



**Model D5P/D10P
Power Ditcher
Operator's Manual**



LANDOLL CORPORATION

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Introduction

The Landoll Model D5P/D10P Power Ditcher is a quality product designed to give years of trouble free performance. By following each section of this manual, your system will perform as designed for you and your operation

CHAPTER 1	gives basic instructions on the use of this manual.
CHAPTER 2	gives product specifications. These specifications supply lengths and measures for your equipment. A Standard Bolt Torque Table is provided to give guidelines for bolt torques to be used when servicing this product.
CHAPTER 3	contains assembly instructions for your Model D5P/D10P Power Ditcher. When these procedures are correctly followed, your equipment should provide you years of trouble-free operation and service.
CHAPTER 4	instructs how to operate your equipment before using it, and describes adjustments needed. It also gives practical advice for the care and maintenance of your Landoll equipment. Drawings in this section locate adjustment points on the equipment. NOTE: IF THE EQUIPMENT IS IMPROPERLY ASSEMBLED OR MAINTAINED, THE WARRANTY IS VOID. IF YOU HAVE ANY QUESTIONS CONTACT: LANDOLL CORPORATION 1900 NORTH STREET MARYSVILLE, KANSAS 66508 or phone: (785) 562-5381 or (800) 428-5655 (888) 527-3909
CHAPTER 5	is a troubleshooting guide to aid in diagnosing and solving problems with the equipment.
PARTS LIST	is a separate manual showing the various assemblies, subassemblies, and systems. Refer to that manual when ordering Landoll replacement parts. Order parts from your Landoll dealer.
WARRANTY	The Warranty Registration form is included with the product documents. Fill it out and mail it within 15 days of purchase. NOTE: IMPROPER ASSEMBLY, MODIFICATION, OR MAINTENANCE OF YOUR LANDOLL MACHINE CAN VOID YOUR WARRANTY.
COMMENTS	Address comments or questions regarding this publication to: LANDOLL CORPORATION 1900 NORTH STREET MARYSVILLE, KANSAS 66508 ATTENTION: PUBLICATIONS -DEPT. 55

Understanding Safety Statements

You will find various types of safety information on the following pages and on the machine signs (decals) attached to the vehicle. This section explains their meaning.

The Safety Alert Symbol means ATTENTION! YOUR SAFETY IS INVOLVED!



DANGER

Danger means a life-threatening situation exists. Death can occur if safety measures or instructions on this label are not properly followed.



WARNING

Warning means serious injury or death can occur if safety measures or instructions on this label are not properly followed.



CAUTION

Caution means serious equipment or other property damage can occur if instructions on this label are not properly followed.

NOTE

Means that failure to follow these instructions could cause damage to the equipment or cause it to operate improperly.

NOTE

Make sure you read and understand the information contained in this manual and on the machine signs (decals) before you attempt to operate or maintain this vehicle.

The safety statements contained in this manual relate to the operation of the Model D5P/D10P Power Ditcher.

Standard Specifications

The D5P/D10P Series Power Ditchers are connected to the tractor PTO shaft by means of a shielded double u-joint. The 2-3/16" diameter alloy steel in-put and out-put shafts are connected by a #80-2 double roller chain drive. The drive system rotates on four (4) tri-ply seal ball bearings in a continuous oil bath.

The D5P18A has a 22 tooth in-put sprocket and a 16 tooth out-put sprocket. The D10P18A has a 16 tooth in-put sprocket and a 22 tooth out-put sprocket. This combination gives a cutter head speed of 740 RPM on both models. (D5P18 @ 540 RPM PTO and D10P18 @ 1000 RPM PTO.)

The entire drive system is inside a 6"x10" steel case, easily accessible by two removable end plates.

The cutter head has four (4) heat treated high carbon steel blades with a cutting diameter adjustable from 18" to 20".

The D5P18A Power Ditcher is designed for use on tractors with 50 to 110 PTO horsepower and 540 RPM PTO. The D10P18A Power Ditcher is designed for use on tractors with 80 to 150 PTO horsepower and 1000 RPM PTO.

	Model D5P18A	Model D10P18A
Horsepower Recommendation	For use on tractors with 540 RPM PTO from 50 to 110 PTO horsepower.	For use on tractors with 1000 RPM PTO from 80 to 150 PTO horsepower.
"A" Frame	Category II and III 3-point hitch.	
Cutter Head	Adjustable 18" to 20" Features four (4) replaceable high-carbon steel blades. Rotates at 740 RPM.	
Chain Drive	Heavy duty, endless #80H roller chain. Shafts 2-3/16" dia. high carbon steel.	
	Case hardened top sprockets with 22 teeth and bottom sprockets have 16 teeth.	Case hardened top sprockets with 16 teeth and bottom sprockets have 22 teeth.
Shear Bolt	Two - 3/8" dia. grade 8	
Universal Drive Shaft	1-3/8"- 6B Spline. Quick coupler connects to 540 RPM tractor PTO shaft. Shaft is telescoping and fully shielded.	1-3/8"- 21 Spline. Quick coupler connects to 1000 RPM tractor PTO shaft. Shaft is telescoping and fully shielded. (Note: D10PH18A Models use 1-3/4" - 20 Spline Drive Shaft)
Chain Drive	6" x 10" x 1/4" tubing welded into rigid, one-piece, all-welded main frame	

NOTE

D10P models can be used with 540 PTO tractors by reversing sprockets and replacing the tractor end PTO yoke.

STANDARD SPECIFICATIONS

LANDOLL CORPORATION GENERAL TORQUE SPECIFICATIONS (REV. 4/97)

THIS CHART PROVIDES TIGHTENING TORQUES FOR GENERAL PURPOSE APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.

ASSEMBLY TORQUES APPLY TO PLATED NUTS AND CAPSCREWS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED.

WHEN FASTENERS ARE DRY (SOLVENT CLEANED), ADD 33% TO AS RECEIVED CONDITION TORQUE.

BOLT HEAD IDENTIFICATION MARKS INDICATE GRADE AND MAY VARY FROM MANUFACTURER TO MANUFACTURER.

THICK NUTS MUST BE USED ON GRADE 8 CAPSCREWS.

USE VALUE IN [] IF USING PREVAILING TORQUE NUTS.

TORQUE IS SPECIFIED IN FOOT POUNDS

UNC Size	SAE Grade 2		SAE Grade 5		SAE Grade 8		UNF Size	SAE Grade 2		SAE Grade 5		SAE Grade 8	
1/4-20	4	[5]	6	[7]	9	[11]	1/4-28	5	[6]	7	[9]	10	[12]
5/16-18	8	[10]	13	[16]	18	[22]	5/16-24	9	[11]	14	[17]	20	[25]
3/8-16	15	[19]	23	[29]	35	[43]	3/8-24	17	[21]	25	[31]	35	[44]
7/16-14	24	[30]	35	[43]	55	[62]	7/16-20	27	[34]	40	[50]	60	[75]
1/2-13	35	[43]	55	[62]	80	[100]	1/2-20	40	[50]	65	[81]	90	[112]
9/16-12	55	[62]	80	[100]	110	[137]	9/16-18	60	[75]	90	[112]	130	[162]
5/8-11	75	[94]	110	[137]	170	[212]	5/8-18	85	[106]	130	[162]	180	[225]
3/4-10	130	[162]	200	[250]	280	[350]	3/4-16	150	[188]	220	[275]	320	[400]
7/8-9	125	[156]	320	[400]	460	[575]	7/8-14	140	[175]	360	[450]	500	[625]
1-8	190	[237]	408	[506]	680	[850]	1-14	210	[263]	540	[675]	760	[950]
1-1/8-7	270	[337]	600	[750]	960	[1200]	1-1/8-12	300	[375]	660	[825]	1080	[1350]
1-1/4-7	380	[475]	840	[1050]	1426	[1782]	1-1/4-12	420	[525]	920	[1150]	1500	[1875]
1-3/8-6	490	[612]	110	[1375]	1780	[2225]	1-3/8-12	560	[700]	1260	[1575]	2010	[2512]
1-1/2-6	650	[812]	1460	[1825]	2360	[2950]	1-1/2-12	730	[912]	1640	[2050]	2660	[3325]
1-3/4-5	736	[920]	1651	[2063]	2678	[3347]	1-3/4-12	920	[1150]	2063	[2579]	3347	[4183]

METRIC

COARSE THREAD METRIC CLASS 10.9 FASTENERS AND CLASS 10.0 NUTS AND THROUGH HARDENED FLAT WASHERS, PHOSPHATE COATED, ROCKWELL "C" 38-45.

USE VALUE IN [] IF USING PREVAILING TORQUE NUTS.

Nominal Thread Diameter mm	Standard Torque		Nominal Thread Diameter mm	Standard Torque					
	Newton-Meters	Foot-Pounds		Newton-Meters	Foot-Pounds				
6	10	[14]	7	[10]	20	385	[450]	290	[335]
7	16	[22]	12	[16]	24	670	[775]	500	[625]
8	23	[32]	17	[24]	27	980	[1105]	730	[825]
10	46	[60]	34	[47]	30	1330	[1470]	990	[1090]
12	80	[101]	60	[75]	33	1790	[1950]	1340	[1450]
14	125	[155]	90	[115]	36	2325	[2515]	1730	[1870]
16	200	[240]	150	[180]	39	3010	[3210]	2240	[2380]
18	275	[330]	205	[245]					

Table 2-1: General Torque Specifications

**LANDOLL CORPORATION
HYDRAULIC FITTING TORQUE SPECIFICATIONS
37° JIC, ORS, & ORB (REV. 10/97)**

THIS CHART PROVIDES TIGHTENING TORQUES FOR HYDRAULIC FITTING APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.

ASSEMBLY TORQUES APPLY TO PLATED CARBON STEEL AND STAINLESS STEEL FITTINGS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED. BRASS FITTINGS AND ADAPTERS - 65% OF THE TORQUE VALUE FOR STEEL. STAINLESS STEEL, ALUMINUM AND MONEL - THREADS ARE TO BE LUBRICATED.

TORQUE IS SPECIFIED IN FOOT POUNDS

PARKER BRAND FITTINGS			
Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-13	15-17	13-15
-5	14-16	—	21-23
-6	20-22	34-36	25-29
-8	43-47	58-62	40-44
-10	55-65	100-110	57.5-62.5
-12	80-90	134-146	75-85
-16	115-125	202-218	109-121
-20	160-180	248-272	213-237
-24	185-215	303-327	238-262
-32	250-290	—	310-340
GATES BRAND FITTINGS			
Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	10-11	10-12	14-16
-5	13-15	—	—
-6	17-19	18-20	24-26
-8	34-38	32-40	37-44
-10	50-56	46-56	50-60
-12	70-78	65-80	75-83
-14	—	65-80	—
-16	94-104	92-105	111-125
-20	124-138	125-140	133-152
-24	156-173	150-180	156-184
-32	219-243	—	—
AEROQUIP BRAND FITTINGS			
Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-12	10-12	14-16
-5	15-16	—	18-20
-6	18-20	18-20	24-26
-8	38-42	32-35	50-60
-10	57-62	46-50	72-80
-12	79-87	65-70	125-135
-14	—	—	160-180
-16	108-113	92-100	200-220
-20	127-133	125-140	210-280
-24	158-167	150-165	270-360
-32	245-258	—	—

Table 2-2: Hydraulic Fitting Torque Specifications

Assembly Instructions

Assembly - Safety



CAUTION

1. The person or persons who assemble this machine must have the ability to read, understand and follow the step by step assembly procedures and safety instruction outlined herein.
2. Assembly area should be level, clean and free of debris to prevent assembly personnel from tripping or falling.
3. Inspect all parts for sharp edges, grease, oil or dirt which might cause injury during assembly.



WARNING

1. Wear personal protective equipment (PPE) such as, but not limited to, protection for eyes, lungs, ears, head, hands and feet when operating, servicing or repairing equipment.
2. Use lift crane, jack, tackle or fork lift truck to lift heavy parts and assemblies.
3. Keep clear of parts which may move or drop when removing shipping straps or brackets.
4. If machine requires blocking up, use blocking material of adequate strength and in good condition. Blocks must be on a smooth dry surface.
5. Never place any part of your body under blocked-up assemblies.
6. If welding or flame-cutting is required, be sure no flammable materials are in the area. Also, clear bystanders from area.

After Assembly - Safety



WARNING

1. Be sure all nuts, bolts, other fasteners and hydraulic fittings are properly tightened. Refer to the bolt torque chart.
2. Be sure all safety guards and safety locking devices are in place and function properly.



CAUTION

Before operating the machine, be sure to read the safety and operation sections of the operator's manual.



CAUTION

Before delivering the machine, review machine maintenance, operation and safety with the customer.

General Assembly Instructions

1. The terms "right" and "left", "front" and "rear", refer to the machine as viewed by facing in the direction of forward travel.
2. Open all bundles. Do not mix parts of one bundle with those of another. Place all bundles where they will be easy to access.
3. Neatly arrange parts and tools within easy reach of work area.
4. Use the correct grade of bolt in the proper locations as indicated. Refer to the bolt torque chart for descriptive markings on bolt heads.
5. After completing each assembly step, review next step in procedure before proceeding with that step.

Assembly Instructions

1. The D5P18A and D10P18A Series Power Ditcher is completely assembled at the factory, except for the universal drive shaft which is wired to the "A" frame.
2. Thoroughly clean the end of the drive shaft and attach it to the input shaft of the ditcher with a 7/16" x 1" hex bolt, lock washer and special flat washer and with two 3/8" x 2-1/2" grade 8 shear bolts and lock nuts.
3. The power ditcher is now fully assembled and ready for attachment to the tractor.

Physical Characteristics

See Figures 3-1, 3-2, and the list below for parts identification.

1. Parking Stands
2. Shear Flange Safety Shield
3. Shielded Drive Shaft
4. All Welded Main Frame and chain Case
5. Adjustable Hardened High Carbon Steel Blades
6. Cat. II or III Standard or Quick Coupler Hitch
7. Removable End Plates for Ease of Service
8. Adjustable Skid for Depth Control
9. Safety Collars on Input and Output Shafts
10. Chain Adjustment

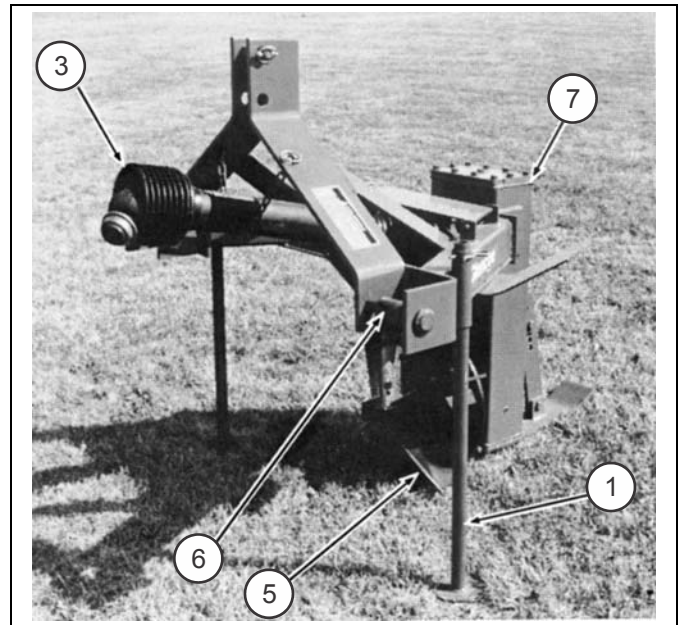


Figure 3-1: D5P/D10P Power Ditcher

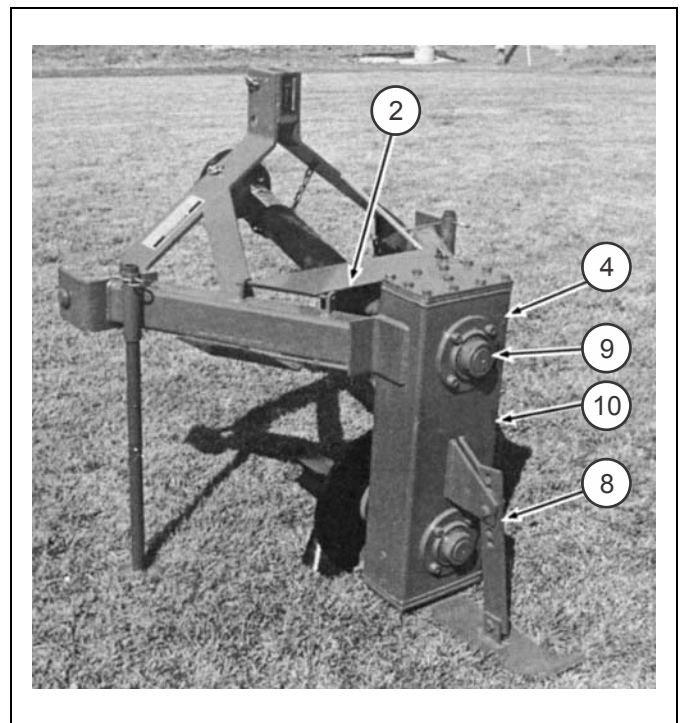


Figure 3-2: D5P/D10P Power Ditcher

Notes:

Operation and Maintenance

The Landoll D5P/D10P Power Ditcher is a ditching machine for controlling field water drainage by improving water run-off conditions. The Power Ditcher can make shallow trenches for irrigation and be used to build fire lanes.

This manual provides suggested operating techniques to help you obtain efficient and dependable service from your new machine. This manual also contains general information, specifications, safety information, maintenance and service requirements for your machine. Read this manual carefully.

Keep this manual handy for future reference. If you have any questions, contact your Landoll equipment dealer. Your dealer is the best qualified to help you. He has qualified service technicians and genuine Landoll replacement parts to keep your machine in top operating condition. This manual should remain with the machine when sold.

This manual was prepared from the latest product information available at publication time. The Company reserves the right to make changes at any time without notice.



CAUTION

1. Remove tractor start key when tractor and implement will be unattended.
2. Never leave unattended equipment in the unlocked raised position. Lower the unit to the ground or use transport locks.
3. Do not leave tractor or implement unattended with tractor engine running.



CAUTION

1. Avoid injury or fatal accidents. Read these safety precautions completely and carefully! Utilize these instructions when operating your machine.
2. The operator should be a responsible adult familiar with farm machinery and trained in this machine's operations. Do not allow persons to operate this machine until they have read this manual and have developed a thorough understanding of the safety precautions and of how the machine works.
3. To prevent injury or death, use a tractor equipped with a roll-over protection structure (ROPS) and seat belt. Do not paint over, remove or deface any safety decals on your equipment. Observe all safety decals and follow the instructions on them.
4. Remember! Your best insurance is a careful and responsible operator. If there is any portion of this manual or of the machine's operation you do not understand, contact your local authorized Landoll dealer, or Landoll Corporation.



DANGER

Never allow anyone to ride on this equipment.



WARNING

1. Do not clean, adjust or service when the machine is in motion.
2. All hydraulically or mechanically elevated components must be blocked to prevent accidental lowering or must be lowered to the ground when adjustments or repairs are made.
3. Properly tighten all mounting hardware. see bolt torque chart.
4. Periodically inspect all moving parts for wear and replace with only authorized service parts if any excessive wear is present. If safety decals are missing, illegible, or damaged, they should be replaced.



DANGER

Clear the area of bystanders before starting operation.



CAUTION

1. Avoid sharp turns using brakes. drive slowly over rough ground, side hills and around curves to avoid tipping.
2. Always shut off tractor, shift to “park” position (or shift to neutral), set brakes and cycle hydraulic levers before dismounting tractor or working around the machine.



CAUTION

1. Wear personal protective equipment (PPE) such as, but not limited to, protection for eyes, lungs, ears, head, hands and feet when operating, servicing or repairing equipment. Do not wear loose clothing or jewelry as it may entangle or catch on moving parts.
2. Never use your hands to locate a hydraulic leak. Use a piece of wood or cardboard. Hydraulic fluid escaping under pressure can penetrate the skin causing serious injury.
3. Openings in the skin and minor cuts are susceptible to infection from hydraulic fluid. If injured by escaping fluid, see a doctor at once. without immediate medical treatment, serious infection can occur.
4. Comply with your state and local laws governing highway safety, lighting & marking, and the movement of farm machinery on public roads.
5. Always drive at a reasonable speed to maintain control of the equipment. do not tow at speeds in excess of 20 mph.
6. Be a safe and courteous operator.



CAUTION

Keep safety decals free of dirt and grime.

Safety Decals

1. The following decals are installed to alert operators to hazards in specific machine areas (**See Figure 4-1.**) The decals are for personal safety...
READ AND UNDERSTAND THE DECALS!
 - a. Keep decals clean by wiping off regularly. Use a cleaning solution if necessary.
 - b. Replace missing, damaged or painted over decals.



Figure 4-1: Safety Decals

Power Ditcher Operation and Adjustments



WARNING

Stop the tractor and disengage the PTO before making any adjustments. Keep all shields in place.

1. The Power Ditcher should be lifted from the ground and the parking stands raised and secured with the hair pin clips. If the tractor is equipped with a float position on the three (3) point lift, this should be used. This will allow the skid to control the depth of cut. To get a deeper ditch, raise the skid by means of the adjusting bar at the rear of the chain case. To get a more shallow ditch, lower the skid by means of the adjusting bar.
2. The cutting diameter may be adjusted by moving the location of the blades on the cutter head. Location in the inside set of holes will give an 18" diameter cut. Locating the blades in the outside set of holes will give a 20" diameter cut.
3. Raise and lower the ditcher slowly to check engagement of the drive shaft. At least 6" of the square shaft should be engaged in the tubular portion of the drive shaft. Also check to be sure the drive shaft will not hit the tractor drawbar and is not binding when rotated. Be sure the safety shield is secured over the shear flange.
4. The ditcher should be lowered just above the ground and the PTO engaged. The PTO should not be engaged with the blades resting on the ground. This sudden shock could result in broken shear bolts, chain or drive shaft. After the cutter head has started rotating, set the engine speed for 540 or 1000 RPM PTO speed. Start the forward motion of the tractor and lower the ditcher into the ground. Forward speed and depth of cut should be matched to soil conditions.
5. When backing or turning, the ditcher should be raised to clear the ground. The ditcher should never be raised to maximum height with the PTO engaged.

Attaching to the Tractor



WARNING

Stop the tractor and disengage the PTO before making any adjustments. Keep all shields in place.

1. Both the D5P18A and D10P18A Power Ditchers are designed for use on a Category II or III three point linkage or a Category II or III quick coupler (**See Figure 4-2.**) A Category II three point linkage attaches to the upper top hole with 1" diameter top pin. The lower links fit the 1-1/8" diameter portion of the lower hitch pins. A Category II quick coupler is attached to the lower top hole using the 1" diameter top pin and 1-1/2" O.D. bushing. The lower hitch attaches to the lower hitch pins using the 1-7/16" O.D. bushing over the 1-1/8" diameter portion of the pin with the 2" O.D. spacer over the 1-7/16" diameter portion of the pin. A Category III three point linkage and quick coupler attaches in the upper top hole with the 1" diameter top pin and the 1-1/4" O.D. bushing. The lower links fit the 1-7/16" diameter portion of the lower hitch pins with the 1-7/16" O.D. bushing and the 2" O.D. spacer both located over the 1-1/8" diameter portion of the hitch pin. All pins should then be secured with the klik pins.



Figure 4-2: D5P/D10P Tractor Attachment

2. The yoke of the universal drive shaft is then attached to the PTO shaft of the tractor and secured with the bolt and nut in the yoke on the D10P18A, 1000 RPM, drive shaft and with the slip pin in the yoke on the D5P18A, 540 RPM driveshaft.
3. The tractor's top lift link should be extended or retracted until the chain case is vertical when lowered to the normal operating position. The universal drive shaft must have an equal offset in each joint (**See Figure 4-3.**) As an example, if the front joint is offset 6 degrees the rear joint must also have a 6 degree offset. Should the rear joint be offset 4 degrees or 8 degrees the cutter head will not run at a constant speed and will vibrate excessively. Operating the ditcher in this condition will cause drive shaft, shear bolt and chain failures.

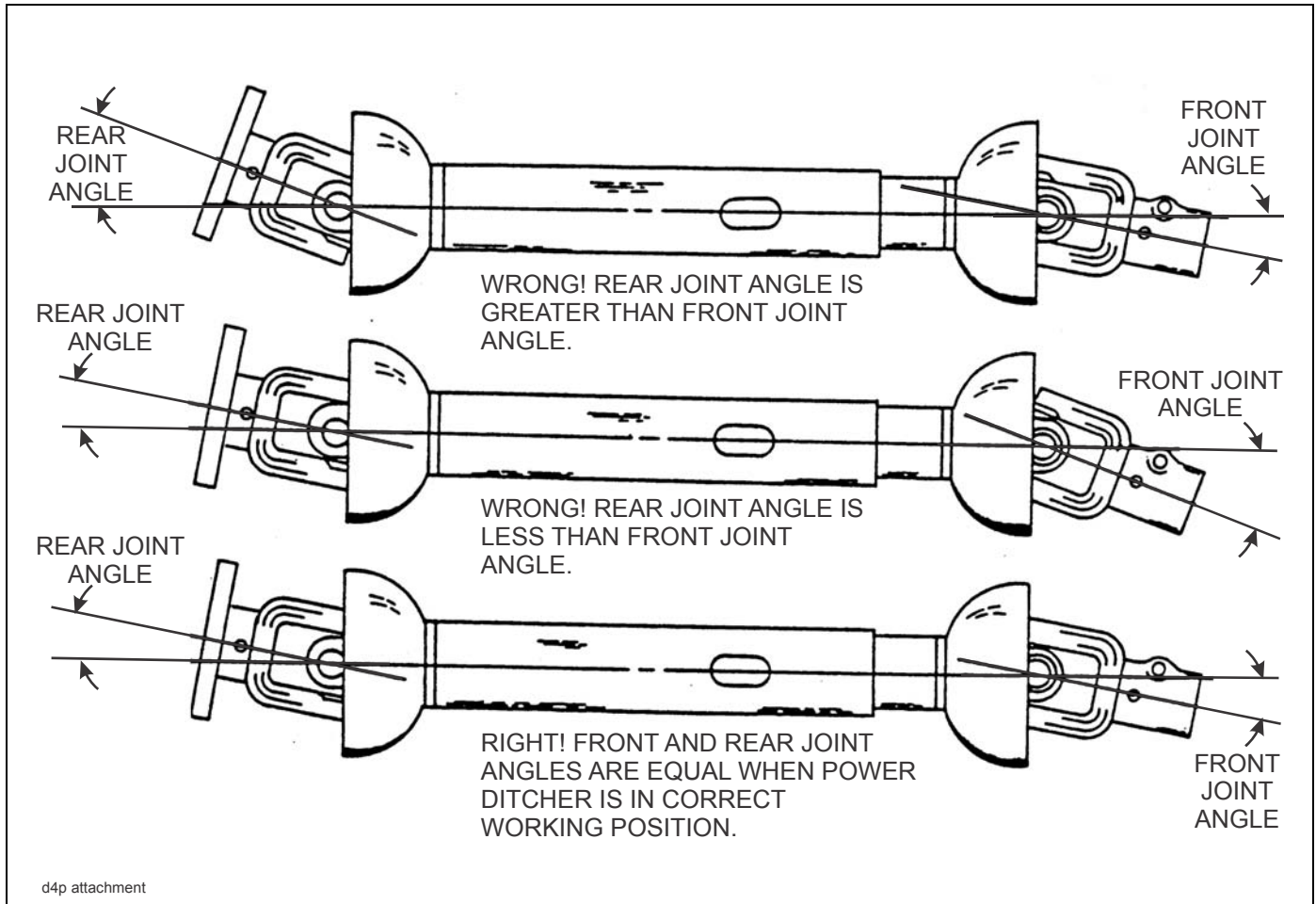


Figure 4-3: D5P/D10P Attachment to Tractor

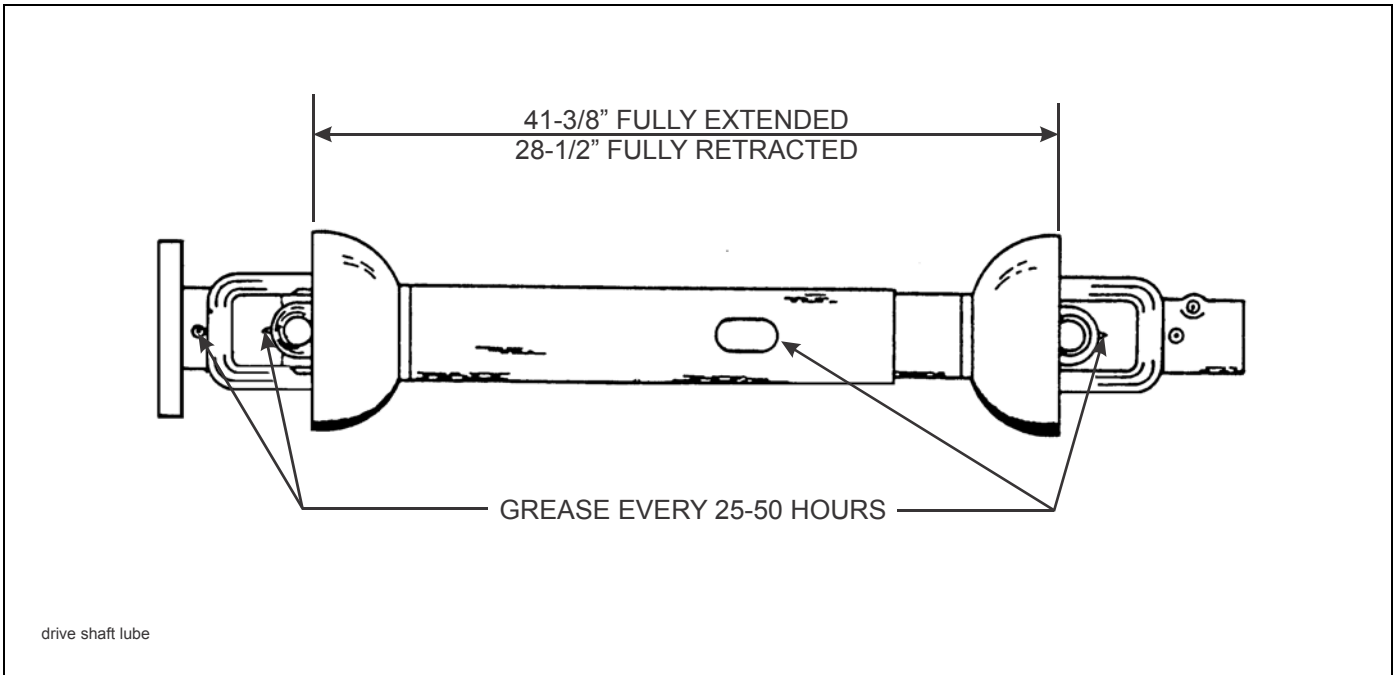


Figure 4-4: Drive Shaft Lubrication

Lubrication



WARNING

Do not clean, adjust or service when machine is in motion.



WARNING

All hydraulically or mechanically elevated components must be blocked to prevent accidental lowering or must be lowered to the ground when adjustments or repairs are made.



WARNING

Before working on this machine, disengage tractor P.T.O., shut off tractor and allow all moving parts to come to a complete stop.



WARNING

Replace all shields and guards after servicing and before starting machine. Always keep all safety shields in place when operating machine.

1. Proper lubrication of your machine is instrumental in obtaining optimum performance and extended life. Neglect leads to needless breakdowns and unnecessary expenses.
2. Check oil level at the check plug on the chain housing when the Power Ditcher is in an upright position. Oil should be level with the plug hole. The chain housing was filled to the proper level at the factory with one quart of SAE 90 oil or equivalent. A similar grade should be used for replacement.
3. Lubricate the drive shaft with a good grade of Lithium Soap Base Grease every 25 to 50 hours of operation (**See Figure 4-4.**) Remove the male end of the drive shaft and pack tube with a generous amount of grease. The drive shaft has four grease fittings.

Maintenance



WARNING

Do not clean, adjust or service when machine is in motion.



WARNING

All hydraulically or mechanically elevated components must be blocked to prevent accidental lowering or must be lowered to the ground when adjustments or repairs are made.



WARNING

Before working on this machine, disengage tractor P.T.O., shut off tractor and allow all moving parts to come to a complete stop.



WARNING

Replace all shields and guards after servicing and before starting machine. Always keep all safety shields in place when operating machine.

Chain Adjustment

1. The chain adjusting bolt is located on the right hand side of main frame. Tighten to “finger tight” in order to remove excess chain slack. Do not over tighten.
2. Secure by tightening jam nut.

Shear Bolts

1. The Power Ditcher has two 5/16” x 1-3/4” grade 8 shear bolts secured with locknuts. They are located in the flange of the main drive shaft at the PTO.

Notes



Intertek

Equipment from Landoll Corporation is built to exacting standards ensured by ISO 9001 registration at all Landoll manufacturing facilities.

Model D5P/D10P
Power Ditcher
Operator's Manual

Re-Order Part Number F-351-0411

LANDOLL CORPORATION

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