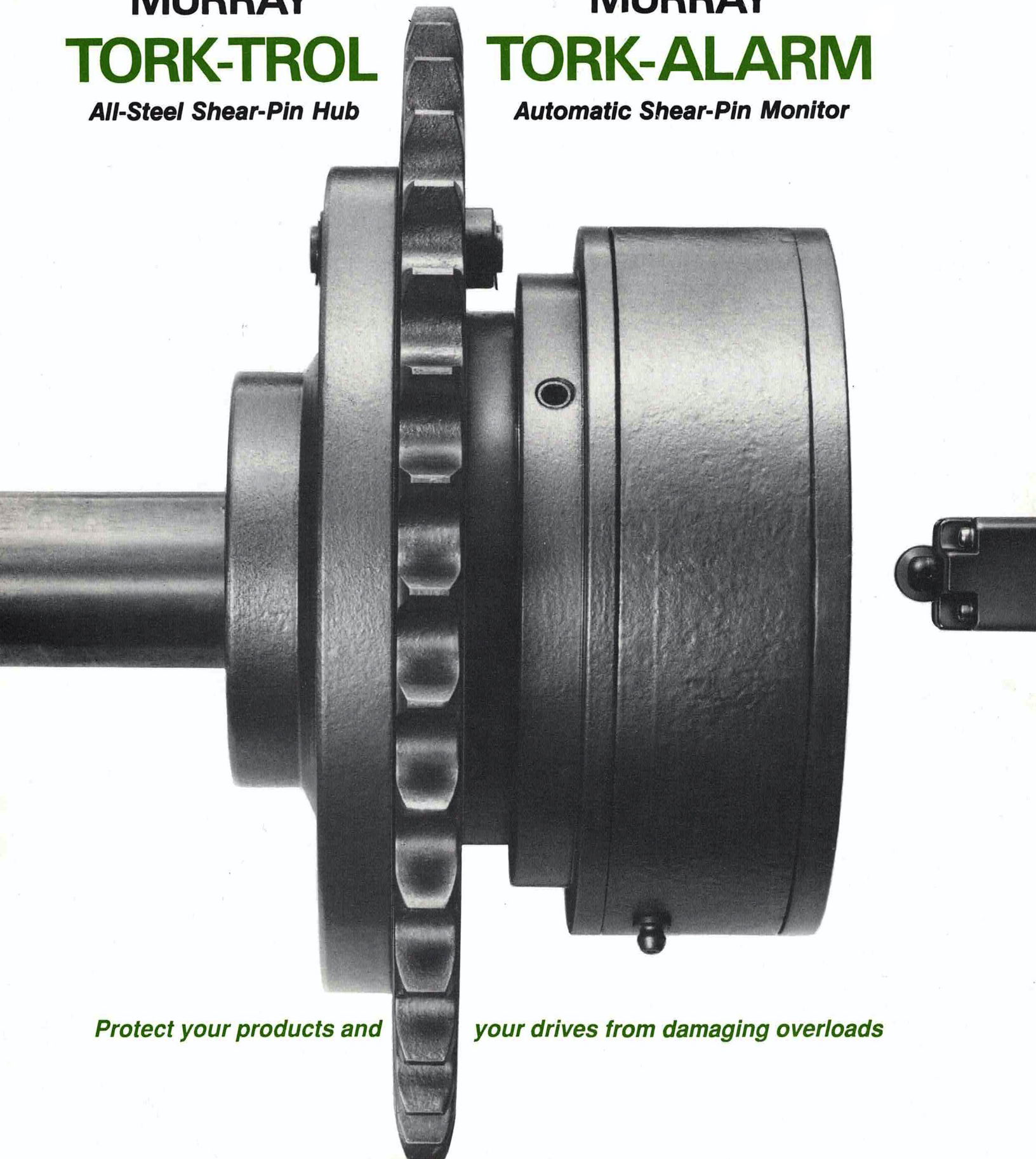


# MURRAY TORK-TROL

*All-Steel Shear-Pin Hub*

# MURRAY TORK-ALARM

*Automatic Shear-Pin Monitor*



*Protect your products and*

*your drives from damaging overloads*



# MURRAY TORK-TROL

***Shear-Pin Hubs, Your Best Choice For Complete Protection: Here's Why . . .***

- **All-Steel Construction**

Tork-Trol hubs are compact and strong. They take less space on the shaft and have higher torque ratings than cast iron or iron-on-steel hubs of similar size.

- **Corrosion-Resistant Bronze Bushings**

Hub sections that rotate when a pin shears are separated by a bronze bushing. They can't fret or corrode together. Breakaway torque is always uniform and repeatable.

- **Disc-Type Design**

Pins are located in a solid steel disc, which is much stronger and more reliable than "arm-type" designs. Disc-type design also makes it possible to provide multiple pin locations where desired.

- **Pins Mounted In Special Shear Bushings**

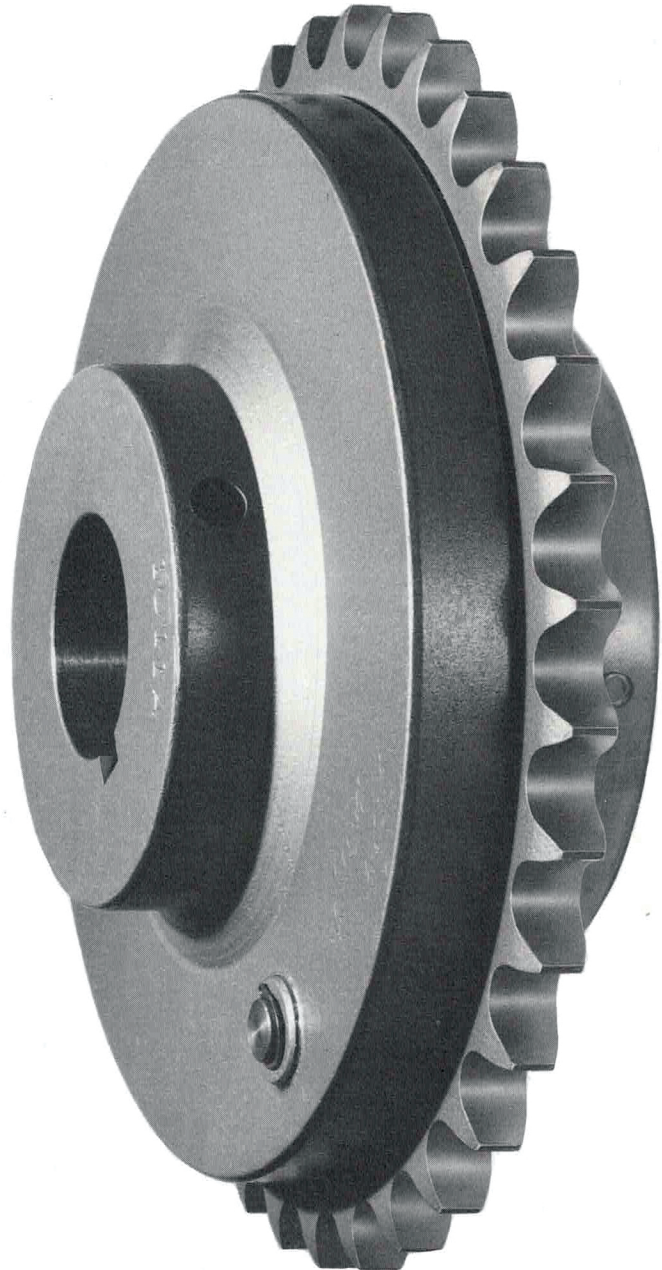
Heat treated, sharp-edged shear bushings are press-fit at the head to provide a true shearing action. Pin bending, common with ordinary drill bushing equipped hubs, is minimized for more reliable operation.

- **Welded Steel Sprockets**

Standard construction on Tork-Trol hubs, eliminates the inherent problems of bolted sprockets. Hub and sprocket are welded together for maximum strength.

- **Outstanding Versatility**

Two standard styles, and the widest range of stock sizes in the industry make Tork-Trol hubs your best choice for most applications. And, where a special hub is needed, Tork-Trol's simple design makes modification quick and inexpensive.

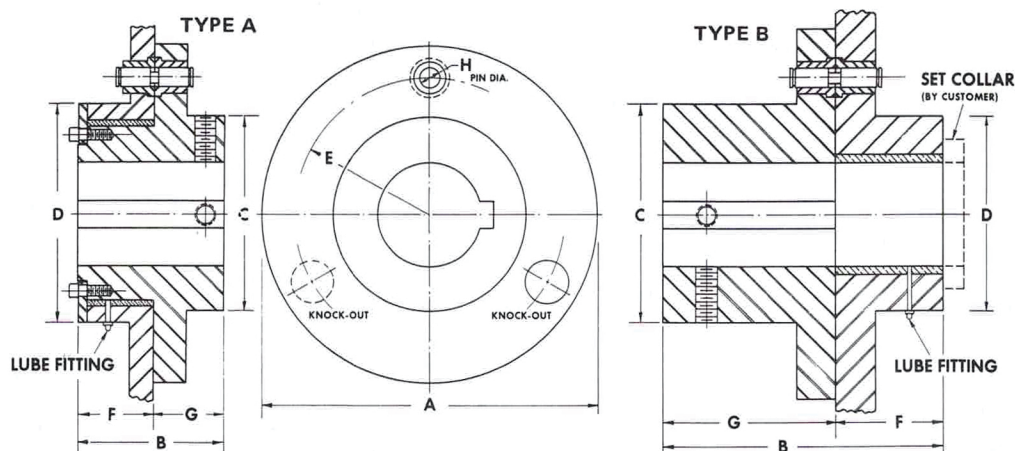


Tork-Trols are premium quality shear-pin hubs, designed to protect heavily loaded, slow-speed drives against damage from overloads and stalls. They are built in two styles with standard bore sizes from 7/8" to 9 1/2". Larger bores available on request.

Use them with Murray's precision flame-cut steel conveyor sprockets,

compensating drive sprockets, or roller chain sprockets, to build reliable, low-cost, shear-pin protected drives for your equipment. They combine the advantages of custom-built drives with the economy of standard, off-the-shelf components and the strength of all-steel construction.

**Table I General Dimensions — Standard Tork-Trol**



**TYPE A**

STD. HUB	TYPE	MAX. BORE	A	B	C	D	E	F	G	H
15	A	1-1/2	5-1/2	2-1/2	3	3-1/2	2-1/4	1-3/8	1-1/8	1/4
25-1	A	2	7-3/4	3-3/8	4	5	3-1/8	1-13/16	1-9/16	7/16
25-2	A	2-1/2	7-3/4	3-3/8	4-1/4	5	3-1/8	1-13/16	1-9/16	7/16
35-1	A	3-1/8	12	4-1/2	5-1/2	7	5	2-1/2	2	5/8
35-2	A	3-1/2	12	4-1/2	6	7	5	2-1/2	2	5/8
45-1	A	4-1/2	14	6	7	8-1/2	5-1/4	3-3/8	2-5/8	3/4
45-2	A	5	14	6	8	9	5-1/2	3-3/8	2-5/8	3/4
55	A	5-1/2	18	7-3/4	9	11-1/2	7	4-7/8	2-7/8	3/4
65	A	6-1/2	19	9	10	12	8	5-3/4	3-1/4	1"
75	A	7-1/2	23	10	11	14	9	6-1/2	3-1/2	1-1/4
85	A	8-1/2	25	12	13	16	10	7-1/2	4-1/2	1-1/2
95	A	9-1/2	30	14	14-1/2	18	12	9-1/2	4-1/2	1-1/2

**TYPE B**

35-1	B	3-1/8	12	6-1/2	5-1/2	5	5	2-1/2	4	5/8
35-2	B	3-1/2	12	6-1/2	6	5-1/2	5	2-1/2	4	5/8
45-1	B	4-1/2	14	8	7	6	5-1/4	3	5	3/4
45-2	B	5	14	9	8	7	5-1/2	3	6	3/4
55	B	5-1/2	18	11	9	8	7	4	7	3/4
65	B	6-1/2	19	13	10	8-1/2	8	5	8	1
75	B	7-1/2	23	16	11	10	9	6	10	1-1/4
85	B	8-1/2	25	20	13	12	10	8	12	1-1/2
95	B	9-1/2	30	22	14-1/2	14	12	9	13	1-1/2

Dimensions In Inches.  
Three pins included with standard assembly.  
Extra shear bushings can be furnished to order.

Tork-Trol hubs with double sprockets available.  
Certified prints on request.  
NOTE: Grease hub on regular schedule.



# TORK-TROL

## Selection Procedure

### Hub & Sprocket Size

Hub size and the minimum number of teeth on the sprocket it carries are both related to shaft diameter. Refer to Table 2 to select the proper Tork-Trol hub to fit your shaft size, and then read the minimum number of teeth required on your roller chain sprocket, for that hub. If your sprocket has the minimum number of teeth or more, proceed with the torque and pin neck diameter calculations below.

If your application involves a sprocket with fewer teeth than the minimum indicated in Table 2, Murray can probably provide a special Tork-Trol hub designed to accommodate it. Other hub modifications are also possible to meet special needs. Consult your distributor or Murray's engineering department for assistance.

### Torque Load & Pin Neck Diameter

Use one of the three methods listed below to determine the torque load on the hub. Once the load is known, consult Table 3 and select an appropriate shear-pin neck diameter to carry it.

#### Symbols

- T — Torque in inch pounds
- HP — Horsepower at the sprocket
- RPM — Sprocket revolutions per minute
- R — Sprocket pitch radius
- CP — Chain pull in pounds
- 1.5 — Starting load factor

#### Method A

When reducer output torque and drive speed ratio are known.

$$T = \text{Output torque} \times \text{Drive Speed Ratio} \times 1.5$$

#### Method B

When horsepower at sprocket and sprocket RPM are known.

$$T = \frac{\text{HP} \times 63000 \times 1.5}{\text{RPM}}$$

#### Method C

When chain pull and sprocket pitch radius are known.

$$T = \text{CP} \times R \times 1.5$$

## Selection Example

### Select a Tork-Trol assembly for a conveyor chain drive:

**Conveyor Requirements:** Head shaft requires 5 HP at 22.8 RPM, with 1925 lbs. chain pull. Conveyor sprocket pitch diameter is 14.334 in. and head shaft diameter is 2-7/16 in.

**Drive Specifications:** Motor; Reducer with 4600 in. lbs. torque output; and 3:1 ratio chain drive consisting of RC80, 15-tooth and RC80 45-tooth sprockets. (Pitch diameter of RC80A45 sprocket is 14.334 in.).

### Hub & Sprocket Size

Refer to Table 2: A #25-2 Tork-Trol hub will fit the 2-7/16 in. diameter head shaft. The RC80A45 sprocket will fit the 25-2 hub and has more than the minimum number (28) of teeth.

### Find Torque Load & Pin Neck Diameter:

#### Method A

Known: Speed reducer output torque (4600 in. lbs.)  
Speed ratio of chain drive (3:1)

$$T = 4600 \times \frac{45}{15} \times 1.5 = 20,700 \text{ in. lbs.}$$

#### Method B

Known: Head shaft HP (5)  
Sprocket RPM (22.8)

$$T = \frac{5 \times 63000 \times 1.5}{22.8} = 20,700 \text{ in. lbs.}$$

#### Method C

Known: Chain pull (1925 lbs.)  
Sprocket pitch radius (7.17)

$$T = 1925 \times 7.17 \times 1.5 = 20,700 \text{ in. lbs.}$$

After determining the torque load, refer to Table 3 to select the appropriate pin neck diameter. It shows 3/8-in. diameter pin neck will shear at 20,700 in. lbs.

### To Order:

The part number for the appropriate Tork-Trol hub will be: 80A45 x 2-7/16 bore Tork-Trol Shear-Pin Hub Sprocket with a #25-2, Type A hub, Pin neck 3/8-in.



**Table 2 Bore Size and Minimum Sprocket For Standard Hubs**

HUB NO.	BORE RANGE	35	41	40	50	60	80	100	120	140	160	180	200	240
15	7/8 to 1-1/2	54	40	38	31	26								
25-1	1-1/2 to 2			52	42	36	28	23	20	17	16	14	13	
25-2	2-1/16 to 2-1/2			52	42	36	28	23	20	17	16	14	13	
35-1	2-9/16 to 3-1/8				60	54	41	35	30	25	22	20	18	16
35-2	3-3/16 to 3-1/2				60	54	41	35	30	25	22	20	18	16
45-1	3-9/16 to 4-1/2					64	47	39	35	28	25	23	21	18
45-2	4-9/16 to 5					64	47	39	35	28	25	23	21	18
55	5-1/16 to 5-1/2							49	42	40	32	29	26	22
65	5-9/16 to 6-1/2								45	40	33	30	27	23
75	6-9/16 to 7-1/2										40	36	32	27
85	7-9/16 to 8-1/2											40	35	30
95	8-9/16 to 9-1/2											48	45	36

*Special Tork-Trol hubs for undersize sprockets available.*

**Table 3 Shear Pin Torque Ratings (in. lbs.)**

PIN NECK DIA.	TORK-TROL HUB SIZE												
	#15	25-1	25-2	35-1	35-2	45-1	45-2	55	65	75	85	95	
3/32	900												
1/8	1600												
5/32	2600	3600	3600										
3/16	3700	5200	5200	8260									
7/32	5000	7000	7000	11260	11260								
1/4	6600	9200	9200	14700	14700	15500	16100						
9/32		11600	11600	18600	18600	19600	20400						
5/16		14400	14400	23000	23000	24200	25200	32000					
11/32		17400	17400	27800	27800	29300	30500	38750					
3/8		20700	20700	33000	33000	34700	36100	46000	52700				
7/16		28000	28000	45000	45000	47400	49600	63500	72500				
1/2				58900	58900	62000	64500	82000	94000	106,000			
9/16				74500	74500	78300	82000	104500	120000	134,300			
5/8				92200	92200	96500	101000	129000	148000	165,500	185,000	220,800	
11/16						117000	122000	156000	178000	200,000	223,000	267,200	
3/4						139000	145800	185550	212000	238,500	266,000	318,000	
13/16									249000	279,500	312,000	373,300	
7/8									288000	324,000	362,000	432,900	
15/16									332000	372,000	415,000	497,000	
1"									377000	424,000	472,500	565,400	
1-1/16										479,000	539,000	638,300	
1-1/8										546,000	598,000	715,600	
1-3/16										597,000	666,000	797,400	
1-1/4										662,600	740,000	883,500	
1-3/8											895,000	1,069,000	
1-1/2											1,060,200	1,272,000	

*Dimensions in inches.*

*Based on shear strength of 60,000 psi.*

*Pins with higher shear strength available on request.*

*Special pin sizes and/or neck diameters available on request.*



# MURRAY TORK-ALARM

*Shear Pin Monitors, The Logical Companion For Tork-Trol Hubs: Here's Why . . .*

- **Instant Warning of Pin Failure**

Tork-Alarm will sound a warning, or shut down a drive, within 10° of drive rotation after a pin shears.

- **Unique Design**

Unlike overload clutches or spring-detent devices, Tork-Alarm does not carry any part of the load. It can't wear out or change capacity with use.

- **Mechanical Simplicity**

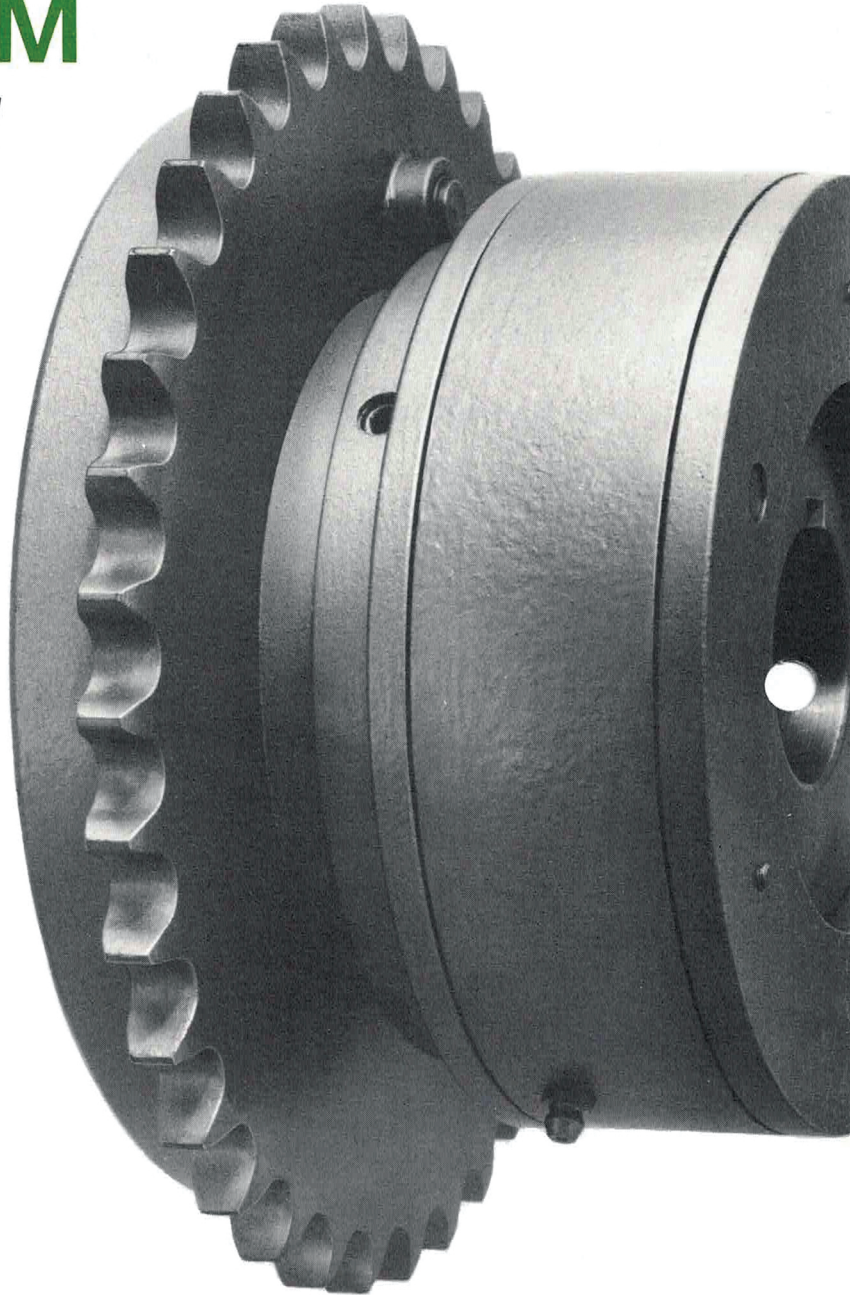
Tork-Alarm is a rugged, all mechanical device, with a minimum number of parts. All-steel construction, with heat treatment where necessary for strength and wear resistance. Elimination of complex mechanisms ensures optimum reliability.

- **Complete Compatibility**

Can be used with any size or style Tork-Trol hub and sprocket. Basic design simplicity makes even special models economical.

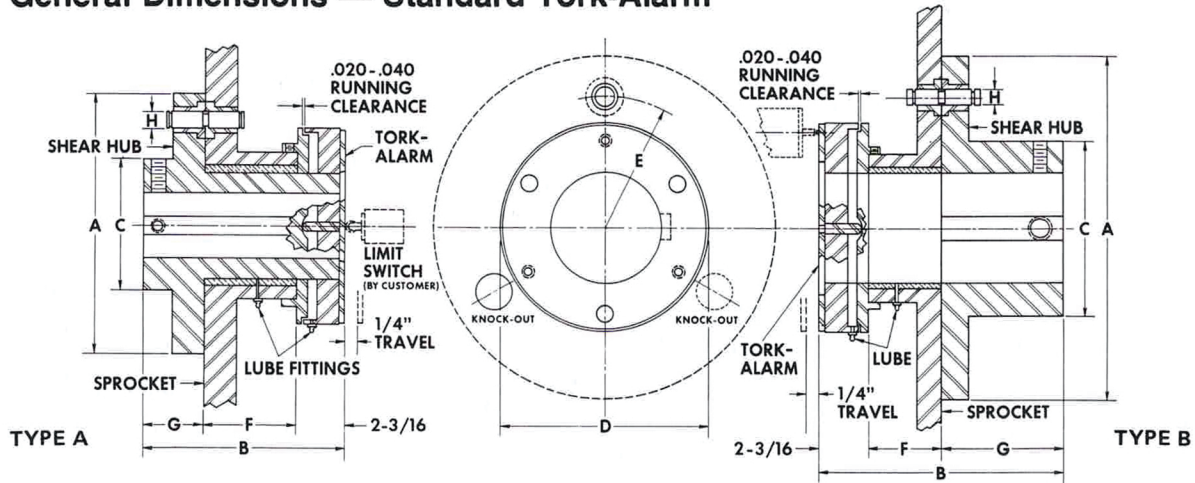
- **Remote Signaling Capability**

You can monitor performance of hidden drives from a central station. Know instantly when a pin shears.





## General Dimensions — Standard Tork-Alarm



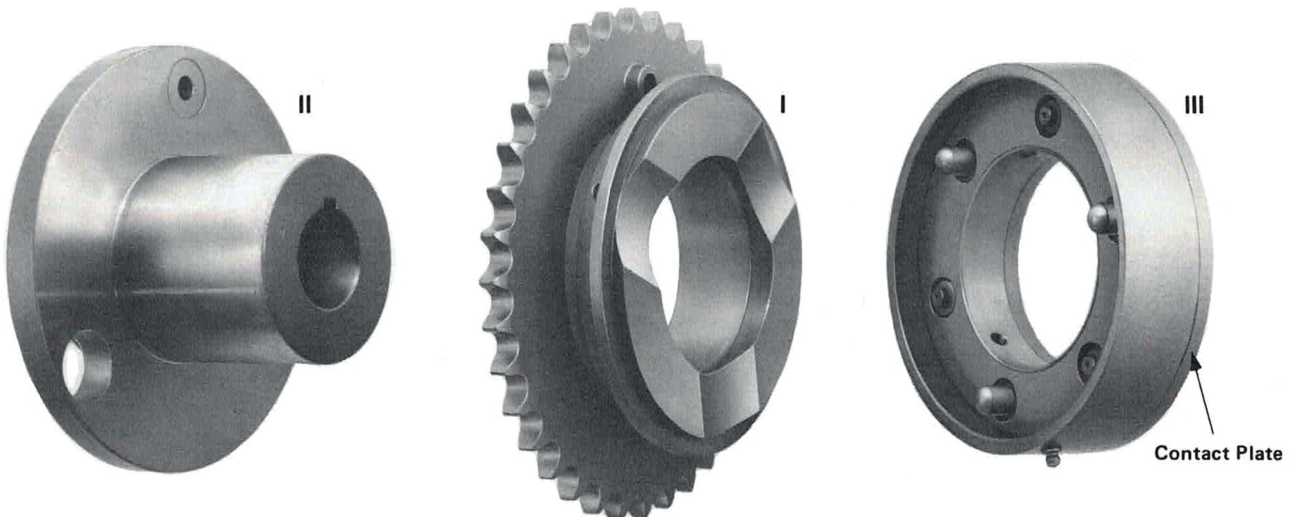
STD. HUB	TYPE	MAX. BORE	A	B	C	D	E	F	G	H
15	A	1-1/2	5-1/2	5-3/16	3	5	2-1/4	1-7/8	1-1/8	1/4
25-1	A	2	7-3/4	6-1/4	4	6-5/8	3-1/8	2-1/2	1-9/16	7/16
25-2	A	2-1/2	7-3/4	6-1/4	4-1/4	6-5/8	3-1/8	2-1/2	1-9/16	7/16
35-1	A	3-1/8	12	6-7/16	5-1/2	8-5/8	5	2-1/4	2	5/8
35-2	A	3-1/2	12	6-7/16	6	8-5/8	5	2-1/4	2	5/8
45-1	A	4-1/2	14	8-9/16	7	10-3/4	5-1/4	3-3/4	2-5/8	3/4
45-2	A	5	14	8-9/16	8	10-3/4	5-1/2	3-3/4	2-5/8	3/4
55	A	5-1/2	18	9-9/16	9	11	7	4-1/2	2-7/8	3/4
45-1	B	4-1/2	14	10-3/16	7	8-5/8	5-1/4	3	5	3/4
45-2	B	5	14	11-3/16	8	8-5/8	5-1/2	3	6	3/4
55	B	5-1/2	18	13-3/16	9	8-5/8	7	4	7	3/4
65	B	6-1/2	19	15-3/16	10	10-3/4	8	5	8	1
75	B	7-1/2	23	18-3/16	11	10-3/4	9	6	10	1-1/4
85	B	8-1/2	25	22-3/16	13	14	10	8	12	1-1/2

Dimensions in inches. Limit switch not supplied.

### How Tork-Alarm Works

Part I is secured to the sprocket, Part II to the shaft. Part III, the Tork-Alarm mechanism, is attached to Part II or shaft, but has a contact plate that is free to move along the shaft axis. While the shear-pin is intact, all parts rotate together. When a pin shears, Part I continues to rotate,

but Parts II and III stop. Continued rotation of Part I forces cam pins attached to the contact plate out of their grooves, resulting in linear motion of the plate. This motion is used to trip a limit switch (not supplied) to sound an alarm or shut down the drive.





# MURRAY

## ***Tork-Trol Shear-Pin Hub***

- All-Steel Construction
- Corrosion Resistant Bronze Bushings
- Disc-Type Design
- Pins Mounted In Special Shear Bushings
- Welded Steel Sprockets
- Outstanding Versatility

## ***Tork-Alarm Shear-Pin Monitor***

- Instant Warning Of Pin Failure
- Unique Design
- Mechanical Simplicity
- Complete Compatibility
- Remote Signaling Capability

***Your best choice for  
complete drive protection***

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