



Blue
Ribbon
Service

Service Manual

INTERNATIONAL[®]
CUB CADET[®] TRACTORS
Models 582, 582 Special, 682,
782 and 982 Chassis &
IH Equipment

GSS-1497 W/Revision 2
August, 1981

INTERNATIONAL HARVESTER

NORTH AMERICA OPERATIONS
AGRICULTURAL EQUIPMENT GROUP

401 NORTH MICHIGAN AVENUE • CHICAGO, ILLINOIS, 60611, U.S.A.

Due to a continuous program of research and development, some procedures, specifications and parts may be altered in a constant effort to improve our products.

When changes and improvements are made in our products, periodic revisions may be made to this manual to keep it up-to-date. It is suggested that customers contact their dealer for information on the latest revision.

LIBRARY FILING INFORMATION

1. File this manual and divider in the last binder of your OPP Service Manual Library.
2. On page 15 (Cub Cadets and Equipment) of your OPP library index, enter model heading 582, 682, 782 and 982 on the open line below the last Model 1100 entry. Enter this manual description, form number and book filed in under the 582, 682, 782 and 982 heading.

INTERNATIONAL[®] CUB CADET[®] TRACTORS Models 582, 582 Special, 682, 782 and 982 Chassis & IH Equipment

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CHASSIS

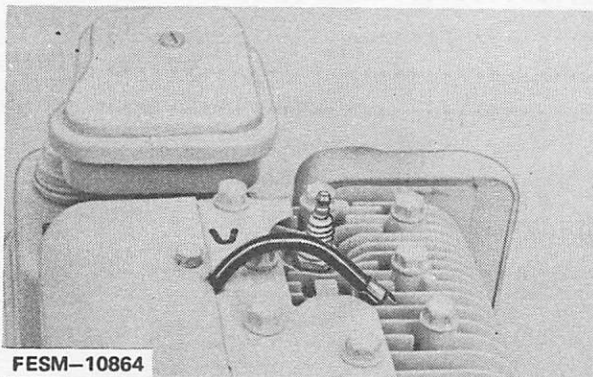
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IH EQUIPMENT

WORK SAFELY – FOLLOW THESE RULES



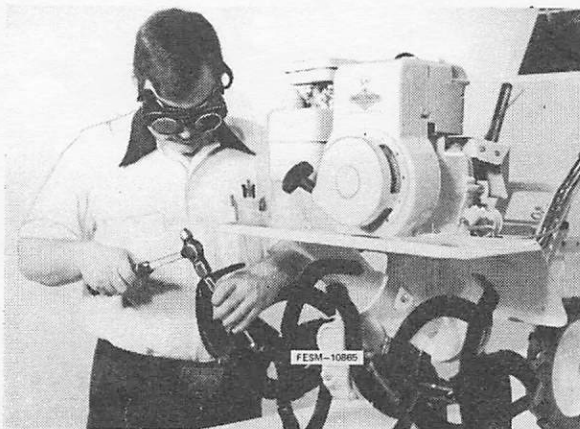
This symbol is used to call your attention to instructions concerning your personal safety. Be sure to observe and follow these instructions.



1. To prevent accidental starting, always pull the high tension wire(s) off of the spark plug(s) before servicing and/or adjusting the machine.

2. To prevent injury, do not allow children or by-standers around the machine while it is being adjusted and/or serviced.

3. Do not wear rings, wrist watches or loose fitting clothing when working on machinery, they could catch on moving parts causing serious injury. Wear sturdy, rough-soled work shoes. Never adjust and/or service a machine in bare feet, sandals or sneakers.



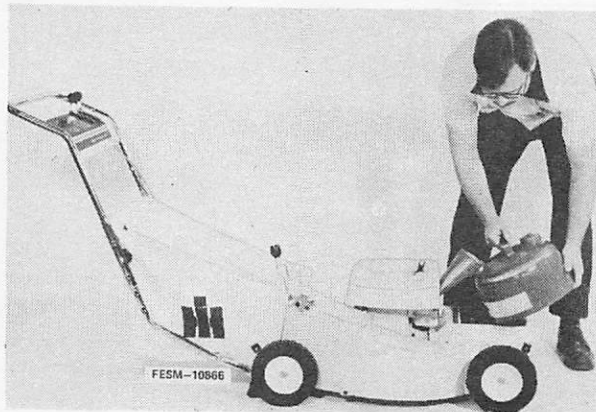
4. Always wear safety glasses when using a hammer, chisel or other tools that may cause chips to fly.

5. Be sure to reinstall safety devices, guards or shields after adjusting and/or servicing the machine.

6. When operating a power washer to clean a machine before servicing, be careful at all times to avoid injury. Maintain proper footing and balance at all times. Never direct the spray at people or animals, as high pressure spray can cause serious injury.

7. If a portable heater is used to heat the service area the following precautions must be observed:

- (a) Do not use portable heaters in presence of volatile materials such as gasoline or paint, as fire or explosion may result.
- (b) To avoid being burned, do not touch the heater during operation.
- (c) Portable heaters consume oxygen and combustion fumes can be hazardous. Heater should be used only in a well ventilated area. Keep a window or door partially open to provide ventilation.
- (d) Keep the heater at least four (4) feet from combustible materials.
- (e) Never use gasoline as fuel.



8. Handle gasoline with care - it is highly flammable:

- (a) Use approved gasoline container.
- (b) Never remove the fuel tank cap or fill the fuel tank when the engine is running, is hot, or indoors. Also, do not smoke when working around flammable fuel.

- (c) Avoid fires — be sure container or funnel does not touch the battery. Do not overfill the fuel tank. Wipe up spilled gasoline.

(d) Replace fuel tank cap securely.

9. Never use trouble lights or electric powered tools that have cut and/or damaged cords or plugs. Be sure all electric tools are properly grounded.

10. Never run an engine in a confined area such as a garage or storage building any longer than is necessary for immediate moving of the machine out of or into the area. **EXHAUST GASES ARE TOXIC. OPENING DOORS AND WINDOWS MAY NOT PROVIDE ADEQUATE VENTILATION.**

11. After servicing, be sure all tools, parts, or servicing equipment are removed from the machine.

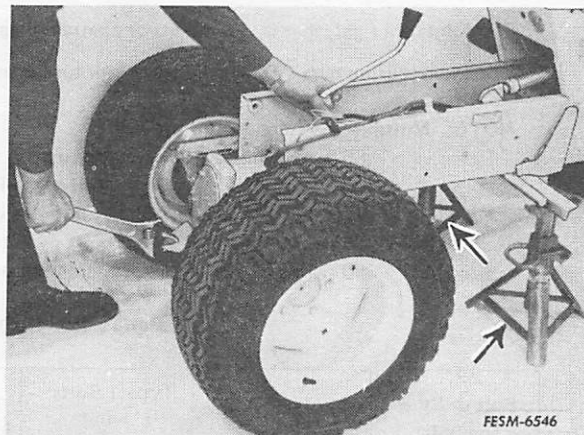
12. Electrical storage batteries give off highly inflammable hydrogen gas when charging and continue to do so for some time after receiving a steady charge. Do not under any circumstances allow an electric spark or an open flame near the battery. Always disconnect a battery cable before working on the electrical system.

13. Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result if medical treatment is not given immediately.

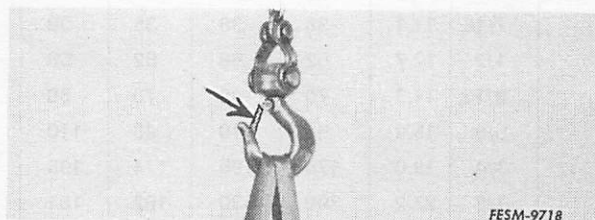
Do not attempt to repair or tighten hoses that are under pressure, when the boom is raised, or with the tractor engine running. Cycle all hydraulic control valves to relieve all pressure before disconnecting the lines or performing other work on the hydraulic system. Make sure all connections are tight and hoses and lines are in good condition before applying pressure to the system. To locate a leak under pressure, use a small piece of cardboard or wood. Never use hands.

14. When using an acetylene torch always wear welding goggles and gloves. Keep a "charged" fire extinguisher within reach. Do not weld or heat areas near fuel tanks or fuel lines and utilize proper shielding around hydraulic lines.

15. Always use safety stands in conjunction with hydraulic jacks or hoists. Do not rely on the jack or hoist to carry the load, they could fail. Always use a safety bar to block hydraulic cylinders.



16. When splitting tractors, or disassembling machines, be sure to use safety stands and adequate supports to prevent tipping or roll-over.



17. Use a safety catch on all hoist hooks. Do not take a chance, the load could slip off of the hook.

18. Use pullers to remove bearings, bushings, gears, cylinder sleeves, etc. when applicable. Use hammers, punches and chisels only when absolutely necessary. Then, be sure to wear safety glasses.

19. Be careful when using compressed air to dry parts. Use approved air blow guns, do not exceed 30 psi, wear safety glasses or goggles and use proper shielding to protect everyone in the work area.

IMPORTANT: The above is only a partial list of safe work rules. In addition, always refer to the Operator's Manual for the specific machine for additional safe work rules regarding the machine operation.

STANDARD TORQUE DATA FOR NUTS AND BOLTS— FOOT POUNDS

Recommended torque for all Standard Application Nuts and Bolts, provided:

- A. All thread surfaces are clean and lubricated with SAE-30 engine oil. (See NOTE.)
- B. Joints are rigid, that is, no gaskets or compressible materials are used.
- C. When reusing nuts or bolts use minimum torque values.

NOTE: Multiply the standard torque by:







- .65 when finished jam nuts are used.
- .70 when Molykote, white lead or similar mixtures are used as lubricants.
- .75 when parkerized bolts or nuts are used.
- .85 when cadmium plated bolts or nuts and zinc bolts w/waxed zinc nuts are used.
- .90 when hardened surfaces are used under the nut or bolt head.


1 FOOT POUND = 1.355 NEWTON METERS

Bolt or Stud Diameter		Type 1 Studs Only		Type 1 Bolts 6" length or less		Type 1 Bolts longer than 6"		Type 5 (all lengths)		Type 8 (all lengths)			
										Only when used† in cast (gray) iron		All other applications	
Inches	MM	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.4	5	6	5	6	3	3	9	10	11	13	12	14
5/16	8.0	12	13	12	13	6	7	19	21	24	27	27	30
3/8	9.5	21	24	21	24	11	13	33	37	43	47	45	50
7/16	11.1	35	38	35	38	19	21	53	60	69	76	75	85
1/2	12.7	52	58	52	58	29	32	80	90	104	117	115	130
9/16	14.3	70	80	70	80	41	46	115	130	150	170	165	185
5/8	15.9	98	110	98	110	57	63	160	180	210	230	220	250
3/4	19.0	174	195	174	195	100	112	290	320	350	390	400	450
7/8	22.2	300	330	162	181	162	181	420	470	570	630	650	730
1	25.4	420	470	250	270	250	270	630	710	850	950	970	1090
1-1/8	28.6	600	660	350	380	350	380	850	950	1200	1350	1380	1550
1-1/4	31.8	840	940	490	540	490	540	1200	1350	1700	1900	1940	2180
1-3/8	34.9	1100	1230	640	710	640	710	1570	1760	2300	2500	2600	2800
1-1/2	38.1	1470	1640	850	940	850	940	2000	2300	3000	3300	3300	3700
1-3/4	44.5	2350	2450	1330	1490	1330	1490	3300	3700	4700	5200	5300	6000
2	50.8	3500	3900	2000	2200	2000	2200	5000	5500	7000	7800	8000	9000

†When bolt penetration is 1-1/2 times the diameter of the bolt.

BOLT TYPE IDENTIFICATION CHART

IH TYPE	S.A.E. GRADE	DESCRIPTION	BOLT HEAD MARKING *
1	1 or 2	WILL HAVE A  STANDARD MONOGRAM IN THE CENTER OF THE HEAD Low or Medium Carbon Steel Not Heat Treated	
5	5	WILL HAVE A  AND 3 RADIAL LINES Quenched and Tempered Medium Carbon Steel	
8	8	WILL HAVE A  AND 6 RADIAL LINES Quenched and Tempered Special Carbon or Alloy Steel	

* The center marking identifies the bolt manufacturer. The  monogram is currently used. Some bolts may still have an IH or a raised dot which previously identified IH bolts.

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Recommended torque for all Standard Application Nuts and Bolts, provided:

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- B. Joints are rigid, that is, no gaskets or compressible materials are used.
- C. When reusing nuts or bolts use minimum torque values.

NOTE: Multiply the standard torque by:







- .65 when finished jam nuts are used.
- .70 when Molykote, white lead or similar mixtures are used as lubricants.
- .75 when parkerized bolts or nuts are used.
- .85 when cadmium plated bolts or nuts and zinc bolts w/waxed zinc nuts are used.
- .90 when hardened surfaces are used under the nut or bolt head.


1 NEWTON METER = 0.738 FOOT POUND

Bolt or Stud Diameter		Type 1 Studs Only		Type 1 Bolts 6" length or less		Type 1 Bolts longer than 6"		Type 5 (all lengths)		Type 8 (all lengths)			
										Only when used† in cast (gray) iron		All other applications	
Inches	MM	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.4	7	8	7	8	4	4	12	14	15	18	16	19
5/16	8.0	17	18	17	18	8	10	26	29	33	37	37	41
3/8	9.5	29	33	29	33	15	18	45	50	58	64	61	68
7/16	11.1	48	52	48	52	26	29	72	81	94	103	102	115
1/2	12.7	71	79	71	79	39	43	108	122	141	159	156	176
9/16	14.3	95	108	95	108	56	62	156	176	205	230	225	250
5/8	15.9	133	149	133	133	77	85	220	245	285	310	300	340
3/4	19.0	240	265	240	265	136	152	390	430	470	530	540	610
7/8	22.0	400	450	220	245	220	245	570	640	770	850	880	990
1	25.4	570	640	340	365	340	365	850	960	1150	1290	1300	1480
1-1/8	28.6	810	900	470	510	470	510	1150	1290	1630	1830	1870	2100
1-1/4	31.8	1140	1270	660	730	660	730	1600	1830	2300	2600	2600	3000
1-3/8	34.9	1490	1670	870	960	870	960	2100	2400	3100	3400	3500	3800
1-1/2	38.1	2000	2200	1150	1270	1150	1270	2700	3100	4100	4500	4500	5000
1-3/4	44.5	3200	3300	1800	2000	1800	2000	4500	5000	6400	7000	7100	8100
2	50.8	4750	5300	2700	3000	2700	3000	6800	7500	9500	10500	10800	12200

†When bolt penetration is 1-1/2 times the diameter of the bolt.

BOLT TYPE IDENTIFICATION CHART

IH TYPE	S.A.E. GRADE	DESCRIPTION	BOLT HEAD MARKING *
1	1 or 2 Equivalent	WILL HAVE A  STANDARD MONOGRAM IN THE CENTER OF THE HEAD Low or Medium Carbon Steel Not Heat Treated	
5	5	WILL HAVE A  AND 3 RADIAL LINES Quenched and Tempered Medium Carbon Steel	
8	8	WILL HAVE A  AND 6 RADIAL LINES Quenched and Tempered Special Carbon or Alloy Steel	

*The center marking identifies the bolt manufacturer. The  monogram is currently used. Some bolts may still have an IH or a raised dot which previously identified IH bolts.

CONVERSION TABLE

—inches to millimeters—

Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1	25.4	26	660.4	51	1295.4	76	1930.4
2	50.8	27	685.8	52	1320.8	77	1955.8
3	76.2	28	711.2	53	1346.2	78	1981.2
4	101.6	29	736.6	54	1371.6	79	2006.6
5	127.0	30	762.0	55	1397.0	80	2032.0
6	152.4	31	787.4	56	1422.4	81	2057.4
7	177.8	32	812.8	57	1447.8	82	2082.8
8	203.2	33	838.2	58	1473.2	83	2108.2
9	228.6	34	863.6	59	1498.6	84	2133.6
10	254.0	35	889.0	60	1524.0	85	2159.0
11	279.4	36	914.4	61	1549.4	86	2184.4
12	304.8	37	939.8	62	1574.8	87	2209.8
13	330.2	38	965.2	63	1600.2	88	2235.2
14	355.6	39	990.6	64	1625.6	89	2260.6
15	381.0	40	1016.0	65	1651.0	90	2286.0
16	406.4	41	1041.4	66	1676.4	91	2311.4
17	431.8	42	1066.8	67	1701.8	92	2336.8
18	457.2	43	1092.2	68	1727.2	93	2362.2
19	482.6	44	1117.6	69	1752.6	94	2387.6
20	508.0	45	1143.0	70	1778.0	95	2413.0
21	533.4	46	1168.4	71	1803.4	96	2438.4
22	558.8	47	1193.8	72	1828.8	97	2463.8
23	584.2	48	1219.2	73	1854.2	98	2489.2
24	609.6	49	1244.6	74	1879.6	99	2514.6
25	635.0	50	1270.0	75	1905.0	100	2540.0

1 inch = 25.4 millimeters

To convert inches to millimeters, the inch value to be converted should be written down, carried to as many decimal places as the desired accuracy requires. It should then be split into groups of not more than two figures each. The equivalent of each group should then be taken from the table, proper regard being given to the position of the decimal point in each case, and the equivalent of the inch value given.

For example, to convert 2.4635 inches to millimeters:

2.0000 inches = 50.80000 millimeters

.4600 inches = 11.68400

.0035 inches = .08890

2.4635 inches = 62.57290 millimeters

Correct to 3 decimal places.

2.4635 inches = 62.573 millimeters

CONVERSION TABLE

—millimeters to inches—

Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches
1	0.03937008	26	1.0236220	51	2.0078740	76	2.9921260
2	0.07874016	27	1.0629921	52	2.0472441	77	3.0314961
3	.11811024	28	1.1023622	53	2.0866142	78	3.0708661
4	.15748031	29	1.1417323	54	2.1259842	79	3.1102362
5	.19685039	30	1.1811024	55	2.1653543	80	3.1496063
6	.23622047	31	1.2204724	56	2.2047244	81	3.1889764
7	.27559055	32	1.2598425	57	2.2440945	82	3.2283465
8	.31496063	33	1.2992126	58	2.2834646	83	3.2677165
9	.35433071	34	1.3385827	59	2.3228346	84	3.3070866
10	.3937008	35	1.3779528	60	2.3622047	85	3.3464567
11	.4330709	36	1.4173228	61	2.4015748	86	3.3858268
12	.4724409	37	1.4566929	62	2.4409449	87	3.4251968
13	.5118110	38	1.4960630	63	2.4803150	88	3.4645669
14	.5511811	39	1.5354331	64	2.5196850	89	3.5039370
15	.5905512	40	1.5748031	65	2.5590551	90	3.5433071
16	.6299213	41	1.6141732	66	2.5984252	91	3.5826772
17	.6692913	42	1.6535433	67	2.6377953	92	3.6220472
18	.7086614	43	1.6929134	68	2.6771654	93	3.6614173
19	.7480315	44	1.7322835	69	2.7165354	94	3.7007874
20	.7874016	45	1.7716535	70	2.7559055	95	3.7401575
21	.8267717	46	1.8110236	71	2.7952756	96	3.7795276
22	.8661417	47	1.8503937	72	2.8346457	97	3.8188976
23	.9055118	48	1.8897638	73	2.8740157	98	3.8582677
24	.9448819	49	1.9291339	74	2.9133858	99	3.8976378
25	.9842520	50	1.9685039	75	2.9527559	100	3.937008

1 mm = .03937008 inches

To convert millimeters to inches the millimeter value to be converted should be written down, carried to as many decimal places as the desired accuracy requires. It should then be split up into groups of not more than two figures each. The equivalent of each group should then be taken from the table, proper regard being given to the position of the decimal point in each case, and the equivalent of the several groups found by addition. This sum will be the inch equivalent of the millimeter value given.

For example to convert 75.384 millimeters to inches:

75.000 millimeters = 2.9527559 inches

.380 millimeters = .0149606

.004 millimeters = .0001574

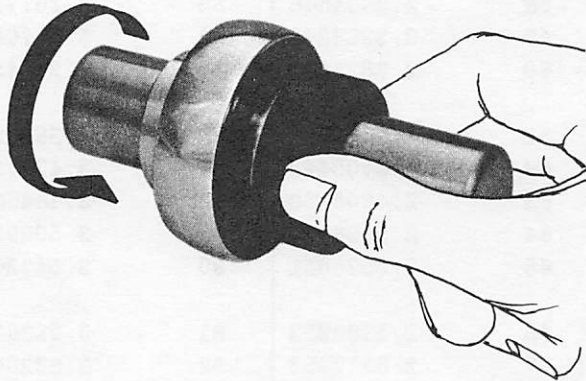
75.384 millimeters = 2.9678739 inches

Correct to 5 decimal places.

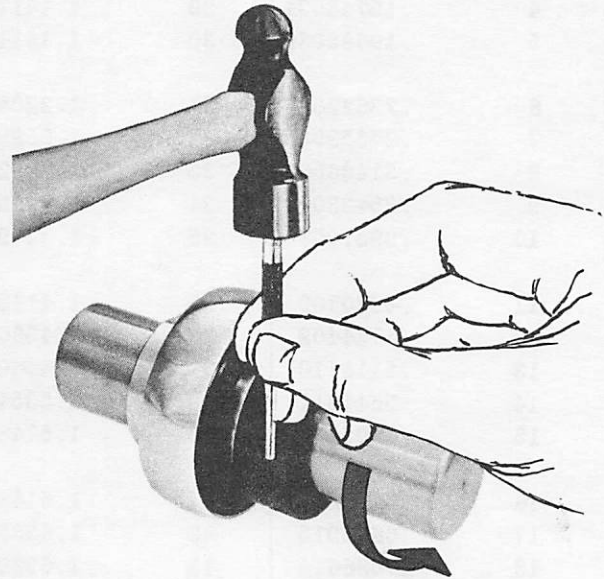
75.384 millimeters = 2.96787 inches

How To Install Bearings With Self-Locking Collar

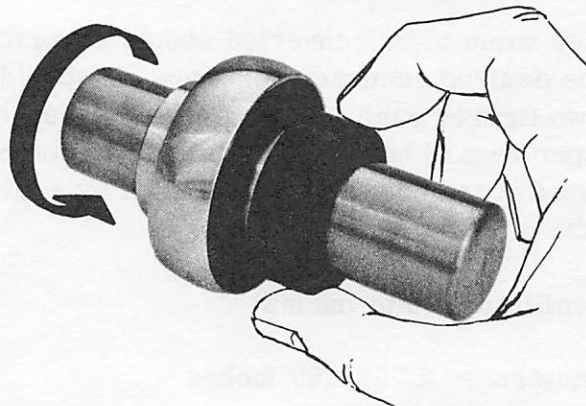
1. Be sure the shaft is free of rust, paint and nicks before installing bearing.



2. Mate cam of collar with cam of bearing inner ring.

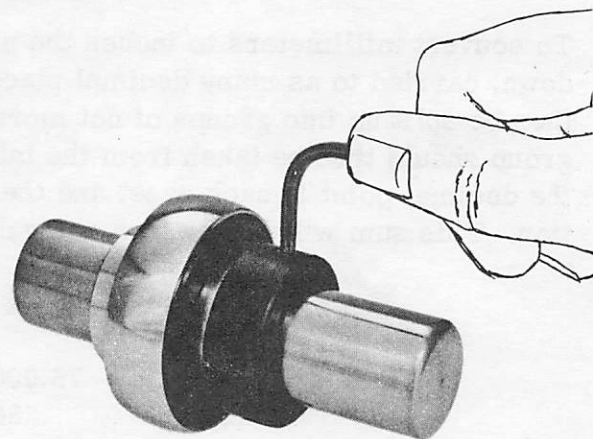


3. Shaft must be in operating position and flangettes tightened securely before tightening locking collars.



4. Pressing collar lightly against inner ring, turn collar in direction of shaft rotation until engaged.

5. With drift pin in collar hole, strike in direction of shaft rotation to lock.



6. Tighten set screw in collar.

Section 1

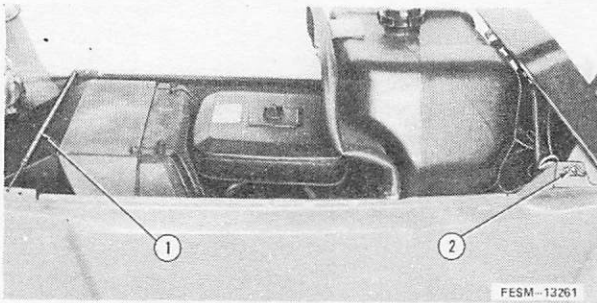
ENGINE

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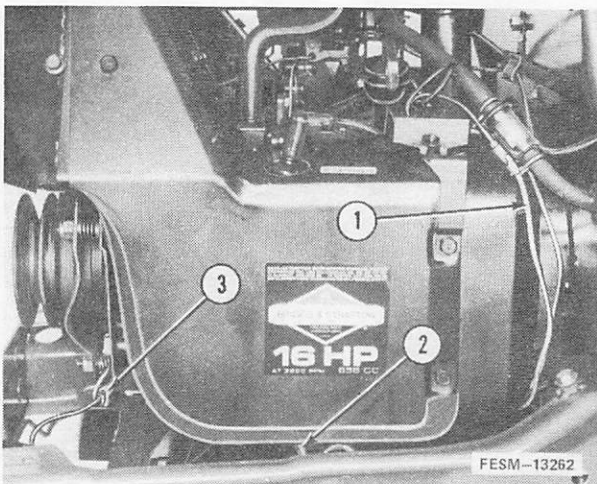
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ENGINE

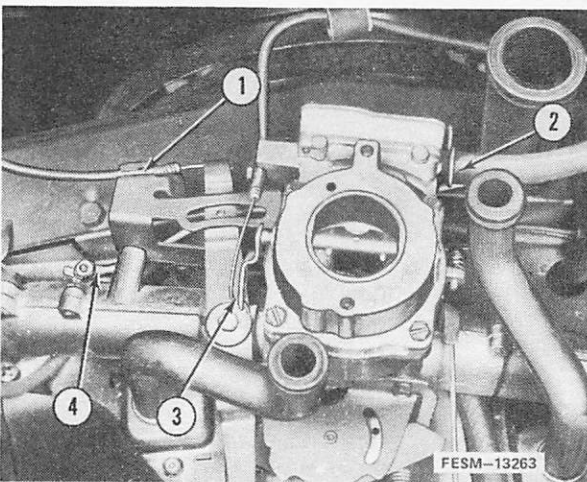
Model 582 and 582 Special



- 1. Spring
- 2. Wing nut



- 1. Alternator regulator wire
- 2. Starter wire
- 3. PTO clutch wire



- 1. Throttle cable
- 2. Fuel line
- 3. Choke cable
- 4. Engine shut-off wire

Removal

1. Disconnect the battery ground cable.

2. Raise the hood and remove the engine side panels secured by wing nuts and a spring.

3. Disconnect the headlight wiring and remove the hood and grille as an assembly.

4. Disconnect the alternator - regulator wire.

5. Disconnect the starter wire and the PTO clutch wire.

6. Remove the air cleaner assembly.

7. Disconnect the choke and throttle cables. Disconnect the engine shut-off wire.

8. Shut off the fuel and disconnect the fuel line at the carburetor. Be sure to plug the line.

9. 582 Special Only - Remove the two capscrews securing the flex coupler to the engine.

10. Remove the engine mounting bolts and slide the engine forward.

11. Using a suitable hoist and sling, lift out the engine.

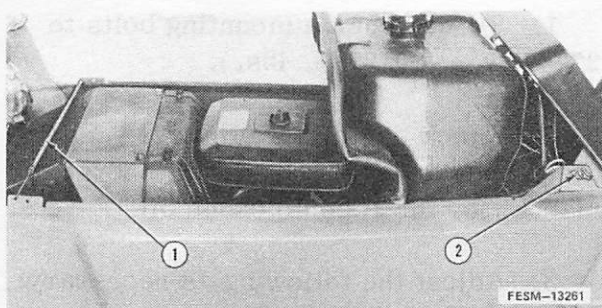
NOTE: For specifications and overhaul procedures, refer to Service Manual GSS-1498.

Installation

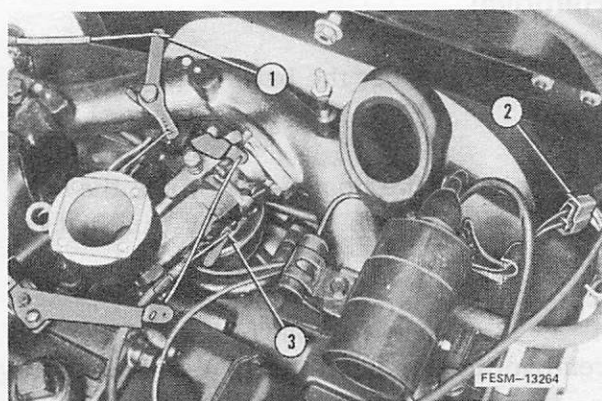
Installation is the reverse of the removal procedure with special attention to the following:

1. Torque engine mounting bolts to 27-34 N·m (20-25 ft. lbs.).
2. Check the engine oil level. Fill to the proper level. Refer to the operator's manual for the recommended oil.
3. Adjust the following as necessary:
 - a. Carburetor
 - b. Governor
 - c. Ignition timing

Models 682 and 782



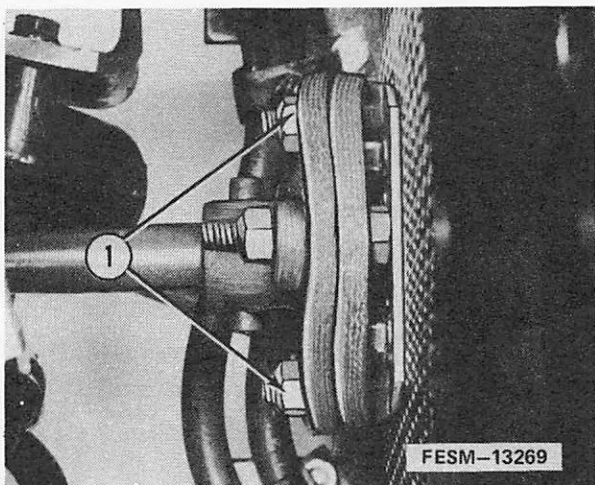
1. Spring
2. Wing nut



Removal

1. Disconnect the battery ground cable.
2. Raise the hood and remove the engine side panels secured by wing nuts and a spring.
3. Disconnect the headlight wiring and remove the hood and grille as an assembly.
4. Remove the air cleaner assembly. Disconnect the choke cable, throttle cable and wire harness.
5. Disconnect the PTO clutch wire and the starter wire (LH side of engine).
6. Shut off the fuel and disconnect the fuel line at the tank. Be sure to plug the line.

1. Throttle cable
2. Wire harness
3. Choke cable



7. Remove the nuts securing the front flex coupler to the flywheel flange.

8. Remove the engine mounting bolts. Using a suitable hoist and sling, remove the engine.

NOTE: For specifications and overhaul procedures, refer to Service Manual GSS-1495.

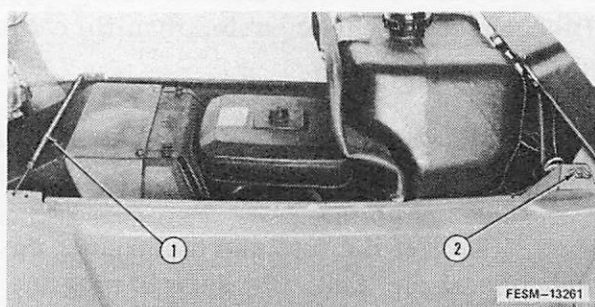
1. Flywheel flange nuts

Installation

Installation is the reverse of the removal procedure with special attention to the following:

1. Torque engine mounting bolts to 27-34 N·m (20-25 ft. lbs.).
2. Check the engine oil level. Fill to the proper level. Refer to the operator's manual for the recommended oil.
3. Adjust the following as necessary:
 - a. Carburetor
 - b. Governor
 - c. Ignition timing

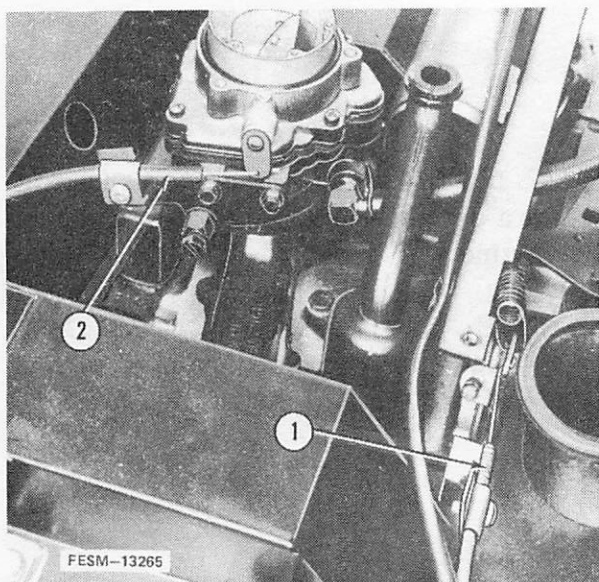
Model 982



1. Spring
2. Wing nuts

Removal

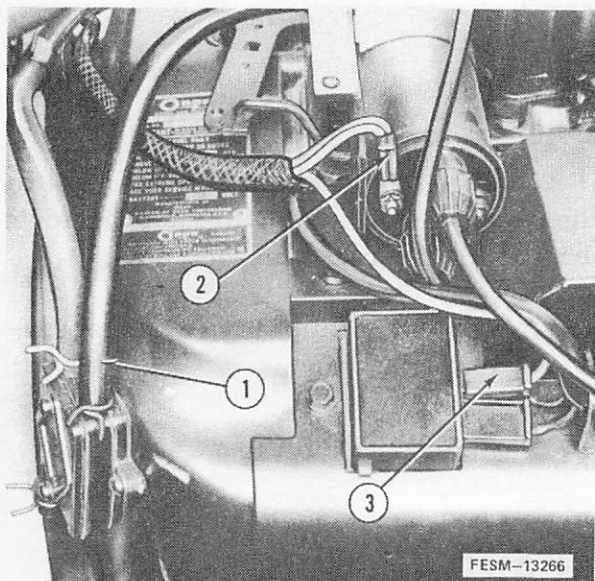
1. Disconnect the battery ground cable.
2. Raise the hood and remove the engine side panels secured by wing nuts and a spring.
3. Disconnect the headlight wiring and remove the hood and grille as an assembly.



4. Disconnect the PTO clutch wire and the starter wire.

5. Remove the air cleaner assembly and disconnect the choke and throttle cables.

1. Throttle cable
2. Choke cable

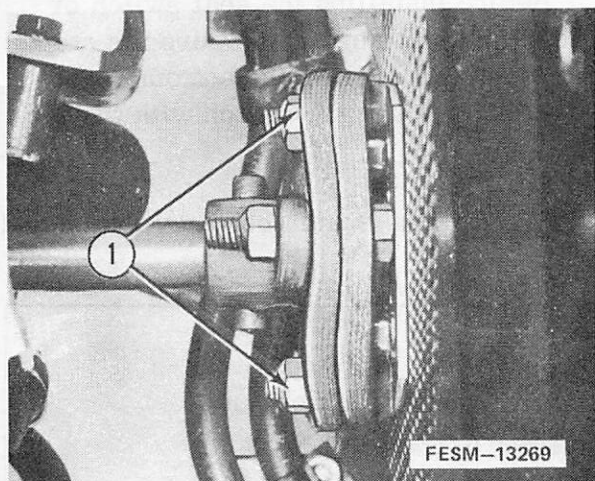


6. Shut off the fuel and disconnect the fuel line from the fuel pump. Be sure to plug the line.

7. Disconnect the lead at the positive (+) terminal on the coil.

8. Disconnect the lead at the rectifier.

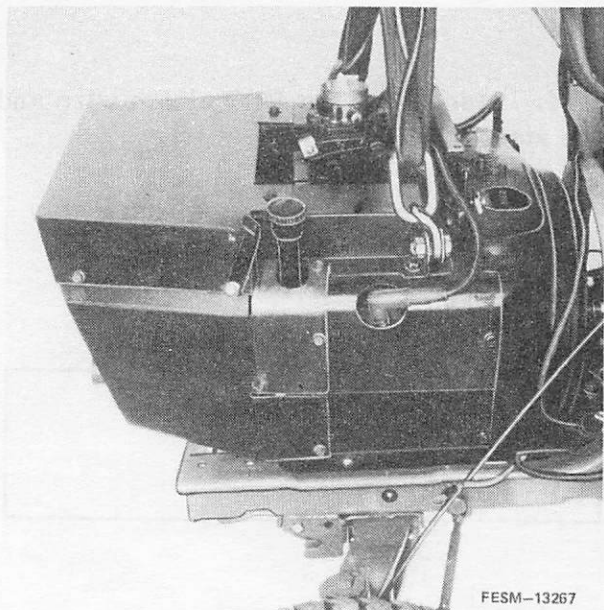
1. Fuel line
2. Coil positive lead
3. Rectifier lead



9. Remove the nuts securing the front flex coupler to the flywheel flange.

10. Remove the engine mounting bolts.

1. Flywheel flange nuts



11. Install lifting brackets as shown. Using a suitable hoist and sling, remove the engine.

NOTE: Refer to Service Manual GSS-1484-1 for specifications and overhaul procedures.

Installation

Installation is the reverse of the removal procedure with special attention to the following:

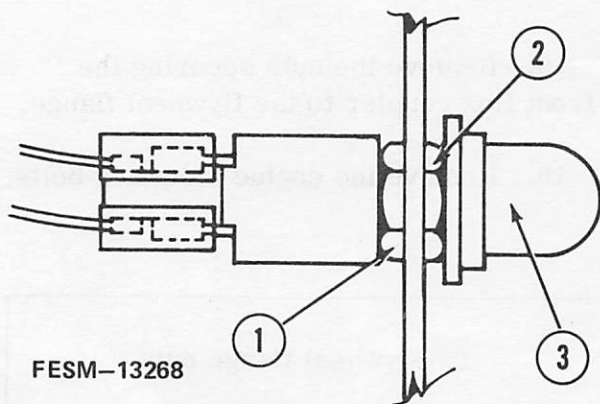
1. Torque engine mounting bolts to 27-34 N·m (20-25 ft. lbs.).

2. Check the engine oil level. Fill to the proper level. Refer to the operator's manual for the recommended oil.

3. Adjust the following as necessary:

- Carburetor
- Governor
- Ignition timing

SEAT SWITCH AND SAFETY START SWITCH



Before installing the seat switch or the safety start switch be sure the stop nut is turned down to the bottom of the threads. Secure the switch with the lock nut.

NOTE: The switch boot screws on and off.

1. Stop nut
2. Lock nut
3. Boot

ELECTRICAL SCHEMATICS Model 582 and 582 Special

CLUTCH SWITCH

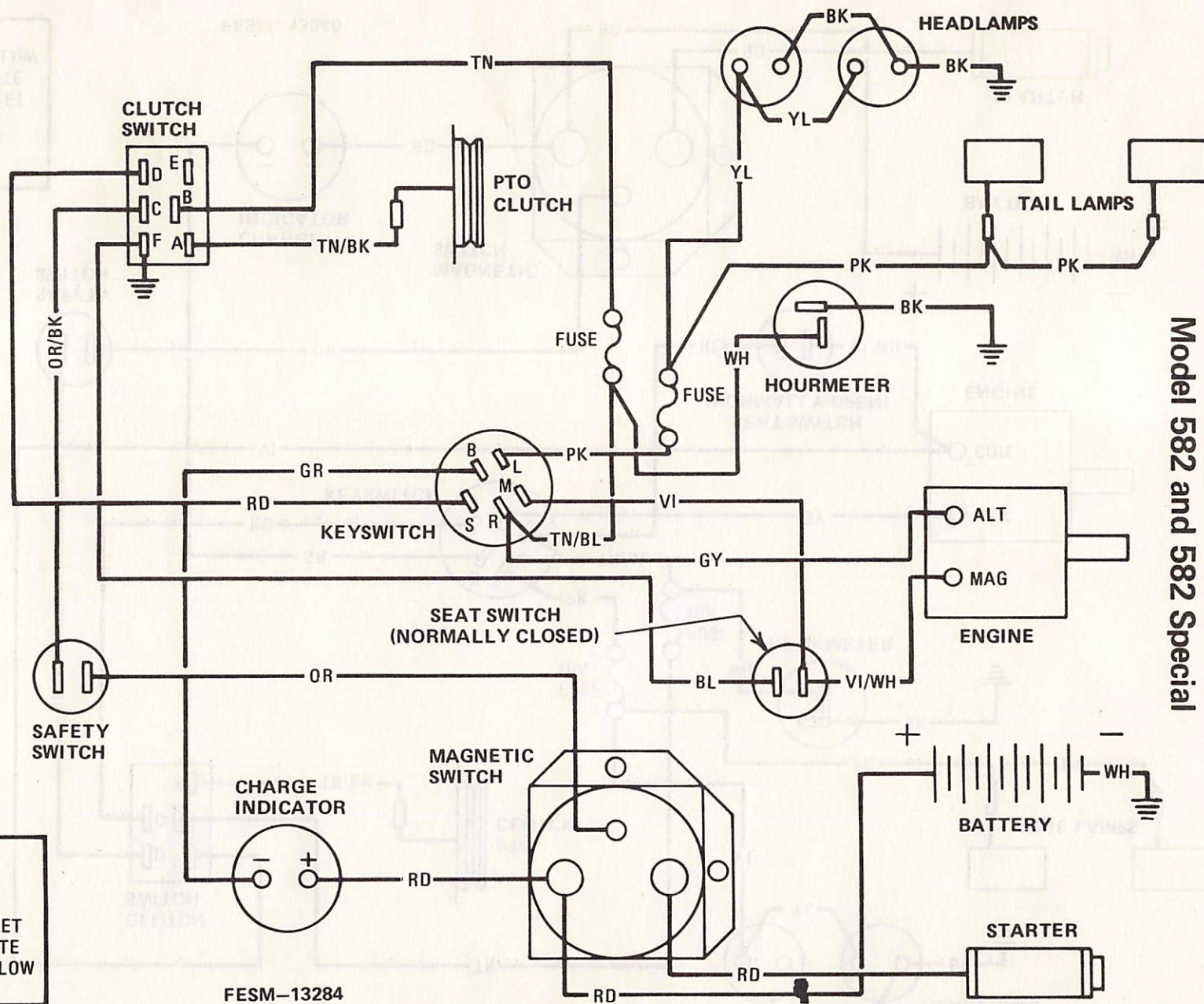
OFF	B+E, C+D
ON	B+A, C+F

KEY SWITCH

OFF	M+G
RUN LGT	R+L+B
RUN	B+R
START	B+S

COLOR CODE

BK-BLACK	RD-RED
BL-BLUE	TN-TAN
GR-GREEN	VI-VIOLET
GY-GREY	WH-WHITE
OR-ORANGE	YL-YELLOW
PK-PINK	



FESM-13284

CLUTCH SWITCH

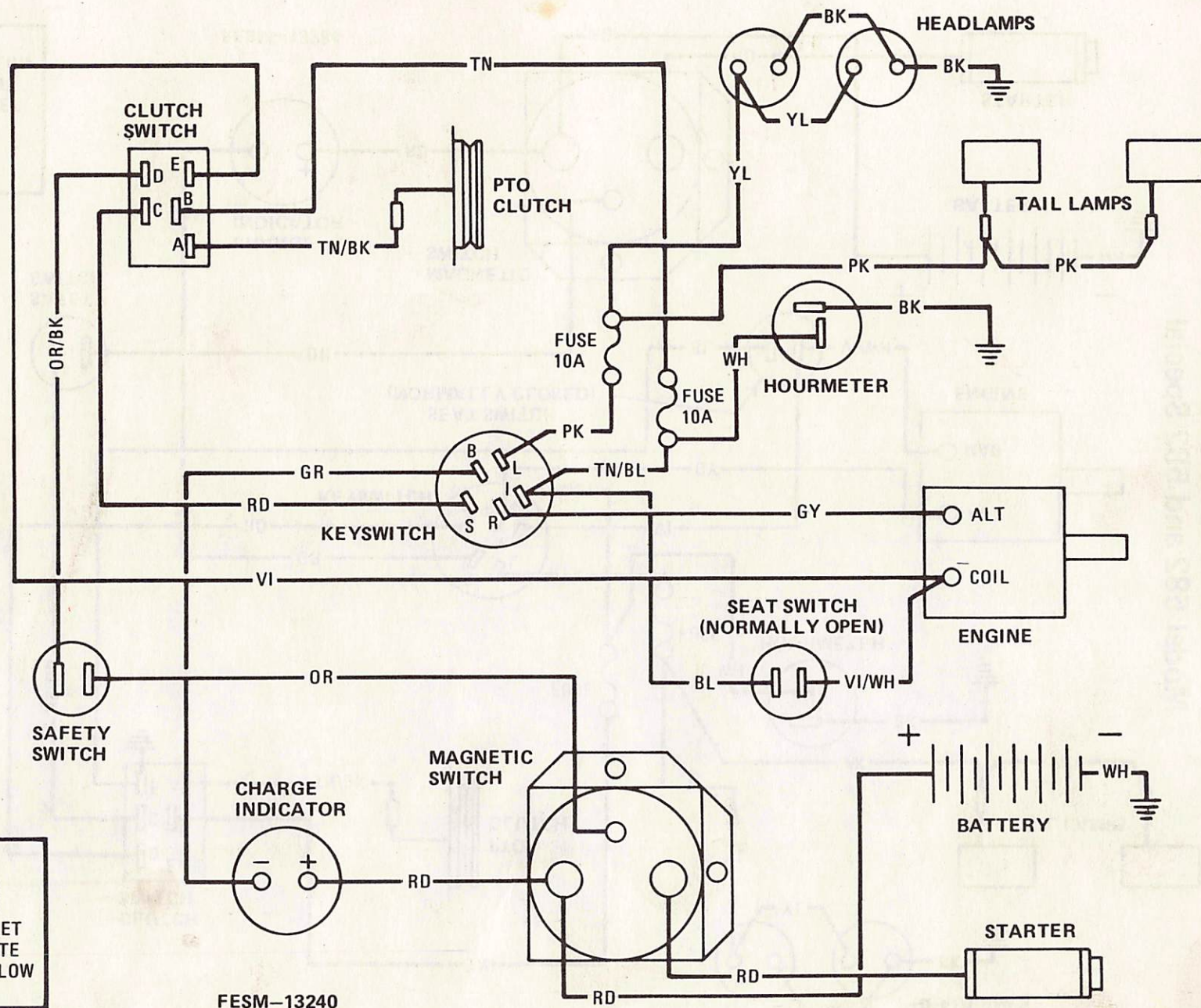
OFF	B+E, C+D
ON	B+A

KEY SWITCH

OFF	NONE
RUN LGT	B+I+R+L
RUN	B+I+R
START	B+I+S

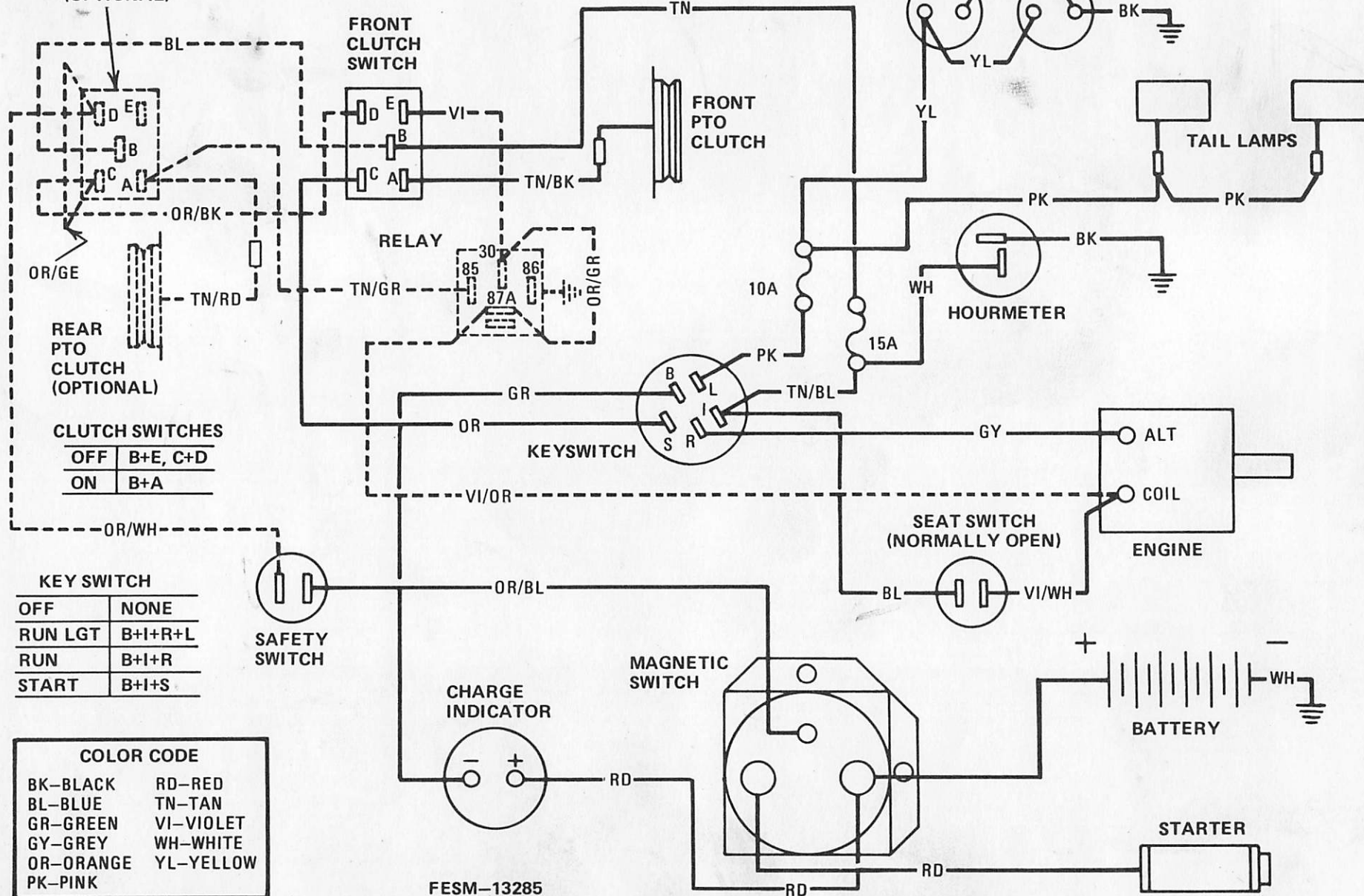
COLOR CODE

BK-BLACK	RD-RED
BL-BLUE	TN-TAN
GR-GREEN	VI-VIOLET
GY-GREY	WH-WHITE
OR-ORANGE	YL-YELLOW
PK-PINK	



FESM-13240

REAR CLUTCH SWITCH (OPTIONAL)



Section 2

CHASSIS

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SPECIAL TORQUES

Gear Drive

Reduction gear	75 N•m (55 ft. lbs.)
Transmission countershaft nut	115 N•m (85 ft. lbs.)
Transmission countershaft bearing retainers	27 N•m (20 ft. lbs.)
Reduction housing to transmission	108 N•m (80 ft. lbs.)

Hydrostatic Drive

Charge pump capscrews	71 N•m (52 ft. lbs.)
Hydrostatic cover to hydrostatic unit center section	47 N•m (35 ft. lbs.)
Motor swash plate 12 point capscrews	91 N•m (67 ft. lbs.)
Hydrostatic unit to differential housing	40 N•m (30 ft. lbs.)

General

Wheel lug bolts	76 to 85 N•m (56 to 63 ft. lbs.)
Steering wheel	43 to 50 N•m (32 to 37 ft. lbs.)
Steering sector jam nut	54 N•m (40 ft. lbs.)
Cam follower lock nut	54 N•m (40 ft. lbs.)
Front wheel capscrews	
Models 582, 582 Special, 682 and 782	47 to 54 N•m (35 to 40 ft. lbs.)
Model 982	88 to 102 N•m (65 to 75 ft. lbs.)
Drag link and tie rod ball joint nuts	
Models 582, 582 Special, 682 and 782 (tighten to align cotter pin hole)	20 N•m (15 ft. lbs.)
Model 982	
3/8 inch (tighten to align cotter pin hole)	41 N•m (30 ft. lbs.)
1/2 inch (tighten to align cotter pin hole)	54 N•m (40 ft. lbs.)

SPECIFICATIONS

Front Axle

Axle pivot bolt diameter	18.97 to 19.05 mm (.747 to .750 inch)
Steering knuckle bolt diameter	18.97 to 19.05 mm (.747 to .750 inch)
Steering knuckle bore	19.08 to 19.2 mm (.751 to .756 inch)

Clutch (Model 582) - Not Model 582 Special

Clutch Load Spring

Free length	170 mm (6.7 inches)
Test length	132 mm (5.2 inches)
Test load	1053 to 1067 N (235 to 240 lbs. force)

Clutch Teaser Spring

Free length	11 mm (.442 inch)
Test length	9 mm (.370 inch)
Test load	222 N (50 lbs. force)

Gear Drive Transmission (Model 582) - Not Model 582 Special

Reduction drive shaft to reduction

gear backlash102 to .279 mm (.004 to .011 inch)
-------------------------	-------------------------------------

Countershaft spacer lengths:

Between front bearing and 3rd speed driven gear

(beveled edge to bearing)	21.5 to 21.6 mm (.848 to .852 inch)
-------------------------------------	-------------------------------------

Between 3rd speed driven gear and 2nd speed

driven gear	33.2 to 33.3 mm (1.310 to 1.314 inches)
-----------------------	---

Between 2nd speed driven gear and 1st speed

driven gear	7.9 to 8 mm (.310 to .314 inch)
-----------------------	---------------------------------

Between 1st speed driven gear and reverse

driven gear	17.4 to 17.5 mm (.686 to .690 inch)
-----------------------	-------------------------------------

Between reverse driven gear and rear bearing

(beveled edge to bearing)	17.5 to 17.6 mm (.690 to .694 inch)
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Hydrostatic Drive Transmission (Models 682, 782 and 982)

Pressures:

Charge pump w/o hydraulic lift

(@ maximum idle speed) - Model 68262 to 1.1 MPa (90 to 165 psi)
--	--------------------------------

Charge pump w/hydraulic lift

(@ maximum idle speed) - Model 782 & 98262 to 1.3 MPa (90 to 200 psi)
--	--------------------------------

Implement lift relief pressure

Model 782 3.4 to 4.3 MPa (500 to 625 psi)

Model 982 4.8 to 6.2 MPa (700 to 900 psi)

Tolerances:

Slipper thickness minimum (pump and motor) 3 mm (.121 inch)

All slippers in block assembly must be within .05mm (.002 inch) thickness of each other.

Spring Specifications

Description	Free Length	Test Length	Test Load
Pump and motor cylinder block assemblies	27 mm (1-1/16 inches)	15 mm (19/32 inch)	307 N (69 lbs.)
Charge pump relief valve Models 682 and 782	27 mm (1.057 inches)	13 mm (.525 inch)	32 N (7.3 lbs.)
Model 982	24 mm (.95 inch)	12 mm (.485 inch)	9 N (2 lbs.)
Implement relief valve	20 mm (.78 inch)	17 mm (.674 inch)	160 N (36 lbs.)

Differential (All Models Except 582 Special)

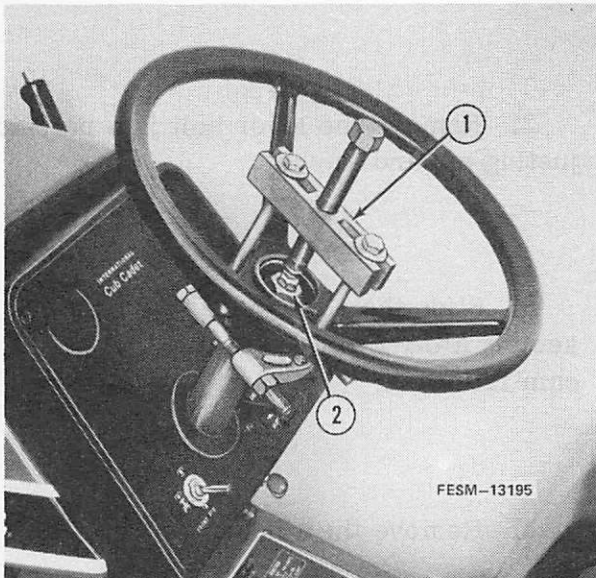
Bearing pre-load26 to 1.4 N/mm (1.5 to 8 inch lbs.)

Adjusting shim sizes - inch004, .007, .015, .030

Bevel pinion and drive gear backlash076 to .127 mm (.003 to .005 inch)

STEERING ASSEMBLY

Model 582, 582 Special, 682 & 782



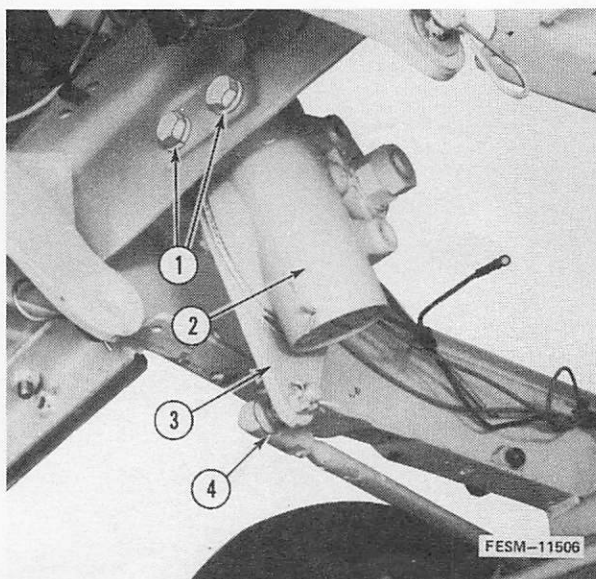
1. Puller assembly
2. 3/8 inch bolt

Removal

1. Remove the steering wheel cover.
2. Remove the nut securing the wheel to the column.
3. Place a 3/8 inch bolt into the column to protect the column end from damage. Remove the steering wheel using a puller as shown.

For Model 782:

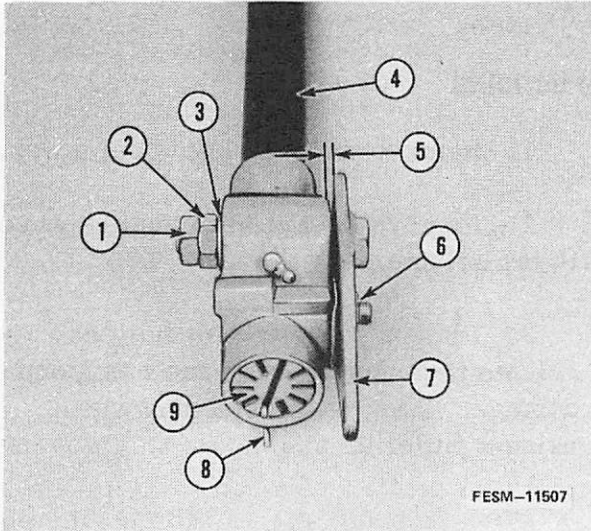
Disconnect the hydraulic lines (from the transmission) at the control valve. Remove the connecting link(s) from the control valve spools. Remove the control valve from the mounting plate. Scribe a line on the steering column just above and below the control valve mounting plate and remove the mounting plate.



4. Disconnect the drag link rear ball joint from the steering lever.
5. Remove the mounting bolts securing the unit. Remove the steering assembly by lowering it thru the control panel.

1. Mounting bolts
2. Steering unit
3. Steering lever
4. Drag link rear ball joint

Disassembly



1. Secure the steering lever and bolt in a vise.

2. Remove the lever bolt jam nut, adjusting nut and washer.

3. Slide the column and housing assembly away from the lever, bolt and cam follower.

4. Remove the adjusting plug.

5. Remove the steering cam and bearings from the housing.

1. Jam nut
2. Adjusting nut
3. Washer
4. Steering column
5. 2.4 mm gap (3/32 inch)
6. Cam follower with lock nut
7. Steering lever
8. Cotter pin
9. Adjusting plug

Inspection and Repair

1. Wash all parts in cleaning solvent, then dry thoroughly.

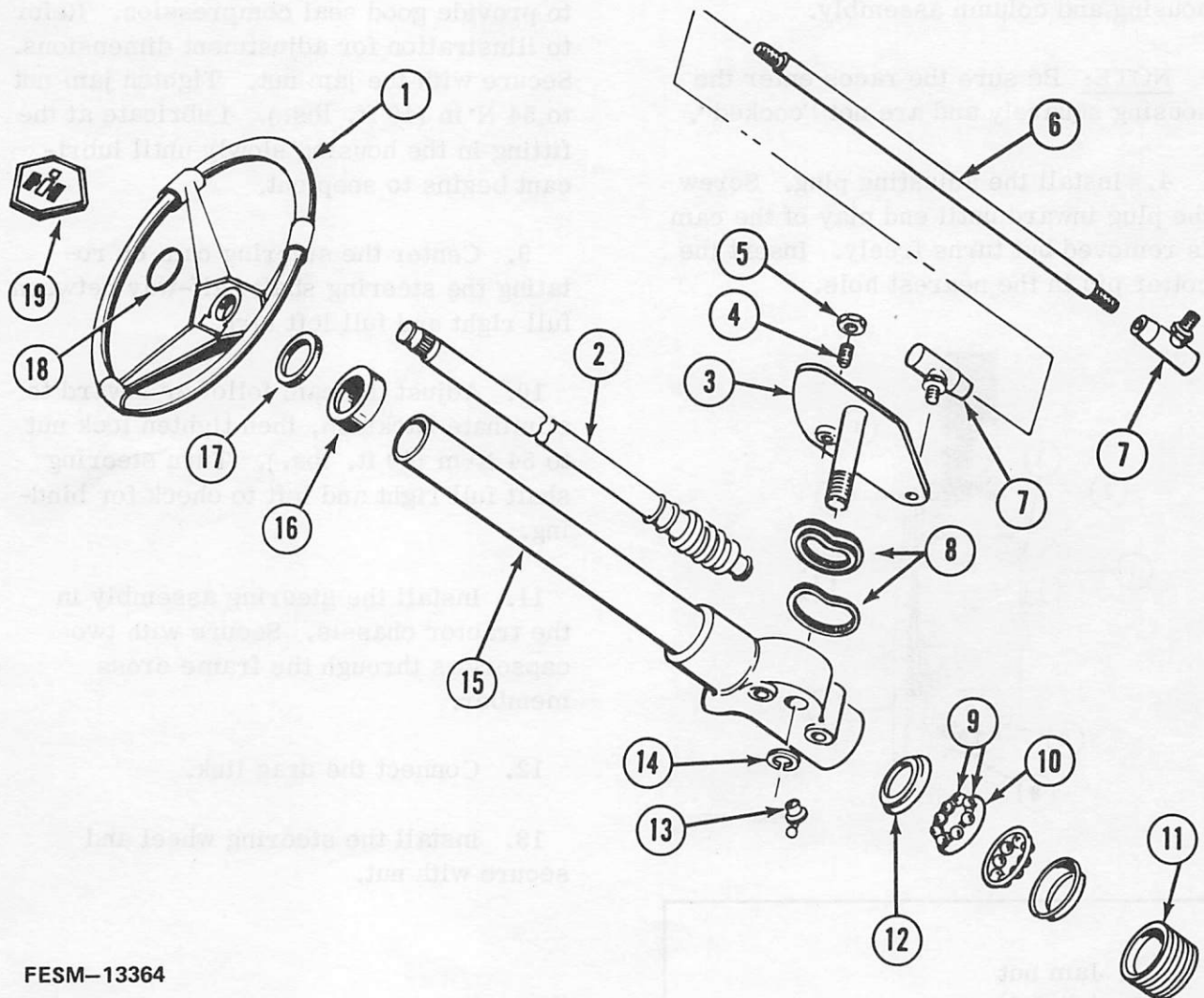
2. Inspect the cam follower for wear (flat spots).

3. Inspect the cam ends, bearings and races for wear, roughness and pitting.

4. Inspect the cam grooves for wear, roughness and galling.

5. Inspect the housing for cracks and stripped threads.

6. Inspect the upper bearing (nylon bushing) for wear or damage.



FESM-13364

- | | | |
|-------------------|-------------------------------|-------------------|
| 1. Steering wheel | 7. Ball joint | 13. Fitting |
| 2. Cam and tube | 8. Seal and retainer | 14. Washer |
| 3. Lever | 9. Retainer and ball assembly | 15. Tube assembly |
| 4. Stud | 10. Retainer | 16. Bearing |
| 5. Nut | 11. Adjusting plug | 17. Seal |
| 6. Drag link | 12. Bearing | 18. Insert |

Reassembly and Adjustment

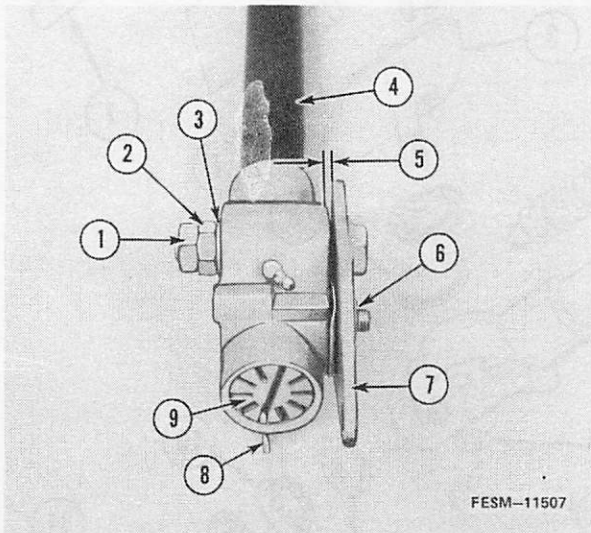
1. Thoroughly coat the cam ends, balls and races with IH 251H E. P. (or equivalent lithium base grease).

2. Install the balls and races on the cam ends.

3. Thoroughly coat the cam with chassis lubricant then install into the housing and column assembly.

NOTE: Be sure the races enter the housing squarely and are not "cocked".

4. Install the adjusting plug. Screw the plug inward until end play of the cam is removed but turns freely. Insert the cotter pin in the nearest hole.



1. Jam nut
2. Adjusting nut
3. Washer
4. Steering column
5. 2.4 mm gap (3/32 inch)
6. Cam follower with lock nut
7. Steering lever
8. Cotter pin
9. Adjusting plug

5. Fill the housing with IH 251H E. P. (or equivalent lithium base grease).

6. Loosen the cam follower lock nut, then back out the cam follower two turns.

7. Install the seal, retainer and lever-bolt assembly to the housing.

8. Install the washer and adjusting nut. Tighten the adjusting nut sufficiently to provide good seal compression. Refer to illustration for adjustment dimensions. Secure with the jam nut. Tighten jam nut to 54 N·m (40 ft. lbs.). Lubricate at the fitting in the housing slowly until lubricant begins to seep out.

9. Center the steering cam by rotating the steering shaft half-way between full right and full left turn.

10. Adjust the cam follower inward to eliminate backlash, then tighten lock nut to 54 N·m (40 ft. lbs.). Turn steering shaft full right and left to check for binding.

11. Install the steering assembly in the tractor chassis. Secure with two capscrews through the frame cross member.

12. Connect the drag link.

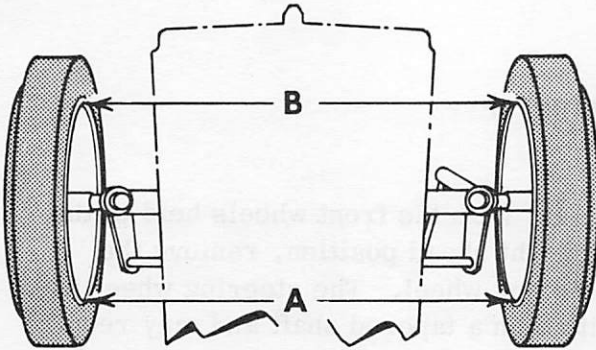
13. Install the steering wheel and secure with nut.

For Model 782:

a. Install the control valve mounting plate aligning it with the scribe marks on the column.

b. Install the control valve and connect the hydraulic lines. Install the connecting link(s).

14. Adjust the tie rod to provide .8 to 3 mm (1/32 to 1/8 inch) toe-in as follows:



FESM-13367

a. With the wheels straight ahead place a chalk mark on each rim at points "A" (wheel hub height). Measure the distance between the two points.

b. Move the tractor straight forward a distance equal to one-half revolution of the front wheels. The chalk marks will now be at points "B".

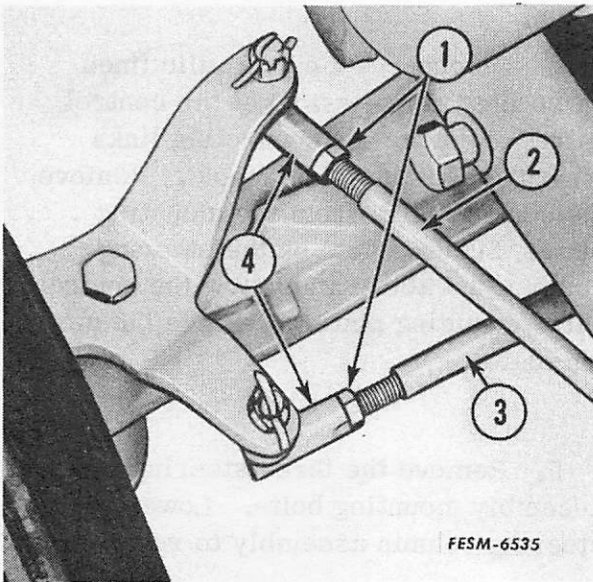
c. Measure the distance between points "B". This distance must be .8 to 3 mm (1/32 to 1/8 inch) less than distance "A".

d. To adjust, remove one of the tie rod ball joints and loosen the lock nut.

e. Screw the ball joint in or out to obtain the specified toe-in and tighten the lock nut.

f. Connect the ball joint to the steering knuckle and be sure to install the cotter pin.

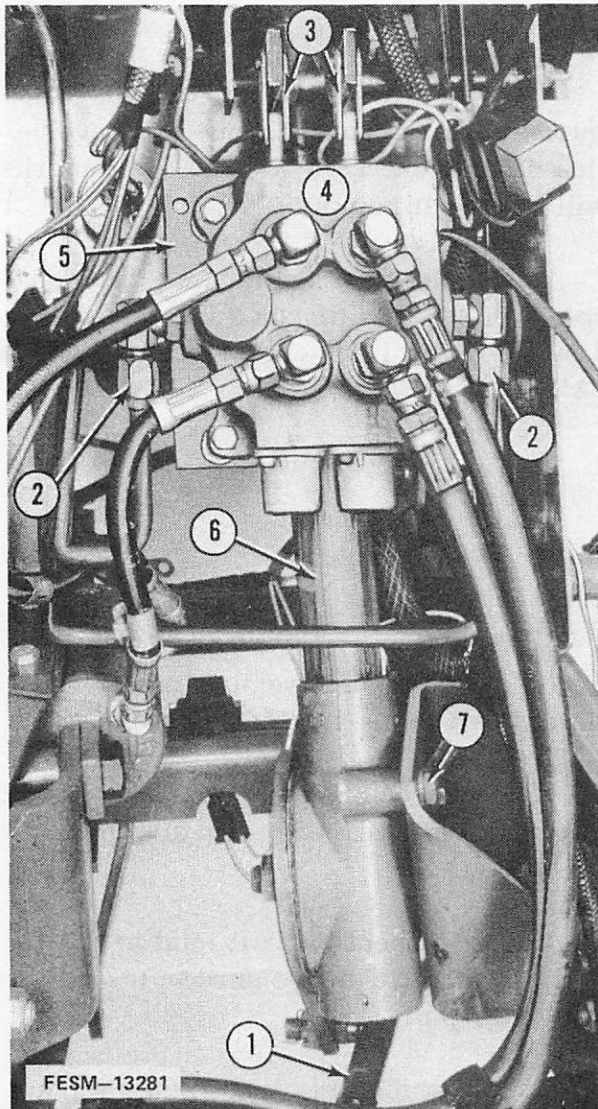
15. Adjust the drag link to the proper length to place the front wheels in the straight ahead position when the steering assembly is centered.



FESM-6535

1. Lock nuts
2. Drag link
3. Tie rod
4. Ball joints

Model 982



1. Drag link rear ball joint
2. Hydraulic lines
3. Connecting links
4. Control valve
5. Control valve mounting plate
6. Steering column
7. Steering column assembly mounting bolts

Removal

1. With the front wheels held in the straight ahead position, remove the steering wheel. The steering wheel is fitted on a tapered shaft and may require a puller for removal.

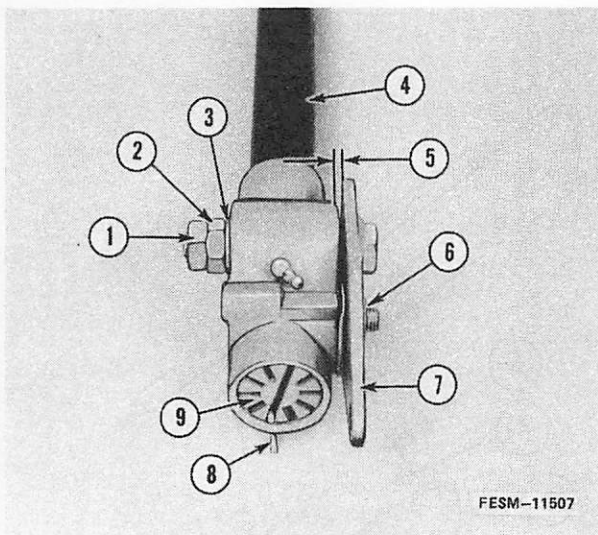
2. Shut off the fuel at the fuel tank. Disconnect the fuel line. Remove the fire wall and fuel tank as an assembly.

3. Remove the drag link rear ball joint from the steering lever.

4. Disconnect the hydraulic lines (from the transmission) at the control valve. Remove the connecting links from the control valve spools. Remove the control valve from the mounting plate. Scribe a line on the steering column just above and below the control valve mounting plate. Remove the mounting plate.

5. Remove the three steering column assembly mounting bolts. Lower the steering column assembly to remove it.

Disassembly



1. Jam nut
2. Adjusting nut
3. Washer
4. Steering column
5. 2.4 mm gap (3/32 inch)
6. Cam follower with lock nut
7. Steering lever
8. Cotter pin
9. Adjusting plug

1. Secure the steering lever and bolt in a vise.

2. Remove the lever bolt jam nut, adjusting nut and washer.

3. Slide the column and housing assembly away from the lever, bolt and cam follower.

4. Remove the adjusting plug.

5. Remove the steering cam and bearings from the housing.

Inspection and Repair

1. Wash all parts in cleaning solvent, then dry thoroughly.

2. Inspect the cam follower for wear (flat spots).

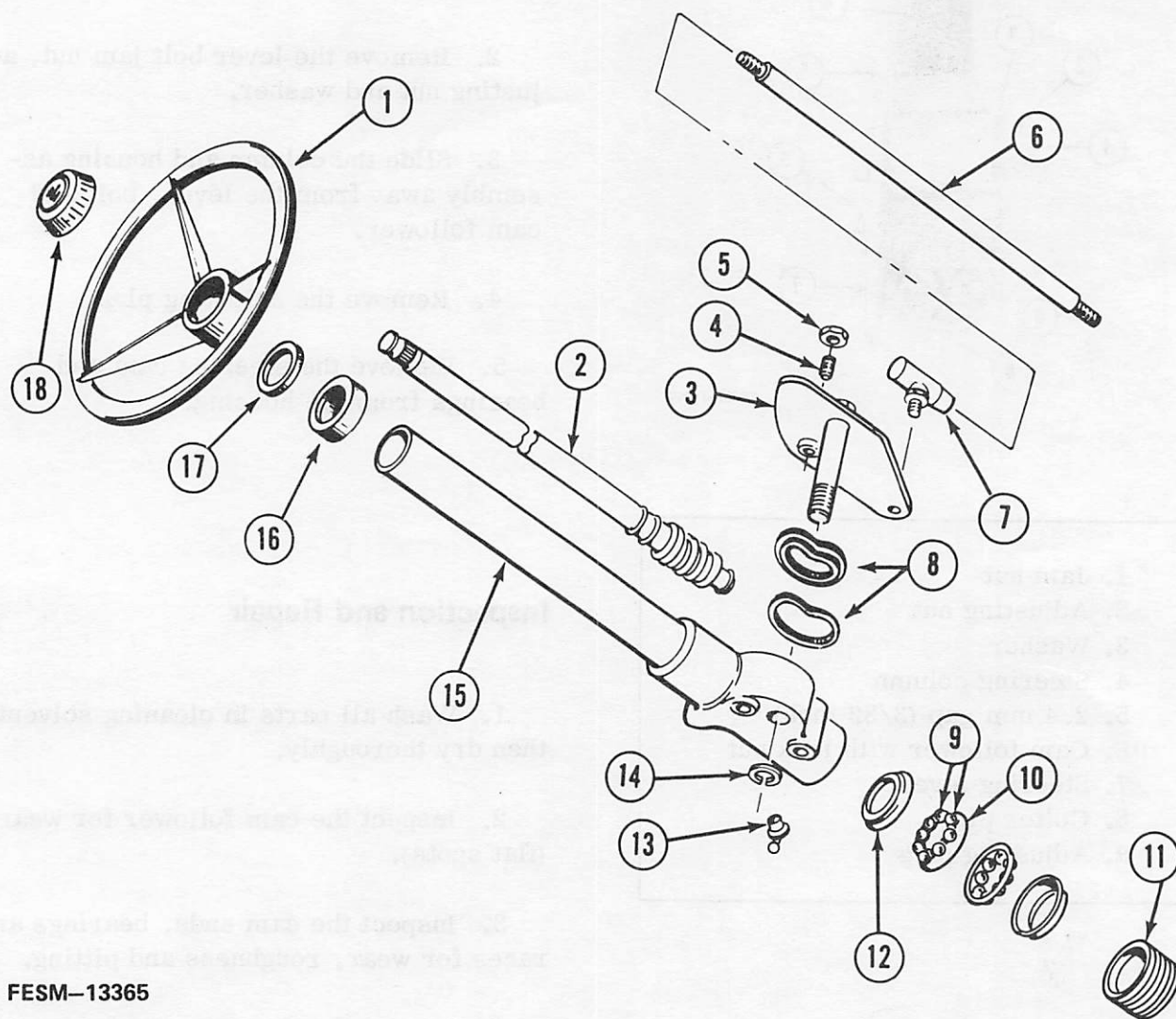
3. Inspect the cam ends, bearings and races for wear, roughness and pitting.

4. Inspect the cam grooves for wear, roughness and galling.

5. Inspect the housing for cracks and stripped threads.

6. Inspect the upper bearing (nylon bushing) for wear or damage.

Reassembly and Adjustment



FESM-13365

1. Steering wheel
2. Cam and tube
3. Lever
4. Stud
5. Nut
6. Drag link
7. Ball joint
8. Seal and retainer
9. Retainer and ball assembly

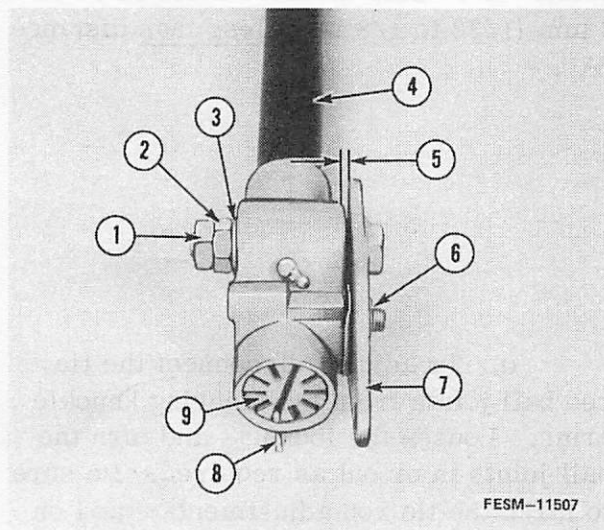
10. Retainer
11. Adjusting plug
12. Bearing
13. Fitting
14. Washer
15. Tube assembly
16. Bearing
17. Seal
18. Insert

1. Thoroughly coat the cam ends, balls and races with chassis lubricant.

2. Install the balls and races on the cam ends.

3. Thoroughly coat the cam with chassis lubricant then install into the housing and column assembly.

NOTE: Be sure the races enter the housing squarely.



- 1. Jam nut
- 2. Adjusting nut
- 3. Washer
- 4. Steering column
- 5. 2.4 mm gap (3/32 inch)
- 6. Cam follower with lock nut
- 7. Steering lever
- 8. Cotter pin
- 9. Adjusting plug

4. Install the adjusting plug. Screw the plug inward until end play of the cam is removed but turns freely. Insert the cotter pin in the nearest hole.

5. Fill the housing with chassis lubricant.

6. Loosen the cam follower locknut, then "back out" the cam follower two turns.

7. Install the seal, retainer and lever-bolt assembly to the housing.

8. Install the washer and adjusting nut. Tighten the adjusting nut sufficiently to provide good seal compression. Refer to illustration for adjustment dimensions. Secure with the jam nut. Tighten jam nut to 54 N·m (40 ft. lbs.). Lubricate at the fitting in the housing slowly until lubricant begins to seep out.

9. "Center" the steering cam by rotating the steering shaft half-way between full right and full left turn.

10. Adjust the cam follower inward to eliminate backlash, then tighten locknut to 54 N·m (40 ft. lbs.). Turn steering shaft full right and left to check for binding.

11. Install the steering column assembly in the tractor chassis.

12. Install the control valve mounting plate aligning it with the scribe marks on the column.

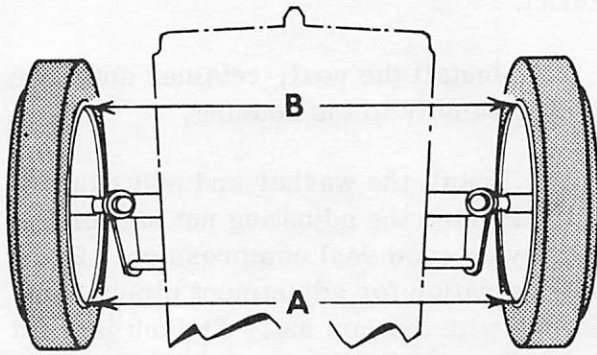
13. Install the control valve and connect the hydraulic lines. Install the connecting links.

14. Connect the drag link.

15. Install the fire wall and fuel tank. Connect the fuel line.

16. Install the steering wheel and secure with nut.

17. Adjust the tie rods to provide .8 to 3 mm (1/32 to 1/8 inch) toe-in as follows:



FESM-13366

a. Place a chalk mark on the rim at points "A" at the hub height and measure the distance between them.

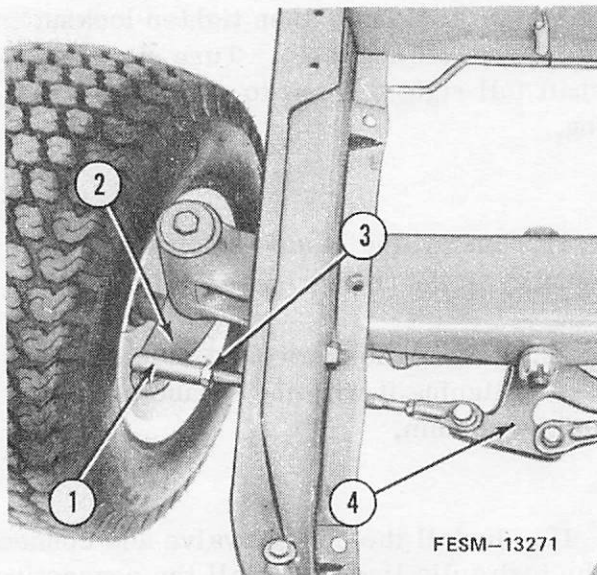
b. Move the tractor straight forward a distance equal to one-half revolution of the front wheels. The chalk marks will now be at points "B".

c. Measure the distance between points "B". This distance must be .8 to 3 mm (1/32 to 1/8 inch) less than distance "A".

d. To adjust, disconnect the tie rod ball joints from the steering knuckle arms. Loosen the locknuts and turn the ball joints in or out as required. Be sure to make the tie rod adjustments equal on both sides, and be sure the knuckle arms stop on the axle.

e. Reconnect the ball joints to the steering knuckle arms. Tighten the ball joint locknuts.

18. Adjust the drag link to the proper length to place the front wheels in the straight ahead position when the steering assembly is centered.



FESM-13271

1. Tie rod ball joint
2. Steering knuckle arm
3. Lock nut
4. Steering lever

FRONT WHEELS AND BEARINGS

Removal

1. Lock the brake and block the rear wheels. Jack up the front axle.
2. Remove the capscrew and flat washer from the outer end of the front spindle.
3. Slide the wheel and bearings from the spindle.

NOTE: The bearings are a press fit in the wheel and a slip fit on the spindle.

4. Wheel bearings can be driven from the wheel hub with a hammer and long drift punch. Drive from the inside toward the outside.

Inspection and Repair

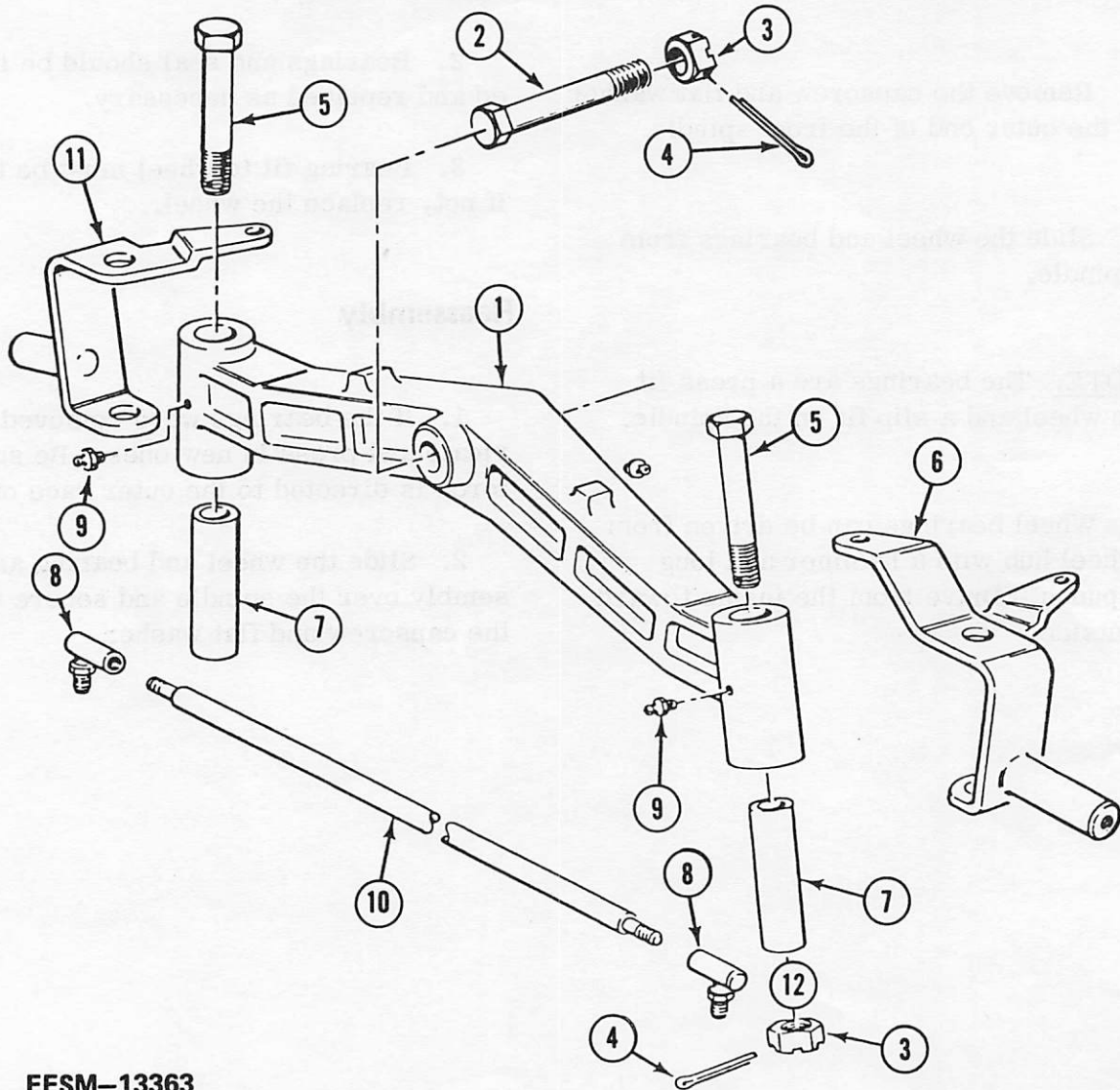
1. Inspect the entire wheel and hub for wear or damage.
2. Bearings and seal should be inspected and replaced as necessary.
3. Bearing fit to wheel must be tight. If not, replace the wheel.

Reassembly

1. If the bearings were removed, lubricate and press in new ones. Be sure force is directed to the outer race only.
2. Slide the wheel and bearing assembly over the spindle and secure with the capscrew and flat washer.

FRONT AXLE

Model 582, 582 Special, 682 & 782



FESM-13363

- | | |
|--------------------------|-------------------------|
| 1. Axle | 7. Spacer |
| 2. Axle pivot bolt | 8. Ball joint |
| 3. Nut | 9. Fitting |
| 4. Cotter pin | 10. Tie rod |
| 5. Steering knuckle bolt | 11. RH steering knuckle |
| 6. LH steering knuckle | |

Disassembly

1. Lock the brake, raise the front of the tractor and support it with jack stands.
2. Remove the front wheels.
3. Disconnect the drag link from the LH steering knuckle.
4. Remove the tie rod.
5. Remove the steering knuckle bolt, steering knuckle and spacer from both sides.
6. Remove the axle pivot bolt and remove the axle.

Inspection and Repair

Clean and inspect all parts closely for wear or damage. Replace as necessary.

Reassembly and Adjustment

1. Coat the axle pivot pin and its bore in the axle with IH 251H E. P. or its equivalent.
2. Position the axle in the support bracket and install the axle pivot bolt.
3. Install the steering knuckles. Tighten the nut to 108 N·m (80 ft. lbs.). Install the cotter key. If the cotter key cannot be installed, tighten the nut only enough to line up the slot with the hole.

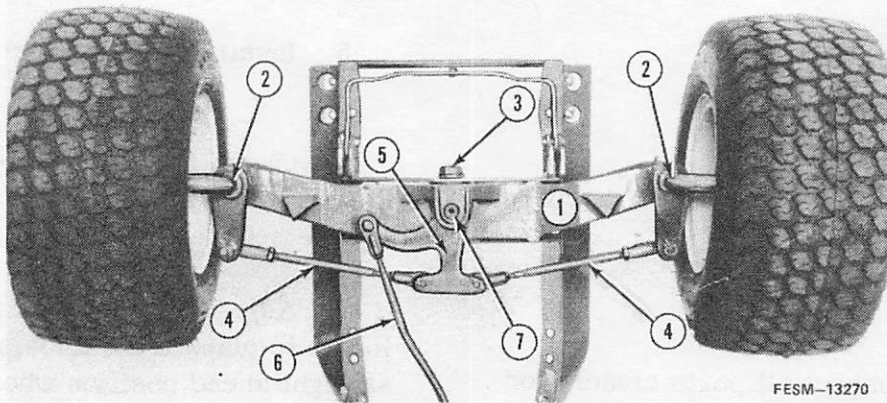
NOTE: Be sure to check for free rotation of the steering knuckles after securing the nut.

4. Install the tie rod and connect the drag link to the left steering knuckle.
5. Install the wheels.
6. Check and adjust toe-in. Adjust the tie rod to provide .8 to 3 mm (1/32 to 1/8 inch) toe-in.
7. Adjust the drag link to proper length to place front wheels in the straight ahead position when the steering assembly is centered.

Model 982

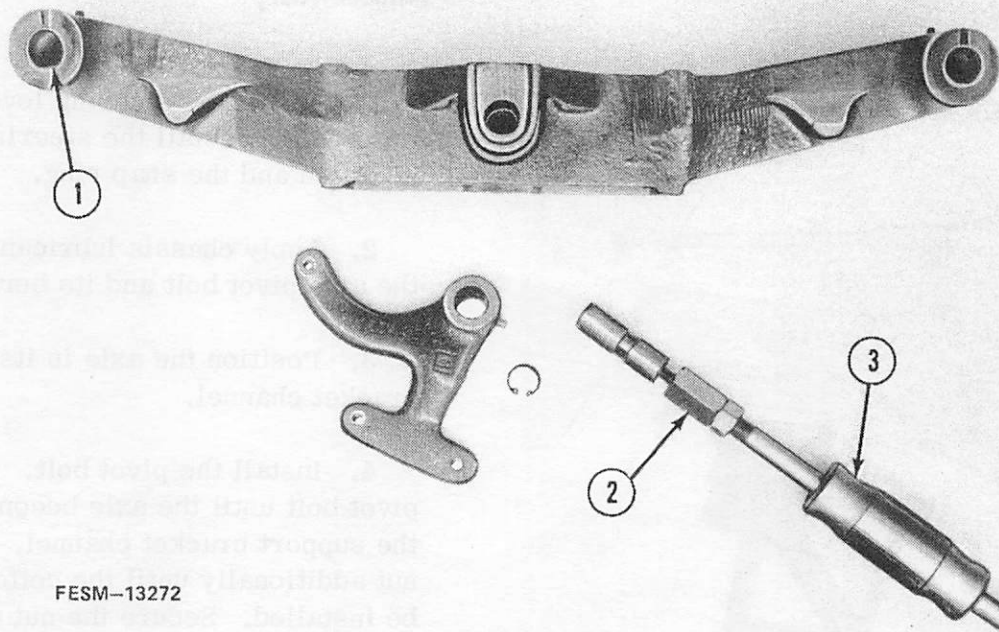
Disassembly

1. Lock the brake, jack up the front of the tractor and support it on a suitable stand.
2. Remove the front wheels.
3. Disconnect the tie rod ball joints from the left and right steering knuckles.
4. Remove the capscrew and flat washer and remove the steering knuckle from the axle.
5. Disconnect the tie rod ball joints from the steering lever.
6. With the front of the tractor frame supported on a suitable stand, remove cotter pin from the pivot bolt and remove the nut.
7. Remove the pivot bolt and lower the front axle.



FESM-13270

- | | |
|---------------------|---|
| 1. Front axle | 5. Steering lever |
| 2. Steering knuckle | 6. Drag link |
| 3. Pivot bolt | 7. Steering lever pivot pin and snap ring |
| 4. Tie rod | |



FESM-13272

1. Knuckle bushings
2. 5/8-18 Female - 3/8-16 Male adapter
3. Slide hammer

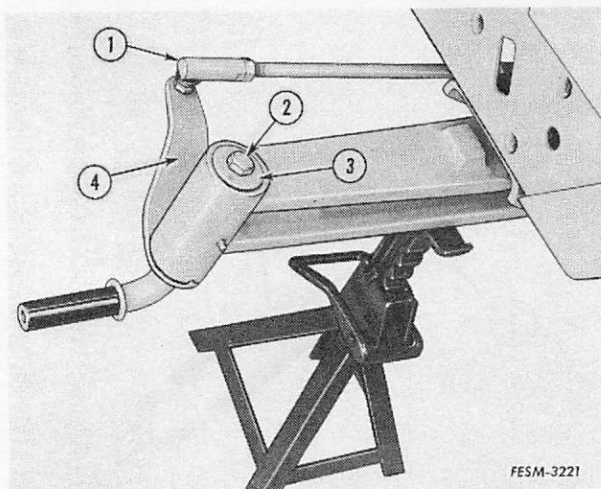
8. Remove the snap ring which retains the steering lever pivot pin. Thread a 5/8-18 Female 3/8-16 Male adapter into the pivot pin. Thread a slide hammer into the adapter. Remove the pivot pin and steering lever.

9. Drive the steering knuckle bushings from the axle if necessary.

Inspection and Repair

Clean and inspect all parts closely for wear or damage. Replace as necessary.

Reassembly



1. Ball joint
2. Capscrew
3. Washer
4. Steering knuckle arm

1. Install the steering lever in the front axle. Install the steering lever pivot pin and the snap ring.

2. Apply chassis lubricant liberally to the axle pivot bolt and its bore in the axle.

3. Position the axle in its support bracket channel.

4. Install the pivot bolt. Tighten the pivot bolt until the axle becomes snug in the support bracket channel. Tighten the nut additionally until the cotter pin can be installed. Secure the nut with the cotter pin.

5. Connect the tie rod ball joints to the steering lever. Be sure to tighten the lock nuts securely.

6. Thoroughly lubricate the steering knuckle shaft.

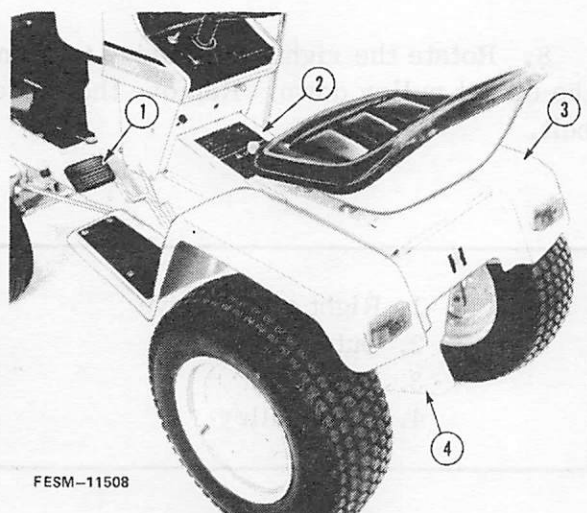
7. Install the RH and LH steering knuckles in their respective bores in the axle and secure with the capscrews and flat washers. Tighten the capscrews securely.

8. Connect the tie rod ball joints to the steering knuckle arms. Be sure to tighten the lock nuts securely.

9. Install the front wheels and check the toe-in. Adjust the tie rods to provide .8 to 3 mm (1/32 to 1/8 inch) toe-in.

DRIVE BELT, CLUTCH SPRING AND LINKAGE

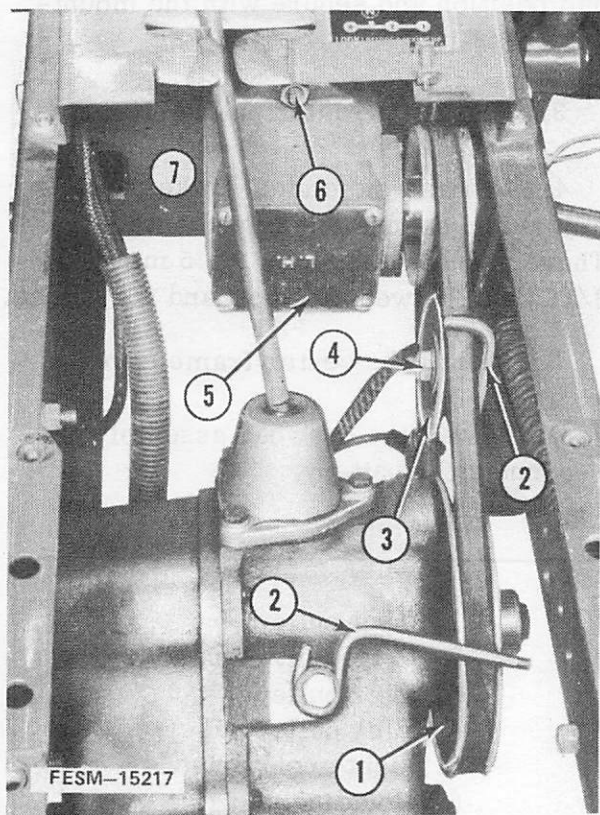
Drive Belt Replacement



NOTE: All photos were taken with the fender assembly removed for clarity. It is not necessary to remove the fender assembly for replacement of the drive belt (or clutch spring and linkage).

1. Disconnect the battery.
2. Remove the drawbar assembly.
3. Remove the center frame cover.

1. Clutch-brake pedal
2. Center frame cover
3. Fender assembly
4. Drawbar assembly

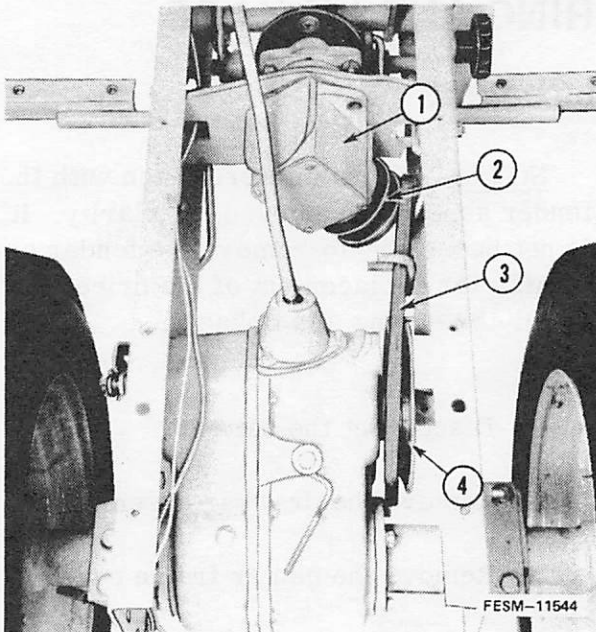


4. Depress the clutch-brake pedal and lock into its lowest position.

5. Loosen the nut securing the idler pulley and the bolts securing the drive belt guides.

6. Work the drive belt off of the trans-axle input pulley.

1. Input pulley
2. Drive belt guides
3. Idler pulley
4. Idler pulley nut
5. Right angle drive
6. Mounting bolt (2)
7. Cross support

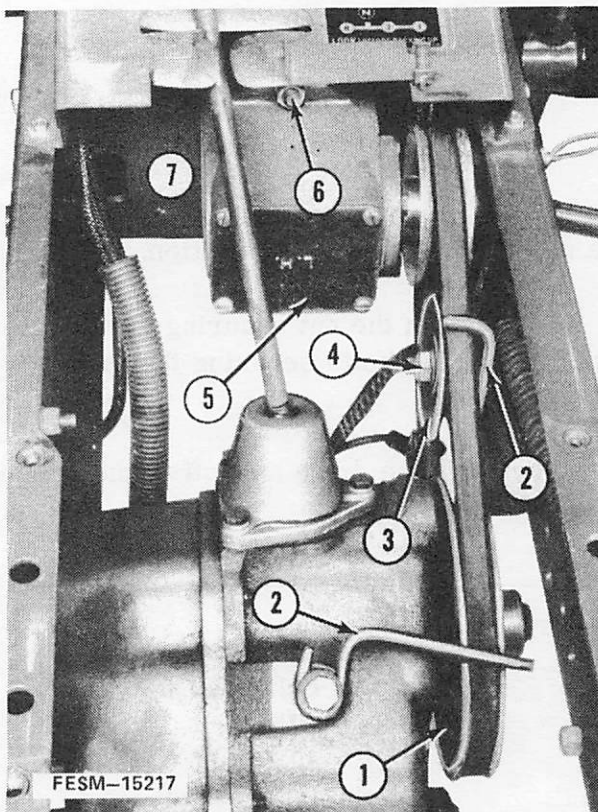


7. Remove the two mounting bolts securing the right angle drive to the cross support.

8. Rotate the right angle drive to bring the output pulley down. Remove the drive belt.

1. Right angle drive
2. Output pulley
3. Drive belt
4. Input pulley

Installation



1. Slip the drive belt into position on the output and input pulleys.

2. Rotate the right angle drive back into position and secure with the mounting bolts.

3. Tighten the idler pulley nut.

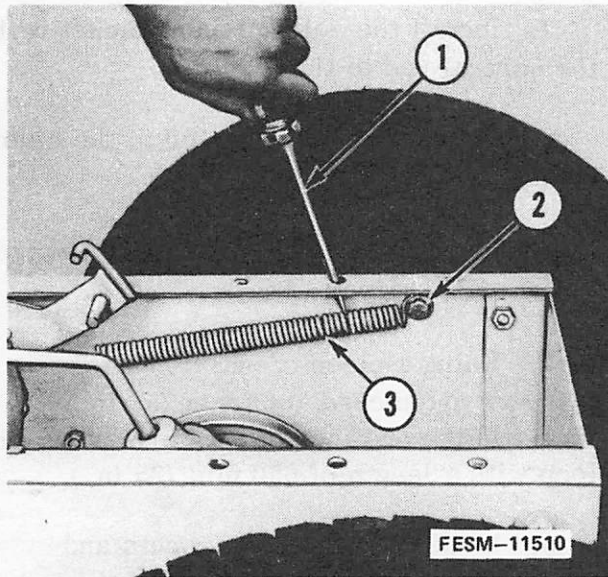
4. Release the clutch-brake pedal. Adjust and secure the drive belt guides. There should be a gap of 3 - 5 mm (1/8 - 3/16 inch) between the belt and the guides.

5. Install the center frame cover.

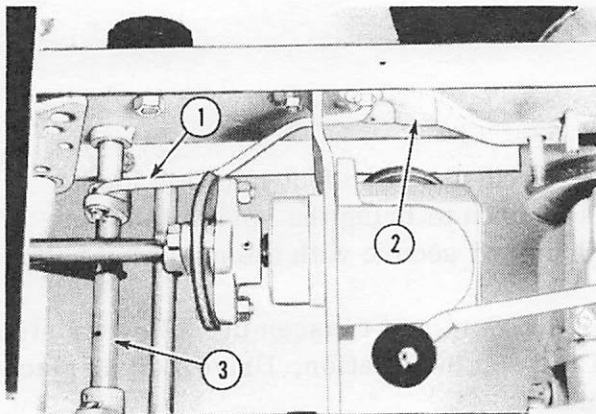
6. Install the drawbar assembly and reconnect the battery.

1. Input pulley
2. Drive belt guides
3. Idler pulley
4. Idler pulley nut
5. Right angle drive
6. Mounting bolt (2)
7. Cross support

Clutch Spring and Linkage Removal



1. Screwdriver
2. Mounting bolt
3. Clutch spring

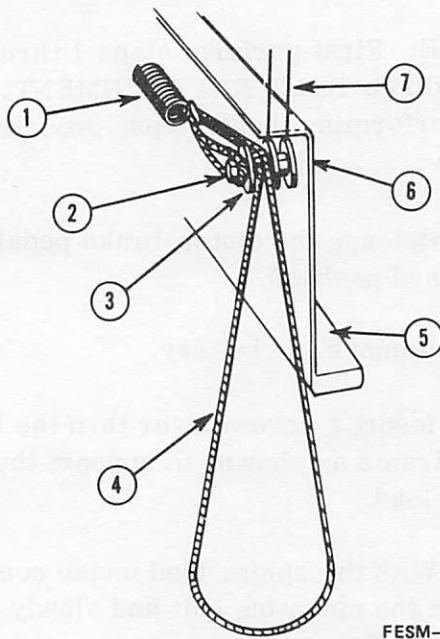


1. Control rod
2. Belt tension bracket
3. Clutch shaft

NOTE: First perform steps 1 thru 8 under DRIVE BELT REPLACEMENT. After performing these steps, proceed as follows:

1. Release the clutch-brake pedal to the raised position.
2. Remove the battery.
3. Insert a screwdriver thru the hole in the frame as shown, to support the spring load.
4. With the spring load under control, remove the mounting bolt and slowly ease the spring forward.
5. Work the spring free from the belt tension bracket and remove the spring.
6. Disconnect the control rod from the clutch shaft.
7. Remove the mounting bolt securing the belt tension bracket to the frame and remove the bracket.

Installation



1. Clutch spring
2. 3/8" X 3-1/2" bolt
3. Washer
4. Twine
5. Frame
6. Washer-nut (not shown)
7. Washer-nut-washer

1. Install the belt tension bracket with the control rod to the frame.

2. Connect the control rod to the clutch shaft.

3. Insert the clutch spring into the hole in the belt tension bracket.

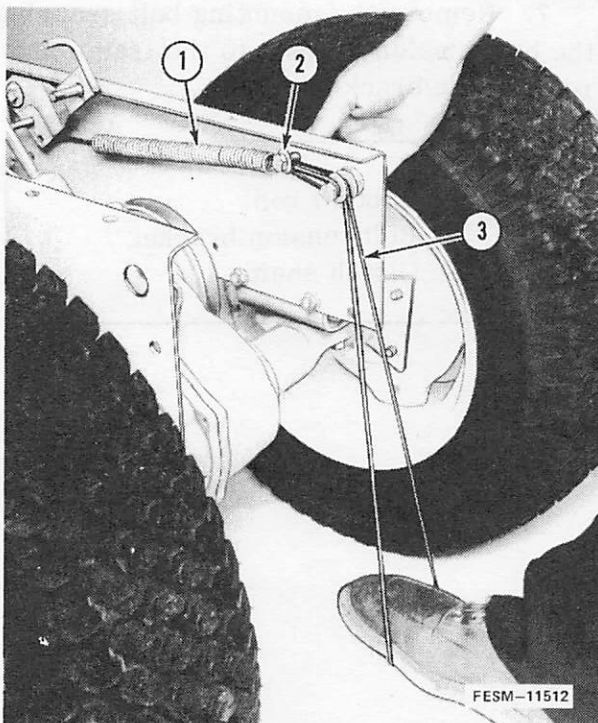
4. Using a piece of plastic baling twine or nylon cord 1300 mm (50 in.) long, tie the end together to form a closed loop with a length of 650 mm (25 in.).

5. Install a bolt with two nuts and four washers to the frame as illustrated.

6. Loop one end of the twine around the bolt head. Run the other end through the spring, then over and down between the washers.

7. Insert your foot into this loop. Step down to bring the spring back into place and secure with the mounting bolt.

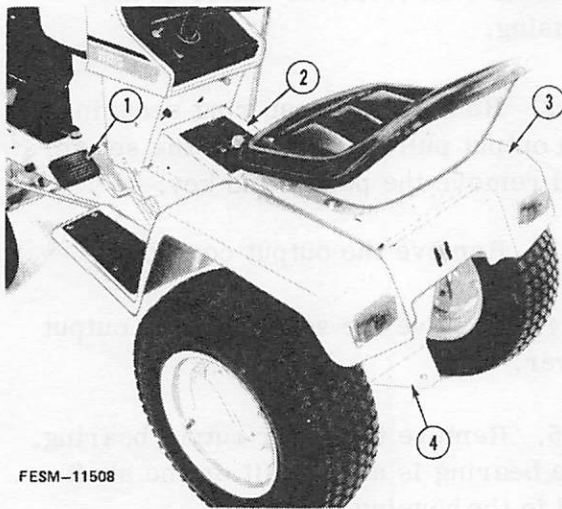
8. Continue reassembly following steps 1 thru 6, Installation, Drive Belt Replacement.



1. Clutch spring
2. Mounting bolt
3. Twine

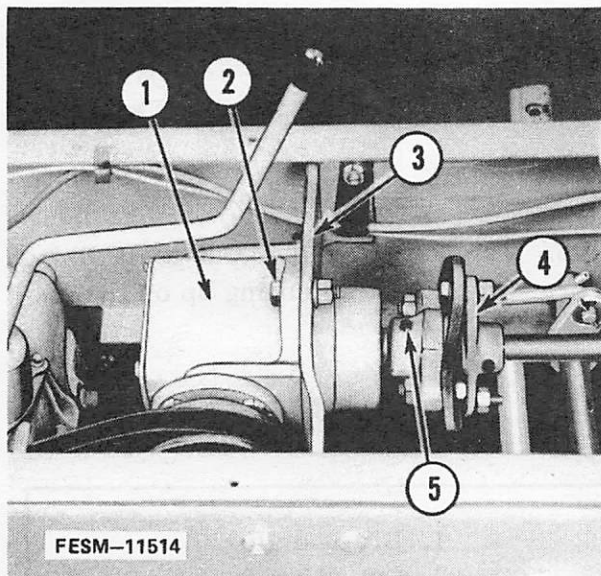
RIGHT ANGLE DRIVE

Removal



1. Disconnect the battery.
2. Remove the center frame cover.
3. Depress the clutch-brake pedal and lock into its lowest position.

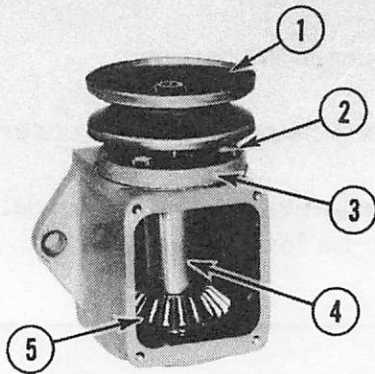
1. Clutch-brake pedal
2. Center frame cover
3. Fender assembly
4. Drawbar assembly



4. Drive the roll pin from the rear half of the flexible coupler.
5. Remove the two mounting bolts securing the right angle drive to the cross support.
6. Remove the right angle drive.

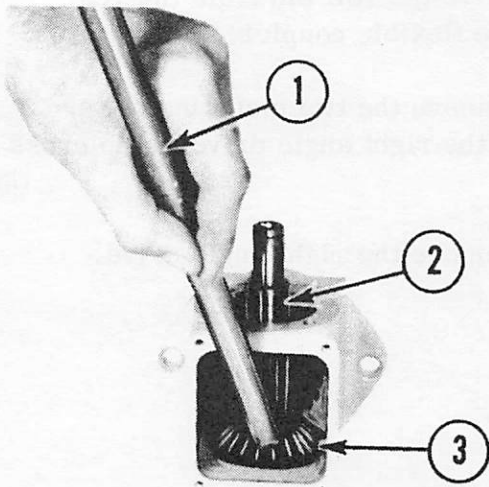
1. Right angle drive
2. Mounting bolt (2)
3. Cross support
4. Flex coupler
5. Roll pin

Disassembly



FESM-11515

1. Output pulley
2. Capscrew (4)
3. Output cover
4. Output shaft
5. Output gear



FESM-11516

1. Remove the rear cover and clean the lubricant from the inside of the housing.

2. Remove the snap ring securing the output pulley. Back out the set screw and remove the pulley and key.

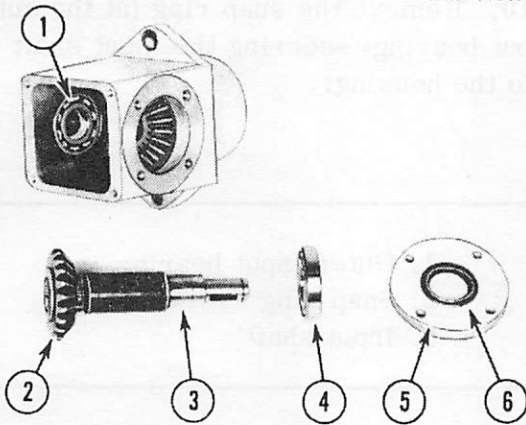
3. Remove the output cover.

4. Remove the seal from the output cover.

5. Remove the outer output bearing. The bearing is a loose fit on the shaft and in the housing.

6. Tap down on the output gear, using a brass drift, while pulling up on the output shaft.

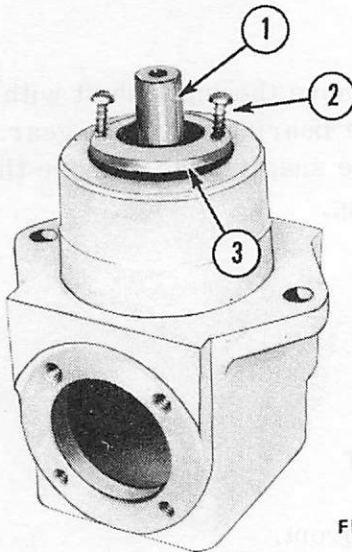
1. Brass drift
2. Output shaft
3. Output gear



1. Inner output bearing
2. Output gear
3. Output shaft
4. Outer output bearing
5. Output cover
6. Seal

7. Continue this procedure until the output shaft is free of the inner output bearing. Remove the gear and shaft thru the back opening of the housing.

8. Remove the inner output bearing.



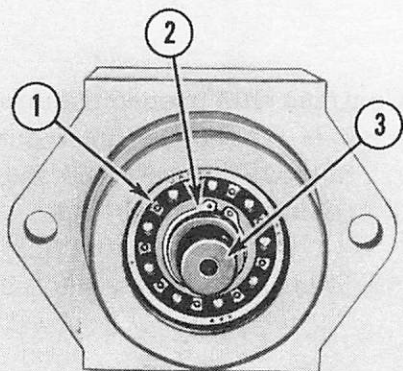
FESM-11518

1. Input shaft
2. Sheet metal screw (2)
3. Input shaft seal

9. Remove the input seal as follows:

a. Punch two small holes in the seal at the outer edge using an awl. Do not drill the holes as the ball bearing under the seal could be damaged.

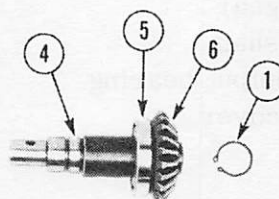
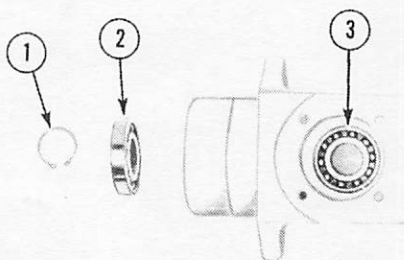
b. Insert sheet metal screws into the holes and pull the seal out. The seal can be forced out if the screws are long enough by turning the screws in.



FESM-11519

10. Remove the snap ring (at the outer input bearing) securing the input shaft into the housing.

1. Outer input bearing
2. Snap ring
3. Input shaft



FESM-11520

1. Snap ring
2. Outer input bearing
3. Inner output bearing
4. Input shaft
5. Inner input bearing
6. Input gear

11. Remove the input shaft with the inner input bearing and input gear. Remove the snap ring to remove the gear and bearing.

Inspection and Repair

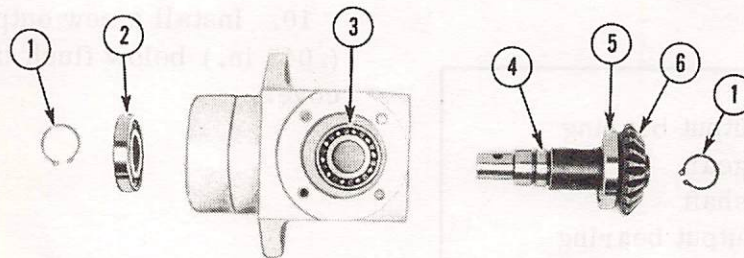
Clean all parts in a cleaning solvent. Examine the shafts and gears for excessive wear or damage.

The ball bearings should turn freely without binding. Replace all oil seals and gaskets during reassembly.

Lubrication

After assembly, fill the housing with four ounces of MOLYKOTE[®] lithium grease. However, some of this grease should be used during reassembly to generously lubricate the ball bearings and seals.

Reassembly



FESM-11520

1. Snap ring
2. Outer input bearing
3. Inner output bearing
4. Input shaft
5. Inner input bearing
6. Input gear

1. Position the inner input bearing and the input gear onto the input shaft. Secure with the snap ring.

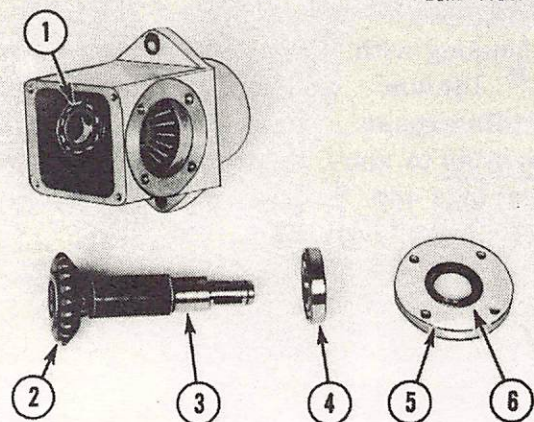
2. Install the input assembly into the housing.

3. Install the outer input bearing and secure to the input shaft with the snap ring.

4. Install a new input seal being sure to seal it fully in the housing.

5. Install the inner output bearing.

FESM-11517



1. Inner output bearing
2. Output gear
3. Output shaft
4. Outer output bearing
5. Output cover
6. Seal

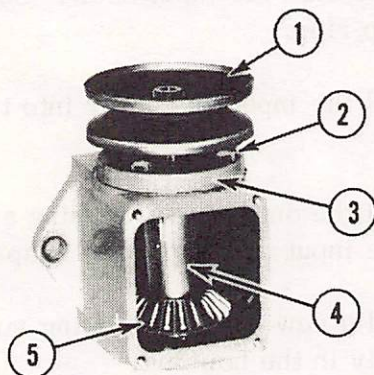
6. Insert the output shaft into the output gear until it is flush with the bottom face of the gear.

7. Position the shaft and gear into the housing.

8. Using a brass hammer, tap the output shaft to its seat in the gear.

9. Install the outer output bearing.

10. Install a new output seal 1.1 mm (.045 in.) below flush into the output cover.



FESM-11515

1. Output pulley
2. Capscrew (4)
3. Output cover
4. Output shaft
5. Output gear

11. Install the output cover, torquing the capscrews to 10 N·m (7 ft. lbs.).

12. Install the output pulley with key and secure with the set screw and snap ring.

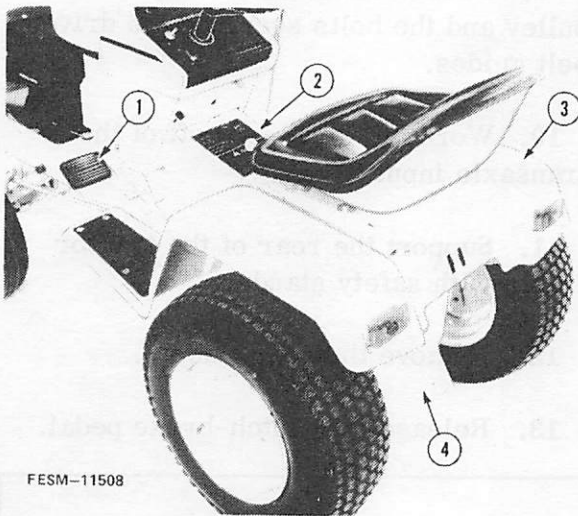
13. Fill the housing with the remainder of the MOLYKOTE lithium grease (four ounces required).

14. Install the back cover with gasket and secure with the four capscrews.

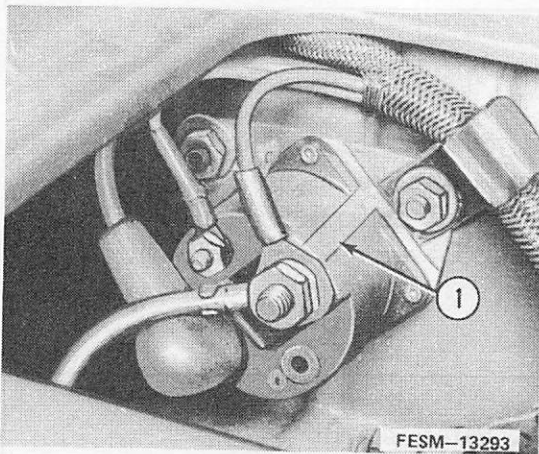
15. Installation is in the reverse order of removal.

TRANSAXLE

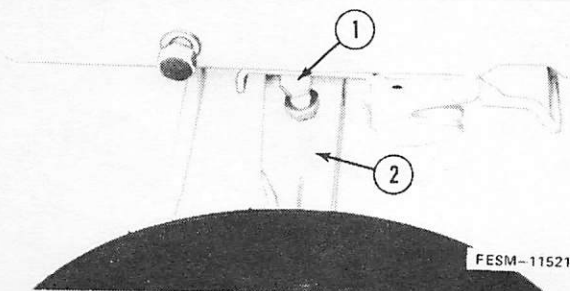
Removal



1. Clutch-brake pedal
2. Center frame cover
3. Fender assembly
4. Drawbar assembly

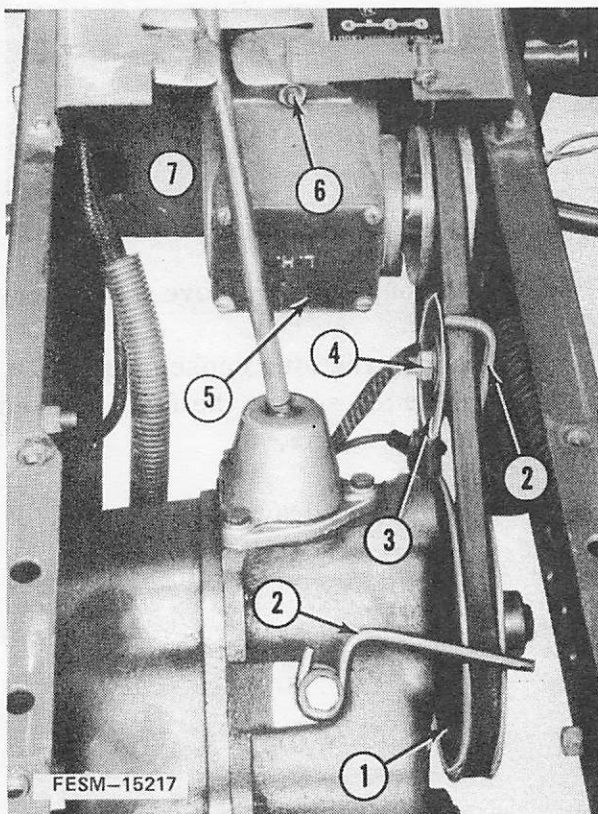


1. Solenoid



1. Disconnect and remove the battery.
2. Remove the four capscrews in the battery pit which secure the fender assembly to the rear frame.
3. Remove the drawbar assembly.
4. Disconnect the seat safety switch and wiring harness from both rear fender lights.
5. Disconnect the electrical leads from the solenoid.
6. Remove the mounting screws from the foot platforms and remove the fender assembly.
7. Block the front axle on both sides as shown to prevent accidental tipping.

1. 1/2" X 1" bolt with nut
2. Front axle



8. Depress the clutch-brake pedal to its lowest position.

9. Loosen the nut securing the idler pulley and the bolts securing the drive belt guides.

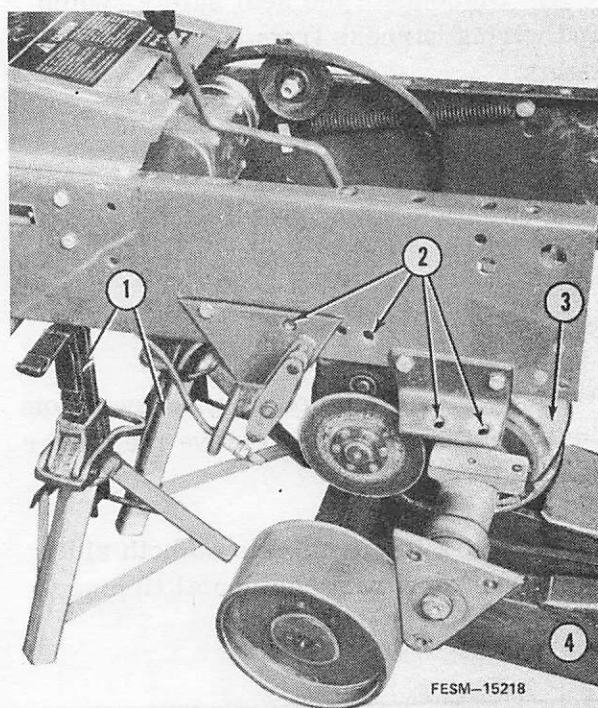
10. Work the drive belt off of the transaxle input pulley.

11. Support the rear of the tractor frame with safety stands.

12. Remove the rear wheels.

13. Release the clutch-brake pedal.

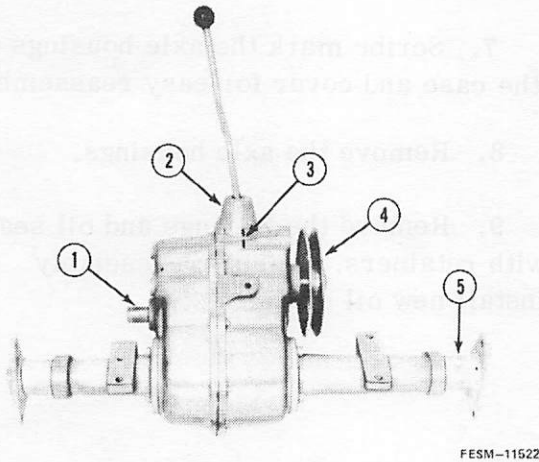
1. Input pulley
2. Drive belt guides
3. Idler pulley
4. Idler pulley nut
5. Right angle drive
6. Mounting bolt (2)
7. Cross support



14. Support the transaxle with a floor jack and remove the mounting bolts securing the transaxle assembly to the frame. Lower the assembly out of the frame.

1. Safety stands
2. Transaxle mounting bolt holes
3. Transaxle assembly
4. Floor jack

Disassembly



1. Brake shaft
2. Shift lever housing
3. Match marks
4. Input pulley
5. Wheel hub

1. Thoroughly clean the transaxle with solvent.

2. Place the assembly on a work bench and drain the lubricant.

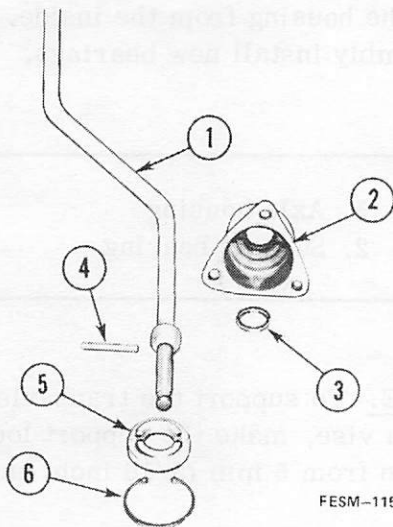
3. Remove the snap ring securing the wheel hub to the axle and remove the hub with Woodruff key.

4. Remove the brake disc from the brake shaft.

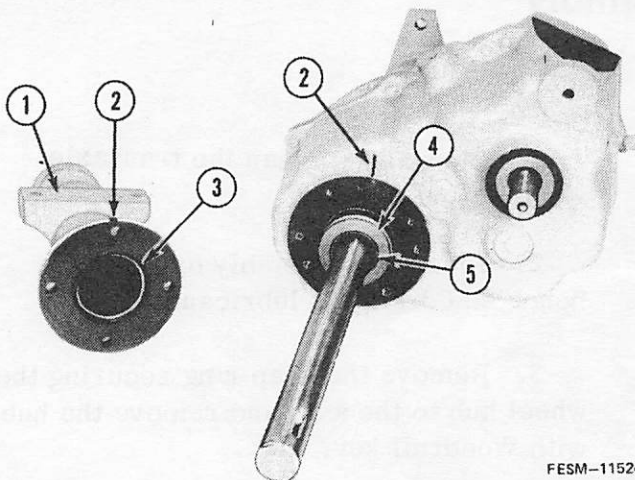
5. Remove the input pulley being sure to first loosen the allen head screw.

6. Position the shift lever into neutral position. Remove the shift lever housing and gasket.

NOTE: If necessary, disassemble the shift lever assembly by removing the snap ring. Be sure to match mark the shift lever to the housing before disassembly so the lever is not reassembled 180° out of line.



1. Shift lever
2. Housing
3. Quad ring
4. Pin
5. Keeper
6. Snap ring



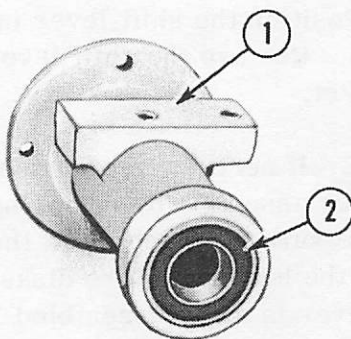
FESM-11524

1. Axle housing
2. Scribe mark
3. O-ring
4. Bearing retainer
5. Oil seal

7. Scribe mark the axle housings to the case and cover for easy reassembly.

8. Remove the axle housings.

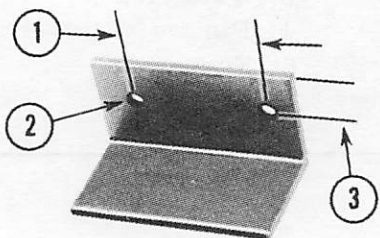
9. Remove the O-rings and oil seals with retainers. During reassembly install new oil seals.



FESM-11525

10. If necessary, remove the axle support bearing by driving the bearing out of the housing from the inside. During reassembly install new bearings.

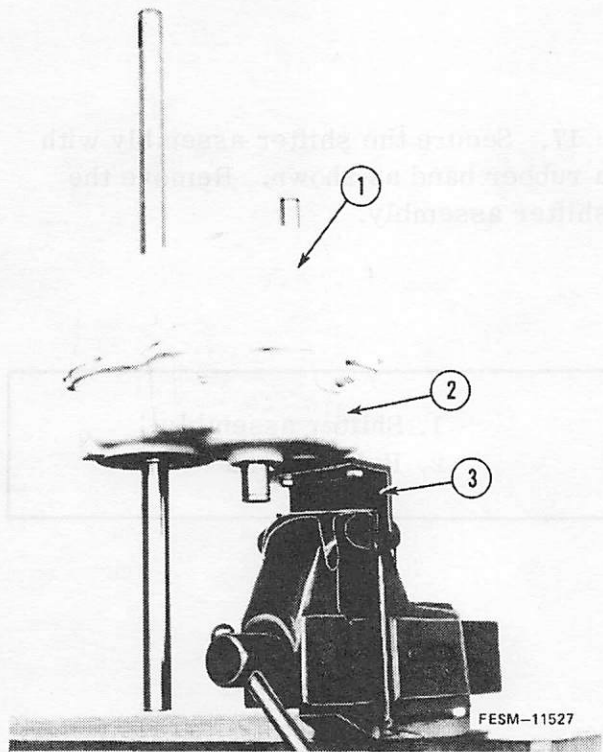
1. Axle housing
2. Support bearing



FESM-11526

NOTE: To support the transaxle properly in a vise, make the support locally as shown from 5 mm (3/16 inch) angle iron.

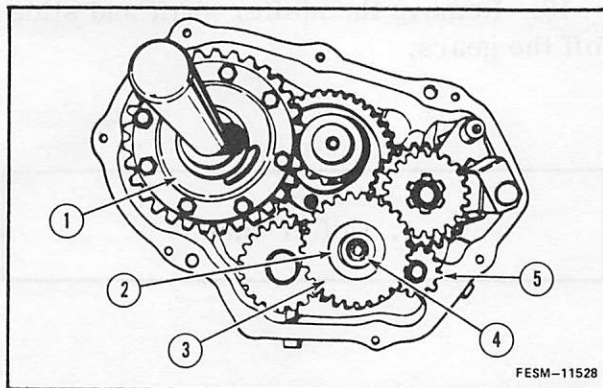
1. 108 mm (4-1/4 in.) center to center
2. 11 mm (7/16 in.) hole
3. 25 mm (1 inch) edge to center



11. Mount the transaxle in a vise with the case to the top.

12. Tap the two dowel pins into the cover and remove the eight capscrews.

- 1. Case
- 2. Cover
- 3. Support - 5 mm (3/16 inch) angle iron



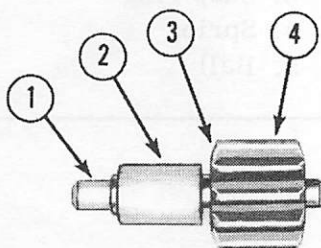
13. Separate the case from the cover.

14. Remove the differential assembly.

15. Remove the thrust washer and three gear clusters from the brake shaft.

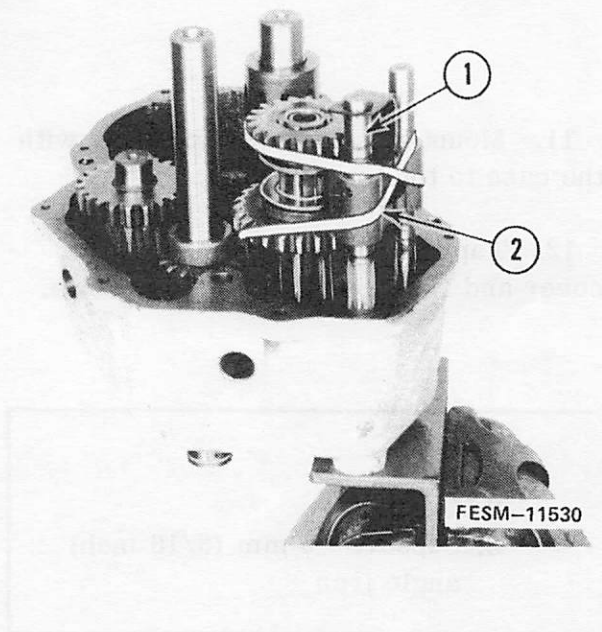
16. Remove the reverse idler gear, spacer and shaft from the cover.

- 1. Differential assembly
- 2. Thrust washer
- 3. Three gear cluster
- 4. Brake shaft
- 5. Reverse idler gear



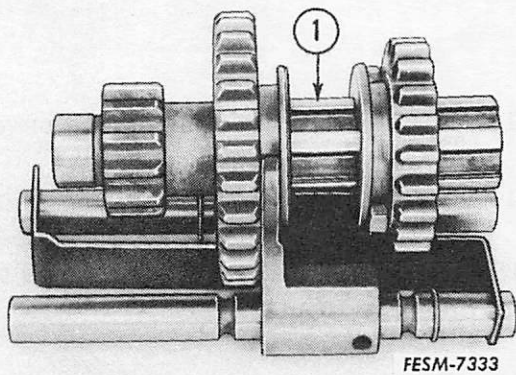
NOTE: The beveled edge of the reverse idler gear goes down towards the cover.

- 1. Reverse idler shaft
- 2. Spacer
- 3. Beveled edge
- 4. Reverse idler gear



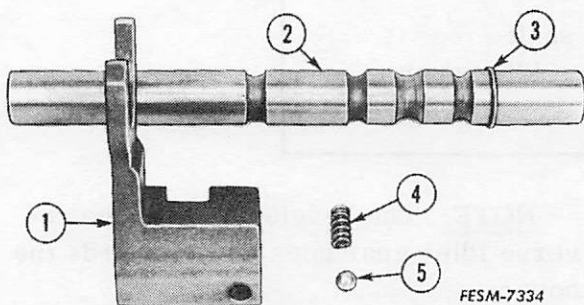
17. Secure the shifter assembly with a rubber band as shown. Remove the shifter assembly.

- 1. Shifter assembly
- 2. Rubber band



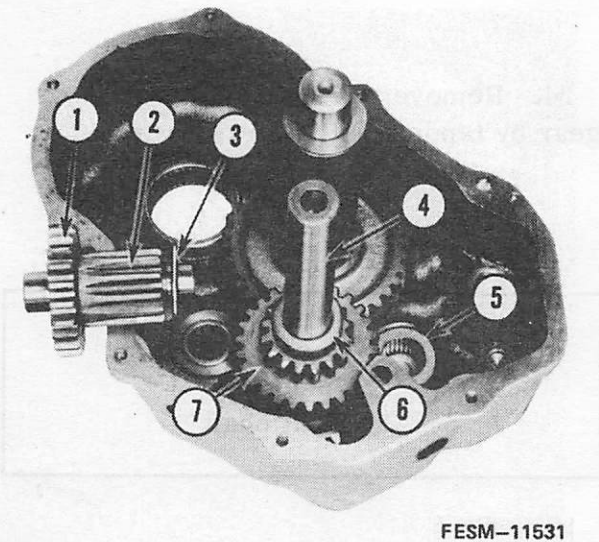
18. Remove the shifter shaft and slide off the gears.

- 1. Shifter shaft



19. Slide the forks off the rails. Be careful to catch the poppet ball as the fork comes off the rail.

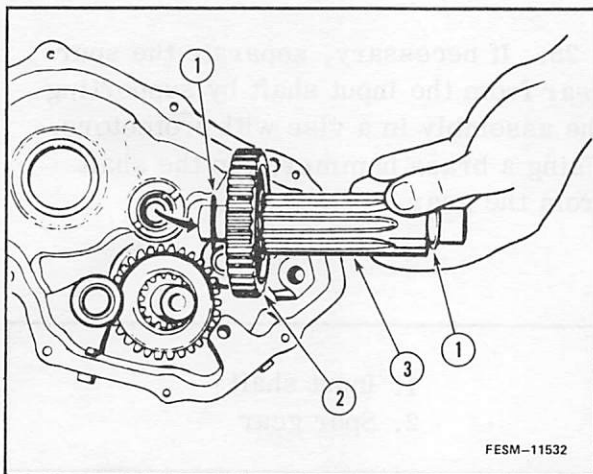
- 1. Fork
- 2. Rail
- 3. Snap ring
- 4. Spring
- 5. Ball



20. Remove the low gear shaft and spur gear. Note that a thrust washer is used only between the low gear shaft and the cover.

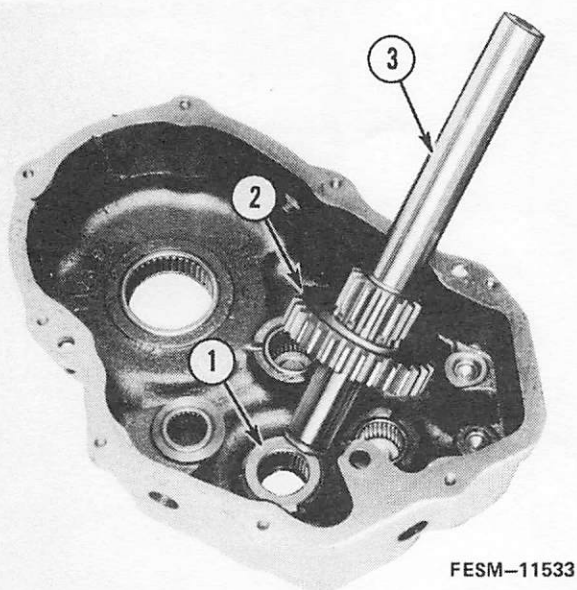
21. Remove the two gear clusters and spacer from the brake shaft.

1. Spur gear
2. Idler shaft
3. Thrust washer
4. Brake shaft
5. Thrust washer
6. Spacer
7. Two gear cluster



22. Remove the output shaft and gear. Remove the thrust washers from each end of the shaft.

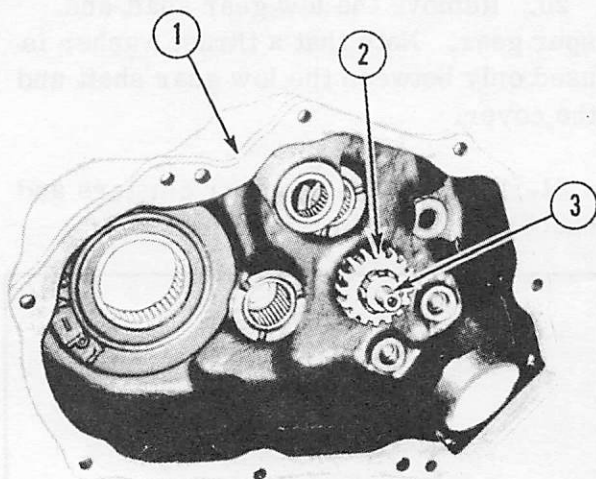
1. Thrust washer
2. Output gear
3. Output shaft



23. Remove the brake shaft and idler gear.

NOTE: If separated, be sure that when reassembled the chamfer on the idler gear faces up.

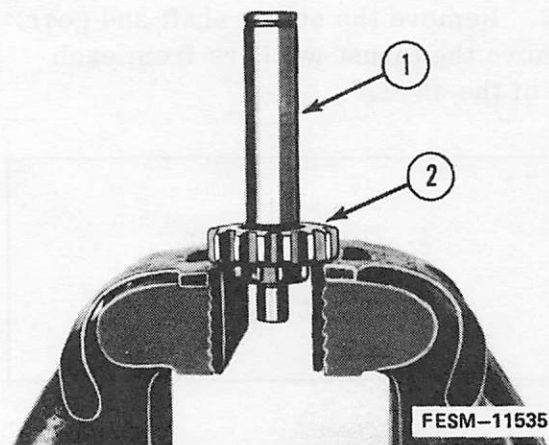
1. Thrust washer
2. Idler gear (chamfer up)
3. Brake shaft



FESM-11534

24. Remove the input shaft with spur gear by tapping with a brass hammer.

1. Case
2. Spur gear
3. Input shaft

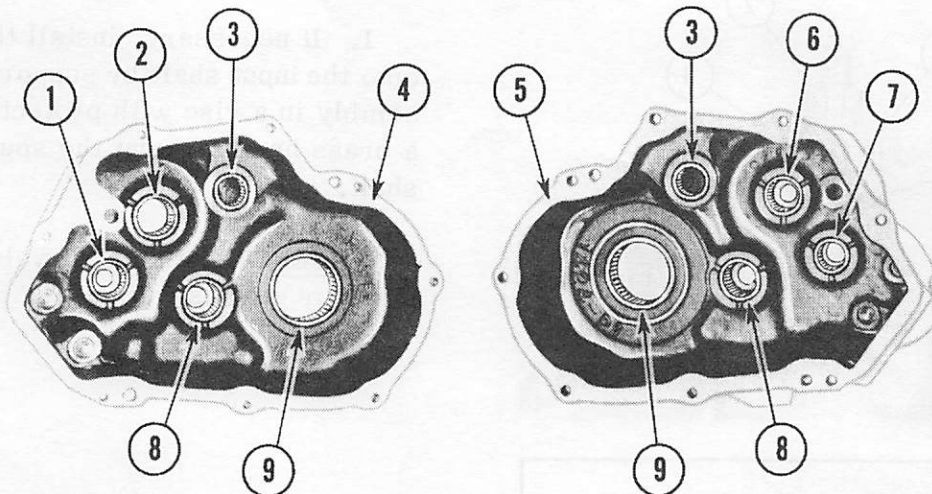


FESM-11535

25. If necessary, separate the spur gear from the input shaft by supporting the assembly in a vise with protectors. Using a brass hammer, tap the shaft from the gear.

1. Input shaft
2. Spur gear

Inspection and Repair



FESM-11536

- | | |
|------------------------------------|---|
| 1. Shifter shaft bearing (outside) | 6. Brake shaft bearing (outside) |
| 2. Brake shaft bearing (inside) | 7. Input shaft bearing (inside) |
| 3. Low gear shaft bearing (inside) | 8. Output shaft bearing (outside) |
| 4. Cover | 9. Differential carrier bearing (outside) |
| 5. Case | |

1. Clean all parts in clean solvent and dry thoroughly.

2. Examine the teeth and splines of the shifter gears and shaft. The gears should slide freely on the shaft. Excessive wear of the splines will cause cocking of the gears.

3. Examine all the gears for broken teeth, wear or burrs.

4. Examine all the shafts for wear.

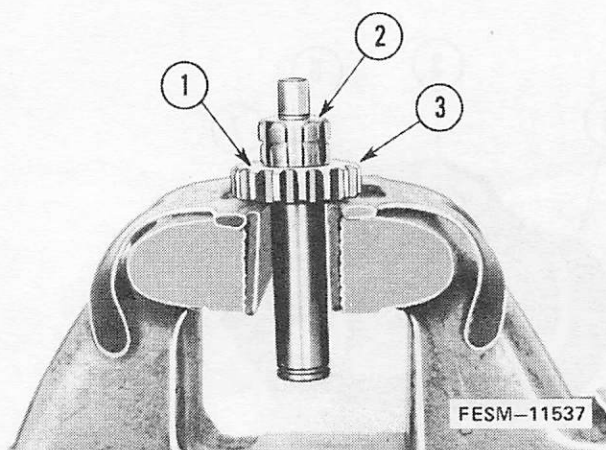
5. Examine the case, cover and axle housing for cracks.

6. Examine the bearings for wear, roughness or scoring.

7. The bearings in the case or cover may be removed in a press. Press the new bearings in 0.38 - 0.51 mm (.015 - .020 in.) below the inside surface of the case.

NOTE: Refer to the illustration call-outs for the direction from which new bearings should be installed. Be sure to press only on the flat bearing race edge with the manufacturing initials or numbers exposed. The radius edge of the bearing has not been hardened, which could result in damage to the bearing.

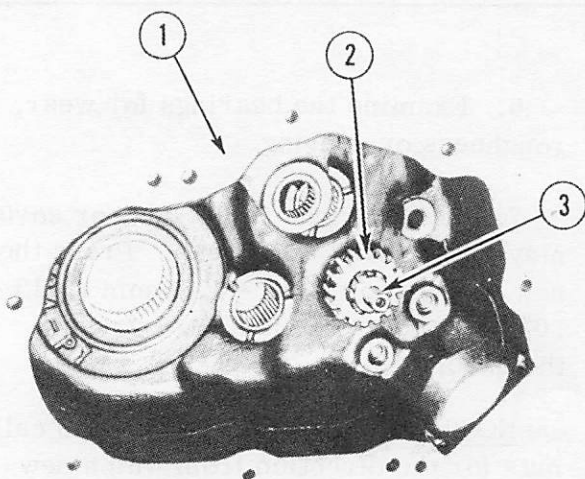
Reassembly



1. Spur gear
2. Input shaft
3. Beveled edge

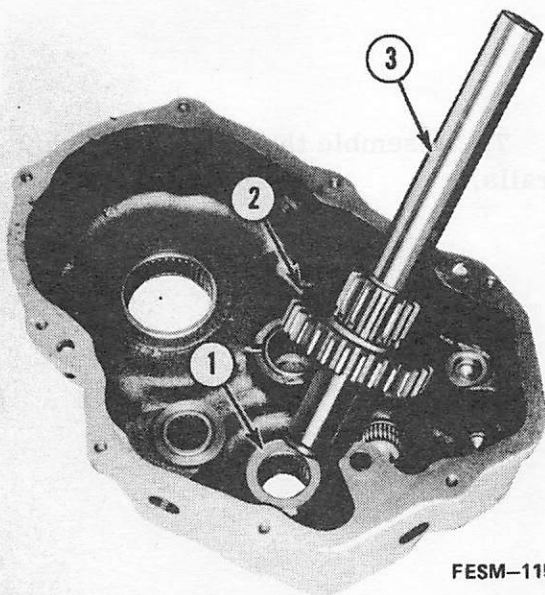
1. If necessary, install the spur gear onto the input shaft by supporting the assembly in a vise with protectors. Using a brass hammer seat the spur gear on the shaft.

NOTE: Be sure the beveled edge of the spur gear is in the "up" position.



1. Case
2. Spur gear
3. Input shaft

2. Install the input shaft and spur gear with thrust washer into the case. Use a brass hammer to seat the shaft. Binding in the assembled unit can often be traced to a partially installed input shaft.

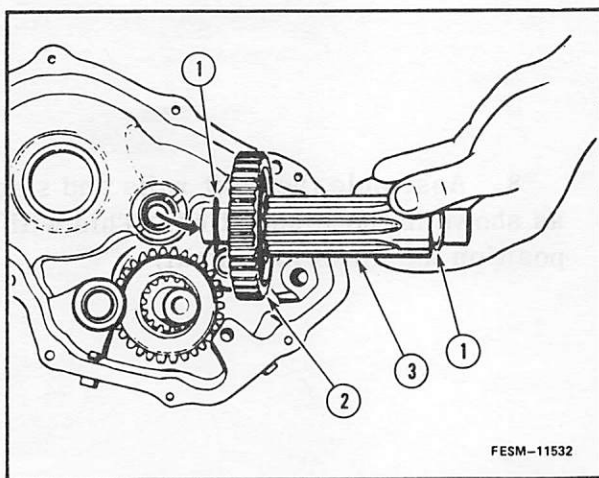


FESM-11533

3. Install the brake shaft and idler gear with thrust washer.

NOTE: Be sure that the chamfer on the idler gear faces up.

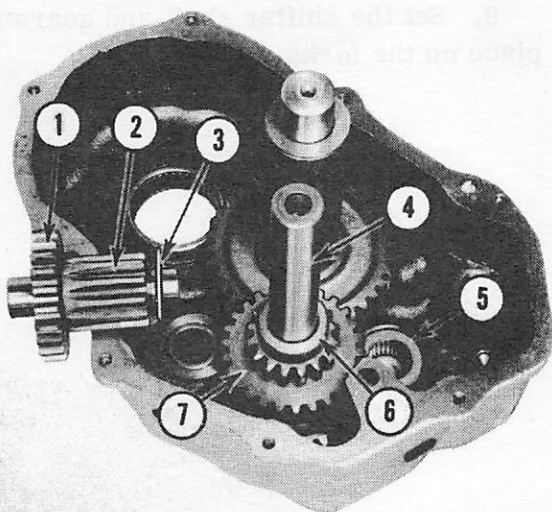
1. Thrust washer
2. Idler gear
3. Brake shaft



FESM-11532

4. Install the output shaft and gear with a thrust washer on each end of the shaft.

1. Thrust washer
2. Output gear
3. Output shaft

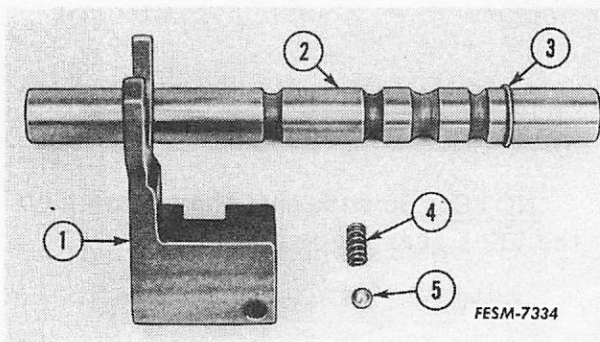


FESM-11531

5. Install the two gear clusters (small gear up) and spacer onto the brake shaft.

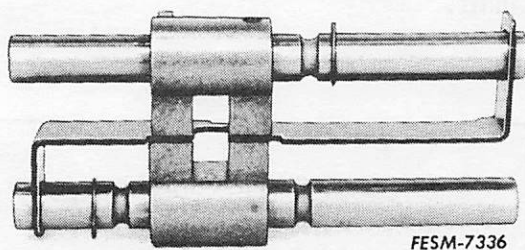
6. Install the thrust washer, low gear shaft and the spur gear.

1. Spur gear
2. Low gear shaft
3. Thrust washer
4. Brake shaft
5. Thrust washer
6. Spacer
7. 2 gear cluster

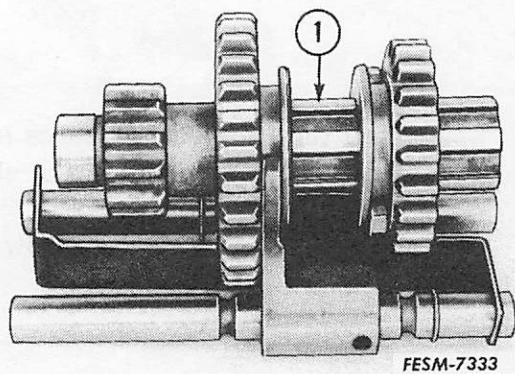


1. Fork
2. Rail
3. Snap ring
4. Spring
5. Ball

7. Assemble the forks to the shift rails.

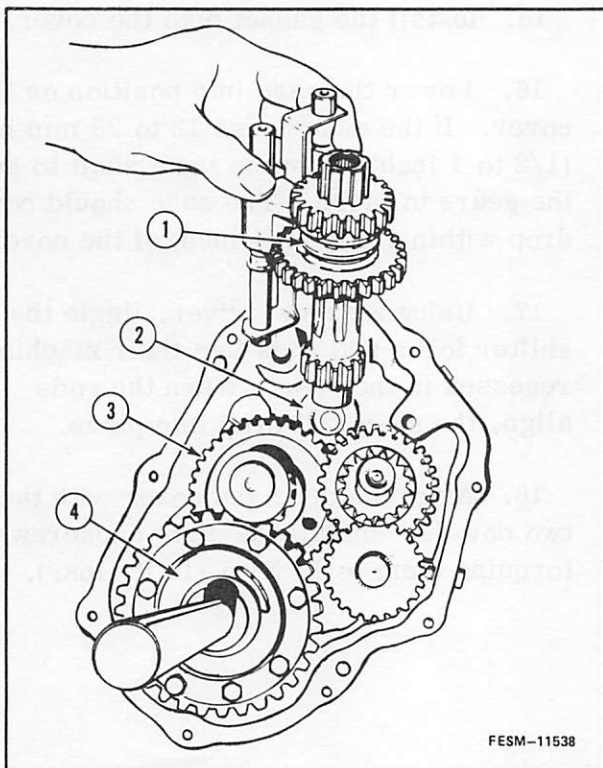


8. Assemble the shift rails and stop as shown in the illustration. This will position the forks in neutral.



9. Set the shifter shaft and gears in place on the forks.

1. Shifter shaft

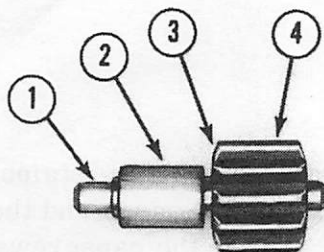


10. Position a thrust washer on the cover shifter shaft bearing.

11. Install the shifter shaft assembly.

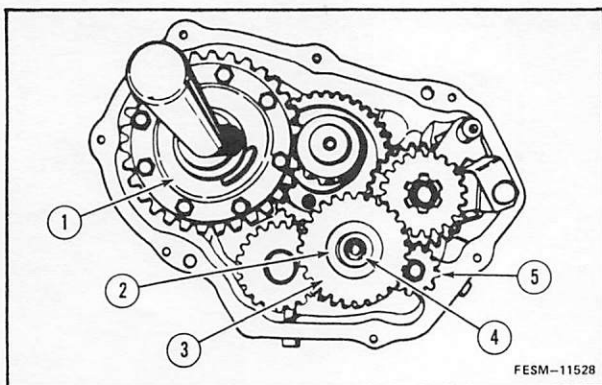
12. Install the differential assembly. The differential thru bolts should be up and away from the output gear.

1. Shifter shaft assembly
2. Thrust washer
3. Output gear
4. Differential assembly



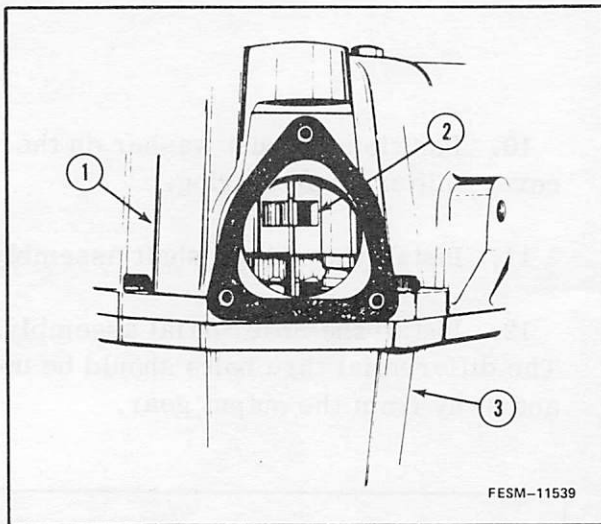
13. Install the reverse idler shaft, spacer and gear into the cover. Be sure the beveled edge of the gear is down.

1. Reverse idler shaft
2. Spacer
3. Beveled edge
4. Reverse idler gear



14. Install the three gear clusters with the small gear down. Install the thrust washer.

1. Differential assembly
2. Thrust washer
3. Three gear cluster
4. Brake shaft
5. Reverse idler gear



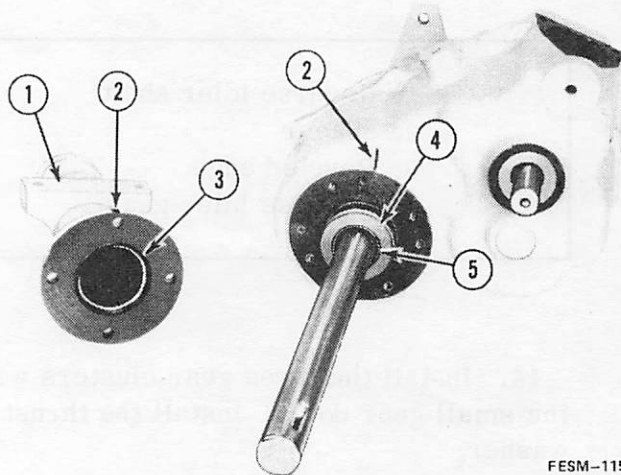
1. Case
2. Shifter forks
3. Cover

15. Install the gasket onto the cover.

16. Lower the case into position on the cover. If the case hangs 12 to 25 mm high (1/2 to 1 inch), turn the input shaft to get the gears to mesh. The case should now drop within 6 mm (1/4 inch) of the cover.

17. Using a screw driver, jiggle the shifter forks and rods into their machined recesses in the case. When the rods align, the case will drop into place.

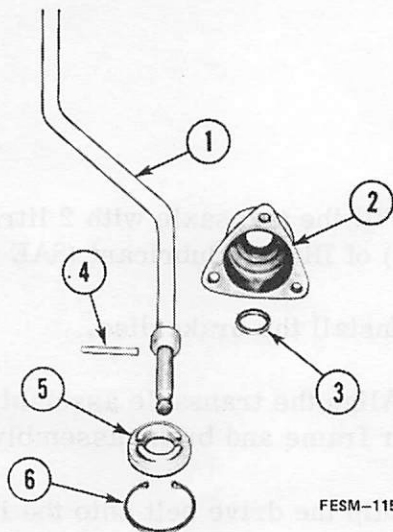
18. Align the case and cover with the two dowels. Install the eight capscrews, torquing them to 14 N·m (10 ft. lbs.).



1. Axle housing
2. Scribe mark
3. O-ring
4. Bearing retainer
5. Oil seal

19. Install the bearing retainers with new oil seals and O-rings and the axle housings. Torque the capscrews to 18 N·m (13 ft. lbs.).

NOTE: Install the retainers so that the oil seals are towards the outside.



20. Reassemble and install the shift lever assembly to the case, torquing the capscrews to 14 N·m (10 ft. lbs.).

1. Shift lever
2. Housing
3. Quad ring
4. Pin
5. Keeper
6. Snap ring

Testing the Transaxle

1. Place the shift lever in neutral.
2. Turn both axles one way at the same time. If the axles won't turn, internal binding is present.

RECHECK THE FOLLOWING:

- a. The gasket between the cover and case is missing.
- b. Dowel pins should be aligned before tightening capscrews.
- c. A thrust washer could be misplaced or missing.

d. Differential thru bolts on wrong side (should be up and away from output gear).

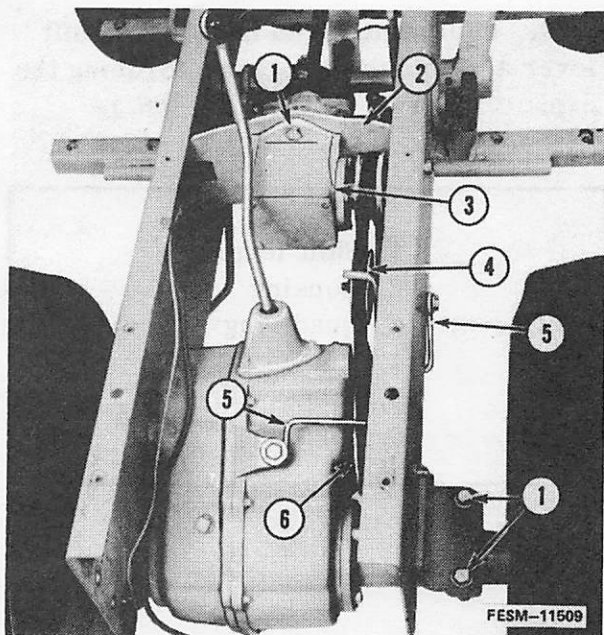
e. The bearing retainers with oil seals are incorrectly installed (seals should be towards the outside).

f. Gears meshing improperly (shafts or gears mis-assembled).

3. If the axles turn properly, the brake shaft should turn and the input shaft should remain in neutral.

4. By shifting the assembly into gear, the input shaft will rotate at a speed corresponding to the gears in mesh. Shifting into reverse should change the direction of the input pulleys rotation.

Installation



1. Mounting bolts
2. Cross support
3. Right angle drive
4. Idler pulley
5. Drive belt guides
6. Input pulley

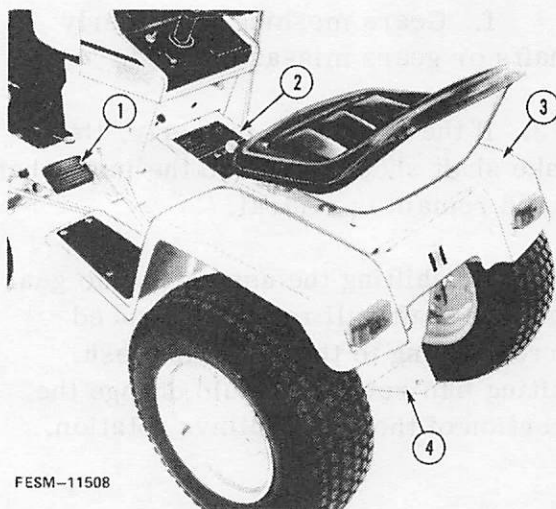
1. Fill the transaxle with 2 litres (4 pints) of IH gear lubricant (SAE 90 oil).

2. Install the brake disc.

3. Align the transaxle assembly with the rear frame and brake assembly.

4. Slip the drive belt onto the input pulley and secure the transaxle to the frame with mounting bolts.

5. Secure and adjust the drive belt guides being sure to obtain a gap of 3-5 mm (1/8-3/16 inch) between the belt and the guides.



6. Install the rear wheels.

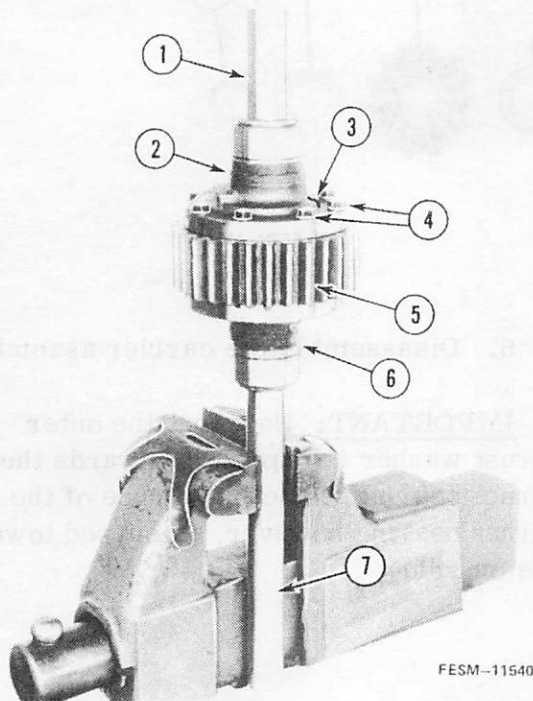
7. Install the fender assembly. Reconnect the battery and electrical leads.

8. Install the drawbar assembly.

1. Clutch-brake pedal
2. Center frame cover
3. Fender assembly
4. Drawbar assembly

DIFFERENTIAL

Removal and Disassembly



FESM-11540

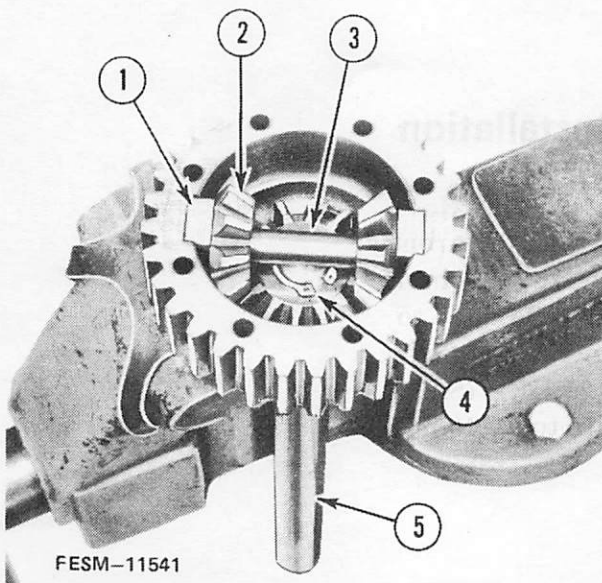
Refer to "REMOVAL", steps 1 thru 11 and "DISASSEMBLY", steps 1 thru 14 under "TRANSAXLE", this section. Continue disassembly then as follows:

1. Secure the differential assembly in a vise with brass jaws. Clamp on the left axle to keep the thru bolts facing upward.

NOTE: Do not clamp on the carrier bearing surface as damage could result to this surface.

2. Remove the thru bolts and lift off the right axle and carrier.

- | | |
|---------------------|-----------------|
| 1. Right axle | 5. Ring gear |
| 2. Right carrier | 6. Left carrier |
| 3. Lubrication port | 7. Left axle |
| 4. Thru bolts | |



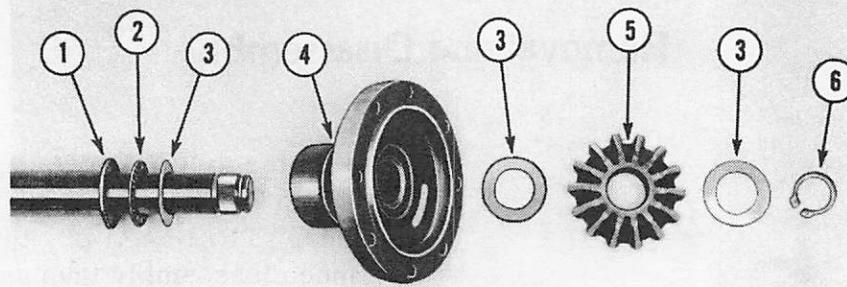
FESM-11541

3. Lift out the pinion shaft with the drive blocks and the pinion gears.

4. Remove the ring gear from the left carrier.

5. Remove the snap ring securing the left axle into the carrier.

- | |
|-----------------|
| 1. Drive block |
| 2. Pinion gear |
| 3. Pinion shaft |
| 4. Snap ring |
| 5. Left axle |



FESM-11542

1. Cupped thrust washer
2. Thrust bearing
3. Thrust washer
4. Differential carrier
5. Bevel gear
6. Snap ring

6. Disassemble the carrier assembly.

IMPORTANT: Note that the outer thrust washer is cupped in towards the thrust bearing. The inner race of the thrust bearing however, is cupped towards the outside.

Inspection and Repair

1. Clean all parts in clean solvent and dry thoroughly.

2. Examine the gears for broken or worn teeth, breakage or burrs.

3. Examine the shafts for bending or

wear. Examine the splines for wear or breakage.

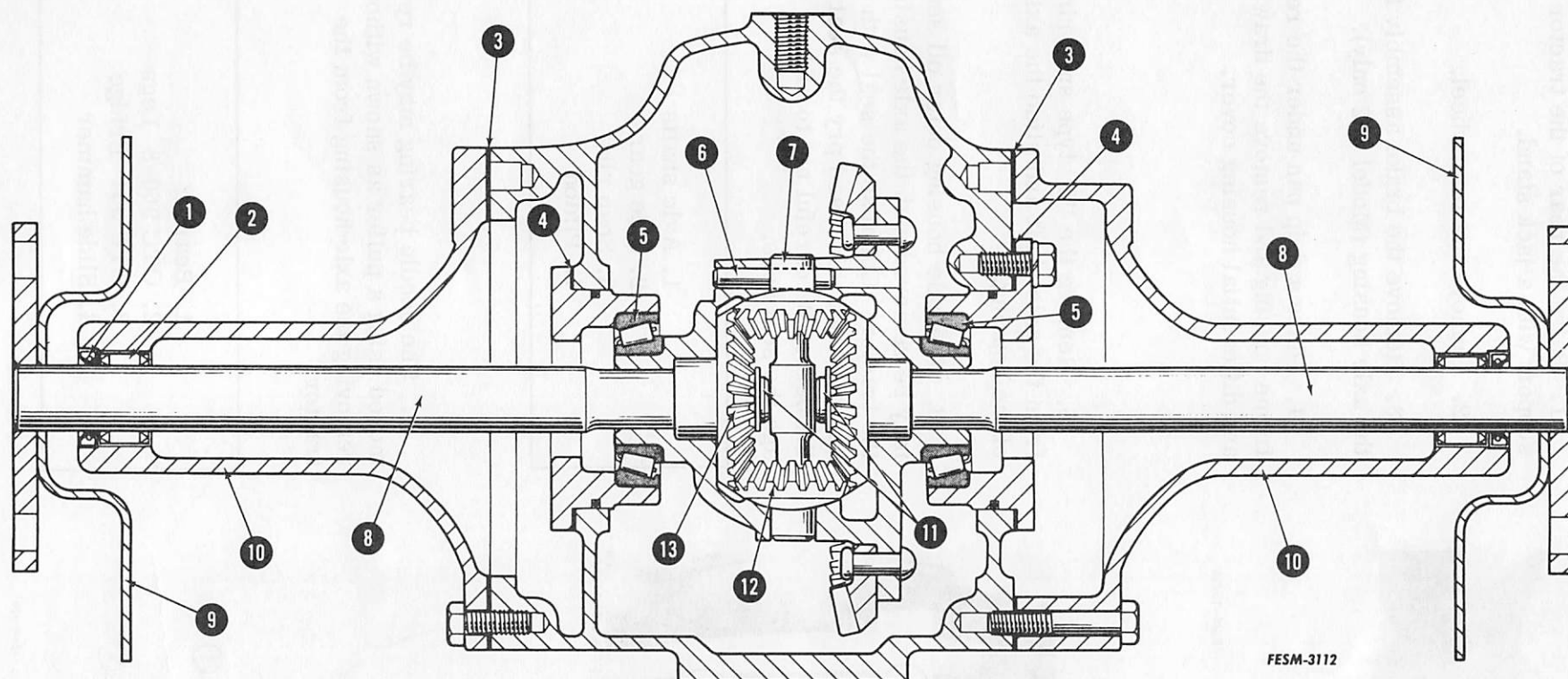
4. Check all components for wear, breakage or warping.

5. Replace parts as necessary.

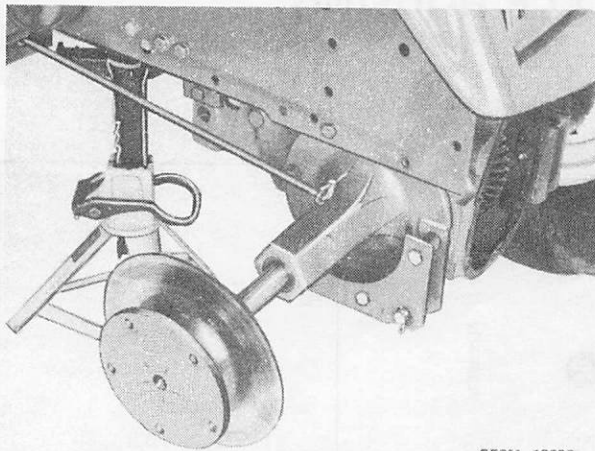
Reassembly and Installation

Reassemble and install the differential in the reverse order of the disassembly and removal procedures. Be sure to lubricate the parts during reassembly using IH gear lubricant 135 HEP (SAE 90). Torque the thru bolts to 10 N·m (7 ft. lbs.).

REAR AXLE AND AXLE HOUSING



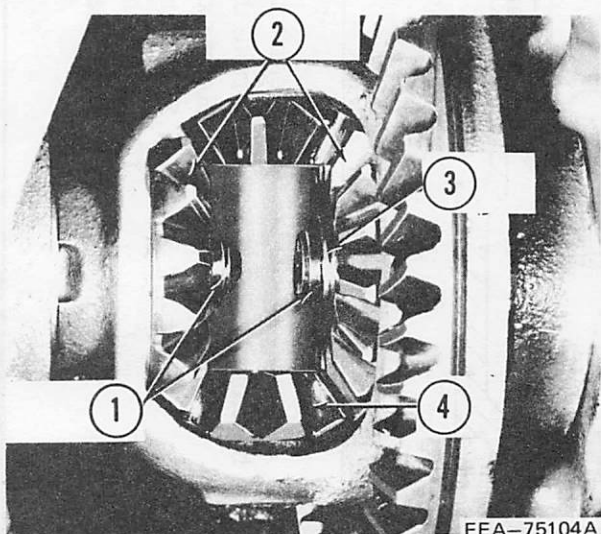
- | | |
|------------------------------|---------------------------------|
| 1. Oil seal | 8. Rear axles |
| 2. Needle bearing or bushing | 9. Brake discs (Model 982 only) |
| 3. Gaskets | 10. Rear axle carriers |
| 4. Shims | 11. Snap ring retainers |
| 5. Differential bearings | 12. Differential pinion |
| 6. Lock pin | 13. Side gear |
| 7. Pinion shaft | |



FESM-13298

Disassembly

1. Raise the rear of the tractor and support with a jack stand.
2. Remove the rear wheel.
3. Remove the brake assembly from the axle housing (Model 982 only).
4. Place a drip pan under the rear frame housing and remove the drawbar and differential housing cover.

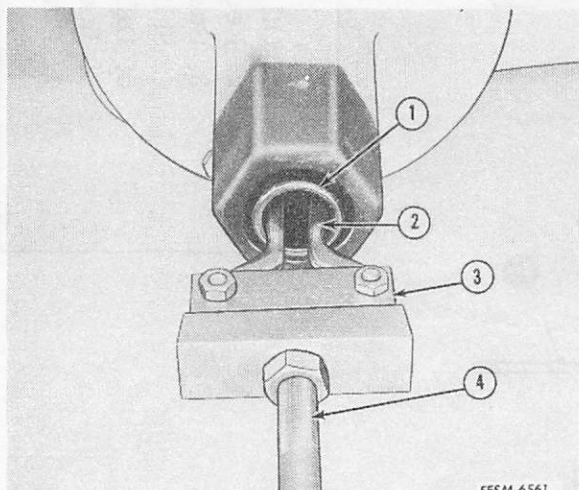


FEA-75104A

5. Remove the "C" type snap ring from the axle shaft and slide the axle out of the housing.

6. The axle housing outer oil seal may be removed with the axle housing on the tractor. Collapse the seal with a hammer and chisel and pry the seal from the bore. Be careful not to nick or damage the seal bore.

1. Axle shafts
2. Side gears
3. Snap ring
4. Pinion



FESM-6561

7. The needle bearing may be removed using a puller as shown without removing the axle housing from the tractor.

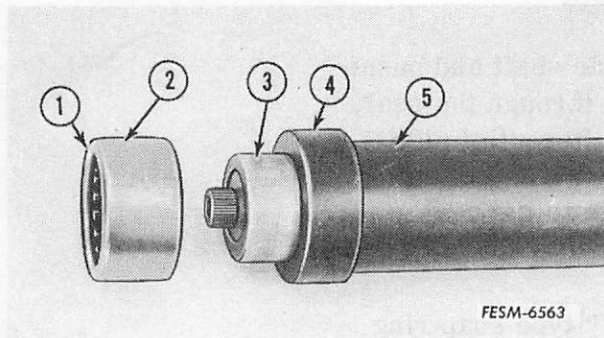
1. Bearing
2. OTC 960-8 Legs
3. OTC 954 Bridge
4. Slide hammer

8. To remove the axle housing, remove the capscrews attaching the frame to the axle housing and reduction housing. Raise the frame clear of the axle housing and remove the housing.

Inspection

1. Inspect the axle shaft for wear at the oil seal area, bearing location and splines on the inner end.
2. Roll the axle shaft along a flat surface to detect any warping or bending.
3. Check the axle carriers for cracks or breaks. Remove any high spots from the gasket surface with a flat file.

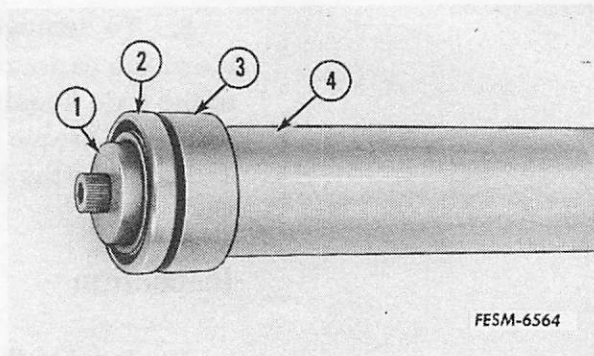
Reassembly



1. Chamfered end
2. Bearing
3. 1" Pilot
4. 1-7/16" Plate
5. Installing tool

1. Using a new gasket, install the axle carrier to the differential housing. Capscrew threads should be coated with a non-hardening sealer to avoid oil leaks. The frame pad of the axle carrier must be to the top.

2. Install the needle bearing into the housing with a suitable tool as shown. One side of the bearing is chamfered to aid in installation. Install the bearing flush with the outer edge of its bore.



1. 15/16" Pilot
2. Seal
3. 1-1/2" Plate
4. Installing tool

3. Install the seal with a suitable tool as shown. Fill the cavity between the lips of the oil seal with IH 251H E. P. before installing the seal.

4. Lubricate the axle shaft and bushing then slide the shaft through the seal, bushing, carrier and differential side gear. Rotate the axle as it is pushed through to avoid damage to the seal. Wipe off excess lubricant.

5. Install a new "C" type snap ring to the inner end of the axle shaft.

6. Replace the rear cover and drawbar.

7. Install the brake assemblies on the outer ends of the axle carriers (Model 982 only).

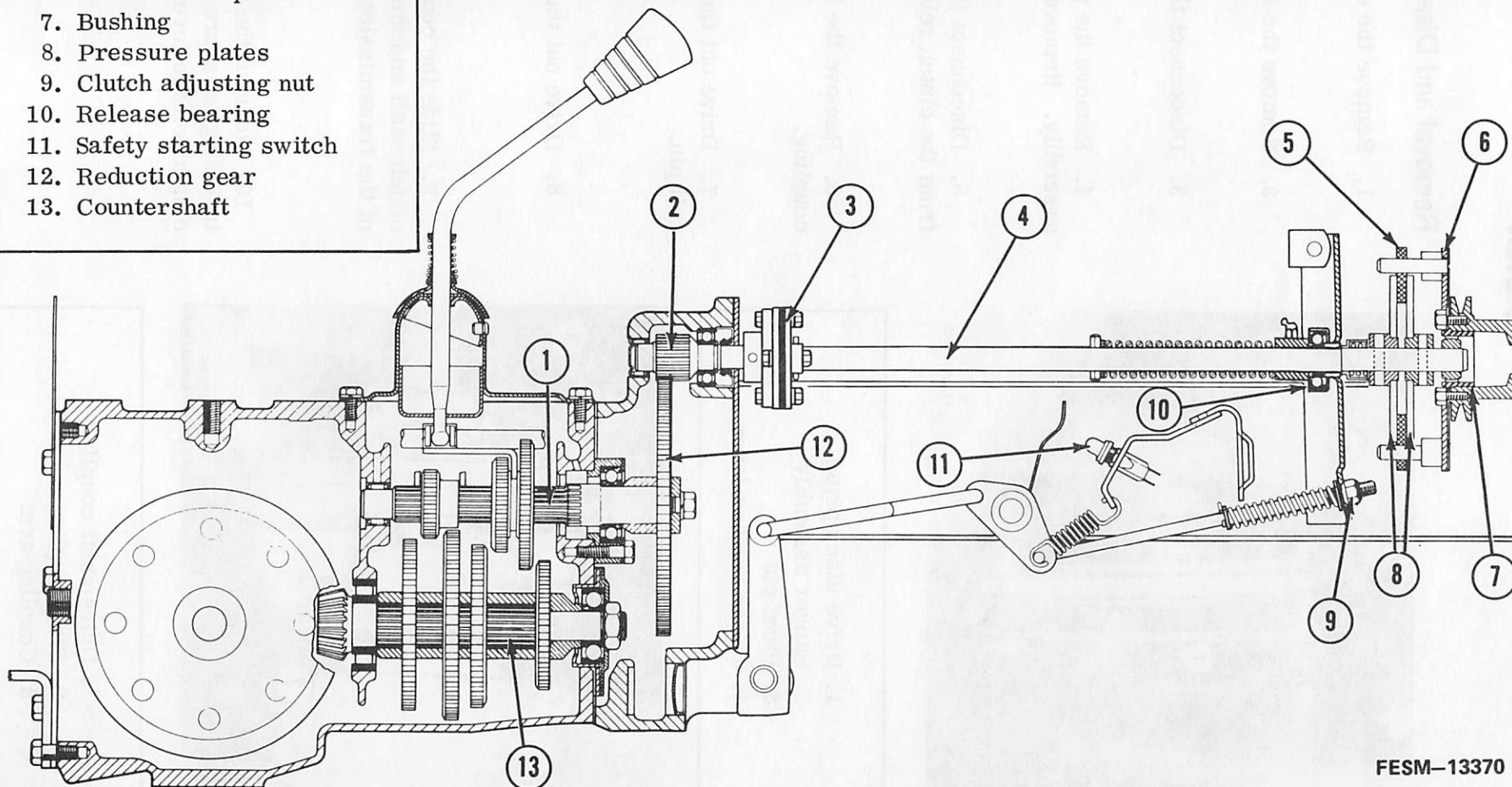
8. Install the wheel.

9. Fill differential housing to specified level with Hy-Tran.

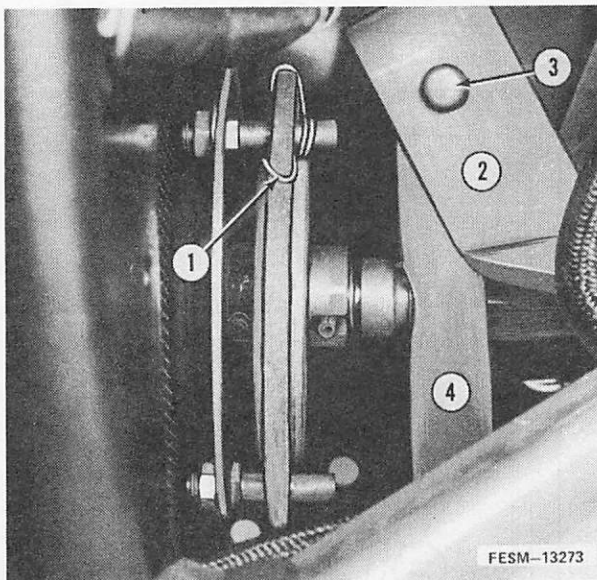
STANDARD TRANSMISSION

Model 582

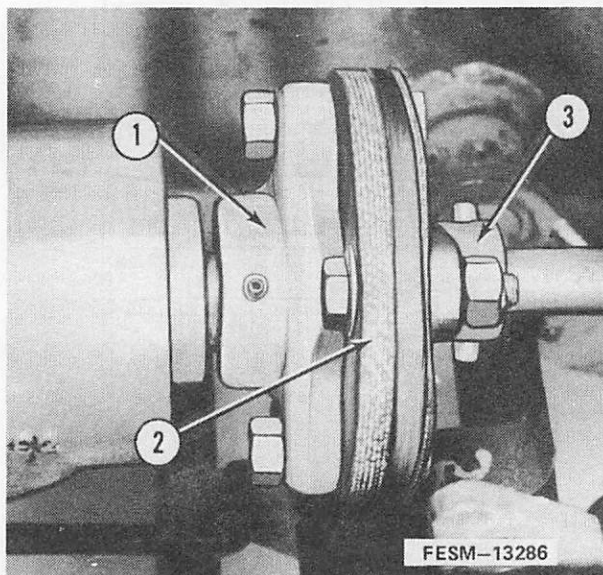
1. Transmission mainshaft
2. Reduction drive shaft
3. Coupling
4. Clutch shaft
5. Clutch driving disc
6. Clutch drive plate
7. Bushing
8. Pressure plates
9. Clutch adjusting nut
10. Release bearing
11. Safety starting switch
12. Reduction gear
13. Countershaft



Clutch



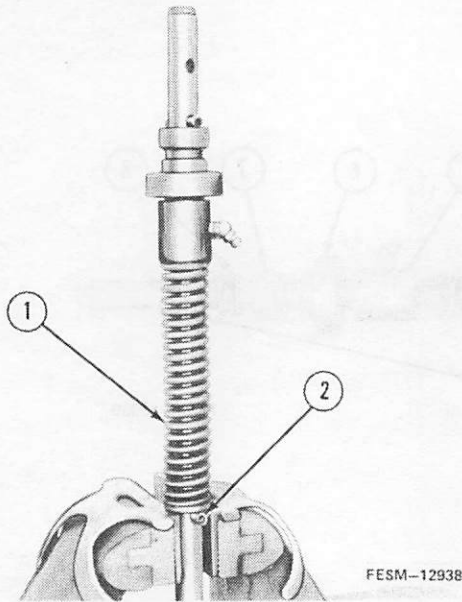
1. Drive disc spring
2. Hanger assembly
3. Pivot pin
4. Clutch release lever



1. Drive shaft coupling
2. Flex coupling
3. Coupling arm

Removal and Disassembly

1. Remove the engine side panels.
2. Remove the frame cover.
3. Disconnect the battery ground cable.
4. Remove the pivot pin and hanger assembly. Remove the drive disc spring.
5. Disconnect the clutch release rod from the clutch release lever.
6. Remove the bolts from the flex coupling.
7. Drive out the drive shaft coupling roll pin.
8. Drive out the coupling arm roll pin.
9. Slide the couplings forward on the clutch shaft and move the shaft to the side of the transmission or creeper input shaft.
10. Remove the clutch shaft assembly including pressure plates, drive plate and clutch release lever.



1. Loading spring
2. Coiled pin

11. Remove the drive plate, pressure plate and clutch release lever from the clutch shaft.

12. Using a vise equipped with brass jaws, clamp the clutch shaft snug and tap the shaft down enough to slightly compress the spring. Remove the coiled spring pin.



CAUTION! Slowly release the vise allowing the spring to expand as the shaft slips through the vise jaws.

Inspection and Repair

1. Inspect the clutch driving disc for wear from pressure plates and for elongated holes from the driving plate pins. Disc must be free of grease and oil.

2. Inspect both pressure plates for warping and wear on their contact faces.

3. Inspect the slotted hub of the rear pressure plate for pin wear. If the slots are cupped from pin wear the plate must be replaced.

4. Inspect the teaser spring ends. Ends should be rounded to prevent gouging the clutch shaft. Check the spring tension. (Refer to Specifications.)

5. Inspect the loading spring ends. Ends should be rounded to prevent gouging the clutch shaft. Check the spring tension. (Refer to Specifications.)

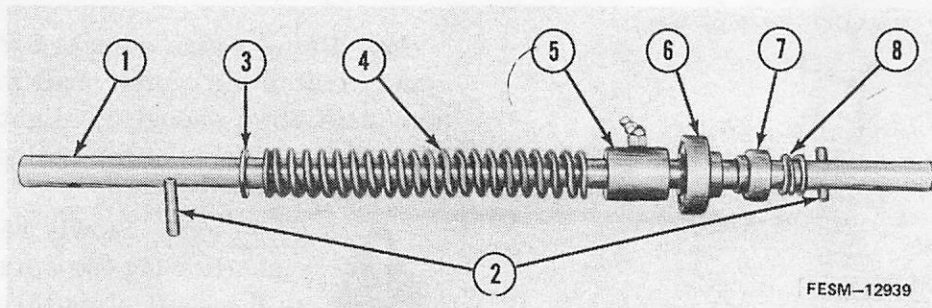
6. Inspect the clutch release lever channel for wear on the curved area where contact is made with the release bearing.

7. Inspect the clutch shaft for wear at the front (pilot bushing area). Pin holes should not be "wallowed out" or elongated.

8. Release bearing area and teaser spring area should be free from scoring.

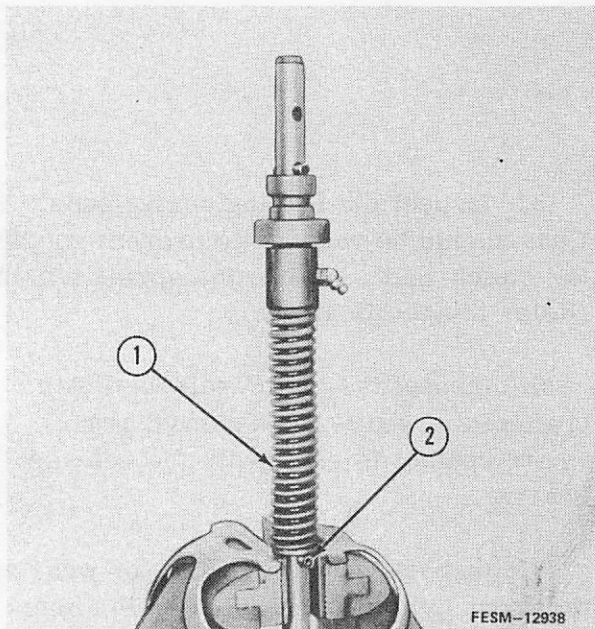
9. Clutch shaft coupling pin holes should not be "wallowed out" or elongated.

Reassembly and Installation



1. Clutch shaft
2. Coiled pin
3. Washer
4. Loading spring
5. Bushing
6. Throw out bearing
7. Spring spacer
8. Teaser spring

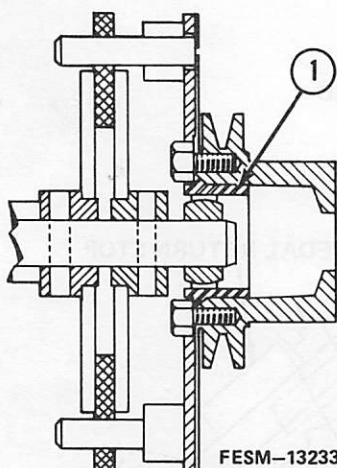
1. Assemble the front coiled spring pin, teaser spring, spring spacer, throw-out bearing, bushing, loading spring and washer onto the clutch shaft.



2. Using a vise equipped with brass jaws, clamp the clutch shaft snug. Tap the shaft down enough to compress the loading spring and install the rear coiled spring pin.

3. Continue reassembling the clutch by reversing the disassembly procedure.

1. Loading spring
2. Coiled pin



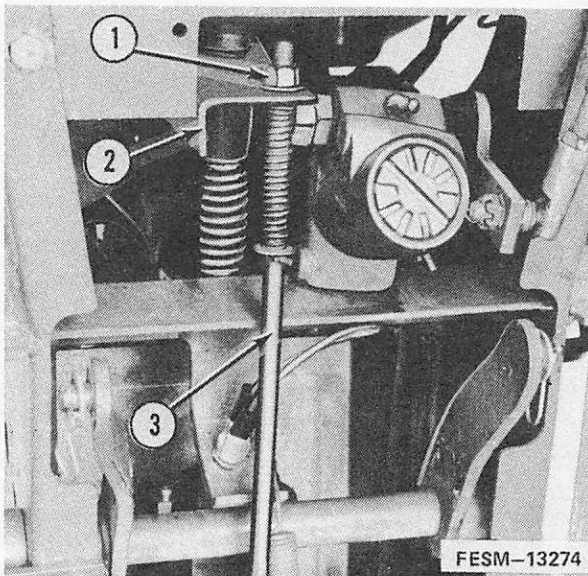
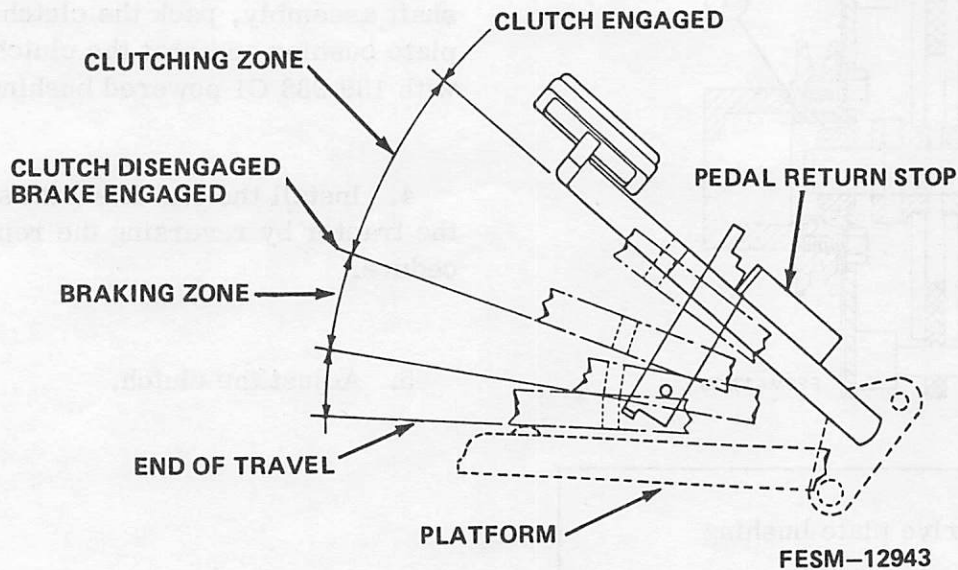
NOTE: Before installing the clutch shaft assembly, pack the clutch drive plate bushing and coat the clutch shaft with 139 933 C1 powered bushing grease.

4. Install the clutch shaft assembly in the tractor by reversing the removal procedure.

5. Adjust the clutch.

1. Drive plate bushing

Adjustment

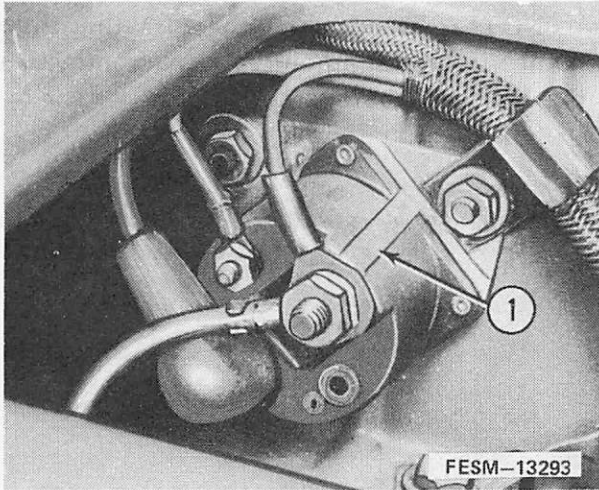


1. Adjusting nut
2. Clutch release lever
3. Release rod

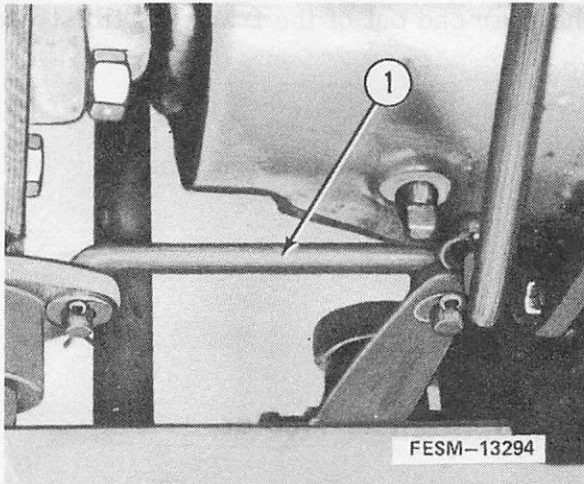
1. Adjust the clutch linkage. It is important that a clearance of 1.27 mm (.05 inch) be maintained between the clutch release lever and the clutch release bearing. In order to maintain this clearance, the pedal should have a free movement of approximately 7 mm (9/32 inch). This measurement is taken at the point of contact of the pedal arm with the front edge of the pedal return stop. When it is necessary to adjust the clutch, turn the adjusting nut on the clutch release rod in or out as required to get the proper measurements.

Splitting and Recoupling

Splitting the Tractor



1. Solenoid



1. Brake rod

1. Remove the battery strap and the battery.

2. Disconnect the electrical leads from the solenoid.

3. Disconnect the tail light leads and the seat switch.

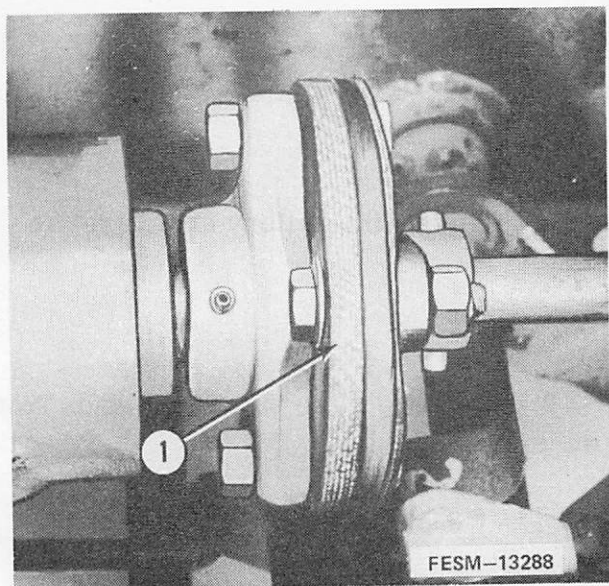
4. Remove the rear fender to frame bolts and the battery ground wire.

5. Remove the mounting screws from the foot platforms.

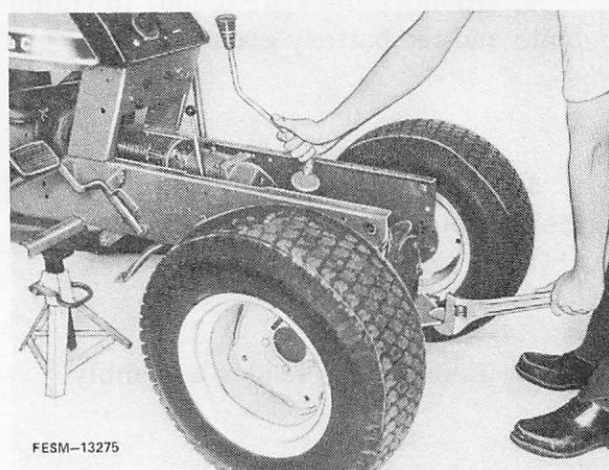
6. Remove the fender assembly.

7. Remove the frame cover.

8. Remove the brake rod.



1. Rear flex coupling



9. Disconnect the rear flex coupling.

NOTE: Tractors equipped with a three point hitch attachment require removal of the lift lever before splitting.

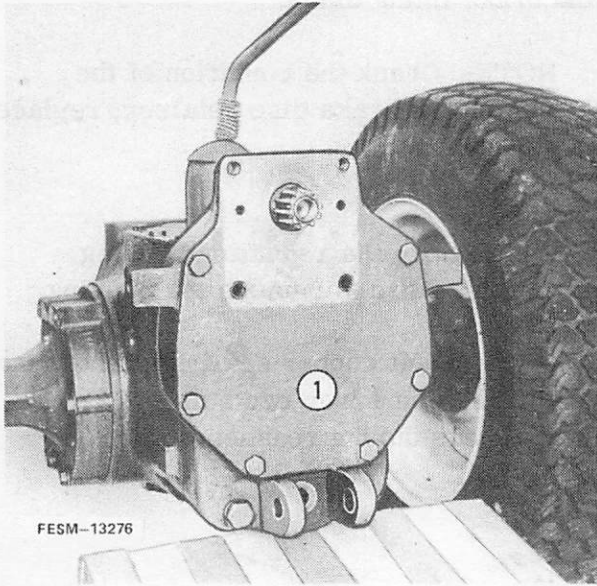
10. Support the frame of the tractor, remove the frame mounting bolts and roll the rear end out of the frame as illustrated.

Recoupling The Tractor

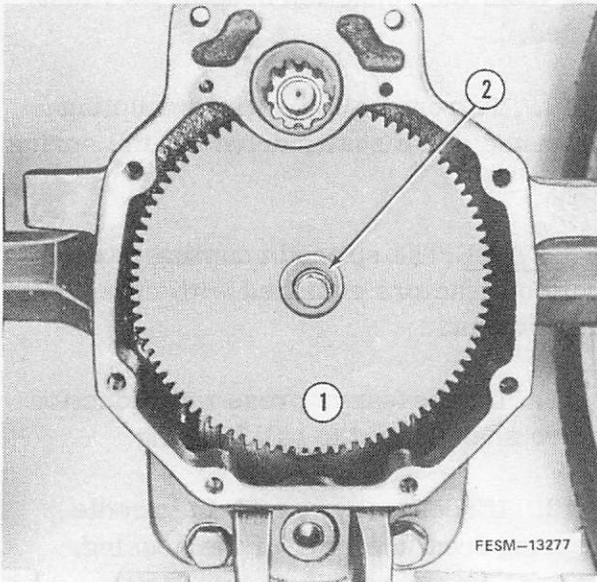
1. Recouple the tractor by reversing the splitting procedure.

2. Check the oil level of the rear frame and fill to proper level with IH Hy-Tran.

Reduction Drive



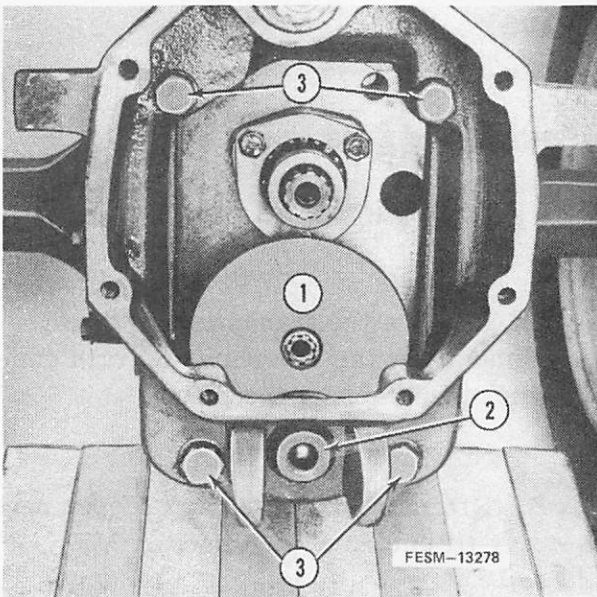
1. Reduction housing cover plate



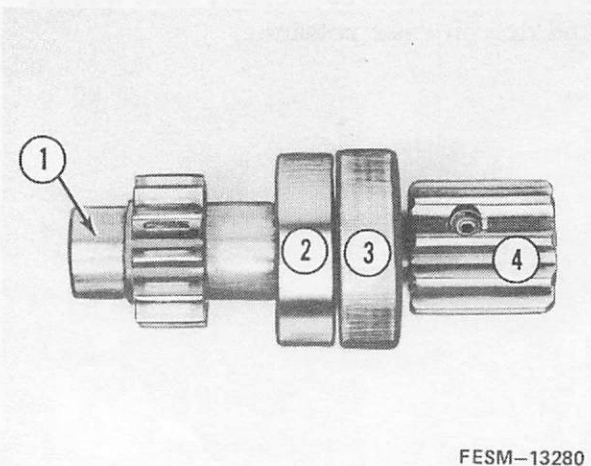
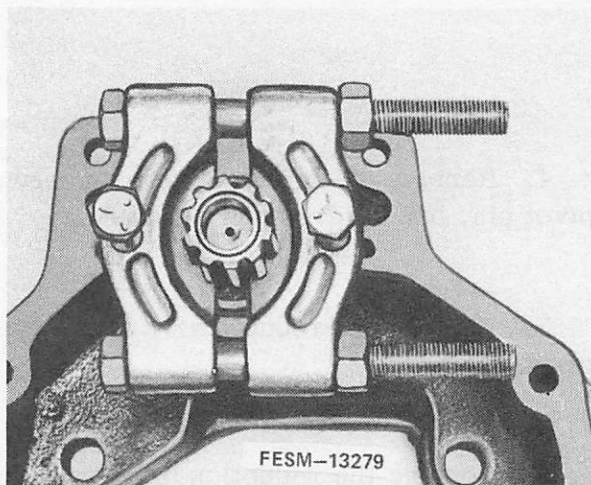
1. Reduction driven gear
2. Driven gear retainer

Removal and Disassembly

1. Split the tractor.
2. Remove the transmission drain plug and allow the lubricant to drain completely; then replace the plug.
3. Drain and remove the creeper assembly (if unit is so equipped).
4. Remove the brake adjusting screw, pivot pin, brake lever and push rod.
5. Remove the reduction housing cover plate.
6. Remove the reduction driven gear by removing the capscrew, lock washer and driven gear retainer.



1. Brake disc
2. Brake disc retainer
3. Mounting bolts



7. Using pliers, remove the brake disc retainer. Remove the brake disc and brake lining discs.

NOTE: Check the condition of the O-ring on the brake disc retainer; replace as necessary.

8. Remove the reduction housing mounting bolts and remove the housing.

NOTE: Soft copper sealing washers are used under the lower two bolts. Replace the washers during reassembly.

9. Using a split jawed puller, remove the reduction drive shaft, seal and bearing from the reduction housing as illustrated.

10. To remove the splined coupling from the drive shaft, drive out the spring pin.

NOTE: The splined coupling is used only on tractors equipped with creeper attachment.

11. If necessary, press the reduction drive shaft from the ball bearing.

12. If necessary, press the needle bearing from the rear of the housing.

1. Reduction drive shaft
2. Ball bearing
3. Seal
4. Splined coupling

Inspection and Repair

1. Inspect the drive shaft for wear on the gear teeth, needle bearing area, oil seal contact area and drive pin hole.
2. Inspect the reduction gear teeth for wear or chipping and the fit of the gear on the transmission shaft.
3. On tractors with creeper attachment, inspect wear of pilot bushing on creeper drive shaft.
4. Inspect the needle bearings and ball bearings for wear, pitting and smoothness of operation.
5. Thoroughly clean the reduction housing, bearings and gears.

Reassembly and Installation

1. If removed, press the needle bearing into the reduction housing from the rear. The rear end of the bearing must be flush with the housing.
2. If removed, press the ball bearing onto the reduction drive shaft.
3. Lubricate the lip of a new oil seal and install the seal onto the shaft. Be careful when sliding the seal lip over the pin hole in the shaft.
4. Install the splined coupling on the drive shaft (if tractor is equipped with a creeper). Spring pin ends must be even with or below the spline root to avoid interference when shifting the creeper unit.
5. Install the reduction housing on the transmission case. Be sure to install a new gasket.
6. Install new copper sealing washers on the two lower mounting bolts. Torque the bolts to 108 N·m (80 ft. lbs.).

7. Clean the brake cavity and the brake lining recess in the housing.

8. Apply a small quantity of petroleum jelly in the rear brake lining recess in the reduction housing, then install the brake lining.

9. Install the brake disc on the counter-shaft and slide it rearward against the rear brake lining.

10. Install a new O-ring on the front lining retainer and install the front lining in the retainer. Lubricate the retainer and push it into the bore in the reduction housing.

11. Install the reduction gear on the transmission main shaft and secure with the retainer, lock washer and capscrew. Tighten the reduction gear capscrew to 75 N·m (55 ft. lbs.).

12. Install the reduction drive shaft with bearing, seal and splined coupling (on tractors with creeper). Seal case must be flush with housing.

13. Install a new gasket and install the housing cover plate.

14. With the ball in place in the front brake lining retainer, install the push rod, brake lever, pivot pin, adjusting screw and lock nut.

15. Install a new gasket and install the creeper unit (on tractors so equipped).

16. Recouple the tractor.

17. Fill the transmission and creeper to proper level with IH Hy-Tran.

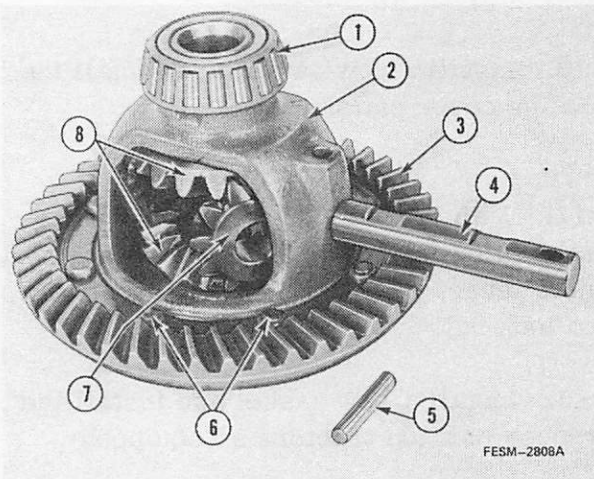
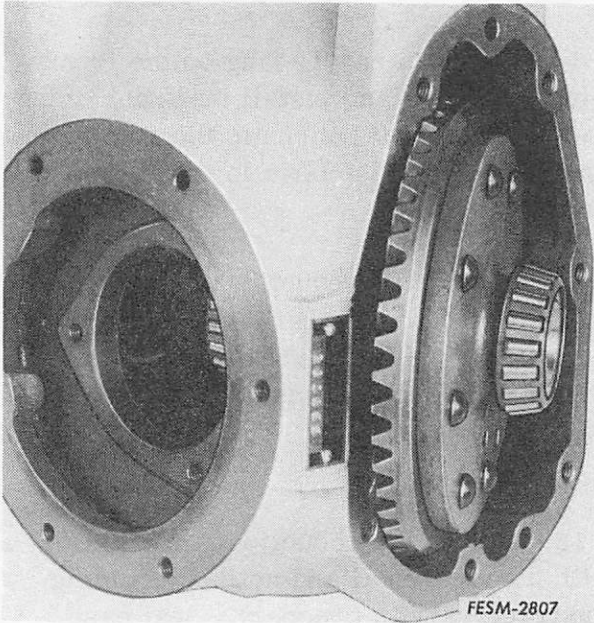
18. Adjust the brake. Refer to Internal Brakes - Adjustment.

Transmission and Differential

Complete service of the transmission requires splitting of the tractor, removal of the reduction drive (and creeper if so equipped), rear axles, carriers and the differential. The differential can be removed and replaced without disassembling

the transmission, however, the transmission countershaft must be removed when checking preload of the differential carrier bearings. The transmission and differential are therefore covered together.

Removal and Disassembly (Differential)



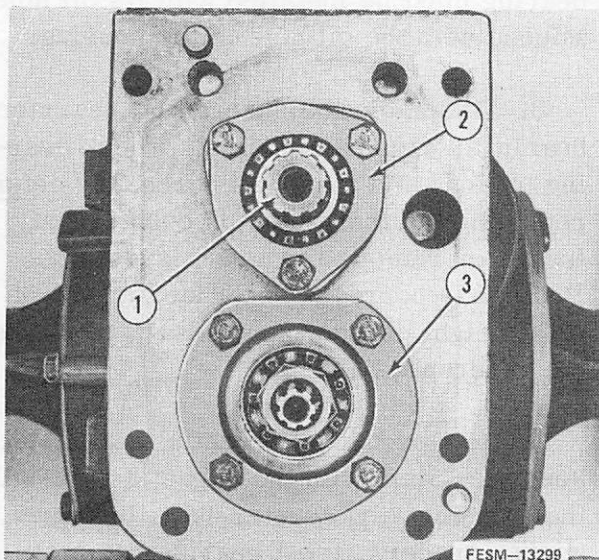
- | | |
|-------------------------|----------------|
| 1. Carrier bearing | 5. Lock pin |
| 2. Differential carrier | 6. Rivets |
| 3. Ring gear | 7. Pinion gear |
| 4. Pinion shaft | 8. Side gears |

1. Drain the lubricant.
2. Split the tractor.
3. Remove the reduction drive.
4. Remove the rear axles and their carriers.
5. Remove the differential carrier bearing cage and shims from each side. Keep the shims with each cage and identified for each side.
6. Turn the differential into the position shown and remove it from the transmission case. If the assembly will not clear the side of the transmission case, it will be necessary to remove one of the differential carrier bearings.
7. Drive out the pinion shaft lock pin.
8. Remove the pinion shaft.
9. Remove the pinion gears and side gears.
10. If the drive gear requires separate replacement, press out the retaining rivets.
11. Remove the carrier bearing cones from the differential carrier if they are to be replaced.
12. Remove the bearing cups from each cage if replacement is necessary.

Disassembly (Transmission)

1. Remove the differential.
2. Remove the gear shift lever and cover assembly.

Shift the transmission into two gear speeds to lock the transmission then remove the nut from the countershaft.



1. Mainshaft
2. Bearing retainer
3. Countershaft bearing retainer

3. Remove the shifter fork set screws.



CAUTION! Cover the gearshift poppet ball hole to prevent the ball and spring from flying out as the rods are removed.

Drive the shifter rods forward and out of the transmission.

4. Remove the capscrews from the mainshaft front bearing retainer.

5. Pull the mainshaft forward and out of the transmission as the gears are removed.

6. Push the countershaft rearward and out of the transmission as the gears and spacers are removed. Note the sequence of spacers and gears for re-assembly.

7. Pull the mainshaft needle bearing from the housing.

8. Remove the reverse idler shaft and gear.

9. Remove the countershaft front bearing, retainer and shims.

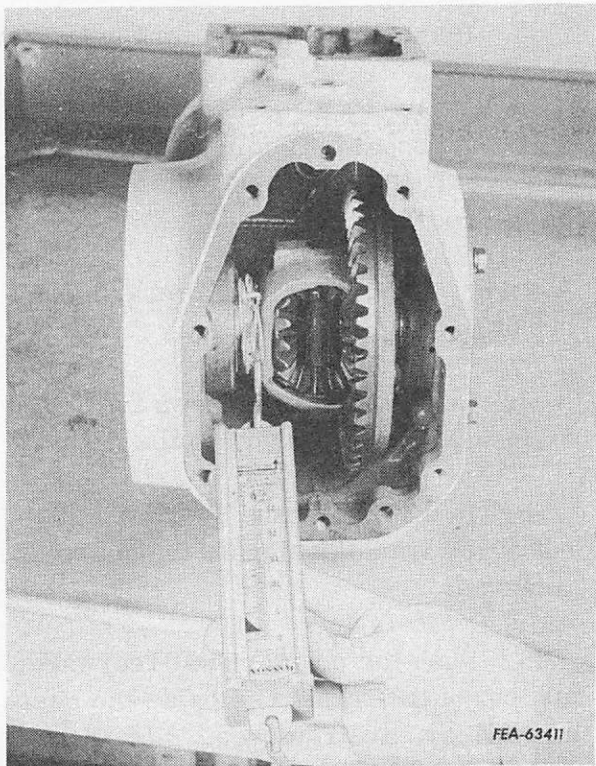
Inspection and Repair

1. Wash all parts in cleaning solvent and dry with compressed air. Do not spin bearings.

2. Check all bearings for looseness, wear, roughness, pitting and scoring.

3. Check gears and shafts for wear and burrs. Remove any burrs with a fine stone.

4. Inspect the housing for cracks, restricted oil passages or raised places on its machine faces. Smooth off raised places with a file.



Reassembly

Reassembly is basically the reverse of disassembly; however, particular attention should be given to the following steps.

1. Be sure all bearings are thoroughly lubricated.

2. The transmission mainshaft needle bearing must be installed with its oil hole aligned with the oil hole in the housing.

3. Assemble the differential, carrier bearings, cages and shims. Check bearing preload and adjust as necessary before replacing the transmission countershaft. Install or remove shims as necessary. Preload is correct when a steady pull of one to eight pounds is necessary to rotate the differential assembly.

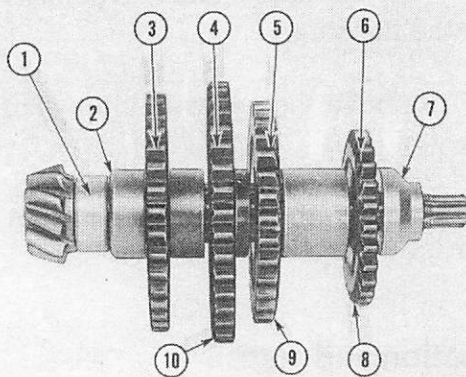
4. Remove the differential assembly, keep the shims with the cages then install the transmission countershaft, bearings, gears, spacers, front bearing retainer, shims and nut. Tighten the nut to 115 N·m (85 ft. lbs.). Tighten retainer capscrews to 27 N·m (20 ft. lbs.).

5. Install the differential assembly, keeping the preload shim pack as previously established. Drive gear must be on the right with teeth facing left.

6. Check the backlash between the drive gear and bevel pinion and the gear teeth bearing pattern as follows.

7. Apply a thin coat of red lead or prussian blue to the bevel pinion teeth faces, then rotate the gears by hand and observe the bearing pattern.

Some deflection will occur under load. Allowance is made in gear design to prevent concentration of load on tooth edges.



1. Bearing
2. Bevel to bearing
3. Reverse gear
4. 1st gear
5. 2nd gear
6. 3rd gear
7. Bevel to bearing
8. Rounded edge to rear
9. Rounded edge to front
10. Rounded edge to rear

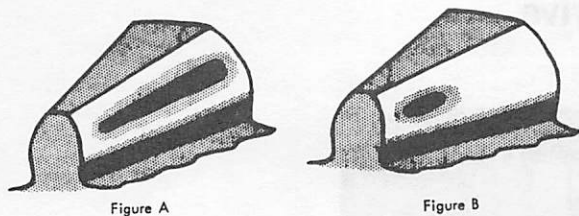
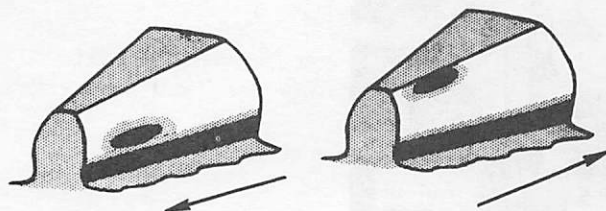


Figure A

Figure B



FEA-63284

Figure C

Figure D

8. Hand testing and very light loads should provide a pattern as shown in Figure "B". When load and deflection increases the pattern will progress as in Figure "A".

9. The desirable (no load) pattern in Figure "B" is the result of adjusting the drive gear lateral position to the specified range of .076 to .127 mm (.003 to .005 inch) backlash.

10. Tooth bearing position from the root to the crown of the tooth is controlled by lateral position of the bevel pinion. If low tooth bearing on bevel pinion is indicated (as shown in Figure "C") the bevel pinion must be adjusted toward the drive gear. If high tooth bearing on the bevel pinion is indicated (as shown in Figure "D") the bevel pinion must be adjusted away from the drive gear.

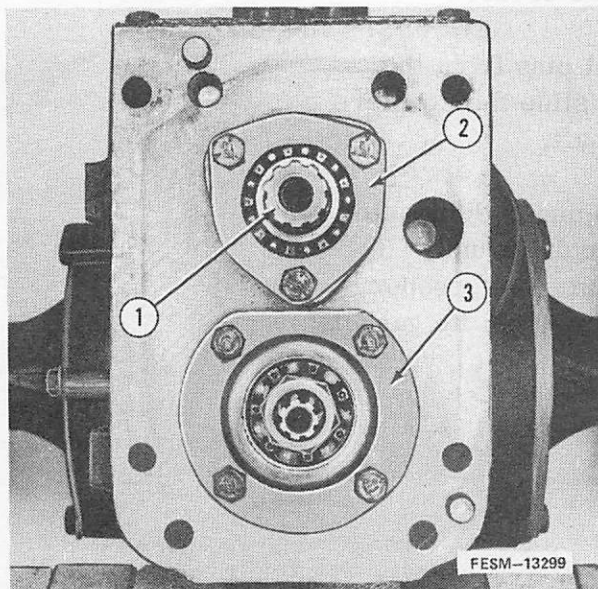
11. Stake the countershaft nut by center-punching the face of the nut over a spline groove.

12. Continue the assembly in reverse order of disassembly.

NOTE: The right side axle carrier mounting bolt hole located at the nine o'clock position is tapped through the differential case. The bolt installed in this hole should be coated with IH Gasket-maker to prevent oil seepage past the threads.

13. Fill housing to proper level with specified lubricant.

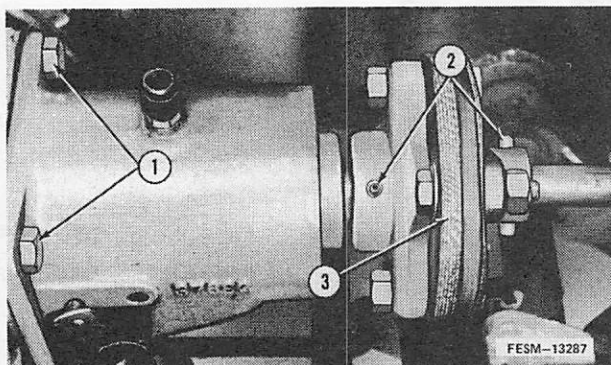
NOTE: Creeper attachment has its own lubricant separate of the transmission. Fill creeper at breather and check at side plug in creeper housing.



FESM-13299

1. Mainshaft
2. Bearing retainer
3. Countershaft bearing retainer

Creeper Drive

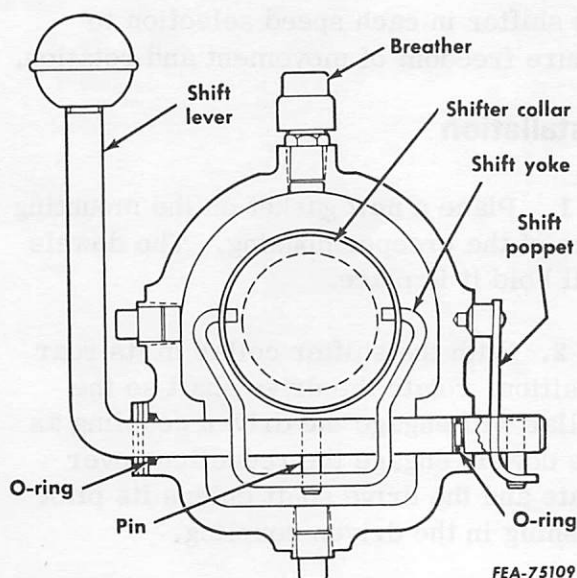
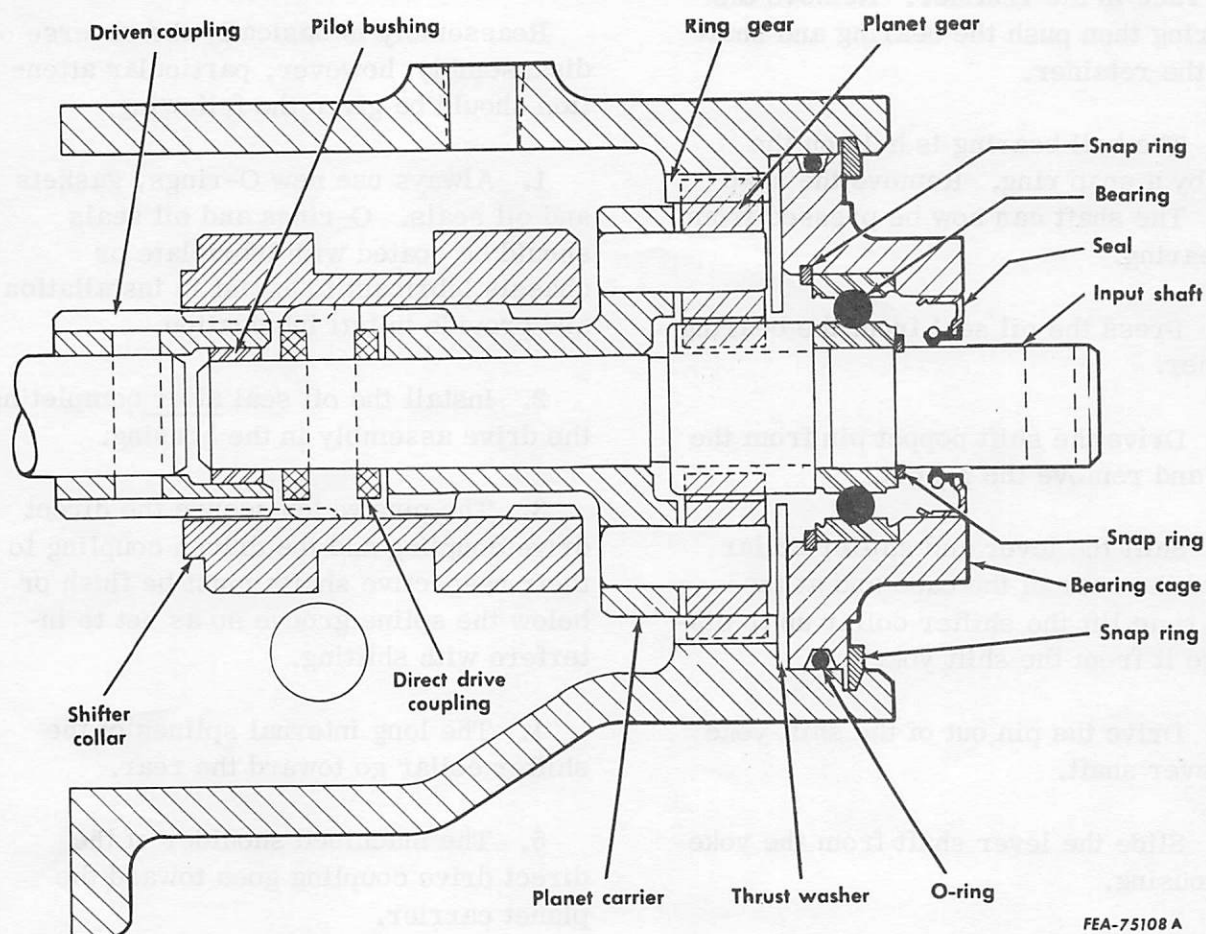


1. Mounting bolts
2. Roll pins
3. Flex coupling

Removal

1. Remove the frame cover.
2. Drive out the roll pins from the flex coupling arms and slide the couplers forward on the drive shaft.
3. Place a drip pan under the tractor and remove the creeper drive unit. It may be necessary to bump the creeper unit to loosen the housing from its gasket and dowels.

Disassembly



1. Remove the snap ring which holds the input shaft bearing cage in the housing.

2. Pull the shaft, bearing, retainer, planetary assembly and the direct drive coupling from the housing.

NOTE: The spline grooves of the direct drive coupling must align with the splines of the shifter collar.

3. Support the drive coupling and drive the coiled spring pin out. Remove the coupling from the shaft.

4. Slide the planet carrier off the input shaft and the planet gears off the carrier pins.

5. Remove the flat thrust washer.

6. A snap ring holds the ball bearing outer race in the retainer. Remove the snap ring then push the bearing and shaft from the retainer.

7. The ball bearing is held on the shaft by a snap ring. Remove the snap ring. The shaft can now be pressed from the bearing.

8. Press the oil seal from the bearing retainer.

9. Drive the shift poppet pin from the shaft and remove the poppet.

10. Shift the lever and shifter collar toward the rear of the case and at the same time lift the shifter collar up to disengage it from the shift yoke.

11. Drive the pin out of the shift yoke and lever shaft.

12. Slide the lever shaft from the yoke and housing.

13. Remove the O-rings from the shaft, housing and bearing retainer.

14. Wash all parts in cleaning solvent then dry thoroughly.

Inspection and Repair

1. Check the input drive shaft for oil seal groove wear, worn or chipped teeth on the integral gear and pilot bushing wear on the rear end.

2. Check the splines of the direct drive coupling, planet carrier and the shifter collar for wear and chipping.

3. Check the housing for cracks and the integral sun gear for wear and broken teeth.

4. Inspect the ball bearing for pitting, scoring, wear and rough operation.

Reassembly

Reassembly is basically the reverse of disassembly; however, particular attention should be given the following:

1. Always use new O-rings, gaskets and oil seals. O-rings and oil seals should be coated with lubriplate or chassis lubricant to assist in installation and provide initial lubrication.

2. Install the oil seal after completing the drive assembly in the housing.

3. The pins which secure the direct drive coupling and the driven coupling to their respective shafts must be flush or below the spline groove so as not to interfere with shifting.

4. The long internal splines of the shifter collar go toward the rear.

5. The machined shoulder of the direct drive coupling goes toward the planet carrier.

6. Lubricate the components and rotate the drive shaft several turns with the shifter in each speed selection to insure freedom of movement and rotation.

Installation

1. Place a new gasket on the mounting face of the creeper housing. The dowels will hold it in place.

2. With the shifter collar in its rear position, rotate the drive shaft so the collar will engage the driven coupling as the dowels engage the reduction cover plate and the drive shaft enters its pilot bushing in the driven coupling.

3. Secure the creeper to the reduction housing cover plate and reconnect the rear coupling.

4. Fill the creeper housing to proper level (check plug on side of housing) with the same lubricant as specified for the transmission - differential.

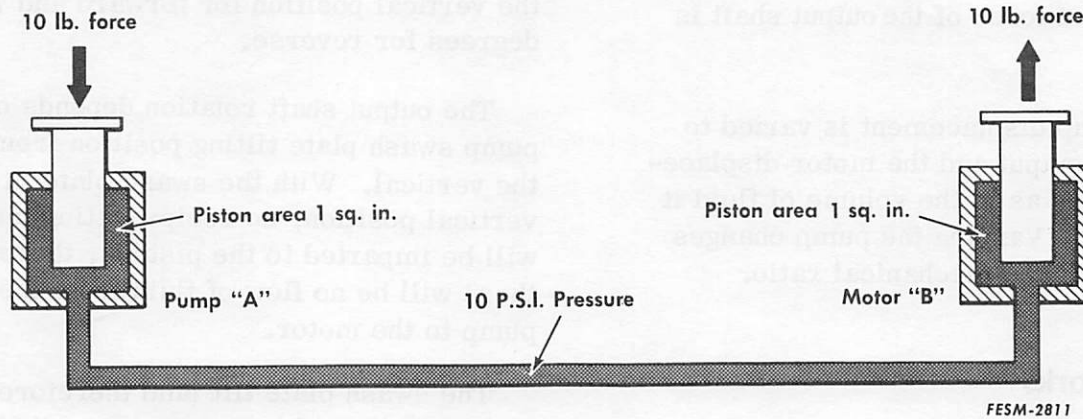
5. Shift the unit several times to insure freedom of movement.

6. Install the frame cover.

HYDROSTATIC TRANSMISSION

Models 682, 782 and 982

Principles of Hydrostatics



This hydrostatic drive can be defined as an energy transfer system composed of a variable displacement pump and a fixed displacement motor for the transmission of power by fluid under pressure and in a contained vessel. The pump converts mechanical energy into hydraulic energy, and the motor converts hydraulic energy into mechanical energy.

A simple hydrostatic drive is shown. A 10 lb. force on "pump" piston (A) creates 10 psi pressure on the fluid connecting the "pump" and "motor". Since the fluid under pressure exerts 10 psi equally and in all directions, the "motor" piston (B) moves up with a force of 10 lbs. since its area is 1 square inch. If the "pump" piston (A) is moved 1 inch, the "motor" piston (B) will also move 1 inch since its area is the same as the pump piston.

This illustrates the basic principles in their simplest form. Modern hydrostatic transmission consist of multiple piston pumps and multiple piston motors arranged in a manner so as to continuously perform the transfer of energy shown.

The piston pump is designed with a rotating shaft which imparts a reciprocating motion to its pistons, pumping fluid in a continuous stream to a motor which accepts the fluid under pressure in its pistons, which in turn imparts a rotating motion to the motor shaft.

In a hydrostatic drive, there are only three basic items to control. These three items are:

1. Rate of fluid flow.
2. Direction of fluid flow.
3. Fluid pressure.

Since infinite control of these three basic items is possible, it therefore follows that a hydrostatic drive is infinitely controllable. Infinite control over the rate of fluid flow results in control of the output speed. Infinite control over the direction of fluid flow results in control of the rotation of the output shaft. Control over the fluid pressure results in control of the magnitude of force applied to the output shaft. Therefore, infinite control over the speed, rotation and magnitude of force of the output shaft is obtainable.

The pump displacement is varied to change its output and the motor displacement is fixed as to the volume of fluid it will accept. Varying the pump changes motor speed and mechanical ratio.

How It Works

(Refer to foldout at back of manual)

Variable Displacement Pump and Fixed Motor

The pump drive shaft is coupled to the engine drive shaft. Nine (9) pistons are located in the cylinder block and they reciprocate in the cylinder block as it rotates. The distance they reciprocate depends on the angle of the swash plate. The drive shaft and cylinder block assembly are the only parts that rotate. The pump cylinder block always rotates the same direction as the engine.

The swash plate is mounted on trunnions supported by one needle bearing and one bushing mounted in the transmission case. The swash plate does not rotate but merely tilts back and forth from a vertical plane. The vertical plane is a "zero output" position as the pistons are not reciprocating. The drive shaft drives through a center hole in the swash plate and does not touch it. The center section

which has the hydraulic porting, referred to as kidneys, allowing fluid to flow between the pump and motor is bolted to the transmission case. "Kidneys" which are open passages from the pump to the motor through the center section are the only connection between them.

By reversing the tilt of the pump swash plate the flow through the inlet and outlet kidneys can be reversed. The pump swash plate can be tilted 15 degrees from the vertical position for forward and 7 degrees for reverse.

The output shaft rotation depends on the pump swash plate tilting position from the vertical. With the swash plate in the vertical position, no reciprocating motion will be imparted to the pistons, therefore, there will be no flow of fluid from the pump to the motor.

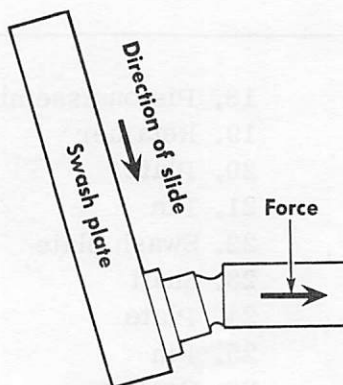
The swash plate tilt (and therefore direction and speed of travel) is controlled by mechanical linkage. With the drive shaft rotating clockwise (as viewed from the drive end) and the swash plate tilted to the rear, kidney "B" will be the inlet and kidney "A" will be the outlet. As the cylinder block rotates past kidney "B" fluid is drawn into the piston bores, then as rotation continued fluid is expelled into kidney "A" by the pistons. The distance that the pistons reciprocate depends on the angle of the swash plate; this determines the displacement per revolution of the pump.

The greater the angle, the greater the displacement; therefore, the more flow of fluid from the pump. Now it can be seen as the swash plate angle is varied so it will vary the flow from the pump.

When the pump swash plate is tilted to the front, the flow reverses and kidney "A" becomes the inlet and kidney "B" becomes the outlet -- the flow of fluid has been reversed while the drive shaft continued to rotate in the same direction.

The motor used is an axial piston fixed displacement motor of the same design as the pump. A splined output shaft is splined to the cylinder block and is driven by it. As fluid under pressure is introduced from the pump, force is exerted against the pistons in the motor cylinder block. Since the swash plate of the motor is inclined, the pistons slide on the incline and rotate the motor cylinder block. As the cylinder continued to rotate fluid is expelled. When the swash plate angle is moved beyond vertical, fluid under pressure is introduced by the pump into the opposite kidney and the motor cylinder block and output shaft will rotate in the opposite direction. There is very little flow of high pressure fluid. The charge pump furnishes fluid to make up for leakage and to furnish circulation for cooling.

The only connection between the pump and motor is the hydraulic porting in the center section referred to above as kidneys.



As angle of pump swash plate changes volume of displacement of pistons changes

FESM-1914

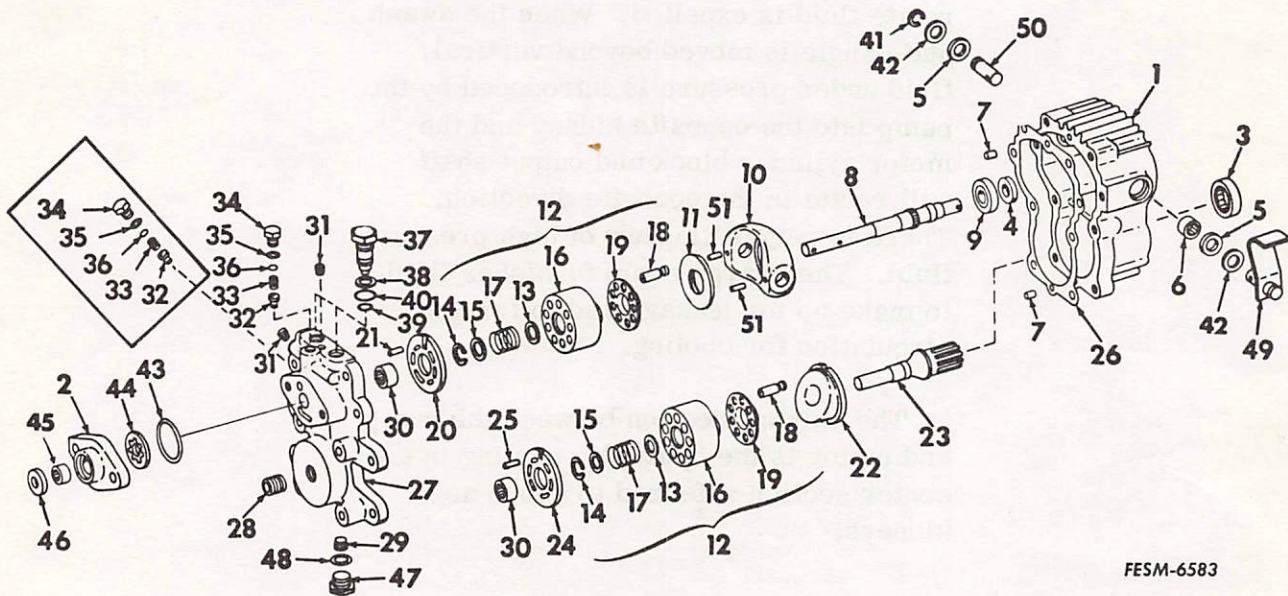
General Information

Refer to this page for additional reference to the parts described during service procedures in this manual.

Many of the component parts have highly polished machined surfaces. Extreme care must be taken to prevent damage

during disassembly and reassembly.

Coat hands with clean Hy-Tran before handling the polished surfaces of the parts in order to minimize rust formation.



FESM-6583

- | | | |
|------------------------|---------------------|--------------------|
| 1. Housing | 18. Piston assembly | 35. O-ring |
| 2. Charge pump housing | 19. Retainer | 36. Shim |
| 3. Bearing | 20. Plate | 37. Valve assembly |
| 4. Seal | 21. Pin | 38. Washer |
| 5. Seal | 22. Swash plate | 39. O-ring |
| 6. Bearing | 23. Shaft | 40. O-ring |
| 7. Pin | 24. Plate | 41. Ring |
| 8. Shaft | 25. Pin | 42. Washer |
| 9. Bearing | 26. Gasket | 43. O-ring |
| 10. Swash plate | 27. Housing | 44. Rotor assembly |
| 11. Plate | 28. Fitting | 45. Bearing |
| 12. Kit | 29. Plug | 46. Seal |
| 13. Washer | 30. Bearing | 47. Plug |
| 14. Ring | 31. Plug | 48. O-ring |
| 15. Washer | 32. Cone | 49. Shaft assembly |
| 16. Block | 33. Spring | 50. Shaft |
| 17. Spring | 34. Plug | 51. Pin |

Troubleshooting

If the tractor will not move or moves slowly in both directions, a preliminary check of the power train can be made as follows:

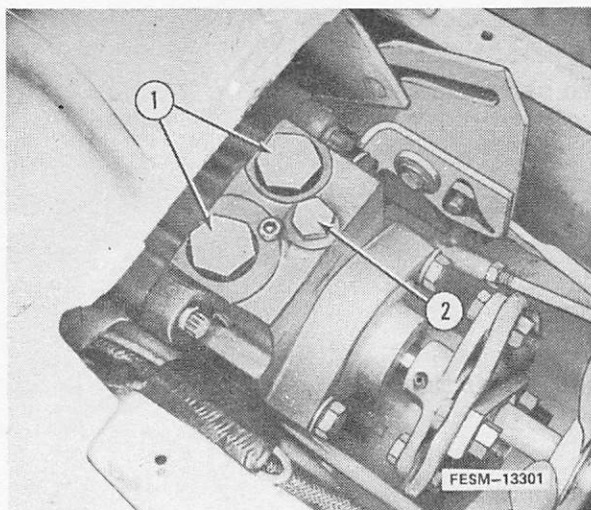
1. Check the oil level. Change the oil filter.
2. Remove the frame cover.
3. Check the suction tube and fittings for tightness.
4. Support the tractor so both rear wheels are off the ground and free to move. Block the front wheels. Start the engine.
5. Check the drive shaft rotation into the charge pump and out the rear of the transmission case for mechanical break down. Work the control lever to make sure there is no binding in the cam plate or linkage.

If the shaft does not turn, remove and overhaul the transmission. If the shaft is turning, continue with the following steps.

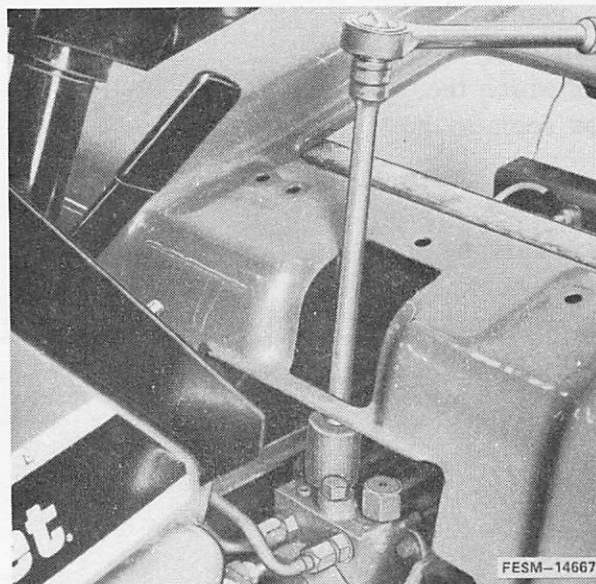
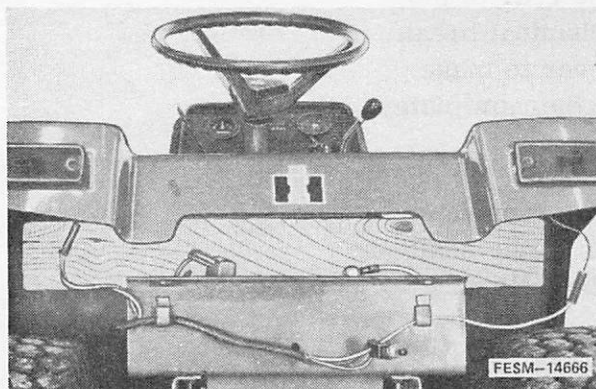
6. If the tractor moves slowly or not at all in only one direction, remove both check valves and switch positions. If this changes the direction in which the problem originally occurred replace the respective check valves.

7. If interchanging check valves failed to reveal the problem, check charge pressure. Refer to Hydraulic Lift-Pressure Check on page 2-94.

Check Valve Service



1. Check valves
2. Charge pressure relief valve



The check valves are serviced as an assembly only. Servicing of the valve is limited to replacement only, except for external O-rings and back-up washer.



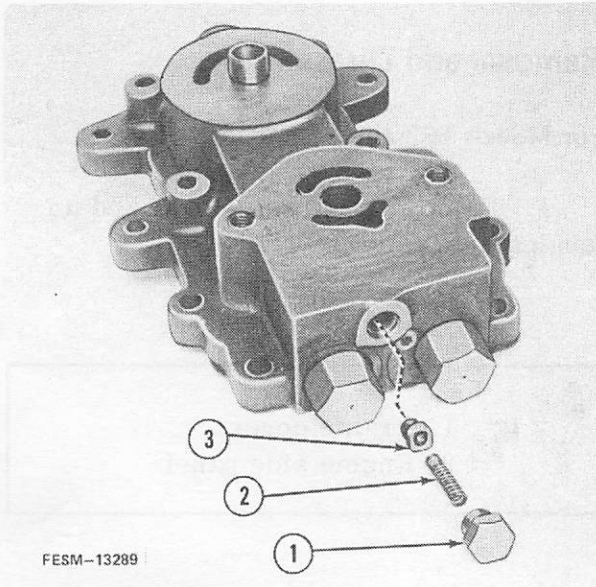
CAUTION! Any time the engine is shut off the brake pedal must be locked to prevent the tractor from rolling.

NOTE: Steps 2 thru 4 apply only to the 682 and 782.

1. Remove the frame cover.
2. Remove all bolts and screws securing the rear deck to the chassis except the front two screws located on each leg of the rear deck.
3. Disconnect seat safety start switch from rear deck.
4. Raise rear deck and block into position required for access to check valves.
5. Remove valves and wash valves in clean solvent.
6. Check the valves for dirt, paint corrosion and free plunger movement. Replace any valve in doubtful condition.
7. Replace all O-rings and back-up washers.
8. Thoroughly lubricate the valves in clean Hy-Tran and install. Apply IH 251 HEP grease to the external ends of the valve spools.

NOTE: The valves are identical, therefore they are interchangeable.

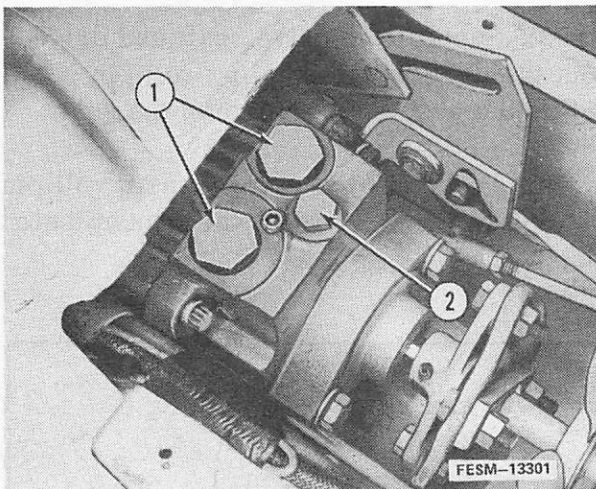
Charge Pump Relief Valve Service



The charge pump relief valve is serviced by removing the frame cover.

1. Remove the relief valve plug, shim (if any), spring and cone from the housing.
2. Wash and dry the components.

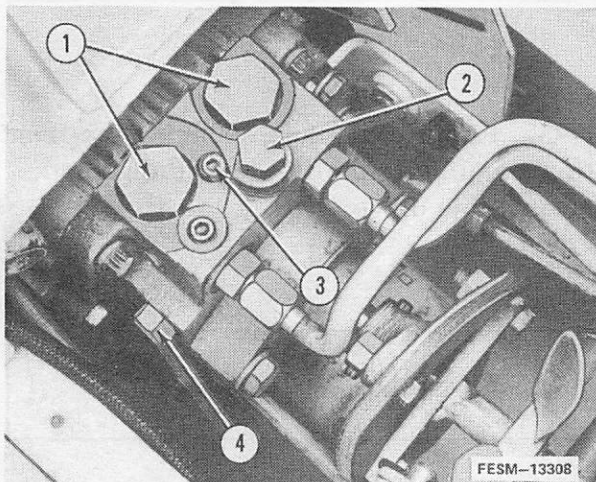
1. Plug
2. Spring
3. Cone



Not equipped with hydraulic lift.

3. Check the spring for pitting and rust.
4. Check the cone for wear or damage. Check the valve seat in the housing for dirt, nicks and scratches.

1. Check valves
2. Charge pump relief valve

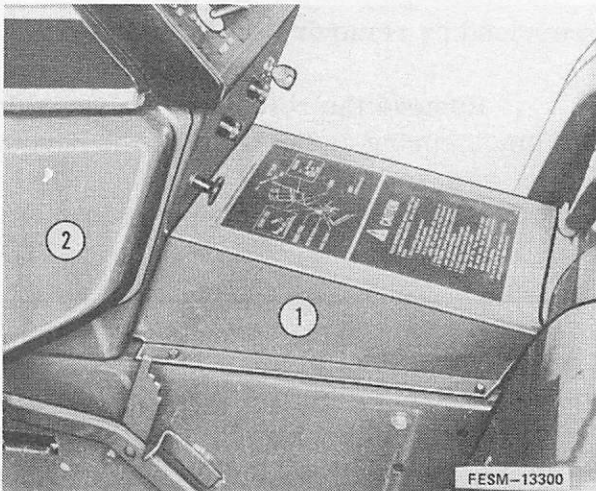


Equipped with hydraulic lift.

5. Install the relief valve in the reverse order of removal. Use a new O-ring on the plug.

1. Check valves
2. Implement lift relief valve
3. Test port
4. Charge pump relief valve

Charge Pump Service

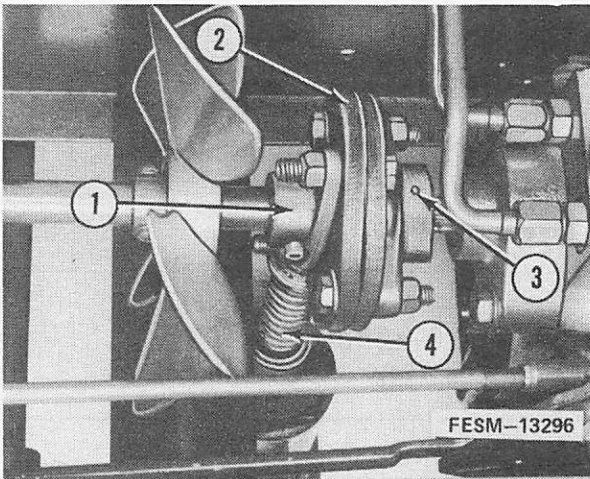


Removal and Disassembly

For Models 682 and 782:

1. Remove the frame cover and an engine side panel.

1. Frame cover
 2. Engine side panel

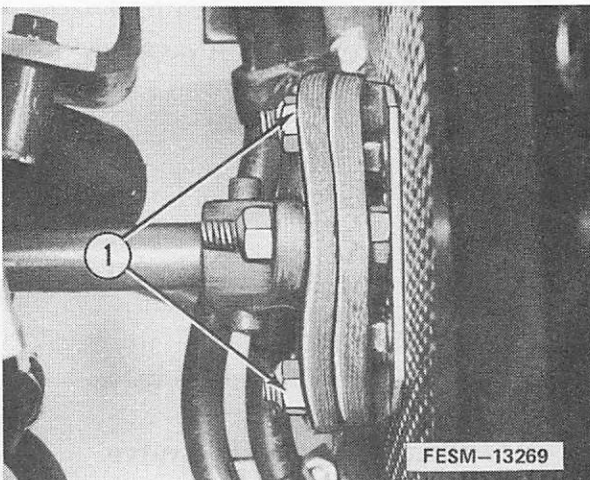


2. Remove the bolts from the flex coupling.

3. Support the drive shaft and drive out the drive shaft coupling roll pin. Slide the coupling forward on the shaft.

4. Drive out the coupling arm roll pin and slide it rearward on the transmission input shaft.

1. Drive shaft coupling
 2. Flex coupling
 3. Coupling arm
 4. Hydraulic jack



5. Remove the nuts securing the front flex coupling to the flywheel flange and remove the drive shaft.

1. Flywheel flange nuts

For Model 982:

To service the charge pump it is necessary to remove the drive shaft. For Model 982 the engine must be moved forward for drive shaft removal. Use the following procedure.

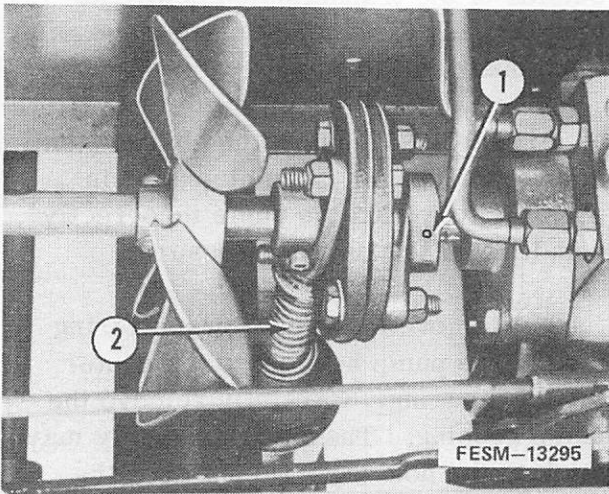
1. Raise the hood and remove the engine side panels. Remove the frame cover.

2. Disconnect the headlight wiring and remove the hood and grille as an assembly.

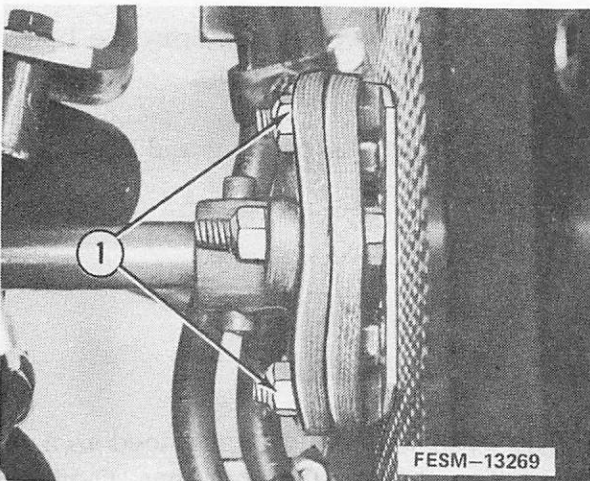
3. Remove the oil filter, support the drive shaft and drive out the coupling arm locating pin.

4. Remove the engine mounting bolts and slide the engine forward until the coupling arm is clear of the transmission input shaft.

5. Remove the nuts securing the front flex coupling to the flywheel flange and remove the drive shaft.



1. Locating pin
2. Hydraulic jack



1. Flywheel flange nuts

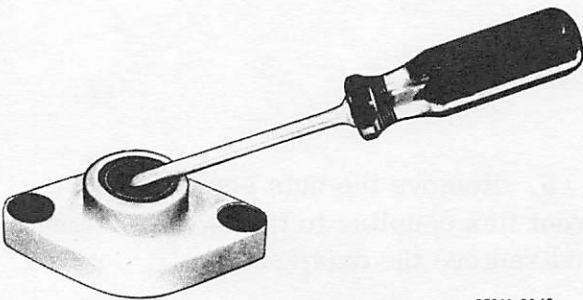
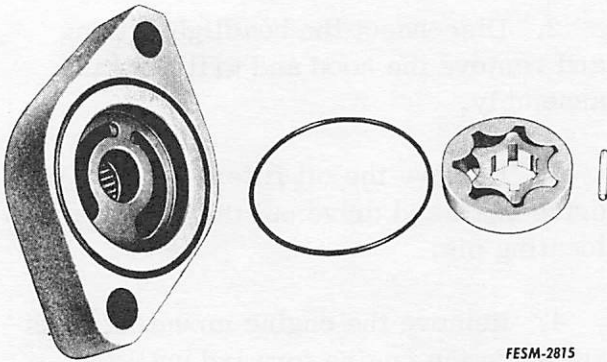
All Models:

1. Thoroughly clean and deburr the outside of the transmission before attempting any disassembly. Remove paint from shaft surfaces.

IMPORTANT: Mark the charge pump housing before disassembly, as it is possible to install the pump incorrectly resulting in low charge pressure.

2. Remove the capscrews securing the charge pump housing to the center section housing. Carefully remove the pump housing. The rotor assembly may stick to the housing. Do not drop the assembly.

3. Remove the rotor and pin assembly (if it was not removed in step 2). Because of the polished surface, be sure to protect the assembly against nicks, scratches and rust.



4. Using a screwdriver, pry the lip seal out of the pump housing.

5. Check needle bearing and replace if necessary.

Inspection and Repair

The rotor assembly is serviced as a unit. The charge pump housing, O-ring, lip seal and rotor pin are all serviced separately.

Inspect all parts for excessive wear or damage, replace if necessary.

Use a new lip seal and O-ring.

Reassembly and Installation

Reassembly and installation of the charge pump to the center section housing is the exact reverse of removal and disassembly with particular attention paid to the following:

1. Thoroughly lubricate all parts in clean Hy-Tran.

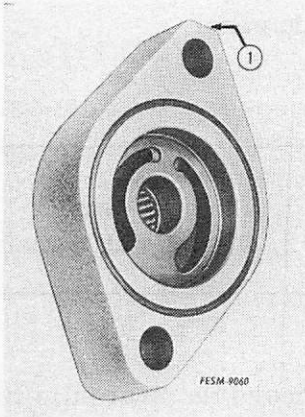
2. If removed, install the new needle bearing in the pump housing. Be sure the bearing is "bottomed" in the bore.

3. Install a new oil seal in the pump housing. Install a new O-ring.

4. If the housing is new or unmarked, the flat side by the mounting bolt hole should face the right side of the machine.

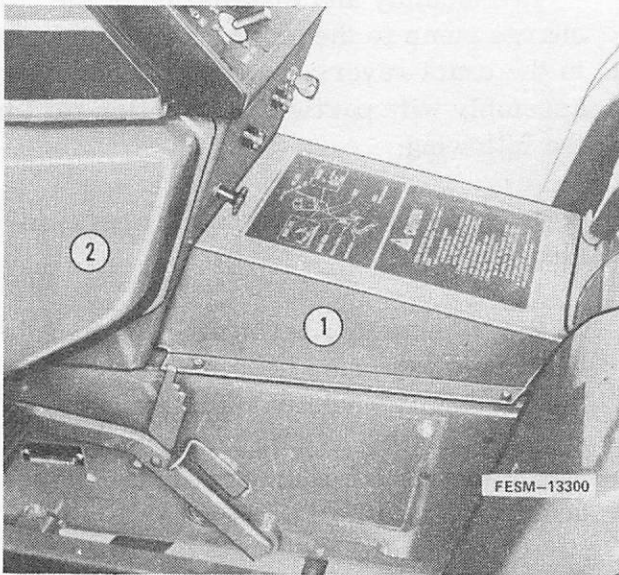
5. Torque the pump housing capscrews evenly to 70 N·m (52 ft. lbs.). Rotate the pump shaft while tightening the capscrews. Loosen and retighten the capscrews evenly as necessary to relieve any binding of the shaft.

6. On Model 982 for ease of installation, connect the drive shaft to the transmission first, then align the shaft to the engine flywheel flange. Lubricate the splined transmission input and output shafts and couplings with IH 251 HEP grease.



1. Flat side

Transmission

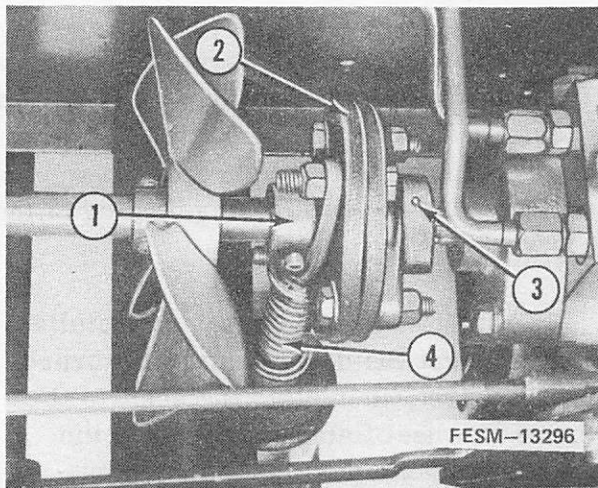


Removal

For Models 682 and 782:

1. Remove the frame cover and an engine side panel.

- 1. Frame cover
- 2. Engine side panel



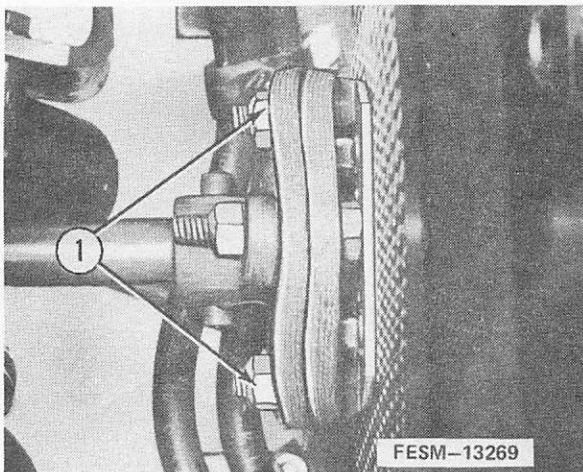
2. Remove the hydraulic lines from the center section to the lift control valve, if so equipped.

3. Remove the bolts from the flex coupling.

4. Support the drive shaft and drive out the drive shaft coupling roll pin. Slide the coupling forward on the shaft.

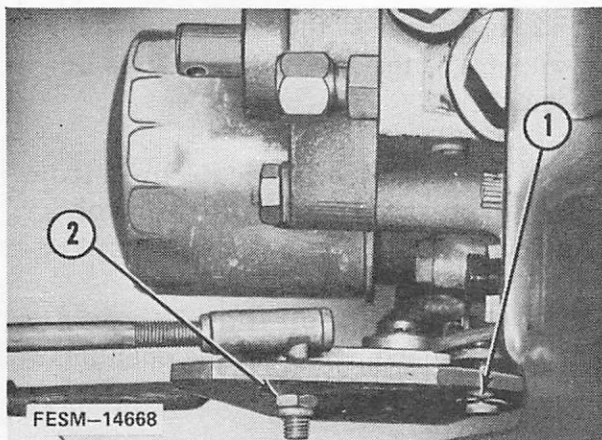
5. Drive out the coupling arm roll pin and slide it rearward on the transmission input shaft.

- 1. Drive shaft coupling
- 2. Flex coupling
- 3. Coupling arm
- 4. Hydraulic jack



6. Remove the nuts securing the front flex coupling to the flywheel flange and remove the drive shaft.

- 1. Flywheel flange nuts



1. Retaining ring
2. Lock nut

7. Remove the retaining ring which secures the control cam assembly to the damper spring plate assembly.

8. Disconnect the connecting stud ball joint from the control cam assembly by removing the lock nut.

9. Remove the cam bracket mounting bolts and move the bracket and linkage up and out of the way.

10. Disconnect the brake rod from the brake lever.

11. Remove the brake adjusting screw.

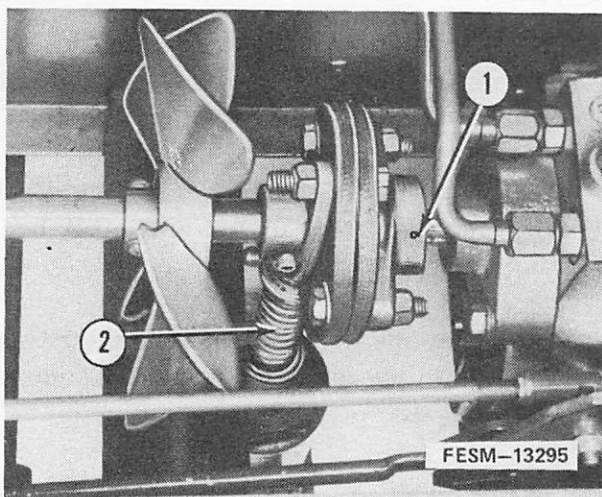
12. Place a pan under the hydrostatic unit and disconnect the suction line from the unit. Cap the fitting and rotate the suction line away from the hydrostatic unit.

13. Remove the hydrostatic mounting bolts from the rear frame housing. Bring the unit forward tilting the top of the unit downward and bring it up and out.

For Model 982:

To remove the hydrostatic transmission, removal of the drive shaft is necessary. For Model 982 the engine must be moved forward for drive shaft removal. Use the following procedure.

1. Raise the hood and remove the engine side panels. Remove the frame cover.



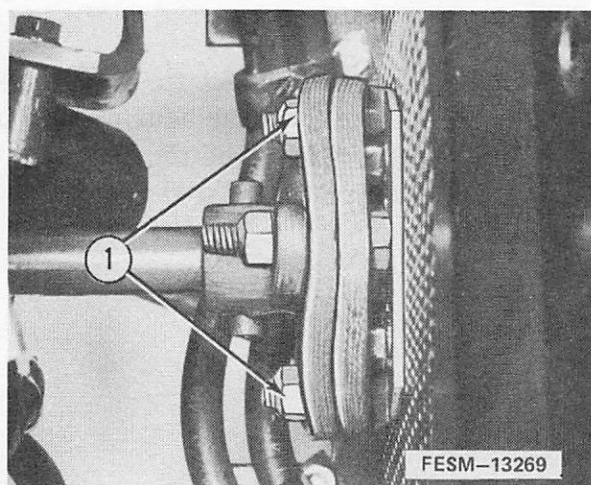
1. Locating pin
2. Hydraulic jack

2. Disconnect the headlight wiring and remove the hood and grille as an assembly.

3. Remove the hydraulic lines from the center section to the lift control valve.

4. Remove the oil filter, support the drive shaft and drive out the coupling arm locating pin.

5. Remove the engine mounting bolts and slide the engine forward until the coupling arm is clear of the transmission input shaft.



1. Flywheel flange nuts

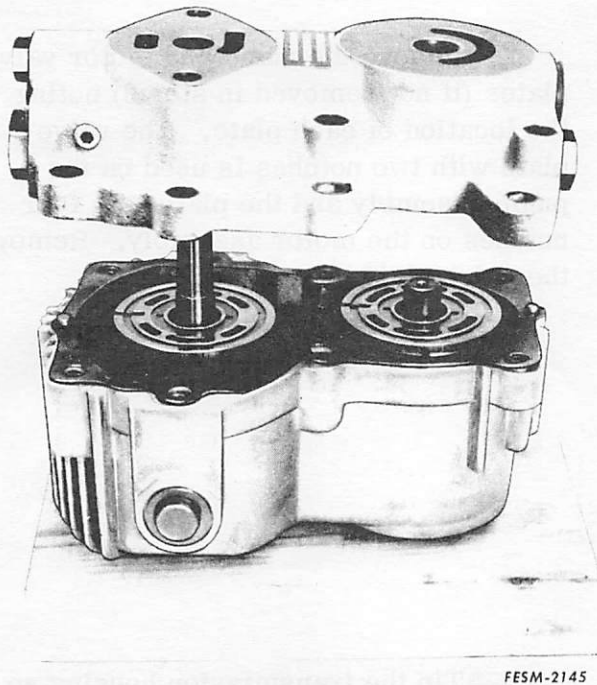
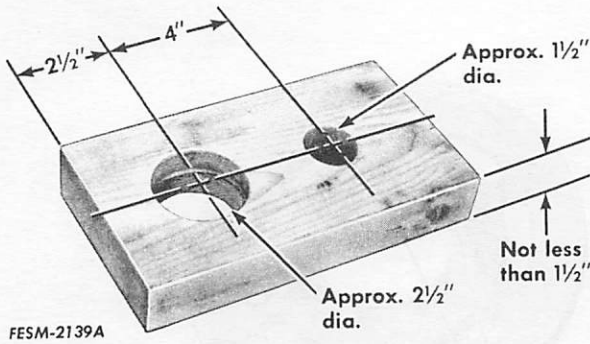
6. Remove the nuts securing the front flex coupling to the flywheel flange and remove the drive shaft.

7. Remove the cam bracket mounting bolts and move the bracket and linkage up out of the way.

8. Remove the brake rod and return spring.

9. Place a pan under the hydrostatic unit and disconnect the suction line from the unit. Rotate the suction line away from the hydrostatic unit.

10. Remove the hydrostatic mounting bolts from the rear frame housing. Bring the unit forward, up and out.



Disassembly

All Models:

A holding fixture made of wood is necessary to conveniently service this unit.

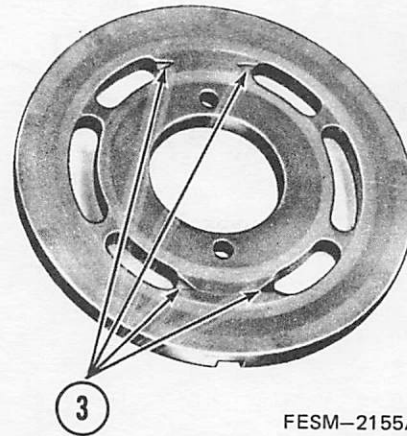
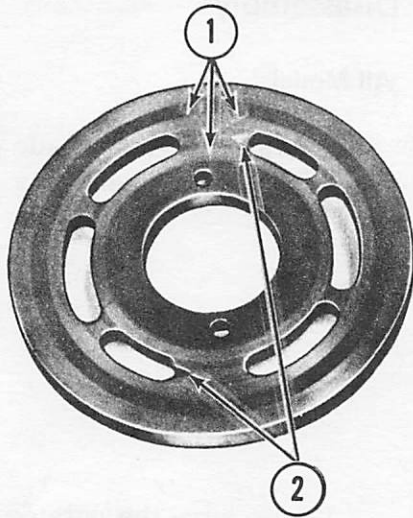
1. Be sure the outside surfaces of the transmission have been thoroughly cleaned. Place the transmission assembly in the holding fixture.

IMPORTANT: Mark the charge pump housing before disassembly, as it is possible to install the pump incorrectly resulting in low charge pump pressure.

2. Remove the charge pump. Remove the capscrews securing the center section housing to the transmission housing.

3. Lift the center section housing from the transmission housing.

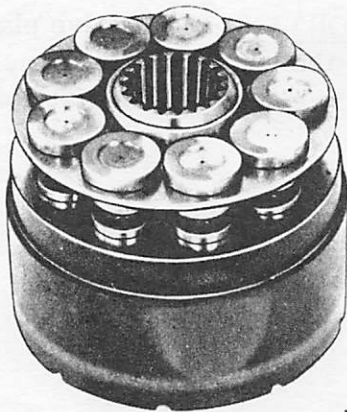
IMPORTANT: The valve plates may stick to the center section housing surface. Be extremely careful not to drop them.



FESM-2155A

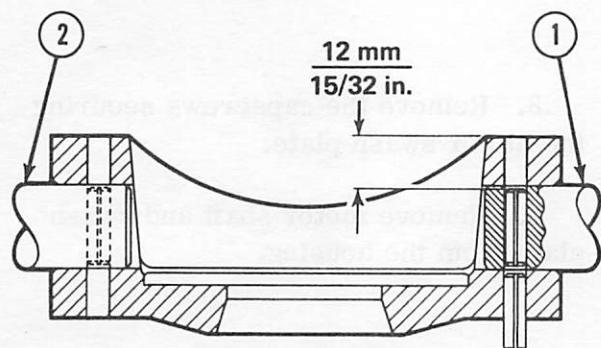
1. Check these areas for wear
2. Pump valve plate (two notches)
3. Motor valve plate (four notches)

4. Remove the pump and motor valve plates (if not removed in step 3) noting the location of each plate. The valve plate with two notches is used on the pump assembly and the plate with four notches on the motor assembly. Remove the valve plate pins.



FESM-2148

5. Tip the transmission housing so that the pump and motor cylinder block assemblies can be removed. Grasp the assemblies so that the pistons will not fall out and be damaged.



Hydraulic pump swash plate.

FESM-4245B

1. Control shaft
2. Trunnion shaft

6. Remove the trunnion shafts from the hydrostatic pump swash plate as follows:

NOTE: Two spring pins are used on the control shaft and one pin is used on the opposite trunnion.

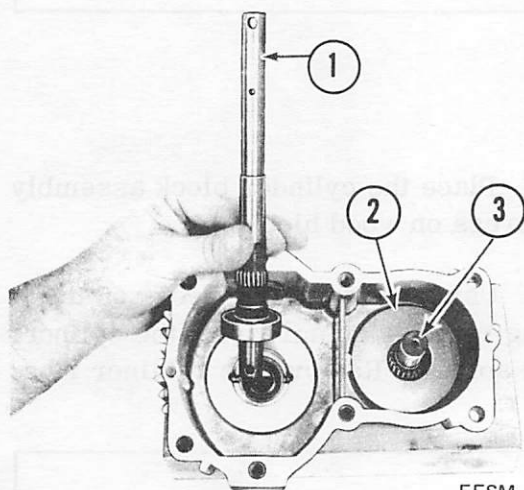
a. Mark or tape a punch exactly 11.9 mm (15/32 inch) from the end.

b. Drive on the spring pins very carefully until the mark on the punch is even with the top surface of the swash plate, a distance of 11.9 mm (15/32 inch). At this point the spring pins should be centered in the trunnion shafts and the shafts are free of the swash plate.

IMPORTANT: Be extremely careful not to drive the top control shaft pin or the trunnion shaft pin through the shaft and into the hole in the bottom of the swash plate as removal is then very difficult. Also if the pins are driven too far, it is possible to drive the pins through the hydrostatic unit housing.

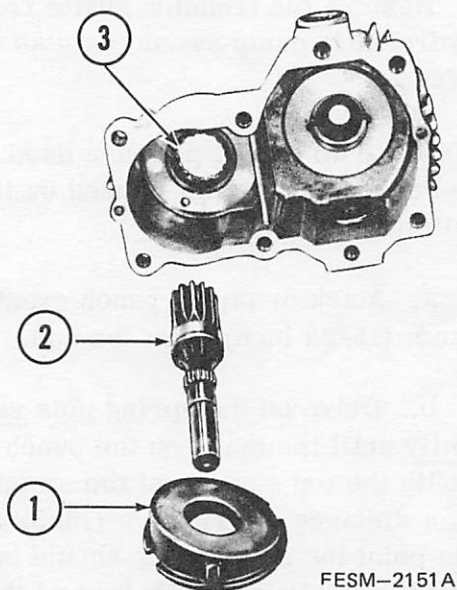
c. Remove the trunnion shafts and swash plate from the transmission case. After the swash plate has been removed, drive out the pin remaining in the lower lower half of the swash plate.

7. Remove the pump shaft assembly.



FESM-2149A

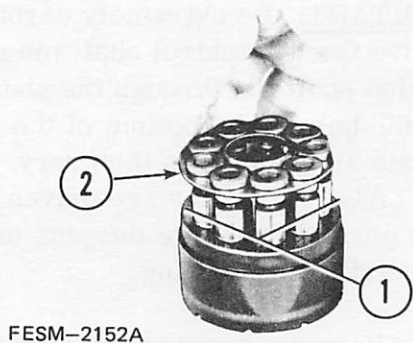
1. Pump shaft assembly
2. Motor swash plate
3. Motor shaft assembly



8. Remove the capscrews securing the motor swash plate.

9. Remove motor shaft and swash plate from the housing.

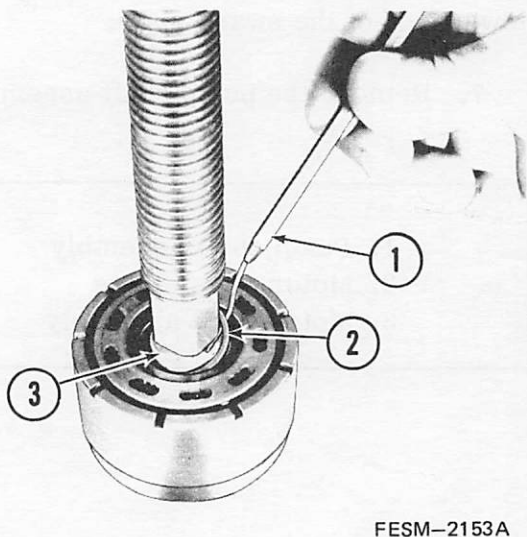
1. Motor swash plate
2. Motor shaft
3. Roller bearing



Inspection and Repair

1. Remove the slipper retainer and pistons.

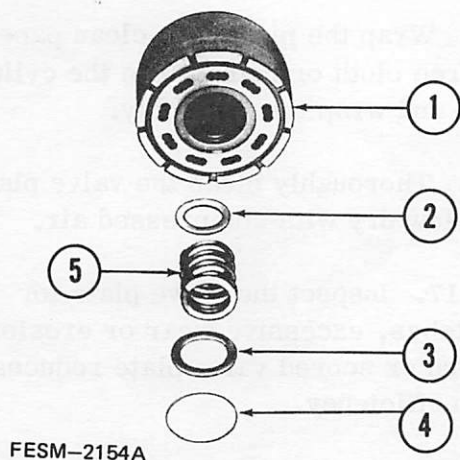
1. Pistons
2. Slipper retainer



2. Place the cylinder block assembly in a press on wood blocks.

3. Using a step plate, press on the spring retainer compressing the cylinder block spring. Remove the retainer ring.

1. 14-57-3 O-ring pick
2. Retainer ring
3. Step plate



1. Cylinder block
2. Spring washer
3. Spring retainer
4. Retainer ring
5. Spring

4. Carefully release the press. Remove the spring retainer, spring and spring washer. Remove the cylinder block from the press.

5. Thoroughly clean all parts and blow dry with compressed air.

6. Check the spring against specifications.

7. Check the cylinder block valve face for damage and the piston bores for excessive wear. Any linear scratches along the length of the bore will reduce efficiency. Check piston fit in the bores.

8. Install the spring washer (bevel side in), spring and spring retainer. Place the assembly in a press.

9. Compress the spring, using a step plate. Install the retaining ring.

10. Release the press and wrap the assembly in clean paper or lint free cloth before setting aside.

11. Remove the pistons from the slipper retainer. Thoroughly clean the pistons and blow dry with compressed air. Be certain center oil passage is open.

12. Carefully inspect each piston for scoring, wear or scratches.

13. Check the slippers for severe scratches or embedded material. Slippers may be lapped, but do not remove more than .127 mm (.005 inch). All slippers must be within .05 mm (.002 inch) thickness of each other.

14. If cylinder bores or pistons are badly worn or scored, a block assembly with pistons is available for replacement. Pistons or block are not serviced as individual parts.

15. Wrap the pistons in clean paper or lint free cloth or reinstall in the cylinder block and wrap the assembly.

16. Thoroughly clean the valve plate and blow dry with compressed air.

17. Inspect the valve plate for scratches, excessive wear or erosion. A worn or scored valve plate reduces pump efficiency.

NOTE: To check the plate for wear, run your finger nail or a sharp pencil across the face of the plate. If wear is felt, replace the plate.

18. Inspect the pin slot and grooves of the valve plate. Clean out any foreign matter and deburr the surface as necessary.

19. Inspect the slipper retainer for damage. A slight wear pattern where the slippers ride is normal. Replace if wear is excessive.

20. Inspect the thrust plate (for the hydraulic pump swash plate) for wear, embedded material, or scoring.

21. Inspect all the bearings and replace as necessary.

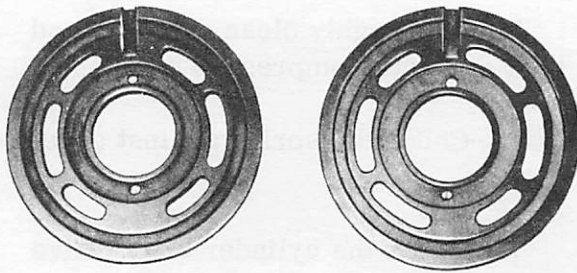
Reassembly

Reassembly is the reverse of disassembly, however, particular attention should be given to the following:

1. Thoroughly lubricate all parts with Hy-Tran.

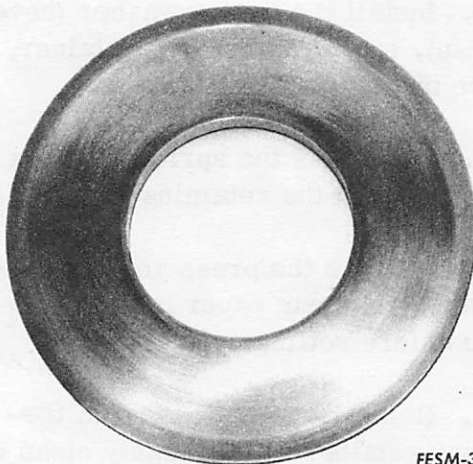
2. Be sure to install the pump swash plate with the thin pad toward the top of the transmission housing.

3. Use all new O-rings, seals and gaskets.



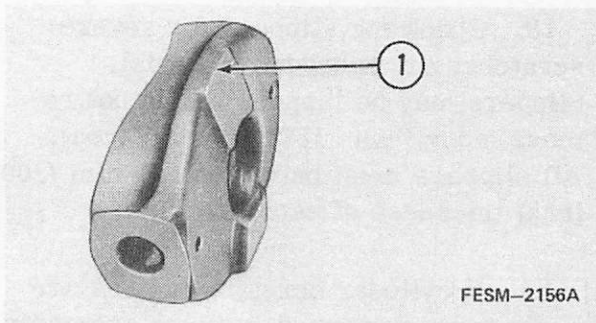
FESM-2147

Valve plates



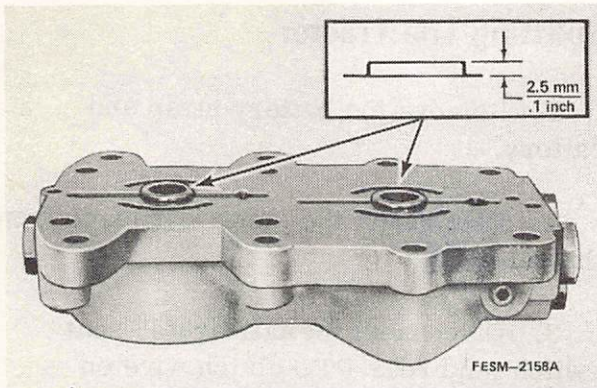
FESM-337

Thrust plate



FESM-2156A

1. Thin pad



4. The valve plate with two notches is used in the pump and the plate with four notches is used in the motor.

5. The thickness of the piston slippers in the block assembly must not vary more than .05 mm (.002 inch) of each other.

6. If new center section needle bearings are installed, they must extend 2.5 mm (.1 inch) above the machined surface of the center section.

7. Install a new oil filter.

Installation

IMPORTANT: Prior to installing the hydrostatic unit onto the differential case, squirt Hy-Tran into the suction line fitting. Turn the unit upside down to allow the oil to flow into the passages. Rotate the pump input shaft and motor output shaft to insure free rotation.

1. Install the hydrostatic unit on the rear frame housing with all the bolts except the ones which hold the cam bracket. Torque the bolts to 41 N·m (30 ft. lbs.).

2. For Models 682 and 782, connect the brake rod to the brake lever and install the brake adjusting screw. Refer to Internal Brakes - Hydrostatic Transmission - Adjustment for brake adjustment procedures.

3. Connect the control cam assembly to the connecting stud ball joint.

4. Secure the control cam assembly to the damper spring plate assembly with the retaining ring.

5. Install the cam bracket, but do not tighten the bolts as the bracket must be adjusted.

6. Install the drive shaft and roll pins. Support the drive shaft when installing the roll pins.

On Model 982 for ease of installation, connect the drive shaft to the transmission first, then align the shaft to the engine flywheel flange. Lubricate the splined transmission input and output shafts and couplings with IH 251 HEP grease.

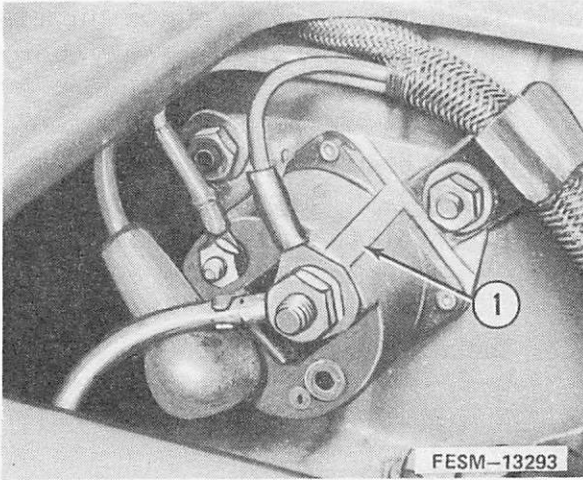
7. Install the hydraulic lines to the control valve.

8. Fill the rear frame to the proper level with Hy-Tran.

9. Adjust the cam bracket. Refer to Cam Bracket Adjustment.

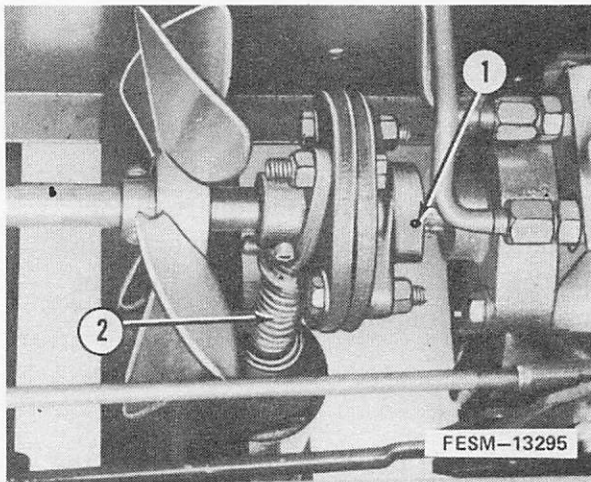
Splitting and Recoupling

Splitting The Tractor



1. Solenoid

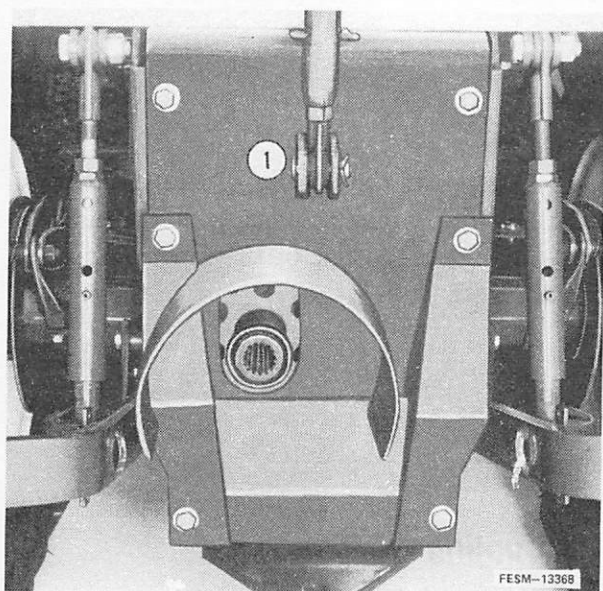
1. Remove the battery strap and battery.
2. Disconnect the electrical leads from the solenoid.
3. Disconnect the tail lights, seat switch (and rear PTO clutch wire on Model 982 so equipped).
4. Remove the foot platform screws.
5. Remove the fender to frame mounting bolts and the battery ground wire. Remove the fender assembly.
6. Remove the frame cover and disconnect the hydraulic lines on units so equipped. Cap and plug the openings.



1. Roll pin
2. Hydraulic jack

7. Support the drive shaft and drive out the roll pin securing the drive shaft to the transmission input shaft.
8. Remove the cam bracket mounting bolts and move the bracket and linkage out of the way.
9. For Models 682 and 782, remove the brake rod.

For Model 982, disconnect the brake rods from the caliper assemblies.

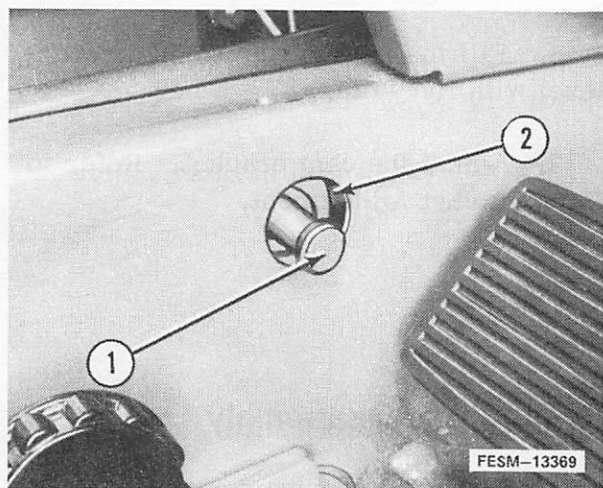


10. For Models 682 and 782, remove the three point if so equipped.

For Model 982 equipped with a three point hitch, remove the hitch assembly as follows:

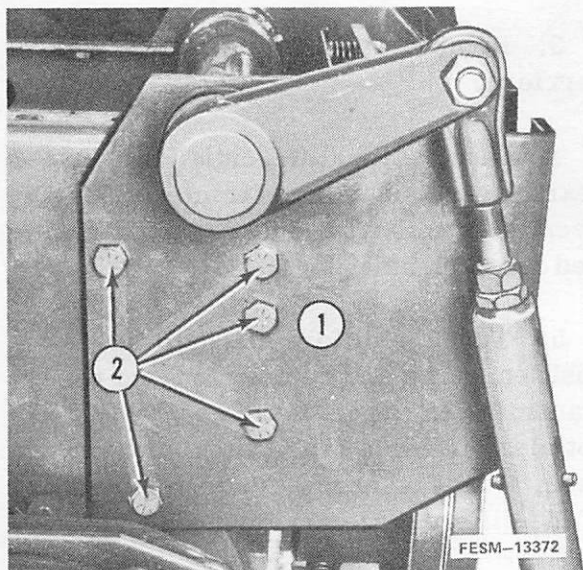
a. Remove the drawbar support plate.

1. Drawbar support plate



b. With the hitch at its highest point, remove the headed pin securing the implement lift bar to the lift bracket. Remove the pin thru the access hole in the RH side of the frame.

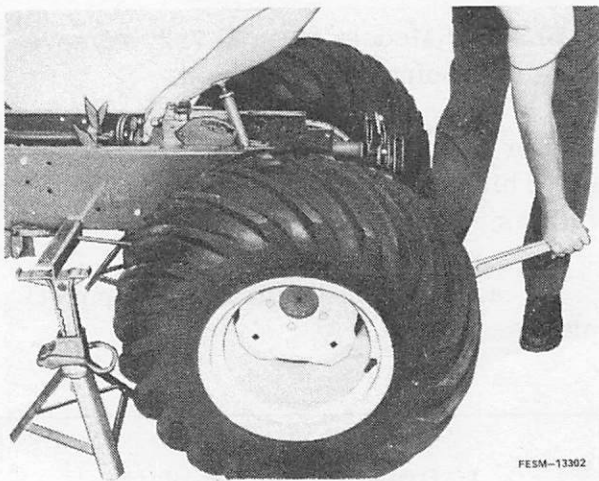
1. Headed pin
2. Access hole



c. Remove the rockshaft support plate mounting bolts. Lift the rockshaft over the PTO clutch if so equipped and rest the assembly on the ground.

d. Remove the clevis pins securing the lower links to the lower link support plate and remove the hitch assembly.

1. Rockshaft support plate
2. Mounting bolts

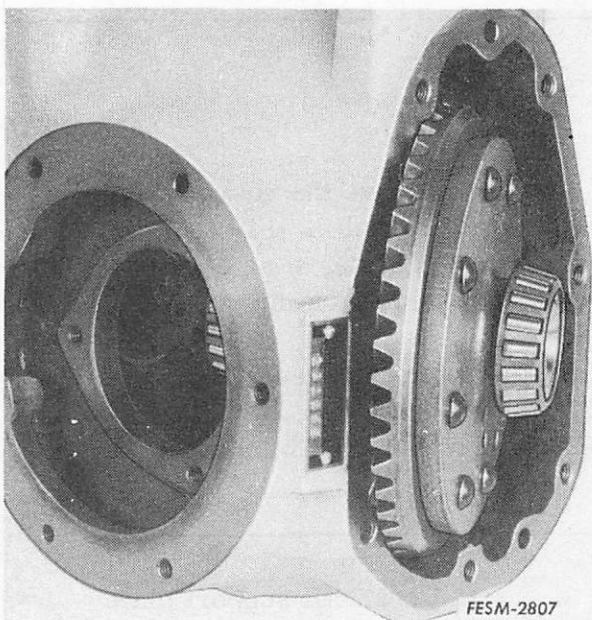


11. Support the frame of the tractor, remove the frame mounting bolts and roll the rear end out of the frame as illustrated.

Recoupling the Tractor

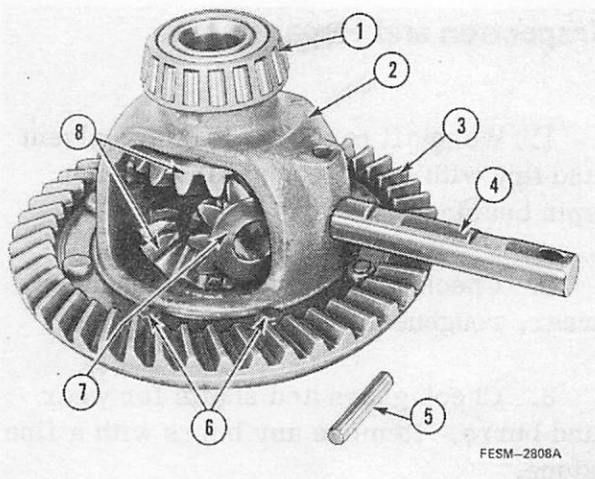
1. Recouple the tractor by reversing the splitting procedure.
2. Fill the rear frame to the proper level with Hy-Tran.
3. Adjust the cam bracket. Refer to Cam Bracket Adjustment.

Differential



Removal and Disassembly

1. Drain the lubricant.
2. Split the tractor.
3. Remove the rear axles and their carriers.
4. Remove the differential carrier bearing cage and shims from each side. Keep the shims with each cage and identified for each side.
5. Turn the differential into the position shown and remove it from the transmission case. If the assembly will not clear the side of the transmission case, it will be necessary to remove one of the differential carrier bearings.



1. Carrier bearing
2. Differential carrier
3. Ring gear
4. Pinion shaft
5. Lock pin
6. Rivets
7. Pinion gear
8. Side gears

6. Drive out the pinion shaft lock pin.

7. Remove the pinion shaft.

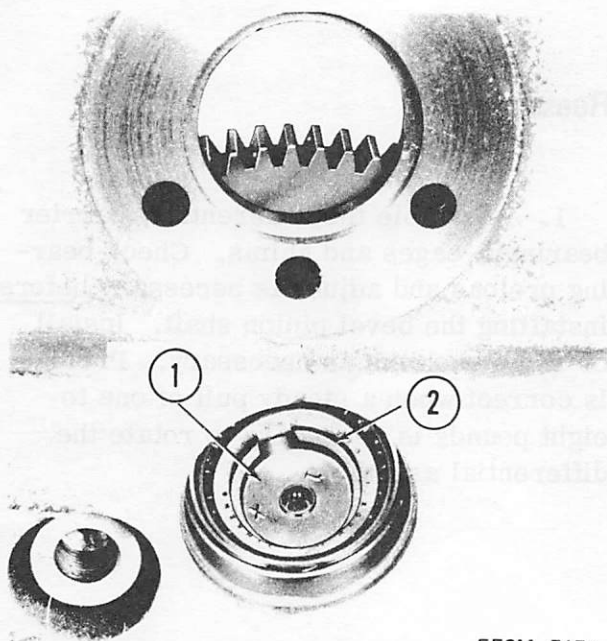
8. Remove the pinion gears and side gears.

9. If the differential drive gear requires separate replacement, press out the eight retaining rivets.

10. Remove the bearing cones from the differential carrier if they are to be replaced.

11. Remove the bearing cups from each cage if replacement is necessary.

12. Remove the hydrostatic drive unit.



13. Remove the bevel pinion shaft expansion plug.

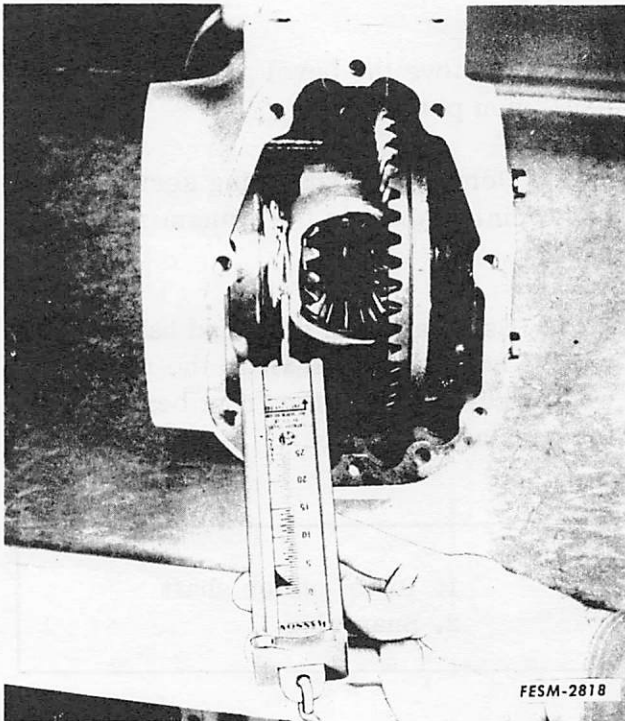
14. Remove the snap ring securing the bevel pinion shaft in the transmission case.

15. Using a brass drift and hammer, tap the bevel pinion shaft to the rear which will release it from the front bearing and the constant mesh gear.

1. Bevel pinion shaft
2. Snap ring

Inspection and Repair

1. Wash all parts in cleaning solvent and dry with compressed air. Do not spin bearings.
2. Check all bearings for looseness, wear, roughness, pitting and scoring.
3. Check gears and shafts for wear and burrs. Remove any burrs with a fine stone.
4. Inspect the housing for cracks, restricted oil passages and dents or raised places on its machine faces. Smooth off raised places with a file.



Reassembly

1. Assemble the differential, carrier bearings, cages and shims. Check bearing preload and adjust as necessary before installing the bevel pinion shaft. Install or remove shims as necessary. Preload is correct when a steady pull of one to eight pounds is necessary to rotate the differential assembly.

2. Remove the differential assembly, keep the shims with the cages.

3. If the original bevel pinion shaft and transmission case is used, skip step 4.

4. If a new bevel pinion shaft, transmission case or rear bearing cup and cone are used proceed as follows:

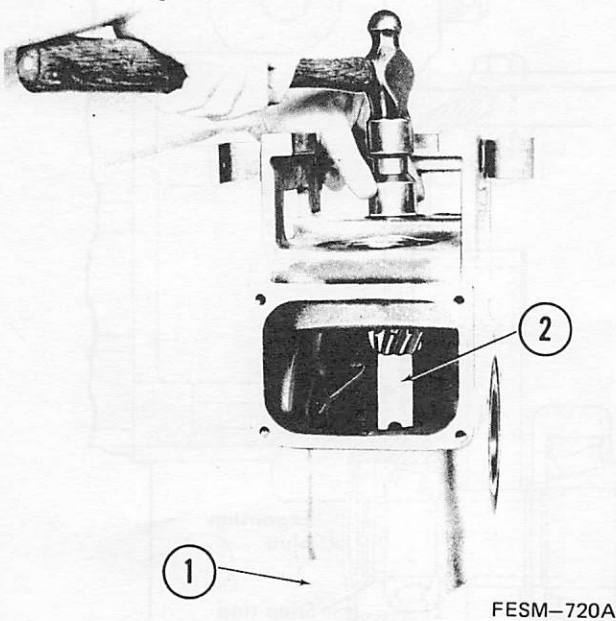
a. Take the number stamped on the case and the number stamped on the end of the bevel pinion shaft and add them together.

b. Add .015 inch.

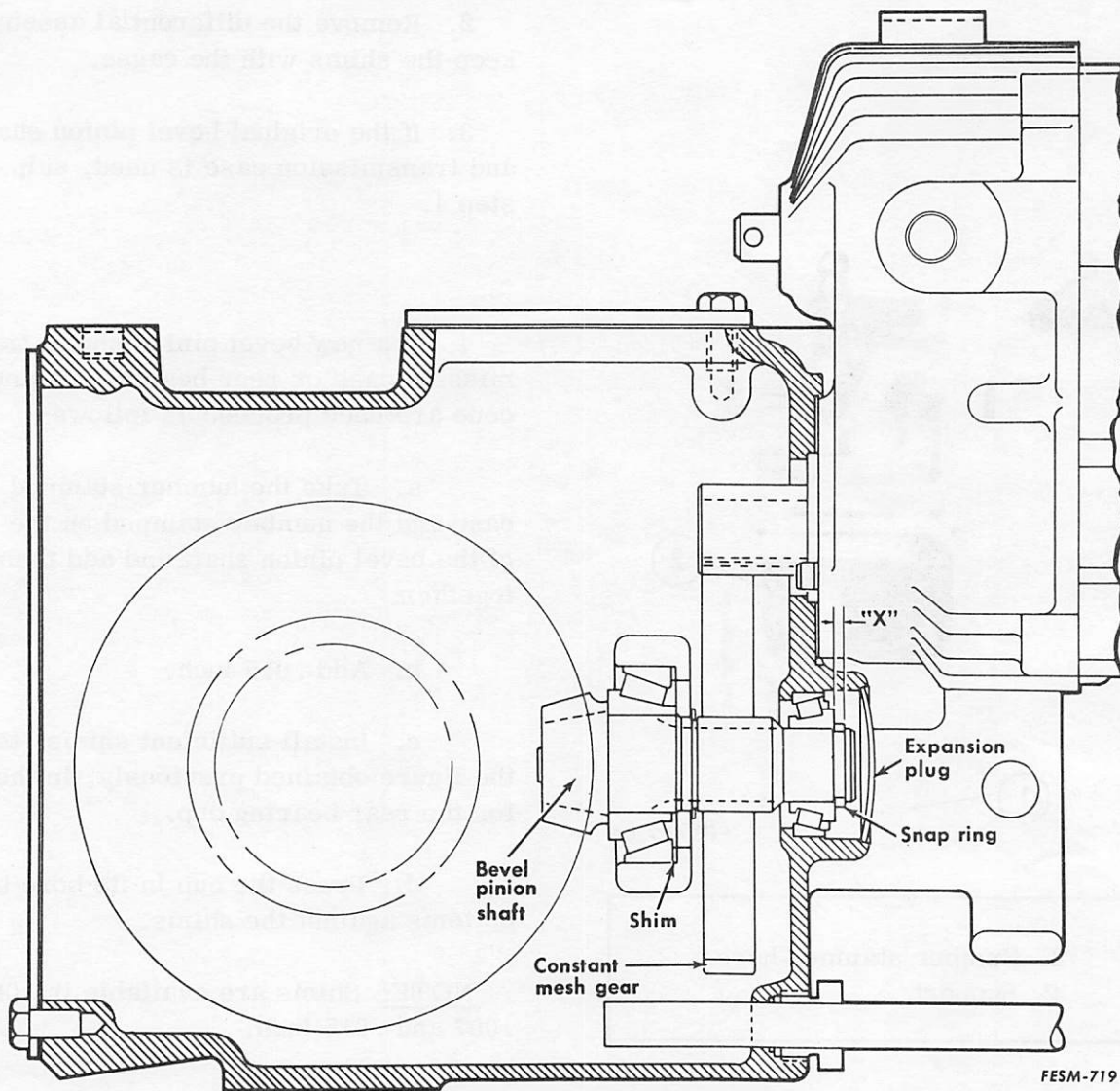
c. Install sufficient shims, to total the figure obtained previously, in the bore for the rear bearing cup.

d. Press the cup in its bore till it bottoms against the shims.

NOTE: Shims are available in .004, .007 and .015 inch.



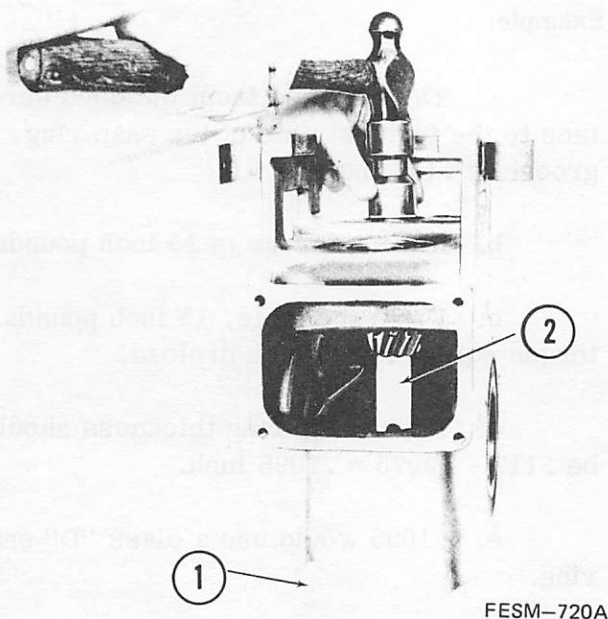
1. Number stamped here
2. Support



5. If it was removed, press the rear bearing cone on the bevel pinion shaft until it bottoms against the shoulder on the shaft.

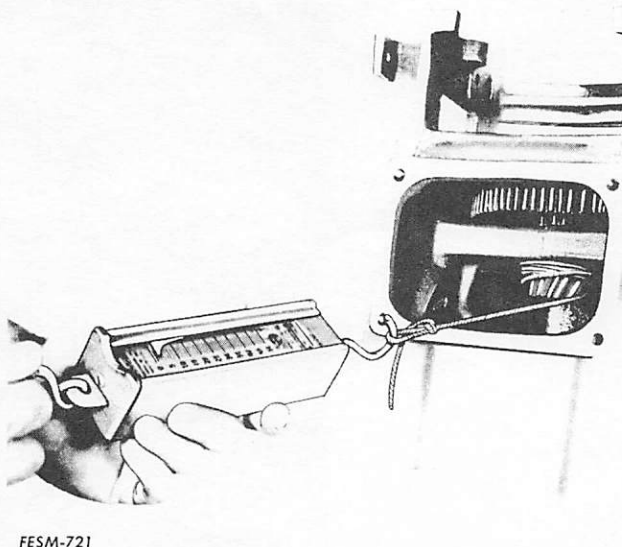
6. Install the constant mesh gear retaining ring on the pinion shaft.

7. Start the bevel pinion shaft assembly in its bore in the rear of the transmission case. Install the constant mesh gear and complete the installation of the bevel pinion shaft assembly.



8. With the bevel pinion shaft supported at the gear end, gradually press or tap the front bearing cone onto the shaft. Rotate the shaft while installing the bearing to be sure the bearing does not get cocked or damaged. Press the bearing cone onto the shaft until the bearings are preloaded within the range of 5 inch pounds to 30 inch pounds rolling torque.

1. Number stamped here
 2. Support



9. With the rolling torque figures obtained in step 8, refer to the table below to determine the amount of axial preload in the assembly at this time.

<u>Rolling Torque - inch lbs.</u>	<u>Preload*</u>
5	.0045
10	.0060
15	.0075
20	.0090
25	.0105
30	.0120

*The distance the bearings are telescoped beyond the desired .003 inch end play.

10. Using a feeler gauge, measure the gap between the cone surface of the front bearing to the furthest edge of the groove for the snap ring. The measurement obtained is to be considered "X".

<u>Class</u>	<u>Snap Ring Thickness Chart</u> <u>(inch)</u>
A	.122 or up
B	.122 - .116
C	.116 - .110
D	.110 or under

11. Using the dimension obtained from the table in step 9, subtract the value of preload from the figure obtained for "X" in step 10. This value will be the correct size for the snap ring to give an average of .003 inch end play.

Example:

a. The distance from the cone surface to the furthest side of the snap ring groove is .117 inch.

b. Rolling torque is 15 inch pounds.

c. From the table, 15 inch pounds torque equals .0075 inch preload.

d. Exact snap ring thickness should be $.117 - .0075 = .1095$ inch.

e. .1095 would use a class "D" snap ring.

12. Install the snap ring selected and be sure it bottoms in its groove. Tap the pinion shaft back to seat the front bearing against the snap ring.

13. Install a new expansion plug.

14. Install the differential assembly, keeping the preload shim pack correct as previously established. Drive gear must be on the right with teeth facing left.

15. Check the backlash between the drive gear and bevel pinion and the gear teeth bearing pattern as follows.

16. Apply a thin coat of red lead or prussian blue to the bevel pinion teeth faces, then rotate the gears by hand and observe the bearing pattern.

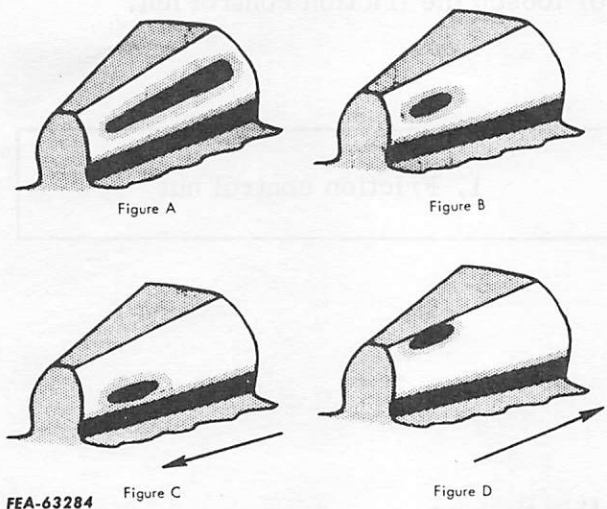
Some deflection will occur under load. Allowance is made in gear design to prevent concentration of load on teeth edges.

17. Hand testing and very light loads should provide a pattern as shown in Figure "B". When load and deflection increases the pattern will progress as in Figure "A".

18. The desirable (no load) pattern in Figure "B" is the result of adjusting the drive gear lateral position to the specified range of .003 to .005 inch backlash.

19. Tooth bearing position from the root to the crown of the tooth is controlled by lateral position of the bevel pinion. If low tooth bearing on bevel pinion is indicated (as shown in Figure "C") the bevel pinion must be adjusted toward the drive gear. If high tooth bearing on the bevel pinion is indicated (as shown in Figure "D") the bevel pinion must be adjusted away from the drive gear.

NOTE: If it is necessary to move the bevel pinion in or out to correct "Root-to-crown" bearing, the drive gear must also be moved laterally to maintain the specified backlash.



20. Install the rear axles and wheels.

NOTE: The right side axle carrier mounting bolt hole located at the nine o'clock position is tapped through the differential case. The bolt installed in this hole should be coated with IH Gasket-maker to prevent oil seepage past the threads.

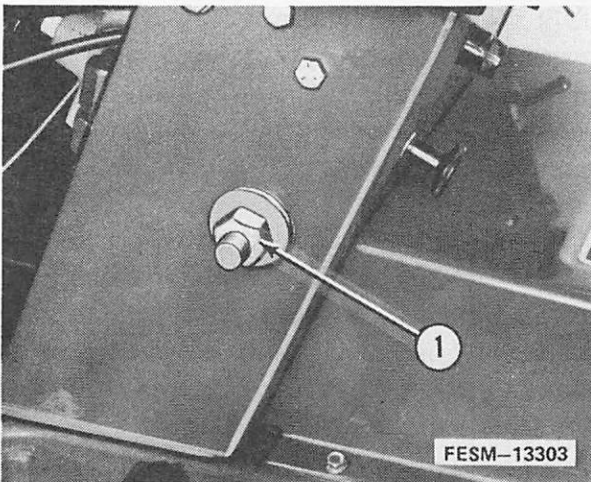
21. Install the hydrostatic drive.

22. Recouple the tractor.

Speed Control Lever Adjustment



The speed control lever is properly adjusted when a pull of 31 to 36 N (7 to 8 lbs.) on a scale keeps the handle in motion.



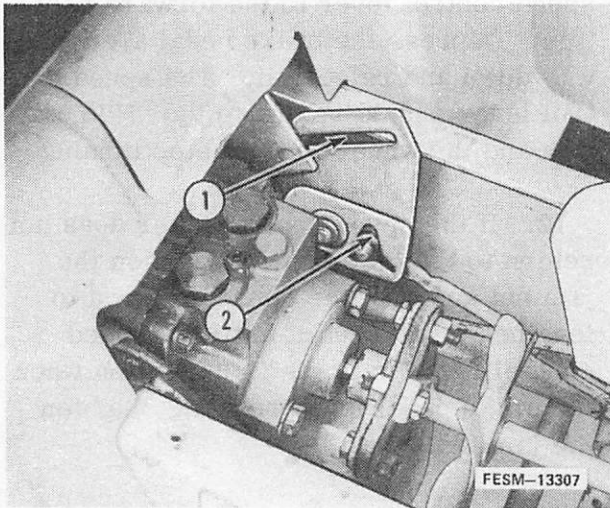
To adjust the speed control lever remove the LH side engine panel and tighten or loosen the friction control nut.

1. Friction control nut

Cam Bracket Adjustment

NOTE: The brake (neutral return) pedal and the speed control lever must be properly adjusted before beginning the cam bracket adjustment.

If the tractor creeps in the "N" position or, if the speed control linkage has been disassembled or removed, the following adjustment must be made.



1. Cam control slot
2. "T" slot

1. Lubricate the "T" slot in the cam bracket and the cam control assembly slot with IH 251H E. P. or its equivalent.

2. Block the tractor so the rear wheels are off the ground and the tractor is secured so it can not move.

3. Move the speed control lever to the "F" or forward position.

4. Loosen the cam bracket mounting capscrews if not previously left loose.

5. Move the cam bracket to its highest position in the slotted holes and tighten the capscrews slightly to hold it in place.

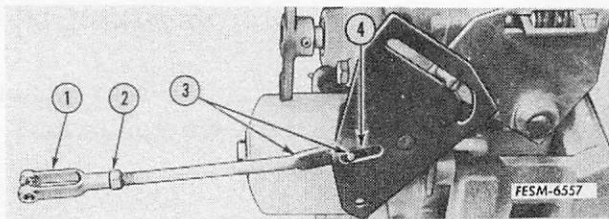
6. Start the engine and with a punch and hammer adjust the cam bracket downward until the wheels stop turning.

7. Move the speed control lever to the forward position. Depress the brake pedal and lock in place.

8. If there is excessive vibration or noise in the transmission when the brake pedal is depressed, adjust the cam bracket to eliminate the noise.

9. Release the brake pedal and stop the engine.

10. Move the speed control lever to the "F" position and tighten the cam bracket capscrews.



1. Clevis
2. Jam nut
3. "N" return rod
4. Speed control cam slot

11. With the engine running, move the speed control lever to the forward position. Depress the brake pedal all the way down and release it. The speed control lever should return to the "N" position and the wheels should stop turning.

12. If the speed control lever does not return to the "N" position, loosen the jam nut and turn the connecting rod to lengthen or shorten it until the speed control lever is in the "N" position when the brake pedal is depressed. Tighten the jam nut.

13. Check the rod in the speed control cam slot. The rod should not be touching the end of the slot when the brake pedal is fully depressed.

14. If the rod touches the end of the slot adjust as follows:

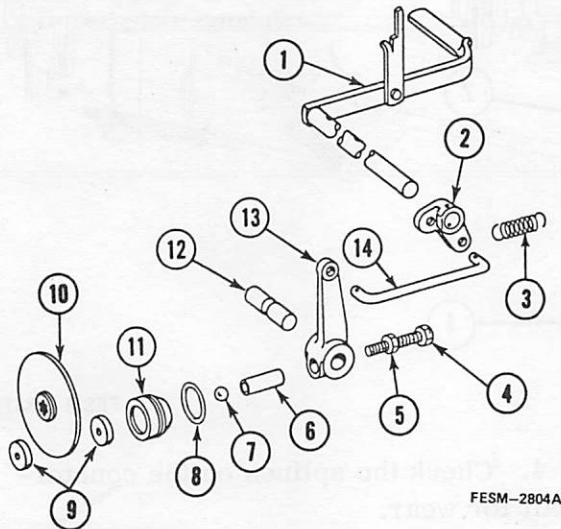
Remove the clevis end of the rod from the brake cross shaft. Loosen the jam nut and turn the clevis to lengthen the rod to prevent it from hitting the end of the slot.

15. Tighten the jam nut and install the clevis on the brake cross shaft.

INTERNAL BRAKES

Standard Transmission

Model 582

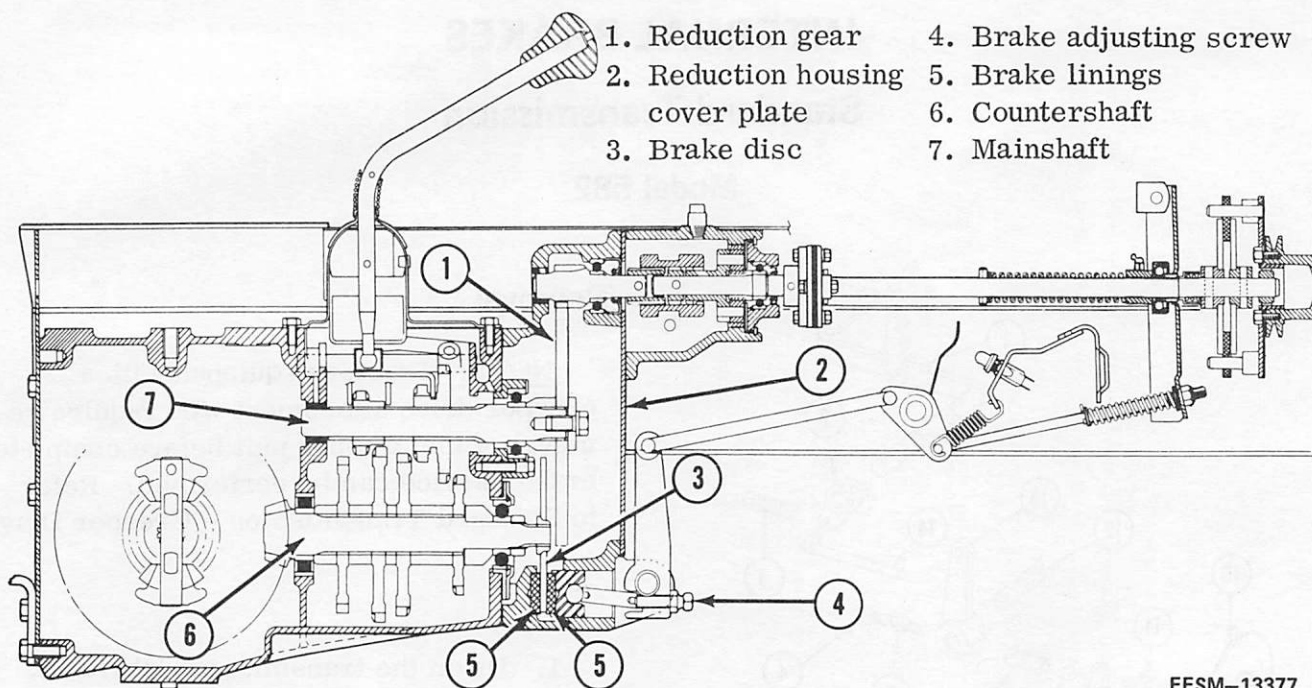


1. Clutch and brake pedal
2. Arm
3. Return spring
4. Adjusting screw
5. Lock nut
6. Push rod
7. Ball
8. O-ring
9. Lining disc
10. Brake disc
11. Retainer
12. Pivot pin
13. Brake lever
14. Brake rod

Removal

NOTE: Tractors equipped with a creeper drive attachment will require removal of the creeper unit before complete brake service can be performed. Refer to Standard Transmission - Creeper Drive.

1. Drain the transmission lubricant.
2. Remove the brake adjusting screw and lock nut from its lever.
3. Remove the brake lever, pivot pin and push rod.
4. Remove the reduction housing front cover plate and slide it forward on the clutch shaft. Also see "Note" above.



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5. Remove the reduction gear from the front of the transmission main shaft.

6. Move the gear upward and the bottom of the gear forward to clear the cover screw bosses as the gear is lifted from the housing.

7. Slide the brake disc forward on the countershaft as the front lining and retainer are moved forward in their bore.

NOTE: Both linings and the disc can be removed without removing the front lining retainer; however, removal of the retainer is recommended for inspection and replacement of the retainer O-ring.

Inspection

1. Inspect the control rods and levers for wear at their connecting pivot points.

2. Inspect the linings and disc for wear.

3. Inspect the disc hub splines for wear.

4. Check the splines on the countershaft for wear.

5. Check the pedal return spring ends for wear.

Installation

1. Clean the brake cavity and lining recess in the reduction housing.

2. Place a small quantity of grease in the rear brake lining recess in the reduction housing then insert the lining.

3. Install the brake disc on the countershaft and slide it rearward against the rear lining.

4. Install the front lining in the retainer.

5. Install a new O-ring on the front lining retainer, lubricate the retainer and O-ring then push them into the retainer bore in the reduction housing.

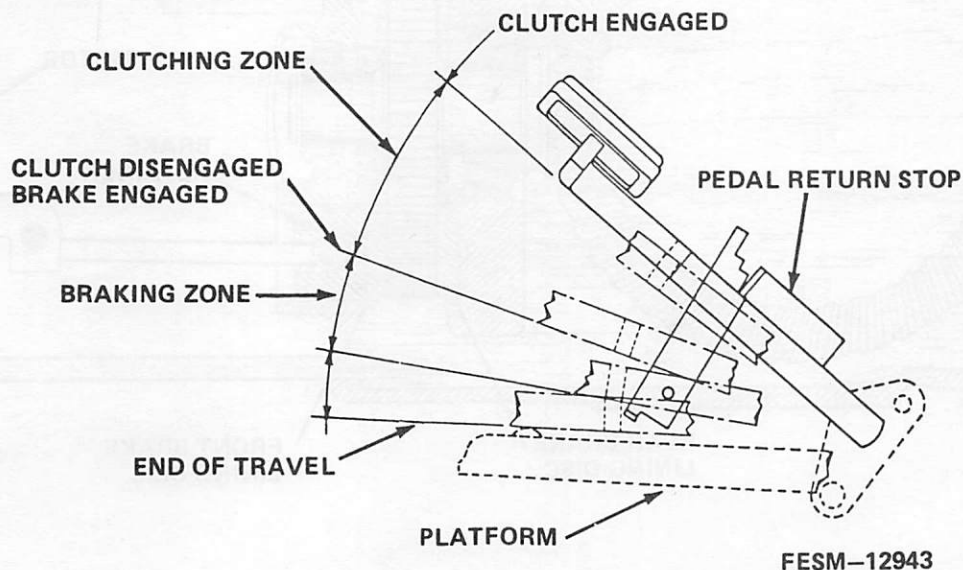
6. Install the reduction gear on the transmission main shaft and secure with flat washer, lock washer and capscrew. Tighten capscrew to 75 N·m (55 ft. lbs.).

7. Install a new cover gasket; then install the cover plate.

8. Be sure the ball is in place in the front lining retainer; then install the push rod, lever, pivot pin, adjusting screw and lock nut.

9. Fill transmission to proper level with Hy-Tran.

Adjustment



The brake should engage when the pedal arm is pressed down to within a maximum of 33 mm (1-5/16 inches) and a minimum of 19 mm (3/4 inch) distance above the top of the left foot support, which serves as the pedal stop.

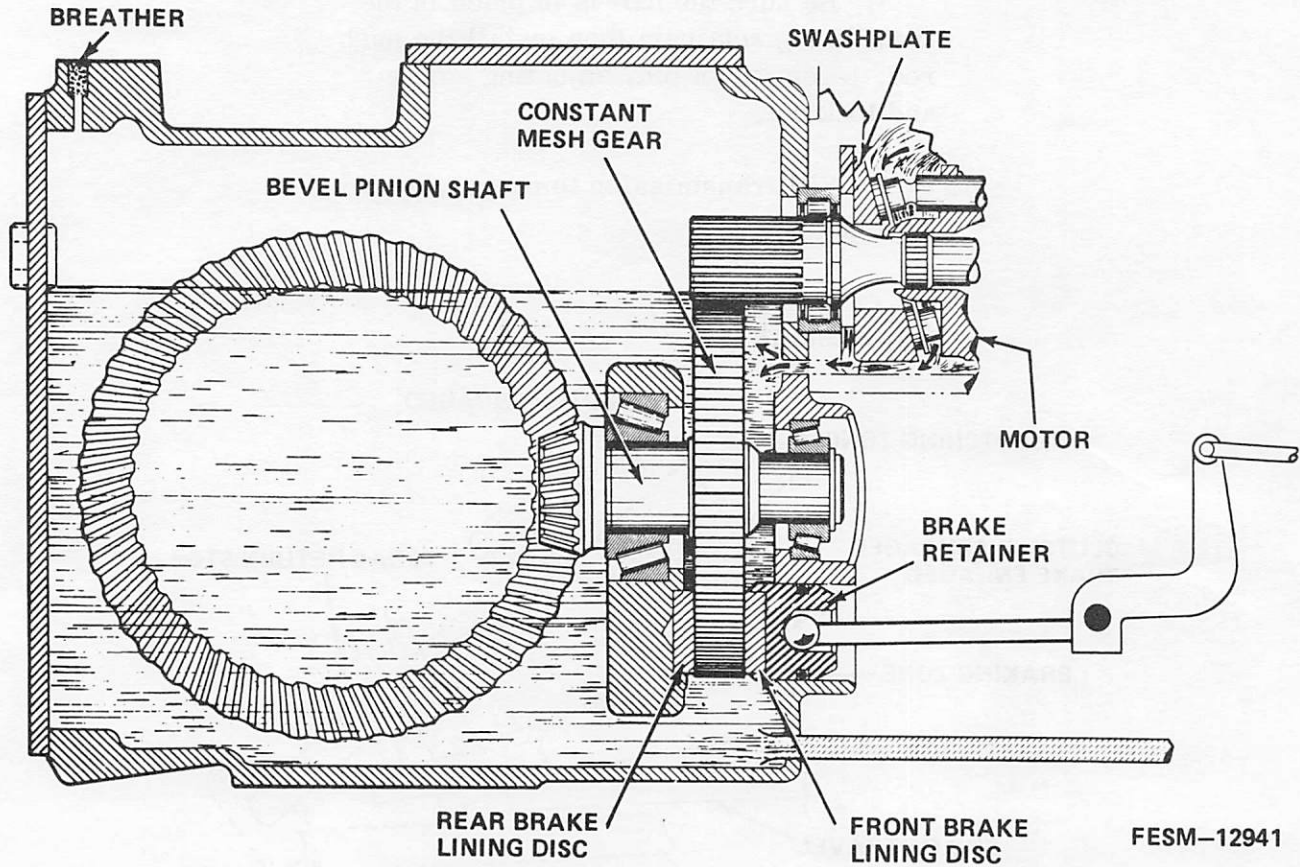
To adjust, loosen the lock nut and turn the brake lever adjusting screw in or out as required.

It may be possible to push the pedal all the way down to the pedal stop, but this is of no concern as long as the brake is engaged within above limits.

Hydrostatic Transmission

Models 682 & 782

Removal



1. Drain the lubricant.
2. Split the tractor.
3. Remove the differential.
4. Remove the bevel pinion shaft and constant mesh gear.
5. Remove the rear brake lining disc.
6. Using pliers, remove the brake disc retainer.
7. Remove the brake lining disc from the retainer.

Inspection

1. Inspect the control rods and levers for wear at their connecting pivot points.
2. Inspect the brake lining discs and the constant mesh gear for wear.
3. Check the pedal return spring ends for wear.

Installation

1. Clean the brake cavity and lining recess in the transmission case.

2. Place a small quantity of grease in the rear brake lining recess in the transmission case; then install the brake lining.

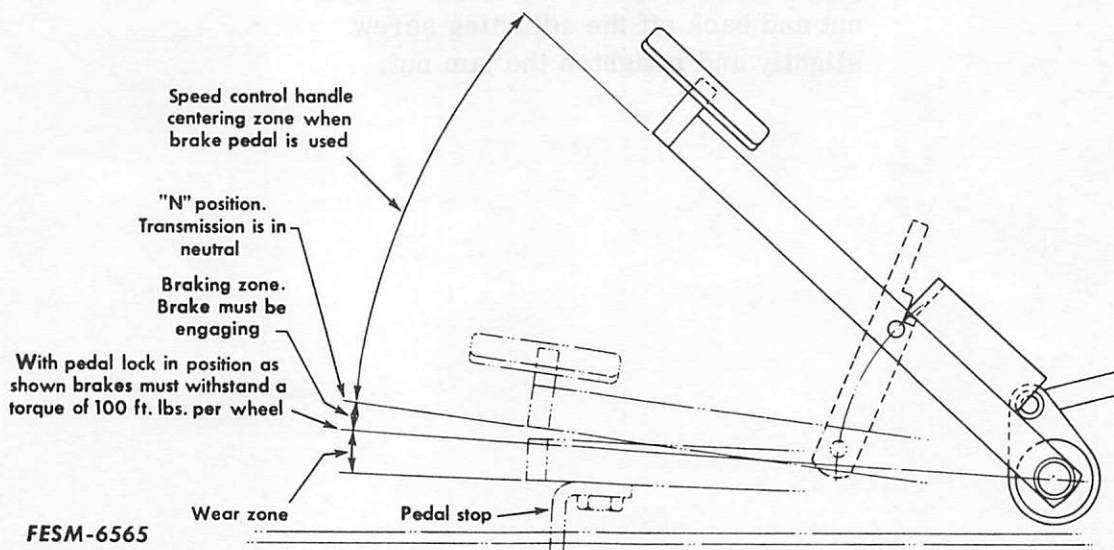
3. Install the front brake lining disc in the retainer.

4. Install a new O-ring on the front lining retainer, lubricate the retainer and O-ring, then push them into the retainer bore in the transmission case.

5. Reassemble the transmission case. Refer to Hydrostatic Transmission - Differential - Reassembly.

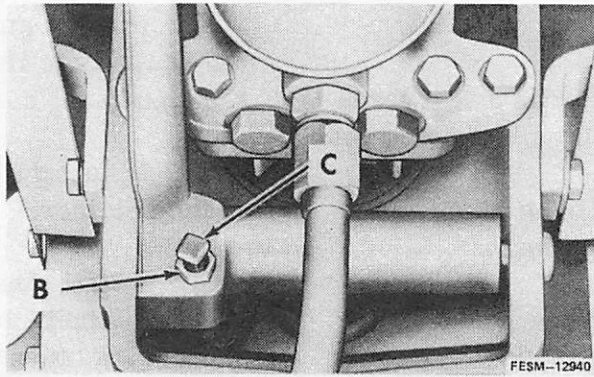
6. Fill the transmission to the proper level with Hy-Tran.

Adjustment



1. Block the front tires and support the rear end so one rear tire is off the ground and free to turn.

2. Place the brake pedal in the up position.



3. Loosen the jam nut "B". Then tighten the brake lever adjusting screw "C" until finger tight (8 to 10 inch pounds). Retighten the jam nut "B" while holding the adjusting screw "C".

4. Actuate the brake pedal through a full stroke at least one time.

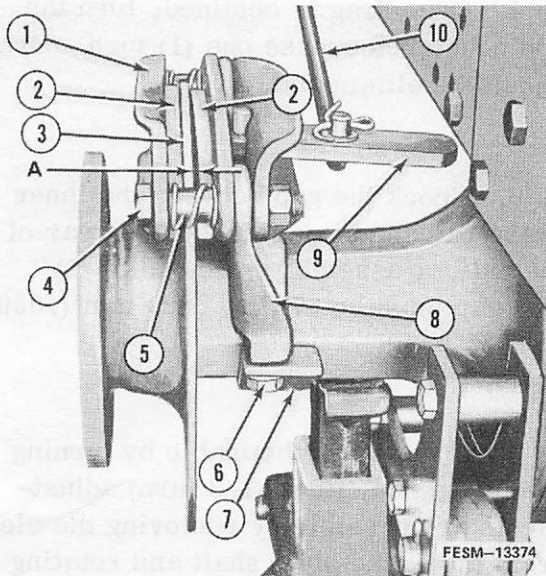
5. Repeat step 3.

6. If the brake drags with the brake pedal in the up position, loosen the jam nut and back off the adjusting screw slightly and retighten the jam nut.

EXTERNAL BRAKES

Hydrostatic Transmission

Model 982



1. Caliper assembly
2. Brake pads
3. Brake disc
4. Capscrew
5. Spacer and spring
6. Capscrew
7. Mounting flange
8. Bracket assembly
9. Brake arm
10. Brake rod

Removal

1. Remove the cotter pin and washer and disconnect the brake rod from the brake arm.
2. Remove the capscrews from the mounting flange and remove the brake assembly from the axle carrier.
3. Remove the capscrews securing the caliper assembly to the bracket assembly.

Inspection and Repair

1. Inspect the control rods and levers for wear at their connecting pivot points.
2. Inspect the brake pads for excessive wear. Replace if necessary.
3. Check the brake discs for excessive wear or damage.
4. Check the ends of the pedal return springs for wear.

Installation

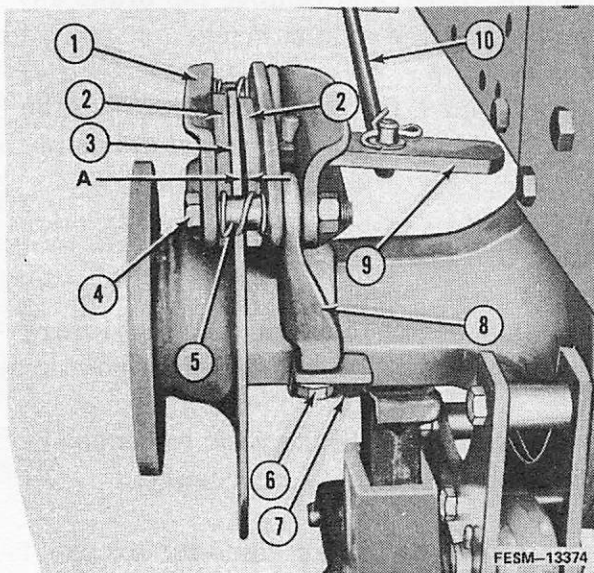
1. Assemble the caliper assembly to the bracket assembly. Be sure to install the spacers and springs.
2. Install the caliper assembly and bracket assembly on the disc and axle carrier.
3. Install the brake rods in the brake arms.

Adjustment

1. Raise the rear of the tractor and support with safety stands. Be sure both tires are off the ground.

NOTE: Adjust the LH side brake first and make all adjustments one (1) turn at a time.

2. Rotate the wheel and notice the amount of drag put on the brake disc by the brake pads.



3. Disconnect the brake rod from the brake arm. Shorten the rod by turning it clockwise in the clevis until drag is noticeable on the brake disc when the wheel is rotated.

4. Once drag is obtained, turn the rod counterclockwise one (1) turn. Drag should be eliminated.

5. Check the gap between the inner brake pad and brake disc at the rear of the caliper assembly, dimension "A". The gap must be .762 to .889 mm (.030 to .035 inch).

If the gap is unobtainable by turning the brake rod, finer (1/2 turn) adjustments are possible by removing the clevis from the brake pivot shaft and rotating it 1/2 turn.

6. Repeat the above procedures for the RH side brake.

7. Once both brake assemblies are adjusted and clearance gaps obtained, test the tractor for equal braking.

Driving forward at a moderate speed, apply the neutral return (clutch) pedal. If the tractor brakes unevenly (pulls left or right), adjust the RH side brake rod until equal braking is obtained.

Transaxle

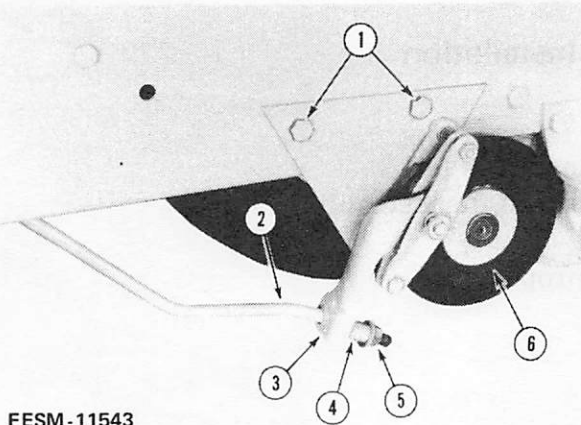
Model 582 Special

Removal and Disassembly

1. Support the tractor and remove the left rear wheel.

2. Disconnect the brake control rod from the clutch shaft.

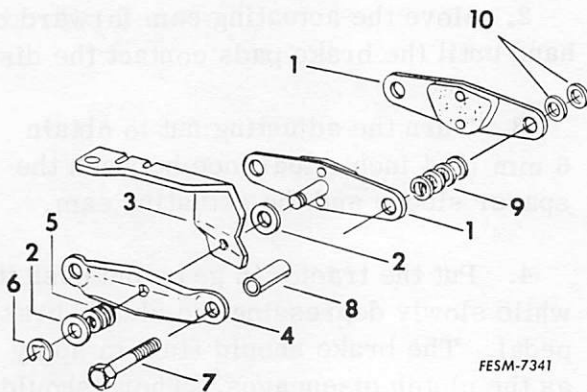
3. Remove the mounting bolts securing the brake assembly to the frame and remove the brake assembly.



FESM-11543

- 1. Mounting bolts
- 2. Control rod
- 3. Actuating cam

- 4. Sleeve spacer
- 5. Adjusting nut
- 6. Brake disc



FESM-7341

- 1. Brake plate
- 2. Thrust washer
- 3. Actuating cam
- 4. Actuating plate
- 5. Spring
- 6. Retaining ring
- 7. Bolt
- 8. Bushing
- 9. Spring
- 10. Spacer washer

4. Remove the retaining ring from the brake plate and disassemble the brake.

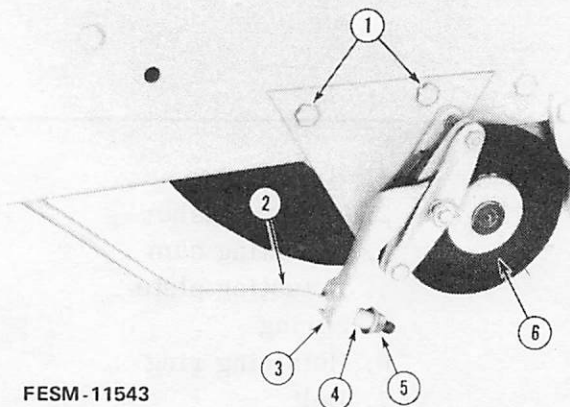
Inspection and Repair

Inspect all parts for wear, scoring or breaking and replace as necessary.

Reassembly and Installation

1. Reassemble and install in the reverse order of removal and disassembly.
2. Adjust the brake properly as follows:

Adjustment



FESM-11543

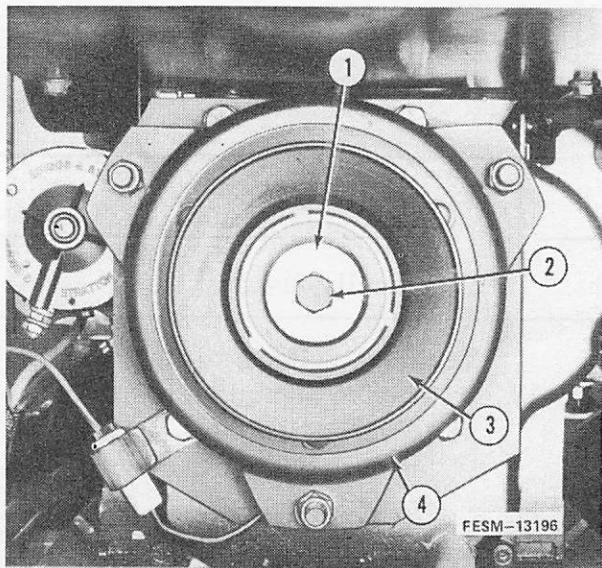
1. Mounting bolts
2. Control rod
3. Actuating cam
4. Sleeve spacer
5. Adjusting nut
6. Brake disc

1. The clutch-brake pedal should be in the raised (clutch engaged) position.
2. Move the actuating cam forward by hand until the brake pads contact the disc.
3. Turn the adjusting nut to obtain 6 mm (1/4 inch) clearance between the spacer sleeve and the actuating cam.
4. Put the tractor in gear and push it while slowly depressing the clutch-brake pedal. The brake should start to apply as the clutch disengages. There should be no neutral or free zone between the braking and clutch action. Adjust the brake as necessary.

FRONT PTO CLUTCH

Troubleshooting

PROBLEM	CAUSE	TEST
Clutch does not engage	1. Blown fuse.	1. Visually inspect.
	2. Broken wire or bad connection.	2. Check voltage at clutch wire. Voltage should be more than 10 volts. If there is no reading check for broken wires or connections.
	3. Faulty field coil.	3. Make sure that the coil is making good ground contact. Engage the clutch and check the amperage draw at the battery. Normal amperage draw is 3.5 to 4.0. A reading outside these figures indicates a faulty coil.
Engine driven attachment rotates slower than normal	1. Loose drive belt.	1. Check and adjust belt tension.
	2. Attachment not turning freely.	2. Remove drive belt and check that the attachment turns freely.
	3. Grease, oil, dirt or other contaminant in pulley grooves or on clutch faces.	3. Check and clean.
	4. Intermittent break or poor connection in wiring.	4. Check and repair.



1. Washer
2. Retaining bolt
3. Armature assembly
4. Brake flange

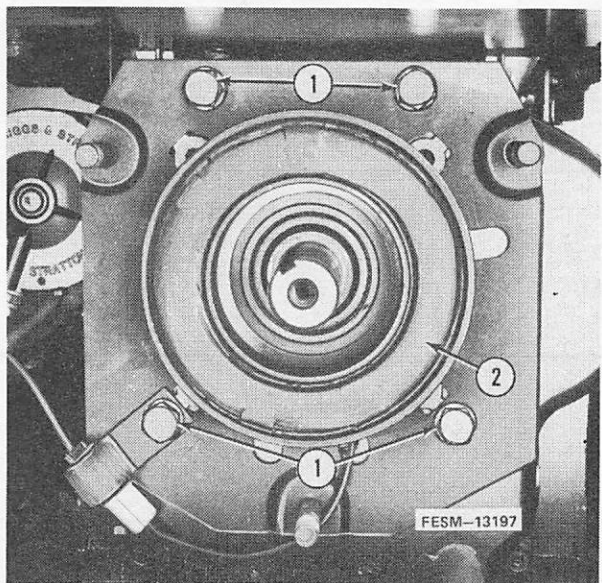
Removal

1. Disconnect the battery ground cable and the clutch wire.

2. Remove the grille housing and hood as an assembly.

3. Remove the brake flange.

4. Remove the retaining bolt, washer and armature assembly.

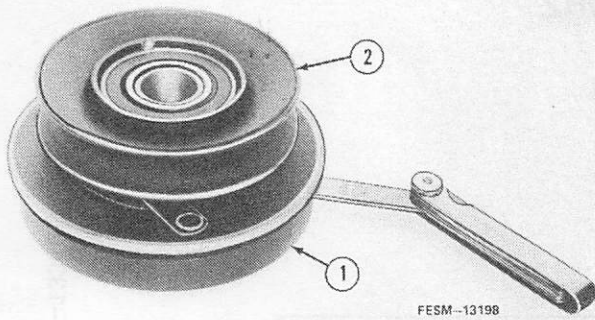


1. Mounting bolts
2. Field coil

5. Remove the rotor and key from the crankshaft.

6. To remove the field coil, remove the mounting bolts

Installation and Adjustment



1. Armature assembly
2. Rotor

1. Prior to installation, check the clearance between the armature assembly and the rotor. Using a feeler gauge, check the clearance at three evenly spaced locations. There should be a gap of 1.5 to 3.2 mm (.060 to .125 inch). If the gap is exceeded, the armature assembly and rotor should be replaced.

2. Install the field coil.

3. Install the rotor and key on the crankshaft.

4. Install the armature assembly, washer and retaining bolt.

5. Install the brake flange.

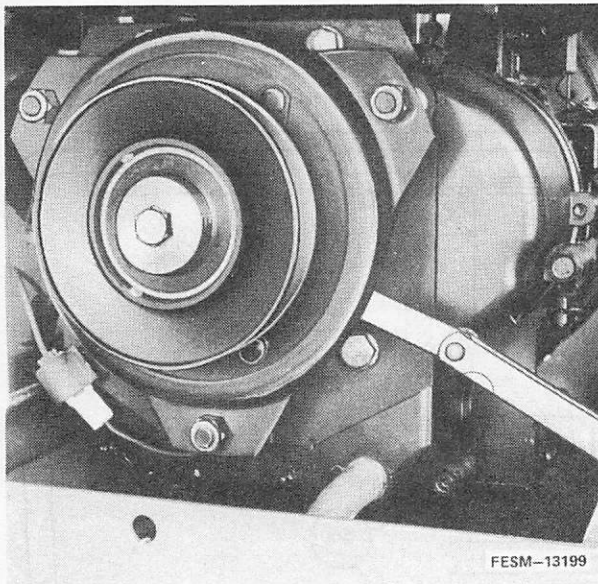
6. Adjust the clutch as follows:

a. With the clutch disengaged, check the clearance between the rotor and armature assembly. Using a feeler gauge, check the clearance at both access slots between the ears of the brake flange. The air gap must be .25 to .38 mm (.010 to .015 inch).

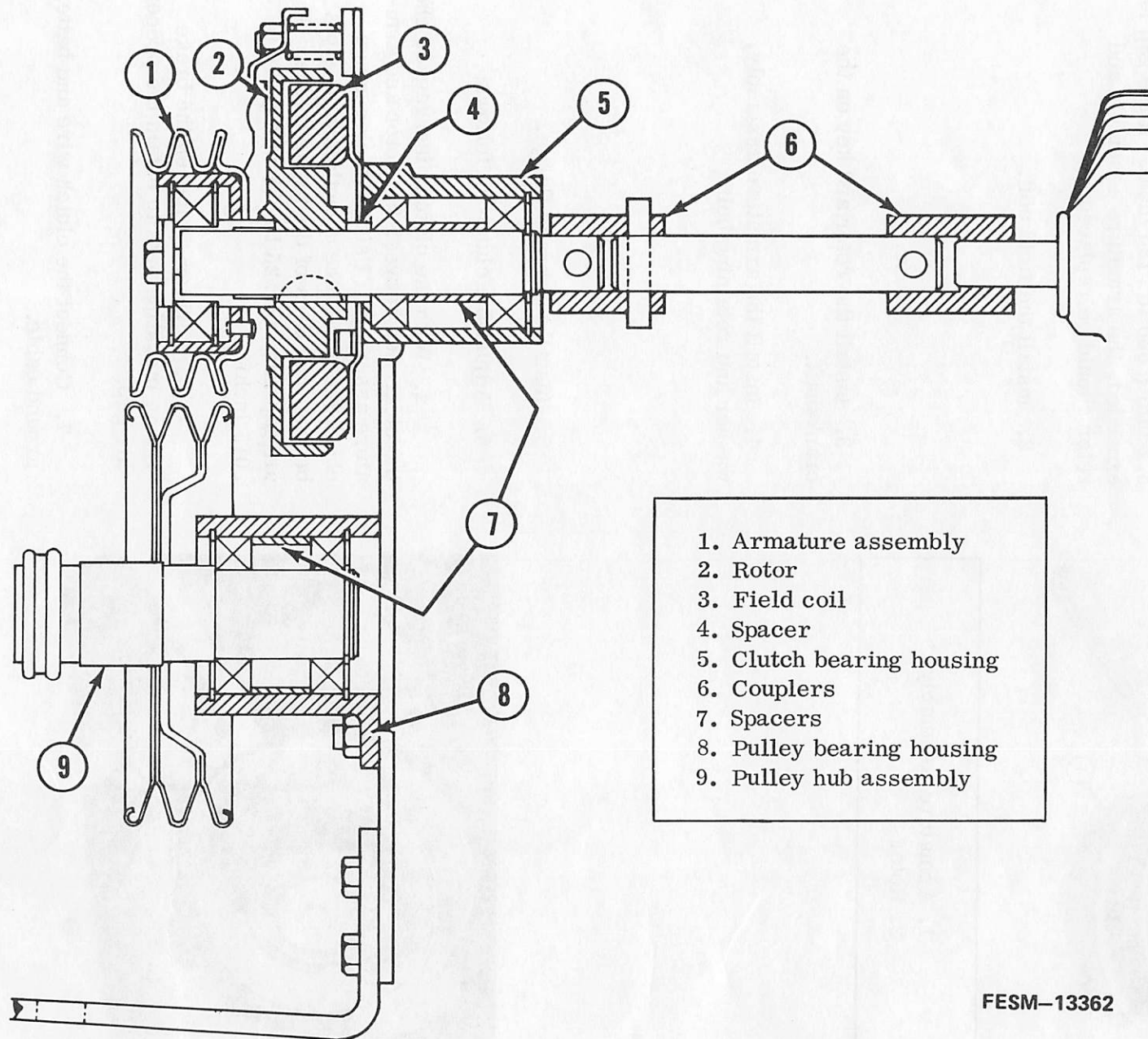
b. Tighten or loosen the brake flange mounting nuts to obtain the proper air gap.

7. Connect the clutch wire and battery ground cable.

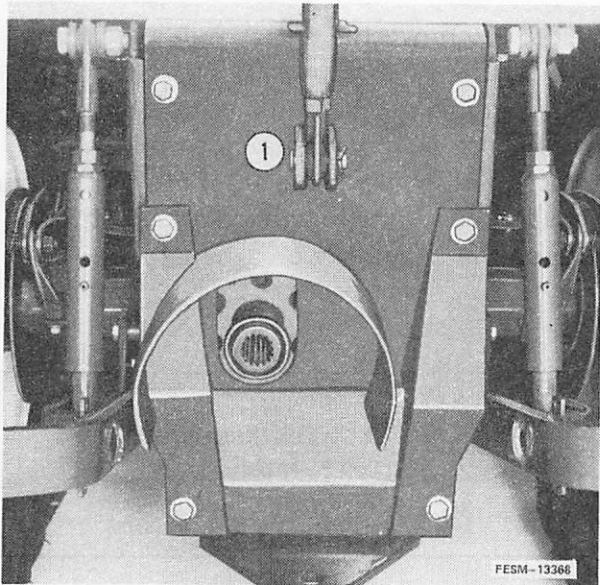
8. Install the hood and grille assembly.



REAR PTO CLUTCH AND HITCH MODEL 982



FESM-13362

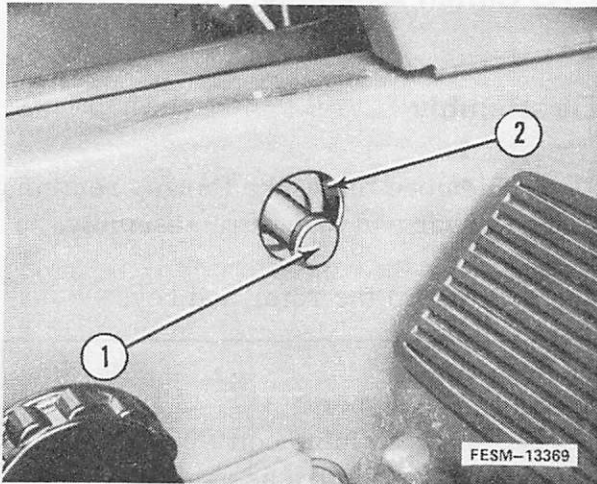


Removal

To remove the PTO clutch assembly it is necessary to first remove the three point hitch. Use the following procedure:

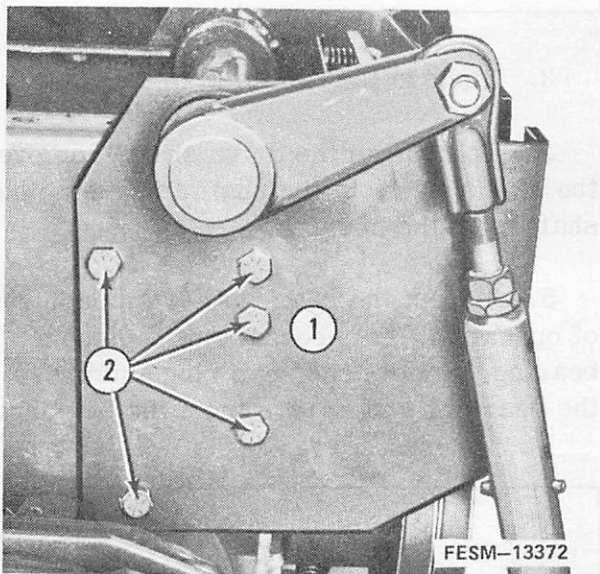
1. Remove the fender assembly.
 - a. Remove the drawbar support plate.
 - b. Remove the frame cover.

1. Drawbar support plate



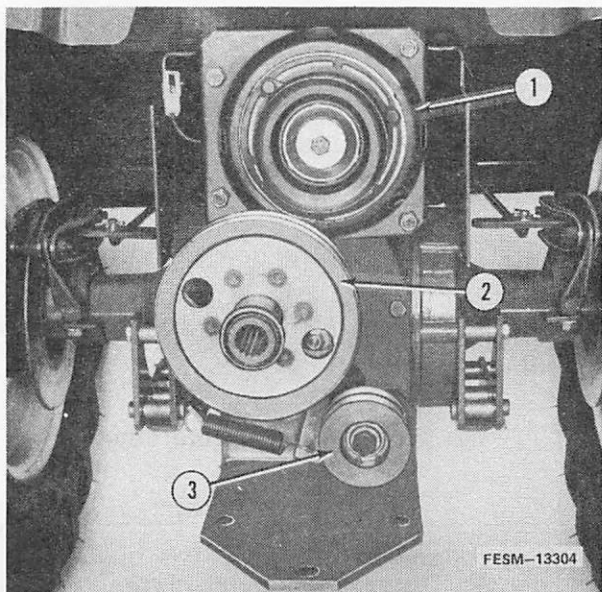
2. With the hitch at its lowest point, remove the headed pin securing the implement lift bar to the lift bracket. Remove the pin thru the access hole in the RH side of the frame.

1. Headed pin
2. Access hole



3. Remove the rockshaft support plate mounting bolts. Lift the rockshaft over the PTO clutch and rest the assembly on the ground.

1. Rockshaft support plate
2. Mounting bolts



4. Remove the pulley hub assembly.

5. Remove the capscrews securing the clutch bearing housing to the rear frame and remove the PTO clutch, bearing housing and drive shaft as an assembly. Place the assembly on a bench.

- 1. PTO clutch assembly
- 2. Pulley hub assembly
- 3. Idler pulley

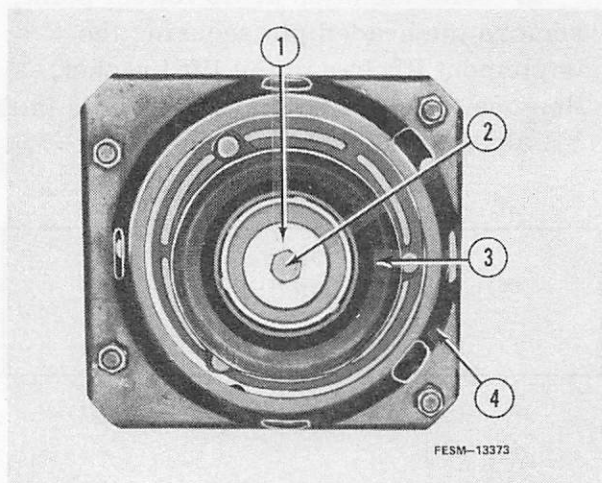
PTO Clutch Assembly

Disassembly

1. Remove the brake flange, retaining bolt, washer and armature assembly.

2. Remove the rotor and key.

- 1. Washer
- 2. Retaining bolt
- 3. Armature assembly
- 4. Brake flange

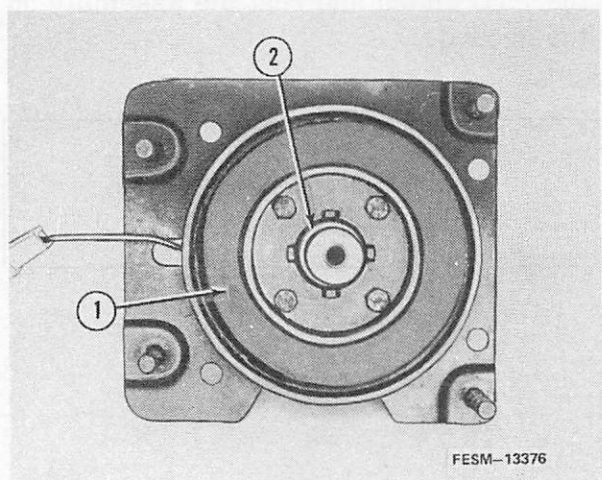


3. Remove the field coil and spacer.

4. To remove the drive shaft, remove the snap ring from the shaft and press the shaft from the housing.

5. Inspect the bearings for smoothness of operation. If necessary to replace a bearing, remove the snap ring and press the bearings and spacer from the housing.

- 1. Field coil
- 2. Spacer



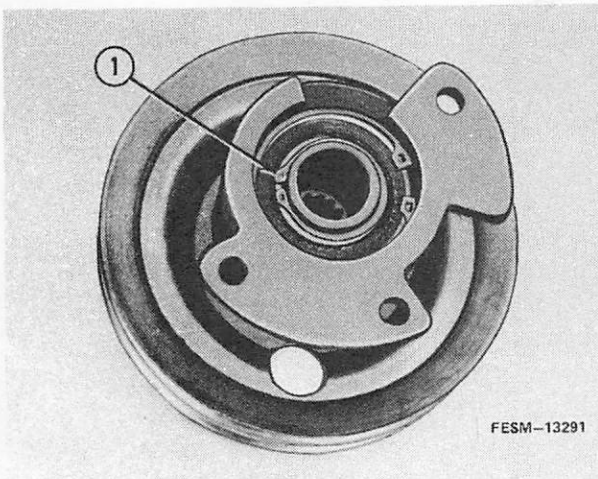
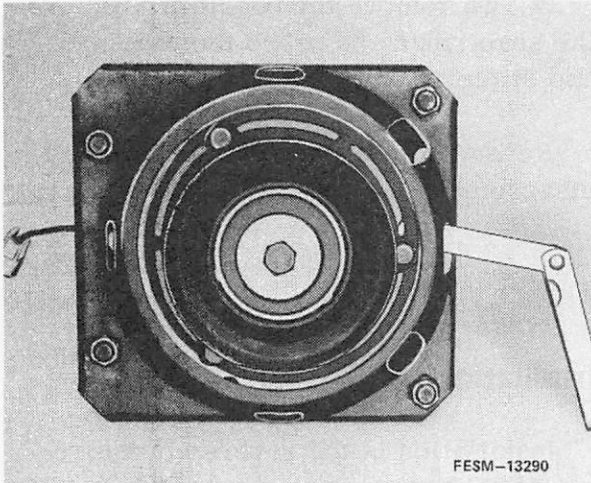
Reassembly and Adjustment

Reassembly is the reverse of the disassembly procedure, paying special attention to the following.

1. Prior to installation, check the clearance between the armature assembly and the rotor. Using a feeler gauge, check the clearance at three evenly spaced locations. There should be a gap of 1.4 to 2.5 mm (.054 to .1 inch). If the gap is exceeded, the armature assembly and rotor should be replaced.

2. Once assembled, check the clearance between the armature assembly and the rotor by inserting a feeler gauge in the four slots in the brake flange. The gap should be .25 to .38 mm (.010 to .015 inch).

Tighten or loosen the brake flange mounting nuts to obtain the correct gap.

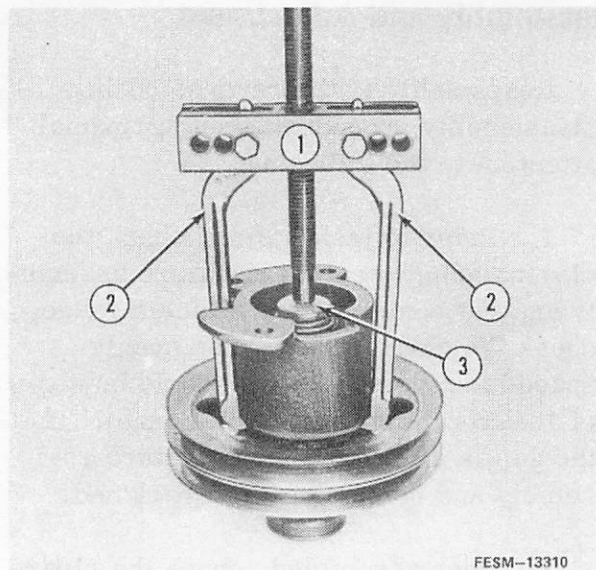


Pulley Hub Assembly

To disassemble the pulley hub assembly use the following procedure.

1. Remove the snap ring from the shaft.

1. Snap ring



1. OTC 943 Bridge
2. OTC 960-9 Jaws
3. Spacer

2. Assemble a puller as illustrated and pull the bearing housing (with bearings) from the shaft. Be sure to use a spacer.

3. To remove the bearings, remove the snap rings and press the bearings and spacer from the housing.

Reassemble in the reverse order of disassembly.

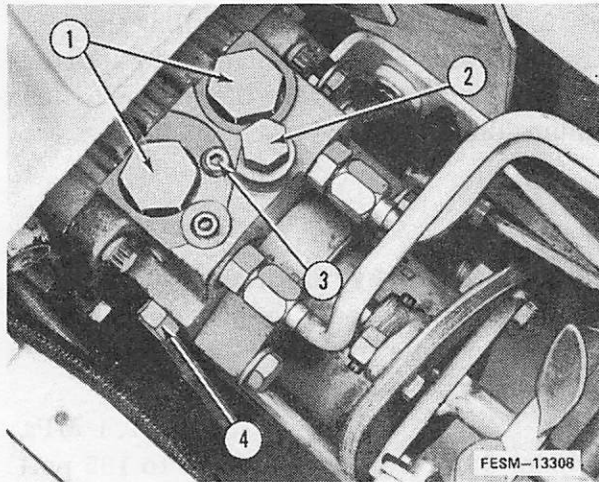
Installation

Installation is the reverse of the removal procedure paying special attention to the following.

Before installing the PTO clutch assembly on the rear frame lubricate the splined transmission output shaft and PTO drive shaft couplers with IH 251H E. P. grease.

HYDRAULIC LIFT

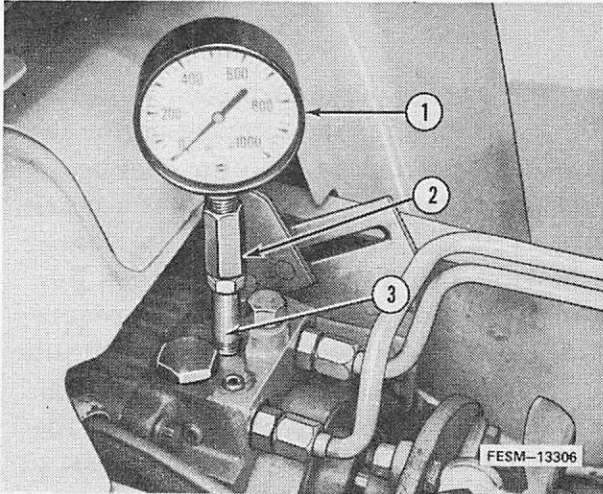
General Information



1. Check valves
2. Implement lift relief valve
3. Test port
4. Charge pump relief valve

The charge pump furnishes fluid to the hydrostatic pump to make up for leakage and to circulate fluid for cooling. Charge pressure is regulated at a maximum of 1.3 MPa (200 psi) by the charge pressure relief valve. The excess flow over the valve is returned to the reservoir. On models equipped with hydraulic lift, this excess flow is directed to the implement control valve. The fluid returns from the valve to the reservoir. Moving the control handle to the raise or lower position will direct fluid to the hydraulic cylinder. Charge pressure during the raise or lower cycle will be equivalent to the lift pressure. Lift pressure is regulated by the lift pressure relief valve at 3.4 to 4.3 MPa (500 to 625 psi).

Pressure Check



1. Gauge
2. 1/8" to 1/4" Adapter
3. 1/8" Steel pipe nipple

1. Install a 7 MPa (1000 psi) gauge.

2. Start the engine and allow the transmission fluid to warm up to approximately 130°F. Operate the engine at maximum idle speed.

3. With the hydraulic control valve in neutral (if equipped), the gauge should indicate charge pressure as follows:

	.62 to 1.1 MPa
Model 682	(90 to 165 psi)

Model 782 &	.62 to 1.3 MPa
982	(90 to 200 psi)

4. With the control valve in the raised position and the cylinder at the end of its stroke, the gauge should indicate maximum lift pressure as:

	3.4 to 4.3 MPa
Model 782	(500 to 625 psi)

	4.8 to 6.2 MPa
Model 982	(700 to 900 psi)

Charge Pump Relief Valve Adjustments

1. If charge pressure is not within specifications, remove the charge pump relief valve. Clean and inspect the valve. Refer to Specifications for spring length dimensions. Replace the spring if necessary.

2. If the spring is within specifications add or remove spring shims to bring charge pressure within specifications.

3. If shimming the relief valve does not correct the problem, replace the relief valve and shim as necessary.

4. If replacing the relief valve does not solve the problem, inspect the charge pump. Change the O-ring and if necessary replace the charge pump.

5. Remove and overhaul the transmission inspecting for scored valve plates.

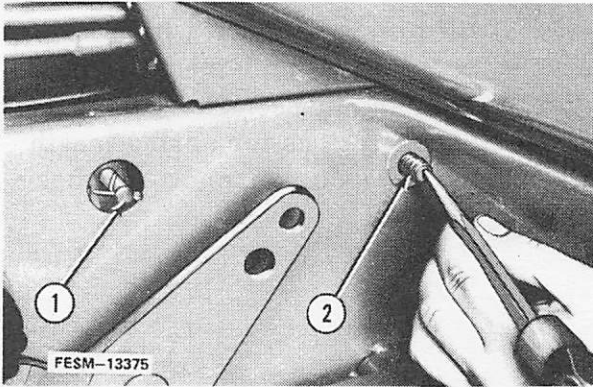
Implement Lift Relief Valve Adjustments

1. If lift pressure is not within specifications, remove the implement lift relief valve. Clean and inspect the relief valve. Refer to Specifications for spring length dimension. Replace the spring if necessary.

2. If the spring is within specifications add or remove shims to bring lift pressure within specifications.

3. If shimming the implement lift relief valve does not correct the problem replace the relief valve.

Lift Cylinder



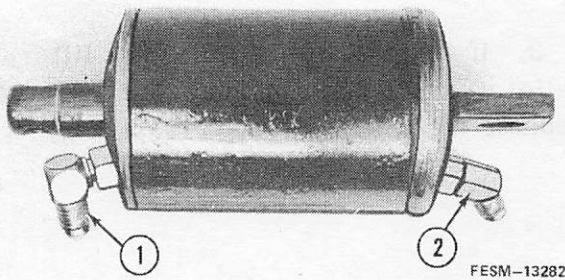
1. Pin
2. Mounting bolt

Removal

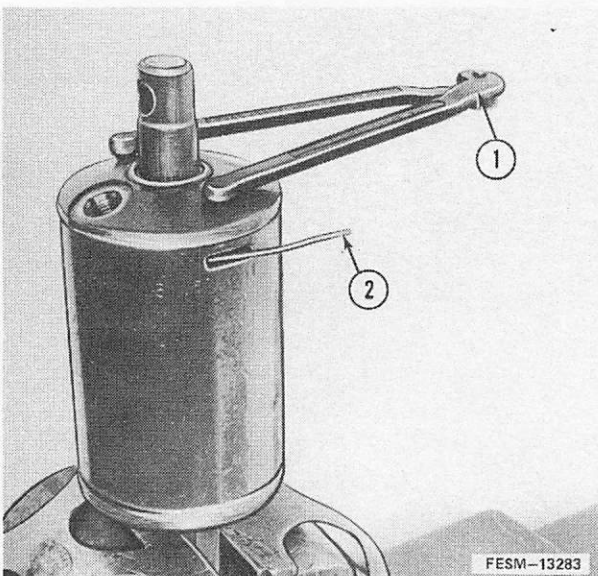
1. Remove the frame cover.
2. Disconnect the hydraulic lines from the cylinder. Cap and plug the openings.
3. Remove the pin securing the cylinder to the lift bracket. Remove the pin thru the access hole in the RH side frame.
4. Remove the cylinder mounting bolt and remove the cylinder.

Disassembly

1. Note the position of the 45° and 90° fittings then remove them.

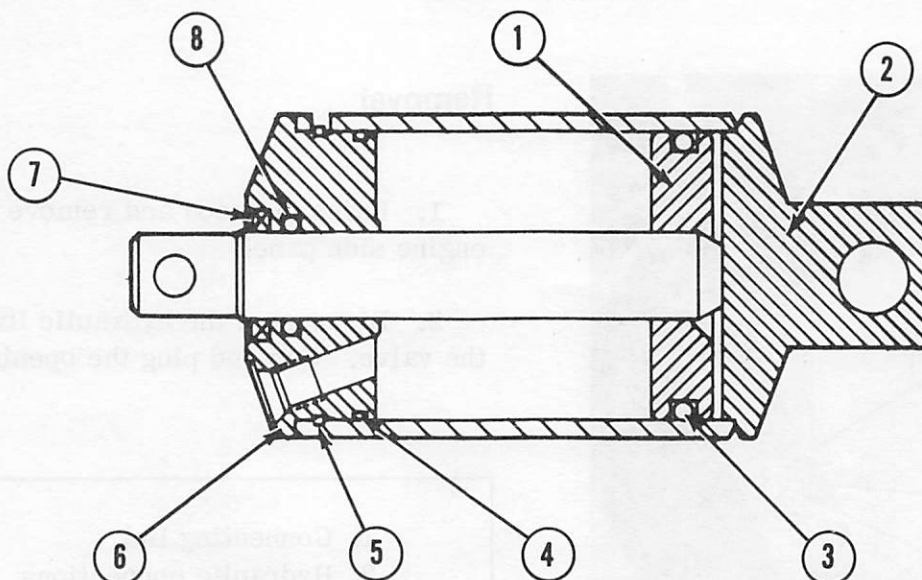


1. 90° Fitting
2. 45° Fitting



2. Place the mounting end of the cylinder body in a vise. Insert the pins of a 3/16 inch adjustable face spanner wrench into the two holes of the cylinder head. Turn the cylinder head counterclockwise until the end of the retaining wire appears in the access hole of the cylinder body. Pry the end of the wire out of the hole and continue to turn the cylinder head counterclockwise to remove the retaining wire.

1. 3/16" Spanner wrench
2. Retaining wire



FESM-13378

- | | |
|------------------|-------------------|
| 1. Piston | 5. Retaining wire |
| 2. Cylinder body | 6. Cylinder head |
| 3. Piston O-ring | 7. Wiper seal |
| 4. Outer O-ring | 8. Inner O-ring |

3. Pull the cylinder head out of the cylinder body and off of the piston.

NOTE: The cylinder head may become difficult to remove once the outer O-ring enters the retaining ring groove in the cylinder body. If so, through the access hole in the cylinder body, cut and remove this O-ring. This should allow the cylinder head to slide out easily.

4. Insert a drift through the hole in the piston rod. Remove the piston assembly by pulling the rod while turning it spirally.

Replace all O-rings and the wiper seal with new ones.

5. Inspect the piston and cylinder walls for scoring, pitting or damage. Clean all parts.

Reassembly

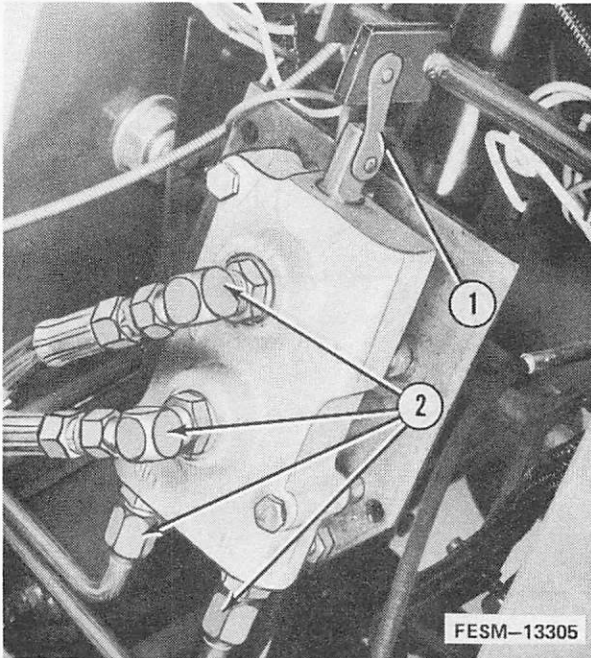
1. Coat all the O-rings with petroleum jelly. Thoroughly lubricate the inner walls of the cylinder body.

2. Reassembly is the reverse of the disassembly procedure.

Installation

Installation is the reverse of the removal procedure.

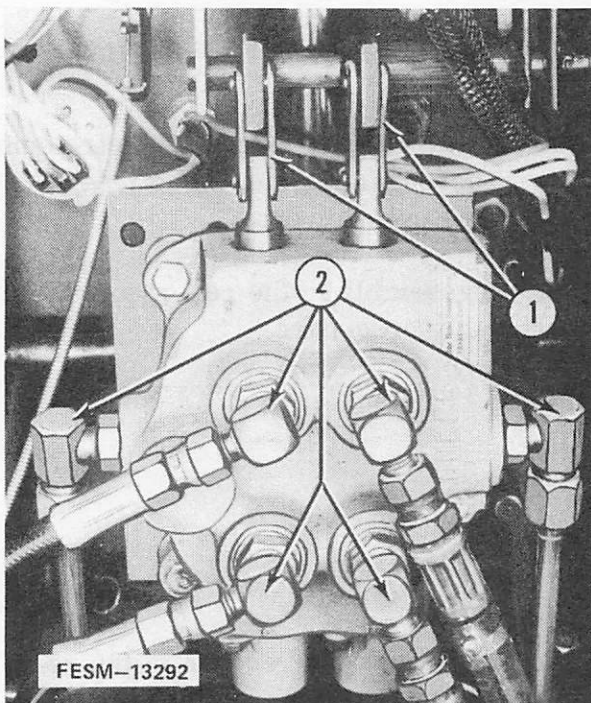
Control Valve



Removal

1. Raise the hood and remove an engine side panel.
2. Disconnect the hydraulic lines at the valve. Cap and plug the openings.

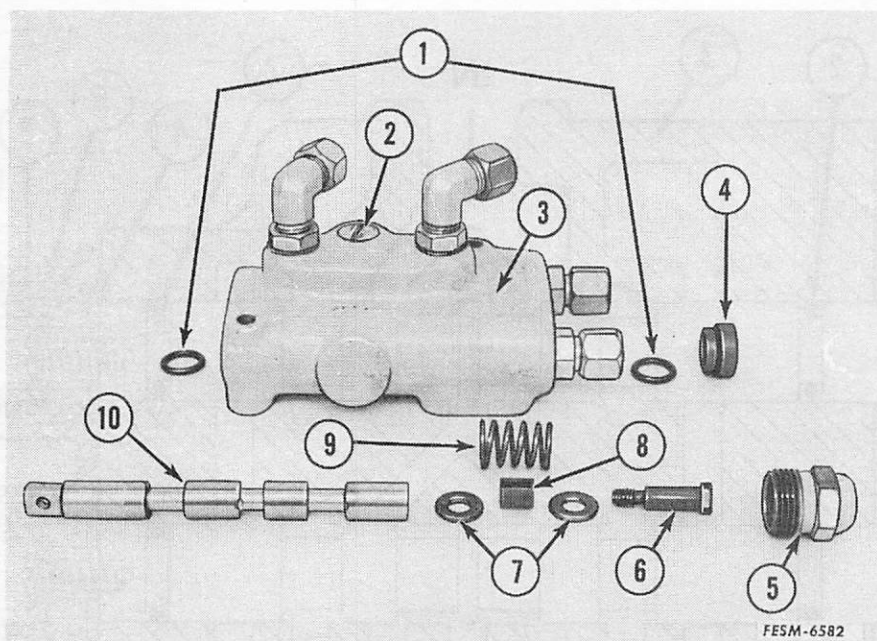
- | |
|---|
| <ol style="list-style-type: none">1. Connecting link2. Hydraulic connections |
|---|



3. Remove the connecting links.
4. Unbolt and remove the control valve.

- | |
|--|
| <ol style="list-style-type: none">1. Connecting links2. Hydraulic connections |
|--|

Single Spool Valve



- | | |
|-------------------------|-----------------|
| 1. O-ring | 6. Spool screw |
| 2. Check valve assembly | 7. Washer |
| 3. Valve body | 8. Spool spacer |
| 4. Bushing | 9. Spring |
| 5. Cap | 10. Spool |

Disassembly

1. Secure the control valve in a vise equipped with brass jaws.
2. Remove the cap and slide the spool out. The bushing and O-ring will probably come out with the spool.

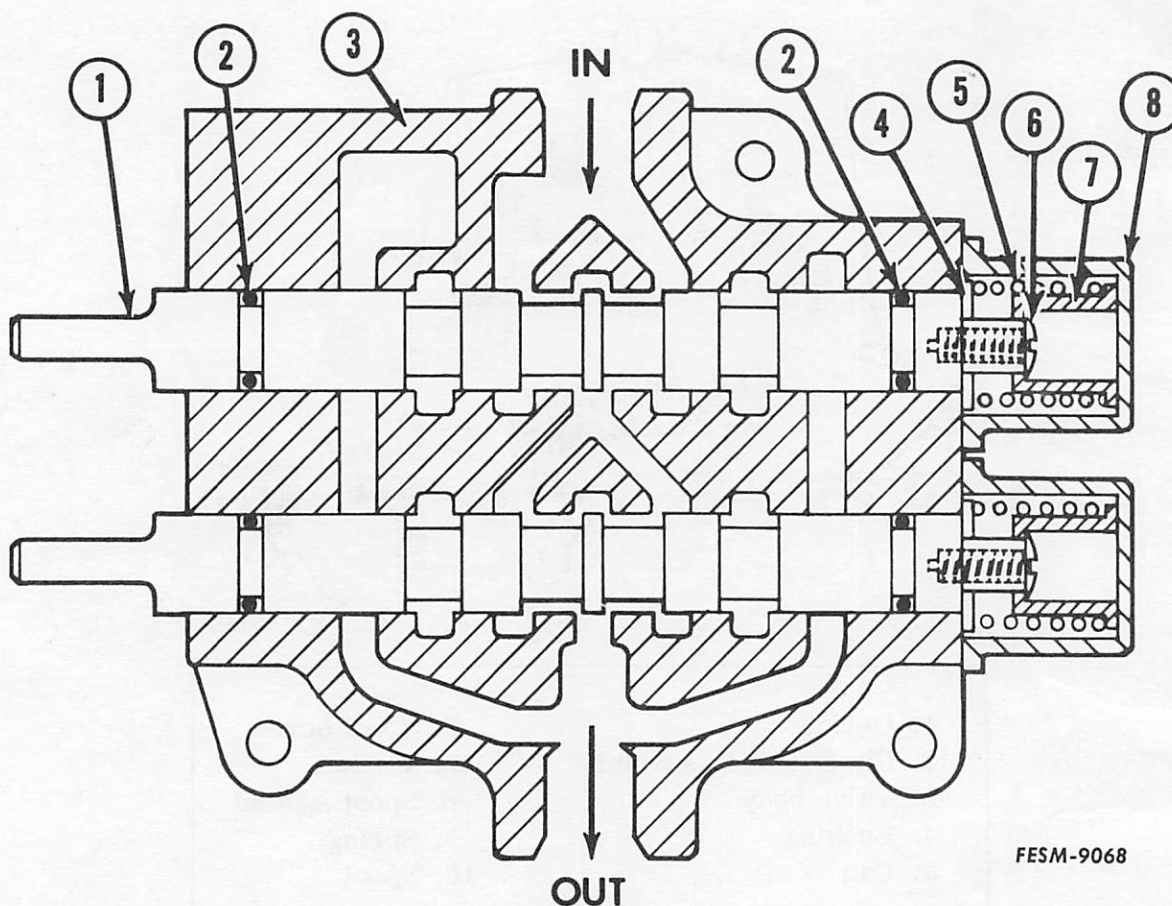
Cleaning and Inspection

1. Clean all parts in clean solvent.
2. Inspect the spool and body for scoring or wear. Replace as an assembly, if necessary, as the spool and body are not serviced individually.
3. Inspect all other parts and replace as necessary.

Reassembly

1. Coat all parts thoroughly with clean Hy-Tran to ease assembly.
2. Assemble the centering spring, washers and shoulder bolt. Coat the threads with IH Thread Sealer 634 016 C1 (Loctite 262) and install on the valve spool. Torque the shoulder bolt 7 to 10 N·m (60 to 90 in. lbs.). Check the movement of the spring and washers to make sure the bottom washer is not caught between the shoulder bolt and the valve spool.
3. Install the O-rings and bushings in the body.
4. Install the valve spool.
5. Install the cap and tighten 27 to 34 N·m (20 to 25 ft. lbs.).

Double Spool Valve



- | | |
|---------------|------------|
| 1. Spool | 5. Spring |
| 2. O-ring | 6. Screw |
| 3. Valve body | 7. Spacer |
| 4. Washer | 8. End cap |

Disassembly

1. Secure the control valve in a vise equipped with brass jaws.

2. Remove the end caps.

3. Hold the spool and remove the centering spring screw, centering spring, spacer and washer.

4. Slide the spool out the rear just far enough to remove the rear O-ring.

5. Slide the spool out of the valve to the front and remove the front O-ring.

Cleaning and Inspection

1. Clean all parts in clean solvent.
2. Inspect the spool and body for scoring or wear. Replace as an assembly, if necessary, as the spool and body are not serviced individually.
3. Inspect all other parts and replace as necessary.

Reassembly

1. Coat all parts thoroughly with clean Hy-Tran to ease assembly.
2. Install the front O-rings on the spools and slide them in through the front.

3. Push the spools just far enough through to install the rear O-rings and centering mechanism. Pull each spool forward to be sure the spacer is on the spool, not the washer.

4. Install the end caps.

Installation

1. Install the control valve by reversing the removal procedure.
2. Cycle the cylinder several times to expel the air from the system and check for leaks.
3. Check the fluid level in the rear housing and fill to proper level with Hy-Tran or its equivalent.

Section 3

IH EQUIPMENT Contents

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MOWER

Removal

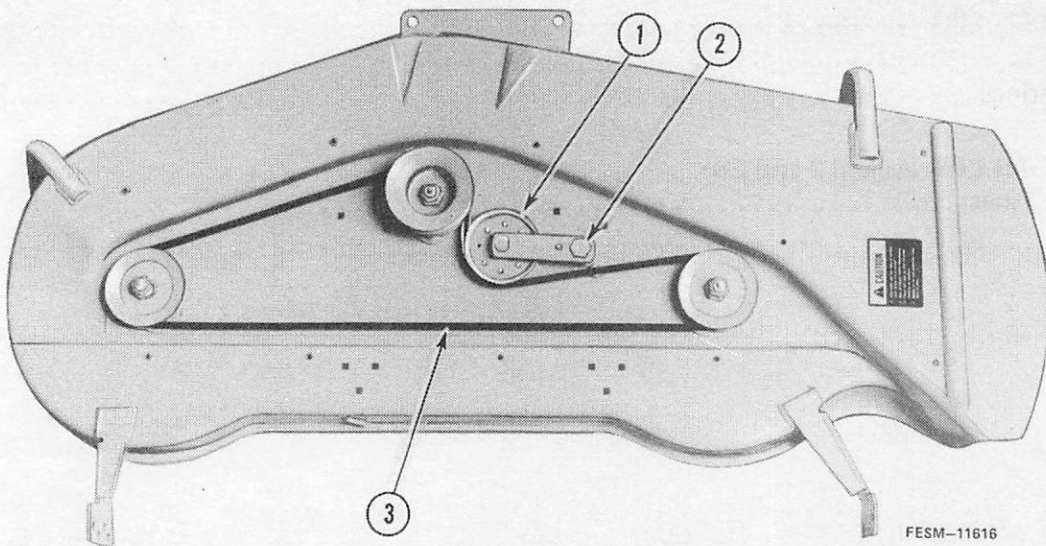
1. Lower the mower to the ground.
2. Pull the support pins to release the mower from the lift frame.
3. Slide the mower forward to free it from the lift support clevises. Pull the lift handle back to raise the lift frame.

4. Position the front wheels to allow the mower to be removed.

To remove the lift frame detach the two "Q-A" cotters, one on each side, and push the tractor quick hitch latch assembly down.

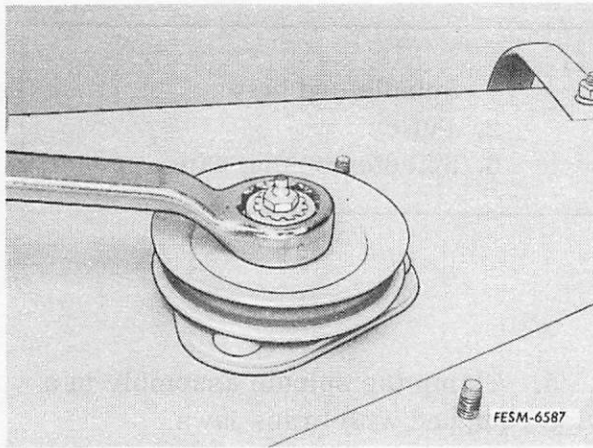
Pull the hanger assembly forward to uncouple from the tractor.

Disassembly



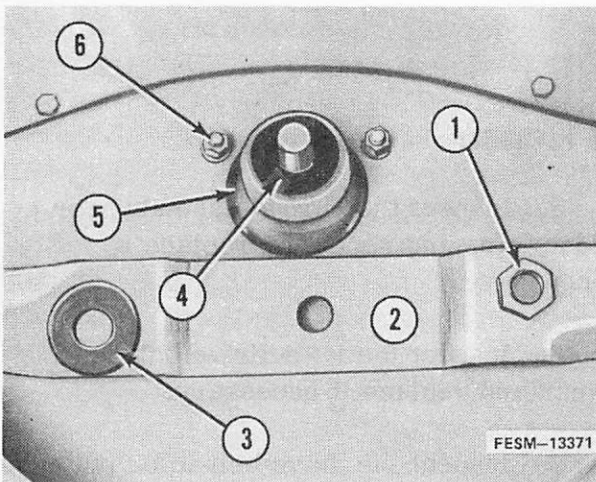
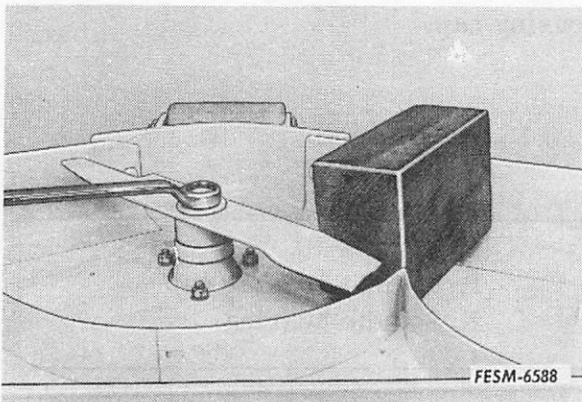
1. Spring loaded idler arm
 2. Idler arm pivot bolt
 3. Spindle drive belt

1. Remove the belt shields.
2. Remove the spindle drive belt.
3. To remove the idler arm assembly, remove the nut and washer securing the spring and pivot bolt.

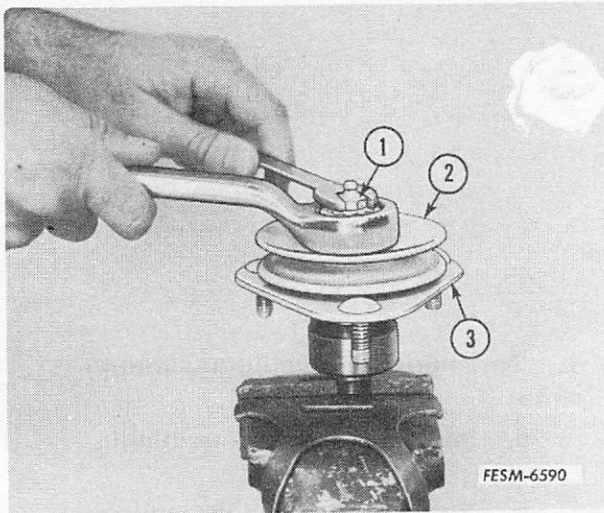


4. To remove a spindle assembly:

- a. Secure the pulley or blade.
- b. Remove the spindle nut, washer, blade, spacer and spindle cup.
- c. Remove the nuts holding the spindle housing and lift the assembly out.



1. Spindle nut
2. Blade
3. Washer
4. Spindle cup
5. Spindle housing
6. Spindle housing nut

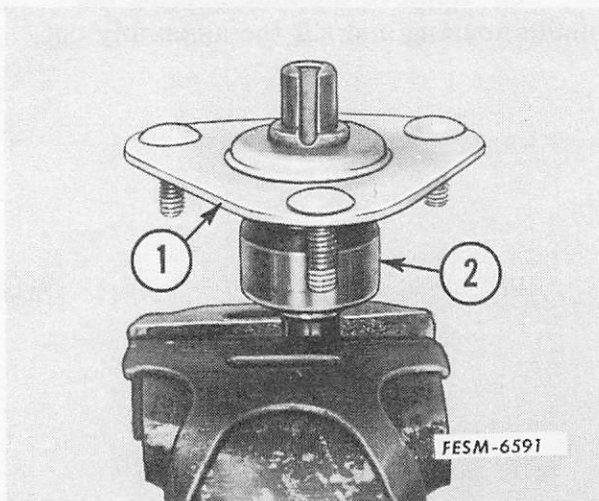


1. Spindle end bolt
2. Pulley
3. Spindle housing cap

5. Clamp the spindle assembly in a vise equipped with brass jaws.

6. Secure the pulley and remove the end bolt.

7. Lift off the pulley, key and spindle housing cap.



1. Spindle housing cap
2. Spindle bearing

Inspection and Repair

1. Inspect the spindle bearing for wear, roughness of operation or shaft damage. Replace if necessary.

2. Check the spindle housing for cracks, breaks or wear. Replace if necessary.

3. Inspect the spindle drive belt for wear and replace if necessary.

4. Inspect the pulleys for wear and replace if necessary.

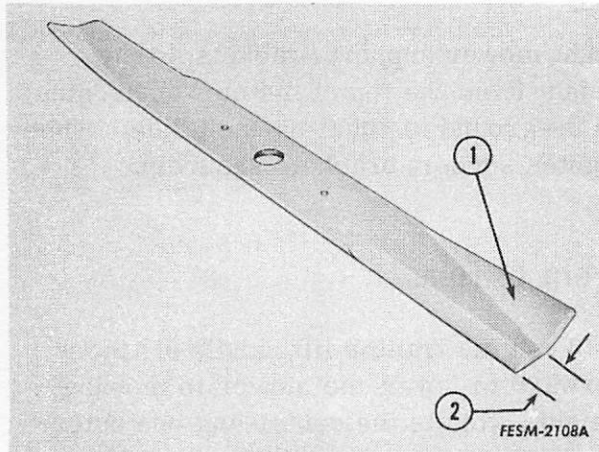
5. Inspect the shroud assembly for dents etc. and repair or replace if necessary.

6. Inspect the main drive belt for wear and replace if necessary.

7. Inspect the drive belt idler pulleys for freeness of rotation and replace if necessary.

8. Inspect the blades for excessive wear and nicks. Refer to Blade Sharpening.

Blade Sharpening

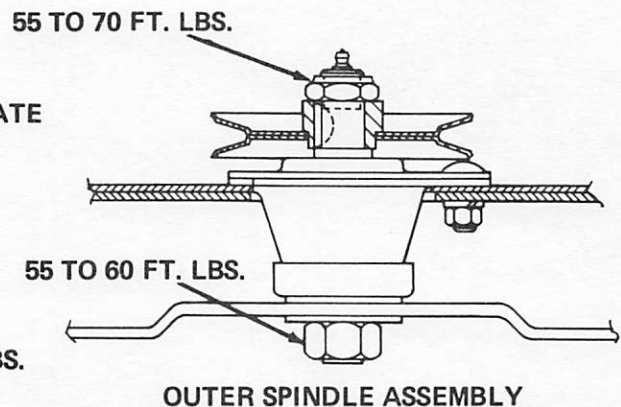
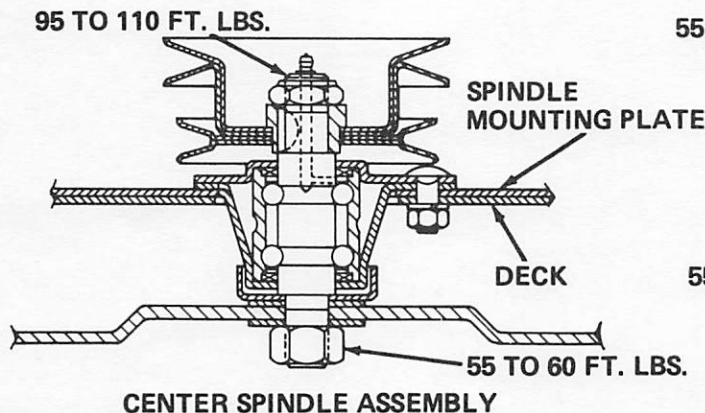


The cutting blades must be kept sharp at all times. The blades can be sharpened on the mower (mower removed from tractor) with a file or they can be removed and sharpened on a grinding wheel.

Sharpen the blade ends evenly so the blade remains balanced. If the cutting edge of the blade is within 10 mm (3/8 inch) of the blade wind wing, replace the blade.

1. Wind wing
2. 10 mm (3/8 inch)

Reassembly



FESM-12945

1. Reassemble the mower by reversing the disassembly procedure.

2. Torque the spindle hex nut as follows:

Center spindle assembly $\frac{129 \text{ to } 149 \text{ N}\cdot\text{m}}{(95 \text{ to } 110 \text{ ft. lbs.})}$

Outer spindle assembly $\frac{75 \text{ to } 95 \text{ N}\cdot\text{m}}{(55 \text{ to } 70 \text{ ft. lbs.})}$

3. Torque the spindle end nut to 75 to 81 N·m (55 to 60 ft. lbs.).

4. Torque the idler arm pivot bolt to 41 to 43 N·m (30 to 32 ft. lbs.).

Installation and Adjustment

Install the mower by reversing the removal procedure.

Level Adjustment

Before adjusting the mower on the tractor, check the tires for proper inflation before making a level and height adjustment.

To adjust the mower for level, first place the tractor on a level surface, preferably a hard surface area such as a garage floor or sidewalk.

Side to Side

Lower the mower almost to the ground making sure the runners do not touch the ground. Add 13/32 x 13/16 x .065 inch washers, as required, under the left or

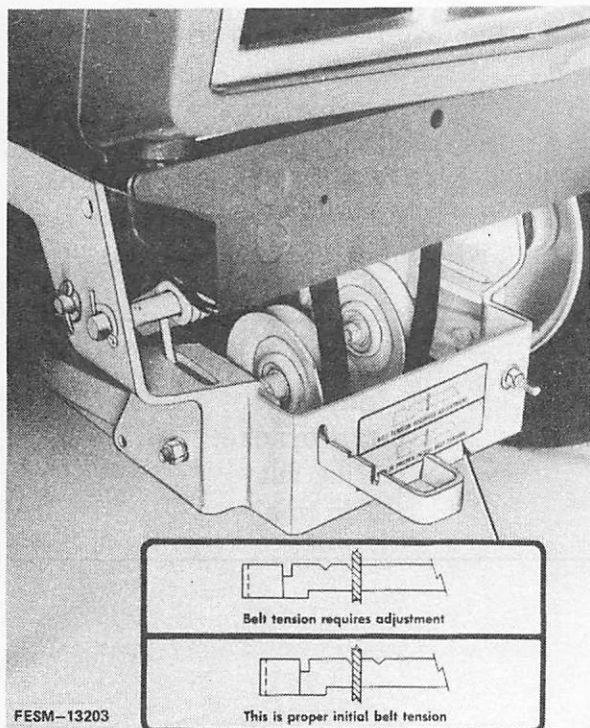
right mower support brackets so the height from the top of the mower housing to the ground is equal on each side. Then tighten support brackets securely.

Front to Rear

Push the tractor lift handle all the way forward to lower the mower to mowing height. Rotate the center and one outer blade so they are parallel and pointing straight to the front and rear. Then adjust the left and right support clevises so the front edge of the center blade is level with the back edge of the outer blade. Rotate blades 180° and recheck.

If mower leveling is difficult, check for bent blades.

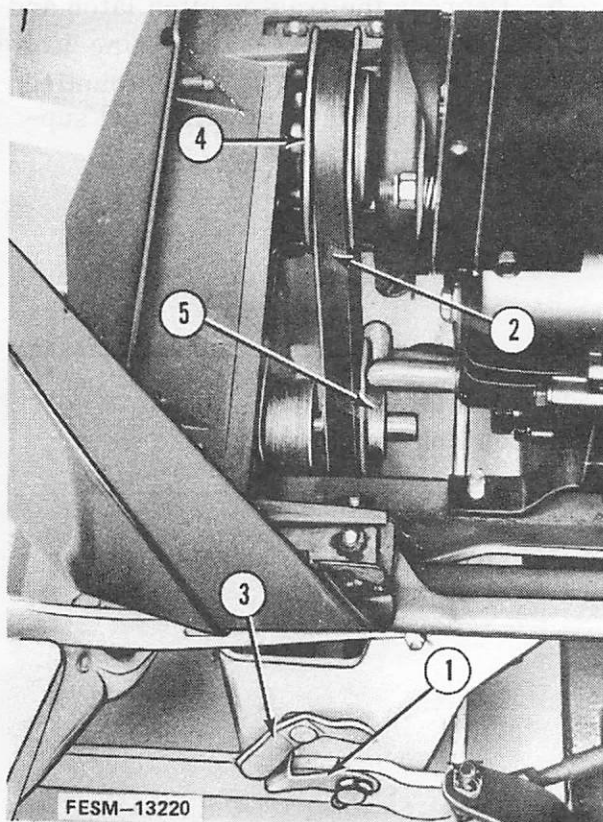
Main Drive Belt Adjustment



Adjust the V-belt tension bolt so the notch on the idler bracket is in line with the slot as shown.

SNOW THROWER

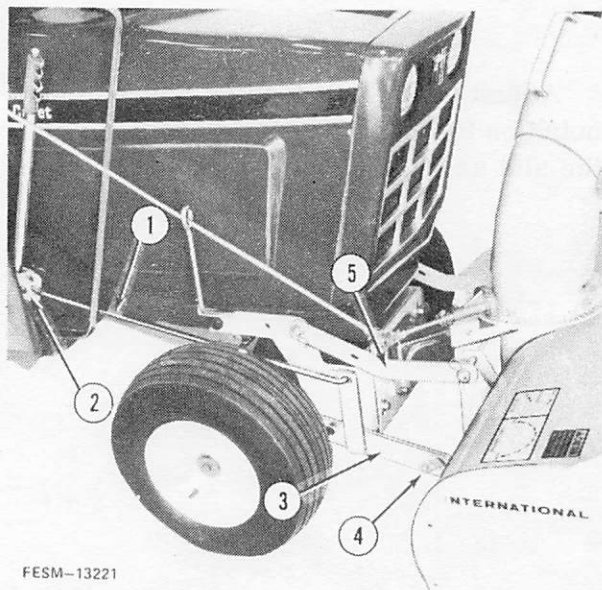
Detaching the Snow Thrower



1. Lock the tractor brakes. Disengage the power take off clutch. Stop the tractor engine. Lower the snow thrower.

2. Rotate the lock clip clear of the adjustment screw (toward the rear). Loosen the drive belt by turning the belt tension adjustment screw to raise gear box assembly thus loosening the drive belt. Remove the drive belt.

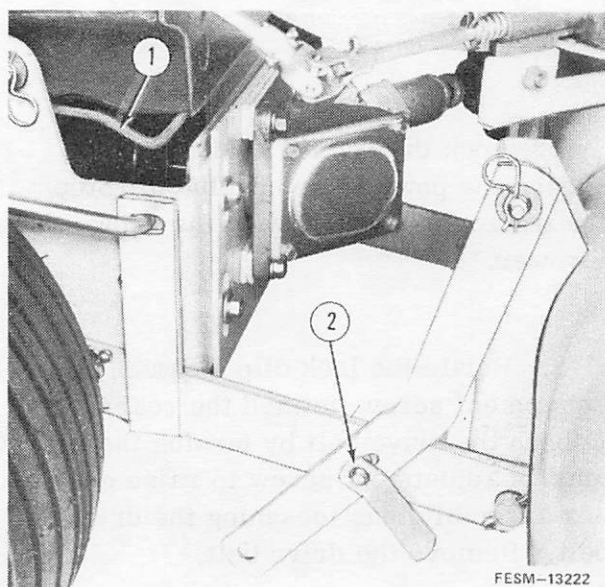
- 1. Lock clip
- 2. Drive belt
- 3. Belt tension adjustment screw
- 4. PTO clutch pulley
- 5. Gear box pulley



3. Remove the lift rod from the lift arm.

4. Remove the quick-attach (Q-A) pin from the rear of the right hand top link. Secure the top link to the stud of the lift bracket with the wing nut provided.

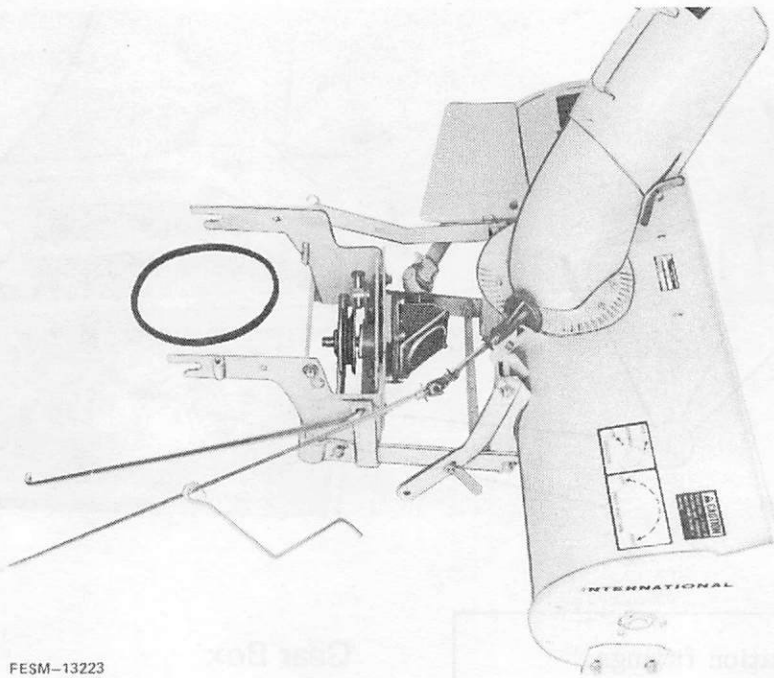
1. Lift rod
2. Lift arm
3. Lift bracket
4. Wing nut
5. Top link



5. Depress the tractor hitch latch and roll the tractor away from the snow thrower assembly. The snow thrower, mounting assembly and lift linkage will stand supported by the top link.

1. Hitch latch
2. Top link supporting snow thrower

Attaching the Snow Thrower

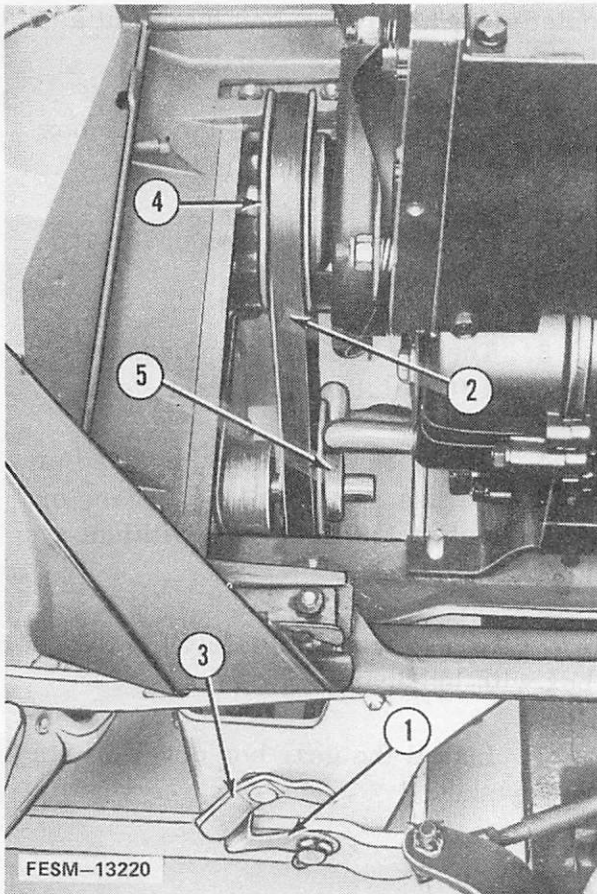


FESM-13223

1. Roll the tractor into position and lock the brakes. Ensure the PTO clutch is turned off and stop the engine.

2. Align the tractor with the snow thrower and reverse the detaching instructions.

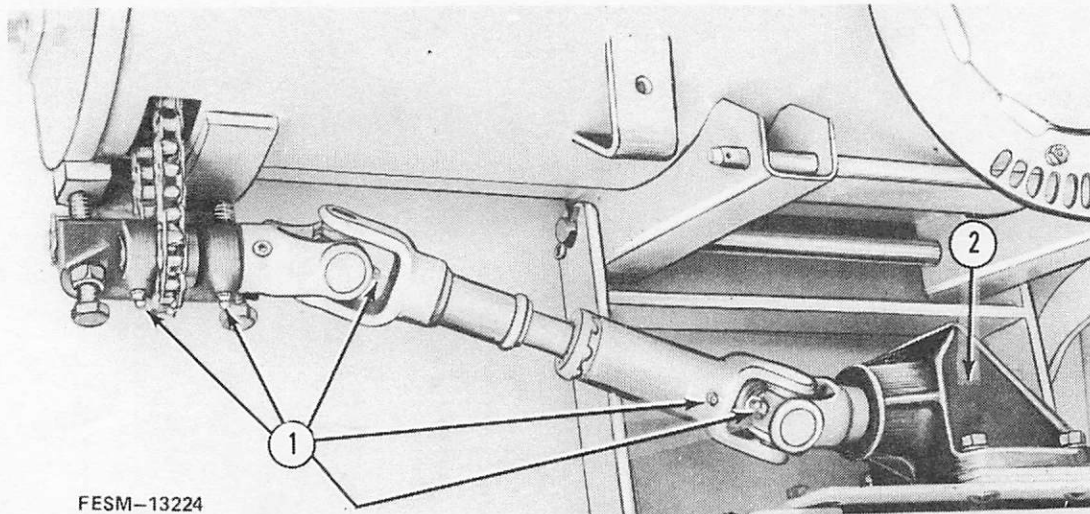
3. After installing the drive belt make sure the belt is in the PTO clutch pulley groove and not between the pulley and the engine. Turn the belt tension adjusting screw clockwise until the slack is out of the belt. (Belt sides become straight.) Then tighten an additional 1 to 1-1/2 turns. Rotate the clip forward.



FESM-13220

- 1. Lock clip
- 2. Drive belt
- 3. Belt tension adjusting screw
- 4. PTO clutch pulley
- 5. Gear box pulley

Lubrication



1. Lubrication fittings
2. Gear box

Lubrication Fittings

Lubricate the universal drive line and the chain sprocket shaft each time the snow thrower is used. Use IH 251H E. P. grease. Refer to the illustration for the location of the fittings.

Gear Box

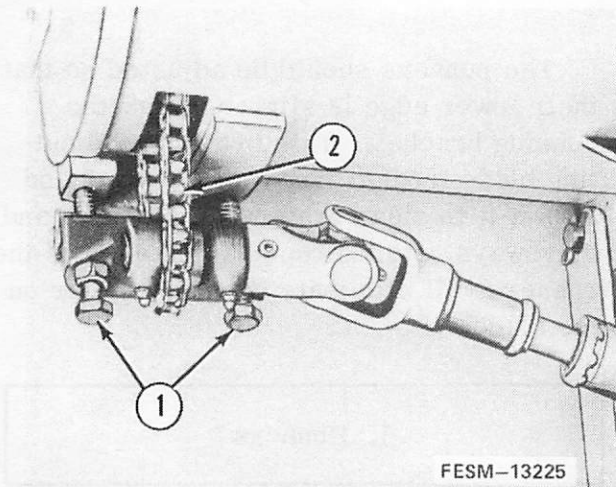
At the beginning of every operating season (or when lubricant leakage is noted) check the gear box lubricant as follows:

1. Wipe the outside of the gear box clean and free of foreign material.
2. Remove the gear box cover and discard the gasket.
3. The box should be approximately one half (1/2) full of lubricant.
4. If lubricant needs to be added or replaced, use IH 251H E. P. grease or equivalent #2 Multi-purpose lithium grease.

NOTE: Never completely fill the gear box with lubricant.

5. Install the gear box cover with a new gasket.

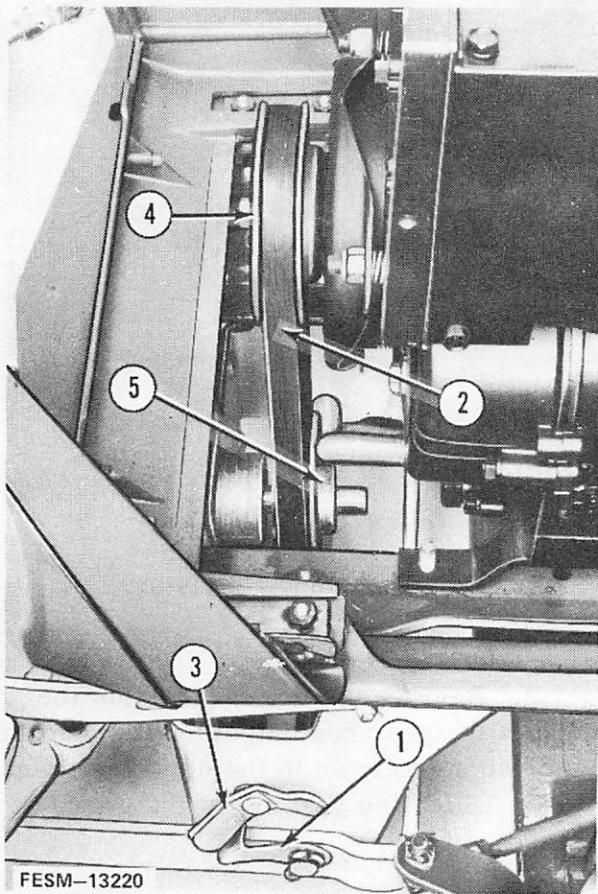
Adjustments



- 1. Chain adjustment bolts
- 2. Roller chain

Roller Chain

The chain should be adjusted to have a slight amount of slack. Too much tension causes undue wear on the chain and wasteful friction on the bearings. Too little tension may allow the chain to jump the sprockets, ride the teeth, and break or whip excessively. To adjust the chain, loosen the jam nuts and turn the adjustment bolts in or out until the desired tension is obtained; then tighten the jam nuts securely.



Drive Belt

The belt should be adjusted to have enough tension to keep it from slipping. Turn belt tension adjustment screw clockwise until all slack is out of the belt. Then, tighten an additional 1 to 1-1/2 turns for proper tension. Secure the adjusting screw with the lock clip.

- 1. Lock clip
- 2. Drive belt
- 3. Belt tension adjusting screw
- 4. PTO clutch pulley
- 5. Gear box pulley



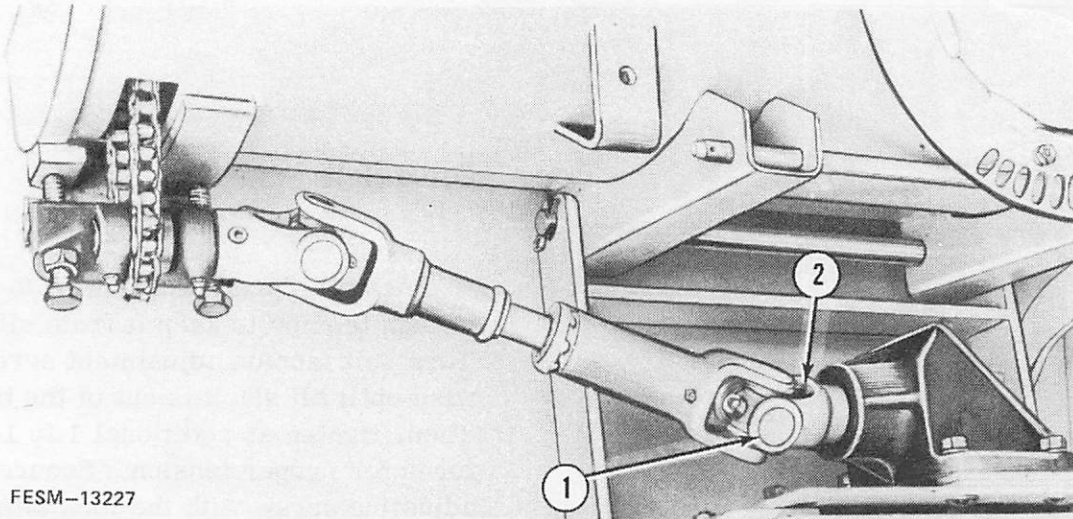
FESM-13226

Runners

The runners should be adjusted so that their lower edge is slightly below the housing bracket. This prevents the cutting blade from riding on the ground and allows it to clear cracks in sidewalks and driveways, etc. Proper adjustment of the runners will eliminate excessive wear on the blade.

1. Runners

Gear Box

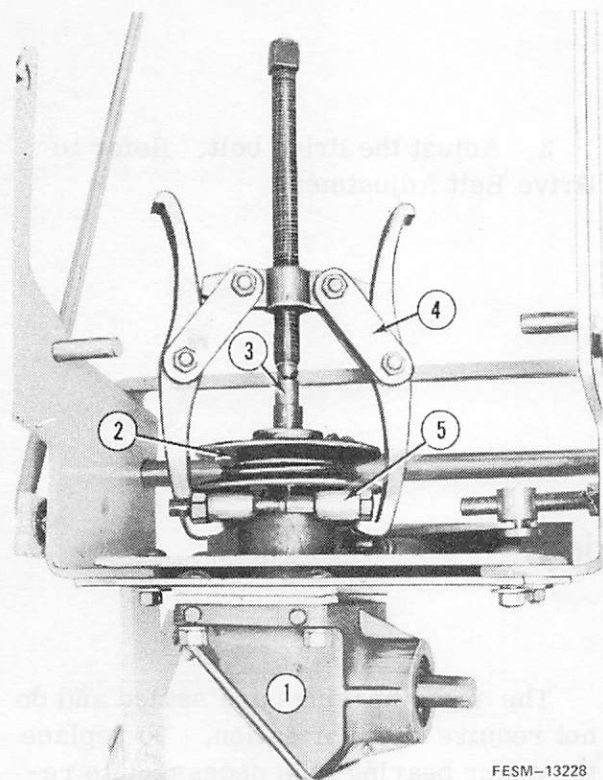


FESM-13227

1. Universal joint yoke
2. Cotter pin location

Removal

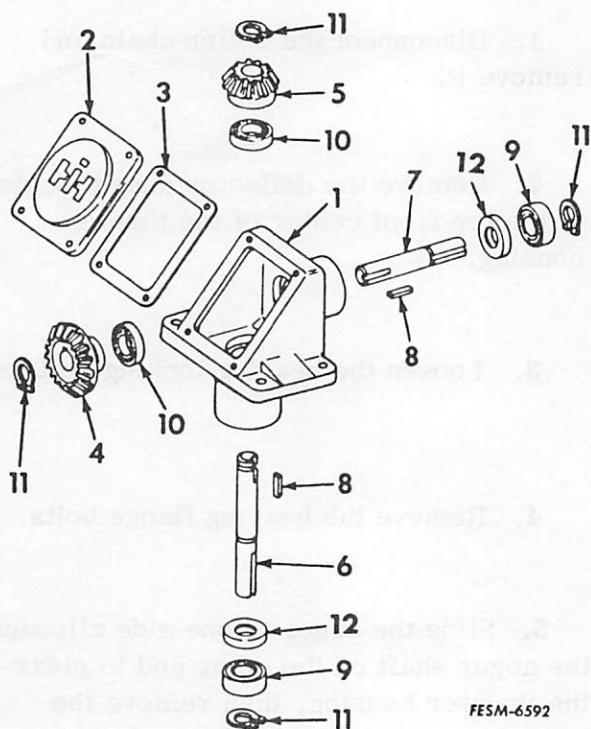
1. Detach the snow thrower.
2. Remove the cotter pin from the end of the gear box output shaft. Loosen the two set screws in the universal joint yoke. Slide the yoke off of the gear box output shaft.



3. Loosen the two set screws on the gear box pulley. Remove the pulley from the shaft. If the pulley won't slide off the shaft, assemble a puller as shown. Place a bearing puller behind the pulley with two 1/2" hex nuts (used as spacers) between the pulley and the bearing puller. Grasp the bearing puller with a two jaw puller and pull the pulley off the shaft.

NOTE: Use grease to hold the two hex nuts in place while the puller is being assembled.

1. Gear box
2. Gear box pulley
3. Step plate
4. 17-473-3 Two Jaw Puller
5. 17-473-22 Bearing Puller



4. Remove the four gear box mounting bolts and lift off the gear box. Note the spacers between the gear box and the mounting plate.

Disassembly

Remove the gear box cover. The four bearings are bottomed against shoulders in the gear box. The bearings at the outer ends of the shaft are retained in the gear box with snap rings. The bevel and pinion gears are keyed to their shafts and held in position with snap rings. There is no shimming of the gears for backlash as this is predetermined by the manufacturer. Refer to Lubrication for the correct fill level and lubricant.

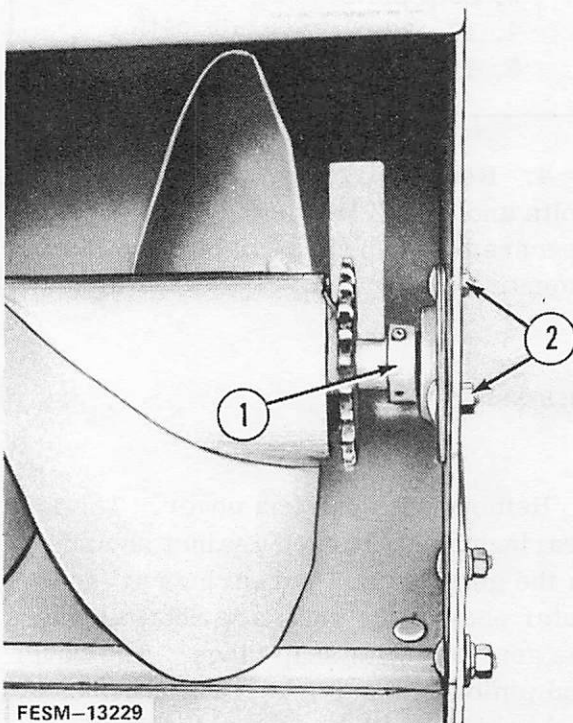
- | | | |
|---------------|-----------------|---------------|
| 1. Case | 5. Bevel gear | 9. Bearing |
| 2. Cover | 6. Input shaft | 10. Bearing |
| 3. Gasket | 7. Output shaft | 11. Snap ring |
| 4. Bevel gear | 8. Key | 12. Not used |

Installation

1. Reverse the removal procedure.
2. Tighten the set screws on the universal yokes to 27 to 31 N·m (20 to 23 ft. lbs.) and the set screws on the gear box pulley to 18 to 20 N·m (13 to 15 ft. lbs.).

3. Adjust the drive belt. Refer to Drive Belt Adjustment.

Auger Bearings



The auger bearings are sealed and do not require any lubrication. To replace the auger bearing it is necessary to remove the auger as follows.

1. Disconnect the roller chain and remove it.
2. Remove the deflector guard located at the top front center of the thrower housing.
3. Loosen the bearing locking collars.
4. Remove the bearing flange bolts.
5. Slide the auger to one side allowing the auger shaft on the other end to clear the thrower housing, then remove the auger.
6. Pull the bearings off the auger shaft. If necessary, use a bearing puller to remove bearings.

- | |
|---|
| <ol style="list-style-type: none">1. Bearing locking collar2. Bearing flange bolts |
|---|

7. Install new bearings with the locking collars between the bearing and the auger.

8. Install the auger into the thrower housing. Center the auger, aligning the auger sprocket with the sprocket on the chain tightener. Tighten the bearing flange bolts and secure the locking collars.

9. Install the chain and adjust. Refer to Adjustments.

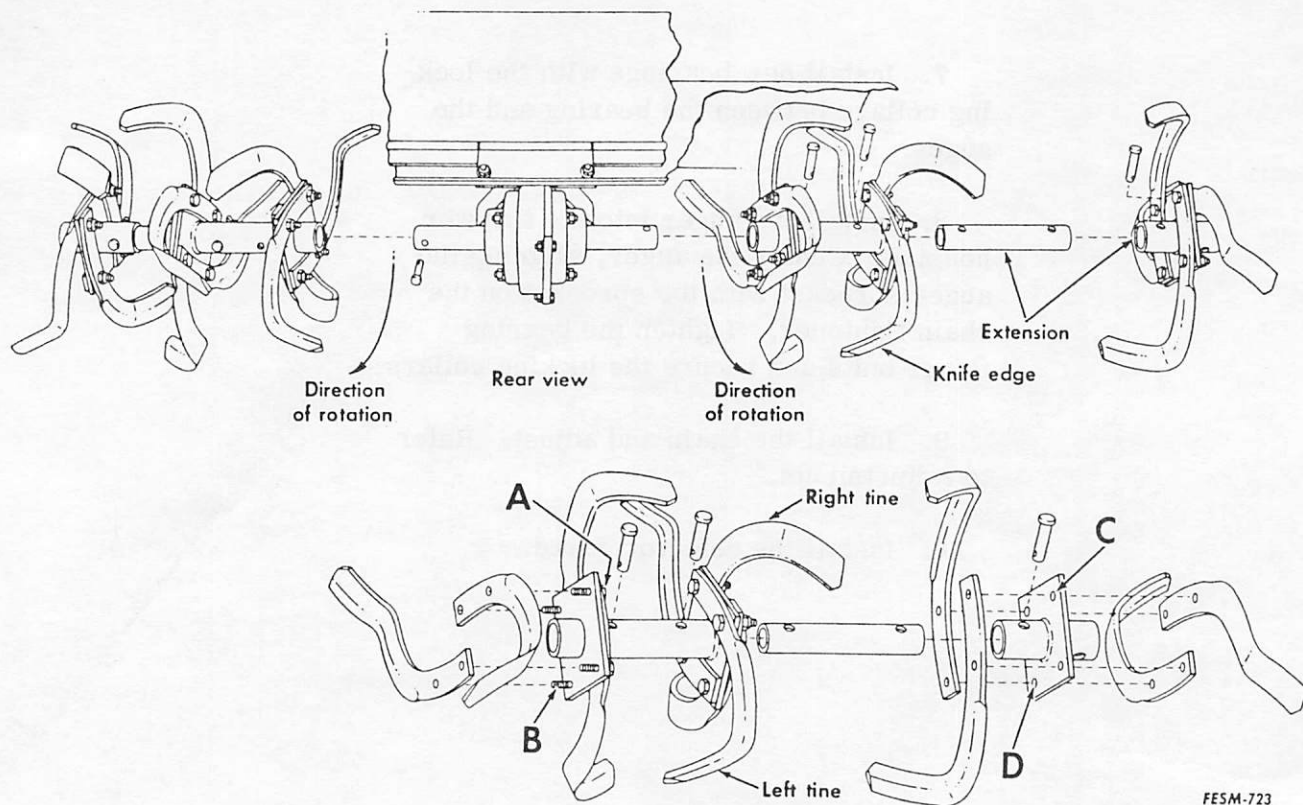
10. Install the deflector guard.

ROTARY TILLER

Replacing Tines

The tines are marked and identified as "lefts" and "rights". They must be re-installed in the same identical position as they were before removal so the knife edge will always lead in the direction of rotation.

When the tines are properly assembled on the shaft, the knife edges of the tines create a clockwise spiral effect around the shaft when viewed from the right side of the machine.



FESM-723

Rear view showing proper tine assembly for correct timing.

The left and right tines are always positioned 90 degrees from each other and bolted on opposite sides on the mounting plate.

Attach the right tines to the right side and the left tines to the left side of the mounting plate when viewed from the rear of the machine.

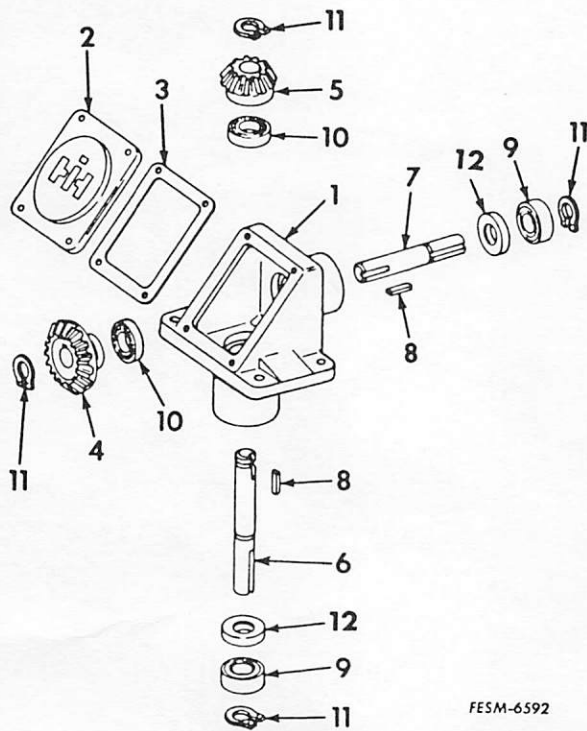
The tine shaft having two mounting plates has one plate with bolt holes "A" and "B" in line with the shaft pin hole.

Position the shaft with this particular plate toward the left. Then locate the end hole of a right tine at hole "A" and the end hole of the other right tine at hole "B" on the right side of the mounting plate. Locate the inner hole of a left tine at hole "A" and the inner hole of the other left tine at hole "B" on the left

side of the mounting plate. Complete the tine shaft assembly as shown. The completed assembly is the same for each side of the tiller; make sure the knife edges (cutting edges) lead in the direction of rotation.

Position the extension mounting plate so the shaft pin hole that lines up with bolt holes "C" and "D" is toward the left. Then locate the end hole of a left tine at hole "C" and the end hole of the other left tine at hole "D" on the left side of the mounting plate. Locate the inner hole of a right tine at hole "C" and the inner hole of the other right tine at hole "D" on the right side of the mounting plate. Complete the assembly as shown. The completed extension assembly is the same for each side of the tiller; make sure the knife edges lead in the direction of rotation.

Gear Box



The gear box for the rotary tiller is the only assembly that requires servicing information. The four bearings are bottomed against shoulders in the gear box. The bearings at the outer ends of the shaft are retained in the gear box with snap rings. The bevel gears are keyed to their shafts and held in position with snap rings. There is no shimming of the gears for backlash as this is predetermined in manufacturing. Always replace the oil seals when the gear box is disassembled. Refer to the Operator's Manual for the correct fill level and lubricant.

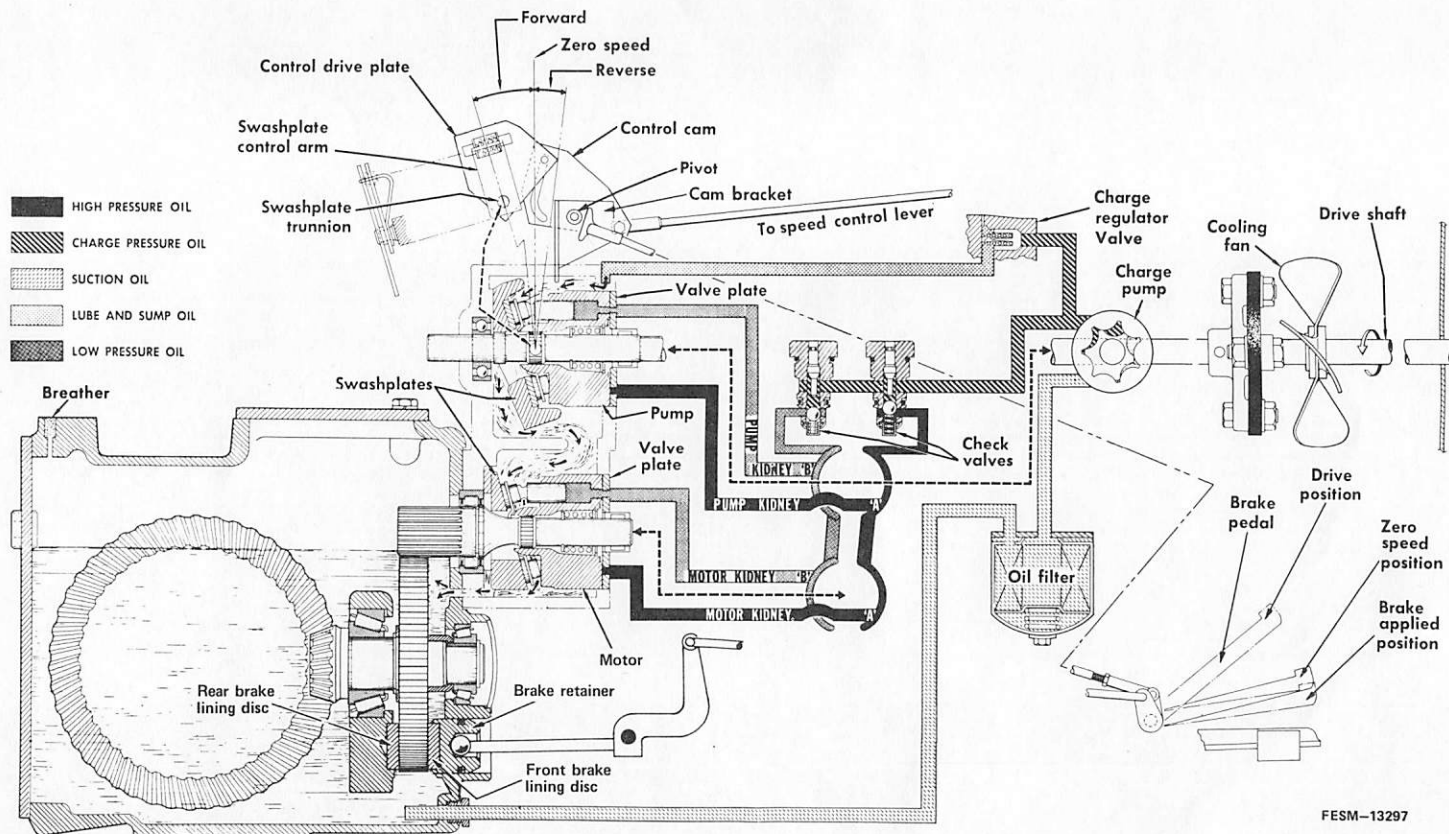
FESM-6592

1. Case
2. Cover
3. Gasket
4. Bevel gear

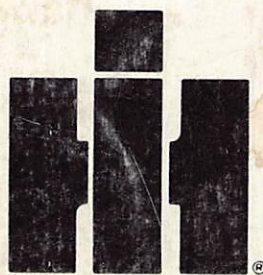
5. Bevel gear
6. Input shaft
7. Output shaft
8. Key

9. Bearing
10. Bearing
11. Snap ring
12. Seal

HYDROSTATIC TRANSMISSION (INTERNAL BRAKES)



FESM-13297



INTERNATIONAL HARVESTER