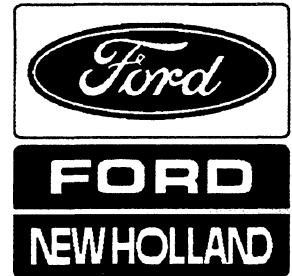


VERSATILE

Service Manual



4 Wheel Drive Tractor 700, 900

1972 - 1975

40070020

Reprinted

700 AND 900 TRACTOR SPECIFICATIONS

OVERALL DIMENSIONS

SPECIFICATIONS

700 TRACTOR SPECIFICATIONS

- GENERAL
- TIRE SIZE
- ENGINE SPECIFICATIONS
- COOLING SYSTEM
- ELECTRICAL
- AIR CLEANER
- CLUTCH
- BRAKES
- TRANSMISSION
- FRAME
- CAB
- COLD START AID
- INSTRUMENT PANEL
- BALLAST RECOMMENDATIONS
- AXLE
- DRIVELINES
- HYDRAULICS
- STEERING
- DRAWBAR

900 TRACTOR SPECIFICATIONS

(SIMILAR TOPICS TO ABOVE)

OVERALL DIMENSIONS

WIDTH 7 ft. 10 inches - 24.5x32 tires.
9 ft. 2 inches - 30.5x32
11 ft. 7 inches - 18.4x38 duals.

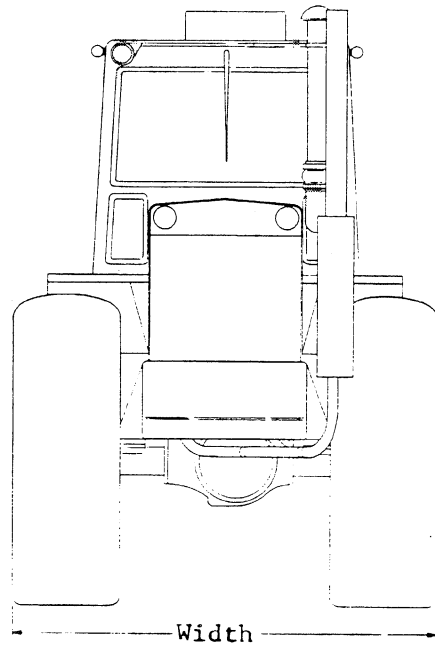
OVERALL LENGTH 21 ft. 1 inch.

WHEELBASE 10 Ft. 10 inches.

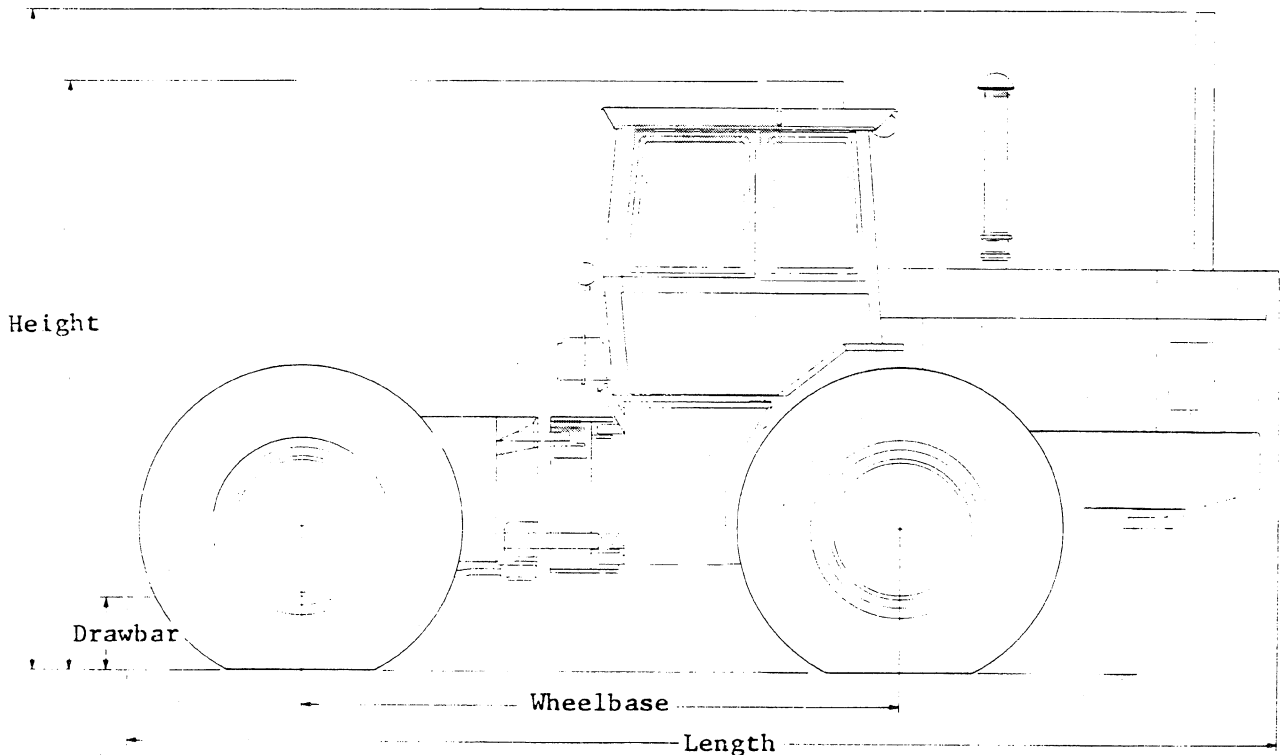
DRAWBAR HEIGHT 1 ft. 4 inches.

OVERALL HEIGHT

Ground to Air Pressurizer - 11 Feet
Ground to exhaust stack - 12 Feet
2 inches.



Different tire sizes affect tractor height negligibly.



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700 TRACTOR SPECIFICATIONS

GENERAL

ENGINE HP - 220 @2850 rpm
WHEELBASE - 130 inches
MAXIMUM OPERATING WEIGHT - 28,000 lbs.
RECOMMENDED RANGE OF OPERATING WEIGHT - 22,500 to 25,000 lbs.
FUEL TANK CAPACITY - 145 U. S. Gallons
LENGTH OVERALL - 253 in.
HEIGHT OVERALL - 130 inches.

TIRE SIZE	THREAD	WIDTH	SHIPPING WEIGHT
18.4x38 Duals	72"	90 1/2	18,100 Total 11,580 Front
24.5x32	70 3/4	95 1/2	16,740 Total 10,960 Front
30.5x32	77 1/4	107 3/4	18,400 Total 12,060 Front

ENGINE SPECIFICATIONS

RATINGS, S. A. E. (500 FT. 85° F.):

HORSEPOWER/GOVERNED RPM	230 @ 3300 200 @ 2800
NUMBER OF CYLINDERS	8
BORE and STROKE - in.	4 5/8 x 4 1/8
PISTON DISPLACEMENT - cu. in.	555
COMPRESSION RATIO	17.0
OPERATING CYCLES	4
ENGINE OIL CAPACITY - gals.	7.9
OIL PAN CAPACITY - gals.	5
COOLANT CAPACITY - gals.	4
NET WEIGHT	1710 app.
LBS. PER HORSEPOWER	7.43

BEARINGS: Precision type, steel backed inserts.

CAMSHAFT: Single camshaft controls all valve and injector movement.
Induction hardened alloy steel with gear drive.

CAMSHAFT FOLLOWERS: Roller type for long cam and follower life.

CONNECTING RODS: Drop forged, 6.72" center to center length.
Taper piston pin end reduces unit pressures.

COOLER, LUBRICATING OIL: Tubular type, jacket water cooled.

CRANKSHAFT: High tensile strength steel forging. Bearing journals are induction hardened.

CYLINDER BLOCK: Alloy cast iron with removable, wet liners. Cross bolt support to main bearing cap.

CYLINDER HEADS: Two, one each bank. All fuel lines are drilled passages. Individual intake and exhaust porting for each cylinder. Corrosion resistant inserts on intake and exhaust valve seats.

DAMPER, VIBRATION: Compressed rubber type.

FUEL SYSTEM: Cummins PT self adjusting system with integral flyball type governor. Camshaft actuated injectors.

GEAR TRAIN: Heavy duty, located rear of cylinder block. PTO with 0.785 to 1 ratio available at rear of fuel pump.

LUBRICATION: Force feed to all bearings. Gear type pump.

PISTONS: Aluminum, cam ground, with two compression and one oil ring.

PISTON PINS: 1 1/2 " diameter, full floating.

THERMOSTAT: Single unit, modulating by-pass type.

VALVES: Dual intake and exhaust each cylinder. Each valve 1 5/8" diameter.

CLEANER AIR: 12 dia., two stage dry type

CORROSION RESISTOR: Mounted. Checks rust and corrosion, controls acidity, and removes impurities from coolant.

ELECTRICAL EQUIPMENT: 12 volt positive engagement starting motor; 12 volt, 55 ampere negative ground alternator; voltage regulator; magnetic switch.

FAN: 24 inch, 6 Blade, High Mount, Ratio 1 to 1

FILTERS: Cummins. Lubricating oil, full flow paper element type, mounted and by-pass type, mounted.

GOVERNOR: Mechanical flyball, limiting speed type.

MANIFOLD, AIR INTAKE: Two, with crossover and common inlet.

MANIFOLD, EXHAUST: With front outlet directed downwards.

PAN OIL: Cast aluminum, rear sump type, 5 U. S. gallon capacity.

SUPPORT, ENGINE: Fully Rubber mounted.

COOLING SYSTEM

Capacity - 48 U. S. quarts
Radiator - 750 sq. in. 4 row core
Independent surge tank
Quick removeable perforated metal grill screen

ELECTRICAL

12 Volt - 58 Amp Delco Alternator
2-204 amp hour batteries.
Negative ground system
000 starting cables.

AIR CLEANER

United - Model 112D14 Triphase
Dual element - Dry type with safety element
Centrifuge action with automatic dust unloader
5 1/2 in. inlet tubing system

CLUTCH

Dana-Spicer - 14" Two plate dry type.
Model AS - 1402 angle spring, pull type.
1 3/4 x 10 spline spring loaded cushion hub discs.
Organic linings, or Ceramic Button linings.
Greaseable shaft and release bearings.
Foot operated, mechanically actuated.
Integral disk type transmission brake with spring loaded backing plate.

BRAKES

UP TO SERIAL NUMBER 070426

Bendix - 14 x 2 1/4 expansion shoe type Driveline type, transmission mounted.
Hydraulic actuated by a single foot pedal. Overcenter hand operated parking brake.

FROM SERIAL NUMBER 070427 AND UP

15" Disc and Caliper Driveline mounted Hydraulic actuated by one foot pedal.
Caliper parking brake mechanically actuated by overcenter lever.

TRANSMISSION

12 speed fully constant mesh with shift - collar shifting.
Versatile 4 shaft, vertically arranged design.
Timken tapered roller bearings.
Independant lubrication system with pump, filter, cooler, steel lines and wire braid hose, dash mounted oil pressure indicator light.
One dash mounted, in-line shift, range lever.
One floor mounted gear shift lever.
Helical input gears with straight cut low speed gears.
3 inch diameter shafts drilled for lubrication.
Speeds at 2850 engine rpm and 24.5 x32 tires (31.5 in. loaded radius tires)

Low gear	2.6	3.2	3.6	4.2
Second gear	4.7	5.6	6.3	7.5
High gear	9.9	11.7	13.2	15.6
Reverse	3.3	4.0	4.5	5.3

Oil Capacity - 19.0 qts.

FRAME

Articulated frame 4 wheel drive. Front and rear frames are bolted rigidly to their respective axles and joined at the center to a subframe. Steering is accomplished by pivoting on two, 2 in. ball-bushings between the front and subframe.

Oscillation to 15° in both directions is accomplished between the subframe and the rear frame which are joined by a 2 1/4 ball-bushing and two 1 3/4 x 5 drag links mounted in 1 3/4 ball-bushings. The rear frame oscillates about the ball joint and is held in alignment with the subframe by the two drag links.

The front frame consists of 3/8 in. formed side plates with a 1/2 in. rear end plate.

The rear frame consists of formed 1/2 in. plates.

CAB

Module type with protective structure.

Fully isolated on rubber mounts.

Pressurizer with filters and vents.

Accoustical foam noise insulation

12 gauge wall panels with 7 ga. firewall.

Two speed windshield wiper

Tinted glass, rear view mirror

Standard height - 63" in. outside

Optional extension height - 72" in. outside

Width - 56 in. outside.

Bostrom Seat with arm rests.

COLD START AID

Make - Turner Quickstart

Type - Ether, operated from Instrument panel.

INSTRUMENT PANEL

1. Tachometer with hour meter.
2. Ammeter
3. Oil pressure gauge with cutout at less than 20 psi.
4. Engine temperature gauge with cutout at 205° F.
5. Transmission Oil pressure indicator light.
6. Fuel gauge on fuel tanks.
7. Key ignition.
8. Starter button with cutout override switch [key dependant]
9. Push button turn signals and flashers.
10. Light Switch.
11. Ether Cold start aid control.

BALLAST RECOMMENDATIONS

BALLAST PER TIRE LBS.

Tire Size	Front	Rear
18.4 x 38 Duals	1100	1100
24.5 x 32	1500	1500
30.5 x 32	1500	1500

In the case of duals fluid should be added to the INNER tires. More weight may be added if necessary for particular applications but a weight distribution of 62% on the front axle should be maintained and the maximum weight of 28,000 lbs. should not be exceeded.

AXLE

Make - Verstile
Type - Sprial bevel differential with planetary final drives in hubs.
Ratio 21.3
Differential - Eaton - Series 17103
Differential Housing - Cast Iron
Axle Tubes - Ductile Iron
Oil Capacity - 23 Imp. Qts.
Differential Ratio - 4.88 (5.57 after Serial Number 070427)
Planetary ratio - 4.36
Lubrication - SAE 90 MIL 2105 - B gear Oil
No. of wheel mounting bolts - 12
Axle seals - Double lip neoprene, greaseable laybrinth type guard.

DRIVELINES

Engine to Trans. - Spicer 1550 series
Trans. to axles - Spicer 1600 series
Lubrication - SAE 90 gear oil

HYDRAULICS

Pump - Cessna gear type tandem pump.
Engine mounted gear driven

Flow - 24 gpm for steering.
- 24 gpm for implements.

Operating pressures - 2000 psi for implements.
- 1800 psi for steering.

Reservoir - 95 U. S. qts.

Filters - two reusable 100 mesh screen on suction
- one 10 Micron spin - on type on steering return.

Cooler - Connected into power steering return lines and mounted in front of radiator.

Control Valve - Gresen Model CP three spool with two self cancelling spools and one spring loaded, or one float control.
Two self cancelling spools connected are standard equipment.
An optional kit consisting of hoses, fittings couplers and lever connects third spool.

Couplers - Pioneer 8200 series.
- Push to connect type under pressure
- Two sets connected are standard.

STEERING

Articulated frame, 42° in each direction
Fully hydrostatic actuation.
2-3x16 1/2 in. cylinders mounted on ball bushings.
Control Valve - 45 cu. in. Ross HGB - 24
Pump - 24 Gear Type

DRAWBAR

Swinging clevis type of 1 3/4 x 5 steel with wear block.
1 1/2 in. hardened steel pin.
Replaceable hardened bushings.
Height - 18 in.

900 TRACTOR SPECIFICATIONS

GENERAL

ENGINE HP - 300 @ 2400 rpm @ 500 ft. & 85° F.
WHEELBASE - 130 inches.
MAXIMUM OPERATING WEIGHT - 28,000 lbs.
RECOMMENDED RANGE OF OPERATING WEIGHT - 26,000 to 27,000 lbs.
FUEL TANK CAPACITY - 145 U. S. Gallons.
HEIGHT OVERALL - 130 inches.
LENGTH OVERALL - 253 inches.

TIRE SIZE	THREAD	WIDTH	SHIPPING WEIGHT
18.4x38 Duals	72"	90 1/2	18,590 Total 12,960 Front
24.5x32	70 3/4	95 1/2	17,250 Total 12,340 Front
30.5x32	77 1/4	107 3/4	18,350 Total 12,840 Front

ENGINE SPECIFICATIONS

HORSEPOWER320
GOVERNED RPM2600
NUMBER OF CYLINDERS8
BORE & STROKE-- in.5 1/2 x 4 1/4
PISTON DISPLACEMENT -- cu. in.903
OPERATING CYCLES4
ENGINE OIL CAPACITY -- gals.6 1/2
ENGINE COOLANT CAPACITY -- gals.7
NET WEIGHT with STANDARD ACCESSORIES [lbs.]2200
BEARINGS: Precision type, steel backed inserts. 5 main bearings, 3/4" diameter. Connecting Rod -- 3 1/8" diameter.
CAMSHAFT: Single camshaft controls all valve and injector movement. Induction hardened alloy steel with gear drive.
CAMSHAFT FOLLOWERS: Roller type for long cam and follower life.
CONNECTING RODS: Drop forged, 8.193" center to center length. Rifle drilled for pressure lubrication of piston pin. Taper piston pin end reduces unit pressures.
COOLER, LUBRICATING OIL: Tubular type, jacket water cooled.
CRANKSHAFT: High tensile strength steel forging. Bearing journals are induction hardened. Fully counterweighted.
CYLINDER BLOCK: Alloy cast iron with removable, wet liners. Cross bolt support to main bearing cap.

CYLINDER HEADS: Two, one each bank. All fuel lines are drilled passages. Individual intake and exhaust porting for each cylinder. Corrosion resistant inserts on intake and exhaust valve seats.

DAMPER, VIBRATION: Compressed rubber type.

FUEL SYSTEM: Cummins PT wear-compensating system with integral flyball type governor. Camshaft actuated injectors.

GEAR TRAIN: Heavy duty, located rear of cylinder block.

LUBRICATION: Force feed to all bearings. Gear type pump.

PISTONS: Aluminum, cam ground, with two compression and one oil ring.

PISTON PINS: 1 3/4" diameter, full floating.

THERMOSTATS: Dual, modulating by-pass type.

VALVES: Dual intake and exhaust each cylinder. Each valve 1 7/8 diameter. Heat and corrosion resistant face on intake and exhaust valves.

BREATHERS, CRANKCASE: Two, dry element

AIR CLEANER: 14" diameter, two stage dry type.

CORROSION RESISTOR: Fleetguard, mounted. Checks rust and corrosion, controls acidity, and removes impurities from coolant.

ELECTRICAL EQUIPMENT: 12 volt negative ground system. 12 volt positive engagement starting motor; 12 volt 55 ampere alternator; voltage regulator; magnetic switch and key type starting switch.

FANS: 6 Blade High Mount Ratio 1 to 1 (14.75 to centres).

FILTERS: Fleetguard, Lubricating oil, full flow paper element type, mounted, and by-pass type, not mounted. Fuel, heavy duty replacable paper element type, mounted.

GOVERNOR: Mechanical flyball, limiting speed type.

HOUSING, FLYWHEEL: S.A.E. NO. 2

MANIFOLD, AIR INTAKE: Two with crossover and common inlet.

MANIFOLD, EXHAUST: Dual, with horizontal outlets to front

PAN OIL: Aluminum, rear sump type, 4 1/2 U.S. gallon capacity. Angularity capability -- front up 45°; front down 45°; side to side 30°.

PUMP COOLANT: Belt driven, centrifugal type, 127 gpm @2600 rpm.

SUPPORT, ENGINE: Fully Rubber Mounted.

COOLING SYSTEM

Capacity - 53 U. S. quarts
Radiator - 930 sq. in. 4 row core
Independent surge tank

ELECTRICAL

12 Volt - 58 Amp Delco Alternator
2-204 Amp hour batteries.
Negative ground system
000 starting cables.

AIR CLEANER

United - Model 114D9 Triphase
Dual element - Dry type with safety element
Centrifuge action with automatic dust unloader
5 1/2 in. inlet tubing system

CLUTCH

Dana - Spicer - 14" Two plate dry type.
Model AS-1402 angle spring, pull type.
1 3/4 x 10 spline spring loaded cushion hub discs.
Ceramic Buttom Linings.
Greaseable shaft and release bearings.
Foot Operated, Mechanically Actuated
Integral disk type transmission brake with spring loaded backing plate.

BRAKES

15" Disc. and Caliper Driveline Mounted - Hydraulically actuated by one foot pedal.
Caliper parking brake - mechanically actuated by overcenter lever.

TRANSMISSION

12 speed fully constant mesh with shift - collar shifting.
Versatile 4 shaft, vertically arranged design.
Timken tapered roller bearings.
Independant lubrication system with pump, filter, cooler, steel lines and wire braid hose, dash mounted oil pressure indicator light.
One dash mounted, in-line shift, range lever.
One floor mounted gear shift lever.
All helical forward gears with straight cut reverse gears.
3 inch diameter shafts drilled for lubrication

Speeds at 2400 engine rpm and 24.5x32 tires (31.5 in. loaded radius tires)				
Low gear	2.6	3.1	3.4	4.1
Second gear	4.6	5.5	6.1	7.4
High gear	8.9	10.7	11.9	14.3
Reverse	3.3	3.9	4.4	5.2

Oil Capacity - 23.0 qts.

AXLE

Make - Versatile
Type - Sprial bevel and planetary differential with planetary final drives.
Ratio - 27.1 total
Differential - Eaton - Series 17303 Double Reduction
Differential Housing - Cast Iron
Axle Tubes - Ductile Iron
Oil Capacity - 23 Imp. Qts.
Differential Ratio - 6.21
Planetary ratio - 4.36
Lubrication - SAE 90 MIL 2105 - B gear oil
No. of wheel mounting bolts - 12
Axle seals - Double lip neoprene, greaseable laybrinth type guard.

DRIVELINES

Engine to Trans. - Spicer 1550 Series
Trans. to axles - Spicer 1600 series
Lubrication - SAE 90 gear oil.

HYDRAULICS

Pump - Cessna gear type tandem pump.
Engine mounted gear driven

Flow - 26 gpm for steering.
26 gpm for implements.

Operating pressures - 2000 psi for implements.
- 1800 psi for steering.

Reservoir - 95 U. S. qts.

Filters - two reusable 100 mesh screen on suction.
- one 10 Micron spin - on type on steering return.

Cooler - Connected into power steering return lines and mounted in front of radiator.

Control Valve - Gresen Model CP three spool with two self cancelling spools and one Float Spool.

Two self cancelling spools connected are standard equipment.

An optional kit consisting of hoses, fittings couplers and lever connects the third spool.

Couplers - Pioneer 8200 series.
- Push to connect type under pressure
- two sets connected are standard.

STEERING

Articulated frame, 42° in each direction.

Fully hydrostatic actuation.

Two - 3 x 16 1/2 in. cylinders mounted on ball bushings

Control Valve - 45 cu. in. Ross HGB - 24

Pump - 26 gpm Gear Type

DRAWBAR

Swinging clevis type of 1 3/4 x 5 steel with wear block.

1 1/2 in. hardened steel pin.

Replaceable hardened bushings.

Height - 18 in.

FRAME

Articulated frame 4 wheel drive. Front and rear frames are bolted rigidly to their respective axles and joined at the center to a subframe. Steering is accomplished by pivoting on two 2 in. ball-bushings between the front and sub-frame.

Oscillation to 15° in both directions is accomplished between the subframe and the rear frame which are joined by a 2 1/4 ball-bushing and two 1 3/4 x 5 drag links mounted in 1 3/4 ball-bushings. The rear frame oscillates about the ball joint and is held in alignment with the subframe by the two drag links.

The front frame consists of 3/8 in. formed side plates with a 1/2 in. rear end plate.

The rear frame consists of formed 1/2 in. plates.

CAB

Module type with protective structure.
Fully isolated on rubber mounts.
Pressurizer with filters and vents.
Accoustical foam noise insulation
12 gauge wall panels with 7 ga. firewall.
Two speed windshield wiper
Tinted glass, rear view mirror
Standard height - 63" in. outside
Optional extension height - 72" in. outside
Width - 56 in. outside.
Bostrom seat with arm rests.

COLD START AID

Make - Turner Quickstart
Type - Ether, operated from Instrument panel.

INSTRUMENT PANEL

1. Tachometer with hour meter.
2. Ammeter
3. Oil pressure gauge with cutout at less than 20 psi.
4. Engine temperature gauge with cutout at 205 ° F.
5. Transmission oil pressure indicator light.
6. Fuel gauge on fuel tanks.
7. Key Ignition.
8. Starter button with cutout override switch (key dependant).
9. Push Button Turn Signals and Flashers
10. Light switch.
11. Ether Cold start aid control.

BALLAST RECOMMENDATIONS

BALLAST PER TIRE LBS.

Tire Size	Front	Rear
18.4x38 Duals	1000	1000
24.5x32	1800	1800
30.5x32	2200	2200

In the case of duals fluid should be added to ALL tires. More weight may be added if necessary for particular applications but a weight distribution of 62% on the front axle should be maintained and the maximum weight of 28,000 lbs. should not be exceeded.

OPTIONS

1. Third Spool hydraulic valve kit. Consists of 2 hoses, levers, couplers and fittings.
2. Air conditioning.
3. Cab Heater.
4. Cab Extension

CLUTCH SERVICE

INTRODUCTION TO CLUTCH SERVICE AND REPAIRS

CLUTCH DISASSEMBLY

CLUTCH ADJUSTMENT PROCEDURE

SPICER SERVICE MANUAL



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INTRODUCTION TO CLUTCH SERVICING AND REPAIRS

Listed are several of the characteristics of the clutch assembly used on the Versatile 4 wheel drive tractors.

TYPE: Dana Spicer - 14" Two plate dry type.

MODEL: AS 1402 Angle Spring - Pull-Type.

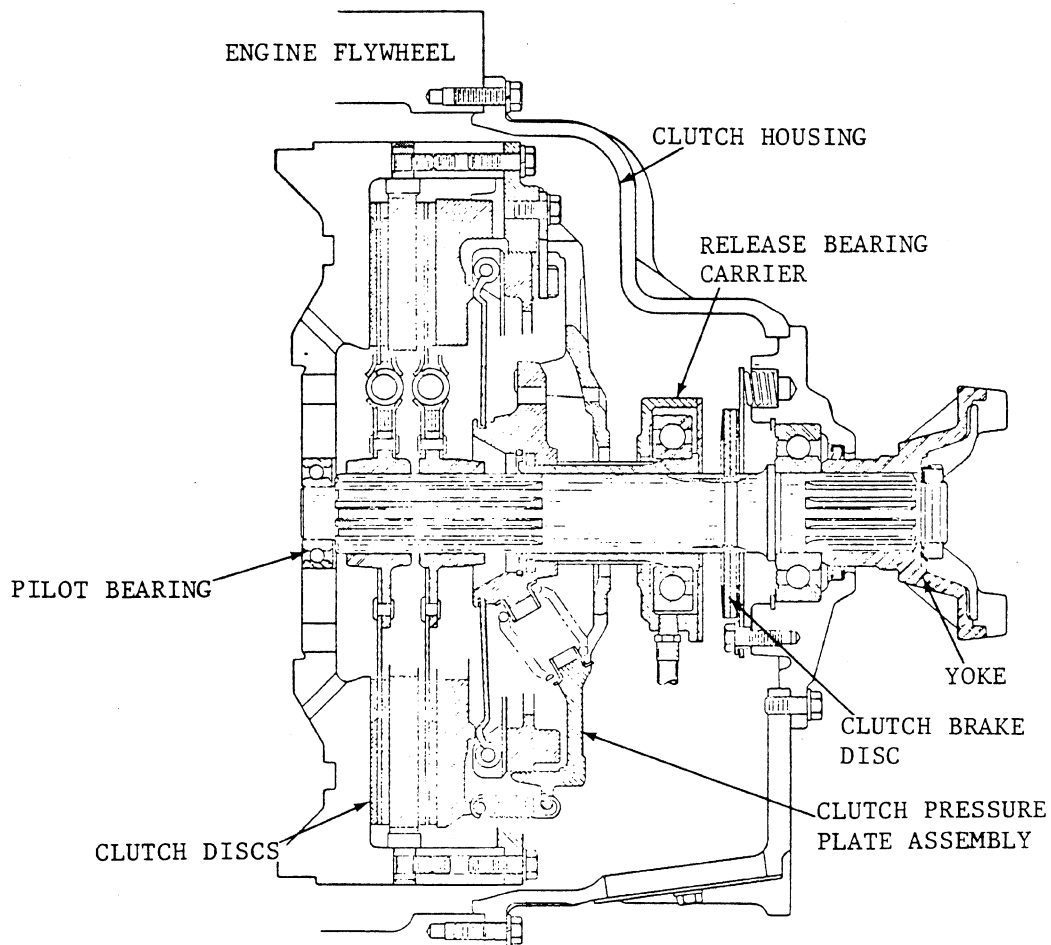
1 3/4 x 10 Spline Spring loaded cushion hub discs.

Metal Pad Linings

Shaft and release bearing are both greaseable.

Foot operated with mechanical linkage.

Integral disc type transmission brake with spring loaded backing plate.



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