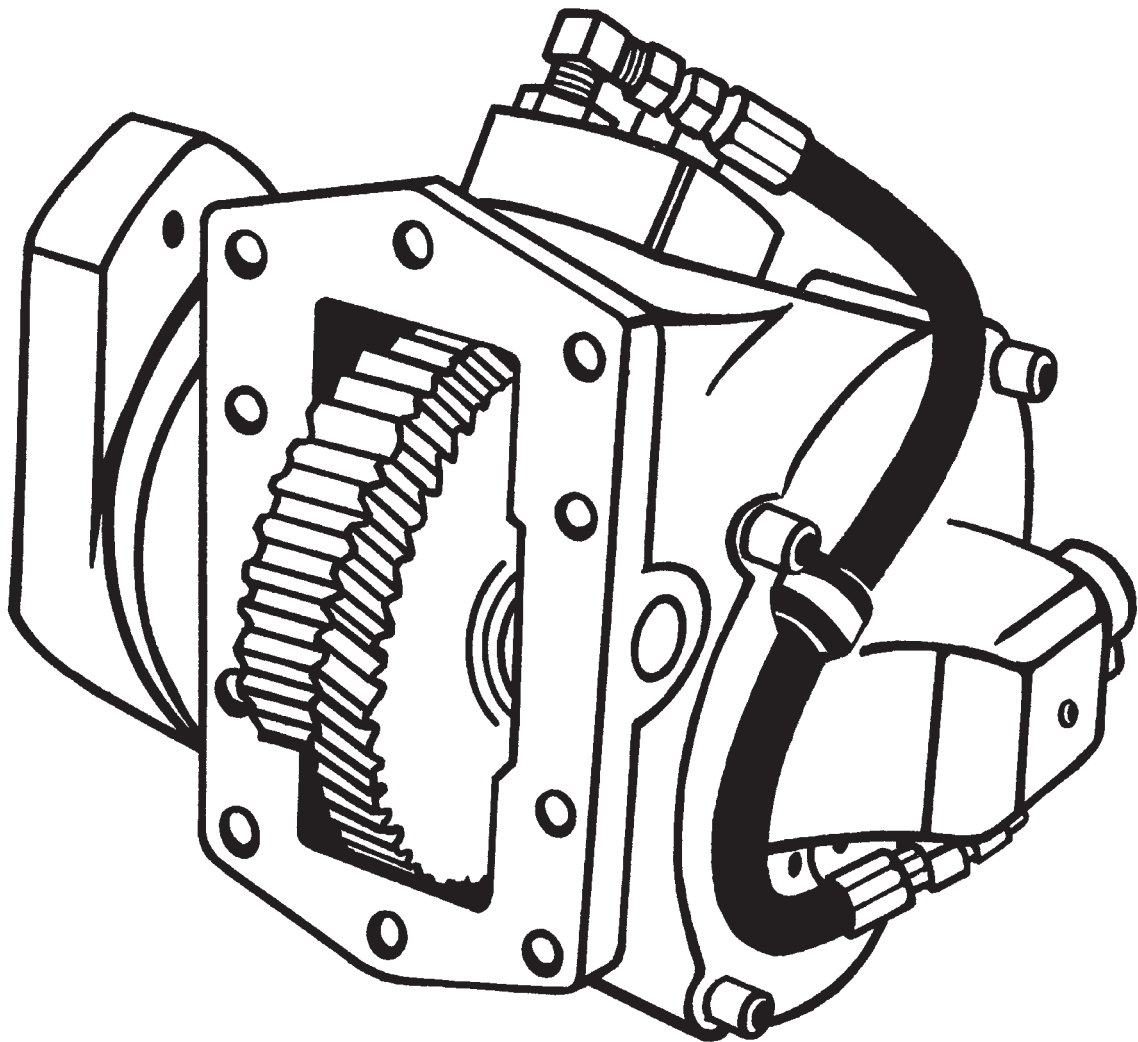




**CS10 & CS11 SERIES**  
**CLUTCH SHIFT PTO**  
PARTS LIST AND SERVICE MANUAL

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*U.S. Pat. 5,542,306*

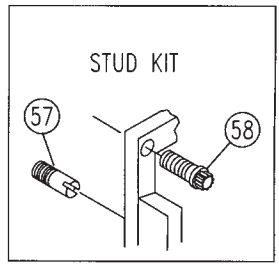
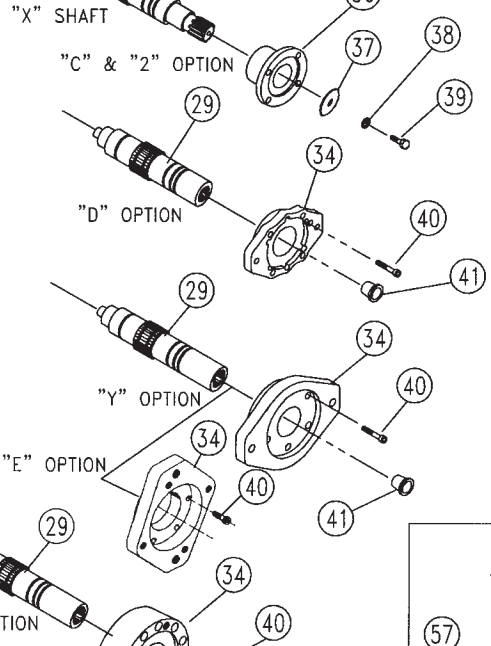
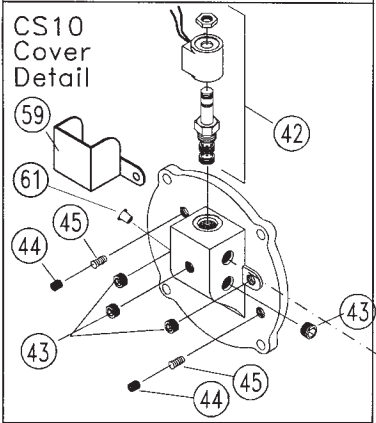
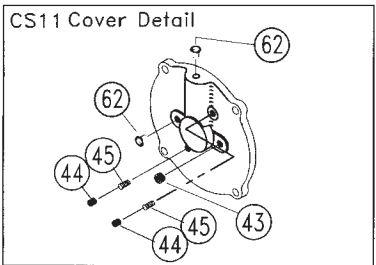
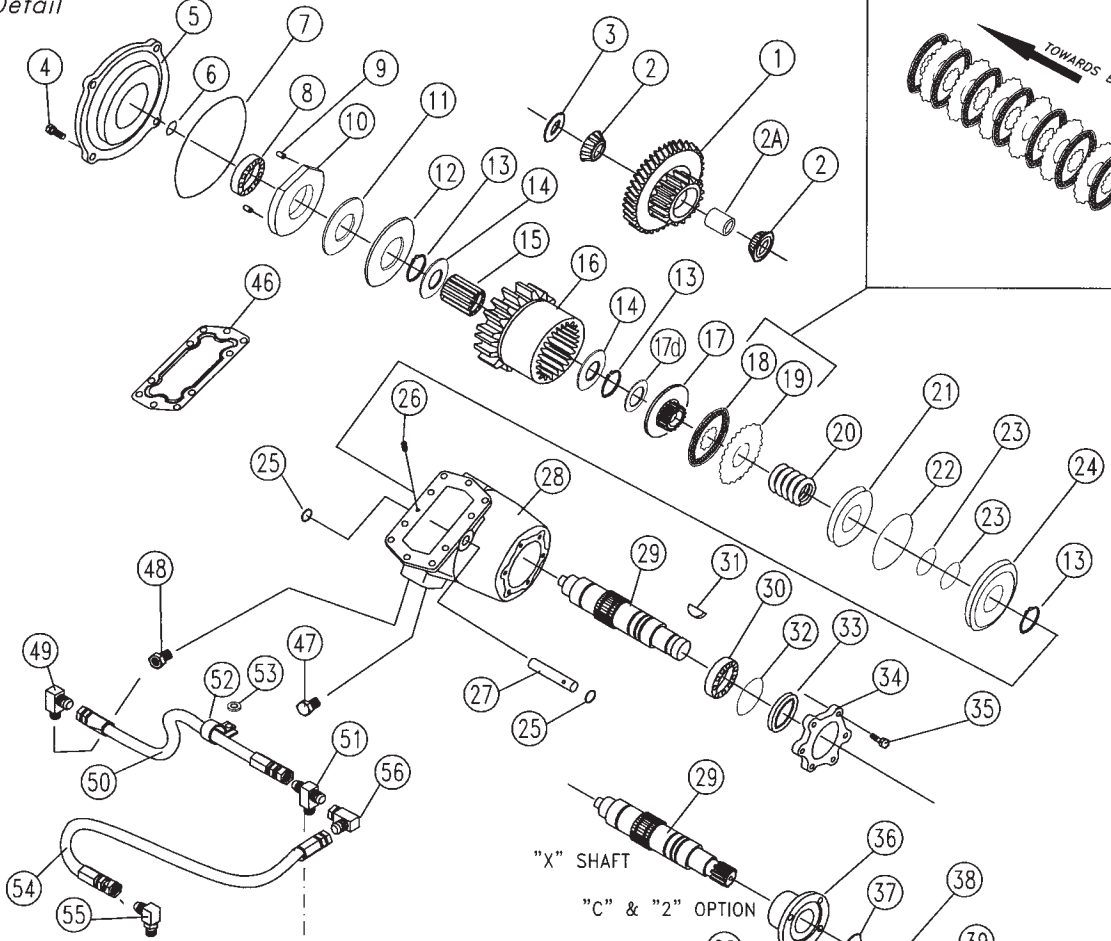
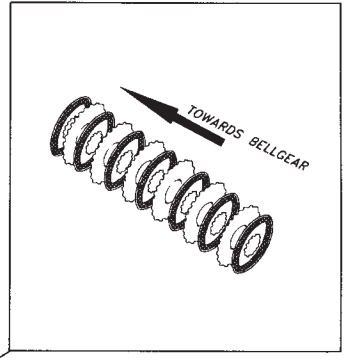
FOR THE ALLISON WORLD TRANSMISSION

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Muncie Power Products, Inc.

# CS10 & CS11 SERIES CLUTCH SHIFT PTO EXPLODED VIEW

See Cover  
Detail



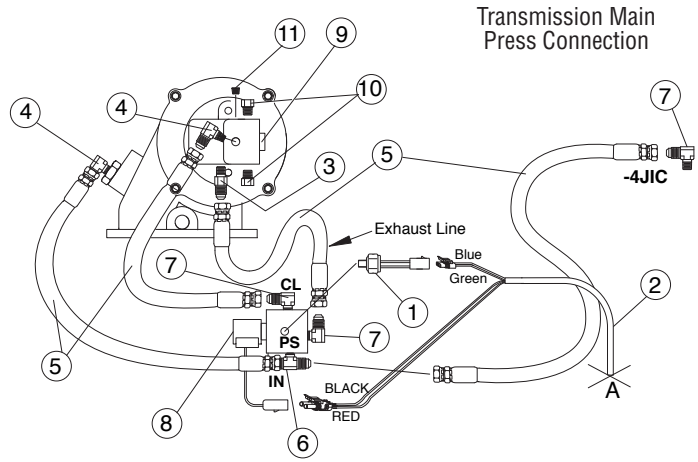
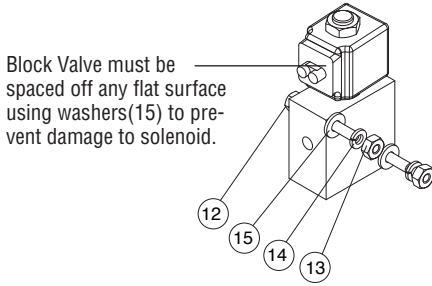
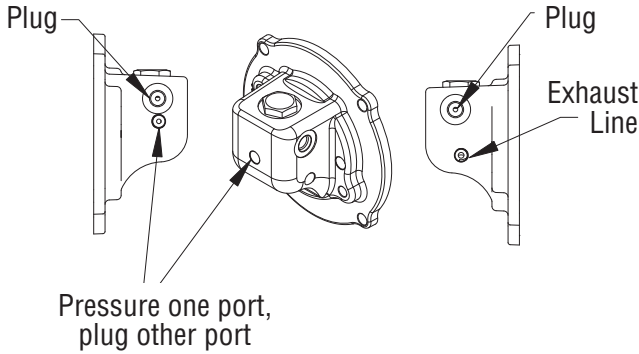
# PARTS LIST AND DESCRIPTION

ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	03T36214	Input Gear (05) (50T/27T) <i>(See Table A for additional gears)</i>	34	<i>continued</i>	14T40576	Hyd Flange ("E" Only)
2	2	10T35776	Input Bearing			14T36007	Hyd Flange ("Y" Only)
2a	1	18T38748	Cone Spacer( 0.743/0.741) <i>(See Table B for additional spacers)</i>			14T36834	Hyd Flange ("I" Only)
3	1	18T35783	Bearing Shim <i>(See Table C for additional shims)</i>			14T37474	Hyd Flange ("S" Only)
4	4	19T39418	Capscrew "C", "D", "2"	35	6	19T39417	Capscrew ("B", "C", "X", "2")
5	1	15T36206	Bearing Cover, Closed (CS10)	36	1	14T31499	Companion Flange ("C" Only)
		15T37970	Bear. Cov. w/o Valve Prov. (CS11)			14T37498	Companion Flange ("2" Only)
6	1	12T36081	O-Ring	37	1	21T20092	Washer ("C", "2" Only)
7	1	12T36207	O-Ring	38	1	21T20526	Lock Washer ("C", "2" Only, If Req.)
8	1	10T35994	Bearing	39	1	19T20522	Capscrew ("C" Only) (CS11)
9	2	26T36175	Roll Pin (CS10)			19T38266	Capscrew ("X", "2" Only) (CS11)
10	1	21T36170	Drag Brake Plate (CS10)	40	6	19T39257	Socket Capscrew "D", "P", "S", "Z" Hyd
11	1	21T36172	Bronze Brake Disc (CS10)			19T35386	Socket Capscrew "I" Hyd
12	1	21T36171	Drag Brake Rotor (CS10)			19T31577	Socket Capscrew "E", "Y" Hyd (CS10/11)
13	3	24T36040	Snap Ring	41	1	25T35724	Cap Plug "D", "S" (Storage Only)
14	2	10T35989	Thrust Race			25T35936	Cap Plug "E", "I", "Y", "Z" (Storage Only)
15	1	10T35991	Bearing			25T35725	Cap Plug "P" (Storage Only)
16	1	02T36219	Bell Gear (05) (47T)	42	1	35T36092	Solenoid (12 Volt)
		02T36220	Bell Gear (06) (45T)			35T36447A	Solenoid (24 Volt)
		02T36221	Bell Gear (07) (43T)	43	4	25T21684	Pipe Plug
		02T36222	Bell Gear (08) (40T)	44	2	19T36174	Set Screw
		02T36223	Bell Gear (10) (38T)	45	2	27T36173	Spring
17	1	02T36113	Clutch Hub (Before 4/99)	46	1	13T35777	Gasket
	1	49TA4136	Clutch Hub Assembly (4/99) <i>(Includes: 17a,17b,17c) (See Pg 8)</i>	47	1	25T35999	Plug
17a	1	49T37920	Clutch Hub (4/99)	48	1	25T35784	Orifice
17b	1	49T37921	Clutch Flange (4/99)	49	1	43T35867	Elbow
17c	1	24T37951	Snap Ring (4/99)	50	1	45T35865	Hose
17d	1	10T37930	Thrust Washer (4/99) <i>(Used w/49TA4136 Only)</i>	51	1	43T36231	Tea
18	7	49T33564	Friction Disc	52	1	49T36283	Hose Clamp
19	11	49T40641	Spacer Disc (Before 4/99)	53	1	21T36448	Washer
	6	49T40641	Spacer Disc (4/99)			<b>43TK3881</b>	<b>Standard Hose Kit</b>
20	1	27T36112	Spring			<b>43TK3885</b>	<b>HD For R.S. Installation</b>
21	1	49T36114	Piston	54	1	45T36274	Hose (Std 28")
22	1	12T36054	O-Ring			45T36273	Hose (HD R.S. 57")
23	2	12T36053	O-Ring	55	1	43M68014	Elbow
24	1	49T36115	Piston Cup	56	1	43T36445	Elbow (use as needed)
25	2	12T35774	O-Ring			<b>20MK1001</b>	<b>Mounting Bolt Kit (Incl. 57, 58)</b>
26	1	19T35785	Set Screw	57	2	20T35779	Alignment Stud
27	1	07T35780	Idler Shaft	58	8	19T35778	12 Pt. Capscrew (30mm)
28	1	01T36204	Housing (1 Arrangement)	59	1	49T36493	Protector
		01T36202	Housing (3 Arrangement)	60	1	35T37928	Remote Mount Valve Ass'y (CS11) <i>(See Page 6)</i>
<i>Output Shafts (OS) were changed 4/99 to accommodate the two-piece clutch hub (17). When replacing shaft in PTO prior to 4/99, clutch hub assembly (17) and washer (17d) must be added to required parts.</i>				61	1	25T34029	Caplug
29	1	06T37932	OS "B" replaces 06T36039	62	2	25T34029	Caplug (CS11)
		06T37933	OS "C", "2", "X" replaces 06T36072	N.S.	1	<b>48TK4037</b>	<b>Installation Kit (12v)</b> Incl: Shift Kit, Gasket Pack, Stud Kit, Std. Hose Kit
		06T37934	OS "D", "S" replaces 06T36073			<b>48TK4039</b>	<b>Installation Kit (24v)</b> Incl: Shift Kit, Gasket Pack, Stud Kit, Std. Hose Kit
		06T37935	OS "E", "Y", "Z" replaces 06T36074	N.S.	1	<b>CS10-GSK</b>	<b>Gasket Kit</b> Incl: (1)6, (1)7, (1)22, (2)23, (2)25, (1)32, (1)33, (1)46
		06T37936	OS "I" replaces 06T36832	N.S.	1	<b>CS10-RBK</b>	<b>Rebuild Kit</b> Incl: (2)2, (1)3, (1)6, (1)7, (1)8, (2)9, (1)11, (3)13, (2)14, (1)15, (7)18, (11)19, (1)22, (2)23, (2)25, (1)30, (1)32, (1)33, (2)45, (1)46
		06T37937	OS "P" replaces 06T36799	N.S.	1	<b>48TK4051</b>	<b>CS11 Conversion Kit</b> Includes: 43TK4036 Hose Kit (page 6), 35T37928 Control Valve 12VDC, 15TA4056 Cover Kit, and Solenoid Mounting Hardware.
30	1	10T35775	Output Bearing				Caplug
31	1	26T01627	Woodruff Key	N.S.	1	25T37702	Caplug
32	1	12T35773	O Ring				
33	1	11T37795	Seal				
34	1	15T39226	Bearing Cov., Open ("2", "B", "C", "X")				
		14T35767	Hyd Flange ("D", "P", "Z")				

\* Date Code Is Located Under PTO Model Label.

# CS10 SERIES CONVERSION TO REMOTE ACTIVATION SOLENOID

## CONVERSION KIT 48TK4942



### CONVERSION KIT - 48TK4942

ITEM	QTY	PART NO.	DESCRIPTION
1**	1	30T36727	Pressure Switch
2**	1	34T35872	Wire Harness
3	1	43T37503	1/8" NPT/JIC Fitting
4	2	43T35867	1/8" NPT/JIC Elbow
5	4	45T36274	Hose Assembly
6	1	43T36231	Straight Branch Tee
7	3	43M68014	7/16-20 Str. Elbow
8	1	35T37928	Valve 12V D.C.
9	1	25T40727	Cavity Plug
10	2	25T36726	Str. Plug
11	1	25T21684	Pipe Plug
SOLENOID MOUNTING HARDWARE			
12	2	19T36623	Capscrew
13	2	22T35140	Nut
14	2	21T37991	Lockwasher
15	2	21T23153	Washer

\*\* Included with original PTO, not included in this kit.

## TABLES A, B, C

**TABLE A**  
INPUT GEAR ASSEMBLY — ITEM 1 (Sold only as assembly)

Input Sub Assembly	Designation	Based on Input Gear	Ratio	Teeth
03TA4619	A1005	03T36214	05	50T/27T
03TA4620	A1006	03T36215	06	50T/29T
03TA4621	A1007	03T36216	07	50T/31T
03TA4622	A1008	03T36217	08	50T/34T
03TA4623	A1010	03T36218	10	50T/36T

**TABLE B**  
Cone Spacer — ITEM 2a

PART NO.	THICKNESS
18T38748	0.743/0.741
18T38532	0.740/0.738
18T38533	0.737/0.735
18T38534	0.734/0.732
18T38535	0.731/0.729
18T38536	0.728/0.726
18T38537	0.725/0.723
18T38538	0.722/0.720
18T38539	0.719/0.717
18T38540	0.716/0.714
18T38590	0.713/0.711
18T38591	0.710/0.708
18T38592	0.707/0.704

**TABLE C**  
Bearing Shim — ITEM 3

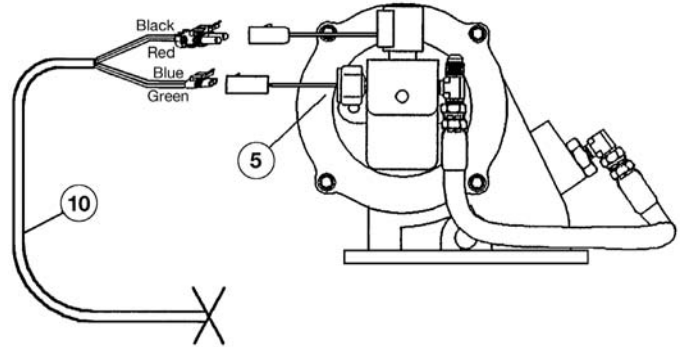
PART NO.	THICKNESS
18T37153	0.1500/0.1480
18T38731	0.1475/0.1455
18T37152	0.1450/0.1430
18T38730	0.1425/0.1405
18T37151	0.1400/0.1380
18T38729	0.1375/0.1355
18T36229	0.1350/0.1330
18T38728	0.1325/0.1305
18T36230	0.1300/0.1280
18T38727	0.1275/0.1255
18T38726	0.1225/0.1205
18T35781	0.1250/0.1230

# INSTALLATION KITS

## CS10 INSTALLATION KIT - 48TK3882 (12V)

ITEM	QTY	PART NO.	DESCRIPTION
		<b>30T36270</b>	<b>Switch Ass'y (includes 1,2,3,4)</b>
1	1	36MA1005	Switch Bracket
2	1	36T36271	Face Plate without light access
3	1	30T35687	Rocker Switch (12v)
4	1	33T36299	Fuse Assembly
5	1	30T37954	Pressure Switch
6	1	34M18250	Female Spade Connector
7	1	34M18009	Ring Terminal
8	2	34M18187	Female Spade Connector
9	1	34M18002	Butt Splice
10	1	34T40902	Wire Harness
11	6	37M18000	Wire
12	1	37T35674	Grommet
N.S.	1	36MK1007	Bolt Kit Incl. w/30T36270 & 30T36453
N.S.	1	43M05522	Elbow
<b>For 24v Option Kit No. 48TK3891 (substitute)</b>			
		<b>30T36453</b>	<b>Switch Ass'y (includes 1 &amp; 2 above and 3 below.</b>
3	1	30T35712	Rocker Switch (24V)

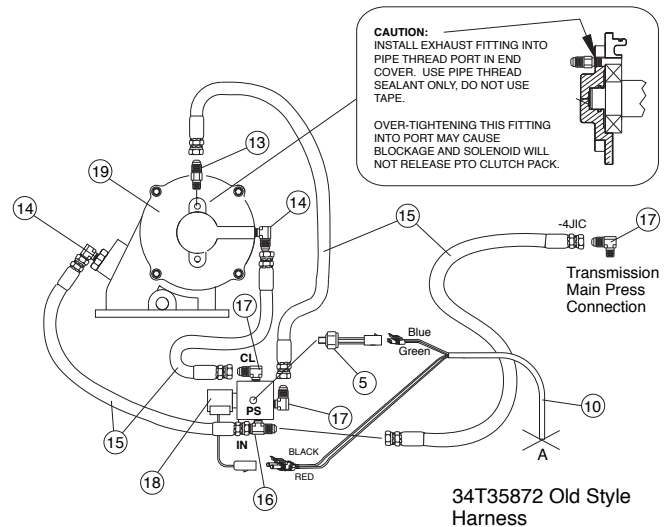
## CS10 INSTALLATION KIT with DIRECT ACTIVATION SOLENOID (No Hose Kit required)



## CS11 INSTALLATION KIT with REMOTE ACTIVATION SOLENOID

## CS11 CONVERSION KIT - 48TK4051 (12V) Use with 48TK3882 (N.S.)

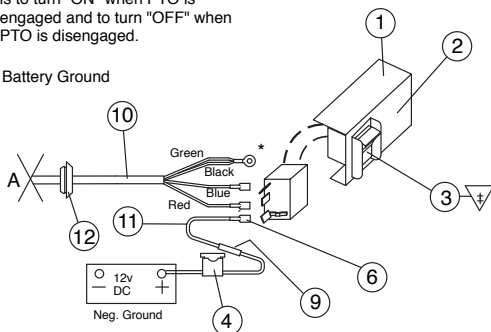
ITEM	QTY	PART NO.	DESCRIPTION
13	1	43T37503	1/8" NPT/JIC Fitting
14	2	43T35867	1/8" NPT/JIC Elbow
15	4	45T36274	Hose Assembly
16	1	43T36231	Straight Branch Tee
17	3	43M68014	7/16-20 Str. Thread Elbow
18	1	35T37928	Valve 12V D.C.
19	1	15TA4056	Cover Assembly (Includes Bearing & o-ring (6 & 7) as shown on page 2.
N.S.	2	19T36623	Capscrew
N.S.	2	22T35140	Nut
N.S.	2	21T37991	Lockwasher
<b>For 24v Option Kit No. 48TK4052 (Use with 48TK3891) Substitute:</b>			
18	1	35T37967	Valve 24V D.C.



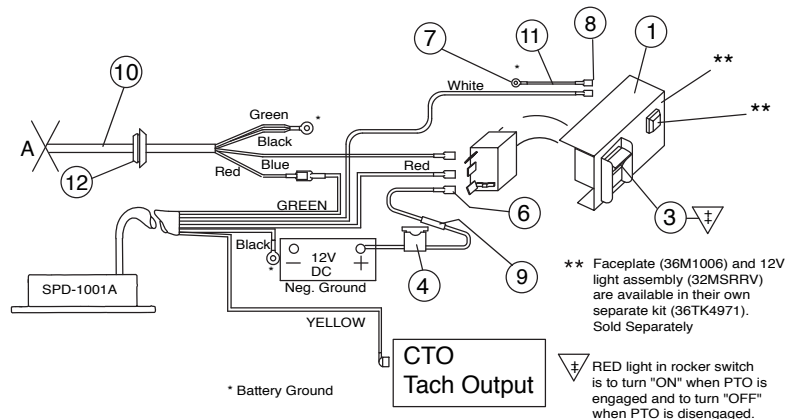
## CIRCUIT INSTALLATION When used without Overspeed Switch

⚠ RED light in rocker switch is to turn "ON" when PTO is engaged and to turn "OFF" when PTO is disengaged.

\* Battery Ground



## CIRCUIT INSTALLATION When used with Overspeed Switch

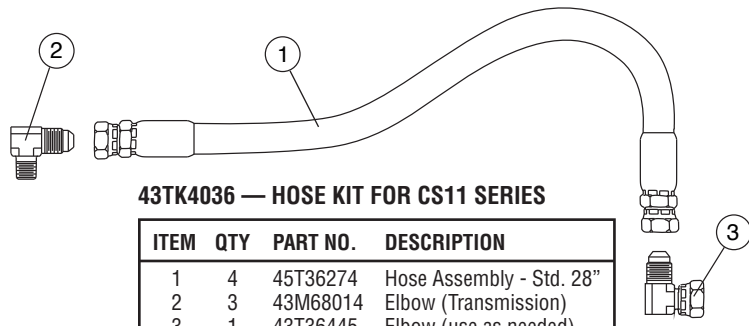


# ACCESSORY KITS

## INSTALLATION HOSE KIT

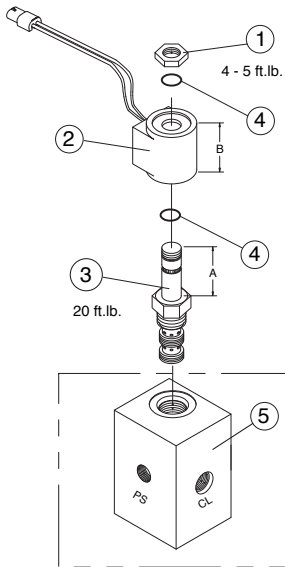
- 43TK3881 — HOSE KIT - STANDARD 28"
- 43TK3885 — HOSE KIT - FOR TOP R. S. HD SERIES 57"
- 43TK4545 — HOSE KIT - SPECIAL 17"

ITEM	QTY	PART NO.	DESCRIPTION
1	1	45T36274	Hose Assembly - Std. 28"
		45T36273	Hose Assembly - HD Top 57"
		45T39186	Hose Assembly - Special 17"
2	1	43M68014	Elbow (Transmission)
3	1	43T36445	Elbow (use as needed)
(43TK3881 & 43TK4545 only)			



## 43TK4036 — HOSE KIT FOR CS11 SERIES

ITEM	QTY	PART NO.	DESCRIPTION
1	4	45T36274	Hose Assembly - Std. 28"
2	3	43M68014	Elbow (Transmission)
3	1	43T36445	Elbow (use as needed)
N.S.	2	43T35867	Elbow
N.S.	1	43T36231	Tee Fitting



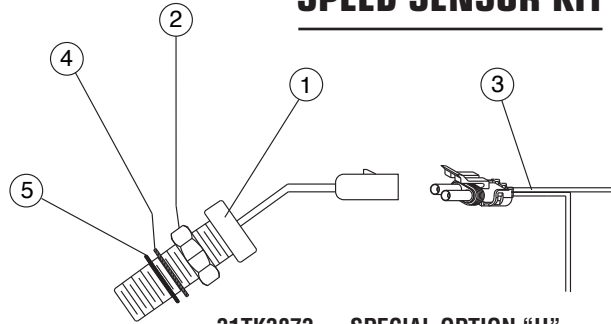
## SOLENOID VALVE

- 35T37928 (12V) - w/ 35T36092 Solenoid
- 35T37967 (24V) - w/ 35T36447 Solenoid

ITEM	QTY	PART NO.	DESCRIPTION
1	8	22T39429	Nut
2	1	37T39088	12v Coil (Delta)
		35T38997	24v Coil (Delta)
3	1	35T37997	Valve
4	2	12T39408	O-ring
5*	1	N.A.	Manifold Blk(CS11)

\* (Not Sold Separately)

## SPEED SENSOR KIT

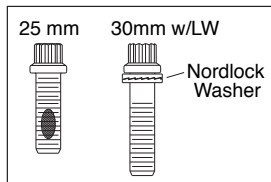


## 31TK3873 — SPECIAL OPTION "U"

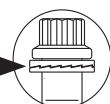
ITEM	QTY	PART NO.	DESCRIPTION
1	1	31T35108	Mag Pickup
2	1	21T35109	Jam Nut
3	1	34MA1415	Wiring Harness
4	1	21T36099	Flat Washer
5	1	12T35774	O-ring

## 20MK1001 — BOLT KIT FOR CS10

QTY	PART NO.	DESCRIPTION
6	19T40266	12pt. Capscrew - 30mm
2	19T37727	12pt. Capscrew - 25mm
2	20T35779	Alignment Stud
6	21T40360	Nordlock Washer



Mount two halves of washer with insides facing.



## BOLT KIT

The two(2) 25mm long capscrews are to be used in positions 1 and 3 as shown in diagram (Fig. 1). The six(6) 30mm long capscrews and six(6) special lock washers are used in positions 2, 4, 5, 6, 7, & 8.

Torque to 45 lb.Ft.

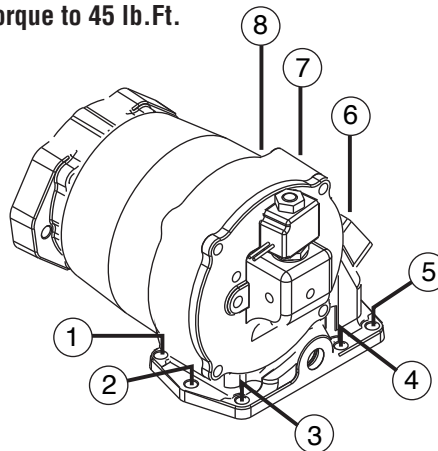


Figure 1. - CAPSCREW PLACEMENT

## IMPORTANT

The CS10 includes the mounting kit, special shim/gasket, high pressure hose hookup kit, wiring harness, dash bracket kit, and installation instructions. The PTO is available with a pulse generator (pick-up) for use with the Muncie Digital Tachometer - 38MK2000 (request MP92-04) or use with the Muncie digital switch SPD-1001A to control the engagement or overspeed protection of the PTO. Contact your Muncie Application Specialist for assistance with these options.

# CS10 & CS11 DISASSEMBLY AND REASSEMBLY

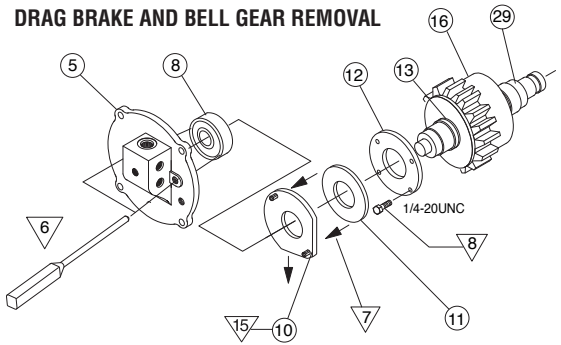
(Reference Exploded View on page 2)

## ▽ DENOTES SPECIAL SERVICE PROCEDURES

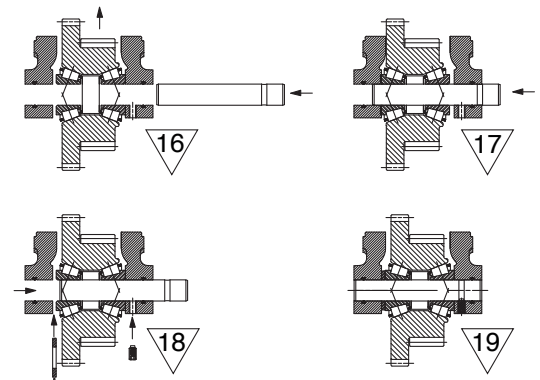
### DISASSEMBLY PROCEDURE

1. Remove the CS10 input gear, by removing the set screw in the pad and driving the idler shaft from the housing. (26,27)
2. Remove the set screws (44) from the bearing cover (5) which hold the drag brake springs (45). Position the housing so that the springs fall from housing.
3. Remove the four large socket capscrews (4) which hold the back cover to the PTO housing.
4. Position the housing against a bench block and hit the end of the output shaft with a soft face hammer to remove the entire output shaft assembly with bearing cover (5).
5. Remove the two pipe plugs (43) from the bearing cover. This exposes the ball bearing assembly within the cover.
6. Using a 1/4" punch and alternating between the two holes, drive the bearing and shaft assembly from the bearing cover.
7. Using a bearing puller remove the rear bearing (8) by grabbing the drag brake plate (10) and removing both pieces. The bronze brake disk (11) can be removed.
8. Insert four 1/4-20 capscrews into the drag brake rotor (12) until they just touch the back of the bell gear. Using an "X" pattern screw the capscrews in at 1/4 turn intervals until the brake rotor is free of the output shaft (29).
9. The piston and clutch pack may be serviced without removal of the drag brake. Using snap ring pliers, remove the snap ring (13) located on the output shaft end while gently pushing on the piston cup (24).
10. Pull the piston cup (24) from the shaft and the piston (21) will go with it.
11. Tap the piston cup on a wood surface to remove the piston.
12. Remove the spring (20). The clutch friction discs (18) and spacer discs (19) and inner clutch hub (17) can be removed by pointing the shaft end down.
13. With the drag brake removed, the snap rings (13) on this end of the bell gear can be removed with snap ring pliers. This allows the bell gear to be removed towards the closed end. The internal bearing (15) of the bell gear can easily be removed.

### DRAG BRAKE AND BELL GEAR REMOVAL



### TAPER ROLLER BEARINGS



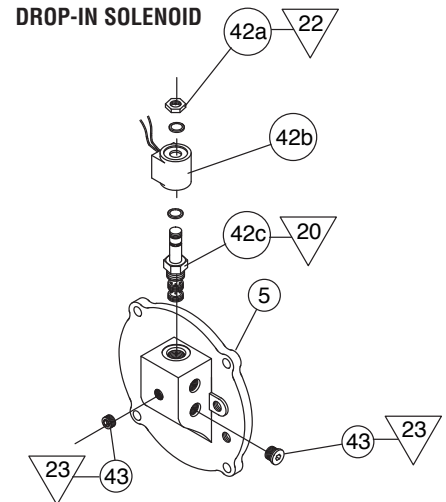
### REASSEMBLY PROCEDURE

14. The reassembly of the unit is made in reverse of the disassembly. The re-use of seals, o-rings and snaprings are not recommended.
15. Be sure to lubricate the o-rings and all bearings upon installation. It is important to position drag brake plate so that input gear clears. This is the reason for the flat sides of the plate. Torque capscrews to the values shown or to the following values.  
5/16 capscrews - 18 ft. lb. 3/8 capscrews - 36 ft. lb. 1/4 set screw - 9 ft. lb.
16. The Input Gear is replaced as a set which includes the gear, cone spacer, & bearings. **See Table A.** Slide this sub-assembly into the housing to line up the idler shaft.
17. Tap the idler shaft into the housing and through both bearing races.
18. Tap the idler shaft in the reverse direction so that it is flush with the bearing in this assembly. Insert the thickest shim that can be installed by hand in the gap between the bearing and housing. Remove shim and select the next thicker shim and drive it into the gap. Rotating the gear to make sure it easily rotates. The recommended bearing pre-load is .002" to .006" loose. (The cone spacer sets this pre-load and measurement is not required.)
19. Tap the idler shaft into position and install set screw.

### SOLENOID VALVE INSTALLATION (CS10 ONLY)

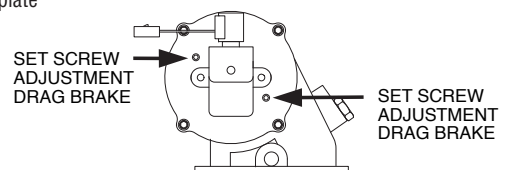
20. Separate the coil from the valve assembly. Insert the valve cartridge into the rear cover and torque to 20 ft. lb.
21. Slip one o-ring and the coil over the valve. Slip the second o-ring on.
22. Place thread locking compound on the post threads and install nut. Torque the nut 4 to 5 ft. lb. max.
23. Place thread sealant on pipe plugs. Torque 10-16 ft. lb.

### DROP-IN SOLENOID



### DRAG BRAKE ADJUSTMENT (CS10 ONLY)

24. When installing the rear cover be sure to align the roll pins in the drag brake plate with the holes in the rear cover. NOTE: It is important that one of the flat edges of this plate is positioned towards the input gear.
25. After the cover has been attached to the housing insert the springs into the holes.
26. Insert the setscrew over the spring and turn the screw four (4) full turns.
27. Follow the test and adjustment procedures in the CS10 owners manual.



# MODEL NUMBER CONSTRUCTION

**CS 10 A10 05 H 1 B X**

## PTO TYPE

Clutch Shift CS

## MOUNTING

10-Bolt Mount – 10  
10-Bolt Mount with Remote Solenoid – 11

## TRANS. CS GEAR DATA

Allison 10.16P RH - A10

## SPEED RATIO

05 - .57:1  
06 - .64:1  
07 - .72:1  
08 - .85:1  
10 - .95:1

## SPECIAL FEATURES

X - None (Pressure Lube is standard on all units)  
B - Hose kit (HD Trans. R.S.)  
D - Pulse Generator & SPD-1001A  
U - Pulse Generator  
3 - 17" Activation Hose  
4 - Less Activation Hose (CS10)

## OUTPUT TYPE

B - 1-1/4 Round 5/16KW  
C - 1-1/4 20 Spl. (1410 Companion Flange)  
D - SAE "B" 2&4 Bolt  
E - SAE "C" 2&4 Bolt  
I - DIN 5462  
P - SAE "B&B" 2&4 Bolt  
S - SAE "B" 2 Bolt  
Y - SAE "C" 2 Bolt  
2 - DIN Companion Flange

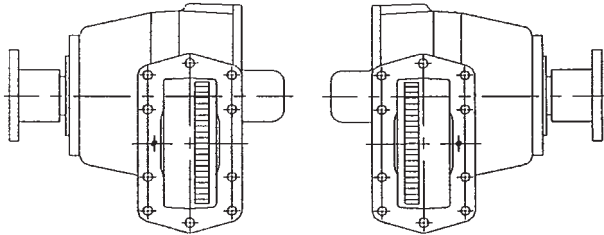
## ASSEMBLY ARRANGEMENT

1 or 3

## SHIFTER TYPE

H - 12 Volt Electric/Hydraulic  
J - 24 Volt Electric/Hydraulic

## PTO ASSEMBLY ARRANGEMENTS



NO. 1 ASSEMBLY

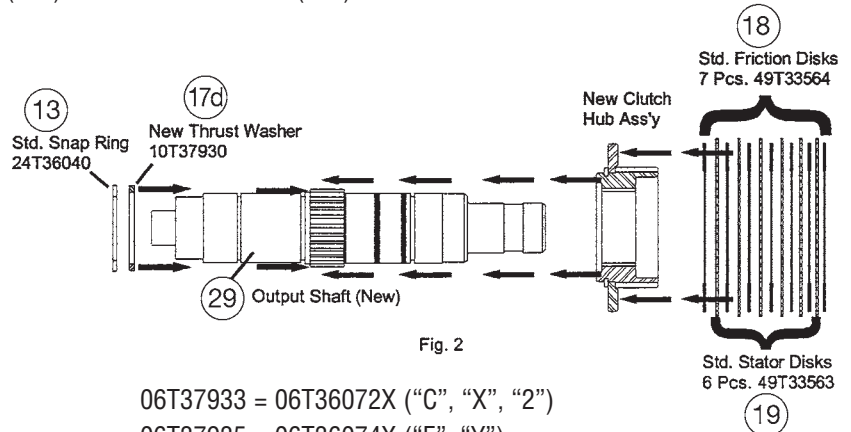
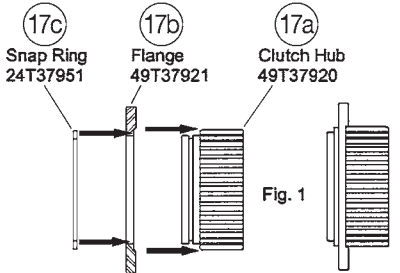
NO. 3 ASSEMBLY

# CS10 CLUTCH HUB REPLACEMENT

Effective April 1999 the clutch hub supplied in the CS10 Series PTO has the two piece clutch hub as shown on this page. The two piece hub consists of a splined hub and a flange which is held together by a snap ring. Because of this design change the clutch pack stack up has changed as shown on page 2.

Begin by assembling the new Clutch Hub:

1. Place the flange (17b) on to the Clutch Hub (17a) so that the recessed area of the flange is against the splines. Fig. 1.
2. Using snap ring pliers install the Snap Ring (17c) on to the Clutch Hub (17a).
3. The New Clutch Hub requires a new output shaft. Select the appropriate shaft and install the Thrust Washer (17d) against the splines on the output shaft (29). Fig. 2.
4. Hold thrust washer in place with the Snap Ring (13).



06T37932 = 06T36039X ("B")

06T37934 = 06T36073X ("S", "D")

06T37636 = 06T36832X ("I")

06T37933 = 06T36072X ("C", "X", "2")

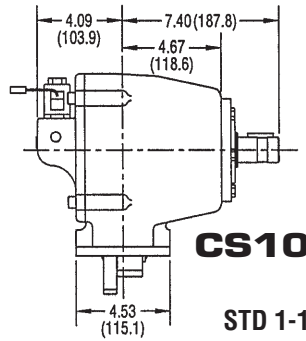
06T37935 = 06T36074X ("E", "Y")

06T37937 = 06T36799X ("P")

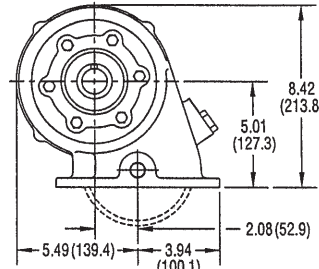
Current Inventory that has been reworked will have an "X" marked on the shaft by the part number.



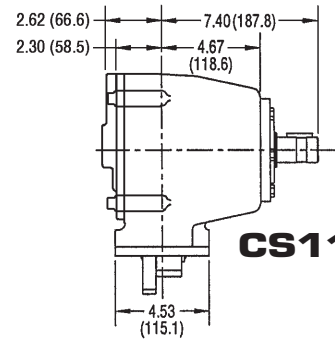
# DIMENSIONS IN INCHES (MM)



**CS10**

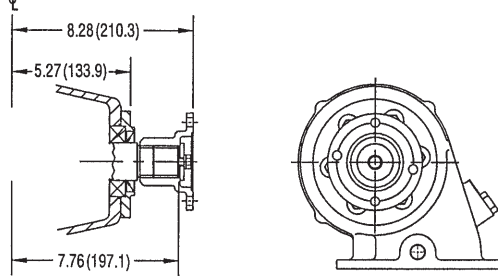


**STD 1-1/4" ROUND KEYED SHAFT ("B" OPTION)**

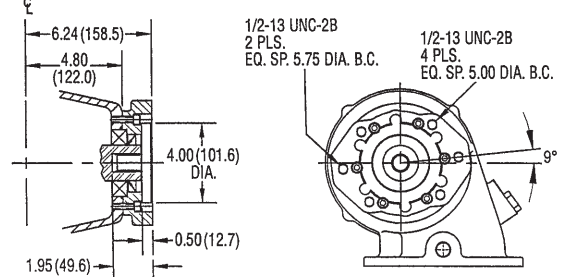


**CS11**

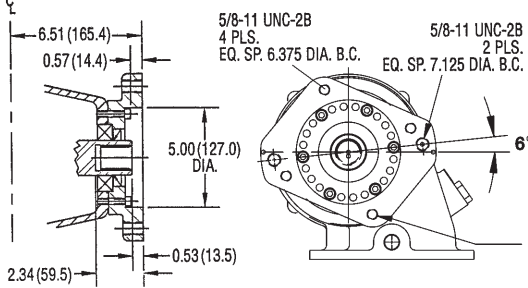
**1-1/2" 10 SPLINE W/1410 SERIES FLANGE ("C" OPTION)**



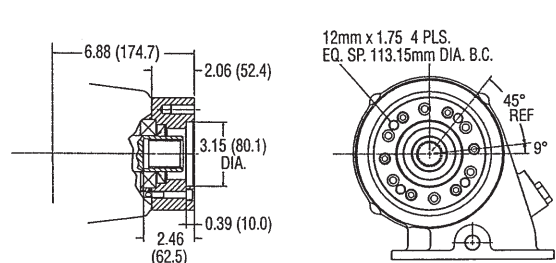
**SAE "B" 2&4 BOLT 7/8" 13 SPLINE ("D" OPTION)**



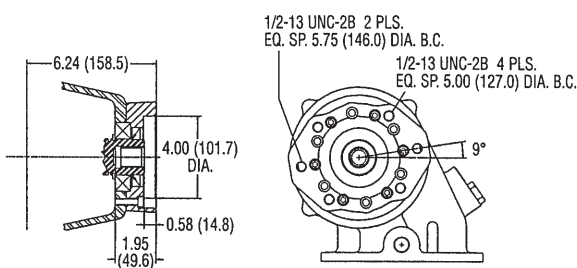
**SAE "C" 2&4 BOLT 1-1/4" 14 SPLINE ("E" OPTION)**



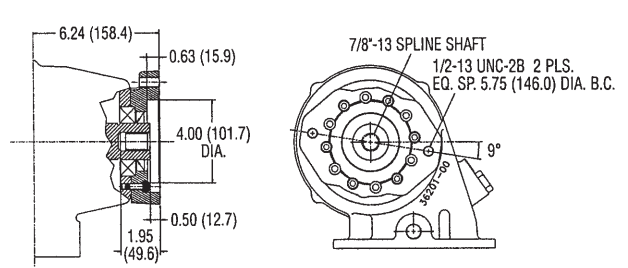
**DIN 5462 36MM 8 SPLINE ("I" OPTION)**



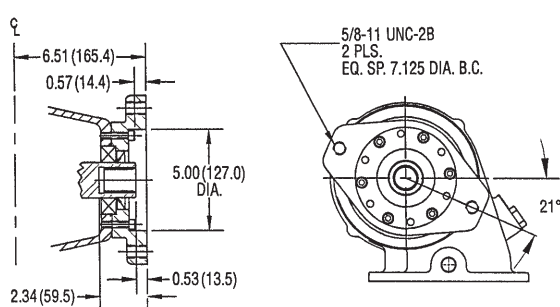
**SAE "B&B" 2&4 BOLT 1" 15 SPLINE ("P" OPTION)**



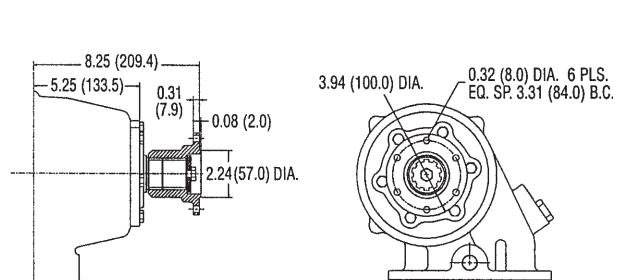
**SAE "B" 2 BOLT 7/8" 13 SPLINE ("S" OPTION)**



**SAE "C" 2-BOLT 1-1/4" 14 SPLINE ("Y" OPTION)**



**1-1/2" 10 SPLINE W/DIN 100 FLANGE ("2" OPTION)**





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General Offices and Distribution Center • P.O. Box 548 • Muncie, IN 47308-0548  
(765) 284-7721 • FAX (765) 284-6991 • E-mail [info@munciepower.com](mailto:info@munciepower.com)  
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