

## Optimization Examples

```

BLE STRESS .....F8.0,
S OF ELASTICITY .....E11.3,4H
MODULUS .....E11.3,4H
M WORKING LOAD .....F10.2,5H
M FREE LENGTH .....F7.2,8H
M WIRE DIAMETER .....F7.3,8H
M OUTSIDE SPRING DIAMETER .....F7.2,8H
D COMPRESSION FORCE .....F10.2,5H
M DEFLECTION UNDER PRELOAD .....F7.2,8H
TION FROM PRELOAD TO MAXIMUM LOAD ....F7.2,8H
EFFICIENT .....F5.1,/)
30
IS NOT GUIDED,/)
IS GUIDED,/)
VALUES OF DESIGN VARIABLES,/)
AMETER .....F7.3,8H
AN DIAMETER .....F7.2,8H
OF COILS .....F6.1,///
CHARACTERISTICS,/)
OF WIRE .....F8.2,7H
+2.)
OF WIRE .....F8.2,7H
NGTH .....F7.2,8H
CONSTANT .....F8.2,8H
EIGHT .....F7.2,8H
ON UNDER PRELOAD .....F7.2,8H

```

## Optimum Belleville Spring

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```

24 WRITE(6,24)DELS
   FORMAT(1H,43HDEFLECTION FROM PRELOAD TO MAXIMUM LOAD ....F7.2,
1   IN.,/)
   WRITE(6,25)PCRT
25 FORMAT(1H,43HBUCKLING LOAD .....F10.2,
1   LB,/)
   WRITE(6,26)C
26 FORMAT(1H,43HRATIO COIL DIAMETER TO WIRE DIA .....F6.2,
   RETURN
   END

```

## 8.5 OPTIMUM BELLEVILLE SPRING DESIGN PACKAGE: USER'S MANUAL

The objective of this package is to automatically design a minimum weight spring, subject to user-supplied specifications.

### 8.5.1 General Configuration

The general configuration is shown in Fig. 8.17. The load is assumed to be concentric, and the loading faces are parallel.

#### Design Variables

$D_e$  = external diameter, in.

DE

$D_i$  = internal diameter, in.

DI

$t$  = thickness, in.

THICK

$h$  = free height, in.

HIT

#### Specifications

The designer must provide data for the following specifications:

$P_{max}$  = desired maximum load, lb

PMA

$\delta_{max}$  = desired maximum deflection, in.

DEFT

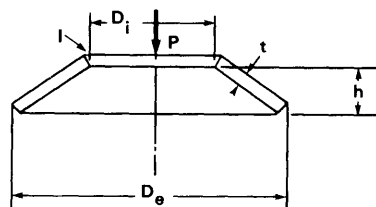


FIG. 8.17 Spring configuration.