

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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AT&T Co Standard

TRUCK CAB CONTROL LEVERS

IDENTIFICATION BY COLOR CODE

OPERATION

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1. GENERAL

1.01 This practice describes a color code designed to facilitate positive identification of truck cab control levers which may be found on trucks equipped with auxiliary power equipment. The practice also outlines procedures which may be helpful in the operation of the levers.

1.02 The levers are painted different colors in accordance with a standard color code. The color and a description of the work of the corresponding lever is as shown in the following figure. All, or the appropriate part, of the following general markings are shown on the instrument panel of the truck by means of printed tapes.

P-333	CAB CONTROL LEVERS For Operation See BSP- G91. 300.1
P-334	BLACK - Truck Trans., Parking Brake & Axle RED - Winch Clutch & Brake YELLOW - Winch Power Take-Off
P-335	WHITE - Hydraulic Pump Power Take-Off ALUMINUM - Derrick Remote Control
P-336	GREEN - Front Wheel Disconnect ORANGE - Transfer Case
P-337	BLUE - Winch Drum Selector PINK - Digger Gear Box RUBBER - Winch Forward & Reverse

1.03 There are certain fundamentals which should be observed in the further and positive identification and operation of the levers and equipment, as discussed in the following paragraphs.

1.04 The truck clutch is a cushioning connection between the truck engine and the truck wheels or auxiliary equipment. It is used to start the load and to rotate or stop the gears. Excessive slipping of the clutch should be avoided, but it should always be engaged slowly so that some slippage occurs to cushion the starting of any load or gears.

1.05 Most of the power equipment is driven by square-tooth gears, and a slight rotation of the driving gear will often facilitate shifting the gears. This is accomplished by partially engaging the clutch and disengaging it just before shifting the gears.

1.06 The gears of auxiliary power drives are generally locked in position by a spring loaded detent. This develops additional drag on the shifting mechanism at the position where the gears are properly engaged. For proper shifting, the operator should become accustomed to feeling for these detent positions in the shifting mechanism.

1.07 To identify a lever and to determine how it should operate, reference should be made to the shifting charts and the color code shown in this practice and to any available manufacturers shifting charts for unusual or different shifts.

1.08 If a lever can not be identified from the charts, its operation may be analyzed by test procedure, either with or without the engine running. Some of the tests must be made with the engine running.

1.09 If a test is to be made without the engine running, the lever may be moved by the operator while another individual observes from around or under the truck, what movement of controls is taking place.

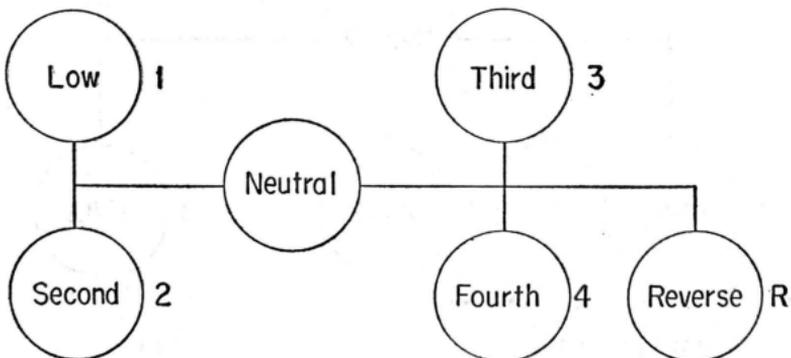
1.10 If the test must be made with the engine running, the engine should be at an idling speed and the truck clutch pedal should be fully depressed. The control lever should be moved in to an operating position or a light pressure held on it in the direction of an operating position. The clutch pedal should be let up very slowly and the clutch only partially engaged and then quickly disengaged. Carefully observe the various parts of the equipment for a slight movement and listen for gear noises. The lever can be identified by a very small movement of the operated equipment, and the possibility of damage to the equipment is much less with a small movement at slow speed and little applied power than with greater movement at a higher speed.

2. BLACK—TRUCK TRANSMISSION, PARKING BRAKE AND AXLE

Transmission

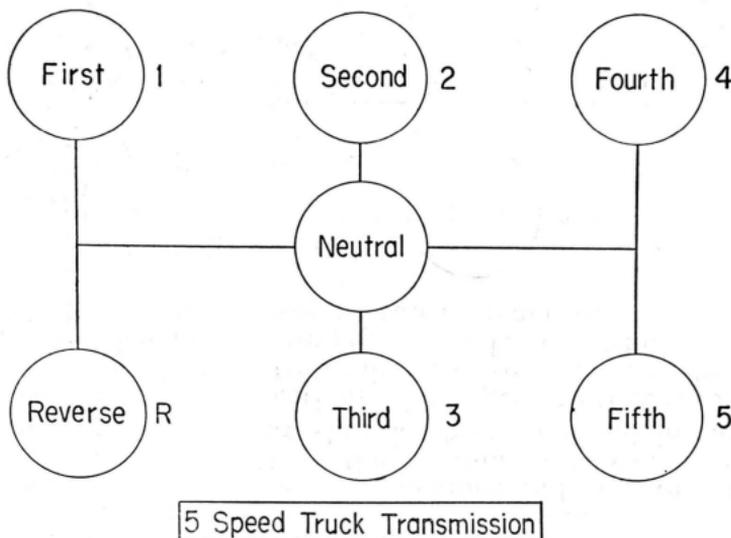
2.01 There are two types of truck transmissions in general use in winch equipped trucks, the four speed and the five speed. Quite often the gear positions will be shown in the cab on a chart furnished by the manufacturer which may be cut in the top of the gear shift knob or mounted in the cab.

2.02 In general, the positions of the gear shift lever for the four speed truck transmissions are as shown: Some of the gear shift levers are equipped with latches which must be released before certain positions can be reached.



4 Speed Truck Transmission

2.03 In general, the positions of the gear shift lever for the five speed transmissions are located as shown:



2.04 If no indication of the type of transmission is evident, it will be necessary to determine the positions by test. First without the engine running, determine the total number of gear positions by moving the gear shift lever as much as possible in all directions. For some of the gear positions the lever may not move into the fully engaged position due to the teeth of the gears not being in the proper position to engage.

2.05 After the total number of positions has been determined, refer to the charts in Paragraph 2.02 or 2.03 for the probable sequence of the gears.

2.06 Start the engine and let it run at idling speed, hold the truck with the foot brake lightly applied and release the parking brake. Check the positions as outlined in Paragraph 1.10. The higher speed gear positions can be identified from the lower ones by the fact that at the higher speeds the truck will either start out rapidly or the engine will stall due to insufficient power. Reverse can be identified by the direction of movement.

Parking Brake

2.07 There are only two correct operating positions of the parking brake, fully applied or fully released. This brake should not be applied when the truck is in motion, except in an emergency.

2.08 Whenever the truck is to be driven this brake should be in the fully-released position which is usually a motion forward or away from the driver.

2.09 Whenever the truck is to be parked the brake should be fully applied after the vehicle has come to a complete stop and, the transmission placed in low or reverse gear if this is in keeping with local practice. In addition, if the truck is on a grade the front wheels should be turned sharply toward the side of the thoroughfare on which the truck is parked. If there is need for greater security on a grade wheel chocks should also be used to prevent movement of the truck.

2.10 If there is any question of the holding condition of the parking brake, it should be tested by attempting to move the truck on level ground with the brake fully applied, the engine at a fast idle, the transmission in third gear and normal operation of the clutch. With proper adjustment of the brake, the engine should stall.

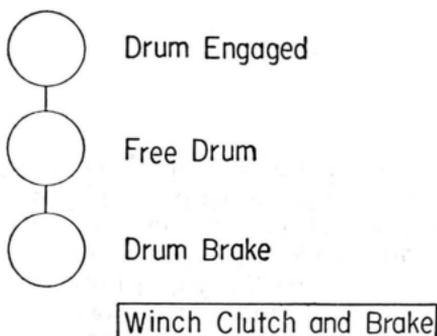
Two-Speed Axle

2.11 Some trucks are equipped with two-speed rear axles resulting in two complete speed ranges for a truck. The higher speed range is advantageous for use when the truck is being operated on improved highways and where only slight grades are encountered. The lower speed range is advantageous for off-the-road operation and where additional truck ability is required due to soft ground, steep grades, or heavy loads. Consideration of the various factors involved at any particular time will usually indicate which speed range should be used.

2.12 Two-speed axles are usually shifted by means of cable controls connected to small knobs located on the instrument panel, on the steering column or on the gear shift lever. Since the proper method of shifting will depend on the particular type of axle, the instructions in the operating manual furnished with the truck should be studied. The manual will also show the preferred upshift and downshift combinations of transmission and axle speeds to meet various conditions.

3. RED—WINCH CLUTCH AND BRAKE

3.01 This lever controls the main drum of the winch as shown:



3.02 This control will lock into the Drum Engaged (forward) position and into the Free Drum (midway) position. Pressure must be held on the lever to apply the brake (rear position).

3.03 This control lever should be moved to the Free Drum position only when required to pay off a considerable amount of line under no load or when the power reel is used with a single-drum winch. The drum brake position is used only to prevent overrunning of the drum when paying out line. **It should never be used to hold a load.**

3.04 At all other times the drum should be engaged to the winch shaft. This engagement is accomplished by pushing the lever forward and holding pressure against it while a few feet of line are pulled off if necessary. The clutch should engage with a characteristic click and may be visually inspected for full engagement. Before an attempt is made to raise a load with the winch line the full engagement of the clutch should be verified.

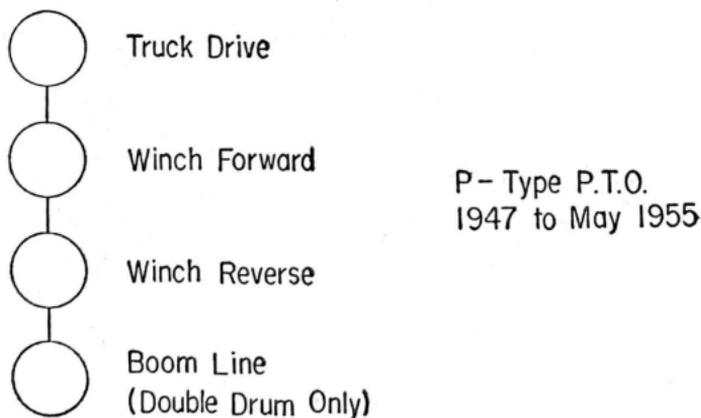
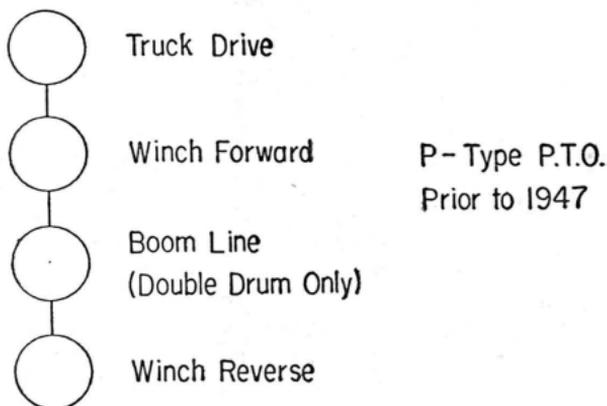
4. YELLOW—WINCH POWER TAKE-OFF

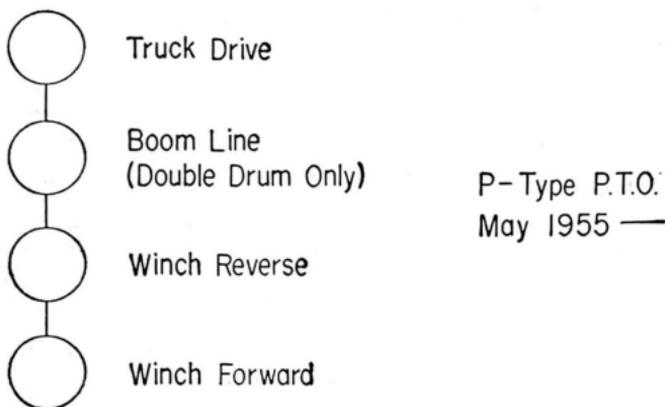
4.01 The operating positions of this lever will depend on the type and also the model of the power take-off used.

4.02 There are three general types of power take-offs, the split-shaft type, the SAE side-opening type and the transfer case type. The transfer case type is found only on trucks which drive with all four wheels.

4.03 The split-shaft type, such as the P for a single drum winch or the P2 for a double drum winch, is installed in the propeller shaft drive line of the truck and has all speeds of the truck transmission available for the winch. This is a heavy duty power take-off capable of delivering to the winch the full torque of the engine even when multiplied by the gear reduction of the truck transmission. This power take-off requires shifting the truck transmission into gear. Since there is a reverse drive for the main winch drum built into this type of power take-off, all of the transmission speeds including reverse are available for driving the drum in either direction. The truck and winch can not be driven at the same time.

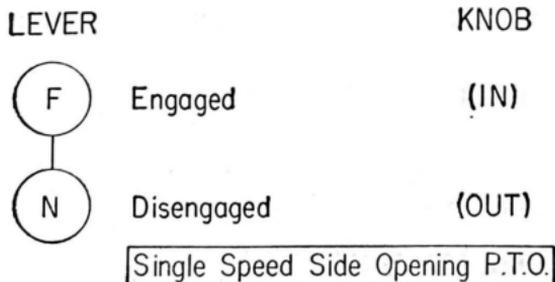
4.04 There are three models of the split shaft take-offs in common use and the shifting diagrams for these models are as shown:

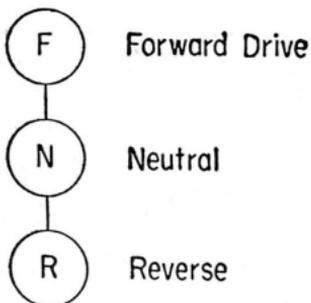




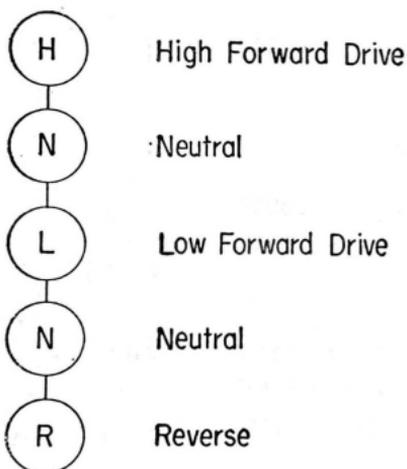
4.05 The side-opening type power take-off is mounted on the side of the truck transmission and has available, for the auxiliary equipment, only the speeds that are built into the power take-off. This is usually one speed forward, or one speed forward and reverse, or two speeds forward and one reverse. The side opening take-off is a limited duty power take-off and is not designed to deliver more than 140-foot pounds of torque or about 25 horsepower at 1000 rpm of the engine. This is only about enough pull to break a 1/4-inch line (5000 pounds) on a full drum or a 3/8-inch winch line (12,000 pounds) on an empty drum. This type power take-off requires that the transmission be shifted into neutral. The truck and the winch or auxiliary equipment can be run at the same time if the truck transmission is in a gear.

4.06 The shifting positions of the side opening power take-offs will depend on type of truck transmission. The following charts show arrangements commonly used, however, for some installations this sequence of positions may be found by test to be in reverse order. (See Paragraph 1.10.)





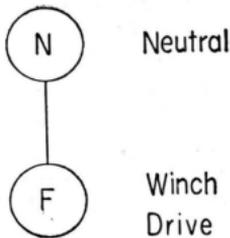
One Speed Forward & Reverse Side Opening P.T.O.



Two Speed Forward & Reverse Side Opening P.T.O.

4.07 The transfer case type power take-off is usually a heavy duty type and has available, for the auxiliary equipment, all of the speeds of the truck transmission. This type power take-off requires shifting the truck transmission into gear and the transfer case into neutral. (See Part 8.) Winch reverse is obtained by the use of reverse in the truck transmission. The truck and the auxiliary equipment will be driven at the same time if the transfer case is not shifted to neutral.

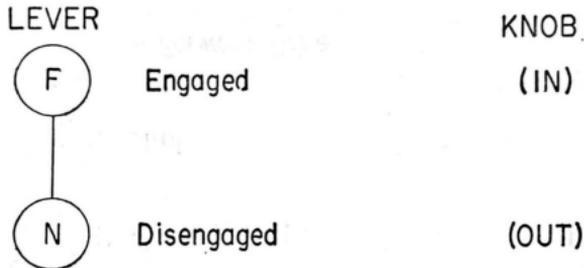
4.08 The following charts show the usual shifting positions for the transfer case type power take-off.



Transfer Case Power Take - off.

5. WHITE—HYDRAULIC PUMP POWER TAKE-OFF

5.01 The hydraulic pump is usually driven by a single speed side-opening power take-off. (See Paragraphs 4.05 and 4.06.)

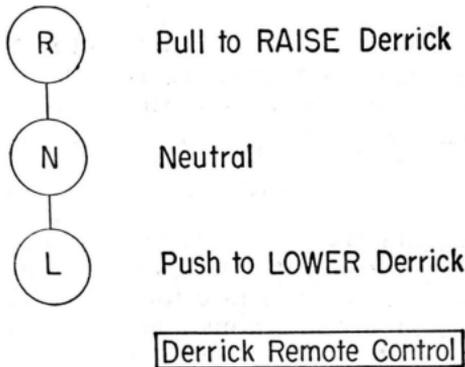


Hydraulic Pump Power Take - off

6. ALUMINUM—HP DERRICK REMOTE CONTROL

- 6.01 This is a small lever painted aluminum usually located on the forward wall of the cab or under the dash.
- 6.02 This lever actuates a vacuum valve which operates the hydraulic valve to change the working position of the boom of the hydraulic power derrick.
- 6.03 Since this control operates the hydraulic valve rather quickly, it is desirable to slip the truck clutch so that the hydraulic pump furnishes only a limited amount of oil, particularly when a small movement of the derrick is required.

6.04 The operating positions of this lever, when mounted on the forward wall of the cab, are as shown. The lever is spring loaded to return to neutral. Its operating positions are the same as the lever on the hydraulic valve which it controls.

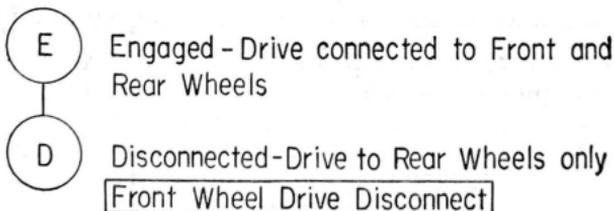


7. GREEN—FRONT WHEEL DISCONNECT (4 x 4 CHASSIS)

7.01 This green lever is found only on trucks which drive with all four wheels. It disconnects or connects the drive to the front wheels. It can usually be operated into the engaged position only when the transfer case is in the low range. (See Part 8.)

7.02 Except in soft ground or other conditions of poor traction where the drive on the front wheels is required, this lever should be in the "disconnect" position. On all but the heavy duty trucks excessive tire wear and axle breakage will be caused by operating the truck on firm dry surfaces or paved highways with the front wheels engaged.

7.03 The operating positions of this lever are usually as shown:

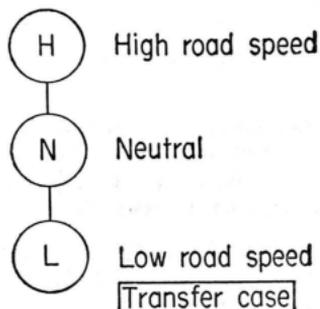


8. ORANGE—TRANSFER CASE (4 x 4 CHASSIS)

8.01 This lever is found only on trucks which drive with all four wheels. It shifts the gears in an auxiliary gear case that is required to connect the power from the truck transmission to the propeller shafts driving the front and the rear axles. This case usually contains two driving gear ratios and a neutral.

8.02 When auxiliary equipment is driven by a power take-off on the transfer case, this lever must be in neutral if it is not desired to move the truck. (See Paragraphs 4.07 and 4.08.) The truck and auxiliary equipment may be driven at the same time by shifting this lever to a road speed.

8.03 The operating positions of this lever are usually as shown:

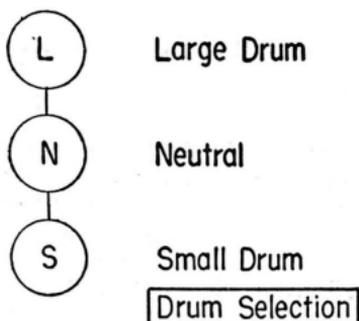


8.04 In general the truck should not be operated in low speed of the transmission and low speed of the transfer case with the drive to the front wheels disconnected since this will deliver excessive torque to the rear axle and cause axle failure.

9. BLUE—WINCH DRUM SELECTOR

9.01 There are some installations where a double-drum winch is driven by a side-opening power take-off. For these installations a lever control is required to shift the drive from one drum to the other.

9.02 The positions for this control lever are usually as shown:

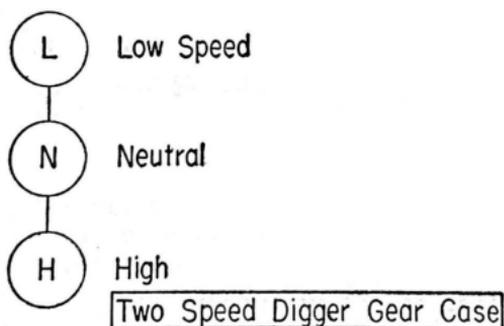


10. PINK—DIGGER GEAR CASE

10.01 Some of the mechanically-driven digger installations use a two-speed gear box in the digger drive line. This case also has a neutral position.

10.02 The low speed is generally used for digging and the high speed for spinning the auger to remove the spoil.

10.03 The operating positions of this control lever are usually as shown:



11. RUBBER GRIP—WINCH FORWARD AND REVERSE

11.01 This is a relatively long lever with a rubber grip usually found only on trucks equipped with a mechanically driven digger.

11.02 The lever operates two friction clutches in a gear box which provides a forward, reverse and neutral for the winch drive.

11.03 This is a limited duty drive for a winch and is designed to deliver about the same amount of power as the side-opening power take-off with which it is used. (See Paragraph 4.05.)

11.04 Since this control operates friction clutches, similar to, but smaller than the truck clutch, excessive slipping should be avoided. The clutches should be locked into full engagement for all operations except momentarily while the cushion of a slipping clutch is required.

11.05 The operating positions of this lever are usually as shown when the power take-off lever is shifted into the proper position for operating the digger. When the power take-off is shifted to a speed in the opposite direction the positions of this lever are reversed.

