International Harvester

Service Manual

Cable Control Units Used on TD15B, TD20B, TD25B & TD30B Crawlers

Service Manual

IH-S-CABLE CTL

CABLE CONTROL UNITS

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When requesting information or ordering parts for your cable control unit, always state the model and serial number shown on the name plate.

NOTES

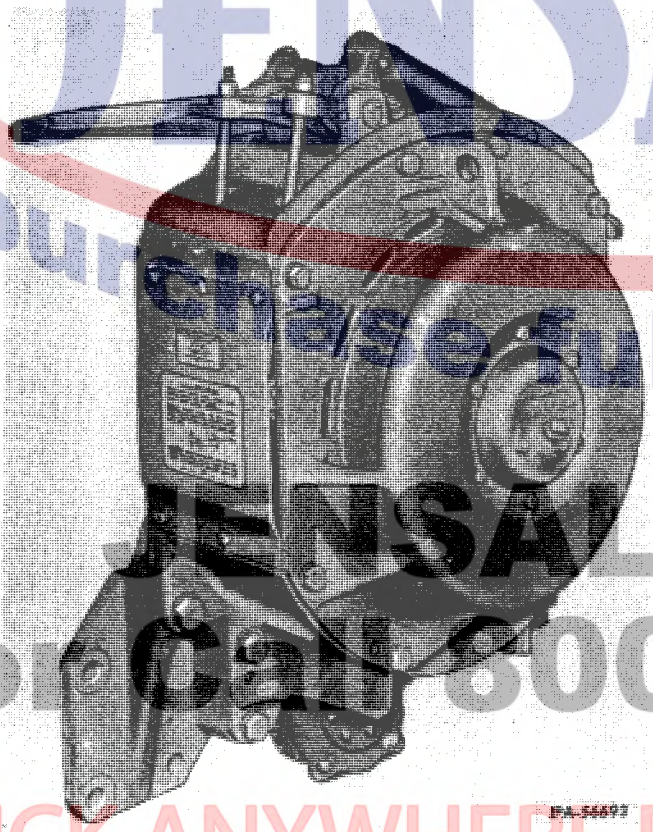
1. DESCRIPTION

The Model 160 is a front mounted single drum cable control unit of the planetary gear driven type designed for use with the International TD-25 SERIES B and TD-30 crawler tractors to operate cable bullgraders and bulldozers.

Basically it consists of a gear case which carries a clutch drum, brake drum, cable drum and an operating lever bracket that supports the control levers and linkage.

The unit is powered by the tractor front power take-off through a pinion gear that drives the mainshaft gear. The mainshaft carries the sun gear of the planetary mechanism. The entire planetary mechanism operates in an oil bath for cool operation and long life.

The cable drum movement is controlled by friction brake bands on both the clutch drum and brake drum. Simple external adjustments are provided for these brakes.



Illust. 1
Model 160 Cable Control Unit (Front View).

Illust. 2
Model 160 Cable Control Unit (Rear View).

BEARINGS: Heavy-duty single-row ball bearings support the mainshaft and pinion shaft. The clutch drum, brake drum and cable drum rotate on four heavy-duty single-row ball bearings.

The planet gears rotate on straight roller bearings. All bearings are lubricated by oil in the gear case.

OIL SEALS: Four garter type oil seals effectively seal the drum and gear case against oil leakage and dirt infiltration.

DRUMS: The clutch and cable drums are cast with large air-cooled surfaces. These drums enclose the planetary gear system.

(Continued on next page.)

1. DESCRIPTION - Continued

CONTROLS: An adjustable operating lever is rigidly supported by two needle bearings. The hand lever is adjustable radially to suit the operator's reach. The operating lever linkage is supported and rotates on needle bearings for easy operation. When the clutch is engaged to spool in the cable, an automatic interlocking feature releases the brake by force generated at the clutch band dead end. This is so designed that the cable control unit will not drop its load as the clutch is being engaged, whether the engagement is quick or gradual.

Operating Principle

The planetary system consists of a sun gear, four planet gears and an internal ring gear. The sun gear is splined to the drive shaft and meshes with the four planet gears. The planet gears are installed on pins in the cable drum and mesh with the internal teeth of the ring gear which is bolted inside the clutch housing.

SPOOLING: The sun gear rotates whenever the tractor engine is running. When the clutch band is applied to the clutch housing, the housing and ring gear cannot rotate. The stationary ring gear forces the four planet gears to travel around the inside of the ring gear and drive the cable drum in the spooling direction.

HOLDING: When the brake band is applied to the brake housing, it holds the cable drum firmly and keeps the loaded cable taut. The planet gears spin on their own axis and cause the ring gear and clutch housing to rotate since the clutch band is loose at this time.

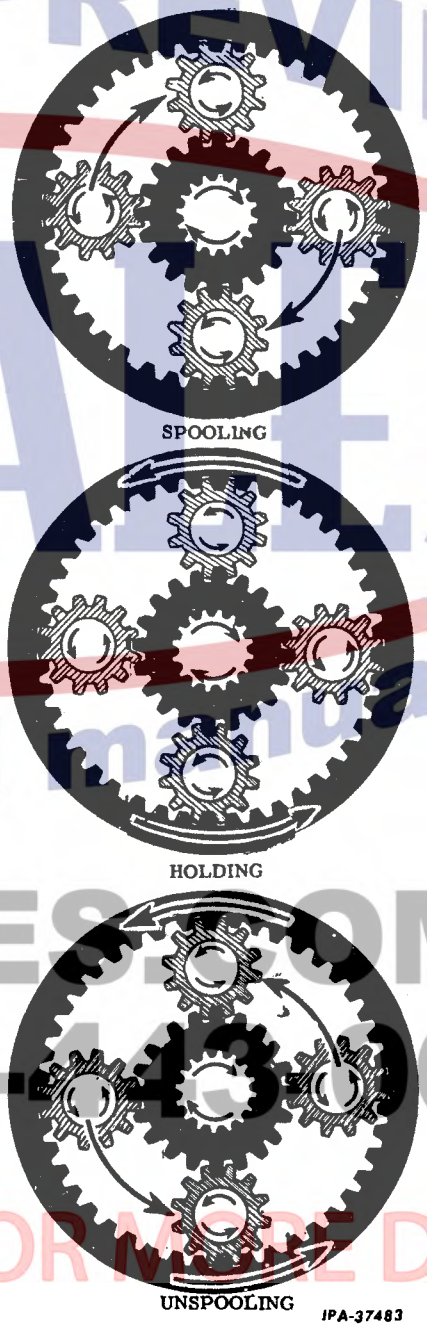
UNSPOOLING: When both bands are released from the drums, the planet gears and cable drum rotate in the unspooling direction. The ring gear with the clutch housing also rotates in the same direction, but at a faster rate than when holding, and the sun gear continues to turn on its axis in the opposite direction.

BRAKE AND CLUTCH BAND OPERATION: The planetary-type control unit clutch is engaged by means of an external contracting band operating on a drum which is bolted to the ring gear. The brake band, which is interchangeable with the lower clutch band, operates on a drum attached directly to the cable drum.

Engaging the clutch tightens its band on the drum and, at the same time, the clutch band dead end forces the brake release lever to rotate. The lug on the brake release lever pushes against lug on the brake lever causing the brake lever to overcome the brake holding spring and release the brake band.

The brake band is held tight on its drum by the brake holding spring when the control lever is in the hold position.

Releasing the brake to unspool the cable is accomplished by moving the long lever at the rear of the control unit (clutch lever) toward the center of the control unit. This causes the lug on the clutch lever to contact the lug on the brake lever, rotating the brake lever so as to release the brake band.



Illust. 3
Principle of Operation.

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There are no bearing adjustments. Positioning of bearings and drums is maintained by spacers on the mainshaft. The spacers, bearings and sun gear are secured by castellated nuts at each end of the mainshaft. The nuts are locked by cotter pins.

A shoulder on the rear of the sun gear spline serves as a basis for the location of all parts mounted on the mainshaft. The entire mainshaft assembly is prevented from end movement by a snap ring around the outer race of the mainshaft rear bearing.

Heavy construction plus doweling of the gear case, outboard bearing bracket, operating lever bracket and cable drum cover, maintain the alignment of the front and rear main shaft bearings.

2. SPECIFICATIONS

Type of drive	Planetary
CABLE DRUM:	
Number	1
Length, inches	2-15/16
Diameter, inches	10
Flange diameter, inches	15
Cable required, feet (1/2 inch, 6 x 25 wire rope core)	100
Front bearing bore diameter, inches	4.7239 - 4.7250
Wear sleeve surface outside diameter, inches	5.739 - 5.749
FRICTION BANDS:	
Clutch	1
Brake	1
Type	Enclosed external contracting
Diameter, inches	18
Friction area per band, square inches	160
Material	Bi-metallic and woven
GEAR CASE:	
Mainshaft rear bearing bore diameter, inches	3.1493 - 3.1502
Gear case pinion oil seal bore diameter, inches	2.874 - 2.876
Gear case pinion shaft outer bearing bore diameter, inches	3.9365 - 3.9376
Idler gear shaft bore diameter, inches	1.0005 - 1.0015
Pump drive gear bearing bore diameter, inches	2.4409 - 2.4416
GEAR CASE COVER:	
Gear case cover oil seal bore diameter, inches	6.998 - 7.002
Gear case pinion shaft inner bearing bore diameter, inches	3.1493 - 3.1502
Idler gear shaft bore diameter, inches	1.751 - 1.753
Pump drive gear bearing bore diameter, inches	2.4409 - 2.4416
PLANETARY HOUSING:	
Gear case cover wear sleeve surface outside diameter, inches	5.739 - 5.749
Rear bearing bores diameter, inches	3.9365 - 3.9376
Bearing spacer bore diameter, inches	3.560 - 3.580
Ring gear bore diameter, inches	9.187 - 9.197
Oil seal bore diameter, inches	11.373 - 11.377

(Continued on next page.)

4. BRAKE AND CLUTCH BAND REPLACEMENT - Continued

3. Install the cable. Refer to Par. 10, "CABLE."

4. Make adjustments as necessary. Refer to operator's manual for procedure.

5. Install the radiator guard grille doors.

5. REMOVAL

The cable control unit can be removed with the cable wound on the drum, or removed from the drum.

1. Stop the engine and lower the blade to the ground.

CAUTION: Always stop the engine when removing or installing the cable on the drum.

2. The control lever must be held in the "UNSPOOL" position (both bands released). Only in this position is the cable drum free to turn in either direction.

3. Free the dead end of the cable from the upper sheave block.

4. Wind the cable onto the drum. Secure the loose end of the cable with wire.

NOTE: If desired, the cable may be wound on a cable spool. Wind the cable on the spool until the live end of the cable can be freed from the wedge on the cable drum. Wind the rest of the cable on the cable spool.

5. Remove the radiator guard grille door.

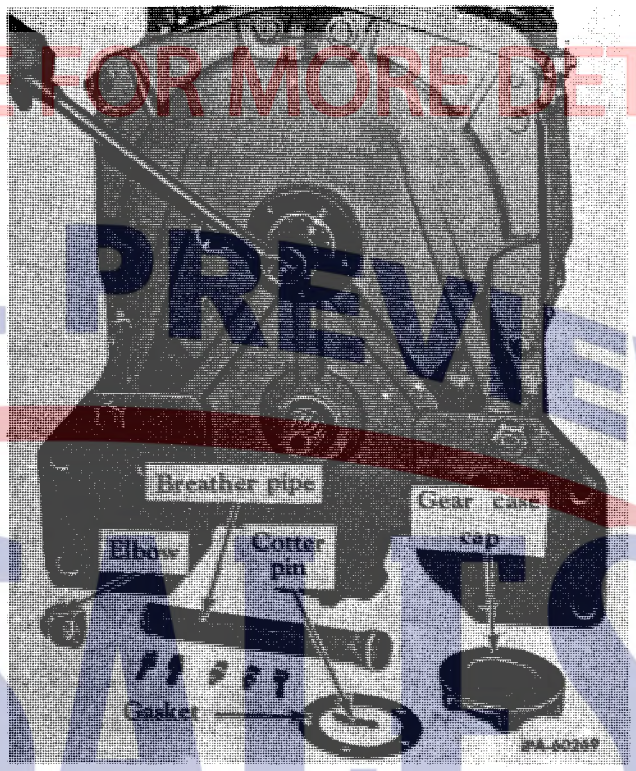
6. Disconnect the control link from the clutch lever located at the top of the cable control unit by removing the nut and cap screw.

7. Attach a hoist to the control unit and remove the cap screws securing the unit to the front support frame. Lift the control unit out of the radiator guard.

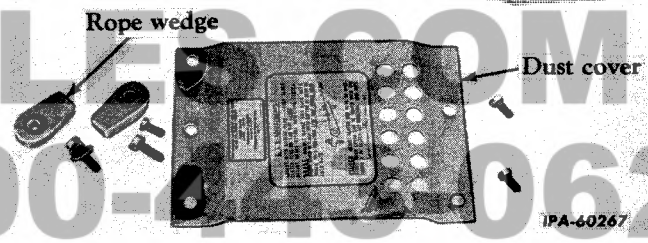
8. As the unit is being lifted out of the radiator guard, the main shaft will slip out of the fitting yoke.

9. Remove the drain plug and drain the lubricating oil from the unit.

10. Clean the drain plug and, when the oil has drained, install the plug.



Illust. 4
Removing Mainshaft Rear Nut.



Illust. 5
Removing Dust Covers.

6. DISASSEMBLY

1. With the unit in an upright position, remove the breather pipe and breather pipe elbow.

2. Remove the gear case cap.

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