INTRODUCTION AND IMPORTANT SAFETY NOTICE

This publication should give the operation and maintenance personnel the needed information to operate our clutch. If there is any information not covered in this publication, please call your dealer or engineering department.

GENERAL INFORMATION: Decoding of Model Number
Example: CO1-11-3A or CN2-11-3A

CO - Clutch that uses a sliding sleeve with a brass throwout collar.

CN - Clutch that uses a sliding sleeve with camrollers. The only exception is in the CN1-06 and CN1-07 which uses two tapered roller bearings on the main shaft (instead of one ball bearing), but still uses the sliding sleeve with a brass throwout collar.

1, 2, or 3 - following CO or CN will give the number of drive plates in the clutch.

06, 07, 08, 10, 11, 14 = Nominal diameter of clutch drive plate in inches.

0,1, 2, 3, 4, 5 = SAE size of clutch housing.

A through Z = Will indicate clutch options (i.e. pilot bearing change or shaft size or plate configuration).

[PLEASE READ THE FOLLOWING WARNING AND SAFETY NOTICE]

IMPORTANT SAFETY NOTICE:

The possible danger which may result from the use of manufactured products to person(s) or property, make it very important to follow correct procedures. Proper guards and other suitable safety devices or procedures that may be desirable or specified in safety codes should be provided. These devices are neither provided by PEC Manufacturing nor are they the responsibility of PEC Manufacturing.

CAUTION:

WHILE CLEANING BEARINGS, NEVER SPIN DRY WITH COMPRESSED AIR. THIS CAN CAUSE INJURY.

CAUTION:

WHEN A SEALED PILOT BEARING IS BEING USED, DO NOT LUBRICATE DURING SERVICE. THIS COULD DAMAGE THE ENGINE CRANKSHAFT DUE TO PRESSURE BUILDUP FROM TRAPPED GREASE.

CAUTION:

EXCESSIVE SIDE LOADING CAN DAMAGE CLUTCH PARTS AND ENGINE. DEFLECTION SHOULD BE CHECKED BEFORE OPERATION OF CLUTCH.

INSTALLATION

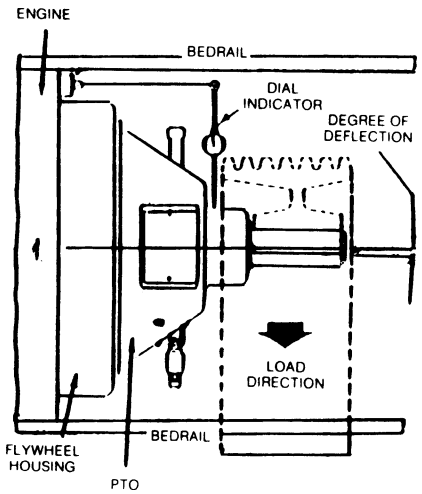
Caution: PEC clutches are made to be mounted directly to the engine flywheel. It is possible, due to mismatched components or many other reasons, to have interference between the engine and clutch. Due to this possibility, engine crankshaft endplay must be measured before the pto is installed. This endplay must again be measured after installation. The second measurement should be the same as the first. If it is not then interference is indicated and the pto should be removed so the source of the interference can be located. **This procedure is considered mandatory.** PEC Manufacturing will NOT be responsible for any damage caused by component interference regardless of the cause.

To avoid wear of clutch due to misalignment, the following checks should be made: (See page 7 of Table and Tolerance)

1. Check flywheel housing face
2. Flywheel housing bore
3. Driving ring surface of flywheel
4. Driving ring pilot bore of flywheel
5. Pilot bearing bore of flywheel
6. After all alignments have been checked, install driving ring onto flywheel and tighten bolts. (See Chart on pg. 15)
7. Install Pilot Bearing on PTO shaft.

   Note: Unit is supplied with sealed pilot bearings. If lubrication is desired, remove the forward seal (engine side). If no lubrication is desired, leave seals intact and remove Grease Fitting from shaft and install plug.
8. Install guide studs (if needed) in the flywheel housing to help in alignment and installation of PTO.
9. Slide PTO into place making sure that the drive plate teeth are not in a bind. Bolt the PTO to the housing and tighten all bolts. After tightening the bolts, use a soft hammer and rap the end of the shaft to unload any pressure on the bearings that may result from installation of the clutch.
10. Check installation of PTO for side load deflection. To check side load deflection, attach a dial indicator to a rigid part of the engine with the plunger resting on the housing at the main bearing area. This reading should be taken directly opposite the known load direction (see Figure (A) below; if the load direction is unknown you may have to use two indicators. Zero the dial indicator and attach the drive belts. In no case should the indicated deflection exceed .010 inch at the clutch housing.

Figure A



11. After installation, operator should check to make sure clutch is properly adjusted and lubricated before starting unit.

LUBRICATION OF CLUTCH

The Anti-Friction Bearing(s) located in the housing hub and unsealed pilot bearings need grease approximately every 100 hours. Use a small amount of high grade, high temperature, lithium base gun lubricant for anti-friction bearing with operating temperature of 200 degrees Fahrenheit.

NOTE:	If you have installed a sealed pilot bearing, remove grease fitting and install pipe plug in shaft. These bearings are sealed for life; inspect every two years.
Throwout Collar:	Lubricate the brass collar daily with a small amount of grease. Care should be taken that the grease hose is in good condition.
Operating Shaft:	Lubricate as needed to maintain a freely moving shaft.
Clutch levers and linkage:	Lubricate with engine oil after every 500 hours of operation.
CAUTION:	Lubricate sparingly to avoid oil on clutch facings.

CLUTCH ADJUSTMENT

WARNING: DO NOT ADJUST CLUTCH WHILE ENGINE IS IN OPERATION!

WARNING: DO NOT ADJUST THE CLUTCH ABOVE THE MAXIMUM RECOMMENDED TORQUE. THIS MAY CAUSE CLUTCH COMPONENT FAILURE. (See page 8)

A new clutch may need several adjustments during its first run-in period. If the PTO heats or does not pull a load or the operating shaft lever disengages, the clutch needs adjusting. To adjust the clutch, the following steps should be followed:

1. Make sure the engine or power source is off.

2. Remove the inspection plate cover and turn the clutch until you locate the adjusting lock pin.

3. Pull the pin out and you will find a small hole in the side. Install a piece of wire or cotter pin in the hole to hold the pin out.

4. Turn the adjusting ring clockwise until the clutch engages at the proper torque shown on the chart found on page 8 in the Table and Tolerance section of the manual. This chart is a method of measuring clutch adjustments from operating shaft or hand lever.

REMOVAL AND DISASSEMBLY

1. Remove everything from the output end of the clutch shaft and remove the instruction cover plate.

2. Remove cap screws that secure the clutch housing to the flywheel housing. There are two 3/8 cap screw holes in the housing to be used for pusher bolts to assist in removing clutch from engine.

3. Remove pilot bearing from end of shaft using a standard bearing puller.

4. Remove the jam nut and lock washer from the grease hose fitting, located on the side of the housing. Push the grease hose and fitting into the clutch housing.

5. Remove the shaft nut and lock washer.

6. Place prybars on opposite sides over the housing and under the front of the clutch floating plate. Hold pressure on both bars and rap the shaft end with soft hammer to release the hub and back plate from tapered shaft. Another method is to fit a protective cap on the pilot bearing end of the shaft. While applying pressure on the operating lever in the engaged direction, rap the protective cap to free the hub and back plate from the shaft taper.

7. Remove clutch pack assembly. Place clutch pack with sliding sleeve up. Pull adjusting lock pin out and insert a small piece of wire in hole. Screw the adjusting sliding sleeve assembly counterclockwise and remove.

8. After removing the sliding sleeve and adjusting yoke remove the floating plate and the drive plate from the hub and back plate.

9. To replace any damaged part, straighten and remove all cotter pins and links connected to the damaged part.

10. (CO1-06, CO1-07) Remove the four cap screws and lock washers from the bearing retainer and tap or press the shaft from the clutch housing.
    Remove the bearing retainer lock and unscrew the bearing retainer and press or tap the shaft from housing.

11. Remove the cap screws from the throwout yoke, tap the operating shaft to expose the woodruff keys, remove the woodruff keys, then remove the operating shaft from yoke.

12. Place housing face down, remove the two small plugs, and carefully drive the bearing cup out of the housing with a small punch.

ASSEMBLY

1. Prepare housing by replacing grease fittings If damaged or removed during disassembly.

2. Install operating shaft and throwout yoke. Install operating shaft halfway into the clutch housing, then slip the throwout yoke onto the operating shaft. Slide the operating shaft through the housing and install woodruff keys, then tighten the two 3/8 capscrews. The head of the capscrew in the throwout yoke should be on the pilot bearing side or flange side of the clutch.

3. Install rear bearing cup into housing.

4. Install bearings onto the shaft using arbor press, if possible. (Note: Using torch to heat bearings can cause damage. Bearings can be heated in oven or oil bath.) Recommend bearing temperature of 248 Fahrenheit.

5. Install clutch shaft in housing, and press the upper cup into place. Install bearing retainer and tighten until 60 lbs. of pressure is required to turn the shaft. After you have seated the bearing, use a soft hammer and rap the pilot bearing end of shaft. Check to assure 60 lbs. of pressure is still required to rotate the shaft. Adjust as necessary.

6. Back off the bearing retainer 3 1/4 - 4 1/4 notches. Rap the output end of shaft to equalize bearings. Check shaft end play (See chart on page 8).

7. Place housing and shaft assembly on table and set up your dial indicator as shown in Figure (B). Bolt housing to table and hook up chain and eyebolt using a hanging scale between the hoist and eyebolt.

8. Apply 200 lbs. of force to the shaft and rotate it twice in each direction.

9. The indicator reading is the endplay. Using the chart, adjust the bearing retainer by loosening or tightening to achieve the recommended endplay.

10. After adjustments have been made, position the bearing retainer lock, then bolt and tighten.

11. Assemble the sliding sleeve assembly by putting split brass collar and shims on sleeve with two 3/8 x 2 1/4 capscrews and tighten. Using four lever link pins and new cotter pins, install lever links to ears on sleeve. Install four finger levers to the adjusting yoke with lever pins and cotter pins. Join the sliding sleeve assembly with the adjusting yoke assembly using lever link pins and cotter pins.

12. Install the adjusting lock pin and spring into the adjusting yoke by inserting a small wire in hole of the adjusting lock pin.

13. Set the hub and back plate on flat surface with threads up. Insert release springs in holes on hub and back plate, then set drive plate and floating plate in position on hub and back plate.

14. Install the adjusting yoke and sliding sleeve assembly on the hub and back plate. Tighten the yoke until you can push the sliding sleeve downward and snap the clutch in. Final clutch adjustment will be made on installation.

15. Slide clutch pack assembly onto the clutch shaft aligning the hub and shaft keyways. Install hub key into shaft and hub about 2/3 way. Tap the clutch pack into place making sure that the ears on the brass collar slip into the throwout yoke. Then tap hub key into position.

16. Install new shaft lock washer and nut. Tighten nut to 30 lbs. ft. torque and then turn nut an additional 60-90 degrees. Bend lock washer in place to lock nut.

17. Install hand lever and disengage clutch. With clutch set up, use drive ring and align plates in center. Engage clutch.

18. While rotating shaft, fill main bearing cavity with a lithium base #2 grease. Grease brass collar and operating shaft.

19. Install pilot bearing.

20. If all assembly instructions have been followed precisely, the clutch is ready to install.

CAMROL BEARING ADJUSTMENT

If unit is equipped with a Brass or Ball Bearing Collar, disregard this section.

1. With clutch properly adjusted for engagement pressure and engaged.

2. Position Shift Fork into center of Sliding Sleeve and install both Stop Collars on operating shaft to prevent side movement of Shift Fork.

3. With the Detent Roller in the forward groove, position the Detent Lever to allow a minimum clearance of .100 in. between the Camrol Bearing and the front side of the Sliding Sleeve.

4. Position Detent Lever to provide a clearance of .120 in. between the detent pin snap-ring and Detent Lever.

CHECKING FLYWHEEL HOUSING FACE

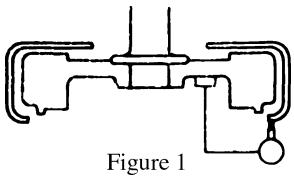


Figure 1

Bolt the indicator to the flywheel so that the indicator is vertical to the housing face and the indicator stem rides on the housing face. (See Fig. 1). Runout should not exceed tolerance listed in table No. 1.

CHECKING FLYWHEEL HOUSING BORE

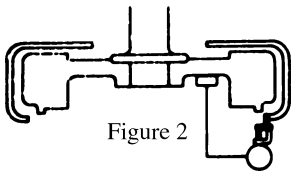


Figure 2

Readjust indicator so that the stem rides on the bore of the flywheel housing. (See Fig. 2). Runout should not exceed tolerances listed in table No. 1.

CHECKING DRIVING RING SURFACE OF FLYWHEEL

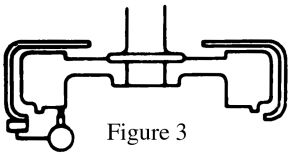


Figure 3

Remove indicator base from flywheel, and bolt indicator to flywheel housing proper, and check flywheel (See Fig. 3).

The variation of the face runout of the surface to which the driving ring or clutch plate is bolted, should not exceed .0005 maximum total indicator reading per inch of diameter.

CHECKING DRIVING RING PILOT BORE OF FLYWHEEL

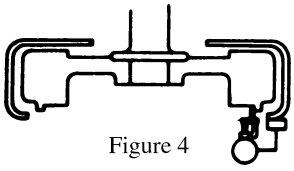


Figure 4

Readjust indicator so that the stem will ride on the driving ring pilot bore. The eccentricity of the driving ring pilot bore should not exceed .005 maximum total indicator reading. Eccentricity between driving ring pilot bore and pilot bearing bore should not exceed .008 total indicator reading.

CHECKING PILOT BEARING BORE OF FLYWHEEL

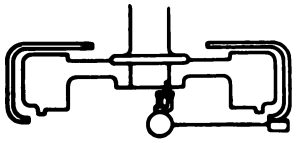


Figure 5

Readjust the indicator so stem rides on the pilot bearing bore cavity. The eccentricity of the pilot bearing bore should not exceed .005 maximum total indicator reading.

TABLE 1

MAXIMUM FLYWHEEL HSG. DEVIATION

HOUSING SIZE S.A.E. NO.	A FACE DEVIATION TIR INCHES	B BORE ECCEN. TIR INCHES
00	.012	.012
0 – 1/2	.010	.010
1 – 2 – 3	.008	.008
4 – 5 – 6	.006	.006

TABLE 2

MAXIMUM FLYWHEEL DEVIATION

NORMAL CLUTCH DIA. INCHES	A FACE DEVIATION TIR INCHES	B DRIVING RING PILOT & PILOT BRG. BORE TIR INCHES
8	.005	.005
10	.006	.005
12 – 1/2	.009	.005
14 (18 – 3/4 Bore)	.009	.005
14 (22 – 1/2 Bore)	.011	.005
18	.011	.005

CHART A

CLUTCH MODEL	OPERATING SHAFT TORQUE (POUNDS/FEET) MIN	MAX	HAND LEVER EFFORT (POUNDS) MIN	MAX	HAND LEVER LENGTH (A) (INCHES)
C01-06	66	86	58	76	13.6
CN1-06	66	86	58	76	13.6
C01-07	66	86	58	76	13.6
CN1-07	66	86	58	76	13.6
C01-08	71	94	63	83	13.6
C01-10	88	117	78	103	13.6
C01-11	108	142	95	125	13.6
C02-11	134	177	118	156	13.6
CN2-11	134	177	118	156	13.6
C01-14	218	289	123	163	21.3
CN1-14	218	289	123	163	21.3
C02-14	218	289	123	163	21.3
CN2-14	218	289	123	163	21.3
C03-14	218	289	123	163	21.3
CN3-14	218	289	123	163	21.3

NOTE

THE HAND LEVERS HAVE A CASTED HEX NUT WHICH A SOCKET AND **TORQUE** WRENCH CAN BE USED TO CHECK THE OPERATING SHAFT TORQUE.

FIGURE A

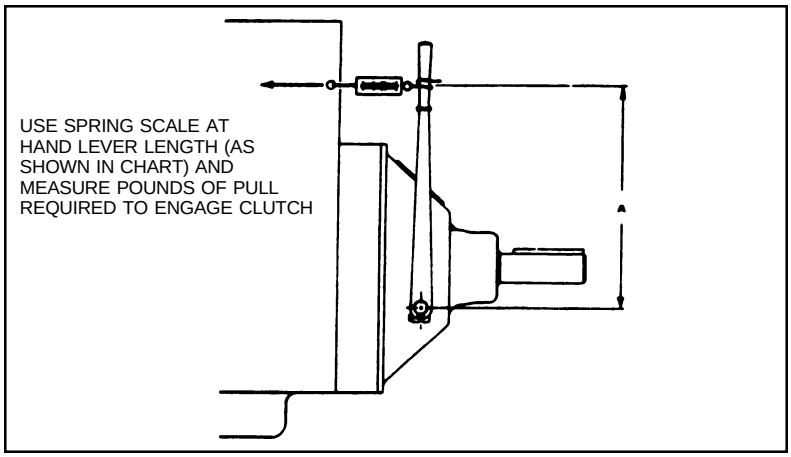


FIGURE B

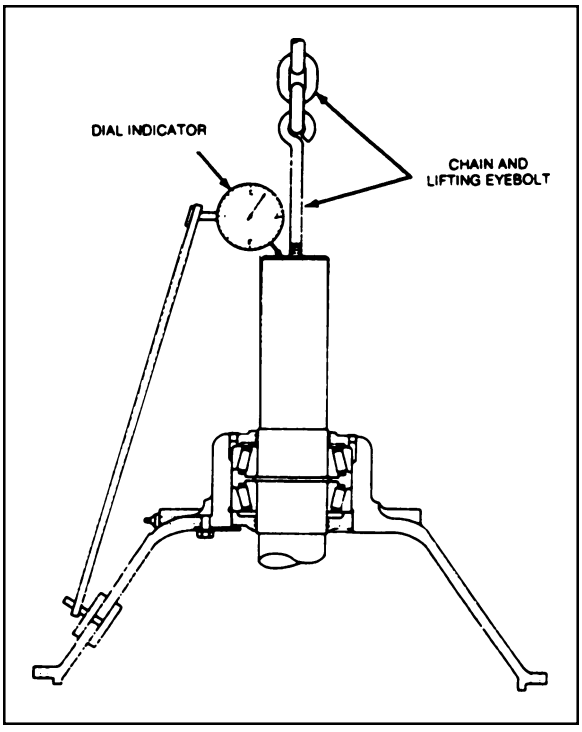


CHART B

SHAFT END PLAY

STANDARD CHART	
CLUTCH SIZE	REC. END PLAY
C01-06 C01-07	NOT REC. FOR SIDE LOAD
ALL 6", 7", 8" CLUTCHES	.004 – .006
ALL 10", 11" CLUTCHES	.004 – .007
ALL 14" CLUTCHES	.006 – .010

Allowable Side-Pull Loads For POWER TAKE-OFFS

PTO	RPM	"X" DISTANCE, INCHES / MM (See Sketch)								
		1/25	2/50	3/75	4/100	5/125	6/150	7/175	8/200	9/225
CO1-06	1000	835	625	475						
		380	284	215						
CO1-07	2000	665	595	475						
		302	270	215						
	3000	585	525	475						
		265	238	215						
CN1-06	1000	1075	795	635						
		488	360	288						
CN1-07	2000	1075	795	635						
		488	360	288						
	3000	1075	795	635						
		488	360	288						
CN1-08	1000	1495	1110	885	735	630				
		680	505	403	334	286				
	2000	1495	1110	885	735	630				
		680	505	403	334	286				
	3000	1495	1110	885	735	630				
		680	505	403	334	286				
CO1-10	1000	2740	2190	1730	1430	1216				
		1245	995	786	650	552				
	1500	2420	2190	1730	1430	1216				
		1098	995	786	650	552				
	2000	2230	2070	1730	1430	1216				
		1100	940	786	650	552				
	2600	2050	1910	1730	1430	1216				
		1013	868	786	650	552				
CO1-11	1000	2790	2600	2240	1840	1570				
		1268	1182	1018	836	713				
	1500	2630	2450	2240	1840	1570				
		1195	1113	1018	836	713				
	2000	2330	2170	2030	1840	1570				
		1059	986	922	836	713				
	2400	2140	1990	1865	1750	1570				
		972	904	847	795	713				
CO2-11	1000	5450	3395	2710	2255	1930	1690			
		2063	1543	1231	1025	877	768			
CN2-11	1500	4370	3395	2710	2255	1930	1690			
		1986	1543	1231	1025	877	768			
	2000	3900	3395	2710	2255	1930	1690			
		1772	1543	1231	1025	877	768			
	2400	3550	3330	2710	2255	1930	1690			
		1613	1513	1231	1025	877	768			
CO1-14	1000	3390	2600	2120	1780	1535	1350	1210	1090	
		1540	1181	963	809	697	613	505	495	
CN1-14	1500	3390	2600	2120	1780	1535	1350	1210	1090	
		1540	1181	963	809	697	613	505	495	
	2000	3390	2600	2120	1780	1535	1350	1210	1090	
		1540	1181	963	809	697	613	505	495	
	2200	3390	2600	2120	1780	1535	1350	1210	1090	
		1540	1181	963	809	697	613	505	495	
CO2-14	1000	5980	4700	3880	3290	2870	2540	2270	2060	
		2718	2137	1763	1495	1304	1154	1031	936	
CN2-14	1500	5980	4700	3880	3290	2870	2540	2270	2060	
		2718	2137	1763	1495	1304	1154	1031	936	
	2000	5980	4700	3880	3290	2870	2540	2270	2060	
		2718	2137	1763	1495	1304	1154	1031	936	
	2200	5980	4700	3880	3290	2870	2540	2270	2060	
		2718	2137	1763	1495	1304	1154	1031	936	
CO3-14	1000	6170	5120	4200	3570	3100	2740	2460	2220	2035
		2804	2327	1909	1622	1409	1245	1118	1009	925
CN3-14	1500	5350	5120	4200	3570	3100	2740	2460	2220	2035
		2431	2327	1909	1622	1409	1245	1118	1009	925
	2000	5025	4750	4200	3570	3100	2740	2460	2220	2035
With 80mm		2284	2159	1909	1622	1409	1245	1118	1009	925
Pilot Bearing	2200	4850	4650	4200	3570	3100	2740	2460	2220	2035
		2204	2113	1909	1622	1409	1245	1118	1009	925
CO3-14	1000	6170	5850	5580	4720	4110	3630	3260	2945	2690
		2804	2659	2536	2146	1868	1650	1431	1338	1222
CN3-14	1500	5350	5120	4850	4650	4110	3630	3260	2945	2690
		2431	2327	2204	2113	1868	1650	1431	1338	1222
	2000	5025	4750	4450	4650	4110	3630	3260	2945	2690
With 100mm		2284	2159	2022	2113	1868	1650	1431	1338	1222
Pilot Bearing	2200	4850	4650	4350	4150	4000	3630	3260	2945	2690
		2204	2113	1977	1886	1818	1650	1431	1338	1222

For determination of actual applied load, the following formula should be used.

$$L\ (lbs.) = \frac{126000 \times H.P.}{N \times D\ (inch)} \times F$$

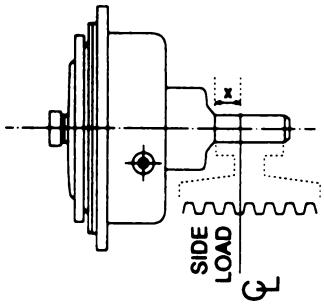
$$L\ (kgs.) = \frac{1430000 \times H.P.\ (Metric)}{N.D.\ (mm)} \times F$$

WHERE:

L = Actual load applied
N = Shaft speed in RPM
D = Pitch dia. of sheave
F = Load factor

★ 1.0 for chain or gear drive
★ 1.5 for timing belts
★ 2.5 for all V belts
★ 3.5 for flat belts

For all the severe shock drives, multiply above factors by 2.1 for added safety.



Note: Shaded areas are metric.

PTO SPECIFICATIONS

PEC PTO Model Number	Available SAE Housing Number	Clutch Diameter ins/mm	Max. Torque Recommended lb-ft/kg	Max. engine H.P./M.H.P. Recommended			Max. safe operating speed (RPM)		Approx. Net Weight lb/kg
				Light Duty	Normal Duty	Heavy Duty	Solid Plate	Split Plate	
CO1-06	4, 5, 6	6 1/2	178	40	27	20	3500	3500	53
CN1-06		165.10	21.91	40.15	27.25	20.28			24.00
CO1-07	4, 5, 6	7 1/2	234	53	35	27	3200	3200	55
CN1-07		190.50	26.12	53.05	35.06	27.41			24.92
CO1-08	3, 4, 5	8	282	64	43	32	3100	3050	72
		203.20	29.38	63.57	43.60	32.24			32.62
CO1-10	2, 3, 4	10	427	97	65	49	3100	2650	115
		254.0	48.50	96.79	65.90	49.56			52.10
CO1-11	2, 3	11	553	126	84	63	2850	2200	141
		279.4	65.16	126.05	84.69	63.70			63.88
CO2-11	2, 3	11	1090	239	159	120	2850	2200	155
CN2-11		279.4	129.39	236.71	155.65	107.88			70.23
CO1-14	1	14	900	204	136	102	2400	1950	260
CN1-14		355.6	123.39	217.50	138.13	102.61			117.80
CO2-14	0, 1	14	1710	389	259	195	2500	1950	328
CN2-14		355.6	235.16	378.13	246.43	169.48			148.61
CO3-14	0, 1	14	2565	583	389	292	2500	1920	408
CN3-14		355.6	353.38	557.50	351.98	226.60			184.86

Note: Figures in gray are in mm

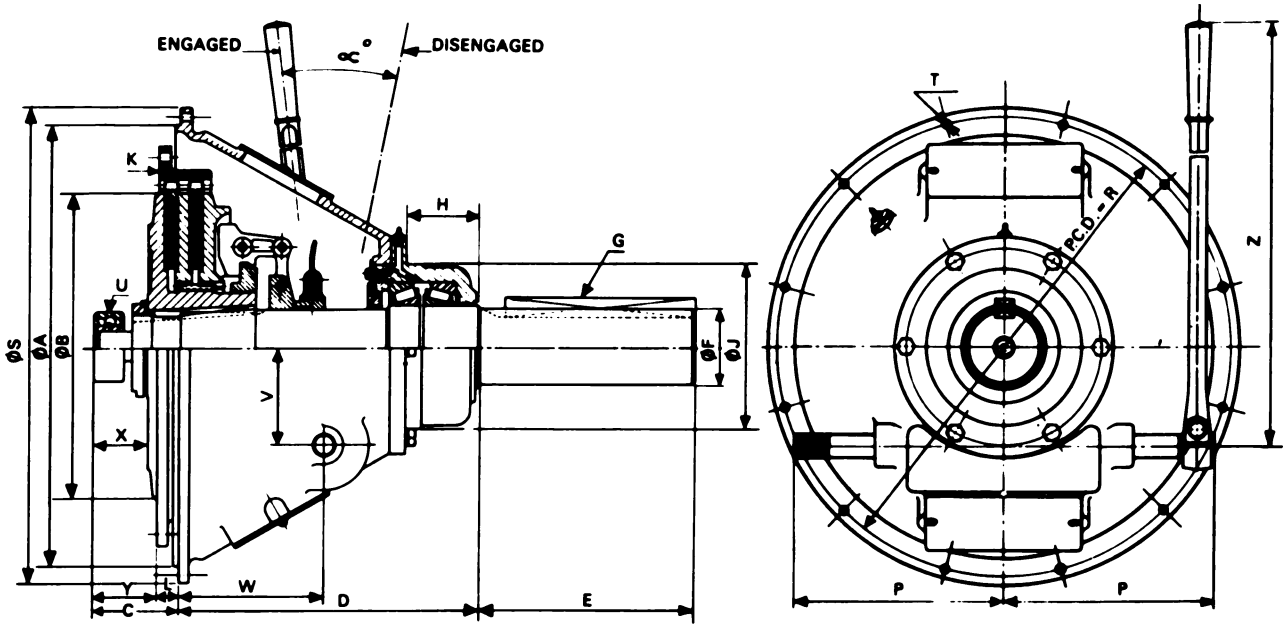
Maximum Speed

For Proper Release of Clutches with Split Plates

Size	RPM	Size	RPM	Size	RPM
6 1/2"	3250	10"	2375	14" single	1240
7 1/2"	3050	11 1/2" single	2100	14" double	940
8"	2900	11 1/2" double	1625	14" triple	800

LIGHT DUTY	NORMAL DUTY	HEAVY DUTY
AGITATORS, pure liquids.	**AGITATORS**, (solids or semi solids).	**COMPRESSORS**, reciprocating (single or 2 cylinder).
BLOWERS, centrifugal, vane.	**COMPRESSORS**, centrifugal, reciprocating (3 or more cylinders).	**CONVEYORS**, reciprocating and vibrating (natural frequency).
CONVEYORS, uniformly loaded or fed, all types except reciprocating and vibrating.	**CONVEYORS**, not uniformly loaded or fed, all types except reciprocating and vibrating.	**CRUSHERS**
GENERATORS	**ELEVATORS, BUCKET**, not uniformly loaded or fed.	**FEEDERS**, reciprocating.
ELEVATORS, BUCKET, uniformly loaded or fed, all types.	**FEEDERS**, (under bins, hoppers, etc.) apron, belt, screw rotary vane.	**MILLS**, hammer, rolling.
FEEDERS, disc type.	**HOISTS**	**PAPER MACHINERY**, chipper and debarkers.
PUMPS, centrifugal.	**KILNS, DRYERS**, rotary.	**MACHINES** of all types with severe impact loads or speed vibration and reversing type.
SCREENS, rotary, uniformly fed.	**MILLS**, ball pebble tube.	
MACHINES of all types with uniform loads, non-reversing.	**PUMPS**, reciprocating (3 or more cylinders).	
	MACHINES of all types with moderate pulsating loads, non-reversing.	

PTO ASSEMBLY DRAWING



HOUSING SPECIFICATIONS

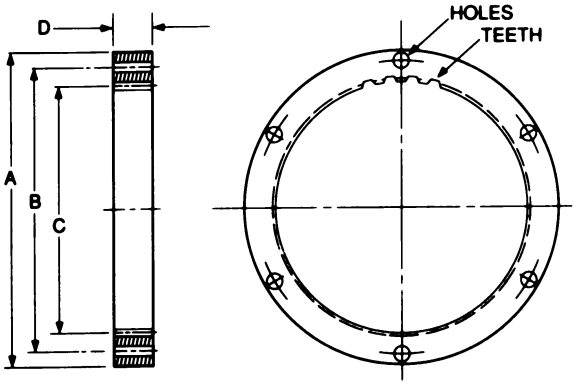
SAE Housing Number	A	R	S	T		P
				No.	Dia.	
6	10-1/2	11-1/4	12-1/8	8	13/32	7-3/4
	266.7	285.7	307.9		10.3	196.8
5	12-3/8	13-1/8	14	8	13/32	7-3/4
	314.3	333.3	355.6		10.3	196.8
4	14-1/4	15	15-7/8	12	13/32	7-3/4
	361.9	381	403.2		10.3	196.8
3	16-1/8	16-7/8	17-3/4	12	13/32	9-3/4
	409.5	428.6	450.8		10.3	247.6

SAE Housing Number	A	R	S	T		P
				No.	Dia.	
2	17-5/8	18-3/8	19-1/4	12	13/32	9-3/4
	447.6	466.7	488.9		10.3	247.6
1	20-1/8	20-7/8	21-3/4	12	15/32	9-3/4
	511.2	530.2	552.4		11.9	247.6
0	25-1/2	26-3/4	28	16	17/32	12-3/4
	647.7	679.4	711.2		13.5	323.8

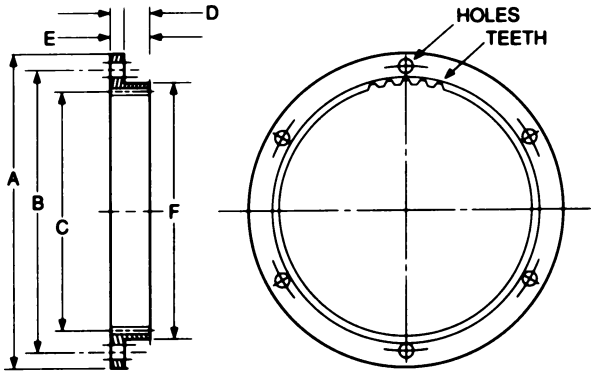
INSTALLATION DETAILS

PTO Model	Housing Length D	Shaft			Clutch de.	C	H	J	Pilot Bearing U			V	W	X	Y	L	Hand Lever Travel oc	Z	Driving Ring Number K
		Dia. – F +0.000 –0.001 +0.000 –0.026	Length E	Keyway G					Ø +0.0000 +0.0005 +0.0000 +0.0125	Width +0.000 +0.005 +0.000 +0.125	Type								
CO1-06	5-9/16	1-7/16	3-1/2	3/8 x 3/16	6-1/2	2-13/16	7/8	4-1/2	2.0472	0.5856	205 SF	3	2-1/8	1-5/16	1-5/8	1-3/16	13º	15-3/8	6X-325
	141.30	36.50	88.9	9.52 x 4.76	165.1	71.44	22.22	114.3	51.99	14.87		76.20	53.97	33.33	41.27	30.16		390.52	
CO1-07	5-9/16	1-7/16	3-1/2	3/8 x 3/16	7-1/2	2-13/16	7/8	4-1/2	2.0472	0.5856	205 SF	3	2-1/8	1-5/16	1-5/8	1-3/16	13º	15-3/8	7X-312
	141.30	36.50	88.9	9.52 x 4.76	190.5	71.44	22.22	114.3	51.99	14.87		76.20	53.97	33.33	41.27	30.16		390.52	
CO1-08	7-1/16	1-3/4	6	1/2 x 1/4	8	3-15/16	2-11/32	5	2.4409	0.6643	305 SF	3	1-7/8	1-1/4	1-1/2	2-7/16	17º	15-3/8	8X-298
	179.40	4.45	152.40	12.7 x 6.35	203.20	100.0	59.53	127.0	61.99	18.87		76.20	47.62	31.75	38.10	60.90		390.52	
CO1-10	8-5/8	2-1/4	5-1/2	5/8 x 5/16	10	3-15/16	3-3/4	5-3/4	2.8346	1.1825	306SFFC	3	2	1-9/16	1-13/16	2-1/8	15º	15-3/8	10X-149
	219.07	57.15	139.70	15.87 x 7.94	254.0	100.0	95.25	146.05	71.99	30.03		76.20	50.80	39.70	46.04	53.97		390.52	
CO1-11	9-1/4	2-1/4	6-1/2	5/8 x 5/16	11-3/8	3-15/16	3-3/4	5-3/4	2.8346	1.1825	306 SFFC	3	3-3/16	1-15/16	2-3/8	1-9/16	15-1/2º	15-3/8	11X-150
	234.95	57.15	165.10	15.87 x 7.94	288.92	100.0	95.25	146.05	71.99	30.03		76.20	80.96	49.20	60.32	39.70		390.52	
CO2-11	9-5/8	2-1/2	6-1/2	5/8 x 5/16	11-3/8	3-15/16	3	6-1/2	2.8346	1.1825	306 SFFC	3-3/4	4-1/16	2	2-3/8	1-9/16	15-1/2º	15-3/8	11X-151
CN2-11	244.47	63.50	165.10	15.87 x 7.94	288.92	100.0	76.20	165.10	71.99	30.03		95.25	103.20	50.80	60.32	39.70		390.52	
CO1-14	12-1/8	3	8-1/2	3/4 x 3/8	14	3-15/16	3-7/16	6-21/32	3.1496	1.370	307 SFFC	4-1/2	5-7/16	2-9/16	2-15/16	1	18º	23-3/8	14X-152
CN1-14	307.97	76.20	215.90	19.05 x 9.52	355.6	100.0	87.31	169.00	79.99	34.80		114.30	138.11	85.10	74.60	25.40		593.72	
CO2-14	13-3/4	3-1/2	10	7/8 x 7/16	14	3-15/16	3-3/8	7-1/2	3.1496	1.370	307 SFFC	4-1/2	6-5/8	2-7/16	2-15/16	1	18º	23-3/8	14X-153
CN2-14	349.25	88.90	254.00	22.22 x 11.11	355.6	100.00	85.72	190.50	79.99	34.80		114.30	168.27	61.90	74.60	25.40		593.72	
CN3-14	14-1/2	3-15/16	10	1 x 1/2	14	3-15/16	3-3/8	7-1/2	3.1496	1.370	307 SFFC	4-1/2	7-3/4	2-1/2	2-15/16	1	18º	23-3/8	14X-154
	368.30	100.00	254.00	25.4 x 12.7	355.6	100.0	85.72	190.50	79.99	34.80		114.30	196.85	63.50	74.80	25.40		593.72	

Note: Figures in gray are in mm



"A" TYPE

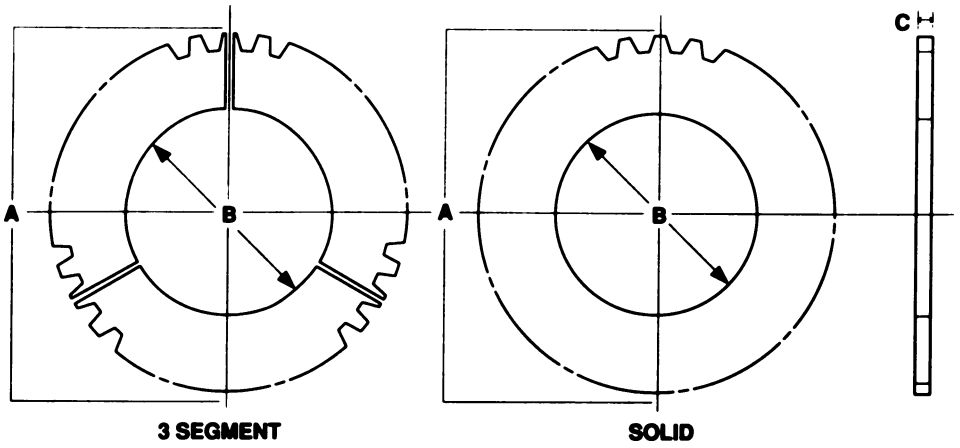


"B" TYPE

DRIVING RING DETAILS

PEC Driving Ring #	Driving Ring Type	A	B	C (Nominal)	D	E	F	Holes		Teeth No.	Approx. Net Weight lb/kg
								No.	Size		
6X-325	A	8-1/2	7-7/8	7	5/8	—	—	6	21/64	42	2-3/4
		215.9	200.0	177.8	15.8				8.33		1.25
7X-312	A	9-1/2	8-3/4	7-13/16	5/8	—	—	8	21/64	47	3-3/8
		241.3	222.25	198.4	15.8				8.33		1.53
8X-298	A	10-3/8	9-5/8	8-1/2	5/8	—	—	6	13/32	51	4-1/4
		263.5	244.5	215.9	15.8				10.3		1.93
10X-149	A	12-3/8	11-5/8	10-1/2	7/8	—	—	8	13/32	63	7
		314.3	295.3	266.7	22.2				10.3		3.17
11X-150	A	13-7/8	13-1/8	12	7/8	—	—	8	13/32	72	8
		352.4	333.4	304.8	22.2				10.3		3.62
11X-151	A	13-7/8	13-1/8	12	1-7/8	—	—	8	13/32	72	18
		352.4	333.4	304.8	47.6				10.3		8.16
14X-152	B	18-3/8	17-1/4	14-3/4	1-1/8	1/2	16	8	17/32	59	16-1/2
		466.7	438.1	374.6	28.6	12.7	406.4	8	13.5		7.48
14X-153	B	18-3/8	17-1/4	14-3/4	2-3/8	1/2	16	8	17/32	59	25-3/4
		466.7	438.1	374.6	60.33	12.7	406.4		13.5		11.67
14X-154	B	18-3/8	17-1/4	14-3/4	3-3/8	1/2	16	8	17/32	59	32-5/8
		466.7	438.1	374.6	85.73	12.7	406.4		13.5		14.78

Note: Figures in gray are in mm



DRIVE PLATE SPECIFICATIONS

PEC #	T.D. #	Outside Diameter Dim. A	Inside Diameter Dim. B	# Teeth	Thickness Dim. C	# Segments	Drive Ring #
6X-099	A-3507-E	7-1/4	3-5/8	42	7/16	3	6X-325
6X-099A	A-3507-D	7-1/4	3-5/8	42	7/16	1	6X-325
7X-100	A5436-A	8-1/4	4-1/2	47	7/16	3	7X-312
7X-100A	A5436	8-1/4	4-1/2	47	7/16	1	7X-312
8X-290	6479-S	8-3/4	5-1/2	51	7/16	3	8X-298
8X-290A	6479	8-3/4	5-1/2	51	7/16	1	8X-298
10X-131	5878-S	10-3/4	5-1/2	63	7/16	3	10X-149
10X-131A	5878	10-3/4	5-1/2	63	7/16	1	10X-149
10X-131B	06314-F	10-3/4	5-1/2	63	7/16	1	10X-149
11X-132	A-5579-A	12-1/4	6-1/4	72	7/16	3	(1) 11X-150 (2) 11X-151
11X-132A	A-5579	12-1/4	6-1/4	72	7/16	1	(1) 11X-150 (2) 11X-151
11X-132B	06310-L	12-1/4	6-1/4	72	7/16	1	(1) 11X-150 (2) 11X-151
14X-133	5659-L	15-5/32	7	59	5/8	3	(1) 14X-152 (2) 14X-153 (3) 14X-154
14X-133A	5659-K	15-5/32	7	59	5/8	1	(1) 14X-152 (2) 14X-153 (3) 14X-154
14X-134	5659-N	15-5/32	9-1/4	59	5/8	3	(1) 14X-152 (2) 14X-153 (3) 14X-154
14X134A	5659-M	15-5/32	9-1/4	59	5/8	1	(1) 14X-152 (2) 14X-153 (3) 14X-154
14X-134B	05499-E	15-5/32	9-1/4	59	5/8	1	(1) 14X-152 (2) 14X-153 (3) 14X-154
18X-135	5658-H	19-1/8	12-1/2	75	5/8	3	

BEARING INTERCHANGE

PEC	TWIN DISC	NTN	SKF	MRC	N.D.	FAFNIR	IKO	McGILL	TORRINGTON
7X-281	M-177	6308-LL	6308-2RS	308-SZZ	Z-99308	308-NPP	—	—	—
7X-282	M-141-B	6205-LL	6205-2RS	205-SZZ	Z-99505	205-KPP	—	—	—
7X-326	M-141	6205-Z	6205-Z	205-SF	7507	205-KD	—	—	—
8X-284	M-163-A	6305-LL	6305-2RS	305-SFF	Z-99605	305-KDD	—	—	—
8X-285	M-1590	25521/25584	25521/25584	—	—	—	—	—	—
10-216	M-224-A	63306LLBC	462306	306-SFFC	—	W-306-PP	—	—	—
10-221	M-207	395/394-A	394A/395	—	—	—	—	—	—
10X-277	M-167	6306LL	6306-2RS	—	—	—	—	—	—
10X-278	M2262-A	63206LL	462206	206-SFFC	—	W-206-PP	—	—	—
10X-331	M-1687	5206CZZ	—	—	—	—	—	—	—
11X-218	M-2467	RA1562EBL	—	—	—	—	—	—	—
11X-222	M-2196	3920/3984	3920/3984	—	—	—	—	—	—
11X-225	M-2292	—	—	—	—	—	CR-12-UU	CF-3/R-SB	CRS-12
11X-330	M-224	5306AZZ	—	—	—	—	—	—	—
14X-217	M-1985	63307LLBC	462307	307-SFFC	—	W-307-PP	—	—	—
14X-219	M-2529	RA1567EBL	—	—	—	—	—	—	—
14X-220	M-2713	RA1572EBL	—	—	—	—	—	—	—
14X-223	M-282	563/568	563/568	—	—	—	—	—	—
14X-224	M-215	592-A/594	592-A/594	—	—	—	—	—	—
14X-226	M-2241	—	—	—	—	—	CR-14-VUU	CF-7/8-SB	CRS-14
14X-328	M-214	592-A/593	592-A/593	—	—	—	—	—	—

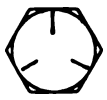
TORQUE VALUES

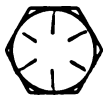
FOR TIGHTENING CAPSCREWS, BOLTS, NUTS, TUBE FITTINGS AND PLUGS

CAP SCREWS, BOLTS & NUTS

TORQUE (LB. FT.) FOR COARSE AND FINE THREADS (1)

NOMINAL THREAD DIAMETER	SAE GRADE 5		SAE GRADE 8		Screws for Universal Joint Bearing Caps
	AS RECEIVED (2)	LUBRICATED (3)	AS RECEIVED (2)	LUBRICATED (3)	LUBRICATED (3)
1/4	9 ± 1	7 ± 1	14 ± 1	11 ± 1	.....
5/16	19 ± 2	15 ± 2	27 ± 2	22 ± 2	.....
3/8	33 ± 3	27 ± 2	46 ± 4	38 ± 3	.....
7/16	52 ± 4	40 ± 3	73 ± 6	60 ± 5	64 ± 4
1/2	80 ± 6	65 ± 5	112 ± 8	90 ± 7	100 ± 7
9/16	112 ± 8	90 ± 8	158 ± 12	130 ± 10	.....
5/8	158 ± 12	130 ± 10	224 ± 16	180 ± 15	190 ± 10
3/4	280 ± 20	225 ± 20	390 ± 30	320 ± 25	330 ± 17
7/8	448 ± 32	360 ± 30	630 ± 50	510 ± 40	510 ± 40
1	680 ± 50	540 ± 45	960 ± 70	775 ± 60	.....
1 1/8	850 ± 60	675 ± 60	1360 ± 100	1100 ± 85	.....
1 1/4	1175 ± 85	925 ± 75	1850 ± 150	1500 ± 125	.....





(4)

SAE STANDARD HEX BOLT HEAD MARKINGS

12 Pt. Head and Undercut Body

TAPERED PIPE PLUGS

RECOMMENDED TORQUE (LB. FT.)

NPTF SIZE	LUBRICATED (a)	
	In Cast Iron or Steel	In Aluminum
1/16-27	8.5 ± 1.0	5.5 ± 0.7
1/8-27	10.5 ± 1.3	6.5 ± 0.8
1/4-18	25 ± 3	16 ± 2
3/8-18	27 ± 3	17 ± 2
1/2-14	50 ± 6	30 ± 4
3/4-14	54 ± 7	34 ± 4
1 -11 1/2	80 ± 10	50 ± 6
1 1/4-11 1/2	85 ± 10	55 ± 7
1 1/2-11 1/2	85 ± 10	55 ± 7

(a) THE LUBRICANT IS TO BE JOHN CRANE INSOLUBLE PLASTIC LEAD SEAL NO. 2 OR EQUIVALENT OR LOCTITE NO. 92 OR EQUIVALENT AND PLUGS ARE TO BE CAPABLE OF REMOVAL WITHOUT DAMAGE. OVERTIGHTENING MAY CAUSE INITIAL LEAKAGE PLUS POTENTIAL REMOVAL DAMAGE. AN OPTION OF A MAX. OF TWO FULL TURNS AFTER FINGER TIGHTENING THE PLUG MAY BE USED IF REQUIRED AND IF REMOVAL CONDITIONS ARE MET.

C

(1) THESE TORQUE VALUES APPLY TO USE OF IRONS. STEELS AND ALUMINUM TAPPED HOLES.
THE THREAD ENGAGEMENT LENGTH IN ALUMINUM IS TO BE TWICE THE NOMINAL THREAD DIAMETER AND ENGAGEMENT LENGTH RATIO IS TO BE 1.5 FOR IRONS AND SOFT STEEL WHEN ZINC PLATING IS USED. LUBRICATE THE ZINC PLATED SURFACES OF THE SCREWS AND/OR NUTS AND USE SPECIAL TORQUE VALUES.

(2) USE FOR ALL CAPSCREWS, BOLTS AND NUTS COATED ONLY WITH THE FASTENER MANUFACTURER'S RUST PREVENTATIVE OIL AND USE FOR PARTS WIPED OR WASHED NEARLY FREE OF OIL. DO NOT USE FOR PLATED PARTS.

(3) USE FOR ALL CAPSCREWS AND NUTS WHOSE THREADS AND WASHER FACE ARE LUBRICATED, ALSO FOR SCREWS OR NUTS WHOSE WASHER FACE IS ASSEMBLED AGAINST A HARDENED WASHER OR SMOOTH FINISHED HARD PART. (R_c40 OR ABOVE AND 40AA MAX.). ALSO USE FOR PLATED SCREWS (EXCEPT ZINC PLATED).
LUBRICATING THE THREADS AND SCREW OR NUT FACE WITH SAE 20 OR 30 OIL IS RECOMMENDED FOR BEST RESULTS FOR ALL THE GRADE 8 SCREWS AND IS REQUIRED FOR ALL THE UNIVERSAL JOINT BEARING CAPSCREWS.

DO NOT USE MOLY-DISULFIDE, WHITE LEAD, COPPER FILLED OR OTHER SUCH FILLED LUBRICANTS WITH THESE TORQUE VALUES. SUCH LUBRICANTS REQUIRE SPECIAL TORQUE VALUES.

(4) SOCKET HEAD SCREWS AND 12 POINT HEAD SCREWS WITH FULL BODY ARE GRADE 8 OR BETTER QUALITY AND ARE TO BE ASSEMBLED WITH THE ABOVE TORQUE VALUES.

WARRANTY

PEC Manufacturing guarantees all parts and assembled products against defective materials and workmanship for a period of 1 year or 2000 hours from the date such part or product is put into service.

PEC Manufacturing reserves the right to repair, replace or issue credit for any parts or products found by PEC to be defective in material or workmanship.

This warranty is void if the part or product failure is found by PEC to be the result of an accident, neglect, abuse or improper installation.

All parts or products for which warranty is claimed, must be returned to PEC Manufacturing within the warranty period, with transportation charges prepaid.

This warranty does not provide for labor or other costs incurred by buyer for removal and reinstallation of part or product covered by this warranty. Buyer assumes full responsibility for such labor and other costs.

Buyer agrees to indemnify and hold PEC Manufacturing harmless from and against any loss, liability, damages or expenses resulting from injury to persons or property, without limitation, due to acts or omissions of the buyer, its agents and employees in the installation, use and operation of products of PEC Manufacturing origin, and shall assert no claim against PEC Manufacturing for consequential damages.

PEC Manufacturing reserves the right to improve its products through changes in material or design without being obligated to incorporate such changes in products for prior manufacture. Any such changes in material or design cannot be used by buyer as proof of insufficiency or inadequacy of prior material or design.

This written warranty is the only warranty provided by PEC Manufacturing and supersedes all other warranties, express or implied.