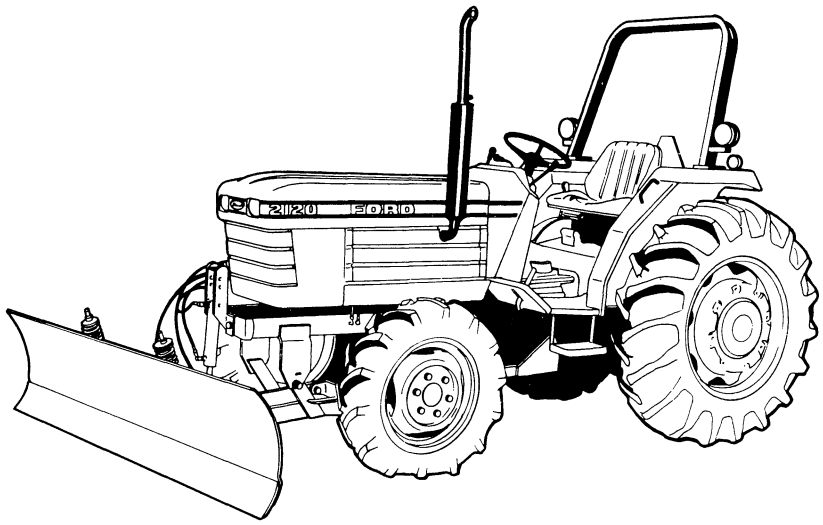
FORD

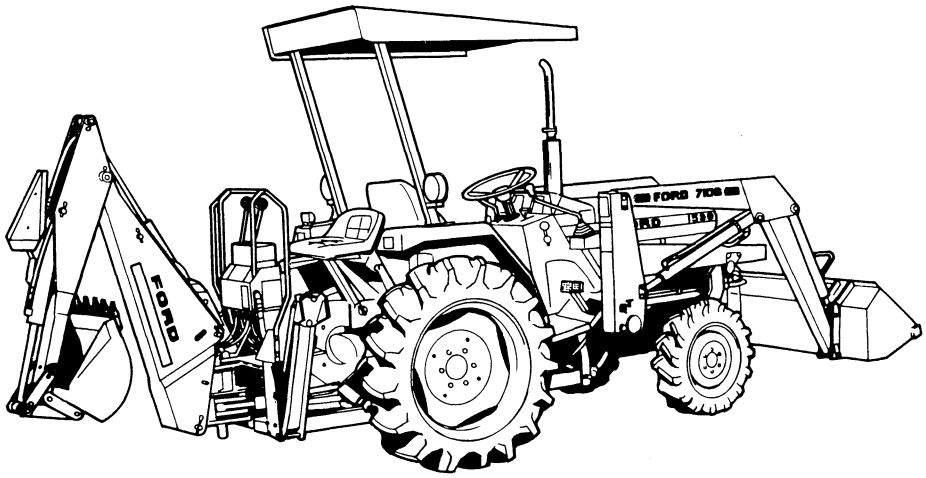
Service Manual

FORD
NEW HOLLAND

700 Series Implements

40070090





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CAUTION! THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER PERSONAL SAFETY IS INVOLVED. TAKE TIME TO READ AND FOLLOW THE INSTRUCTIONS. BE CAREFUL!

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INTRODUCTION
SAFETY PRECAUTIONS

Practically all Service work involves the need to drive a tractor. The Operator's Manual, supplied with each tractor or implement, contains detailed safety precautions relating to Driving, Operating and Servicing. These precautions are as applicable to the service technician as they are to the operator, and should be read, understood and practiced by all personnel.

Prior to undertaking any maintenance, repair, overhaul, dismantling or re-assembly operations, whether within a workshop facility or out "in the field", consideration should be given to factors that may have an effect upon Safety, not only upon the mechanic carrying out the work, but also upon bystanders.

PERSONAL CONSIDERATIONS

- The wrong clothes or carelessness in dress can cause accidents. Check to see that you are suitably clothed.

  Some jobs require special protective equipment.

- **Eye Protection**
  The smallest eye injury may cause loss of vision. Injury can be avoided by wearing eye protection when engaged in chiselling, grinding, discing, welding, painting, etc.

- **Breathing Protection**
  Fumes, dust and paint spray are unpleasant and harmful. These can be avoided by wearing respiratory protection.

- **Hearing Protection**
  Loud noise may damage your hearing and the greater the exposure the worse the damage. If you feel the noise excessive, wear ear protection.

- **Hand Protection**
  It is advisable to use a protective cream before work to prevent irritation and skin contamination. After work clean your hands with soap and water. Solvents such as white spirit, paraffin, etc., may harm the skin.

- **Foot Protection**
  Substantial or protective footwear with reinforced toe-caps will protect your feet from falling objects. Additionally, oil-resistant soles will help to avoid slipping.

- **Special Clothing**
  For certain work it may be necessary to wear flame or acid-resistant clothing.

- Avoid injury through incorrect handling of components. Make sure you are capable of lifting the object. If in doubt get help.

EQUIPMENT CONSIDERATIONS

- **Machine Guards**
  Before using any machine, check to ensure that the machine guards are in position and serviceable. These guards not only prevent parts of the body or clothing coming in contact with the moving parts of the machine, but also ward off objects that might fly off the machine and cause injury.

- **Lifting Appliances**
  Always ensure that lifting equipment, such as chains, slings, lifting brackets, hooks and eyes are thoroughly checked before use. If in doubt, select stronger equipment than is necessary.

  Never stand under a suspended load or raised implement.

- **Compressed Air**
  The pressure from a compressed air line is often as high as 100 psi (6.9 bar) 7 (kgf/cm^2). It is perfectly safe if used correctly. Any misuse may cause injury.

  Never use compressed air to blow dust, filing, dirt, etc., away from your work area unless the correct type of nozzle is fitted and eye protection is used.

  Compressed air is not a cleaning agent, it will only move dust, etc., from one place to another. Look around before using an air hose as bystanders may get grit into their eyes, ears or skin.

- **Hand Tools**
  Many cuts, abrasions and injuries are caused by defective tools. Never use the wrong tool for the job, as this generally leads either to some injury, or to a poor job.

Never use

— A hammer with a loose head or split handle.
— Spanners or wrenches with splayed or worn jaws.
— Spanners or files as hammers; or drills, clevis pins or bolts as punches.

For removing or replacing hardened pins use a copper or brass drift rather than a hammer.

For dismantling, overhaul and assembly of major and sub components, always use the Special Service Tools recommended.

These will reduce the work effort, labor time and the repair cost.

Always keep tools clean and in good working order.

- **Electricity**
  Electricity has become so familiar in day to day usage, that its potentially dangerous properties are often overlooked. Misuse of electrical equipment can endanger life.

  Before using any electrical equipment — particularly portable appliances — make a visual check to make sure that the cable is not worn or frayed and that the plugs, sockets, etc., are intact. Make sure you know where the nearest isolating switch for your equipment is located.

GENERAL CONSIDERATIONS

- **Solvents**
  Use only cleaning fluids and solvents that are known to be safe. Certain types of fluids can cause damage to components such as seals, etc., and can cause skin irritation. Solvents should be checked that they are suitable not only for the cleaning of components and individual parts, but also that they do not affect the personal safety of the user.

- **Housekeeping**
  Many injuries result from tripping or slipping over, or on, objects or material left lying around by a careless worker. Prevent these accidents from occurring. If you notice a hazard, don't ignore it — remove it.

  A clean, hazard-free place of work improves the surroundings and daily environment for everybody.

- **Fire**
  Fire has no respect for persons or property. The destruction that a fire can cause is not always fully realized. Everyone must be constantly on guard.

  — Extinguish matches/cigars/cigarettes, etc., before throwing them away.
  — Work cleanly, disposing of waste material into proper containers.
  — Locate the fire extinguishers and find out how to operate them.
  — Do not panic — warn those near and raise the alarm.
  — Do not allow or use an open flame near the fuel tank, battery or component parts.

- **First Aid**
  In the type of work that mechanics are engaged in, dirt, grease, fine dusts, etc. all settle upon the skin and clothing. If a cut, abrasion or burn is disregarded it may be found that a septic condition has formed within a short time. What appears at first to be trivial could become painful and injurious. It only takes a few minutes to have a fresh cut dressed, but it will take longer if you neglect it. Make sure you know where the First Aid box is located.

- **Cleanliness**
  Cleanliness of the tractor hydraulic system is essential for optimum performance. When carrying out service and repairs plug all hose ends and component connections to prevent dirt entry.

  Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficiency and working life of a component and lead to costly replacement. Use of a high pressure washer or steam cleaner is recommended.

OPERATIONAL CONSIDERATIONS

- Stop the engine, if at all possible, before performing any service.

- Place a warning sign on tractors which, due to service or overhaul, would be dangerous to start. Disconnect the battery leads if leaving such a unit unattended.

- Do not attempt to start the engine while standing beside the tractor or attempt to by-pass the safety start switch.

- Avoid prolonged running of the engine in a closed building or in an area with inadequate ventilation as exhaust fumes are highly toxic.

- Always turn the radiator cap to the first stop, to allow pressure in the system to dissipate when the coolant is hot.

- Never work beneath a tractor which is on soft ground. Always take the unit to an area which has a hard working surface — concrete for preference.

- If it is found necessary to raise the tractor or implement for ease of servicing or repair, make sure that safe and stable supports are installed, beneath axle housings, casings, etc., before commencing work.

- Certain repair or overhaul procedures may necessitate "separating the tractor", either at the engine/front transmission or front transmission/rear transmission locations. These operations are simplified by the use of the Tractor Splitting Kit/Stands. Should this equipment not be available, then every consideration must be given to stability, balance and weight of the components, especially if a cab is installed.

- Use footsteps or working platforms when servicing those areas that are not within easy reach.

- Before loosening any hoses or tubes connecting implements to remote control valves, etc., switch off the engine, remove all pressure in the lines by operating levers several times. This will remove the danger of personal injury by oil pressure.

- Prior to pressure testing, make sure all hoses and connectors not only of the tractor and implement, but also those of the test equipment, are in good condition and tightly sealed. Pressure readings must be taken with the gauges specified. The correct procedure should be rigidly observed to prevent damage to the system or the equipment, and to eliminate the possibility of personal injury.

- When equipment or implements are required to be attached to the hydraulic linkage, either for testing purposes or for transportation, then "position control" should be used.

- Always lower equipment to the ground when leaving the tractor.

- If high lift attachments are installed on a tractor beware of overhead power, electric or telephone cables when traveling. Drop attachment near to ground level to increase stability and minimize risks.

- Do not park or attempt to service a tractor on an incline. If unavoidable, take extra care and block all wheels.

- Observe recommended precautions as indicated in this Service Manual when dismantling the air conditioning system as escaping refrigerant can cause frostbite.

- Prior to removing wheels and tires from a tractor, check to determine whether additional ballast (liquid or weights) has been added. Seek assistance and use suitable equipment to support the weight of the wheel assembly.

- When inflating tires beware of over inflation — constantly check the pressure. Over inflation can cause tires to burst and result in personal injury.

Safety precautions are very seldom the figment of someone's imagination. They are the result of sad experience, where most likely someone has paid dearly through personal injury.

Heed these precautions and you will protect yourself accordingly. Disregard them and you may duplicate the sad experience of others.

SERVICE TECHNIQUES

SERVICE SAFETY

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual doing the work. This Service Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the vehicle's integrity by his choice of methods, tools or parts.

SERVICE TECHNIQUES

Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficient working life of a component and lead to costly replacement.

Time spent on the preparation and cleanliness of working surfaces will pay dividends in making the job easier and safer and will result in overhauled components being more reliable and efficient in operation.

Use cleaning fluids which are known to be safe. Certain types of fluid can cause damage to O-rings and cause skin irritation. Solvents should be checked that they are suitable for the cleaning of components and also that they do not risk the personal safety of the user.

Replace "O"-rings, seals or gaskets whenever they are disturbed. Never mix new and old seals or O-rings, regardless of condition. Always lubricate new seals and "O"-rings with hydraulic oil before installation.

When replacing component parts use the correct tool for the job.

HOSES AND TUBES

Always replace hoses and tubes if the cone end or the end connections are damaged.

When installing a new hose, loosely connect each end and make sure the hose takes up the designed position before tightening the connection. Clamps should b tightened sufficiently to hold the hose without crushing and to prevent chafing.

The hoses are the arteries of the unit, be sure they are in good condition when carrying out repairs or maintenance, otherwise the machine's output and productivity will be affected.

After hose replacement to a moving component check that the hose does not foul by moving the component through the complete range of travel.

Be sure any hose which has been installed is not kinked or twisted.

Hose connections which are damaged, dented, crushed or leaking, restrict oil flow and the productivity of the components being served. Connectors which show signs of movement from the original swaged position have failed, and will ultimately separate completely.

A hose with a chafed outer cover will allow water entry. Concealed corrosion of the wire reinforcement will subsequently occur along the hose length with resultant hose failure.

Ballooning of the hose indicates an internal leakage due to structural failure. This condition rapidly deteriorates and total hose failure soon occurs.

Kinked, crushed, stretched or deformed hoses generally suffer internal structural damage which can result in oil restriction, a reduction in the speed of operation and ultimate hose failure.

Free-moving, unsupported hoses must never be allowed to touch each other or related working surfaces. This causes chafing which reduces hose life.

BEARINGS

Bearings which are considered suitable for further service should be cleaned in a suitable solvent and immersed in clean lubricating oil until required.

Installation of a bearing can be classified in two ways: press fit on rotating parts such as shafts, and gears, and push fit into static locations such as reduction gear housings. Where possible, always install the bearing onto the rotating component first.

Use the correct tools or a press, to install a bearing or bushing. In the absence of the correct tools or press, heat the bearings and/or the casing in hot oil to assist the installation of the bearing.

When bearings or bushings are removed always carefully check that the bearing is free from discoloration and signs of over-heating. Also check for mechanical damage such as excessive clearance, nicks and scuffing. If in doubt replace the bearings or bushings.

Bearings should never be removed unless absolutely necessary. Always use the recommended puller to reduce the risk of bearing or related component damage.

The reliability and durability of a unit depends on the effective operation of the many types of bearings and bushings which are incorporated in the complete assembly.

These bearings and bushings are subjected, in normal operation, to high working loads and adverse conditions.

Be sure during normal routine servicing, maintenance or repair that bearings are given the right attention and are installed with care.

PRESSURE TESTING

Prior to pressure testing be sure all hoses are in good condition and all connections tight. Pressure readings must be taken with gauges of specified pressure ratings.

The correct procedure should be rigidly observed to prevent damage to the system or the equipment and to eliminate the possibility of personal injury.

PART 0
GENERAL INFORMATION

Chapter 1
DRIVELINE

A. COMPONENT REPAIR

Ford New Holland implements are manufactured by various suppliers using several different PTO shaft designs. Although the PTO shafts are not identical, they are similar in most respects.

There may be differences in the method of retaining the shaft to the tractor or implement, retention of the universal joint bearing cups (outside vs inside snap ring), and rotating safety shield removal.

This part is a general overview of the disassembly and assembly of one PTO shaft. The methods described can be used as a guide for any Ford New Holand inmplement.

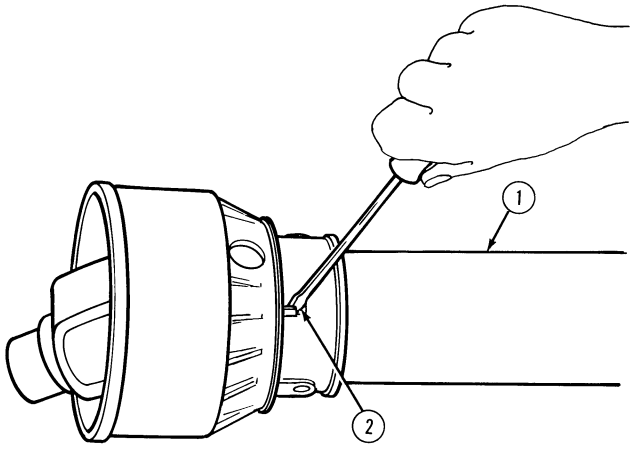


Figure 1

PTO SHAFT REMOVAL

1. Disconnect the PTO shaft from the tractor. There are several methods used to release the PTO shaft from the tractor including rotation of the collars, sliding the collar forward or backward, or a latch pin. The method used depends on the supplier.

2. Disconnect the PTO shaft from the implement. The implement end may be disconnected by depressing a latch pin, rotation of a collar, or if a shear bolt is used, it may be held on by a snap ring. The method used depends on the supplier.

PTO SHAFT DISASSEMBLY

1. Remove the rotating shield (1), Figure 1, by removing the locking screw (2) and aligning the bearing tabs with the cone pockets. Remove the half guard (1), Figure 2, and bearing ring (1), Figure 3. Examine the shaft for dents or gauling in the area of the slip joint. If a dent or evidence of bending of the slip joint is present, the shaft must be replaced. Examine the bearing ring for nicks or burrs.

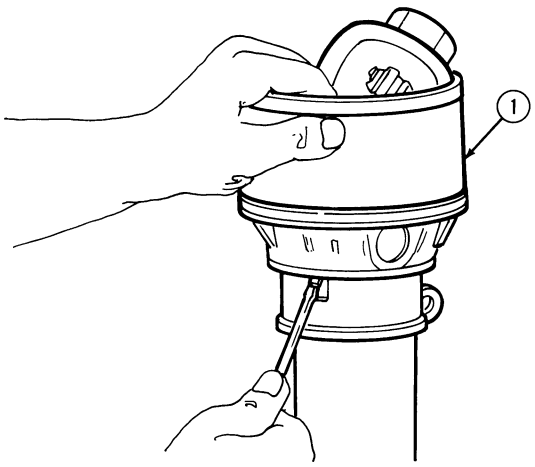


Figure 2

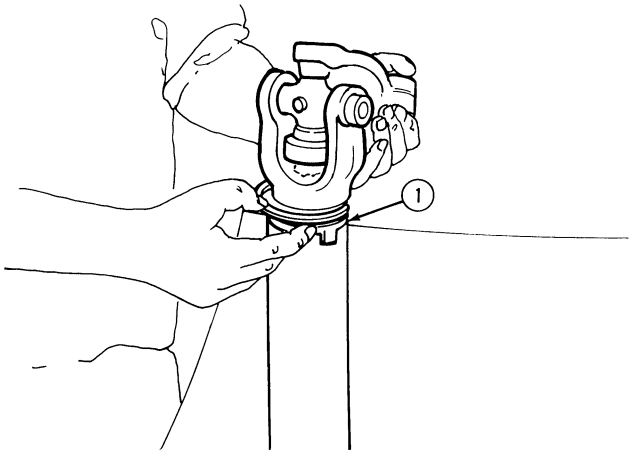


Figure 3

2. Depress the lock collar (1), Figure 4, and remove the snap ring (2). Remove the lock collar (1), compression spring (2) and balls (3), Figure 5. Examine all parts for nicks or burrs. Replace parts as required.

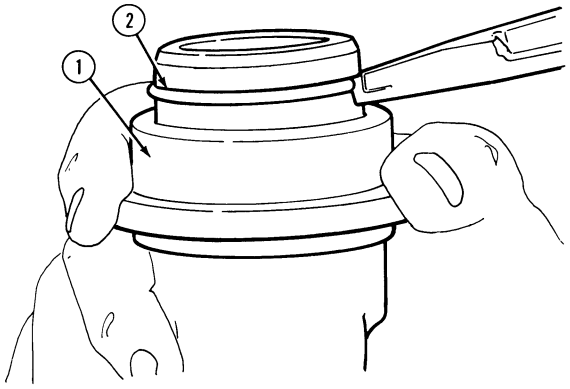


Figure 4

PTO SHAFT REASSEMBLY

1. Install the balls (3), Figure 5, compression spring (2), and lock collar (1). Compress the spring with the lock collar and install the snap ring.

2. Install the bearing ring (1), Figure 3. Install the half guard and retaining screw.

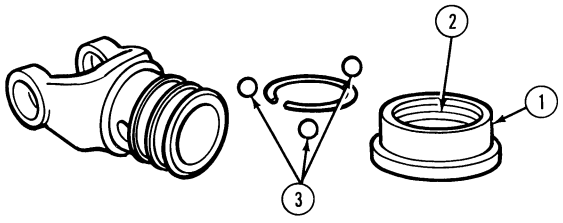


Figure 5

UNIVERSAL JOINT DISASSEMBLY

1. Separate the PTO shaft at the slip joint.

2. Thoroughly clean the universal joint with solvent and air dry.

3. Remove the snap rings (1), Figure 6, that hold the bearing cups in the yoke. The snap rings may be inside the yoke (as shown) or on the outside depending on the supplier.

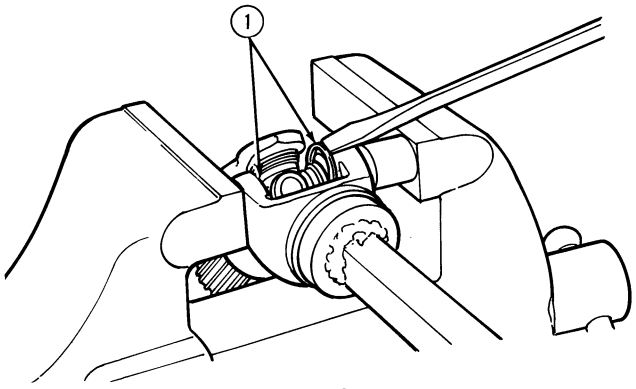


Figure 6

4. It will be necessary to choose a socket or a piece of pipe that will just fit (1/32" clearance), in the bearing cup bore in the yoke. Also choose a socket or a piece of pipe that is slightly larger (1/32" clearance), than the bearing cup bore in the yoke.

5. Place the universal joint in a press or large vise with the larger socket (1), Figure 7, or pipe supporting the yoke and the smaller socket (2), Figure 7, or pipe against the bearing cup.

6. Increase the load on the press or tighten the vise until the universal joint cross is pressed as far as it can move. Remove the assembly from the press or vise. If the bearing cup is out of the bore, proceed to step 8, if not, proceed to step 7.

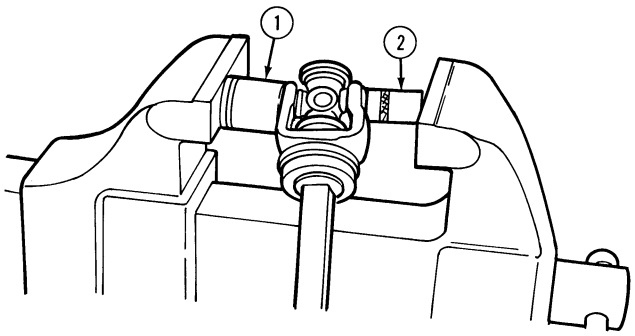


Figure 7

7. Place the protruding portion of the bearing cup in the vise and just snug the jaws so the bearing cup will not be distorted. Use a prying motion on the yoke to work the bearing cup out of the joke as shown in Figure 8.

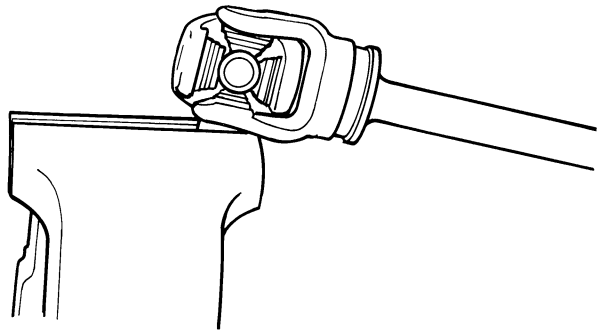


Figure 8

8. Insert the yoke in the vise with the smaller socket against the cross and the larger socket supporting the yoke as shown in Figure 9.

9. Tighten the vise until the cross is pressed as far as it can move. Loosen the vise and remove the bearing cup as described in step 7.

10. Remove the cross from the yoke and examine it and the bearing cups for evidence of scoring or discoloration on the bearing surfaces. Examine the needle bearings for scoring or wear. Replace the cross and bearing cups if required. Use this procedure for all of the bearing cups. Replace the cross and bearings as an assembly.

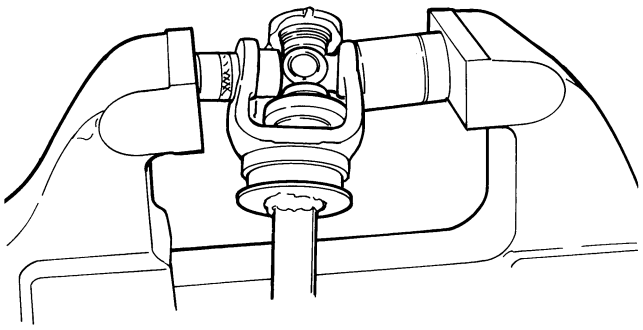


Figure 9

UNIVERSAL JOINT ASSEMBLY

1. Thoroughly lubricate the bearings cups with a good grade of grease. If a new cross and bearing cups are being installed, they will be pre-lubricated.

2. Place the cross in the center of the yoke and start a bearing cup using hand pressure only.

3. Place the yoke in a large vise with the jaws tight against the bearing cup. Slowly tighten the vise while moving the cross to assure it moves into the bearing cup correctly, as shown in Figure 10. Repeat this procedure for the other bearing cup.

4. When the bearing cups are flush with the end of the yoke loosen the vise and place the smaller socket against one of the bearing cups and press it in until the snap ring can be replaced, as shown in Figure 11.

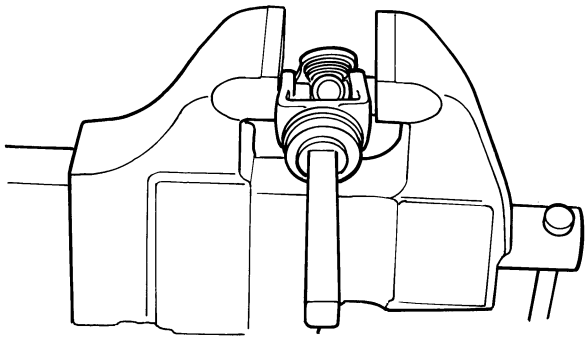


Figure 10

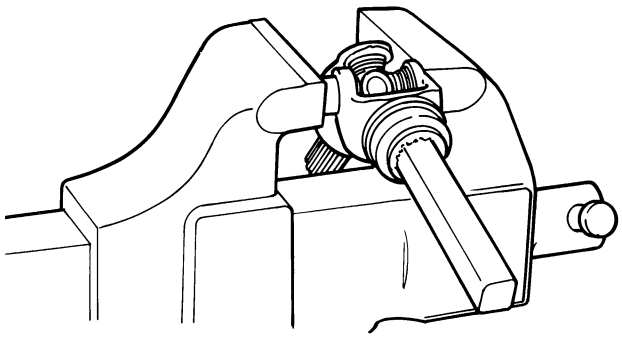


Figure 11

5. Loosen the vise and repeat step 4 for the other bearing cup. Install the snap ring (1), Figure 12, in the yoke.

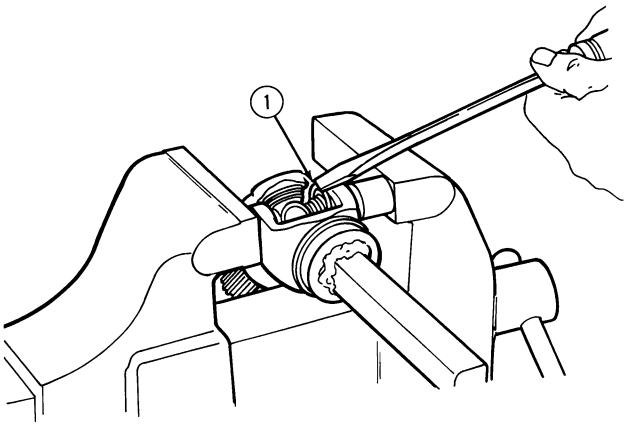


Figure 12

6. Rotate the cross by hand. The cross must rotate smoothly, however, it may rotate somewhat tight. This assembly procedure should be used for all of the bearing cups.

   NOTE: *If the joint is stiff strike the yoke ears with a soft hammer to seat the needle bearing.*

PTO SHAFT INSTALLATION

1. Slide the slip joint together and lubricate with a good grade of grease.
2. Reassemble the rotating shield to the PTO shaft.
3. Attach the PTO shaft to the implement by depressing the latch pin shaft until it latches.
4. Attach the PTO shaft to the tractor by sliding the coupling until it releases and slide it on the shaft until it latches.
5. Replace all safety shields.

B. SIZING DRIVELINE

Due to the many variations in tractor/implement hitch points and corresponding differences in distances between tractor P.T.O. shafts and implement input shafts, drivelines may need to be shortened as described in the following steps:

1. Attach the implement to the tractor lift arms and level right to left.
2. Adjust the tractor top link until the implement gearbox input shaft is parallel with the tractor PTO shaft as shown in Figure 13.

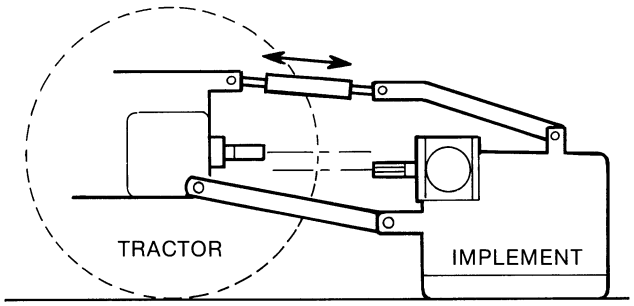


Figure 13
Implement Level

3. Raise the implement until the gearbox input shaft is level with the tractor PTO shaft as shown in Figure 14.
4. Install the rear driveshaft half onto the implement gearbox.

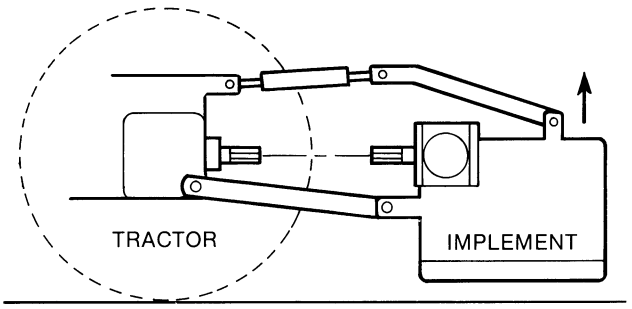


Figure 14
Implement Raised Driveline Level

5. Hold the tractor end of the driveshaft against the rear end of tractor PTO shaft, then align the front and rear driveshaft halves side-by-side.

6. Determine the excess driveshaft length by measuring from the rearmost edge of the front half shield to just behind the bell-shaped shield on the rear driveshaft half as shown at (2), Figure 15.

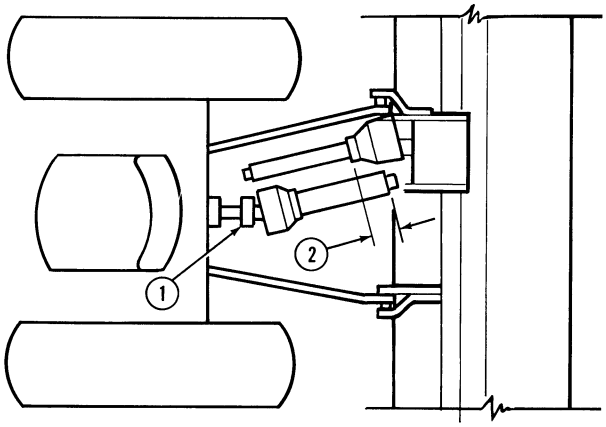


Figure 15
Driveline Overlap
1. End of Tractor PTO Shaft
2. Driveline Cutoff Dimension

7. Hold the driveline sections parallel to each other and check for a minimum of 5" overlap as shown at, (1), Figure 16. The overlap will be the distance between the two marks on the shields. If the driveline has less than minimum overlap, DO NOT USE. Recheck the mounting of the implement. Adjust the top link to assure the implement is level front to rear. Adjust the lower links to assure the implement is level right to left.

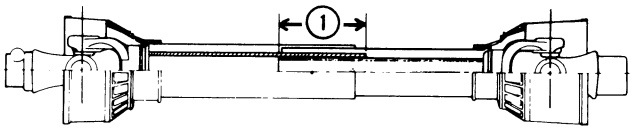


Figure 16
Driveline Overlap
1. 5" (127 mm) Minimum

8. Clamp the driveline in a well padded vice to prevent damage to the shield. Cut off the shield where it was marked in step 6 as shown in Figure 17.

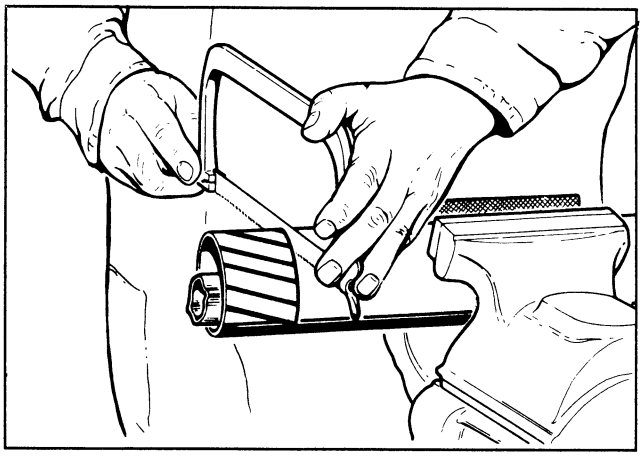


Figure 17
Cutting Shield

9. Using the cut off section as a guide, cut the shaft the same amount. (Figure 18)

NOTE: *The shaft should be longer than the shield before and after sizing.*

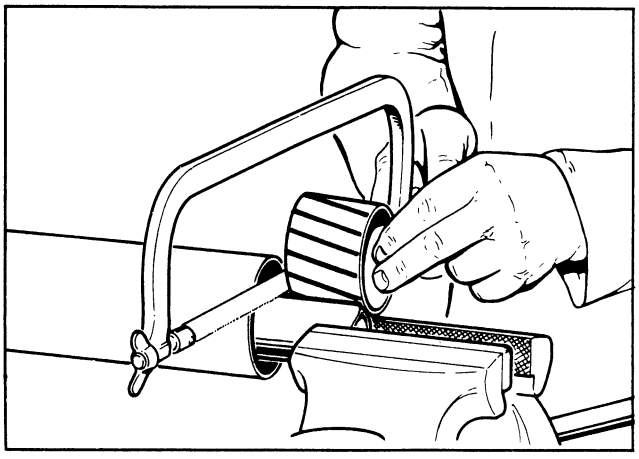


Figure 18
Cutting Shaft

10. Repeat steps "8" and "9" to the other driveline section.

11. Deburr the ends of the driveline sections and clean away all chips and filings as shown in Figure 19.

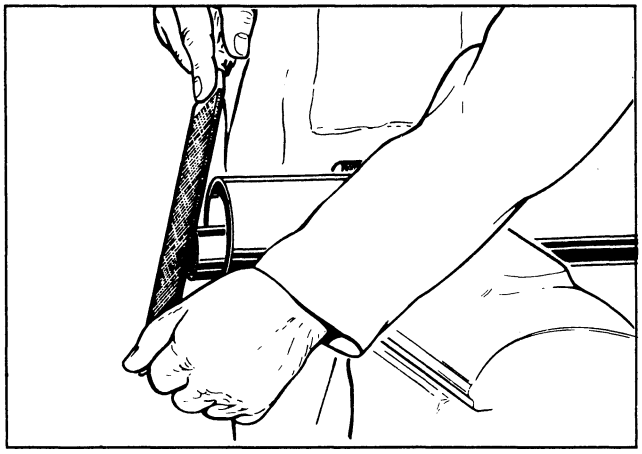


Figure 19
Deburring Shaft

12. Apply grease to the outside of the inner (male) driveline section as shown in Figure 20. Assemble the driveline and install on the tractor and implement. Pull on each driveline section to be sure the yokes lock into place. Make certain the driveline shielding is in place.

    Raise and lower the implement to both extremes to assure the driveline does not come apart nor bottom out.

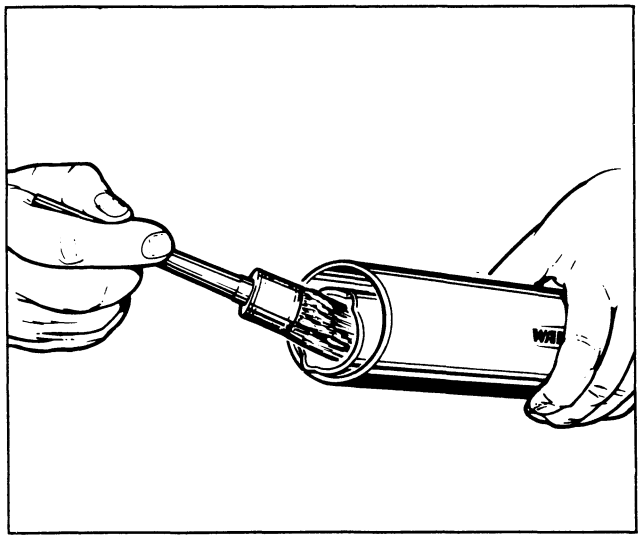


Figure 20
Lubrication

PART 0
GENERAL INFORMATION

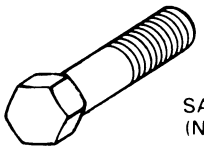
Chapter 2
TORQUE SPECIFICATIONS

A. TORQUE SPECIFICATIONS

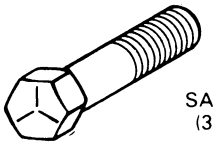
Proper torque for American fasteners used on Ford New Holland equipment. Recommended Torque in Foot Pounds (Newton Meters).*

AMERICAN

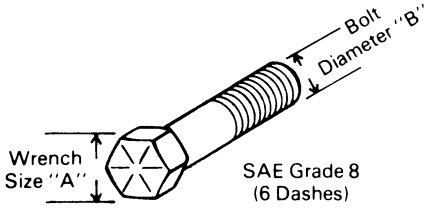
Bolt Head Markings



SAE Grade 2
(No Dashes)



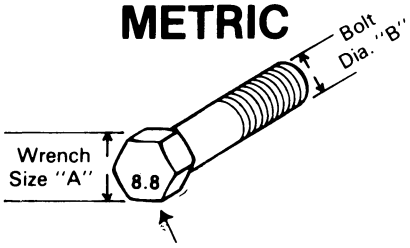
SAE Grade 5
(3 Dashes)



SAE Grade 8
(6 Dashes)

WRENCH SIZE (IN.) "A"	BOLT DIAMETER (IN.) "B" AND THREAD SIZE	SAE GRADE 2	SAE GRADE 5	SAE GRADE 8
7/16	1/4 - 20 UNC	6 (7)	8 (11)	12 (16)
7/16	1/4 - 28 UNF	6 (8)	10 (13)	14 (18)
1/2	5/16 - 18 UNC	11 (15)	17 (23)	25 (33)
1/2	5/16 - 24 UNF	13 (17)	19 (26)	27 (37)
9/16	3/8 - 16 UNC	20 (27)	31 (42)	44 (60)
9/16	3/8 - 24 UNF	23 (31)	35 (47)	49 (66)
5/8	7/16 - 14 UNC	32 (43)	49 (66)	70 (95)
5/8	7/16 - 20 UNF	36 (49)	55 (75)	78 (106)
3/4	1/2 - 13 UNC	49 (66)	76 (103)	106 (144)
3/4	1/2 - 20 UNF	55 (75)	85 (115)	120 (163)
7/8	9/16 - 12 UNC	70 (95)	109 (148)	153 (207)
7/8	9/16 - 18 UNF	79 (107)	122 (165)	172 (233)
1	5/8 - 11 UNC	97 (131)	150 (203)	212 (287)
1	5/8 - 18 UNF	110 (149)	170 (230)	240 (325)
1-1/8	3/4 - 10 UNC	144 (195)	266 (360)	376 (509)
1-1/8	3/4 - 16 UNF	192 (260)	297 (402)	420 (569)
1-5/16	7/8 - 9 UNC	166 (225)	430 (583)	606 (821)
1-5/16	7/8 - 14 UNF	184 (249)	474 (642)	668 (905)
1-1/2	1 - 8 UNC	250 (339)	644 (873)	909 (1232)
1-1/2	1 - 12 UNF	274 (371)	705 (955)	995 (1348)
1-1/2	1 - 14 UNF	280 (379)	721 (977)	1019 (1381)
1-11/16	1-1/8 - 7 UNC	354 (480)	795 (1077)	1288 (1745)
1-11/16	1-1/8 - 12 UNF	397 (538)	890 (1206)	1444 (1957)
1-7/8	1-1/4 - 7 UNC	500 (678)	1120 (1518)	1817 (2462)
1-7/8	1-1/4 - 12 UNF	553 (749)	1241 (1682)	2013 (2728)
2-1/16	1-3/8 - 6 UNC	655 (887)	1470 (1992)	2382 (3228)
2-1/16	1-3/8 - 12 UNF	746 (1011)	1672 (2266)	2712 (3675)
2-1/4	1-1/2 - 6 UNC	870 (1179)	1950 (2642)	3161 (4283)
2-1/4	1-1/2 - 12 UNF	979 (1327)	2194 (2973)	3557 (4820)

METRIC



Numbers appearing on bolt heads indicate ASTM class.

Proper torque for metric fasteners used on Ford New Holland equipment. Recommended Torque in Foot Pounds (Newton Meters).*

WRENCH SIZE (mm) "A"	BOLT DIA. (mm) "B"	ASTM CLASS 4.6	ASTM CLASS 8.8	ASTM CLASS 9.8	ASTM CLASS 10.9
8	5	1.8 (2.4)		5.1 (6.9)	6.5 (8.8)
10	6	3 (4)		8.7 (12)	11.1 (15)
13	8	7.3 (10)	19 (26)	21.1 (29)	27 (37)
16	10	14.5 (20)	38 (52)	42 (57)	53 (72)
18	12	25 (34)	67 (91)	73 (99)	93 (126)
21	14	40 (54)	107 (145)	116 (157)	148 (201)
24	16	62 (84)	167 (226)	181 (245)	230 (312)
30	20	122 (165)	325 (440)		449 (608)
33	22		443 (600)		611 (828)
36	24	211 (286)	563 (763)		778 (1054)
41	27		821 (1112)		1138 (1542)
46	30	418 (566)	1119 (1516)		1547 (2096)

Use 75% of the specified torque value for plated fasteners. Use 85% of the specified torque values for lubricated fasteners.

FOR BOLTS USED WITH WAXED PREVAILING TORQUE LOCKNUTS, TORQUE SHOULD BE 70% OF VALUES SHOWN IN CHART

PRINTED IN U.S.A.

PART 7
700 SERIES IMPLEMENTS

Chapter 1
702C FRONT BLADES

A. GENERAL INFORMATION IDENTIFICATION AND SPECIFICATIONS

The Ford Series 702C Front Blade is designed for installation on the Ford 20 Series Compact Tractors. The tractors may be 2WD or 4WD. The blades are available in 60", 74", and 84" widths. There are five positions for manual angling of the blade.

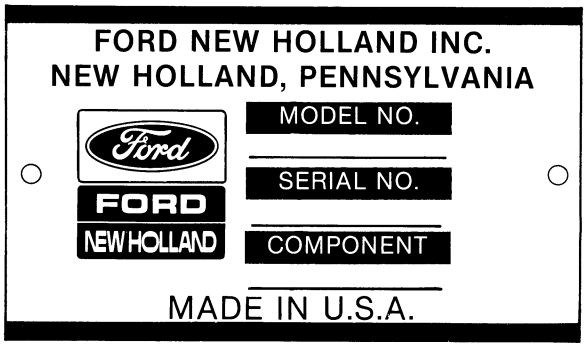
Skid shoes, trip springs, and blade lockout are standard equipment.

A hydraulic angle package is available as optional equipment.

The Series 702C Blades are designed for snow removal or moving loose soil.

The hydraulic system features a float position that is useful when removing snow or when back blading. The float position will allow the blade to follow the contour of the ground for clean and effective snow or loose soil removal.

The serial number plate is located at the front of the forward frame.



SPECIFICATIONS:

	Blade Width		
	60"	74"	84"
Tractor			
1120-1220	X	–	–
1320-1520	X	X	–
1720-1920	–	X	X
2120	–	X	X
Skid Shoes	X	X	X
Hyd. Angle (optional)	X	X	X
Trip Springs	X	X	X
Blade Lockout	X	X	X
Moldboard Height	18"	20"	20"
Moldboard Thickness	7 Ga.	1/4"	1/4"
Cutting Edge	1/2 x 6" Reversible		
Blade Lift Height	12"	10-3/4"	10"
Digging Depth	3"	4"	4-1/4"
Maximum Blade Angle	30°	30°	30°

B. TRACTOR REQUIREMENTS

The tractor used with the Series 702C Front Blades can be 2WD or 4WD. Tractors equipped with 4WD will provide more flexibility in usage due to the increased traction. The horsepower requirement for each blade size is as follows:

PTO Horsepower	60"	74"	84"
12-40	X	–	–
16-40	–	X	–
21-40	–	–	X

The tractor may be equipped with a rear blade or other light implement to counter balance the blade during transport.

The tractor hydraulic system must have a minimum of one remote value to operate the hydraulic blade lift. If the optional hydraulic blade angle kit is to be installed the two spool single lever remote is required.

C. ASSEMBLY

D. ATTACHING THE IMPLEMENT

Due to the implement sections C and D are combined.

ASSEMBLY AND ATTACHING THE IMPLEMENT

1120-1220: FRONT AND REAR MOUNTING BRACKETS

1. Attach the rear mounting bracket, (4), Figure 1 to the underside mid section of the tractor using four M12 x 1.75 x 30 mm hex hd. bolts, (1), lockwashers, (2), and stud and thread sealer. Torque the bolts to 51-59 lbs.-ft.

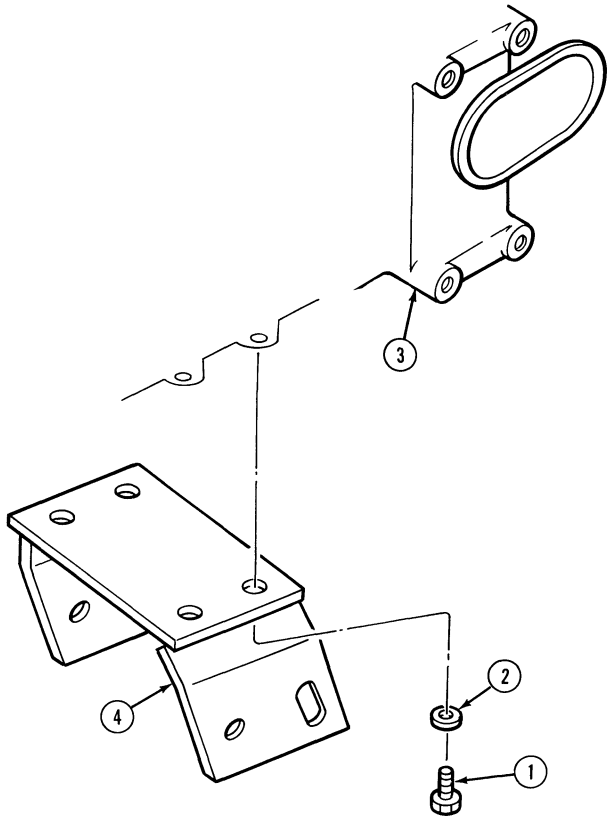


Figure 1
Rear Mounting Bracket - 11/1220
1. Bolt - M12x30 mm
2. Lockwasher - M12
3. Tractor
4. Rear Mounting Bracket

NOTE: *When using stud and thread sealer, make sure tractor casting holes are clean.*

2. Attach the right and left front mounting brackets, (1), Figure 2, to the outside of tractor frame. Attach the bumper reinforcement, (2), to the inside of tractor bumper and frame.

NOTE: *The mounting brackets are offset so that there is less of a spacing at the lower end than at the upper end attached to the tractor frame. In addition, the angle on the lower end of the brackets should be located to the front.*

Attach the front mounting brackets and bumper reinforcement using four 1/2" NF x 2" hex hd. bolts, (3), lockwashers, (5), nuts, (6), and flat washers, (4), as shown in Figure 2. Use two flat washers over each slotted hole on either side of the bumper reinforcement. Do not tighten the bolts at this time.

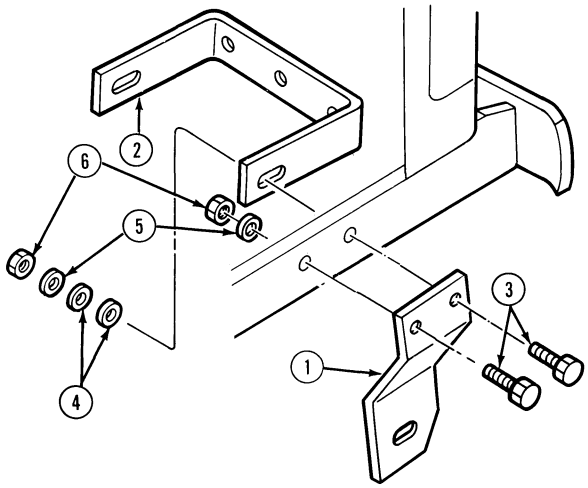


Figure 2
Front Mounting Bracket - 11/1220

1. Front Mounting Bracket
2. Bumper Support
3. Bolts - 1/2"x2"
4. Flat Washers - 1/2"
5. Lockwashers - 1/2"
6. Nuts - 1/2" NF

1120-1220 REAR FRAME:

1. Slide the rear frame under the tractor.

2. Attach the rear frame, (1), to the back hole in the rear mounting bracket, (4), using two 1/2" NF x 1-1/2" hex hd. bolts, (2), flatwashers, (3), lockwashers, (5), and nuts, (6), as shown in Figure 3. Do not tighten the bolts at this time.

3. Attach the rear frame, (1), to the front mounting bracket, (2), using two 1/2" NF x 1-3/4" hex hd. bolts, (3), lockwashers, (5), nuts, (6), and four flat washers, (4), as shown in Figure 4. Do not tighten the bolts at this time. Use two flat washers over each slotted hole, as shown.

NOTE: *Use the front hanger/rear frame hole combination that locates the frame pivot pin nearest to 7-1/2 inches from the ground line to the pivot pin center.*

4. Attach the rear frame to the front hole in the rear mounting bracket using two 1/2" NF x 1-1/2" hex head bolts, lockwashers, nuts, and four flat washers, as shown in Figure 3. Use two flat washers over each slotted hole as shown.

IMPORTANT: *Torque the bolts attaching the rear frame to the front and rear mounting brackets (Figure 3 and 4), and front mounting brackets at the tractor frame (Figure 2) to 80-96 lbs.-ft.*

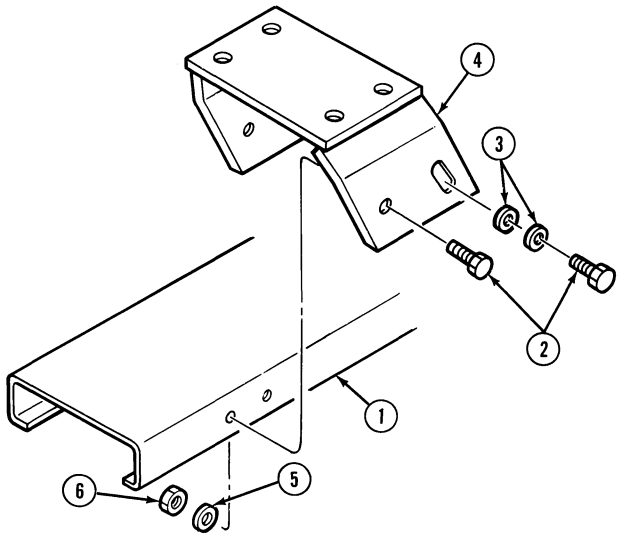


Figure 3
Rear Frame - 11/1220

1. Rear Frame
2. Bolts - 1/2"x1-1/2"
3. Flat Washers - 1/2"
4. Rear Mounting Bracket
5. Lockwasher
6. Nut - 1/2" NF

1320-1520: FRONT MOUNTING BRACKETS AND REAR FRAME

1. Attach the front mounting bracket, (1), Figure 5 to the outside of the tractor frame, (5).

NOTE: *The angle on the lower end of the mounting brackets should be located to the front.*

Attach the front mounting brackets using four 1/2" NF x 1-3/4" hex hd. bolts, (2), lockwashers, (3), and nuts, (4), as shown in Figure 5. Do not tighten the bolts at this time.

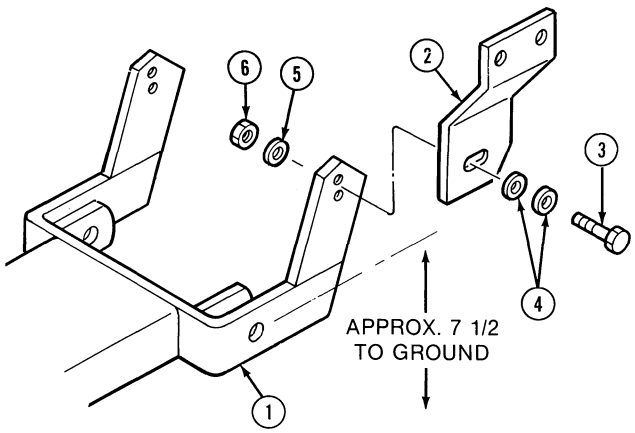


Figure 4
Front Mounting Bracket - 11/1220

1. Rear Frame
2. Front Mounting Bracket
3. Bolt - 1/2"x1-3/4"
4. Flat Washers - 1/2"
5. Lockwashers - 1/2"
6. Nut - 1/2" NF

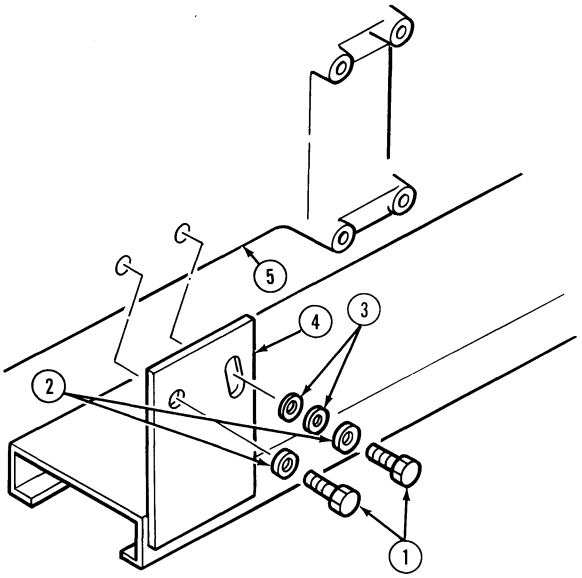


Figure 6
Rear Frame

1. Bolts - M14x30 mm
2. Lockwashers - M14
3. Flat Washer - M14
4. Blade Rear Frame
5. Tractor

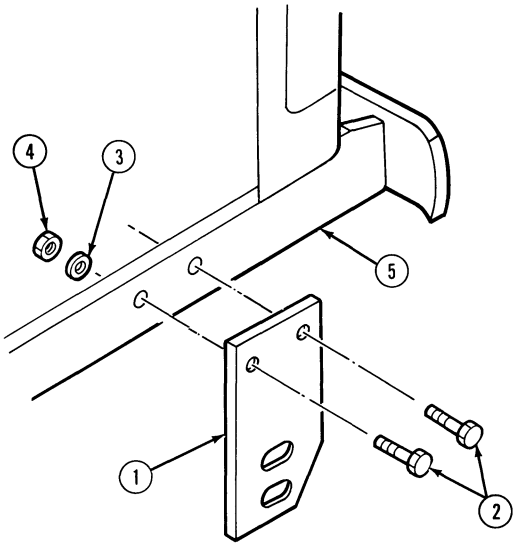


Figure 5
Front Mounting Bracket - 13/1520

1. Front Mounting Bracket
2. Bolts - 1/2"x1-3/4"
3. Lockwasher - 1/2"
4. Nut - 1/2" NF
5. Tractor Frame

1. Slide the rear frame under the tractor.

2. Attach the rear frame, (4), Figure 6, to the back hole on the side mid section of the tractor, (5), using two M14 x 1.50 x 30 mm hex hd. bolts, (1), lockwashers, (2), and stud and thread sealer, as shown in Figure 5. Do not tighten bolts at this time.

NOTE: *When using stud and thread sealer, make sure the tractor casting holes are clean.*

3. Attach the rear frame (1), Figure 7, to front mounting bracket, (2), using two 1/2" NF x 1-3/4" hex hd. bolts, (3), lockwashers, (5), nuts, (6), and four flat washers, (4), as shown in Figure 7. Do not tighten the bolts at this time. Use two flat washers over each slotted hole, as shown.

NOTE: *Use the front hanger/rear frame hole combination that locates the frame pivot pin nearest to 8-1/2 inches from the ground line to the pivot pin center.*

4. Attach the rear frame, (4), Figure 6, to the front hole on the side mid section of the tractor using, two M14 x 1.50 x 30 mm hex head bolts, (1), lockwasher, (2), four flat washers, (3), and stud and thread sealer. Use two flat washers over each slotted hole as shown.

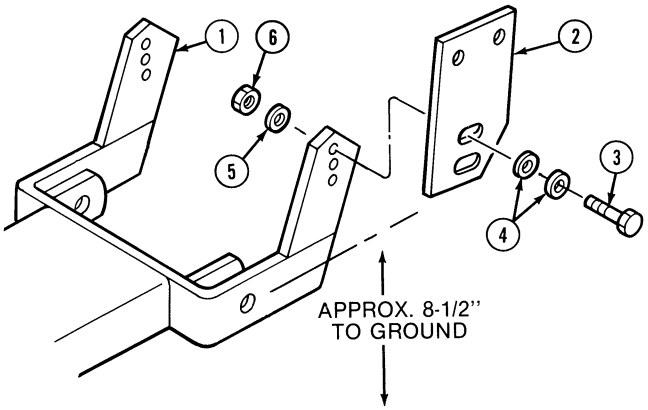


Figure 7
Rear Frame Mounting - 13/1520

1. Rear Frame
2. Front Mounting Bracket
3. Bolt - 1/2"x1-3/4"
4. Flat Washers - 1/2"
5. Lockwashers - 1/2"
6. Nuts - 1/2" NF

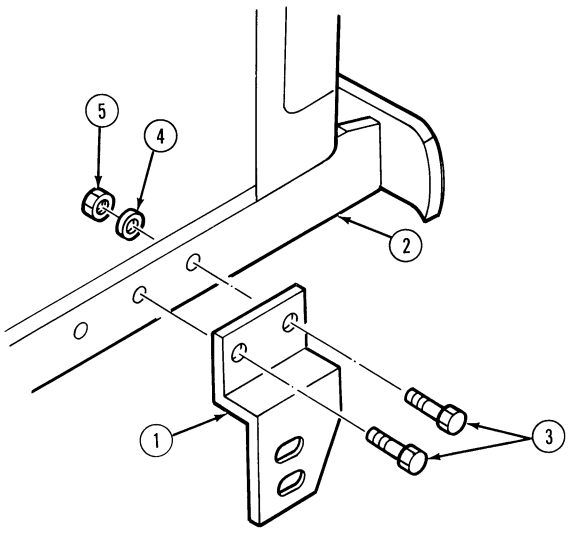


Figure 8
Front Mounting Bracket - 17/1920

1. Front Mounting Bracket
2. Tractor Frame
3. Bolts- 1/2"x2"
4. Lockwasher - 1/2"
5. Nut - 1/2" NF

IMPORTANT: *Torque the bolts attaching the rear frame to the tractor mid section (Figure 6) to 90-106 lbs.-ft. Torque the bolts attaching the rear frame to the front mounting brackets (Figure 7), and front mounting brackets to the tractor frame (Figure 5) to 80-96 lbs.-ft.*

1720-1920: FRONT AND REAR MOUNTING BRACKETS

1. Using the tractor frame hole combination nearest to the tractor bumper, attach the front mounting brackets, (1), Figure 8, using four 1/2" NF x 2" hex hd. bolts, (3), lockwashers, (4), and nuts, (5). Do not tighten the bolts at this time.

NOTE: *The mounts are offset so that there is a greater spacing at the lower end than at the upper end attached to the tractor frame. In addition, the angle of the lower end of the brackets should be located to the front.*

2. Before the rear mounting bracket can be attached the existing two M10 bolts, (1), Figure 9, at the rear of the brake/clutch support brackets must be removed. They are located on the underside mid section of the tractor.

3. Attach the right and left rear mounting brackets, (2), Figure 9, (slot to front) to the underside mid section of the trctor, (3), using four M10 x 1.50 x 35 mm hex hd. bolts, (4), lockwashers, (5), and stud and thread sealer. Do not tighten the bolts at this time.

NOTE: *When using stud and thread sealer, make sure the tractor casting holes are clean.*

4. Depending on the tractor model (1720 or 1920), insert two 5/8" NF x 2" hex hd. bolts, (9), through proper hole in rear assist bracket, (6), and back hole in the rear mounting bracket, (2), as shown in Figure 9. Do not attach lockwashers and nuts at this time. Attach the rear assist bracket, (6), to the underside rear section of the tractor, (3), using two M16 x 2.00 x 40 mm hex hd. bolts, (7), lockwashers, (8), and stud and thread sealer. Do not tighten bolts at this time.

IMPORTANT: *Torque the M10 dia. bolts, (4), Figure 9, to 47-51 lbs.-ft.*

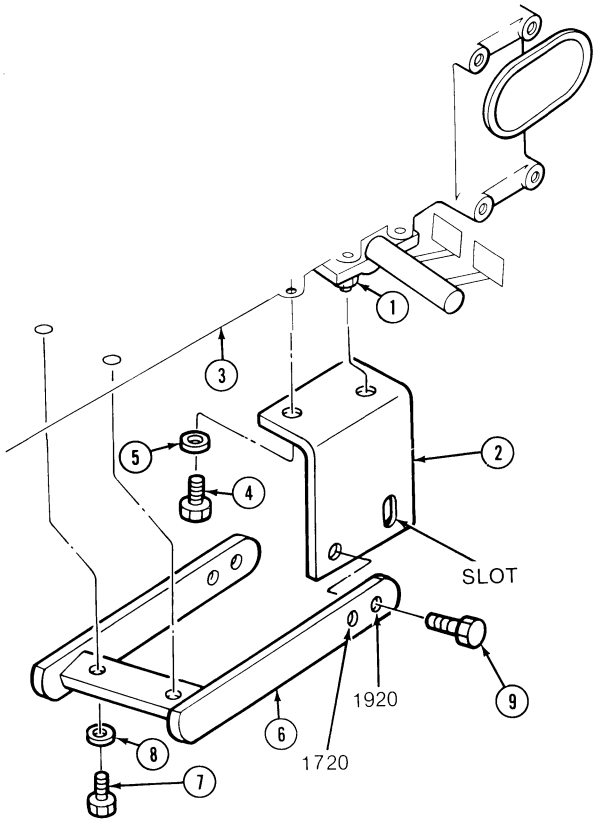


Figure 9
Rear Mounting - 17/1920

1. Bolts - M10
2. Rear Mounting Bracket
3. Tractor
4. Bolt - M10 x 1.50 x 35 mm
5. Lockwasher
6. Rear Assist Bracket
7. Bolt - M16 x 2.00 x 40 mm
8. Lockwasher
9. Bolt - 5/8" NF x 2"

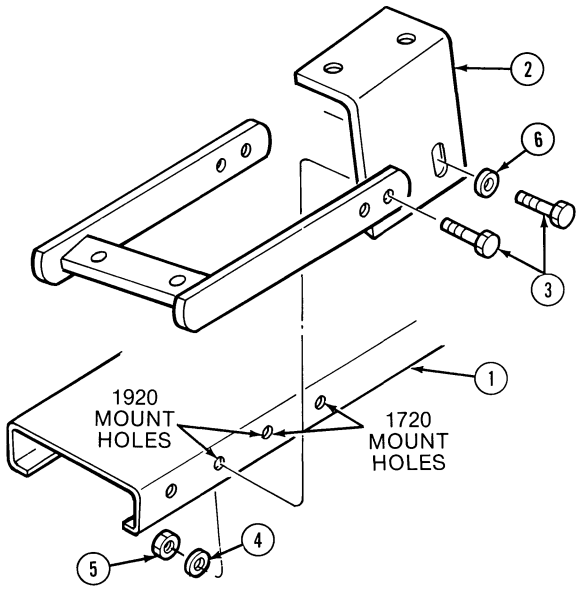


Figure 10
Rear Frame - 17/1920

1. Rear Frame
2. Rear Mounting Bracket
3. Bolts - 5/8"x2"
4. Lockwasher - 5/8"
5. Nut - 5/8" NF
6. Spacer

1720-1920 REAR FRAME:

1. Slide the rear frame under the tractor.

2. Select the proper hole in the rear frame, (1), Figure 10, depending on the tractor model (1720-1920). Attach the rear frame, (1), Figure 10, to the rear mounting bracket, (2), using two 5/8" NF x 2" hex hd. bolts, (3), lockwashers, (4), and nuts, (5). Do not tighten at this time.

3. Attach the rear frame, (1), to the front mounting brackets, (2), using two 5/8" NF x 2" hex hd. bolts, (3), spacers, (4), lockwashers, (5), and nuts, (6), as shown in Figure 11. Do not tighten the bolts at this time.

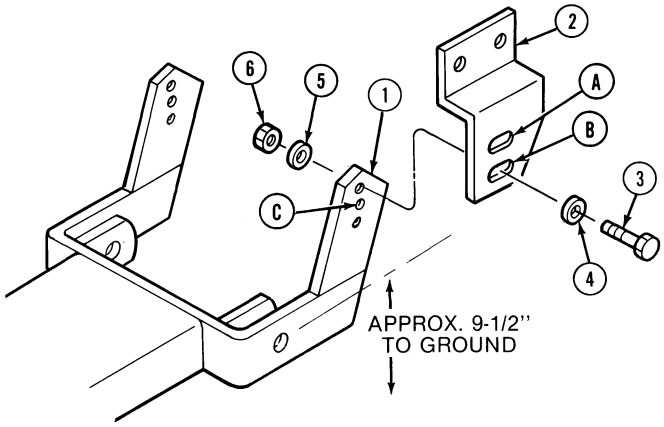


Figure 11
Front Mounting - 17/1920

1. Rear Frame
2. Front Mounting Bracket
3. Bolt - 5/8"x2"
4. Spacer
5. Lockwasher - 5/8"
6. Nut - 5/8" NF

NOTE: *Use the front hanger/rear frame hole combination that locates the frame pivot pin nearest to 9-1/2 inches from the ground line to the pivot pin center. The following tractor/tire combinations are exceptions and should use the mounting holes indicated:*

1720 or 1920 2WD Turf Tires use holes A & C
1720 or 1920 4WD Turf Tires use holes B & C
1720 4WD with 7-14 Front Tires use holes B & C

4. Attach the rear frame, (1), to the front hole in the rear mounting bracket using two 5/8" NF x 2" hex hd. bolts, (3), spacers, (6), lockwashers, (4), and nuts, (5), as shown in Figure 10. Use spacer, (6), over each slotted hole, as shown in Figure 10.

IMPORTANT: *Torque the 5/8" dia. bolts, (3), (Figure 10 and 11) to 150-180 lbs.-ft. Torque the 1/2" dia. bolts, (3), (Figure 8) to 80-96 lbs.-ft. Torque the M16 dia. bolts, (4), (Figure 9) to 129-145 lbs.-ft.*

2120: FRONT AND REAR MOUNTING BRACKETS

1. Remove the existing two M10 bolts, (1), at the rear of brake/clutch support brackets, located on the underside mid section of the tractor, as shown in Figure 12.

2. Attach the rear mounting bracket, (2), Figure 12, to the underside mid section of the tractor using two M10 x 1.50 x 40 mm hex hd. bolts, (3), lockwashers, (4), two M16 x 2.00 x 45 mm hex hd. bolts, (5), lockwashers, (6), and stud and thread sealer. Torque the M10 dia. bolts to 38-46 lbs.-ft. Torque the M16 dia. bolts to 152-188 pounds feet.

3. Using the tractor frame hole combination nearest to the tractor bumper attach the front mounting brackets, (1), using four 1/2" NF x 2" hex hd. bolts, (2), lockwashers, (3), and nuts, (4), as shown in Figure 13. Do not tighten the bolts at this time.

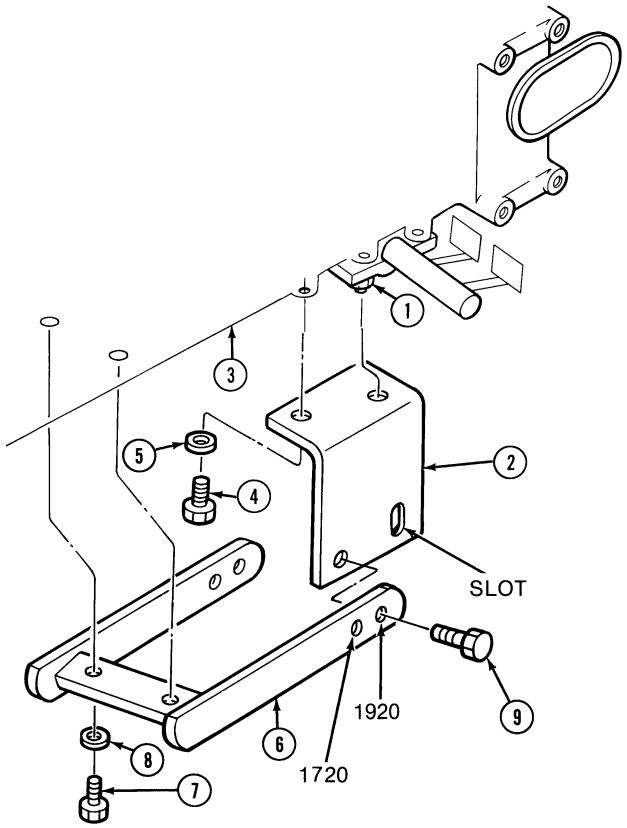


Figure 12
Rear Mounting Bracket - 2120

1. Bolts - M10
2. Rear Mounting Bracket
3. Bolt - M10 x 1.50 x 40 mm
4. Lockwasher
5. Bolt - M16 x 2.00 x 45 mm
6. Lockwasher

NOTE: *The mounts are offset so that there is a greater spacing at the lower end than at the upper end attached to the tractor frame. In addition, the largest angle on the lower end of the brackets should be located to the front.*

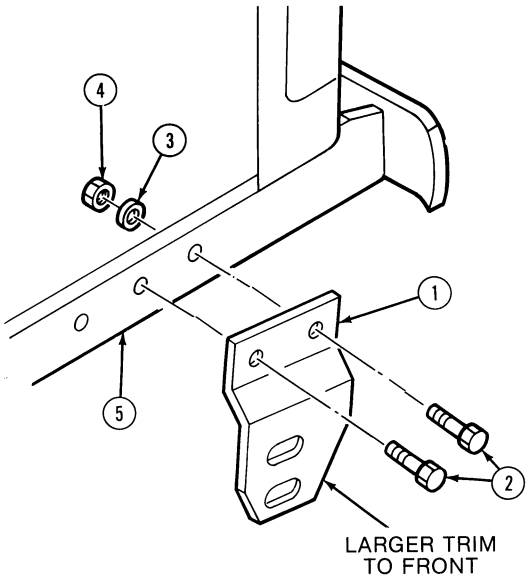


Figure 13
Front Mounting Bracket - 2120

1. Front Mounting Bracket
2. Bolts 1/2" NFx2"
3. Lockwasher - 1/2"
4. Nut - 1/2" NF
5. Tractor Frame

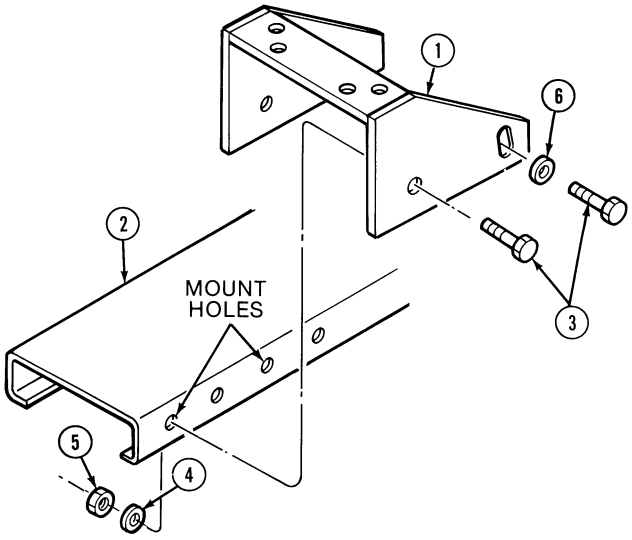


Figure 14
Rear Frame - 2120

1. Rear Mounting Bracket
2. Rear Frame
3. Bolts - 5/8"x2"
4. Lockwasher - 5/8"
5. Nut - 5/8" NF
6. Spacer

2120: REAR FRAME

1. Slide the rear frame under the tractor.

2. Attach the rear frame, (2), to the back hole in the rear mounting bracket, (1), using two 5/8" NF x 2" hex hd. bolts, (3), lockwashers, (4), and nuts, (5), as shown in Figure 14. Do not tighten the bolts at this time.

3. Attach the rear frame, (1), to the front mounting bracket, (2) using two 5/8" NF x 2" hex hd. bolts, (3), spacers, (6), lockwashers, (4), and nuts, (5), as shown in Figure 15. Do not tighten the bolts at this time.

NOTE: *Use the front hanger/rear frame hole combination that locates the frame pivot pin nearest to 9-1/2 inches from the ground line to the pivot pin center. On 4WD tractors with turf tires only, use holes A and B, as shown in Figure 15.*

4. Attach the rear frame to the front hole in the rear mounting bracket using two 5/8" NF x 2" hex hd. bolts, (3), spacers, (6), lockwashers, (4), and nuts, (5), as shown in Figure 14. Use a spacer over each slotted hole, as shown.

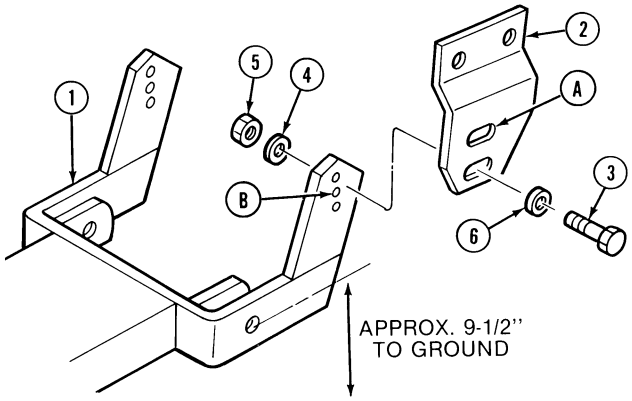


Figure 15
Front Mounting - 2120

1. Rear Frame
2. Front Mounting Bracket
3. Bolt - 5/8"x2"
4. Lockwasher - 5/8"
5. Nut - 5/8" NF
6. Spacer

IMPORTANT: *Torque the 5/8" dia. bolts (3) Figure 14 and 15 to 150-180 lbs.-ft. Torque the 1/2" dia. bolts (2) Figure 13 to 80-96 lbs.-ft.*

ALL MODELS: FORWARD FRAME

1. Raise the front of the forward frame and block up approximately 5".

2. Slide the forward frame, (1), toward the rear frame, (2), and secure using two 1-1/4" dia. x 3-5/8" pins, (3), and four 1/4" x 2-1/2" cotter pins, (4), as shown in Figure 16.

3. Attach the grease fitting, (5), Figure 16, to the forward frame. Position the grease fitting toward the rear of the tractor and angled down approximately 15°.

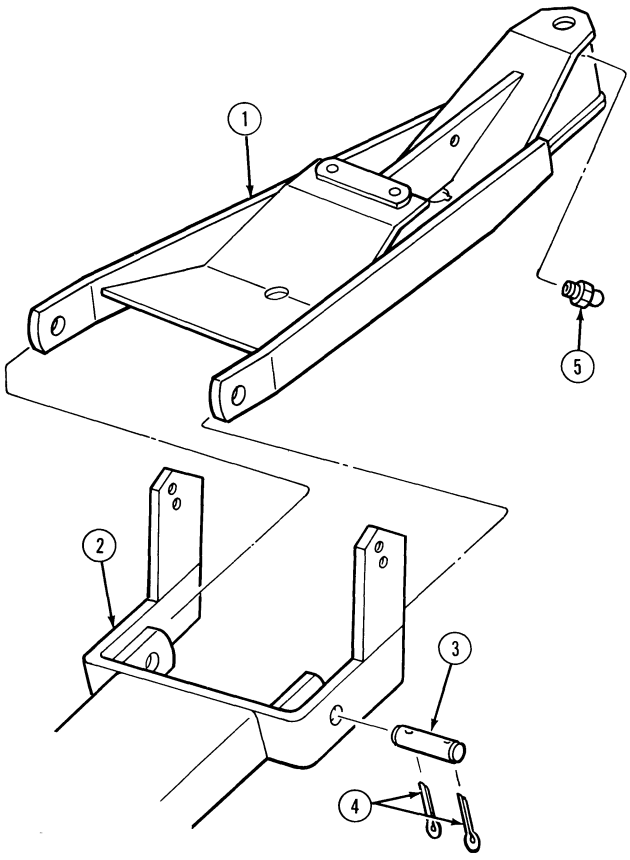


Figure 16
Forward Frame

1. Forward Frame
2. Rear Frame
3. Pin
4. Cotter Pins
5. Grease Fitting

ALL MODELS: BLADE

1. With the forward frame, (1), still blocked up approximately 5", slide the blade, (2), toward the forward frame and secure using a 1-1/4" dia. x 7-3/4" pin, (3), 1/2" NF x 2-1/2" hex hd. bolt, (6), lockwasher, (5), and nut, (4), as shown in Figure 17. Torque the bolt to 80-96 lbs.-ft.

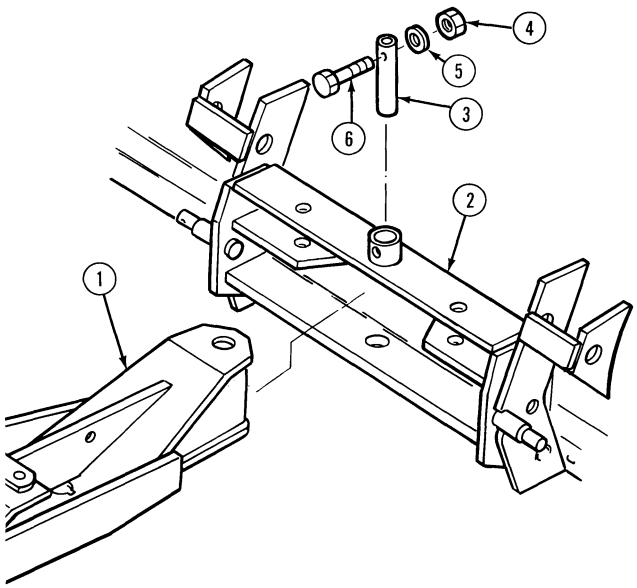


Figure 17
Blade

1. Rear Frame
2. Blade
3. Pin
4. Nut - 1/2" NF
5. Lockwasher - 1/2"
6. Bolt - 1/2"x2-1/2"

ALL MODELS: SPRING TRIP

Refer to Figure 18

1. Insert the 1-1/4" dia. x 5-1/8" pivot pin, (2), into blade, (1).

2. Slide the spring eye bolt, (3), through the pivot pin and onto blade peg, and secure with a 5/8" flat washer, (4), and 3/16" x 1-1/2" cotter pin, (5).

3. Slide the spring guide, (6), spring, (7), spring cap, (8), and (2) 5/8" NC nuts, (9), over the spring eye bolt, (3).

4. Repeat this procedure for the other spring trip.

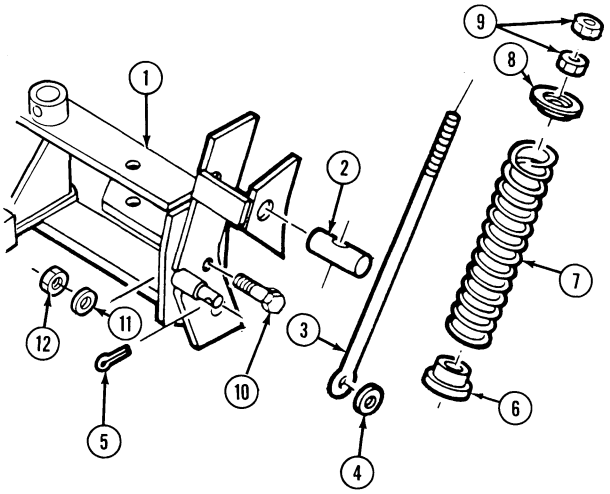


Figure 18
Spring Trip

1. Blade
2. Pivot Pin
3. Spring Eye Bolt
4. Flat Washer
5. Cotter Pin
6. Spring Guide
7. Spring
8. Spring Cap
9. Nuts - 5/8" NC
10. Bolt - Lockout - 3/4"x1-1/2"
11. Lockwasher - 3/4"
12. Nut - 3/4" NF

5. To unlock the blade and actuate the spring mechanism, remove two 3/4" NF x 2-1/2" hex hd. bolts, (10), lockwashers, (11), and nuts, (12).

6. Spring tension can be adjusted depending on the type of material to be moved (moving snow requires less tension than dirt, etc). However, it is recommended that the tension be adjusted equally on both springs so that approximately 1-1/2" of eye bolt thread is exposed above the adjusting nut and the jam nut.

7. For moving dirt and material other than snow, lock the blade using two 3/4" NF x 1-1/2 hex hd. bolts, (10), lockwashers, (11), and nuts, (12).

ALL MODELS: CYLINDER MOUNT

1. Attach the cylinder support, (1), to the tractor bumper, (2), using three 5/8" NC x 1-3/4" hex hd. bolts, (3), lockwashers, (4), and nuts, (5), as shown in Figure 19. Torque the bolts to 95-105 lbs.-ft.

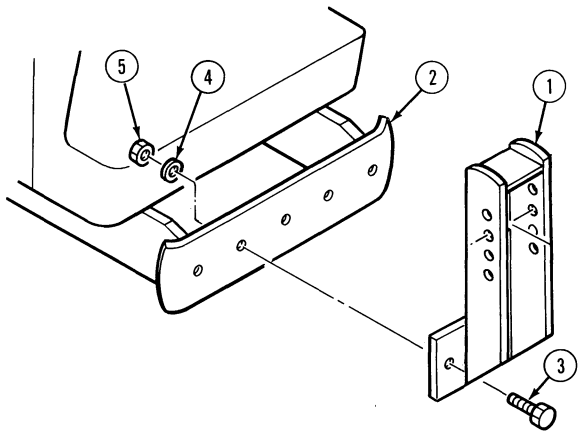


Figure 19
Cylinder Mount

1. Cylinder Support
2. Tractor Bumper
3. Bolt - 5/8"x1-3/4"
4. Lockwasher - 5/8"
5. Nut - 5/8" NC

ALL MODELS: LIFT CYLINDER

1. Insert two 1/4" x 90° adapter unions, (1), into both ports of the lift cylinder, (2), Figure 20. Use pipe compound or teflon tape on the threads. Position the fittings as shown in Figure 20.

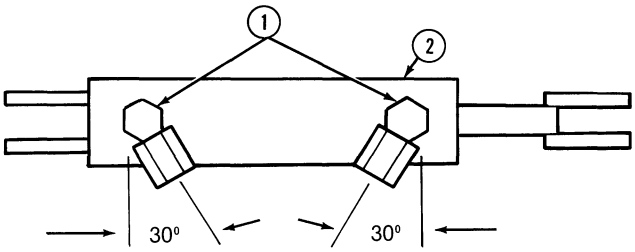


Figure 20
Lift Cylinder

1. 90° Adapter Unions
2. Hydraulic Cylinder

2. Attach the cylinder, (1), to the cylinder support, (2), using one pin, (3), and two 1/4" x 1-1/2" cotter pins, (4), as shown in Figure 21.

NOTE: *Attach the lift cylinder to the support mount hole combination that is nearest 30 inches from the ground line to the cylinder pin center.*

3. Attach the lift cylinder rod to the forward frame, (5), using a 3/4" dia. x 2" clevis pin, (6), and 1/8" x 1-1/4" cotter pin, (7), as shown in Figure 21.

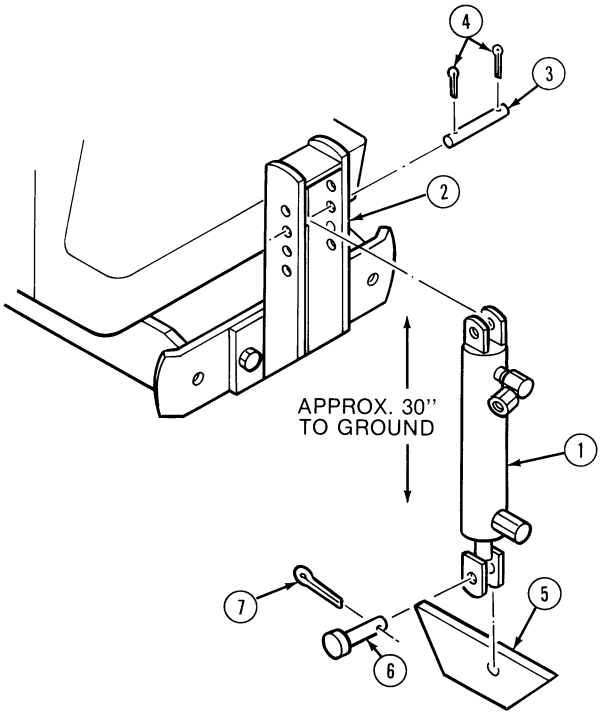


Figure 21
Cylinder Support

1. Hydraulic Cylinder
2. Cylinder Support
3. Pin
4. Cotter Pin - 1/4" x 1-1/2"
5. Forward Frame
6. Pin - 3/4" x 2"
7. Cotter Pin - 1/8" x 1-1/4"

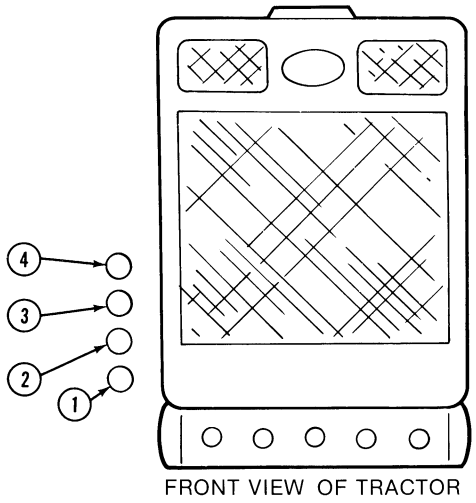


Figure 22
Hydraulic Connections

1. Blade Lower
2. Blade Raise
3. Angle - Right
4. Angle - Left

ALL MODELS: HYDRAULIC HOSES

1. Assemble the male quick disconnect fittings to one end of the hydraulic hoses. Use pipe compound or teflon tape on the threads.

NOTE: *The quick disconnect fittings are not included with the front blade kit.*

2. Attach the 22" hoses to the upper and lower ports of the lift cylinder.

3. Connect the hose from the upper port of the lift cylinder to the tractor quick coupler, (1), Figure 22. Connect the hose from the lower port of the lift cylinder to the tractor quick coupler, (2), Figure 22.

4. Using the plastic tie, secure the hoses to each other.

ALL MODELS: MECHANICAL ANGLING LINKS

1. Attach the male link, (1), Figure 23, to the blade, (2), using a 3/4" dia. x 3" headed pin, (3), and a 1/4" x 1-1/2" cotter pin, (4).

2. Slide the female link, (5), Figure 23, over the male link, (1), then attach the female link to the forward frame, (6), using a 3/4" dia. x 2-1/4" headed pin, (7), and 1/4" x 1-1/2" cotter pin, (8).

3. Repeat the procedure for the other mechanical angling link.

4. The mechanical angling links are designed to lock the blade in any one of five positions from left to right. After positioning the blade to the desired angle, lock the mechanical links with L-pin, (9), Figure 23, 3/16" x 1-1/2" cotter pin, (10) and hair pin clip, (11).

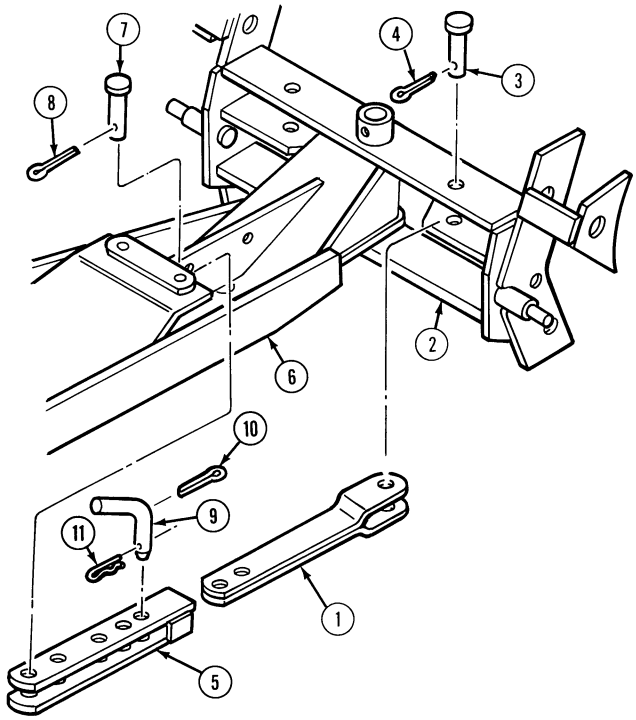


Figure 23
Angling Links

1. Male Link
2. Blade
3. Pin
4. Cotter Pin
5. Female Link
6. Front Frame
7. Pin
8. Cotter Pin
9. L-Pin
10. Cotter Pin
11. Hair Pin

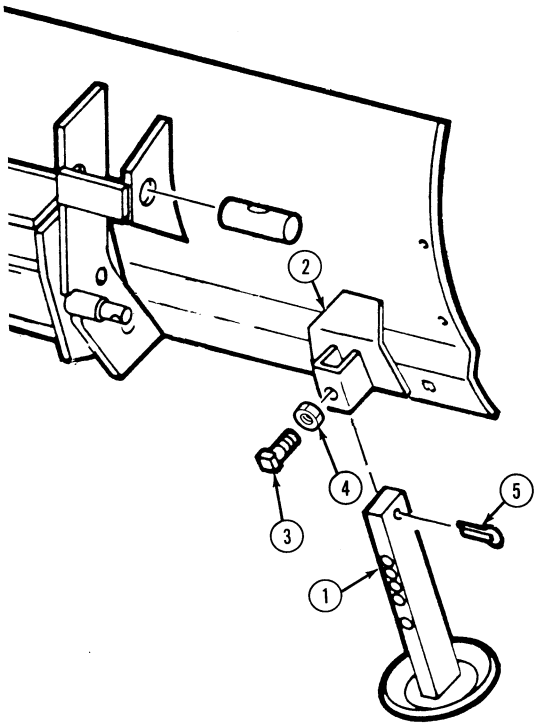


Figure 24
Skid Shoe

1. Skid Shoe
2. Bracket
3. Square Head Setscrew - 1/2''x 1-1/2''
4. Jam Nut - 1/2'' NC
5. Cotter Pin

ALL MODELS: SKID SHOES

1. Insert the skid shoe, (1), Figure 24, into the bracket, (2), and secure using a 1/2'' NC x 1-1/2'' sq. hd. setscrew, (3), jam nut, (4), and 1/4'' x 1'' cotter pin, (5).

NOTE: *The skid shoe post has small indentations at the back edge. Be sure the setscrew has engaged the proper indentation before tightening the jam nut.*

2. Repeat the procedure for the other skid shoe.

3. The skid shoes can be adjusted to provide the desired blade clearance for various ground conditions.

ALL MODELS: (OPTIONAL) HYDRAULIC ANGLE KIT

1. Insert a 1/4'' x 90º adapter union, (1), Figure 25 into the ports of both angling cylinders, (2). Use pipe compound or teflon tape on the threads. Position the fittings as shown in Figure 25.

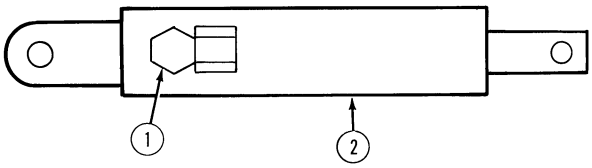


Figure 25
Angle Cylinder

1. 90º Adapter Union
2. Hydraulic Cylinder