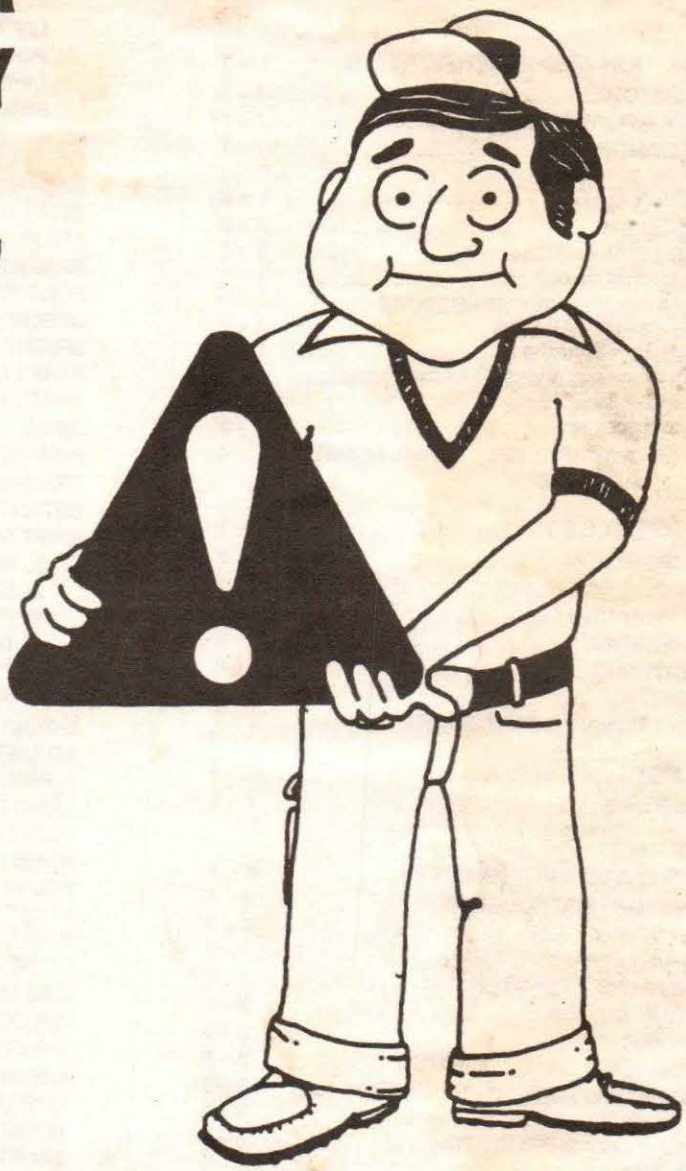
TRACTORS

AGCO

OPERATOR'S MANUAL

"REMEMBER THIS SAFETY ALERT SYMBOL!!!"



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DEALER POST-DELIVERY AND OWNER PRESEASON CHECK LIST

Use following list as a guide for post-delivery and pre-season service. For information not contained in this list, refer to manual. Items to be checked are listed in a systematic manner, so begin with first item and work down. Suggested post-delivery service to be accomplished at approximately 50 hours.

Dealer checks - Circle each "X" as service is accomplished.

Pre Season	Post Delivery	
		LUBRICATION
X		Check engine oil level.
X	X	Check powershift transmission oil level.
X	X	Check final drive and hydraulic system oil level.
X		Check PFA differential and planetary oil levels.
	X	Change engine oil and filter.
	X	Change final drive/hydraulic filter.
	X	Change powershift transmission oil filter.
	X	Change PFA differential and planetary oil (where applicable)
X	X	Lubricate all grease fittings.
X	X	Tighten all hydraulic hose clamps.
X	X	Check front wheel bearings (2WD).
X	X	Check for any leaks and correct.
X	X	Tighten all drain plugs.
		COOLING SYSTEM
X	X	Cooling air chamber, coolers and cylinder fins free of dirt and debris.
X	X	Air chamber cover securely installed and latched.
		ELECTRICAL SYSTEM
X	X	Check electrical system using procedure outlined in Maintenance section.
X	X	Check operation of ether starting aid.
X	X	Check operation of lights.
		AIR INTAKE
X	X	Check all hose connections.
X	X	Check air cleaner element.
		GENERAL
X	X	Check and tighten wheel bolts front and rear.
X	X	Check tire inflation pressure.
X	X	Check front wheel toe-in and front wheel bearing adjustment.
X	X	Make sure all safety decals are in place.
X		Operator's Manual with unit.

DEALER POST-DELIVERY AND OWNER PRESEASON CHECK LIST

Pre Season	Post Delivery	
		ENGINE
X	X	Check low idle speed.
X	X	Check high idle, no-load speed.
	X	Retighten oil pan bolts.
	X	Retighten engine mounting bolts.
	X	Retighten intake and exhaust manifold bolts to cylinder heads.
X	X	Drain water separator.
	X	Check valve clearance.
		OPERATION
X	X	Check park lock engagement.
X	X	Check park lock safety start operation.
X	X	Check PTO operation.
X	X	Check PTO lever safety start operation
X	X	Check clutch pedal safety start operation.
X	X	Check hydraulic system operation. Try all functions.
X	X	Check steering operation.
X	X	Check brakes-check pedal free travel.
X	X	Check instruments and gauges for proper response.
		OWNER INSTRUCTION
X		Thoroughly review with operator the Safety, Controls and Instrument, Operation, Lubrication-Maintenance and Service Adjustments, and Troubleshooting sections of this manual.

SERVICE RECORD

SERVICE PERFORMED	HOURS

NOTES

SECTION I
INTRODUCTION AND IDENTIFICATION

TO OUR CUSTOMER

The following pages and illustrations are printed to help supply you with the knowledge to better operate and service your new AGCO equipment.

Any piece of equipment needs, and must have a certain amount of service and maintenance to keep it in top running condition. We have attempted to cover all the adjustments required to fit most conditions; however, there may be times when special care must be taken to fit a condition.

Study this operator's manual carefully and become acquainted with all the adjustments and operating procedures before attempting to operate your new equipment. Remember, it is a machine and has been designed and tested to do an efficient job in most operating conditions and will perform in relation to the service it receives.

If special attention is required for some conditions, ask your AGCO Dealer; his parts and Service Organization will be glad to help and answer any questions on operation and service of your new machine.

ATTENTION! BECOME ALERT
YOUR SAFETY IS INVOLVED!

This symbol is used to call your attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol–Heed its Warning.

THIS MANUAL SHOULD REMAIN WITH THE TRACTOR WHEN SOLD

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

WARRANTY INFORMATION

Your AGCO Warranty for this tractor appears on your copy of the Retail Purchase Order and Warranty Terms and Conditions Statement which you received from your dealer when you purchased the tractor.

As indicated on the Retail Purchase Order signed by you and your dealer, you, the equipment purchaser, shall assume charges for service calls or transportation of equipment to and from the location of Servicing AGCO dealer.

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IDENTIFICATION DATA

SERIAL NUMBERS

When ordering repair parts, it is important to advise your dealer of the serial numbers of your tractor. Serial number locations are shown in Figures 1 through 5.

RIGHT AND LEFT

When reference is made concerning the right and left of the tractor this is determined when sitting in the operator's seat and facing the front of the tractor.

TRACTOR SERIAL NUMBER (Figure 1, Item 1)

Both Tractor model and serial numbers are stamped on metal plate attached to left side of transmission. Record both the tractor model and its serial number on line provided below.

MODEL: _____

SERIAL NUMBER: _____

ROLL-OVER PROTECTIVE STRUCTURE (ROPS) SERIAL NUMBER (Figure 1, Item 2)

ROPS model number, serial number and tractor model are stamped on a metal plate attached to cab door threshold. Record ROPS serial number on line provided below.

SERIAL NUMBER: _____

ENGINE SERIAL NUMBER (Figure 2)

Engine serial number is stamped on metal plate attached to left hand side of engine block beneath the starter. Record serial number on line provided below.

ENGINE SERIAL NUMBER: _____

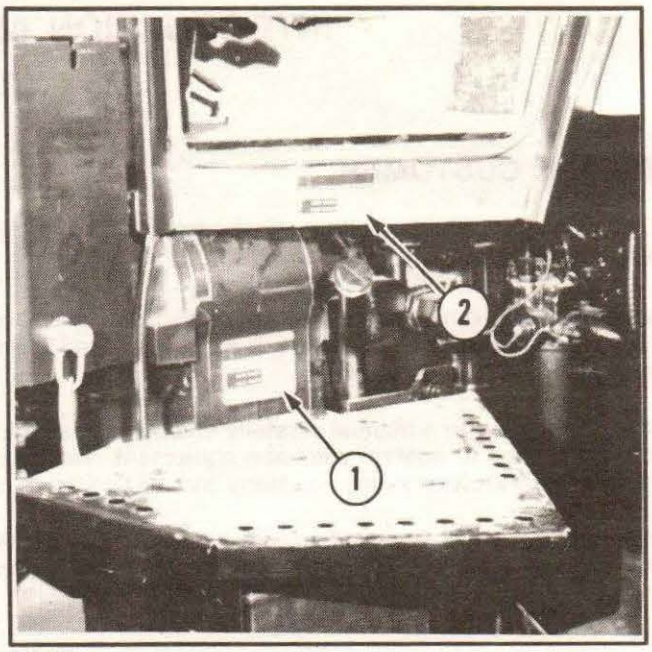

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FIGURE 1 - L.H. SIDE OF TRACTOR

1. **Tractor Serial Number Plate**
2. **ROPS Serial Number Plate**

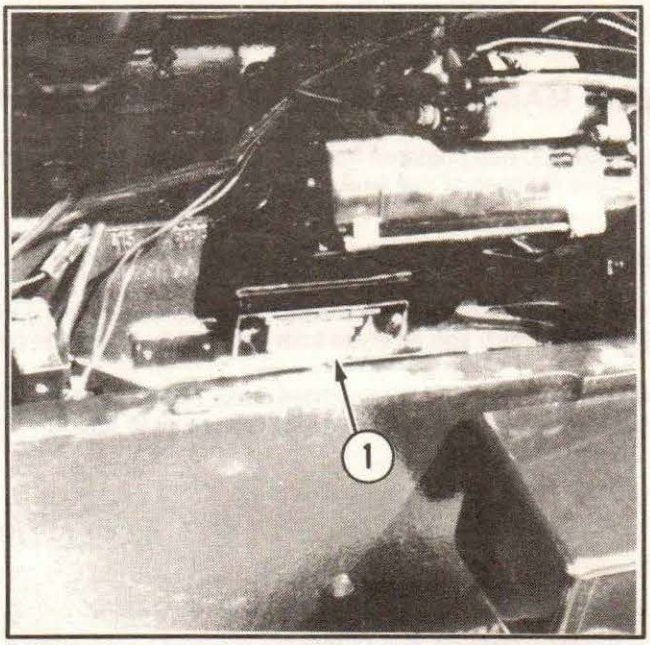

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FIGURE 2 - L.H. SIDE OF ENGINE

1. **Engine Serial Number Plate**

POWERSHIFT TRANSMISSION SERIAL NUMBER (Figure 3)

Powershift transmission serial number is stamped on metal plate attached to lower right hand side of transmission housing. Record transmission serial number on line provided below.

SERIAL NUMBER: _____

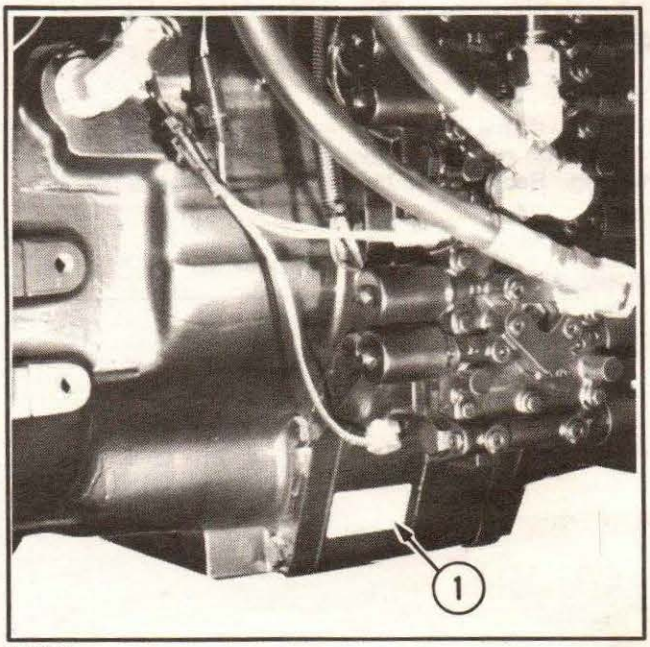

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FIGURE 3 - R.H. SIDE OF TRANSMISSION

1. Powershift Transmission Serial Number Plate

POWER FRONT AXLE (PFA) SERIAL NUMBER (Figure 4)

The PFA serial number is stamped on metal plate attached to the left side of the axle housing. Record PFA serial number on line provided below.

SERIAL NUMBER: _____

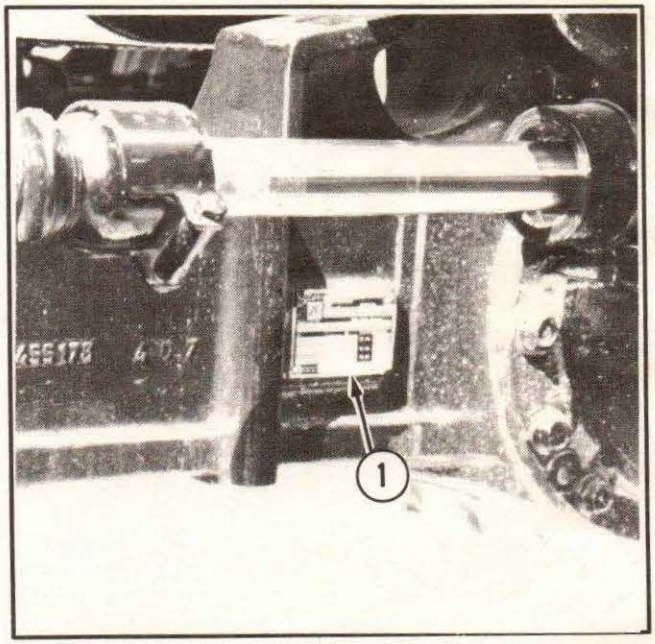

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FIGURE 4 - L.H. REAR SIDE OF AXLE HOUSING

1. PFA Serial Number Plate

REAR MAINFRAME ASSEMBLY SERIAL NUMBER
(Figure 5)

Rear mainframe assembly model and serial numbers are stamped on metal plate located on left hand side of main housing. Record serial number on line provided below.

SERIAL NUMBER: _____

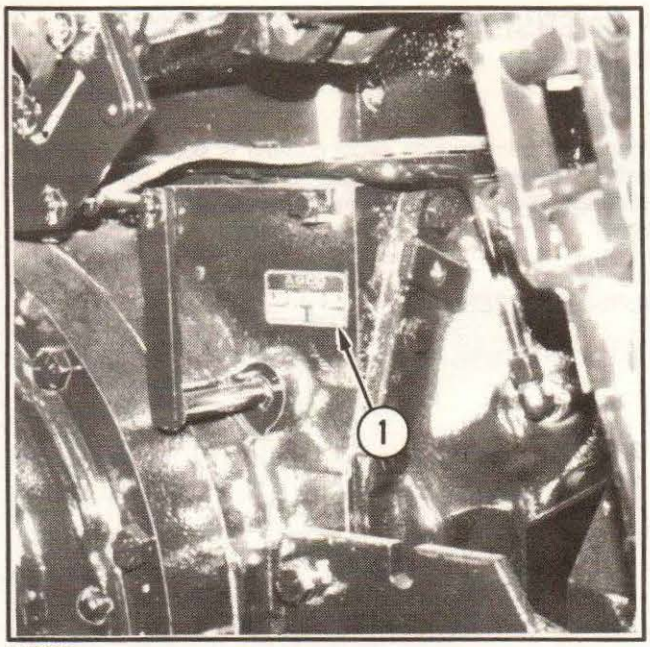

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FIGURE 5 - L.H. REAR SIDE OF REAR MAIN FRAME

1. Rear Main Frame Assembly Serial Number

SECTION II
SAFETY MESSAGES

THIS SAFETY ALERT SYMBOL

MEANS:

Attention!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

THIS SAFETY ALERT SYMBOL IS USED THROUGHOUT THIS MANUAL TO CALL YOUR ATTENTION TO SAFETY PRECAUTIONS ASSOCIATED WITH OPERATION AND SERVICE. CAREFULLY STUDY AND FOLLOW THE SAFETY RULES AND INSIST THEY BE FOLLOWED BY THOSE WORKING WITH AND FOR YOU.

ALTHOUGH THIS TRACTOR IS DESIGNED WITH THE SAFETY OF OPERATION IN MIND. POSSIBILITIES OF ACCIDENTS CANNOT BE COMPLETELY ELIMINATED UNTIL YOU UNDERSTAND AND PRACTICE ALL SAFETY PRECAUTIONS.

ATTENTION!

PICTURES IN THIS MANUAL MAY SHOW PROTECTIVE SHIELDS AND GUARDS OPENED OR REMOVED FOR ILLUSTRATION PURPOSES. BE CERTAIN ALL SHIELDS AND GUARDS ARE IN PLACE DURING OPERATION.

SOME PHOTOGRAPHS IN THIS MANUAL WERE TAKEN OF PROTOTYPE MODELS. PRODUCTION MODELS MAY VARY IN SOME DETAIL.

BEFORE OPERATION

All tractor owners must warn their employees, or anyone who works around or operates tractors and equipment, of all safety rules and good operating practices as found in this manual. Allow only persons trained in safe and proper tractor operation to operate tractor.

BEFORE STARTING ENGINE

Be sure all functional controls are in correct positions such as transmission control lever, park lock lever, PTO and remote valve levers in neutral, 3-point hitch lever in lower-most position and throttle lever at recommended position to start tractor.

Be sure area around tractor and equipment is clear of personnel.

Be sure all provided shields are in place and the tractor SMV sign can be seen.

Never operate engine without adequate ventilation. In a closed building tractor exhaust must be vented outside.

Keep mounting steps and platform clear of debris and mud to prevent slippery surfaces.

Use handles and steps and face the tractor when mounting and dismounting.

Avoid wearing loose fitting clothing and tie up long hair that can catch in moving parts or snag on projecting parts of tractor.

Always fasten seat belts before operating tractor.

DURING OPERATION

Allow only persons trained in safe and proper tractor operation to operate tractor. Do not allow anyone other than a trained operator to ride on tractor except on passenger seat with approved seat belt fastened. There is no other safe place for extra riders to ride the tractor.

Allow no one to ride on implement or towed equipment.

Avoid leaving a running engine unattended.

Engage clutch smoothly and adjust travel speed to ensure safe operation according to terrain. Always reduce travel speed when driving on rough or uneven ground.

Keep a firm grip on steering wheel at all times.

Start engine only from the operator's seat. Do not by-pass the safety start switches. If they malfunction, contact your AGCO dealer.

Operate tractor only from operators seat.

Do not pull from rear axle. Hitch only to the drawbar and attach implement safety chains.

Never, under any circumstances, attempt to pull anything from the adjustable upper link, the axle, or the drawbar bracket. Hitch loads to tractor only at the drawbar, except when pulling implements specifically designed for and properly fastened by 3-point hitch.

During field or road operation, always reduce travel speed when turning to maintain total control of tractor and equipment.

Always apply park lock as the transmission will not hold tractor in parked position.

Always apply park lock when using tractor for stationary power take-off operations.

When using tractor for stationary power take-off operations, stay away from power drive line and never step over a rotating shaft.

Stop tractor engine and all rotating parts before connecting, or disconnecting PTO driveline or working on PTO driven equipment.

Keep all provided shields in place at all times.

Lower implement to ground, move transmission control lever to neutral, apply parklock and stop tractor engine before making adjustments in field.

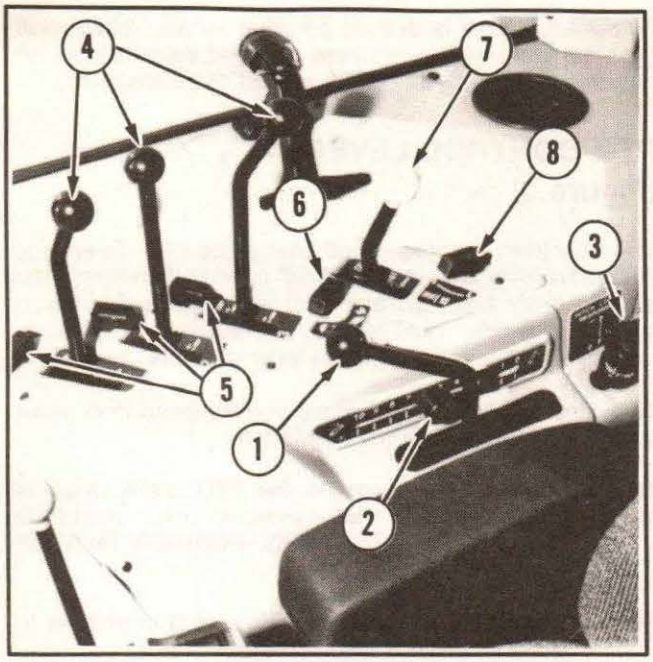
To prevent possible tractor turnover, never drive tractor close to edge of ditch or gully. Avoid holes into which a wheel might drop, causing tractor to overturn.

Tractor turnover may place severe stress on roll-over protective cab frame. Therefore, re-use of structure is not recommended if its upright beams, cross-bar or attaching parts have been bent, buckled or stretched. Also, do not modify structure in any way. Drilling holes or welding on frame structure could weaken it.

AFTER OPERATION

Do not leave tractor operator's area until tractor has come to a complete stop. Move transmission control lever to neutral, apply park lock, stop the engine, and remove the key.

Before leaving tractor operator's area, lower implement to ground to prevent possibility of implement dropping and causing injury. Wait for all implement movement to stop.



T-76314

FIGURE 9 - R.H. CONSOLE

1. **Position Control Lever**
2. **Adjustable Depth Stop**
3. **Hitch Load Response Control**
4. **Remote Cylinder Control Levers**
5. **Float Position Lockout Knob**
6. **Remote Cylinder Flow control Knob**
7. **PTO Control Lever**
8. **Heater Temperature Control**

3-POINT HITCH POSITION CONTROL LEVER

(Figure 9)

Move control lever (Item 1) rearward to raise hitch and forward to lower hitch. Move lever fully forward for float position.

ADJUSTABLE DEPTH STOP

(Figure 9)

Depth stop (Item 2) is used to return hitch to same working depth each time it is lowered. To set depth stop loosen knob, slide stop to desired position and tighten knob.

3-POINT HITCH LOAD RESPONSE CONTROL

(Figure 9)

Hitch load response (draft sensitivity) is varied with control knob (Item 3). Depress center button on control knob and push down for increased sensitivity or pull up for less sensitivity. To make fine adjustments rotate control knob (Item 3) clockwise to increase and counterclockwise to decrease sensitivity.

See Operation Section for complete instructions.

REMOTE HYDRAULIC CONTROL LEVERS

(Figure 9)

These levers (Item 4) control the flow of hydraulic oil to three remote couplers at rear of tractor. Front lever controls bottom coupler number one. Middle lever controls middle coupler number two. Rear lever controls top coupler number three.

Move control levers (Item 4) away from operator to retract or toward operator to extend remote cylinders. Each lever has a detent at float, lower, neutral, and raise positions with a return to neutral at raise and lower positions only.

WARNING: Always lower implements supported by remote cylinders to ground before shutting off tractor engine.

NOTE: Remote valves are not designed to hold implements in raised position for extended periods. Implement should be equipped with a lift lock which should be engaged when transporting implement or parking implement in raised position.

FLOAT POSITION LOCKOUT KNOB

(Figure 9)

Lockout knob (Item 5) prevents remote control levers (Item 4) from going into float position. To operate in float position rotate lockout knobs (Item 5) so control levers can be pushed past "Lower" position into "Float" position. The levers must be manually returned from the detented float position.

REMOTE CYLINDER FLOW CONTROL

(Figures 9 and 10)

Control knob (Item 6) controls flow rate of hydraulic oil from first remote valve to remote coupler (number one). Turn knob (Item 6) clockwise to decrease flow rate and counterclockwise to increase flow rate.

NOTE: Remote cylinder control lever MUST be in float position or tractor engine stopped when adjusting flow control.

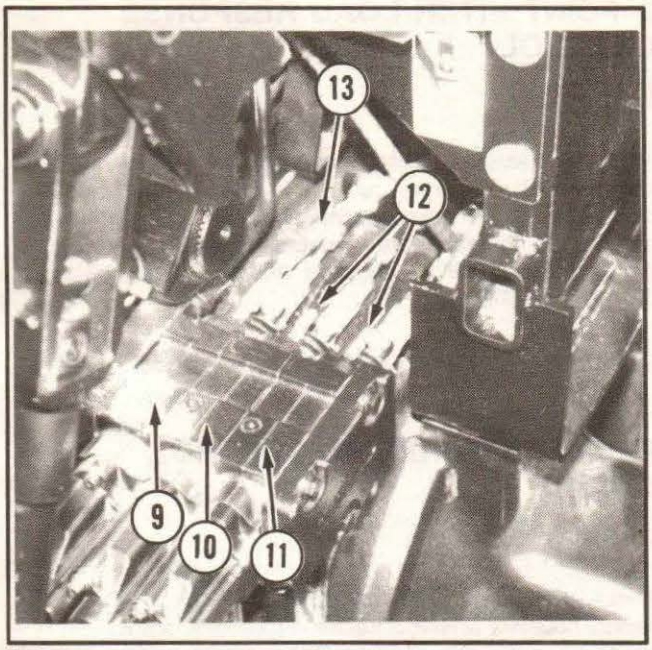


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FIGURE 10 - REMOTE VALVES

9. **First Remote Valve**
10. **Second Remote Valve**
11. **Third Remote Valve**
12. **Flow Control Shaft**
13. **Control Cable**

Operator may choose to control oil flow from second or third remote valve (Item 10 and 11) from cab by attaching control cable (Item 13) to desired valve control shaft (Item 12).

If flow adjustment is desired on other valves, rotate shaft (Item 12) clockwise to decrease flow and counterclockwise to increase flow. Shaft can be rotated 180^0 maximum.

PTO CONTROL LEVER (Figure 9)

This lever (Item 7) engages and disengages PTO. To engage PTO move lever left out of "BRAKE" position then slowly and steadily away from operator until additional resistance to movement is felt. Hold lever in this position until PTO is rotating at full speed then move lever into "ON" position.

To disengage PTO slowly reduce engine speed then move control lever (Item 7) to "OFF" position.

The "BRAKE" position engages the PTO brake which is designed to prevent PTO shaft movement ONLY when PTO is not in use. DO NOT USE "BRAKE" POSITION TO STOP PTO DRIVEN IMPLEMENTS.

NOTE: When engine is shut off, PTO control lever goes to "BRAKE" position automatically.

Regulate engine speed to attain 1000 rpm PTO operation. Adjust accordingly with equipment under load.

HEATER TEMPERATURE CONTROL (Figure 9)

Rotate control knob (Item 8) clockwise to turn ON and increase heat or counterclockwise to decrease and turn heat OFF.

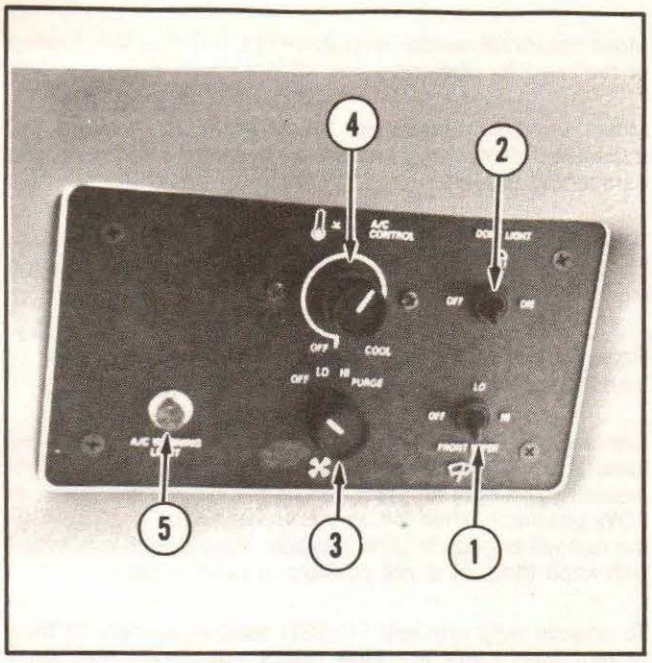

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FIGURE 11 - R.H. SIDE CAB CEILING

1. Windshield Wiper Switch
2. Dome Light Switch
3. Blower Control
4. Air Conditioner Temperature Control
5. Air Conditioner Warning Light

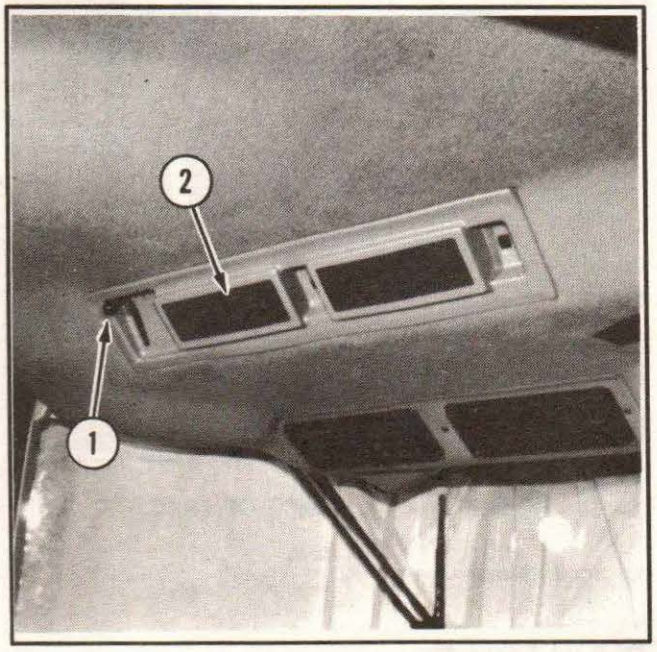

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FIGURE 12 - CAB CEILING

1. Recirculation Air Damper Control
2. Recirculation Air Damper

WINDSHIELD WIPER SWITCH (Figure 11)

Tractor is equipped with two-speed windshield wiper. To operate wiper, move switch (Item 1) to desired speed. Wiper blade returns to park position when switch is moved to OFF.

DOME LIGHT SWITCH (Figure 11)

Move dome light switch (Item 2) to ON to illuminate dome light. Dome light is door activated when dome light is in center position.

CAB BLOWER CONTROL (Figure 11)

This knob (Item 3) controls speed of cab fan. Positions are off, low, high and purge.

AIR CONDITIONER TEMPERATURE CONTROL (Figure 11)

Rotate control knob (Item 4) clockwise to turn ON and increase cooling or counterclockwise to decrease and turn cooling OFF.

AIR CONDITIONER WARNING LIGHT (Figure 11)

This light (Item 5) will glow when A/C system is not operating properly. Consult Maintenance Section.

IMPORTANT: Do NOT operate air conditioner when red warning light is glowing.

RECIRCULATION AIR DAMPER (Figure 12)

Use control lever (Item 1) to open and close damper (Item 2). When damper is closed only filtered outside air enters blower to provide maximum pressurization of cab. Opening damper allows air in cab to recirculate while mixing with only a small amount of outside air to provide minimum pressurization of cab.

Vary control lever (Item 1) between open and closed positions to regulate amount of recirculated air.

When damper is open air conditioner will keep cab cooler and heater will keep cab warmer.

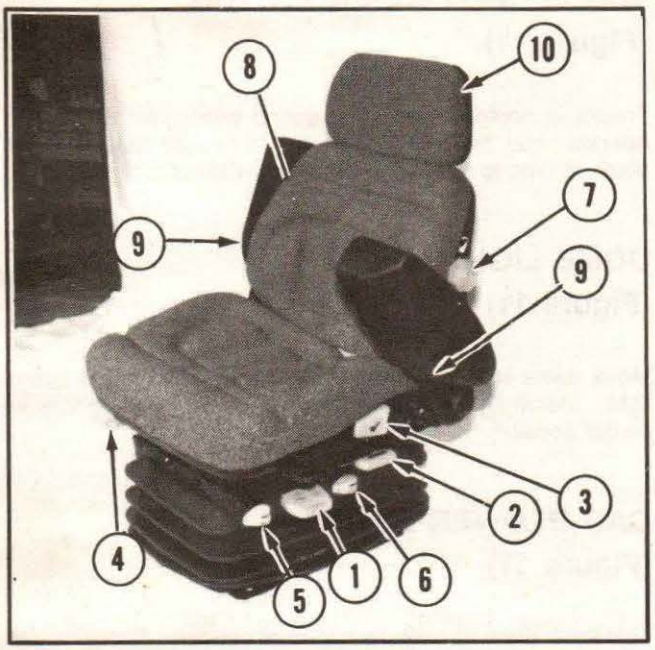

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FIGURE 13 - OPERATORS SEAT

1. **Weight-Height Adjustment**
2. **For and Aft Adjustment**
3. **Seat Back Adjustment**
4. **Seat Swivel Adjustment**
5. **Horizontal Isolator**
6. **Vertical Dampening Adjustment**
7. **Lumbar Curvature Adjustment**
8. **Lumbar Height Adjustment**
9. **Arm Rest Adjustment**
10. **Back Rest Extension**

OPERATORS SEAT (Figure 13)

To adjust for operators weight briefly lift weight-height adjustment lever (Item 1) while sitting on seat. Seat automatically adjusts to operators weight. Seat weight adjustment is maintained even if driver gets off seat.

To raise seat, lift weight-height adjustment lever (Item 1) completely and release when desired height is obtained.

To lower seat, push adjustment lever (Item 1) down until desired height is obtained and release.

NOTE: Seat will automatically return to minimum operating height if adjusted below that level by operator.

To adjust seat position forward or rearward, lift adjustment lever (Item 2). Release lever to lock in position.

To change position of back rest, lift adjustment lever (Item 3). Reposition back rest, then release lever.

To swivel seat push adjustment lever to the (Item 4) left. Seat is now unlatched and swivels freely. To relatch seat in desired position briefly lift adjustment lever.

Move horizontal isolator lever (Item 5) forward for free floating or rearward for stationary operation.

Move vertical dampening lever (Item 6) forward for decreased dampening (softer) and rearward for increased dampening (firmer).

Increase lumbar support by rotating adjustment knob (Item 7) counterclockwise or decrease support by rotating clockwise.

Raise lumbar support by rotating adjustment knob (Item 8) counterclockwise or lower support by rotating clockwise.

Arm rests may be "fine" adjusted to different heights by turning adjustment knobs (Item 9) or folded back if not needed. The right arm rest can be placed in either HIGH or LOW position. When lowered from the folded back position the rest will engage in LOW position. Fine height adjustment with knob (Item 9) is not possible in LOW position.

To engage right arm rest in HIGH position partially lift front of rest then lower it. Fine height adjustment with knob (Item 9) is possible with rest in HIGH position.

Back rest extension (Item 10) is adjustable. Pull up to raise or push down to lower.

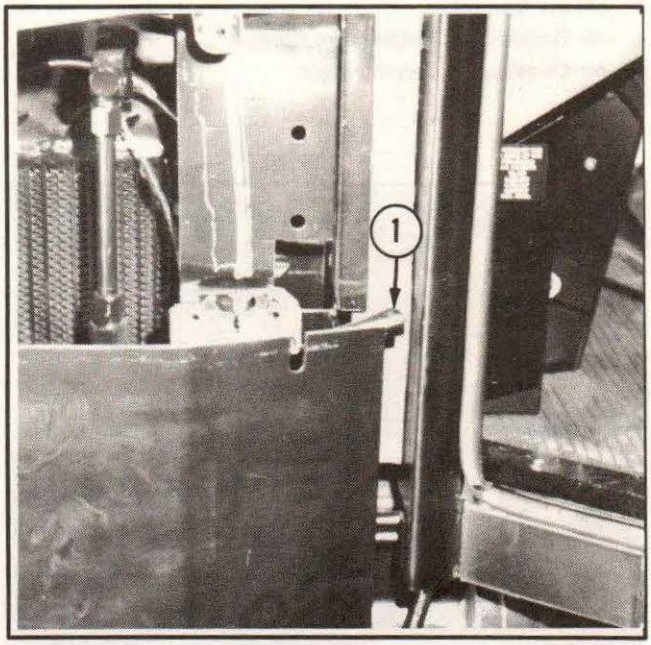

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FIGURE 14 - L.H. SIDE OF TRACTOR

1. **Hood Release Lever**

HOOD LATCH (Figure 14)

Unlatch hood by pushing down on lever (Item 1). Hood will raise slowly on its own. Latch engages automatically when hood is closed.

SAFETY SEAT BELT (Figure 15 and 16, Item 5)

CAUTION: The operator SHOULD WEAR the seat belt, properly adjusted, at all times to take advantage of the protection afforded by the roll over protective structure. Replace seat belt promptly if it becomes frayed or damaged.

PASSENGER SEAT (Figures 15 and 16)

To remove passenger seat from stowed position pull inward on inner cushion (Item 1) to unlatch seat. Unfold outer cushion (Item 2). Align mounting holes on bottom of inner cushion with mounting posts (Item 3) on seat support and place in position as shown in Figure 16.

To stow passenger seat fold and position seat cushions as shown in Figure 15. Push outward on passenger seat to latch in stowed position.

STORAGE COMPARTMENT (Figures 15 and 16)

Storage compartment (Item 6) for operators manual etc. is located underneath passenger seat. Lift seat cushions (Items 1 and 2) for access

SAFETY SEAT BELT (Figure 15 and 16, Item 4)

CAUTION: The passenger SHOULD WEAR the seat belt, properly adjusted, at all times to take advantage of the protection afforded by the roll over protective structure. Replace seat belt promptly if it becomes frayed or damaged.

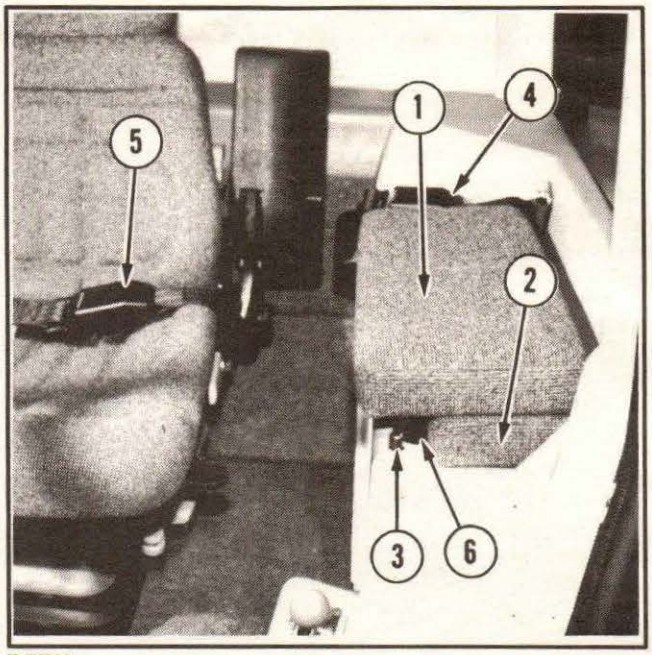

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FIGURE 15 - PASSENGER SEAT (STOWED POSITION)

1. Inner Cushion
2. Outer Cushion
3. Front Mounting Post
4. Passemger Seat Belt
5. Operators Seat Belt
6. Storage Compart. Location

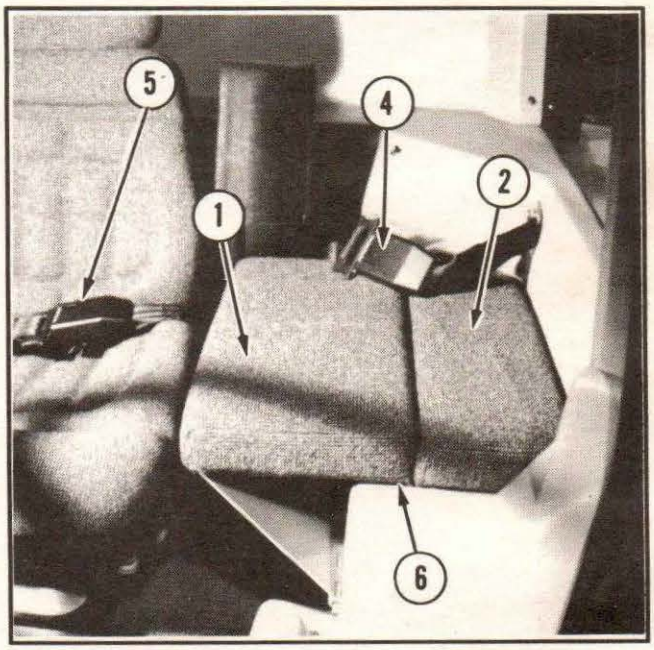

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FIGURE 16 - PASSENGER SEAT

1. Inner Cushion
2. Outer Cushion
4. Passenger Seat Belt
5. Operators Seat Belt
6. Storage Compartment Location

NOTES

SECTION IV
OPERATION

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CAUTION: Read, understand and follow the Safety Precautions located in front section of this manual.

REMEMBER THAT SAFE OPERATION IS NO ACCIDENT!

After you have studied and learned the tractor controls, read and study this section of the manual before operating your tractor. Be sure to follow the Break-in Instructions.

STARTING THE ENGINE

DANGER: START the engine from ONLY the operators seat.

Before starting the engine for the first time each day, make certain that all points of lubrication and service have been performed as instructed in the Lubrication and Maintenance Chart.

NOTE: The instrument panel warning lights and buzzer are actuated during the starting process. See Controls and Instruments, Section III.

NOTE: Place transmission in neutral. Engage park lock. Place throttle lever in low idle position for all ambient temperatures. Depress clutch pedal. Turn key switch to "START" position.

NOTE: If engine fails to start after a short cranking period of about 30 seconds, wait two minutes before cranking again. This is to prevent overheating of the starting motor. If, after three attempts, the engine fails to start, determine cause and correct failure.

NOTE: If the engine cranks over slowly, stop cranking at once and check electrical system for discharged batteries, loose connection and low voltage at starter. Continued cranking at slow speed can burn out a field coil in the starter.

BATTERY BLANKET (Optional)

Minimum cranking speed of 150 rpm is critical for starting a diesel engine. As temperature drops, battery cranking power reduces and can affect startability. Installation of a battery blanket can be an important element for cold weather starting. Contact your AGCO dealer to obtain this option.

AIR CHAMBER HEATER (Optional)

A heating element (P/N 0032275) can be installed in the cooling air chamber. When connected to a 110 volt power source, this element will indirectly heat engine cylinder components. Contact your AGCO dealer to obtain this option.

NOTE: Heater is NOT thermostatically controlled. DO NOT leave heater plugged to power source for extended periods. Plug in element approximately 2 hours before tractor is started.

ETHER STARTING AID

The tractor ether starting aid is a fully-automatic Engine Starting Fluid System designed to spray a controlled amount of starting fluid into the air intake system of the engine during and immediately after cranking.

The system's engine temperature sensor (ETS) switch determines when the System should function. When needed, the solenoid valve is activated automatically during engine cranking and starting fluid is released from the pressurized cylinder, flows through the valve, through a flow metering orifice fitting at the bottom of the valve, through the nylon tubing, and out of an injector nozzle located in the engine's air intake system. A reservoir in the valve maintains a flow of starting fluid after cranking to prevent the just-started engine from faltering or dying. The ETS switch is set to begin injecting ether at engine temperature below 50° F (10° C).

If engine fails to start, as well as it did in the past, the ether cylinder may be empty. A full cylinder weighs 18 oz. (510 gr.) while an empty cylinder weighs 10 oz. (283 gr.).

To change cylinders, first clean thoroughly around cylinder and valve. Then loosen hose clamp and spin off old cylinder. Discard sealing washer if one was used. Install new sealing washer (P/N 74057949) and ether cylinder (P/N 72163195) and tighten. Retighten hose clamp to hold cylinder in place. Keep black rubber cover on top of cylinder to prevent rusting.

WARNING: Keep ether cylinder from heat or flame. DO NOT store at temperature above 140° F (60° C). Avoid contact with the skin. Avoid breathing fumes. DO NOT store spare containers in driver's compartment. Keep out of reach of children. If swallowed, DO NOT induce vomiting. Call physician immediately.

IMPORTANT: Tractor can not be started by towing because there will be no oil pressure to engage powershift clutches. DO NOT attempt to start engine by towing, to do so may cause severs transmission damage.

NOTE: See "Jump Starting the Battery" in Maintenance section of this manual.

FAST WARM-UP PERIOD

Condensation accumulates in any engine during initial warm-up period or when operating at too low a temperature. To reduce condensation and undue engine wear, practice fast warm-up. The warm-up period can be reduced by operating the engine at approximately 1000 rpm and slightly loading engine for first five to ten minutes, such as driving to field. Never operate the tractor under full load until engine has reached operating temperature.

Avoid unnecessary idling of the engine, as this will cause engine operating temperature to fall below its normal operating range and cause rapid accumulation of engine sludge. Idling also causes engine oil dilution due to incomplete fuel burning as well as forming deposits on valves and piston rings. It is best to stop engine if tractor is to be idling for a time.

STOPPING THE ENGINE

When stopping an engine which has been operating at full load, the engine should be allowed to idle at 1000 rpm approximately two to five minutes. This will rapidly cool the engine and turbocharger and prevent damage to parts.

When sufficiently cooled, stop engine by turning key to OFF position.

CAUTION: Always place transmission control lever in neutral and engage park lock before leaving operator's seat. Remove "START" key if unit is to be left unattended.

POWER SHIFT TRANSMISSION

GENERAL INFORMATION

The tractor is equipped with a powershift transmission having 18 forward speeds and 9 reverse speeds. The transmission is controlled by an Electronic Transmission Control Module (TCM) that controls hydraulic engagement and disengagement of speed and directional clutches within the transmission. The operator uses the transmission control lever and the clutch pedal to tell the TCM what to do. The TCM monitors other tractor functions such as engine load and ground speed and regulates shifts accordingly.

The engaged gear, direction of travel, preset starting gears and various error codes are displayed on the shift display. Always check the display for error codes after starting engine. If an error code appears see "Troubleshooting" section of this manual.

Unlike conventional transmissions it is unnecessary to use the clutch pedal to begin ground travel or shift gears. However, the clutch pedal may be used in the conventional method if desired. Using the clutch pedal allows a smoother more controlled start up and should be used for maneuvering in tight quarters, hitching to an implement or whenever slight movement is required.

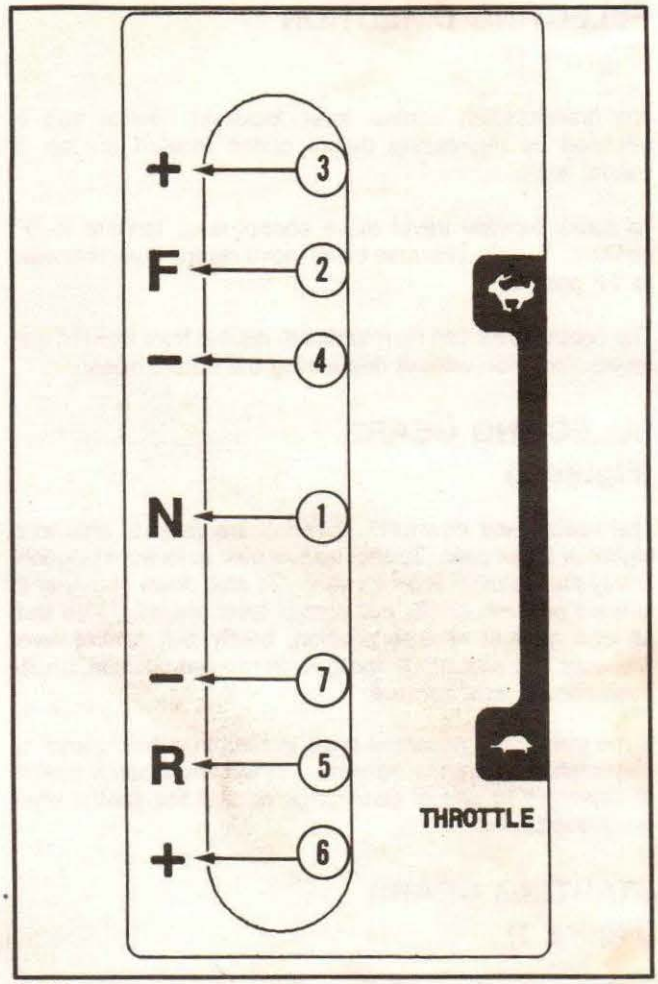

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FIGURE 1 - TRANSMISSION CONTROL LEVER SHIFT PATTERN

1. **Neutral Position**
2. **Forward Position**
3. **Forward Upshift**
4. **Forward Downshift**
5. **Reverse Position**
6. **Reverse Upshift**
7. **Reverse Downshift**

SELECTING DIRECTION (Figure 1)

The transmission control lever locks in neutral and is released by depressing detent button located on top of control lever.

To select forward travel move control lever forward to "F" position. To select reverse travel move control lever rearward to "R" position.

The control lever can be returned to neutral from forward and reverse position without depressing the detent button.

SELECTING GEARS (Figure 1)

The upshift and downshift positions are used to shift to a higher or lower gear. To shift up one gear in forward position, briefly push control lever forward. To shift down one gear in forward position, briefly pull control lever rearward. To shift up one gear in reverse position, briefly pull control lever rearward. To shift down one gear in reverse position, briefly push control lever forward.

If the transmission control lever is held in either upshift or downshift position, the transmission will sequentially upshift or downshift to end of gear range or until the control lever is released.

STARTING GEARS (Figure 1)

Starting gears are those gears that can be used to begin ground travel from a standstill.

Available starting gears are 1F through 11F in forward position and 1R through 8R in reverse position.

PRESET STARTING GEARS (Figure 1)

The powershift transmission can be either PRESET by operator to bypass all lower gears and initially engage any desired forward or reverse STARTING GEAR when shifting from neutral position or the factory preset starting gears can be used.

Factory preset starting gears are 6F and 3R. Every time the tractor is started, (ignition switch is turned from OFF to ON position), the transmission will preset these two starting gears.

Preset starting gears are not limited to the factory programmed gears 6F and 3R.

Any STARTING GEAR 1F through 11F and 1R through 8R may be PRESET by the operator.

To change from the factory preset starting gears depress clutch pedal and move transmission control lever to forward or reverse position. Then move control lever into either upshift or downshift positions to select higher or lower starting gear. Selected gear will be engaged when clutch pedal is released.

The transmission will then constantly change the preset starting gears to the last STARTING gear selected by operator in forward and reverse.

CAUTION: Transmission will always engage the last STARTING gear selected in forward and reverse until ignition switch is turned off. Sudden and/or unexpected change of ground speed may result when shifting between gears that are not closely matched.

STARTING GROUND TRAVEL (Using clutch pedal)

CAUTION: When operating the tractor for the first time, start in one of the lower gears until you learn to handle and get the "feel" of tractor controls.

To start tractor in motion, start engine and set throttle at 1/3 to 1/2 open. Depress clutch pedal. Release parklock. Place transmission control lever in forward or reverse. Select desired starting gear. Release clutch pedal gently but firmly to provide a smooth start without excess slippage. As soon as transmission clutches engage increase throttle setting to desired engine speed.

NOTE: If transmission is placed in forward or reverse before park lock is disengaged the shift display will indicate error code "E02" and the transmission will not function.

To remove the error code and reactivate the transmission proceed as follows.

1. Place transmission control lever in neutral.
2. Fully depress and hold clutch pedal until error code disappears from shift display.

STARTING GROUND TRAVEL (Without clutch pedal)

CAUTION: When operating the tractor for the first time, start in one of the lower gears until you learn to handle and get the "feel" of tractor controls.

To start tractor in motion, start engine and set throttle at 1/3 to 1/2 open. Select desired starting gear and return transmission control lever to neutral. Release park lock. Place control lever in forward or reverse. As soon as transmission clutches engage selected gear increase throttle setting to desired engine speed.

NOTE: If transmission is placed in forward or reverse before park lock is disengaged the shift display will indicate error code "E02" and the transmission will not function.

To remove the error code and reactivate the transmission proceed as follows.

1. Place transmission control lever in neutral.
2. Fully depress and hold clutch pedal until error code disappears from shift display.

SHUTTLE SHIFTING

CAUTION: When operating the tractor for first time, start in one of the lower gears until you learn to handle and get the "feel" of tractor controls.

Direction change shuttle shifts can be performed at any ground speed. When transmission control lever is moved from one direction to the opposite direction, transmission will determine how to slow tractor speed and engage desired gear in opposite direction, without any braking or clutch use by operator.

NOTE: Transmission can shuttle from any gear to STARTING GEARS ONLY.

NOTE: Depressing detent button on transmission control lever allows control lever movement between forward and reverse and blocks control lever from both upshift positions.

NOTE: Transmission will not downshift while shuttle shifting unless control lever hesitates at downshift positions.

CAUTION: Transmission will always engage last starting gear used in a shuttle direction. Sudden and/or unexpected change of ground speed may result when shuttling between gears that are not closely matched.

GROUND SPEED MATCHING

Ground speed matching can only take place in forward gears F11 through F18.

If clutch pedal is depressed and released when tractor is in motion, the powershift transmission will either automatically downshift to match an increase in engine speed or upshift to match a decrease in engine speed, engaging a gear that most nearly matches ground speed to engine speed.

TRANSMISSION CLUTCHES

The power shift transmission clutches are adequate for many hours of normal use, but if abused or incorrectly used in any manner, their life can be drastically shortened. The clutches should never be slipped excessively when starting loads and loads must be started at reduced engine speed. If the clutches are used as a speed reducer, or for starting loads under full engine power, their life will be drastically shortened. Downshift or use the throttle to slow tractor speed rather than slipping the clutches. Slipping the clutches causes heat in the clutch assemblies and will cause premature failure.

In the normal use of the clutch pedal, it should only be engaged with the engine at reduced speeds, and engaged as fast as possible to acquire a gentle start with the least amount of slipping. Therefore, the fastest engagement possible under the existing circumstances gives the best transmission life. Increase engine speed after the clutches are engaged.

DO NOT use clutch pedal for a foot rest.

CAUTION: Always limit tractor to safe speeds for the ground conditions it is traveling on. DO NOT attempt short turns at high speeds.

ALLOWING THE TRACTOR TO COAST

WARNING: Never allow tractor to coast down hill with transmission in neutral or clutch pedal depressed. To do so may cause loss of control and injury to operator or by-stander. In addition to possible personal injury, coasting can cause damage to gears, clutches, brakes and engine parts of the tractor from over speeding.

TOWING TRACTOR

IMPORTANT: If transmission lube system or transmission has malfunctioned, towing tractor may cause extensive transmission damage.

ENGINE INOPERATIVE

Tractor should not be towed if engine is inoperative since transmission lubrication system will not function. Severe transmission damage could result. Also there will be no hydraulic pressure to operate steering and brakes.

If tractor must be towed a short distance (1/2 mile or less) have an operator on disabled tractor, disengage park lock and DO NOT EXCEED 5 MPH (8km/h) WHEN TOWING.

IMPORTANT: Engine can NOT be started by towing tractor. See Jump Starting the Battery in Section V of this manual.

ENGINE OPERATIVE

If tractor must be towed, run engine to provide hydraulic pressure to steering and brakes and to provide lubrication to transmission. Have an operator on disabled tractor, disengage parklock and DO NOT EXCEED 5 MPH (8 km/h) WHEN TOWING.

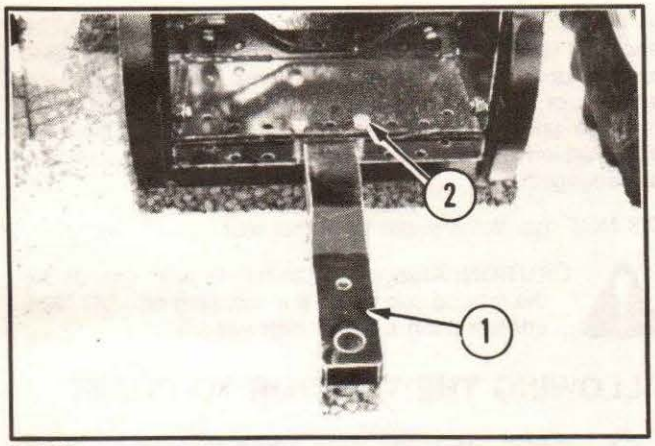

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FIGURE 2 - DRAWBAR-REGULAR

1. Regular Drawbar
2. Capscrew

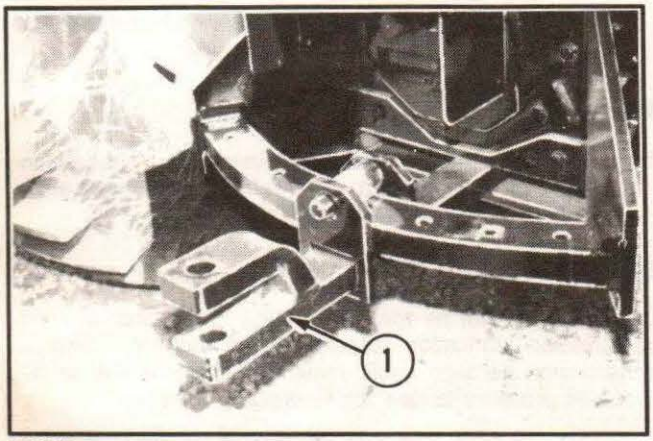

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FIGURE 3 - DRAWBAR-WIDE SWING

1. Wide Swing Drawbar

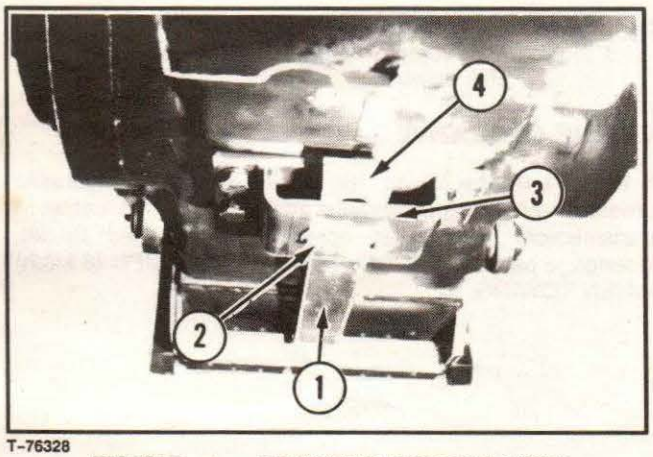

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FIGURE 4 - DRAWBAR BOTTOM VIEW

1. Drawbar
2. Retaining Plate
3. Anchor
4. Front

DRAWBARS

CAUTION: When towing heavy equipment at transport speeds, PIN the drawbar in its center position with retaining pins and attach implements safety chains.

CAUTION: When hitching an implement to drawbar, ALWAYS secure hitch pin with a safety pin and attach implements safety chains.

CAUTION: Weight of towed equipment, without brakes, should NOT exceed weight of tractor.

Regular drawbar (Figure 2, Item 1) used on tractors equipped with 3-point hitch, has 2 vertical positions and 3 length positions.

Wide swing drawbar (Figure 3, Item 1), used on tractors without 3-point hitch, has a 2 vertical and 3 length positions.

Attach drawbar to anchor (Figure 4, Item 3) with retaining pin, through alternate holes at front of drawbar (Item 4) to change length. Retaining plate (Figure 4, Item 2) holds retaining pin in place.

To change vertical hitch point turn drawbars over.

Drawbar may swing freely within limits of horizontal support or be locked in place by installing capscrews (Figure 2, Item 2) through support on both sides of drawbar.

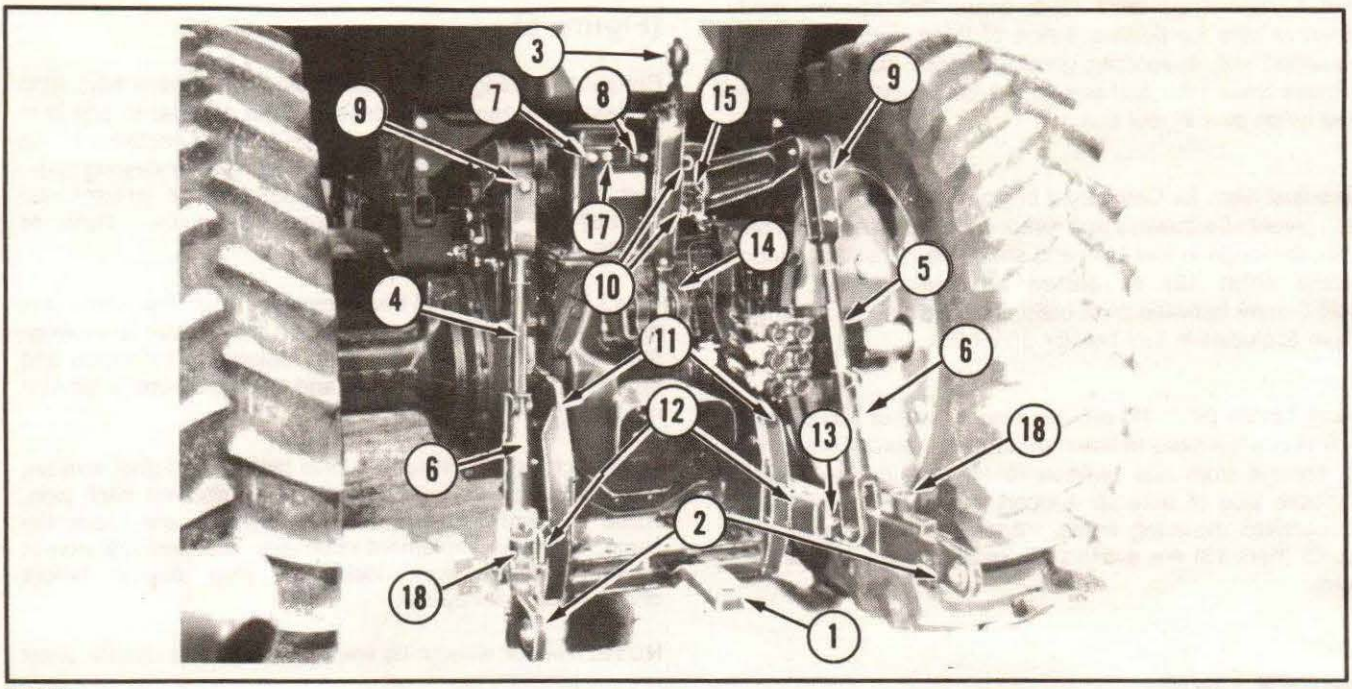

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FIGURE 5 - TRACTOR REAR VIEW

1. Drawbar
2. Lower Links
3. Upper Link
4. L.H. Lift Link
5. R.H. Lift Link
6. Lift Link Wrench
7. Raise Restrictor Valve
8. Lower Restrictor Valve
9. Float Stop Pins
10. Locking Pins
11. Sway Blocks
12. Category Blocks
13. Shims
14. Upper Link Support
15. Auxiliary Light Socket
16. Zero Return Port
17. 3-Point Auxiliary Cylinder Port
18. Lower Link Extension Latch

3-POINT HITCH LINKAGE
(Figure 5)

The 3-point hitch provides a quick and easy method of attaching implements to the tractor in such a way that they can be controlled by the hydraulic lift system of the tractor.

The hitch can be adjusted to fit either Cat. II, Cat. III Narrow, or Cat. III implements.

When attaching implements to the 3-point hitch, the tractor drawbar may have to be moved forward.

ADJUSTING LIFT LINKS
(Figure 5)

To level or tilt implement, move desire adjustment wrench (Item 6) upward from locked position and turn shaft by means of wrench handle. When adjustment has been made, allow wrench to move downward to locked position, handle to rear.

AVOID EXCESSIVE LENGTHENING OF LINKS. Locking hex of adjustment wrench, must engage lift link hex shaft, in its locked position when shaft is in most lengthened position.

Float stop pins (Item 9) are provided with lift link clevises so that a rigid three-point hitch connection can be made. Remove pins for floating action of three-point implements equipped with supporting gauge wheels. To remove pins, remove lynch pins and pull pins from clevises. Store float and lynch pins in tool box.

To adjust hitch for Category II implement, remove snap ring, turn pivot ball sideways and remove. Install Category II pivot balls (included in tool box) and snap ring. Position category blocks (Item 12) as shown to obtain 32-1/2 inches (825.5 mm) between pivot balls. Use bushing and Category II pin (included in tool box)for upper link.

Sway blocks (Item 11) are mounted in one of two positions to limit or allow sway of three-point hitch mounted equipment. To change from one position to another, move blocks to opposite side of drawbar support, invert, and mount using appropriate mounting holes. Additional adjustment block shims (Item 13) are available to reduce side sway of lower links.

UPPER LINK (Figure 5)

Attach three-point hitch upper link (Item 3) to upper link support (Item 14) in a position which provides most desirable pitch or inclination of implement. For very heavy tools, select a position which allows upper link to be most nearly parallel with lower links when lower links are horizontal (or parallel) with ground line. Exact upper link adjustments can be made by removing locking pins (Item 10) and rotating upper link turnbuckle. Replace locking pins after adjustment to hold turnbuckle at desired length.

NOTE: DO NOT adjust upper link by turning only inner or outer end. Always make certain an equal portion of threaded ends are in center of threaded tube.

IMPLEMENTS & ATTACHMENTS

CAUTION: Implements and attachments used with this tractor should meet ASAE and SAE standards to avoid interference between tractor and implement and attachments, or the overloading of hitch and drawbar components. Usage of implements and attachments that do not meet ASAE and SAE standards could cause accidents resulting in personal injury.

CAUTION: AGCO will not be responsible for any damage to this tractor caused by implements and attachments which are not manufactured or sold by AGCO, nor will AGCO be responsible for personal injury caused by implements and attachments which are not manufactured or sold by AGCO.

HITCHING TO IMPLEMENTS (Figure 5)

Before attempting to hitch the tractor to a 3-point hitch type implement, it may be necessary to pin drawbar to one side or move it to the forward position to clear implement. To move to forward position, remove capscrews, retaining plate, and pin at front of drawbar; slide drawbar forward and reinstall pin, retaining plate, and capscrews. Refer to Figure 4.

Check latches (Item 18) that release the lower link extensions and see that they are free to operate and remove any foreign material if necessary. Check by unlatching extension and sliding in and out by hand and be sure arm extension relatches as it is moved forward.

Back tractor up to implement until pin holes in draft arm are within approximately 2" (50 mm) of implement hitch pins. Raise or lower links hydraulically until they are nearly the same height as implement hitch pin. Put transmission in neutral, engage park lock and stop engine before dismounting from tractor.

NOTE: Tractor without lift link extensions will require exact positioning

Lift the latch (Item 18) at top of lower links to release lower link extensions. This permits hitching ball and extension arms to be moved freely in all directions for easier hitching. Hitch one link to implement an insert quick hitch pin. To hitch second link may require lengthening or shortening the lift link.

Attach upper link to tower on implement. The link may be lengthened or shortened to facilitate hitching. Lock lower link extensions in their operating position by backing up tractor. Be sure latches are in the locked position before moving tractor forward.

By placing the upper link in lower hole of tractor upper link support shortening lift links prior to lifting implement from ground with the hydraulic system will provide the greatest clearance for mounted implements.

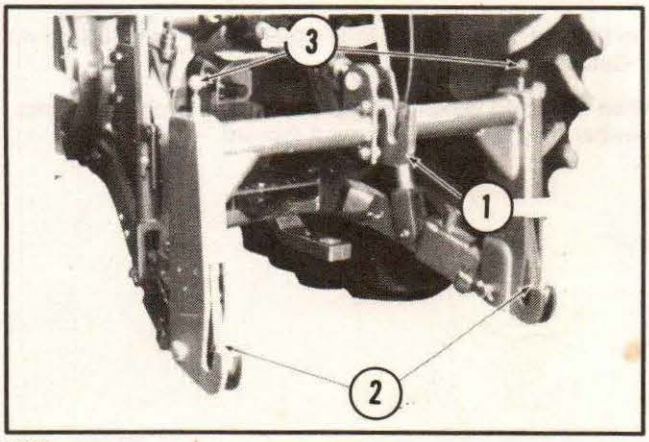

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FIGURE 6 - QUICK HITCH

1. **Mast Anchor**
2. **Hitch Hooks**
3. **Latch Pins**

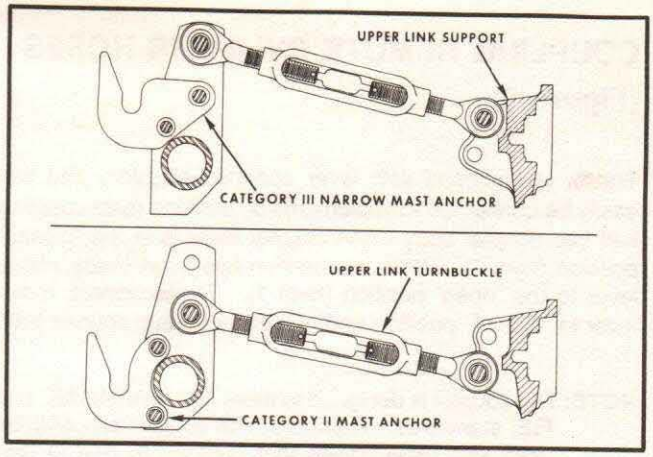

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FIGURE 7 - UPPER LINK POSITIONS

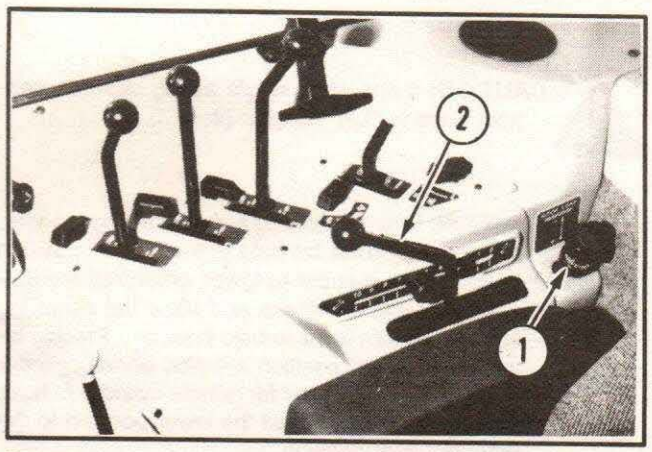

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FIGURE 8 - R.H. CONSOLE

1. **Hitch Load Response Control**
2. **Position Control Lever**

QUICK HITCH (Optional) (Figures 6 and 7)

Tractor may be quipped with either Category III Quick Hitch or Category II Quick Hitch (adjustable to III Narrow). Category II Quick Hitch Has two mast anchors (Item 1) to adjust hitch to either Category II or Category III narrow application. For Category II, the bushings (included in tool box), must be installed on implement hitch pins. . For Category III Narrow mast anchor must be removed from lower position and replaced with Category III narrow mast anchor in upper position.

Suggested attaching locations for upper link when using quick hitch are illustrated (Figure 7). Upper link location depends on position of mast anchor on quick hitch frame that will best accommodate implement being used.

HITCHING TO IMPLEMENT (With Quick Hitch) (Figures 6 and 7)

Lower hitch and position hitch hooks (Item 2) directly beneath implement hitch pins. Raise hitch until pins are positioned in hitch hooks. Allow latch pins (Item 3) to move downward to lock implement to hitch.

To disconnect implement pull latch pins upward and lock in open position, lower implement to ground and slowly drive tractor away from implement.

ADJUSTING RATE OF LOWER AND RATE OF RAISE (Figure 5)

CAUTION: BE SURE everyone is clear of three-point hitch before starting engine and making adjustments. Place hitch control lever in LOWERED position before starting engine. Lower three-point hitch and stop engine before making adjustments.

To increase raising speed, turn left adjustment screw (Item 7) counterclockwise. Turn same screw clockwise to decrease raising speed.

To increase lowering speed, turn right adjustment screw (Item 8) counterclockwise. Turn same screw clockwise to decrease lowering speed.

As a starting setting, adjust lower restrictor so that it takes 3 seconds for the implement to go from the fully raised position to the ground. Adjust raise restrictor so that it takes 3 seconds for implement to go from the ground to fully raised position.

ADJUSTING HITCH LOAD RESPONSE (Figures 5 and 8)

CAUTION: BE SURE everyone is clear of tractor and drawn equipment before making hitch response adjustment.

To determine correct hitch load response (draft sensitivity), operate unit at normal speed and depth. Place hitch response control (Figure 8, Item 1) in highest position and slowly adjust downward until correct sensitivity position is found where engine does not lug down and variance of implement working depth is in acceptable range.

Additional adjustments may be required when switching implements and when different soil types are encountered. Adjust restrictor valves (Figure 5, Items 7 and 8) in conjunction with hitch load response control to obtain desired sensing action.

POSITION CONTROL (Figure 8)

The height of 3-point hitch is set by moving Position control Lever (Item 2).

Pushing lever all the way forward fully lowers 3-point hitch. Moving it all the way rearward fully raises 3-point hitch. If lever is positioned any place between these two positions, then 3-point hitch will move and hold at a height proportional to lever placement.

Move Position Control Lever to the fully forward position to place the system in "Float". This will allow implement to follow the contour of ground. To raise and lower implement use Position Control Lever.

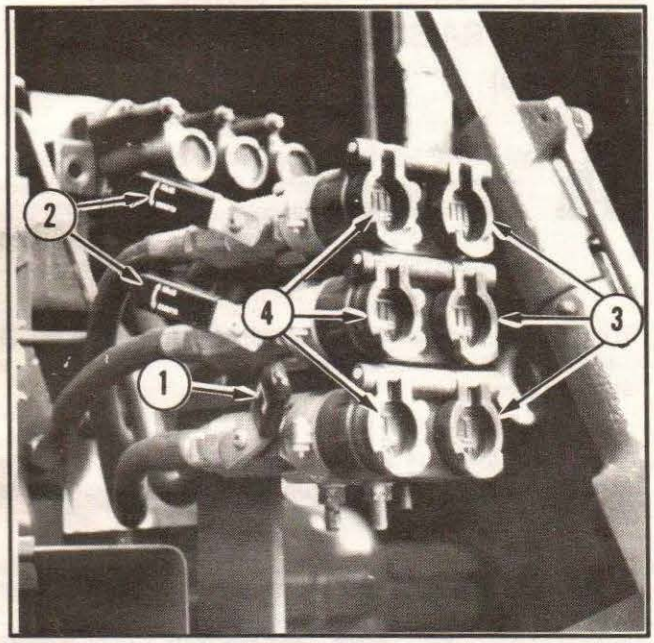

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FIGURE 9 - REMOTE OUTLETS

1. **Open Position**
2. **Closed Position**
3. **Lift Coupler**
4. **Drop Coupler**

COUPLING REMOTE CYLINDER HOSES (Figure 9)

Tractor is equipped with lever operated couplers and can easily be connected to implements by pushing male coupling half into coupler body when coupler lever is in the "closed" position (Item 2). When connection has been made, move lever to the "open" position (Item 1). To disconnect, move lever to "closed" position and pull out the male coupler half.

NOTE: The coupler is designed to meet ISO, SAE ASAE, and FIEI standards. Therefore, this coupler can only be used with male halves that conform to AGCO part 70594977, ISO SAE, ASAE, or FIEI standards.

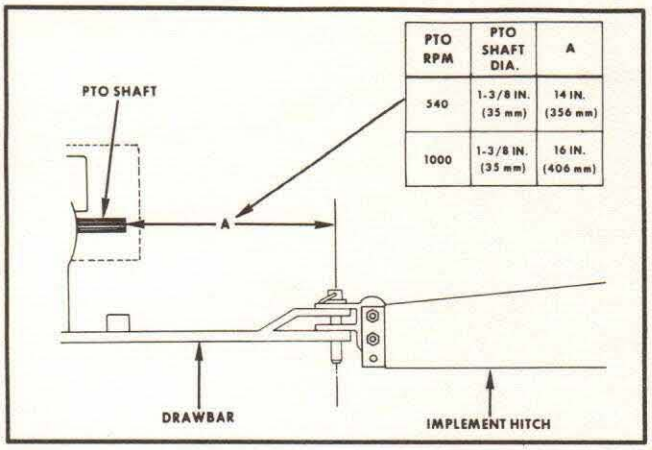
CAUTION: Make certain hoses from remote hydraulic cylinders are connected to remote outlets so that implement raises when lever is in "RAISE" position and lowers when lever is in "LOWER" position.

CAUTION: If operating single acting cylinder, connect hose to "Lift" coupler (Item 3).

CAUTION: When operating a single-acting cylinder, control lever must be held in the "lower" position to permit the cylinder to lower, otherwise the detent will pressure release and allow the centering spring to return lever to hold position. Placing lever in the "float" position will also permit cylinder to lower. If it is desired for remote cylinder to float, move lever forward past the lower position to the detented float position.

NOTE: Clean both tractor and cylinder coupler halves, to prevent contaminating hydraulic system, before coupling halves together.

OPERATING TIPS



PTO RPM	PTO SHAFT DIA.	A
540	1-3/8 IN. (35 mm)	14 IN. (356 mm)
1000	1-3/8 IN. (35 mm)	16 IN. (406 mm)

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FIGURE 10 - DRAWBAR LENGTH

PTO OPERATION

CAUTION: BE SURE everyone is clear of tractor and attached or drawn equipment before operating PTO. DO NOT connect, disconnet or adjust PTO with engine running.

Tractor is equipped with a dual speed 540 and 1000 rpm PTO unit. Interchangeable 1-3/8" (35 mm) diameter shafts are provided with tractor. For procedure see changing PTO shafts in Section V of this manual.

IMPORTANT: DO NOT USE 540 RPM PTO WITH IMPLEMENTS REQUIRING 60 OR MORE HORSEPOWER.

Position drawbar to provide SAE and ASAE standard hitch distance from end of PTO shaft to center of rear hole in drawbar. Refer to Figure 10 for correct adjustment.

1. Be sure tractor engine is stopped before attempting to attach implement PTO front yoke to tractor PTO shaft. With engine stopped and PTO clutch lever in brake position, shaft can be turned by hand to align with splines in yoke.
2. Refer to "PTO Control Lever" in "Control" section for instructions on how to use lever.
3. Read the Implement Operator's Manual for any special instructions.
4. Regulate engine speed as indicated on the field facts monitor to prevent over speeding of the PTO. Adjust engine speed accordingly with equipment under load.
5. Select a ground speed to permit handling the heaviest areas of crop without lugging engine. Then in lighter crop area shift into next higher gear for increased efficiency, dropping back to a lower gear as required in heavy crop areas.

IMPORTANT: Always disengage the PTO before making sharp turns and before raising mounted equipment to its fully raised position.

CAUTION: NEVER attach a 540 RPM implement to tractor when tractor is fitted with 1000 rpm PTO shaft.

CAUTION: Keep all shields on tractor and PTO driven equipment in place at all times.

CAUTION: Disengage the PTO clutch, shift transmission to neutral, engage park lock, and stop engine before attempting to perform any operation of service on a PTO driven machine.

CAUTION: When a PTO driven implement is attached to the tractor, do not leave the tractor operator's platform unless the PTO clutch is disengaged, the transmission control lever is in "neutral", the park lock is engaged and the engine is stopped. Exception-For certain implements like forage blower, feed grinder, forage harvester knife sharpening, etc., which require PTO operation while in stationary position without an operator on the tractor, follow the specific instructions for operation as given in implement operator's manual.

STATIONARY PTO OPERATION

1. Place transmission control lever in neutral.
2. Engage park lock.
3. The implement PTO shaft should run as straight as possible.
4. Do not operate the tractor engine at more that 80% of rated power for an extended period of time.

POWER FRONT AXLE (PFA)

Note the following when operating tractor with PFA.

1. On PFA tractors, front and rear tires must be matched by size per manufacturers' recommendations in order to avoid excessive tire wear and scuffing.
2. On hard surfaces, always disengage PFA. Failure to do so can result in rapid tire wear and possible drive-train failure.
3. For greatest efficiency in operating the tractor in the field, it is best to operate the PFA continuously, especially in wet or loose soil or on slopes. This will provide easier steering and maximum tractive efficiency.
4. Disengage PFA for speeds over 10 MPH on paved roads.
5. For optimum utilization of PFA in field, it maybe desirable to add front weight. Liquid ballast and front "suitcase" weights may be used, however, for extensive driving on road, it is best to operate with front end as light as possible for ease of steering and fuel economy. See "Front End Loader Operation" in the Service Adjustments section of this manual for proper weighting instructions when a loader is used.
6. The Power Front Axle is not designed for use under water. If front axle is submerged in water, axle must be drained and all seals must be replaced.

NOTES

SECTION V
LUBRICATION, MAINTENANCE AND SERVICE ADJUSTMENTS

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CAUTION: Read, understand and follow the safety precautions located in front section of this manual.

NEVER permit anyone to examine, clean, service or adjust the tractor or any equipment operated by it UNTIL TRACTOR ENGINE IS STOPPED, THE TRANSMISSION GEARS ARE IN NEUTRAL, THE PARK LOCK ENGAGED, THE P.T.O. IS DISENGAGED AND ALL MOVING PARTS HAVE STOPPED, UNLESS SPECIFICALLY INSTRUCTED IN THE OPERATORS MANUAL TO DO OTHERWISE.

The following section deals with lubricating and servicing your tractor. Be sure to follow the recommended time intervals and use the type of lubricants that are recommended.

The few dollars you may save by using cheaper lubricants or not following the recommended change intervals may cost you many dollars later on.

In order for your tractor warranty to be valid the recommended time intervals must be followed and the recommended types of lubricants must be used.

PREPARATION FOR STORAGE

If tractor is to be idle for 30 days or longer, procedures listed below should be followed to reduce deterioration.

Run engine to thoroughly warm oil in crankcase. Drain oil and install new filter element. Refill crankcase with fresh oil as recommended in Specifications section.

Fill the fuel tank to the top to prevent condensation. The fuel should be treated with the proper amount of AGCO diesel fuel conditioner to prevent formation of gum or wax. Run engine long enough to be sure all filters and injection equipment is filled with conditioned fuel.

Remove, clean and reinstall air cleaner filter element.

Lubricate tractor as outlined in this section.

Remove and clean batteries, following closely safety precautions in Battery discussion. Store batteries in a cool dry place and keep them charged.

Cover air cleaner intake pipe and exhaust outlet with sturdy plastic bags and tape.

Thoroughly clean tractor and touch up any areas where paint is missing.

Coat exposed metal surfaces with grease to prevent rusting.

Place tractor on blocks so full weight of tractor is not supported on tires.

Store tractor inside a suitable enclosure. Cover tractor with a waterproof tarp if it is to be stored outside.

IMPORTANT: Never allow tractor to stand idle over 30 days unless prepared for storage.

PREPARATION FOR OPERATION AFTER STORAGE

Remove tractor from blocks.

Remove all special covers that were installed.

Check and install batteries. Follow safety precautions in Battery discussion when handling batteries.

Turn engine over slowly to insure all working parts are free to move.

Start engine and run at idle speed. Do not increase engine speed until sure engine is operating correctly.

Turn to the pre-season checklist at the front of this manual and use it as a guide to prepare tractor for operation.

LUBRICANTS

Use quality oils and greases furnished by AGCO and be sure to use proper lubricants for lubrication required. Refer to following discussion in this section for specific lubrication requirements. Insist that your supplier follow all specifications listed in Specifications section and Lubrication section when supplying you with lubricants.

SERVICE PROCEDURES

Keep lubricants in clean, covered containers. Be sure funnels, measures and other handling equipment are cleaned before and after use. Clean fittings, plug openings and other lubrication points before servicing. Apply lubricant to grease fittings when tractor is warm to insure free flow of grease to lubricated parts. Inspect and clean plugs and other detachable fittings before reinstalling. Liquid capacities for reservoirs outlined in following lubrication chart are listed in Specification section.

Follow safe operating procedures when performing service functions. Be sure tractor is securely blocked and/or Park Lock Lever is in "P" position when servicing tractor. Run engine only when specifically instructed to do so.

SERVICE INTERVALS

Frequency requirements listed in the following lubrication chart are based on normal operating conditions. If tractor is being operated under extreme weather or dust conditions, lubricate more often. Change engine oil filters as specified on lubrication chart.

LUBRICATION & MAINTENANCE CHART

C=Clean
✓ =Check
DR=Drain and Refill
R=Replace
RC=Remove and Clean
G=Grease
Number=Number of Grease Zerks

REFERENCE PAGE	ITEM	OPERATION
EVERY 10 HOURS (DAILY)		
5-11	Engine Oil Level	✓
5-6	Refill Fuel Tank	✓
5-11	Final Drive/Hydraulic Oil	✓
5-13	Power Shift Transmission Oil	✓
5-19	Drawbar Roller	G-1
5-19	3-Point Hitch	G-12
5-15	PFA Dropbox Output Shaft	G-1
5-15	PFA Clutch Input Shaft	G-1
5-15	PFA Drive Shaft	G-2
5-16	PFA Axle Pivots	G-2
5-16	PFA Universal Joints	G-4
5-16	PFA King Pins	G-4
EVERY 50 HOURS		
5-22	Engine Valve Lash (INITIAL)	✓
5-11	Engine Oil (INITIAL)	DR
5-11	Engine Oil Filter (INITIAL)	R
5-12	Final Drive/Hydraulic Oil Filter (INITIAL)	R
5-14	Power Shift Transmission Oil Filter (INITIAL)	R
5-7	Fuel Filter (INITIAL)	R
5-18	Tie Rod Ends (2WD)	G-4
5-18	Front Axle Pivot Bushing (2WD)	G-1
5-18	Stay Rod Pivot Bushing (2WD)	G-1
5-18	Pitman Shaft Bearings (2WD)	G-2
5-18	Steering Knuckle Bushings (2WD)	G-4
5-16	PFA Differential Oil (INITIAL)	DR
5-16	PFA Differential Oil Level	✓
5-17	PFA Planetary Oil (INITIAL)	DR
5-17	PFA Planetary Oil Level	✓
5-11	Engine Cooling Fan Belt	✓
5-25	Alternator Belt	✓
5-25	Air Conditioner Receiver/Drier	✓
5-25	Air Conditioner Condenser	✓
5-25	Air Conditioner Compressor Belt Tension	✓
5-28, 5-30	Tire Pressure	✓

LUBRICATION & MAINTENANCE CHART

C=Clean
✓ =Check
DR=Drain and Refill
R=Replace
RC=Remove and Clean
G=Grease
Number=Number of Grease Zerks

REFERENCE PAGE	ITEM	OPERATION
EVERY 250 HOURS		
5-7	Water Separator	✓
5-11	Engine Oil (After INITIAL)	DR
5-11	Engine Oil Filter (After INITIAL)	R
5-12	Final Drive/Hydraulic Oil Filter	R
5-14	Powershift Transmission Oil Filter	R
5-9	Engine Inter-Cooler	✓
5-9	Engine Cylinder Cooling Fins	✓
5-9	Engine Oil Cooler	✓
5-9	Final Drive/Hydraulic Oil Cooler	✓
5-9	Power Shift Transmission Oil Cooler	✓
5-40	Wheel Bolt Torque	✓
EVERY 500 HOURS		
5-7	Fuel Filter	R
5-7	Water Separator	R
5-22	Engine Valve Lash	✓
5-6	Fuel Tank	DR
EVERY 1000 HOURS		
5-23	Engine Air Filters	R
5-12	Final Drive/Hydraulic Oil	DR
5-12	Final Drive/Hydraulic Inlet Screen	RC
5-13	Final Drive/Hydraulic Breather	R
5-14	Powershift Transmission Oil	DR
5-18	Front Wheel Bearings (2WD)	RC-G
5-16	PFA Differential Oil	DR
5-17	PFA Planetary Oil	DR
5-25	Starter Motor	✓

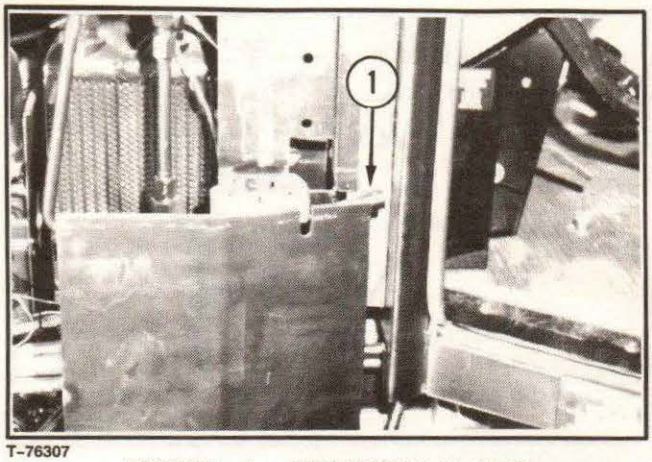

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FIGURE 1 - TRACTOR L.H. SIDE

1. Hood Release Lever

HOOD

(Figure 1)

Unlatch hood by pushing down on lever (Item 1). Hood will raise slowly on its own. Latch engages automatically when hood is closed.

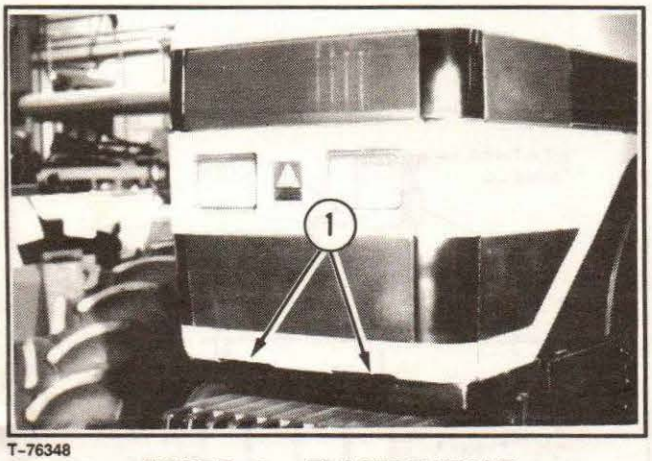

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FIGURE 2 - TRACTOR FRONT

1. Hand Grips

FRONT GRILLE

(Figure 2)

Clean front grille whenever needed. To remove grille the hood must be open. Then use hand grips (Item 1) to pull bottom of grille outward to unlatch. Grille may then be lifted from top support rod.

To replace hang brackets at top of grille, on support rod and push latch posts on grille bottom into latch sockets.

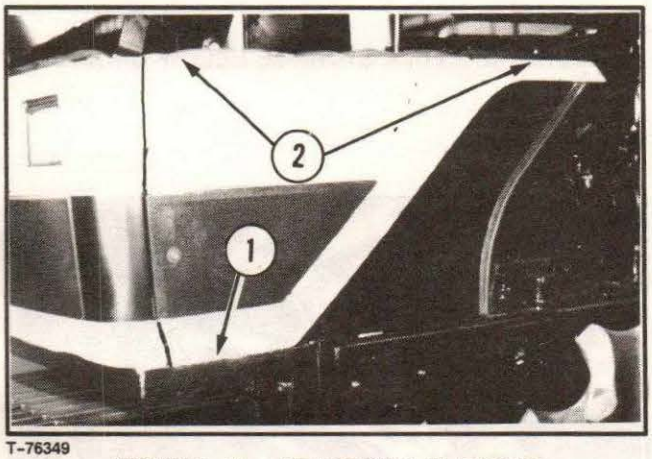

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FIGURE 3 - TRACTOR L.H. FRONT

1. Latch Socket Location
2. Mounting Post Locations

SIDE PANELS

(Figure 3)

To remove side panels hood must be opened and front grille removed. Grasp bottom of panels and carefully pull outward to disengage latch socket (Item 1) on backside of panels. Lift panels to remove from mounting posts (Item 2).

To install, hang panels on mounting posts and push latch post into latch socket.

DIESEL FUEL

Fuel used in your AGCO tractor should be grade No. 2-D as defined by ASTM D975 specification for diesel fuel oils. For maximum performance and fuel filter life, sulfur content should be less than 0.5 percent and water and sediment content should be less than 0.1 percent.

For cold weather operation, below +20° F (-6.7° C), Grade No. 1-D fuel should be used to ensure ease of starting and proper fuel flow. Fuel pour point should be 10° F (5.6° C) below lowest expected ambient temperature.

FUEL STORAGE

The importance of proper fuel storage cannot be too strongly stressed. Storage tanks, drums or portable service tanks must be free from rust, scale, sediment or any other foreign matter which will contaminate the fuel. Contaminated fuel will clog the fuel filter and eventually damage the fuel injection pump and injector nozzles.

NOTE: If fuel is to be stored more than 3 months it should be treated with AGCO diesel fuel conditioner as a protection against wax and gum build up and water contamination.

REFUELING

Tractor is equipped with a fuel gauge which monitors fuel level. Fuel capacity of rear tank, is 67 gal (254 L). Total fuel capacity can abe increased to 97 gal (367 L) if the optional side fuel tank is installed. Avoid running out of fuel as bleeding fuel system may be necessary to re-start engine.

FILL TRACTOR FUEL TANK AT END OF DAY

The tractor fuel tank should be filled at the end of the days run, rather than at the start of the days run, more condensation will form in an empty fuel tank than in a full fuel tank. This practice will reduce the amount of water contamination of the fuel.

CAUTION: DO NOT fill fuel tank while engine is running, while engine is hot, near open flame or while smoking.

FUEL TANK (Figure 6)

Condensation and sediment will accumulate in bottom of tank. Every 500 hours drain condensation and sediment by removing fuel supply line (Item 1) from rear tank fitting (Item 2) located on bottom R.H. side of tank.

NOTE: If optinal side tank is installed use same procedure at side tank.

Before draining, position tractor so tank fitting is at the lower most point of tank. Also drain tank when fuel quantity is low to minimize fuel loss.

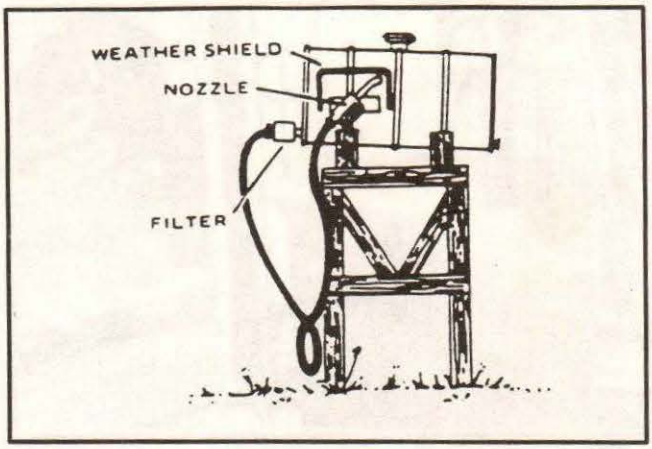

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FIGURE 4 - FUEL STORAGE ABOVE GROUND

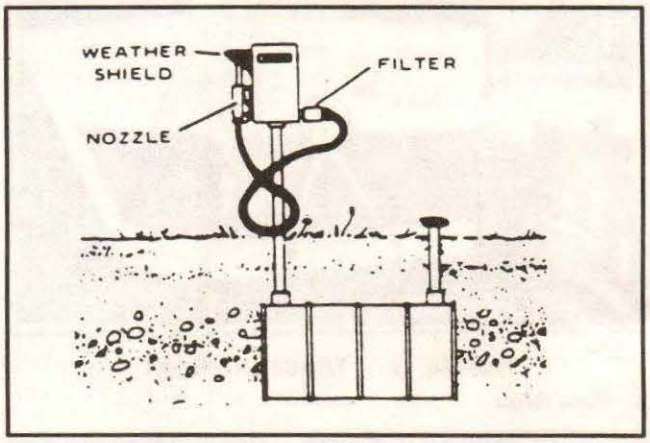

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FIGURE 5 - FUEL STORAGE BELOW GROUND

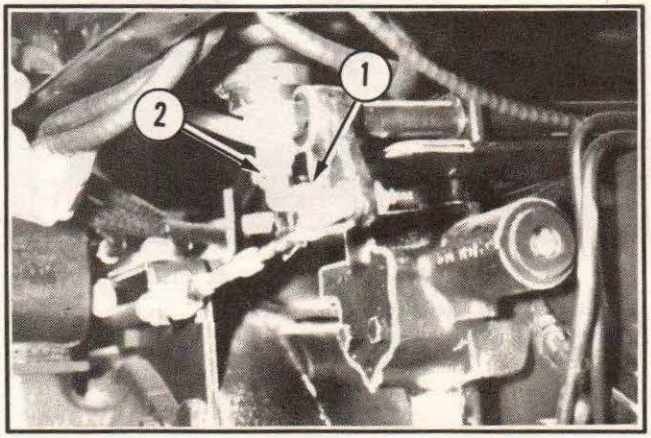

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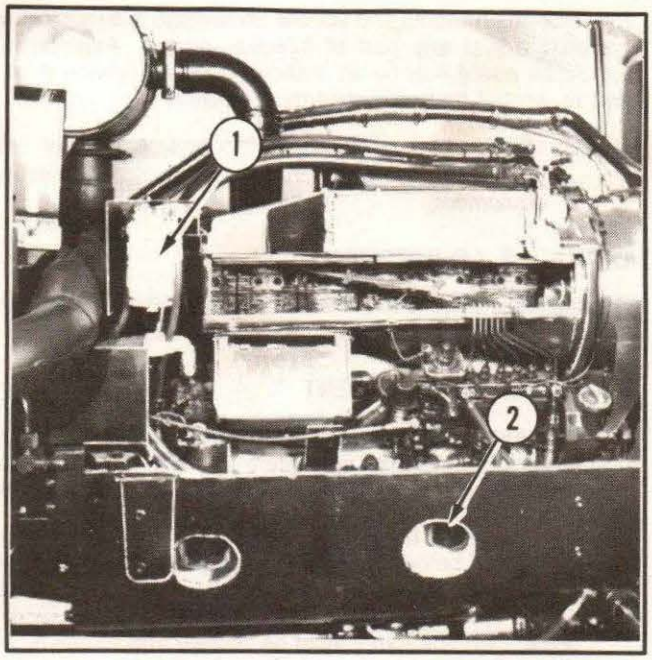
FIGURE 6 - REAR FUEL TANK (BOTTOM R.H. SIDE)

1. **Fuel Supply Line**
2. **Tank Fitting**



T-76358

FIGURE 7 - ENGINE R.H. SIDE

1. Water Separator
2. Fuel Filter

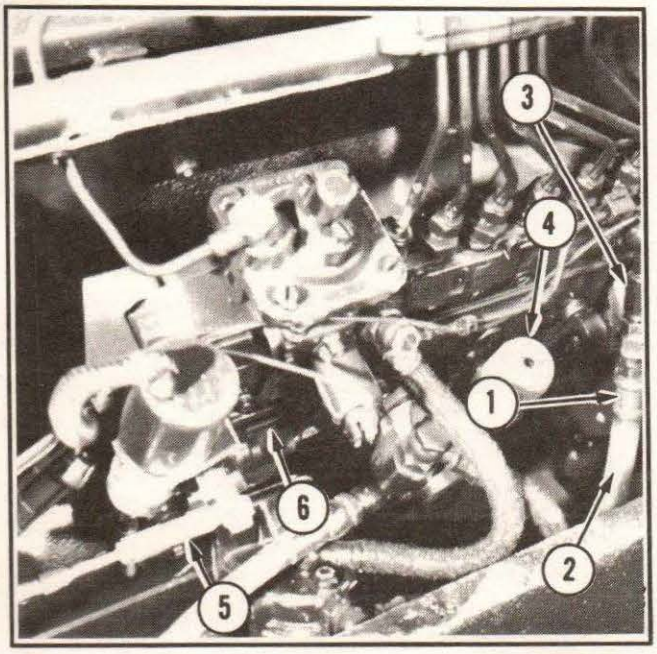


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FIGURE 8 - ENGINE R.H. SIDE

1. Hose Clamp
2. Return Hose
3. Fitting
4. Primer Pump
5. Ball Joint Assembly
6. High Idle Stop

FUEL SYSTEM SERVICING

WARNING: DO NOT smoke or light matches when servicing or bleeding fuel system.

NOTE: When servicing fuel system fuel supply may be shut off at valve located at water separator inlet.

IMPORTANT: Be sure fuel line shut off valve is fully open during operation.

WATER SEPARATOR (Figure 7)

Drain water separator (Item 1) every 250 hours or whenever water is present. Drain water by opening drain valve on separator base. Replace separator canister yearly (500 hours). Retain canister base. Replacement canister does not include a new base. Apply a light coat of clean oil to top and bottom gasket of new canister. Tighten canister and base securely to prevent air leaks.

FUEL FILTER (Figure 7)

Replace fuel filter (Item 2) initially at 50 hours and every 500 hours thereafter.

To replace filter, shut off fuel supply hose and clean area around filter head. Remove filter. Clean gasket surface of filter head. Fill new filter with clean diesel fuel and lubricate gasket with clean oil. Install new filter. Tighten filter 1/2 turn after gasket contacts filter head. If done carefully fuel system will not need to be bled.

BLEEDING FUEL SYSTEM (Figure 8)

The diesel fuel system is divided into two parts: low pressure side from fuel tank to injection pump, and high pressure side from injection pump through injection nozzles. Whenever the fuel system has been opened or air has been allowed to enter the fuel system, it must be bled.

Make certain the fuel tank has an ample supply of fuel then proceed to bleed system as follows.

BLEEDING LOW PRESSURE SIDE (Figure 8)

1. Remove hose clamp (Item 1) and return hose (Item 2) from injection pump return fitting (Item 3). Loosen primer pump knob (Item 4) and pump until fuel is forced out through return fitting.

2. Reinstall hose and clamp and secure primer pump knob.

BLEEDING HIGH PRESSURE SIDE

WARNING: Escaping diesel fuel under pressure can penetrate skin and cause serious injury. Use paper towel or cardboard to identify fuel spray. If injured, seek proper medical attention immediately.

Try to start engine before bleeding high pressure side of system. If engine runs unevenly or smokes, CAREFULLY loosen injection line fitting at nozzle adapter until air-free fuel is observed. Then CAREFULLY tighten fitting. Continue procedure with each successive line until all lines are bled. If the engine continues to not start, CAREFULLY loosen each consecutive injection line fitting at nozzle adapter, crank engine until air free fuel is observed. Then CAREFULLY tighten each line fitting.

ADJUSTING INJECTION PUMP (Figure 8)

Injection pump adjustments are factory set to provided optimum performance and maximum engine life.

Precision instruments and special knowledge are required to correctly adjust any part of injection pump. Adjustments should be made only by an authorized diesel service dealer and re-sealed for your warranty protection.

NOTE: Seals broken by unauthorized personnel will jeopardize warranty on engine and fuel injection equipment.

LOW IDLE ADJUSTMENT

Special knowledge is required to correctly adjust the low idle setting. Contact your authorized service dealer.

HIGH IDLE ADJUSTMENT

1. With throttle lever in high idle position, check that pump lever comes against stop (Item 6). If not, readjust ball joint assembly (Item 5) on threaded end of throttle cable.
2. If pump lever is contacting high idle stop but engine rpm's are below specifications replace fuel filter and check fuel supply line for restrictions. If rpm's are still below specifications contact your authorized service dealer. Engine rpm's must be verified and torque curve should be performed on dynamometer before any pump settings are changed.

ENGINE COOLING FINS
(Figure 9)

Inspect the cooling system every 250 hours with engine off to insure that it is clean. Inspect more frequently when operating in extreme conditions. Check engine cooling fins (Item 2) for foreign material build up. Plugged cooling fins can cause excessive heat build up in engine. To access cooling chamber, disconnect cover latches and remove cover. If any fuel or oil leaks are observed, DO NOT run engine. Locate source of leak and correct. Fuel and oil leaks will rapidly accumulate dirt and other foreign material which can cause engine overheating. After inspection or cleaning is completed, reinstall chamber cover.

NOTE: BE SURE cover is installed correctly and latches are tight. Any air leak at cover may reduce cooling efficiency of the cooling blower (Item 1) which could cause engine to overheat.

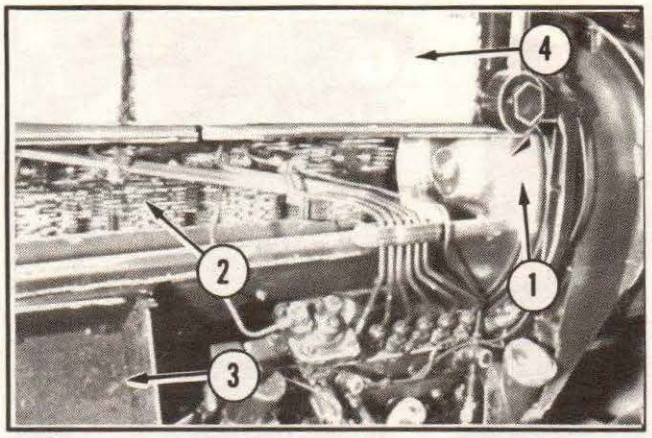

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FIGURE 9 - COOLING CHAMBER

1. **Cooling Blower**
2. **Engine Cooling Fins**
3. **Engine Oil Cooler**
4. **Transmission Oil Cooler**

ENGINE OIL COOLER
(Figure 9)

An engine oil cooler (Item 3) is used to provide additional engine cooling. The oil cooler should be inspected, along with the cooling fins, every 250 hours. Check cooler "honey combs" and fittings for oil leaks or foreign material build up. Clean as necessary.

TRANSMISSION OIL COOLER
(Figure 9)

Inspect powershift transmission oil cooler (Item 4) every 250 hours.

Check cooler "honey combs and fittings for oil leaks or foreign material buildup. Clean as necessary.

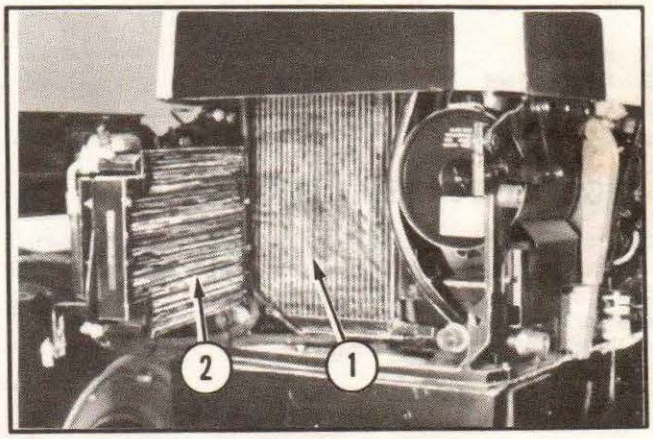

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FIGURE 10 - COOLER BEHIND GRILLE

1. **Hydraulic/Final Drive Oil Cooler**
2. **A.C. Condenser (Open position)**

FINAL DRIVE/HYDRAULIC OIL COOLER
(Figure 10)

Inspect final drive/hydraulic oil cooler (Item 1) every 250 hours. Check cooler "honey combs" and fittings for oil leaks or foreign material build up. Clean as required.

ENGINE INTER-COOLER
(Figure 11)

Inspect inter-cooler (Item 1) every 250 hours. Check cooler "honey combs" and fittings for air leaks or foreign material build up. Clean are required.

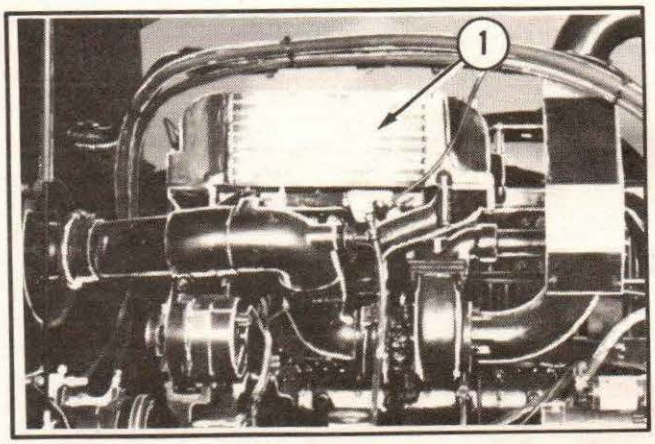

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FIGURE 11 - ENGINE L.H. SIDE

1. **Inter-Cooler**

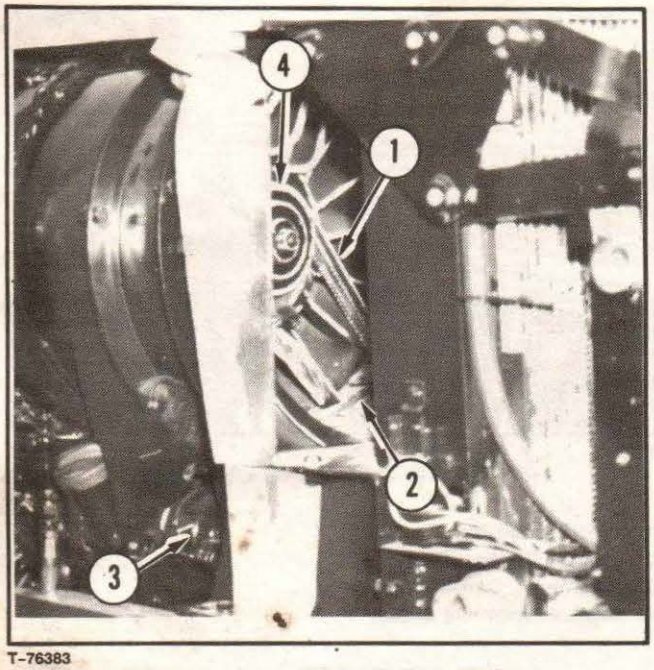

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FIGURE 12 - ENGINE R.H. FRONT

1. **Fan Belt**
2. **Rubber Boot**
3. **Belt Idler**
4. **Blower Pulley**

COOLING SYSTEM CLEANING

Cleaning of cooling fins and coolers may be accomplished with compressed air, water pressure, a wire, or a brush. DO NOT use any kind of solvent or fuel to clean cooling components. Be CAREFUL not to damage the "honey comb" of the coolers during cleaning.

Also clean air ducts and cooling fan. If cleaning has been done with water pressure, run engine until warm after cleaning to allow residual water to evaporate.

ENGINE COOLING FAN BELTS (Figure 12)

The cooling fan belt (Item 1) is adjusted with a spring-loaded self-tensioning idler. No tensioning adjustment is required. If belt breaks or comes off, the idler will contact a switch and a warning light in the cab will illuminate. Stop tractor and engine immediately and replace belt.

Inspect belt every 50 hours and replace if cracked or frayed as follows:

1. Open hood and remove grille and right-hand side panel.
2. Pull rubber boot (Item 2) from bottom side of blower shroud and slide boot partway down on oil tube.
3. Cooling fan drive belt idler (Item 3) has a 1/2" square hole in idler arm. Insert 1/2" drive ratchet into hole and use ratchet to remove idler tension from belt.
4. Work belt off idler and crankshaft pulley, then remove belt from blower pulley (Item 4).
5. Reverse procedure to reassembly.
6. Reposition rubber boot into opening in bottom of blower shroud.

ENGINE OIL

Oil meeting or exceeding API specification "CE" or "CF-4" are approved for use in Deutz air-cooled diesel engines. Refer to engine oil specifications in Specifications Section for engine oil viscosity and classification

CHECKING ENGINE OIL (Figure 13)

With tractor on level ground, check lubricant level daily or every 10 hours, whichever comes first, and replenish, if necessary, to maintain level between ADD-FULL marks on dipstick (Item 1). Check lubricant level before starting engine. If engine has been in operation allow one hour for lubricant to drain into pan before checking. Add as required through filler neck (Item 2).

CHANGING ENGINE OIL

Crankcase oil change frequency depends on working conditions. Remove factory installed break-in oil after first 50 operating hours. Then, under normal conditions, change oil every 250 operating hours. Drain oil while engine is warm. Change oil more often when tractor is operated during winter months or in extreme dust conditions. If oil change interval is not reached within six months, change oil and filters regardless of hours of operation.

Oil sampling is the best way to determine the ideal change interval for each individual operation. If sampling is not used, it is usually more economical in the long run to change oil more frequently than necessary rather than risk engine damage from "overused" oil. This manual suggests oil change intervals for "average" operating conditions for each machine.

NOTE: Reduce oil change interval by one-half (125 hours) when using fuel having sulphur content in excess of 0.5%, or when using API specification "CD" oil.

ENGINE OIL FILTER (Figure 13)

Replace filter element each time oil is changed. To change filter (Item 3) remove filter from base and lower until top of filter can be removed through frame opening. Make certain oil filter gasket is removed from filter base. Wipe filter base and apply thin coat of clean engine oil to gasket on new filter. Fill filter with clean oil, thread filter onto base and tighten by hand 1/2 turn after gasket contact base.

FINAL DRIVE/HYDRAULIC OIL (Figure 14)

Check oil level daily or every 10 hours. Maintain oil level at FULL mark on dipstick (Item 1) with AGCO power fluid 821 XL.

NOTE: When checking oil level tractor should be level lower links should be lowered completely and any remote cylinders attached to tractor should be completely retracted.

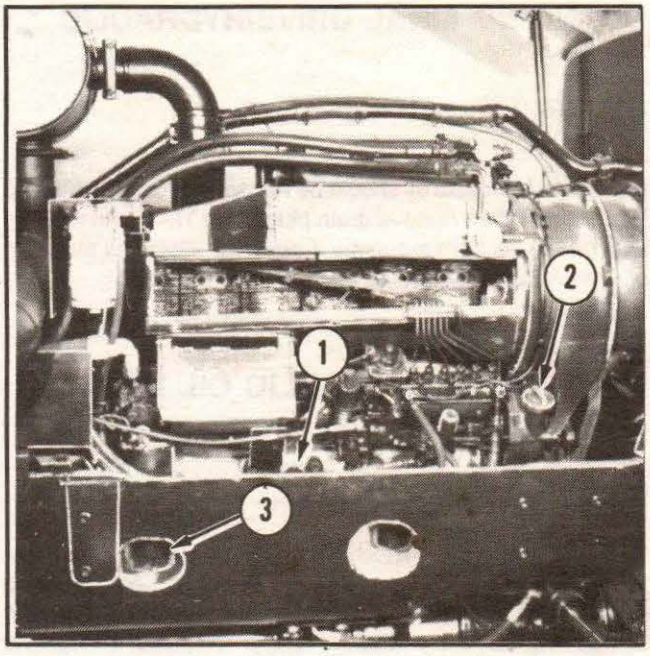

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FIGURE 13 - ENGINE R.H. SIDE

1. **Dipstick**
2. **Fillerneck**
3. **Engine Oil Filter**

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FIGURE 14 - TRACTOR REAR VIEW

1. **Final Drive/Hydraulic Fill Opening and Dipstick**

CHANGING FINAL DRIVE/HYDRAULIC OIL

(Figure 15)

Final drive/hydraulic oil should be replaced every 1000 hours. While oil is warm remove drain plug (Item 1). Clean metallic accumulations from magnetic drain plug. Reinstall plug and fill with AGCO power fluid 821XL.

FINAL DRIVE/HYDRAULIC OIL INLET SCREEN

(Figure 16)

Remove and clean screen (Item 1) at every oil change. Screen is located on right side of rear frame. Remove snap ring (Item 2) and slide out screen. Thoroughly wash screen in cleaning solvent and allow to dry. Replace o-ring seal (Item 3) and lubricate with oil. Re-install screen and snap ring.

NOTE: Remove screen carefully. Tang breakage may occur if screen is twisted during removal. If damage occurs, replace screen.

FINAL DRIVE/HYDRAULIC FILTER

(Figure 17)

Replace final drive/hydraulic filter (Item 1) after first 50 hours, then every 250 hours and when oil is replaced at 1000 hour interval.

To replace filter, turn filter base counterclockwise and separate housing from filter head. Discard element, seal, o-ring, and gaskets. Wash metal parts in solvent. Allow parts to dry. Coat new gaskets, seal, and o-ring with oil and position seal and gasket on filter head. Assemble o-ring, housing, spring, washer, element and gaskets on filter base. Install filter assembly on filter head and tighten base to a maximum of 50 ft.-lbs. (68 Nm). Check for leakage.

NOTE: Do not operate tractor if hydraulic pressure warning light is illuminated. If warning light illuminates while operating hydraulic system with cold oil, immediately stop tractor motion and discontinue operation of hydraulically assisted functions. Allow oil to warm by operating tractor engine at reduced throttle for a few minutes.

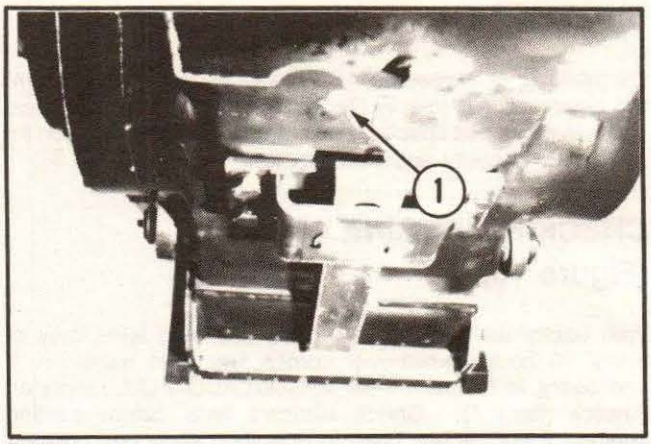

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FIGURE 15 - FINAL DRIVE HOUSING BOTTOM VIEW

1. Oil Drain Plug

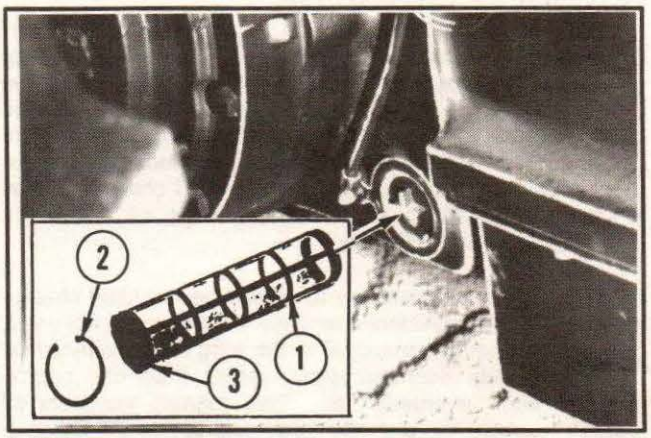

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FIGURE 16 - FINAL DRIVE HOUSING R.H. SIDE

1. Inlet Screen
2. Snap Ring
3. O-ring

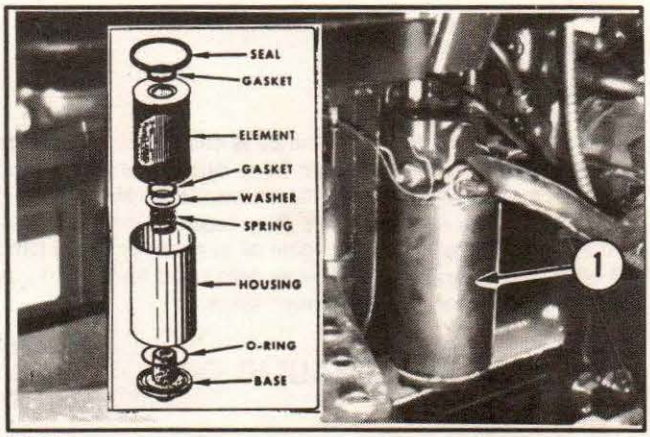

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FIGURE 17 - FINAL DRIVE HOUSING L.H. SIDE

1. Final Drive/Hydraulic Filter

FINAL DRIVE/HYDRAULIC RESERVOIR BREATHER (Figure 18)

Replace hydraulic breather element (Item 1) when hydraulic oil is changed every (1000 hours). Replace element more frequently under extreme dust conditions. When installing breather, tighten capscrew carefully so as not to collapse breather assembly (Item 2).

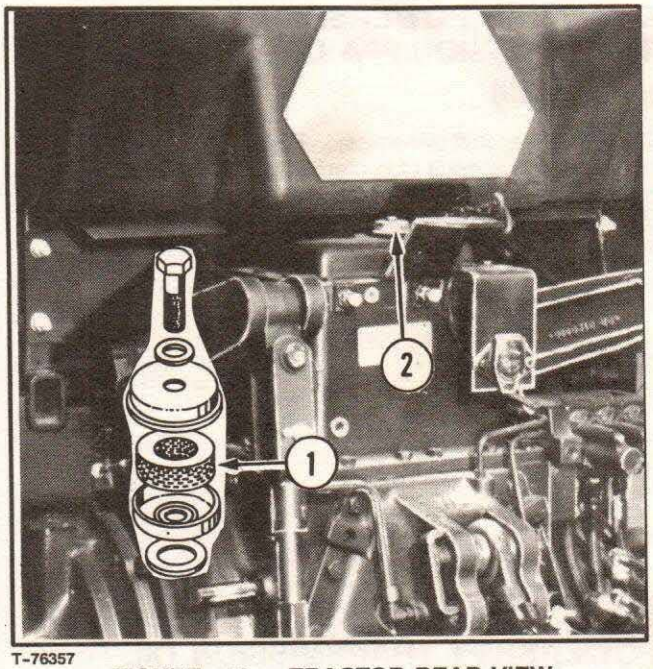

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FIGURE 18 - TRACTOR REAR VIEW

1. Breather Element
2. Breather Assembly

POWERSHIFT TRANSMISSION/PFA DROPBOX OIL (Figure 19)

PFA dropbox oil is common with powershift transmission oil. With tractor on level ground check powershift transmission/PFA dropbox oil level daily or every 10 hours, whichever comes first. Always check oil level before start-up or after waiting at least five minutes after shutdown (to allow for proper drain back of oil). Maintain level between ADD-FULL marks on dipstick (Item 1) with AGCO Power Fluid 821XL. Fill through tube (Item 2).

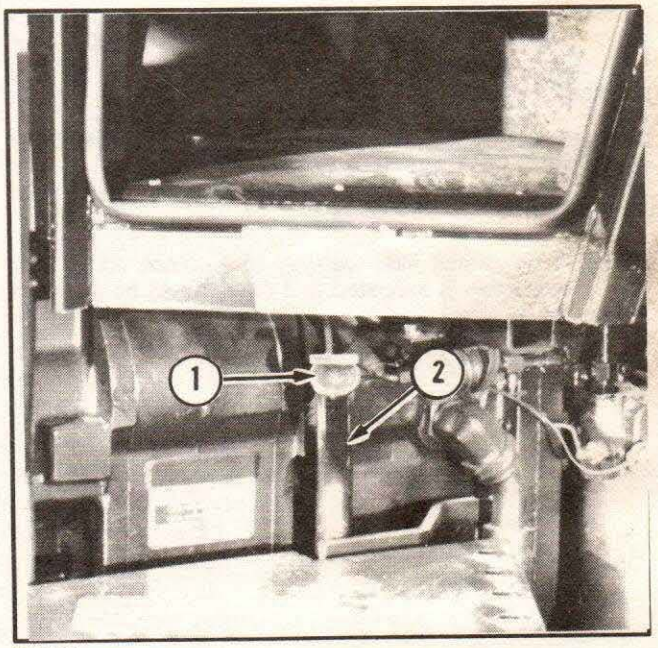

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FIGURE 19 - TRACTOR L.H. SIDE

1. Dipstick
2. Dipstick/Oil fill Tube

CHANGING POWERSHIFT TRANSMISSION/PFA DROPBOX OIL (Figure 20)

Change power shift transmission/PFA dropbox oil every 1000 hours. Remove drain plug (Item 1) and drain oil, while warm from operation. Clean metallic accumulations from magnetic drain plug. Reinstall plug and fill transmission with AGCO Power fluid 821XL.

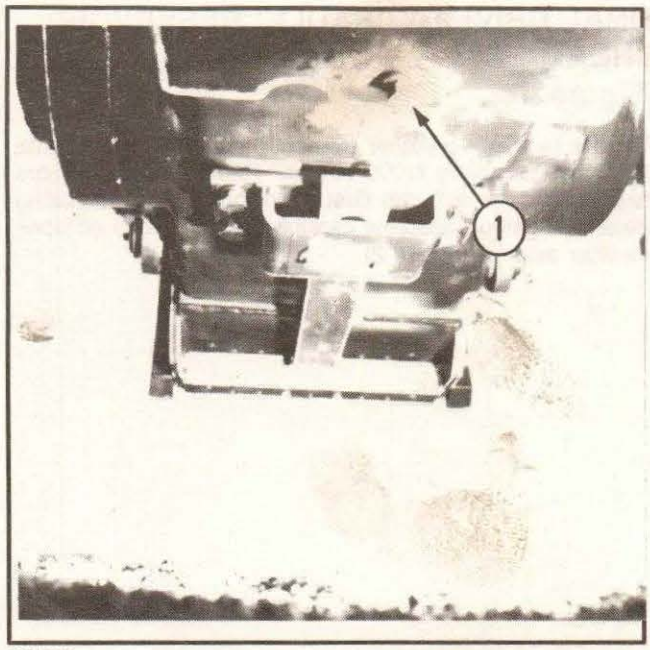

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FIGURE 20 - PFA DROPBOX BOTTOM VIEW

1. Oil Drain Plug

POWERSHIFT TRANSMISSION OIL FILTER (Figure 21)

Replace oil filter element (Item 1) after first 50 hours, then every 250 hours and when oil is replaced at 1000 hour interval. Remove element from base by turning counterclockwise.

Lubricate o-ring on new element with oil. Thread new element onto base, turn clockwise no more than 1/2 turn after o-ring first contacts base. Check oil level after initial operation and check for leaks.

NOTE: If powershift filter warning light comes on, a filter restriction is indicated and filter should be changed immediately.

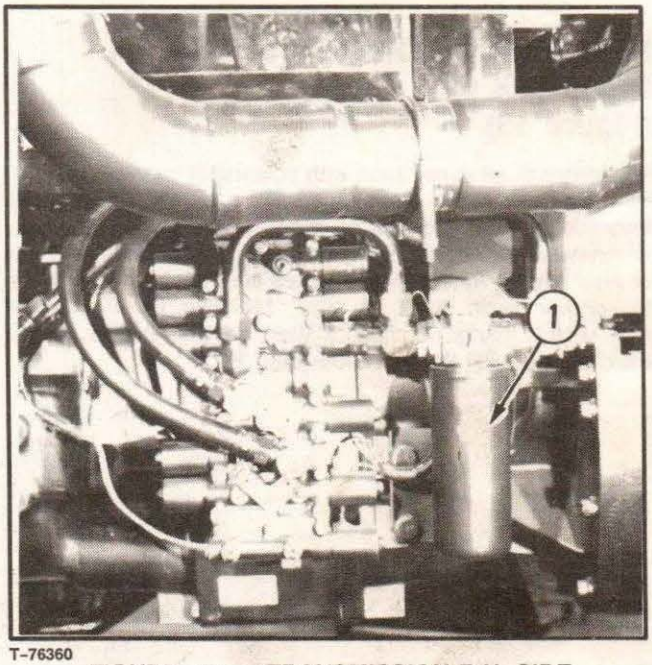

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FIGURE 21 - TRANSMISSION R.H. SIDE

1. Powershift Transmission Oil Filter

PFA DROPBOX OUTPUT SHAFT (Figure 22)

Lubricate PFA dropbox output shaft fitting (Item 1) daily (10 hours) with multi-purpose grease. 1 fitting total.

PFA DRIVE SHAFT (Figures 22 and 23)

Lubricate fittings on PFA drive shaft splined couplings (Item 2, Figure 22 and 23) daily (10 hours) with multi-purpose grease. 2 fittings total.

NOTE: Universal joints are sealed units.

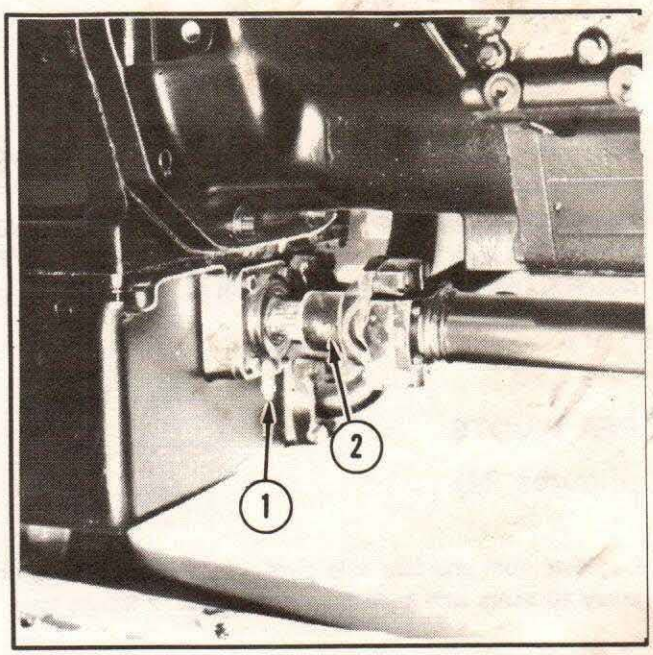

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FIGURE 22 - PFA DROPBOX

1. Output Shaft Grease Zerk
2. Rear PFA Drive Shaft Zerk

PFA CLUTCH INPUT SHAFT (Figure 23)

Lubricate PFA clutch input shaft fitting (Item 1) daily (10 hours) with multi-purpose grease. 1 fitting total.

PFA CLUTCH (Figure 23)

The PFA clutch is lubed by oil which leaks from the clutch and accumulates in the clutch housing (Item 3). Excess oil is returned to the final drive. No operator maintenance is required.

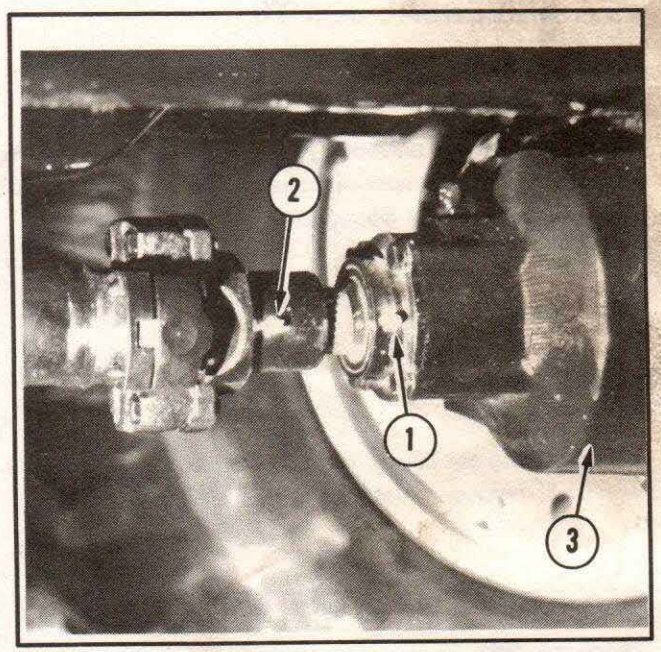

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FIGURE 23 - PFA CLUTCH R.H. SIDE

1. PFA Clutch Input Shaft Zerk
2. Front PFA Drive Shaft Zerk
3. PFA Clutch Housing

PFA DIFFERENTIAL

(Figure 24)

Check lubricant level every 50 hours. Oil should be at plug level (Item 1) when axle is level. Change lubricant after first 50 hours, then yearly or every 1000 hours. Remove plug (Item 2) and drain lubricant while warm from operation. Fill differential through fill-check plug (Item 1) with AGCO Gear Lube 715.

PFA PIVOTS

(Figures 24)

Lubricate front and rear axle pivot fittings (Item 3) daily or every 10 hours with multi-purpose grease. 2 fittings total.

PFA UNIVERSAL JOINTS

(Figure 25)

Sparingly lubricate universal joint fittings (Item 1) daily or every 10 hours, with multi-purpose grease. Fittings are 180^0 apart on universal. 4 fittings total.

PFA KING PINS

(Figure 25)

Lubricate king pin fittings (Item 2) daily or every 10 hours, with multi-purpose grease. 4 fittings total.

PFA STEERING CYLINDER

(Figure 26)

If tractor is to be stored for a long time period apply a light coat of multi-purpose grease to cylinder rods (Item 1) to protect them from rust. 2 total.

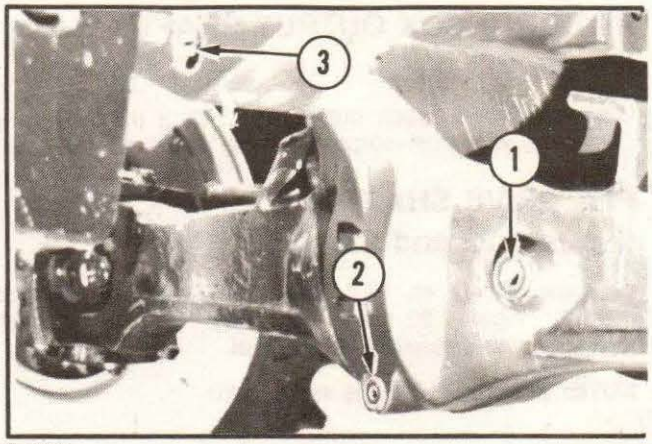

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FIGURE 24 - PFA FRONT

1. PFA Differential Fill-Check Plug
2. PFA Drain Plug
3. Front Axle Pivot Zerks

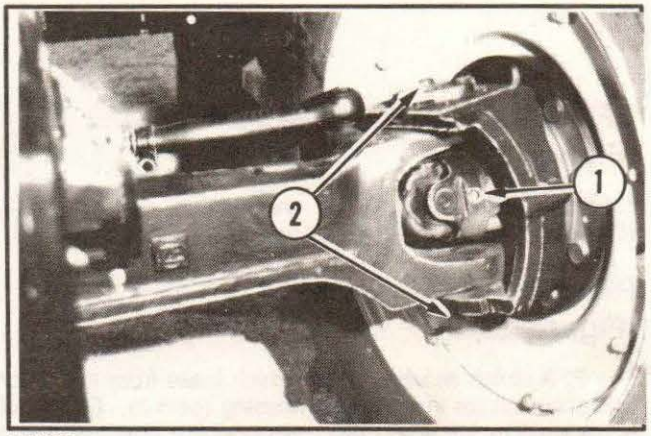

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FIGURE 25 - PFA L.H. FRONT

1. Universal Joint Zerk
2. King Pin Zerks

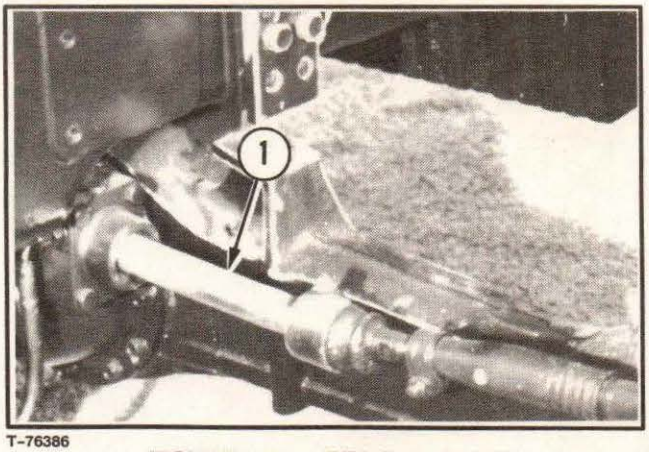

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FIGURE 26 - PFA R.H. REAR

1. Steering Cylinder Rod

PFA PLANETARY DRIVES (Figure 27)

Check lubricant level every 50 hours. Oil should be at plug level (Item 1) when the words "Oil Level" are horizontal and PFA is level. Change lubricant after first 50 hours, then yearly or every 1000 hours. Rotate wheel to position plug (Item 1) at bottom of hub. Remove plug and drain while lubricant is warm from operation. Re-install plug. Rotate wheel until the words "Oil Level" are horizontal. Fill planetary through plug (Item 1) with AGCO Gear Lube 715.

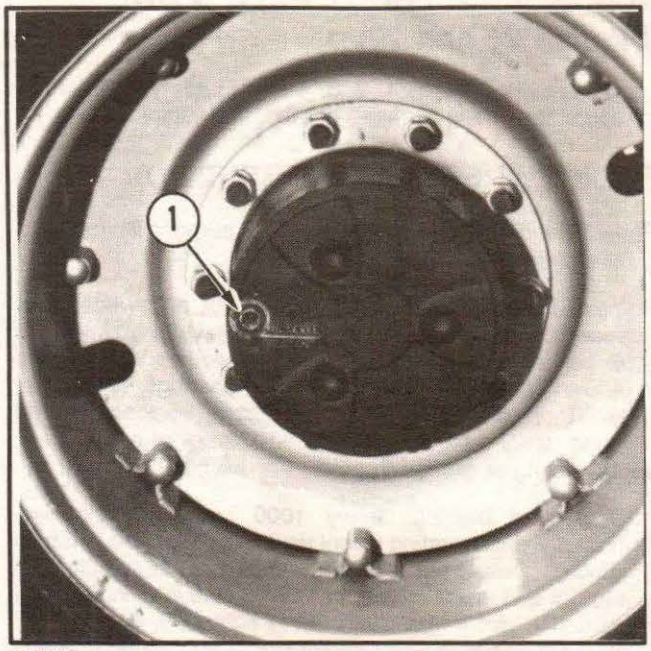

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FIGURE 27 - PFA PLANETARY (Fill/Check Position Shown)

1. **Fill/Check/Drain Plug**

ADJUSTABLE FRONT AXLE (2WD) (Figures 28 and 29)

Lubricate fittings (Items 1, 2, 3, 4 and 5) every 50 hours of operation with multi-purpose grease. 12 fittings total.

FRONT WHEEL BEARINGS (2WD)

Repack bearings with No. 2 grade multi-purpose lithium base grease every 1000 hours of operation.

Remove hub cap, gasket, cotter pin, nut and wheel hub. Support hub as inner bearing slides off spindle and prevent outer bearing from falling as hub is removed. Wash all parts in cleaning solvent. Inspect seals and bearings for chips or nicks. Replace all damaged or worn parts. Pack each wheel hub and bearing set with 0.5 pound (227 g) of grease, and apply coating of grease to seal.

Adjust wheel bearings every 1000 hours of operation. Tighten nut while rotating wheel until a definite drag is felt on bearings. Loosen nut to align nearest hole in spindle with slot in nut and insert cotter pin. If one hole in spindle is not aligned with slot in nut when nut is tightened, back off nut to align second hole with nearest slot in nut. Bend one end of cotter pin against spindle and other against nut. Reinstall cap and gasket.

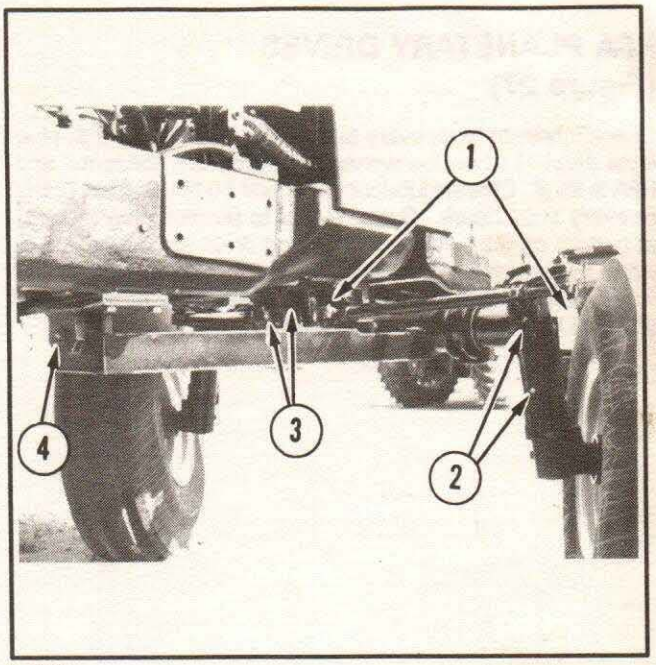

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FIGURE 28 - ADJUSTABLE FRONT AXLE (2WD)

1. **Tie Rod End Zerk**
2. **Steering Knuckle**
3. **Pitman Shaft Bearing Zerks**
4. **Stay Rod Pivot Bushing Zerks**

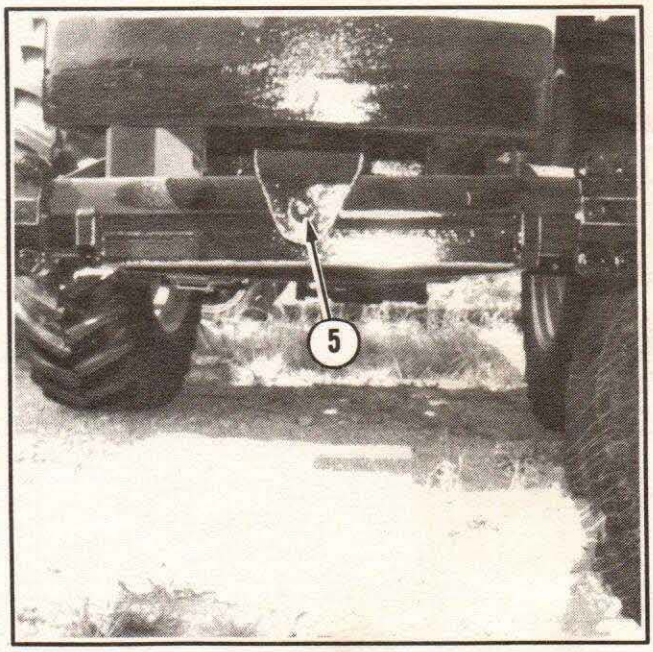

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FIGURE 29 - ADJUSTABLE AXLE PIVOT (2WD) (Front View)

5. **Axle Pivot Zerk**

WIDE SWING DRAWBAR ROLLER

Lubricate wide swinging drawbar roller daily or every 10 operating hours, whichever comes first, with multi-purpose grease. 1 fitting total.

3-POINT HITCH LINKAGE

Lubricate three-point hitch grease fittings (Item 1) daily or every 10 operating hours, whichever comes first, with multi-purpose grease. 12 fittings total.

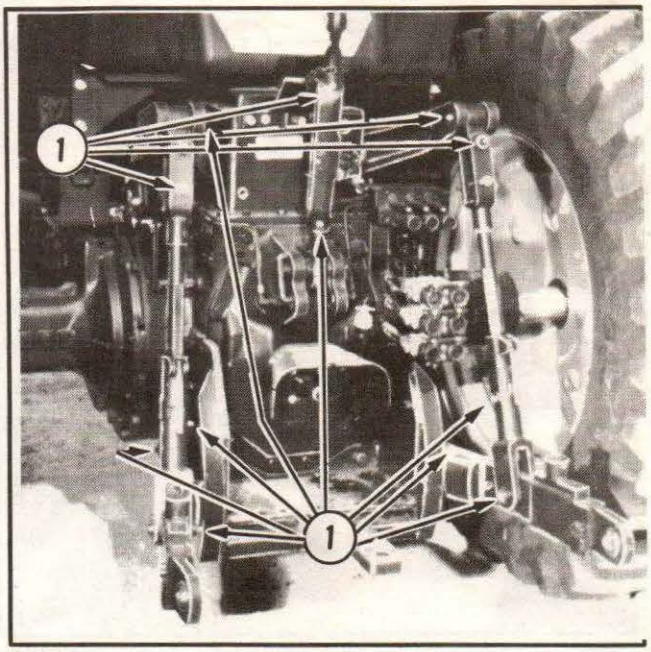

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FIGURE 30 - 3-POINT HITCH

1. 3-Point Hitch Zerks

3-POINT HITCH POSITION CONTROL LEVER (Figure 31)

Adjust operating tension of position control lever by tightening friction disc retaining nuts (Item 1) evenly until 10-11 foot pounds of torque are required to turn control shaft (Item 2).

CAUTION: Lower 3-point hitch linkage and shut off tractor engine before adjusting position control lever tension.

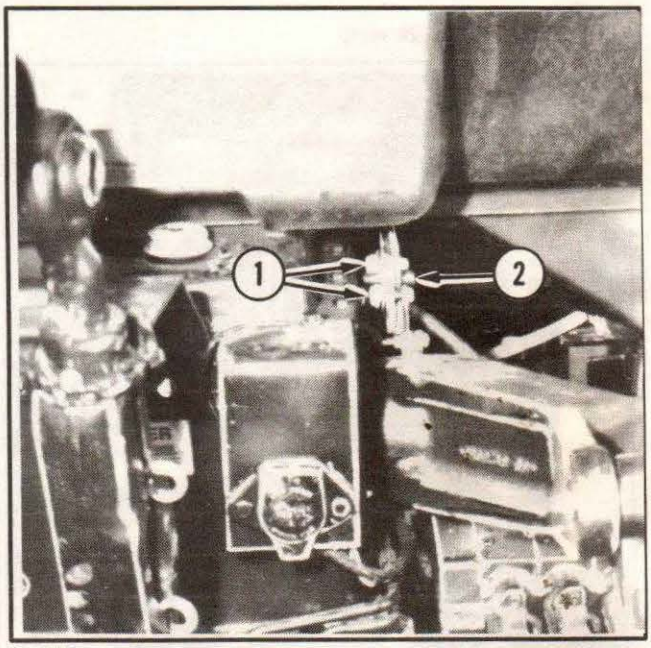

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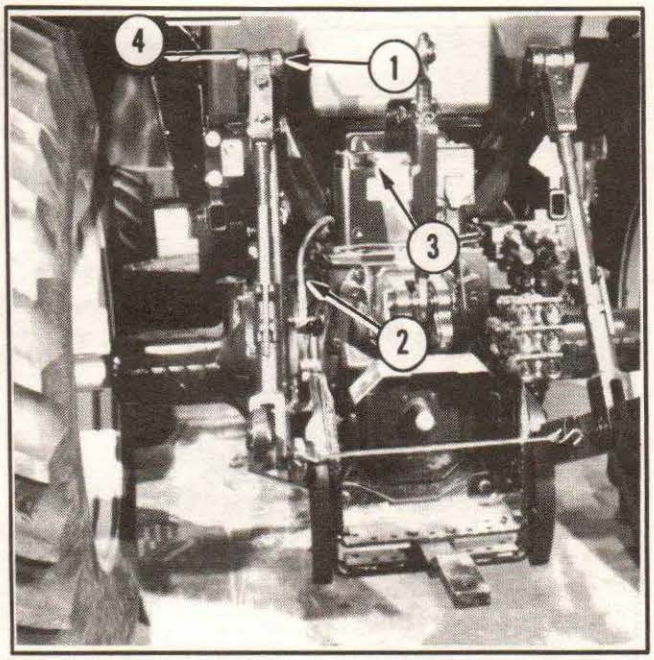
FIGURE 31 - 3-POINT HOUSING R.H. SIDE

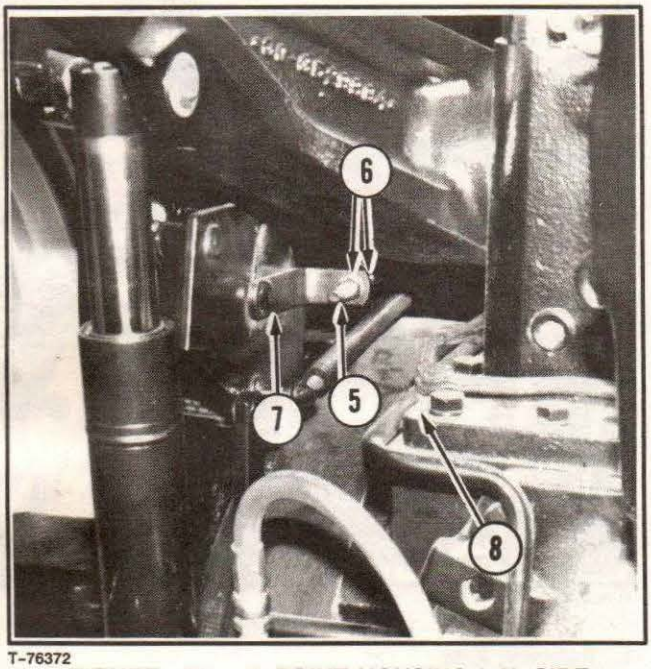
1. Retaining Nuts
2. Control Shaft



T-76371

FIGURE 32 - TRACTOR REAR VIEW

1. **Lift Arm Pin**
2. **External Cylinder Hose (Disconnected)**
3. **Plug**
4. **1/2" to 1" (13 to 26 mm)**



T-76372

FIGURE 33 - 3-POINT HOUSING L.H. SIDE

5. **Control Rod**
6. **Adjustment Nuts**
7. **Bracket**
8. **3-point Housing Flange**

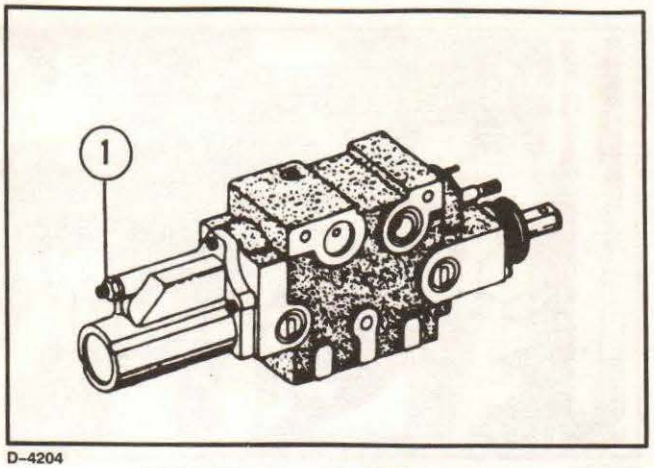
3-POINT HITCH CONTROL LINKAGE (Figures 32 and 33)

DANGER: LOWER 3-point hitch and stop engine before making adjustments.

Control linkage will not normally require adjustment unless linkage becomes bent or damaged. Before making adjustments to linkage the external cylinder hose (Item 2) must be disconnected at the lift housing, a plug (Item 3) installed in housing, and the hitch load response control must be placed in mid-position.

Determine maximum travel - Lower hitch and remove any attached implements. Raise hitch to maximum height and measure distance from top of 3-point housing flange (Item 8) to center of lift arm pin (Item 1). Lower hitch. Lengthen control rod (Item 5) by turning adjustment nuts (Item 6) 2 or 3 turns. Raise hitch and repeat measurement. Repeat procedure until there is no change in measurement, indicating lift arm has reached maximum travel height.

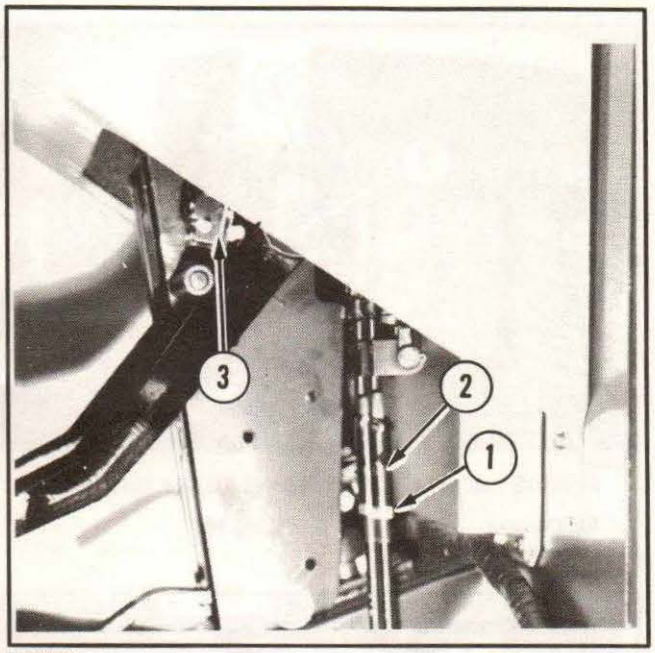
Adjust to Operating Position - Lower hitch and adjust control rod to reduce lift arms maximum height by 1/2" to 1" (13 to 26 mm) (Item 4). To adjust, shorten control rod by turning adjustment nuts 1 or 2 turns. Each full turn of adjustment nuts will raise or lower maximum lift arm travel by approximately 1/2" (13 mm). Raise hitch and check measurement. Repeat procedure until height reduction (Item 4) is obtained. Jam adjusting nuts against bracket (Item 7) to lock in position.



D-4204

FIGURE 34 - REMOTE VALVE

1. Detent Adjustment Screw



T-76373

FIGURE 35 - STEERING PEDESTAL R.H. SIDE

1. Jam Nut
2. Turnbuckle
3. Brake Switches

ADJUSTING REMOTE VALVE DETENT (Figure 34)

If control lever for remote valve fails to stay in either detent position (raise or lower) or lever does not go back to neutral after cylinder reaches end of stroke, a slotted adjustment screw (Item 1) is provided on rear of valve to adjust remote valve detent relief pressure.

Loosen locknut and turn adjustment screw clockwise to increase detent relief pressure. Turn adjustment screw only enough to maintain lever detent position and allow lever to return to neutral position at end of cylinder stroke. Hold adjustment screw and tighten locknut to secure adjustment screw.

DANGER: When adjusting detent kickout pressure, DO NOT back screw all the way out. This will cause valve parts to blow out and high pressure oil to escape, potentially resulting in severe personal injury.

CLUTCH PEDAL ADJUSTMENT

The clutch pedal controls various switches used by the transmission control module. The system is self calibrating and requires no adjustment.

BRAKE PEDAL ADJUSTMENT (Figure 35)

Adjust brake pedal free travel as required. Loosen jam nut (Item 1) and rotate turn buckle (Item 2) to obtain 3/4" (19 mm) pedal free travel. Tighten jam nut when correct free travel is obtained.

BRAKE PEDAL SWITCH ADJUSTMENT (Figure 35)

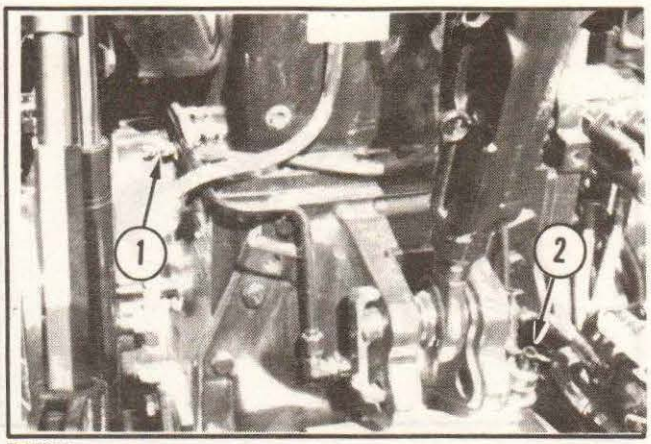
Periodically check brake pedal switches (Item 3). To check switches electrically, turn key switch to ON position and activate differential lock switch. Differential lock indicator light on dash will glow until either one or both brake pedals are depressed. to complete the check depress both pedals simultaneously. PFA light will glow until either one or both brake pedals are fully released.

To adjust brake switches loosen mounting bolts and move each switch until both switches turn ON and OFF "click" simultaneously between 1/4" (6 mm) and 1/2" (13 mm) below brake pedals fully raised position.

BLEEDING THE BRAKES
(Figure 36)

WARNING: Before starting tractor, make sure three point hitch is down and hitch control lever is positioned so hitch will stay down. Engage park lock by placing lever in "P" position.

Back out bleed screw (Item 1) one turn. Install a length of clear tubing between screw and reservoir filler neck. Start tractor and maintain idle speed. Fully depress corresponding brake-pedal, pause 5 seconds, release brake pedal, and pause 5 seconds. Repeat 10 to 12 times until oil flow through tubing appears clear of air. Partially depress brake pedal to create a small amount of return flow and close bleed screw. Repeat procedure for remaining bleed screw located on opposite side of lift housing.



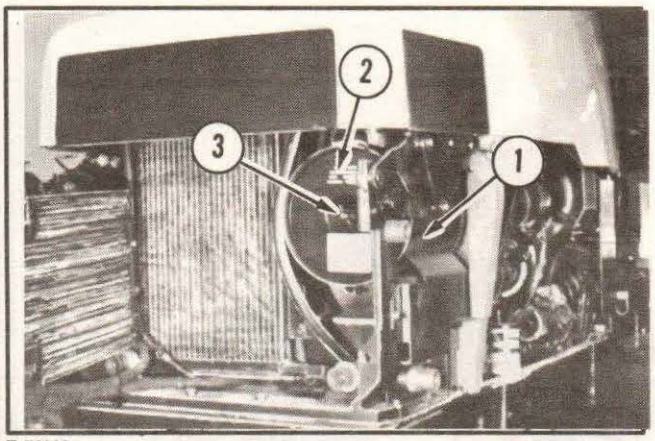
T-76374

FIGURE 36 - TRACTOR REAR VIEW

1. Bleed Screw (L.H. side)
2. Filler Neck

ENGINE VALVE CLEARANCE

Engine must have intake and exhaust valve clearance checked by your dealer after the first 50 hours of operation and every 500 operating hours thereafter or once a year whichever comes first. Intake valve clearance is 0.006" (.15 mm). Exhaust valve clearance is 0.006" (.15 mm). Adjust valve clearance when engine is cold. Cool down time for a "cold" engine is 4 hours.



T-76369

FIGURE 37 - ENGINE FRONT (Grille Removed)

1. Air Cleaner
2. Element Cover
3. Wing Nut

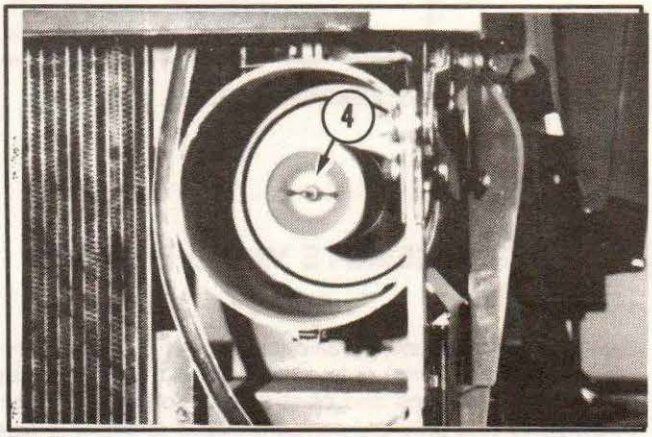
THROTTLE LEVER ADJUSTMENT

Throttle lever tension can be increased or decreased by tightening or loosening the allen head screw in clamp at bottom of throttle lever.

ASPIRATED PRE-CLEANER

Pre-cleaner is self cleaning. Debris separated out of intake air flow in the pre-cleaner is siphoned off through venturi action inside aspirating muffler and then discharged with muffler exhaust.

At the time of air cleaner service, check that aspirator tube connections are tight and muffler venturi is working properly.



T-76390

FIGURE 38 - ENGINE FRONT (Grille Removed)

4. Safety Element

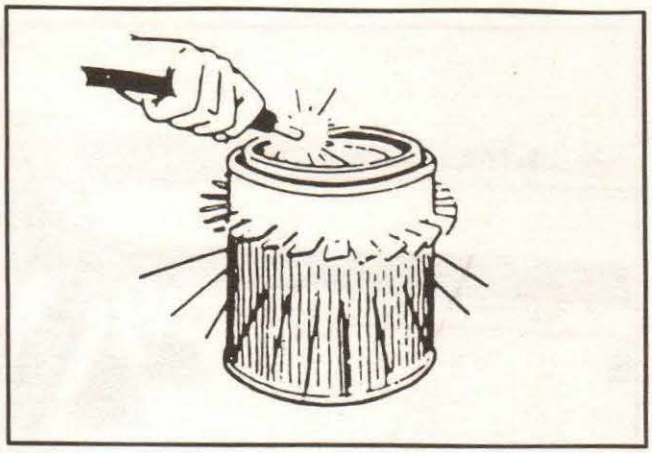


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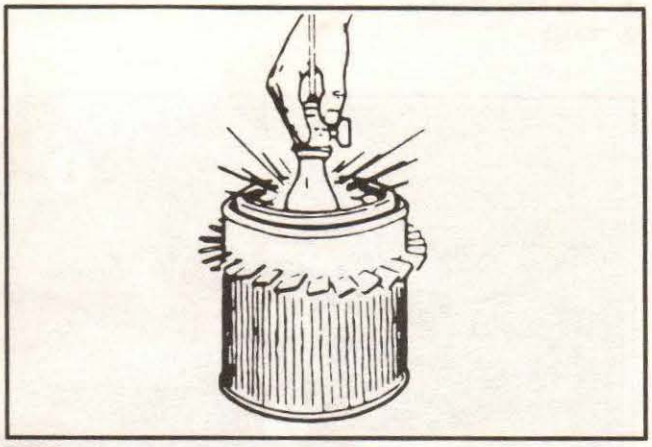
FIGURE 39 - CLEANING FILTER ELEMENT



D-3884

FIGURE 40 - INSPECTING AIR FILTER

AIR CLEANER (Figures 37, 38, 39 and 40)

The air restriction indicator light, located on instrument panel, will glow when air cleaner filter element requires cleaning. Air cleaner is provided with a safety element (Item 4) for additional protection of engine. For maximum engine protection, cleaning of safety element is not recommended.

If air restriction indicator light glows very shortly after primary element has been cleaned or replaced, safety element probably needs replacement.

SERVICING AIR CLEANER ELEMENT (Figures 37 and 39)

Remove front grille, element cover (Item 2) and wing nut (Item 3). Remove element from housing. Clean inside of housing and cover. Direct compressed air of not more than 100 psi (690 kPa) up and down pleats on inner side of element maintaining reasonable distance between air nozzle and element.

IMPORTANT: Be careful to see that the element is not ruptured by the nozzle or the air jet. NEVER direct air jet against the outside surface of filter element.

IMPORTANT: Washing element with water is NOT recommended as damage to the element is likely to result.

CAUTION: Never use gasoline or solvents to clean elements.

INSPECTING THE CLEANED FILTER ELEMENT (Figure 40)

After cleaning the filter element, inspect the element for damage. Look for dust on the clean air side, the slightest rupture, or a damaged gasket. A good method to detect ruptures in the element is to select a dark place, place a light inside the element, and look toward the light from the outside. Any hole in the element, even the smallest, will pass dust to the engine and cause unnecessary wear.

IMPORTANT SERVICE INFORMATION

1. Replace primary element yearly, or every 1000 hours of operation or after six cleanings, whichever occurs first.

   Replace safety element yearly or every 1000 hours, or when there has been a leak or break in the primary filter which makes the safety element excessively dirty.
2. Service primary element only when restriction indicator light stays on. Excessive handling of element may cause damage and allow dirt to get on safety element.
3. Stop engine before removing primary element.
4. Do not use engine exhaust to blow out element. (Exhaust soot will plug element very rapidly).
5. A light may be used inside element to check for ruptures in paper.
6. Inspect element gasket. (If damaged, replace element).
7. Inspect gasketed washer on element retaining wing nut. (Replace if damaged. Rubber face should be against element end).
8. Wipe out air cleaner housing before installing a new or cleaned primary element. (Chaff or straw might become lodged under gasket seal or if there is a large accumulation of dirt at bottom of housing it might be forced into engine air pipe when element is installed).
9. Tighten element retaining wing nut securely. (Finger tightening is adequate. Do not overtighten with pliers or wrench).
10. Check hose connections at air cleaner and engine periodically.
11. When replacing filter elements, be absolutely sure that the proper element is used. Your AGCO dealer can supply you with the proper element.

IMPORTANT: Never operate the engine without a filter element in the air cleaner housing and always use genuine AGCO filter elements for maximum protection.

INSPECTING AIR INDUCTION SYSTEM

The air induction system should be periodically checked for parts that may be worn, missing, or damaged. Hoses, gaskets, and connections particularly should be checked for possibility of an air leak. Any air leak that is detected should be corrected before operating the engine.

CAB AIR FILTER (Figure 41)

WARNING: Cab air filters are NOT designed to prevent harmful chemicals from entering cab. When using agricultural chemicals, carefully follow instructions given by chemical manufacturer.

WARNING: DO NOT stand on any part of tractor to reach air filter.

The cab air filter element (Item 1) seldom requires removal for cleaning since accumulated dust and dirt on bottom of filter is usually jarred loose whenever cab door is closed. If a noticeable reduction in performance of cab air conditioner, heater or pressurizer becomes evident, filter element should be removed and cleaned.

Do not climb on tractor when removing filter element. Use a suitable ladder to stand on to reach element retaining latch. Loosen retaining latch (Item 2) and swing right-hand end of filter assembly down. Filter-element support pan is hinged on end opposite retaining latch. Remove filter from hinged cover.

The heavy-duty paper element may be cleaned by tapping carefully on a flat surface, dirty side down, or by directing compressed air (100 psi) (690 kPa) through filter opposite direction of arrows in side of filter.

When installing filter, make certain that air flow will be same as direction of arrows in side of filter.

Replace filter element if ruptured or otherwise damaged.

AIR RECIRCULATION FILTERS (Figure 42)

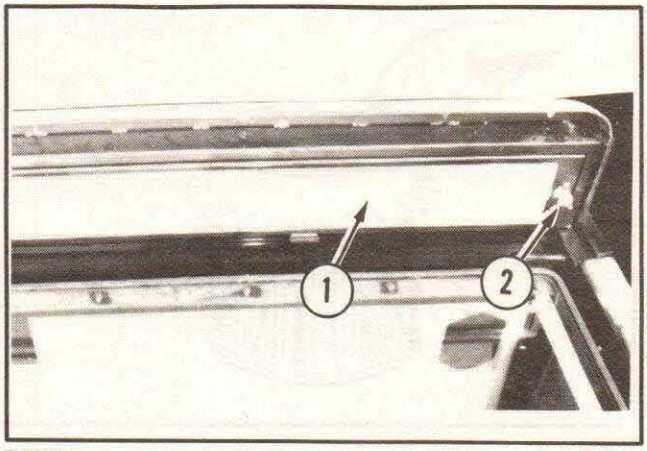
Filters (Item 1) should be cleaned periodically. Rotate latches (Item 2) 90° to remove cover (Item 3).

AIR CONDITIONER (Figure 43)

Check receiver-drier sight glass (located next to precleaner) every 50 hours to detect loss of refrigerant from system. Operate engine at 1800 rpm and activate A/C system. When compressor clutch engages, some bubbles will be observed; however, sight glass should show clear fluid shortly. If unit is not cooling properly and sight glass does not clear up, have unit checked by qualified air conditioning serviceman.

Check condenser every 50 hours of operation. Remove front grille and clean condenser (Item 1) with brush, air hose, water hose or vacuum cleaner. Also, check that oil cooler (Item 4) and fuel cooler (Item 5) are free of dirt and chaff so air flow is not restricted.

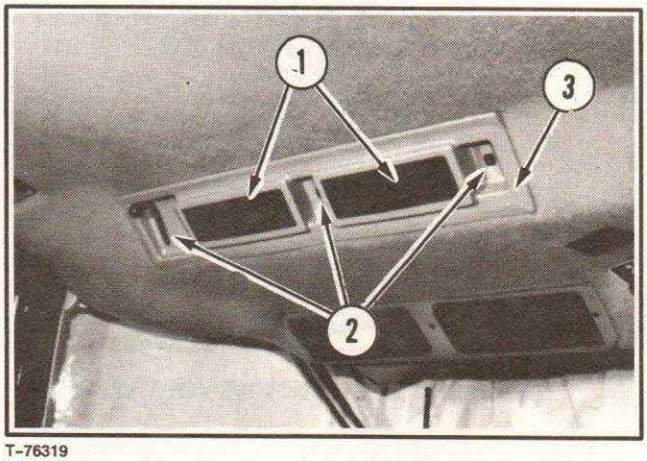
Check refrigerant hoses occasionally for abrasions and nicks, being sure hoses are not allowed to wear by having sharp bends or rubbing on metal parts.



T-76377

FIGURE 41 - CAB REAR

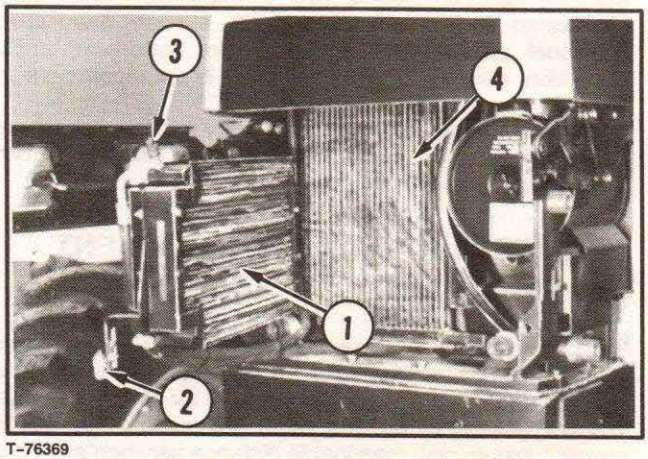
1. Cab Filter Element
2. Latch



T-76319

FIGURE 42 - CAB CEILING

1. Air Recirculation Filter
2. Latch



T-76369

FIGURE 43 - TRACTOR FRONT

1. Air Conditioning Condenser
2. Air Conditioning Condenser Latch
3. High Pressure Switch
4. Oil Cooler

AIR CONDITIONER WARNING LIGHT (Figure 43)

Air conditioner warning light is located on control panel in cab ceiling.

If red warning light glows during operation, shut off air conditioner and check for these possible problems:

1. Dirty or plugged condenser core.
2. Compressor clutch circuit breaker open;
   A. Clutch may have burned up from slippage.
   B. Short circuit in A/C wiring.
   C. Refrigerant has leaked out of system.

If problem cannot be corrected, consult qualified air conditioning serviceman.

IMPORTANT: DO NOT operate air conditioner when red warning light glows red.

Periodically check warning light operation by disconnecting high pressure switch lead (Item 3) (located on condenser behind front grille) or low pressure switch lead (located on receiver-drier). Turn air conditioner temperature control fully clockwise, turn on blower and turn key switch to ON. Warning light will glow red if operating properly.

AIR CONDITIONING COMPRESSOR BELT

Check belt tension every 50 hours of operation. To tighten belt, first remove the engine side panels. Loosen two bottom pivot bolts and top anchor bolt. Use a pry bar against the compressor to increase tension on belt. Retighten top anchor bolt then bottom pivot bolts.

ALTERNATOR

An alternator us used in the electrical charging system and requires no lubrication. The alternator and regulator are designed for use on only one polarity system. This tractor uses a negative ground electrical system. The following precautions must be observed when working on the charging circuit. Failure to observe these precautions will result in serious damage to the electrical equipment.

1. When installing a battery, always make absolutely sure the ground polarity of the battery and the ground polarity of the alternator are the same. If a battery is of the wrong polarity, or if the battery is reversed when installing and connecting it into the charging system, the battery is directly shorted through the diodes. This will cause the diodes and wiring to be endangered by high current flow, and burned out diodes and wiring harness will probably result.
2. When connecting a booster battery or auxiliary starting power as a starting aid, make certain to follow the same connecting procedures as outlined in steps 1 through 4, under "Jump Starting the Batteries".
3. When connecting a battery charger to the battery, connect the charger positive lead to the battery positive terminals, and the charger negative lead to the battery negative terminals. Failure to follow this procedure will result in damage to diodes and wiring harness. NEVER ATTEMPT TO START ENGINE OR TURN KEY SWITCH TO THE "RUN" POSITION WHILE CHARGER IS IN USE.
4. Never operate the alternator with the battery wire disconnected. With no electrical load in the circuit (wires removed or disconnected), the alternator can build up high voltages which can be extremely dangerous to anyone who might accidentally touch the battery terminal or alternator. Before making tests or checks, make sure all connections in the circuit are tight.
5. Do not short across or ground any terminals of the alternator. Grounding or shorting any alternator terminals can cause serious electrical malfunctions that may damage components of the electrical system.
6. Do not attempt to polarize the alternator. This is not necessary since the voltage developed within the alternator is of both polarities and the diode rectifier automatically controls the direction of current flow. It is important that the battery ground and the alternator ground be of the same polarity for diode protection.
7. If welding on tractor is required disconnect battery, alternator and starter cables. Keep ground of welder close to welding point.

ALTERNATOR BELT

Check belt tension every 50 hours of operation. To tighten belt, first remove engine side panels. Loosen bottom pivot bolt and top anchor bolt. Using a pry bar against the alternator, increase tension on belt. Retighten top anchor bolt then bottom pivot bolt.

If replacing alternator belt, it will be necessary to first remove the air conditioning compressor belt.

STARTER MOTOR

The starter requires no specific maintenance or lubrication. However, every 1000 hours the starter should be checked by your dealer.

BATTERIES

WARNING: Batteries generate explosive gases. Keep sparks, open flames, burning cigarettes, and other ignition sources away from batteries at all times. Wear proper eye protection when working near batteries.

Tractor is equipped with two 12 volt batteries located beneath the step platform. (Figure 45, Item 3)

Batteries are sealed and maintenance free. Top covers can not be removed.

BATTERY INSTALLATION (Figure 44)

IMPORTANT: THIS TRACTOR HAS NEGATIVE GROUND.

Check and replace cables if broken strands or defective insulation is found. Remove corrosion from top of battery, cable clamps and terminals with stiff brush, be careful not to scatter corrosion. Wipe top of battery, cable clamps and terminals with cloth moistened with ammonia or solution of baking soda and water. Coat battery terminals and cable clamps with grease and install batteries. Connect starter cables to positive terminal of batteries and ground cables to remaining negative terminals. DO NOT ALLOW CABLES TO EXERT PULLING FORCE ON BATTERY TERMINALS.

BATTERY REMOVAL (Figure 45)

WARNING: Turn OFF all electrical loads before disconnecting or connecting battery cables to prevent sparks and possible explosion.

To remove batteries open latch (Item 4) at front of battery case and lift off battery case cover. Disconnect the negative ground cables from battery terminals first. Upon reinstalling batteries, connect the ground cables last to negative terminals of batteries. The battery retainer should be in place and tightened snugly to prevent battery from damage caused by vibration.

DANGER: The engine CAN be started with transmission in gear when safety switches are bypassed. Unexpected movement of tractor and connected equipment can cause injury to operator and bystanders.

JUMP STARTING THE BATTERY (Figure 45)

Booster cable terminals (Items 1 and 2) are provided to safely connect a booster battery or auxiliary power as a starting aid.

CAUTION: Start engine ONLY from operator's seat.

CAUTION: WEAR eye protection when charging or jumping battery.

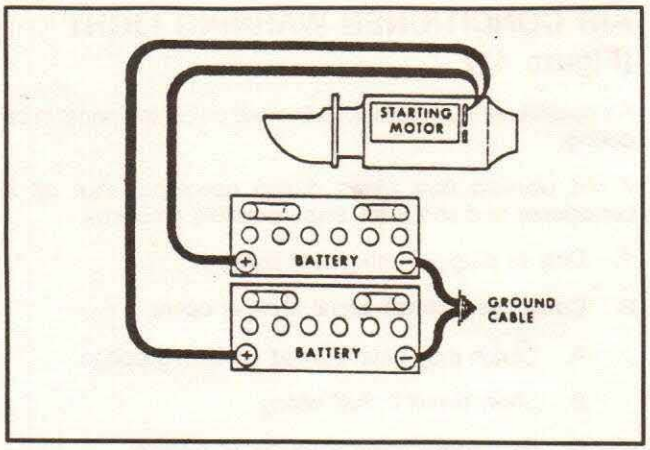


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FIGURE 44 - BATTERY CONNECTIONS

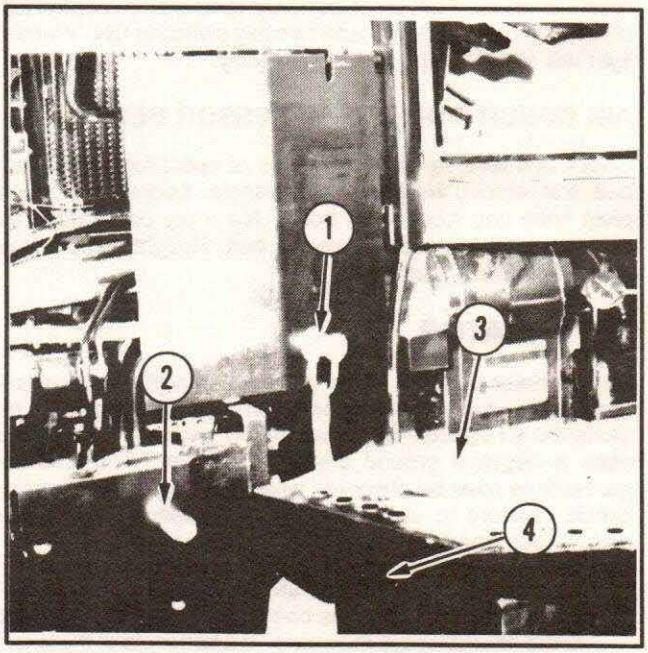

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FIGURE 45 - L.H. SIDE OF TRACTOR

1. **Positive Booster Terminal**
2. **Negative Booster Terminal**
3. **Step Platform**
4. **Latch**

1. Connect one end of booster cable to positive (+) booster terminal (Item 1) and the other to auxiliary battery positive (+) terminal.

2. Connect one end of other booster cable to auxiliary battery negative (–) terminal and the other end to negative (–) booster terminal (Item 2).

3. Start engine from operator's seat using recommended starting procedures.

4. When engine starts turn off all electrical equipment then disconnect booster cables in reverse order to connecting procedure.

DIAGNOSING CHARGING SYSTEM

Voltmeter (located on instrument panel) indicates system voltage and provides immediate check of condition of battery, voltage regulator and alternator. Battery condition can be checked with engine not running by first turning lights on for 1 minute to remove "surface" voltage from battery. Then with lights off, place key switch in either ACC or IGN positions. Pointer should show approximately 12 volts. If pointer fails to move when key switch is in either position, it indicates that battery is discharged or wiring to voltmeter is disconnected. When engine is running and alternator and regulator are working properly, pointer will indicate in upper GREEN area of dial which is approximately 14 volts. If pointer indicates in either RED position when engine is running, it indicates trouble with regulator or alternator.

CIRCUIT BREAKERS (Figures 46 and 47)

If circuit breaker (Item 1) opens because of electrical overload, the circuit breaker will automatically reset itself when overload is removed.

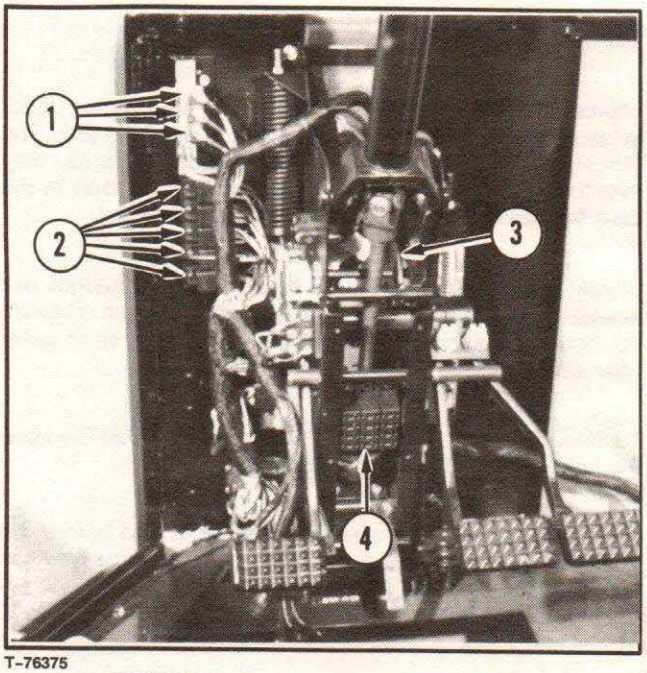
Remove warning light panel in dash to access circuit breakers.

RELAYS (Figures 46 and 47)

Remove warning light panel in dash to access relays (Item 2) No. 1 through 5. Remove instrument gauge panel in dash to access relay No. 6 (Item 3).

FUSES (Figures 46 and 47)

Remove lower pedestal cover to access fuses (Item 4).



T-76375

FIGURE 46 - STEERING PEDESTAL (Panels Removed)

1. **Circuit Breakers**
2. **Relays 1-5**
3. **Relay 6**
4. **Fuses**

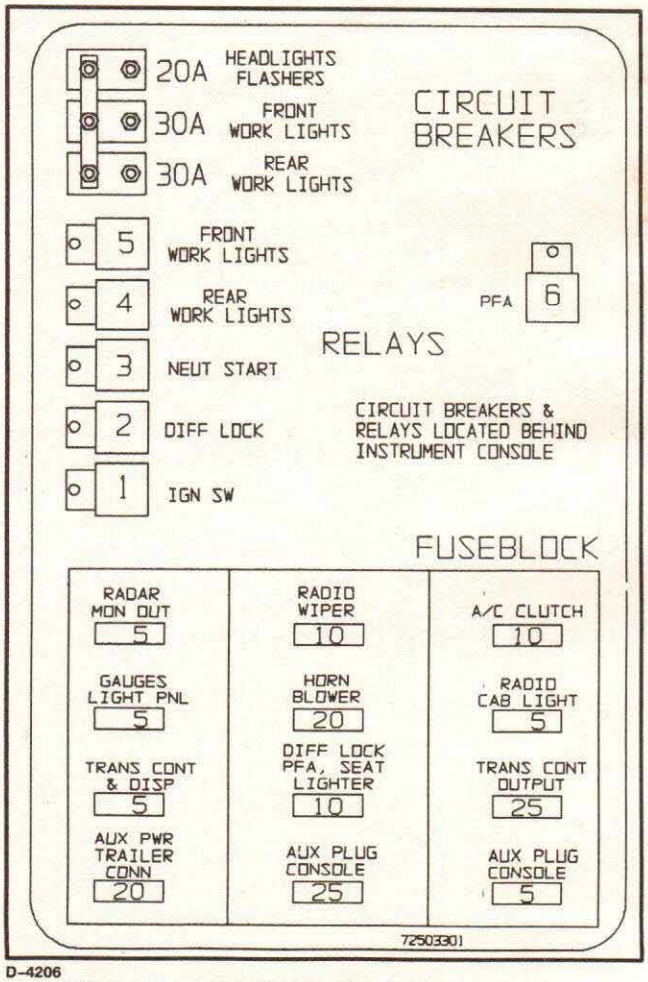


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FIGURE 47 - BREAKER-RELAY-FUSE POSITIONS

TIRE INFLATION

Improper inflation is a large contributor to tire failure. Under inflation will cause damage to the cord body of the tire. The repeated excessive flexing of the sidewall area may eventually cause a series of breaks and separation in the cord fabric. Over inflation should also be avoided.

Check tire pressures every 50 hours. Special gauges are available for checking tires filled with calcium chloride solutions. Be sure to wash out the gauge with clear water after using on tires filled with calcium chloride.

To determine the true operating pressure for a liquid filled tire. the valve should be at the bottom of the tire.

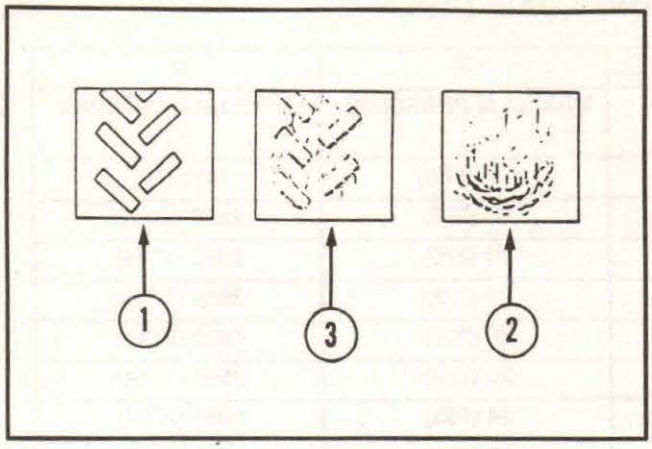
Tires should be tested when they are cold and before the tractor is put into operation, since the pressure in the tire rises somewhat as the tire gets warm. A tire that has enough pressure when it is hot may be under inflated when it cools.

Generally speaking, tire inflation should be high enough in both rear tires to prevent them from wrinkling severely or buckling.

The pressure and load table lists the tire manufacturers recommendation for the maximum pressures and corresponding maximum permissible load ratings for the agricultural tractor tires available for this tractor. These load ratings represent the maximum permissible total weight supported by each tire at speeds up to 20 MPH maximum.

TIRE MOUNTING

WARNING: The proper and safe mounting of tractor tires, tube type and tubless, requires special equipment and special procedures. To attempt to mount tires without this equipment can cause tire or rim rupture during inflation resulting in a dangerous explosive force sufficient to cause personal injury or death. For this reason, we recommend the tractor tire mounting be done only by your Tire Dealer or other qualified person equipped and trained to perform this service.



D-4207

FIGURE 48 - TREAD MARKS

1. **Overweight**
2. **Underweight**
3. **Correct weight**

WEIGHTING THE TRACTOR (Figure 48)

Conditions may exist where you will wish to add weight to the tractor to increase drawbar pulling power and decrease excessive wheel slippage. This additional weight can be in the form of calcium chloride solution in the tires, cast iron weight on wheels, and front "suitcase" weight. The amount you need will depend on your ground conditions and jobs you are performing.

If general 115 lbs./PTO HP is considered optimum and total tractor weight should never exceed 140 lbs/PTO HP. If too much weight is used, tread marks will be clear and distinct (Item 1). With too little weight tread marks will be scattered (Item 2) because of excessive slippage. Wheel slippage of 10% to 15% for 2WD or 8% to 12% for PFA tractors provides greatest efficiency.

It is recommended that you do not use more weight than is actually needed to provide reasonable traction. Total weight on each wheel should not exceed the recommended load ratings of the tire manufacture as listed on the tire.

It is also suggested that the added weights be removed for the light draft jobs such as cultivating, planting, etc. Carrying un-needed weight will increase soil compaction, waste fuel and reduce life of tires, bearings, gears, etc.

As weight is added to the rear wheels, the increased draft force tends to take weight off the front wheels.

CAUTION: Make certain that tractor is always equipped with sufficient front end weight to maintain tractor stability and prevent loss of steering control.

The optimum weight ratio for 2WD tractors is 25% of total weight on front axle and 75% on rear axle. Tractors with power front axles (PFA) should carry 40% front and 60% rear.

If power hop/wheel hop is encountered on PFA tractor perform the following steps, trying unit in field after each step.

1. Adjust weight ratio to 40% front and 60% rear.
2. Reduce rear tire inflation pressure by 2 psi, then 4 psi below maximum.
3. Increase front tire inflation pressure 2 psi, then 4 psi above maximum.
4. Set ballast at 35% front/65% rear.
5. Check tire lead lag percentage in this section.
6. Consult your AGCO dealer.

FRONT END LOADER OPERATION

Note the following when using a front end loader.

1. Tractors equipped with PFA should have all front weight removed, including liquid ballast in front tires, when operating with a loader.
2. When using a loader, front wheels should be set at the widest possible tread.

TIRE PRESSURE AND LOAD TABLE

COLUMN	1	2	3	4
TIRE SIZE	PLY (1)	TREAD	MAXIMUM PRESSURE	MFG. LOAD RATING (2)
FRONT			PSI (kPa)	LBS (kg)
11.00–16	6	F2	32 (220)	2520 (1143)
11.00–16	8	F1	40 (276)	2920 (1324)
14L–16.1	6	F2	28 (193)	2840 (1288)
14.9R–28	***	R1	30 (207)	4800 (2177)
14.9–28	6	R1	20 (138)	3560 (1614)
16.9–28	**	R1	24 (165)	5080 (2304)
16.9R–28	6	R1	18 (124)	4050 (1837)
16.9R–28	**	R1	24 (165)	5440 (2467)
18.4R–26	**	R1	24 (165)	5910 (2681)
18.4–26	10	R2	26 (179)	5830 (2644)
REAR				
18.4R–38	*	R1	18 (124)	6000 (2721)
18.4–38	8	R1	20 (138)	5980 (2713)
18.4–38	8	R2	20 (138)	5980 (2713)
18.4R–42	*	R1	18 (124)	6400 (2903)
18.4–42	8	R1	20 (138)	6310 (2862)
20.8R–38	*	R1	18 (124)	7150 (3243)
20.8–38	8	R1	18 (124)	6820 (3093)
20.8–38	8	R2	18 (124)	6820 (3093)
20.8R–42	**	R1	24 (165)	9100 (4128)
20.8–42	10	R1	22 (152)	8090 (3670)

(1). Ply ratings (*, **, *** symbols) are ratings according to tire manufacturers.
(2). Maximum calculated load (including additional cast iron weights and tire ballast) determines tire size, ply rating, and inflation pressure.

POWER FRONT AXLE LOAD TABLE

TREAD WIDTH		MAXIMUM LOAD (1) (2)	
INCHES	(MM)	LBS.	Kg.
UNDER 67	1702	7,300	3311
OVER 67	1702	8,500	3855

(1.) Weight includes front wheels.
(2.) Do not exceed tire maximum load capacity.

LIQUID BALLAST IN TRACTOR TIRES

Placing water in tires is an economical means of adding weight to the wheels of a tractor. The addition of calcium chloride is recommended to prevent the water from freezing. This solution, when added in the tire inner tube, will not damage the inner tube or tire if used in proper proportions. Use of this method of weighting the tires has the full approval of the tire manufacturers.

See your AGCO dealer for information on filling your tires.

The following tables provide data on the filling of front and rear tractor tires with calcium chloride solution, based on valve level or approximately 75% fill.

These tables are based on the use of Type 1 (77%) commercial calcium chloride flake. If Type 2 (94%) calcium chloride flake is used, reduce the "Lbs. (kg) CaCl2" weights in these tables by 25%.

Plain water freezes solid 32° F (0° C). The 3-1/2 lbs. (1.6 kg) calcium chloride solution is slush free to -12° F (-24° C) and will freeze solid at -52° F (-47° C). the 5 lbs. (2.3 kg) calcium chloride solution is slush free to -52° F (-47° C) and will freeze solid at -62° F (-52° C).

If more weight is needed for difficult traction conditions, wheel weights may be added.

If the valve core is to be removed for any reason it will be necessary to jack up tractor and turn the wheel until the valve stem is on top, otherwise the solution will be lost.

CAUTION: Calcium chloride and water solution as used in tractor tires is not dangerous, but because it may attack clothing or cause skin irritations on some persons, especially if it comes in contact with open cuts or sores, we urge everyone to avoid coming in direct contact with it.

CAUTION: A remedy after having contacted this solution, is to simply wash the skin with plenty of clean water.

LIQUID BALLAST TABLE

	WATER ONLY				3-1/2 Pounds $CaCl_2$/Gal. 0.42 kg $CaCl_2$/Liter						5 Pounds $CaCl_2$/Gal. 0.60 kg $CaCl_2$/Liter					
Tire Size	Gal.	Lbs.	Litre	Kg	Gal. Water	Lbs. $CaCl_2$	Total Wt. lbs.	Litre	Kg $CaCl_2$	Total Wt. Kg	Gal. Water	Lbs. $CaCl_2$	Total Wt. Lbs.	Litre	Kg $CaCl_2$	Total Wt. Kg.
10.0 x 16	17	142	64	64	14.5	51	172	55	23	78	13.8	69	184	52	31	83
11.0 x 16	23	192	87	87	20	70	237	76	32	108	18.6	93	248	70	42	112
14L x 16.1	27	225	102	102	24	84	284	91	38	129	22	110	293	83	50	133
14.9 x 28	53	442	201	200	46	161	545	174	73	247	43	215	574	163	98	260
14.9 x 30	57	475	216	215	48	168	568	182	76	258	46	230	614	174	104	279
16.9 x 28	69	575	261	261	59	207	699	223	94	317	56	280	747	212	127	339
16.9 x 30	73	609	276	276	63	221	746	238	100	338	59	295	787	223	134	357
16.9 x 38	90	751	341	340	77	270	912	291	122	414	73	365	974	276	166	442
18.4 x 26	79	659	299	299	68	238	805	257	108	365	64	320	854	242	145	387
18.4 x 38	110	917	416	416	94	329	1113	356	149	505	89	445	1187	337	202	538
18.4 x 42	120	1001	454	454	103	361	1220	390	164	554	97	485	1294	367	220	587
20.8 x 38	140	1168	530	530	120	420	1420	454	190	644	114	570	1521	432	259	690
20.8 x 42	153	1276	579	579	131	459	1552	496	208	704	124	620	1654	469	281	750

POWER FRONT AXLE/REAR AXLE RATIO

It is important that ground speed of front tires match speed of rear tires when PFA is engaged. Excessive tire wear, wheel hop, reduced economy, and loss of usable horsepower will result if tire combinations are mis-matched, tires are worn unequally or if tire inflation pressure is incorrect.

When replacing tires, consult your AGCO dealer for proper size tires which will best match loaded radius of worn tires remaining on tractor. If tire size is changed both front and rear tires will have to be changed to maintain the correct ratio.

Static loaded radius is the distance measured from center of axle to ground level (hard surface) with tire at maximum pressure and under maximum rated load. Correct tire inflation is important so that recommended loaded radius for front and rear tires will be maintained thereby avoiding excessive lead or lag in ground speed between front and rear tires.

Tire lead/lag percentage is the amount that the front tires are turning (either faster or slower) than the rear tires. If the tire lead/lag formula equals 100% it means that the front tires are turning exactly the same speed as the rear tires and the lead/lag equals 0.0%.

Use the formula below to calculate tire lead/lag %.

$$\text{Tire Lead/Lag \%} = \frac{\text{Front Tire Loaded Radius}}{\text{Rear Tire Loaded Radius}} \times 1.303 \times 100$$

Example: 25.5/32.6 x 1.303 x 100 = 101.92
(Front tires are turning 1.9% faster than rear tires).

For optimum performance front tires should turn the same speed or no more than 3.0% faster than rear tires. For acceptable performance front tires can turn from 1.0% slower to 5.0% faster than rear tires.

ADJUSTING REAR WHEELS (Figure 49 and 50)

Adjust wheel tread width by sliding wheel on axle, reversing wheel on axle, reversing single ramp rim or moving double ramp rim to other ramp. If tire has directional tread design, move to opposite side of tractor for correct tread direction when wheels or rims are reversed.

To change wheel position on axle, raise wheel so there is no weight on tire. Loosen two center bolts (Item 1) about 3 turns. Remove remaining pusher bolts (Item 2) in each hub half and install them in tapped holes (Item 3) using criss-cross tightening pattern until wheel is loose on hub. Move hub and wheel to desired position on axle. Reverse procedure to secure wheel to axle.

NOTE: When single wheel is used, wheel tread must not exceed 96" (2.44 mm) when pulling heavy loads that generate high weight transfer.

NOTE: DO NOT USE A BAR TO PRY HUB OUT OF WHEEL CENTER AS DAMAGE MAY RESULT.

REAR WHEEL TREAD VARIATION (Figure 50)

WARNING: Narrow wheel tread reduced tractor stability, REDUCE SPEED when turning and use caution when operating on side slopes.

NOTE: Dimensions are given on tractors equipped with long axles. Wheel treads on tractors with short axles will vary accordingly.

TIRE SIZES

16.9-38, 16.9R-38

No. on Illust.	Rim Type	Tread Adjustment* Inches (mm)
1	Double Ramp Rim	60-93 (1524-2362)
2	Double Ramp Rim	65-102 (1651-2591)

TIRE SIZES

18.4-38, 18-4R-38, 18.4-42, and 18.4R-42

No. on Illust.	Rim Type	Tread Adjustment* Inches (mm)
1	Double Ramp Rim	62-94 (1575-2388)
2	Double Ramp Rim	65-102 (1651-2591)
3	Dual Dbl.Ramp Rims:	
	Inner	62-76 (1575-1930)
	Outer	112-126 (2845-3200)
4	Dual Wheels w/:	
	Double Ramp Inner	
	(38")	62-77 (1575-1956)
	(42")	62-76 (1575-1930)
	Pressed Steel Outer	
	(38")	110-125 (2794-3175)
	(42")	110-124 (2794-3150)

TIRE SIZES

20.8-38, 20.8R-38, 20.8-42, and 20.8R-42

No. on Illust.	Rim Type	Tread Adjustment* Inches (mm)
1	Dbl. Ramp Rim	64-94 (1626-2388)
2	Dbl. Ramp Rim	65-102 (1651-2591)
3	Dual Dbl. Ramp Rims:	
	Inner	64-74 (1626-1880)
	Outer	116-126 (2946-3200)
4	Dual Wheels w/:	
	Dbl. Ramp Inner	
	(38")	64-70 (1626-1778)
	(42")	64-72 (1626-1829)
	Pressed Steel Outer	
	(38")	116-122 (2946-3099)
	(42")	116-124 (2946-3150)

*Maximum tread adjustment for illustrations #1 and #2 must be reduced by 19" (483 mm) for tractors with 96" (2438 mm) axles.

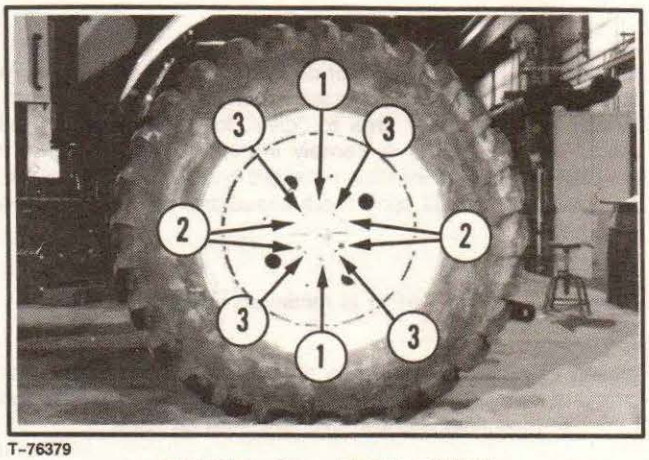


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FIGURE 49 - REAR WHEEL

1. **Center Bolts**
2. **Pusher Bolts**
3. **Tapped Holes**

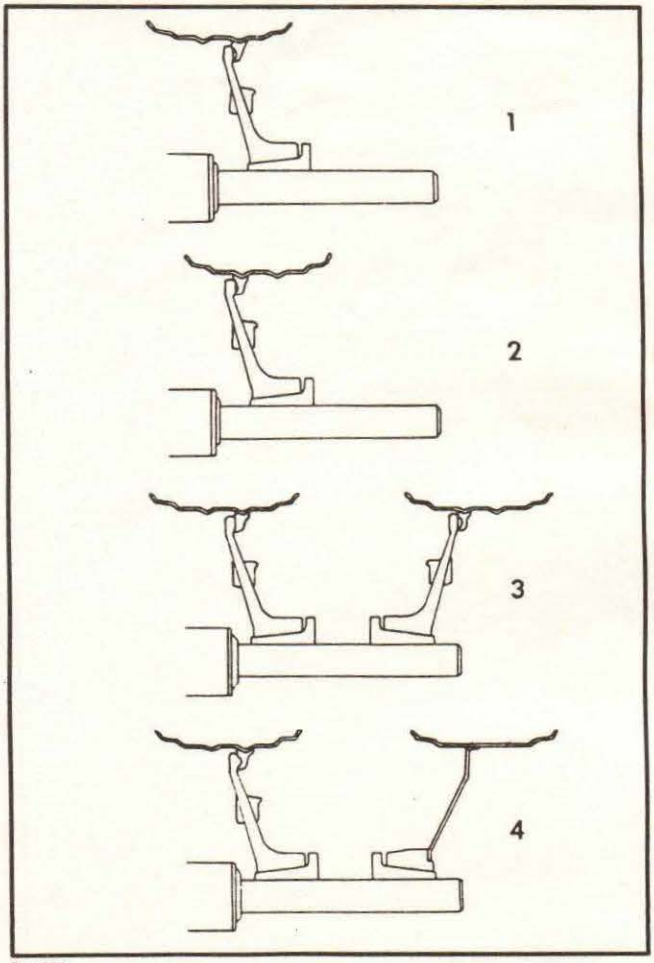

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FIGURE 50 - TREAD VARIATION

DUAL WHEELS
(FIgure 51 and 52)

NOTE: AGCO does not recommend dueling front wheels on power front axle tractors.

NOTE: To avoid tire damage, minimum clearance between dual wheels should be approximately 5" (127 mm) (Item 1).

If same size tires are used for dual wheels, inflation pressure in outer tires must be reduced when operating on uneven terrain to allow outer tires to "give" for rocks and ground irregularities. This is extremely important because if both tires have the same inflation pressure and the outside tire hits an obstruction, it will carry the full load and cause excessive axle loading.

NOTE: 12 psi (82.7 kPa) is minimum inflation pressure.

Mixing of radial ply and bias tires is not recommended for single or dual applications except radial ply tires may be used as inner dual tires if outer tires are bias ply tires.

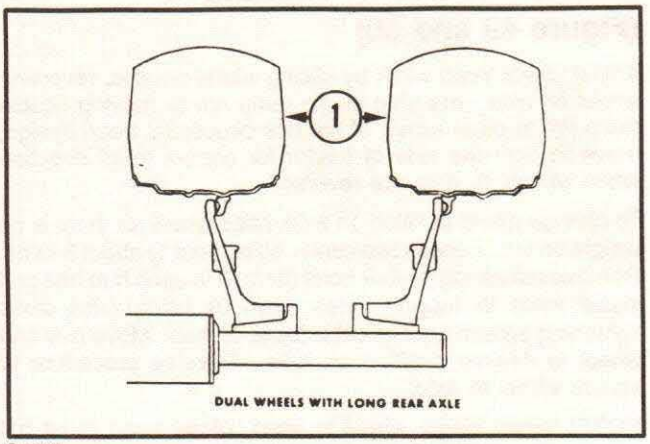

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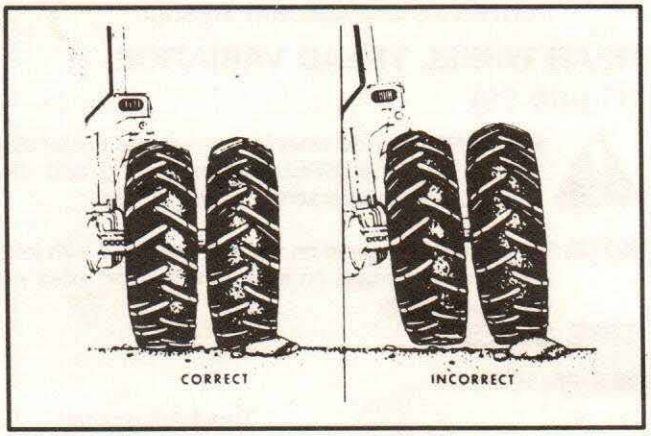
FIGURE 51 - DUAL MOUNTING

1. 5" (127 mm)



D-4210

FIGURE 52 - DUAL INFLATION

ADJUSTING FRONT WHEELS (PFA VERSION)

The front wheel discs can be mounted on the hub with the dish facing in for narrow treads or with the dish facing out for wide tread widths.

The rim lugs can be mounted on either the inside or the outside of the discs. In addition, the rim lugs are offset to one side of the rim making it possible to install the wheel with the center of tire inside of the lugs or outside of the lugs.

To reverse relationship of tire center line and rim lug the tire and rim is moved from one wheel to the other without turning it around. NOTE: The tire tread must always point the same way and tire must rotate in direction of arrow in tire when tractor is moving forward; therefore, one rim must have the tire mounted with the rim lug on the L.H. side of the tire when standing behind it, and the other rim must have tire mounted with the rim lug on the R.H. side.

NOTE: If front wheel tread is changed, the oscillation stops and turn stops should be adjusted. See oscillating and turning stops later in this section.

POWER FRONT AXLE TREAD WIDTHS

Illustration	Wheel Disc	18.4R-26 1.75 Offset Wheel	14.9R-28 4.13 Offset Wheel	16.9R-28 Tire 1.75 Offset Wheel	16.9R-30 Tire 2.16 Offset Wheel
		Inches/(mm)	Inches/(mm)	Inches/(mm)	Inches/(mm)
A	Turned In	64.5 (1638)	59.7 (1516)	62.6 (1590)	63.7 (1618)
B	Turned In	68.9 (1750)	64.0 (1626)	67.0 (1702)	69.1 (1755)
C	Turned Out	71.5 (1816)	76.3 (1938)	69.6 (1768)	72.3 (1836)
D	Turned Out	75.9 (1928)	80.6 (2047)	74.0 (1880)	76.8 (1951)
E	Turned In	75.2 (1910)	70.5 (1790)	77.2 (1960)	74.4 (1890)
F	Turned In	79.7 (2024)	74.8 (1900)	81.6 (2073)	78.8 (2002)
G	Turned Out	82.2 (2088)	87.0 (2210)	84.2 (2139)	83.0 (2108)
H	Turned Out	86.6 (2200)	91.3 (2319)	88.6 (2250)	87.5 (2222)

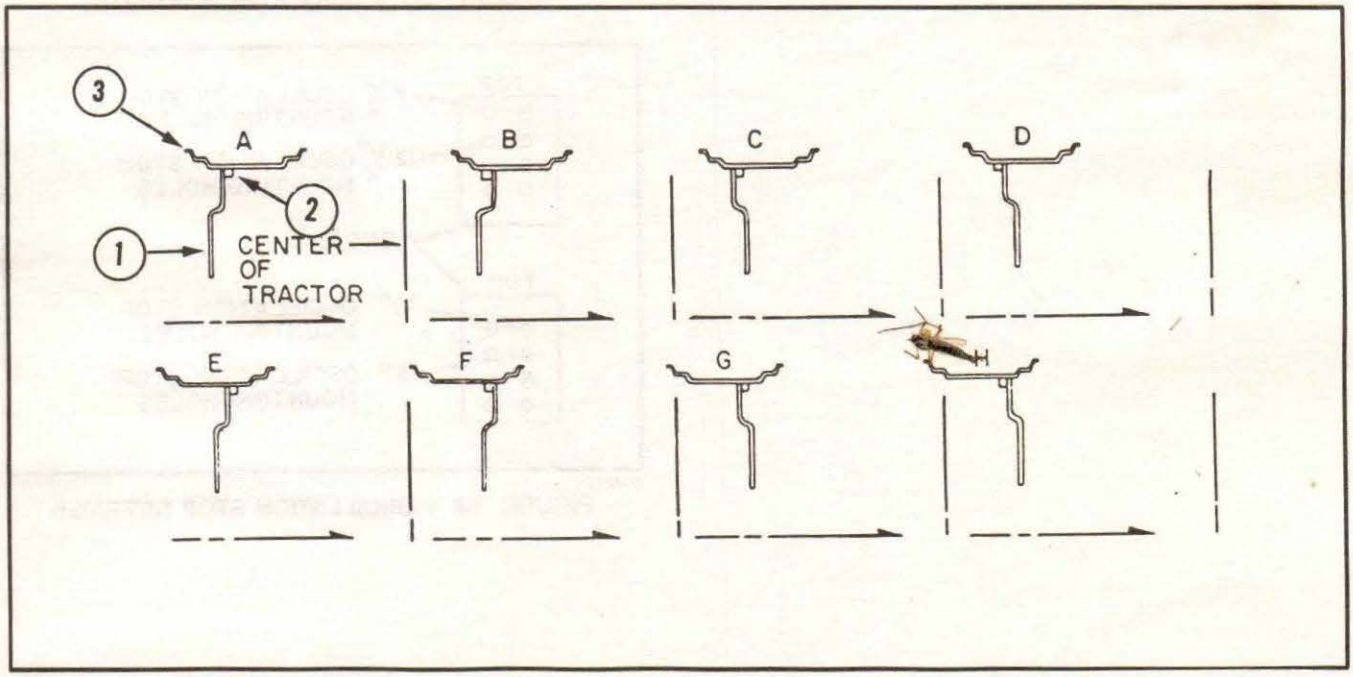


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FIGURE 53 - POWER FRONT AXLE WHEEL TREAD ILLUSTRATIONS

1. Wheel Disc **2. Rim Lug** **3. Wheel Rim**

ADJUSTING PFA OSCILLATING AND TURNING STOPS (Figure 54, 55 and 56)

After tread width had been established, oscillating (Item 1) and turning (Item 2) stops should be adjusted to prevent tire interference with tractor frame during full turn and maximum oscillation. Suggested stop settings shown may be used as a guide. Before tractor is used, axle should be oscillated to stops and wheels turned to stops to check for tire interference.

Depending on tire size and wheel tread setting, maximum turn angle is controlled by adjusting turn stop spacer. Turn stop angle of 30^0 and 50^0 are available with 1-7/8" (48 mm) wide stops. Turn stop angles of 40^0 and 50^0 are available with 1-1/8" (28 mm) wide stops. Remove bolt (Item 3) and turn stop around to achieve alternate setting for each stop. Make sure both left and right hand stops are set the same. Figure 55 and chart show recommended selections. (Second set of stops are provided in tractor tool box).

Oscillation stops (Item 1) are adjusted to five different angles. Maximum axle oscillation is controlled through proper selection of stop mounting holes and inverting stop on tractor. Figure 56 and chart shows recommended stop positions for different tire sizes and wheel tread settings.

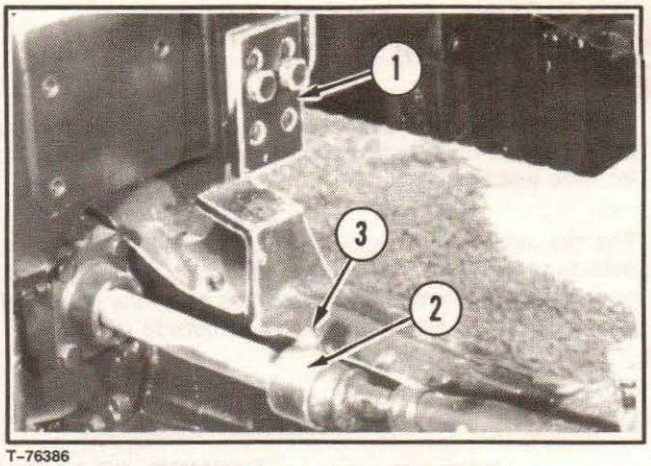

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FIGURE 54 - PFA R.H. SIDE

1. Oscillation Stop
2. Turning Stop
3. Bolt

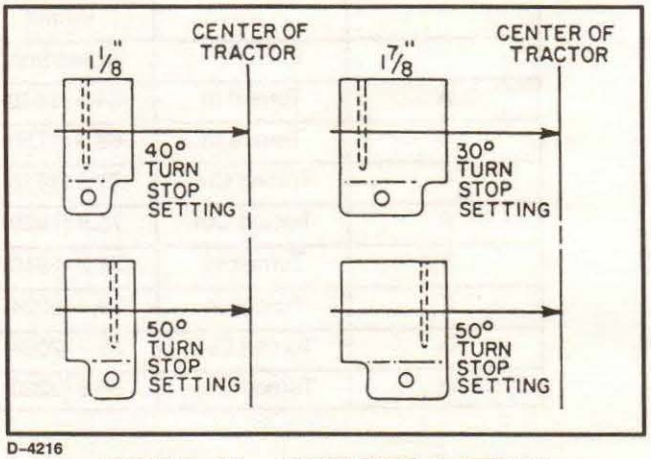

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FIGURE 55 - TURN STOP SETTINGS

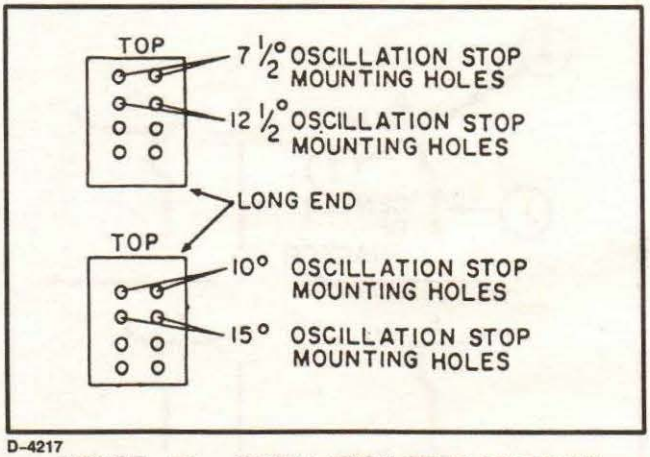

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FIGURE 56 - OSCILLATION STOP SETTINGS

SUGGESTED STOP SETTINGS (W/O FENDERS)

(Refer to Figures 55 and 56)

TIRE	WHEEL TREAD In./(mm)	TURN STOP ANGLE	OSCILLATION STOP POSITION
18.4R-26	64.5 (1638)	Not Recommended	Not Recommended
	68.9 (1750)	30°	7-1/2°
	71.5 (1816)	40°	7-1/2°
	75.2 (1910)	40°	10°
	75.9 (1928)	40°	12-1/2°
	79.7 (2024)	50°	15°
	82.2 (2088)	50°	15°
	86.6 (2200)	50°	15°
14.9R-28	59.7 (1516)	Not Recommended	Not Recommended
	64.0 (1626)	30°	7-1/2°
	70.5 (1790)	40°	10°
	74.8 (1900)	50°	12-1/2°
	76.3 (1938)	50°	15°
	80.6 (2047)	50°	15°
	87.0 (2210)	50°	15°
	91.3 (2319)	50°	15°
16.9R-28	62.6 (1590)	Not Recommended	Not Recommended
	67.0 (1702)	30°	7-1/2°
	69.6 (1768)	40°	7-1/2°
	74.0 (1880)	40°	12-1/2°
	77.2 (1960)	50°	15°
	81.6 (2073)	50°	15°
	84.2 (2139)	50°	15°
	88.6 (2250)	50°	15°
16.9R-30	63.7 (1618)	30°	7-1/2°
	69.1 (1572)	40°	7-1/2°
	72.1 (1831)	50°	10°
	74.4 (1890)	50°	12-1/2°
	76.8 (1951)	50°	15°
	78.8 (2001)	50°	15°
	83.0 (2108)	50°	15°
	87.5 (2222)	50°	15°

FRONT WHEEL TOE-IN (PFA VERSION) (Figure 57)

Inflate tires to recommended pressure. Turn wheels to straight ahead position. Measure distance between tires at front and rear of tires at hub height. Rotate wheels 1/2 turn and repeat measurements. Determine averages of front and rear readings separately. Average distance at front of tires should be 0 to 1/8 inch (0 to 3 mm) closer together than at rear.

If adjustment is necessary loosen tie rod clamp (Item 1) and turn tie rod (Item 2) in or out. Make equal adjustments on each tie rod. Tighten tie rod clamps and recheck toe-in.

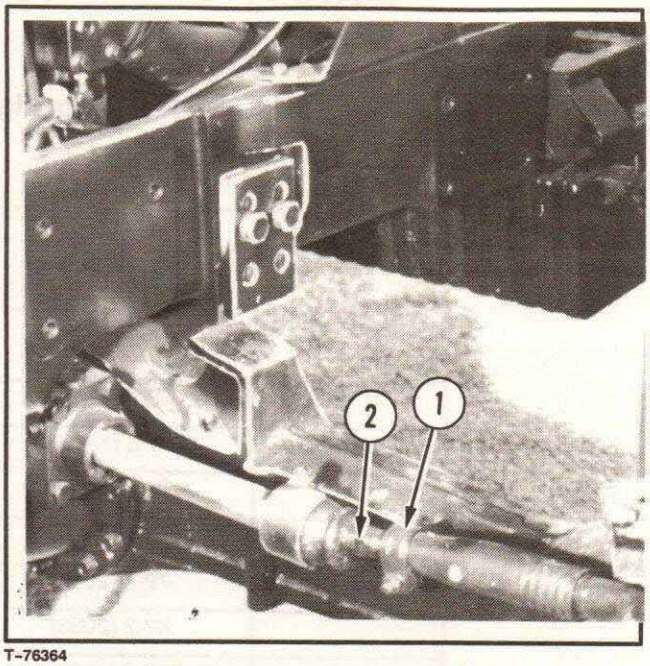

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FIGURE 57 - PFA R.H. REAR

1. **Tie Rod Clamp**
2. **Turn Tie Rod Here**

ADJUSTING FRONT AXLE (2WD VERSION) (FIgure 58)

Front wheel tread width on tractor with 11.00-16 tires may be adjusted from 62 to 86 in. (1575-2184 mm). This is 2 in. (51 mm) on each wheel or a total of 4 in. (102 mm) when both wheels are readjusted 2 in. (51 mm) at same time to increase or decrease wheel tread width.

To change front wheel tread width, raise axle to remove tractor weight and loosen front clamps (Item 1) on axle. Remove cap screw (Item 2) from outer tie rod clamp. Slide extension axle to desired location and re-install clamps on axle and tie rod. Tighten axle clamp nuts to 200 ft.-lbs. (226 Nm).

Readjust toe-in each time tread width is changed.

FRONT WHEEL TOE-IN (2WD VERSION) (Figure 59)

Inflate tires to recommended pressure. Turn wheels to straight ahead position. Measure distance between outside edges of a common tire rib at rear (A) and front (B) of tires at hub height. Rotate wheels s1/2 turn and repeat measurements. Determine averages of front and rear readings separately. The average distance at front of tires should be 3/16 in. (4.8 mm) less than at rear. If adjustment is necessary, loosen locknuts (Item 2) and remove outer clamp bolts (Item 1). Rotate tie rods as required. Make equal adjustments on each rod. Tighten locknuts and install and tighten clamp bolts. Recheck toe-in.

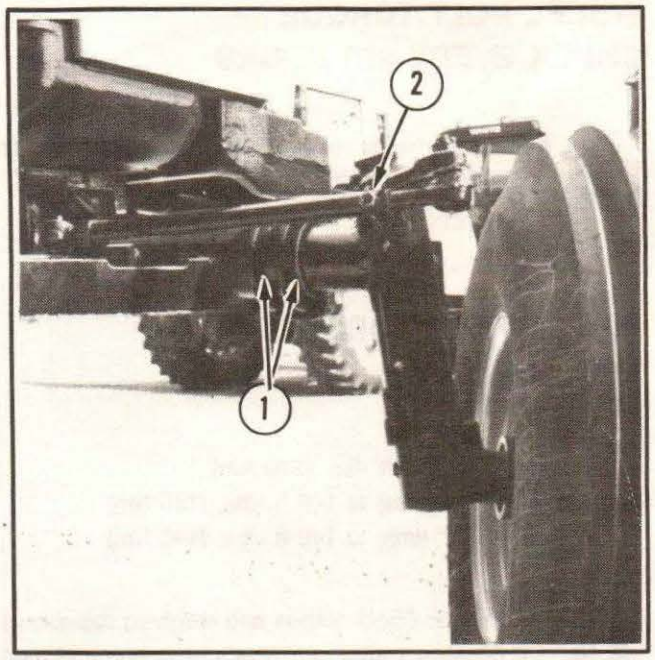

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FIGURE 58 - 2WD AXLE R.H. REAR

1. Axle Clamps
2. Capscrew

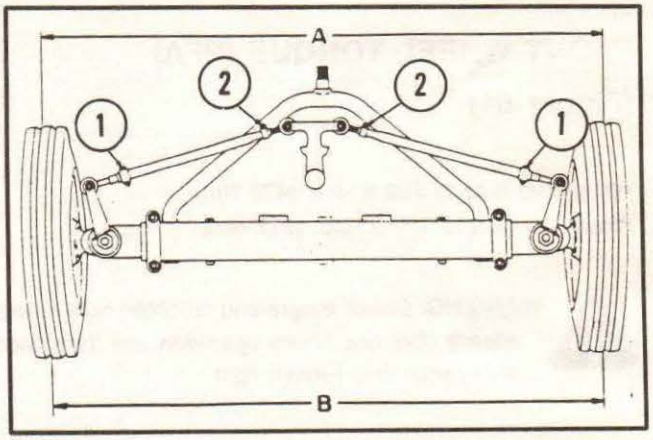

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FIGURE 59 - 2WD AXLE

1. Clamp Bolts
2. Locknuts
A. Rear Center Line
B. Front Center Line

WHEEL BOLT TORQUE
CHECK EVERY 250 HOURS

CAUTION: Never operate a tractor with loose wheel, rim or hub bolts.

REAR WHEEL TORQUE
(Figure 60)

Inner hub bolts to 200 ft.-lbs. (270 Nm)
Rim lock bolts (38" rims) to 100 ft.-lbs. (136 Nm)
Rim lock bolts (42" rims) to 140 ft.-lbs. (190 Nm)

WARNING: Check torque and retighten capscrews if necessary after one hour's operation and then once a day until they remain tight.

FRONT WHEEL TORQUE (PFA)
(Figure 61)

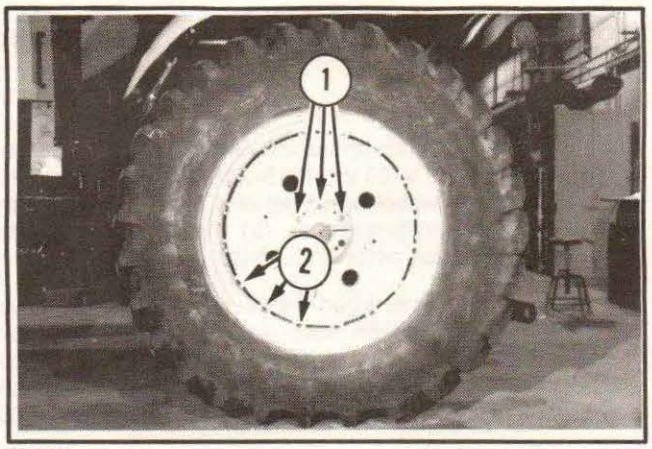
Wheel hub nuts to 350 ft.-lbs. (475 Nm)
Wheel rim nuts to 160 ft.-lbs. (217 Nm)

WARNING: Check torque and retighten nuts if necessary after one hour's operation and then once a day until they remain tight.

FRONT WHEEL TORQUE (2WD)
(Figure 62)

Wheel to axle hub (Item 1) 115 ft.-lbs. (156 Nm).

WARNING: Check torque and retighten capscrews if necessary after one hour's operation and then once a day until they remain tight.



T-76379

FIGURE 60 - REAR WHEEL

1. Wheel Hub Bolts 2. Wheel Rim Bolts

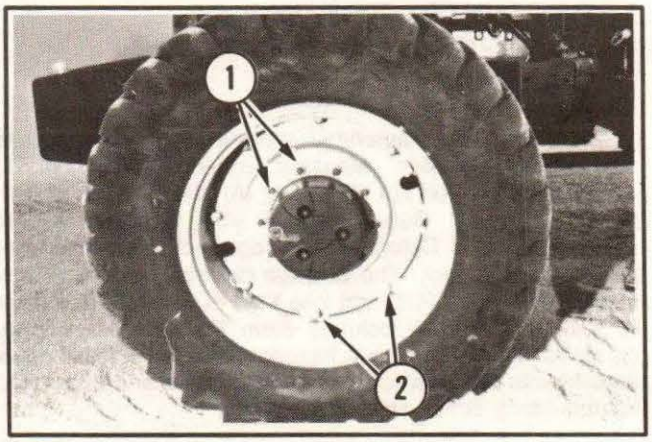


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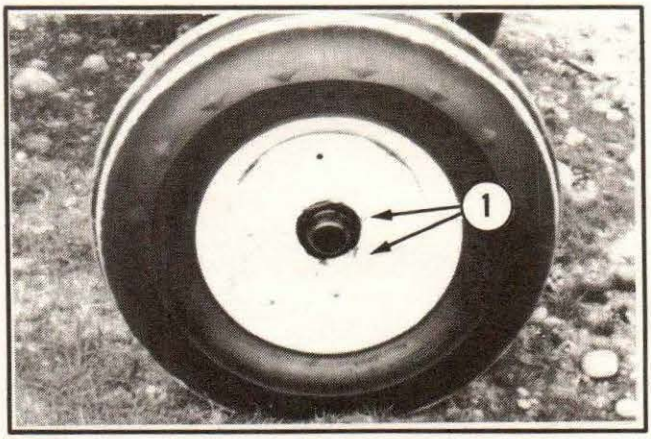
FIGURE 61 - FRONT WHEEL

1. Wheel Hub Nuts 2. Wheel Rim Nuts



T-75507

FIGURE 62 - FRONT WHEEL

1. Wheel Hub Bolts

CHANGING PTO SHAFTS (Figure 63)

The tractor may be equipped with either a 6 splined or a 21 splined shaft. The 6 splined shaft is used with implements which rotate at 540 rpm. The 21 spline shaft is used with implements which rotate at 1000 rpm.

NOTE: The 1000 rpm shaft must be used when operating heavy PTO loads, where horsepower requirements are above 60 PTO horsepower (45 kW).

WARNING: DO NOT connect, disconnect or adjust PTO with engine running.

Use following procedure to change PTO shafts. When changing shaft assemblies, keep entire assembly clean.

From 540 rpm to 1000 rpm

1. Remove four capscrews (Item 1) securing shaft (Item 2) and safety shield (Item 3) to tractor.
2. Remove safety shield and pull 540 rpm shaft from tractor and install 1000 rpm shaft. (1000 rpm shaft is shipped in tool box).
3. Reinstall safety shield with capscrews securing shaft in tractor.

From 1000 rpm to 540 rpm

1. Remove four capscrews securing shaft and safety shield to tractor.
2. Remove safety shield and pull 1000 rpm shaft from tractor and install 540 rpm shaft. (540 rpm shaft is shipped in tool box)
3. Re-install safety shield with capscrews, securing shaft in tractor.

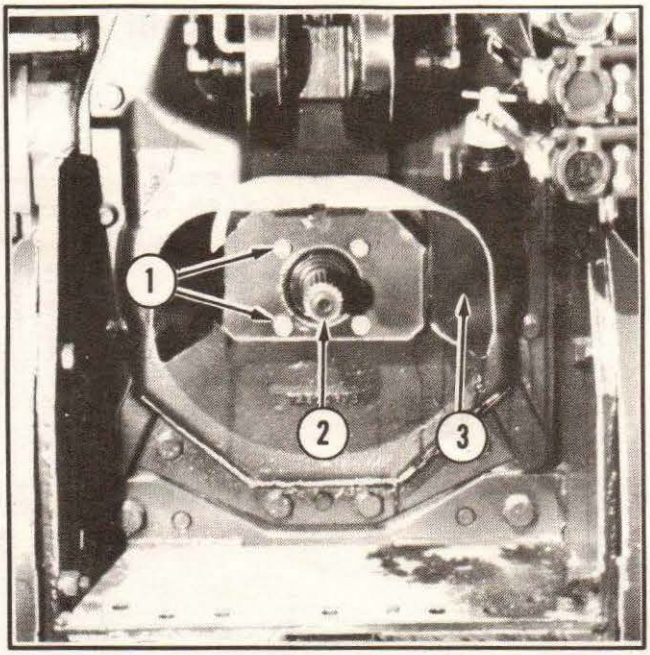


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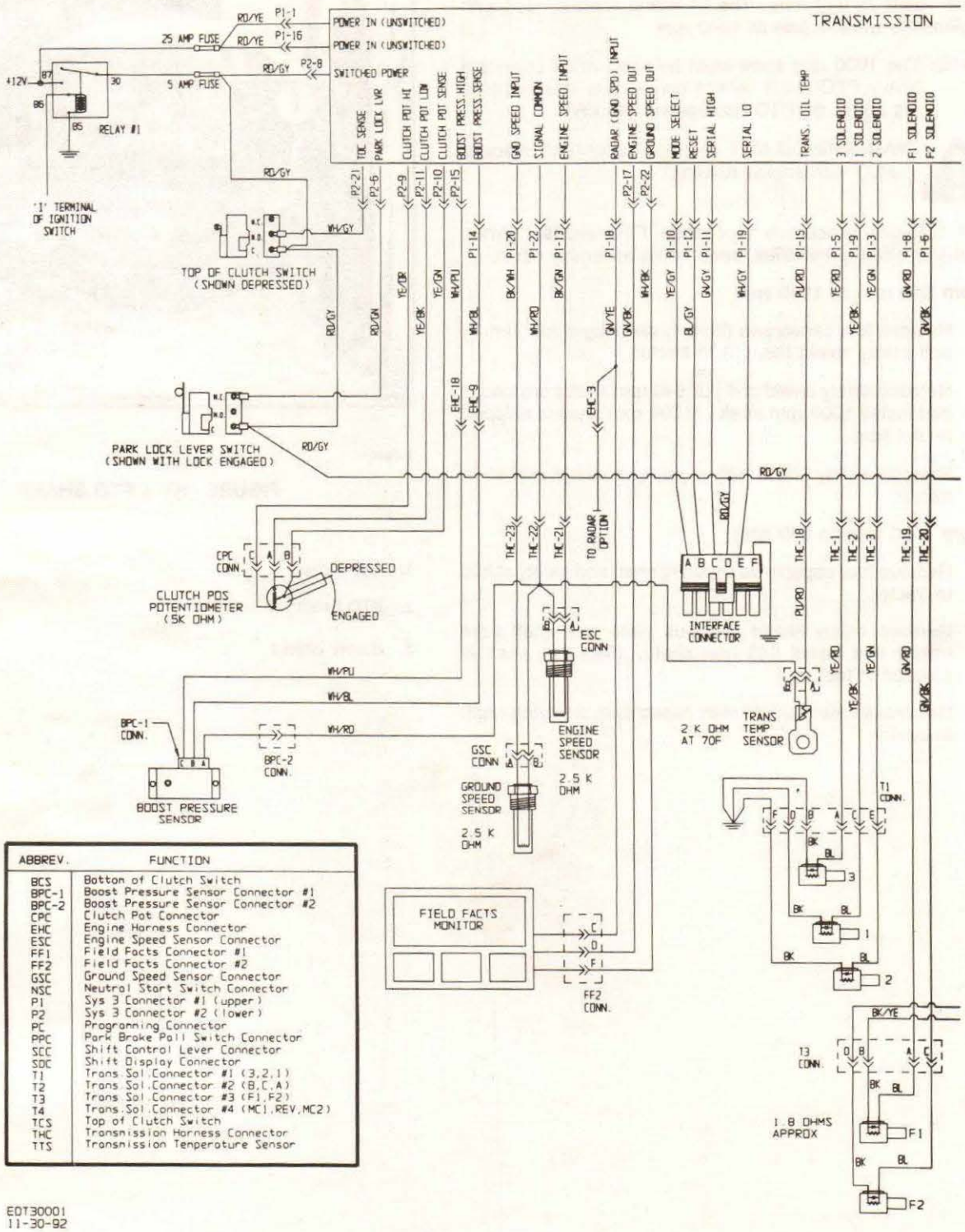
FIGURE 63 - PTO SHAFT

1. **Capscrew**
2. **PTO Shaft**
3. **Safety Shield**

POWERSHIFT TRANSMISSION CIRCUIT



ABBREV.	FUNCTION
BCS	Bottom of Clutch Switch
BPC-1	Boost Pressure Sensor Connector #1
BPC-2	Boost Pressure Sensor Connector #2
CPC	Clutch Pot Connector
EHC	Engine Harness Connector
ESC	Engine Speed Sensor Connector
FF1	Field Facts Connector #1
FF2	Field Facts Connector #2
GSC	Ground Speed Sensor Connector
NSC	Neutral Start Switch Connector
P1	Sys 3 Connector #1 (upper)
P2	Sys 3 Connector #2 (lower)
PC	Programming Connector
PPC	Park Brake Pall Switch Connector
SCC	Shift Control Lever Connector
SDC	Shift Display Connector
T1	Trans.Sol.Connector #1 (3,2,1)
T2	Trans.Sol.Connector #2 (B,C,A)
T3	Trans.Sol.Connector #3 (F1,F2)
T4	Trans.Sol.Connector #4 (MC1,REV,MC2)
TCS	Top of Clutch Switch
THC	Transmission Harness Connector
TTS	Transmission Temperature Sensor

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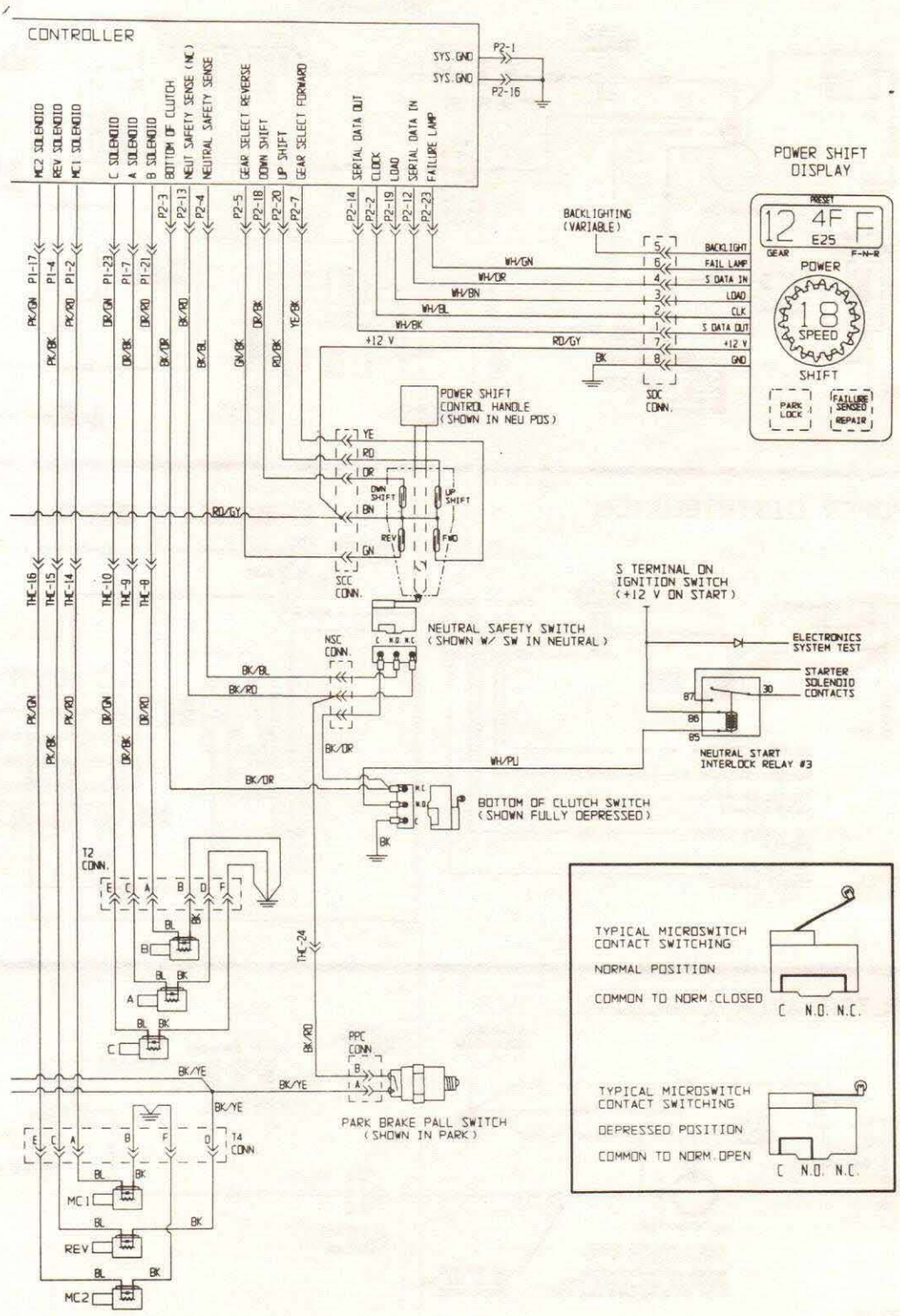
CONTROLLER
SYS.GND
SYS.GND
P2-1
P2-16
MC2 SOLENOID
REV SOLENOID
MC1 SOLENOID
C SOLENOID
A SOLENOID
B SOLENOID
BOTTOM OF CLUTCH
NEUT SAFETY SENSE (NC)
NEUTRAL SAFETY SENSE
GEAR SELECT REVERSE
DOWN SHIFT
UP SHIFT
GEAR SELECT FORWARD
SERIAL DATA OUT
CLOCK
LOAD
SERIAL DATA IN
FAILURE LAMP
POWER SHIFT DISPLAY
BACKLIGHTING (VARIABLE)
BACKLIGHT
FAIL LAMP
S DATA IN
LOAD
CLK
S DATA OUT
+12 V
GND
SDC CONN.
POWER SHIFT CONTROL HANDLE (SHOWN IN NEU POS)
SCC CONN.
S TERMINAL ON IGNITION SWITCH (+12 V ON START)
ELECTRONICS SYSTEM TEST
STARTER SOLENOID CONTACTS
NEUTRAL START INTERLOCK RELAY #3
NEUTRAL SAFETY SWITCH (SHOWN W/ SW IN NEUTRAL)
NSC CONN.
BOTTOM OF CLUTCH SWITCH (SHOWN FULLY DEPRESSED)
T2 CONN.
T4 CONN.
PPC CONN.
PARK BRAKE PALL SWITCH (SHOWN IN PARK)
TYPICAL MICROSWITCH CONTACT SWITCHING
NORMAL POSITION
COMMON TO NORM.CLOSED
C N.O. N.C.
TYPICAL MICROSWITCH CONTACT SWITCHING
DEPRESSED POSITION
COMMON TO NORM.OPEN
C N.O. N.C.

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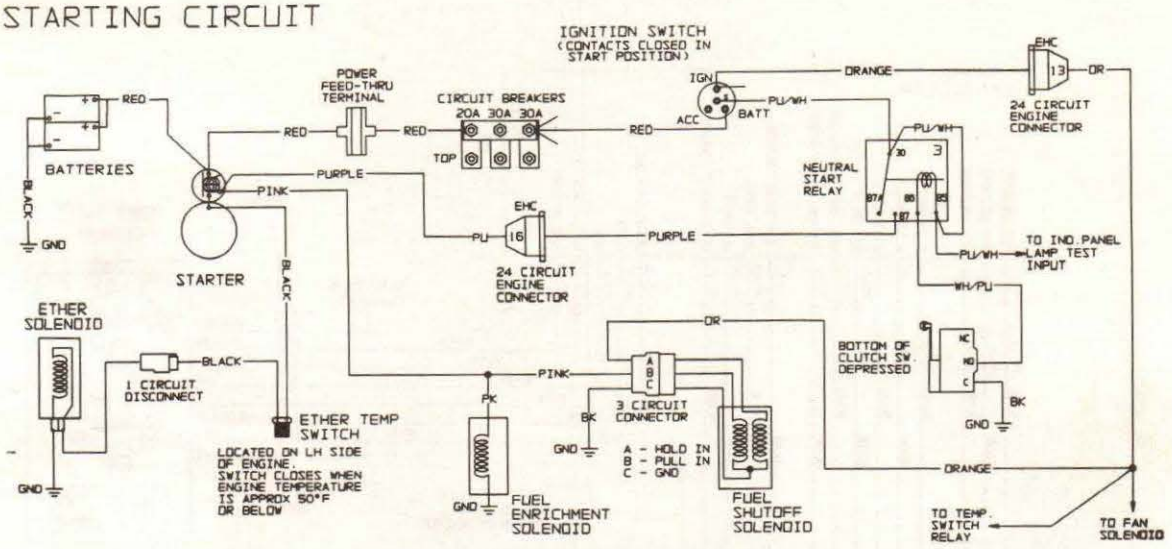
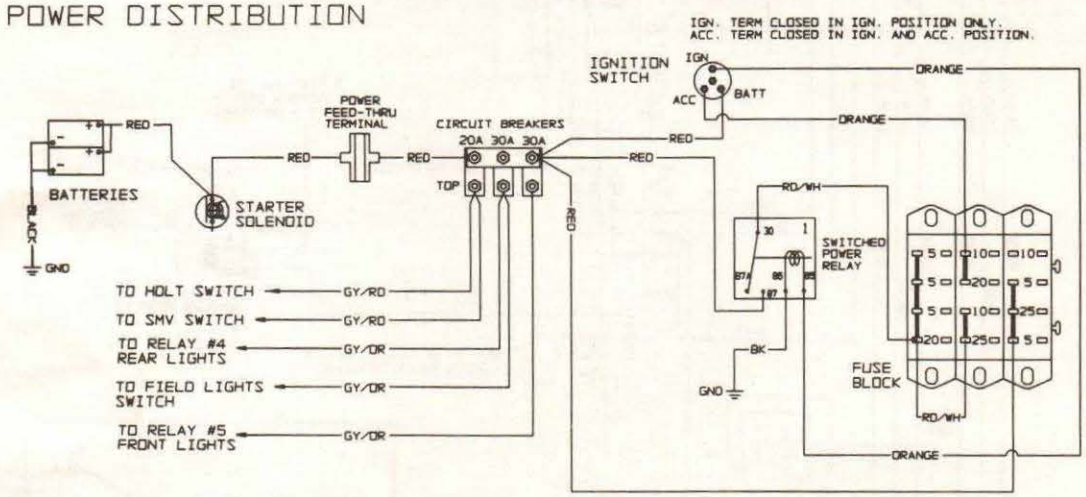
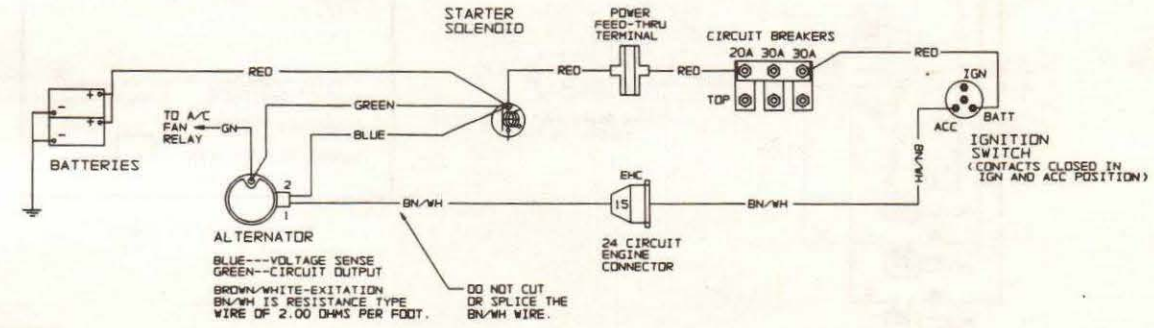
STARTING CIRCUIT



POWER DISTRIBUTION



ALTERNATOR CIRCUIT



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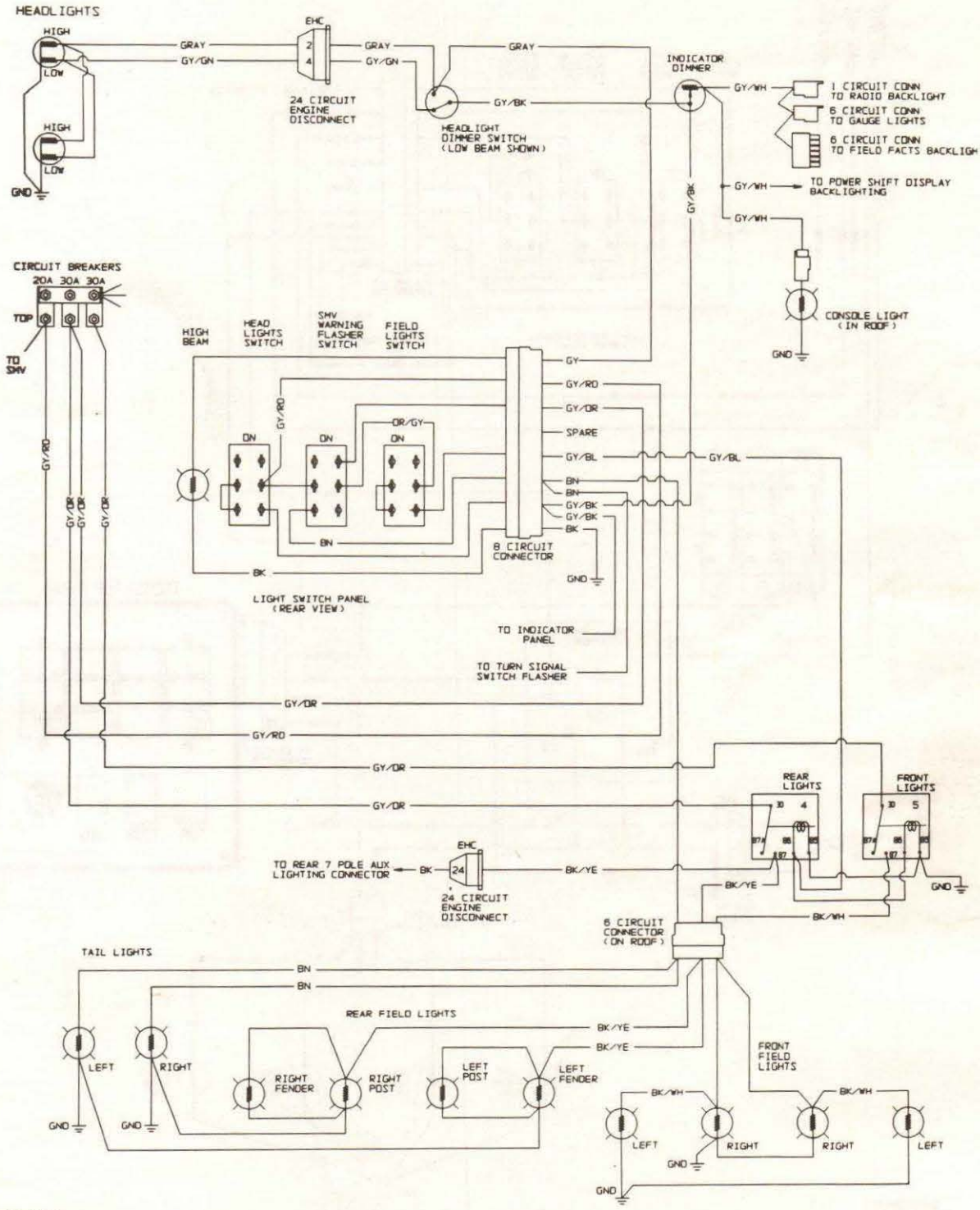
LIGHTING CIRCUITS
HEADLIGHTS, TAILLIGHTS, AND FIELD LIGHTS



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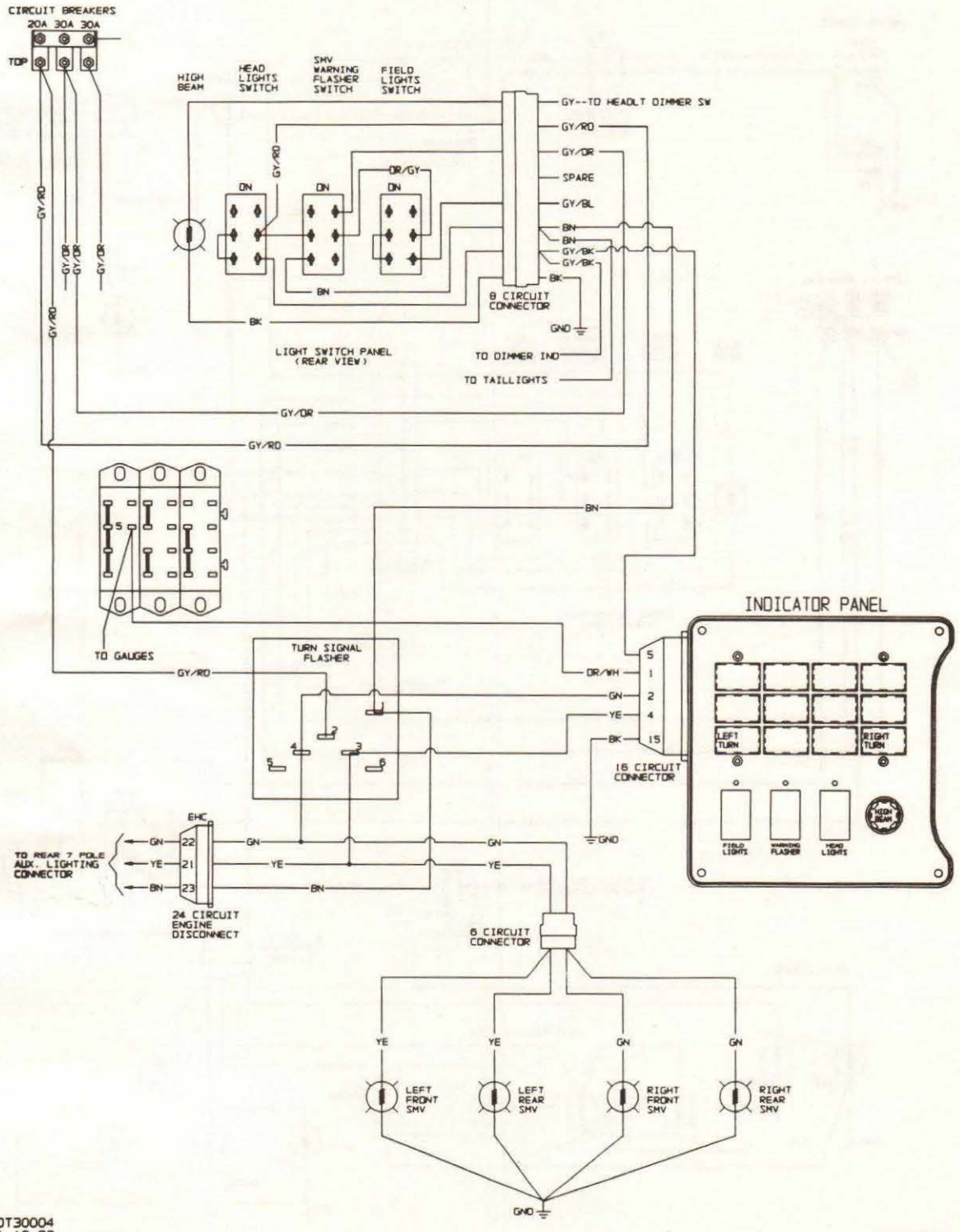
SMV WARNING LIGHTS AND TURN SIGNALS



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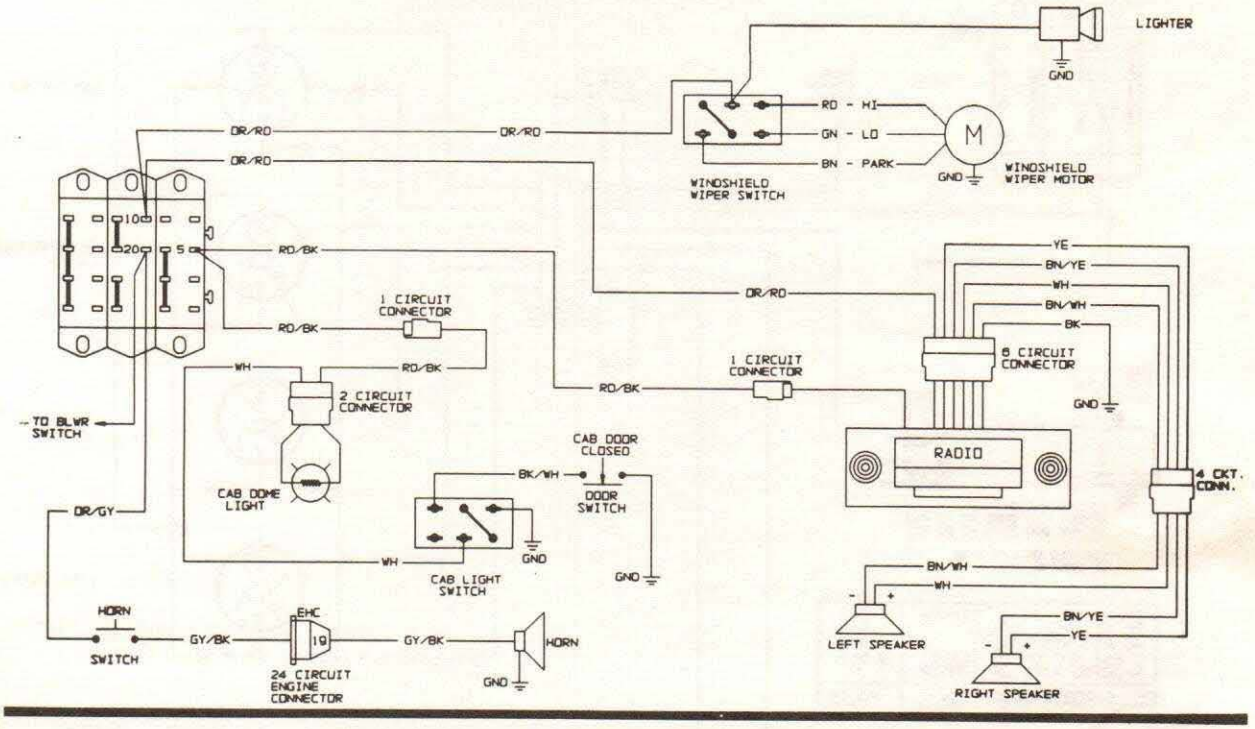
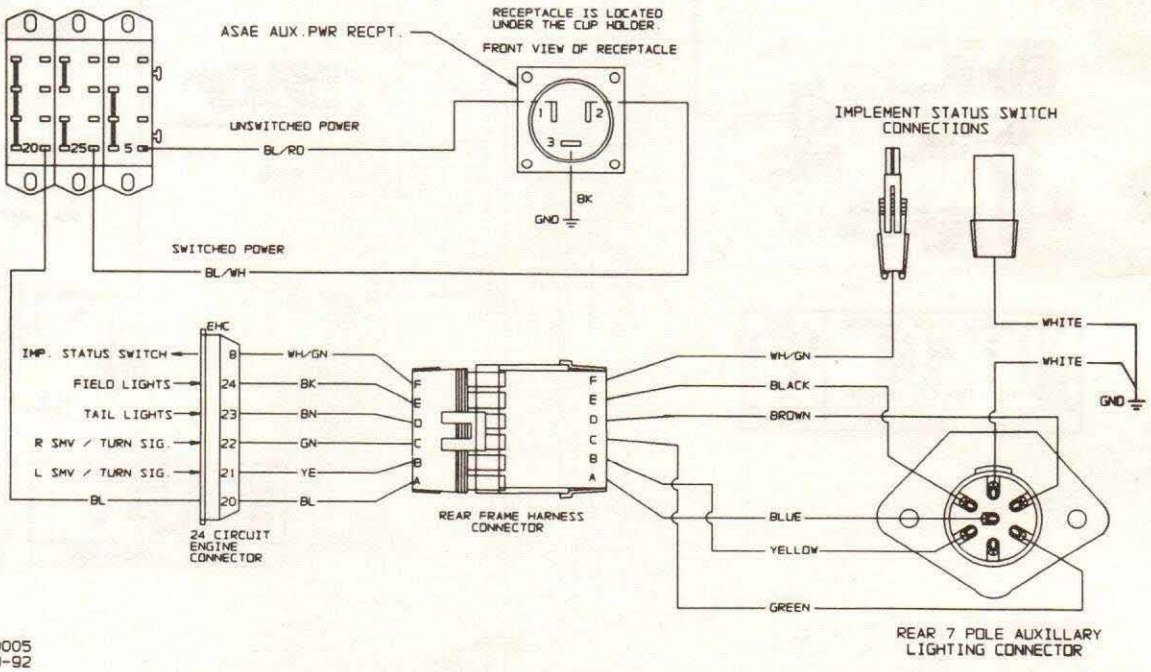
11-18-92

WINDSHIELD WIPER, CAB DOME LIGHT, HORN, LIGHTER, AND RADIO CIRCUITS



ASAE AUXILLARY POWER RECEPTACLE CIRCUIT
REAR 7 POLE AUX. LIGHTING CONNECTOR
IMPLEMENT STATUS SWITCH CONNECTOR



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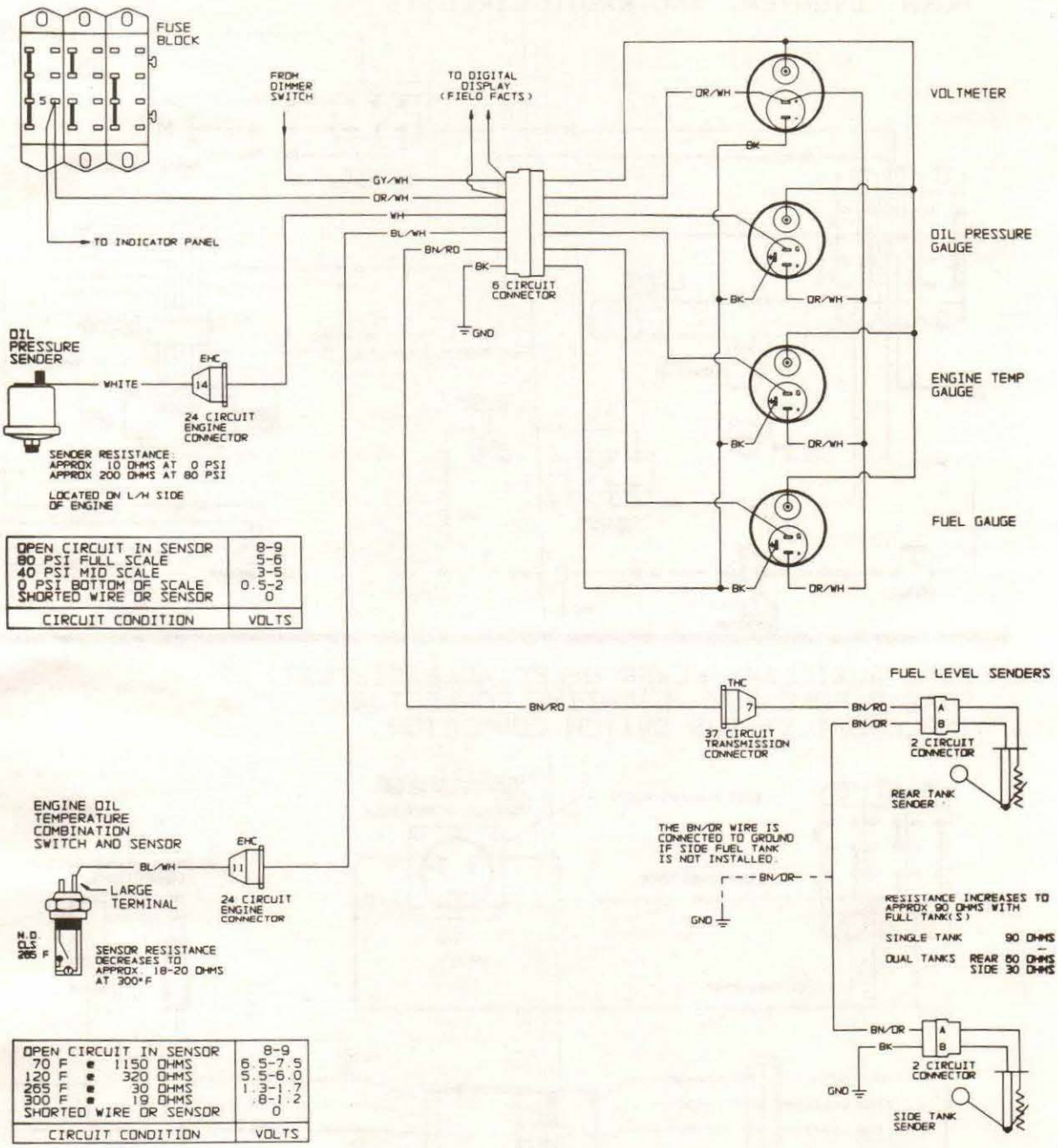
GAUGE CIRCUITS



OPEN CIRCUIT IN SENSOR	8-9
80 PSI FULL SCALE	5-6
40 PSI MID SCALE	3-5
0 PSI BOTTOM OF SCALE	0.5-2
SHORTED WIRE OR SENSOR	0
CIRCUIT CONDITION	VOLTS

OPEN CIRCUIT IN SENSOR	8-9
70 F = 1150 OHMS	6.5-7.5
120 F = 320 OHMS	5.5-6.0
265 F = 30 OHMS	1.3-1.7
300 F = 19 OHMS	.8-1.2
SHORTED WIRE OR SENSOR	0
CIRCUIT CONDITION	VOLTS

OPEN CIRCUIT IN SENSOR	8-9
FULL FUEL TANK	4-6
HALF FUEL TANK	3-4
EMPTY FUEL TANK OR SHORTED WIRE	0
CIRCUIT CONDITION	VOLTS

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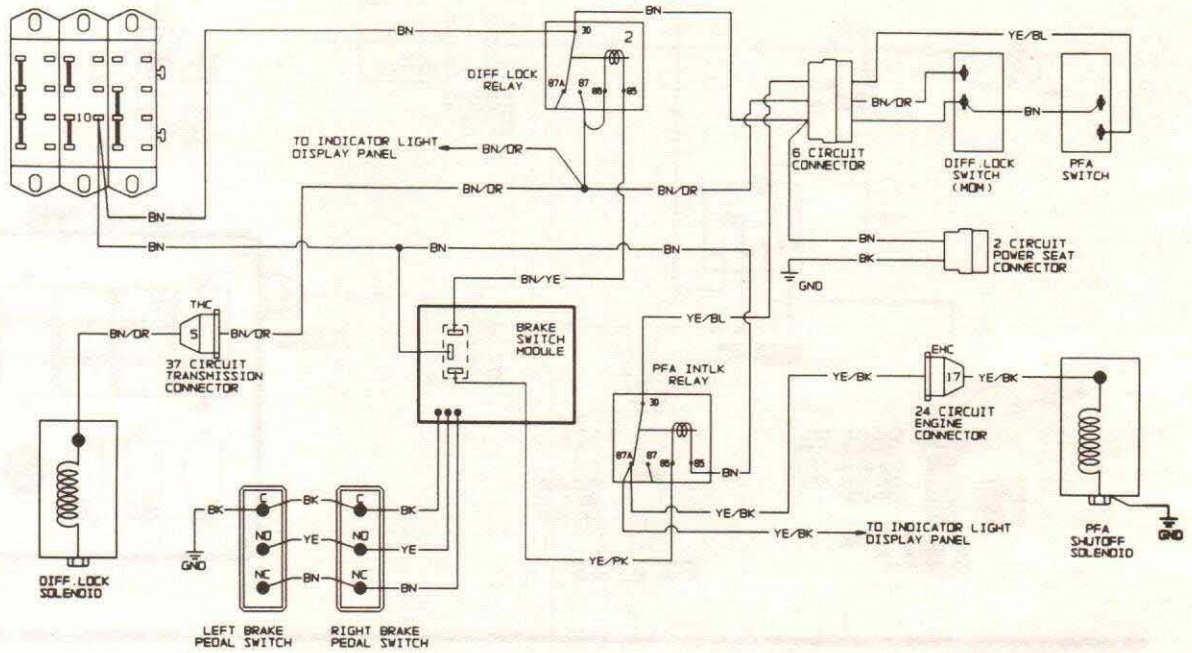
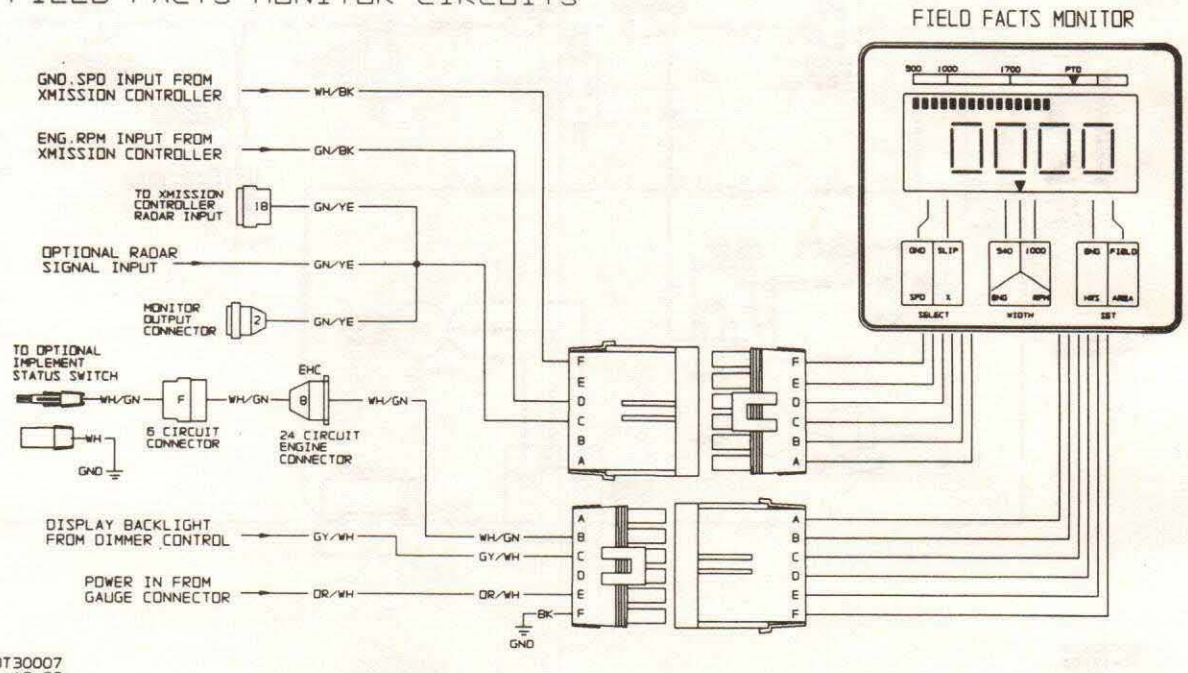
PFA, DIFF.LOCK, AND POWER SEAT CIRCUIT



FIELD FACTS MONITOR CIRCUITS



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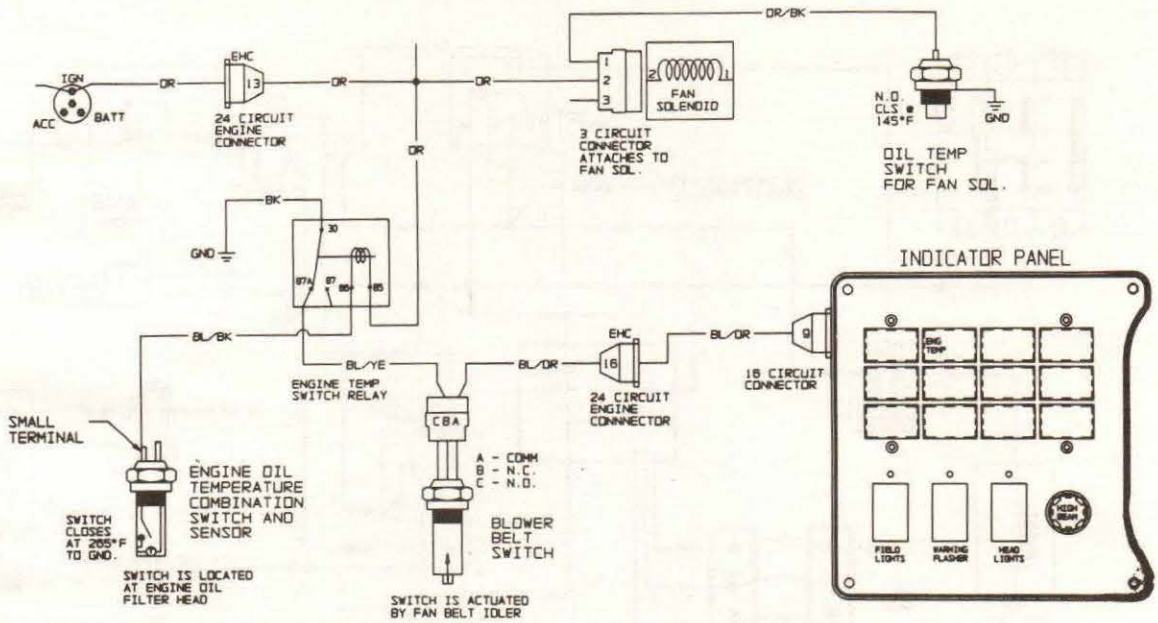
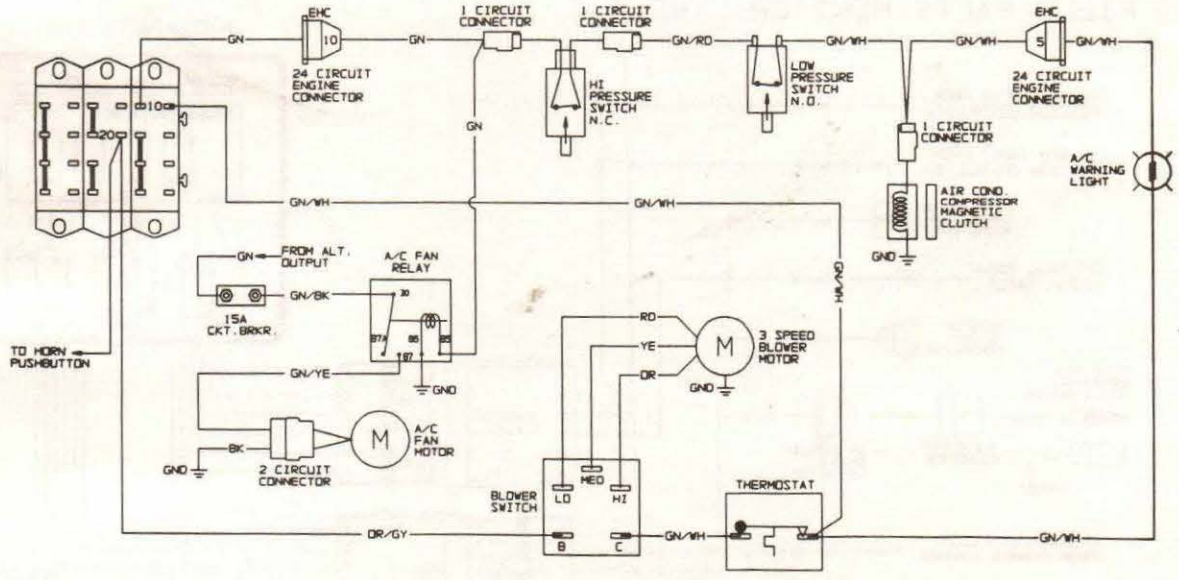
ENGINE TEMPERATURE WARNING CIRCUITS



AIR CONDITIONING CIRCUIT



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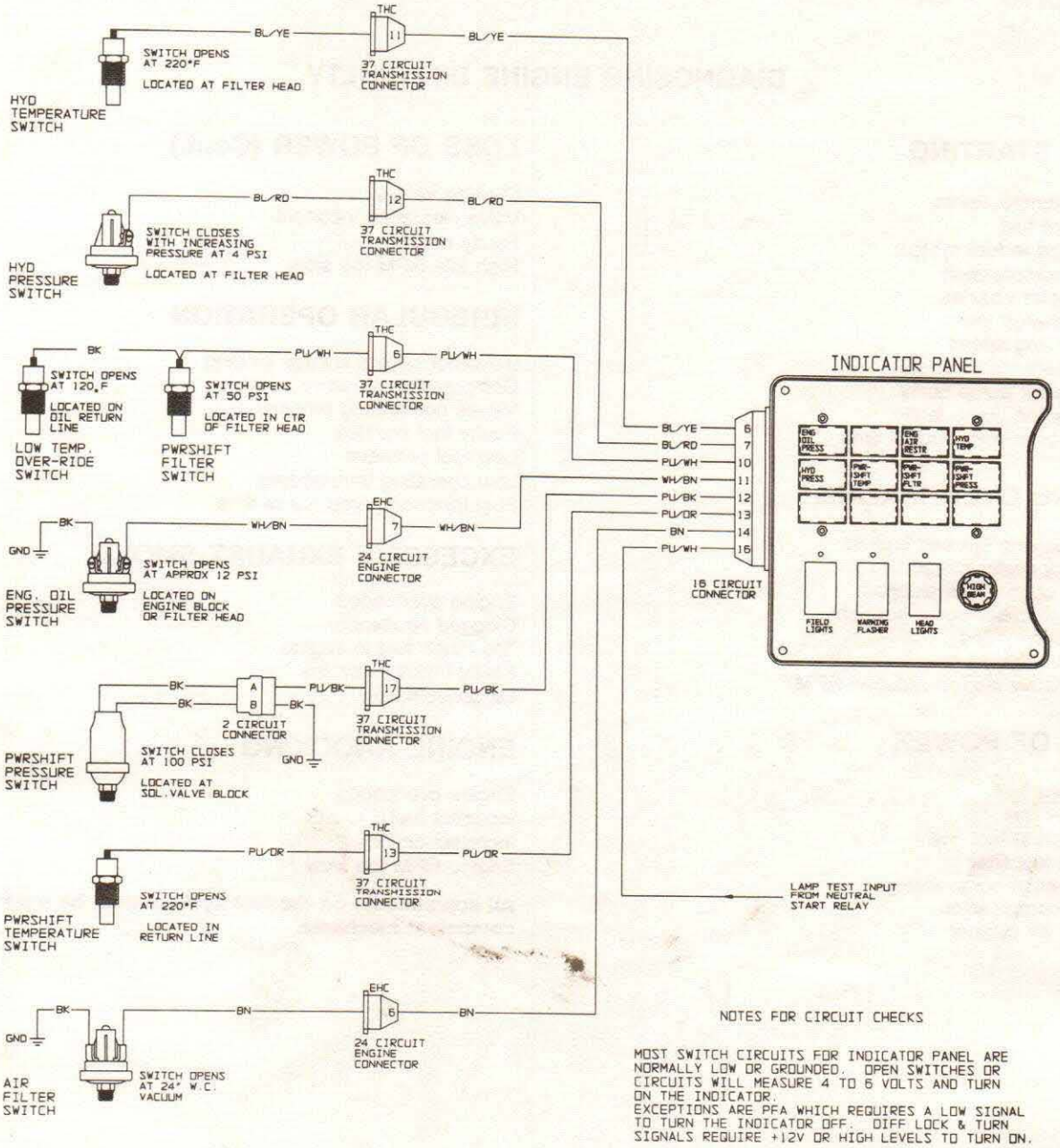
WARNING CIRCUITS



NOTES FOR CIRCUIT CHECKS

MOST SWITCH CIRCUITS FOR INDICATOR PANEL ARE NORMALLY LOW OR GROUNDED. OPEN SWITCHES OR CIRCUITS WILL MEASURE 4 TO 6 VOLTS AND TURN ON THE INDICATOR.
EXCEPTIONS ARE PFA WHICH REQUIRES A LOW SIGNAL TO TURN THE INDICATOR OFF. DIFF LOCK & TURN SIGNALS REQUIRE +12V OR HIGH LEVELS TO TURN ON.

2WD TRACTORS WILL NOT INCLUDE PFA BULB

COLOR CODE FOR WIRING DIAGRAMS

BK	BLACK
BN	BROWN
BL	BLUE
GN	GREEN
OR	ORANGE
RD	RED
PK	PINK
PU	PURPLE
GY	GRAY
WH	WHITE
YE	YELLOW
BK/WH	BLACK WITH WHITE TRACER

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11-19-92

SERVICE TIPS

The following suggestions are listed for your assistance. You can make simple adjustments on your tractor that will improve its operation and save you the time and expense of engaging a serviceman.

Always make one adjustment at a time and if the adjustment made does not improve the condition, return to the original setting before proceeding to next adjustment.

DIAGNOSING ENGINE DIFFICULTY

HARD STARTING

Cold air temperatures
Insufficient fuel
Air trapped in fuel system
Loss of compression
Dirty injector nozzles
Battery charge low
Low cranking speed
Valve clearance incorrect
Fuel transfer pump faulty
Fuel injection pump faulty
Fuel injection pump out of time

ENGINE OVERHEATING

Engine cooling fan belt broken
Engine oil cooler pugged
Cylinder cooling fins plugged
Cooling chamber cover not tight
Engine overloaded
Diluted lubricating oil
Pulling heavy load at reduced RPM

LOSS OF POWER

Insufficient fuel
Air in fuel line
Restriction in fuel line
Clogged fuel filter
Late injection pump timing
Loss of compression
Clogged air cleaner

LOSS OF POWER (Cont.)

Sticking valves
Valve clearance incorrect
Faulty nozzles
High idle RPM too slow

IRREGULAR OPERATION

Governor control linkage binding
Compression pressure uneven
Valves not seating properly
Faulty fuel nozzles
Low fuel pressure
Low operating temperature
Fuel injection pump out of time

EXCESSIVE EXHAUST SMOKE

Engine overloaded
Clogged air cleaner
Too much fuel to engine
Faulty injector nozzles
Oil consumption

ENGINE KNOCKING

Engine overloaded
Incorrect fuel
Incorrect timing
Engine RPM too slow

All adjustments on the fuel system must be made by a competent mechanic.

SECTION VI
TROUBLESHOOTING

T-76484

Identified on the following pages are some of the more common problem diagnostic procedures associated with engine and powertrain malfunctions. If problems encountered with hydraulic or powertrain components cannot be corrected by following the lubrication, maintenance and service adjustment guidelines printed in this manual, the fastest cure is a trip to your dealer.

ENGINE TROUBLESHOOTING

Engine Fails to Turn Over

Clutch not disengaged - Clutch must be disengaged to actuate safety start switch.

Batteries dead or weak - Recharge or replace batteries.

Battery cables loose, broken or corroded - Clean and tighten or replace cables.

Starter switch or motor defective - Consult dealer

Engine Turns Over But Fails to Start

Electric solenoid on fuel injection pump failing to open pump.

Fuel tanks empty - Check fuel level before attempting to start engine.

Fuel lines plugged - Remove and clean lines.

Fuel with too high viscosity being used - High viscosity fuel thickens in cold weather. Use lower viscosity fuel.

Fuel with too low cetane rating being used - See Fuel Specifications in Section V.

Air in fuel lines - See Bleeding fuel system discussion in Section V..

Fuel filter clogged - Replace elements.

Cranking speed too slow - Batteries must be in good condition to start engine, especially in cold weather. Starting motor may be defective.

Compression low - Consult dealer.

Engine Starts But Fails to Develop Full Power

Throttle linkage to injection pump not properly adjusted See Injection Pump Section V.

Ground speed too fast - Shift transmission into lower gear to avoid overloading engine.

Vent for fuel tank obstructed - Consult dealer.

Clogged fuel filter - Replace filter.

Improper fuel - See fuel Specifications.

Fuel viscosity too low - Fuel with low viscosity may not pass through system in cold weather.

Air leak in fuel system - See dealer.

Exhaust muffler clogged - Replace.

Improperly timed - Consult dealer.

Air intake clogged - Clean air intake. Check air cleaner.

Air cleaner dirty - See Air Cleaner

Engine running too hot - Consult dealer.

Transmission clutches slipping - Consult dealer.

Engine Overheating

Cooling fan belt broken - Replace belt.

Blocked cooling fins - See Maintenance Section

Exhaust thermostat not allowing engine oil to drive cooling blower. Consult dealer.

Engine oil level low - Add oil.

Engine oil to heavy - Use recommended oil.

Tractor overloaded - Use lower transmission speed.

Brakes dragging - See Brake Adjustment

Improper fuel - See Fuel Specifications.

Exhaust muffler clogged - Replace.

Incorrect timing - Consult dealer.

Excessive Fuel Consumption

Air intake clogged or air cleaner plugged - See Maintenance section.

Fuel lines leaking - Stop leaks.

Incorrect timing - Consult dealer.

Improper fuel being used - See Fuel Specifications.

Engine overloaded - For best fuel economy use engine on rated loads only.

Excessive Oil Consumption

Oil pan drain plug loose - Tighten.

Gasket leaking - Replace.

Improper grade of oil being used - See Section VII

Crankcase oil diluted - See dealer.

Engine temperature too high - Check for overheating.

Oil pressure too high - Consult dealer.

Crankcase breather valve sticking - Consult dealer.

Piston rings not seated or worn - Consult dealer.

Engine Misfires

Injection nozzles dirty or out of adjustment - Consult dealer.

Burned or sticking valves - Consult dealer.

Irregular Engine Speed

Transmission clutches slipping - See Clutch Adjustment.

Governor action slow - Consult dealer.

HYDRAULIC SYSTEM TROUBLESHOOTING

Remote Cylinder Will Not Retract

Self-sealing couplings improperly connected or not matched - Check self-sealing couplings and tighten connections.

Coupling lever in CLOSED position - Move lever to OPEN.

Remote Cylinder Will Not Extend

Self-sealing couplings improperly connected or not matched - Check connections.

Coupling lever in CLOSED position - Moved lever to OPEN position.

Flow control closed on remote valve - See Remote Valve flow control in Section III.

Load on cylinder too heavy - Load must not exceed limit listed in Section VII.

Implement design does not allow complete piston stroke or implement lift restricted - Check cylinder mounting on implement and make sure cylinder is permitted to travel through entire stroke.

Implement lift linkage binding - Clean and lubricate or straighten lift mechanism.

Cylinder leads internally - Consult dealer.

Lift Arms Will Not Raise

Restrictor valve improperly adjusted - Adjust rate of raise and lower as outlined in Section VII.

Load on hitch too heavy - Load must not exceed limit listed in Section VII.

Lift arm control linkage out of adjustment - Adjust linkage as outlined in Section V.

Pump Does Not Develop Sufficient Pressure To Lift Normal Load

Pump faulty - Consult dealer.

Remote Valves Do Not Return To Neutral At End of Cylinder Stroke

Detent adjusting screw on remote valve not properly adjusted or operator not moving control lever far enough for detent to catch. Move lever all the way forward or back. (Linkage adjustment may be required). With remote valve in float position, remote cylinder control lever has manually returned to neutral position. Re-position control lever lockouts if float position is not desired.

Selector valve or spool valve sticking - Move hydraulic control lever into UP and DOWN positions several times to try to eliminate sticking action.

Return actuating mechanism leaks internally - Consult dealer.

Remote Valves Return To Neutral Before Cylinder Reaches End of Stroke

Detent adjusting screw on remote valve not properly adjusted.

Operator not moving control lever far enough for detent to catch - Move lever all the way forward or back. (Linkage adjustment may be required.)

Detent springs broken or holding grooves worn - Consult dealer.

Oil Foams Out Breather

Oil level too high - See Final Drive/Hydraulic Oil Section V.

Oil level too low - See Final Drive/Hydraulic Oil Section V.

Wrong oil in reservoir - See Final Drive/Hydraulic Oil Section V.

Relief valve blowing - Consult dealer.

Air leaks in system - Consult dealer.

Oil Leaks at Fittings

Loose connection - Check tightness.

Threads damaged - Install new fittings or hoses as required.

Breakaway Disconnects Under Load

Improper male coupler used - See Coupling Remote Cylinder hoses in Section IV.

Improper installation of hoses on drawn implements - Clamp hoses in hose support so that they cannot swing freely behind breakaway coupling.

Tractor operating on rough ground - Clamp hoses in hose in support on drawn implements so that slack in hoses between breakaway and hose support is not great enough to allow them to swing freely.

Remote Cylinder Lift Mechanism Bent

Implement does not allow complete piston stroke - Check and adjust implement so that cylinder rod is allowed to extend completely.

Binding in lift mechanism of implement - Straighten and lubricate lift mechanism of implement.

Loss of Oil from Reservoir

External leaks - Repair or replace hoses, fittings, tubes, seals, etc. as necessary.

Final Drive/Hydraulic Oil Overheats

Oil level low – See Final Drive/Hydraulic Oil in Section V.

Oil too heavy or light – See Final Drive Hydraulic Oil in Section V.

Contaminated oil – See changing Final Drive/Hydraulic Oil in Section V.

Relief valve improperly adjusted – Consult dealer.

Valves leak internally – Consult dealer.

Excessive cycling of lift arms – Adjust hitch load response for heavier draft – See Adjusting Hitch Load Response in Section IV.

Air flow through oil cooler restricted – Clean front grille and oil cooler as outlined in Section V.

Engine cooling fan not engaging – Consult dealer.

Cooler by-pass valve stuck open – Consult dealer.

Unequal Brake Pedal Free Travel

Brakes out of adjustment – See Brake Pedal Adjustment in Section V.

Spongy Brakes

Air in lines – Bleed brake system. See Section V.

Brake valve malfunction – Consult dealer.

Differential Lock Indicator Light Will Not Remain Illuminated

Check electrical continuity of release and lock relay. Check switch adjustment – See Section V.

POWERSHIFT TRANSMISSION TROUBLESHOOTING

Transmission upshift or downshifts during shuttle operation. See shuttle shifting in Section IV.

Desired gear cannot be selected when tractor is stationary. See starting gears in Section IV.

Transmission shifts past desired gear. See selecting gears in Section IV.

Transmission overheats – Cooler by-pass valve stuck open – Consult dealer.

Cooler air flow restricted – Clean grille and oil cooler as outlined in Section V.

Relief valve improperly adjusted – Consult dealer.

Oil level low – See Powershift Transmission Oil in Section V.

Failure Sensed – Repair light on shift display glows, and an "unnatural" display is shown on the LCD. – This indicates that the automatic control of the transmission is NOT active. Two gears (F7 and R2) are provided to allow movement of the tractor. To move the tractor, first depress the clutch. Next, move the transmission control lever to the desired direction of travel. Lastly, release the clutch slowly to engage the transmission. This engagement should be done carefully to avoid lugging down the engine or causing a sudden lurch of the tractor. **No upshifts, downshift, or shuttle shifts are available at this time.** Call your dealer service department for assistance when the tractor has been moved to a location suitable for performing repairs.

POWERSHIFT TRANSMISSION ERROR CODES

Error codes are indicated on the shift display and are used to diagnose operational and system faults.

ERROR CODE	CAUSE	CORRECTION
E00	Shift Control lever not in expected position at start of engine.	Move Shift Control lever to Neutral position.
E01	Clutch overload detected – load too big.	Reduce load or shift to lower gear
E02	Park lock lever engaged while Forward or Reverse selected.	Return transmission control lever to neutral. Then fully depress and hold clutch pedal to remove error code.
E10	System voltage low.	Tighten alternator belt, take other corrective action.
E11	System voltage high.	Repair alternator, take other corrective action.
E12	Transmission coil temperature high.	Allow coil to cool, reduce load. If error code continues to display consult dealer.
E15	Transmission Coil temperature low 10° F (–12° C) or below.	Allow to reach operating temperature.
	Wire connection faulty.	Repair loose or broken wire. If error code continues to display consult dealer.
E60	Bottom of clutch switch fault.	1. Bottom of clutch switch not adjusted correctly.
		2. Defective switch or harness.
		3. Wire disconnected from switch.
E65	Top of clutch switch fault.	1. Top of clutch switch not adjusted correctly
		2. Defective switch or harness.
		3. Wire disconnected from switch.
E71 E72 E73	Clutch pedal calibration incorrect.	1. Clutch pedal potentiometer defective.
		2. Potentiometer lever arm not contacting clutch pedal linkage.
		3. Connector or wiring harness defective.
E74 E75 E76	Boost pressure sense calibration incorrect.	1. Boost sensor defective.
		2. Boost line from manifold disconnected or plugged.
		3. Connector or wiring harness defective.
Other		Consult dealer

NOTES

SECTION VII
SPECIFICATIONS

	MODEL 9630		BOTH		MODEL 9650	
PERFORMANCE	**U.S.**	**METRIC**	**U.S.**	**METRIC**	**U.S.**	**METRIC**
P.T.O. HORSEPOWER						
Manufactures estimate hp/kW	135	101			150	112
ENGINE			DEUTZ			
Model			BF6L913C			
Type			Turbo charged, inter-cooled, direct injection, air cooled diesel			
Number Cylinders			6			
Bore inches/mm			4.00	102		
Stroke inches/mm			4.92	125		
Displacement cu.in/liters			374	6.13		
Compression ratio			15.5 : 1			
Firing order			1-5-3-6-2-4			
High idle (no load) rpm			2550-2600			
Rated speed rpm			2400			
Low idle rpm			700-750			
Oil pressure (normal) psi/kPa			50-90	345-620		
Oil pressure (minimum at low idle) psi/kPa			7-8	48-55		
Valve adjustment (cold)						
Intake inches/mm			0.006	0.15		
Exhaust inches/mm			0.006	0.15		
Injection Pump						
Make/Model			Bosch-PES			
Injectors						
Make/Model			Bosch-DLLA			
Pressure psi/bar			2500-2700	173-186		

PTO Shaft rpm	**540**		**1000**	
Diameter inches/mm	1-3/8	35	1-3/8	35
Number of splines	6		21	
PTO Speeds				
At High Idle Speed rpm	618-630		1159-1182	
At Rated Speed rpm	582		1091	
At Low Idle Speed rpm	170-181		318-341	

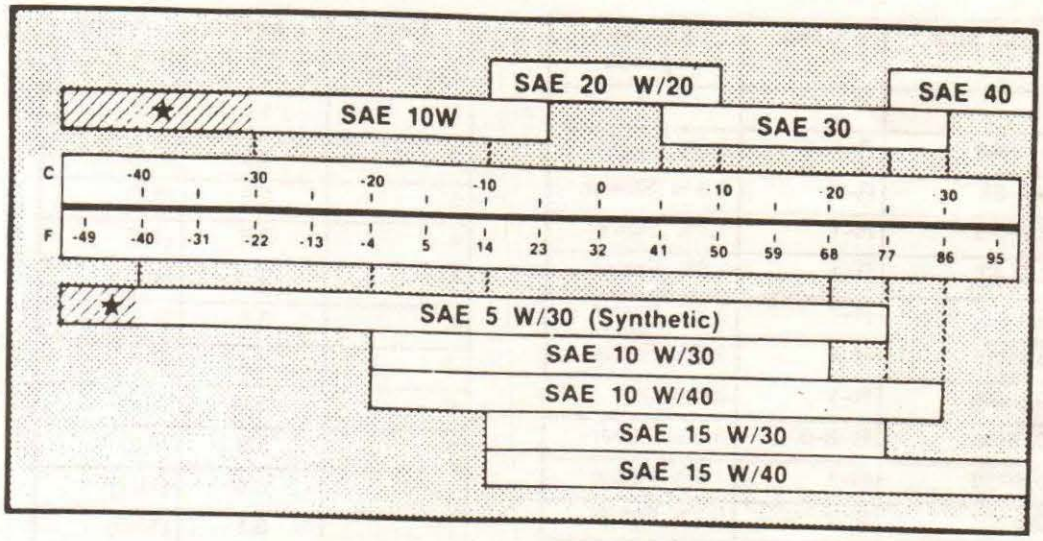
	MODEL 9630		BOTH		MODEL 9650	
	U.S.	METRIC	U.S.	METRIC	U.S.	METRIC
TRANSMISSION						
Model			8800 EA			
Type			Powershift 18Fx9R			
Spec.			YZ14525A			
ELECTRICAL						
Volts			12			
Alternator			105 amp			
BATTERY						
Quantity/Voltage			2/12			
Performance–Cold cranking amps			580			
Group Number			24			
FUSES						
Radar			5A			
Radio/Wiper			10A			
A/C Clutch			10A			
Gauges/Light Panel			5A			
Horn/Blower			20A			
Radio/Cab Light			5A			
Transmission Control/Display			5A			
Differential Lock, PFA, Seat, Lighter			10A			
Transmission control output			25A			
Auxillary power/Trailer connector			20A			
Auxillary Plug, Console			25A			
Auxillary Plug, Console			5A			
CIRCUIT BREAKERS						
Headlight, flashers			20A			
Front work lights			30A			
Rear work lights			30A			
DRAWBAR (Regular)						
Vertical height variation in./mm			4	102		
Horizontal variation in./mm			23–1/8	587		
Length variation in./mm			5	127		
DRAWBAR (Wide Swinging)						
Vertical variation in./mm			8	203		
Horizontal variation in./mm			37–1/2	952		
Length variation in./mm			5	127		

	MODEL 9630		BOTH		MODEL 9650	
	U.S.	METRIC	U.S.	METRIC	U.S.	METRIC
BRAKES						
Type			Hydraulic			
Style			Wet, disc			
HYDRAULIC PUMP						
Style			Closed piston			
Type			Charged piston			
Flow gpm/lpm			24	91		
Pressure psi/bar			2225–2275	153–157		
3–POINT HITCH – INTERNAL LIFT CYLINDER						
Number			1			
Diameter in./mm			5	127		
Stroke in./mm			6–1/8	156		
Lift Capacity @ hitch point lbs./kg			7212	3271		
Lift capacity at high point with optional externl cylinder lbs./kg			8544	3875		
REMOTE CYLINDER VALVE						
Detent relief pressure psi/bar			1900–2100	131–145		
CAPACITIES						
Rear fuel tank gal/L			67	253.5		
Side fuel tank (optional) gal/L			30	113.5		
Fuel tanks (total) gal/L			97	367		
Engine crankcase without filters qt/L			17.0	16.0		
Engine crankcase with filters qt./L			19.5	18.4		
Powershift transmission gal/L			11.0	41.6		
Final drive/Hydraulics gal/L			22	83.3		
PFA Differential qt./L			10.6	10.0		
PFA Planetary drives (each) qt./L			1.8	1.7		

APPROXIMATE DIMENSIONS AND WEIGHTS						
	MODEL 9630		BOTH		MODEL 9650	
Front axle type	Adjustable				PFA	
Front tire size	11.00–16				16.9R–28	
Rear tire size	18.4R–38				20.8R–38	
	U.S.	METRIC	U.S.	METRIC	U.S.	METRIC
Height at top of hood in./mm	82.5	2095			82.5	2095
Height to top of cab in./mm	119.7	3040			121.0	3073
Height to top of exhaust stack in./mm	119.2	3028			120.5	3061
Overall width (Minimum)						
Short axles in./mm			96	2438		
Long axles in./mm			115	2921		
Wheel base in./mm	123.2	3129			117	2972
Overall length w/lower links in./mm			189	4801		
Ground Clearance						
Under front axle in./mm	23.0	584.0			22	559
Under rear axle housing in./mm	28.0	711			29	737
Under drawbar in./mm	15.5	394			17	432
Front Wheel Tread Width						
Minimum in./mm	60	1524			61	1549
Maximum in./mm	80	2032			87	2210
Rear Wheel Tread Width						
Short Axle						
Minimum in./mm	62	1575			64	1626
Maximum in./mm	107	2718			107	2718
Long Axle						
Minimum in./mm	62	1575			64	1626
Maximum in./mm	126	3200			126	3200
Shipping Weight lbs./kg	14,800	6713			16,100	7303

LUBRICATION SPECIFICATIONS

ENGINE



POWERTRAIN/HYDRAULICS

AGCO Power Fluid 821XL

Powershift Transmission
Final Drive/Hydraulics

AGCO Super Lithium No. 2

~All Grease Zerks

AGCO Gear Lube 715

PFA Differential
PFA Planetaries

RECOMMENDATION

	QUANTITIES				
	Quart	2.5 Gal.	5 Gal.	30 Gal.	55 Gal.
	PART NUMBER				
AGCO Power Fluid 20W20	79014689	79014690	79014691	79014692	79014693
AGCO Power Fluid 30W	79014694	79014695	79014696	79014697	79014698
AGCO Power Fluid 40W	79014699	79014700	79014701	79014702	79014703
AGCO Power Fluid 15W40	79014672	79014674	79014675	79014676	79014677
AGCO Power Fluid 821XL	79014711	79014712	79014713	79014714	79014715
AGCO Gear Lube 715	79014721	79014722	N/A	N/A	79014723
AGCO Super Lithium No. 2	14.5 ounce tube–part number 79009887				

POWERSHIFT TRANSMISSION GROUND SPEEDS

(Engine speed 2400 rpm, with 20.8–38 R–1 radial rear tires)

Tire Size	Tread	Changes in Speeds
14.9R46	R–1	3.3% Faster
18.4–38	R–1	3.8 % Slower
18.4R38	R–1	1.9% Slower
18.4–42	R–1	1.9% Faster
18.4R42	R–1	3.8% Faster
18.4R46	R–1	8.5% Faster
20.8–38	R–1	Base Tire
20.8R38	R–2–0	3.4% Faster
20.8R38	R–1	1.9% Faster
20.8–42	R–1	5.7% Faster
20.8R42	R–1	8.0% Faster
23.1–34	R–1	2.4% Slower
24.5–32	R–1	2.8% Slower
24.5–32	R–2–0	0.5% Faster
24.5R32	R–1	0.5% Slower
30.5L–32	R–1	1.9% Slower

Gear	mph	(km/h)
Forward		
1	1.6	(2.6)
2	2.0	(3.2)
3	2.3	(3.7)
4	2.6	(4.2)
5	3.0	(4.8)
6	3.6	(5.8)
7	4.2	(6.7)
8	5.0	(8.0)
9	5.9	(9.5)
10	6.9	(11.1)
11	8.1	(13.0)
12	9.5	(15.3)
13	10.9	(17.5)
14	12.9	(20.7)
15	15.0	(24.0)
16	117.7	(28.5)
17	20.9	(33.6)
18	24.5	(39.4)
Reverse		
1	2.0	(3.2)
2	2.4	(3.7)
3	2.8	(4.5)
4	3.2	(5.1)
5	3.7	(5.9)
6	4.4	(7.1)
7	5.2	(8.4)
8	6.1	(9.8)
9	7.2	(11.6)

METRIC INFORMATION

In this manual measurements in U.S. customary units are followed by the metric equivalent in parentheses. For example: 5 inches (127 mm), 10 bushels (0.3524 m^3) and 100 horsepower (74.6 kW).

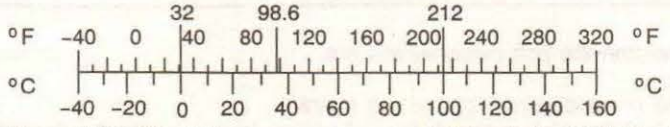
These metric equivalents are provided for your convenience as an aid in converting to the metric system. A chart showing metric terms, examples, and abbreviations used in this manual is provided below.

METRIC/U.S. CUSTOMARY UNIT EQUIVALENTS

	MULTIPLY:		BY:		to get: MULTIPLY		by:		to get:
LINEAR	inches	x	25.4	=	millimeters (mm)	x	0.03037	=	inches
	feet	x	0.3048	=	meters (m)	x	1.0936	=	feet
	yards	x	0.9144	=	meters (m)	x	1.0936	=	yards
	miles	x	1.6093	=	kilometers (km)	x	0.6214	=	miles
	inches	x	2.54	=	centimeters (cm)	x	0.3937	=	inches
	microinches	x	0.0254	=	micrometers (um)	x	39.37	=	microinches
AREA	$inches^2$	x	645.16	=	$millimeters^2$ (mm^2)	x	0.00155	=	$inches^2$
	$inches^2$	x	645.16	=	$centimeters^2$ (cm^2)	x	0.155	=	$inches^2$
	$feet^2$	x	0.0929	=	$meters^2$ (m^2)	x	10.764	=	$feet^2$
	$yards^2$	x	0.8361	=	$meters^2$ (m^2)	x	1.196	=	$yards^2$
	acres	x	0.4047	=	$hectometers^2$ (hm^2)	x	2.471	=	acres
				=	hectares (ha)				
VOLUME	$inches^3$	x	16387	=	$millimeters^3$ (mm^3)	x	0.000061	=	$inches^3$
	$inches^3$	x	16.387	=	centimeters3 (cm^3)	x	0.06102	=	$inches^3$
	$inches^3$	x	0.01639	=	liters	x	61.024	=	$inches^3$
	quarts	x	0.94635	=	liters	x	1.0567	=	quarts
	gallons	x	3.7854	=	liters	x	0.2642	=	gallons
	$feet^3$	x	28.317	=	liters	x	0.03531	=	$feet^3$
	$feet^3$	x	0.02832	=	$meters^3$ (m^3)	x	35.315	=	$feet^3$
	fluid oz.	x	29.57	=	milliliters (ml)	x	0.03381	=	fluid oz.
	$yards^3$	x	0.7646	=	$meters^3$ (m^3)	x	1.3080	=	$yards^3$
	teaspoons	x	4.929	=	milliliters (ml)	x	0.2029	=	teaspoons
	cups	x	0.2366	=	liters	x	4.227	=	cups
	bushel	x	35.239	=	liters	x	0.02838	=	bushels
	bushel	x	0.03524	=	$meters^3$ (m^3)	x	28.378	=	bushels
MASS	ounces (av)	x	28.35	=	grams (g)	x	0.03527	=	ounces (av)
	pounds (av)	x	0.4536	=	kilograms (kg)	x	2.2046	=	pounds (av)
	tons (2000 lbs)	x	907.18	=	kilograms (kg)	x	0.001102	=	tons (2000 lbs)
	tons (2000 lbs)	x	.90718	=	metric tons (t)	x	1.1023	=	tons (2000 lbs)
	tons (long) (2240 lbs)	x	1016.05	=	kilograms (kg)	x	.000984	=	tons (long) (2240 lbs)
FORCE	ounces – f (av)	x	0.278	=	newtons (N)	x	3.597	=	ounces – f (av)
	pounds – f (av)	x	4.488	=	newtons (N)	x	0.2248	=	pounds – f (av)
	kilograms – f	x	9.807	=	newtons (N)	x	0.10197	=	kilograms – f
PRESSURE OR STRESS	pounds/sq. in.	x	6.895	=	kilopascals (kPa)	x	0.145	=	pounds/sq. in
	pounds/sq. in.	x	0.069	=	bar	x	14.49	=	pounds/sq. in
POWER	horsepower	x	0.746	=	kilowatts (kW)	x	1.34	=	horsepower
	ft–lbf/min.	x	0.0226	=	watts (W)	x	44.25	=	ft–lbf/min.
TORQUE	pound–inches	x	0.11298	=	newton–meters (N.m)	x	8.851	=	pound–inches
	pound–feet	x	1.3558	=	newton–meters (N.m)	x	0.7376	=	pound–feet
VELOCITY	miles/hour	x	1.6093	=	kilometers/hour (km/h)	x	0.6214	=	miles/hour
	feet/sec.	x	0.3048	=	meters/sec. (m/s)	x	3.281	=	feet/sec.
	kilometers/hr.	x	0.27778	=	meters/sec. (m/s)	x	3.600	=	kilometers/hr.
	miles/hours	x	0.4470	=	meters/sec (m/s)	x	2.237	=	miles/hour

TEMPERATURE

TEMPERATURE



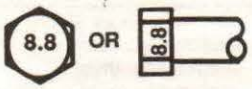
°Celsius = 0.556 (°F – 32)

°Fahrenheit = (1.8° C) + 32

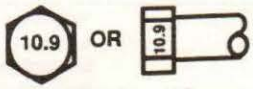
ASSEMBLY TORQUE VALUES FOR METRIC HARDWARE (ALL HARDWARE PLATED OR LUBRICATED)				
PROPERTY CLASS 4.8 (APPROX. SAE GR. 2)				
	ZINC PLATED DRY OR LUB		UNPLATED LUBRICATED	
DIAMETER & PITCH	IN.–LBS.	*N.m	IN.–LBS.	N.m
M2.5 x 0.45	2	.23	1.5	.17
M3 x 0.5	6	.68	4.5	.51
M3.5 x 0.6	9	1	7	.79
M4 x 0.7	14	2	11	1
M5 x 0.8	29	3	22	2
M6 x 1	50	6	38	4
M8 x 1.25	120	14	90	10
	FT.–LBS.	*N.m	FT.–LBS.	N.m
M10 x 1.5	20	27	15	20
M12 x 1.75	35	47	26	35
M14 x 2	55	74	41	56

ASSEMBLY TORQUE VALUES FOR METRIC HARDWARE (ALL HARDWARE PLATED OR LUBRICATED								
DIAMETER & PITCH	PROPERTY CLASS 8.8 (APPROX. SAE GR. 5)				PROPERTY CLASS 10.9 (APPROX. SAE GR. 8)			
	ZINC PLATED DRY OR LUB.		UNPLATED LUBRICATED		ZINC PLATED DRY OR LUB.		UNPLATED LUBRICATED	
	FT.–LBS	*N.m	FT.–LBS	N.m	FT.–LBS	N.m	FT.–LBS	N.m
M5 x 0.8	4	6	5	7	6	8	7	9
M6 x 1	7	10	8	11	10	14	12	16
M8 x 1.25	18	24	20	27	25	33	28	38
M10 x 1.5	34	47	37	53	49	66	54	74
M12 x 1.75	60	81	67	91	84	114	94	128
M14 x 2	95	129	107	145	134	182	150	204
M16 x 2	146	198	164	222	206	279	231	313
M20 x 2.5	285	386	320	434	400	543	450	610
M24 x 3	493	668	553	750	690	935	774	1050
M30 x 3.5	978	1326	1099	1490	1370	1857	1539	2086
M36 x 4	1707	2314	1918	2600	2390	3241	2686	3642

*N.m = NEWTON METERS



Nut Marking 8 or 9



Nut Marking 10

NOTE: In the diameter and pitch column the bolt designations are:
- M indicated bolt in metric
- Number following M is the (mm) diameter of the bolt shank.
- The last number is thread pitch which is the distance in (mm) from 1 peak of a thread to the next peak of the adjacent thread.

TORQUE CHART

Use the following chart as a guide for tightening bolts and capscrews when performing maintenance work. Use the dry column when using plain hardware. Use the lube column when using plated hardware. Refer to this chart unless a different torque is specified in the instructions.

SIZE	SUGGESTED ASSEMBLY TORQUE VALUES											
	SAE GRADE 2 ASSEMBLY TORQUE				SAE GRADE 5 ASSEMBLY TORQUE				SAE GRADE 8 ASSEMBLY TORQUE			
	DRY		LUB		DRY		LUB		DRY		LUB	
	Ft-Lb.	N·m	Ft-Lb.	N·m	Ft-Lb.	N·m	Ft-Lb.	N·m	Ft-Lb.	N·m	Ft-Lb.	N·m
5/16 -18	11	15	8	11	17	23	13	18	25	34	18	24
5/16 - 24	12	16	9	12	19	26	14	19	27	37	20	27
3/8 -16	20	27	15	20	30	41	23	31	45	61	35	47
3/8 - 24	23	31	17	23	35	47	25	34	50	68	35	47
7/16 -14	30	41	23	31	50	68	35	47	70	95	55	68
7/16 - 20	35	47	26	35	55	75	40	54	80	108	60	81
1/2 -13	50	68	35	47	75	102	55	75	110	140	80	108
1/2 - 20	55	75	40	54	85	115	65	88	120	163	90	122
9/16 -12	70	95	50	68	110	149	80	108	150	203	110	149
9/16 -18	80	108	60	81	120	163	90	122	170	230	130	176
5/8 - 11	95	129	70	95	150	203	110	149	210	285	160	217
5/8 -18	110	149	80	108	170	230	130	176	240	325	180	244
3/4 -10	170	230	125	169	265	359	200	271	375	508	280	380
3/4 -16	190	258	140	190	300	407	225	305	420	569	315	427
7/8 - 9	165	224	120	163	430	583	320	434	600	813	450	610
7/8 -14	185	251	135	183	475	644	360	488	670	908	500	678
1 - 8	250	339	190	258	645	874	480	651	900	1220	675	915
1 -14	280	380	210	285	720	976	540	732	1000	1356	750	1017


GRADE 2
NO MARKS


GRADE 5
3 MARKS


GRADE 8
6 MARKS

The following chart is included for your convenience in converting fractions to decimals or the metric equivalent.

CONVERSION CHART					
FRACTION	DECIMAL	METRIC	FRACTION	DECIMAL	METRIC
1/32"	.031	.79 mm	17/32"	.531	13.49 mm
1/16"	.062	1.59 mm	9/16"	.562	14.29 mm
3/32"	.094	2.38 mm	19/32"	.594	15.08 mm
1/8"	.125	3.17 mm	5/8"	.625	15.87 mm
5/32"	.156	3.97 mm	21/32"	.656	16.77 mm
3/16"	.187	4.76 mm	11/16"	.687	17.46 mm
7/32"	.219	5.56 mm	23/32"	.719	18.26 mm
1/4"	.250	6.35 mm	3/4"	.75	19.05 mm
9/32"	.281	7.14 mm	25/32"	.781	19.84 mm
5/16"	.312	7.94 mm	13/16"	.812	20.64 mm
11/32"	.344	8.73 mm	27/32"	.844	21.43 mm
3/8"	.375	9.53 mm	7/8"	.875	22.23 mm
13/32"	.406	10.32 mm	29/32"	.906	23.02 mm
7/16"	.437	11.11 mm	15/16"	.937	23.81 mm
15/32"	.469	11.91 mm	31/32"	.969	24.61 mm
1/2"	.50	12.7 mm	1"	1.0	25.4 mm

NOTES

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