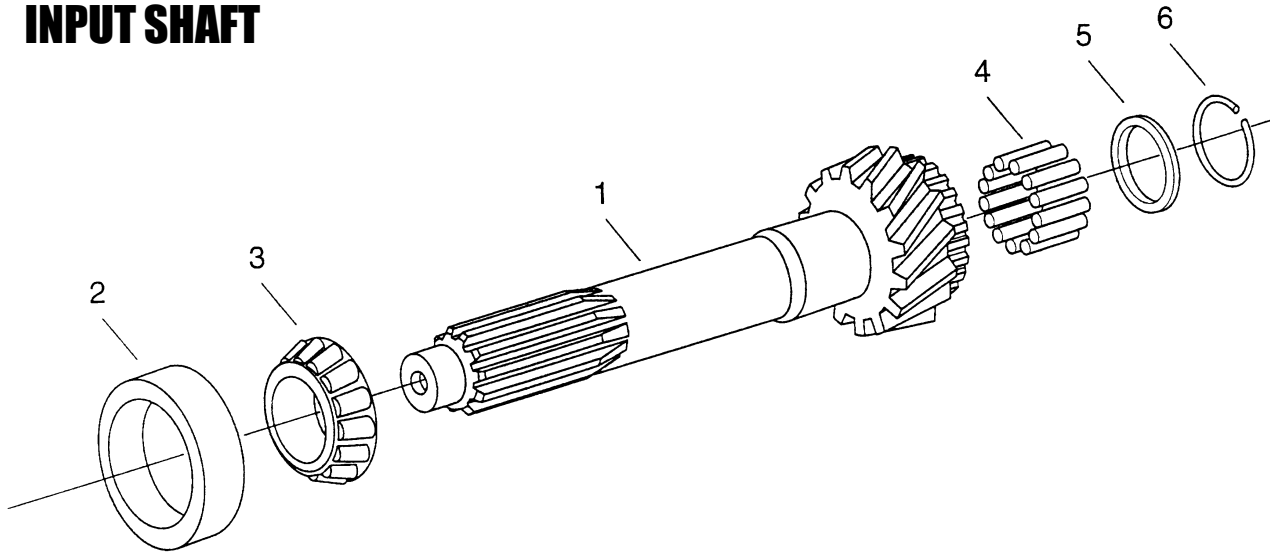
K-2120	Basic Rebuild Kit	K-7004	Synchronizer Kit
K-2129	Basic Rebuild Kit	K-7005	Synchronizer Kit
K-2144	Small Parts Kit	K-7029	Rebuilder Kit

TRANSMISSION DETAIL

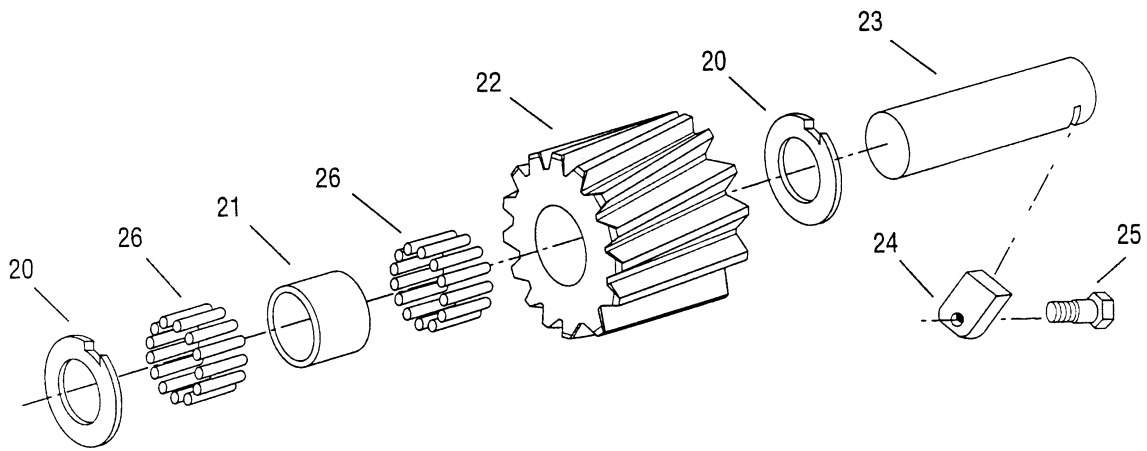
MCL 54/60

Input Shaft

INPUT SHAFT



Reverse Idler Gear Assy



TRANSMISSION DETAIL

McL 54/60

Input Shaft

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
1	4302062	Input Shaft-1.118" Push		1	Use 3315494 Front Brg Cover	
1	4301622	Input Shaft-1.375" Push		1	Use 237743 Front Brg Cover	
1	4301623	Input Shaft-1.375" Push		1	Use 3315552 Front Brg Cover	
1	4301624	Input Shaft-1.375" Push		1	Use 3315303 Front Brg Cover	
1	4301827	Input Shaft-1.375" Push		1	Use 4300882 Front Brg Cover	
1	4302061	Input Shaft-1.375" Push		1	Use 3315497 Front Brg Cover	
1	4301526	Input Shaft-1.50" Push		1	Use 4300882 Front Brg Cover	
1	4301616	Input Shaft-1.50" Push		1	Use 4300882 Front Brg Cover	
1	4301618	Input Shaft-1.50" Push		1	Use 4300882 Front Brg Cover	
1	4301619	Input Shaft-1.50" Push		1	Use 239821 Or 4300882 Front Brg Cover	
1	4301620	Input Shaft-1.50" Push		1	Use 4300354 Or 4300355 Front Brg Cover	
1	4301621	Input Shaft-1.50" Push		1	Use 22129 Front Brg Cover	
1	4301615	In/Shaft-1.50"Push/Pull		1	Use 23147 Front Brg Cover	
1	4301614	In/Shaft-1.75"Push/Pull		1	Use 23147 Or 4300882 Front Brg Cover	
2	1314774	Bearing Cup		1	1.118",1.375" & 1.50" Input	K-2120/K-7029
2	235417	Bearing Cup		1	1.75" Input	K-2129/K-7029
3	1314773	Bearing Cone		1	1.118",1.375" & 1.50" Input	K-2120/K-7029
3	235418	Bearing Cone		1	1.75" Input	K-2129/K-7029
4	235414	Bearing		14		K-2120/K-2129/K-7029
5	235415	Washer		1		K-2144
6	235416	Snap Ring		1		K-2144

Reverse Idler Gear Assy

Item	Current Part	Description	Replaced Part	Qty	Notes	Kits / Assys Where Used
20	240023	Washer		2		K-2144
21	240024	Spacer		1		K-2144
22	4301592	Idler Gear		1		
23	240022	Idler Shaft		1		
24	201929	Shaft Lock		1		
25	239611	Capscrew		1	3/8"-16X7/8"	
26	235376	Bearing		52		K-2120/K-2129/K-7029

Kits and Assemblies

K-2120 Basic Rebuild Kit
 K-2129 Basic Rebuild Kit
 K-2144 Small Parts Kit
 K-7029 Rebuilder Kit

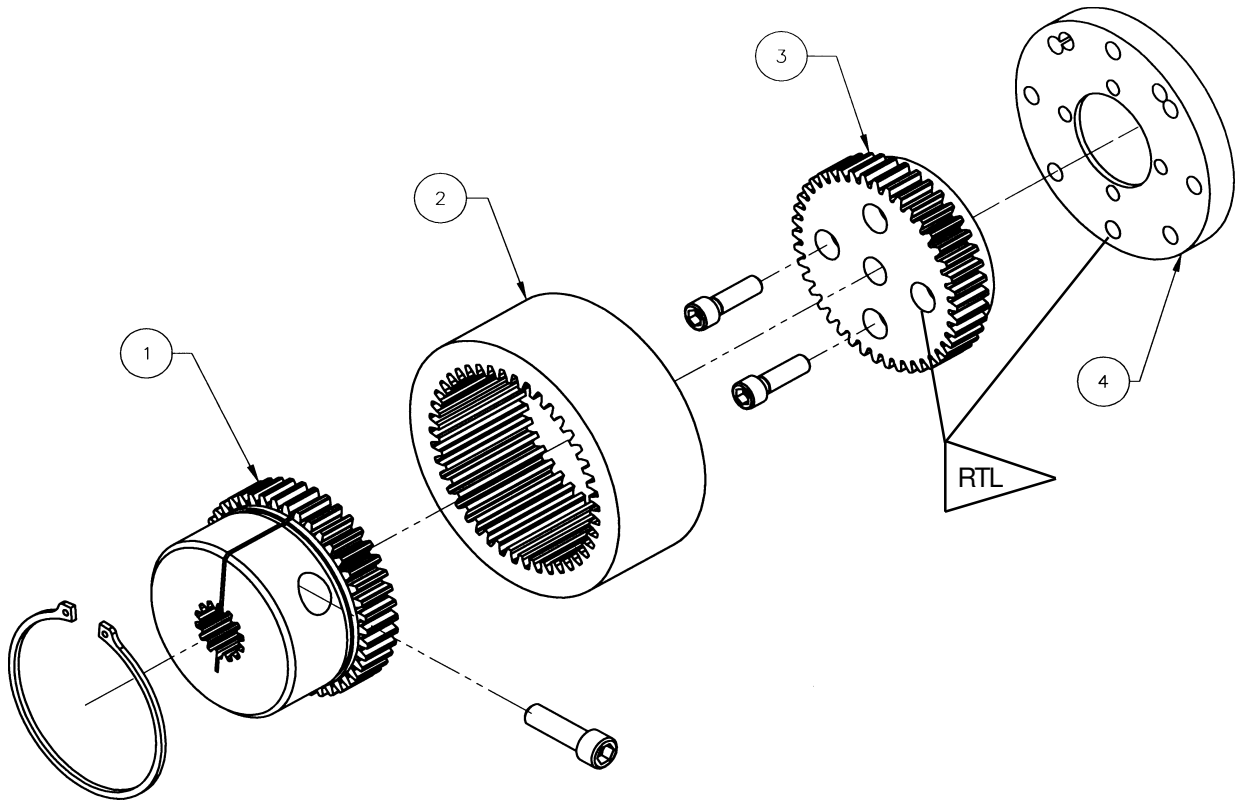
TRANSMISSION MAINTENANCE SCHEDULE

McL 54/60

DATE/HRS	SERVICE PERFORMED	BY

HYDRAULIC PUMP COUPLING

McL 54/60



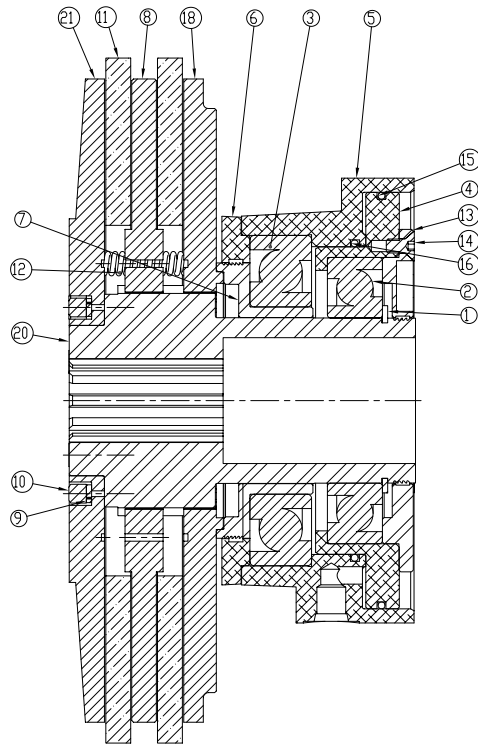
HYDRAULIC PUMP COUPLING

McL 54/60

ITEM #	QTY	NUMBER	DESCRIPTION
1	1	4800355	Coupling Hub
	1	4800389	Snap Ring
	1	U010220	Screw, HSH .438-14x1.50"
2	1	4800357	Nylon Sleeve
3	1	4800358	Pully Hub
	4	U010085	Screw, HSH .375-16x1.25"
4	1	4800359	Pully Flange
	8	U030900	Screw, Soc 8mm x 30mm

HYDRAULIC CLUTCH ASSEMBLY

MCL 54/60



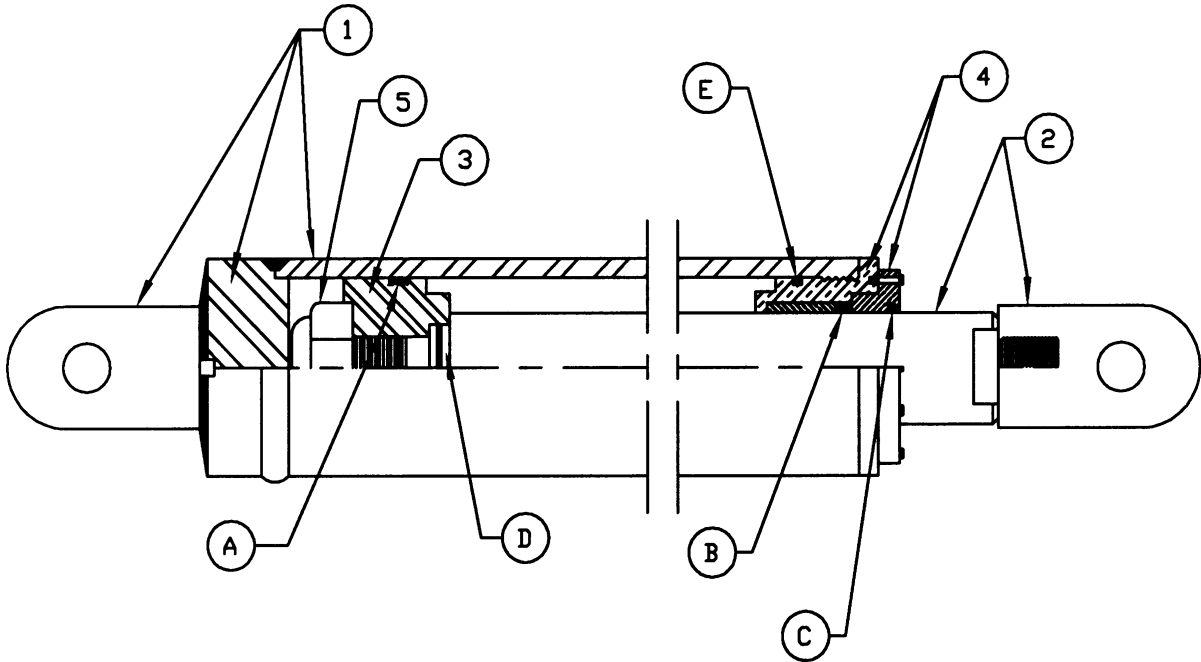
HYDRAULIC CLUTCH ASSEMBLY

ITEM#	QTY	NUMBER	DESCRIPTION
1	1	481039901	RETAINING RING
2	1	481039902	ANGULAR CONTACT BEARING (7215)
3	1	481039903	ANGULAR CONTACT BEARING (7217)
4	1	481039904	CYLINDER ASSEMBLY
5	1	481039905	PISTON
6	1	481039906	SPACER
7	1	481039907	BEARING HUB
8	1	481039908	SEPARATOR PLATE
9	6	481039909	HIGH COLLAR LOCK WASHER
10	6	481039910	5/16-18 UNC X 0.75 LG SHCS
11	2	481039911	FRICTION DISC
12	6	481039912	COMPRESSION SPRING
13	1	481039913	SPACER
14	3	481039914	1/4-20 UNC X 0.50 LG FHSCS
15	1	481039915	O-RING
16	1	481039916	O-RING
17	3	481039917	5/16-18 UNC X 0.625 LG FHSCS
18	1	481039918	PRESSURE PLATE
19	2	481039919	#10-24 X 0.75 LG SHCS
20	1	481039920	HUB
21	1	481039921	BACKPLATE

HYDRAULIC THRUST CYLINDER

McL 54/60

COMPONENTS



HYDRAULIC CYLINDER

McL 54/60

ITEM #	QTY.	NUMBER	DESCRIPTION
1	1	480072901	Tube Assembly
2	1	480072902	Rod Assembly
3	1	480072903	Piston
4	1	480072904	Rod Gland Assembly
5	1	480072905	Lock Nut
6	1	480072906	Seal Kit

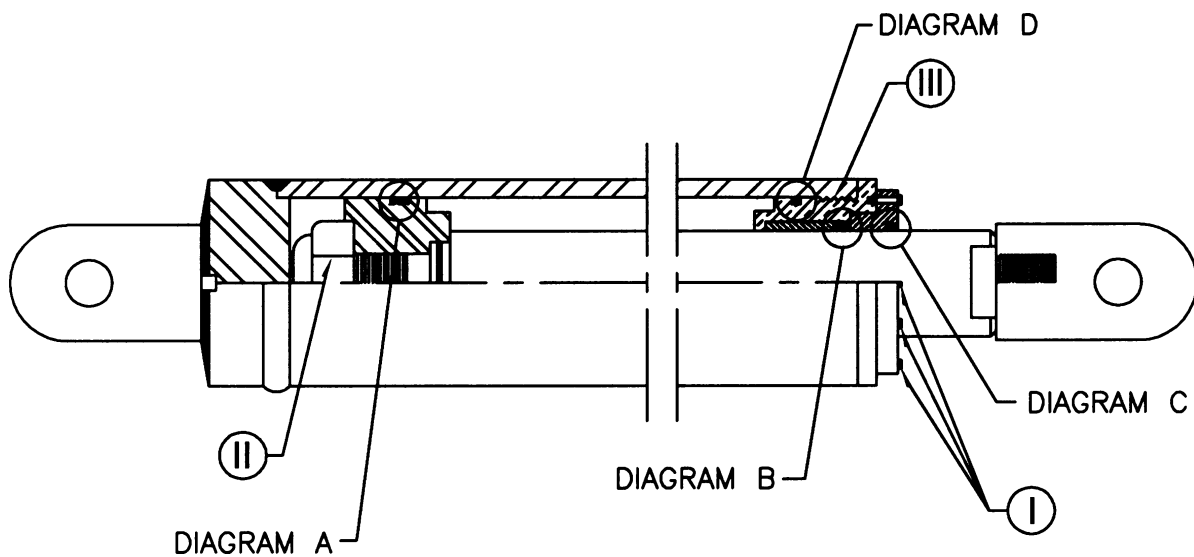
Complete Seal Kit to include:

ITEM #	QTY.	DESCRIPTION
A	1	Piston Seal
B	1	Rod Seal
C	1	Wiper
D	1	O-Ring
E	1	O-Ring & Back Up

HYDRAULIC THRUST CYLINDER

MCL 54/60

SEAL DETAILS



Torque Specifications:

- I. For 1/2"-13 thread socket head cap screws, torque to 300ft/lbs with impact gun in field.
- II. For 2 1/2"-12 thread lock nut, torque to 600 ft/lbs.
- III. For gland, torque to 100ft/lbs.

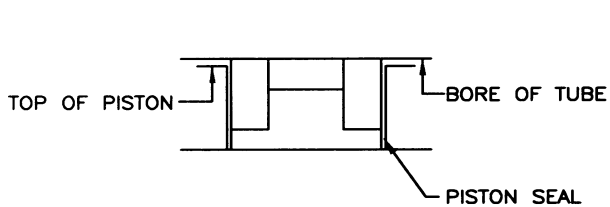


DIAGRAM A

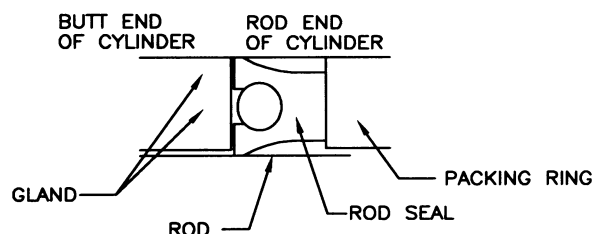


DIAGRAM B

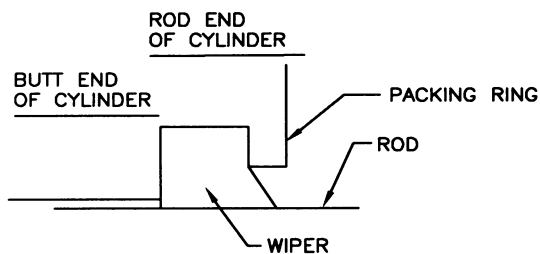


DIAGRAM C

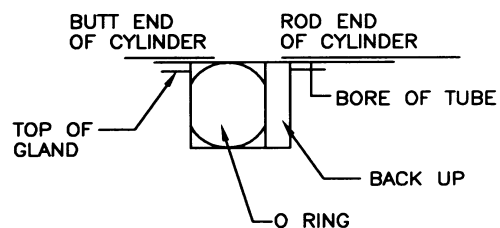
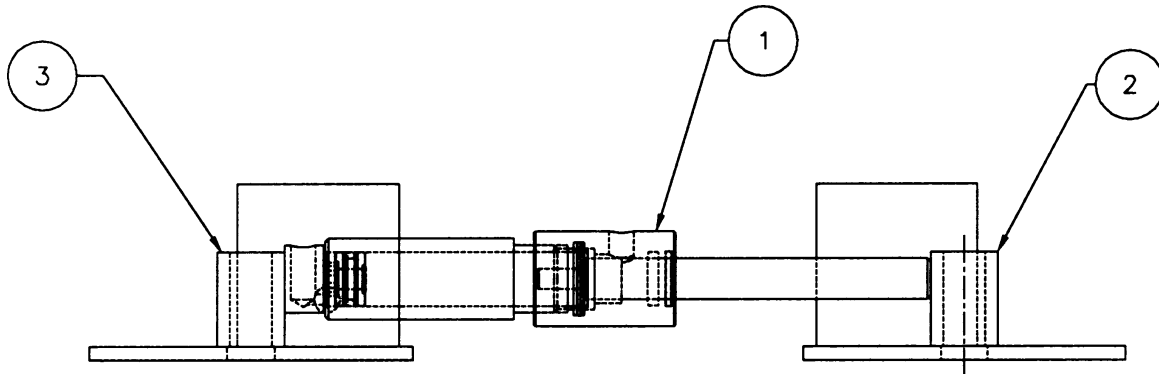


DIAGRAM D

HYDRAULIC DOG PLATE CYLINDER

McL 54/60



ITEM#	QTY	NUMBER	DESCRIPTION
1	1	4801710-05	Threaded Cap
2	1	4801710-15	Rod/Clevis Weldment
3	1	4801710-10	Barrel/Clevis Weldment
4	1	4801710-20	Seal Kit

HYDRAULIC DOG PLATE CYLINDER

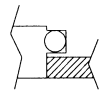
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SEAL KIT ASSEMBLY

New Seal Kit Reference Print



DETAIL A



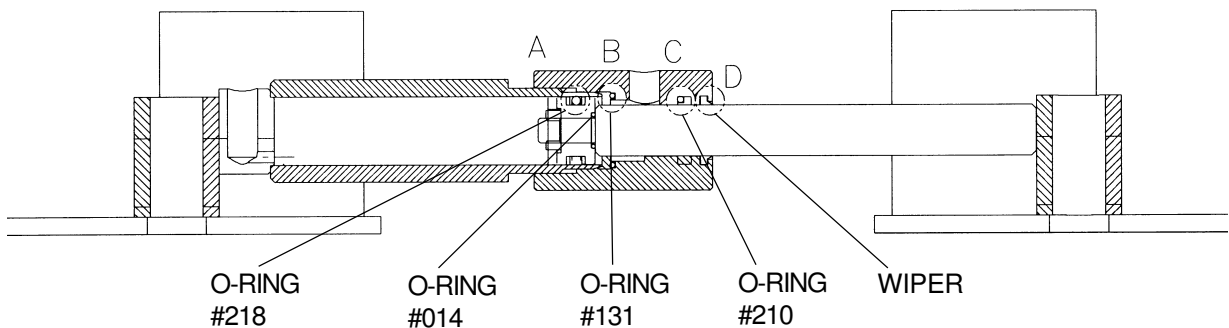
DETAIL B



DETAIL C

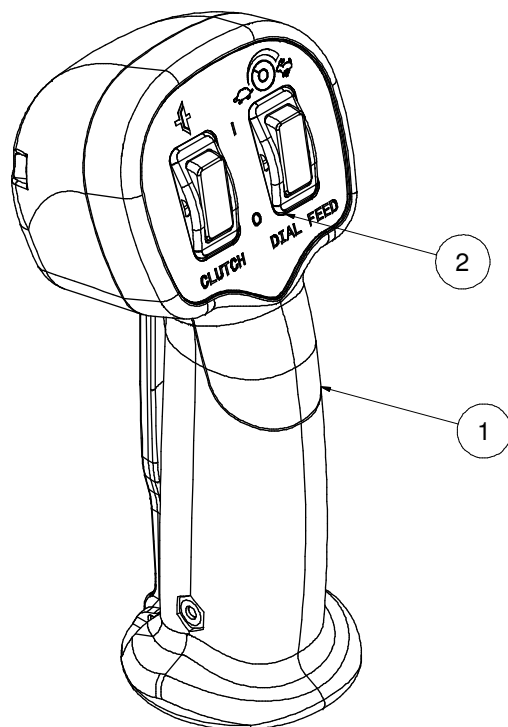


DETAIL D



HYDRAULIC VALVE PARTS

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VALVE HANDLE - MAIN THRUST VALVE

McL 54/60

ITEM#	QTY	NUMBER	DESCRIPTION
1	1	CM00152	Joystick
2	1	J800166	Decal, Joystick

HYDRAULIC CLUTCH

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6.1 OPERATING

NOTE:

1. Engaging the clutch against an immovable load, will cause premature failure of the clutch. Do not cycle the clutch (on/off/on/off etc.) with augers under-load.

COLD WEATHER OPERATION

Cold weather affects the operation of the boring machine. Cold hydraulic fluid causes sluggish machine performance and can contribute to the premature failure of some machine components. Before starting to bore, the machine and hydraulic fluid must be at operating temperature (i.e. the machine must be warmed-up before boring).

Warm-up procedure:

1. Start the machine and let it run at idle for 1-2 minutes.
2. Slowly increase the engine rpm to about 1/2 to 3/4 full throttle
3. Allow the engine to run at this higher speed for 4-5 minutes
4. Extend and retract the thrust cylinders to warm up the hydraulic fluid.
5. Occasionally running the machine over relief will help to reduce the warm-up time.

Only after the machine is warmed up should you begin to bore!

Hydraulic Clutch Operation:

SLUGGISH OR DELAYED APPLY TIME FOR THE CLUTCH CAN CAUSE PREMATURE FAILURE.

The apply time for the clutch (the time it takes to build full pressure) is critical to the operation of the machine. Normal clutch apply time is less than 2 seconds. If the apply time is greater than 2 seconds, wait until the oil temperature increases before boring. The apply time can be monitored by the pressure gauge on the console panel. Cycle the clutch during warm-up, waiting 10 seconds between engagements. WHEN APPLYING THE CLUTCH DURING THE WARM-UP PERIOD, THE TRANSMISSION MUST BE IN NEUTRAL. Do not cycle the clutch during warm-up while coupled to loaded augers. Boring with an extended clutch apply time will cause premature failure of the clutch.

The hydraulic clutch operating system has 2 switches.

1. O.P.C. Switch
2. Clutch Switch

Both the O.P.C. switch and the Clutch switch must be in the "ON" position before the clutch will operate. If the clutch does not operate, make sure that both of these switches are "ON".

The hydraulic pressure is set at the factory for 225 psi. This pressure must be maintained for proper operation. DO NOT operate the clutch if the clutch pressure gauge is reading below 150 psi. Too low an operating pressure will result in premature clutch failure.

HYDRAULIC CLUTCH

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COLD WEATHER OPERATION

Hydraulic Fluid:

Use the alternate hydraulic fluid for the following:

- To reduce warm-up time before boring.
- When consistently boring in cold weather.

Standard hydraulic fluid:

- ISO grade #46 with anti-wear additives.
- 76 Unax AW #46
- Or equivalent

Alternate hydraulic fluid:

- ISO grade #32 Wide Temperature Range oil with anti-wear additives.
- 76 Unax AW-WR #32
- Or equivalent

Consult McLaughlin for more information.

HYDRAULIC CLUTCH

McL 54/60

6.2 TROUBLESHOOTING

DANGER: DO NOT OPERATE MACHINE IF CLUTCH IS NOT OPERATING PROPERLY. DEATH OR SERIOUS INJURY WILL RESULT.

The hydraulic clutch supplied with this machine is a dry-running, self-adjusting, twin-disk clutch. The clutch requires very little maintenance. Following is a list of symptoms which may require servicing the clutch.

1. Contamination

The clutch is designed to run in a dry environment. However, the clutch housing can become contaminated. Contamination can result from dirt or sandy grit, oils, or water (which causes rust) entering the clutch housing.

Clean the disc pack kit with kerosene to restore to normal condition.

2. Drag in Neutral

It is natural for a twin-disc clutch to have a small amount of drag in the disengaged state. The drag should be more noticeable at low engine speeds and in low transmission gears.

A. New machines or rebuilt clutches

There is an indeterminate break-in time required for new clutches. Once a clutch has been working for a while, it should seat itself and neutral drag should be at a minimum.

B. Abrupt changes in clutch drag

If the drag in the clutch abruptly increases, it may be due to insufficient spring tension between the clutch discs. Weaker springs cause more drag between the discs of the clutch. Excessive heat, generated in the clutch by cycling the clutch or by applying the clutch against locked augers, will weaken the springs and cause excessive neutral drag.

Replace disc pack kit and inspect all other components for damage and replace as necessary.

Refer to the Clutch Components and Disassembly/Assembly section of this manual for components and proper clutch service procedures.

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SERVICE AND REPAIR INSTRUCTIONS

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DETAIL	PAGE
MACHINE SPLIT	7.1.1
COUPLING (PUMP & GEARBOX)	7.2.1
HYDRAULIC PUMP COUPLING	7.3.1
DOG PLATE	7.4.1
THRUST CYLINDER	7.5.1
HYDRAULIC CLUTCH	7.6.1
PUMP SETTINGS AND ADJUSTMENTS	7.7.1
MAIN THRUST VALVE ADJUSTMENT	7.8.1

SERVICE AND REPAIR INSTRUCTIONS

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WARNING:

Moving parts. Keep all guards in place. Shut down engine before service or maintenance. Being caught in machinery could cause serious injury.



DANGER:

Crushing weight will cause serious injury. Place machine on solid surface to prevent rollover or falling.



CAUTION:

High Pressure. Leaking hydraulic fluid under pressure may penetrate and cause serious injury. Check for leaks with cardboard. Relieve pressure before working on any system.



CAUTION:

Do not modify this machine. Use only authorized McLaughlin repair parts. Failure to comply may result in serious injury. Service this equipment according with maintenance instructions in this manual.

7.1 Machine Split Instructions

A. Removing the Carriage

Important Note: If the jacking station is to be removed from the track, then do the following, in sequence, before removing, the carriage:

- 1.) Fully retract dog pins.
- 2.) Close dog pin valve while pins are retracted.
- 3.) Turn OFF dog pin switch.
- 4.) Fully retract thrust cylinders.

1.) With the engine OFF, and the key in the OFF position, cycle the thrust valve handle up and down a few times to release any pressure in the system. Disconnect all hydraulic and electrical connections. There are a total of five hydraulic connections and one electrical connection. Use Figures 1 a-d to identify connection points.

- Main Thrust Valve - 2 hydraulic connections. (Figure 1a)
- Track Brake - 1 hydraulic connection (Figure 1b)
- Dog Plate - 1 hydraulic connection, 1 electrical connection. (Figure 1c)
- Fast Feed Valve - 1 hydraulic connections (Figure 1d)

Install all caps on disconnects.

2.) There are eight bolted connection between the jacking station and carriage. Four bolts fasten vertically and four bolts fasten horizontally. Loosen and rotate the carriage hold down bolts out of their carriage slots.. (Figure 2)

3.) Use the four lifting eyes on the roll bars to raise the carriage out of the jacking station. **DO NOT LIFT THE CARRIAGE AT ANY OTHER POINT EXCEPT BY ALL**

1a



1b



1c



SERVICE AND REPAIR INSTRUCTIONS

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FOUR LIFTING EYES. The weight of the carriage is not evenly distributed. Use caution when lifting. Make sure all hoses and wires are free from machine components before separating the machine. Place the carriage on a flat and stable surface.

B. Removing the Casing Pusher

- 1.) The casing pusher has four bolted connections. Loosen, but do not remove the bolts. Rotate the bolts out of the carriage slots.
- 2.) The casing pusher must be moved far enough horizontally in order to clear the chuck before it can be lifted vertically from the machine.

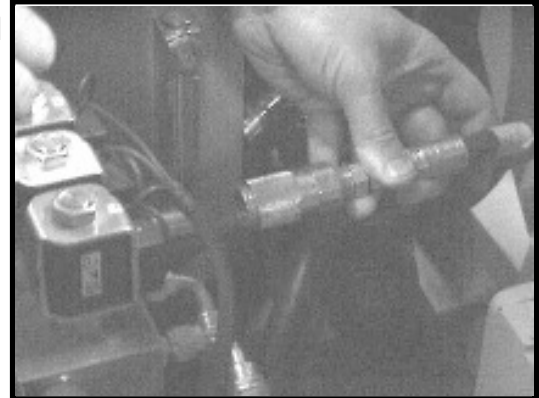
C. Removing the Jacking Station from Track

- 1.) The procedures from "Section I - Important Note" must be followed prior to removing the jacking station from the track.
- 2.) Raise and pin the track hold downs in the retracted position. (Figure 3)
- 3.) Use the four lifting eyes in the jacking station to lift the jacking station out of the track. The weight of the jacking station is not evenly distributed. Use caution when lifting.
- 4.) Place the jacking station on a flat and stable surface.

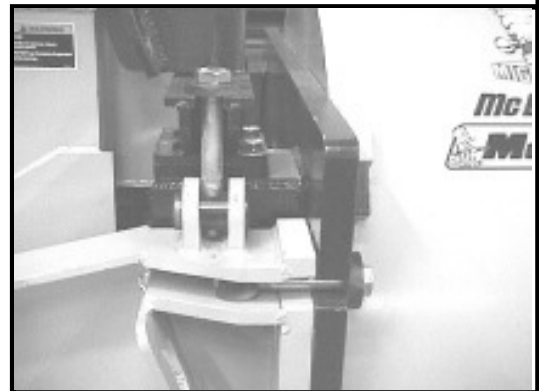
D. Assemble Carriage to Jacking Station

- 1.) Verify all hoses and wires are free from being pinched or crushed when placing the carriage into the jacking station. Be careful not to damage machine components when placing the carriage.
- 2.) Once the carriage is resting in the jacking station, fasten the four horizontal bolts first. This will secure the carriage front plate against the jacking station's thrust wall. Now fasten the four vertical bolts.
- 3.) Make the six hydraulic and one electrical connection.
- 4.) Fully open dog pin valve.

1d



2



3



SERVICE AND REPAIR INSTRUCTIONS

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7.2 Coupling Instructions

Tools Required:

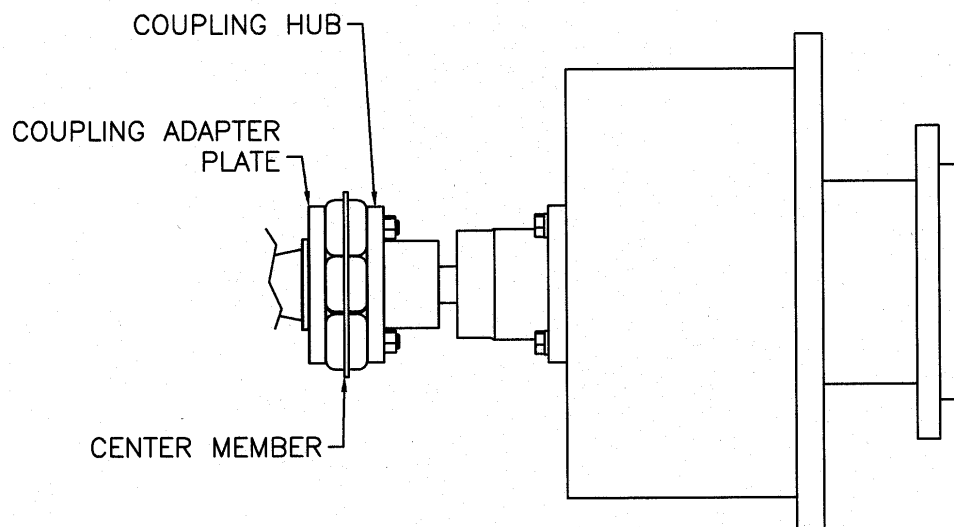
- 5/8" hex bit socket and ratchet
- 1 1/8" socket or wrench
- 3/16" Allen-head T-handle wrench
- McLaughlin Tool #4810321

I. REMOVAL

- Remove the coupling guard from mounted position on the transmission.
- Remove the two bolts that fasten the coupling hub to the coupling. Loosen the set screw over the key in the coupling hub. Slide the coupling hub up the input adapter shaft to create enough clearance for removing the coupling center member.
- Next, fit McLaughlin tool #4810321 onto the companion flange. Use this tool to prevent the transmission from rotating when removing the last two bolts of the coupling center member.

II. INSTALLATION

- Install the coupling hub onto the input adapter shaft.
- Install the coupling center member into its' respective pilot holes on the coupling adapter plate. Fit McLaughlin tool #4810321 onto the companion flange and then tighten the two bolts to 225 ft-lbs.
- Slide coupling hub onto the pilots of the coupling center member. Tighten the two bolts to 225 ft.lbs.
- Tighten the set screw over the key.
- Install the coupling guard.



SERVICE AND REPAIR INSTRUCTIONS

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7.3 Hydraulic Pump Coupling

Alignment

Loosen, but do not remove the 4 screws that attach the pump adapter plate to the pump mount. Adjust the pump plate until the nylon sleeve on the coupling slides freely. Tighten the 4 screws.

(Fig. 1-c)

Disassembly/Assembly

D1. Remove the screw for the pump and pull the pump out of the adapter plate. Do not remove the 4 screws which attach the adapter plate to the pump mount.

D2. Loosen the coupling cross-clamp and remove the coupling from the pump shaft.

D3. Remove the nylon sleeve.

D4. Remove the screws that attach the coupling hub to the adapter plate and remove the coupling hub.

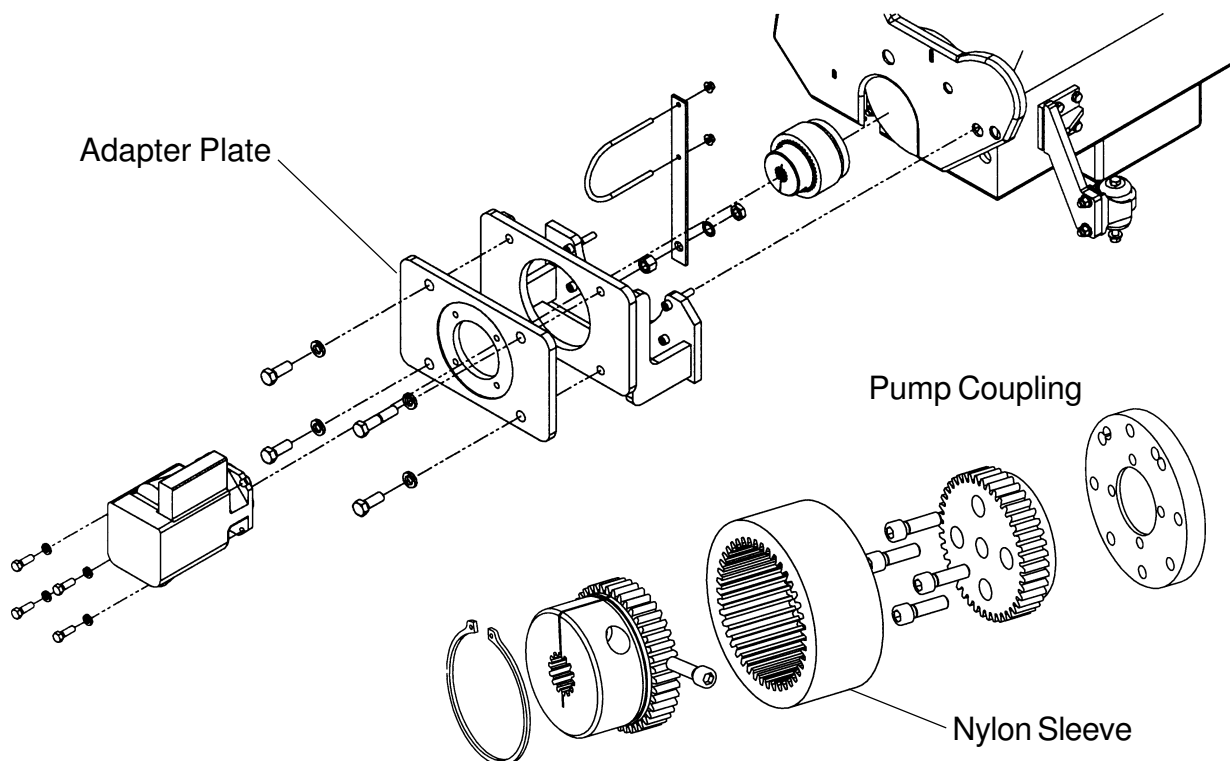
Assembly

A1. Pilot the adapter plate to the engine crankshaft pulley. Make sure that all hoses are properly lined up and that the adapter is sitting flush against the pulley. Apply Loctite #271 to the screws and tighten the screws in an alternating circular pattern.

A2. Pilot the coupling hub into the adapter. Make sure that the coupling is sitting properly on the face of the adapter. Apply loctite #271 to the screws and tighten the screws in an alternating pattern.

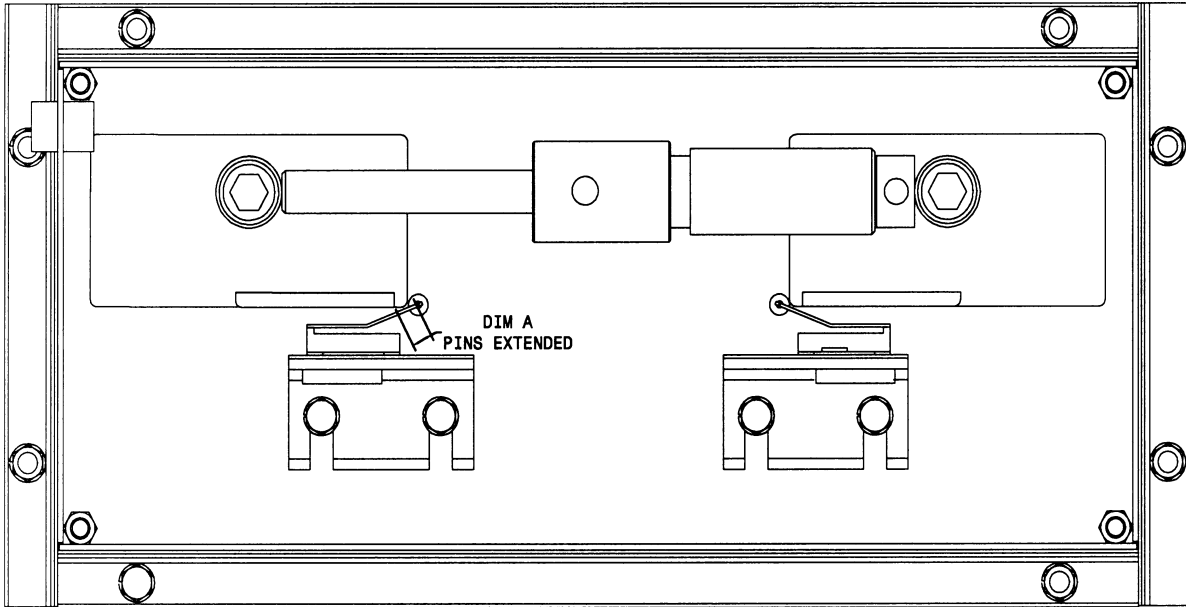
A3. Install the nylon sleeve onto the coupling.

A4. Install the pump coupling onto the pump



SERVICE AND REPAIR INSTRUCTIONS

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Dog Pin Indicator Detail
Some items not shown for clarity.

7.4 DOG PLATE

Dog Pin Indicators - The dog pin indicator lights should come on when the dog pins are retracted and go off when the dog pins are fully extended. Adjust the switches so the lights give an accurate indication of the dog pin position. Sometimes the dog pin may be in a bind and may not be able to extend fully. Check that the dog pins are working freely before making any adjustments. Make sure that the dog pin valve is open enough (5-6 turns) for the pins to move freely.

Dog Pin Indicator Switch Adjustment

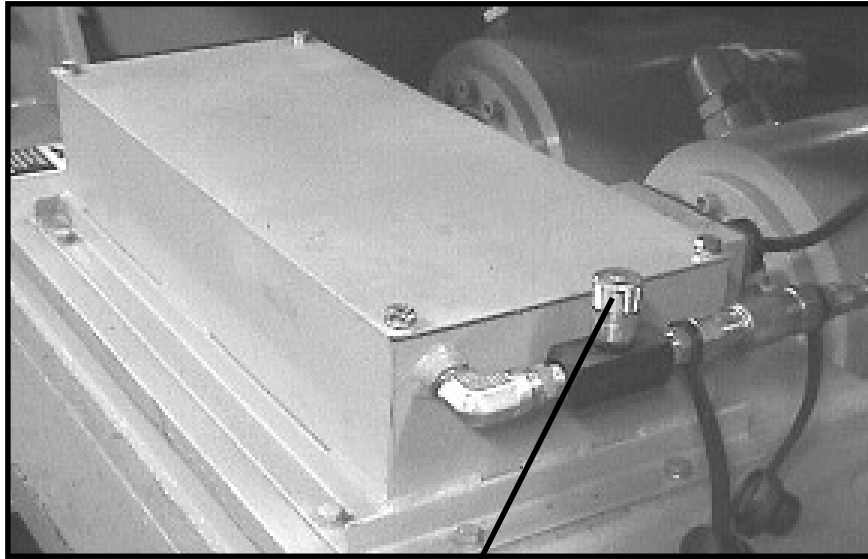
1. Extend the dog pins.
2. Remove the top plate on the dog plate cover box.
2. Turn the ignition switch to the "ON" position and note dog pin positions and dog pin indicator lights.
3. The switch brackets allow for adjustment forward and backward, and side to side. Loosen, but do not remove the screws which will allow movement in the required direction for proper switch placement.

Note: The switch should be positioned with "DIM A" = 1/4"-3/8" air gap between the switch arm and the hydraulic dog plate cylinder. Refer to the illustration above.

4. Tighten the screws and test the operation by repeatedly extending and retracting the dog pins. Repeat these steps if further adjustments are necessary.

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Dog Plate Adjustable Valve

Dog Plate Cylinder Replacement

D1. Open the dog pin valve completely.

D2. Remove the top plate of dog plate box.

D3. Disconnect and cap the hydraulic hose at the cylinder swivel fitting.

D4. Remove the two screws that attach the cylinder to the dog pins. The dog pins are spring loaded, so there will be pressure on the screws when they are removed. Note: Be careful not to damage machine components still in place, wires, switches, etc.

D5. It is recommended that the dog plate be thoroughly cleaned whenever the dog plate cylinder is removed.

D6. Remove the dog pins and dog pin springs. Clean the dog pins and remove any rust or corrosion on the pins. Clean any mud or dirt out of the springs. Replace springs if necessary. Clean the dog plate housing. Make sure the dog pins can slide freely in and out by hand, before reassembling.

A1. The dog pin has a top and a bottom. The top of the dog pin is determined by the depth of the set screw in the tapped hole. The top of the dog pin has a set screw depth of $\sim 5/16$ ". If this dimension is not correct, adjust the set screw. Remove the set screw and clean off any residual thread lock. Clean the tapped hole in the dog pin. Apply Loctite #243 to the set screw and insert it into the dog pin to the proper depth. Allow the thread lock to cure before reassembling.

SERVICE AND REPAIR INSTRUCTIONS

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A2. Insert the dog pin springs into the dog plate. Make sure the springs slide over the center pin and are seated on the stop in the center of the housing.

A3. After the dog plate and pins have been cleaned, apply a thin film of oil to the pins and insert them into the dog plate. **Do not use grease or heavy oils.** These heavier lubricants tend to attract dirt more than lighter oils.

A4. Press the dog pins into the housing until the tapped holes in the dog pins are accessible in the slots in the top plate.

A5. Put the cylinder screws through the cylinder end lugs and thread the screws into the dog pins. Tighten the screws until they bottom out on the set screws in the dog pins. Once tight, there should be a small gap between the base of the cylinder and the dog plate. The gap keeps the cylinder from pulling the dog pins against the top of the dog plate. Note: The cylinder must be positioned properly to match up with the dog pin indicator switches.

A6. Connect the hose to the dog plate cylinder swivel fitting.

A7. Operate machine and check for leaks.

A8. Replace the top plate.

Dog Plate Cylinder Seal Kit Replacement

D1. Remove cylinder as described in the above section.

D2. Remove the swivel fitting and unscrew the threaded cap.

NOTE: FLUID UNDER PRESSURE. THERE MAY BE REMAINING HYDRAULIC FLUID IN THE CYLINDER. EXTENDING OR RETRACTING THE CYLINDER CAN FORCE FLUID OUT OF THE CYLINDER. FLUID UNDER PRESSURE CAN CAUSE SERIOUS INJURY.

D3. Pull the rod assembly out of the barrel.

D4. Remove the piston from the end of the rod assembly.

D5. Remove the threaded cap from the rod assembly.

D6. Remove and discard all seals, o-rings, back-up washers and wipers. Visually note the placement and orientation of all seals before removal.

A1. Clean all components with brake cleaner and let dry.

A2. Refer to the Dog Plate Cylinder Components section of this manual for proper seal placement and orientation. Lube all seals and wipers with a thin coat of oil before assembly.

A3. Install the threaded cap onto the rod assembly, note proper orientation.

A4. Install the piston onto the rod assembly.

A5. Insert the rod assembly into the barrel.

A6. Tighten the threaded cap.

A7. Refer to Dog Plate Cylinder Replacement instructions for assembly procedure.

SERVICE AND REPAIR INSTRUCTIONS

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THRUST CYLINDER

Removal:

- D1. Remove the carriage from the jacking station.
- D2. Disconnect and cap the hydraulic hoses and cylinder ports.
- D3. Disconnect the hydraulic and electrical connections at the dog plate.
- D4. Remove the 3 cylinder pins in the dog plate and slide the dog plate away from the cylinders.
- D5. Remove the cylinder from the jacking station. Note: Be careful not to damage machine components already in place.

Thrust Cylinder Seal Kit Replacement:

- D1. Remove the rod clevis.
- D2. Remove the rod-end base plate.
- D3. Unscrew the rod end cap.
- D4. Pull the rod assembly out of the barrel.
- D5. Remove the piston from the end of the rod assembly.
- D6. Remove and discard all seal and wipers. Visually note the placement and orientation of all seals before removal.
- A1. Clean all components with brake cleaner and let dry.
- A2. Refer to the Thrust Cylinder Components section of this manual for proper seal placement and orientation and torque requirements for fasteners. Lube all seals with a light coat of oil before assembly.
- A3. Install the piston on the rod assembly and torque the retaining nut to the proper specifications.
- A4. Insert the rod assembly into the barrel.
- A5. Install the rod end cap and torque to the proper specifications.
- A6. Install the rod end plate and torque screws to the proper specifications.
- A7. Position the cylinder in the jacking station and reinsert the cylinder pin.
- A8. Position the dog plate on the cylinders and insert the dog plate cylinder pins.
- A9. Connect the hoses.
- A10. Connect the hydraulic and electrical connections at the dog plate.
- A11. Install the carriage.
- A12. Operate the machine and check for leaks.

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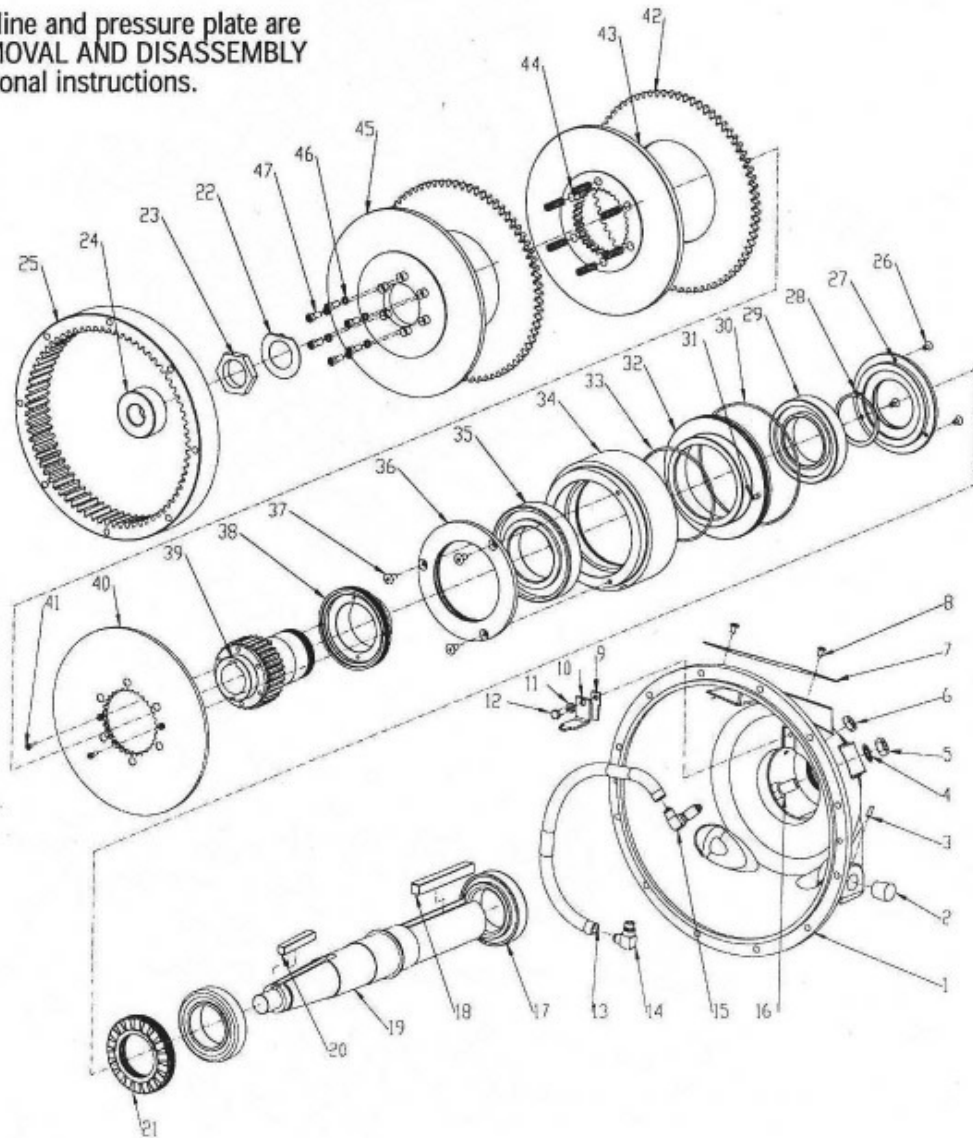
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7.6 CLUTCH SERVICE

Disassemble for Disc Change:

1. Remove sheaves, keys, belts, etc. from the output end of the clutch shaft and remove the instruction cover plate (#7).
2. Remove hydraulic connection (#15) to clutch housing.
3. Remove cap screws that secure the clutch housing to the flywheel housing.
(Note: There are two 3/8-16 tapped holes in the housing to be used for pusher bolts to assist in removing the clutch from engine.)
4. Remove pilot bearing (#24) from end of shaft (#19) using a standard bearing puller.
5. Remove six socket head screws (#47) from clutch back plate (#45). Remove back plate(#45), friction discs (#42), and separator plate (#43).
6. Check for heat damage to springs (#44), pressure plate (#40), back plate (#45), and hub spline (#39).

Note: If the hub spline and pressure plate are worn, refer to "REMOVAL AND DISASSEMBLY" on page 4 for additional instructions.

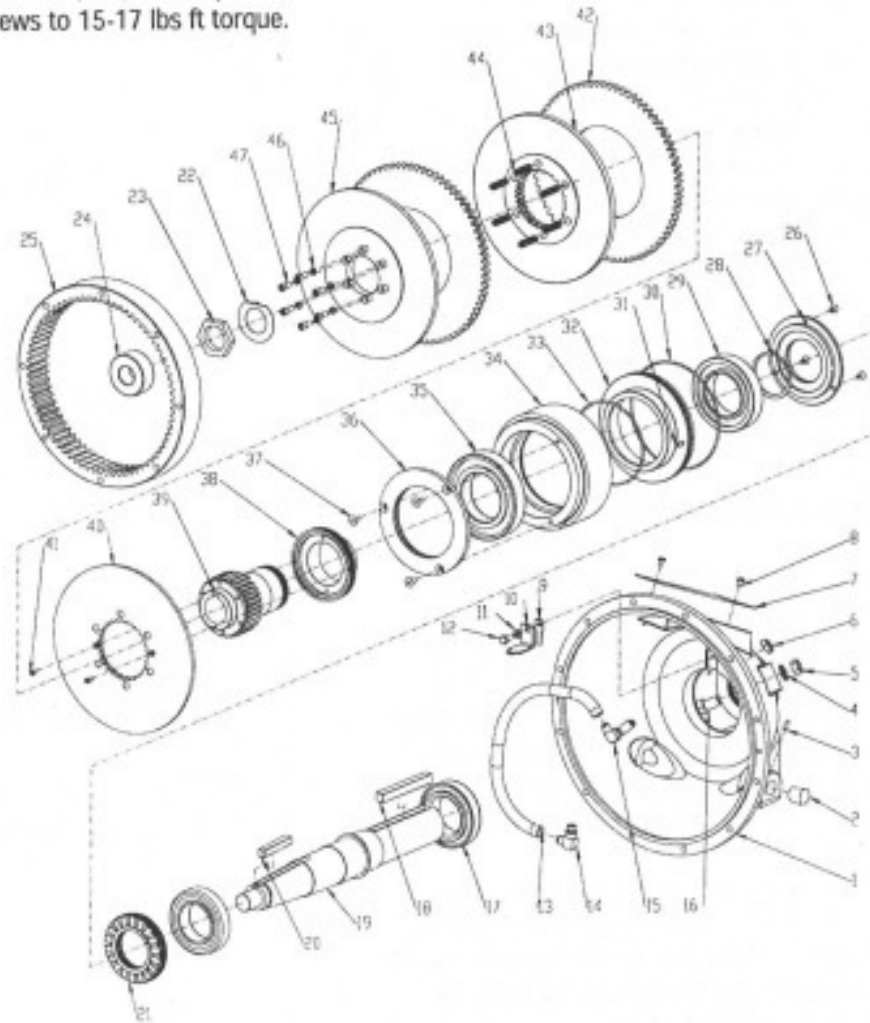


SERVICE AND REPAIR INSTRUCTIONS

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Assemble for Disc Change:

1. Position bell housing clutch assembly in vertical position with input side up.
2. Position friction discs (#42) and separator plate (#43) on to pressure plate (#40).
3. Carefully position back plate (#45) over springs in line with center pilot. Reinstall socket cap screws (#47) and lockwashers (#46) to complete the clutch assembly.
4. Torque screws to 15-17 lbs ft torque.

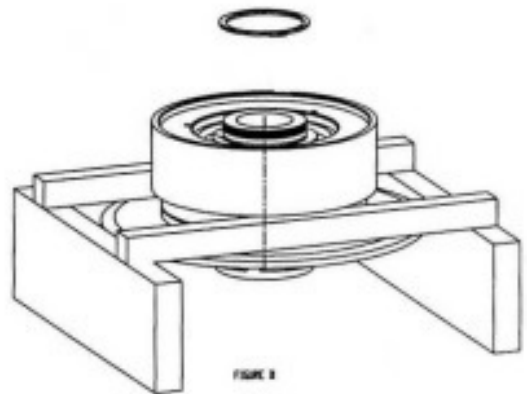
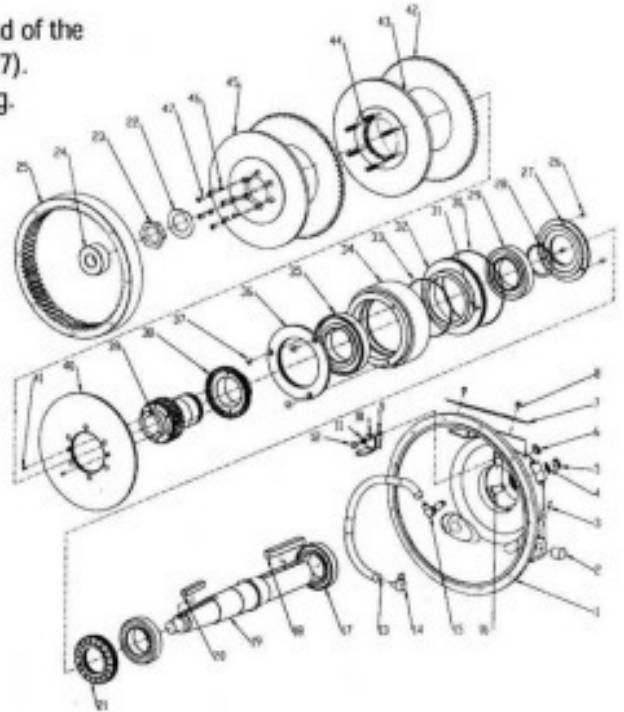


SERVICE AND REPAIR INSTRUCTIONS

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Disassemble Clutch:

1. Remove sheaves, keys, belts, etc. from the output end of the clutch shaft and remove the instruction cover plate(#7).
2. Remove hydraulic connection (#15) to clutch housing.
3. Remove cap screws that secure the clutch housing to the flywheel housing. There are two 3/8-16 tapped holes in the housing to be used for pusher bolts to assist in removing the clutch from engine.
4. Remove pilot bearing (#24) from end of shaft (#19) using a standard bearing puller.
5. Remove six socket head screws (#47) from clutch back plate (#45). Remove back plate (#45) friction discs (#42), separator plate (#43).
6. Remove the shaft nut (#23) and lock washer (#22).
7. Remove the bulkhead fitting (#15), and fitting nut (#6) from side of housing (#1).
8. Remove clutch and key (#20) from tapered shaft (#19) using standard "T" bar wheel puller with two 5/16-18 bolts.
9. Remove hydraulic hose (#13) from fitting on piston body (#34).
10. Turn clutch face down and remove back retainer plate (#27) by removing three 1/4-20 flat head screws (#26).
11. Remove external snap ring (#28) from hub (#39) and press hub (#39) out of clutch body assembly. Note: Clutch body can be supported with two 1" square bars as shown in [Figure B](#) (for disassembly of hub (#39)).
12. Remove cylinder assembly (#32) from piston (#34) by inserting an air hose into the actuation port and providing a blast of air.
13. Check cylinder bearing. If bearing (#29) turns freely and shows no signs of wear, leave assembled in cylinder assembly (#32). If not, set cylinder assembly (#32) face down on spacers and remove bearing (#29) by taping on outer race with flat punch.
14. Turn clutch face up and remove pressure plate (#40) by removing two #10-24 cap screws (#41).
15. Remove front retainer plate (#36) and three 5/16-18 flat head screws (#37).
16. Check piston bearing (#35). If bearing turns freely and shows no signs of wear leave assembled in piston body (#34) and on spacer (#38). If not, turn piston (#34) assembly face down and remove front bearing (#35) and spacer (#38) assembly by taping on outer race with flat punch.
17. Remove bearing (#35) from spacer (#38) using two 1/4-20 screws in holes provided.

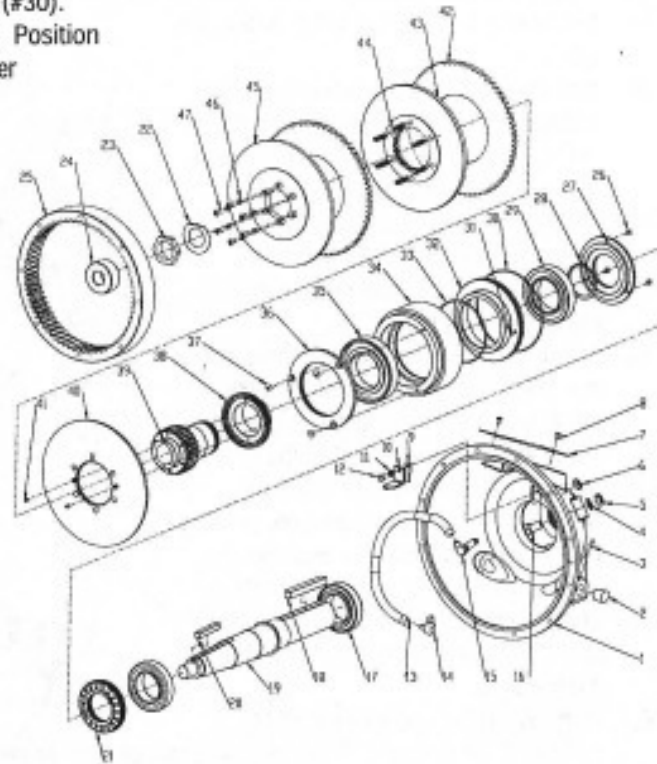


SERVICE AND REPAIR INSTRUCTIONS

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Assemble Clutch:

1. Position cylinder (#32) with three holes up. Position bearing (#29) in cylinder bore with thick side of outer race facing down. Apply Loctite #609 (or equiv.) compound to outer race and press bearing (#29) to seat. Apply oil to o'ring groove and install o'ring (#30).
2. Position piston (#34) with bearing bore up. Position bearing (#35) in bore with thick side of outer race facing down, apply Loctite #609 (or equiv.) compound to outer race and press to seat. Position spacer (#38) in bearing bore, apply retaining compound to spacer and press bearing to seat.
3. Apply Mobil #SHC 100 grease to bearing balls. Position retainer spacer (#36) on piston assembly (#34) and seat securely with three 5/16-18 flat head screws (#37). Torque to 15 to 17 lbs.-ft.
4. Position pressure plate (#40) on assembly, align with two #10-24 holes and install two cap screws (#41) to prescribed torque.
5. Turn assembly with pressure plate face down. Apply oil to o'ring groove and install o'ring (#33). Position cylinder assembly (#32) in bore aligning dowel pin (#31) with anti rotation hole in piston and press the assembly to seat. (Note: the hole intersecting the fitting is the WRONG hole)
6. Position assembly over hub (#39), align gear teeth in pressure plate (#40) with gear teeth in hub (#39) and press to seat.
7. Install external snap ring (#28) on hub (#39).
8. Apply Mobil #SHC 100 grease to bearing balls. Position retainer spacer (#27) on cylinder (#32) and seat securely with three 1/4"-20 flat head screws (#26).
9. Position assembly with pressure plate (#40) face up. Position one friction disc (#42) on pressure plate (#40).
10. Position the separator plate (#43) over the hub (#39), aligning the six thru holes in the separator plate with the six spot faced holes in the pressure plate.
11. Position the six springs (#44) through the holes of the separator plate (#43) and on to the spot faced holes of the pressure plate (#40). The six springs should be flat and square to the pressure plate (40).
12. Position the backplate (#45) so that the six spot-faced holes fit over the six springs.
13. Install six socket head cap screws (#47) and lock washers (#46) to complete the clutch assembly.
14. Attach and tighten hydraulic hose (#13) and (#14) to clutch body.



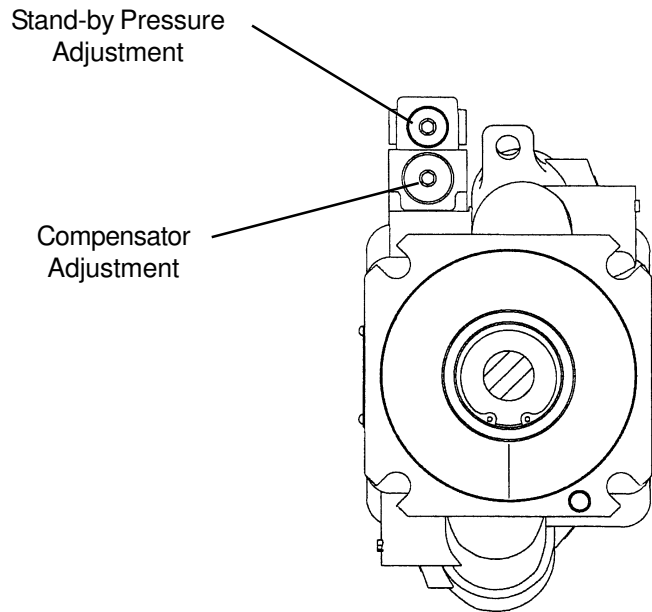
SERVICE AND REPAIR INSTRUCTIONS

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7.7 PUMP SETTINGS AND ADJUSTMENTS

This machine is equipped with a pressure compensated, hydraulic piston pump with load sense. It has two adjustable settings, Compensator pressure setting and Stand-by pressure setting. Refer to the Specifications and Settings section of this manual for those settings. The case ports are identified by the following marks:

- Inlet Port (suction) : Right side of pump (facing the front of the machine)
- Outlet Port (pressure) : Left side of pump (facing the front of the machine)
- Load Sense Port: Top center of pump, marked "X".
- Case Drain Port: Top center of pump, marked "L2".
- Gauge Port (system pressure) : Bottom side of pump, marked "M2".



Pump Setting Detail

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Setting the Stand-by Pressure ~ 250-300 psi (17.5 - 20.7 bar)

***Remove and cap 2nd system to read only pump stand-by pressure.**

The Stand-by pressure setting, is set by adjusting the top set screw on the top-center of the pump case.

1. Install a 0-5000 psi minimum pressure gauge into the gauge port on the pump.
2. Start the engine. The pressure on the gauge is the current stand-by pressure setting.
3. Loosen, but do not remove, the locking set screw in the side of the adjustment housing.
4. Adjust the set screw in the center of the adjustment housing until the desired pressure is achieved.
5. Tighten the locking set screw.
6. Check pressure setting.

Setting the Compensator ~ 5000 psi (344.8 bar)

The Compensator pressure setting is set by adjusting the bottom set screw on the top-center of the pump case.

1. Install a 0-5000 psi minimum pressure gauge into the gauge port on the pump.
2. Start the engine and retract the cylinders using the manual lever on the thrust control valve.
3. Dead-head the cylinder in the retracted position and the pressure on the gauge is the compensator setting.
4. Loosen, but do not remove, the locking set screw in the side of the adjustment housing.
5. Adjust the set screw in the center of the adjustment housing until the desired pressure is achieved. Dead-head the cylinders and make an adjustment. Release the cylinders and allow the pump to drop to stand-by pressure before making more adjustments. Do not try to adjust the pump all at one time.
6. Tighten the locking set screw.
7. Check pressure setting.

NOTE: There are no other adjustable functions on this pump. If the pump requires more service, consult the McLaughlin Manufacturing Co. for pump service and repair instructions.

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7.8 Main Thrust Valve Adjustment

The main thrust valve has both a manual control lever, and an electric solenoid control. The electrical control portion is covered under the Autobore section. The valve has an adjustable relief valve built in. It is preset at the factory and should not require adjustment in the field. Reference the Components section for valve handles.

Relief Valve Adjustment ~ 5100+ psi (351.7 + bar)

The relief valve is located just below the instrument panel. Raise the instrument panel to access the relief valve.

1. Install a 0-5000 psi minimum pressure gauge into the gauge port on the pump.
2. Start the engine and confirm that the compensator is set at the proper setting. Note: the relief valve is set 100-200 psi (6.9 - 13.8 bar) above the compensator setting. If the compensator setting is wrong, the relief valve setting will be wrong.
3. Remove the locking cap.
4. Loosen, but do not remove the locking nut on the relief valve.
5. Loosen the relief valve threaded stud 1-2 turns.
6. Run the machine and collapse the thrust cylinders using the manual lever on the valve.
7. Dead-head the cylinders in the retract position and adjust the relief valve until the engine relieves its self. Adjustment of this valve is an audible determination. When the pump goes over relief it continues to pump oil which lugs the engine down. When the pump reaches proper compensator setting and de-strokes, the relief valve is set properly.
8. After the pump de-strokes, turn the relief valve threaded stud 1/4 of a turn and tighten the lock nut.
9. Install the locking cap.
10. Replace and secure the instrument panel.

WARRANTY & RETURN GOODS POLICY

LIMITED WARRANTY

The Manufacturer warrants its products to be free from defects in material and workmanship for a period of twelve months from the date of shipment from the factory. Hole Hammer pistons, bodies, and nose pieces are warranted to be free from defects in material and workmanship for a period of three years from the date of shipment from the factory. The Manufacturer shall not be responsible for any damage resulting to or caused by its products by reason of installation, improper storage, unauthorized service, alteration of the products, neglect or abuse, or use of the product in a manner inconsistent with its design. This warranty does not extend to any component parts not manufactured by Manufacturer; however, Manufacturer's warranty herein shall not limit any warranties made by manufacturers of component parts which extend to Buyer.

Claims for defects in material and workmanship shall be made in writing to Manufacturer within ten days of discovery of defect. Manufacturer may either send a service representative or have the product returned to its factory at Buyer's expense for inspection. Upon notification of defect, Manufacturer will issue a return goods authorization number to Buyer. The return goods authorization number must accompany the product returned. If judged by the Manufacturer to be defective in material or workmanship, the product will be replaced or repaired at the option of the manufacturer, free from all charges except authorized transportation. Buyer shall be responsible for all maintenance services consisting of lubrication and cleaning of equipment, replacing expandable parts, making minor adjustments, and performing operating checks, all in accordance with procedures outlined in Manufacturer's maintenance literature.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND NO REPRESENTATIONS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, (INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), ARE MADE BY THE MANUFACTURER IN CONNECTION WITH THE

MANUFACTURE OR SALE OF ITS PRODUCTS. NO EMPLOYEE, DISTRIBUTOR, OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY ON BEHALF OF MANUFACTURER THE REMEDIES OF BUYER SET FORTH HEREIN ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER REMEDIES. THE LIABILITY OF MANUFACTURER WHETHER IN CONTRACT, TORT, UNDER ANY WARRANTY, OR OTHERWISE SHALL NOT EXTEND BEYOND ITS OBLIGATION TO REPAIR OR REPLACE, AT ITS OPTION ANY PRODUCT OR PART FOUND BY MANUFACTURER TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP. MANUFACTURER SHALL NOT BE LIABLE FOR COST OF INSTALLATION AND/OR REMOVAL OR BE RESPONSIBLE FOR DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE.

GENERAL RETURNS OF MERCHANDISE

1. All returns must be pre-authorized
 - A. Please call our parts department for an RGA number
 - B. Please include RGA number on the outside of box
 - C. Include any required paper work or special instructions
 - D. Items returned without an RGA number will not be accepted
2. All returns are subject to a 20% restock charge.
3. Special items are non-returnable
 - A. Non-stock parts
 - B. Custom parts
 - C. If you are unsure about a parts status when ordering, ask your McLaughlin representative if the item fits on of the above conditions.
4. Items must be returned within thirty days of original order date.
5. Items not returned within 30 days from the date of RGA is issued will not be accepted.
6. The item(s) must be in new condition. Used item(s) are not returnable.

END OF MANUAL