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

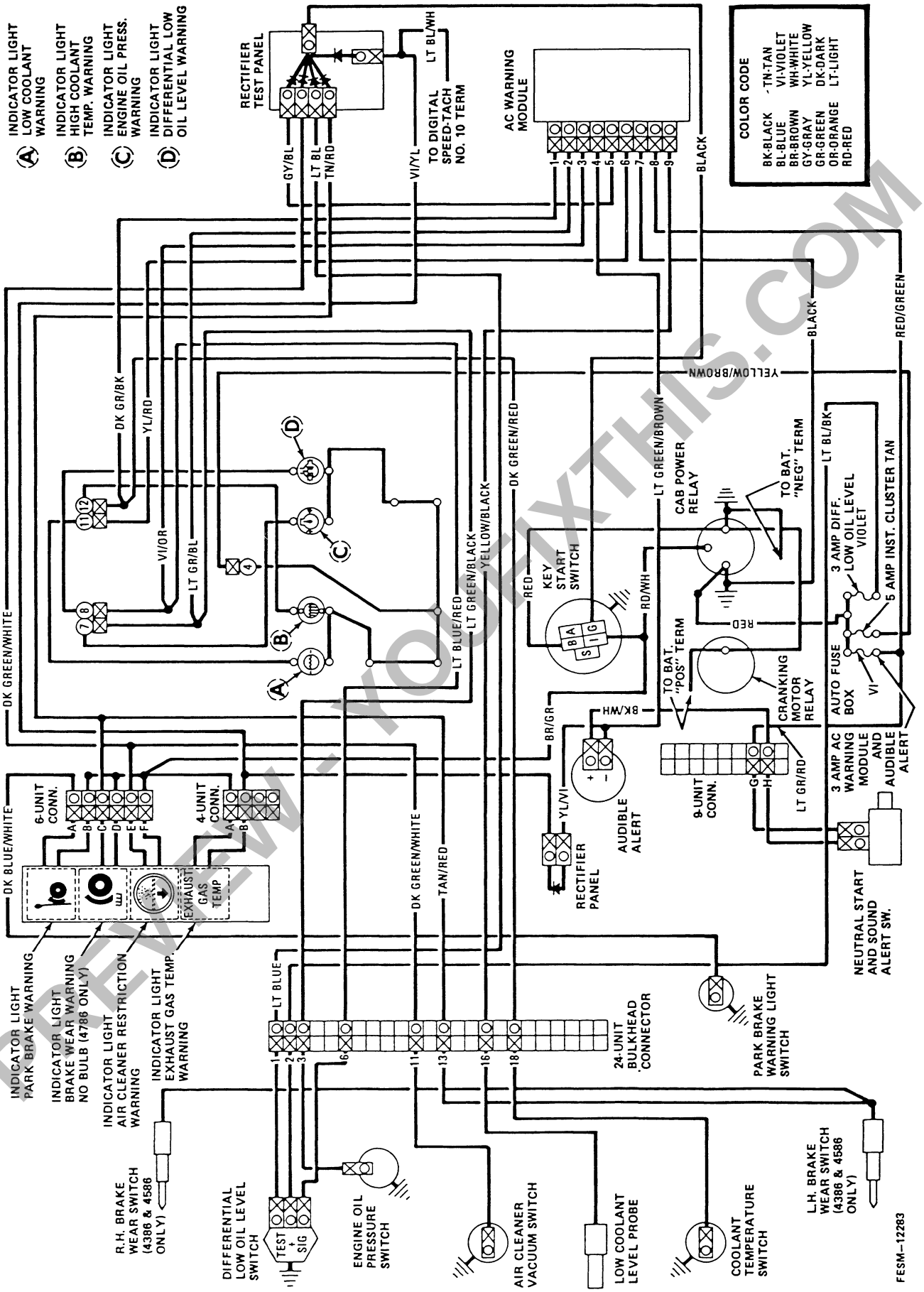
†When bolt penetration is 1-1/2 times the diameter of the bolt.

BOLT TYPE IDENTIFICATION CHART

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

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

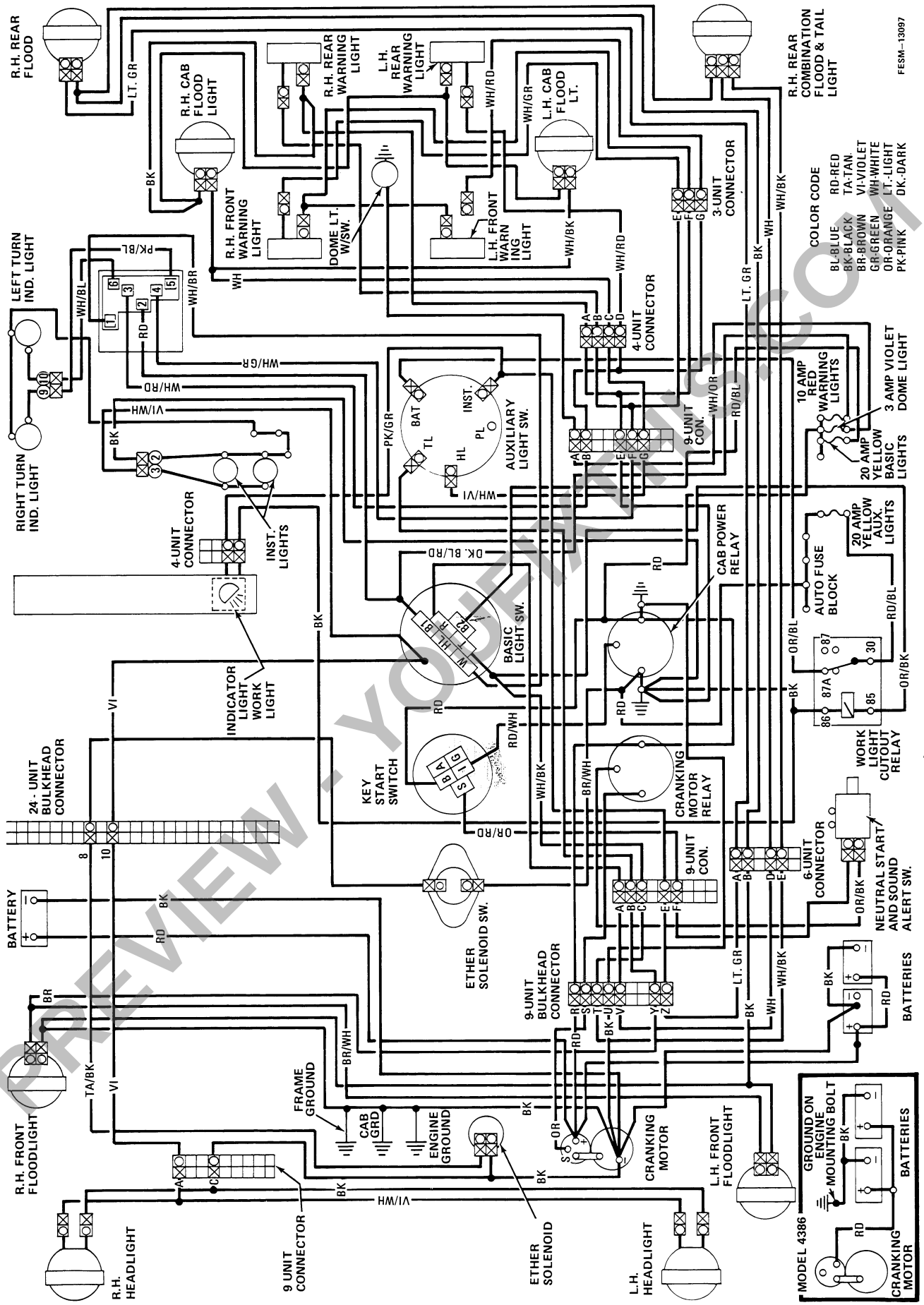
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EARLY WARNING SYSTEM – 4386, 4586 Serial Number 1501 and Above and 4786 Tractor 501 and Above

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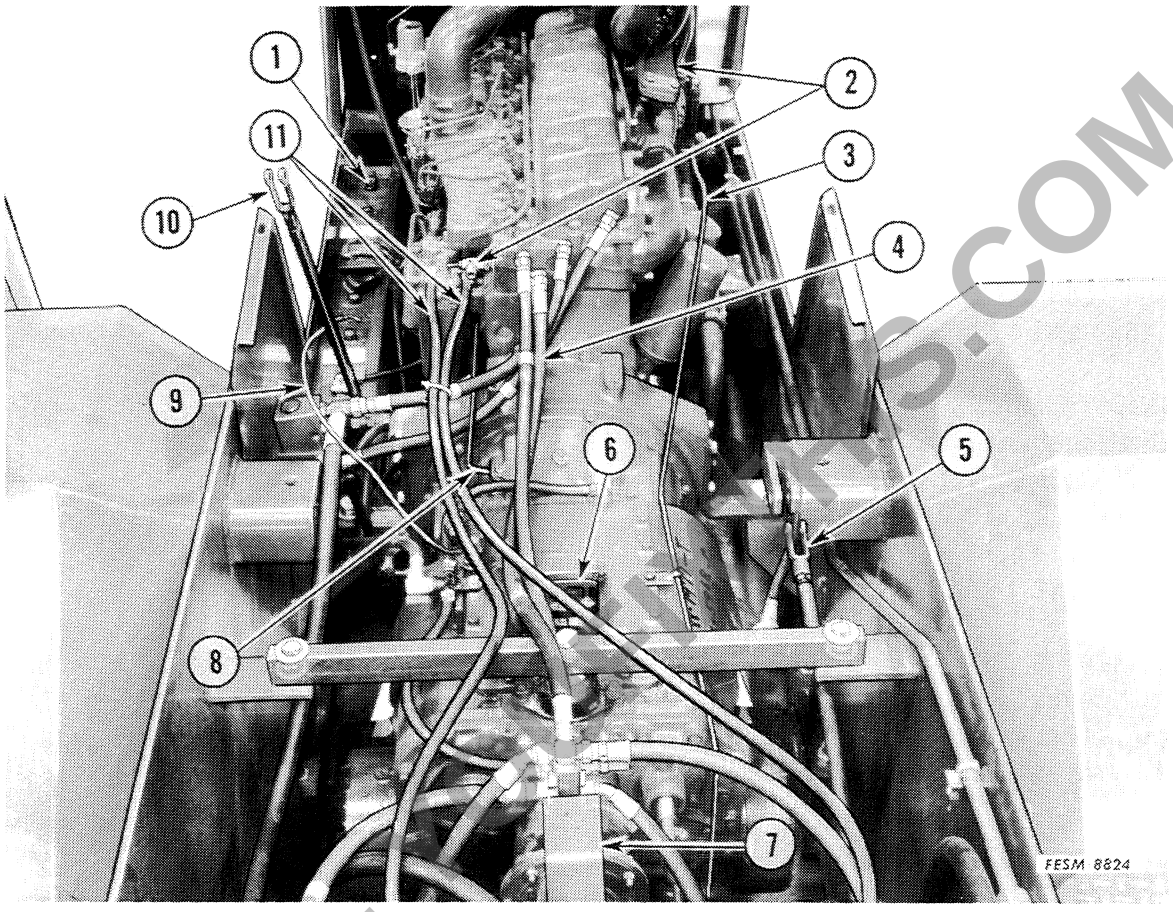
Starting and Lighting Wiring — 4386, 4586 and 4786 Tractors

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CAB

4366 and 4568 Removal and Installation



4366 Shown

1. Battery	5. Range lever	9. Cab ground wire
2. Heater hose connections	6. Speed lever	10. Clutch pedal
3. Brake line	7. Brake linkage	11. Fuel lines
4. Power steering lines	8. Governor control rod	

1. Drain enough coolant so both heater hoses and the evaporator tube can be disconnected.

2. Remove the hood assembly and rear hood support.

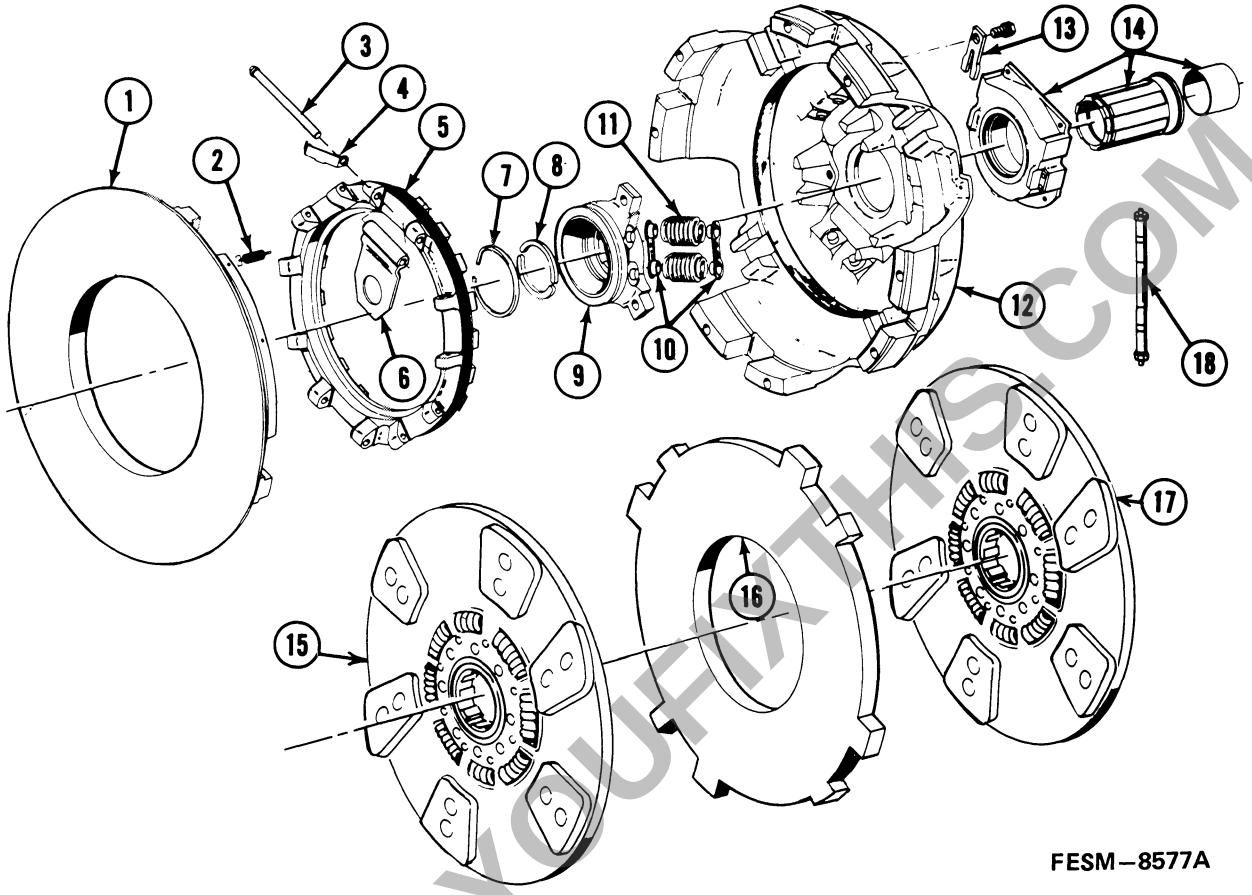
3. Disconnect:

   a. Battery ground.
   b. Brake line.
   c. Power steering lines from the steering hand pump. Plug and cap all open ports.
   d. Range transmission lever.
   e. Clutch rod.
   f. Governor control rod.
   g. Park brake linkage.

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Flat Type Clutch Assembly



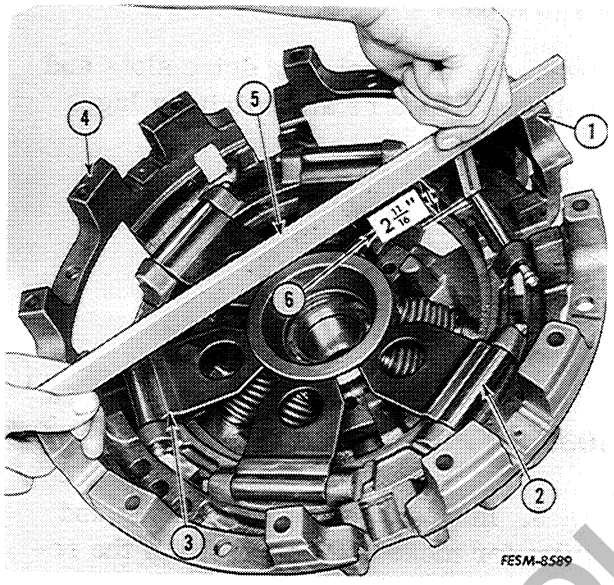
1. Clutch pressure plate
2. Clutch return spring (4)
3. Pivot pins (6)
4. Pin clip (3)
5. Adjusting ring
6. Clutch lever (6)
7. Snap ring
8. Clutch release ring
9. Clutch release retainer
10. Clutch spring pivots (6)
11. Clutch pressure springs (6)
12. Flywheel ring
13. Lock strap and bolt
14. Sleeve release assembly and bearing
15. Rear clutch driven disc
16. Intermediate clutch plate
17. Front clutch driven disc
18. Clutch lube hose assembly

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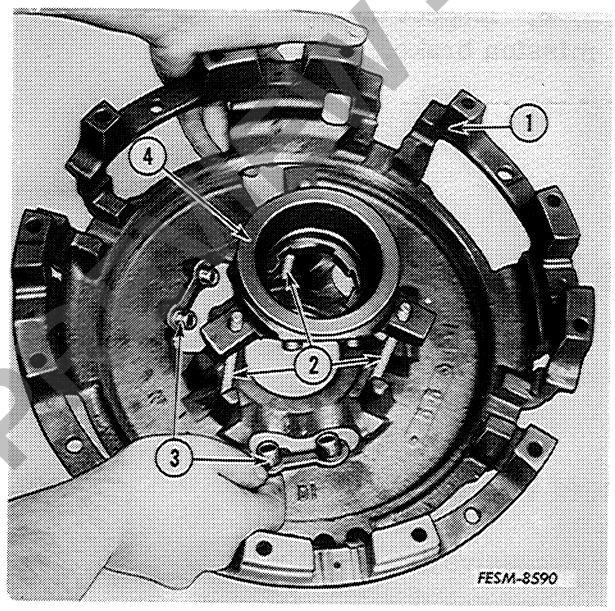
REASSEMBLY

1. Before assembling the adjusting ring into the flywheel ring coat the threads of the flywheel ring and adjusting ring with IH 251 HEP grease.



2. Assemble the adjusting ring to the flywheel ring with notches down. Preset the adjusting ring by placing two pivot pins in the adjusting ring bosses directly opposite each other. The dimension from the flywheel ring mounting surface to the straight edge is approximately 2-11/16".

1. Flywheel ring
2. Adjusting ring
3. Notches (down)
4. Bolt circle face
5. Straight edge
6. Dimension 2-11/16"



3. Install the three threaded rods in the holes provided in the flywheel ring. Place three nuts on the opposite end of the rods so rods are held from being pulled through the flywheel ring. Place the spring pivots on the bosses in the flywheel ring and retainer.

1. Flywheel ring
2. Threaded rods (3)
3. Spring pivots (6)
4. Retainer

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AIR CONDITIONING

NOTE: Refer to GSS-1455 for Air Conditioning Service Information.

SPECIFICATIONS

*Capacity - BTU per hour 18,000

Electrical System
- Volts - DC . . . . . 12 nominal
- Amperes (Fused) . . . . . 25 nominal

Current Draw at Nominal 12 volts
- Blower Fan Circuit - amps . . . . .

	Fan Only	Fan w/ Compressor Clutch
Purge	15.5-19.0	18.0-24.0
High	8.5-10.0	11.0-15.0
Low	6.0-7.0	8.5-12.0

Air Blower CFM
- All Fresh Filtered Cab Air . . . . . 500 CFM max.

Refrigerant Charge . . . . . 3.5 lbs.

	4386	4586 & 4786
Minimum Compressor RPM	789	1244
Minimum Engine RPM	850	1000

Expansion valve superheat setting - degrees . . . . . 7° - 10°F

*Based on 90°F dry, 75°F wet bulb temperatures at the evaporator.

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General Contents

Page

Safe Work Rules, Standard Torque Data for Nuts and Bolts, Metric Conversion Tables, Standard Torque Data for Hydraulic Tubes and Fittings, Special Service Tools Required, Service Information System (S.I.S.) ..... IV – XVI

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3	STEERING
4	ENGINE 4366 AND 4386
4A	ENGINE 4568, 4586 AND 4786
5	FUEL SYSTEM
6	ELECTRICAL SYSTEM
7	COOLING SYSTEM
8	CLUTCH AND FLYWHEEL
9	TRANSMISSION 4366 AND 4386
9A	TRANSMISSION 4568, 4586 AND 4786
10	FRAMES, DIFFERENTIALS, AXLES AND HOUSINGS
11	TRANSFER CASE 4366 AND 4386
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12	BRAKES 4366 AND 4386
12A	BRAKES 4568, 4586 AND 4786
14	HYDRAULIC SYSTEM 4366 AND 4386
14A	HYDRAULIC SYSTEM 4568, 4586 AND 4786
15	TESTING THE HYDRAULIC SYSTEM

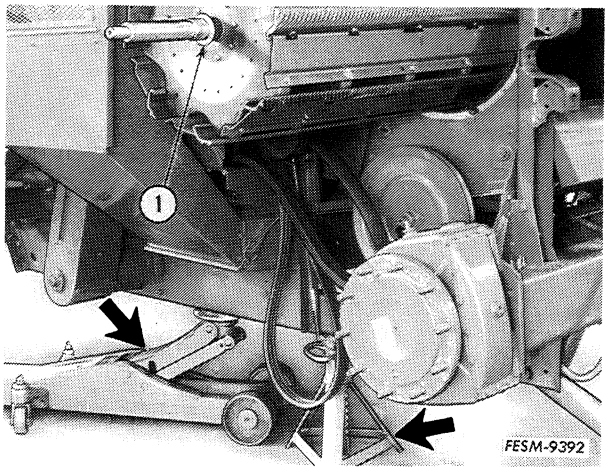
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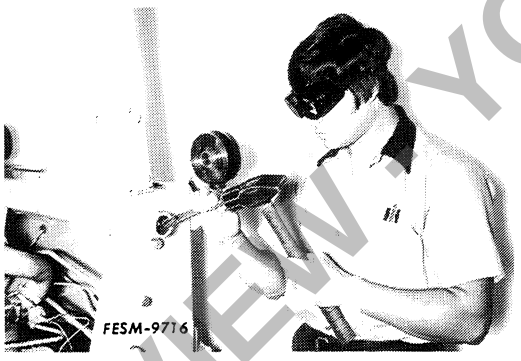
WORK SAFELY – FOLLOW THESE RULES

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



2. 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.

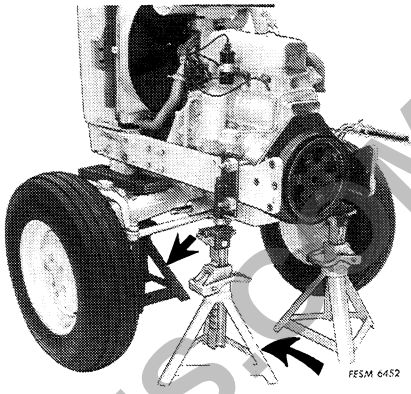


3. Always wear safety glasses when using a hammer, chisel or other tools that may cause chips to fly.

4. Keep work area organized and clean. Wipe up oil or spills of any kind. Keep tools and parts off of the floor. Eliminate the possibility of a fall which could result in a serious injury.

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

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



7. When splitting tractors, or disassembling machines, be sure to use safety stands and adequate supports to prevent tipping or rollover.



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



9. When using an acetylene torch always wear welding goggles and gloves. Keep a "charged" fire extinguisher within reach. Be sure the acetylene and oxygen tanks are separated by a metal shield and are chained to the cart. Do not weld or heat areas near fuel tanks or fuel lines and utilize proper shielding around hydraulic lines.

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10. Always use a safety bar to block hydraulic cylinders. Never rely on the machine hydraulic system to hold when working on loaders, etc. A hydraulic line or cylinder could fail or someone could accidently strike the control levers causing the loader to fall.

11. 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.

12. 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.

13. 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) When refueling, keep the hose and nozzle of the funnel and container in contact with the metal of the fuel tank to avoid the possibility of an electric spark igniting the fuel. Do not overfill the fuel tank - overflow creates fire hazard. Wipe up spilled gasoline.

(d) Replace fuel tank cap securely.

14. Always use a protective fixture when inflating tubeless tires that have been repaired or are loose on the rim. Do not inflate over 30 psi to seat the tire bead.

15. 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.

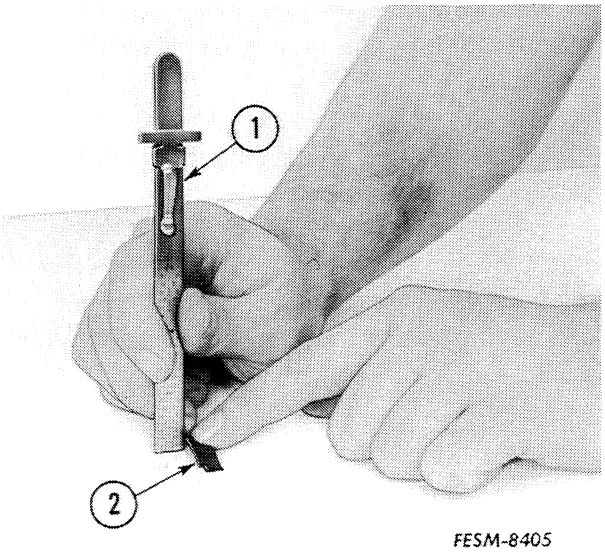
16. Be careful when using compressed air to dry parts. Use approved air blow guns, do not exceed 30 psi, wear safety glasses or goggles and use proper shielding to protect everyone in the work area.

17. 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.

18. Excessive or repeated skin contact with sealants or solvents may cause skin irritation. In case of skin contact, remove sealant or solvent promptly by washing with soap and water.

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.

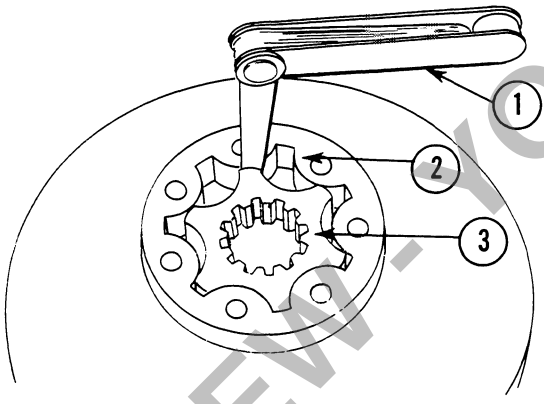
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FESM-8405

1. Place the centering springs on a flat surface. Place a six inch scale along side the spring. Press the spring down to a height of 1/16 inch and release. The return height should be 7/32 inch. If less, replace all the springs.

1. Six inch scale
2. Centering spring



FEA-63350

2. Place a feeler gauge between the inner star and outer ring of the gerotor pump. If there is more than a .005 inch clearance between the two components then replace the pump.

1. Feeler gauge
2. Outer ring
3. Inner star

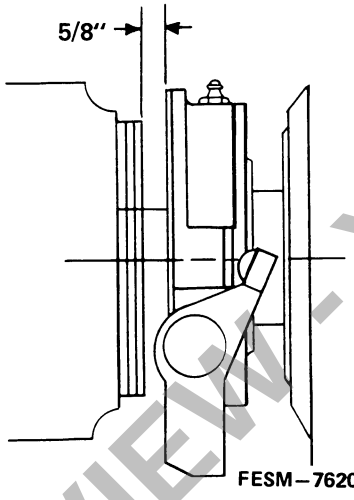
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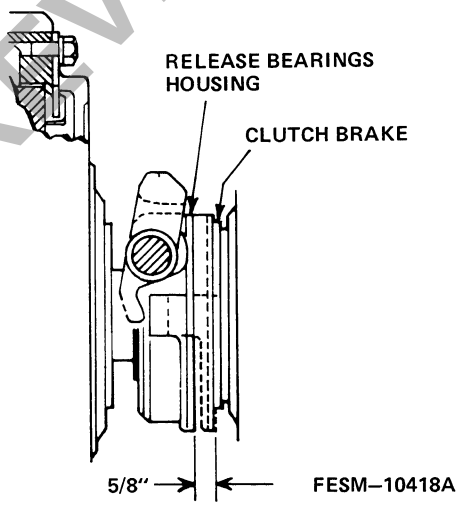
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The proper clutch pedal free travel is a very important key for indicating a necessary adjustment. The first few hours of operation on a new tractor may increase the clutch pedal free travel.

If the pedal free travel exceeds 2-1/2 inches it may be necessary to make an internal adjustment to the specified 5/8 inch to prevent clutch failure. After the initial friction pad "growth stops" and free pedal increases stop, all further adjustments will be made to compensate for facing wear.

Loss of free travel indicates clutch wear. When pedal free travel drops below the minimum of 1/2 inch, it is an indication that the clutch needs to be internally adjusted immediately.





Proper clutch pedal free travel for 4366, 4386, 4568, 4586 and 4786 tractors is 1-3/4 ± 1/4 inches. Check the free travel by placing a square between the console and the top of the clutch pedal pad when in the fully engaged position.

Next depress the clutch pedal and take up all slack and insure release yoke contact with the release bearing.

If the pedal is found to be beyond the 1/2 inch minimum and 2-1/2 inch maximum it will be necessary to make an internal clutch adjustment.

On all current articulated tractors, the internal clutch adjustment is correct with 5/8 inch clearance between the release bearing cage and clutch brake surface.

On 4366 and 4386 Series tractors, the clutch cross shaft is located below transmission input shaft center line as shown.

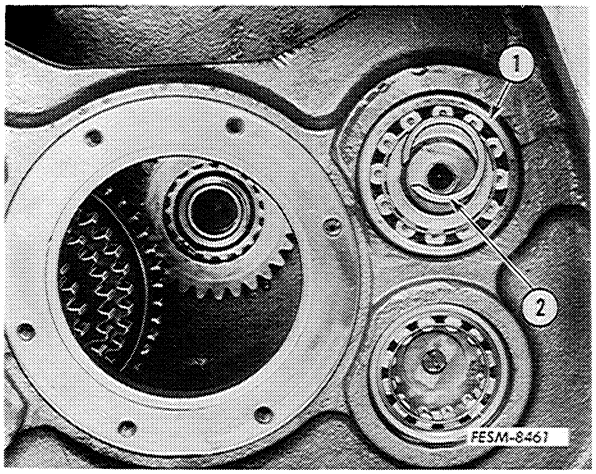
On the 4568, 4586 and 4786 tractors, the clutch cross shaft is located above the transmission input shaft center line as shown.

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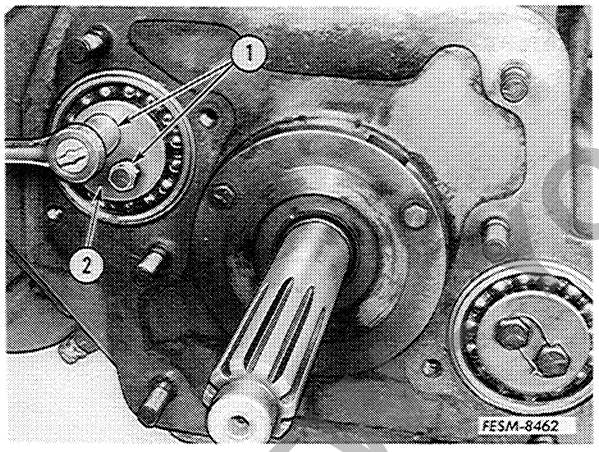
COUNTERSHAFT BEARINGS

Removal



1. Remove the snap ring from the rear of the countershaft. Using a brass drift, from the inside of the case, move the countershaft rear bearing to the rear as far as possible.

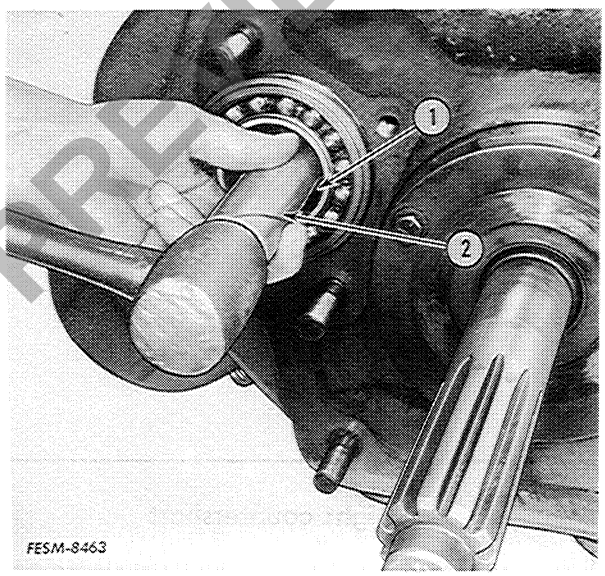
1. Countershaft rear bearing
2. Snap ring



2. Cut the lock wire and remove the two capscrews securing the front bearing retainer plate.

NOTE: When removing the countershaft care should be taken not to damage the holes that are drilled and tapped in the end of the countershaft. Use a large brass drift.

1. Capscrews
2. Bearing retainer



3. Remove the right countershaft to the rear as far as it will go. Using a brass drift against the shaft, tap the shaft and this will partially unseat the front bearing from the shaft and at the same time unseat the rear bearing from its bore.

1. Right countershaft
2. Brass drift

4. Drive the rear bearing from the shaft with a punch and discard the bearing. Do not reuse the bearing.

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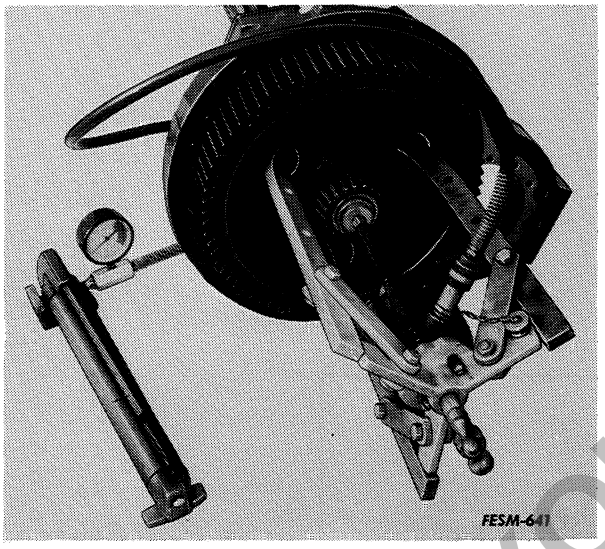
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AXLE AND/OR BEARING REMOVAL

1. Refer to front or rear frame removal.

2. Drain all Hy-Tran from the front or rear frame including the axle housings.

3. Remove the wheel and tire assembly.



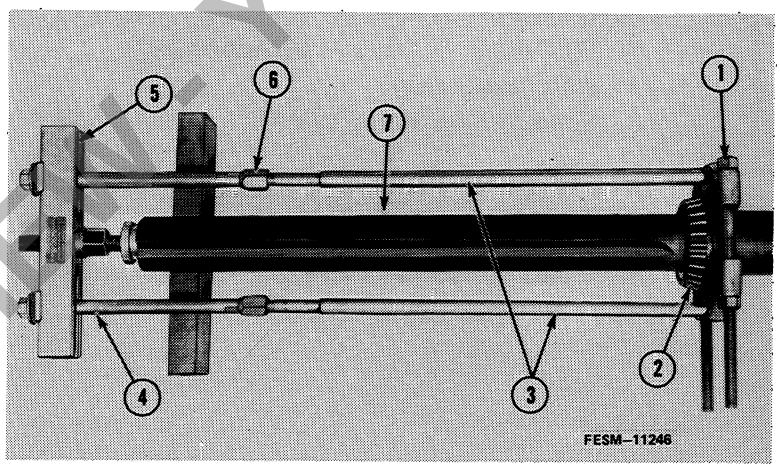
4. Install the FES 527 rear housing handler and the FES 526 tractor wheel handler.

5. Split the axle housing assembly from the housing.

6. Remove the bull gear and the inner bearing using a suitable puller as shown.

7. Remove the axle outer bearing and seal.

8. Remove the axle assembly.

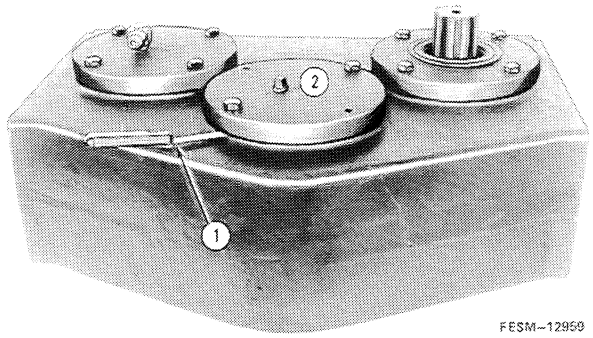


1. OTC 952 Split puller
2. Bearing assembly
3. OTC 930C1 legs - Long
4. OTC 93E1 legs - Short
5. OTC938 Bridge
6. OTC 924 3/4 in. - 16 Adapter
7. Axle assembly

9. With the axle assembly removed, install the puller assembly shown and remove the bearing.

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1. Feeler gauge
2. Bearing cap

4. Install the capscrews opposite from each other and torque them to 60 in. lbs. while rotating the shaft. Continue to torque until the torque stabilizes at 60 in. lbs.

5. Measure the gap between the cap and the housing at the two capscrews with a feeler gauge. If .005 inch or more variance is recorded, repeat step 4.

NOTE: If possible, the actual shim pack thickness should be gauged before installing the end cap.

6. Average the two readings and add .007 inch ± .001. With the first shaft measured correctly loosen the capscrews, remove the bearing cap and add the correct shim pack.

7. Install the bearing cap with O-ring and shims. Install the capscrews and hand tighten.

8. Repeat the same procedure on the other two bearing retainers.

9. With all measurements established torque all capscrews to 85 ft. lbs.

IMPORTANT: The oil level in the transfer case is critical. Be sure to keep the drain elbow located on the right hand side of the transfer case in line with the elbow on the front drive frame.

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ILLUSTRATION 1

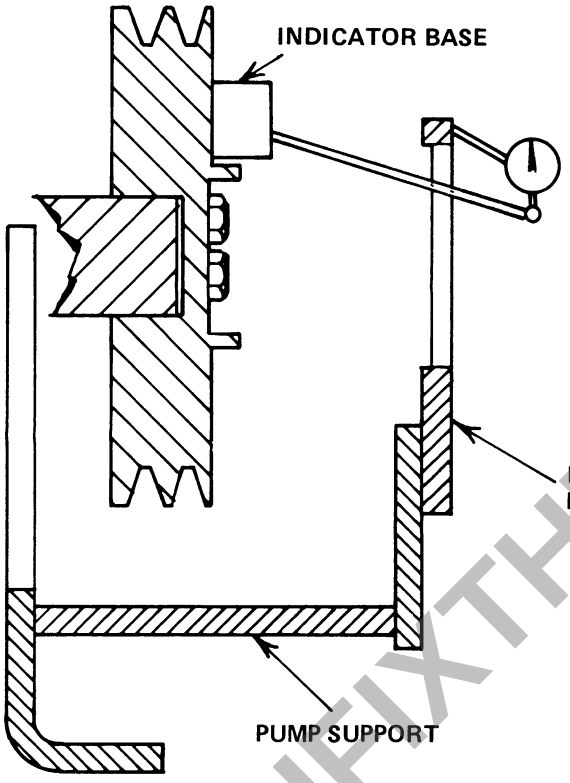
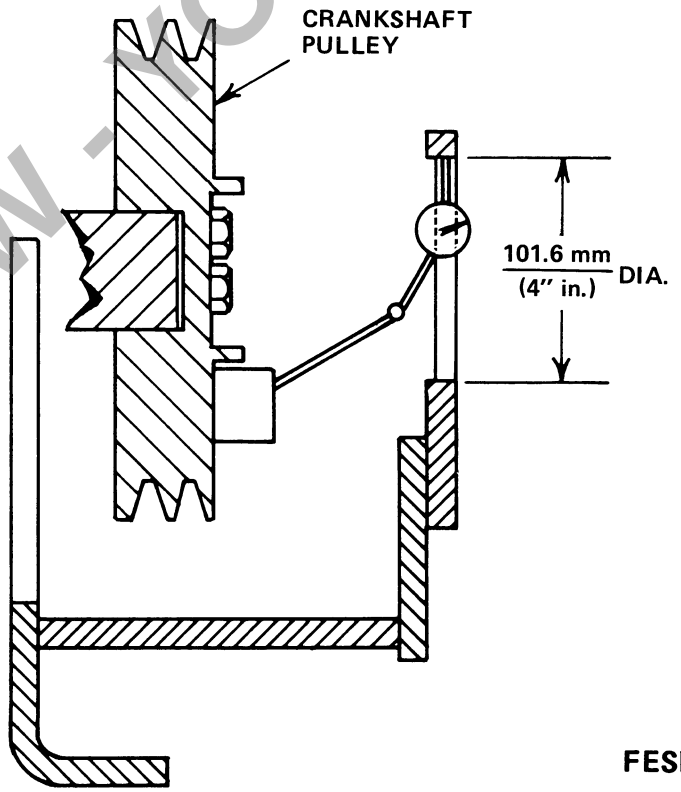


ILLUSTRATION 2



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